

Millipore®

Preparation, Separation,
Filtration & Testing Products

User Guide

Mobius® FlexReady Solution with Smart Flexware® Assemblies

Applicable for MSP5511440x & MSP5511442x

The life science business of Merck KGaA, Darmstadt,
Germany operates as MilliporeSigma in the U.S. and Canada.



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System Overview

Introduction

The Mobius® FlexReady Solutions with Smart Flexware® Assemblies are fully automated industrial systems that deliver optimal operational flexibility. Unlike traditional single-use technology, the systems are quick and easy to set-up, requiring only a minimum number of components.

The system utilizes Smart Flexware® single use flow paths that minimize the risk of cross contamination and the risk of operator error by minimizing the number of connections required.

The system is controlled by the Common Control Platform® (CCP®) software.

A Clamshell Lift and Clamshell Storage Rack are available for moving, storing, installing and removing the clamshell. The lift and rack must be ordered separately.

This guide describes all hardware options and the Smart Flexware® Assemblies for Mobius® Systems. It also provides instructions for using the system including the CCP® software options and instructions.

This user guide is accompanied by a CD containing electrical schematics, and technical documentation for the following components:

- Pumps
- Tanks
- Tank Jackets
- Pressure Sensors
- Temperature and Conductivity Sensors
- pH Sensor
- UV Sensor
- Flowmeters
- Touch screen
- Automated Pinch Valves
- Automated Pressure Control Valve
- Bubble Trap Level Sensors
- End Product Air Sensor
- Precolumn Bubble Sensor
- Feed and Filtrate Weight Scale

The Mobius® FlexReady Solutions with Smart Flexware® Assemblies are available for Chromatography applications and TFF applications.

The Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography

The Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography is a fully automated chromatography system designed to achieve optimum separation and purification of monoclonal antibodies, vaccines, plasma and therapeutic proteins while offering a high degree of operational flexibility. The hardware platform allows for rapid scale up or down depending on the application.

This Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography is available in two configurations:

- Chrom. 2.2 L/min with a feed flow range of 0.1 to 2.2 L/min
- Chrom. 8.0 L/min with a feed flow range of 1.60 to 10 L/min with single-use flowmeters and 1.60 to 8 L/min with multi-use flowmeters

Each system consists of a Smart Cart with a Clamshell, Column Instrumentation Kit, Bubble Trap Support, Pump and Manifold Cart, a Filter Support Kit, and a Smart Flexware® Assembly for Mobius® Systems.


The Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF



The Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF is a fully automated TFF system designed with a single use flowpath that eliminates the need for cleaning operations and validation. This Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF is available in two configurations, TF2S which uses from 0.5 to 5.0 m² Pellicon® 2 or 3 cassettes and TF3S which uses from 2.0 to 10.0 m² Pellicon® 2 or 3 cassettes. Pellicon® cassettes are ordered separately.

Each system consists of a Smart Cart with a Clamshell, a Tank Cart, a Pump and Manifold Cart, an Instrumentation Kit and a Smart Flexware® Assembly for Mobius® Systems.

Operator and Equipment Safety


Anyone operating or near the Mobius® FlexReady Solution with Smart Flexware® Assemblies must comply with the following:



	<p>Read and understand this user guide and all component user guides before using the system. Failure to follow instructions could result in user injury or system damage.</p>
	<p>Read and understand all maintenance instructions in this user guide before performing maintenance on the system. Failure to follow instructions could result in user injury or system damage.</p>
	<p>Use appropriate personal protective equipment, including eye and ear protection, when operating the system. UV eye protection is required when servicing the UV lamp.</p>
	<p>Follow the unpacking instructions on the outside of the crate when removing the system from packaging. Failure to follow these instructions could result in operator injury or equipment damage.</p>
	<p>Use appropriate auditory protection during prolonged use.</p>
	<p>Prior to operation, ensure the system is fully assembled as described in "Assembling and Setting Up the Hardware" and "Assembling and Installing the Flexware® Assembly." Ensure that containers and Flexware® assemblies are properly installed and the pumps and sensors are properly connected.</p>
	<p>Use caution if the system is used on sloped floors.</p>
	<p>Never operate the system in a hazardous environment or use with flammable, combustible, or solvent liquids.</p>
	<p>Any alteration of the system from factory specification may cause unsafe conditions and void the product warranty.</p>
	<p>Use caution when opening and closing the door of the Smart Cart. Failure to open or close pinch valves at the appropriate times could result in trapped high pressure, product loss, damaged filters, chemical spills, or pump damage. Use the Close Door or Open Door recipe and carefully follow all operating instructions.</p>
	<p>Once the system is assembled, do not move it.</p>
	<p>Never move the Tank Cart with liquid in the containers or while system processes are running.</p>
	<p>Move the carts carefully. Avoid sharp turns.</p>
	<p>Engage the locks when the carts are stationary.</p>
	<p>Push the carts only by the push handles.</p>
	<p>Ensure there is no pressure in the Flexware® assemblies before dismantling connections or performing any maintenance operation.</p>
	<p>Do not leave the system unattended during operation.</p>
	<p>The system is not supplied with a safety valve on the tank jacket. If required, user must install a safety valve on the jacket according to applicable regulations and guidelines. For ASME requirements, refer to ASME code BPVC section VIII division 1 paragraph 38G-125.</p>
	<p>Before dismantling the system or performing any maintenance operation, ensure that all sources of energy are shut down (fluid, gas, and electricity).</p>
	<p>Ensure there are no kinks or bends in any tubing.</p>
<p>Use the pressure sensor to monitor signs of pressure increase. If any part of the Flexware® assembly starts to balloon, stop the pump immediately.</p>	
<p>In case of any leak, stop the pump. When the pressure sensor reads zero, identify the location and cause of the leak.</p>	

	<p>Use caution when opening and closing the automatic pinch valves. Failure to open or close the automatic pinch valves on the manifold at the appropriate times could result in trapped high pressure, product loss, chemical spills, pump damage or operator danger.</p>
	<p>Keep hands clear of the valves in the manifold during operation to avoid pinching. An Emergency Release Button is located on the manifold.</p>
	<p>Disconnect UV lamp before servicing the unit.</p>
	<p>The clamshell is heavy (approximately 80 kg). Use the Clamshell Lift to move the clamshell. If the lift is not used, follow local regulations regarding lifting limits.</p>
	<p>Do not expose the Flexware® Assemblies to NaOH for extended periods of time.</p>
	<p>Risk of electric shock.</p>
	<p>To completely shut down the power to the control box, unplug the power cord from the power source</p>
	<p>Visibly inspect the power cord and cables for damage. Replace any worn or damaged power cord and cables.</p>
	<p>Ensure that the power cord and cables do not present a tripping hazard and are located in a dry area.</p>
<p>Use appropriate power supply cable and circuit breakers.</p>	

Sécurité de l'opérateur et de l'équipement


Toute personne utilisant la solution Mobius® FlexReady avec ensembles Smart Flexware® ou intervenant à proximité, doit respecter les consignes suivantes:



	<p>Prenez connaissance du présent guide de l'utilisateur et des guides de tous les composants avant d'utiliser le système. Le non-respect de ces instructions entraîne des risques de blessure ou d'endommagement du système.</p>
	<p>Vous devez lire et comprendre les instructions du présent guide de l'utilisateur avant de procéder à la maintenance du système. Le non-respect de ces instructions entraîne des risques de blessure ou d'endommagement du système.</p>
	<p>Utilisez des équipements de protection appropriés et protégez vos yeux et vos oreilles lorsque vous faites fonctionner le système. Portez impérativement un équipement de protection des yeux contre les UV pendant toute intervention sur la lampe UV.</p>
	<p>Suivez les instructions de déballage indiquées sur la caisse pour retirer le système de l'emballage. Le non-respect de ces instructions entraîne des risques de blessure de l'opérateur ou d'endommagement de l'équipement.</p>
	<p>Utilisez une protection auditive adéquate en cas d'utilisation prolongée.</p>
	<p>Avant la mise en service, assurez-vous que le système est entièrement assemblé de la manière décrite dans « Assemblage et configuration du matériel » et « Assemblage et installation de l'ensemble Flexware® ». Veillez à ce que les conteneurs et les ensembles Flexware® soient installés correctement et à ce que les pompes et les capteurs soient raccordés convenablement.</p>
	<p>Soyez prudent si le système est utilisé sur des sols en pente.</p>
	<p>N'utilisez jamais le système dans un environnement dangereux ou à proximité de liquides inflammables, de combustibles ni de solvants.</p>
	<p>Toute modification du système par rapport aux spécifications d'usine peut rendre le matériel dangereux et annule toute garantie de produit.</p>
	<p>Soyez prudent lors de l'ouverture et de la fermeture du Smart Cart. L'ouverture et la fermeture des vannes à des moments inopportuns sont susceptibles d'entraîner la formation de poches d'air sous pression, la perte de produit, l'endommagement des filtres, des projections chimiques ou l'endommagement de la pompe. Respectez les instructions de fonctionnement.</p>
	<p>Une fois le système assemblé, ne le déplacez pas.</p>
	<p>Ne déplacez pas le système alors qu'il y a du liquide dans les conteneurs ou s'il est en cours de fonctionnement.</p>
	<p>Déplacez les chariots avec précaution. Évitez les virages à angles trop serrés.</p>
	<p>Enclenchez les freins lorsque les chariots sont stationnaires.</p>
	<p>Pour pousser les chariots, utilisez exclusivement les poignées.</p>
<p>Assurez-vous qu'il n'y a pas de pression dans les ensembles Flexware® avant de démonter les raccordements ou d'effectuer une opération de maintenance.</p>	
<p>Ne laissez pas le système sans surveillance pendant le fonctionnement.</p>	
<p>Le système n'est pas fourni avec une soupape de sécurité sur la double enveloppe de la cuve. Si nécessaire, l'utilisateur doit installer une soupape de sécurité sur la double enveloppe, conformément aux directives et réglementations applicables. Pour les exigences de l'ASME, reportez-vous à l'ASME, code BPVC, section VIII, division 1, paragraphe 38G-125.</p>	

	Avant de démonter le système ou de procéder à toute opération de maintenance, vérifiez que toutes les sources d'énergie sont coupées (fluide, gaz, et électricité).
	Augmentez progressivement la vitesse de la pompe. Ne démarrez pas la pompe avec une vitesse élevée.
	Vérifiez l'absence de plis et de nœuds ou de pliures dans les tuyaux.
	Utilisez le capteur de pression pour rechercher des signes d'augmentation de la pression. Si une partie de l'ensemble Flexware® commence à gonfler, arrêtez immédiatement la pompe.
	En cas de fuite, arrêtez la pompe. Lorsque le capteur de pression indique zéro, déterminez l'emplacement et la cause de la fuite.
	Ouvrez et fermez les vannes à pincement automatique avec précaution. L'ouverture et la fermeture des vannes à pincement automatique sur le collecteur à des moments inopportuns sont susceptibles d'entraîner la formation de poches d'air sous pression, la perte de produit, des projections chimiques, l'endommagement de la pompe ou la mise en danger de l'opérateur.
	Pour éviter tout risque de pincement, éloignez vos mains des vannes du collecteur en cours de fonctionnement. Le collecteur est équipé d'une vanne de desserrage d'urgence (Emergency Release Valve).
	Débranchez la lampe UV avant d'intervenir sur l'unité.
	Le Clamshell (ou grappin) est lourd (environ 80 kg). Utilisez le système de levage (Clamshell Lift) pour déplacer le grappin. Si le système de levage n'est pas utilisé, suivez les réglementations locales concernant les limites de levage.
Évitez toute exposition prolongée au NaOH.	
	Risques d'électrocution.
	Pour mettre le boîtier de commandes hors tension, débranchez le cordon d'alimentation de la source d'alimentation.
	Examinez l'état du cordon d'alimentation et des câbles. Remplacez le cordon d'alimentation et les câbles endommagés ou usés.
	Assurez-vous qu'il n'est pas possible de trébucher sur les câbles et le cordon d'alimentation et qu'ils se trouvent dans une zone sèche.
Utilisez le câble d'alimentation et les coupe-circuits appropriés.	

Sicurezza dell'operatore e delle attrezzature


Chiunque utilizzi o operi in prossimità della soluzione Mobius® FlexReady con gruppi Smart Flexware® deve risultare conforme ai seguenti requisiti:



	<p>Leggere e comprendere i contenuti del presente manuale dell'utente prima di utilizzare il sistema. Il mancato rispetto delle istruzioni può causare lesioni all'utente o danni al sistema.</p>
	<p>Leggere e comprendere tutte le istruzioni in questo Manuale dell'utente prima di eseguire la manutenzione del sistema. Il mancato rispetto delle istruzioni può causare lesioni all'utente o danni al sistema.</p>
	<p>Durante l'utilizzo del sistema, indossare attrezzature di protezione personale appropriate, inclusa la protezione per gli occhi e le orecchie. Una protezione UV per gli occhi è necessaria durante le attività di manutenzione della lampada UV.</p>
	<p>Per disimballare il sistema, attenersi alle istruzioni indicate all'esterno della cassa. Il mancato rispetto delle istruzioni può causare lesioni all'utente o danni al sistema.</p>
	<p>Utilizzare le protezioni per le orecchie appropriate in caso di uso prolungato.</p>
	<p>Prima dell'utilizzo, verificare che il sistema sia completamente montato nel rispetto delle istruzioni riportate in "Montaggio e configurazione del sistema" e "Montaggio e installazione del gruppo Flexware®". Verificare che contenitori e gruppi Flexware® siano installati in modo corretto e che pompe di alimentazione e sensori siano collegati come previsto.</p>
	<p>Prestare attenzione nel caso in cui il sistema sia utilizzato su superfici inclinate.</p>
	<p>Non utilizzare mai il sistema in un ambiente pericoloso o con liquidi infiammabili, combustibili o solventi.</p>
	<p>Qualsiasi modifica alle caratteristiche di fabbrica del sistema può causare condizioni di rischio e rende nulla la garanzia del prodotto.</p>
	<p>Prestare attenzione al momento di aprire e chiudere lo sportello dello Smart Cart. Se le valvole di compressione non vengono aperte e chiuse nei momenti appropriati, potrebbe accumularsi pressione all'interno del sistema, causando perdita di prodotto, danni ai filtri e/o alla pompa e versamenti di sostanze chimiche. Attenersi scrupolosamente a tutte le istruzioni operative.</p>
	<p>Dopo il montaggio, evitare di spostare il sistema.</p>
	<p>Non spostare mai il sistema quando i contenitori contengono liquido o mentre sono in esecuzione processi.</p>
	<p>Spostare i carrelli con attenzione. Evitare svolte improvvisate.</p>
	<p>Bloccare i fermi quando i carrelli sono stabili.</p>
	<p>Spingere i carrelli solo tramite le maniglie.</p>
	<p>Verificare che nei gruppi Flexware® non vi sia pressione prima di scollegare tubi o eseguire interventi di manutenzione.</p>
<p>Non lasciare il sistema incustodito durante il funzionamento.</p>	
<p>Il sistema non è dotato di una valvola di sicurezza sul rivestimento del serbatoio. Se necessario, l'utente deve installare una valvola di sicurezza sul rivestimento in conformità a norme e linee guida in vigore. Per i requisiti ASME, fare riferimento al codice ASME, sezione BPVC, divisione VIII, paragrafo 1, 38G-125.</p>	
<p>Prima di smontare il sistema o eseguire interventi di manutenzione, assicurarsi che tutte le origini di alimentazione siano disattivate (liquidi, gas ed elettricità).</p>	
<p>Aumentare gradualmente la velocità della pompa. Non avviare la pompa a velocità elevate.</p>	
<p>Assicurarsi che i tubi non siano attorcigliati o piegati.</p>	

	Utilizzare il sensore della pressione per monitorare i segni di aumento della pressione. Se una qualsiasi parte del gruppo Flexware® inizia a gonfiarsi, arrestare immediatamente la pompa.
	In caso di perdite, arrestare la pompa. Quando il sensore della pressione segna zero, identificare la posizione e la causa della perdita.
	Prestare attenzione al momento di aprire e chiudere le valvole di compressione automatiche. Se le valvole di compressione automatiche sul collettore non vengono aperte e chiuse nei momenti appropriati, potrebbe accumularsi pressione all'interno del sistema, causando perdita di prodotto, danni alla pompa, versamenti di sostanze chimiche e rischi per l'operatore.
	Durante il funzionamento, tenere le mani lontano dalle valvole sul collettore per evitare il rischio di schiacciamento. Sul collettore è posizionata una valvola per il rilascio di emergenza.
	Scollegare la lampada UV prima di eseguire interventi di manutenzione sull'unità.
	Il Clamshell è pesante (circa 80 kg). Per spostare il Clamshell utilizzare il sistema di sollevamento. Se non viene usato il sistema di sollevamento, attenersi alle normative locali sui limiti di sollevamento.
	Non esporre a NaOH per periodi prolungati di tempo.
	Pericolo di folgorazione.
	Per spegnere completamente il quadro di comando, scollegare il cavo di alimentazione dalla presa di corrente.
	Verificare che il cavo di alimentazione e gli altri cavi non presentino danni. Sostituire i cavi danneggiati.
	Assicurarsi che il cavo di alimentazione e altri fili non siano d'intralcio e si trovino in un'area asciutta.
	Utilizzare un cavo di alimentazione e fusibili appropriati.

Bediener- und Anlagensicherheit


Personen, die die Mobius® FlexReady Solution mit Smart Flexware® Assemblies bedienen oder in ihrer Nähe arbeiten, müssen folgende Anweisungen einhalten:



	<p>Lesen Sie vor der Benutzung des Systems sorgfältig die vorliegende Bedienungsanleitung und die Bedienungsanleitungen sämtlicher Komponenten durch. Bei Nichtbeachtung der Anleitungen drohen Personen- und Sachschäden.</p>
	<p>Lesen Sie vor dem Durchführen von Instandhaltungsmaßnahmen an diesem System alle Instandhaltungsanweisungen in dieser Bedienungsanleitung aufmerksam durch. Bei Nichtbeachtung der Anleitungen drohen Personen- und Sachschäden.</p>
	<p>Tragen Sie bei der Bedienung des Systems geeignete Schutzkleidung sowie eine Schutzbrille und Gehörschutz. Bei der Wartung der UV-Lampe ist das Tragen einer UV-Schutzbrille erforderlich.</p>
	<p>Halten Sie sich an die außen an der Kiste angebrachten Anweisungen zum Auspacken, wenn Sie die Verpackung des Systems entfernen. Bei Nichtbeachtung der Anleitungen drohen Sachschäden und es besteht Verletzungsgefahr für den Bediener.</p>
	<p>Treffen Sie während eines längeren Betriebs geeignete Gehörschutzmaßnahmen.</p>
	<p>Stellen Sie vor dem Betrieb sicher, dass das System vollständig zusammengebaut ist, wie unter „Montage und Einrichtung des Systems“ und „Montage und Installation der Flexware® -Filtereinheit“ beschrieben. Achten Sie darauf, dass die Behälter und Flexware® -Filtereinheiten sachgemäß installiert und die Zulauf-Pumpe mit den Sensoren ordnungsgemäß angeschlossen sind.</p>
	<p>Seien Sie bei der Verwendung des Systems auf abschüssigen Flächen vorsichtig.</p>
	<p>Betreiben Sie das System nicht in Gefahrenbereichen oder zusammen mit brennbaren, entflammaren oder lösungsmittelhaltigen Flüssigkeiten.</p>
	<p>Jede Abweichung von den werksseitigen Systemspezifikationen kann die Funktionssicherheit beeinträchtigen und zum Erlöschen der Garantie führen.</p>
	<p>Öffnen und schließen Sie die Tür des Smart Carts vorsichtig. Das Öffnen oder Schließen von Quetschventilen zum falschen Zeitpunkt kann zu eingeschlossenem Hochdruck, Produktverlust, Beschädigungen der Filter, Austritten von Chemikalien und Schäden an der Pumpe führen. Befolgen Sie alle Bedienungsanweisungen gewissenhaft.</p>
	<p>Das System darf nach der Montage nicht bewegt werden.</p>
	<p>Bewegen Sie das System auf keinen Fall, wenn sich Flüssigkeit in den Behältern befindet oder gerade Systemprozesse laufen.</p>
	<p>Lassen Sie beim Bewegen der Wagen Vorsicht walten. Vermeiden Sie plötzliche Richtungsänderungen.</p>
	<p>Arretieren Sie die Feststeller, wenn die Wagen stehen.</p>
	<p>Schieben Sie die Wagen nur an den Handgriffen.</p>
	<p>Stellen Sie sicher, dass die Flexware® -Filtereinheiten nicht mit Druck beaufschlagt sind, bevor Sie Verbindungen trennen oder Wartungsarbeiten durchführen.</p>
	<p>Lassen Sie das System während des Betriebs nicht unbeaufsichtigt.</p>
<p>Das System wird ohne Sicherheitsventil am Tankmantel geliefert. Falls erforderlich, muss der Benutzer gemäß den geltenden Bestimmungen und Richtlinien ein Sicherheitsventil am Tankmantel installieren. Die ASME-Anforderungen (American Society of Mechanical Engineers) finden Sie im BPVC (Boiler and Pressure Vessel Code) der ASME, Kapitel VIII, Abschnitt 1, Absatz 38G-125.</p>	
<p>Achten Sie vor dem Zerlegen des Systems bzw. vor der Durchführung von Wartungsarbeiten darauf, dass alle Energiequellen abgeschaltet sind (Flüssigkeit, Gas und Elektrizität).</p>	

	Erhöhen Sie die Pumpengeschwindigkeit graduell. Starten Sie die Pumpe nicht mit hoher Geschwindigkeit.
	Achten Sie darauf, dass die Schläuche keine Knicke oder Biegungen aufweisen.
	Prüfen Sie mit Hilfe des Druckschalters, ob Anzeichen für einen Druckanstieg vorliegen. Wenn sich Teile der Flexware® -Filtereinheit aufzublähen beginnen, stoppen Sie die Pumpe sofort.
	Stoppen Sie die Pumpe bei Leckagen. Wenn der Drucksensor Null anzeigt, ermitteln Sie die genaue Position und Ursache der Leckage.
	Gehen Sie beim Öffnen und Schließen der automatischen Quetschventile mit Vorsicht vor. Das Öffnen oder Schließen der automatischen Quetschventile am Verteiler zum falschen Zeitpunkt kann zu eingeschlossenem Hochdruck, Produktverlust, Austritten von Chemikalien und Schäden an der Pumpe bzw. einer Gefährdung des Bedieners führen.
	Fassen Sie während des Betriebs nicht an die Ventile des Verteilers, um Quetschungen zu vermeiden. Am Verteiler befindet sich ein Notablassventil.
	Trennen Sie die UV-Lampe vor ihrer Wartung von der Stromversorgung.
	Der Clamshell ist schwer (ca. 80 kg). Verwenden Sie den Clamshell-Heber, um den Clamshell zu bewegen. Falls der Heber nicht verwendet wird, dann halten Sie sich an die örtlichen Vorschriften bezüglich der Hebegrenzen.
	Vermeiden Sie eine längere Aussetzung gegenüber NaOH.
	Es besteht Stromschlaggefahr.
	Um die Stromzufuhr des Steuerpults komplett zu unterbrechen, ziehen Sie den Netzstecker ab.
	Überprüfen Sie das Netzkabel und die übrigen Kabel auf sichtbare Beschädigungen. Ersetzen Sie alle abgenutzten oder beschädigten Kabel.
	Vergewissern Sie sich, dass das Netzkabel und die übrigen Kabel keine Stolpergefahr darstellen und in einem trockenen Bereich verlaufen.
	Verwenden Sie ein geeignetes Stromversorgungskabel und geeignete Sicherungen.

Seguridad del usuario y del equipo


Todas las personas que utilicen la solución Mobius® FlexReady con conjuntos Smart Flexware®, o trabajen cerca de esta, deben cumplir los siguientes requisitos:



	<p>Leer detenidamente el manual del usuario de este sistema y de todos sus componentes antes de utilizarlo. De lo contrario, podrían producirse lesiones personales o daños en el sistema.</p>
	<p>Leer con atención todas las instrucciones de mantenimiento que contiene el presente manual del usuario antes de efectuar el mantenimiento del sistema. De lo contrario, podrían producirse lesiones personales o daños en el sistema.</p>
	<p>Cuando se trabaje con el sistema, utilizar el equipo de protección personal apropiado, incluida protección ocular y auditiva. Es imprescindible utilizar protección ocular contra rayos ultravioleta durante el mantenimiento de la lámpara ultravioleta.</p>
	<p>Seguir las instrucciones de desembalaje que encontrará en el exterior del cajón al retirar el embalaje del sistema. De lo contrario, podrían producirse lesiones personales o daños en el equipo.</p>
	<p>Utilizar la protección contra el ruido apropiada durante el uso prolongado.</p>
	<p>Antes de empezar a trabajar con el sistema, asegurarse de que está completamente montado como se describe en las secciones "Montaje y configuración del equipo" y "Montaje e instalación del conjunto Flexware®". Comprobar que los contenedores y los conjuntos Flexware® están instalados correctamente, y que las bombas y los sensores están conectados de forma adecuada.</p>
	<p>Usar con precaución si el sistema se emplea en suelos con pendiente.</p>
	<p>No utilizar nunca el sistema en entornos peligrosos ni con líquidos inflamables, combustibles o disolventes.</p>
	<p>Cualquier alteración de las características de fábrica del sistema puede resultar peligrosa y anular la garantía del producto.</p>
	<p>Utilizar con precaución al abrir y cerrar la puerta de Smart Cart. Si las válvulas de presión no se abren o cierran a los intervalos apropiados, podría quedar atrapada una presión elevada y producirse pérdida de producto, daños en los filtros, derrames químicos y avería de la bomba. Seguir con cuidado todas las instrucciones de funcionamiento.</p>
	<p>No mover el sistema una vez montado.</p>
	<p>No mover nunca el sistema cuando haya líquido en los contenedores o mientras se están ejecutando los procesos del sistema.</p>
	<p>Mover los carros con cuidado. Evitar giros bruscos.</p>
	<p>Activar los frenos cuando los carros se encuentren estacionarios.</p>
	<p>Utilizar siempre las asas para mover los carros.</p>
	<p>Comprobar que no queda presión en los conjuntos Flexware® antes de retirar las conexiones o llevar a cabo cualquier tarea de mantenimiento.</p>
<p>El sistema debe estar bajo supervisión en todo momento durante su funcionamiento.</p>	
<p>El sistema no se suministra con una válvula de seguridad en la cubierta del depósito. Si es necesario, el usuario debe instalar una válvula de seguridad en la cubierta según las directrices y normativas aplicables. Para los requisitos de ASME, consulte el código BPVC, sección VIII, división 1, párrafo 38G-125 de ASME.</p>	
<p>Antes de desmontar el sistema o realizar cualquier operación de mantenimiento, asegurarse de que todas las fuentes de energía están apagadas (líquido, gas y electricidad).</p>	

	Incrementar la velocidad de la bomba gradualmente. No arrancar la bomba a una velocidad elevada.
	Asegurarse de que ningún tubo esté doblado u obstruido.
	Utilizar el sensor de presión para supervisar las señales de incremento de presión. Si cualquier parte del conjunto Flexware® comienza a hincharse, detener la bomba inmediatamente.
	Detener la bomba si se produce cualquier fuga. Cuando el sensor de presión indique cero, identificar la ubicación y la causa de la fuga.
	Tener cuidado al abrir y cerrar las válvulas de presión automáticas. Si las válvulas de presión no se abren o cierran a los intervalos apropiados, podría quedar atrapada una presión elevada y producirse pérdida de producto, derrames químicos, avería de la bomba y peligro para el operario.
	Mantener las manos alejadas de las válvulas del colector durante el funcionamiento para evitar pellizcos. Existe una válvula de liberación de emergencia en el colector.
	Desconectar la lámpara ultravioleta antes de iniciar el mantenimiento de la unidad.
	La pinza es pesada (aproximadamente 80 kg). Utilizar el sistema de elevación Clamshell para mover la pinza. Si el sistema de elevación no se utiliza, seguir las normativas locales sobre límites de elevación.
No exponerse a NaOH durante periodos prolongados de tiempo.	
	Peligro de descarga eléctrica.
	Para desconectar por completo la caja de control, desenchufar el cable del suministro eléctrico de la fuente de alimentación.
	Inspeccionar los cables, incluido el de alimentación, para verificar su buen estado. Sustituir el cable de alimentación y demás cables, si están dañados o desgastados.
	Asegurarse de que el cable de alimentación y el resto de cables se colocan en una zona seca de manera que no supongan un peligro para la seguridad del usuario.
Utilizar un cable de alimentación y un disyuntor adecuados.	

オペレーターおよびシステムの安全性


Mobius® FlexReady Solution with Smart Flexware® Assemblies を操作する場合、または付近で作業をする場合は、以下の事項を順守する必要があります。



	<p>システムを使用する前に、このユーザーガイドとすべてのコンポーネントユーザーガイドを読んで理解してください。指示に従わない場合、ユーザーの怪我やシステムの故障につながる可能性があります。</p>
	<p>システムのメンテナンスを行う前に、このユーザーガイドに記載されているすべての指示を読んで理解してください。指示に従わない場合、ユーザーの怪我やシステムの故障につながる可能性があります。</p>
	<p>システムを操作する際は、保護メガネおよび防音保護具を含む適切な人体保護具を着用してください。UVランプの保守作業を行う場合は、UV保護メガネが必要です。</p>
	<p>システムをパッケージから取り出す場合は、木箱の外側に記載されている開梱手順に従ってください。指示に従わない場合、オペレーターの怪我や装置の損傷につながる可能性があります。</p>
	<p>長時間の使用時は、適切な聴覚保護具を使用してください。</p>
	<p>操作を行う前に、システムが「ハードウェアの組み立てとセットアップ」および「Flexware® アセンブリの組み立てと取り付け」の説明に従って完全に組み立てられていることを確認してください。コンテナとFlexware® アセンブリが正しく取り付けられており、ポンプとセンサーが正しく接続されていることを確認してください。</p>
	<p>傾斜のある床面（排水溝付近など）でシステムを使用する場合は注意してください。</p>
	<p>このシステムは危険な環境で操作したり、引火性液体、可燃性液体、または溶剤と一緒に使用しないでください。</p>
	<p>このシステムを工場出荷時の仕様から変更すると、危険な状況を引き起こすおそれがあり、製品保証が無効になります。</p>
	<p>Smart Cart のドアを開閉する場合は注意してください。ピンチバルブを適切な時期に開閉しないと、高圧の閉じ込めや製品の損失、フィルタの破損、化学薬品の漏れ、ポンプの破損につながるおそれがあります。すべての操作指示に慎重に従ってください。</p>
	<p>組み立て後は、システムを移動しないでください。</p>
	<p>コンテナに液体が入っている場合、またはシステムプロセスの実行中はシステムを移動しないでください。</p>
	<p>カートは慎重に移動してください。急旋回はしないでください。</p>
	<p>カートを固定するときはロックをかみ合わせます。</p>
	<p>カートを押すときはプッシュハンドルだけを持ちます。</p>
	<p>接続を取り外したり、保守作業を実行する前に、Flexware® アセンブリ内に圧力がないことを確認してください。</p>
	<p>操作中はシステムから離れないでください。</p>
	<p></p>
	<p>システムを分解したり、保守作業を実行する前に、必ずすべてのエネルギー源（液体、ガス、電気）が遮断されていることを確認してください。</p>
	<p>ポンプスピードは徐々に上げてください。ポンプを高速で起動しないでください。</p>
<p>チューブにねじれや曲がりがないことを確認してください。</p>	
<p>圧力センサーを使用して、圧力上昇の兆候を監視してください。Flexware® アセンブリのいずれかの部分が膨張を始めた場合は、ただちにポンプを停止させます。</p>	
<p>何らかの漏れが生じた場合は、ポンプを停止させてください。圧力センサーの読み取り値がゼロになったら、漏れの場所と原因を特定します。</p>	

	<p>自動ピンチバルブを開閉する際は注意してください。マニホールドの自動ピンチバルブを適切な時期に開閉しないと、高圧の閉じ込めや製品の損失、化学薬品の漏れ、ポンプの破損、オペレーターの危険につながるおそれがあります。</p>
	<p>手が挟まれないように、動作中は、マニホールドのバルブから手を離してください。マニホールドには、緊急解放バルブが取り付けられています。</p>
	<p>装置の保守作業を行う前に、UVランプの接続を外してください。</p>
	<p>Clamshellは重量のある部品です(約80 kg)。Clamshellを移動する場合は、Clamshellリフトを使用してください。リフトを使用しない場合は、持ち上げ制限に関する各地域の規定に従ってください。</p>
	<p>NaOH には、長時間触れないようにしてください。</p>
	<p>感電の危険。</p>
	<p>制御ボックスの電源を完全に切るには、電源から電源コードを抜きます。</p>
	<p>電源コードおよびケーブルに損傷がないか目視点検してください。摩耗または損傷のある電源コードおよびケーブルは交換してください。</p>
	<p>電源コードおよびケーブルが、つまづく危険がない状態で、乾燥した場所に配置されていることを確認してください。</p>
<p>適切な電源ケーブルと回路遮断器を使用してください。</p>	

Безопасност на оператора и оборудването


Всеки, който работи с или се намира в близост до решението Mobius® FlexReady с интелигентните модули Flexware®, трябва да следва следните инструкции:



	<p>Прочетете и разберете настоящото ръководство за потребителя и всички ръководства за потребителя относно компонентите, преди да бъде използвана системата. Неспазването на инструкциите може да доведе до нараняване на потребителя или до повреда на системата.</p>
	<p>Прочетете и разберете всички инструкции за техническа поддръжка в настоящото ръководство за потребителя, преди да се извършва техническа поддръжка на системата. Неспазването на инструкциите може да доведе до нараняване на потребителя или до повреда на системата.</p>
	<p>По време на работа със системата използвайте подходящи лични предпазни средства, включително защита за очите и ушите. При обслужването на ултравиолетовата лампа трябва да се използват средства за защита на очите от ултравиолетовите лъчи.</p>
	<p>Следвайте инструкциите за разопаковане на външната страна на кутията, когато изваждате системата от опаковката. Неспазването на тези инструкции може да доведе до нараняване на оператора или до повреда на оборудването.</p>
	<p>Използвайте подходяща защита за слуха по време на продължителна употреба.</p>
	<p>Преди да започнете работа, трябва да се уверите, че системата е напълно сглобена, както е описано в „Сглобяване и настройка на хардуера“ и „Сглобяване и монтиране на модула Flexware®“. Трябва да се уверите, че контейнерите и модулите Flexware® са монтирани правилно и че помпите и сензорите са свързани правилно.</p>
	<p>Внимавайте при използване на системата върху наклонени подове.</p>
	<p>Никога не работете със системата в опасна среда и не я използвайте със запалими, възпламеними или разтварящи течности.</p>
	<p>Всяка промяна на системата спрямо фабричната спецификация може да доведе до опасни условия и да анулира гаранцията на продукта.</p>
	<p>Внимавайте при отваряне и затваряне на вратата на интелигентната количка. Ако спирателните кранове не се отворят или затворят в подходящото време, това би могло да доведе до задържано високо налягане, загуба на продукт, повредени филтри, разливи на химикали и повреда на помпата. Използвайте предписанията за „Отваряне на вратата“ и „Затваряне на вратата“ и следвайте прилежно всички инструкции за работа.</p>
	<p>Да не мести системата, след като тя бъде сглобена.</p>
	<p>Никога да не мести количката на резервоара, когато има течност в контейнерите или когато се осъществяват процеси в системата.</p>
	<p>Да мести количките внимателно. Да избягва резки завои.</p>
	<p>Да задейства блокировките, когато количките са неподвижни.</p>
	<p>Да бутва количките само за дръжките за бутане.</p>
<p>Преди да демонтира връзки или да извърши каквато и да било техническа поддръжка, да се увери, че няма налягане в модулите Flexware®.</p>	
<p>Да не оставя системата без надзор по време на работа.</p>	
<p>Системата не се доставя с предпазен клапан на кожуха на резервоара. Ако е необходимо, потребителят трябва да монтира предпазен клапан върху кожуха в съответствие с приложимите регламенти и указания. Можете да направите справка с изискванията на ASME в кодекса на ASME BPVC, раздел VIII, подраздел 1, параграф 38G-125.</p>	

	<p>Преди демонтиране на системата или извършване на техническа поддръжка се уверете, че всички източници на енергия за изключени (флуид, газ и електричество).</p>
	<p>Уверете се, че няма усуквания или прегъвания на каквито и да било тръби.</p>
	<p>Използвайте сензора за налягане, за да наблюдавате за признаци на повишаване на налягането. Ако някоя част от модула Flexware® започне да се издува, спрете помпата веднага.</p>
	<p>В случай на какъвто и да било теч спрете помпата. При нулево показание на сензора за налягането определете точното местоположение и причината на теча.</p>
	<p>Внимавайте при отварянето и затварянето на автоматичните спирателни кранове. Ако автоматичните спирателни кранове на колектора не се отворят или затворят в подходящото време, това би могло да доведе до задържано високо налягане, загуба на продукт, разливи на химикали, повреда на помпата или до опасност за оператора.</p>
	<p>По време на работа пазете ръцете си от клапаните в колектора, за да избегнете прищипване. Върху колектора има бутон за аварийно освобождаване.</p>
	<p>Преди да извършвате обслужване на агрегата, изключете ултравиолетовата лампа.</p>
	<p>Грайферният модул е тежък (около 80 kg). Използвайте подемника за преместване на грайферния модул. Ако не се използва подемник, тогава следвайте местните регламенти за ограниченията при повдигане.</p>
	<p>Не излагайте модулите Flexware® на NaOH за продължителни периоди от време.</p>
	<p>Опасност от токов удар.</p>
	<p>За да изключите напълно захранването на контролната кутия, извадете захранващия кабел от източника на захранване</p>
	<p>Прегледайте визуално захранващия кабел и другите кабелите за повреди. Заменете каквито и да било износени или повредени захранващи или други кабели.</p>
	<p>Уверете се, че захранващият кабел и другите кабели са поставени така, че не представляват опасност от спъване и че са разположени на сухо.</p>
<p>Използвайте подходящи захранващ кабел и прекъсвачи.</p>	

Bezpečnost obsluhy a zařízení

Kdokoli pracující s řešením Mobius® FlexReady Solution se sestavami Smart Flexware® nebo kdokoli nacházející se v jejich blízkosti musí splňovat následující podmínky:



	<p>Před používáním systému je třeba přečíst si a porozumět této uživatelské příručce a uživatelským příručkám ke všem komponentám. Nedodržení pokynů může vést k úrazu nebo poškození systému.</p>
	<p>Před prováděním údržby systému je třeba přečíst si všechny pokyny týkající se údržby a porozumět jim. Nedodržení pokynů může vést k úrazu nebo poškození systému.</p>
	<p>Při práci se systémem používejte adekvátní osobní ochranné pomůcky včetně ochrany očí a uší. Při provádění servisu UV lampy je nutná ochrana očí proti UV záření.</p>
	<p>Při rozbalování systému se řiďte pokyny pro rozbalování na vnější straně bedny. Nedodržení těchto pokynů může vést k úrazu obsluhy nebo poškození vybavení.</p>
	<p>Při delším používání používejte adekvátní ochranu sluchu.</p>
	<p>Před používáním ověřte, zda je systém plně sestaven podle popisu v sekcích „Sestavování a nastavování zařízení“ a „Sestavování a instalace sestavy Flexware®“. Zajistěte správnou instalaci nádob a sestav Flexware® a správné připojení čerpadel a snímačů.</p>
	<p>Při použití systému na svažující se podlaze dbejte opatrnosti.</p>
	<p>Systém nikdy nepoužívejte v rizikovém prostředí. Nepoužívejte hořlavé kapaliny či rozpouštědla.</p>
	<p>Jakákoli změna továrního nastavení systému může vést k nebezpečným situacím a zrušení záruky na produkt.</p>
	<p>Při otevírání a zavírání dvířek chytrého vozíku dbejte opatrnosti. Pokud nedojde k otevření či zavření stiskových ventilů ve vhodnou dobu, může dojít ke vzniku vysokého tlaku, ztrátě produktu, poškození filtrů, úniku chemikálií nebo poškození čerpadla. Řiďte se návodem pro otevírání a zavírání dvířek a dodržujte všechny provozní pokyny.</p>
	<p>Po sestavení systému s ním již nepohybujte.</p>
	<p>Pokud je ve vozíku s nádrží kapalina nebo pokud systém pracuje, nikdy s vozíkem nehýbejte.</p>
	<p>S vozíky pohybujte opatrně. Nezatáčejte příliš ostře.</p>
	<p>Jakmile s vozíky zastavíte, zaaretujte je proti pohybu.</p>
	<p>Vozíky tlačte pouze za pomoci k tomu určených držadel.</p>
	<p>Před demontáží spojů či prováděním jakékoli údržby zajistěte, aby v sestavách Flexware® nebyl tlak.</p>
	<p>Během činnosti nenechávejte systém bez dozoru.</p>
<p>Systém není dodáván s bezpečnostním ventilem na plášti nádrže. Pokud je vyžadován, uživatel musí na plášť nainstalovat bezpečnostní ventil podle odpovídajících předpisů a pokynů. Informace o požadavcích ASME najdete v předpisech ASME BPVC, oddíl VIII, část 1, odstavec 38G-125.</p>	
<p>Před demontáží spojů či prováděním jakékoli údržby zajistěte, aby byly veškeré energetické zdroje vypnuté (kapalina, plyn, elektřina).</p>	
<p>Ověřte, že potrubí netvoří smyčky či ohyby.</p>	
<p>Monitorujte možné známky nárůstu tlaku pomocí snímače tlaku. Pokud se jakákoli část sestavy Flexware® začne nafukovat, ihned vypněte čerpadlo.</p>	
<p>V případě úniku kapaliny vypněte čerpadlo. Pokud snímač tlaku ukazuje nulovou hodnotu, zkontrolujte místo a příčinu úniku kapaliny.</p>	

	<p>Při otevírání a zavírání automatických stiskových ventilů dbejte opatrnosti. Pokud nedojde k otevření či zavření automatických stiskových ventilů na rozdělovači ve vhodnou dobu, může dojít ke vzniku vysokého tlaku, ztrátě produktu, úniku chemikálií, poškození čerpadla nebo ohrožení obsluhy.</p>
	<p>Během provozu nestrkejte k ventilům ruce, aby nedošlo k přiskřípnutí. Nouzové uvolňovací tlačítko se nachází na rozdělovači.</p>
	<p>Před prováděním servisu zařízení odpojte UV lampu.</p>
	<p>Krytá jednotka je těžká (asi 80 kg). K přemísťování kryté jednotky používejte zvedák. Pokud zvedák nepoužíváte, dodržujte místní předpisy pro maximální zvedanou hmotnost.</p>
	<p>Nevystavujte sestavy Flexware® působení NaOH (hydroxidu sodného) po delší dobu.</p>
	<p>Riziko úrazu elektrickým proudem</p>
	<p>Plné přerušení napájení ovládací skříňky zajistíte vypojením napájecího kabelu ze zdroje.</p>
	<p>Provedte vizuální kontrolu poškození napájecího kabelu a ostatních kabelů. Jakékoli opotřebované či poškozené kabely vyměňte.</p>
	<p>Zajistěte, aby nehrozilo riziko zakopnutí o kabel a aby byly kabely umístěny v suchém prostředí.</p>
<p>Používejte adekvátní napájecí kabel a jističe.</p>	

Sikkerhed for bruger og udstyr


Alle som betjener eller opholder sig i nærheden af Mobius® FlexReady Solution med Smart Flexware®-slangesystem skal overholde følgende:



	Læs og forstå denne brugermanual og brugermanualen til alle komponenter, før du bruger systemet. Hvis disse instruktioner ikke følges, kan det medføre personskade for brugeren eller beskadigelse af systemet.
	Læs og forstå alle instruktioner angående vedligeholdelse i denne brugermanual, før du udfører vedligeholdelse på systemet. Hvis disse instruktioner ikke følges, kan det medføre personskade for brugeren eller beskadigelse af systemet.
	Anvend passende personbeskyttelsesudstyr, herunder øjen- og høreværn, ved betjening af systemet. UV-øjenbeskyttelse er påkrævet ved vedligeholdelse af UV-lampen.
	Følg instruktionerne angående udpakning, som er angivet på ydersiden af kassen, når systemet tages ud af emballagen. Hvis disse instruktioner ikke følges, kan det medføre personskade for brugeren eller beskadigelse af systemet.
	Anvend passende høreværn under langvarig brug.
	Kontroller at systemet er samlet som beskrevet i "Samling og opsætning af hardware" og "Samling og installering af Flexware®-slangesystemet, før du betjener systemet. Kontrollér, at beholdere og Flexware®-slangesystemer er installeret korrekt, og at pumperne og sensorerne er tilsluttet korrekt.
	Vær forsigtig, hvis systemet anvendes på gulve med hældning.
	Betjen aldrig systemet i et farligt miljø, og anvend det ikke sammen med brændbare væsker eller opløsningsmidler.
	Enhver ændring af systemet i forhold til fabriksspecifikationerne kan forårsage potentielt farlige betingelser og gøre produktgarantien ugyldig.
	Vær forsigtig ved åbning og lukning af døren på Smart Cart. Hvis klemmeventilerne ikke åbnes eller lukkes på det korrekte tidspunkt, kan det medføre indespærret højtryk, tab af produkt, beskadigede filtre, kemikaliespild eller beskadigelse af pumper. Brug forskriften Luk dør eller Åbn dør, og følg nøje alle driftsanvisninger.
	Når systemet er samlet, må det ikke flyttes.
	Flyt aldrig beholdervognen med væske i beholderne, eller mens systemprocesser kører.
	Flyt vognene forsigtigt. Undgå skarpe sving.
	Aktiver låsene, når vognene står stille.
	Skub kun vognene ved hjælp af håndtagene.
	Kontroller, at der ikke er noget tryk i Flexware®-slangesystemet, før du adskiller samlinger eller udfører nogen form for vedligeholdelse.
	Efterlad ikke systemet uden overvågning under drift.
	Systemet er ikke forsynet med en sikkerhedsventil på beholderkappen. Hvis det er nødvendigt, skal brugeren montere en sikkerhedsventil på kappen i overensstemmelse med gældende regler og retningslinjer. For ASME-krav henvises til ASME BPVC afsnit VIII division 1 paragraf 38G-125.
	Før systemet adskilles eller der udføres nogen form for vedligeholdelse, skal du sikre, at al energiforsyning er afbrudt (væske, gas og elektricitet).
	Kontroller, at der ikke er knæk eller bøjninger på nogen slanger.
	Brug tryksensoren til at overvåge tegn på trykforøgelse. Hvis nogen del af Flexware®-slangesystemet bliver udspilet, skal pumpen straks stoppes.
	Stop pumpen i tilfælde af lækage. Når tryksensoren viser nul, skal du finde ud af, hvor og hvorfor lækagen forekommer.

	<p>Vær forsigtig, når du åbner og lukker de automatiske klemmeventiler. Hvis klemmeventilerne ikke åbnes eller lukkes på det korrekte tidspunkt, kan det medføre indespærret højtryk, tab af produkt, kemikaliespild, beskadigelse af pumper eller fare for brugeren.</p>
	<p>Hold hænderne væk fra ventilerne i manifolden under drift for at undgå knibning. Der er placeret en knap til nødtrykkudligning på manifolden.</p>
	<p>Afbryd UV-lampen, før der udføres vedligeholdelse på enheden.</p>
	<p>Clamshell'en er tung (ca. 80 kg). Brug Clamshell-hejsen til at flytte Clamshell'en. Hvis hejsen ikke anvendes, skal du følge de lokale bestemmelser angående løft.</p>
	<p>Sørg for, at Flexware®-slangesystemet ikke bliver eksponeret for NaOH i længere perioder.</p>
	<p>Risiko for elektrisk stød.</p>
	<p>For at afbryde strømmen til kontrolboksen fuldstændigt skal du tage strømkablet ud af strømkilden</p>
	<p>Efterse strømkablet og andre ledninger for beskadigelse. Udskift eventuelle slidte eller beskadigede strømkabler og ledninger.</p>
	<p>Sørg for at strømkabler og ledninger ikke udgør en snubelfare, og at de er placeret i et tørt område.</p>
<p>Anvend passende strømkabler og strømafbrydere.</p>	

Ασφάλεια χειριστή και εξοπλισμού

Κάθε άτομο που χειρίζεται τη λύση Mobius® FlexReady με διατάξεις Smart Flexware® ή εργάζεται στον χώρο όπου είναι τοποθετημένο το σύστημα, πρέπει να συμμορφώνεται με τα εξής:



	<p>Διαβάστε και κατανοήστε αυτόν τον οδηγό χρήστη και όλους τους οδηγούς χρήστη των εξαρτημάτων προτού χρησιμοποιήσετε το σύστημα. Αν δεν ακολουθήσετε τις οδηγίες, μπορεί να προκληθεί τραυματισμός του χρήστη ή βλάβη στο σύστημα.</p>
	<p>Διαβάστε και κατανοήστε όλες τις οδηγίες συντήρησης σε αυτόν τον οδηγό χρήστη πριν τη συντήρηση του συστήματος. Αν δεν ακολουθήσετε τις οδηγίες, μπορεί να προκληθεί τραυματισμός του χρήστη ή βλάβη στο σύστημα.</p>
	<p>Χρησιμοποιήστε κατάλληλο προσωπικό προστατευτικό εξοπλισμό, συμπεριλαμβανομένης προστασίας για τα μάτια και τα αυτιά, κατά τον χειρισμό του συστήματος. Κατά την επισκευή της λυχνίας UV, απαιτείται η χρήση προστατευτικών για τα μάτια.</p>
	<p>Ακολουθήστε τις οδηγίες αποσυσκευασίας στο εξωτερικό του κιβωτίου. Αν δεν ακολουθήσετε αυτές τις οδηγίες, μπορεί να προκληθεί τραυματισμός του χειριστή ή βλάβη του εξοπλισμού.</p>
	<p>Χρησιμοποιήστε κατάλληλη προστασία ακοής σε περιπτώσεις παρατεταμένης χρήσης.</p>
	<p>Πριν τη λειτουργία, βεβαιωθείτε ότι το σύστημα έχει συναρμολογηθεί πλήρως, όπως περιγράφεται στις ενότητες "Συναρμολόγηση και ρύθμιση του υλικού" και "Συναρμολόγηση και εγκατάσταση της διάταξης Flexware®". Βεβαιωθείτε ότι τα δοχεία και οι διατάξεις Flexware® έχουν εγκατασταθεί σωστά και ότι οι αντλίες και οι αισθητήρες έχουν συνδεθεί σωστά.</p>
	<p>Να είστε ιδιαίτερα προσεκτικοί αν το σύστημα χρησιμοποιείται σε δάπεδα με κλίση.</p>
	<p>Μην χειρίζεστε ποτέ το σύστημα σε επικίνδυνο περιβάλλον και μην το χρησιμοποιείτε ποτέ με εύφλεκτα, καύσιμα ή διαλυτικά υγρά.</p>
	<p>Οποιαδήποτε τροποποίηση του συστήματος από τις εργοστασιακές προδιαγραφές μπορεί να προκαλέσει επικίνδυνες συνθήκες και να ακυρώσει την εγγύηση του προϊόντος.</p>
	<p>Να ανοίγετε και να κλείνετε τη θύρα του έξυπνου αμαξιδίου με προσοχή. Αν οι εμφραγματικές βαλβίδες δεν ανοίξουν ή κλείσουν τη σωστή στιγμή, μπορεί να προκληθεί παγιδευμένη υψηλή πίεση, απώλεια προϊόντος, καταστροφή των φίλτρων, χημικές διαρροές ή ζημιά της αντλίας. Να ακολουθείτε τη διαδικασία Ανοιχτής ή Κλειστής Πόρτας και να τηρείτε προσεκτικά όλες τις οδηγίες χειρισμού.</p>
	<p>Μην μετακινείτε το σύστημα αφού το συναρμολογήσετε.</p>
	<p>Μην μετακινείτε ποτέ το αμαξίδιο όταν τα δοχεία περιέχουν υγρό ή όταν εκτελούνται διεργασίες συστήματος.</p>
	<p>Να μετακινείτε προσεκτικά τα αμαξίδια. Να αποφεύγετε τις απότομες στροφές.</p>
	<p>Όταν τα αμαξίδια είναι σταματημένα, να ενεργοποιείτε τα κλειδώματα.</p>
	<p>Να σπρώχνετε τα αμαξίδια μόνο από τις λαβές ώθησης.</p>
	<p>Πριν αποσυναρμολογήσετε τις συνδέσεις ή εκτελέσετε οποιαδήποτε λειτουργία συντήρησης, βεβαιωθείτε ότι δεν υπάρχει πίεση στις διατάξεις Flexware®.</p>
	<p>Μην αφήνετε το σύστημα χωρίς επιτήρηση όσο λειτουργεί.</p>
	<p>Το σύστημα δεν διαθέτει βαλβίδα ασφαλείας πάνω στο τζάκετ. Αν χρειαστεί, ο χρήστης πρέπει να τοποθετήσει μια βαλβίδα ασφαλείας στο τζάκετ, σύμφωνα με τους ισχύοντες κανονισμούς και τις οδηγίες. Για τις απαιτήσεις ASME, ανατρέξτε στον κώδικα ASME BPVC, ενότητα VIII, τμήμα 1, παράγραφος 38G-125.</p>
	<p>Πριν αποσυναρμολογήσετε το σύστημα ή εκτελέσετε κάποια λειτουργία συντήρησης, βεβαιωθείτε ότι έχουν απενεργοποιηθεί όλες οι πηγές ενέργειας (υγρά, αέριο και ηλεκτρισμός).</p>
	<p>Βεβαιωθείτε ότι δεν υπάρχουν σωληνώσεις που έχουν τσακίσει ή στριφτεί.</p>

	<p>Χρησιμοποιήστε τον αισθητήρα πίεσης για να παρακολουθείτε τυχόν ενδείξεις αύξησης της πίεσης. Αν οποιοδήποτε μέρος της διάταξης Flexware® αρχίσει να διογκώνεται, σταματήστε αμέσως την αντλία.</p>
	<p>Σε περίπτωση οποιασδήποτε διαρροής, σταματήστε την αντλία. Αν ο αισθητήρας πίεσης δώσει την ένδειξη μηδέν, εντοπίστε το ακριβές σημείο και το αίτιο της διαρροής.</p>
	<p>Να είστε προσεκτικοί όταν ανοίγετε ή κλείνετε τις αυτόματες εμφραγματικές βαλβίδες. Αν οι αυτόματες εμφραγματικές βαλβίδες στο πολύπτυχο δεν ανοίξουν ή κλείσουν τη σωστή στιγμή, μπορεί να προκληθεί παγιδευμένη υψηλή πίεση, απώλεια προϊόντος, χημικές διαρροές, ζημιά της αντλίας ή κίνδυνος για τον χειριστή.</p>
	<p>Κατά τη διάρκεια της λειτουργίας, κρατήστε τα χέρια σας μακριά από τις βαλβίδες στο πολύπτυχο, ώστε να αποφύγετε τυχόν μαγκώματα. Στο πολύπτυχο υπάρχει ένα κουμπί απελευθέρωσης έκτακτης ανάγκης.</p>
	<p>Αποσυνδέστε τη λυχνία UV πριν εκτελέσετε σέρβις στη μονάδα.</p>
	<p>Το προστατευτικό περίβλημα είναι βαρύ (περίπου 80 κιλά). Μετακινήστε το προστατευτικό περίβλημα με το αντίστοιχο σύστημα ανύψωσης. Αν δεν χρησιμοποιείται κάποιο σύστημα, ακολουθήστε τους τοπικούς κανονισμούς σχετικά με τα όρια ανύψωσης.</p>
	<p>Μην εκθέτετε τις διατάξεις Flexware® σε NaOH (υδροξείδιο του νατρίου) για παρατεταμένα χρονικά διαστήματα.</p>
	<p>Κίνδυνος ηλεκτροπληξίας.</p>
	<p>Για να διακόψετε εντελώς την παροχή ρεύματος στο κιβώτιο ελέγχου, αποσυνδέστε το καλώδιο ρεύματος από την πηγή ρεύματος.</p>
	<p>Ελέγξτε οπτικά το καλώδιο ρεύματος και τα λοιπά καλώδια για τυχόν ζημιά. Αν το καλώδιο ρεύματος ή άλλα καλώδια έχουν φθαρεί ή υποστεί ζημιά, αντικαταστήστε τα. Βεβαιωθείτε ότι το καλώδιο ρεύματος και τα λοιπά καλώδια δεν δημιουργούν κίνδυνο παραπατήματος και ότι βρίσκονται σε στεγνό σημείο.</p>
	<p>Χρησιμοποιήστε το κατάλληλο καλώδιο τροφοδοσίας ρεύματος και αυτόματους διακόπτες.</p>

Kasutaja- ja seadmeohutus


Kõik seadmega Mobius® FlexReady Solution, millel on Smart Flexware® osad, või selle lähedal töötavad isikud peavad täitma järgmisi nõudeid.



	Enne süsteemi kasutusele võtmist lugege läbi see kasutusjuhend ja kõigi komponentide kasutusjuhendid ning saage nende sisust aru. Juhiste eiramise korral võib seadme kasutaja vigastusi või süsteem kahjustusi saada.
	Enne süsteemi hooldamist lugege kõiki selles kasutusjuhendis toodud hooldusjuhiseid ja saage nende sisust aru. Juhiste eiramise korral võib seadme kasutaja vigastusi või süsteem kahjustusi saada.
	Süsteemi kasutades kandke asjakohaseid isikukaitsevahendeid, sealhulgas silma- ja kõrvakaitsevahendeid. UV-lambi hooldamisel peate kasutama UV-kaitsega silmakaitsevahendeid.
	Pakendi eemaldamisel järgige kasti välisküljel olevaid lahtipakkimise juhiseid. Nende juhiste eiramise korral võib seadme kasutaja vigastusi või seade kahjustusi saada.
	Süsteemi pikaajalise kasutamise korral kandke sobivaid kuulmiskaitsevahendeid.
	Enne süsteemi kasutamist veenduge, et see oleks täielikult kokku pandud, nagu on kirjeldatud selle kasutusjuhendi jaotistes „Riistvara montaaž ja seadistamine” ning „Süsteemi Flexware® osade montaaž ja paigaldamine”. Veenduge, et mahutid ja süsteemi Flexware® osad oleksid nõuetekohaselt paigaldatud ning söötepump ja andurid oleksid õigesti ühendatud.
	Olge ettevaatlik, kui süsteemi kasutatakse kaldega pörandal.
	Ärge laske süsteemil töötada ohtlikus keskkonnas ega laske sellel kokku puutuda tuleohtlike ja süttivate vedelike või lahustitega.
	Süsteemi mis tahes muutmine, mis tingib kõrvalekaldumise tehase spetsifikatsioonist, võib põhjustada ohtlikke olukordi ja muuta tootele antava garantii kehtetuks.
	Olge nutikäru ukse avamisel ja sulgemisel ettevaatlik. Tangventiilide õigel ajal avamata või sulgemata jätmine võib põhjustada kõrgsurve sissejäämist, tootekadu, kahjustunud filtreid, kemikaali lekkimist või pumba kahjustumist. Kasutage ukse sulgemise või avamise programmi ja järgige kõiki kasutusjuhiseid.
	Ärge teisaldage süsteemi, kui see on juba kokku pandud.
	Ärge kunagi liigutage mahutiga käru, kui mahutites on vedelikku või kui süsteemi protsessid töötavad.
	Liigutage kärusid ettevaatlikult. Vältige järske pöördeid.
	Kui kärud on paigal, rakendage lukud.
	Lükake kärusid ainult lükkamispidemetest.
	Veenduge enne ühenduste lahtivõtmist või mis tahes hooldustööde tegemist, et süsteemi Flexware® osad oleksid rõhu alt vabastatud.
	Ärge jätke töötavat süsteemi järelevalveta.
	Süsteemi mahuti jahutussärgil ei ole kaitseklappi. Vajaduse korral peab seadme kasutaja paigaldama jahutussärgile kaitseklapi, järgides kohalduvaid eeskirju ja juhiseid. ASME nõuded leiate ASME koodi BPVC järgi sektsioonist VIII jaotusest 1 lõikudest 38G–125.
	Enne süsteemi demonteerimist ja mis tahes hooldustööde tegemist veenduge, et kogu energiatoide (vedelikud, gaas ja elekter) oleks katkestatud.
	Veenduge, et mitte üheski torus ei oleks keeru- ega käänukohti.
	Kasutage rõhutõusu märkide jälgimiseks rõhuandurit. Kui süsteemi Flexware® mis tahes koostisosa hakkab õhuga täituma, seisake pump viivitamata.
	Mis tahes lekke korral seisake pump. Kui rõhuanduri näit on null, tuvastage lekke asukoht ja põhjus.

	<p>Olge automaatsete tangventiilide avamisel ja sulgemisel ettevaatlik. Kollektoril olevate automaatsete tangventiilide õigel ajal avamata või sulgemata jätmine võib põhjustada kõrgsurve sissejäämist, tootekadu, kemikaali lekkimist, pumba kahjustumist või ohtu seadme kasutajale.</p>
	<p>Ärge puudutage seadme kasutamise ajal kollektoril olevaid ventiile, et vältida näppude vahelejäämist. Kollektoril on hädaolukorras avamise nupp.</p>
	<p>Enne seadme hooldamist ühendage lahti UV-lamp.</p>
	<p>Haarats on raske (ligikaudu 80 kg). Kasutage haaratsi liigutamiseks haaratsi tõstukit. Kui te tõstukit ei kasuta, järgige tõstepiirangute osas riiklikke määruseid.</p>
	<p>Ärge laske süsteemi Flexware® osadel pikema aja jooksul naatriumhüdroksiidiga kokku puutuda.</p>
	<p>See põhjustab elektrilöögi ohtu.</p>
	<p>Juhtseadme elektritoite täielikuks väljalülitamiseks eemaldage toitepistik vooluallikast.</p>
	<p>Kontrollige visuaalselt, et toitejuhtmel ega kaablitel ei oleks kahjustusi. Vahetage kulunud või kahjustunud toitejuhe ja kaablid välja.</p>
	<p>Veenduge, et toitejuhe ja kaablid ei põhjustaks komistamise ohtu ja et need paikneksid kuivas ruumis.</p>
	<p>Kasutage sobivaid toitekaabli ja ahela kaitselüliteid.</p>

Sigurnost rukovatelja i opreme


Sve osobe koje rade na uređaju Mobius® FlexReady sa sklopovima Smart Flexware® ili u njegovoj blizini moraju se pridržavati sljedećih uputa:



	<p>Prije upotrebe sustava pročitajte i usvojite ovaj priručnik za korisnike, kao i priručnike za korisnike za sve komponente. Nepridržavanje uputa može dovesti do ozljeda korisnika ili oštećenja sustava.</p>
	<p>Prije provođenja održavanja na sustavu pročitajte i usvojite sve upute za održavanje koje se nalaze u ovom priručniku za korisnike. Nepridržavanje uputa može dovesti do ozljeda korisnika ili oštećenja sustava.</p>
	<p>Tijekom rukovanja sustavom upotrebljavajte odgovarajuću zaštitnu opremu, uključujući zaštitu očiju i ušiju. Pri servisiranju UV žarulje obavezno zaštitite oči od UV zračenja.</p>
	<p>Pri vađenju sustava iz ambalaže slijedite upute za raspakiranje s vanjske strane kutije. Nepridržavanje tih uputa može dovesti do ozljeda rukovatelja ili oštećenja opreme.</p>
	<p>Tijekom dugotrajnije upotrebe koristite odgovarajuću zaštitu sluha.</p>
	<p>Prije upotrebe provjerite je li sustav sastavljen u potpunosti kao što je opisano u odjeljcima „Sastavljanje i postavljanje opreme“ te „Sastavljanje i instalacija Flexware® sklopa“. Provjerite jesu li spremnici i sklopovi Flexware® pravilno instalirani, a pumpe i senzori pravilno povezani.</p>
	<p>Pažljivo rukujte sustavom ako se upotrebljava na podovima s nagibom.</p>
	<p>Nikada nemojte upotrebljavati sustav u opasnim okruženjima niti sa zapaljivim i gorivim tekućinama ili otapalima.</p>
	<p>Bilo kakve preinake na sustavu koje nisu u skladu s tvorničkim specifikacijama mogu dovesti do nesigurnosti u radu i poništiti valjanost jamstva na proizvod.</p>
	<p>Budite oprezni pri otvaranju i zatvaranju vrata pametnih kolica. Ako se gniječni ventili ne otvore ili ne zatvore u odgovarajućem trenutku, može doći do nakupljanja visokog tlaka, gubitka proizvoda, oštećenja na filtrima, prolijevanja kemikalija ili oštećenja pumpe. Vrata zatvarajte i otvarajte prema uputama te pažljivo slijedite sve upute za rad.</p>
	<p>Nakon što sastavite sustav, nemojte ga premještati.</p>
	<p>Nipošto nemojte premještati kolica spremnika s tekućinom u spremnicima ili tijekom izvođenja postupaka sustava.</p>
	<p>Pažljivo pomičite kolica. Izbjegavajte oštra skretanja.</p>
	<p>Kad su kolica zaustavljena, aktivirajte blokade.</p>
	<p>Kolica gurajte samo na drškama za guranje.</p>
	<p>Prije rastavljanja spojeva ili bilo kakvog održavanja provjerite je li u sklopovima Flexware® prisutan tlak.</p>
	<p>Nemojte ostavljati sustav bez nadzora tijekom rada.</p>
	<p>Na omotaču spremnika sustava ne nalazi se sigurnosni ventil. Ako je potrebno, korisnik mora montirati sigurnosni ventil na omotač u skladu s važećim propisima i smjernicama. ASME norme potražite u odlomku 38G-125 1. dijela odjeljka VIII ASME BPVC koda.</p>
	<p>Prije rastavljanja sustava ili provođenja bilo kakvog održavanja provjerite jesu li isključeni svi izvori energije (tekućina, plin i struja).</p>
	<p>Cijevi ne smiju biti svinute ili izokrenute.</p>
<p>S pomoću senzora tlaka kontrolirajte ima li znakova povećanja tlaka. Ako se bilo koji dio sklopa Flexware® počne napuhavati, odmah zaustavite pumpu.</p>	
<p>Zaustavite pumpu u slučaju bilo kakvih propuštanja. Ako senzor tlaka pokazuje vrijednost nula, pronađite mjesto i uzrok propuštanja.</p>	

	<p>Budite oprezni pri otvaranju i zatvaranju automatskih gniječnih ventila. Ako se automatski gniječni ventili na cjevovodu ne otvore ili ne zatvore u odgovarajućem trenutku, može doći do nakupljanja visokog tlaka, gubitka proizvoda, prolijevanja kemikalija, oštećenja pumpe ili ozljeđivanja rukovatelja.</p>
	<p>Tijekom rada ne dodirujte ventile na cjevovodu da ne bi došlo do prignječenja. Na cjevovodu se nalazi gumb za otpuštanje u hitnom slučaju.</p>
	<p>Prije servisiranja uređaja iskopčajte UV žarulju.</p>
	<p>Kućište je teško (oko 80 kg). Premještajte ga s pomoću podizača za kućište. Ako ne upotrebljavate dizalo, slijedite lokalne propise o maksimalnom opterećenju pri podizanju.</p>
	<p>Sklopovi Flexware® ne smiju biti dugotrajno izloženi natrijevom hidroksidu (NaOH).</p>
	<p>Rizik od strujnog udara.</p>
	<p>Kako biste u potpunosti isključili napajanje upravljačkog uređaja, iskopčajte kabel napajanja iz izvora napajanja</p>
	<p>Vizualnim pregledom utvrdite ima li na kabelu napajanja i drugim kabelima oštećenja. Zamijenite kabel napajanja ili druge kabele ako su istrošeni ili oštećeni.</p>
	<p>Kabel napajanja i drugi kabeli ne smiju predstavljati rizik od spoticanja, a moraju biti smješteni na suhom mjestu.</p>
<p>Upotrebljavajte odgovarajući kabel napajanja i osigurače.</p>	

Operatoriaus ir įrangos sauga


Visi eksploatuojantys „Mobius® FlexReady Solution“ su „Smart Flexware®“ mazgus arba greta jo esantys asmenys privalo laikytis šių taisyklių:



	<p>Prieš pradėdami naudoti sistemą, perskaitykite ir supraskite šį naudotojo vadovą bei visus papildomus naudotojo vadovus. Nesilaikant instrukcijų galima susižeisti arba sugadinti sistemą.</p>
	<p>Prieš pradėdami sistemos priežiūros darbus, perskaitykite ir supraskite visas šiame naudotojo vadove pateiktas priežiūros darbų instrukcijas. Nesilaikant instrukcijų galima susižeisti arba sugadinti sistemą.</p>
	<p>Eksploatuodami sistemą, naudokite tinkamas asmens apsaugos priemones, įskaitant akių ir ausų apsaugos priemones. Atliekant UV lempos techninę priežiūrą, reikalinga akių apsauga nuo UV spindulių.</p>
	<p>Išimdami sistemą iš pakuotės, vadovaukitės dėžės išorėje esančiomis išpakavimo instrukcijomis. Nesilaikant instrukcijų operatorius gali susižeisti arba gali būti sugadinta įranga.</p>
	<p>Naudojant ilgą laiką, naudokite atitinkamas klausos apsaugos priemones.</p>
	<p>Prieš pradėdami eksploatuoti, įsitikinkite, kad sistema visiškai sumontuota, kaip aprašyta skyriuose „Techninės įrangos surinkimas ir nustatymas“ ir „Flexware®“ mazgo surinkimas ir montavimas“. Įsitikinkite, kad talpyklės ir „Flexware®“ mazgai yra tinkamai sumontuoti, o siurbLIAI ir jutikLIAI tinkamai prijungti.</p>
	<p>Būkite atsargūs, jei sistema naudojama ant nuolaidžių grindų.</p>
	<p>Niekuomet neeksploatuokite sistemos pavojingoje aplinkoje ir nenaudokite degių, lengvai užsiliepsnojančių skysčių arba tirpiklių.</p>
	<p>Bet kokiū būdu pakeitus sistemos gamyklines specifikacijas gali susidaryti nesaugios sąlygos ir nustoti galioti gaminio garantija.</p>
	<p>Išmaniojo vežimėlio duris atidarykite ir uždarykite atsargiai. Jei spyruoklinės sklendės nėra uždaromos arba atidaromos reikiamu laiku, gali susidaryti aukšto slėgio sanKaupa, įvykti produkto nuotėkis, sugesti filtrai, išsilieti cheminės medžiagos arba sugesti siurblys. Naudokite durų uždarymo ir durų atidarymo veiksmų seką ir atidžiai vykdykite visas naudojimo instrukcijas.</p>
	<p>Neperkelkite surinktos sistemos.</p>
	<p>Niekada neperkelkite bako vežimėlio, kai talpyklėse yra skysčio arba kai vyksta sistemos procesai.</p>
	<p>Būkite atsargūs perkeldami vežimėlius. Venkite staigių posūkių.</p>
	<p>Kai vežimėLIAI nejudinami, užfiksuokite užraktus.</p>
	<p>Vežimėlius stumkite laikydami tik už jų stūmimo rankenų.</p>
	<p>Prieš atjungdami jungtis arba atlikdami priežiūros darbus, įsitikinkite, kad „Flexware®“ mazguose nėra slėgio.</p>
	<p>Nepalikite veikiančios sistemos be priežiūros.</p>
<p>Sistema nėra tiekiamą su apsauginiu vožtuvu, esančiu ant bako gaubto. Jei reikia, naudotojas privalo įrengti apsauginį vožtuvą ant gaubto pagal galiojančias taisykles ir gaires. Dėl ASME reikalavimų skaitykite ASME kodekso BPVC VIII skyriaus 1 skirsnio 38G-125 dalį.</p>	
<p>Prieš išardydami sistemą arba atlikdami priežiūros darbus, įsitikinkite, kad išjungti visi energijos šaltiniai (skysčių, dujų ir elektros).</p>	
<p>Įsitikinkite, kad nesusisukę ir nesulenkti jokie vamzdelIAI.</p>	
<p>Naudodami slėgio jutiklį stebėkite slėgio didėjimo požymius. Jei kuri nors „Flexware®“ mazgo dalis pradeda plėstis, nedelsdami išjunkite siurbLį.</p>	
<p>Jei vyksta koks nors nuotėkis, išjunkite siurbLį. Kai slėgio jutiklio rodoma vertė yra lygi nuliui, nustatykite nuotėkio vietą ir priežastį.</p>	

	<p>Būkite atsargūs atidarydami ir uždarydami automatines spyruoklines sklendes. Jei vamzdyno automatinės spyruoklinės sklendės nėra uždaromos arba atidaromos reikiamu laiku, gali susidaryti aukšto slėgio sankaupa, įvykti produkto nuotėkis, išsiliėti cheminės medžiagos, sugesti siurblys arba iškilti pavojus operatoriui.</p>
	<p>Operacijos metu laikykite rankas atokiau nuo kolektoriaus vožtuvų, kad jų neprispaustų. Avarinio atleidimo mygtukas yra ant vamzdyno.</p>
	<p>Prieš atlikdami įrenginio techninę priežiūrą, atjunkite UV lempą.</p>
	<p>Blokas yra sunkus (apie 80 kg). Blokui perkelti naudokite bloko keltuvaž. Jei keltuvas nenaudojamas, laikykitės vietos taisyklių, susijusių su kėlimo apribojimais.</p>
	<p>Nelaikykite ilgai „Flexware[®]“ mazguose NaOH.</p>
	<p>Elektros smūgio rizika.</p>
	<p>Norėdami visiškai išjungti energijos tiekimą į valdymo bloką, atjunkite maitinimo laidą nuo energijos šaltinio</p>
	<p>Vizualiai patikrinkite, ar nepažeisti maitinimo laidai ir kabeliai. Pakeiskite susidėvėjusius maitinimo laidą ir kabelius.</p>
	<p>Užtikrinkite, kad maitinimo laidai ir kabeliai nebūtų atjungti ir būtų sausi.</p>
<p>Naudokite atitinkamus maitinimo kabelį ir grandinės pertraukiklius.</p>	

Operatora un aprīkojuma drošība


Jebkurai personai, kura lieto Mobius® FlexReady Solution kopā ar Smart Flexware® iekārtu vai strādā tās tuvumā, ir jāievēro tālāk norādītie nosacījumi.



	<p>Pirms iekārtas lietošanas izlasiet un izprotiet šajā lietotāja rokasgrāmatā un visu komponentu lietošanas rokasgrāmatās sniegtos norādījumus. Norādījumu neievērošana var radīt traumas lietotājam vai izraisīt iekārtas bojājumus.</p>
	<p>Pirms iekārtas tehniskās apkopes darbu veikšanas izlasiet un izprotiet visus šajā lietotāja rokasgrāmatā sniegtos norādījumus par tehnisko apkopi. Norādījumu neievērošana var radīt traumas lietotājam vai izraisīt iekārtas bojājumus.</p>
	<p>Darbinot iekārtu, lietojiet atbilstošu aizsargaprīkojumu, tostarp aizsargbrilles un ausu aizsarglīdzekļus. Strādājot ar ultravioleto staru lampu, ir jālieto acu aizsarglīdzekļi pret ultravioleto starojumu.</p>
	<p>Lai izņemtu iekārtu no iepakojuma, ievērojiet uz tās kastes sniegtos norādījumus par izpakošanu. Ja šie norādījumi netiek ievēroti, operators var gūt traumas vai var rasties aprīkojuma bojājumi.</p>
	<p>Ilgstošas izmantošanas laikā lietojiet atbilstošus dzirdes aizsarglīdzekļus.</p>
	<p>Pirms lietošanas pārliedziniet, vai iekārta ir pilnībā salikta, kā aprakstīts šeit: "Aprīkojuma montāža un sagatavošana" un "Flexware® iekārtas montāža un uzstādīšana". Nodrošiniet, ka tvertnes un Flexware® iekārtas ir atbilstoši uzstādītas un sūkņi un sensori ir atbilstoši pievienoti.</p>
	<p>Rīkojieties piesardzīgi, izmantojot iekārtu uz slīpām grīdām.</p>
	<p>Nekādā gadījumā nelietojiet iekārtu bīstamā vidē vai kopā ar viegli uzliesmojošiem un ugunsnedrošiem šķīdumiem un šķīdinātājiem.</p>
	<p>Jebkāda iekārtas pārveidošana neatbilstoši rūpnīcas specifikācijām var radīt nedrošus apstākļus un anulēt iekārtas garantiju.</p>
	<p>Rīkojieties piesardzīgi, atverot un aizverot automatizēto ratiņu lūku. Neatverot vai neaizverot slēgvārstus attiecīgajos laikos, var uzkrāties liels spiediens, rasties bojājumi izstrādājumam, filtriem, izšļakstīties ķīmiskās vielas vai rasties bojājumi sūkņim. Izmantojiet durvju atvēršanas un durvju aizvēršanas līdzekli un rūpīgi ievērojiet visus ekspluatācijas norādījumus.</p>
	<p>Kad iekārtas montāža ir pabeigta, to vairs nedrīkst pārvietot.</p>
	<p>Nedrīkst pārvietot trauku ratiņus, kamēr traukos ir šķidrums vai kamēr notiek iekārtas procesi.</p>
	<p>Uzmanīgi pārvietojiet ratiņus. Izvairieties no straujiem līkumiem.</p>
	<p>Aktivizējiet fiksatorus, kamēr ratiņi ir nekustīgi.</p>
	<p>Stumiet ratiņus, tikai turot tos aiz stumjamajiem rokturiem.</p>
	<p>Pirms savienojumu demontāžas vai jebkādu tehniskās apkopes darbu veikšanas pārbaudiet, vai Flexware® iekārtā nav spiediena.</p>
	<p>Iekārtas darbības laikā neatstājiet to bez uzraudzības.</p>
<p>Iekārta netiek piegādāta ar drošības vārstu uz trauka apvalka. Ja nepieciešams, operatoram uz apvalka ir jāuzstāda drošības vārsts atbilstoši piemērojamajiem noteikumiem un vadlīnijām. ASME prasības skatiet ASME kodeksa BPVC VIII iedaļas 1. daļas 38G-125 punktā.</p>	
<p>Pirms iekārtas demontāžas vai jebkādu tehniskās apkopes darbu veikšanas pārbaudiet, vai visi enerģijas avoti ir atvienoti (šķidrums, gāze un elektriskā strāva).</p>	
<p>Pārbaudiet, vai caurules nav samezģlojušās vai izliekušās.</p>	
<p>Paaugstināta spiediena pazīmju uzraudzībai izmantojiet spiediena sensoru. Ja kāda no Flexware® iekārtas daļām sāk izplesties, nekavējoties apturiet sūkni.</p>	
<p>Jebkādas noplūdes gadījumā apturiet sūkni. Kad spiediena sensora rādījums ir nulle, nosakiet noplūdes vietu un tās iemeslu.</p>	

	<p>Rīkojieties piesardzīgi, atverot un aizverot automātiskos slēgvārstus. Neatverot vai neaizverot automātiskos slēgvārstus uz kolektora attiecīgajos laikos, var uzkrāties liels spiediens, rasties bojājumi izstrādājumam, izšļakstīties ķīmiskās vielas, rasties bojājumi sūknim vai apdraudējums operatoram.</p>
	<p>Ekspluatācijas laikā turiet rokas attālāk no kolektora vārstiem, lai tās neiespiestu. Uz kolektora atrodas avārijas atbrīvošanas poga.</p>
	<p>Pirms iekārtas tehnisko darbu veikšanas atvienojiet ultravioleto staru lampu.</p>
	<p>Greifers ir smags (aptuveni 80 kg). Greifera pārvietošanai izmantojiet tā pacēlāju. Ja pacēlājs netiek izmantots, ievērojiet vietējos noteikumus par celšanas ierobežojumiem.</p>
	<p>Flexware® iekārtas nedrīkst pakļaut ilgstošai NaOH iedarbībai.</p>
	<p>Elektrošoka risks.</p>
	<p>Lai pilnībā atvienotu strāvas padevi vadības blokam, atvienojiet strāvas vadu no barošanas avota.</p>
	<p>Apskatiet un pārbaudiet, vai strāvas vadam un kabeļiem nav radušies bojājumi. Nomainiet visus nolietotos vai bojātos strāvas vadus un kabeļus.</p>
	<p>Pārbaudiet, vai strāvas vads un kabeļi nerada pakļupšanas draudus un vai tie atrodas sausā vietā.</p>
<p>Lietojiet atbilstošus strāvas kabeļus un jaudas slēdžus.</p>	

Veiligheid van gebruiker en apparatuur


Iedereen die met of in de buurt van de Mobius® FlexReady Solution met Smart Flexware® werkt, moet de volgende regels naleven:



	Lees deze gebruikershandleiding en alle onderdelen ervan en zorg dat u deze begrijpt voordat u gebruikmaakt van het systeem. Het niet naleven van de aanwijzingen kan leiden tot verwonding van de gebruiker of schade aan het systeem.
	Lees alle onderhoudsaanwijzingen in deze gebruikershandleiding en zorg dat u deze begrijpt voordat u onderhoud uitvoert aan het systeem. Het niet naleven van de aanwijzingen kan leiden tot verwonding van de gebruiker of schade aan het systeem.
	Gebruik geschikte persoonlijke beschermingsmiddelen, waaronder oog- en oorbescherming, tijdens het bedienen van het systeem. UV-oogbescherming is een vereiste bij onderhoud van de UV-lamp.
	Wanneer u het systeem uit de verpakking haalt, dient u de instructies voor het uitpakken te volgen die op de buitenkant van de kist staan. Het niet naleven van deze aanwijzingen kan leiden tot gebruikersverwondingen of schade aan de apparatuur.
	Gebruik geschikte gehoorbescherming tijdens langdurig gebruik.
	Voordat u de apparatuur gaat gebruiken, moet deze volledig worden gemonteerd zoals beschreven in 'Montage en installatie van de hardware' en de 'Montage en installatie van Flexware®-montages'. Zorg dat de containers en Flexware®-montages correct zijn geïnstalleerd en de pompen en sensoren correct zijn aangesloten.
	Wees voorzichtig wanneer het systeem op een hellende vloer wordt gebruikt.
	Bedien het systeem nooit in een gevaarlijke omgeving en gebruik het nooit in combinatie met ontvlambare, brandbare of oplosbare vloeistoffen.
	Alle wijzigingen aan het systeem ten opzichte van de fabrieksspecificaties kunnen tot onveilige situaties leiden en maken de productgarantie ongeldig.
	Wees voorzichtig bij het openen en sluiten van de deur van de Smart-kar. Als de knijpventielen niet op de juiste tijden worden geopend of gesloten, kan dit leiden tot opgesloten hoge druk, productverlies, beschadigde filters, gemorste chemische stoffen en schade aan de pomp. Gebruik de voorschriften voor het openen en sluiten van de deur en volg zorgvuldig alle bedieningsinstructies.
	Zodra het systeem is gemonteerd, mag het niet worden verplaatst.
	Verplaats de Tank-kar nooit wanneer er vloeistof in de containers zit of wanneer de systeemprocessen in werking zijn.
	Verplaats de karren voorzichtig. Vermijd scherpe bochten.
	Schakel de vergrendelingen in wanneer de karren stilstaan.
	Duw de karren alleen aan de handgrepen.
	Zorg ervoor dat er geen druk in de Flexware®-montages is vóór het demonteren van verbindingen of het uitvoeren van onderhoudswerkzaamheden.
	Laat het systeem tijdens bedrijf niet onbeheerd achter.
	Het systeem is niet uitgerust met een veiligheidsventiel op de tankmantel. De gebruiker moet, indien vereist, een veiligheidsventiel op de mantel plaatsen volgens de toepasbare wet- en regelgeving. Raadpleeg voor ASME-vereisten de ASME-code, BPVC-sectie VIII lid 1 artikel 38G-125.

	Zorg ervoor dat alle bronnen van energie (vloeistof, gas en elektriciteit) zijn uitgeschakeld voordat het systeem wordt gedemonteerd of er onderhoudswerkzaamheden worden uitgevoerd.
	Zorg ervoor dat er geen knikken of bochten in de slangen zitten.
	Gebruik de drukschakelaar om te controleren op tekenen van drukstijging. Als enig onderdeel van de Flexware®-montage opzwellt, stop de pomp dan onmiddellijk.
	Stop de pomp in geval van lekkage. Wanneer de druksensor op nul staat, identificeert u de exacte locatie en oorzaak van de lekkage.
	Wees voorzichtig bij het openen en sluiten van de automatische knijpventielen. Als de automatische knijpventielen op het spuitstuk niet op de juiste tijden worden geopend of gesloten, kan dit leiden tot opgesloten hoge druk, productverlies, gemorste chemische stoffen en schade aan de pomp, en kan de veiligheid van de gebruiker in het geding komen.
	Houd uw handen uit de buurt van de ventielen in het spuitstuk wanneer deze in gebruik is om beknelling te voorkomen. Op het spuitstuk bevindt zich een noodontgrendelingsknop.
	Koppel de UV-lamp los voordat u servicewerkzaamheden uitvoert bij de apparatuur.
	De clamshell is zwaar (circa 80 kg). Gebruik de clamshell-lift om de clamshell te verplaatsen. Volg de lokale regelgeving met betrekking tot takelbeperkingen wanneer de lift niet wordt gebruikt.
Stel de Flexware®-montages niet langdurig bloot aan NaOH.	
	Risico op elektrische schokken.
	Haal het netsnoer uit het stopcontact om de voeding naar de bedieningskast volledig uit te schakelen
	Controleer het netsnoer en de kabels visueel op beschadiging. Vervang versleten of beschadigde netsnoeren en kabels.
	Zorg ervoor dat het netsnoer en de kabels geen struikelgevaar vormen en dat deze zich in een droge omgeving bevinden.
Gebruik een geschikte voedingskabel en stroomonderbrekers.	

Bezpieczeństwo operatora i urządzenia


Wszystkie osoby obsługujące Mobius® FlexReady z zespołami Smart Flexware® muszą przestrzegać następujących zaleceń:



	<p>Przed uruchomieniem systemu przeczytać uważnie przewodnik użytkownika i wszystkie przewodniki dotyczące elementów składowych. Niestosowanie się do instrukcji grozi odniesieniem obrażeń ciała przez użytkownika i/lub uszkodzeniem systemu.</p>
	<p>Przed wykonaniem prac serwisowych w systemie należy uważnie przeczytać wszystkie instrukcje zawarte w tym przewodniku użytkownika. Niestosowanie się do instrukcji grozi odniesieniem obrażeń ciała przez użytkownika i/lub uszkodzeniem systemu.</p>
	<p>Podczas użytkowania systemu należy używać odpowiednich środków ochrony indywidualnej, w tym ochrony wzroku i słuchu. Podczas serwisowania lampy UV wymagane jest okularów ochronnych blokujących promieniowanie UV.</p>
	<p>Podczas wyjmowania systemu z opakowania należy przestrzegać znajdujących się na zewnętrznej stronie skrzyni instrukcji dotyczących odpakowywania. Niestosowanie się do tych instrukcji grozi odniesieniem obrażeń ciała przez operatora i/lub uszkodzeniem urządzenia.</p>
	<p>Podczas długotrwałego użytkowania użyć odpowiednich środków ochrony słuchu.</p>
	<p>Przed rozpoczęciem pracy należy upewnić się, że system jest w pełni zmontowany, jak opisano w częściach „Montaż i konfigurowanie sprzętu” oraz „Montaż i instalacja zespołu Flexware®”. Należy zadbać o prawidłową instalację zbiorników oraz zespołów Flexware®, a także odpowiednie podłączenie pomp i czujników.</p>
	<p>Należy zachować ostrożność, jeśli system został umieszczony na pochyłym podłożu.</p>
	<p>Nie wolno używać systemu w niebezpiecznym środowisku ani w obecności łatwopalnych cieczy lub rozpuszczalników.</p>
	<p>Jakiegokolwiek zmiany w systemie w stosunku do specyfikacji fabrycznej mogą doprowadzić do powstania niebezpiecznych warunków i utraty gwarancji.</p>
	<p>Podczas otwierania i zamykania drzwiczek inteligentnego wózka Smart Cart należy zachować ostrożność. Jeśli zawory zaciskowe nie zostaną otwarte lub zamknięte w odpowiednim czasie, może dojść do uwięzienia wysokiego ciśnienia w systemie, utraty produktu, uszkodzenia filtrów, wycieków substancji chemicznych lub uszkodzenia pompy. Należy stosować się do procedur dotyczących zamykania i otwierania drzwi oraz ściśle przestrzegać wszystkich instrukcji.</p>
	<p>Po zmontowaniu systemu nie wolno go przemieszczać.</p>
	<p>Nigdy nie należy przemieszczać wózka transportowego, na którym znajduje się zbiornik z cieczą. Nie należy tego robić również podczas trwania procesów.</p>
	<p>Przemieszczać wózki z zachowaniem ostrożności. Unikać ostrych zakrętów.</p>
	<p>Po ustawieniu wózków na swoim miejscu włączyć blokady.</p>
	<p>Do popychania wózków używać wyłącznie przeznaczonych do tego uchwytów.</p>
	<p>Należy się upewnić, że w zespołach Flexware® nie ma ciśnienia przed demontażem połączeń lub przeprowadzeniem prac konserwacyjnych.</p>
<p>Nie pozostawiać systemu bez nadzoru podczas pracy.</p>	
<p>System nie jest dostarczany z zaworem bezpieczeństwa na płaszczu zbiornika. Jeśli jest to wymagane, należy zainstalować zawór bezpieczeństwa na płaszczu, zgodnie z obowiązującymi przepisami i wytycznymi. Wymogi ASME: norma ASME, kod BPVC, sekcja VIII, dział 1, akapit 38G-125.</p>	

	<p>Przed zdemontowaniem systemu lub przeprowadzeniem prac konserwacyjnych należy się upewnić, że wszystkie źródła energii (ciecz, gaz, prąd) zostały odłączone.</p>
	<p>Sprawdzić, czy rurki nie są skręcone ani pozaginane.</p>
	<p>Za pomocą czujnika ciśnienia monitorować system pod kątem oznak wzrostu ciśnienia. Jeśli którykolwiek z elementów zespołu Flexware® zacznie się wybrzuszać, natychmiast zatrzymać pompę.</p>
	<p>Jeśli dojdzie do jakiegokolwiek wycieku, zatrzymać pompę. Gdy czujnik ciśnienia wskaże zero, zidentyfikować miejsce wycieku i jego przyczynę.</p>
	<p>Zachować ostrożność podczas otwierania i zamykania automatycznych zaworów zaciskowych. Jeśli zawory zaciskowe na zbloczu zaworowym nie zostaną otwarte lub zamknięte w odpowiednim czasie, może dojść do uwięzienia wysokiego ciśnienia w systemie, utraty produktu, wycieków substancji chemicznych, uszkodzenia pompy oraz pojawienia się zagrożenia dla operatora.</p>
	<p>Podczas pracy należy trzymać ręce z dala od zaworów na zbloczu zaworowym, aby uniknąć przytrzaśnięcia. Awaryjny przycisk zwalniający znajduje się na zbloczu zaworowym.</p>
	<p>Przed rozpoczęciem serwisowania należy odłączyć lampę UV.</p>
	<p>Obudowa zamykana jest ciężka (ok. 80 kg). Do przenoszenia obudowy zamykanej należy używać podnośników Clamshell Lift, W przypadku niestosowania podnośników należy stosować się do dopuszczalnych limitów obciążenia przy podnoszeniu określonych przepisami.</p>
<p>Nie wolno wystawiać zespołów Flexware® na działanie NaOH przez dłuższy czas.</p>	
	<p>Ryzyko porażenia prądem.</p>
	<p>Aby całkowicie wyłączyć zasilanie skrzynki sterowania zasilaniem, odłączyć przewód zasilający od źródła zasilania.</p>
	<p>Przewód zasilający i inne przewody należy sprawdzić wzrokowo pod kątem uszkodzeń. Wymienić zużyte lub uszkodzone przewody zasilające i inne przewody.</p>
	<p>Należy się upewnić, że przewód zasilający i inne przewody nie stanowią zagrożenia potknięcia się i że znajdują się w suchych miejscach.</p>
<p>Należy używać odpowiedniego przewodu zasilającego i wyłączników.</p>	

Segurança do utilizador e do equipamento


Qualquer pessoa que utilize ou esteja perto da Solução Mobius® FlexReady com conjuntos Smart Flexware® tem de cumprir o seguinte:



	<p>Leia e entenda este manual do utilizador e os manuais do utilizador de todos os componentes antes de usar o sistema. O não cumprimento das instruções poderá resultar em ferimentos ou danos no sistema.</p>
	<p>Leia e entenda todas as instruções de manutenção neste manual do utilizador antes de efetuar a respetiva manutenção do sistema. O não cumprimento das instruções poderá resultar em ferimentos ou danos no sistema.</p>
	<p>Use equipamento de proteção pessoal adequado, incluindo proteção ocular e auditiva durante a operação do sistema. É necessária uma proteção ocular UV durante os trabalhos de manutenção da lâmpada UV.</p>
	<p>Siga as instruções de desembalagem no exterior da caixa quando retirar o sistema da embalagem. O não cumprimento destas instruções pode resultar em ferimentos ou danos no equipamento.</p>
	<p>Utilize proteção auditiva adequada em caso de utilização prolongada.</p>
	<p>Antes da utilização, deverá garantir que o sistema está completamente montado, tal como descrito em "Montar e configurar o hardware" e "Montar e instalar o conjunto Flexware®". Certifique-se de que os recipientes e os conjuntos Flexware® estão instalados corretamente e que as bombas e os sensores estão ligados corretamente.</p>
	<p>Tenha cuidado se o sistema estiver a ser utilizado em superfícies inclinadas.</p>
	<p>Nunca utilize o sistema num ambiente perigoso nem usá-lo com líquidos inflamáveis, combustíveis ou solventes.</p>
	<p>Qualquer alteração ao sistema que afete as especificações de fábrica poderá causar condições inseguras e anular a garantia do produto.</p>
	<p>Tenha cuidado ao abrir e fechar a porta do Smart Cart. O não abrir ou fechar válvulas manuais nos momentos apropriados pode resultar em alta pressão retida, perda de produto, filtros danificados, derrames de produtos químicos ou danos na bomba. Utilize o método para fechar ou abrir a porta e siga cuidadosamente todas as instruções de funcionamento.</p>
	<p>Não mova o sistema depois de estar montado.</p>
	<p>Nunca mova o carrinho do tanque enquanto houver líquido nos recipientes ou enquanto os processos do sistema estiverem em execução.</p>
	<p>Movimente as plataformas com cuidado. Evite viragens apertadas.</p>
	<p>Ative os bloqueios quando os carrinhos estão parados.</p>
	<p>Empurre os carrinhos utilizando apenas as pegadas de impulso.</p>
	<p>Certifique-se de que não existe pressão nos conjuntos Flexware®, antes de desmontar as ligações ou efetuar tarefas de manutenção.</p>
	<p>Não deixe o sistema sem supervisão durante a operação.</p>
	<p>O sistema não é fornecido com uma válvula de segurança no invólucro do tanque. Se necessário, o utilizador tem de instalar uma válvula de segurança no invólucro, de acordo com os regulamentos e diretrizes aplicáveis. Para requisitos ASME, consulte o código ASME BPVC, secção VIII, divisão 1, parágrafo 38G-125.</p>
	<p>Antes de desmontar o sistema ou efetuar tarefas de manutenção, garantir que todas as fontes de energia estão desligadas (fluidos, gás e eletricidade).</p>
<p>Certifique-se de que os tubos não estão torcidos ou dobrados.</p>	

	<p>Utilize o sensor de pressão para monitorizar a existência de sinais de aumento da pressão. Se qualquer parte do conjunto Flexware® começar a inchar, pare a bomba imediatamente.</p>
	<p>Em caso de qualquer fuga, pare a bomba. Quando o sensor de pressão indicar zero, identifique a localização e a causa da fuga.</p>
	<p>Tenha cuidado ao abrir e ao fechar as válvulas manuais automáticas. O não abrir ou fechar as válvulas manuais automáticas no coletor nos momentos apropriados pode resultar em alta pressão retida, perda de produto, derrames de produtos químicos, danos na bomba ou perigo para o utilizador.</p>
	<p>Mantenha as mãos afastadas das válvulas no coletor durante o funcionamento para evitar entalamentos. Existe um botão de libertação de emergência no coletor.</p>
	<p>Desligue a lâmpada UV antes de realizar a manutenção da unidade.</p>
	<p>A unidade clamshell é pesada (aproximadamente 80 kg). Utilize o elevador da unidade clamshell para a mover. Se não utilizar o elevador, siga os regulamentos locais relativos aos limites de elevação.</p>
	<p>Não expor os conjuntos Flexware® a NaOH durante períodos de tempo prolongados.</p>
	<p>Risco de choque elétrico.</p>
	<p>Para cortar totalmente a energia da caixa de controlo, desligar o cabo da fonte de alimentação.</p>
	<p>Verificar visualmente a (in)existência de danos nos cabos, incluindo o cabo de alimentação. Substituir os cabos gastos ou danificados.</p>
	<p>Garantir que os cabos não podem causar quedas, e que se encontram num local seco.</p>
	<p>Utilizar um cabo de fonte de alimentação e disjuntores adequados.</p>

Siguranța operatorilor și a echipamentului

Oricine utilizează sau lucrează lângă Mobius® FlexReady Solution cu ansamblurile Smart Flexware® trebuie să respecte următoarele instrucțiuni:



	<p>Citiți și înțelegeți acest ghid de utilizare și toate ghidurile de utilizare ale componentelor înainte de a utiliza sistemul. Nerespectarea instrucțiunilor poate duce la rănirea utilizatorului sau la deteriorarea sistemului.</p>
	<p>Citiți și înțelegeți toate instrucțiunile de întreținere din acest ghid de utilizare înainte de a efectua lucrări de întreținere asupra sistemului. Nerespectarea instrucțiunilor poate duce la rănirea utilizatorului sau la deteriorarea sistemului.</p>
	<p>Utilizați echipamentul de protecție personală adecvat, inclusiv ochelarii de protecție și căștile pentru protecția auzului, atunci când utilizați sistemul. Este necesar un echipament de protecție a ochilor împotriva razelor UV, la efectuarea lucrărilor de întreținere asupra lămpii UV.</p>
	<p>Urmați instrucțiunile pentru despachetare, aflate pe exteriorul lăzii la scoaterea sistemului din ambalaj. Nerespectarea acestor instrucțiuni poate duce la rănirea operatorului sau la deteriorarea echipamentului.</p>
	<p>Utilizați protecția adecvată pentru auz în timpul utilizării prelungite.</p>
	<p>Înainte de utilizare, asigurați-vă că sistemul este asamblat complet așa cum este descris în „Asamblarea și configurarea echipamentului” și „Asamblarea și instalarea ansamblului Flexware®”. Asigurați-vă că recipientele și ansamblurile Flexware® sunt instalate corect, iar pompele și senzorii sunt conectați corespunzător.</p>
	<p>Acționați cu atenție atunci când sistemul este utilizat pe podele înclinate.</p>
	<p>Niciodată nu utilizați sistemul într-un mediu periculos sau în apropierea materialelor inflamabile, combustibililor sau solvenților lichizi.</p>
	<p>Orice modificare a sistemului față de specificațiile din fabrică pot cauza condiții de lucru nesigure și pot anula garanția produsului.</p>
	<p>Acționați cu atenție la deschiderea și închiderea ușii Smart Cart. Dacă supapele cu manșon nu sunt deschise sau închise la momentul potrivit, pot apărea următoarele consecințe: presiune înaltă blocată, pierderi de produse, filtre deteriorate, substanțe chimice vărsate sau pompe defecte. Utilizați procedura pentru închiderea sau deschiderea ușii și respectați cu atenție toate instrucțiunile de utilizare.</p>
	<p>După ce sistemul este asamblat, nu-l mișcați.</p>
	<p>Nu deplasați niciodată Tank Cart cu lichid în containere sau când procesele sistemului sunt în curs.</p>
	<p>Deplasați cărucioarele cu atenție. Evitați virajele strânse.</p>
	<p>Cuplați mecanismele de blocare atunci când cărucioarele sunt staționare.</p>
	<p>Împingeți cărucioarele ținând numai de mâner.</p>
	<p>Asigurați-vă că nu există presiune în ansamblurile Flexware® înainte de a dezambla racordurile sau de a efectua orice operație de întreținere.</p>
	<p>Nu lăsați sistemul nesupravegheat în timpul funcționării.</p>
	<p>Sistemul nu este echipat cu o supapă de siguranță pe cămașa rezervorului. Dacă este necesar, utilizatorul trebuie să instaleze o supapă de siguranță pe cămașă, conform reglementărilor și regulamentelor aplicabile. Pentru cerințele ASME, consultați ASME, codul BPVC secțiunea VIII, diviziunea 1, aliniatul 38G-125.</p>
	<p>Înainte de demontarea sistemului sau de a efectua orice operație de întreținere, asigurați-vă că toate sursele de energie sunt închise (lichid, gaze și electricitate).</p>
	<p>Asigurați-vă că niciun tub nu este răsucit sau îndoit.</p>

	<p>Utilizați senzorul de presiune pentru a monitoriza semnele de creștere a presiunii. Dacă oricare parte a ansamblului Flexware® începe să se umfle, opriți pompa imediat.</p>
	<p>În caz de scurgeri, opriți pompa. Când senzorul de presiune indică valoarea zero, identificați locația și cauza scurgerii.</p>
	<p>Atenție la deschiderea și închiderea supapelor automate cu manșon. Dacă supapele automate cu manșon de pe colector nu sunt deschise sau închise la momentul potrivit, pot apărea următoarele consecințe: presiune înaltă blocată, pierdere de produse, substanțe chimice vărsate, pompe defecte sau pericol pentru operator.</p>
	<p>Nu țineți mâinile pe supapele de pe colector în timpul utilizării, pentru a evita prinderea. Pe colector este amplasat un buton de eliberare de urgență.</p>
	<p>Deconectați lampa UV înainte de a efectua lucrări de întreținere a unității.</p>
	<p>Clapeta este grea (aproximativ 80 kg). Utilizați butonul de ridicare a clapetei pentru a deplasa clapeta. Dacă nu este utilizat butonul de ridicare, urmați reglementările locale privind limitele de ridicare.</p>
	<p>Nu expuneți ansamblurile Flexware® la NaOH perioade lungi de timp.</p>
	<p>Risc de electrocutare.</p>
	<p>Pentru a opri complet alimentarea cu energie către caseta de comandă, deconectați cablul de alimentare de la sursa de energie</p>
	<p>Inspectați vizual cablul de alimentare și celelalte cabluri pentru a afla dacă sunt deteriorate. Înlocuiți cablul de alimentare și oricare alt cablu dacă este deteriorat sau uzat.</p>
	<p>Asigurați-vă că cablul de alimentare și celelalte cablurile nu pot provoca împiedicarea persoanelor din zonă și că sunt amplasate într-o zonă uscată.</p>
	<p>Utilizați cablul de alimentare și întrerupătoarele de circuit corespunzătoare.</p>

Bezpečnosť obsluhy a zariadenia


Všetky osoby obsluhujúce alebo nachádzajúce sa v blízkosti systému Mobius® FlexReady Solution so zostavami Smart Flexware® musia spĺňať nasledujúce požiadavky:



	Skôr ako začnete systém používať, je potrebné, aby ste si prečítali túto používateľskú príručku a používateľské príručky ku všetkým súčastiam a porozumeli ich obsahu. Nedodržanie pokynov môže mať za následok poranenie používateľa alebo poškodenie systému.
	Skôr ako budete vykonávať údržbu systému, je potrebné, aby ste si prečítali všetky pokyny k údržbe v tejto používateľskej príručke a porozumeli ich obsahu. Nedodržanie pokynov môže mať za následok poranenie používateľa alebo poškodenie systému.
	Pri práci so systémom používajte vhodné osobné ochranné prostriedky vrátane ochrany očí a uší. Počas vykonávania údržby na UV lampe používajte prostriedky na ochranu očí pred UV žiarením.
	Pri vyberaní systému z obalu sa riadte pokynmi k vybalovaniu, ktoré sa nachádzajú na vonkajšej strane debny. Nedodržanie týchto pokynov môže mať za následok poranenie obsluhy alebo poškodenie zariadenia.
	Pri dlhodobom používaní používajte vhodnú ochranu sluchu.
	Pred použitím systému sa uistite, že je úplne zostavený podľa opisu v častiach Montáž a inštalácia hardvéru a Montáž a inštalácia zostavy Flexware®. Skontrolujte, či sú nádoby a zostavy Flexware® správne zmontované a čerpadlá a snímače správne pripojené.
	Ak sa systém používa na naklonenom povrchu, buďte obzvlášť opatrní.
	Systém nikdy neprevádzkujte v nebezpečnom prostredí ani ho nepoužívajte so zápalnými, horľavými kvapalinami ani rozpúšťadlami.
	Akékoľvek úpravy systému voči výrobným špecifikáciám môžu spôsobiť nebezpečné podmienky a viesť k strate platnosti záruky.
	Pri otváraní a zatváraní dvierok inteligentného vozíka postupujte opatrne. Keď sa škrtiace ventily neotvoria alebo nezatvoria v primeranom čase, môže to viesť k nahromadeniu vysokého tlaku, stratám produktu, poškodeniu filtrov, úniku chemikálií alebo poškodeniu čerpadla. Dvierka otvárajte a zatvárajte podľa návodu a dôsledne dodržiavajte všetky prevádzkové pokyny.
	Po zostavení systém nepremiestňujte.
	Vozíkom s nádržou nikdy nehýbte, kým sa v jeho nádobách nachádza kvapalina alebo kým prebiehajú systémové procesy.
	Vozíkmi pohybujte opatrne. Vyhnite sa ostrým zákrutám.
	Uzávery zapojte, keď sú vozíky v pokoji.
	Vozíky tlačte iba pomocou rúkoviek na tlačenie.
	Pred odpojením spojov alebo vykonávaním akejkoľvek operácie údržby sa uistite, že zostavy Flexware® nie sú pod tlakom.
	Počas prevádzky nenechávajte systém bez dozoru.
	Systém sa nedodáva s bezpečnostným ventilom na plášti nádrže. Bezpečnostný ventil na plášť musí v prípade potreby namontovať používateľ, a to v súlade s platnými predpismi a smernicami. Požiadavky ASME nájdete v kódexe spoločnosti ASME pre kotly a tlakové nádoby (BPVC), časť VIII, oddiel 1, odsek 38G-125.
	Pred demontážou systému alebo vykonávaním akejkoľvek operácie údržby sa uistite, že sú vypnuté všetky zdroje energie (kvapalina, plyn a elektrická energia).
	Uistite sa, že na hadiciach nie sú ohyby ani slučky.
	Na monitorovanie príznakov zvýšeného tlaku používajte snímač tlaku. Ak sa akákoľvek časť zostavy Flexware® začne vzdúvať, okamžite zastavte čerpadlo.

	<p>Ak dôjde k akémukoľvek presakovaniu, zastavte čerpadlo. Keď snímač tlaku udáva nulovú hodnotu, identifikujte miesto a príčinu presakovania.</p>
	<p>Pri otváraní a zatváraní automatických škrtiacich ventilov postupujte opatrne. Keď sa automatické škrtiace ventily na potrubí neotvorí alebo nezatvorí v primeranom čase, môže to viesť k nahromadeniu vysokého tlaku, stratám produktu, úniku chemikálií, poškodeniu čerpadla alebo ohrozeniu obsluhy.</p>
	<p>Počas prevádzky nedávajte ruky do blízkosti ventilov v potrubí, aby nedošlo k priškripeniu. Pohotovostné tlačidlo na uvoľnenie sa nachádza na potrubí.</p>
	<p>Pred údržbou jednotky odpojte UV lampu.</p>
	<p>Upevňovacia svorka je ťažká (približne 80 kg). Na presúvanie upevňovacej svorky používajte na to určený zdvíhací vozík. Ak zdvíhací vozík nepoužívate, riadte sa miestnymi nariadeniami upravujúcimi obmedzenia pri zdvíhaní bremien.</p>
	<p>Zostavy Flexware® dlhodobo nevystavujte pôsobeniu NaOH.</p>
	<p>Riziko zásahu elektrickým prúdom.</p>
	<p>Na úplné vypnutie napájania riadiacej jednotky odpojte napájací kábel od zdroja napájania.</p>
	<p>Skontrolujte, či sa na napájacom kábli a iných kábloch nenachádza viditeľné poškodenie. Vymeňte napájací kábel a iné káble v prípade opotrebovania alebo poškodenia.</p>
	<p>Uistite sa, že nehrozí riziko zakopnutia o napájací kábel a iné káble a že káble sú umiestnené na suchom mieste.</p>
<p>Používajte vhodný napájací kábel a ističe.</p>	

Varnost upravljalca in opreme


Osebe, ki upravljajo sistem Mobius® FlexReady Solution s sklopi Smart Flexware® ali delajo v njegovi bližini, morajo upoštevati naslednje:



	<p>Pred uporabo sistema morate prebrati in razumeti ta uporabniški priročnik in uporabniške priročnike vseh komponent. Če ne upoštevate navodil, lahko pride do poškodbe uporabnika ali škode na sistemu.</p>
	<p>Pred izvajanjem vzdrževalnih del na sistemu preberite vsa navodila za vzdrževanje v tem uporabniškem pripomočku in jih razumite. Če ne upoštevate navodil, lahko pride do poškodbe uporabnika ali škode na sistemu.</p>
	<p>Pri upravljanju sistema uporabljajte osebno zaščitno opremo, vključno z zaščito za oči in ušesa. Med servisiranjem UV-svetilke je potrebno nositi očala z UV-zaščito.</p>
	<p>Med odstranjevanjem sistema iz embalaže sledite navodilom za razpakiranje na zunanji strani zaboja. Če ne upoštevate navodil, lahko pride do poškodbe upravljalca ali škode na opremi.</p>
	<p>Med daljšo uporabo uporabljajte ustrezno zaščito sluha.</p>
	<p>Pred delovanjem zagotovite, da je sistem popolnoma sestavljen, kot je opisano v poglavjih "Sestavljanje in nameščanje strojne opreme" in "Sestavljanje in nameščanje sklopov Flexware®". Poskrbite, da so posode in sklopi Flexware® ustrezno nameščeni in so črpalke za dovajanje ter senzorji ustrezno priključeni.</p>
	<p>Bodite previdni, če sistem uporabljate na nagnjenih tleh.</p>
	<p>Sistema nikoli ne upravljajte v nevarnem okolju in ga ne uporabljajte z vnetljivimi, gorljivimi tekočinami ali topili.</p>
	<p>Spreminjanje sistema, ki ni v skladu s tovarniškimi specifikacijami, lahko povzroči nevarne razmere in izniči garancijo izdelka.</p>
	<p>Pazljivo odpirajte in zapirajte vratca pametnega vozička. Če ne odprete ali zaprete dozirnih ventilov pravočasno, lahko pride do ujetega visokega tlaka, izgube izdelka, poškodovanih filtrov, razlitja kemikalij ali poškodb črpalke. Uporabite postopek "zapri vrata" ali "odpri vrata" in pazljivo upoštevajte vsa navodila za uporabo.</p>
	<p>Ko je sistem sestavljen, ga ne premikajte.</p>
	<p>Vozička z rezervoarjem nikoli ne premikajte, če je v posodah tekočina ali med delovanjem postopkov sistema.</p>
	<p>Pazljivo premikajte vozičke. Izogibajte se ostrih zavojev.</p>
	<p>Ko vozički mirujejo, aktivirajte zavore.</p>
	<p>Vozičke potiskajte samo za ročaje.</p>
	<p>Pred odstranjevanjem povezav ali izvajanjem vzdrževalnih del izpusite tlak iz sklopov Flexware®.</p>
	<p>Med delovanjem sistem ne sme biti brez nadzora.</p>
	<p>Sistem nima varnostnega ventila na plašču posode. Če je potrebno, mora uporabnik namestiti varnostni ventil na plašč posode v skladu z veljavnimi predpisi in smernicami. Zahteve ASME (Ameriško združenje strojnih inženirjev) poiščite v kodeksu ASME, poglavju BPVC, oddelku VIII, 1. odstavku, 38G-125.</p>
	<p>Pred razstavljanjem in izvajanjem vzdrževalnih del izklopite vse vire napajanja (tekočina, plin in elektrika).</p>
	<p>Pazite, da cevi niso prepognjene ali zavozlane.</p>
<p>S senzorjem tlaka preverjajte, ali je tlak narasel. Če se kateri del sklopa Flexware® začne napihovati, takoj ustavite črpalko.</p>	
<p>Če pride do puščanja, ustavite črpalko. Če senzor tlaka prikazuje nič, poiščite natančno lokacijo in vzrok za puščanje.</p>	

	<p>Pazljivo odpirajte in zapirajte samodejne dozirne ventile. Če pravočasno ne odprete ali zaprete samodejnih dozirnih ventilov na razdelilniku, lahko pride do ujetega visokega tlaka, izgube izdelka, razlitja kemikalij, poškodb črpalke ali nevarnosti za upravljalca.</p>
	<p>Med delovanjem ne postavljajte rok na ventile na razdelilniku, da ne pride do priščipnjenja. Gumb za sproščanje v sili je pod razdelilnikom.</p>
	<p>Pred servisiranjem enote odklopite UV-svetilko.</p>
	<p>Ohišje je težko (približno 80 kg). Uporabite dvigalo za ohišje, da ga premaknete. Če ne uporabljate dvigala, upoštevajte lokalne predpise omejitve dviganja.</p>
	<p>Sklopov Flexware® ne smete dlje časa izpostavljati NaOH.</p>
	<p>Nevarnost električnega šoka.</p>
	<p>Da popolnoma prekinete napajanje upravljalne postaje, odklopite napajalni kabel iz vira napajanja.</p>
	<p>Preverite, ali so napajalni kabel in drugi kabli poškodovani. Obrabljene in poškodovane kable ali napajalni kabel zamenjajte.</p>
	<p>Poskrbite, da se ob napajalni kabel in druge kable ne bo mogoče spotakniti in jih namestite na suho mesto.</p>
<p>Uporabljajte ustrezni napajalni kabel in odklopna stikala.</p>	

Operatörs- och utrustningssäkerhet

Alla som använder eller befinner sig i närheten av Mobius® FlexReady-lösningen med Smart Flexware®-enheterna måste följa nedanstående anvisningar:

	Läs och sätt dig in i den här användarhandboken och alla komponentanvändarhandböcker innan du använder systemet. Om anvisningarna inte följs kan det leda till personskador eller skador på systemet.
	Läs och sätt dig in i alla underhållsanvisningar i den här användarhandboken innan du utför underhåll på systemet. Om anvisningarna inte följs kan det leda till personskador eller skador på systemet.
	Använd lämplig personlig skyddsutrustning, inklusive skyddsglasögon och öronskydd, när du använder systemet. Vid underhåll av UV-lampan måste UV-skyddsglasögon användas.
	Följ upppackningsanvisningarna utanpå lådan när du tar ut systemet ur förpackningen. Annars kan det leda till att användaren eller utrustningen skadas.
	Använd lämpligt öronskydd under långvarig användning.
	Kontrollera att systemet är helt monterat enligt "Montera och installera maskinvaran" (Assembly and Setting Up the Hardware) och "Montera och installera Flexware®-enheten" (Assembly and Installing the Flexware® Assembly) innan det används. Kontrollera att behållarna och Flexware®-enheterna är korrekt monterade samt att pumpar och sensorer är korrekt anslutna.
	Var försiktig om systemet används på sluttande golv.
	Använd aldrig systemet i farliga miljöer eller tillsammans med antändningsbara eller brännbara vätskor eller lösningsmedel.
	Om ändringar utförs som får systemet att avvika från fabriksspecifikationen kan följden bli försämrad säkerhet vid användning och även produktgarantin kan påverkas.
	Var försiktig när du öppnar och stänger dörren till Smart-vagnen. Att inte öppna och stänga klämventiler vid rätt tillfällen kan leda till instängt högtryck, produktskador, skadade filter, kemiskt avfall och pumpskador. Följ Stäng dörr-/Öppna dörr-principen och följ alla instruktioner.
	När systemet har monterats får det inte flyttas.
	Flytta aldrig tankvagnen med vätska i behållarna eller medan systemet är igång.
	Flytta vagnarna försiktigt. Undvik skarpa svängar.
	Koppla in låsen när vagnarna står stilla.
	Kör vagnarna framåt endast med tryckhandtagen.
	Se till att det inte finns något tryck i Flexware®-enheterna innan anslutningar nedmonteras eller innan du utför underhåll.
	Lämna inte systemet obevakat under drift.
	Systemet levereras inte med säkerhetsventil på tankens hölje. Vid behov behöver användaren montera en säkerhetsventil på höljet i enlighet med gällande föreskrifter och riktlinjer. För ASME-krav, se i ASME kod BPVC avsnitt VIII division 1 punkt 38G-125.
	Innan systemet nedmonteras eller innan en underhållsåtgärd utförs ska alla energikällor kopplas från (vätska, gas och elektricitet).
	Se till att eventuella slangar inte är vikta eller böjda.
Använd trycksensorn för att upptäcka tecken på tryckökning. Stoppa pumpen omedelbart om någon del av Flexware®-enheten börjar svälla.	
Stoppa pumpen vid läckage. När trycksensorn visar 0, hitta den exakta platsen och orsaken till läckaget.	

	<p>Var försiktig när du öppnar och stänger de automatiska klämventilerna. Om de automatiska klämventilerna på tryckröret inte öppnas och stängs vid rätt tillfällen kan det leda till instängt högtryck, produktskador, kemiskt avfall, pumpsador eller personskador.</p>
	<p>Håll händerna borta från ventilerna på tryckröret under drift för att undvika klämskador. Det sitter en nödknapp på tryckröret.</p>
	<p>Koppla loss UV-lampan innan underhåll utförs på enheten.</p>
	<p>Locket är tungt (cirka 80 kg). Använd lockliften för att flytta på locket. Om liften inte kan användas ska du följa lokala föreskrifter in lyftbegränsningar.</p>
	<p>Utsätt inte Flexware® -enheterna för natriumhydroxid under längre stunder.</p>
	<p>Risk för elektrisk stöt.</p>
	<p>Om du vill stänga av strömmen till styrenheten helt ska strömkabeln vara urkopplad från strömkällan</p>
	<p>Kontrollera att strömkabeln och kablarna inte har några synliga skador. Sliten eller skadad strömkabel eller annan kabel ska bytas ut.</p>
	<p>Se till att strömkabeln och kablarna inte utgör en snubbelrisk och att de är placerade i ett torrt utrymme.</p>
<p>Använd korrekt strömkabel och korrekta strömbrytare.</p>	

System Specifications

Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography

Mechanical Specifications

Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography

Specification		Chrom 2.2 L	Chrom 8.0 L
System Dimensions	Pump & Smart Carts connected H x W x D in mm	1752 x 1715 x 880 ± 20 mm	
Net Weight	Smart Cart with Clamshell	430 kg	
	Pump Cart with 2 Pumps with Manifold	210 kg	
Materials of Construction	Wetted Components		
	Tubing	Silicone	
	Smart Flexware® Assembly	Pureflex™ Film and PE fittings	
	Pump Head	EPDM, Santoprene® and polypropylene	
	Connectors	Polypropylene and polysulfone	
	Flowmeter	Multi Use: 316L stainless steel and PFA Single Use: Polysulfone and 316L stainless steel	
	UV, Conductivity and pH Sensor (MU)	Quartz, EPDM and stainless steel 316L	
	UV, Conductivity and pH Sensor (SUC)	Polysulfone Quartz, EPDM and stainless steel 316L (pins only)	
	Non Wetted Components		
	Carts	Stainless steel 304L with fiberglass cover	
	Clamshell (rear)	POM	
	Clamshell (front)	PMMA	
	Valve Pads	Silicone	
Casters	8 (4 free, 4 locking)		
Connections	Inlets (10) MPC or TC	1/4 in.	3/8 in.
	Outlets, 3 Fractions + 1 waste, MPC	1/4 in.	3/8 in.
	Filters	3/4 or 1 1/2 in. TC	
	Column	3/4 in. TC	
	Pneumatic	Quick connector with pneumatic fitting (flexible hose Ø12mm OD supplied by customer)	

Specification		Chrom 2.2 L	Chrom 8.0 L
Valves	On/Off Valves	Inside Clamshell: Automatic Pneumatic piston	
	Valve control (after Bubble Trap)	Inlet Manifold: Automatic Pinch Valve for 1/4 and 3/8 ID	
Pumps	Model	Quattroflow 150S x 2 (for gradient)	Quattroflow 1200S x 2 (for gradient)
	Maximum Pressure	4 bar	
Flow Range (L/min)		0.1 to 2.2	1.6 to 10
Pump Control		Fixed Position (speed in %) or Flowcontrol	

Operating Specifications

Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography

Specification		Chrom 2.2 L	Chrom 8.0 L
Total Operating Time	Flexware® Assemblies	Do not exceed 24 hours	
	Valve Pads	50 cycles (50 valve openings and 50 valve closings) per valve. The integrity of the installation may be compromised if used for more than 50 cycles.	
Product Temperature Range		Do not exceed 2500 cycles or six months.	
Product Temperature Range		2 to 30 °C	
Maximum Pressure	Pump 1 Manifold	0 to 2 bar	
	Pump Assembly	0 to 4 bar	
	Pump 2 Manifold	0 to 2 bar	
	Bubble Trap Assembly	0 to 4 bar	
	Smart Flexware® Assembly	0 to 4 bar	
	Precolumn Filter Assembly	0 to 4 bar	
	Post Column Instrumentation Assembly	0 to 2 bar	
	Precolumn Instrumentation Assembly	0 to 4 bar	
	Pre-use Instrumentation Cleaning Set	0 to 2 bar	
	Column Assembly	0 to 4 bar	
System Operating Temperature		2 to 30 °C	
Operating Humidity		10 to 90% (non condensing)	

Specification		Chrom 2.2 L	Chrom 8.0 L
Power Supply	Smart Cart	220-240VAC, 50/60 Hz, 1 phase, 3.9 A or 100-120VAC, 50/60 Hz, 1 phase, 8.4 A	
		Maximum consumption 1 KW	
Pneumatic Supply	Smart Cart	6 bar min, 10 bar maximum, oil free	
		Maximum consumption 4 L/min	

Instrument Specifications

Tags refer to the labels on the system hardware.

Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography

Specification		Tag	Range/Setting/ Type/Accuracy	Process Connection
Pressure Indicators		PIT001, PIT003, PT006	0-4 bar \pm 0.2 bar	Non intrusive
High Pressure Switches		PSH001, PSH003	4.42 bar	Non intrusive
Flowmeters	Chrom 2.2 L	FT002, FT004	Multi use: \pm 1% MV between 0.1 and 2.2 L/min and \pm 1 mL/min between 0.01 and 0.1 L/min	TC
	Chrom 8.0 L		Single use: \pm 2% MV between 1.6 L/min and 10 L/min Multi use: \pm 1% MV between 1.6-8.0 L/min \pm 16 mL/min between 0.16 and 1.6 L/min	
Temperature Sensors		TE009, TE012	2-30 °C \pm 1°C	Combined with conductivity sensor
Multi-use Conductivity Sensors		AE007, AE011	0 to 200 mS/cm \pm 2% FS Default Setting: 0-50 mS/cm \pm 2% FS	TC ¾ in.
Single-use Conductivity Sensors			0 to 150 mS/cm \pm 2% FS Default Setting: 0-50 mS/cm \pm 2% FS	in-line
pH Sensors		AE008, AE013	1-14 pH \pm 0.1 pH Default Setting: 3-9 pH \pm 0.1 pH	Multi use: TC ¾ in. Single Use: in line
Air Sensors		XS015, XSH005	N/A	Non intrusive
UV Sensors Do not use UV Sensors in a condensing atmosphere. Condensation may lead to erroneous sensor readings		AE010/014	UV: 0 - 2 AU \pm 2% FS OPL: 1, 2.5 or 10 mm Wavelength: Dual (254, 280 nm)	Multi use: TC ¾ in. Single Use: in line

Automation Specifications

Specification		Chrom 2.2 L	Chrom 8.0 L
Control Platform	PLC	Allen Bradley Compact Logic	
	Control software system	Windows® 7 Operating System	
	Operator interface panel type	iFix® Software	
Operator Interface		12.1 in. touch screen	

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF

Mechanical Specifications

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF

Specification			
System Dimensions	Carts connected	TF2S	2022 x 2167 x 1013 ± 20mm
	H x W x D in mm	TF3S	2022 x 2332 x 1194 ± 20mm
Net Weight	Stainless Steel Tank Cart 050 L		280 kg
	Stainless Steel Tank Cart 100 L		310 kg
	Stainless Steel Tank Cart 200 L		330 kg
	Smart Cart with Clamshell		430 kg
	Pump Cart with 2 Pumps & Manifold	TF2S	200 kg
	Pump Cart with 2 Pumps & Manifold	TF3S	280 kg
Castors			12 (6 free, 6 locking)
Connections	Manifold Inlets (4)		3/4 in. TC
	Manifold Vent		1-1/2 in. TC
	Filtrate	TF2S	1/2 in. MPC
		TF3S	5/8 in., 3/4 in. TC
	Recovery, Drain	TF2S	3/8 in. MPC
		TF3S	1/2 in. MPX
	Filters		Pellicon® 2 Cassette Filters or Pellicon® 3 Cassette Filters
	Tank	TF2S	Top Inlet 1/2 in. MPC
			Top Vent 1 1/2 in.
			Bottom outlet 5/8 in. MPC for Feed
			Bottom Inlet 5/8 in. MPC for Retentate
			Jacket inlet and outlet 3/8 in. BSPP Female
		TF3S	Top Inlet 1/2 in. MPC
			Top Vent 1 1/2 in.
			Bottom outlet 1 in., 1-1/2 in. TC for Feed
Bottom Inlet 5/8 in. 3/4 in. TC for Retentate			
Jacket inlet and outlet 3/8 in. BSPP Female			
Pneumatic		Quick connector with pneumatic fitting (flexible hose Ø12mm OD supplied by customer)	

Specification			
On/Off Valves	Inside Clamshell	Automatic Pneumatic piston	
	Inlet Manifold	Automatic Pinch Valve for 3/4 ID	
Proportional Valves	Retentate Valve	Pneumatic piston with pressure regulator	
	Retentate Valve Control	Fixed position (%) or retentate pressure or TMP	
	Filtrate Valve	Pneumatic piston with pressure regulator	
	Filtrate Valve Control	Fixed position (%) or flow or TMP	
Feed Pump	Model	TF2S	Quattroflow 1200S
	Feed Flow Range		2 to 20 L/min
	Maximum Pressure		4 bar
	Control on feed flow		Fixed Position (speed in %) or Flowcontrol or Pressure Drop Control
	Model	TF3S	Quattroflow 4400S
	Feed Flow Range		4 to 40 L/min
	Maximum Pressure		4 bar
	Control on feed flow		Fixed Position (speed in %) or Flowcontrol or Pressure Drop Control
Transfer Pump	Model	Quattroflow 1200S	
	Transfer Flow Range	TF2S	2 to 9 L/min
		TF3S	2 to 20 L/min
	Maximum Pressure	2 bar	
Transfer Flow Control	Fixed Position (speed in %) or Level control		
Feed Tank	Volume	TF2S	50L in LLDPE or Stainless Steel with Jacket
			100L in LLDPE or Stainless Steel with Jacket
			200L in LLDPE or Stainless Steel with Jacket
		TF3S	200L in LLDPE or Stainless Steel with Jacket
	Tank Level Control	Load Cells	
Feed Tank Jacket	Design Temperature	TF2S	-20 to 60 °C
	Maximum operating pressure		6.2 bar / 90 psi (Liquid)
	Working Volume	TF3S	50 L Tank: 3.3 L
			100 L Tank: 6.0 L
		200 L Tank: 7.8 L	

Caution

- The Tank jacket operating temperatures have to be compatible with :
- the Product temperature range which is: 2 – 45 deg °C
 - the Pureflex™ bag max allowable temperature which is 60°C

Specification		
Materials of Construction	Wetted Components	
	Tubing	Silicone
	Smart Flexware® Assembly	Pureflex™ Film and PE Fittings
	Feed Bag Assembly	Pureflex™ Film
	Pump Head	EPDM, Santoprene® and Polypropylene
	Pellicon® Liners	Polysulfone
	Connectors	Polypropylene and Polysulfone
	Multi-use UV & Conductivity Sensors	Quartz, EPDM and Stainless Steel 316L
	Single Use UV & Conductivity Sensors	Polysulfone Quartz, EPDM and Stainless Steel 316L (pins only)
	Retentate Low Dead Volume TC Sampler	LDVTC: DMDA-1250 NT 7 Sampler: HDPE O-ring: silicone
	TFF Mixer Vortex Breaker & Diverter Plate	HDPE
	Non Wetted Components	
	Carts	Stainless steel 304L with fiberglass cover
	SST Tank	304L
	Plastic Tank	LLDPE
	Clamshell (rear)	POM
	Clamshell (front)	PMMA
Valve Pads	Silicone	
Filtrate flow sensor (optional)	Housing/Lid: Epoxy resin, aluminum, stainless steel	

Operating Specifications

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF

Specification		
Total Operating Time	Flexware® Assemblies	Do not exceed 12 hours 50 cycles (50 valve openings and 50 valve closings) per valve. The integrity of the installation may be compromised if used for more than 50 cycles.
	Valve Pads	Do not exceed 2500 cycles or six months.
Product Temperature Range		2 to 45°C
Maximum Pressure	TFF Recovery Assembly, 10L, KHGEG006FH3	atmosphere
	TFF Recovery Assembly, 20L, KHGEG006FH3	atmosphere
	50L TFF Feed Flexware® Assembly	atmosphere
	100L Feed Flexware® Assembly	atmosphere
	200L Feed Flexware® Assembly	atmosphere
	Pump Assembly	0 to 4 bar

Specification			
Maximum Pressure	Transfer Pump Assembly		0 to 2 bar
	Transfer Pump Manifold Assembly		0 to 2 bar
	Feed Assembly		0 to 2 bar
	Smart Flexware® Assembly		0 to 4 bar
	Cassette Liner Assembly		0 to 4 bar
	Integrity Tester Assembly		0 to 4 bar
	Filtrate Instrument Assembly (multi-use, no sampling)		0 to 2 bar
	Filtrate Instrument Assembly (multi-use, with sampling)		
	Filtrate Assembly, (no instrument, no sampling)		
	Filtrate Sampling Port Assembly		
	Retentate Sampling Port Assembly		
	Filtrate Instrument Assembly (SUC)		
	Flushing Assembly		
	Drain Assembly		
Filtrate Assembly			
System Operating Temperature		2 to 30°C	
Operating Humidity		10 - 90% (non condensing)	
Power Supply	Smart Cart		220-240VAC, 50/60 Hz, 1 phase, 3.9 A or 100-120VAC, 50/60 Hz, 1 phase, 8.4 A Maximum consumption: 1 KW
	Tank Cart 100L, 200L		220-240VAC, 50/60 Hz, 1 phase, 1.8 A or 100-120VAC, 50/60 Hz, 1 phase, 3.7 A Maximum consumption: 0.4 KW
	Tank Cart 50L		220-240VAC, 50/60 Hz, 1 phase, 0.4 A or 100-120VAC, 50/60 Hz, 1 phase, 0.8 A Maximum consumption 0.1 KW
	Pump Cart	TF3S	3 x 200 - 240 VAC, 50/60 Hz, 3 phases + neutral + ground, 10 A or 3 x 400 - 460 VAC, 50/60 Hz, 3 Phases + neutral + ground, 5 A Maximum consumption: 3 KW
	Pneumatic Supply for Smart Cart		6 bar min, 10 bar maximum, oil free Maximum consumption: 4 L/min

Instrument Specifications

Tags refer to the labels on the system hardware.

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF

Specification	Tag		Range/Setting/Type/ Accuracy	Process Connection
Pressure Indicators	PIT001, PIT002, PIT101, PIT401		0 to 4 bar \pm 0.2 bar	Non intrusive
Feed High Pressure Switch	PSH001		4.42 bar	Non intrusive
Transfer High Pressure Switch	PSH401		2.31 bar	Non intrusive
Feed Weight for 50L Tank	WT001		0 -50 kg \pm 0.3% FS	Load Cells
Feed Weight for 100L Tank	WT001		0 -100 kg \pm 0.3% FS	Load Cells
Feed Weight for 200L Tank	WT001		0 -200 kg \pm 0.3% FS	Load Cells
Calculated feed flow	FI001	TF2S	2-18 L/min \pm 10%	N/A
		TF3S	4-40 L/min \pm 10%	N/A
	FI401	TF2S	2-9 L/min \pm 10%	N/A
		TF3S	2-20 L/min \pm 10%	N/A
Calculated Filtrate Flow	FI101		0.5-8 l/min \pm 5%	N/A
Filtrate Weight with Mobius® Weight Scale	WI101	TF2S	0 to 600 Kg \pm 0.3 % FS	Connector on Smart Cart
Filtrate Weight with User Supplied Weight Scale	WI102	TF2S	0 to 1000 Kg (accuracy linked to component connected)	Connector on Clamshell
		TF3S	0 to 1500 Kg (accuracy linked to component connected)	Connector on Clamshell
Filtrate Flowmeter	FI101	TF2S (User Supplied)	2- 9 LPM (accuracy linked to component connected)	Connector on Clamshell
		TF3S (user supplied)	4-25 LPM (accuracy linked to component connected)	Connector on Clamshell
Filtrate Flowmeter	FE101	TF2S (optional)	2 to 10 LPM \pm 5% MV 0.2 to 2 LPM \pm 120 mLPM at 20°C	Non intrusive, clamped on flow path
		TF3S (optional)	2 to 20 LPM \pm 5% MV 0.4 to 2 LPM \pm 120 mLPM at 20°C	Non intrusive, clamped on flow path
Temperature Sensors Feed Container	TE001		2 to 45 °C \pm 2°C	Non intrusive, IR
Conductivity Sensors on Filtrate Assembly	AE101		0 to 150 μ S/cm \pm 2% FS Default Setting 0 to 100 μ S/cm \pm 2% FS	Multi-use: TC ¾ in. Single Use: in line

Specification	Tag	Range/Setting/Type/ Accuracy	Process Connection
UV Sensors on Filtrate Line Do not use UV Sensors in a condensing atmosphere. Condensation may lead to erroneous sensor readings	AE102	UV: 0 to 2 AU $\pm 2\%$ FS OPL: 10 mm Wavelength: 254 nm	Multi use: TC $\frac{3}{4}$ in. Single Use: in line
	AE103	UV: 0 to 2 AU $\pm 2\%$ FS OPL: 10 mm Wavelength: 280 nm	
pH sensor	AE104	1 – 14 pH ± 0.1 pH Default Setting: 3 – 9 pH ± 0.1 pH	Single Use: in line

Automation Specifications

Specification		
Control Platform	PLC	Allen Bradley Compact Logic
	Control software system	Windows® 7 Operating System
	Operator interface panel type	iFix® Software
Operator Interface		12.1 in. touch screen

Storage Requirements

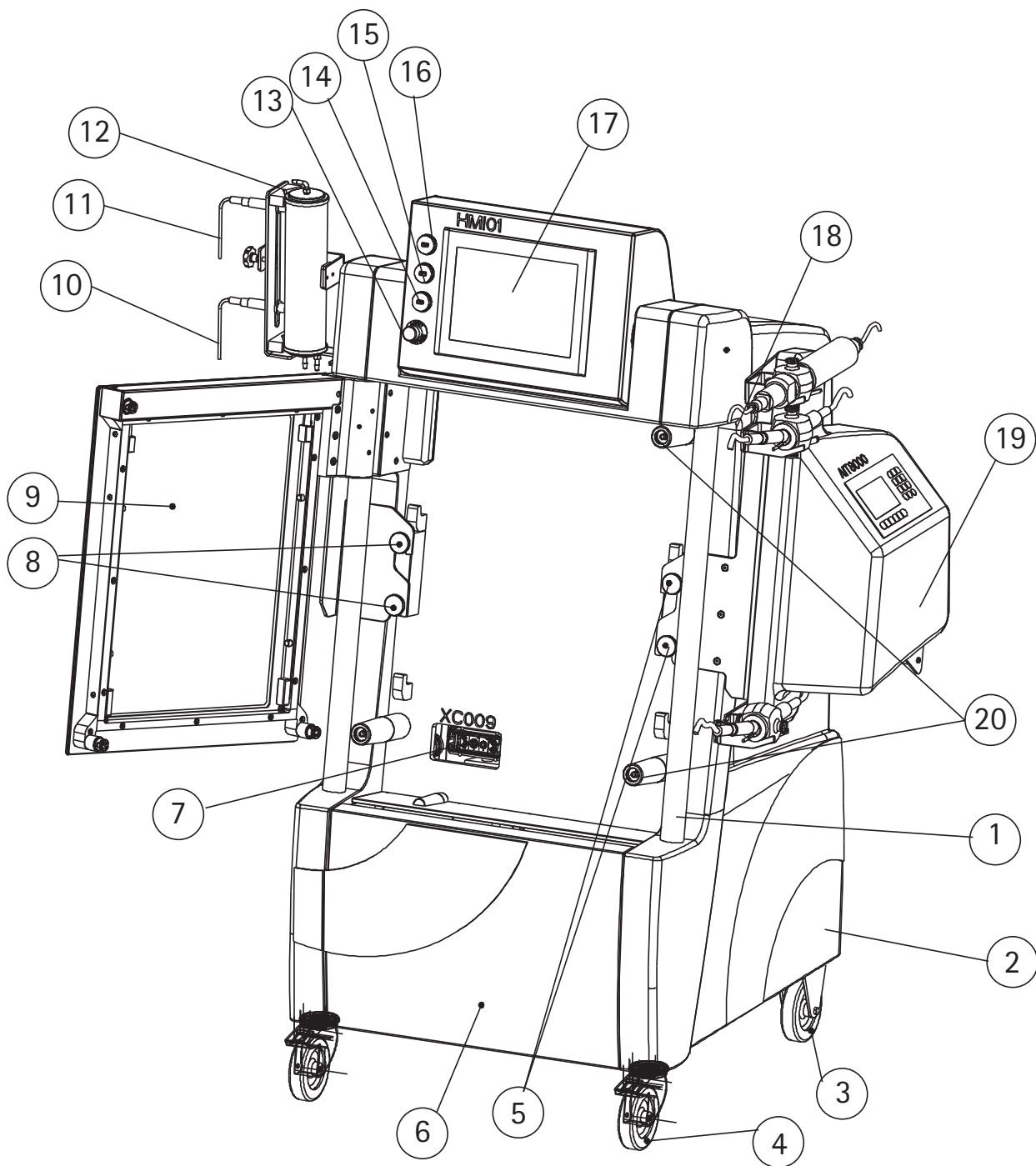
Parameter	Requirement
Temperature Range	2 to 30 °C
Humidity Range	10 to 90%
Cleaning	Unit must be thoroughly cleaned prior to storage.

System Components

Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography

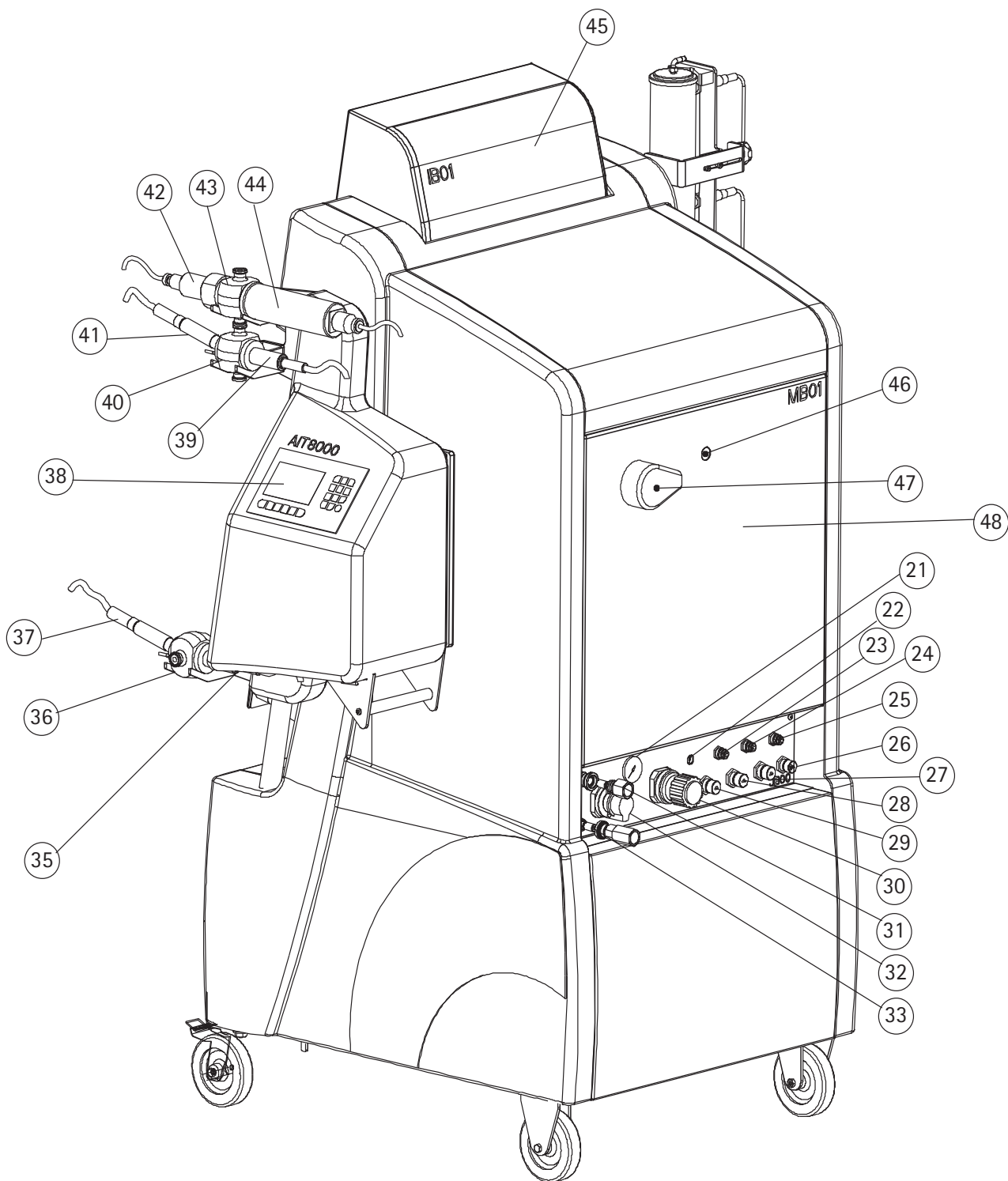
Smart Cart with Instrumentation and Bubble Trap Support

Key No.	Tag (labeled on the system)	Description
1	none	Push Handle
2	none	Fiberglass Coated Plastic Cover
3	none	Fixed Wheel
4	none	Swivel Wheel with Lock
5	none	Column Instrumentation Mounting Pins
6	none	Precolumn Filter Support Access Door
7	XC009	Clamshell Power Connector
8	none	Bubble Trap Support Pins
9	none	Smart Flexware® Viewing Panel
10	LSL017	Bubble Trap Low Level Sensor
11	LSH016	Bubble Trap High Level Sensor
12	none	Bubble Trap Support
13	ES001	Emergency Stop
14	USB001	Mouse Port
15	USB002	Keyboard Port
16	USB003	Printer Port
17	HMI01	Touch Screen
18	XS001	Door Closed Sensor
19	AIT8000	Column Instrumentation
20	XS006	Lock Sensor



Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography Smart Cart Front

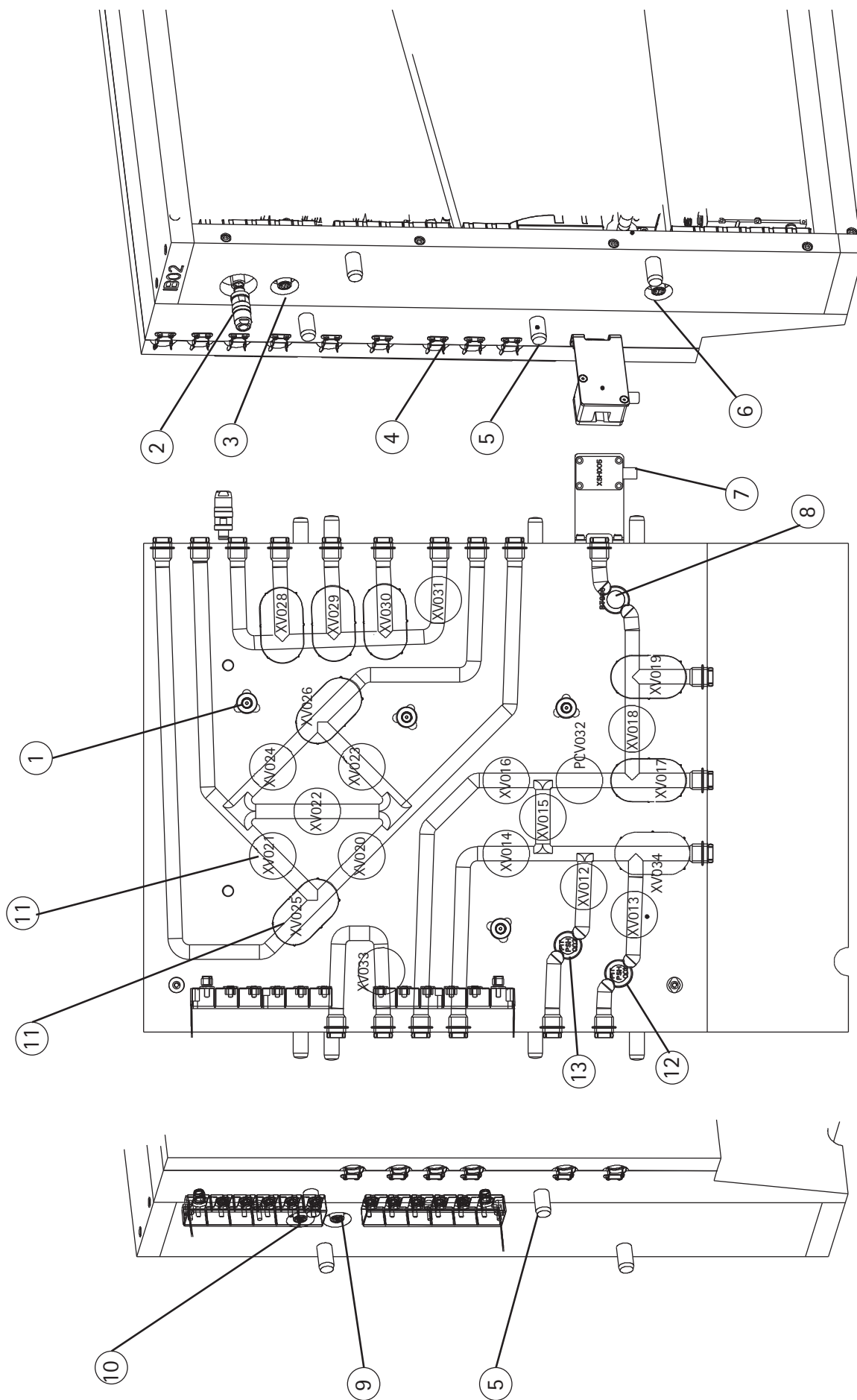
Key No.	Tag (labeled on the system)	Description
21	PI010	System Air Pressure Gauge
22	WE101	External Weight Scale Port (used for TFF only)
23	XC001	Electrical Power Connection
24	XC002A	Pump Cart Electrical Connection
25	XC003A	Pump Cart Electrical Connection for three-phase installations
26	ETH010	Network Connection (connect to user domain, printers, security, etc.)
27	ETH003A	Tank Cart Ethernet Connection (used for TFF only)
28	ETH002A	Pump Cart Ethernet Connection
29	ETH001	Ethernet Connection for PLC
30	PRV001	Pressure Regulator
31	XP001	Air Inlet Connection
32	8O1SP1	Pneumatic Switch
33	XP002A	Air outlet Connection for Manifold
35	AE007 TE009	Conductivity and Temperature Sensor
36	none	Precolumn Conductivity and pH Flow Cell
37	AE008	Precolumn pH Sensor
38	AIT8000	Column Instrumentation Control
39	AE011 TE012	Post Column Conductivity and Temperature Sensor
40	none	Post Column Conductivity and pH Flow Cell
41	AE013	Post Column pH Sensor
42	AE010/014	UV Sensor
43	none	Post Column UV Flow Cell
44	AE010/014	UV Lamp
45	IB01	Control Box Access Panel
46	140H001	Power Supply Indicator
47	101SG1	Electrical Power Switch
48	MB01	Electrical Box
not shown	Y500A/ Y500B	Lock between front Clamshell and rear Clamshell
	Y501A/ Y501B	Glass Door Lock
	Y502A/ Y502B	Lock between mobile Clamshell and door
	Y503A/ Y503B	Lock between Clamshell and Cart



Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography Smart Cart Rear

Clamshell

Key No.	Tag (labeled on the system)	Component
1	XS002, XS003, XS004, XS005	Internal Lock with Sensor (4 places)
2	ETH004	Column Instrumentation Ethernet Connection
3	XC004	Column Instrumentation Power Supply Connection
4	none	Fitting Clips
5	none	Pin for Clamshell Lift
6	XSH005	Precolumn Bubble Sensor Connection
7	XSH005	Precolumn Bubble Sensor
8	PT006	Precolumn Pressure Sensor
9	LSL017	Bubble Trap Low Level Sensor Connection
10	LSH016	Bubble Trap High Level Sensor Connection
11	none	Silicone Valve Pads
12	PIT/PSH 001	Pressure Switch Sensor
13	PIT/PSH 003	Pressure Switch Sensor
—	XV012	Normally Open Valve
—	XV013	Normally Open Valve
—	XV014	Normally Open Valve
—	XV015	Normally Closed Valve
—	XV016	Normally Open Valve
—	XV017	Normally Closed Valve
—	XV018	Normally Open Valve
—	XV019	Normally Closed Valve
—	XV020	Normally Closed Valve
—	XV021	Normally Closed Valve
—	XV022	Normally Open Valve
—	XV023	Normally Closed Valve
—	XV024	Normally Closed Valve
—	XV025	Normally Closed Valve
—	XV026	Normally Closed Valve
—	XV028	Normally Closed Valve
—	XV029	Normally Closed Valve
—	XV030	Normally Closed Valve
—	XV031	Normally Open Valve
—	XV033	Normally Closed Valve
—	XV034	Normally Closed Valve
—	PCV032	Normally Open Control Valve

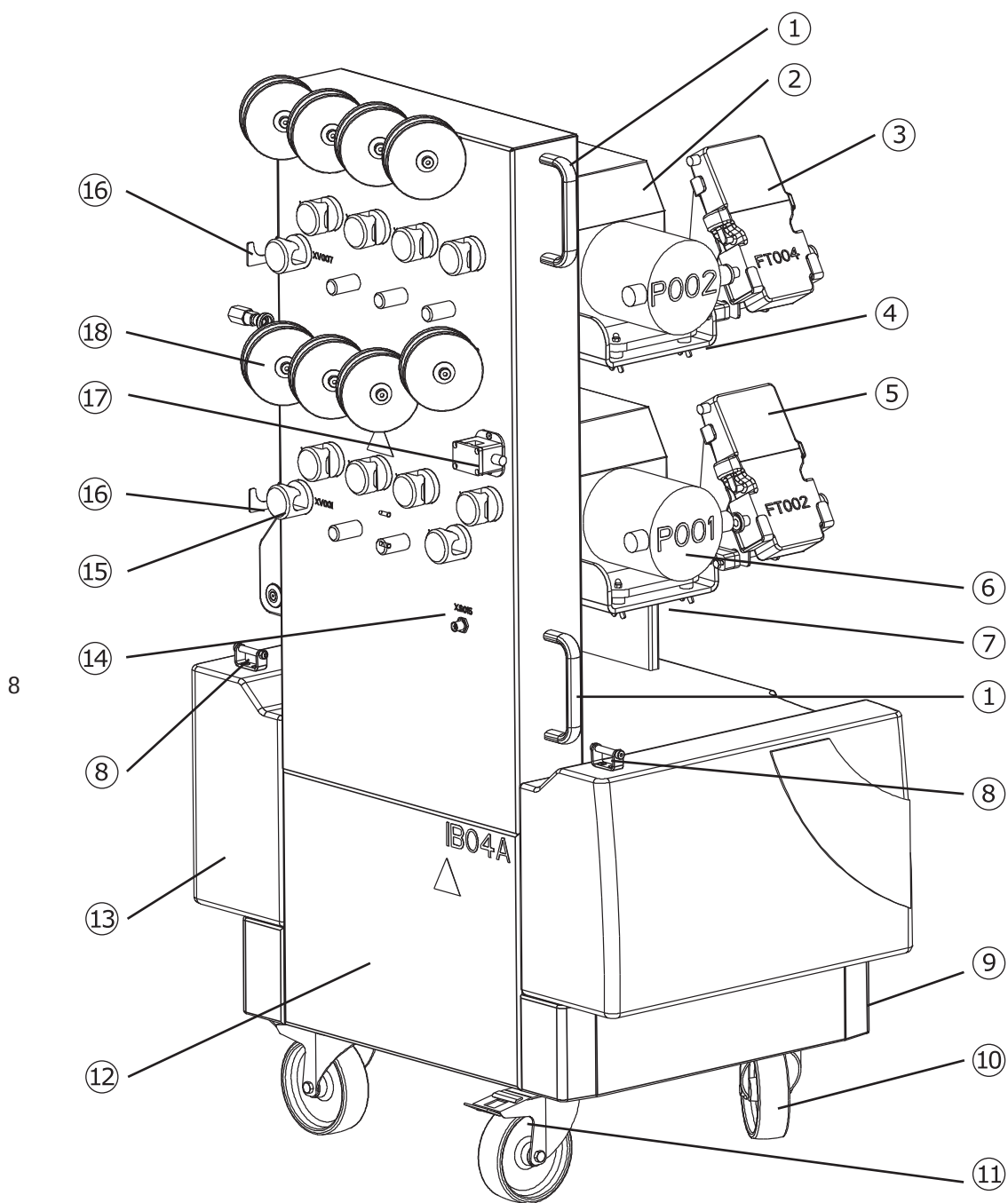


Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography Chrom 8.0 L/min Clamshell

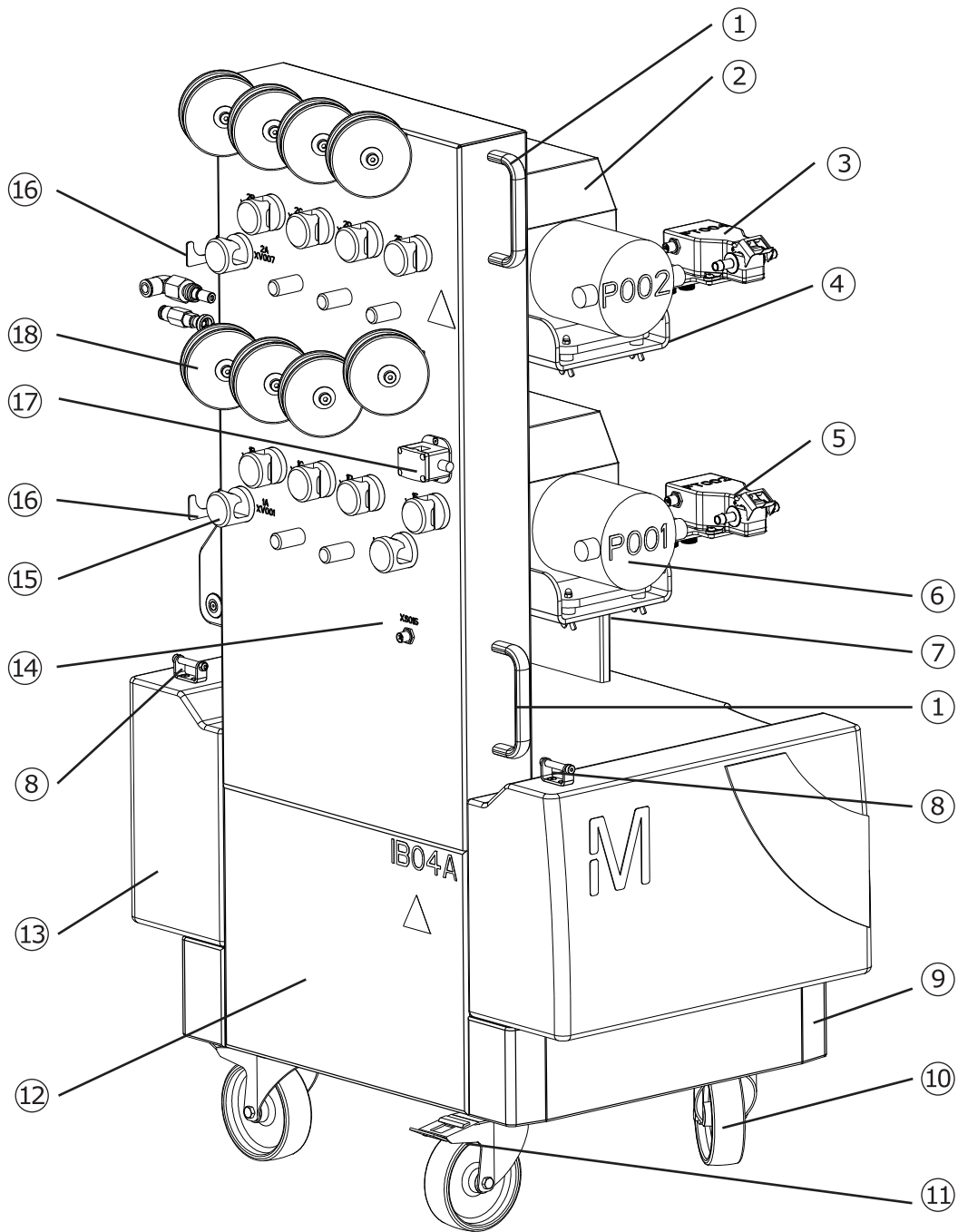
The Mobius® FlexReady Smart System for Chromatography

Pump Cart with Manifold, Pumps and Flowmeters

Key No.	Tag (labeled on the system)	Component
1	none	Handles
2	P002	Secondary Pump
3	FT004	Flowmeter
4	none	Pump P002 Support
5	FT002	Flowmeter
6	P001	Primary Pump
7	none	Pump P001 Support
8	none	Tank Cart Lock (used for TFF only)
9	none	Access Door
10	none	Swivel Wheel
11	none	Swivel Wheel with Lock
12	IB04A	Control Box access Panel
13	IB04	Pump Cart Electrical Box
14	XS015	End Product Air Sensor (Key No. 17) Connection
15	XV001, XV002, XV003, XV004, XV005, XV006, XV007, XV008, XV009, XV010, XV011	Normally Closed Valves
16	none	Flexware® Support
17	XS015	End Product Air Sensor
18	none	Tubing Roller Guide

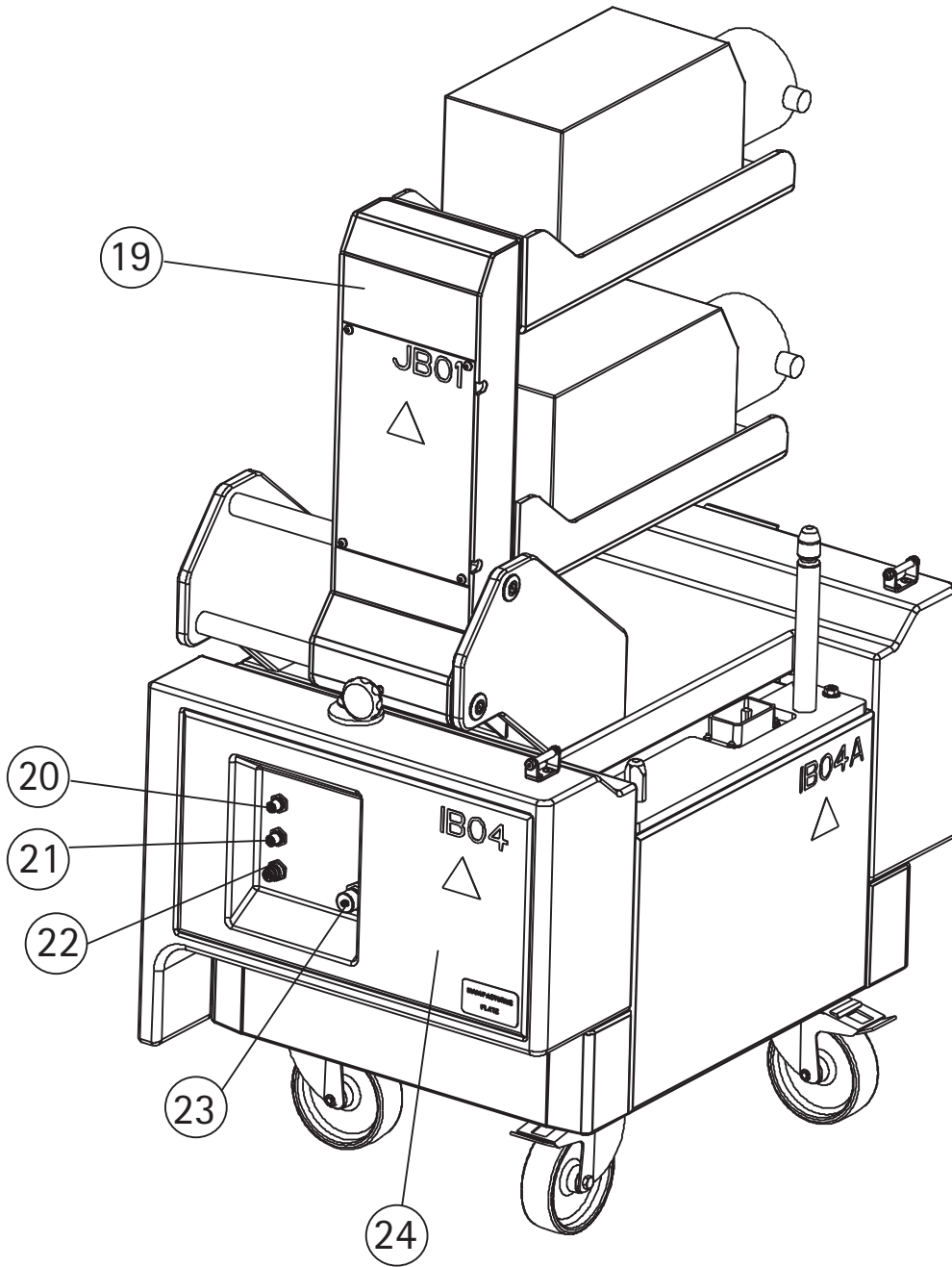


Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography Pump Cart with Manifold and Multi-Use Flowmeter (Front View)



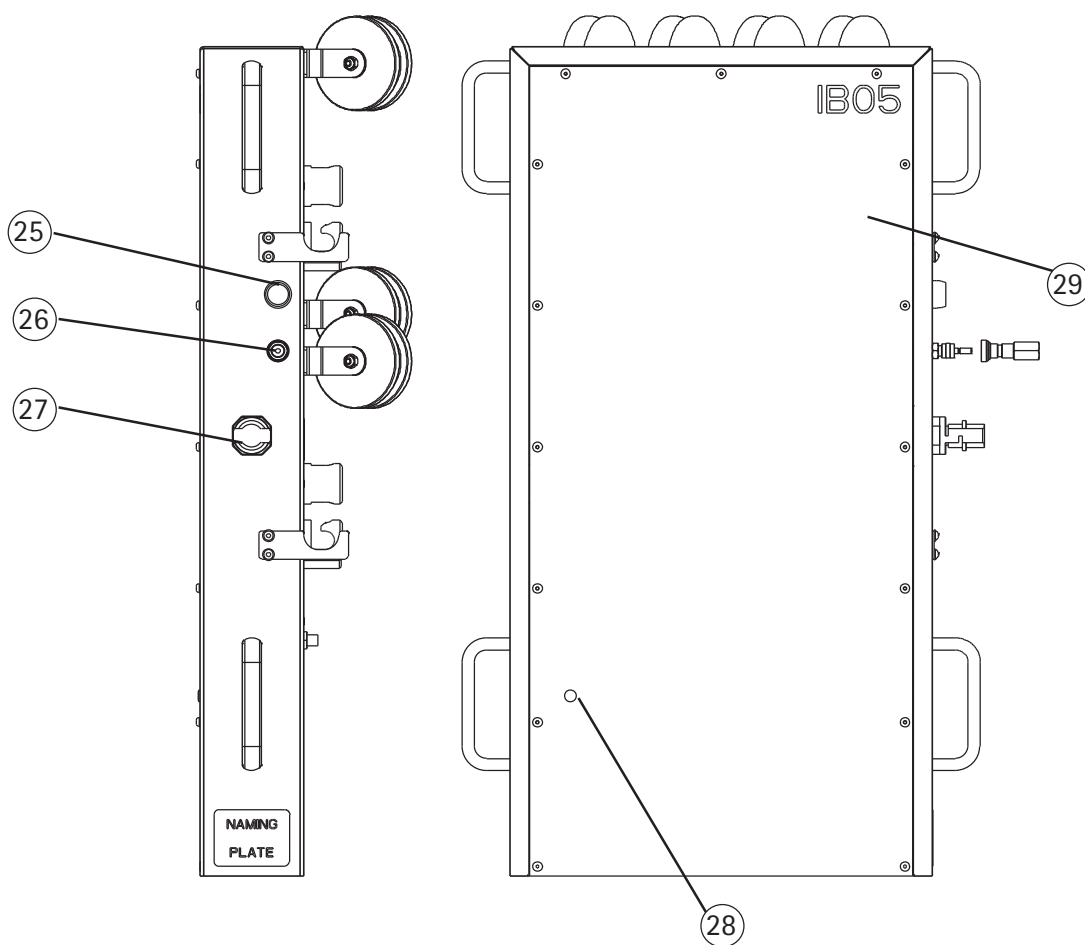
Mobius® FlexReady Solution with Smart Flexware® Assemblies for XMO3 (8.0 L) Chromatography Pump Cart with Manifold with Single-Use Flowmeter (Front View)

Key No.	Tag (labeled on the system)	Component
19	none	Pump Tower
20	FT002	Flowmeter Connector
21	FT004	Flowmeter Connector
22	XC002B	Electrical Connector
23	ETH002B	Ethernet Connector
24	IB04	Pump Cart Electrical Box



Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography Pump Cart without Manifold (Rear View)

Key No.	Tag (labeled on the system)	Component
25	XP002B	Compressed Air Inlet (From Smart Cart)
26	XP003	Emergency Release Button
27	801SP2	Pneumatic ON/OFF Switch
28	none	Manifold to Pump Cart Lock
29	IB05	Manifold Electrical Box

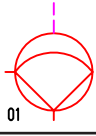
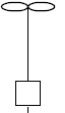

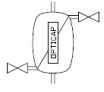
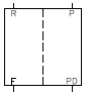











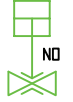

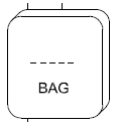
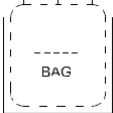



Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography Manifold (Rear View)

Piping and Instrumentation Diagram (P & ID) Legend

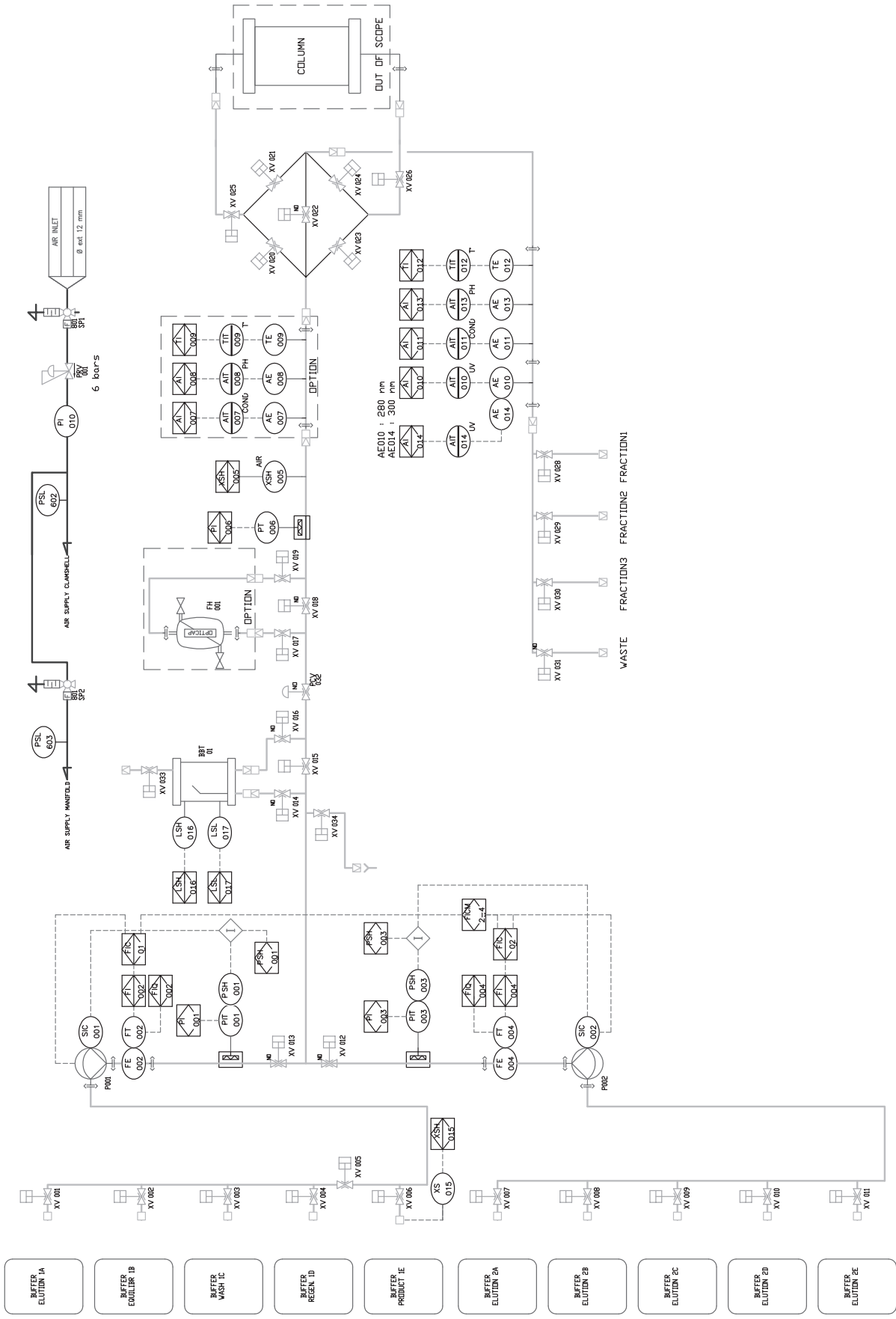
Tag (labeled on the system)	Component
P	Pump
S	Pump speed variator
XV	Automatic Valve
PCV	Pressure Control Valve
PRV	Pressure Reducing Valve
T	Temperature sensor + function
P	Pressure sensor + function
L	Level Sensor
F	Flow Sensor
A	Analyzer
X	Digital

Tag (labeled on the system)	Function
I	Indicator
C	Control
E	Element
T	Transmitter
L	Low value
H	High value
LL	Low Low value
HH	High High value
SH	Switch on High value
SL	Switch on Low value
Q	Totalizer

Symbol	Description
	Diaphragm pump
	Mixer
	Millipak® Filter
	Opticap® Filter
	Pellicon® Holder R=Retentate port, F=Feed port, P=Permeate (High port), PD=Permeate Drain
	HB Connector
	TC Connector
	Low Dead Volume Connector
	Male MPC Connector
	Female MPC Connector

Symbol	Description
	Sampling Port
	Plug
	Pinch Clamp (valve identification tags for P&ID reference only)
	Control Valve
	Normally Open On/Off Valve
	2D Container
	3D Container
	Plastic Holder (for 2D or 3D containers)
	Interlock Logical Symbol
	Or Logical Symbol
	And Logical Symbol

The Mobius® FlexReady Smart System for Chromatography

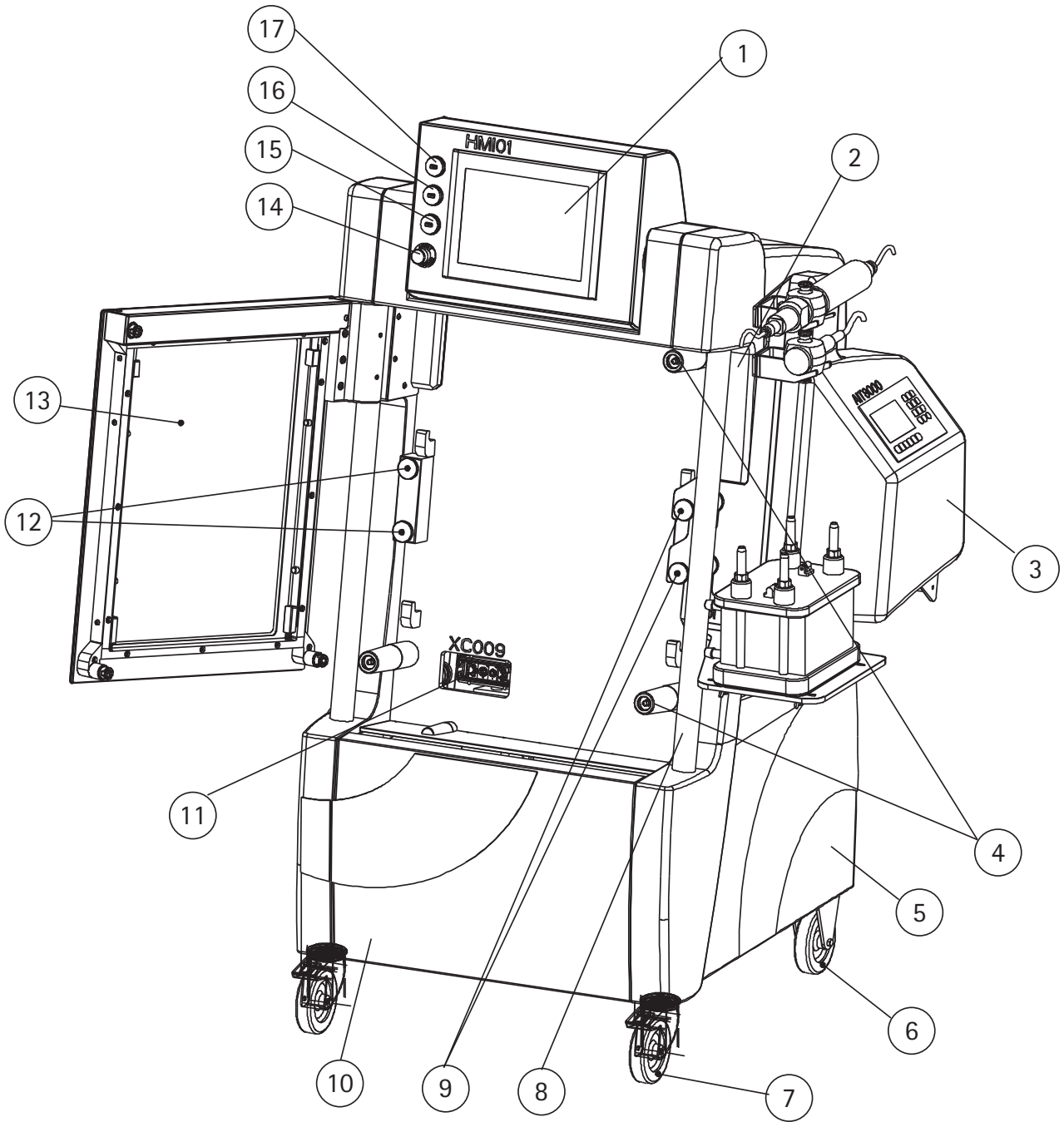


Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography Piping and Instrumentation Diagram (P&ID)

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF

TF2S Smart Cart with Holder Support and Instrumentation Kit

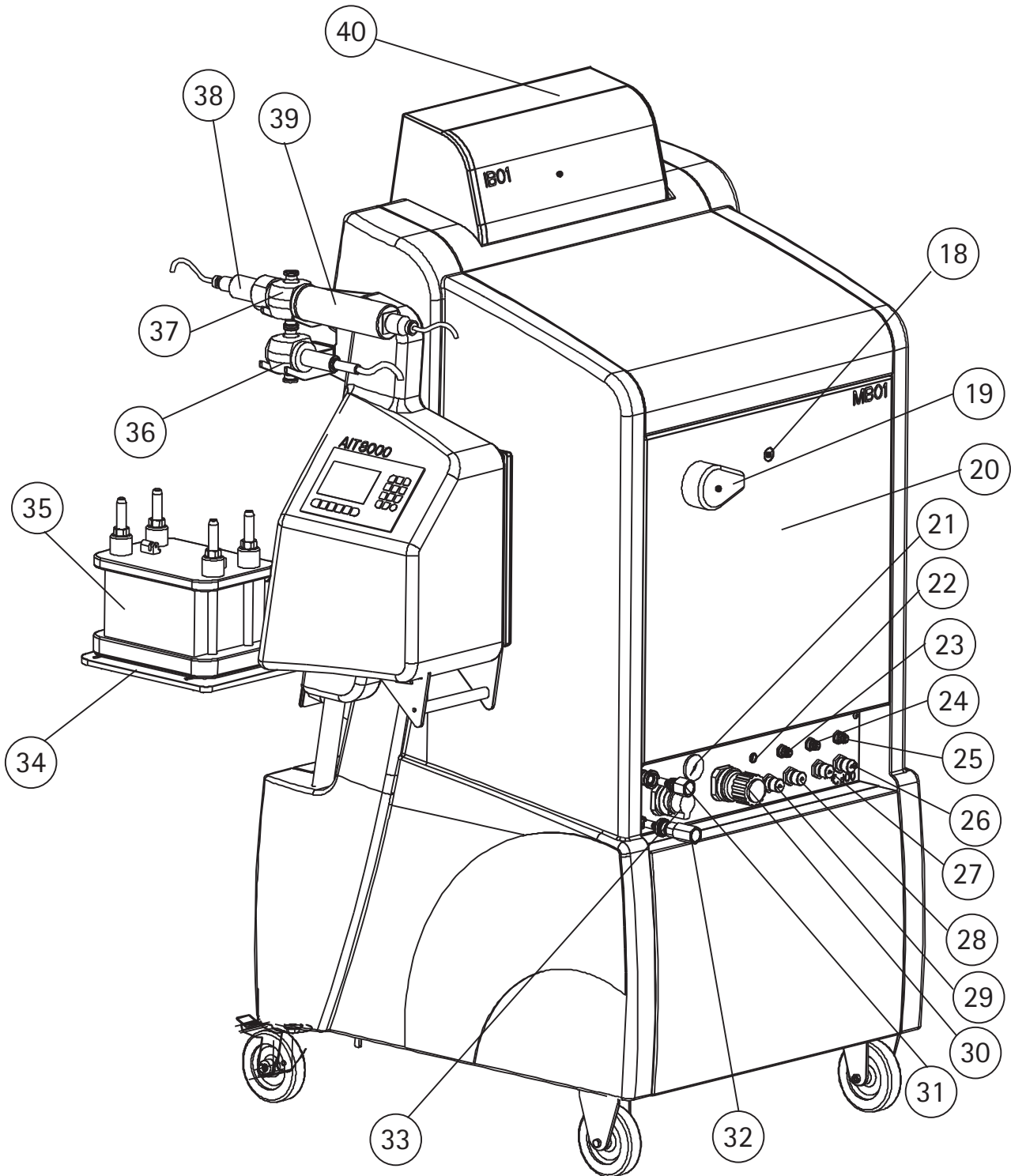
Key No.	Tag (labeled on the system)	Description
1	HMI01	Touch Screen
2	XS001	Door Closed Sensor
3	AIT8000	Filtrate Instrumentation Kit
4	XS006	Lock Sensor
5	none	Fiberglass Coated Plastic Cover
6	none	Fixed Wheel
7	none	Swivel Wheel with Lock
8	none	Push Handles
9	none	Column Instrumentation and Cassette Holder Support Mounting Pins
10	none	Service Door
11	XC009	Clamshell Power Connector
12	none	Bubble Trap Support Pin (not used on TFF System)
13	none	Smart Flexware® Viewing Panel
14	ES001	Emergency Stop
15	USB001	Mouse Port
16	USB002	Keyboard Port
17	USB003	Printer Port



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF2S Smart Cart Front

TF2S Smart Cart with Holder Support and Instrumentation Kit

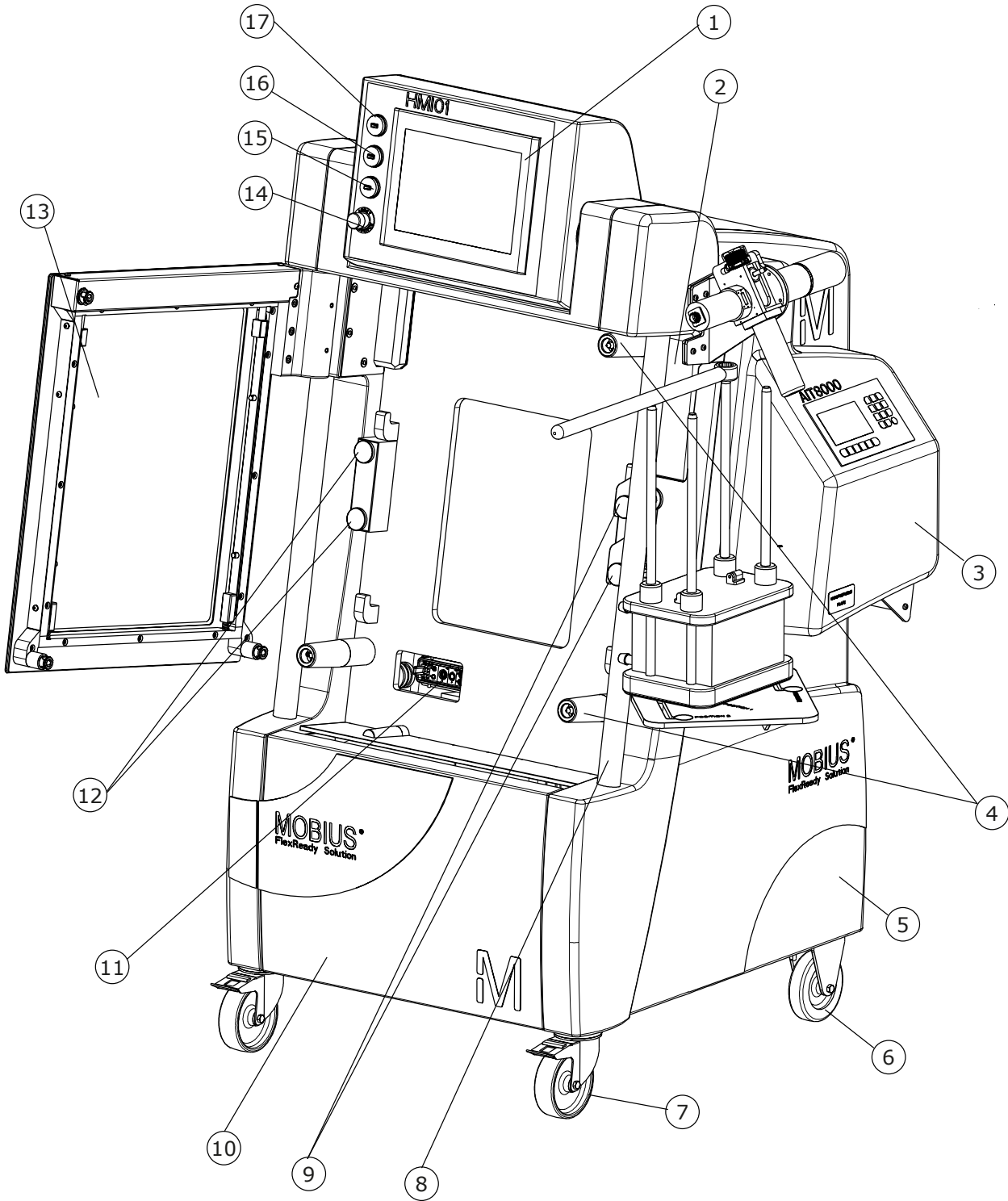
Key No.	Tag (labeled on the system)	Description
18	140H001	Power Supply Indicator
19	101SG1	Electrical Power Switch
20	MB01	Electrical Box
21	PI010	System Air Pressure Gauge
22	WE101	External Weight Scale Port
23	XC001	Electrical Power Connection
24	XC002A	Pump Cart Electrical Connection
25	XC003A	Pump Cart Electrical Connection for three-phase installations
26	ETH010	Network Connection (connect to user domain, printers, security, etc.)
27	ETH003A	Tank Cart Ethernet Connection
28	ETH002A	Pump Cart Ethernet Connection
29	ETH001	PLC Connection
30	PRV001	Pressure Regulator
31	XP001	Air Inlet Connection
32	XP002A	Air outlet Connection for Manifold
33	8O1SP1	Pneumatic Switch
34	FH001	TFF Cassette Holder
35	none	TFF Cassette
36	AE101	Filtrate Conductivity Flow Cell and Sensor
37	none	Filtrate UV Flow Cell
38	AE102 AE103	Filtrate UV Sensor
39	AE102 AE103	Filtrate UV Lamp
not shown	Y500A/Y500B	Lock between front Clamshell and rear Clamshell
	Y501A/Y501B	Glass Door Lock
	Y502A/Y502B	Lock between mobile Clamshell and door
	Y503A/Y503B	Lock between Clamshell and Cart
40	IB01	Control Box Access Panel



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF2S Smart Cart Rear

TF3S Smart Cart with Holder Support and Instrumentation Kit

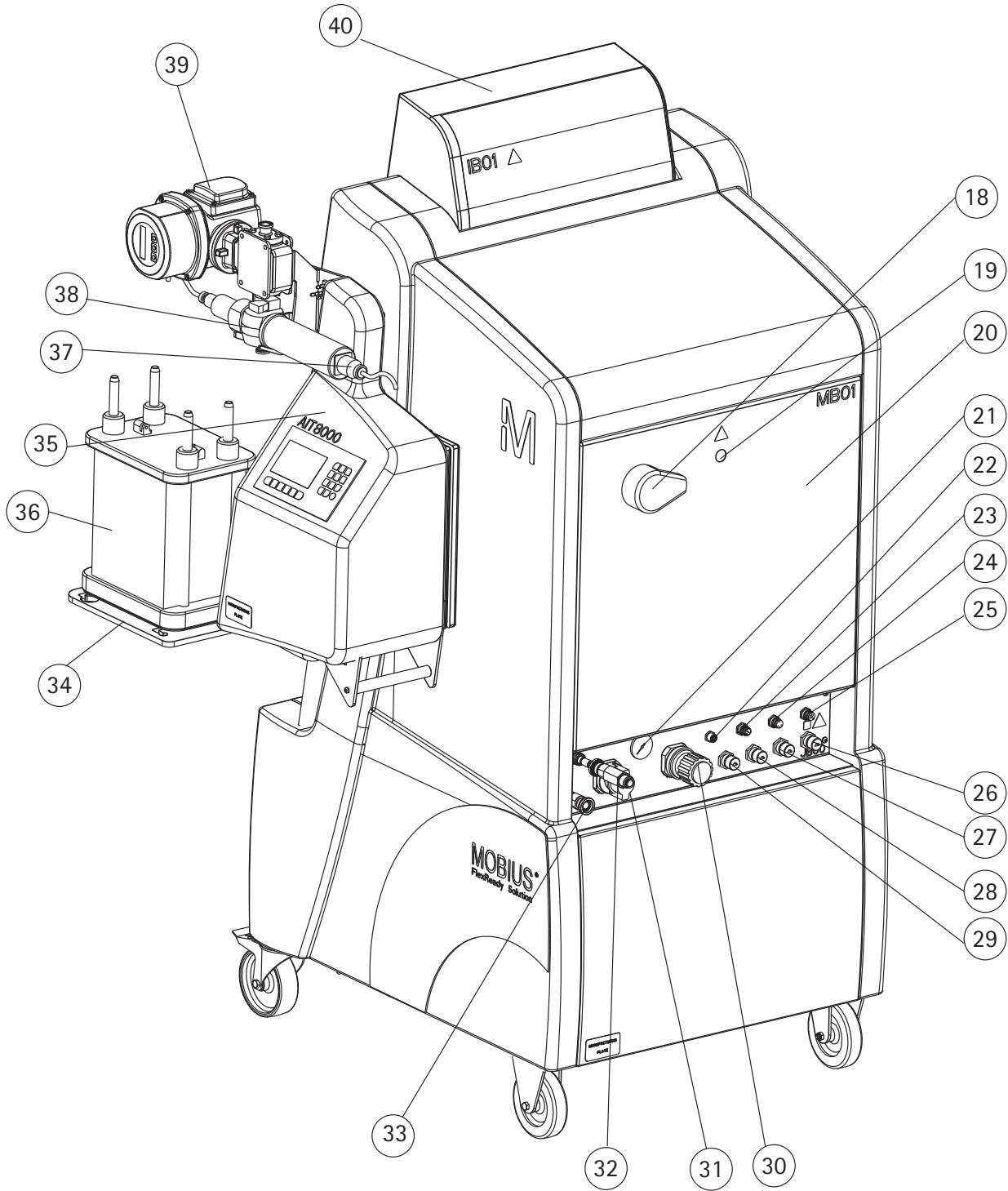
Key No.	Tag (labeled on the system)	Component
1	HMI01	Touch Screen
2	XS001	Door Lock Sensor
3	AIT8000	Filtrate Instrumentation Kit
4	XS006	Lock Sensor
5	none	Fiberglass Coated Plastic Cover
6	none	Fixed Wheel
7	none	Swivel Wheel with Lock
8	none	Push Handles
9	none	Column Instrumentation and Cassette Holder Support Mounting Pins
10	none	Service Door
11	XC009	Clamshell Power Connector
12	none	Bubble Trap Support Pin (not used on TFF System)
13	none	Smart Flexware® Viewing Panel
14	ES001	Emergency Stop
15	USB001	Mouse Port
16	USB002	Keyboard Port
17	USB003	Printer Port



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF3S Smart Cart Front

TF3S Smart Cart with Holder Support and Instrumentation Kit

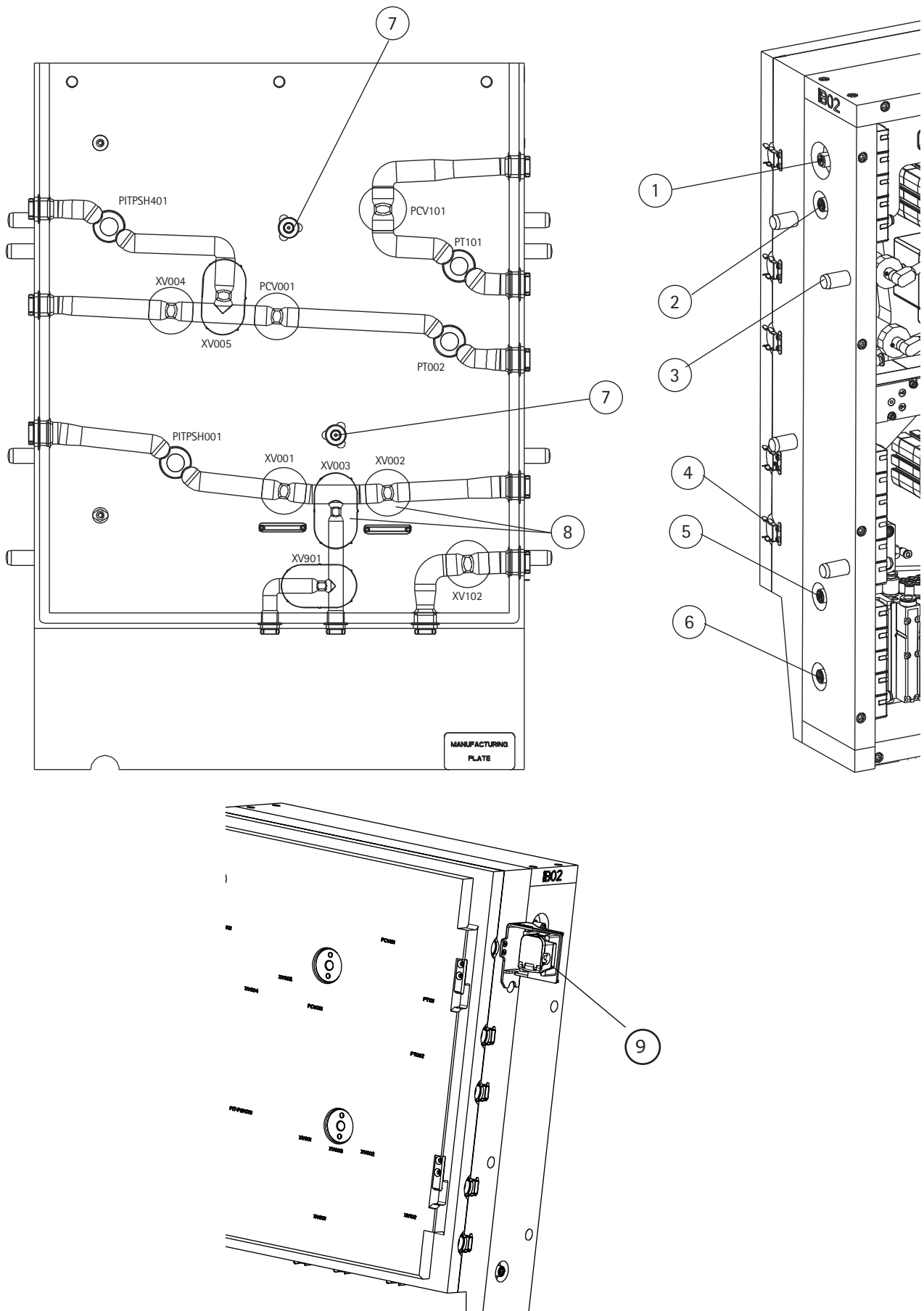
Key No.	Tag (labeled on the system)	Description
18	140H001	Power Supply Indicator
19	101SG1	Electrical Power Switch
20	MB01	Electrical Box
21	PI010	System Air Pressure Gauge
22	WE101	External Weight Scale Port
23	XC001	Electrical Power Connection
24	XC002A	Pump Cart Electrical Connection
25	XC003A	Pump Cart Electrical Connection for three-phase installations
26	ETH010	Network Connection (connect to user domain, printers, security, etc.)
27	ETH003A	Tank Cart Ethernet Connection
28	ETH002A	Pump Cart Ethernet Connection
29	ETH001	PLC Connection
30	PRV001	Pressure Regulator
31	8O1SP1	Pneumatic Switch
32	XP001	Air Inlet Connection
33	XP002A	Air outlet Connection for Manifold
34	FH001	TFF Cassette Holder
35	AE102 AE103	Filtrate UV Lamp
36	none	TFF Cassette
37	AE102 AE103	Filtrate UV Sensor
38	none	Filtrate UV Flow Cell
39	FT101	Optional Filtrate flowmeter
40	IB01	Control Box Access Panel
not shown	Y500A/Y500B	Lock between front Clamshell and rear Clamshell
	Y501A/Y501B	Glass Door Lock
	Y502A/Y502B	Lock between mobile Clamshell and door
	Y503A/Y503B	Lock between Clamshell and Cart



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF3S Smart Cart Rear

Clamshell TFF-2.5m²

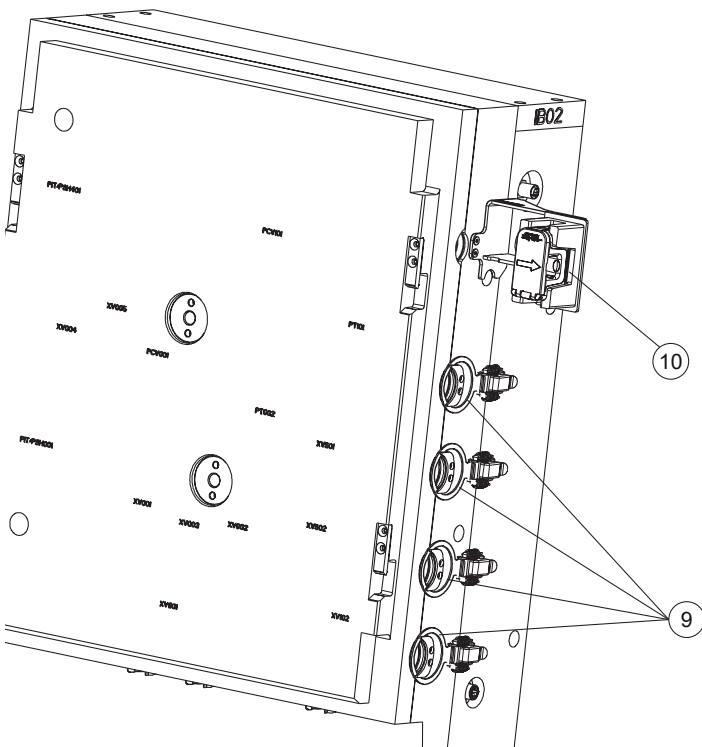
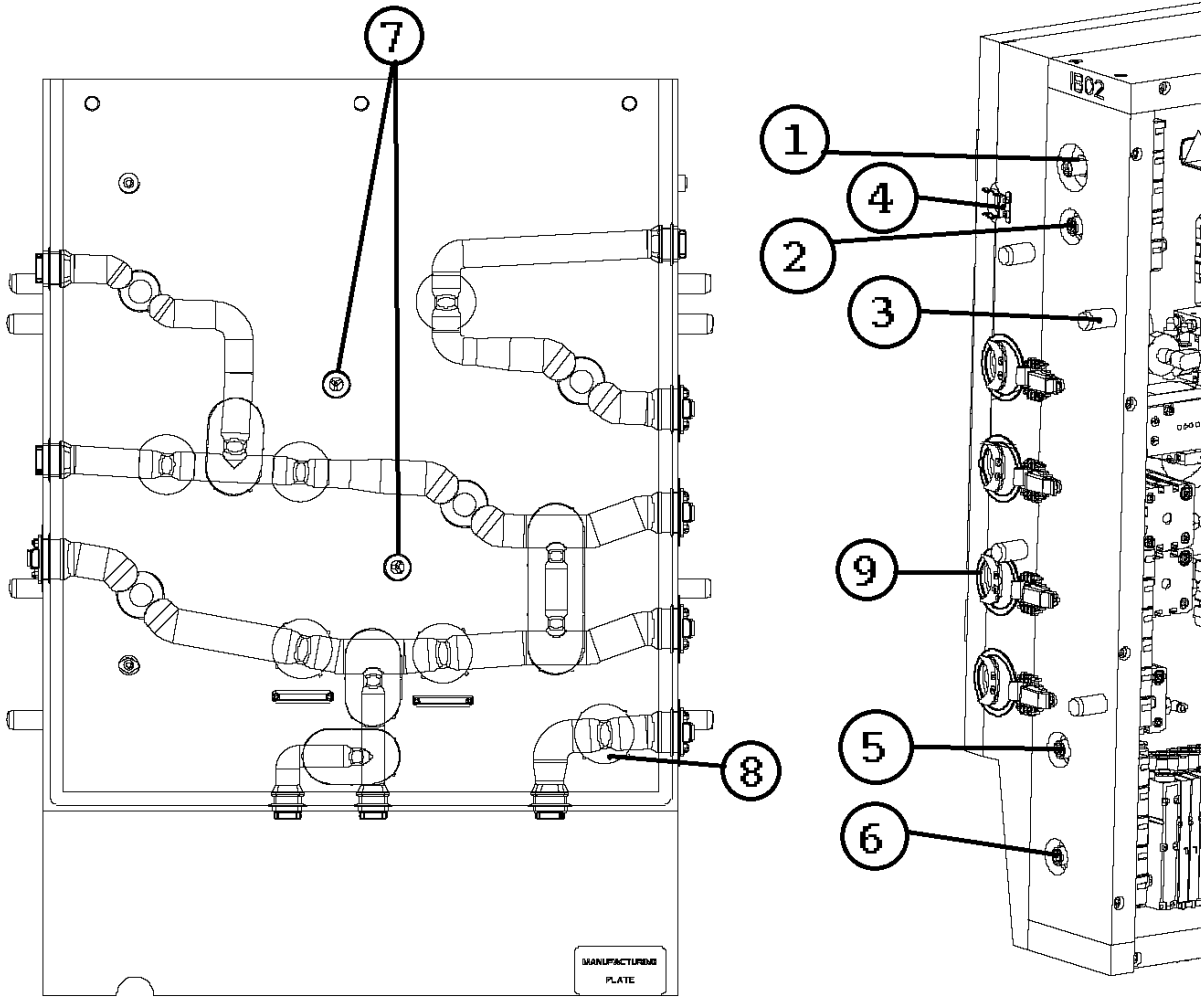
Key No.	Tag (labeled on the system)	Component
1	ETH004	Filtrate Instrumentation Kit Ethernet Connection
2	XC004	Filtrate Instrumentation Kit Power Supply Connection
3	none	Pin for Clamshell Lift
4	none	Fitting Clips
5	FT101	Filtrate Flow Connector for Optional Filtrate Flowmeter or User Supplied Flowmeter
	FE101	Support with filtrate flow sensor (optional)
6	WT102	Filtrate Weight Connector for User Supplied Weight Scale
7	XS002, XS003	Internal Lock and Sensor (2 places)
8	none	Silicone Valve Pads
9	FE101	Support with filtrate flow sensor (optional)
-	PT002	Retentate Pressure Sensor
-	PT101	Filtrate Pressure Sensor
-	XV001	Normally Open Valve
-	XV002	Normally Open Valve
-	XV004	Normally Open Valve
-	XV003	Normally Closed Valve
-	XV901	Normally Closed Valve
-	XV102	Normally Closed Valve
-	XV005	Normally Closed Valve
-	PCV001	Normally Open Control Valve
-	PCV101	Normally Closed Control Valve
-	PIT/PSH001	Feed High Pressure Switch Sensor
-	PIT/PSH401	Transfer High Pressure Switch Sensor



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF2S Clamshell

Clamshell TFF 5.0m²

Key No.	Tag (labeled on the system)	Component
1	ETH004	Filtrate Instrumentation Kit Ethernet Connection
2	XC004	Filtrate Instrumentation Kit Power Supply Connection
3	none	Pin for Clamshell Lift
4	none	Fitting Clips
5	FT101	Filtrate Flow Connector for Optional Filtrate Flowmeter or User Supplied Flowmeter
	FE101	Support with filtrate flow sensor (optional)
6	WT102	Filtrate Weight Connector for User Supplied Weight Scale
7	XS002, XS003	Internal Lock and Sensor (2 places)
8	none	Silicone Valve Pads
—	PT002	Retentate Pressure Sensor
—	PT101	Filtrate Pressure Sensor
—	XV001	Normally Open Valve
—	XV002	Normally Open Valve
—	XV004	Normally Open Valve
—	XV501	Normally Closed Valve
—	XV502	Normally Closed Valve
—	XV003	Normally Closed Valve
—	XV901	Normally Closed Valve
—	XV102	Normally Closed Valve
—	XV005	Normally Closed Valve
—	PCV001	Normally Open Control Valve
—	PCV101	Normally Closed Control Valve
—	PIT/PSH001	Feed High Pressure Switch Sensor
—	PIT/PSH401	Transfer High Pressure Switch Sensor
9	none	3/4 in. Retaining Rings (TF3 only)
10	FE101	Component Support with filtrate flow sensor (optional)



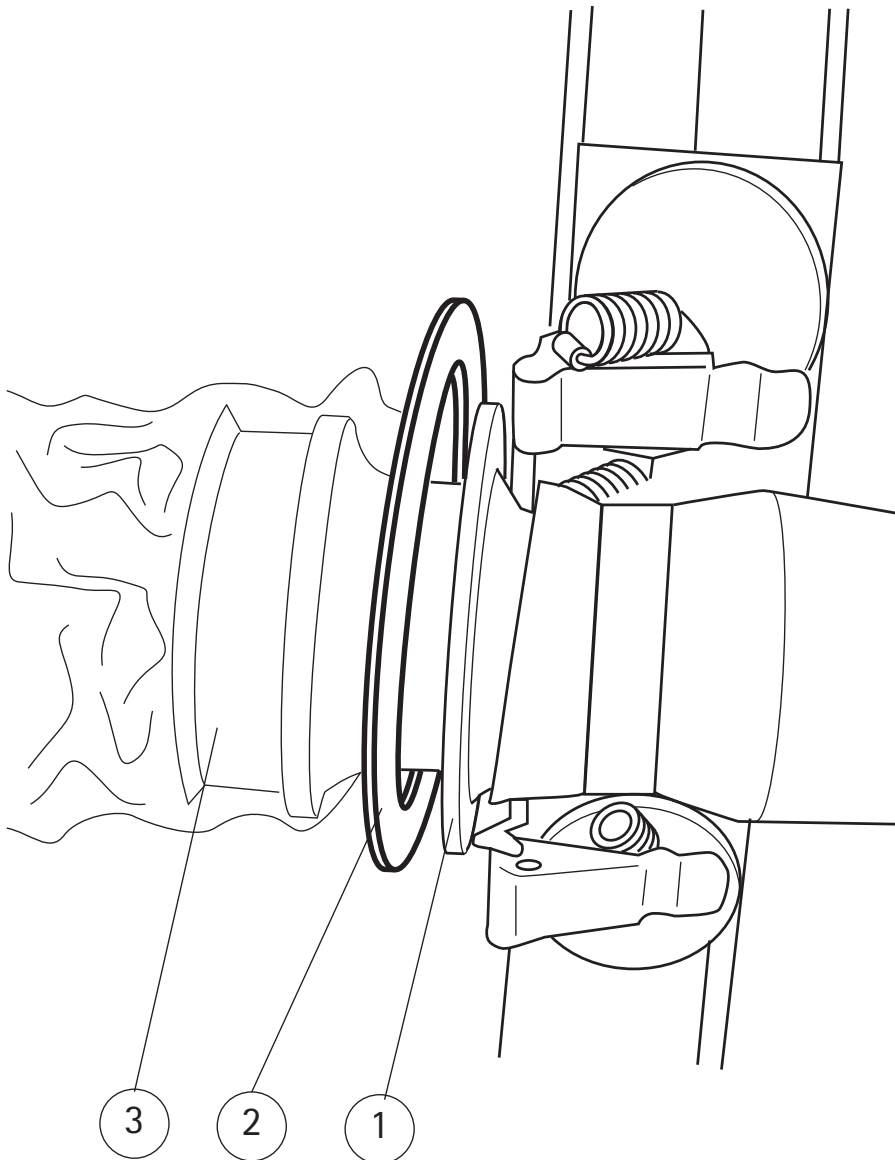
Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF3S Clamshell

Retaining Ring Assemblies

Five retaining ring assemblies are installed on the TF3S clamshell, four on the right side, one on the left side. These assemblies retain the 3/4 in. fittings of the Smart Flexware® Assembly when installed in the Clamshell. The assemblies replace the clips that are used for the other fittings sizes.

Key No.	Tag (labeled on the system)	Component
1	none	Flexware® Fitting Collar
2	none	Locking Ring
3	none	Clamshell Collar (not visible)

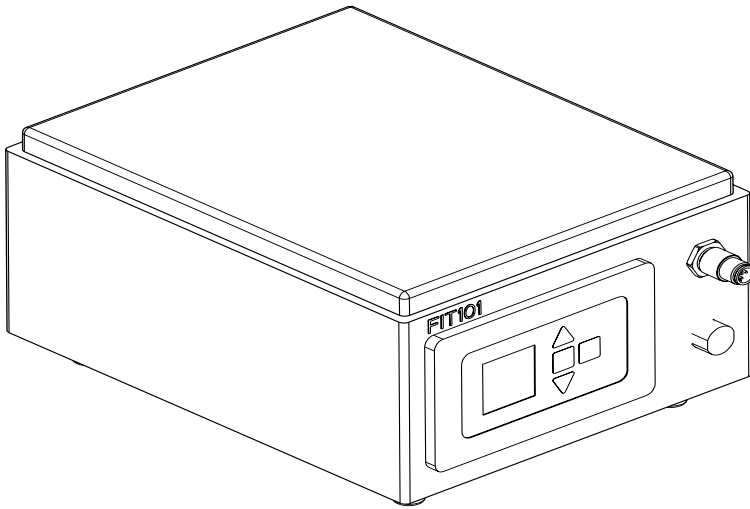
When there is no Flexware® Assembly installed in the clamshell, the Flexware® Fitting Collar is placed into the Clamshell Collar and locked in with the Locking Ring.



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF3S Retaining Ring Assembly

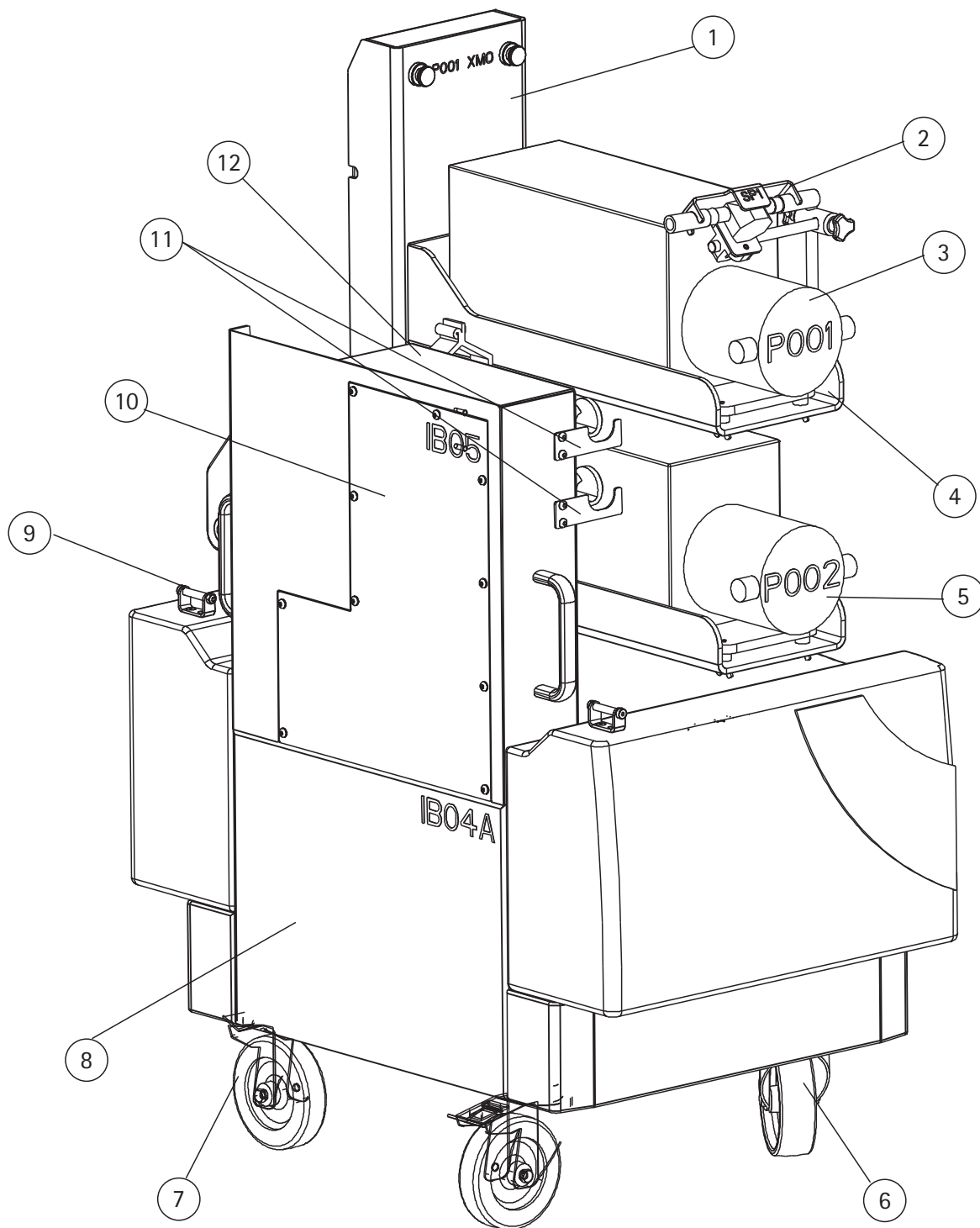
Filtrate Flow Sensor (Optional)

Key No.	Tag (labeled on the system)	Component
-	FE101	Support with Filtrate flow sensor
-	FIT101	Transmitter box for Filtrate flow sensor (shown below)



Pump Cart with Pump and Manifold TF2S

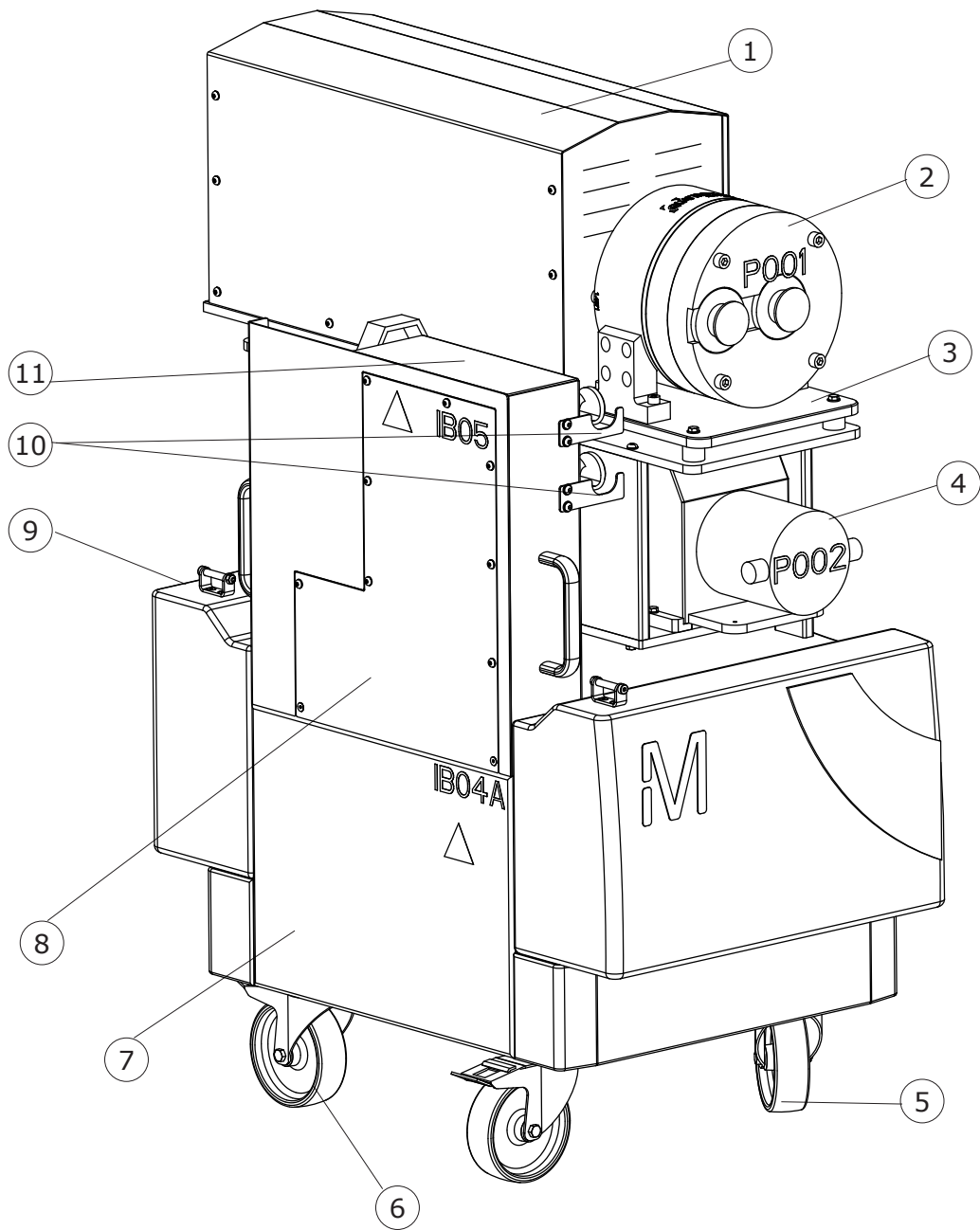
Key No.	Tag (labeled on the system)	Component
1	none	Pump Tower
2	SP1	Retentate Sampler Support
3	P001	Feed Pump
4	none	Pump Support
5	P002	Transfer Pump
6	none	Swivel Wheel
7	none	Locking Swivel Wheel
8	IB04A	Control Box access Panel
9	none	Tank Cart Lock
10	IB05	Manifold Electrical Box
11	none	Flexware® Support
12	none	Inlet Manifold



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF2S Pump Cart with Manifold (Front View)

Pump Cart with Pump and Manifold TF3S

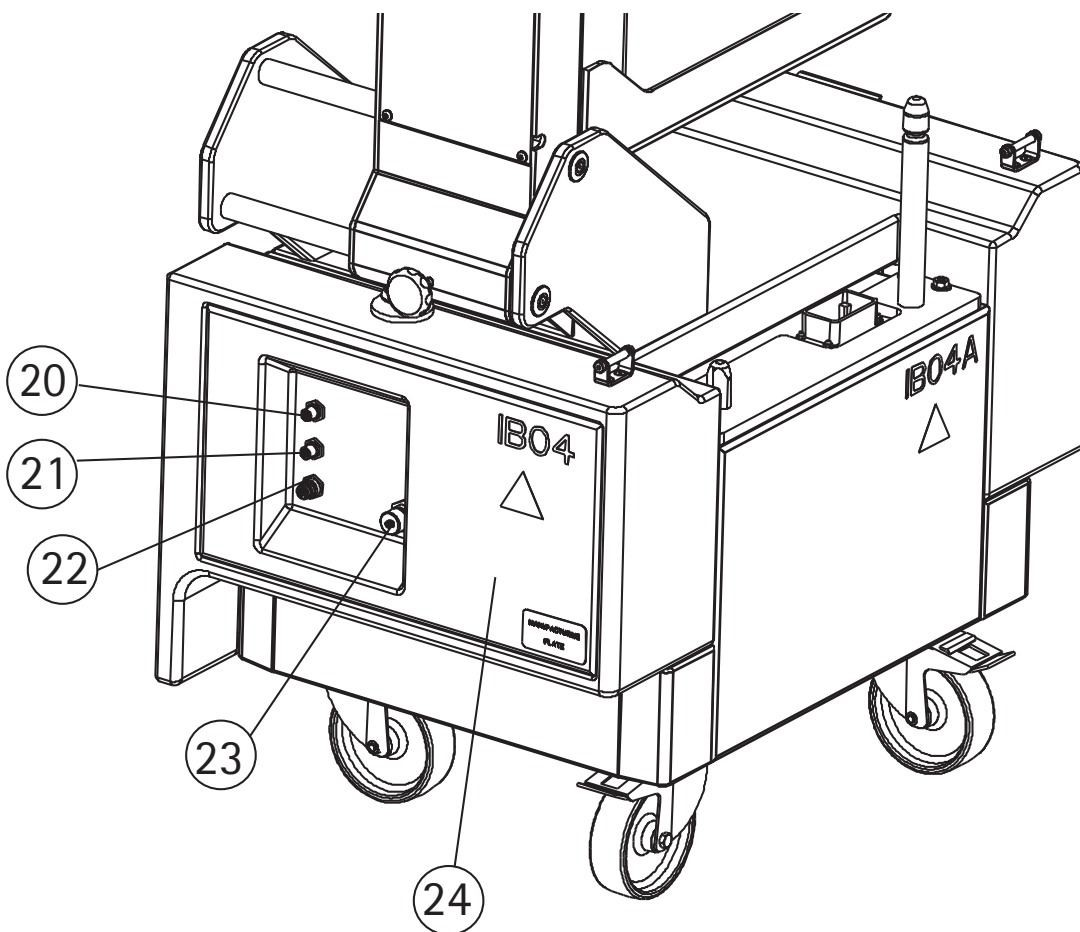
Key No.	Tag (labeled on the system)	Component
1	none	Pump Tower
2	P001	Feed Pump
3	none	Pump Support
4	P002	Transfer Pump
5	none	Locking Swivel Wheel
6	none	Swivel Wheel
7	IB04A	Control Box Access Panel
8	IB05	Manifold Electrical Box
9	none	Tank Cart Lock
10	none	Flexware® Support
11	none	Inlet Manifold



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF3S Pump Cart with Manifold (Front View)

Pump Cart with Pump and Manifold TF2S

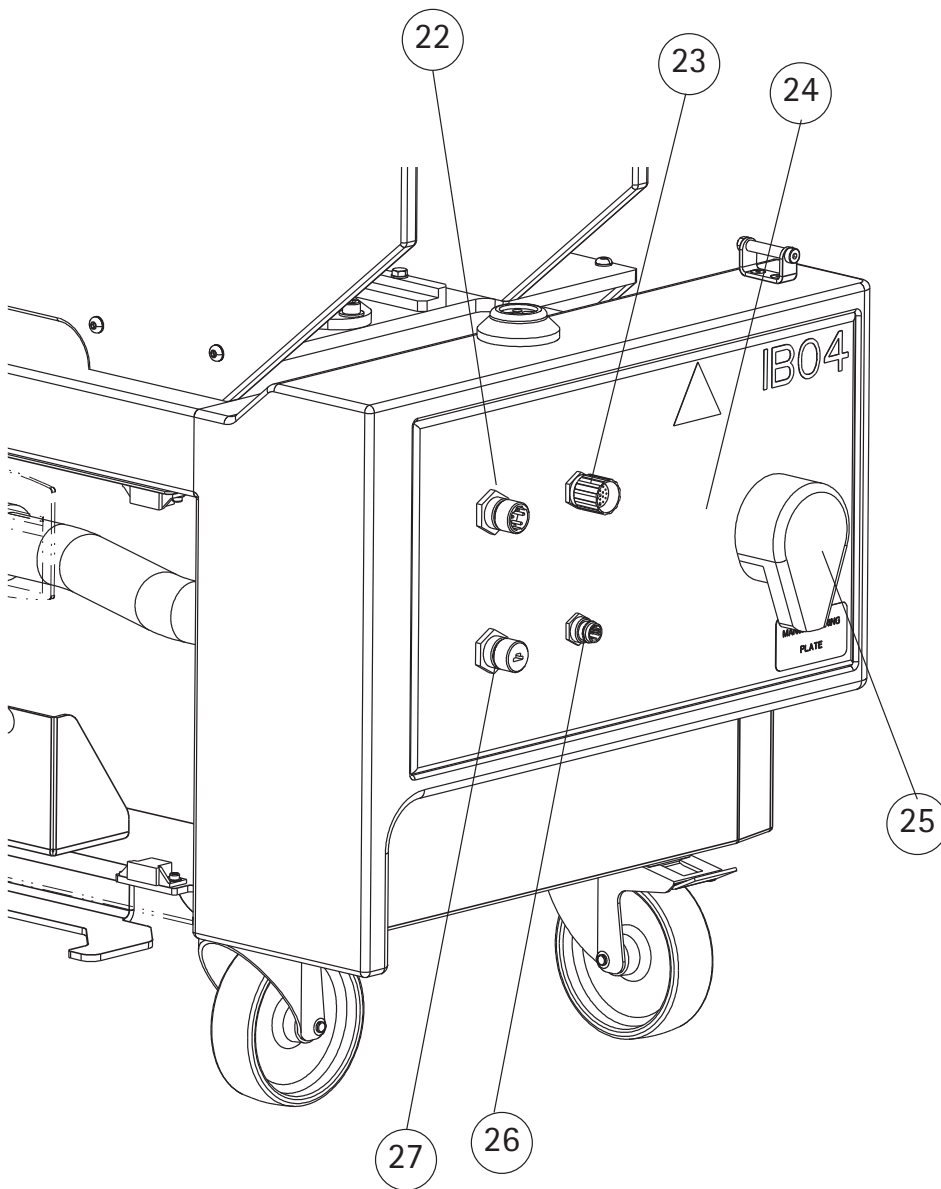
Key No.	Tag (labeled on the system)	Component
20	FT002	Flowmeter Connector (not used on TFF)
21	FT004	Flowmeter Connector (not used on TFF)
22	XC002B	Electrical Connector
23	ETH002B	Ethernet Connector
24	IB04	Pump Cart Electrical Box



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF2S Pump Cart (Rear View)

Pump Cart with Pump and Manifold TF3S

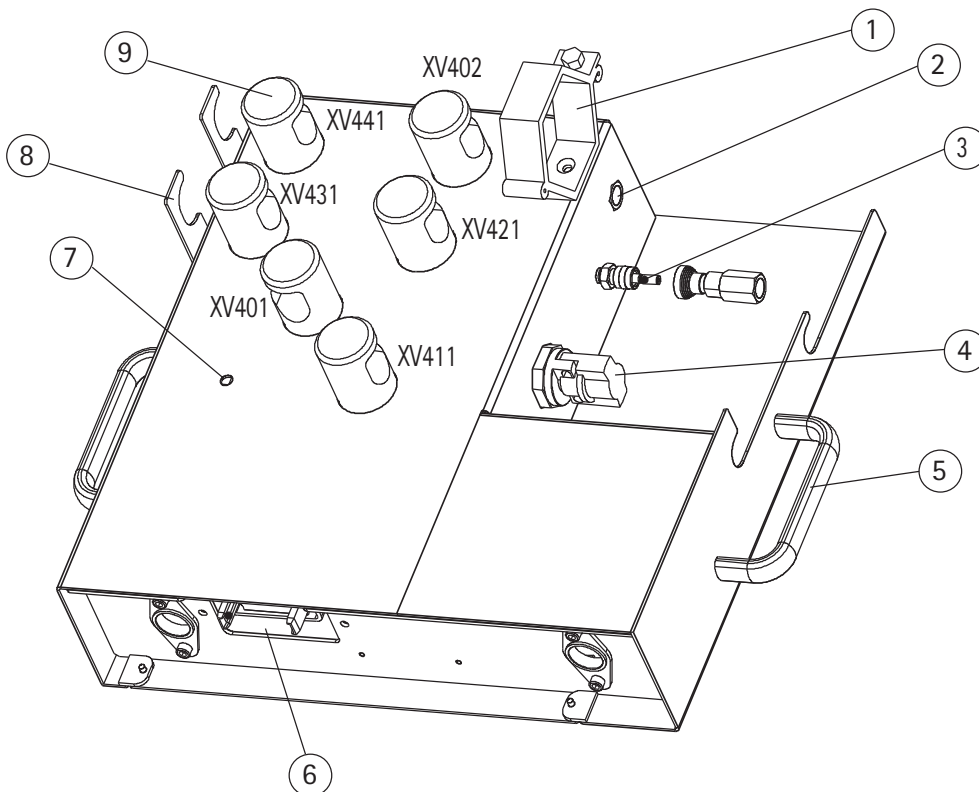
Key No.	Tag (labeled on the system)	Component
22	XC011	Electrical Connector
23	ETH002B	Ethernet Connector
24	IB004	Control Box Access Panel
25	101SG3	Electrical main switch
26	XP002F	Pump (P002) connector
27	XC003B	Safety remote



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF3S Pump Cart (Rear View)

Manifold TF2S and TF3S

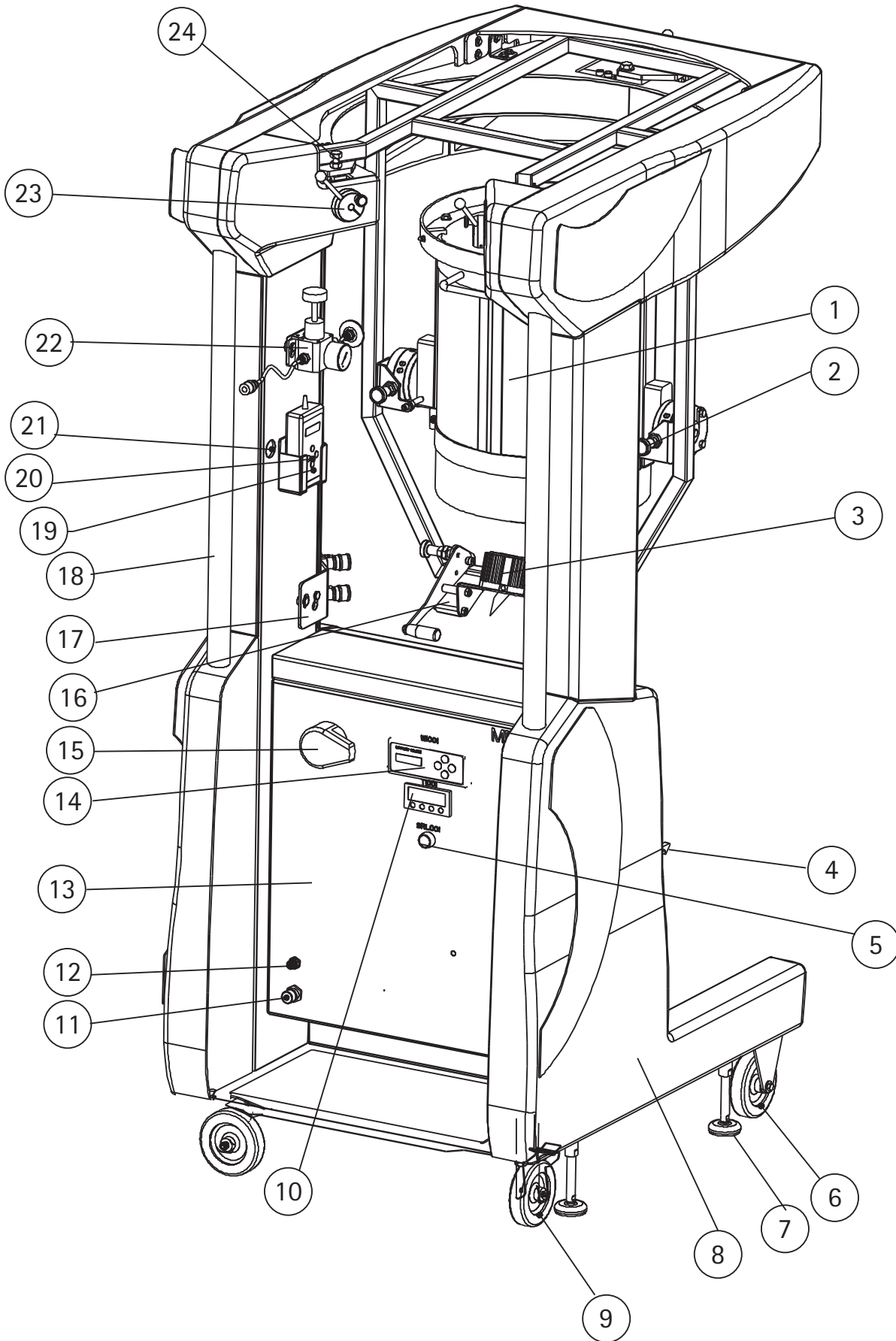
Key No.	Tag (labeled on the system)	Component
1	F401	Vent Filter Support
2	XP003	Emergency Release Button
3	XP002B	Compressed Air Inlet (From Smart Cart)
4	801SP2	Pneumatic ON/OFF Switch
5	none	Handle
6	XC010	Pump Cart Connection
7	none	Manifold to Pump Cart Lock
8	none	Flexware® Support
9	XV441	Normally Closed Pinch Valve (WFI)
	XV402	Normally Closed Pinch Valve (Vent Valve)
	XV431	Normally Closed Pinch Valve (NaOH)
	XV421	Normally Closed Pinch Valve (Buffer)
	XV401	Normally Closed Pinch Valve (Product)
	XV411	Normally Closed Pinch Valve (Isolation)



Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF2S and 5.0 m² Manifold

Tank Cart

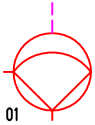
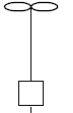

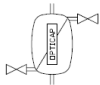






Key No.	Tag (labeled on the system)	Component
1	TNK001	Tank (50 L shown)
2	none	Tank Pivot (50 L only)
3	MIX001	Mixer Motor
4	none	Pump Cart Lock
5	SRL001	Mix Control Selector Switch (remote/standalone)
6	none	Fixed Wheel
7	none	Cart Stabilizer
8	none	Tank Cart
9	none	Swivel Locking Wheel
10	TI001	Temperature Display
11	XC006	Power Connection
12	ETH003B	Ethernet Connection (from Smart Cart)
13	MB02	Control Box Access Panel
14	WI001	Weight Display
15	101SG2	Electrical Switch
16	none	Tank Support
17	none	Cooling Manifold Plate (Stainless Steel only)
18	none	Push Bar
19	MIXREM	Mixer Remote Control
20	none	Mixer Remote Control Holder
21	XC005	Mixer Remote Control Electrical Connection
22	PRV201	Tank Container Inflater
23	none	Load Cell Lock
24	WE001/A WE001/B WE001/C	Load Cell








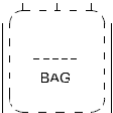





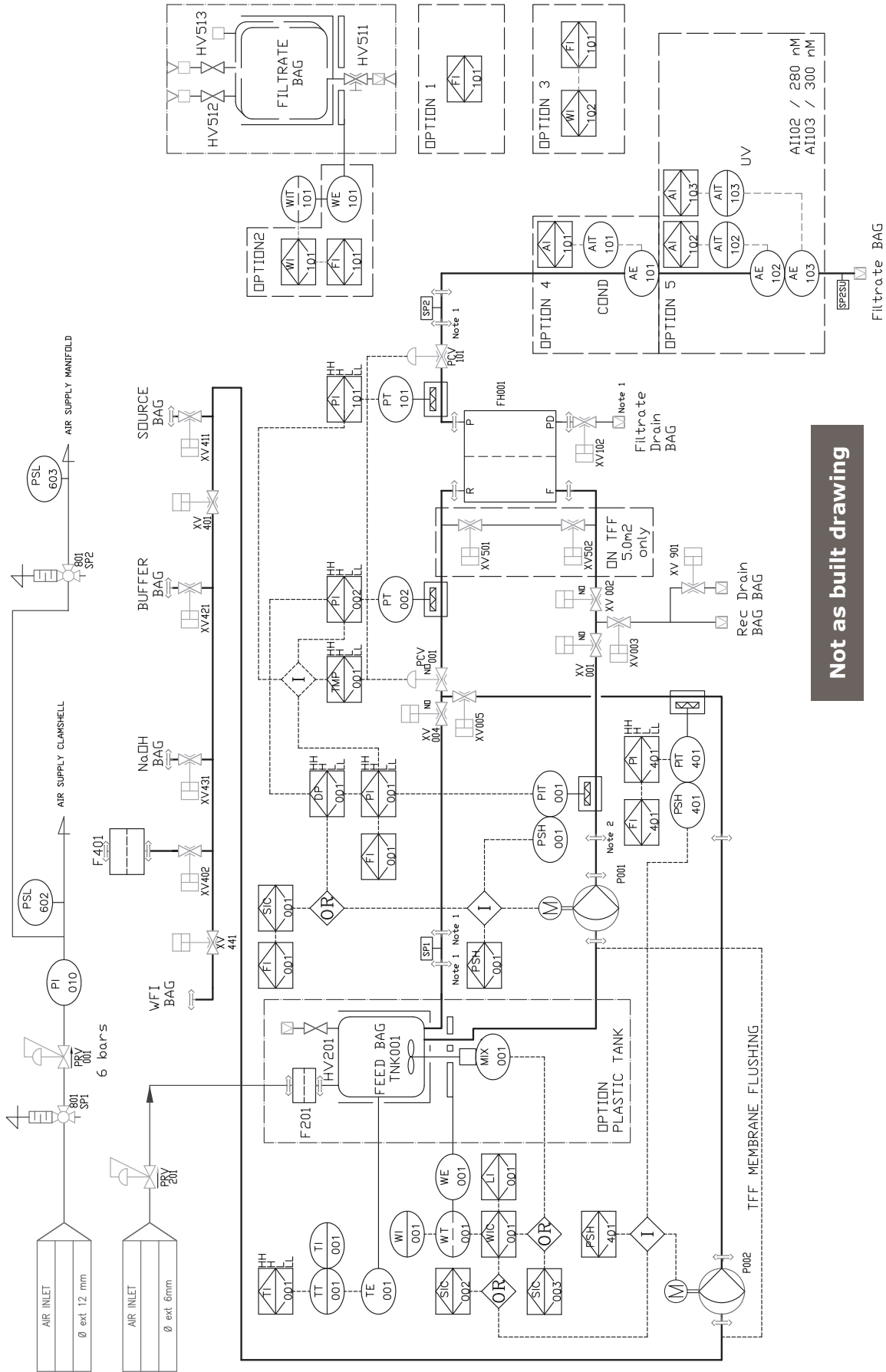
Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF2S and 5.0 m² Tank Cart

Piping and Instrumentation Diagram (P&ID) Legend

Tag (labeled on the system)	Component
P	Pump
S	Pump speed variator
XV	Automatic Valve
PCV	Pressure Control Valve
PRV	Pressure Reducing Valve
T	Temperature sensor + function
P	Pressure sensor + function
DP	Differential pressure
W	Weight + function
L	Level Sensor
F	Flow Sensor
A	Analyzer
X	Digital
MIX	Mixer
I	Indicator
C	Control
E	Element
T	Transmitter
L	Low value
H	High value
LL	Low Low value
HH	High High value
F	Flow
SH	Switch on High value
SL	Switch on Low value
TMP	Trans Membrane Pressure
Q	Totalizer

Symbol	Description
	Diaphragm pump
	Mixer
	Millipak® Filter
	Opticap® Filter
	Pellicon® Holder R=Retentate port, F=Feed port, P=Permeate (High port), PD=Permeate Drain
	HB Connector
	TC Connector
	Low Dead Volume Connector
	Male MPC Connector
	Female MPC Connector

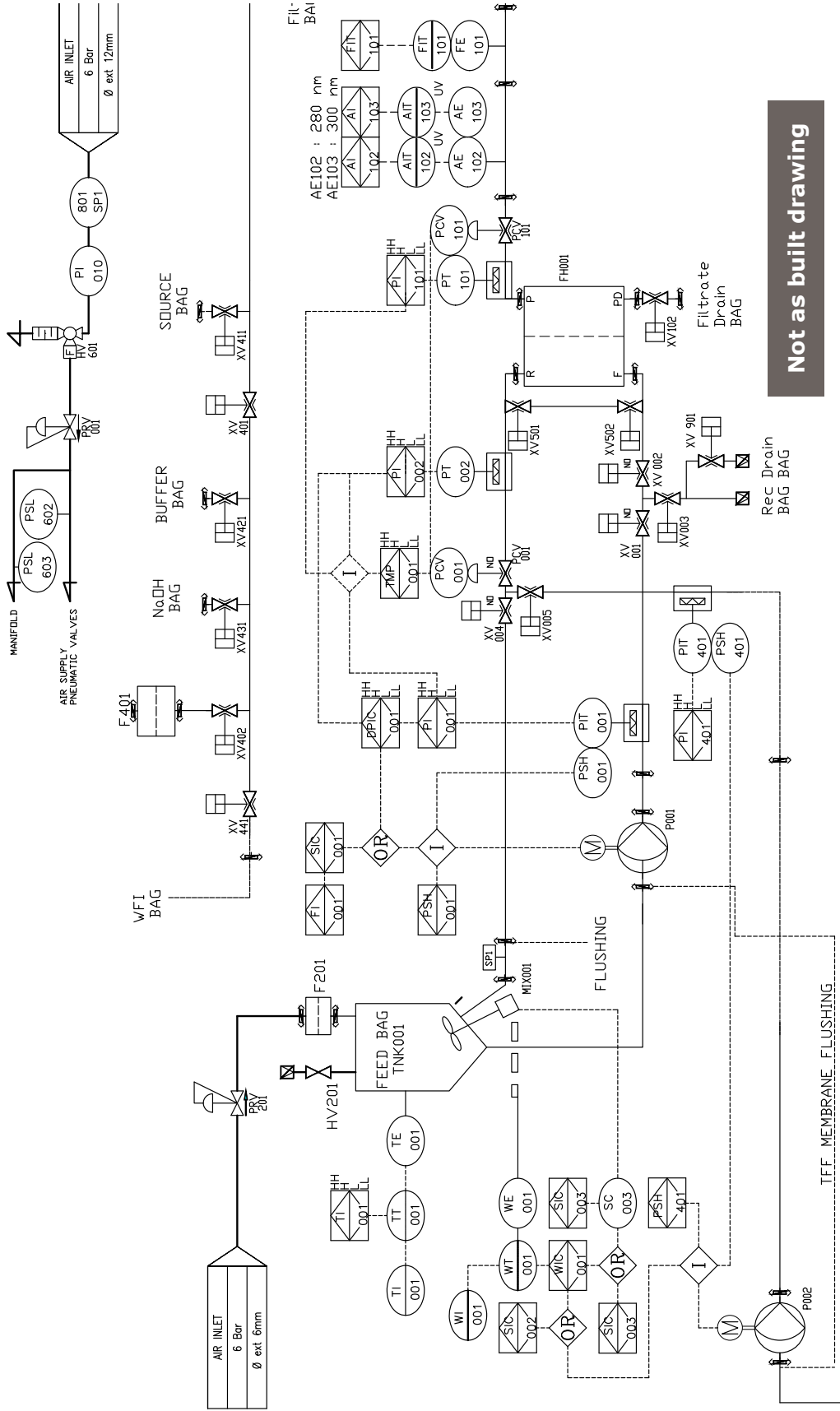
Symbol	Description
	Sampling Port
	Plug
	Pinch Clamp (valve identification tags for P&ID reference only)
	Control Valve
	Normally Open On/Off Valve
	2D Container
	3D Container
	Plastic Holder (for 2D or 3D containers)
	Interlock Logical Symbol
	Or Logical Symbol
	And Logical Symbol



Not as built drawing

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFFS Piping and Instrumentation Diagram (P&ID)

The Mobius® FlexReady Smart System for TFF



Not as built drawing

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TF3S Piping and Instrumentation Diagram (P&ID)

Using the Common Control Platform® Software

User Interface

The User Interface includes a tool bar, piping and instrumentation diagram (P & ID) and various user selectable status displays. The user must have the appropriate security privileges to open certain displays.

There are three main sections of the User Interface:

- The P & ID display
- The status display
- The toolbar

The screenshot displays the MFS System for Chromatography interface. At the top, a blue header bar contains the title 'MFS System for Chromatography', the system name 'XMO-3', and the version 'V 2.09.00'. Below the header is a toolbar with various icons for navigation and control. The main area is divided into three sections:

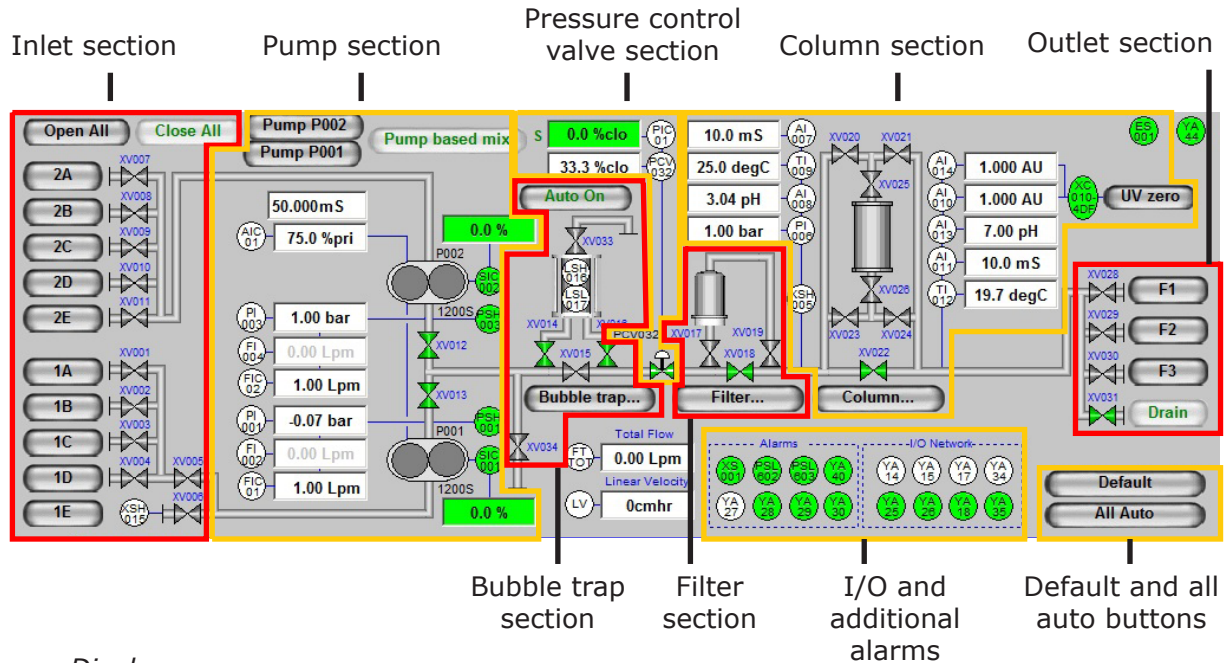
- Toolbar:** Located at the top, it includes icons for home, play, refresh, stop, and help, along with a search icon and a question mark.
- P&ID Display:** The central part of the interface shows a detailed piping and instrumentation diagram. It features two pumps (P001 and P002), various valves (XV001-XV034), flow meters (FI001-FI004), pressure sensors (PI001-PI004), and temperature sensors (TI001-TI012). The diagram is annotated with numerical values such as '1.00 bar', '0.00 Lpm', '25.0 degC', and '3.04 pH'. A 'Phase 0 Status' panel is visible at the bottom left of this section, showing the current phase (0) and its state (Idle).
- Status Display:** Located at the bottom, it provides a summary of the system's operational parameters. It includes a table for 'Criteria 1' and 'Criteria 2', and a table for 'Procedure Total', 'Phase Total', 'Step Total', 'Pause Total', 'Hold Total', and 'User Total'. The 'Procedure Total' table shows values for Time, FQ01 Volume, and FQ02 CVs. The 'User Total' table shows values for Time and FQ01/FQ02 Volume and CVs. 'Start' and 'Reset' buttons are located at the bottom right of this section.

User Interface

The User Interface will reflect the options installed on the system.

Process Display (P&ID)

The P & ID screen dynamically displays all process conditions, analog and digital values and valve and pump status. Many of the buttons and valves can be controlled manually. When the mouse pointer is passed over these buttons and valves, they become highlighted to indicate that they can be controlled.



Process Display

Status Displays














There are multiple Status Displays that can be displayed in lower portion of the screen. Only one display may be viewed at a time. The desired display can be selected by clicking the corresponding icon on the Navigation Tool Bar located on the left side of the status screen or by clicking on a device or instrument on the Process Display.









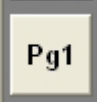


Toolbar












The icons on the toolbars carry out specific actions when clicked. If the mouse pointer is positioned over an icon, a brief description of the selected command displays.






If the user is logged out while on the Process screen, only the Login and Comment icons are available. All other icons will present the Unauthorized Access Attempted screen when the user attempts to access their functionality.

The Navigation Icons are listed in the following table.

Icon	Displayed Text	Description
	Login	Opens the Login prompt. When the system is locked, it is the only active button. The Logout button logs out the current user.
	Start	Starts a recipe.
	Hold	Holds the current recipe (confirmation required). The pumps stop and valves are switched.
	Pause	Pauses the recipe. The pump continues to run.
	Recipe Edit/ Download	Start the recipe editor program that generates an operation recipe used to control a process. See the chapter on <i>Using the Recipe Editor</i> for a comprehensive introduction to the recipe editor.
	Chart Mark	Adds a chart mark to the historical and alarm/event logs.
	Reports	Starts the batch report generator program, which allows the user to obtain process information for different batch runs and generate reports. See the chapters <i>Batch Reporting</i> and <i>Custom Trend Display</i> for more details.
	Comment	During operation runs, allows the user to log a comment and adds it to the alarm/event log. Comments have an 80 character maximum. This utility can be used whether or not a user is logged in.
	Change Language	Allows user to select different languages. The text of the User Interface, Recipe Editor and Report Client changes to the selected language. (Only visible on systems where multiple languages have been enabled.) See the next section for details on changing the language.
	Help	Opens the user manual for the system.
	Alarm Acknowledge	Acknowledges current alarms. A check mark appears in the Ack (Acknowledge) column on the Alarms Summary Display (if open). When the alarm condition clears, the alarm listing is cleared.
	Alarm Silence	Silences the Alarm Notification Horn without acknowledging the current alarm.
	Jump Step	During a run, Jump Step allows the user to jump from the current step to another step in the recipe within the running phase. It is not possible to jump to a different phase.

Icon	Displayed Text	Description
 RUNNING	Abort	Aborts the operation that is currently being executed. This icon is only available when an operation is running.
 HOLD	Resume from Hold	Resumes the run that has been held. There are 2 options available: Resume with current flowpath which will start the system running with the current settings for the valves and pumps or Resume with Previous flowpath which will start the system running with the settings for the valves and pumps from before the hold was initiated.
 PAUSE	Resume from Pause	Resumes the run that has been paused. Paused timer on totalizer freezes.
	Open Previous	Opens the previously open Status Display.
	Operation Status	Displays the information of the current operation, including Phase, State, Steps, Total Times and Flows. It provides access to the Recipe Pool. This is the default Status Display that opens when the User Interface is started.
	Alarm Summary	Lists the acknowledged state, time, tag name and description for all active alarms and provides buttons to enable or disable all alarms. A critical alarm is in red and a non-critical alarm is in yellow. When the alarm is acknowledged, a check mark appears in the Ack (Acknowledge) column on the Alarms Summary display. When the alarm condition clears, the alarm listing clears.
	Discrete Device Status	Displays discrete device state, alarm status and priority and a real time trend for the selected discrete device. Alarm parameters are also configured on this screen. Discrete devices are selected by clicking on the left or right arrows.
	Maintenance	Provides access to the configuration of various parameters, including: analog/digital inputs and outputs, electronic signatures, flowpath configuration, touchscreen calibration, holdup volume, setting Qmax (applicable only to XMO3 with SU flowmeters) and the enabling/disabling options (such as the pre-column instrument option and the second pump option). <i>Access to this section is restricted to those with maintenance privileges.</i>
	Next Page	Moves to the next page of Status Display Icons.
	Gradient Control	Displays and allows for the control of the variables for the gradient control, including: process variable, control value, control deadband, loop mode, loop setpoints, loop state, loop tuning parameters, pump based setpoints, and real-time trend.
	Peak Detection	Peak Detection information and configuration of primary and secondary peak detection status and setpoints, UV setpoints, stability criteria and real-time trend.

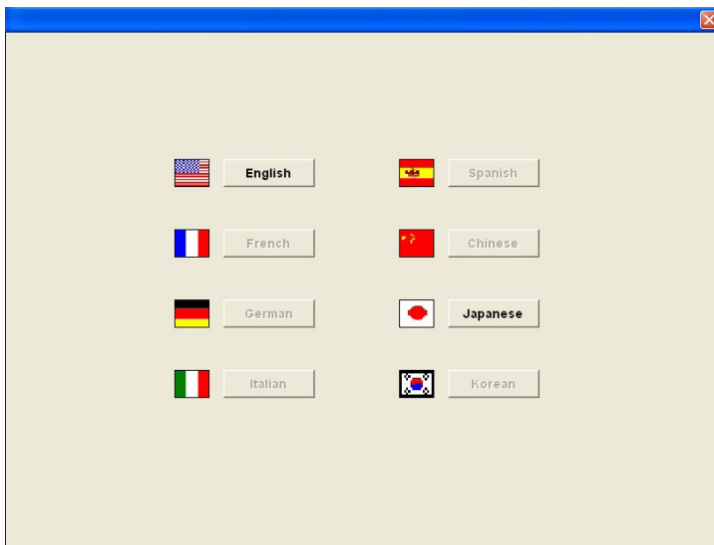
Icon	Displayed Text	Description
	Next Page	Moves to the next page of Status Display Icons.
	Door and Clamshell Control	Provides controls over and displays statuses for various door and clamshell functions. <i>Access to this section is restricted to those with maintenance privileges</i>
	Next Page	Moves to the next page of Status Display Icons.
	Custom Trend	Opens a trend screen that the user can customize to display whatever values desired. Trends can be saved for future access.
Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography		
	Tank Range/ Configuration	Displays Current Feed Bag Weight and Alarm configuration, allows the user to create a New Configuration and Select the Tank Size
	Feed Pump Control	Displays the information about the Feed Pump, including current process value, control value, ramp rate, control deadband, loop modes, loop setpoints, loop state, real-time trend, loop tuning and deviation alarm setpoints. Also allows for the configuration of those variables that can be set by the user.
	Level Control	Displays the information about the Level Control, including process value, control value, ramp rate, loop mode, loop setpoint, loop state, loop tuning, deviation alarm setpoints and real-time trend. Also allows for the configuration of those variables that can be set by the user.
	Mixer Control	Displays the information about the Tank Mixer, including: process value, control value, loop mode, loop setpoint, loop state, and real-time trend. Also allows for the configuration of those variables that can be set by the user.
	Filtrate Control	Displays the information about the Filtrate pressure control valve, including: process value, control value, ramp rate, loop mode, loop setpoint, loop state loop tuning, deviation alarm setpoints and real-time trend. Also allows for the configuration of those variables that can be set by the user.
	Concentration Faceplate	Displays the information about the Concentration, including Feed Bag Volume, Volume Concentration Factor, Protein concentration, Initial and Final Protein Concentrations, Final Volume, Holdup Volume and Totalizer Status. Also allows for the configuration of those variables that can be set by the user.
	Diafiltration Faceplate	Displays the information about Diafiltration, including Feed Bag Volume, Diavolumes, Initial Diafiltration Volume, Diafiltration Volume Setpoint and Totalizer Status. Also allows for the configuration of those variables that can be set by the user.

Icon	Displayed Text	Description
	Membrane Faceplate	Displays the information about the Membrane performance, including Differential Pressure, Trans-Membrane Pressure, Flux, Normal Water Permeability, Membrane Permeability, Membrane Area and fluid Density. Also allows for the configuration of those variables that can be set by the user.
	Retentate Control	Displays the information about for the Retentate pressure control valve, including process value, control value, ramp rate, loop mode, loop setpoint, loop state, loop tuning, deviation alarm setpoints and real-time trend. Also allows for the configuration of those variables that can be set by the user.
Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF		
	Pump P001 Control	For Pump 1: Displays the current process variable, control value, ramp rate, control deadband, loop modes, loop setpoints, loop state, real-time trend, loop tuning and deviation alarm setpoints. Also allows for the configuration of those variables can be set by the user.
	Pump P002 Control	For Pump 2: Displays the current process variable, control value, ramp rate, control deadband, loop modes, loop setpoints, loop state, real-time trend, loop tuning and deviation alarm setpoints. Also allows for the configuration of those variables that can be set by the user.
	PCV032 Control	Displays and allows for the control of the variables for the pressure valve, including: process variable, control value, ramp rate, loop mode, loop setpoint, loop state and real-time trend.



Changing the Language

The Change Language icon in the Main Tool Bar opens the Change Language Screen. This allows the user to select a language for the user interface. There are eight different language options.



Language Selection Screen

The primary language is a customer-specified default language when the software is installed. Only one non-English language is set up as a **Primary Language**. When the primary language is chosen, both the interface texts and the Batch Report content can be in the primary language.

NOTE

The system will not translate the Batch Report into any language other than English and the Primary language.

Changing the Report Language

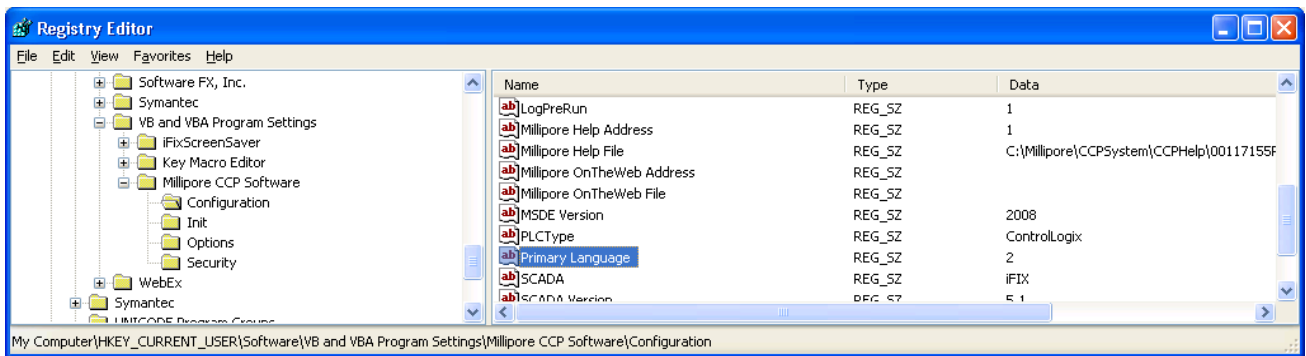
The primary language must be set in the registry. The following table indicates the language index for each language.

Language	Setting
English	1 (default)
French	2
German	3
Italian	4
Spanish	5
Japanese	7 (Default for Japanese system)
Korean	8 (Default for Korean system)

Example for French reports settings:

Registry setting:

HKCU\Software\VB and VBA Program Settings\Millipore CCP® Software\Configuration



Using the Recipe Editor

Introduction

The Recipe Editor is where operations (sequences of actions) and procedures (sequences of operations) are created and managed. The building blocks of operations are individual actions. A series of actions are listed sequentially to form an operation. In addition, operations can be linked in series to form a procedure. The operation or the procedure file is downloaded to the PLC for subsequent execution through the User Interface.

There are actions for virtually all controls on the system, as well as time-based, volume-based and event-based criteria, which can be used to control transitions from step to step.

Actions and criteria vary depending on the system being used but the general recipe functions are the same.

Several pre-defined examples of operations and procedures are supplied with the system.

Launching the Recipe Editor


















Launch the Recipe Editor by clicking on the Recipe Editor icon in the User Interface. The main window of the editor opens as shown below.



Recipe Editor Main Window – XMO3

Recipe Editor - Tool Bar

The functionality of the icons in the Recipe Editor Toolbar is described in the following table.

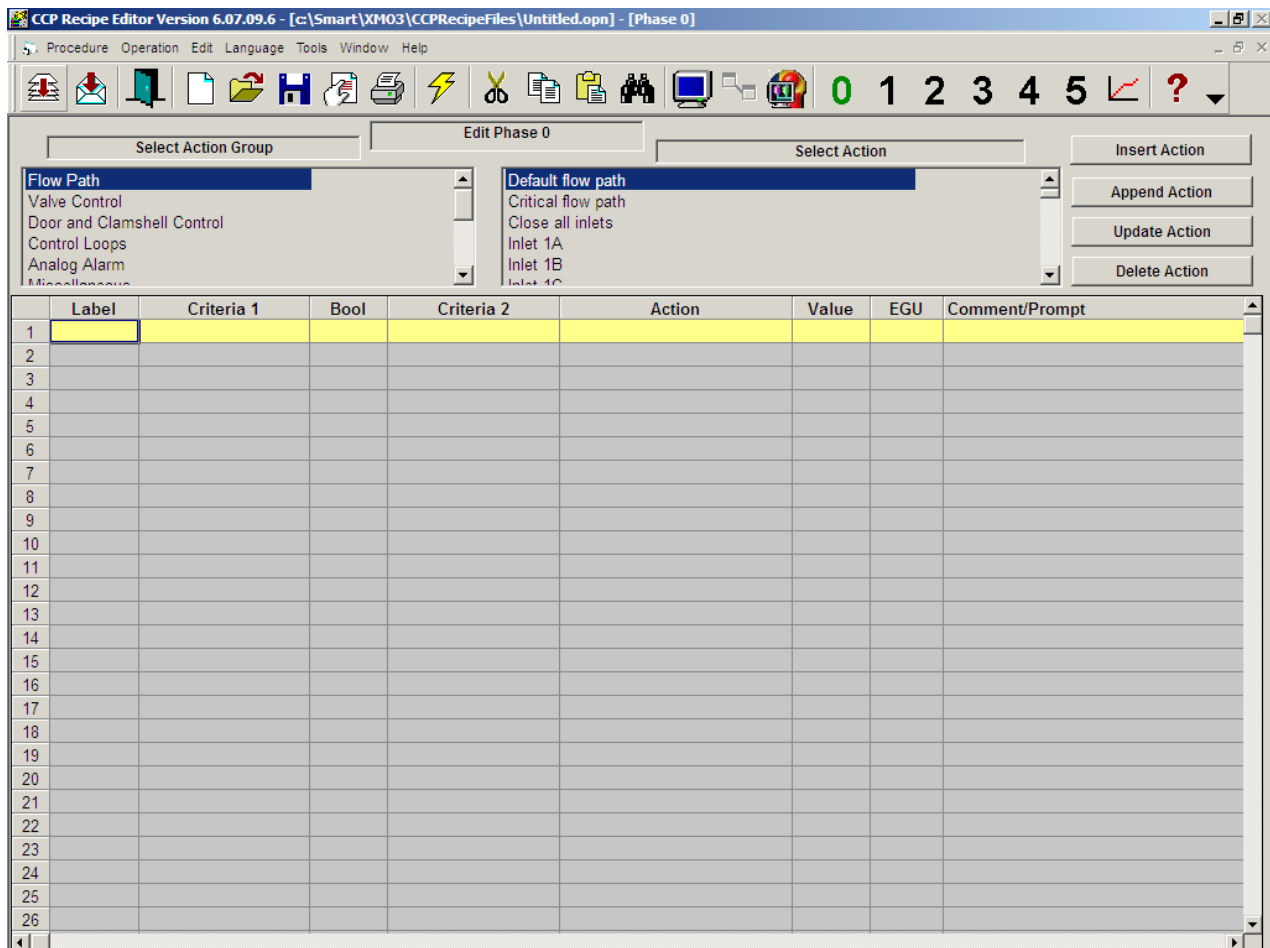
Icon	Description
	Create a new procedure or edit an existing one.
	Download current procedure into the PLC.
	Exit the recipe editor.
	Create a new operation.
	Open and edit an existing operation.
	Save current operation.
	Edit header of current operation.
	Print current operation.
	Download current operation into PLC.
	Cut selection and place in clipboard.
	Copy selection.
	Paste contents of clipboard. Applies cut and copied text as a whole line.
	Search tool
	Toggle popup keyboard. Clicking on this icon toggles between a monitor and a keyboard. The monitor indicates that the touch screen popup keyboard will be employed for data entry while the keyboard indicates that an external keyboard will be employed for data entry.
	This is a selection of the configuration file for the system. These settings are pre-configured at the factory and should not be changed.
	Switches to Work space.
0	Edit Phase 0.
1	Edit Phase 1.
2	Edit Phase 2.
3	Edit Phase 3.
4	Edit Phase 4.
5	Edit Phase 5.
	Edit gradient profiles (for Chrom only).
?	Open on-line manual.



Recipe Editor – Operation Area

An operation consists of a sequence of actions, called steps. The Operation Area of the Recipe Editor application allows the enumeration of steps to be implemented in an operation.

To open the Operation Area to create a new operation, click the New Operation icon in the Recipe Toolbar or click Operation, then New.



Recipe Editor - Operation Area

Steps

The numbered rows in the Operation Area are the steps of the operation. During the execution of an operation, the various steps are implemented in the order they are listed, unless the a jump has been programmed in or manually elected to jump to a particular step.

A single step comprises the following columns:

1. A number to define the position of the step in the operation. The recipe editor allows up to 250 steps in a phase.
2. A user-defined label for the step. The system allows up to ten steps to be labeled in a phase. The labels allow the user to branch to different steps in an operation.
3. Criteria 1 and Criteria 2, which could be time-based, volume-based, or based on specific events.
4. Boolean operators AND and OR to link the two criteria.

5. The action to be executed at the step.
6. Value: Most actions involve setting appropriate values to variables. These could be user-configurable or otherwise. For instance, if the action involves opening a valve, the value field will automatically display a 1 or 0 (as appropriate for the valve). This value would not be user-configurable. However, if the action involves setting the flow rate for the pump, then the user can enter the desired flow rate in the value field.
7. EGU (Engineering Units) for the value field, where applicable.
8. A field for entering comments or prompts. Comments enhance the readability of a programmed operation. Prompts allow messaging on the process User Interface.

Phases

Phases are sets of steps that allow the user to break the recipe into multiple phases. This allows blocks of code to be used multiple times within an operation.

- There can be a maximum of six phases in an operation that allow programming a sequential list of actions. There is a seventh phase that allows the programming of gradient profiles.
- To edit or view the steps within a phase, click on the Edit Phase X button, where X is the phase number that you wish to edit/view.
- Phase 0 is the main phase. When an operation is run, it starts executing actions listed in Phase 0. When creating a new operation or opening an existing one, the application environment opens with Phase 0.
- One can start, stop, pause or resume Phases 1–5 from Phase 0.
- Phases can be run in parallel or in series.
- The current status of a phase is viewed with the Operation Status window of the process User Interface.

Managing Operations

Creating an Operation

To create a new operation, open the Operation Area by clicking the New Operation icon in the Recipe Toolbar or by clicking Operation, then New in the file menu.

Action Buttons

The buttons on the top right of the Operation Area perform the functions described here.

Label	Description
Insert Action	Clicking this button transfers the selected action onto the highlighted step. Any action previously displayed as the highlighted step is transferred to the next step.
Append Action	Clicking on this button transfers the selected action to the step immediately below the highlighted step.
Update Action	Clicking on this button overwrites the current action in the highlighted step with the selected action.
Delete Action	Clicking on this button deletes the current action in the highlighted step.

Note

To select the contents of a step for cutting and pasting, click on the line number of the step and then click on the appropriate icon on the Recipe Toolbar.

Creating a Step

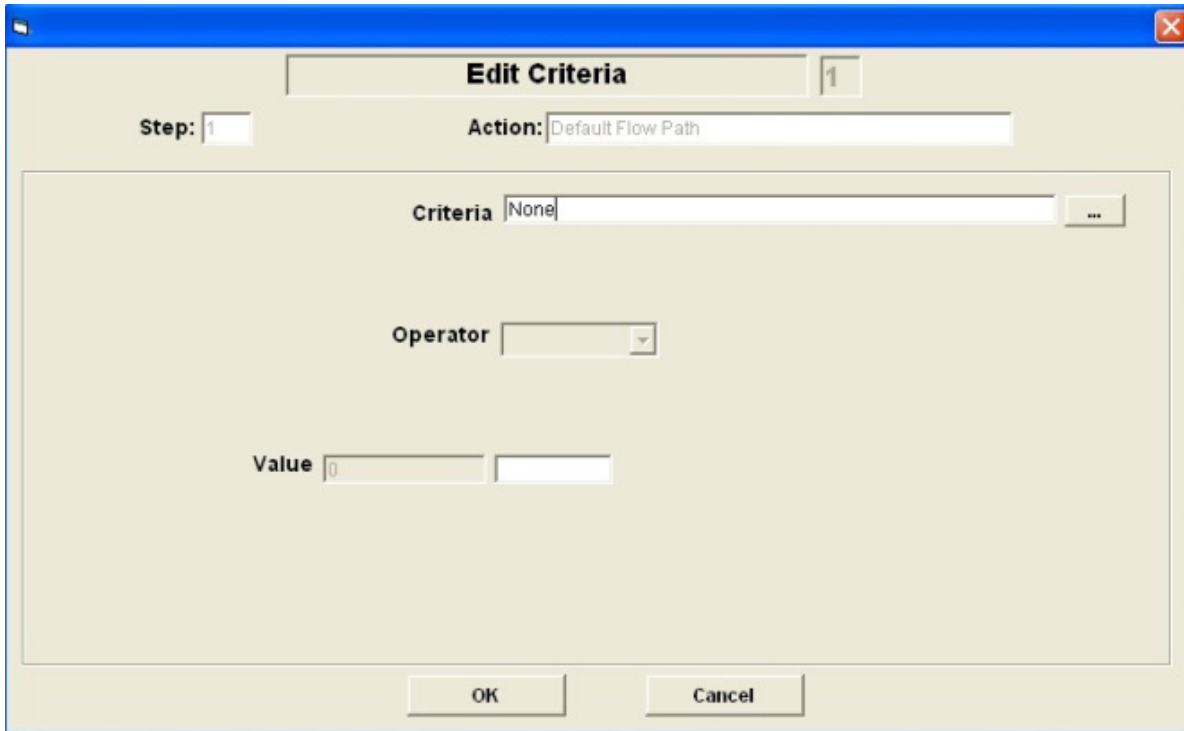
To create the steps for an operation from the Operation Area:

1. Click anywhere on the line where the action is to be added/inserted. The line should now be highlighted in yellow.
2. Click on the appropriate action group in the Select Action Group list on the top left of the Recipe Editor. The actions in the highlighted action group will be listed in the Select Action list on the right side of the recipe editor.
3. Scroll through the actions in the Select Action list and click on the desired action.
4. Click on the insert action button to transfer the selected action to the highlighted line. The line will now be referred to as a step.
5. If the step needs to be labeled, click on the label column. A drop down list will appear with the numerals 1–10. Choose an appropriate number to label the Step.

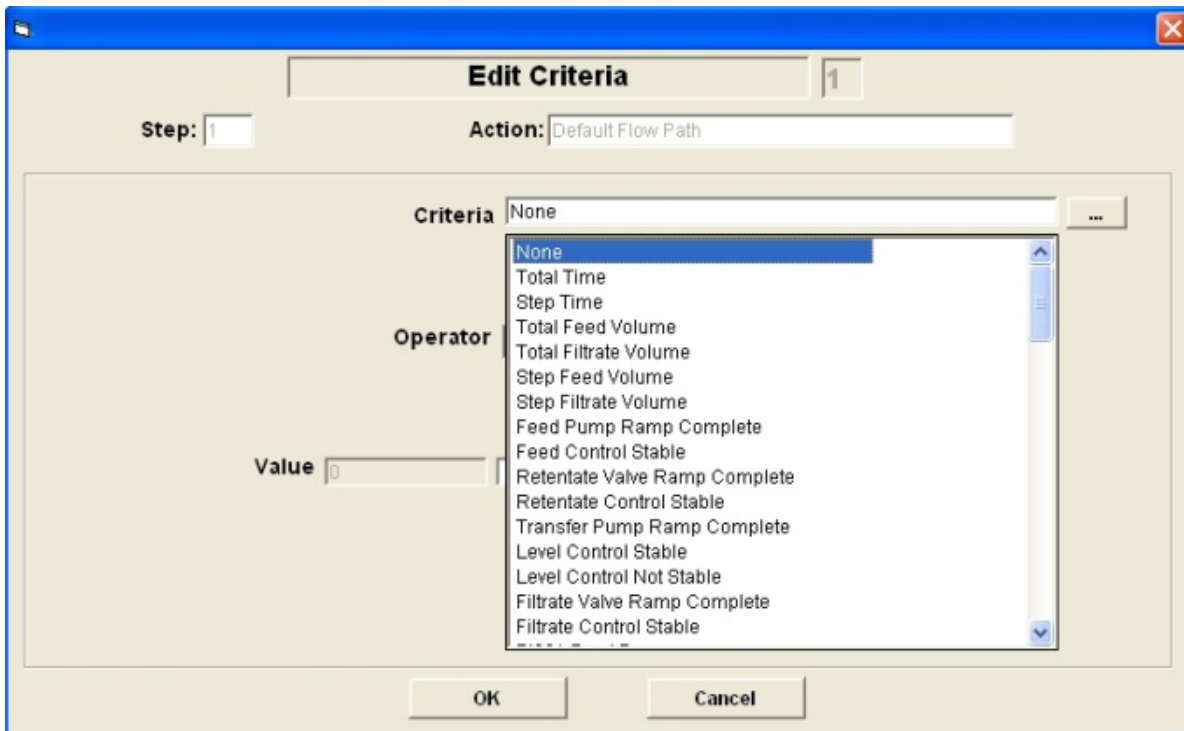
Note

No two steps can have the same label.

6. If the action in the step is to be executed based on some criterion, click on the Criteria 1 column. An edit box will appear.
7. Clicking on the Criteria field in the edit box will cause a drop down menu containing a list of all the criteria to appear. Scroll through the list to select the desired criterion. Then, choose the appropriate operator in the operator field and then enter the appropriate value in the value field. The units in the value field will depend on the selected criterion. For instance, if the criterion is based on time, then the value will be in seconds.
8. If a second criterion is necessary, click on the Criteria 2 column, then carry out the instructions per previous step.
9. Click on the column labeled Bool and choose the appropriate Boolean operator (AND or OR) to link the two criteria.
10. If the action in the step involves setting values to variables (e.g. setpoints for flow rates, gradients etc.), click on the column labeled Value. A data entry box will pop up. The form of the box will depend on the state of the popup keyboard toggle button (monitor or keyboard). Use the box to enter the appropriate values.
11. If the action in the step involves a messaging criterion, click on the Comments/Prompt column. This should launch a data entry box. Enter the appropriate string to appear in the messaging window.
12. Comments can be inserted at each step by clicking on the Comments/Prompt column. These are purely to enhance the readability of the operations.



Criteria Edit Box



Criteria Edit Box with Drop-Down Menu

Creating a Phase

When the new operation is opened, it defaults to Phase 0. To add steps to a different phase, click on the Edit Phase X button, where X is the phase number that you which edit. Then add steps to that phase by following the instructions in the previous section, *Creating a Step*.



Populating the Operation Header

The Operation Header contains information that helps the user understand what the operation is designed to do. The information is saved with the operation. To access the Operation Header, click the Header icon in the Recipe Toolbar or click Operation, then Header in the Recipe Editor menu bar.

Any of the white fields can be populated with relevant information. When clicking on any of these fields, the data entry form appears and the desired information can be submitted.

Note

The field for “Last Saved by” must be populated before the operation can be saved.

	Description	Parameter
1	Machine Name	PETS
2	Product Identification	
3	Description	
4	Last Saved on (Date and Time)	
5	Last Saved by	
6	Comment	
7	Operation File Name	
8	Configuration File Name	DSP090002_cfg.cfg
9	Gradient Basis	1
10	Gradient Variable	1
11	Number Of Gradient Segments	0

OK

Edit Operation Header Form



Saving the Operation

To Save the operation, click the Save icon in the Recipe Toolbar or click Operation and then Save As in the Recipe Editor menu bar. Type a name for the operation in the subsequent dialog box.

The operation will be stored with an .opn extension. The default directory for the *.opn and *.pdr files is C:\SMART\TF2S\CCPRecipefiles, C:\SMART\TF3S\CCPRecipefiles or C:\SMART\XMO1\CCPRecipefiles, C:\SMART\XMO2\CCPRecipefiles, C:\SMART\XMO3\CCPRecipefiles, depending on the type of system. A backup of the file is stored in the corresponding CCPRecipefiles\Backup folder.

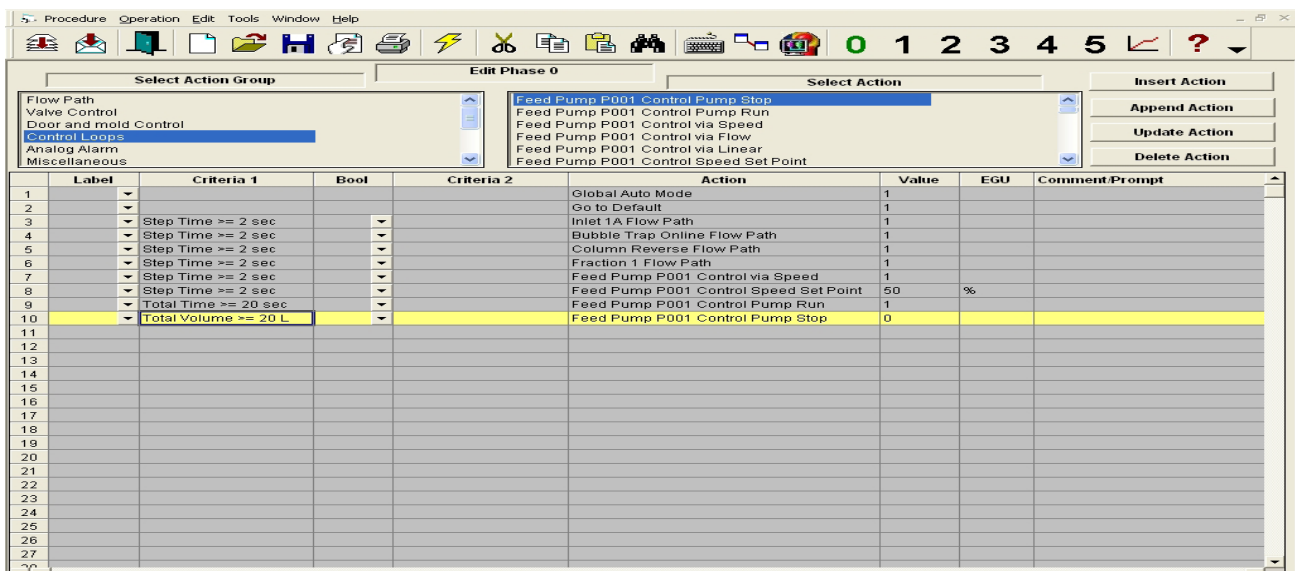
Sample Operation Creation

The following example illustrates the creation of an operation for the system. For details on what Actions and Criteria are available with the system, see the sections of this document titled *Recipe Editor Actions Summary* and *Recipe Editor Criteria Summary*.

To create a simple operation to do the following:

1. Place the system in Global Auto Mode
2. Place the system in Default state.
3. Wait 2 seconds, put Inlet 1A online.
4. Wait 2 seconds, put Bubble Trap online.
5. Wait 2 seconds, put Column operated in reverse.
6. Wait 2 seconds, put Fraction 1 open.
7. Wait 2 seconds, set the Pump to speed control mode.
8. Wait 2 seconds, set a speed of 50%.
9. Wait for operation to run for 20 sec, start the pump.
10. Wait for 20 liters to pass through the system, stop the pump.

The actions are shown listed in order below.



Example Operation

Set the system to Global Auto and Default (Step 1 & 2) at the start of an operation, to ensure that the status of components is known.

CAUTION

Valves that have been manually forced (not set on Auto) will not be affected by the System Default. Having the Global Auto step or clicking the All Auto button may be used to set the valves to Auto, but always visually check the Process Display to make sure that all valves are in their correct state before executing an operation!

Next, the flowpath is defined (Steps 3–6), starting from the inlet and moving sequentially to the bubble trap, column and finally the outlet. Having established a valid flowpath, the pump parameters are set (Steps 7–8). It is important to set these before starting the pump. Finally the pump is started (Step 9).

The steps use a step time of 2 seconds to allow their occurrence at discrete times rather than rapidly one after another (see below).

Note

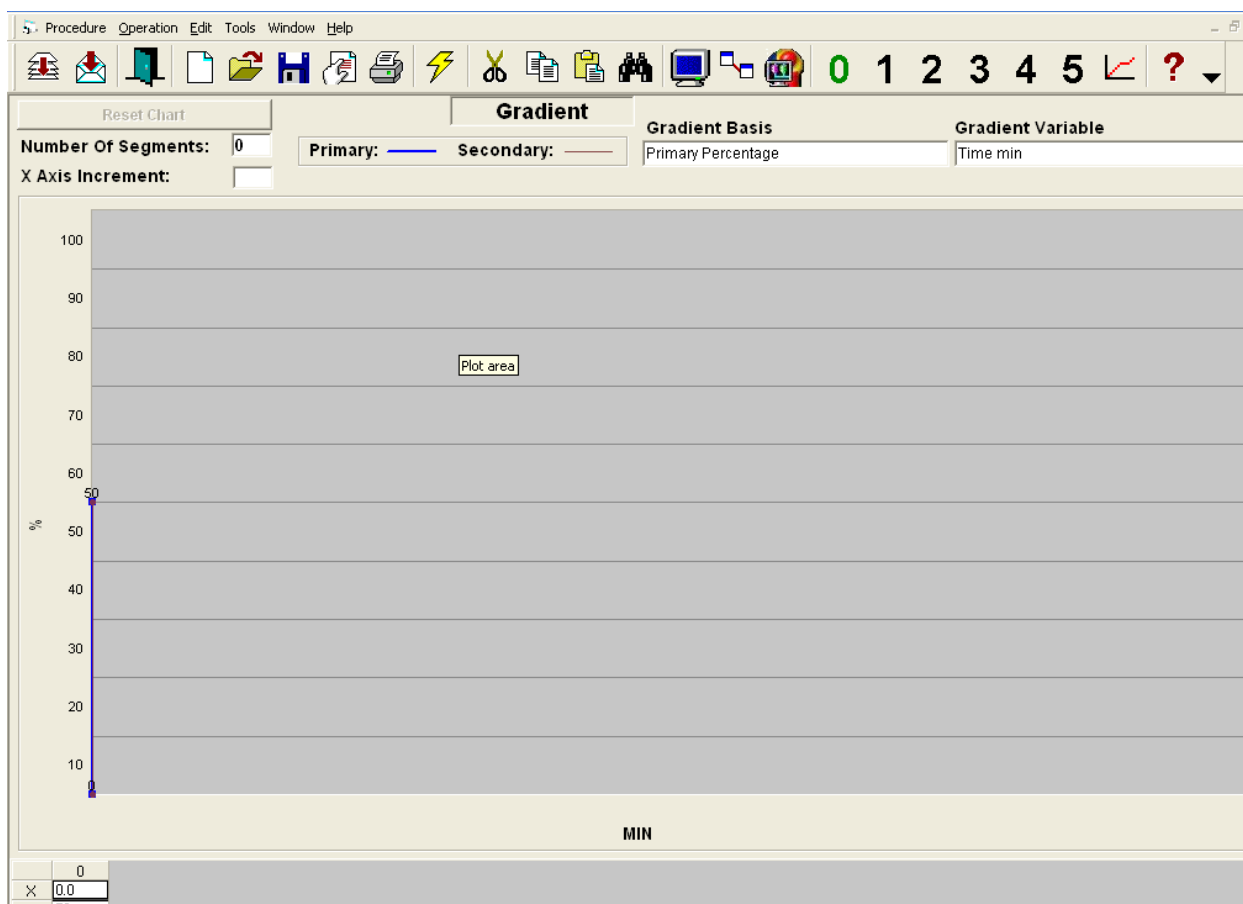
The computer is faster than hardware such as pumps and valves. Allow adequate time (1 or 2 seconds minimum) for an action to take place before proceeding to another step. This holds true for the end of an operation. If you specify that a valve closes at the end of an operation, the computer may send this command, and then end the operation before the last action (valve closing) physically takes place. You may specify None as the last action, and list a wait time as the criterion, or select Go to Default as the final action to ensure that all actions have completed. It is good practice to use Go to Default at the start of an operation.

When operating the system in flow control mode, allow adequate time for the flow rate to stabilize, prior to bypassing the bubble trap. The system will automatically hold the pump at the same speed it is operating at when the bubble trap is bypassed. This is because the control will become unstable when not using the bubble trap.

Gradient Phase

One of the capabilities of the system is the ability to form gradients based on conductivity. It allows a gradient to be defined in terms of the conductivity (in μS) of the fluid entering the column. The software employs a hybrid feed-forward-feedback algorithm to manipulate the gradient valve to achieve the desired conductivity. In addition to gradients based on conductivity, users can program gradients the traditional way by specifying the primary pump percentage (%pri). Linear gradients and/or combinations of step and linear gradients can be executed only through an operation.

To program a gradient in an operation, click on the Gradient icon on the Recipe Editor toolbar to enter the Gradient Programming screen.

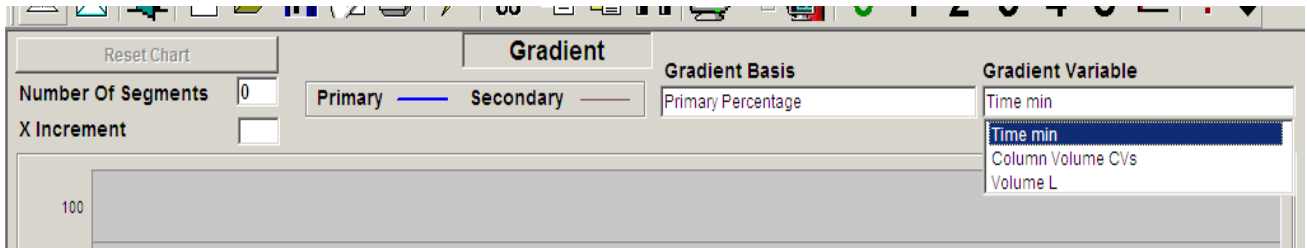


Gradient Programming Screen

Clicking on the Gradient Basis entry box allows one to control the formation of the gradient on primary percentage or conductivity.

In the XMO system, the pump mixing ratio is defined in terms of the primary pump percentage. For instance, if the Control Loop Mode is set to Fixed Speed with a setpoint of 60% and the %pri is set to 80%, the primary pump would have a fixed speed output of 48% (80% of 60%) and the secondary pump would have a fixed speed output of 12% (20% of 60%).

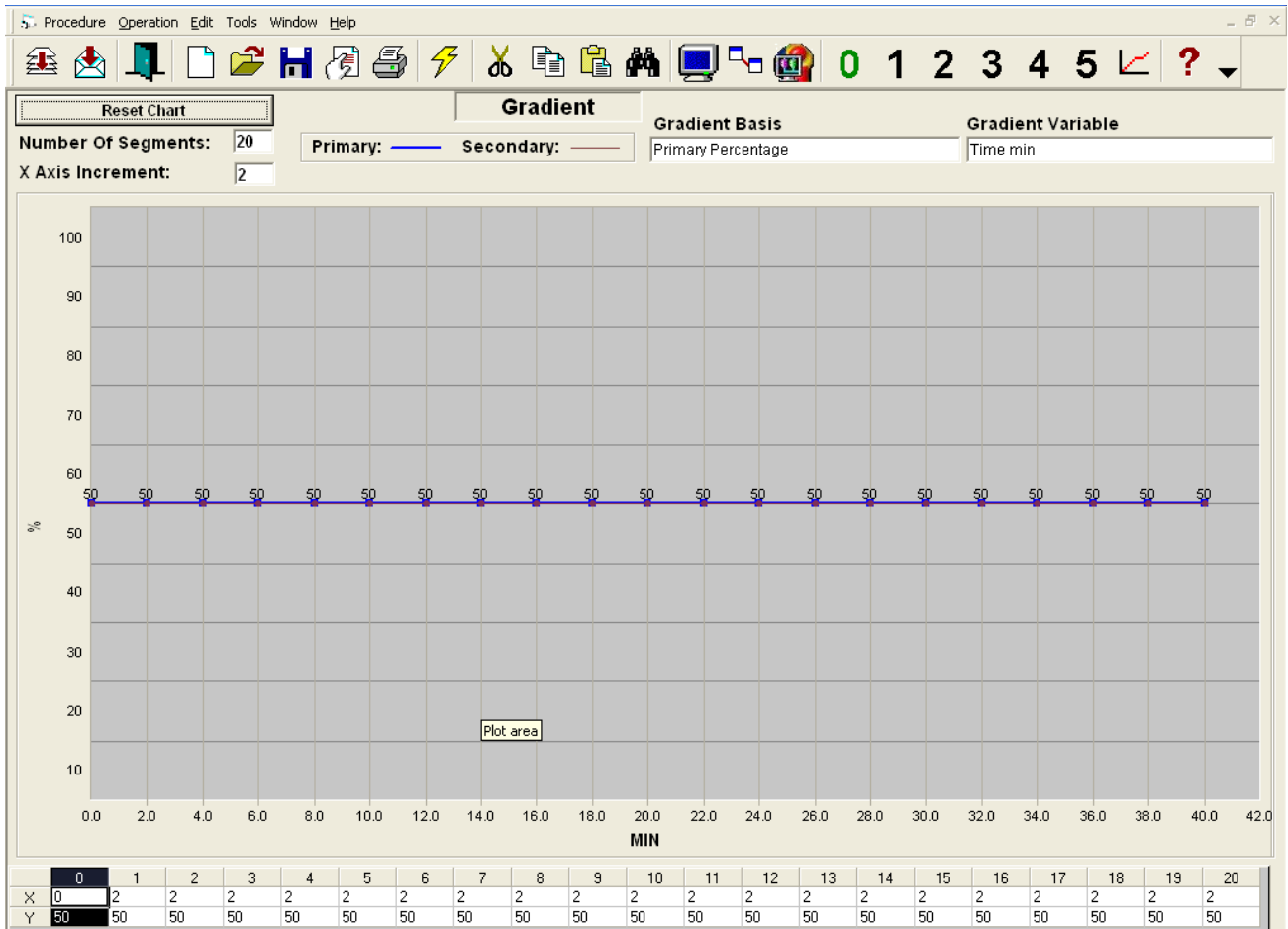
Clicking on the Gradient Variable entry box enables the user to choose the appropriate x-axis for the gradient profile: Time, Volume or Column Volume.



Gradient Variable Drop-Down Menu

CCP® software allows a gradient to have a maximum of 20 segments. The gradient segment entry box allows the user to set the appropriate number of segments for their profile. The X-axis increment entry box is employed to set the intervals for the X-axis. After making changes to these entry boxes, the Reset Chart button must be clicked for the changes to take effect. The Gradient Programming Screen after setting the following values and clicking the Reset Chart button is show below.

- Number of Segments = 20
- X Axis Increment = 2



Gradient Variable Drop-Down Menu

The user can create the desired gradient profile in two ways:

- graphically by clicking and dragging the symbols (**l** and **n**) in the graphical area
- by entering the appropriate values of the gradient basis (**Y**) and gradient variable (**X**) in the table below the graph.

Changing the tabular entries will automatically update the graphical display.

Note

The values of X in the table (other than in column 0) represent intervals and not totals.
Only one gradient profile is allowed per operation.
A segment is defined only by two ordinate (Y) values.

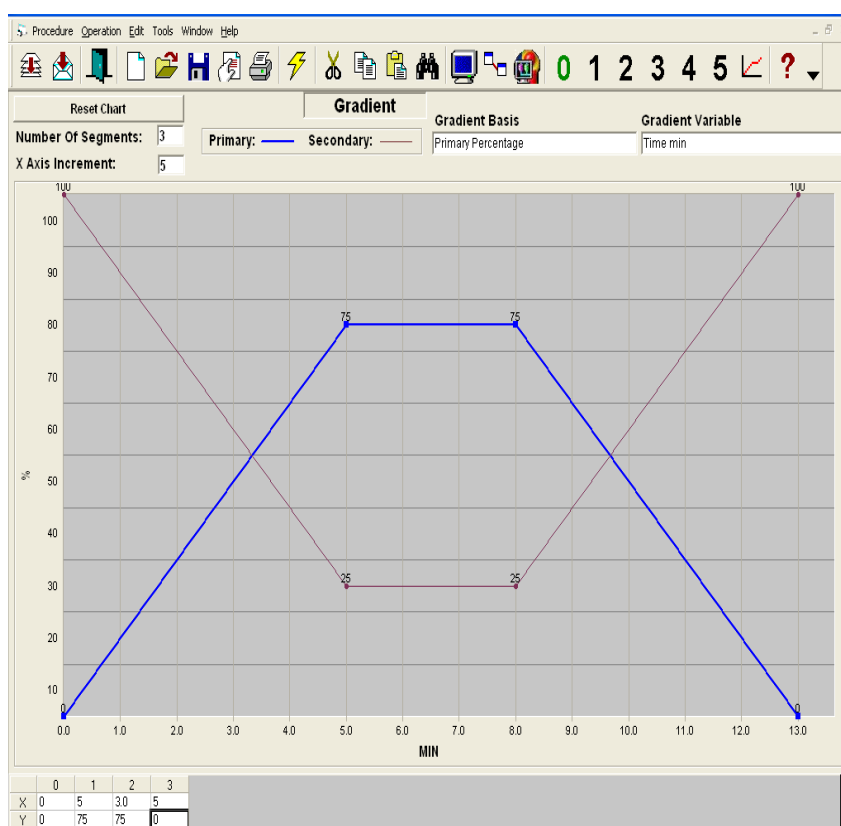
Creating a Gradient Profile

Example: Generate a gradient based on primary percentage: 0–75% over 5 minutes, hold at 75% for 3 minutes and 75–0% over 5 minutes.

To create this profile we need to perform the following tasks:

1. Click on the Gradient icon in the Recipe Editor tool bar to enter the Gradient Programming window.
2. Click on the Gradient Basis entry box and choose Primary Percentage from the drop down menu.
3. Click on the Gradient Variable entry box and choose Time Min from the drop down menu.
4. Click on the Number of Segments entry box and enter "3" in the data entry box that pops up.
5. Click on the X-Axis Increment entry box and enter "5" in the data entry box that pops up.
6. Click on the Reset button. The table at the bottom of the screen should reset to 4 columns.
7. In the first column, enter "0" for X and "0" for Y.
8. In the second column, enter "5" for X and "75" for Y.
9. In the third column, enter "3" for X and "75" for Y.
10. In the fourth column, enter "5" for X and "0" for Y.

The programmed gradient is shown here:



Programmed Gradient

Executing a Gradient from an Operation

For an operation to execute a programmed gradient, the following actions should be listed in the order given below in the appropriate phase of the operation. The Actions are found in the Gradient Action Group in the Operation screen.

1. Define the Gradient Control Mode: via Percent or via Conductivity.
2. Define the setpoint for the previously chosen Gradient Control Mode.
3. Define the inlets for the Gradient Primary and Secondary Flow paths.
4. Enable linear gradient.
5. Enable Gradient.

Caution

As soon as the inlets for the gradient are defined, the software executes the gradient based on the existing setpoint for percentage/conductivity. Enabling the linear gradient should follow immediately after defining the inlets with no time/volume/column volume delay.

Peak Detection

The peak detection capability of the system is based on the absolute values of the UV absorbance. The user can set the UV absorbance for the start of the peak and the end of the peak and can trigger actions based on their attainment. In addition, the software allows for the detection of sub-peaks within the main peak (e.g., shoulders on the front or tail of the main peak). The setpoints for the start and end of the sub-peak are also user-configurable. In addition, if the system has two wavelengths, peak detection can be based on either or both of the wavelengths.

Definition of Peak and Sub-Peak Setpoints

Peak detection setpoints are based on the UV value above the baseline. These values must be defined in the recipe editor using the relevant actions, before peak detection is enabled (see the Peak Detection Action group). The end peak setpoints can also be computed by the system based on a configurable percentage of the maximum peak height. Detection of a peak or sub-peak can be enabled or disabled through operation recipe actions.

Detection of Peak and Sub-Peak Start and End Points

A valid start of peak is detected when the UV value has been rising for at least one second and the start of peak setpoint has been reached for one second. Start of peak is used as an operation step criterion to allow the user to program the desired start of peak action.

A valid start of sub-peak is detected when the start of peak has been detected and the start of sub-peak setpoint has been reached for one second. Start of sub-peak is used as an operation step criterion to allow the user to program the desired start of sub-peak action.

A valid end of sub-peak is detected when the UV value has been falling for at least one second, the start of sub-peak has been detected and the end of sub-peak setpoint has been reached for one second. End of sub-peak is used as an operation step criterion to allow the user to program the desired end of sub-peak action.

A valid end of peak is detected when the UV value has been falling at least one second, the start of peak has been detected and the end of peak setpoint (absolute or % of maximum) has been reached for 1 second. End of peak is used as an operation step criterion to allow the user to program the desired end of peak action.

UV Stability Time

The UV signals can be monitored for stability using the UV Stability Timer. When the timer is enabled, the current UV value is captured and the timer is reset whenever the UV value changes by a configurable deadband. The timer value is used as a criterion for step advance. All stability timer functions are available as operation recipe actions.

UV Auto Zero

The UV Auto Zero function establishes an artificial zero (baseline), based on the current value of the UV signal. The resulting offset remains in effect until the original zero is re-established, when the function is turned off. The UV Auto Zero function is toggled on and off by clicking the Zero button on the Process display or by the use of the operation recipe actions UV Baseline Zero On and UV Baseline Zero Off.

Setting Up Peak Detection

To use the peak detection capabilities, the user must include the following recipe actions (found in the Peak Detection Action group) in the order given below, in the appropriate phase of the operation:

1. Define the start and end setpoints for the peak and sub-peak (if any). The software expects the sub-peak to be contained within the main peak. Thus, the setpoint for the start of the sub peak must be greater than the setpoint for the start of the peak and the setpoint for the end of the sub-peak must be greater than the setpoint for the end of the peak.
2. End peak setpoints can be defined either as explicit values or as a percentage of the maximum peak height (using the End Peak %Height Setpoint recipe actions).
3. Enable the detection of the peak and/or sub-peak by inserting the UV Peak Detection Enable and UV Sub-Peak Detection Enable actions in the operation.

An example of the use of phases can be seen below in an operation that collects a fraction when the start of peak is detected in Phase 0.

In Phase 0:

Action n	Setpoint for start of UV peak.
Action n+1	Setpoint for end of UV peak.
Action n+2	Enable UV peak detection.
Action n+3	If start of peak detected, start Phase 1.

In Phase 1:

Action 1	Open Fraction 1.
Action 2	Following a step Time/Volume/Column volume of "X seconds/L, open fraction waste".

Running an Operation

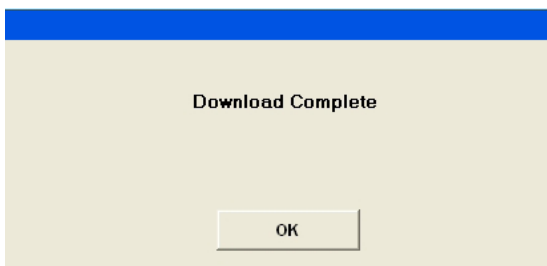


Downloading the Operation

To execute the operation, it must be downloaded to the PLC. To accomplish this, click the Download Operation icon in the toolbar or click Operation and then Download Operation in the Recipe Editor menu bar. The system will display a dialog box to indicate that the download is completed.

Note

The download will not be completed if the system is Held or if the operation has not been saved. Windows® operating system will pop-up to alert the user of any issues that prohibit the download.



Dialog Box on Completion of Operation Download



Running the Operation

To run the operation downloaded to the PLC, exit the recipe editor by clicking on the Exit icon in the Recipe Editor toolbar and return to the Process Display.

Note

Always check the Process Display for proper system status before running an operation. Ensure that no manual forces have been applied to valves, as these will override any operation criteria that are specified. The proper setting for these is Auto.

In the Process Display, click on the Run icon in the tool bar. This causes the Run Header Data Form to display and allows the user to enter the Run Header data.

This form allows the operator to enter run header data to identify the run. Once again, the rows in white can be edited. The CCP® software batch reporting utility identifies each run with a unique run ID. By default, the software supplies a unique run ID by providing a date and time stamp. The user can replace this ID with her or his own unique identifier. For more details on this form, refer to the chapter on Batch Reporting.

Clicking on the OK button on the Run Header Data form closes it, returns the operator to the Process Display and begins execution of the operation stored in the PLC.



Operation Status Display

To monitor the status of the operation, click on the Operation Status icon in the Navigation Toolbar. This opens the Operation Status Display.

Phase 0 Status							
Phase:	0	1	2	3	4	5	Recipe Pool
State:	RUN	IDLE	IDLE	IDLE	IDLE	IDLE	Filename
Pending Step:	10	0	0	0	0	0	c:\Smart\XMO3\CCPRecipeFiles\Test.opn
Criteria 1: Phase 0 Prompt OK							
Boolean:							
Criteria 2:							
Pending Step Action: None							
Value: 0							
Procedure Total Time: 0:09:56	Phase 0 Total Time: 0:09:44	Phase 0 Step Total Time: 0:07:59	Phase 0 Pause Total Time: 0:00:12	Hold Total Time: 0:00:00	User Total Time: 0:00:00		
FQ01 Flow 0.0 L	FQ01 Flow 0.0 L	FQ01 Flow 0.0 L	FQ01 Flow 0.0 L	FQ01 Flow 0.0 L	FQ01 Flow 0.0 L	FQ01 Flow 0.0 L	
FQ02 CVs 0.0	FQ02 CVs 0.0	FQ02 CVs 0.0	FQ02 CVs 0.0	FQ02 CVs 0.0	FQ02 CVs 0.0	FQ02 CVs 0.0	
						Start	Reset

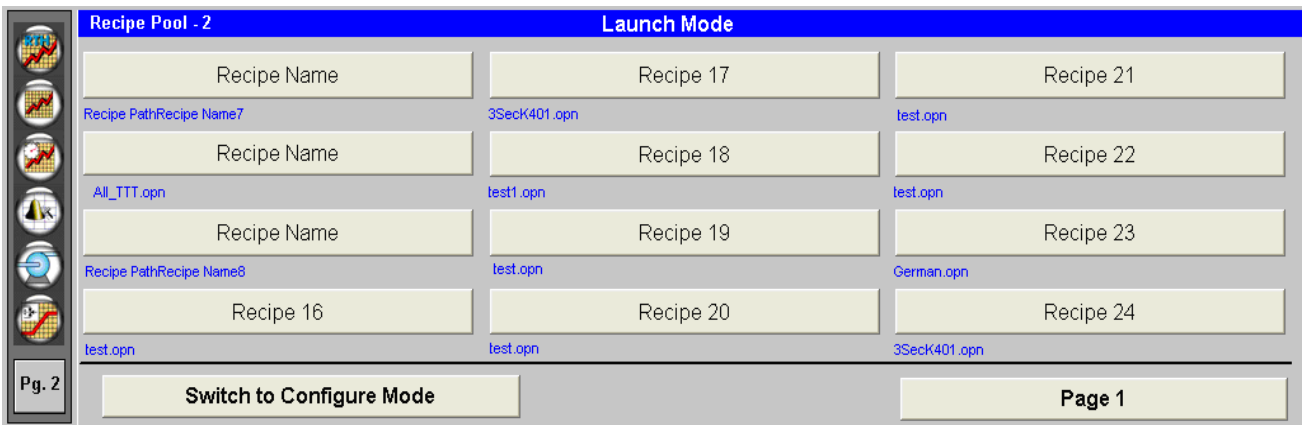
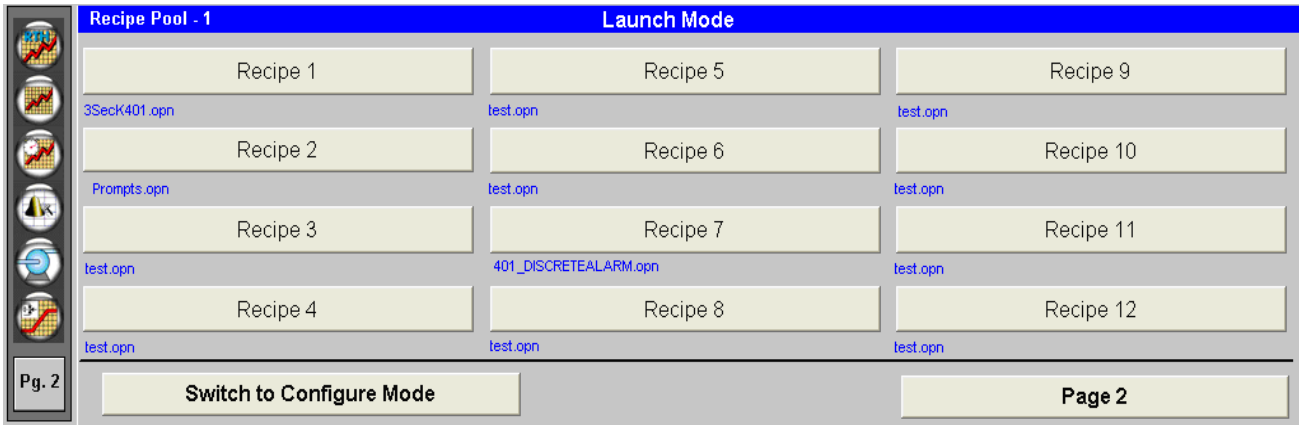
Operation Status Display

The Operation Status Display provides the following:

- Six buttons denoting the status of the various phases (Run or Idle).
- The *.opn file currently being executed
- The various timers (Time, Volume and Column Volume)
 - The **Procedure Total** timer starts at the beginning of a procedure and ends when the entire procedure has been executed.
 - The **Phase Total** timer starts and stops at the beginning and end of each phase. Pausing the operation pauses this timer.
 - The **Phase Step Total** timer starts and stops at the beginning and end of each step. Pausing the operation pauses this timer.
 - The **Pause Total** timer begins when the operation is paused and ends when the operation is resumed.
 - The **Hold Total** timer starts when the system is put on Hold and ends when the system is taken off Hold.
 - The **User Total** timer is a stopwatch. It can be started, stopped or reset by the user, using the buttons above it.
- The step to be executed after the current one and its criterion.
- The step to be executed after the pending step.
- The Recipe Pool button, providing access to the Recipe Pool screen. The Recipe Pool allows selected recipes to be downloaded and run automatically, in a simplified procedure.

The Recipe Pool screen has twelve Recipe buttons and a Mode (Launch/Configure) button.

- In Configure mode, each of the twelve Recipe buttons can be configured with an existing recipe. In Launch mode, if no other operation is running when a given Recipe button is clicked, the associated recipe is downloaded and run.
- Click the Mode button to switch between Launch and Configure modes. The button displays the name of the mode that will be entered when it is clicked. The name of the active mode is displayed beside the button.










Recipe Pool Screens

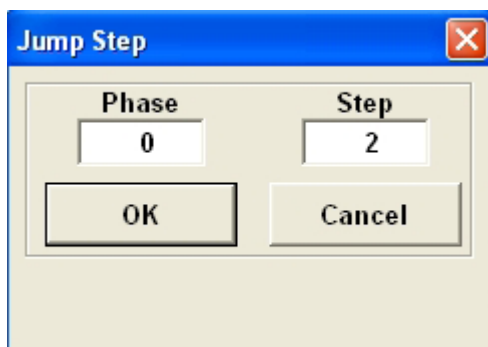
By default, the Operation Status window displays the steps and timers of Phase 0. To view the steps and timers of any of the other phases, click on the button with the appropriate phase number.

At the end of the last step of the operation, the Run Header Data dialog box reappears to allow the operator to add any post-run comments. Post run comments can be added only at this stage. Clicking on the OK button of this dialog box ends the operation and returns the operator to the Process Display.

Controlling a Running Operation

During the course of a run, the operator can manually control the recipe using the button on the Process Display Toolbar. The following **table** summarizes the functionality of the buttons.

Icon	Name	Description
	Start Button	Starts an operation Visible when an operation is not running. The Start icon is replaced by the Abort Button when the operation is started.
	Abort Button	Visible when an operation is running. Ends the run at the current step.
	Hold Button	Holds the current recipe. The pump stops and valves are switched to isolate the column. The Resume from Hold icon replaces the Hold icon when the process is held.
	Resume from Hold Button	Visible when the process is held. Restart the held operation.
	Pause Button	Suspends the operation at the current step. The pumps DO NOT stop and the column is NOT isolated. The Resume from Pause icon replaces the Pause icon. In addition, the Pause Total timers are started
	Resume from Pause Button	Restarts a paused operation. Stops the Pause Total timers and resumes the normal state of the other timers.
	Jump Step Button	Visible when an operation or procedure is being executed. Opens the Jump Step dialog box in which the operator can enter the step number to be executed, following the execution of the pending step. A jump step can occur to any valid step in the same phase, but not to a different phase.



Manual Jump Dialog Box

Recipe Editor Actions Summary

This section summarizes all of the recipe actions available in the Recipe Editor. The actions are listed in Tables organized by Action Group.

Action Group: Flowpath

Actions in the Flowpath group are used to designate the system flowpath. See the User Interface chapter for more details on flow paths. All flow paths are configurable.

Flowpath Action	Description
Default Flow Path	Sets the flowpath to the predefined default flowpath.
Critical Flow Path	Sets the flowpath to the predefined critical flowpath.
Close All Inlets	Closes all inlets.
Inlet 1A-1E	Opens the corresponding primary inlet and closes the other primary inlets.
Inlet 2A-2E	Opens the corresponding secondary inlet and closes the other secondary inlets.
Open All Inlets	Opens all inlets.
Flexware® Installation	Sets the flowpath to the installation flowpath.
Feed Pump P001	Opens the primary pump flowpath and closes the secondary pump flowpath.
Feed Pump P002	Opens the secondary pump flowpath and closes the primary pump flowpath.
Pump Based Mix	Opens both primary and secondary pump flowpath.
Bubble Trap On-Line	Allows the flow to go through the bubble trap.
Bubble Trap Bypass	Prevents the flow to go through the bubble trap.
Bubble Trap Vent	Opens the vent valve of the bubble trap and allows the air accumulated in the bubble trap to be vented. The liquid flow will still go through the bubble trap and the level of liquid in the device is likely to rise during bleeding.
Bubble Trap Clean	Opens the vent valve of the bubble trap and closes the outlet valve of this device. In this way, the air accumulated in the bubble trap and the incoming liquid flow will be directed through the vent valve and out of the system. A message or interlock is provided, in order to prevent the user from directing product to the waste.
Bubble Trap Drain	Opens a flowpath to drain liquid out of the bubble trap.
Bubble Trap User	Opens the user defined flowpath for the bubble trap.
Filter 1 On-Line	Allows the flow to go through the filter.
Filter 1 Bypass	Directs the flow to bypass the filter.
Filter 1 User	Opens the user defined flowpath for the filter.
Column Forward	Allows the flow to go through the column, from top to bottom.
Column Reverse	Allows the flow to go through the column, from bottom to top.

Flowpath Action	Description
Column Bypass	Directs the flow to bypass the column, flowing through the bypass from bottom to top.
Column User	Opens the user defined flowpath for the column.
Fraction Waste	Opens the Drain fraction valve.
Fraction 3 Open	Opens the Fraction 1 valve.
Fraction 2 Open	Opens the Fraction 2 valve.
Fraction 1 Open	Opens the Fraction 3 valve.
User 1	Sets the flowpath to the predefined User 1 flowpath.
User 2	Sets the flowpath to the predefined User 2 flowpath.
User 3	Sets the flowpath to the predefined User 3 flowpath.
System Drain	Sets the flowpath to the predefined System Drain flowpath.

Action Group: Valve Control

Actions in the Valve Control group are used to open or close the specific valve. See the process display for valve locations.

Valve Action	Description
XV### Open	Opens the valve.
XV### Close	Closes the valve.

Action Group: Door and Clamshell Control

Actions in the Door and Clamshell Control group are used to Lock or Unlock Door and Clamshell Hardware. See the User Interface chapter for more details on Door and Clamshell Control.

Door and Clamshell Control Action	Description
Y500A Open	Unlock Clamshell Control
Y500A Closed	Unlock Clamshell Control
Y500B Open	Lock Clamshell Control
Y500B Closed	Lock Clamshell Control
Y501A Open	Unlock Door Control
Y501A Closed	Unlock Door Control
Y501B Open	Lock Door Control
Y501B Closed	Lock Door Control
Y502A Open	Unlock Clamshell in Door Control
Y502A Closed	Unlock Clamshell in Door Control

Door and Clamshell Control Action	Description
Y502B Open	Lock Clamshell in Door Control
Y502B Closed	Lock Clamshell in Door Control
Y503A Open	Connect Clamshell Control
Y503A Closed	Connect Clamshell Control
Y503B Open	Disconnect Clamshell Control
Y503B Closed	Disconnect Clamshell Control

Action Group: Control Loops

Actions in the Control Loops group include setting pump control loop modes, pressure valve control modes and run/stop commands. See the User Interface chapter for more details on these controls.

Control Loops Action	Description
Feed Pump P00X Control...	Controls for individual pumps when gradient control is disabled.
Pump Stop	Stops the pump.
Pump Run	Starts the pump.
Via Speed	Sets pump control mode to speed control.
Via Flow	Sets pump control mode to flow control.
Via Linear	Sets pump control mode to linear velocity control.
Speed Setpoint	Sets the speed setpoint for speed control mode.
Flow Setpoint	Sets the flow setpoint for flow control mode.
Linear Setpoint	Sets the linear velocity setpoint for linear velocity control mode.
Ramp Rate	Sets the ramp rate the for the pump when it speeds up or slows down.
Deadband	Sets the control deadband, outside of which ramp rate controls the pump speed, within this deadband the PID loop is in control.
Deviation Alarm Enable	Enables the deviation alarm.
Deviation Alarm Disable	Disables the deviation alarm.
Deviation Hi Alarm	Sets the deviation hi alarm setpoint.
Deviation HiHi Alarm	Sets the deviation HiHi alarm setpoint.
Pump Based Control...	Controls for pumps when gradient control is enabled.
Pump Stop	Stops the pumps.
Pump Run	Starts the pumps.
Via Speed	Sets pump control mode to speed control.

Control Loops Action	Description
Via Flow	Sets pump control mode to flow control.
Via Linear	Sets pump control mode to linear velocity control.
Speed Setpoint	Sets the speed setpoint for speed control mode.
Flow Setpoint	Sets the flow setpoint for flow control mode.
Linear Setpoint	Sets the linear velocity setpoint for linear velocity control mode.
Pressure Valve PCV032 Control...	
Via Position	Sets valve control mode to position based control.
Position Setpoint	Sets position setpoint when in position based control.
Ramp Rate	Sets the ramp rate for how quickly the valve opens or closes.
Bubble Trap Vent Control Enable	Enables auto vent control.
Bubble Trap Vent Control Disable	Disables auto vent control.

Action Group: Analog Alarm

Actions in the Analog Alarm group enable/disable alarms and set HiHi, Hi, Lo and LoLo setpoints. See the User Interface chapter for more details on Analog Alarms.

Analog Alarm Action	Description
[Analog Device]...	Every analog device has the following alarm actions.
Enable	Enables the alarms on the analog device.
Disable	Disables the alarms on the analog device.
LOLO Alarm	Sets the LoLo Alarm setpoint.
LO Alarm	Sets the Lo Alarm setpoint.
Hi Alarm	Sets the Hi Alarm setpoint.
HIHI Alarm	Sets the HiHi Alarm setpoint.

Action Group: Miscellaneous

Miscellaneous Action	Description	XMO
Enable All Alarms	Enables all alarms.	X
Disable All Alarms	Disables all alarms.	X
None	No action is performed.	X
Global Auto Mode	Sets all controls to auto, overrides any manual control states.	X
Go To Default	Sets the system to the predefined default state.	X
Chart Mark	Put a mark on the chart.	X

Miscellaneous Action	Description	XMO
UV Auto Zero On	Turns on the UV auto zero.	X
UV Auto Zero Off	Turns off the UV auto zero.	
Feed Bag Tare	Tares the weight of the feed bag.	
Filtrate Bag Tare	Tares the weight of the filtrate bag.	
Start User Totalizer	Starts the user totalizer.	X
Stop User Totalizer	Stops the user totalizer.	X
Reset User Totalizer	Resets the user totalizer.	X
Log User Totalizer	Logs the user totalizer.	X
HETP Start	Flags the start of HETP data to be used by the HETP report.	X
HETP End	Flags the end of HETP data to be used by the HETP report.	X
Piping Holdup Volume	The volume of fluid held in the system flowpath.	X

Action Group: Program Flow Control

These actions are related to controlling an operation.

Program Flow Control Action	Description	XMO
System Hold	Places the operation/procedure on hold.	X
System Pause	Pauses the operation/procedure.	X
If Criteria Met then Jump to Label	If the criteria are met, the operation jumps to another labeled action.	X
Phase 1-5...		X
Start	Starts phase X.	X
Stop	Stops phase X.	X
Pause	Pauses phase X.	X
Resume	Resumes phase X.	X
No Default on Complete	Does not set the system to the default state on the completion of an operation.	X
Default on Complete	Sets the system to the default state on the completion of an operation.	X
Criteria Flag 1 On	Sets criteria flag 1 on. Criteria flags can be used to create user-defined criteria.	X
Criteria Flag 1 Off	Sets criteria flag 1 off. Criteria flags can be used to create user-defined criteria.	X
Criteria Flag 2 On	Sets criteria flag 2 on. Criteria flags can be used to create user-defined criteria.	X
Criteria Flag 2 Off	Sets criteria flag 2 off. Criteria flags can be used to create user-defined criteria.	X

Action Group: Messaging

Messaging Action	Description
Phase 0 Prompt with OK Button	When executed, this action displays a dialog box containing a message and an OK button. The user can define the message contents via the comment/prompt column of the selected phase's spreadsheet. Available only for the currently active phase.
Phase 0 Prompt with Yes/No Button	When executed, this action displays a dialog box containing a message, a Yes button and a No button. The user can define the message contents via the comment/prompt column of the selected phase's spreadsheet. Available only for the currently active phase.

Action Group: Discrete Alarms

Actions in the Discrete Alarm group enable/disable discrete. See the User Interface chapter for more details on Discrete Alarms.

Discrete Alarm Action	Description
[Discrete Device]...	Every discrete device has the following alarm options.
Enable	Enables the discrete alarm.
Disable	Disables the discrete alarm.

Action Group: Column Data

Column Data Action	Description
Column Volume	Sets the column height.
Bed Height	Sets the bed height.

Action Group: Peak Detection

Peak Detection Action	Description
Peak Detection Enable	Enables peak detection.
Peak Detection Disable	Disables peak detection.
Sub-Peak Detection Enable	Enables sub-peak detection.
Sub-Peak Detection Disable	Disables sub-peak detection.
Start Peak Setpoint	Sets the setpoint at which the peak is defined as starting.
End Peak Setpoint	Sets the setpoint at which the peak is defined as ending when in End Peak Based on Absolute mode.
Start Sub-Peak Setpoint	Sets the setpoint at which the sub-peak is defined as starting.
End Sub-Peak Setpoint	Sets the setpoint at which the sub-peak is defined as ending when in End Peak Based on Absolute mode.
End Peak Based on Absolute	Enables determination of the end of the peak based on an absolute absorption value.
End Peak Based on % Height	Enables determination of the end of the peak based on a percentage of the peak absorption value.

Peak Detection Action	Description
End Peak % Height Setpoint	Set the setpoint at which peak is defined as ending when in End Peak Based on % Height mode.
End Sub-Peak % Height Setpoint	Set the setpoint at which sub-peak is defined as ending when in End Peak Based on % Height mode.
Stability Deadband	Specifies the maximum allowable change in UV value that is considered stable (see UV1 stability timer actions).
Stability Timer Enable	Starts the timer that will accumulate while the UV value is within the stability deadband. The timer value is used as criteria.
Stability Timer Disable	Stops the timer that will accumulate while the UV value is within the stability deadband.
Set AI010 Signal For Peak Detection	Sets AI010 as the signal to use for peak detection.
Set AI014 Signal For Peak Detection	Sets AI014 as the signal to use for peak detection.

Action Group: Gradient

Gradient Action	Description
Inlet 1A-1E Gradient Primary Flow Path	Sets Inlet Valve 1X as the primary inlet valve.
Inlet 2A-2E Gradient Primary Flow Path	Sets Inlet Valve 2X as the secondary inlet valve.
Gradient Control On	Enables gradient control.
Gradient Control Off	Disables gradient control.
Gradient Control via Percent	Sets gradient control to be based on percent primary pump (%pri).
Gradient Control via Conductivity	Sets gradient control to be based on conductivity of the fluid.
Gradient Control Percent Setpoint	Sets the setpoint (%pri) for gradient control via percent.
Gradient Control Conductivity Setpoint	Sets the conductivity setpoint for gradient control via conductivity.
Gradient Control Deadband	Defines the maximum conductivity deviation allowed as a percent value of the gradient conductivity setpoint. The criteria "Gradient Control within Deadband" is true when the conductivity value is within the deadband limits.
Gradient Control Deviation Alarm Enabled	Enables the gradient control deviation alarm.
Gradient Control Deviation Alarm Disabled	Disables the gradient control deviation alarm.
Gradient Control Deviation Hi Alarm	Sets the setpoint for the gradient control Hi alarm.
Gradient Control Deviation HiHi Alarm	Sets the setpoint for the gradient control HiHi alarm.

Gradient Action	Description
Gradient Percent Calibration On	Enables the calibration of the gradient when in percent primary control mode.
Gradient Percent Calibration Off	Disables the calibration of the gradient when in percent primary control mode.
Gradient Percent Calibrate Segment	Calibrates a single segment of a linear gradient when in %pri mode.
Gradient Percent Total Segments	Sets total number of segments in a linear gradient when in %pri mode.
Gradient Save Primary Inlet Conductivity	Saves the primary inlet conductivity.
Gradient Save Secondary Inlet Conductivity	Saves the secondary inlet conductivity.
Gradient Conductivity Calibration On	Enables the calibration of the gradient when in conductivity control mode.
Gradient Conductivity Calibration Off	Disables the calibration of the gradient when in conductivity control mode.
Gradient Conductivity Calibrate Segment	Calibrates a single segment of a linear gradient when in conductivity mode.
Gradient Conductivity Total Segments	Sets total number of segments in a linear gradient when in conductivity mode.
Linear Gradient Start	Start the programmed linear gradient operation.
Linear Gradient Abort	Abort the programmed linear gradient operation.
Linear Gradient Pause	Pause the programmed linear gradient operation.
Linear Gradient Resume	Resume from pause the programmed linear gradient operation.

Recipe Editor Criteria Summary

The criteria in the Recipe Editor environment are intended to be self-explanatory.

Criterion	Description
None	This criterion (empty field) makes the transition true, i.e., the action associated with the step where this criterion stands will always be executed.
Total Time	This criterion checks the value of the time elapsed from the start of the operation.
Step Time	This criterion checks the value of the time elapsed from the start of the current step.
Total Volume	This criterion checks the value of the volume of fluid that has passed through the system from the start of the operation.
Total CVs	This criterion checks the value of the column volumes of fluid that have passed through the system from the start of the operation.
Step Volume	This criterion checks the value of the volume of fluid that has passed through the system from the start of the current step.
Step CVs	This criterion checks the value of the column volumes of fluid that have passed through the system from the start of the current step.

Criterion	Description
Feed Pump P001 Ramp Complete	This criterion checks for pump feed pump P001 ramp to be completed.
Feed Pump P001 Control Stable	This criterion checks for feed pump P001 control to be stable (within the deadband).
Feed Pump P002 Ramp Complete	This criterion checks for feed pump P002 ramp to be completed.
Feed Pump P002 Control Stable	This criterion checks for feed pump P002 control to be stable (within the deadband).
Valve PCV032 Ramp Complete	This criterion checks for valve PCV032 ramp to be completed.
Valve PCV032 Control Stable	This criterion checks for valve PCV032 control to be stable (within the deadband).
PI003 Feed Pump P002 Outlet Pressure	This criterion checks for a particular value of the feed pump P002 outlet pressure.
PI001 Feed Pump P001 Outlet Pressure	This criterion checks for a particular value of the feed pump P001 outlet pressure.
PI006 Pre-Column Pressure	This criterion checks for a particular value of the Pre-column pressure.
FI004 Feed Pump P002 Flow	This criterion checks for a particular value of the FI004 Feed Pump P002 Flow.
FI002 Feed Pump P001 Flow	This criterion checks for a particular value of the FI002 Feed Pump P001 Flow.
FT_TOT Total Flow	This criterion checks for a particular value of the FT_TOT Total Flow.
AI007 Pre-Col Conductivity	This criterion checks for a particular value of the Pre-Column conductivity.
AI008 Pre-Col pH	This criterion checks for a particular value of the Pre-Column pH.
AI011 Post-Col Conductivity	This criterion checks for a particular value of the Post-Column conductivity.
AI0013 Post-Col pH	This criterion checks for a particular value of the Post-Column pH.
AI010 Post-Col UV	This criterion checks for a particular value of the AI010 Post-Col UV.
AI014 Post-Col UV	This criterion checks for a particular value of the AI014 Post-Col UV.
TI009 Pre-Column Temperature	This criterion checks for a particular value of the Pre-column temperature.
TI012 Post-Column Temperature	This criterion checks for a particular value of the Post-column temperature.
LV Linear Velocity	This criterion checks for a particular value of the AI010 Post-Col UV.
Goto Default on End Enabled	This criterion checks the state of Goto Default on End and is true if Enabled.
Goto Default on End Disabled	This criterion checks the state of Goto Default on End and is true if Disabled.
Criteria Flag 1 On	This criterion checks the state of Criteria Flag 1 and is true if On.
Criteria Flag 1 Off	This criterion checks the state of Criteria Flag 1 and is true if Off.

Criterion	Description
Criteria Flag 2 On	This criterion checks the state of Criteria Flag 2 and is true if On.
Criteria Flag 2 Off	This criterion checks the state of Criteria Flag 2 and is true if Off.
Start of Peak Detected	This criterion checks the state of Start of Peak and is true if Detected.
End of Peak Detected	This criterion checks the state of End of Peak and is true if Detected.
Start of Sub-Peak Detected	This criterion checks the state of Start of Sub-Peak and is true if Detected.
End of Sub-Peak Detected	This criterion checks the state of End of Sub-Peak and is true if Detected.
Peak Stable Time	This criterion checks for a particular value of the Peak Stable Time.
Phase 1 Complete	This criterion checks the status of Phase 1 and is true if the phase is not running.
Phase 2 Complete	This criterion checks the status of Phase 2 and is true if the phase is not running.
Phase 3 Complete	This criterion checks the status of Phase 3 and is true if the phase is not running.
Phase 4 Complete	This criterion checks the status of Phase 4 and is true if the phase is not running.
Phase 5 Complete	This criterion checks the status of Phase 5 and is true if the phase is not running.
Phase 1 Total Time	This criterion checks the value of the time elapsed from the start of Phase 1.
Phase 1 Total Volume	This criterion checks the value of the volume of fluid that has passed through the system from the start of the Phase 1.
Phase 1 Total CVs	This criterion checks the value of the column volumes of fluid that have passed through the system from the start of the Phase 1.
Phase 2 Total Time	This criterion checks the value of the time elapsed from the start of Phase 2.
Phase 2 Total Volume	This criterion checks the value of the volume of fluid that has passed through the system from the start of the Phase 2.
Phase 2 Total CVs	This criterion checks the value of the column volumes of fluid that have passed through the system from the start of the Phase 2.
Phase 3 Total Time	This criterion checks the value of the time elapsed from the start of Phase 3.
Phase 3 Total Volume	This criterion checks the value of the volume of fluid that has passed through the system from the start of the Phase 3.
Phase 3 Total CVs	This criterion checks the value of the column volumes of fluid that have passed through the system from the start of the Phase 3.
Phase 4 Total Time	This criterion checks the value of the time elapsed from the start of Phase 4.
Phase 4 Total Volume	This criterion checks the value of the volume of fluid that has passed through the system from the start of the Phase 4.
Phase 4 Total CVs	This criterion checks the value of the column volumes of fluid that have passed through the system from the start of the Phase 4.

Criterion	Description
Phase 5 Total Time	This criterion checks the value of the time elapsed from the start of Phase 5.
Phase 5 Total Volume	This criterion checks the value of the volume of fluid that has passed through the system from the start of the Phase 5.
Phase 5 Total CVs	This criterion checks the value of the column volumes of fluid that have passed through the system from the start of the Phase 5.
Phase 0 Prompt OK	Within the domain of Phase 0, this criterion checks if the OK button associated with a message-based dialog box has been pressed.*
Phase 0 Prompt Yes	Within the domain of Phase 0, this criterion checks if the Yes button associated with a message-based dialog box has been pressed.*
Phase 0 Prompt No	Within the domain of Phase 0, this criterion checks if the No button associated with a message-based dialog box has been pressed.*
Phase 1 Prompt OK	Within the domain of Phase 1, this criterion checks if the OK button associated with a message-based dialog box has been pressed.*
Phase 1 Prompt Yes	Within the domain of Phase 1, this criterion checks if the Yes button associated with a message-based dialog box has been pressed.*
Phase 1 Prompt No	Within the domain of Phase 1, this criterion checks if the No button associated with a message-based dialog box has been pressed.*
Phase 2 Prompt OK	Within the domain of Phase 2, this criterion checks if the OK button associated with a message-based dialog box has been pressed.*
Phase 2 Prompt Yes	Within the domain of Phase 2, this criterion checks if the Yes button associated with a message-based dialog box has been pressed.*
Phase 2 Prompt No	Within the domain of Phase 2, this criterion checks if the No button associated with a message-based dialog box has been pressed.*
Phase 3 Prompt OK	Within the domain of Phase 3, this criterion checks if the OK button associated with a message-based dialog box has been pressed.*
Phase 3 Prompt Yes	Within the domain of Phase 3, this criterion checks if the Yes button associated with a message-based dialog box has been pressed.*
Phase 3 Prompt No	Within the domain of Phase 3, this criterion checks if the No button associated with a message-based dialog box has been pressed.*
Phase 4 Prompt OK	Within the domain of Phase 4, this criterion checks if the OK button associated with a message-based dialog box has been pressed.*
Phase 4 Prompt Yes	Within the domain of Phase 4, this criterion checks if the Yes button associated with a message-based dialog box has been pressed.*
Phase 4 Prompt No	Within the domain of Phase 4, this criterion checks if the No button associated with a message-based dialog box has been pressed.*
Phase 5 Prompt OK	Within the domain of Phase 5, this criterion checks if the OK button associated with a message-based dialog box has been pressed.*
Phase 5 Prompt Yes	Within the domain of Phase 5, this criterion checks if the Yes button associated with a message-based dialog box has been pressed.*
Phase 5 Prompt No	Within the domain of Phase 5, this criterion checks if the No button associated with a message-based dialog box has been pressed.*
XSH015 Product Inlet Air Detection	This criterion checks.
XS001 Door Closed	This criterion checks the state of XS001 Door and is true if Closed.
XS002 Clamshell Locking 1 Closed	This criterion checks the state of XS002 Clamshell Locking 1 and is true if Closed.

Criterion	Description
XS003 Clamshell Locking 2 Closed	This criterion checks the state of XS003 Clamshell Locking 2 and is true if Closed.
XS004 Clamshell Locking 3 Closed	This criterion checks the state of XS004 Clamshell Locking 3 and is true if Closed.
XS005 Clamshell Locking 4 Closed	This criterion checks the state of XS005 Clamshell Locking 4 and is true if Closed.
XS006 Door to Frame Locking Closed	This criterion checks the state of XS006 Door to Frame Locking and is true if Closed.

*Phase prompt criteria may be used only in the next step after a step with a prompt that is being examined. Only one of the criteria Phase Prompt Yes and Phase Prompt No can be used following a phase prompt.

Using the Off-line Recipe Editor

Introduction

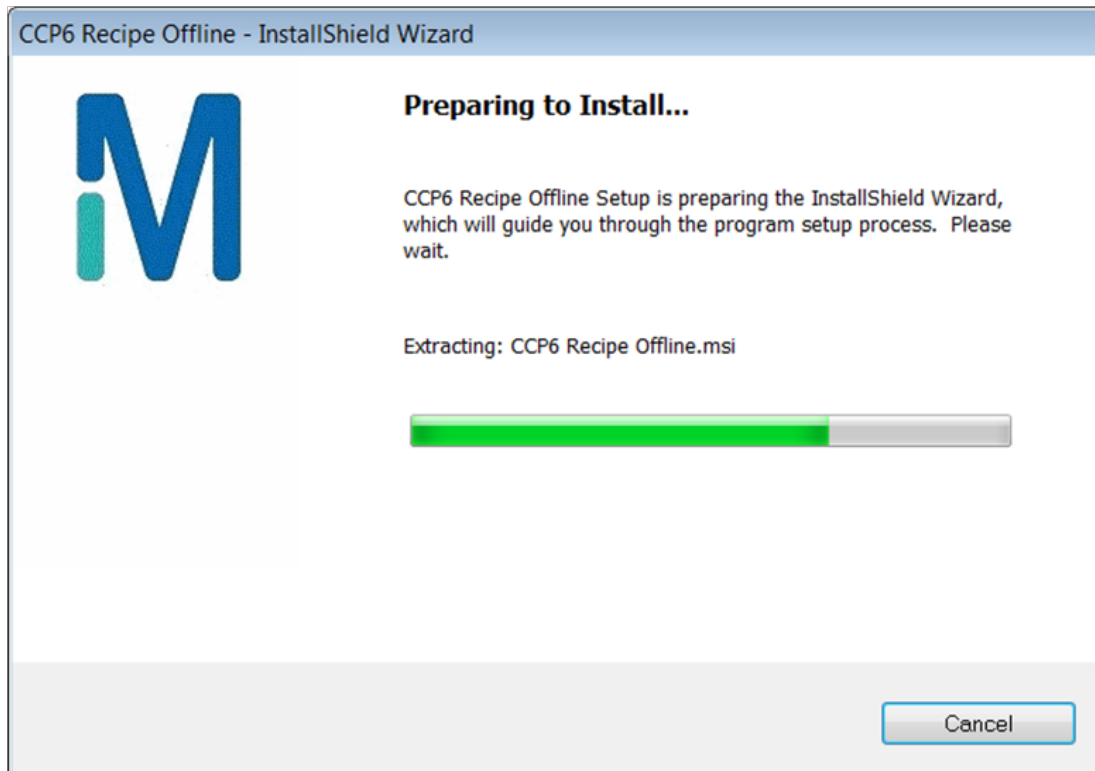
The Off-line recipe editor is an optional feature of CCP® Recipe Editor Application that allows running the Recipe Editor on a stand-alone PC to create or edit recipes. A System Selection screen allows the user to select one of the preconfigured systems to quickly switch from developing recipes for one system or another.

System requirements

- Windows® 7 operating system 32 bit SP1
- Ability to be used as Guest OS on a Virtual machine (VMware and Windows® Virtual PC)
- Same computer requirements as the operating system used on the PC
- Screen resolution is 1024x768 or higher with application viewing area 1024x768

Installation

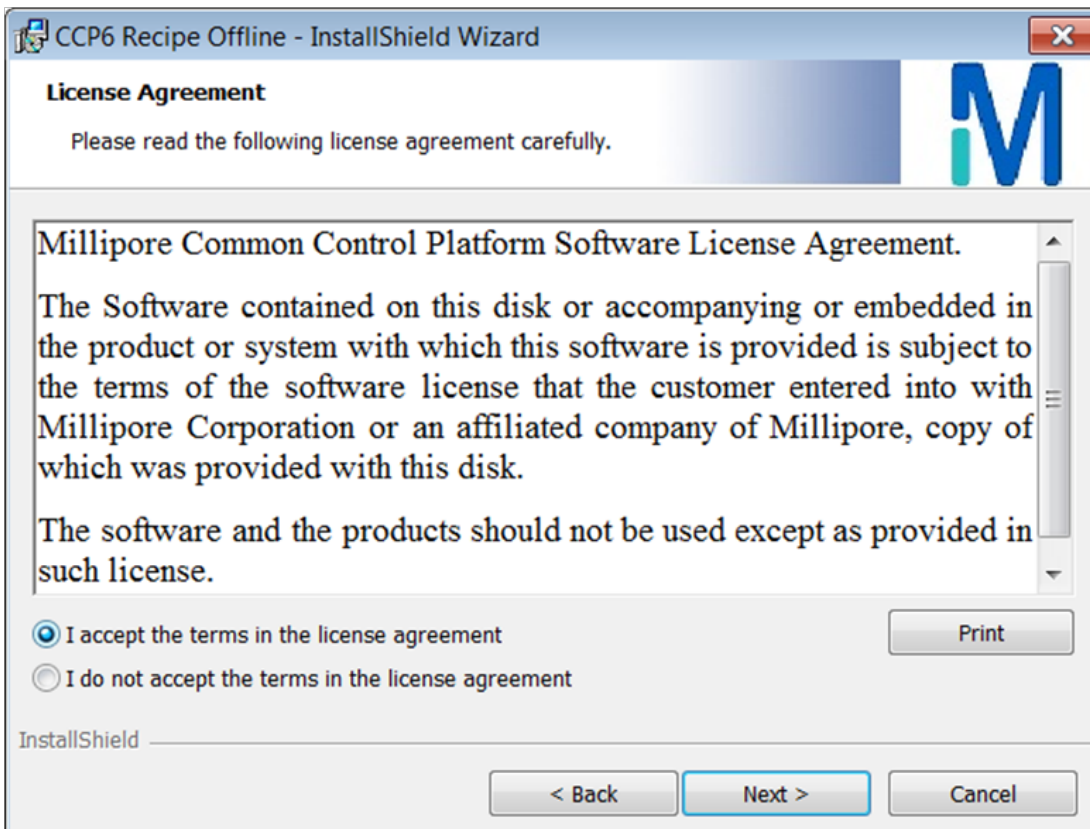
Run the installation setup on a supported operating system.



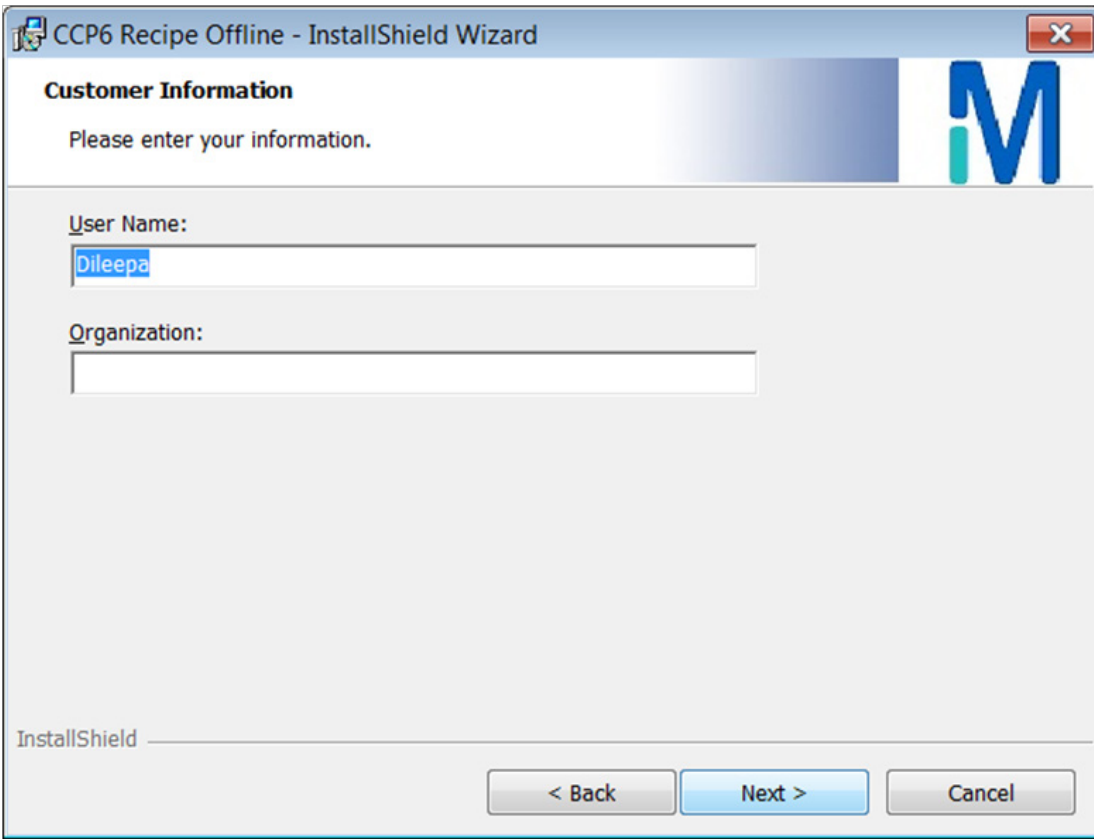
Click the Next button to continue the installation process.



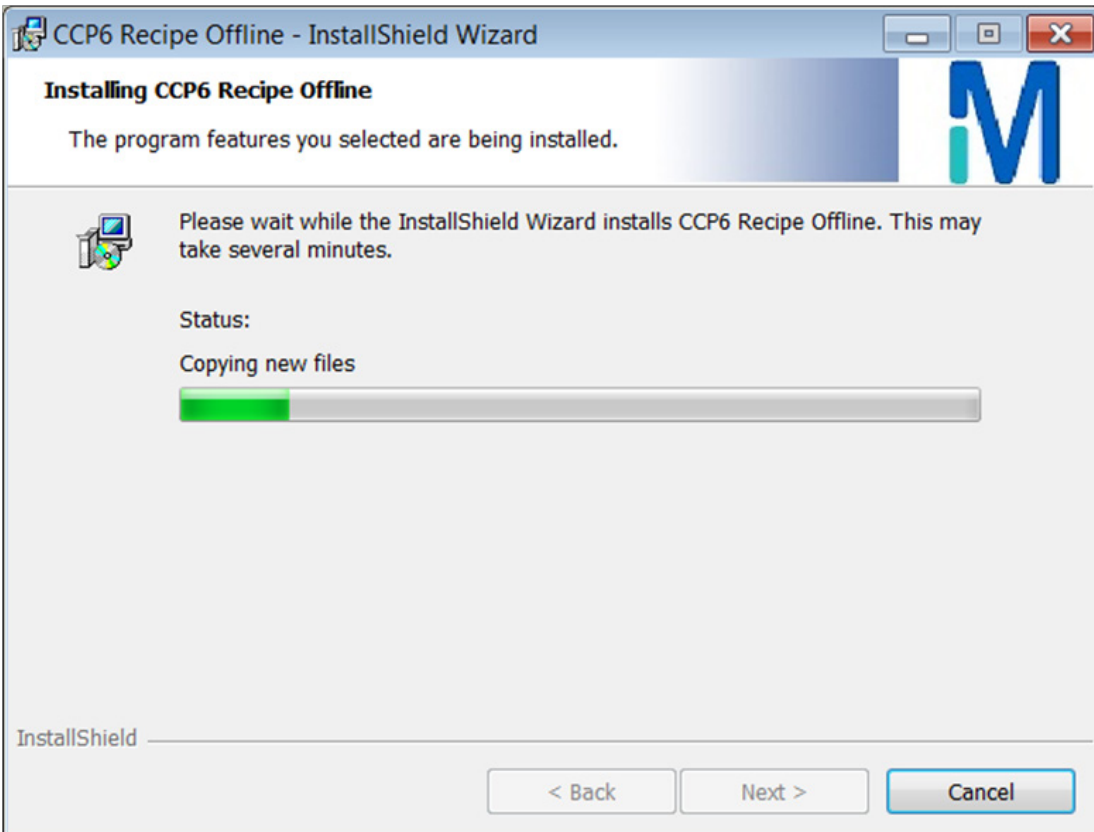
At the License Agreement screen, select I accept the terms in the license agreement to accept the terms. Click the Next button to proceed.



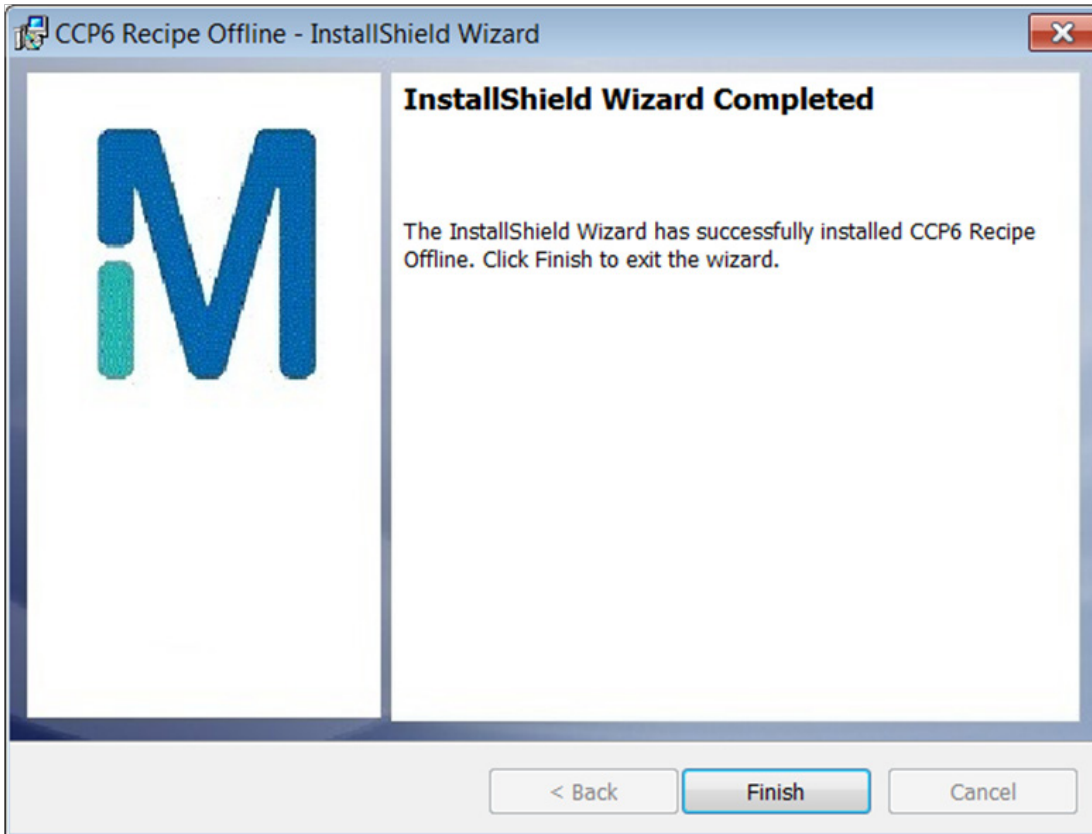
At the Customer Information screen, provide the name of the current user and organization. Click the Next button to continue the installation process.



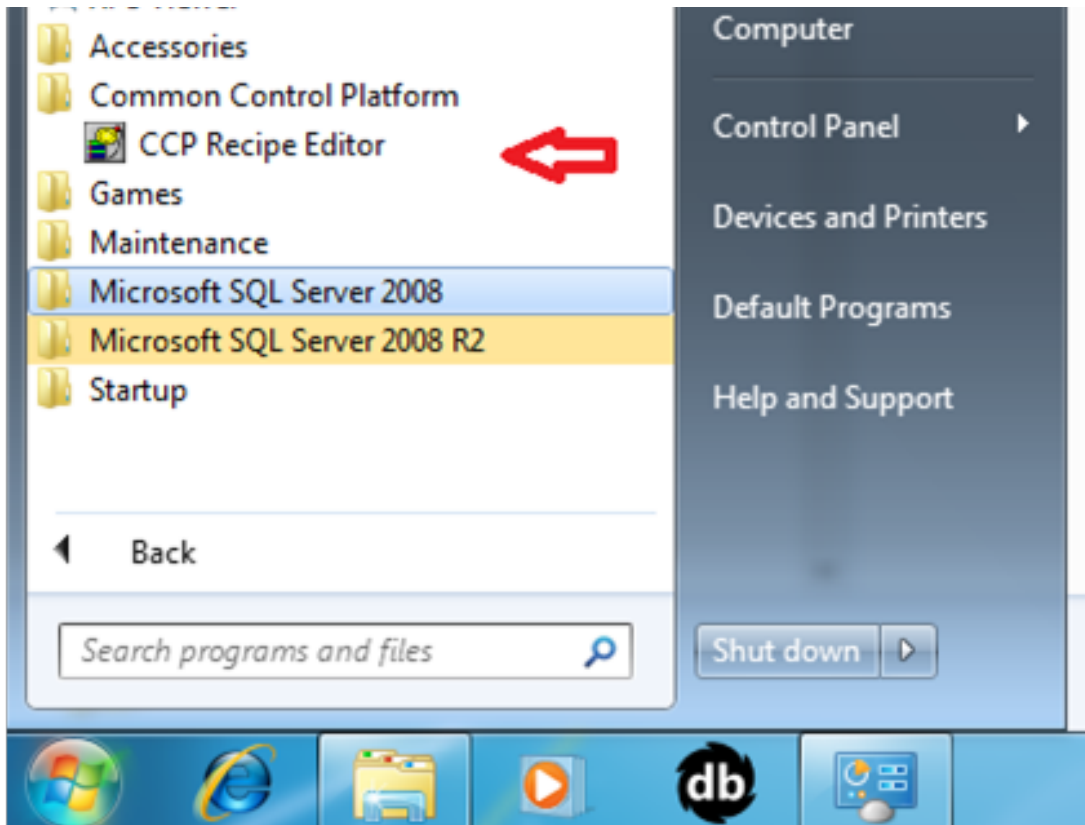
Monitor the installation progress status.



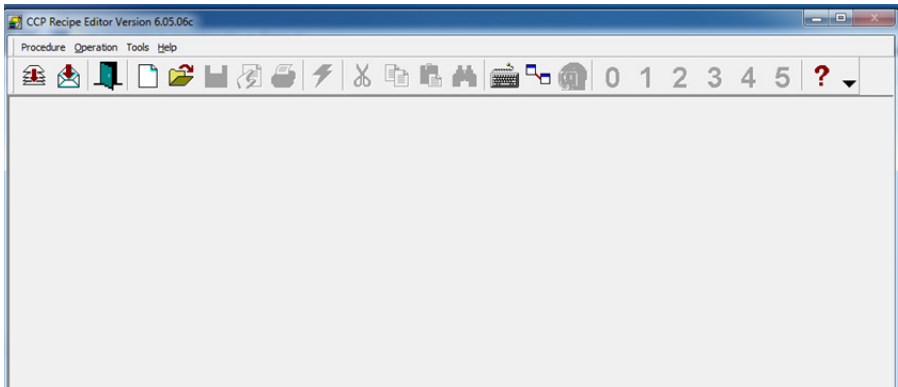
Once the installation is completed, click the Finish button to close the installation dialog.



Verify the installation by checking the Start menu for the following program shortcuts:



Launch the application to ensure it opens.



Custom Configuration after installation

System Selection INI file format

The System Selection configuration file, `systemselection.ini`, stores information that is displayed on the System Selection screen. The online help file path is not displayed on System Selection screen and will be used internally when opening help from Recipe Editor Menu.

The file is configured with the standard `.ini` file syntax:

- A Semicolon at the beginning of a line makes it a comment line.
- Brackets represent a header. They are used to separate one system configuration from another.
- Each setting will be in a separate line with the syntax `Setting Name=Setting Value`.
- The file must include at least one system configuration. Each system configuration must have the same list of settings in the correct order. See the table below for an example.
- Help entry is optional and may be left empty.
- Use 0 or 1 for TFF, Smart Flexware® and EZ-Editor options.
- Use ControlLogix or SLC500 for PLCType.
- Do not add spaces except in parameter string values that include spaces.
- The table below defines settings for each system type in the system selection configuration file. When 0/1 is used as a parameter value, 0 means feature is disabled and 1 means the feature is enabled.

The table below defines the settings for each system type in the system selection configuration file. When 0/1 is used as a parameter value, 0 means feature is disabled and 1 means the feature is enabled.

System Name	TFF	PLCType	SmartFlexware	SmartFlexID	EZ-Editor
Chrom 2.2 or Chrom 8.0 LPM	0	ControlLogix®	1	XMO12 or XMO3	0
TF2S or TF3S	1	ControlLogix®	1	TF2S or TF3S	0
K-Prime	0	SLC500	0	0	0
Pre-Eng/Custom	1 or 0	ControlLogix®	0	0	1 or 0

SystemSelection.ini example

[System1]

SystemType=SmartTF2S

SystemID=DEG080028

TFF=1

PLCType=ControlLogix

SmartFlexware=1

SmartFlexID=TF2S

EZ-Editor=0

ConfigFile=C:\Millipore\CCPSystem\TF2S\DEG080028_cfg.cfg

Help=C:\Millipore\CCPSystem\Ccphelp\help1.pdf

[System2]

SystemType=SmartXMO12

SystemID=DSP090002 US

TFF=1

PLCType=ControlLogix

SmartFlexware=1

SmartFlexID=XMO12

EZ-Editor=0

ConfigFile=C:\Millipore\CCPSystem\XMO12\DSP090002_cfg.cfg

Help=C:\Millipore\CCPSystem\Ccphelp\help2.pdf

[System3]

SystemType=KPrime

SystemID=KP_standard

TFF=0

PLCType=SLC

SmartFlexware=0

SmartFlexID=






EZ-Editor=0

ConfigFile=C:\Millipore\CCPSystem\KP_Standard_cfg.cfg

Help=C:\Millipore\CCPSystem\Ccphelp\help3.pdf

Enabling System Selection Screen

The System Selection screen may be enabled or disabled from the Off-line Recipe Editor Menu.

Icon	Menu Item	Description
	Toggle System Selection*	This option toggles on and off a system selection popup screen that opens on Off-line Recipe Editor opening
	Download Procedure*	Opens a dialog box, that allows to select a procedure file.
	Download Operation*	Downloads the current operation file then uploads it and verifies the transfer was OK.
	Verify Operation with PLC	Reads the Operation from the PLC and compares it with the currently open Operation.
	Configure Analog Points	Opens Analog Points Configuration screen, that allows changing Analog Input scaling and EGU.
	Archive Utility	Opens a screen that lets user backup, purge and restore iFIX® analog data files and SQL Server database.
	Work Space	Switches to the Workspace(iFix® HMI).
	Configuration File*	Displays a File Open dialog box showing the configuration files in the current directory. The user can then select a file to be opened before creating a new operation file. (Only available when no operation files are open).

*Includes a tool bar button although, because the toolbar is configurable, it may not be visible if the standard configuration is not active.

If the System Selection menu item is not available, the following registry setting need to be set to 1:

Registry Section: HKEY_CURRENT_USER\Software\VB and VBA Program Settings\Millipore CCP® Software\Options

Remote Node	Enabled = 1, Disabled = 0	Indicates if the system is a remote computer
-------------	---------------------------	--

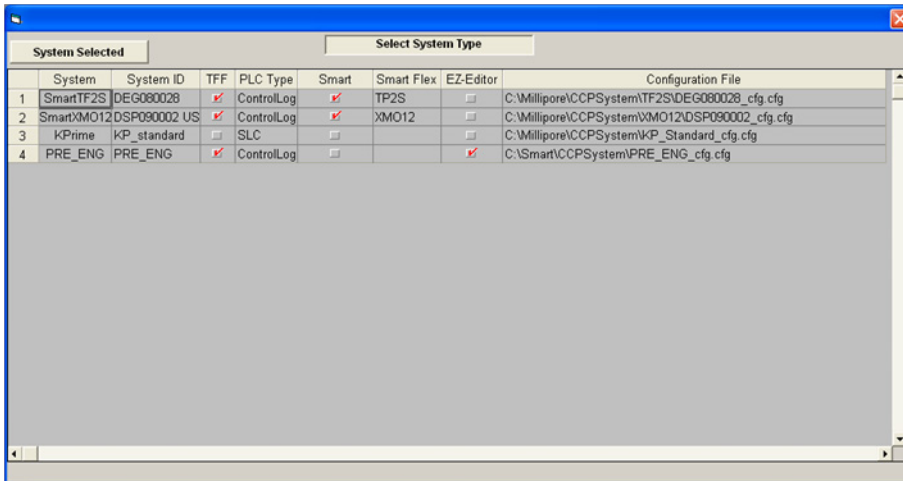
Note

The configuration file menu item button is only available for Non-Smart systems. It allows quick switching between similar Non-Smart systems that do not require use of different language files. If different language files are used then the systems should be switched using System Selection Screen as configured in corresponding ini file.

System Selection Screen

If enabled, the system selection screen opens on Recipe Editor startup. It reads the configuration file SystemSelection.ini and displays a list of preconfigured systems and allows the user to select a specific system. The user can select a row in the grid and click the System Selected button or double click on a row in the grid.

After a selection is made, the system saves the selected parameters to the registry and copies certain files then opens the Recipe Editor Application using these parameters.



Controls	Description
Button System selected	Press this button after selecting a system in the grid or double click any row in the grid to select it. System saves selected attributes to the registry and opens a Recipe Editor application.
Grid Column System	A Descriptive System name. This name is also used as a subdirectory under c:\millipore\ccpsyste\nls path that stores system specific language files.
Grid Column System ID	A system ID that typically matches configuration file name.
Grid Column TFF	A TFF or non-TFF (Chrom) system type. It is saved to registry value upon system selection.
Grid Column PLC Type	PLC Type. It is saved to registry value upon system selection. Use SLC500 or ControlLogix.
Grid Column Smart	Specifies either a Smart type system or an older generation non-Smart (for example KPrime® system). It is saved to registry value upon system selection.
Grid Column Smart Flex	A type of Smart system. Not applicable for non-Smart systems. It is saved to registry value upon system selection.
Grid Column EZ-Editor	Shows either both Parameter Create and Change Options are enabled or disabled. It is saved to 2 corresponding registry values upon system selection.
Grid Column Configuration File	Configuration file name and path. It is saved to the file curr_cfg.txt upon system selection

Multilanguage Support

The system user interface is available with the following languages.

- French
- German
- Italian
- Spanish
- Korean
- Japanese
- Chinese

Language Files Selection

The system name used as a subdirectory name under c:\millipore\ccpsyste\nls path stores the system specific language files below. These files are copied to c:\millipore\ccpsystem after user selects a system from Selection Screen. If directory does not exist then the system disables language support by deleting file c:\millipore\ccpsystem\nls\language.txt.

Run_nls.csv

Current.txt

Language.txt

Online Help

The Off-line Recipe Editor help includes the latest user manual for the SMART System as a default.

Different online help files path can be specified in the system selection configuration file for each system type. System will use such help file when a user selects Help from the Offline Recipe Editor application

If a help file is not specified in systemselection.ini, the system will use a default help file specified in registry setting Millipore Help File.

Registry Section: HKEY_CURRENT_USER\Software\VB and VBA Program Settings\Millipore CCP® Software\Configuration

Key	Used For
Millipore Help File	Specifies a full path to the pdf Help file

Managing Procedures

A Procedure is a collection of Operations. The Procedure will execute the operations in the order they are added to the Procedure.



Creating a Procedure

To create a procedure, click the Edit Procedure icon in the tool or click on Procedure and then Edit Procedure in the Recipe Editor menu bar. The Edit Procedure Form appears.

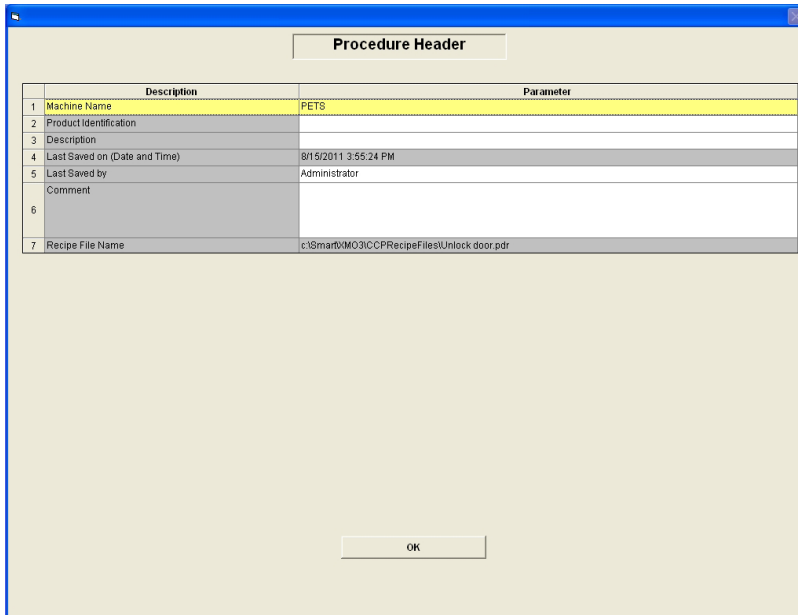
Edit Procedure Form

In the lower right corner of the form, the Operation Files list box presents all the operations currently stored within the path indicated in the Operation Files Path list box.

To add an Operation to the Procedure, select the Operation from the list of Operations on the right and click the Add Operation Button. The Operation is added to the Operations in the Procedure list box located in the lower left corner of the form. To remove operations from this list, click on Remove Operation.

Completed Edit Procedure Form

To edit the Procedure Header click on the Header button. Like an operation, the Last Saved By field must be filled in order to save and download the procedure.

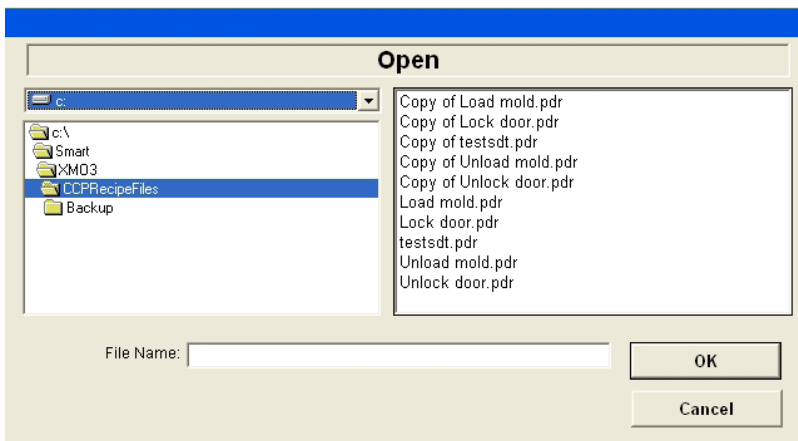


Procedure Header

To save the procedure, click the Save As button in the top left corner of the Edit Procedure Form.

Editing a Procedure

To Edit an existing Procedure, click Open on the Edit Procedure Form. A window opens with a list of existing Procedures. Click on the Procedure that must be edited and click OK.



Open Existing Procedure

The Edit Procedure Form is shown with the Operations in the Procedure section populated with the operations that are in the procedure. The Procedure can be edited by adding or removing operations from the procedure.

Clicking the Save button will save the procedure with the same name. Clicking Save As will allow the user to save the procedure with a different name.



Downloading the Procedure to the PLC

To download a procedure to the PLC, click the Download Procedure icon in the tool bar or click on Procedure and then Download Procedure in the Recipe Editor menu bar.

Executing the Procedure

A procedure is executed in the same way as an operation. See the section *Running an Operation* for details on controlling a running procedure.

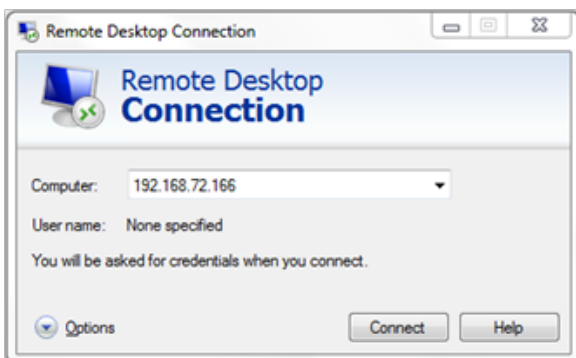
Clicking on the Run icon in the process User Interface causes the Run Header data dialog box to be launched. Closing the dialog box causes the procedure currently downloaded to the PLC to be executed. The Operation Status window displays information about the current operation of the procedure being executed.

Connecting to a Remote Desktop

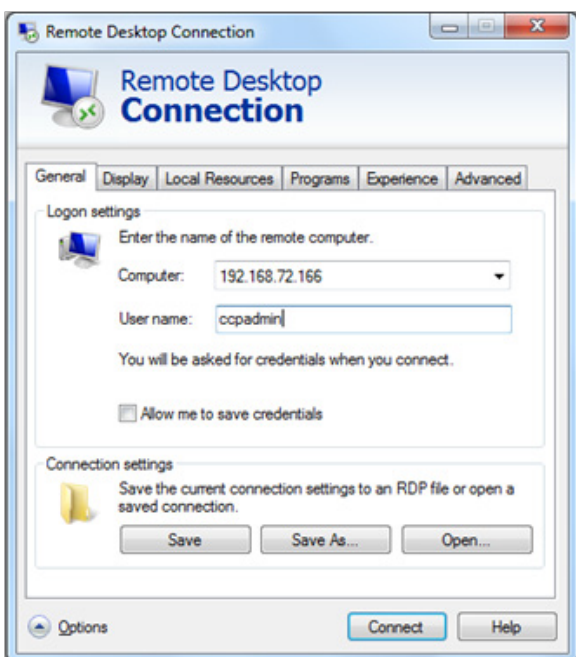
With Remote Desktop Connection, a user may connect to the computer that is running the CCP® application from another computer with the following conditions:

- Operating system: Windows® 7 or above.
- Both computers are connected to the same network.
- The remote computer must have the IP address or computer name of the CCP® computer, and necessary credentials to connect to ccpadmin user account.

1. Click on the Windows® Start button, then select All Programs, Accessories, and Run.
2. In the Open Area, type mstsc.



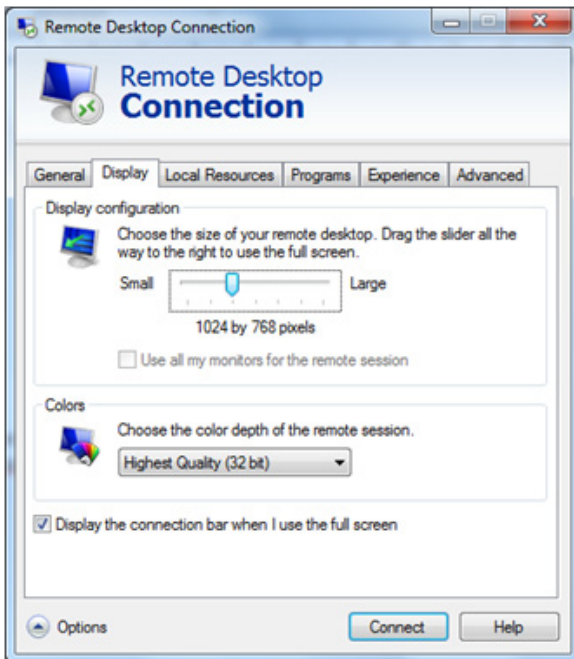
3. When the Remote Desktop Connection is displayed, enter the IP Address or Computer Name of the remote computer.
4. Click on Options, and type ccpadmin in User name field.



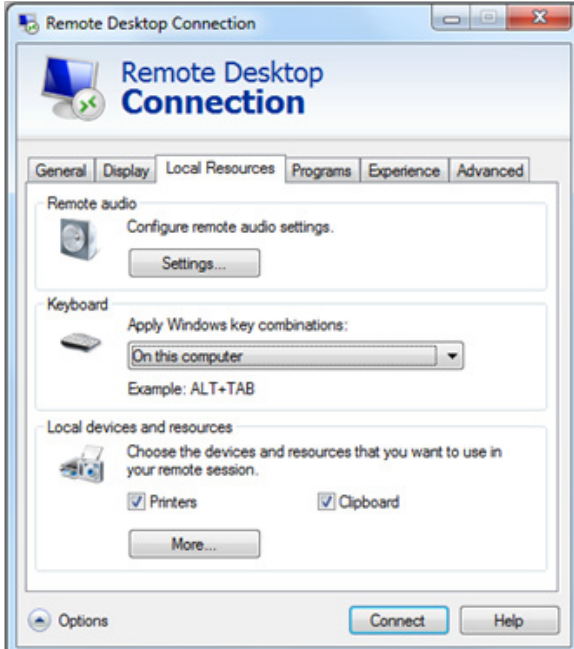
Note

The account on the CCP® computer used to connect to the remote computer is an administrator account. Incorrect use of this tool can damage the CCP® computer and make the computer unusable.

- Click on Display, and configure the size of your remote desktop to 1024x768 (the default size of CCP® application).



- If the final remote user is someone with access rights less than Administrator rights, click on Local Resources, and configure the Keyboard to apply Windows® key combinations on this computer. Check other options to secure the connection.



- Click on Connect to start the remote connection.
- Type ccpadmin credentials when prompted.

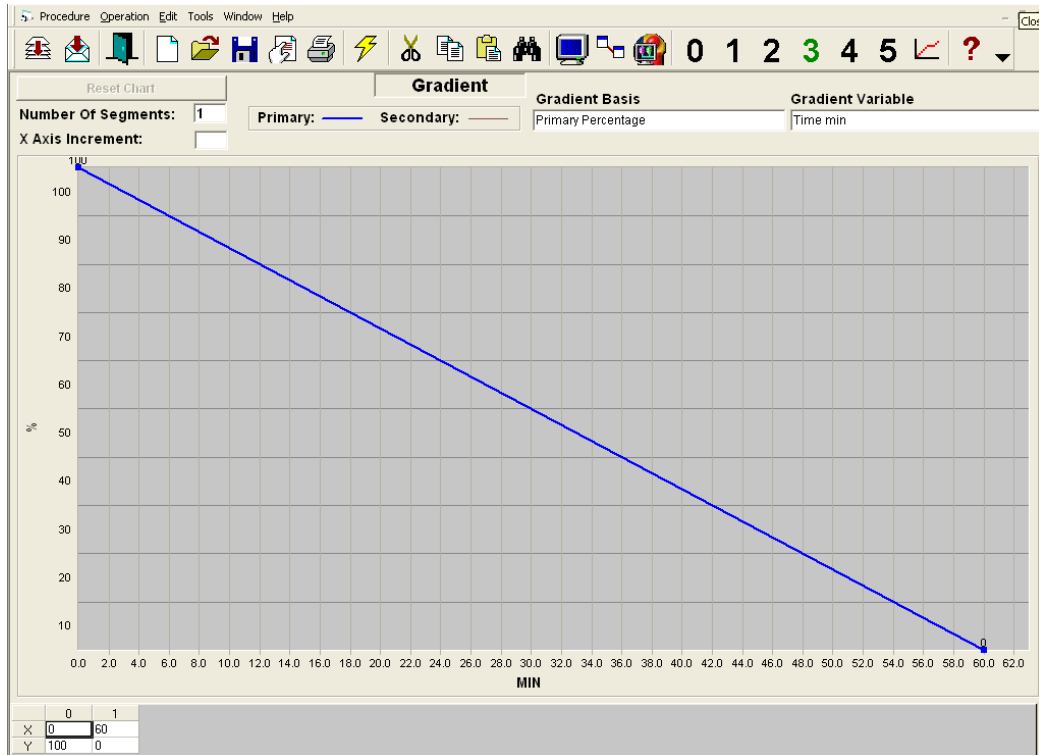
The remote computer is now connected to the CCP® Computer.

Sample Operation for the Chromatography System

Linear Gradient Test Operation

Steps in Phase 0

Step	Criteria 1	Action	Value	EGU
1		Global Auto Mode	1	
2		Go to Default	1	
3		Inlet 1A Flow Path	1	
4	Step Time >= 2 sec	Bubble Trap Online Flow Path	1	
5	Step Time >= 2 sec	Filter 1 Bypass Flow Path	1	
6	Step Time >= 2 sec	Column Forward Flow Path	1	
7	Step Time >= 2 sec	Fraction Waste Flow Path	1	
8	Step Time >= 2 sec	Feed Pump P002 Control via Flow	1	
9	Step Time >= 2 sec	Feed Pump P002 Control Flow Setpoint	0.3	Lpm
10	Step Time >= 2 sec	Feed Pump P002 Control Pump Run	1	
11	Step Time >=360 sec	Inlet 1A Gradient Primary Flow Path	1	
12	Step Time >= 2 sec	Inlet 2A Gradient Primary Flow Path	1	
13	Step Time >= 2 sec	Pump Based Control via Flow	1	
14	Step Time >= 2 sec	Pump Based Control Flow Setpoint	0.3	Lpm
15	Step CVs >= 2	Pump Based Control Pumps Run	1	
16	Step Time >= 2 sec	Gradient Control via Percent	1	
17	Step Time >= 2 sec	Gradient Control via On	1	
18	Sample Air Detected	Linear Gradient Start	1	
19	Step Time >= 3600 sec	Gradient Control Off	0	
20	Step Time >= 360 sec	Pump Based Control Pumps Stop	0	



Programmed Gradient

Batch Reporting

Introduction

The CCP® system provides for the collection, storage, processing and reporting of batch production data, in accordance with international standards on batch control and current good manufacturing practices.

All recorded information pertaining to a batch is referred to as the batch history. CCP® software stores the batch history so that it is associated with the actual execution of the applied purification protocol.

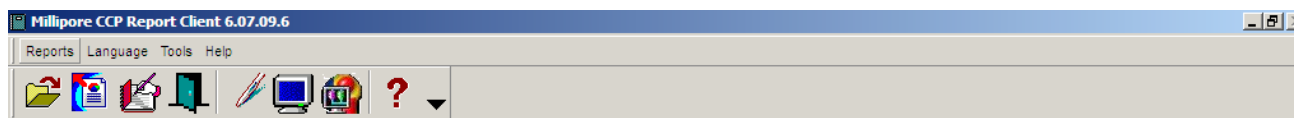
Batch specific information contained in the batch history includes:

- A copy of the actual protocol used to perform the separation. It includes any changes made during the execution. This is basically event data including:
 - **Predictable events:** Certain event data are logged during the execution of the operation. Predictable events include start/stop times of procedural elements.
 - **Unpredictable events:** Any non-programmed operator intervention is logged, such as comments based on observations during system operation, entry of any results, sampling, etc. The log includes intervention type and user ID. Other unpredictable events logged are alarms, equipment failures or other abnormal conditions.
- Trends of measured process parameters such as temperature, pressure, etc.



Launching the Report Client Application




To launch the CCP® Report Client application, which is used for batch reporting, click the Reports icon in the main tool bar.



CCP® Software Report Client Toolbar

Icons in the Report Client Toolbar

	Open Report Icon. Opens existing reports.
	Report generator icon. Opens the report generator.
	Exit the report client
	Verify signature icon. Opens the verify tamper proof signature window
	Toggle popup keyboard icon. Toggles between touchscreen and keyboard input. The monitor icon is visible when the touchscreen input is enabled, the keyboard is visible when the keyboard input is activated

	Workspace icon. Returns the user to the workspace user interface
	Help icon. Opens the user manual.
	More tools icon. Allows user to customize the toolbar



Generating a Report

Within the CCP® Report Client, batch reports are created using the Report Generator. Click the Report Generator icon or On the Report Client menu bar, click on Reports then click Report Generator. The Report Generator form appears.

Report Generator

Report generation may take a long time, and cannot be cancelled.

Run Selection Criteria

Run ID: 9/23/2011 11:40:37 AM

Date Time: Start Date Time: 9/23/2011 11:40:41 AM, End Date Time: 9/23/2011 11:44:22 AM

Report Configuration

Choose Configuration: chw

Report Selections

- Full Report
- Run Header
- Pre-Run Setpoints
- Calculated Values
- Recipe Step Report
- Event Report
- Alarm Report
- Security Report
- Historical Trends

Automatic Report Generation

- Automatic Report File Generation
- Automatic Report Printout

Advanced Query

Run ID	Start Date Time	End Date Time	Product ID	Batch ID	Step ID	User Name	State
1	9/23/2011 11:40:37 AM	9/23/2011 11:40:41 AM	9/23/2011 11:44:22 AM	Administrator		Administrator	Complete
2	9/23/2011 10:29:54 AM	9/23/2011 10:29:57 AM	9/23/2011 10:32:08 AM	Administrator		Administrator	Complete
3	9/22/2011 5:03:15 PM	9/22/2011 5:03:53 PM	9/22/2011 5:20:31 PM	Administrator		Administrator	Complete
4	9/22/2011 5:02:42 PM	9/22/2011 5:02:54 PM	9/22/2011 5:03:05 PM	Administrator		Administrator	Complete
5	9/22/2011 5:00:31 PM	9/22/2011 5:00:51 PM	9/22/2011 5:01:09 PM	Administrator		Administrator	Complete
6	9/20/2011 2:59:18 PM	9/20/2011 2:59:20 PM	9/20/2011 2:59:33 PM	Administrator		Administrator	Complete
7	9/20/2011 2:57:49 PM	9/20/2011 2:58:03 PM	9/20/2011 2:58:22 PM	Administrator		Administrator	Complete
8	9/15/2011 5:39:35 PM	9/15/2011 5:39:40 PM	9/15/2011 5:39:51 PM	Administrator		Administrator	Complete
9	9/15/2011 5:37:46 PM	9/15/2011 5:37:52 PM	9/15/2011 5:38:25 PM	Administrator		Administrator	Complete
10	9/15/2011 5:16:43 PM	9/15/2011 5:17:02 PM	9/15/2011 5:37:32 PM	Administrator		Administrator	Aborted
11	9/8/2011 1:52:22 PM	9/8/2011 1:52:28 PM	9/8/2011 1:52:40 PM	Administrator		Administrator	Complete
12	9/8/2011 1:50:17 PM	9/8/2011 1:50:33 PM	9/8/2011 1:50:51 PM	Administrator		Administrator	Complete
13	9/8/2011 1:37:38 PM	9/8/2011 1:37:40 PM	9/8/2011 1:37:54 PM	Administrator		Administrator	Complete
14	9/8/2011 11:43:38 AM	9/8/2011 11:43:41 AM	9/8/2011 11:44:00 AM	Administrator		Administrator	Complete
15	9/8/2011 11:40:03 AM	9/8/2011 11:40:05 AM	9/8/2011 11:43:20 AM	Administrator		Administrator	Aborted
16	9/8/2011 10:52:25 AM	9/8/2011 10:52:28 AM	9/8/2011 10:52:48 AM	Administrator		Administrator	Complete
17	9/8/2011 10:51:27 AM	9/8/2011 10:51:29 AM	9/8/2011 10:52:09 AM	Administrator		Administrator	Complete
18	9/8/2011 10:50:37 AM	9/8/2011 10:50:39 AM	9/8/2011 10:51:15 AM	Administrator		Administrator	Complete
19	9/8/2011 10:44:49 AM	9/8/2011 10:44:51 AM	9/8/2011 10:49:25 AM	Administrator		Administrator	Aborted
20	9/8/2011 10:40:33 AM	9/8/2011 10:40:36 AM	9/8/2011 10:41:20 AM	Administrator		Administrator	Complete
21	9/8/2011 10:39:40 AM	9/8/2011 10:39:43 AM	9/8/2011 10:40:13 AM	Administrator		Administrator	Complete

Report Generator Form

Run Selection

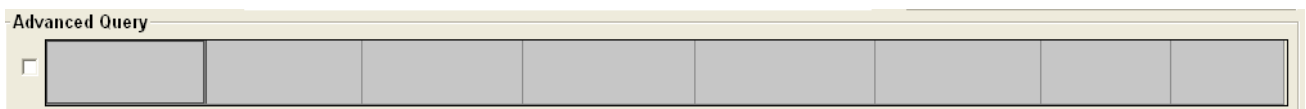
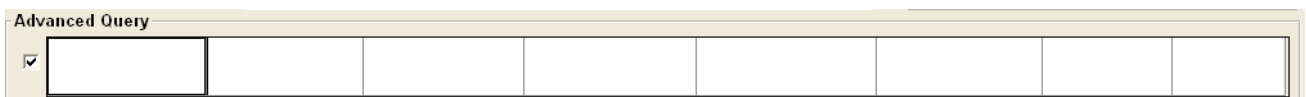
The table in the lower part of the screen contains the data corresponding to runs archived by the system. Data can be sorted by Run ID, Start and End Date and Time of the run, Product ID, Batch ID, Step ID, User Name and State of the run.

Sorting Batch Data

To sort the data within the same column, simply click the column header. Every subsequent click sorts the data in the reverse order, either ascending or descending.

Advanced Query

Checking the box located on the top left corner of the table activates the advanced query boxes placed on top of the column headers. When activated, the gray color of these boxes changes to white. To perform an advanced query within a particular column, click the white box located on top of the corresponding column header. A data entry form appears. Type any desired string of characters in the text box provided with this form and click OK.



Advanced Query Enabled and Disabled

For example, the figure below shows the results of a query when 12 is entered in the white query box of the Run ID column.

Advanced Query								
<input checked="" type="checkbox"/>	12							
	Run ID	Start Date Time	End Date Time	Product ID	Batch ID	Step ID	User Name	State
1	9/8/2011 9:13:12 AM	09/08/2011 09:13:15	09/08/2011 09:13:28	Administrator			Administrator	Complete
2	9/6/2011 12:01:38 PM	09/06/2011 12:01:41	09/06/2011 12:02:31	Administrator			Administrator	Complete
3	8/24/2011 12:10:11 PM	08/24/2011 12:10:13	08/24/2011 12:13:17	Administrator			Administrator	Complete
4	8/24/2011 12:04:11 PM	08/24/2011 12:04:13	08/24/2011 12:07:24	Administrator			Administrator	Aborted
5	8/22/2011 12:28:53 PM	08/22/2011 12:28:55	08/22/2011 12:30:25	Administrator			Administrator	Aborted
6	8/19/2011 9:06:12 AM	08/19/2011 09:06:16	08/19/2011 09:06:32	Administrator			Administrator	Complete
7	8/17/2011 4:05:12 PM	08/17/2011 16:05:15	08/17/2011 16:05:43	Administrator			Administrator	Aborted
8	8/17/2011 12:59:36 PM	08/17/2011 12:59:38	08/17/2011 13:01:17	Administrator			Administrator	Complete
9	8/17/2011 12:58:22 PM	08/17/2011 12:58:26	08/17/2011 12:58:49	Administrator			Administrator	Complete
10	8/17/2011 12:57:01 PM	08/17/2011 12:57:03	08/17/2011 12:57:19	Administrator			Administrator	Complete
11	8/17/2011 12:49:06 PM	08/17/2011 12:49:09	08/17/2011 12:49:33	Administrator			Administrator	Complete
12	8/17/2011 12:48:14 PM	08/17/2011 12:48:17	08/17/2011 12:48:33	Administrator			Administrator	Complete
13	8/17/2011 12:46:18 PM	08/17/2011 12:46:21	08/17/2011 12:47:29	Administrator			Administrator	Complete
14	8/17/2011 12:44:26 PM	08/17/2011 12:44:29	08/17/2011 12:45:40	Administrator			Administrator	Complete
15	8/16/2011 12:10:43 PM	08/16/2011 12:10:46	08/16/2011 12:11:17	Administrator			Administrator	Complete
16	8/16/2011 12:08:18 PM	08/16/2011 12:08:22	08/16/2011 12:08:38	Administrator			Administrator	Complete
17	7/1/2011 12:34:45 AM	07/01/2011 00:34:59	07/01/2011 00:35:41	Administrator			Administrator	Aborted
18								

Result of an Advanced Query

Note that the string "12" is present in *all* Run ID descriptors present in this column.

The advanced query function also provides for "AND-type" Boolean logic. Putting search parameters in the advanced query boxes of more than one column will only return values that match all criteria.

Select a Run

To select a particular run for report generation, click the appropriate row (in any column) that contains the run information for the run you need to report on. The selected row is highlighted in yellow. For example, the run information for the run with Run ID 9/23/2011 11:40:37AM is highlighted in **the figure**, Row 1.

Simultaneously, the Run ID and the Start and End Dates and Times are updated in the Run Selection Criteria box located in the upper central part of the Report Generator form.

The user can also select one of the buttons provided within the Run Selection Criteria box (Run ID and Date Time) to generate a particular report. The Run ID button generates a report for the particular run whose Run ID matches the description defined in the adjacent text box.

If the Run ID entered in the text box is not archived, an error message is displayed.



Invalid Run ID Message

Date Time Button

The Date Time button allows the user to generate a report containing all the data bound by the lower and upper limits of the defined time window. Be aware of the fact that if the time window spans over a period of several days, the generated report will contain a large amount of both sensor and event data.

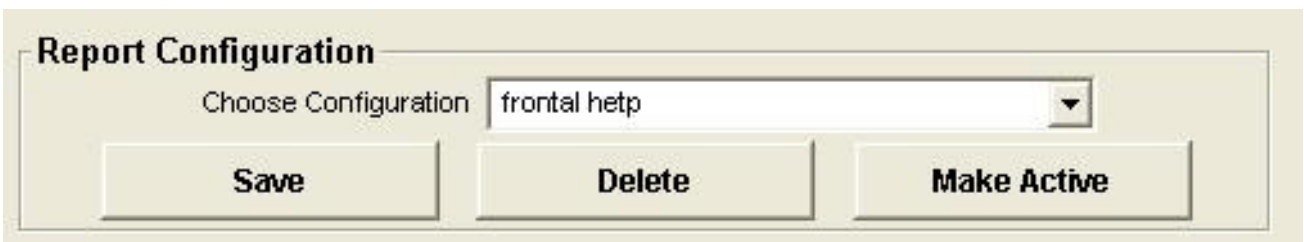
Report Configuration

Report Configuration Menu

The report configuration menu allows the user to save, recall and activate report configurations. Report configurations consist of the chosen Report Selections and Configured tags, if applicable. The following section titled *Report Selections Box* has details on configuring a report.

Note

Only users with appropriate security privileges can save configurations.



Report Configuration Menu

Saving a Configuration

Click the Save button and enter a unique name. The current configuration will be saved for future recall.

Deleting a Configuration

Click the Delete button to delete the currently selected configuration.

Activating a Configuration

Click the Make Active button to activate the configuration currently being displayed.

Report Selections Box

The Report Selections box, located in the upper right corner of the form, provides several check boxes that allow the user to select one or more sections for a particular report from the list provided. If all sections are required within a report, check the Full Report box in the upper left corner of the form, as shown below.

Report Selections Box

Configuring Analog Data

When either the Full Report or the Historical Trend boxes are checked within the Report Selections box, the Configure button is displayed in the lower right corner of the form. The Configure button allows the user to define which sensor data archived by the unit is actually included within a particular report.

When the Configure button is clicked, the Analog Data Configuration table is displayed in the bottom part of the Report Generator form.

Analog Data Configuration												<input type="checkbox"/> Automatic Report Printout
Move Up		Move Down		Insert Row			Delete Row					
	Description	Chart	Tabular	Interval (hh:mm:ss)	Chart Mark	X Axis	Alternate Start Time	Tag	Y Axis	Low/High	EGU	Color
1						Time		FT_TOT	<input checked="" type="checkbox"/>	0/6	Lpm	Red
2								PCV032	<input checked="" type="checkbox"/>	0/100	%	Green
3	group 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	00:00:10	<input checked="" type="checkbox"/>			AI010	<input checked="" type="checkbox"/>		AU	Magenta
4									<input type="checkbox"/>			
5									<input type="checkbox"/>			
6									<input type="checkbox"/>			
7									<input type="checkbox"/>			
8		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>				<input type="checkbox"/>			
9									<input type="checkbox"/>			
10									<input type="checkbox"/>			
11									<input type="checkbox"/>			
12		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>				<input type="checkbox"/>			
13									<input type="checkbox"/>			
14									<input type="checkbox"/>			
15									<input type="checkbox"/>			
16									<input type="checkbox"/>			
17									<input type="checkbox"/>			
18		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>				<input type="checkbox"/>			
19									<input type="checkbox"/>			
20									<input type="checkbox"/>			
21									<input type="checkbox"/>			
22									<input type="checkbox"/>			

Analog Data Configuration Screen

Columns in the Analog Data Configuration Screen.

Column	Description
Description	A description of the data that will be included in the report
Chart	A check box to select if the data is to be presented in a chart
Tabular	A check box to select if the data is to be presented in tabular form
Interval	The frequency of the data included within the report. In this case, one data point per 10 seconds is going to be included for all the tags in the chart groups.
Chart Mark	A check box to select if chart marks created during the process are going to be included in the chart.
X-Axis	A drop-down box to select the X-Axis variable. The choices are Time, CV and Volume.
Alternate Start Time	The time for which values will be returned for an individual tag that is different than the Start Time of the selected run.
Tag	The tag whose value will be returned.
Y-Axis	A check box to select if the tag's data is to be presented along the Y-Axis
Low/High	The low and high range of the engineering units of the tag. Defaults to the tag range in the system but can be manually changed.
EGU	Engineering Units of the tag. Defaults to the tag EGU stored in the system but can be manually changed.
Color	Color of the trend for that tag. Can be manually changed.

Configuring HETP Report

When either the Full Report or the Calculated Values boxes are checked within the Report Selections box, the Configure HETP button is enabled. The Configure HETP button opens the HETP Report Configuration Screen. The user may then define the parameters for HETP calculations, including the Start and End Points, Analysis Mode and HETP Variable.

HETP Report Configuration Screen

Start and End Points

To select Start and End Points for the HETP data, click the appropriate button to choose either Flagged Date Time (the start and end points of the selected run) or Manual Date Time (to input start and end dates and times manually, in the Start and End Date Time boxes).

Analysis Mode

Select Pulse Analysis or Frontal Analysis by clicking the appropriate button. In Pulse Analysis, the HETP peak data points are read directly from the historical data file. In Frontal Analysis, the HETP peak data points are read from the absolute value of the derivative of the historical data.

When Frontal Analysis mode is selected, a smoothing algorithm is applied to the raw historical data before the derivative of the data is calculated. The smoothing value is a moving average, which appears in the Smoothing Index box. This may be adjusted using the scroll bar below the box.

When Frontal Analysis mode is selected, the start point for calculating the derivative of the data is defined as an offset from the start time. The length of this offset may be defined in the Cart Line Offset Time box, if Manual Date Time is selected.

HETP Variables

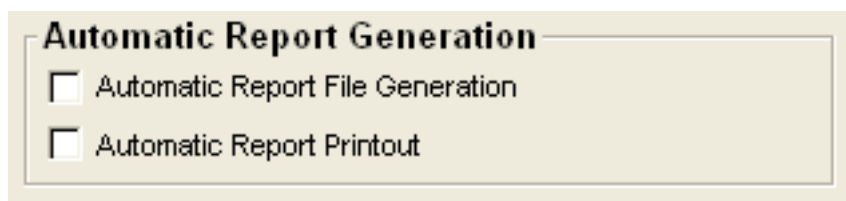
Three choices are available for the variable to be used for HETP calculations:

- Post Column Conductivity
- Post Column pH
- Post Column UV

The chosen variable is selected by clicking on the appropriate button.

Automatic Report Generation

For automatic report generation at the end of a run, check the Automatic Report File Generation box within the Automatic Report Generation box. To also send the report to the default printer at the end of the run, check the Automatic Report Printout box.



Automatic Report Generation


Automatic Report File Generation

Automatic Report Printout

Automatic Report Generation Check Box

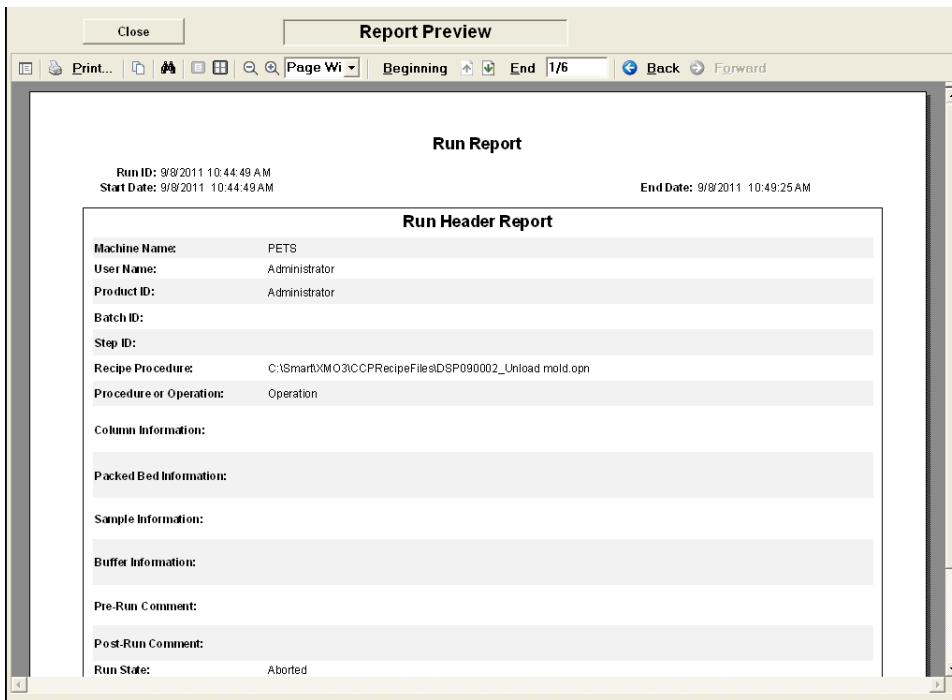
Report Preview

The final report can be previewed by clicking the Preview Report button on the top left corner of the Report Generator form.
















Preview Report


A sample of the final reports is shown below.



Report Preview Window Displaying the Run Header Report

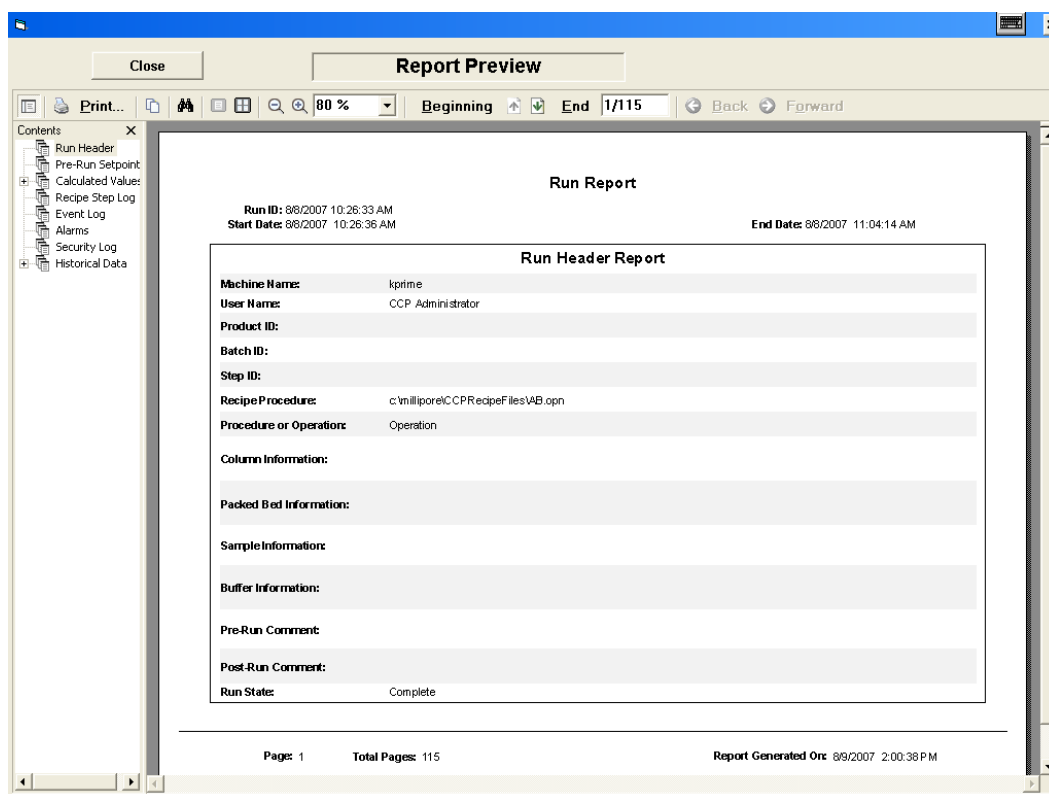
Elements of the Report Preview Window

Icon	Function
	Table of Contents
	Print the report
	Copy - Copies All of the text on the page
	Find - Search for a particular string within the report
	Single Page View
	Multi page View
	Zoom Out/In
	Viewing magnification factor
	Go to the first page of the report
	Go to the next/previous page of the report
	Go to the last page of the report
	Current page being viewed/ total number of pages in the report
	History Back/Next

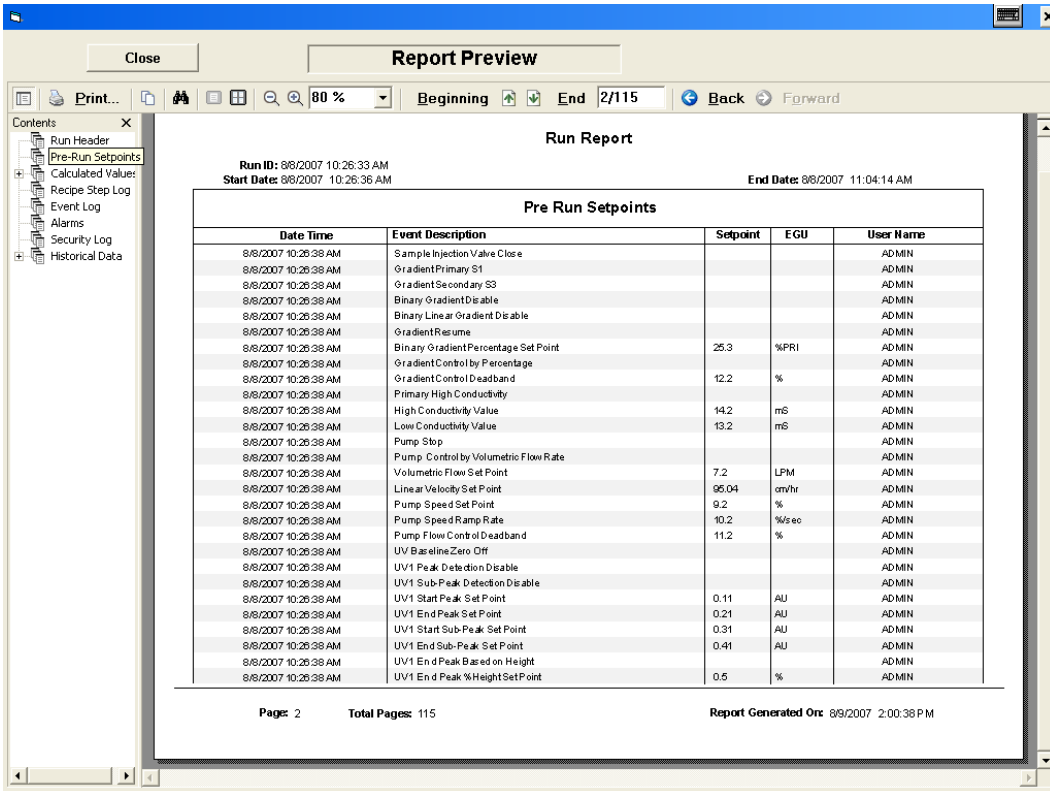
Icon	Function
	Close the form

Click the Table of Contents icon on the tool bar to see the contents of a report. Navigation through the report is available by clicking on the tree nodes representing the sections and controls on report.

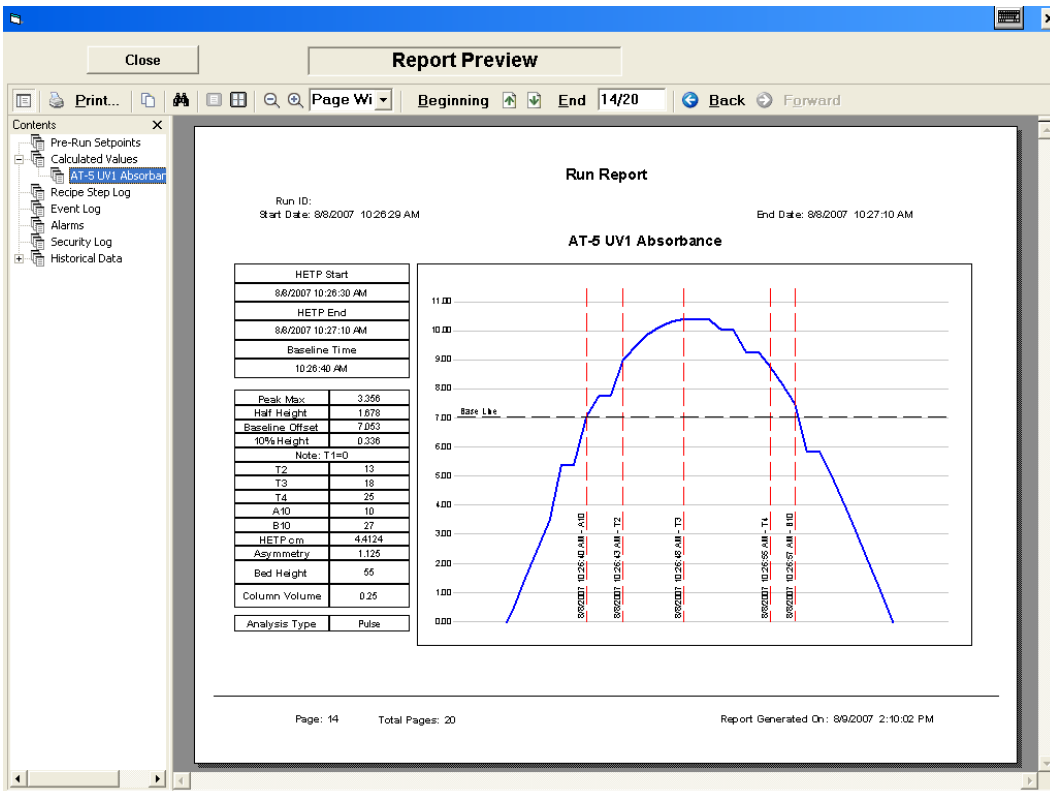
A Full Report preview is presented below.



Run Header Report



Pre Run Setpoints Report



Calculated Values Report

Close Report Preview

Print... 80 % Beginning End 40/115 Back Forward

Contents X
 Run Header
 Pre-Run Setpoint
 Calculated Values
Recipe Step Log
 Event Log
 Alarms
 Security Log
 Historical Data

Run Report

Run ID: 88/2007 10:26:33 AM
 Start Date: 8/8/2007 10:26:36 AM
 End Date: 8/8/2007 11:04:14 AM

Recipe Step Report

Date Time	Phase	Step	Step Action	Action Value	User Name
8/8/2007 10:26:42 AM	0	1	Bubble Trap On-Line	1.00	ADMIN
8/8/2007 10:26:48 AM	0	2	Bubble Trap Bypass	1.00	ADMIN
8/8/2007 10:26:55 AM	0	3	Filter On-Line	1.00	ADMIN
8/8/2007 10:26:57 AM	0	4	Filter Bypass	1.00	ADMIN
8/8/2007 10:27:03 AM	0	5	Column Forward Bypass	1.00	ADMIN
8/8/2007 10:27:09 AM	0	6	Column Reverse Bypass	1.00	ADMIN
8/8/2007 10:27:12 AM	0	7	Column Forward	1.00	ADMIN
8/8/2007 10:27:19 AM	0	8	Column Reverse	1.00	ADMIN
8/8/2007 10:28:18 AM	0	9	Fraction 1 Open	1.00	ADMIN
8/8/2007 10:28:18 AM	0	10	Fraction 2 Open	1.00	ADMIN
8/8/2007 10:28:18 AM	0	11	Fraction 3 Open	1.00	ADMIN
8/8/2007 10:28:18 AM	0	12	Fraction 4 Open	1.00	ADMIN
8/8/2007 10:28:18 AM	0	13	Fraction 5 Open	1.00	ADMIN
8/8/2007 10:28:18 AM	0	14	Fraction 6 Open	1.00	ADMIN
8/8/2007 10:29:57 AM	0	15	Fraction 7 Open	1.00	ADMIN
8/8/2007 10:30:00 AM	0	16	Fraction 8 Open	1.00	ADMIN
8/8/2007 10:30:06 AM	0	17	Fraction 9 Open	1.00	ADMIN
8/8/2007 10:30:12 AM	0	18	Fraction 10 Open	1.00	ADMIN
8/8/2007 10:30:15 AM	0	19	Fraction Waste	1.00	ADMIN
8/8/2007 10:30:21 AM	0	20	Bubble Trap On-Line	1.00	ADMIN
8/8/2007 10:30:27 AM	0	21	Bubble Trap Bypass	1.00	ADMIN
8/8/2007 10:30:30 AM	0	22	Filter On-Line	1.00	ADMIN
8/8/2007 10:30:36 AM	0	23	Filter Bypass	1.00	ADMIN
8/8/2007 10:30:42 AM	0	24	Column Forward Bypass	1.00	ADMIN
8/8/2007 10:30:46 AM	0	25	Column Reverse Bypass	1.00	ADMIN
8/8/2007 10:31:28 AM	0	26	Column Forward	1.00	ADMIN
8/8/2007 10:31:28 AM	0	27	Column Reverse	1.00	ADMIN
8/8/2007 10:31:28 AM	0	28	Fraction 1 Open	1.00	ADMIN
8/8/2007 10:31:28 AM	0	29	Fraction 2 Open	1.00	ADMIN

Page: 40 Total Pages: 115 Report Generated On: 8/8/2007 2:00:38 PM

Recipe Step Report

Close Report Preview

Print... 80 % Beginning End 55/115 Back Forward

Contents X
 Run Header
 Pre-Run Setpoint
 Calculated Values
 Recipe Step Log
Event Log
 Alarms
 Security Log
 Historical Data

Run Report

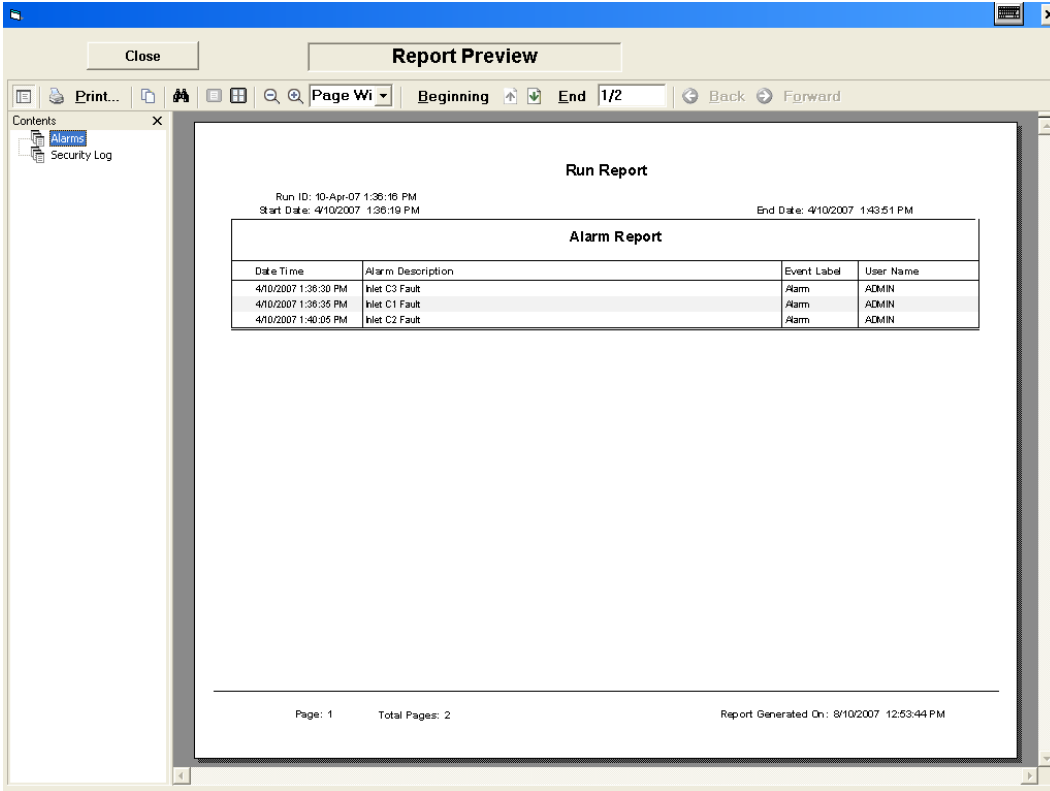
Run ID: 88/2007 10:26:33 AM
 Start Date: 8/8/2007 10:26:36 AM
 End Date: 8/8/2007 11:04:14 AM

Event Report

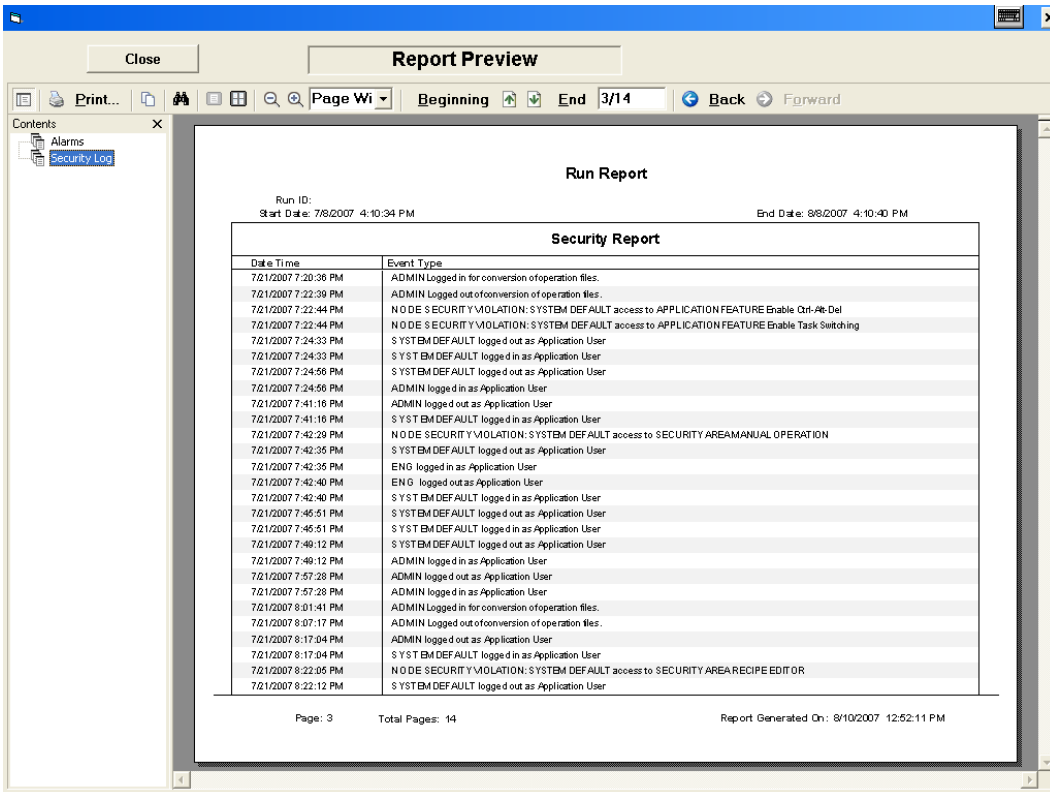
Date Time	Event Type	Event Description	Old Value	New Value	Event Label	EGU	User Name
8/8/2007 10:26:37 AM	Manual	Start performed by CCP Administrator.					ADMIN
8/8/2007 10:26:46 AM	Event	Bubble Trap On-Line					ADMIN
8/8/2007 10:26:48 AM	Event	Bubble Trap Bypass					ADMIN
8/8/2007 10:26:55 AM	Event	Filter On-Line					ADMIN
8/8/2007 10:26:57 AM	Event	Filter Bypass					ADMIN
8/8/2007 10:27:09 AM	Event	Column Reverse Bypass					ADMIN
8/8/2007 10:27:12 AM	Event	Column Forward					ADMIN
8/8/2007 10:27:19 AM	Event	Column Reverse					ADMIN
8/8/2007 10:27:47 AM	Manual	Hold performed by CCP Administrator.					ADMIN
8/8/2007 10:29:49 AM	Manual	Restart performed by CCP Administrator.					ADMIN
8/8/2007 10:29:51 AM	Event	Resume from Hold					ADMIN
8/8/2007 10:29:57 AM	Event	Fraction 7 Open					ADMIN
8/8/2007 10:29:59 AM	Event	Fraction 8 Open					ADMIN
8/8/2007 10:30:06 AM	Event	Fraction 9 Open					ADMIN
8/8/2007 10:30:12 AM	Event	Fraction 10 Open					ADMIN
8/8/2007 10:30:15 AM	Event	Fraction Waste					ADMIN
8/8/2007 10:30:21 AM	Event	Bubble Trap On-Line					ADMIN
8/8/2007 10:30:27 AM	Event	Bubble Trap Bypass					ADMIN
8/8/2007 10:30:29 AM	Event	Filter On-Line					ADMIN
8/8/2007 10:30:36 AM	Event	Filter Bypass					ADMIN
8/8/2007 10:30:42 AM	Event	Column Forward Bypass					ADMIN
8/8/2007 10:30:46 AM	Event	Column Reverse Bypass					ADMIN
8/8/2007 10:31:32 AM	Event	Fraction 7 Open					ADMIN
8/8/2007 10:31:34 AM	Event	Fraction 8 Open					ADMIN
8/8/2007 10:31:40 AM	Event	Fraction 9 Open					ADMIN
8/8/2007 10:31:46 AM	Event	Fraction 10 Open					ADMIN

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Event Report



Alarm Report



Security Report

Close Report Preview

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Contents

- Run Header
- Pre-Run Setpoints
- Calculated Values
- Recipe Step Log
- Event Log
- Alarms
- Security Log
- Historical Data
- 1
 - Tabular Log
 - Chart

Run Report

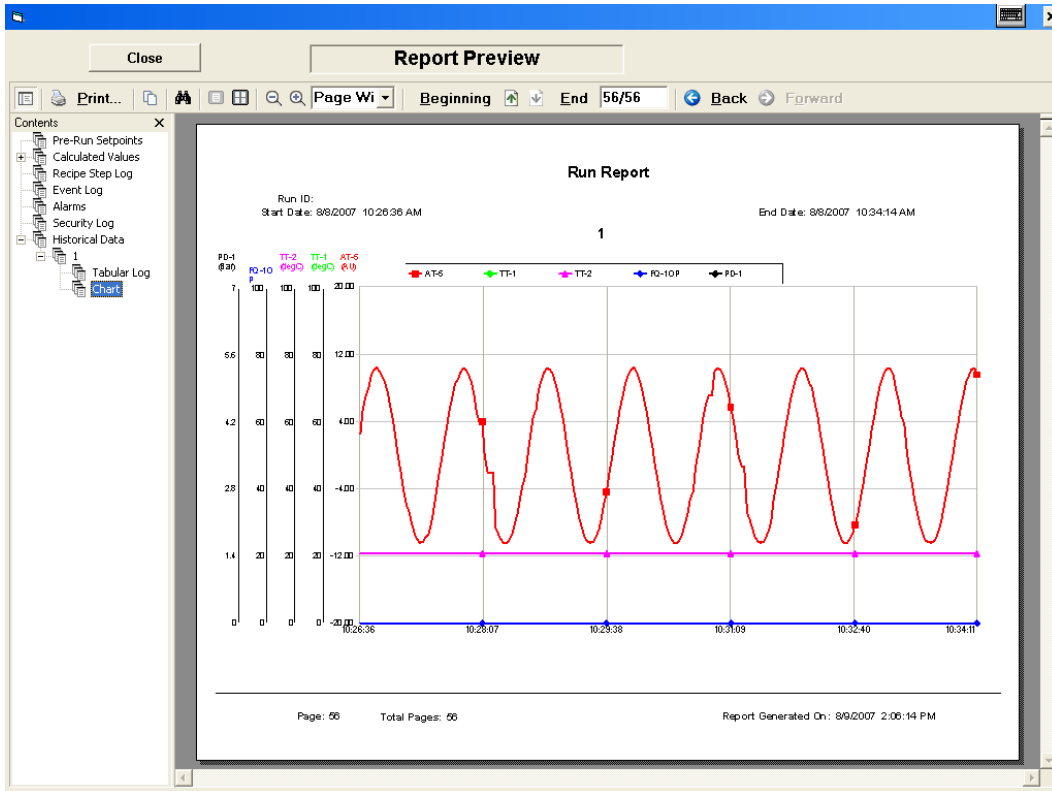
Run ID: 88/2007 10:26:33 AM End Date: 8/8/2007 11:04:14 AM
 Start Date: 8/8/2007 10:26:36 AM

1 Tabular Log

Date Time	AT-5	TT-1	TT-2	FO-10P	PD-1
8/8/2007 10:26:36 AM	2.486	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:38 AM	5.399	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:40 AM	7.063	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:42 AM	7.769	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:44 AM	9.487	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:46 AM	10.143	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:48 AM	10.386	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:50 AM	10.028	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:52 AM	9.265	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:54 AM	8.761	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:56 AM	7.498	-25.0	20.8	0.0	-0.11
8/8/2007 10:26:58 AM	5.988	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:00 AM	4.042	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:02 AM	2.044	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:04 AM	0.006	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:06 AM	-2.104	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:08 AM	-4.078	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:10 AM	-5.910	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:12 AM	-6.712	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:14 AM	-8.173	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:16 AM	-9.278	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:18 AM	-10.033	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:20 AM	-10.410	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:22 AM	-10.326	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:24 AM	-9.947	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:26 AM	-9.469	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:28 AM	-8.405	-25.0	20.8	0.0	-0.11
8/8/2007 10:27:30 AM	-7.016	-25.0	20.8	0.0	-0.11

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Tabular Data Report



Analog Data Report

Printing Reports

To print the report to the default printer, click the Print Report button on the top left corner of the Report Generator form.

Print Report

Saving Reports

A report can be saved in different formats:

- RTF (*.rtf)
- Adobe® Acrobat® (*.pdf)
- Tab Separated (*.tsv).

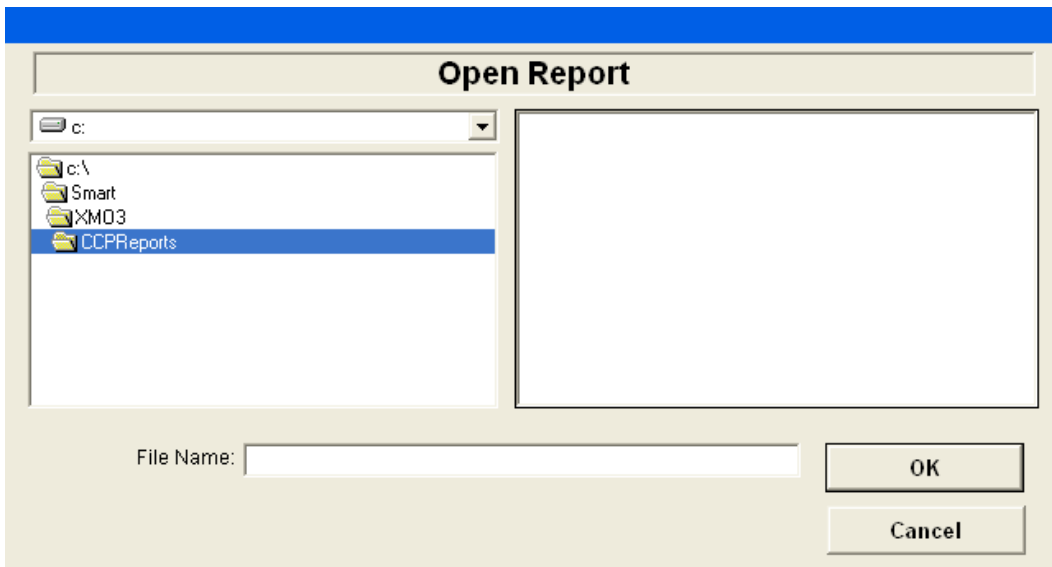
Select the desired format using the drop-down box in the upper left corner of the form and click the Save Report button.

Exiting the Report Generator

To exit the report generator click the Close button on the upper left corner of the form.

Opening an Existing Report

Existing reports can be opened within the CCP® Report Client by clicking the Open Report Icon or by clicking Reports menu and the Open Report menu item. The Open Report window opens.



Open Report Dialog Box

The right side of the form will populate with all of the reports saved to the location defined on the left. To open a report, select the file from the list on the right side of the form and click OK. The File Name can be typed in the text box provided on the bottom of the form. The selected report is opened within the corresponding application.

Additional Features of Report Client Application

Enabling Keyboard or Touchscreen

The CCP® Report Client supports both a keyboard and a touch screen user interface. To switch between the two modes, click the keyboard/monitor icon or click the Tools menu and then the Toggle Popup Keyboard menu item. The monitor icon indicates that the touchscreen mode is active while the keyboard indicates that the keyboard mode is active.

Verifying Tamperproof Signatures

CCP® software keeps track of unauthorized modifications to archived report files. When report files are created within CCP® software, the system codes the file in a way that prevents unauthorized changes from going unnoticed.

To check which archived reports have been modified, click the Verify Signature icon or click the Tools menu and then the Verify Tamperproof Signature menu item. Either action will launch the Verify Tamperproof Signature form.

	Tamperproof Signature Verified	File Name
1	<input checked="" type="checkbox"/>	C:\Smart\TF2S\CCPReports\SampleReport.pdf
2	<input checked="" type="checkbox"/>	C:\Smart\TF2S\CCPReports\SampleReport2.pdf
3	<input checked="" type="checkbox"/>	C:\Smart\TF2S\CCPReports\SampleReport2_NoRunId.pdf
4	<input checked="" type="checkbox"/>	C:\Smart\TF2S\CCPReports\SampleReport_NoRunId.pdf
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	
9	<input type="checkbox"/>	
10	<input type="checkbox"/>	
11	<input type="checkbox"/>	
12	<input type="checkbox"/>	
13	<input type="checkbox"/>	
14	<input type="checkbox"/>	
15	<input type="checkbox"/>	
16	<input type="checkbox"/>	
17	<input type="checkbox"/>	
18	<input type="checkbox"/>	
19	<input type="checkbox"/>	
20	<input type="checkbox"/>	
21	<input type="checkbox"/>	
22	<input type="checkbox"/>	
23	<input type="checkbox"/>	
24	<input type="checkbox"/>	
25	<input type="checkbox"/>	
26	<input type="checkbox"/>	
27	<input type="checkbox"/>	

Verify Tamperproof Signature Form

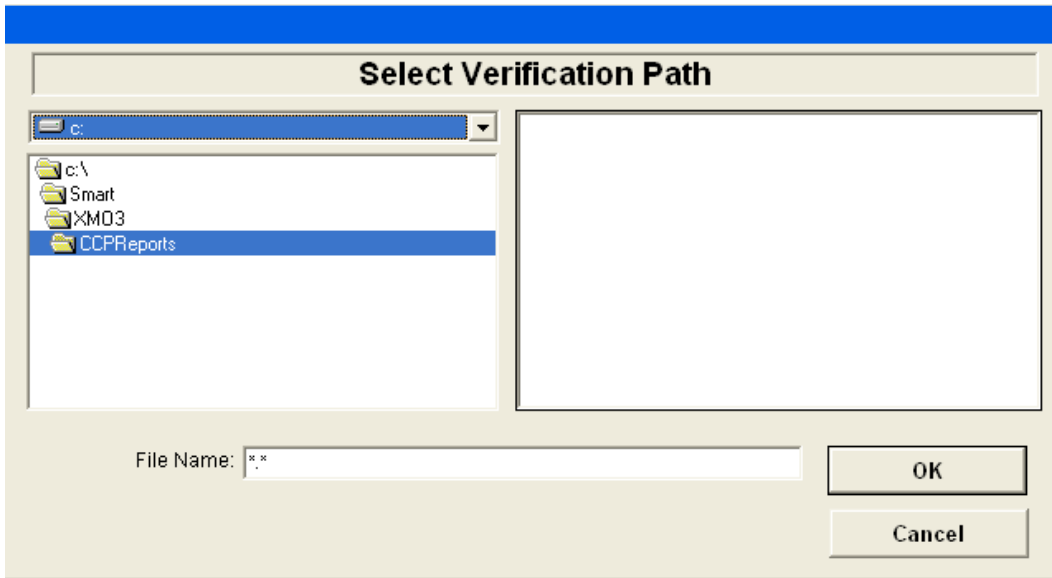
The files with the check marks are the original files created by CCP® software using the unalterable raw data archived during the run. The unchecked report files were altered in some way by software outside the CCP® system.

Note

CCP® software considers ALL types of alterations to be tampering. If you are using Adobe® Acrobat® software to provide electronic signatures for reporting, CCP® software will consider these reports to have been altered, and they will NOT be checked as verified tamperproof. If you are using Adobe® Acrobat® software for this purpose, only Acrobat® software can be used to check the tamperproof status of the document.

To check the integrity of the files residing in different locations within the available drives and folders, click the File Path button located on the top left corner of the Verify Tamperproof Signature form.

The Select Verification Path dialog box appears. Use the drive and folder list controls on the left side of the form to browse over the available drives and folders.



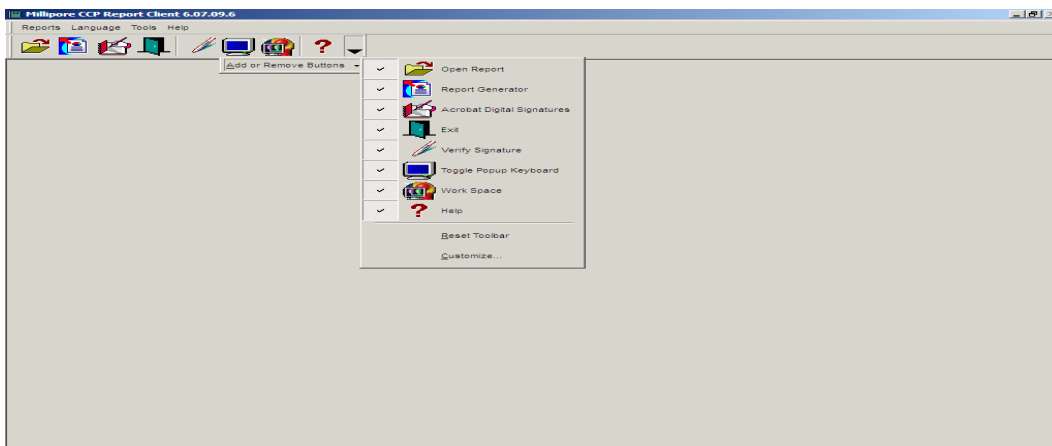
Select Verification Path Dialog Box

Once a path has been selected, click OK and the verification results will be displayed in the Verify Tamperproof Signature form. The selected file path is also updated on the gray text box located on the top part of the Verify Tamperproof Signature form.

To close the Verify Tamperproof Signature form, click the Close button.

Customizing the Report Client Menu Bar

The user interface may be customized by clicking on the black arrow located on the tool bar. The user can add or remove icons, menus or menu items, as shown below.



Customizing the User Interface

Electronic Signatures with Adobe® Acrobat® Software

When the Acrobat® Digital Signature is turned On in the Maintenance Status Display screen of the User Interface, the Adobe® Digital Signature Icon is visible in the Report Client Toolbar.

The Acrobat® signature functionality is tied to the Windows® users configured on the system (see *Security* chapter). Each user can create his/her digital signature to use for signing documents. Clicking on the Acrobat® Digital Signature button opens the login screen. The user can then open any Acrobat® file and sign the document, using an already created digital signature or can create a new digital signature.

For details of the Acrobat® software electronic signature function, please see the online help that is included with the Adobe® Acrobat® software.



Report Client Toolbar with Adobe® Icon

Custom Trend Display

Introduction

The Custom Trend Display helps the user monitor the performance of the process. Custom Trends can be historical or real-time.

The basis of the Custom Trend Display is the Chart Group File, which contains a list of tag names for which data is being collected. When a given Chart Group File is selected for display, the data specified by the tag names in that file will be displayed in the Custom Trend Display. The data for each tag name is represented by a distinctive individual trace, which is referred to as a Pen.

The user can create a variety of Chart Group Files, defining a variety of Custom Trend charts, which can be examined to determine how the process was performing at any point in time.

At any time, a Chart Group File can be modified or a new one created, allowing the user to examine data in a different format or at a different time.

Through the Custom Trend program, the user can create and modify display charts by assigning:

- Colors and optional markers for each tag name for enhanced readability
- High and low limits for display of each tag
- A time span for the display chart that can be shifted on demand
- Different line styles for the tags
- A display legend

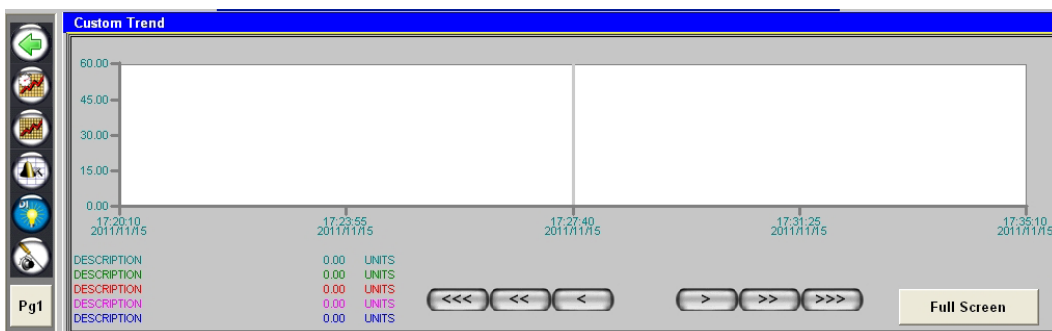
The Custom Trend chart groups are stored as *.csv files. The following is an example of the format using the default system path:

TF2S System: C:\MILLIPORE\HTR\TF2S\PETS\ChartGroup1.csv

XMO3 System: C:\MILLIPORE\HTR\XMO3\PETS\ChartGroup1.csv

Opening the Custom Trend Display

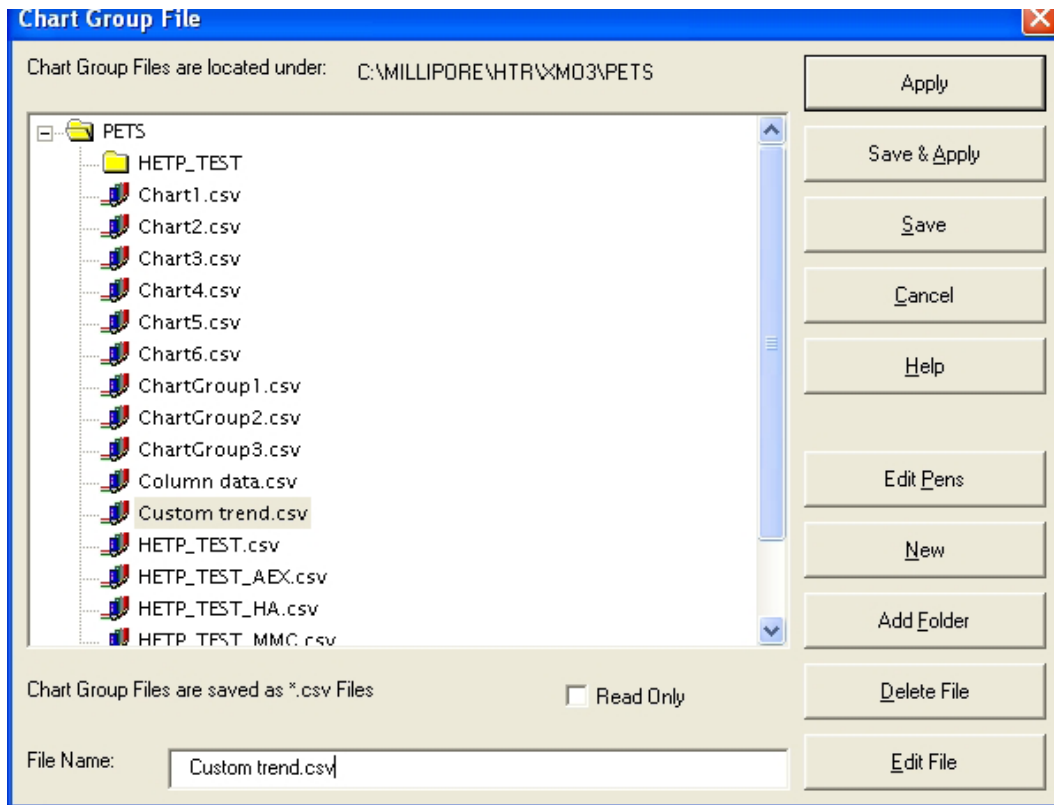
The XMO and TFF systems include custom trends that are accessed by clicking on the Custom Trend Icon in the Navigation Bar of the User Interface. The figure below shows the blank Custom Trend that is opened when the Custom Trend Icon is clicked.



Custom Trend - Blank

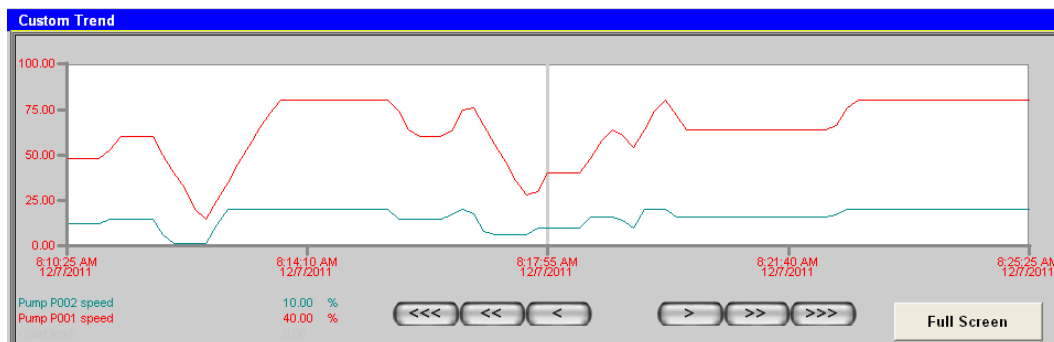
Selecting Pre-Configured Trends

Double Clicking on the Plotted Area of the Custom Trend Display opens the Chart Group File Selection Screen.



Custom Trend – Selecting Chart Group

Selecting a Chart Group File and clicking Apply will open that trend and return the user to the Process Display screen.



Custom Trend – Opened Trend

Existing Charts can be opened and edited and new charts can be created. Folders can also be created to help organize charts into logical groups. Detailed instructions on creating and editing trends can be found in later sections of this chapter.

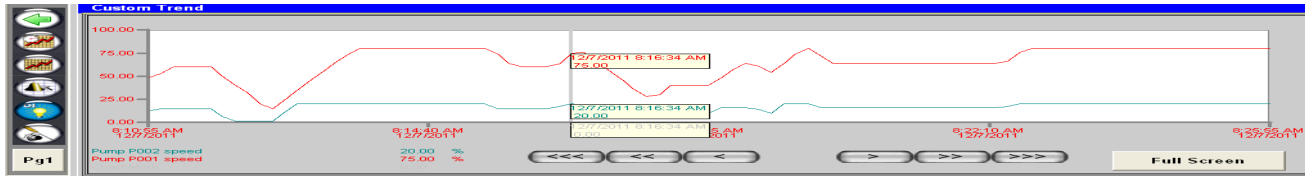
Working with Custom Trends

Working with Custom Trends is very similar to working with the individual trends as described in the *User Interface* chapter.

The list of tag names and tag values that are used on the trend are displayed in the lower left corner of the Custom Trend Display. The X-Axis is time and the Y-Axis is Tag Value.

Drag Bar

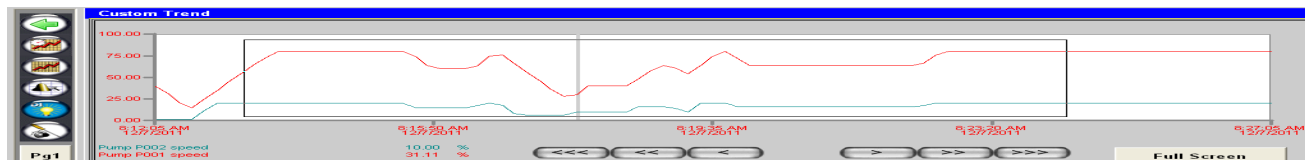
Clicking and dragging the Drag Bar displays the values for the tags at a specific date and time.



Drag Bar

Zoom In, Zoom Out

Zoom in on a selected portion of the trend by left-clicking on the trend and dragging a box across that area of the trend. Both the X and Y axis are adjusted to the zoomed in area. To zoom out of that area, right-click on the trend.

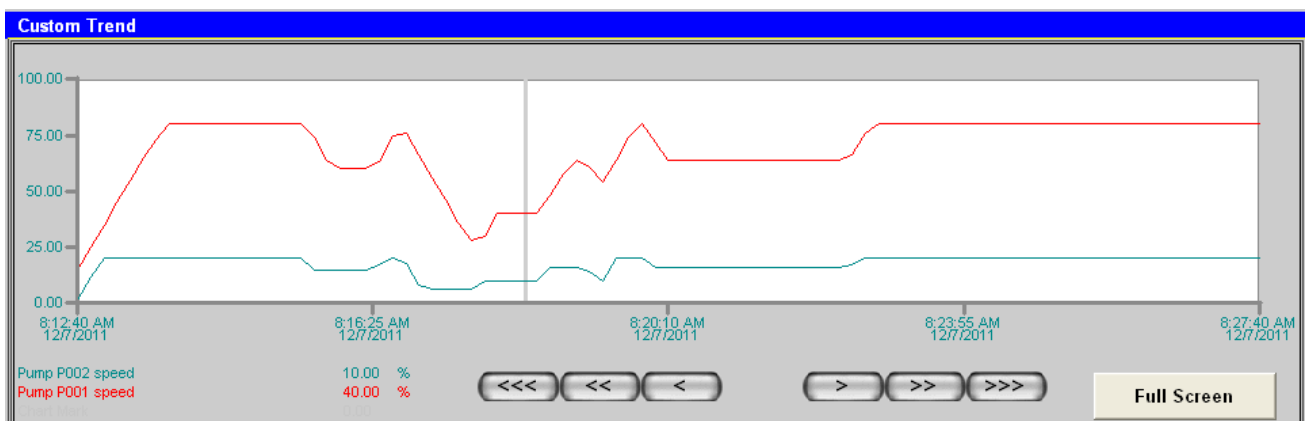


Zoom In Box

Change Y-Axis Scale

The Y-Axis is scaled by default to the min and max EGU of one of the tags. The color of the axis labels matches the color of the tag name on the trend screen. To change the tag range that is displayed on the Y-Axis, click on the tag name or value in the tag list in the bottom left of the trend screen.

The example below shows the Y-Axis for Pump P001 Speed in red. By clicking on the Pump P002 Speed tag name or value, the axis changes to blue and the Y-Axis now represents the EGU range of Pump P002 Speed.



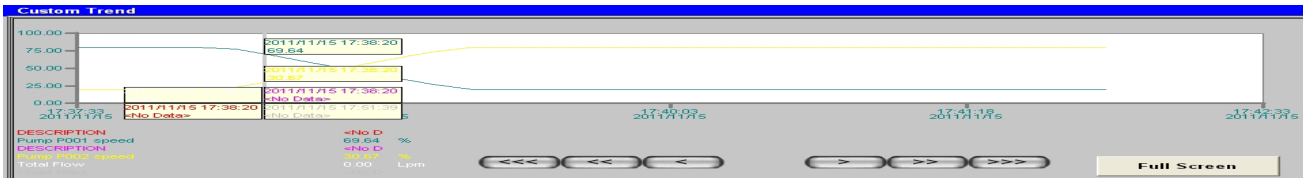
Change Y-Axis Scale

Scroll Through Time

Scroll forward and backward through time by clicking on the Scroll Buttons displayed at the bottom of the Trend Screen.

Clicking on a:

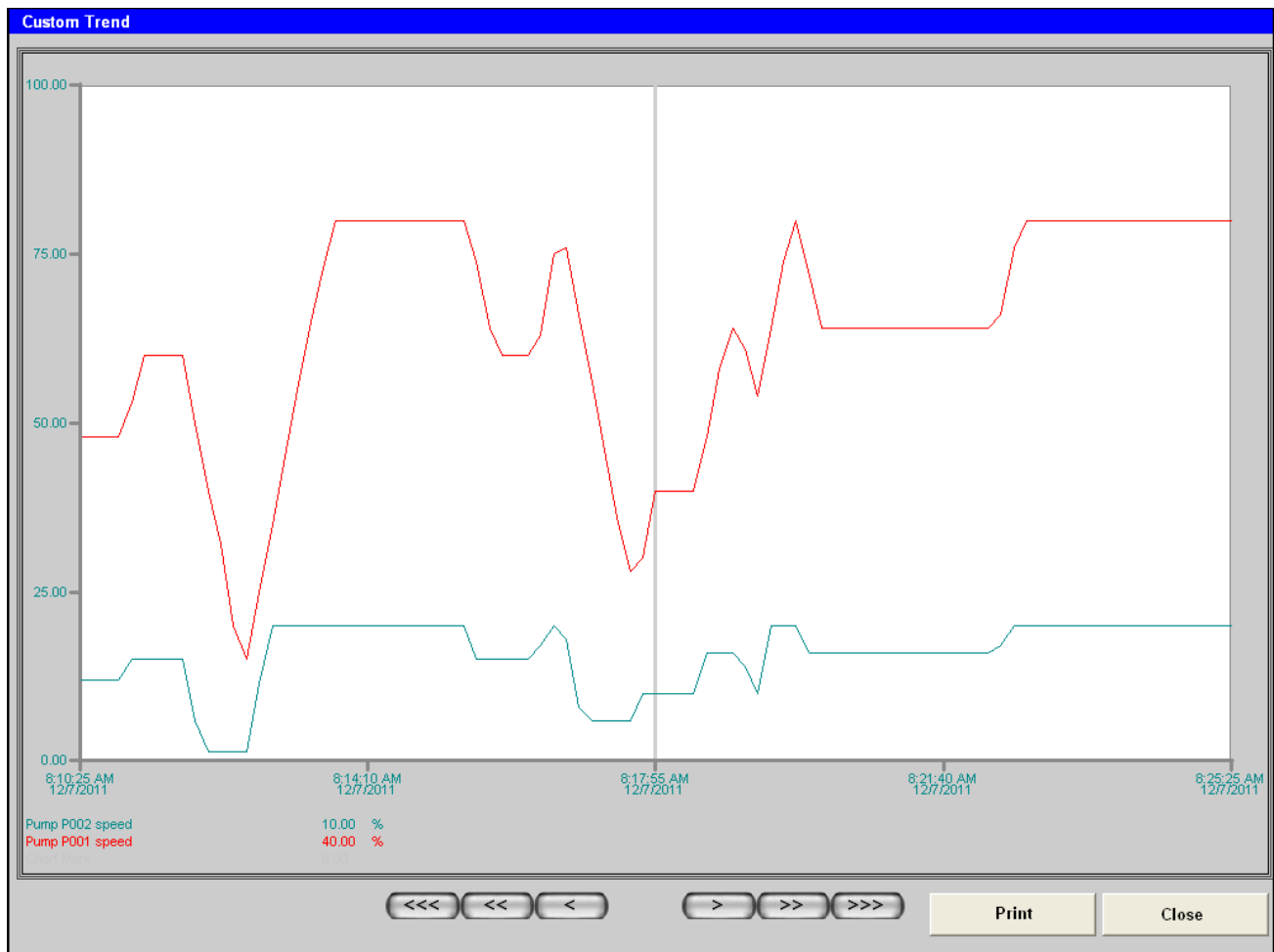
- Single arrow will scroll forward or back 25% of the current timespan
- Double arrow will scroll forward or back 100% of the current timespan
- Triple arrow will scroll forward or back 2400% of the current timespan



Scroll Buttons

Full Screen

Clicking the Full Screen button will increase the size of the trend to take up the full screen. Select the trend file to view it in full screen mode. The same functions are available in full screen mode.



Full Screen Trend.

Print Trend

Clicking the Print button while in full screen mode will allow the user to print the trend. A print window appears allowing the user to select the target printer and other options.

Working with Chart Group Files

Existing Chart Group Files can be edited to change the tags that are displayed, the format of the pens, and the time frame of the trend. Chart Group Files can be created, deleted and organized into folders.

To open the Chart Group File Window double click on the Plotted Area of the Custom Trend Display.

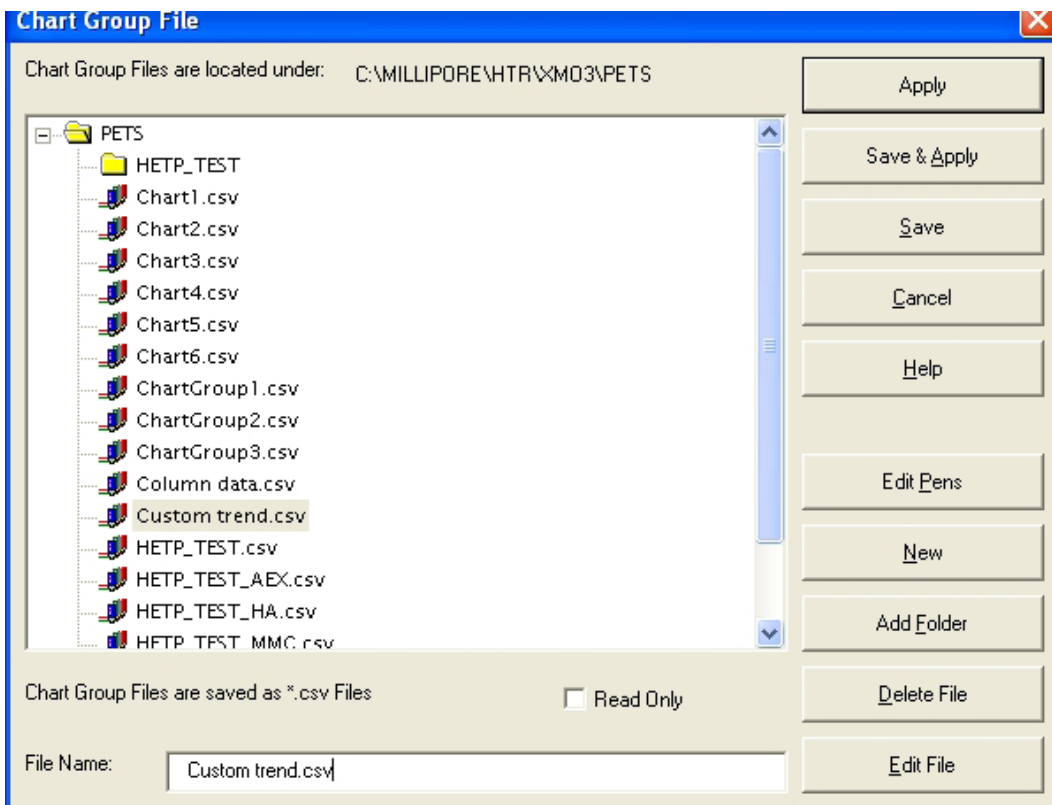


Chart Group File Window

General File Management

Chart Group File Window Buttons

Button	Function
Apply	Applies the selected Chart Group File to the Custom Trend Display and returns the user to the User Interface.
Save & Apply	Saves and applies the selected Chart Group File to the Custom Trend Display and returns the user to the User Interface.
Save	Saves the selected Chart Group File but does not apply it or return the user to the User Interface.
Cancel	Closes the Chart Group File Window without performing any action.

Button	Function
Help	Opens the iFix® Electronic Book on using the Chart Group File Window.
Edit Pens	Opens the Chart Group Configuration Window for the selected Chart Group File. See the section <i>Editing Pens/Editing Files</i> for details on this.
New	Opens the Chart Group Configuration Window for a new Chart Group File. See the section <i>Creating New Files</i> for details on this.
Add Folder	Prompts the user to enter the name of a new folder. Clicking OK creates the new folder in the current path. Moving a file to the folder by clicking and dragging is not enabled in this interface. This can be accomplished through Windows® Explorer or by editing the file and clicking Save As and then selecting the new folder location.
Delete File	Deletes the selected file after a confirmation prompt.
Edit File	Opens the Chart Group Configuration Window for the selected Chart Group File. See the section <i>Editing Pens/Editing Files</i> for details on this.

Edit Pens/Edit File

To configure the Chart Group File, click the Edit Pens or Edit File button on the Chart Group File window. This will open the Chart Group Configuration window. Configure all components of the trend including the pen list (the tags that will be plotted), line style and color, time frame and resolution.

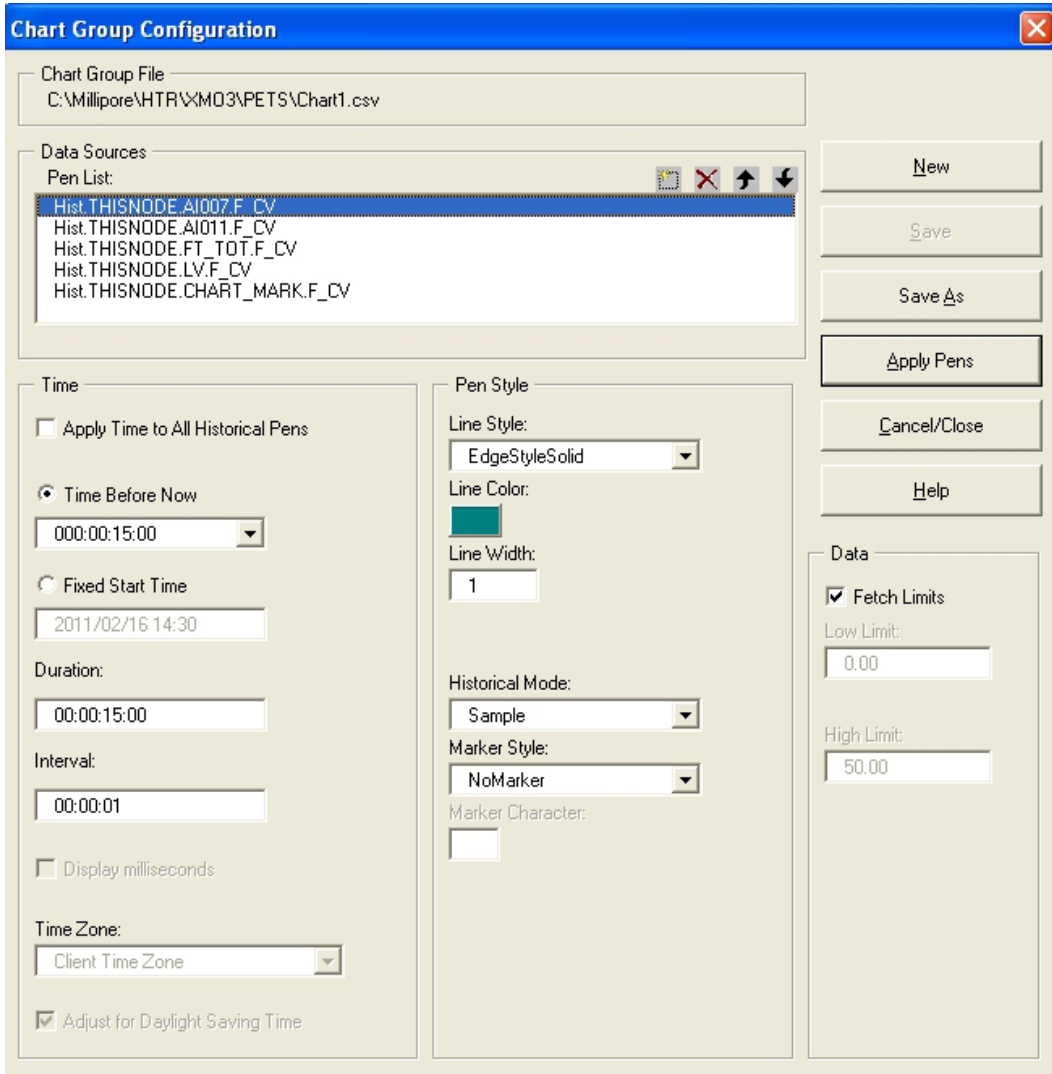


Chart Group Configuration Window

The configuration of these components is described briefly in the **table below** and discussed in more detail in the following sections.

Chart Group Configuration Window Structure

Section	Functionality
Chart Group File	Lists the name of the chart group file that is being configured.
Data Sources	Displays the pen list of the current chart group file. Allows the user to select additional data (pens) from the Historical Datacart.
Time	Sets the time limits (X-axis range) for the data display.
Pen Style	Defines the style of the Trend line for a particular pen.
Data	Sets up high and low limits (Y-axis range) for the data value.
Action Buttons	Controls for saving, canceling and managing the configured chart file.

Chart Group File

When an existing Chart Group File is chosen, the name of the file and directory path will appear in the Chart Group File area

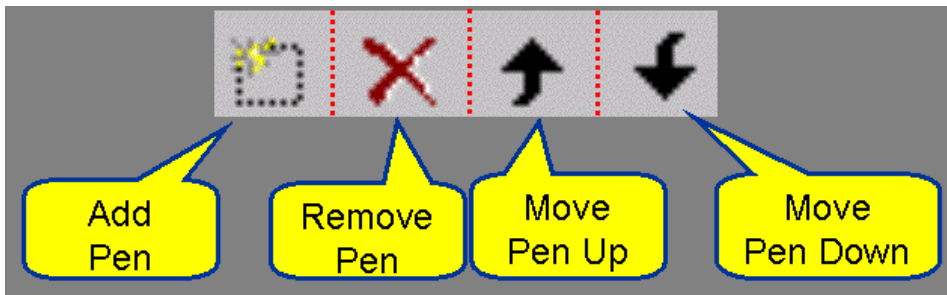
If a new chart group file is being created, the string "no file" will appear in the Chart Group File area.

Data Sources

Displays the list of Pens (tags) that will be displayed on the trend. Also contains the buttons for Pen Selection and Editing.

Pen Selection and Editing

The Data Sources section is for adding, removing and editing pens. There are four buttons to carry out these tasks.



Pen Editing Buttons

Clicking the Add Pen button opens three additional buttons and a pen selection field.





Default Pen Selection Field

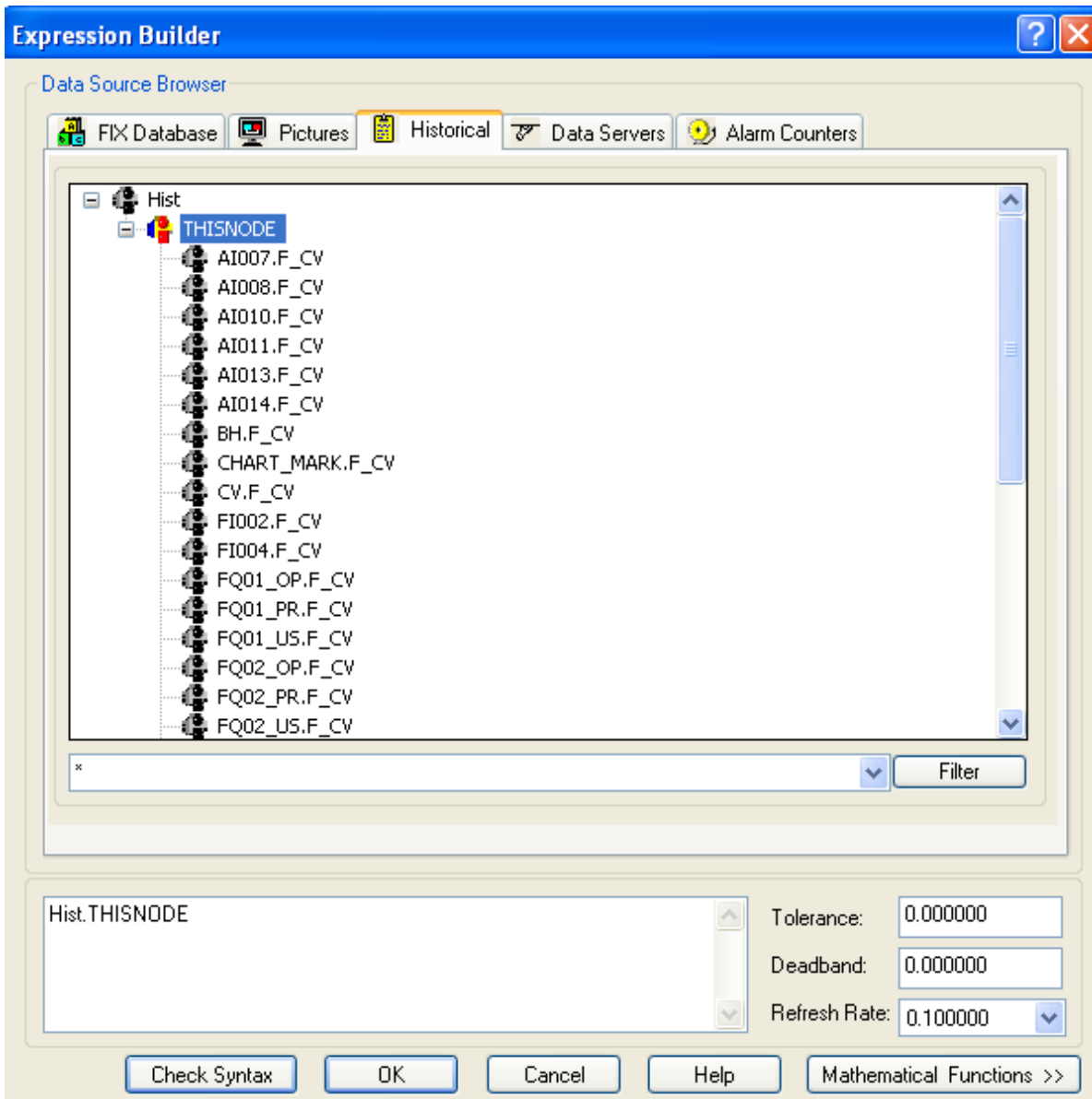
Pens can be added either from the existing pen list or from the historical database. The historical data pens have the format: Hist. Node.Tag.Field

Note

iFix® software pens default as Fix32.Node.Tag.Field. Look at the Historical datacart with pens that have the format as follows: Hist. Node.Tag.Field. See the next section for details.

1. Click on the drop down sign  to list the existing pens. Using the existing pen list, click the pen on the list, highlighting it. Then click on the white space in the Pen List and the software will add the selected pen to the list.
2. Click on the gray button  to launch the Expression Builder window.

Using the Expression Builder Window

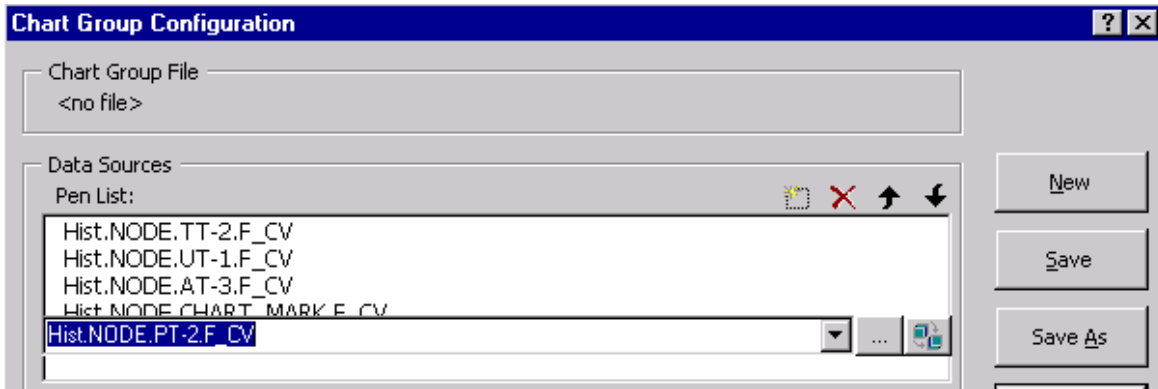


Expression Builder Window

The Expression Builder window has four tabs. Only the Historical tab is needed. Clicking the Historical Tab button opens the historical datacart with the list of historical assigned and collected pens.

To add a pen using the Expression Building Window;

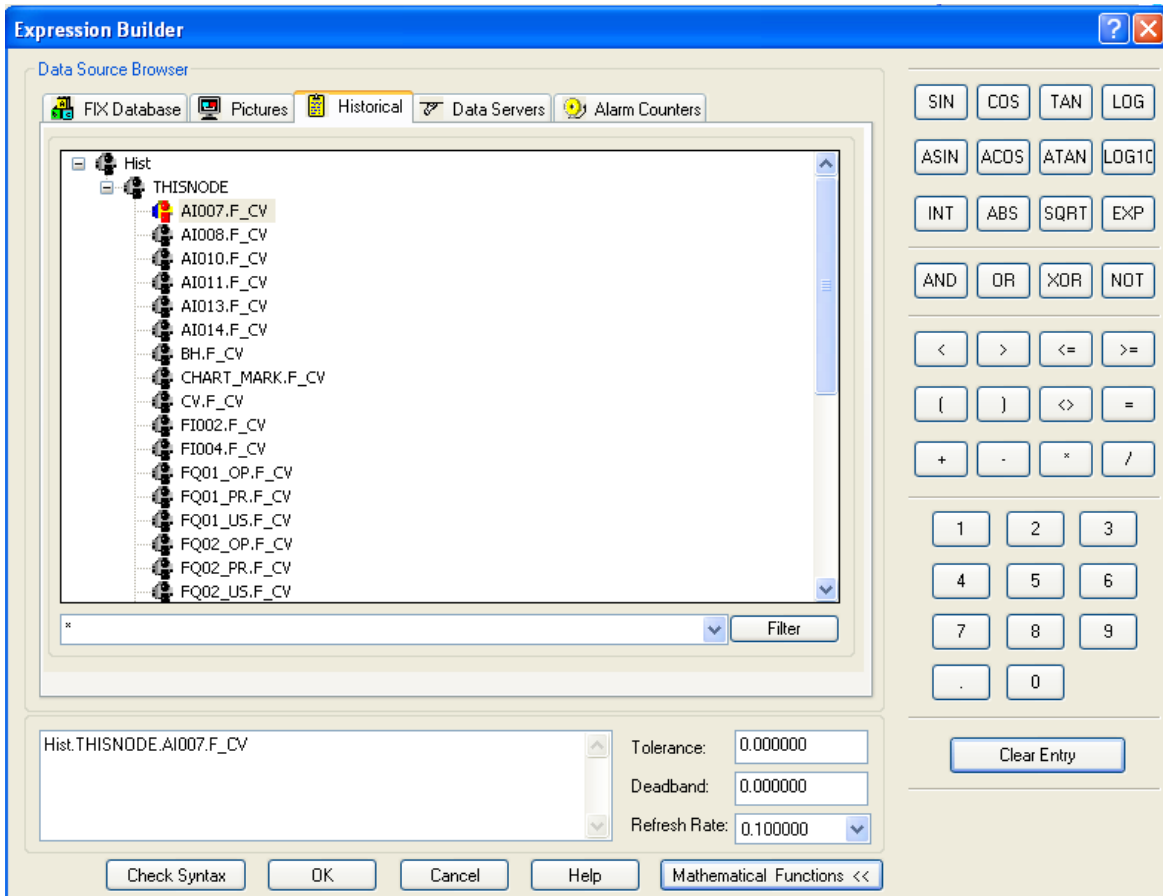
1. Click on the folder Hist and then click on the folder THISNODE. This will display a long list of the pens that can be chosen to display in the Historical Trend display in the process User Interface.
2. Click on a pen to select it. The selected pen will be highlighted and will be listed at the bottom of the window.
3. OPTIONAL: Use the filter to search for specific tags, set Tolerance, Deadband, Refresh Rate, or create an Expression using the Mathematical Functions. See the *Options* section below for details.
4. Click the OK button to return to the Chart Group Configuration window. Clicking in the white space of the Pen List will cause the selected pen to be added to the Pen List.



After the Pen Selection from Historical Database

Options

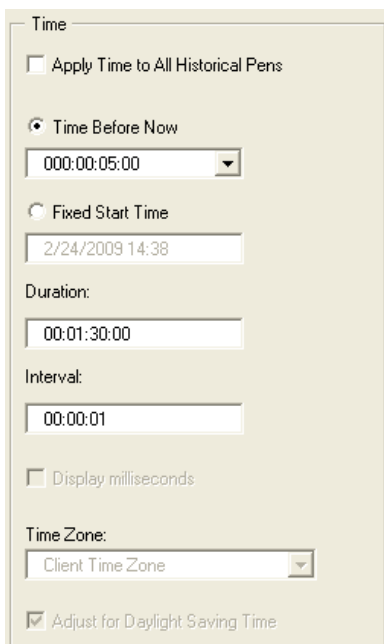
Filter	The Filter button is used to filter the data source by Node, Tag, etc.
Mathematical Functions	Provides a keypad with basic and Boolean math functions.
Tolerance	Specifies the current connection's rounding factor.
Deadband	Specifies the maximum fluctuation you want for the current value before iFix [®] software updates it. This creates a +/- zone around the current value. As long as the value is within this range, iFix [®] software does not update the value.
Refresh	Specifies the rate at which iFix [®] software updates the current value.



Mathematical Function Keypad

Time

The Time section of the Chart Configuration window allows the user to set the time range for pens.



Time Section at Chart Group Configuration Window

Time Section Functionality

Section	Functionality
Apply Time to All Historical Pens	If checked, the time setting will be applied to all the pens in the Group Chart File pen list. If this check box is left empty, the time setting will only apply to the pen that is highlighted.
Time Before Now	Allows the user to set a trend start time relative to current time. A drop down menu is available with pre-configured values, or the user can type any value into the field.
Fixed Start Time	Allows the user to set a fixed start time for the trend.
Duration	Sets the time duration of the trend started at the previously set start time. Format is dd:hh:mm:ss.
Interval	Sets the retrieval rate of tag values. Format is hh:mm:ss. (A date point every X number of hours/mins/secs).
Display Milliseconds	If available, will display milliseconds on the timestamp.
Time Zone	If available, the user can choose to view time as being based on either client or server time zone.
Adjust for Daylight Savings Time	If available, checking the box will have the system automatically adjust the timestamps for daylight savings.

Pen Style

Pen Style

Line Style:
EdgeStyleSolid

Line Color:
[Red]

Line Width:
1

Historical Mode:
Sample

Marker Style:
NoMarker

Marker Character:
[]

Pen Style

The Pen Style section allows the user to choose the appearance of a pen in the Historical Trend display. **T**

Pen Style Functionality

Section	Functionality
Line Style	Allows user to select the line style for the selected pen via a drop down menu. Choices are: solid, dash, dot, dashdot, dashdotdot.
Line Color	Allows user to select the line color for the selected pen via a popup color palette.
Line Width	Allows user to select the line width or thickness for the selected pen. Valid range is 1-9.
Historical Mode	Allows the user to choose the way the data is displayed. Sample will display the historical data according to user's data settings. High displays a straight line that has the highest value of the data over the selected time span. Low displays a straight line that has the lowest value of the data over the selected time span. Avg displays a straight line that has the average value of all the data points during that time period.
Marker Style	Allows the user to configure the marker shape of the individual data points. Selecting Character Marker allows the user to define a custom Marker Character in the Marker Character box.

Data



Data

The Data section in the chart group configuration window allows the user to set the value (Y-axis) range for the selected pen. If the Fetch Limits box is checked, the data range will automatically be set as the default analog data range. If the Fetch Limits box is unchecked, the user can configure the limits.

Action Buttons

When finished with the configuration of the Chart Group File, use the action buttons to save the file or to directly apply the pens that are selected and configured.



Action Buttons in Chart Group Configuration Window

Action Buttons

Button	Functionality
New	Opens a Chart Group Configuration Window for a new Chart File Group. The user will be prompted to save any changes to the current configuration before opening a new configuration.
Save	Save the Chart Group Configuration under the same name
Save As	Save the Chart Group Configuration under a different file name
Apply Pens	Apply the Pens to the Custom Trend screen without saving the configuration and returns the user to the User Interface.
Cancel/Close	Cancels without saving changes and closes the Chart Group Configuration Window
Help	Opens the iFix® Electronic Book Help

Chromatography Assembling and Setting Up the Hardware

Introduction

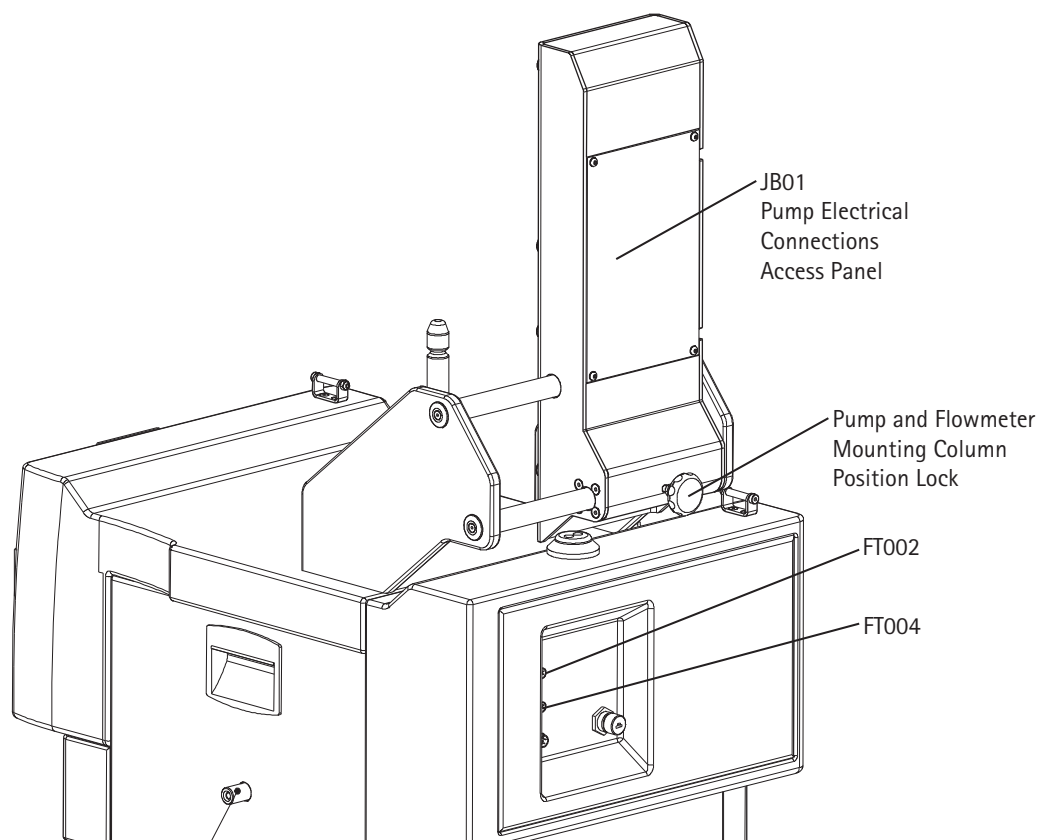
The Mobius® FlexReady Smart System for Chromatography is a modular system that includes the Pump Cart with the manifold and the Smart Cart. Assemble and connect the carts in the order presented in this chapter.

Assembling the Pump Cart

Installing the Pumps

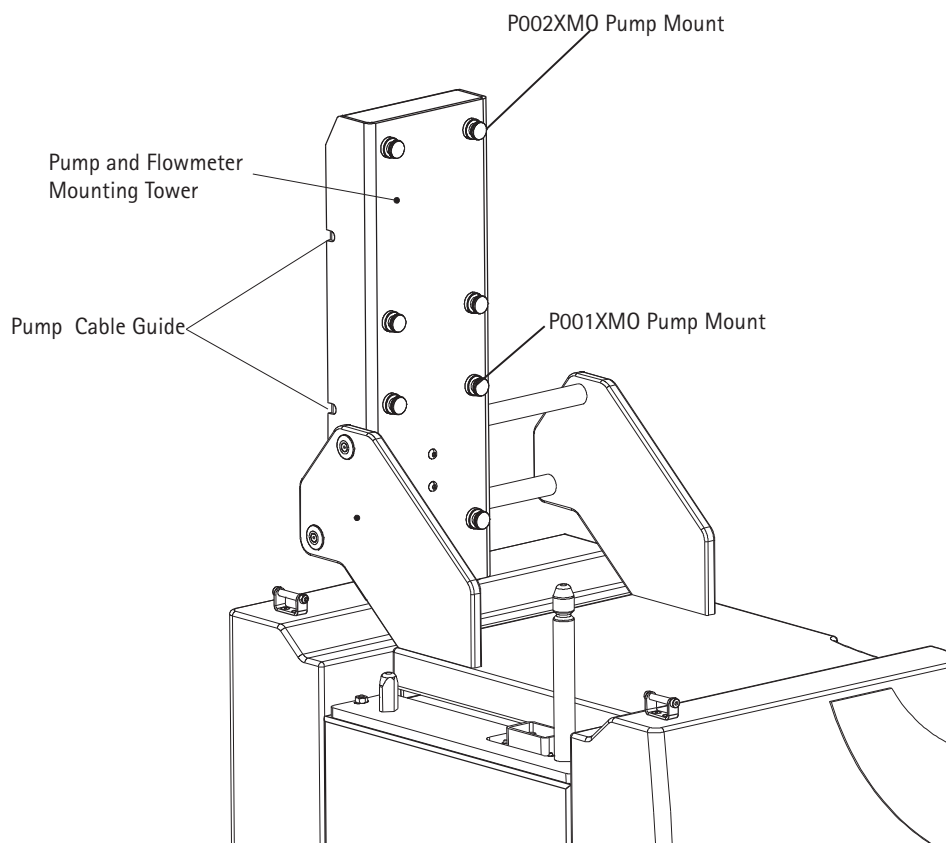
The pumps are supplied attached to the pump supports.

1. Position the pump and flowmeter tower on the left side on the pump cart, as shown below, and lock it in place using the knob on the rear of the column.



Locking the pump and flowmeter column into position.

2. Install pump P001 in the bottom pump position (P001XMO) on the pump and flowmeter column.
3. Install pump P002 onto the top pump position (P002XMO) on the pump and flowmeter column.

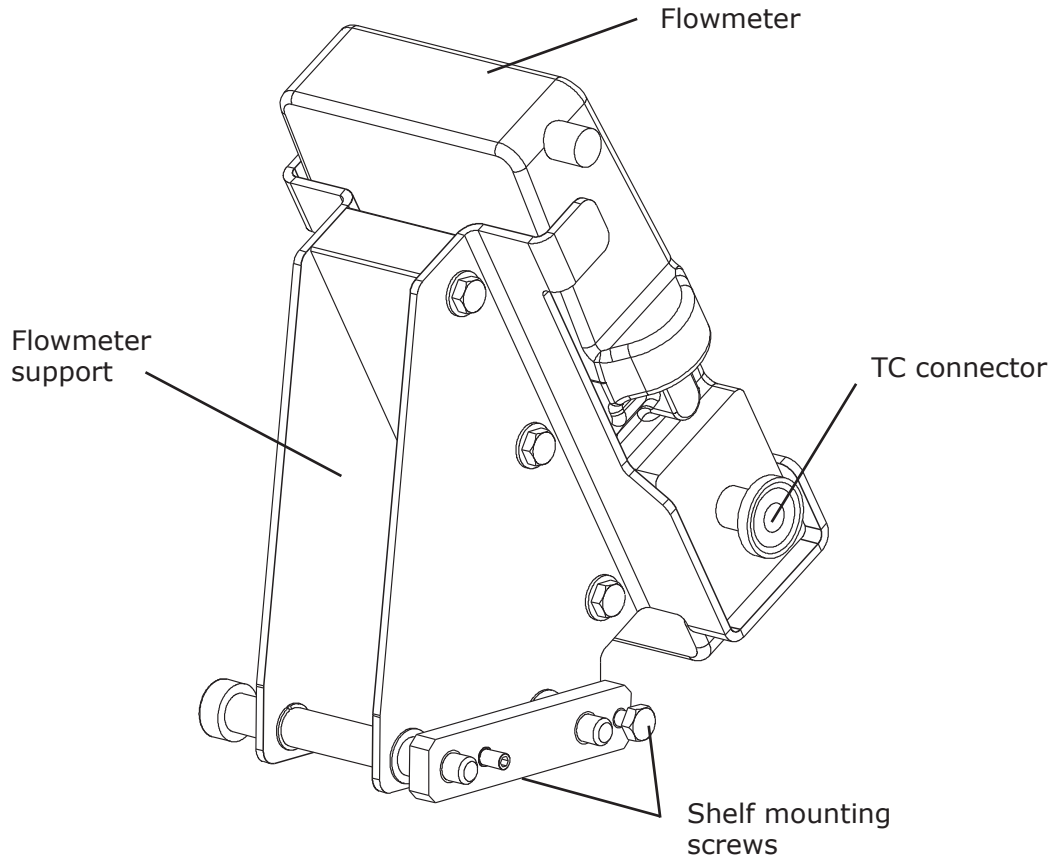


Pump mounting positions

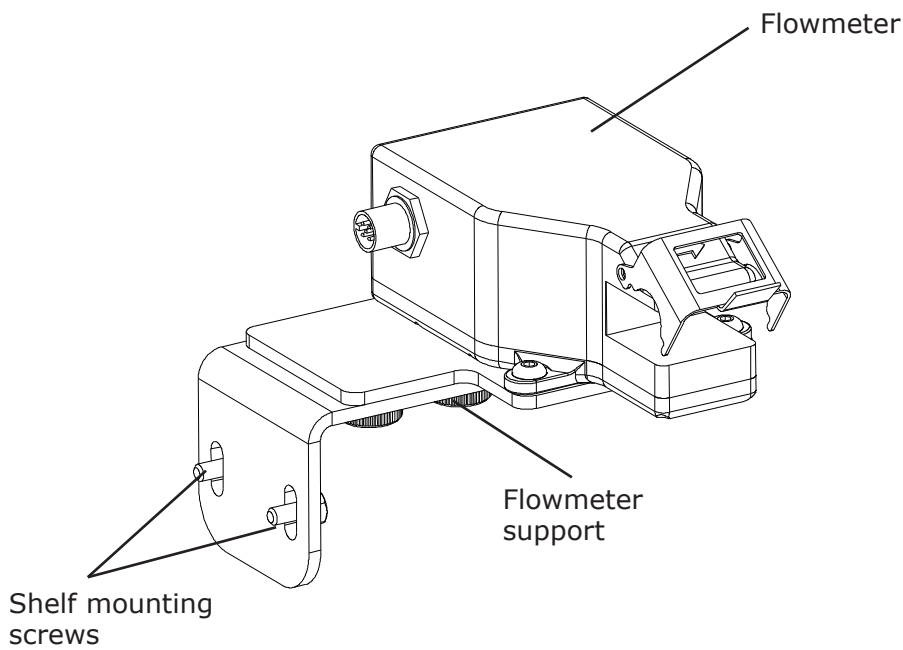
4. Remove the Pump Electrical Connections Access Panel JB01 with a no. 3 Allen wrench. Plug the pumps into the appropriate connectors.
5. Guide the cords through the slot in the top right corner of the panel for P002 and at the bottom corner of the panel for P001.
6. Replace the panel.
7. Replace the screws.

Installing the Flowmeters

1. Install the flowmeter supports onto the pump support with the screws and nuts on the flowmeter support, using a no. 10 socket wrench.

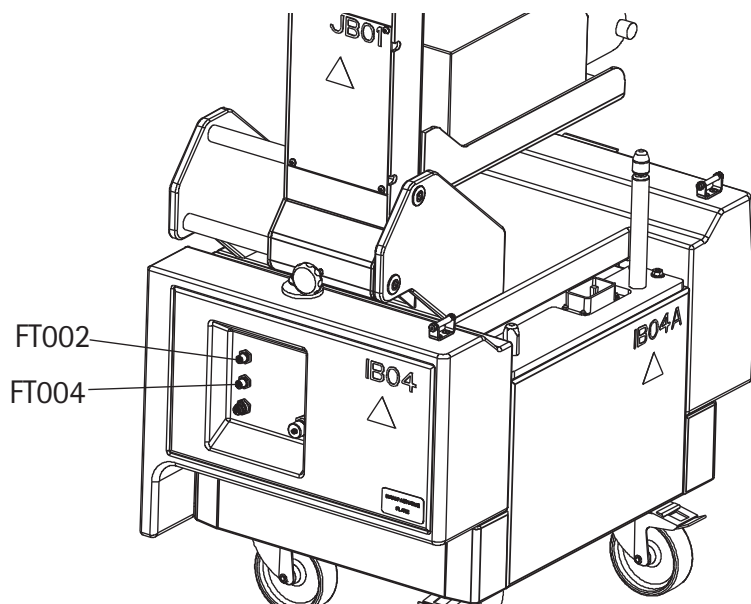


Installing the Multi use Flowmeters



Installing the Single-Use Flowmeters on XMO3

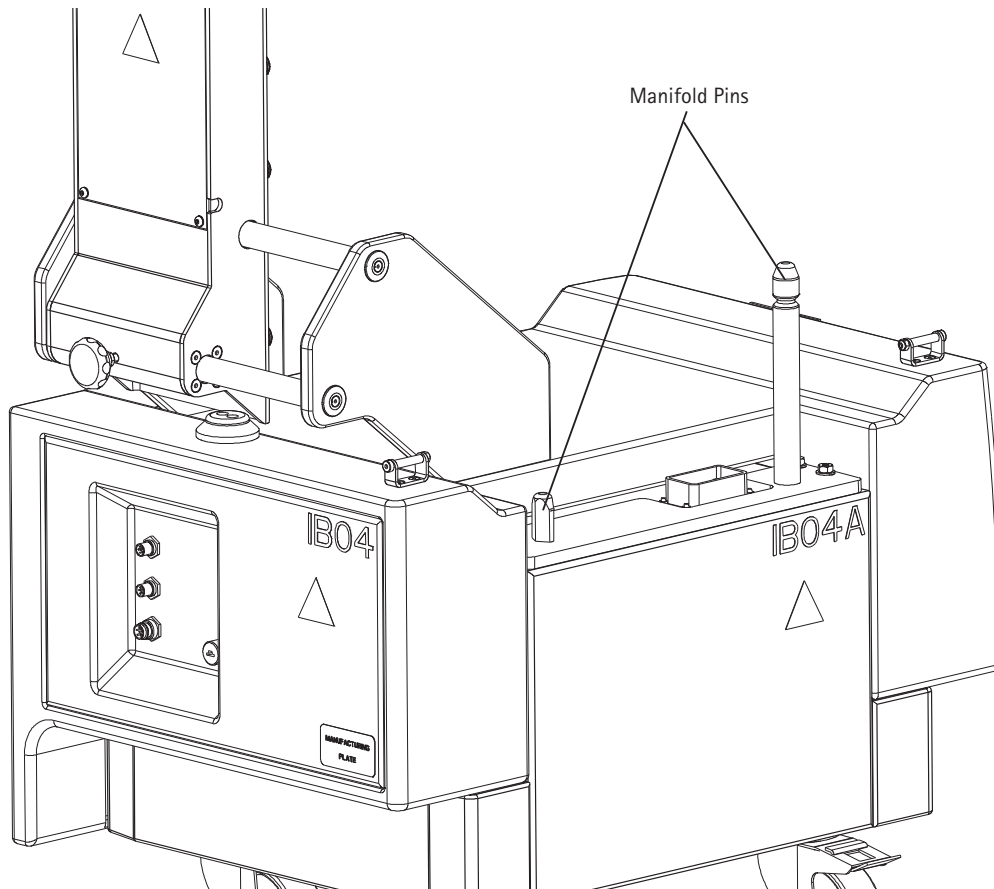
2. Install the flowmeter FT004 onto the flowmeter support located on the P002 pump support. Install the flowmeter FT002 onto the flowmeter support located on the P001 pump support.
3. Connect the flowmeters to the electrical connections on the rear of the pump cart.
4. For the SU version for XMO3, each time a new flowmeter is installed, enter the Qmax value (displayed on the label of the flowmeter) in the maintenance faceplate (see Entering the QMax Factor).



Flowmeter Transmitter Connections

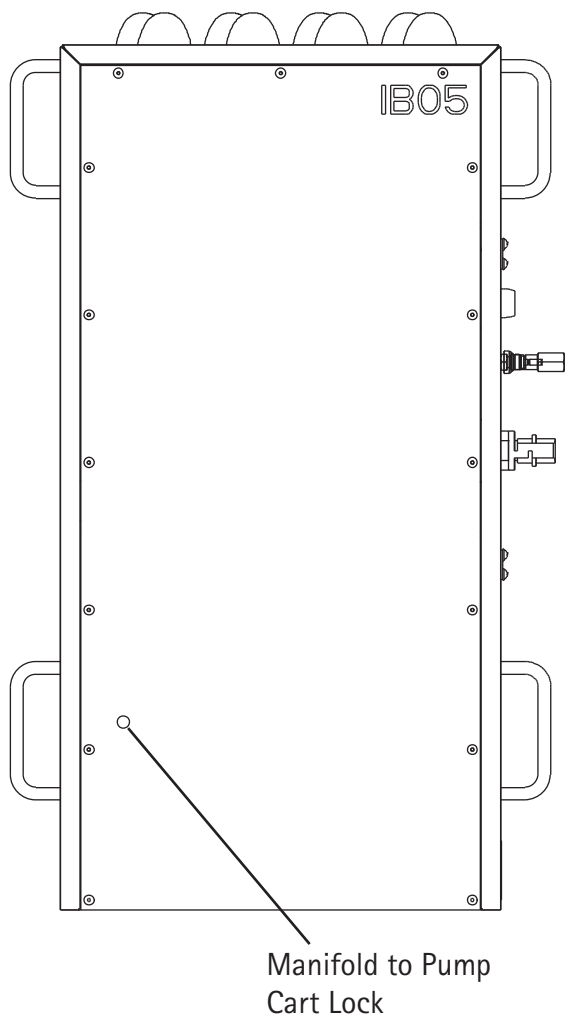
Installing the Manifold

1. Locate the two manifold pins on the pump cart.

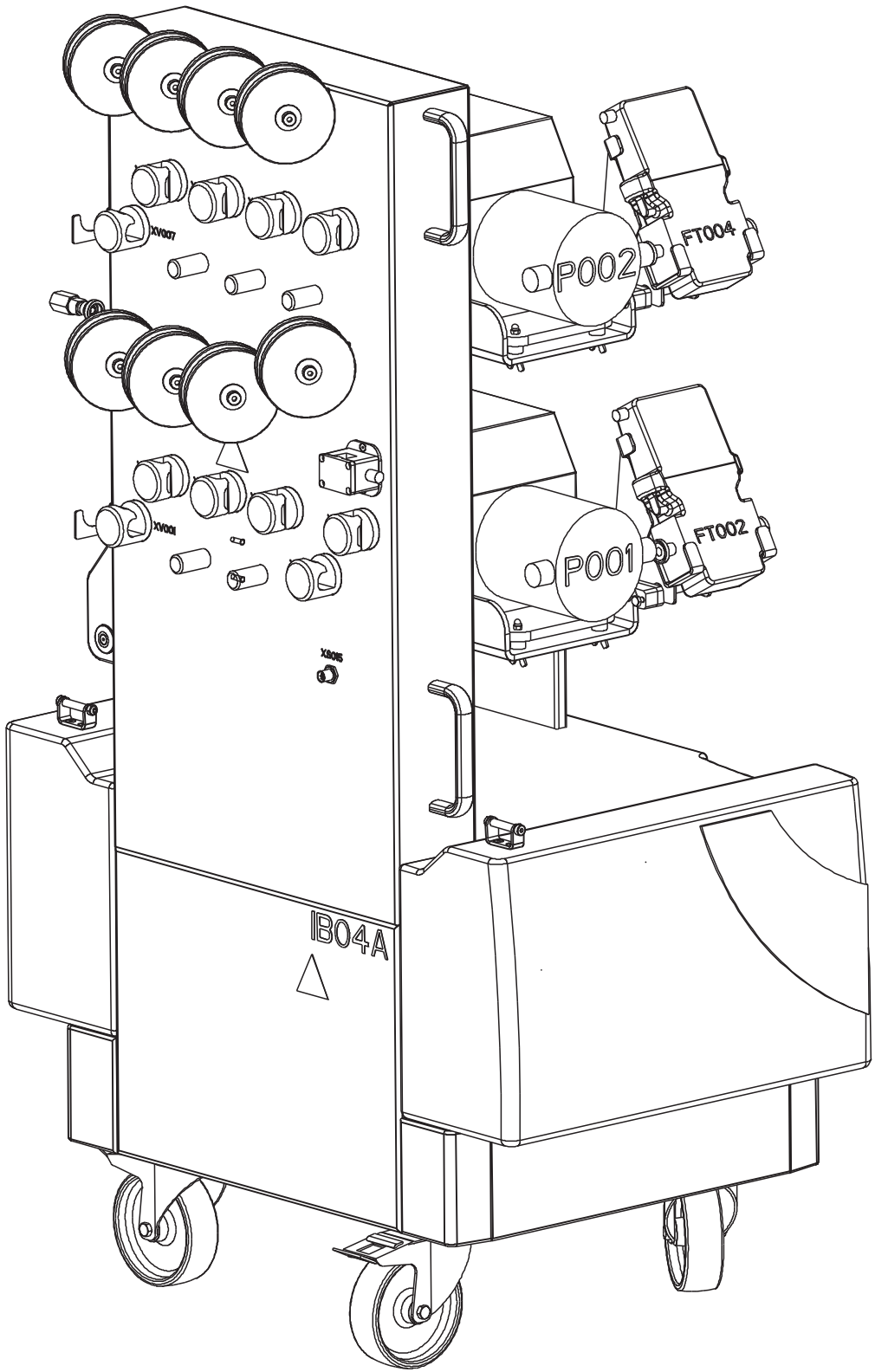


Locating the manifold pins on the pump cart.

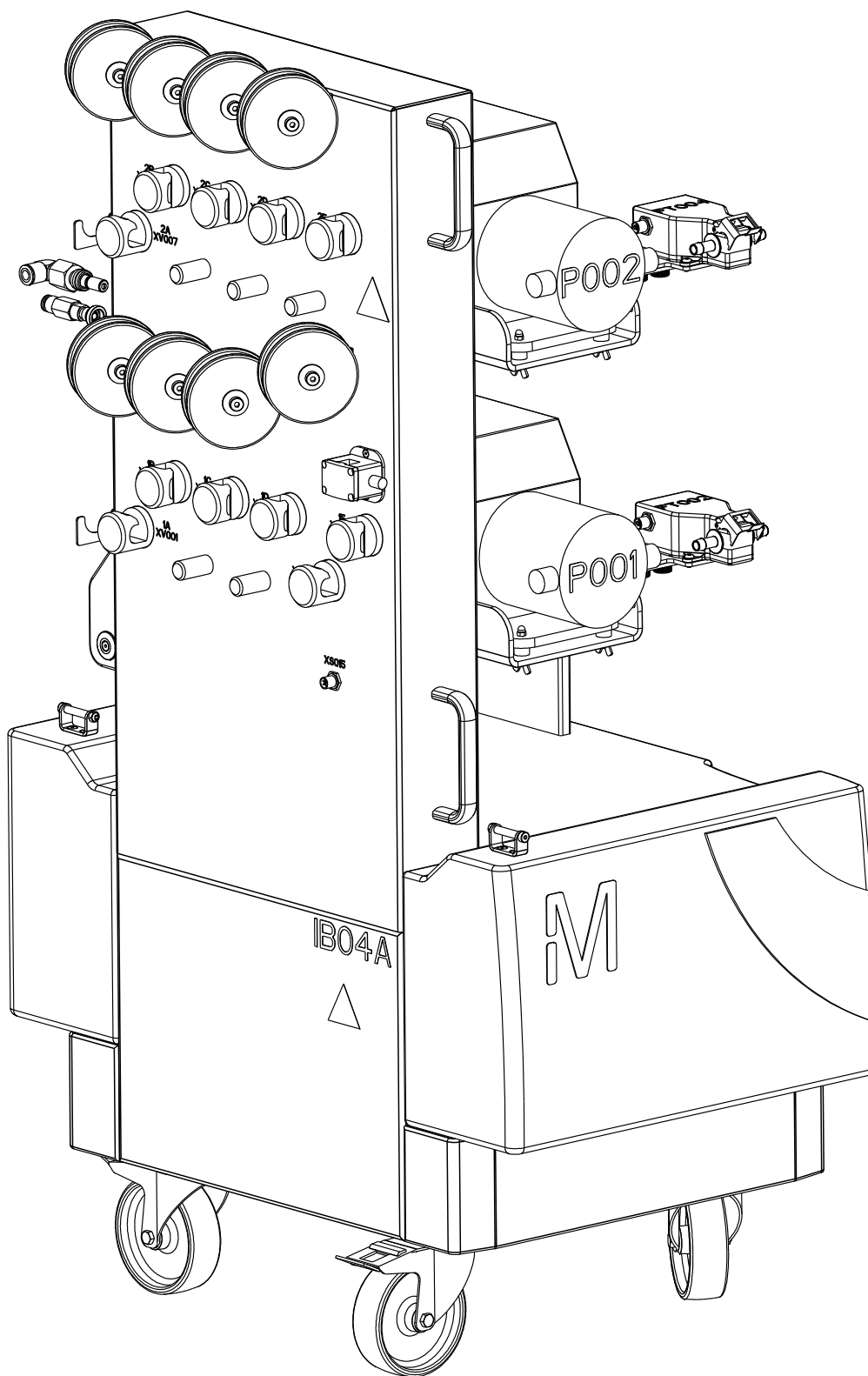
2. Guide the manifold over the pins until the manifold is resting on the cart. Lock the manifold in place using a no. 4 Allen wrench.



Manifold to Pump Cart Lock location



Fully assembled Pump Cart with Multi-Use Flowmeter



Fully assembled XM03 Pump Cart with Single-Use Flowmeters

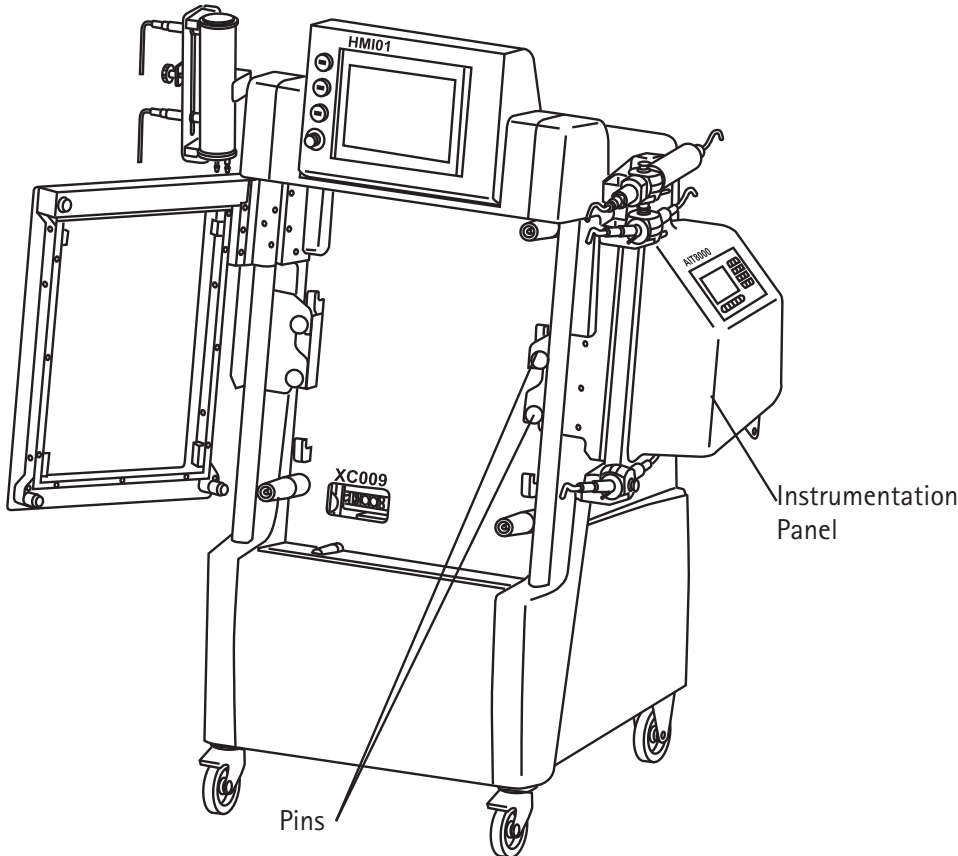
Assembling the Smart Cart

Installing the Column Instrumentation

NOTE

The Column Instrumentation weighs approximately 15 kg. Follow local regulations regarding lifting limits.

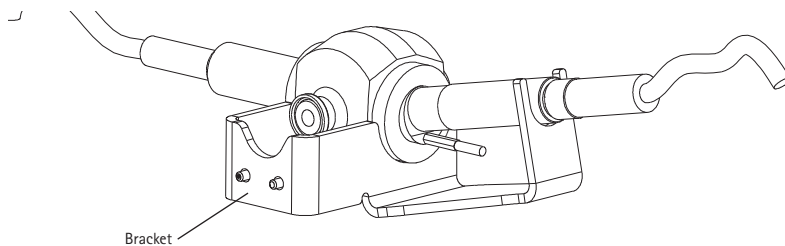
Hook the instrumentation panel onto the two pins located on the right side of the Smart Cart.



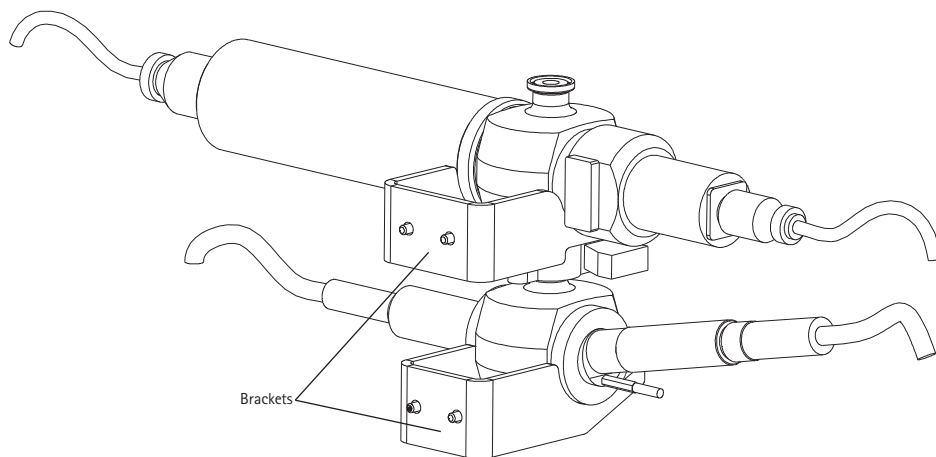
Installing the Instrumentation Panel (shown with Multi-use Instruments)

Installing the Instrument Brackets

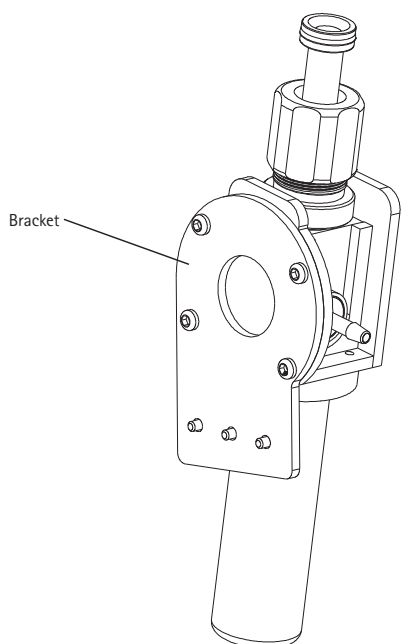
Single and Multi-use instruments require different brackets. The appropriate bracket must be installed on the top and bottom of the Instrumentation Panel Support after it is installed on the cart. The brackets are attached to the Instrumentation Panel Support by screws.



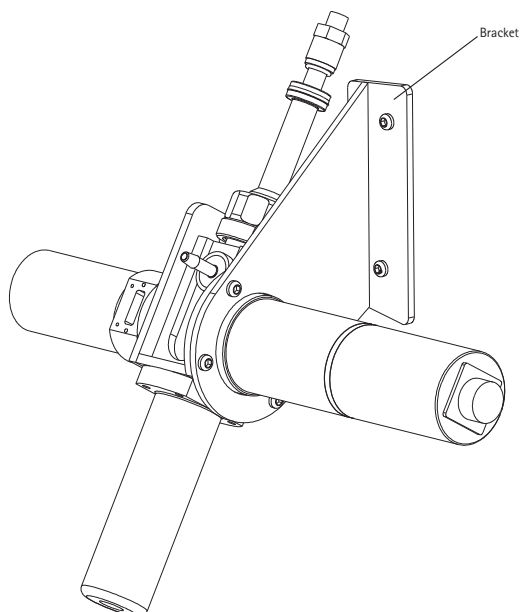
Precolumn Instrumentation Brackets



Post Column Instrumentation Brackets



Pre-column Single Use Instrumentation Brackets



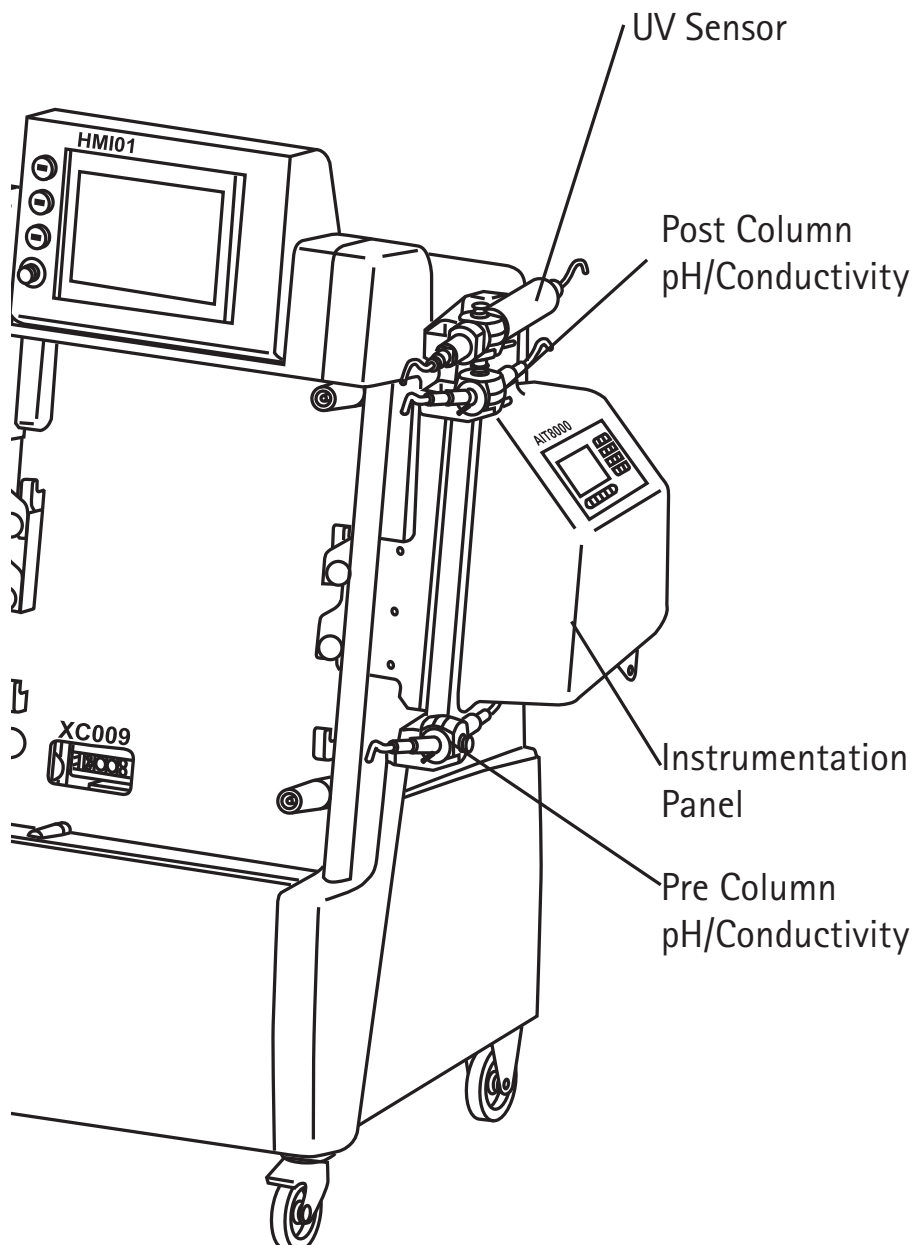
Post Column Single Use Instrumentation Brackets

Installing the Multi-use Instrument Flow Cells

NOTE

Single-use instruments are part of the flexware. Installation instructions are in the following chapter.

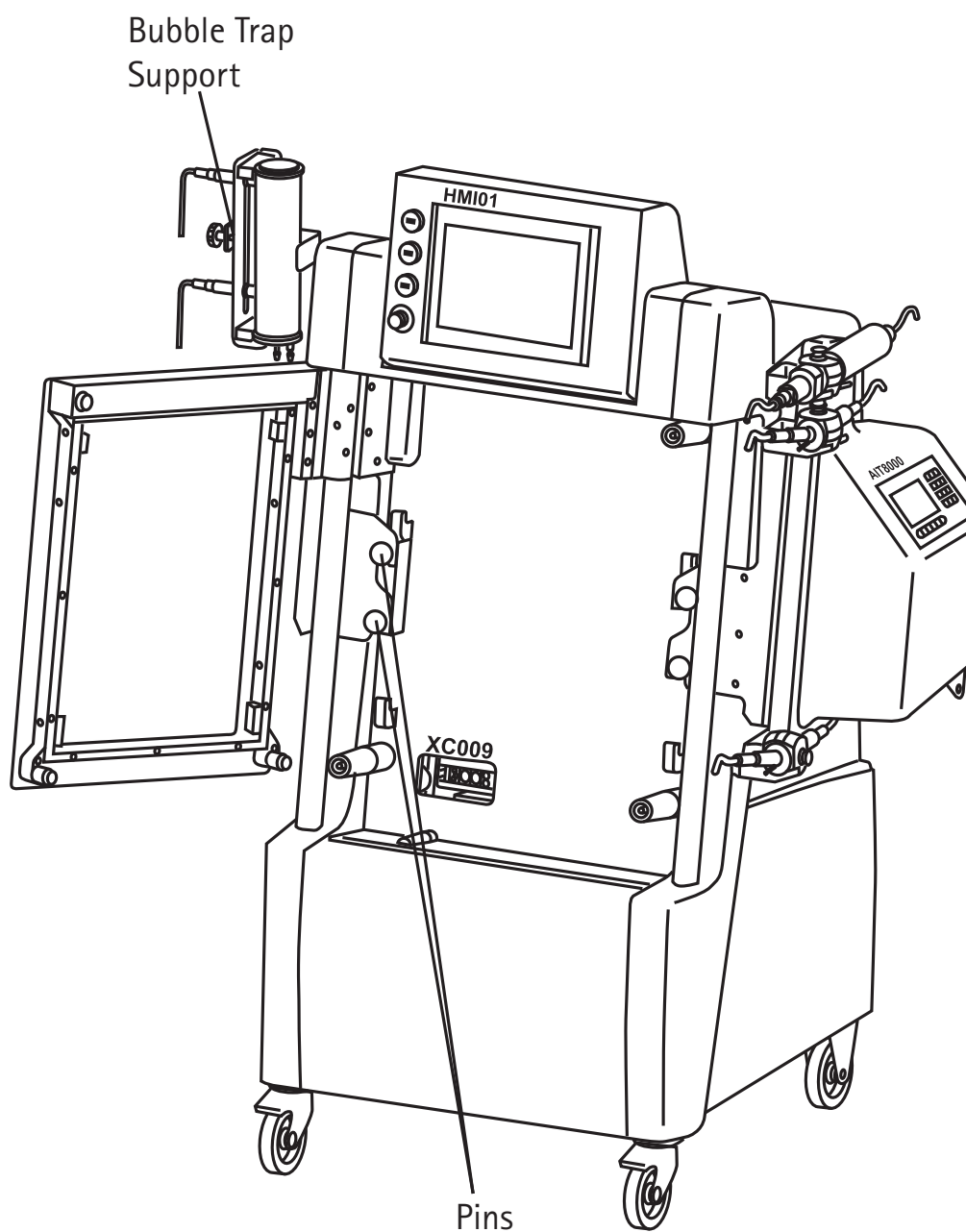
1. Place the pH/Conductivity flow cells (pre and post column) into the supports on the Instrumentation Panel Holder. Note the orientation of the flow cells in the drawing below.
2. Place the pH electrode into the dedicated chambers (pre and post column). Note the orientation of the flow cells in the drawing below.
3. Place the UV sensor (top) into the support. Note the orientation of the sensor in the drawing below.
4. Clamp the outlet of the post column pH/conductivity flow cell to the inlet of the UV flow cell.
5. Connect the cables from the Instrumentation Panel to the appropriate sensors.



Installing the Multi-use Instruments on the Instrumentation Panel

Installing the Bubble Trap (BBT) Support

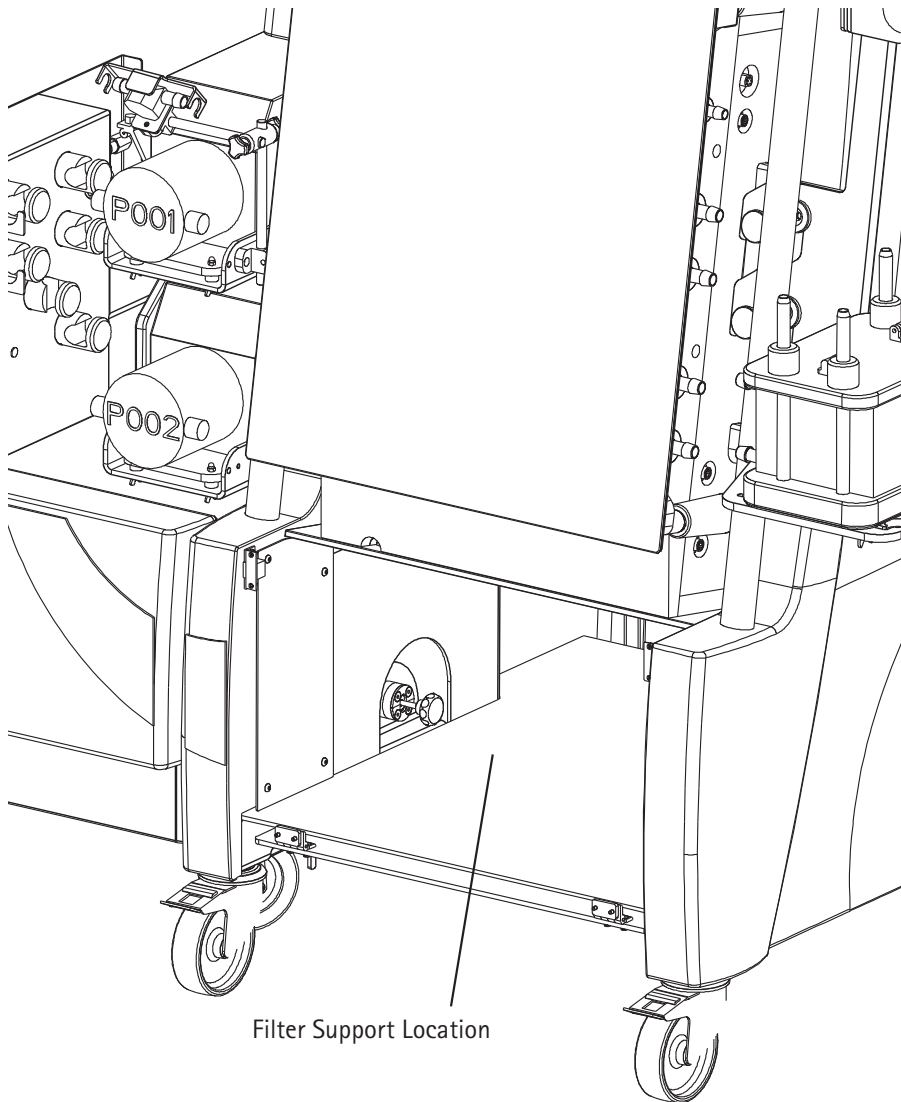
1. Hook the Bubble Trap Support (BBT001 support) onto the pins located on the left side of the Smart Cart.



Installing the BBT support on the Smart Cart

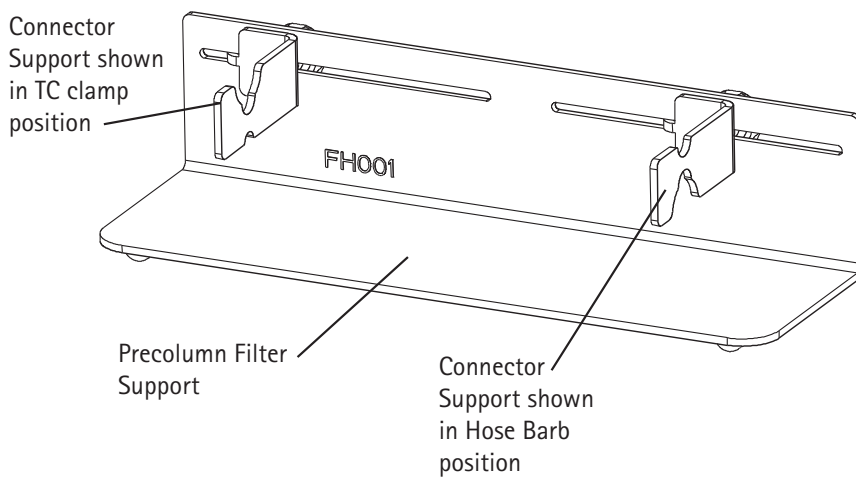
Installing the Precolumn Filter Support

1. Open the service door on the front of the Smart Cart, below the Clamshell door.



Filter Support Location

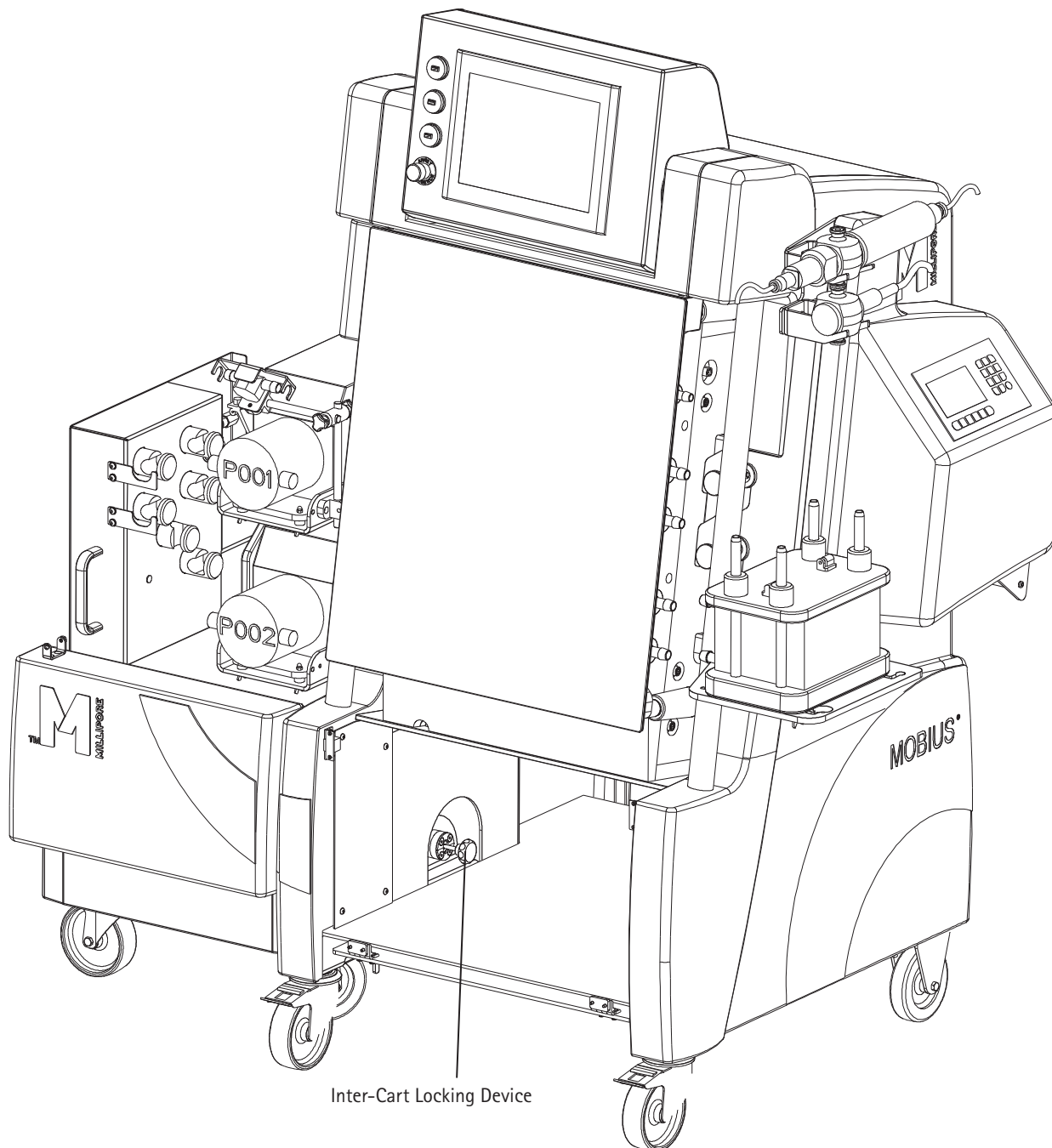
2. Place the Precolumn Filter Support on the floor of the cart.



Precolumn Filter Support

Connecting the Carts

To connect the two carts, position the Smart Cart and lock the wheels. Push the Pump cart towards the Smart Cart until the inter-cart locks slide together and engage. Turn the thumbscrews on the lock clockwise to tighten. Lock the Pump Cart wheels.

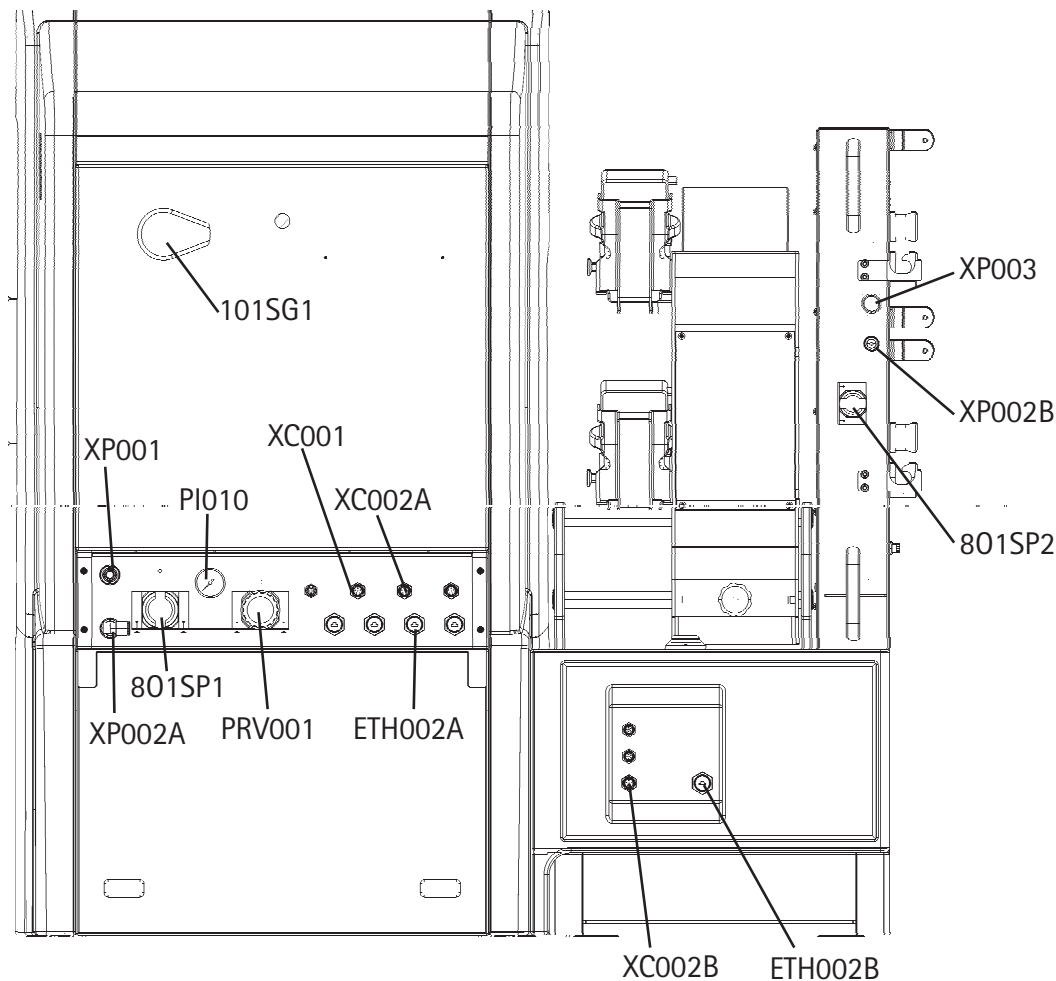


Connecting the Pump Cart with the Smart Cart

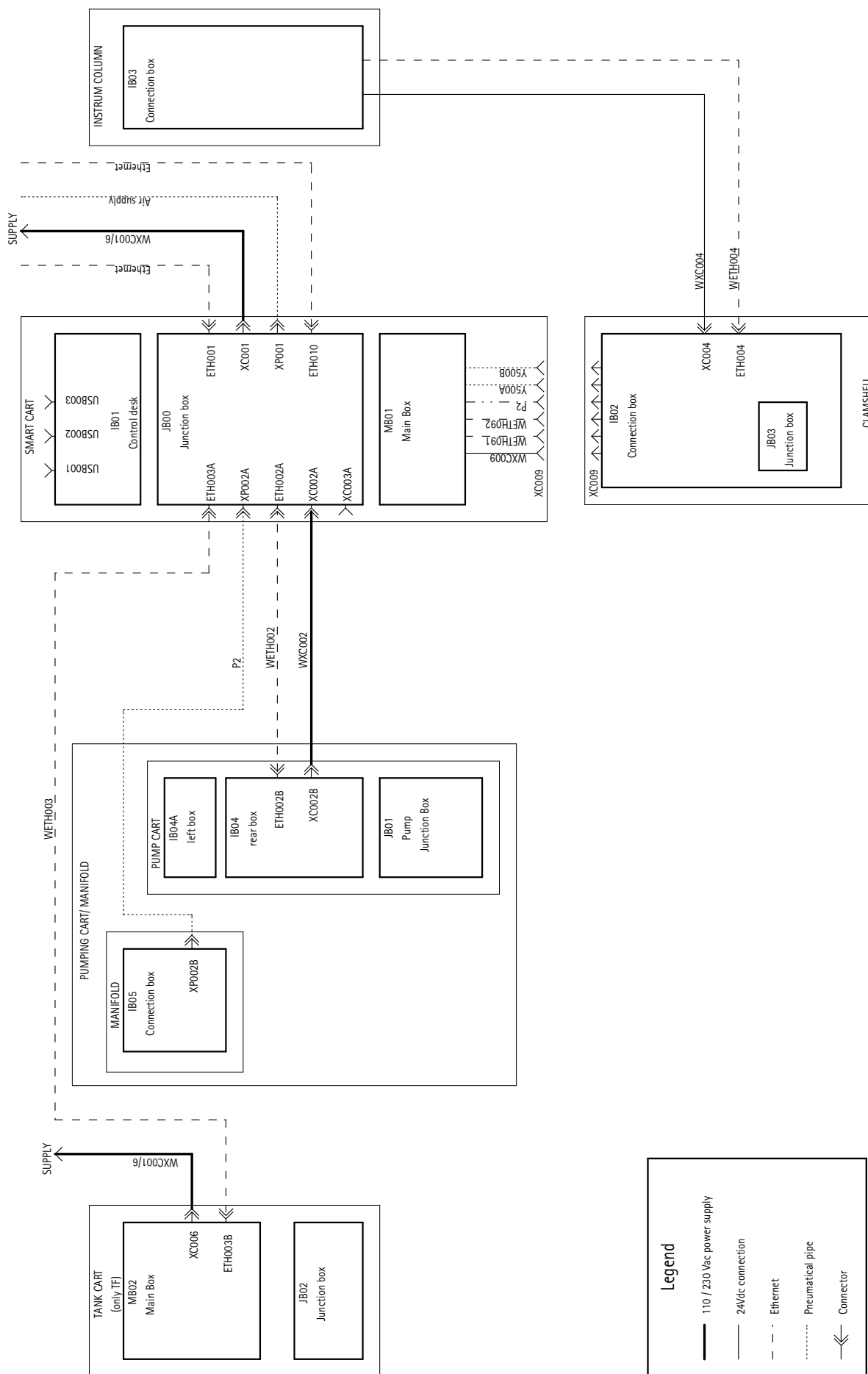
Connecting to Power, Pneumatic and Ethernet Sources

1. Connect XP001 on the Smart Cart to an appropriate compressed air source with ≥ 6 bar pressure (see "Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography").
2. Connect XP002A on the Smart Cart to XP002B on the Manifold.
3. Turn 801SP1 on the rear of the Smart Cart ON. Pressure Sensor PI010 should indicate a pressure ≥ 6 bar.
4. Turn 801SP2 on the manifold ON.
5. Use the Ethernet cable to connect ETH002A on the Smart Cart to ETH002B on the Pump Cart.
6. Connect XC001 on the Smart Cart to the external power supply.
7. Connect XC002A on the Smart Cart to XC002B on the Pump Cart.
8. Turn the main power switch 101SG1 ON.

The following drawing shows the utilities connections for the system.



Utilities Connections



Power, Pneumatic and Ethernet Schematic

Installing the Clamshell

The Smart Cart is delivered with one Clamshell installed. The Clamshell can be removed and replaced with a different unit if required.

All Flexware® Assemblies must be removed from the Clamshell before loading and unloading it onto the system.

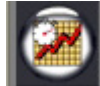
The clamshell is heavy (approximately 80 kg). Use the Clamshell Lift to move the clamshell. If the lift is not used, follow local regulations regarding lifting limits.

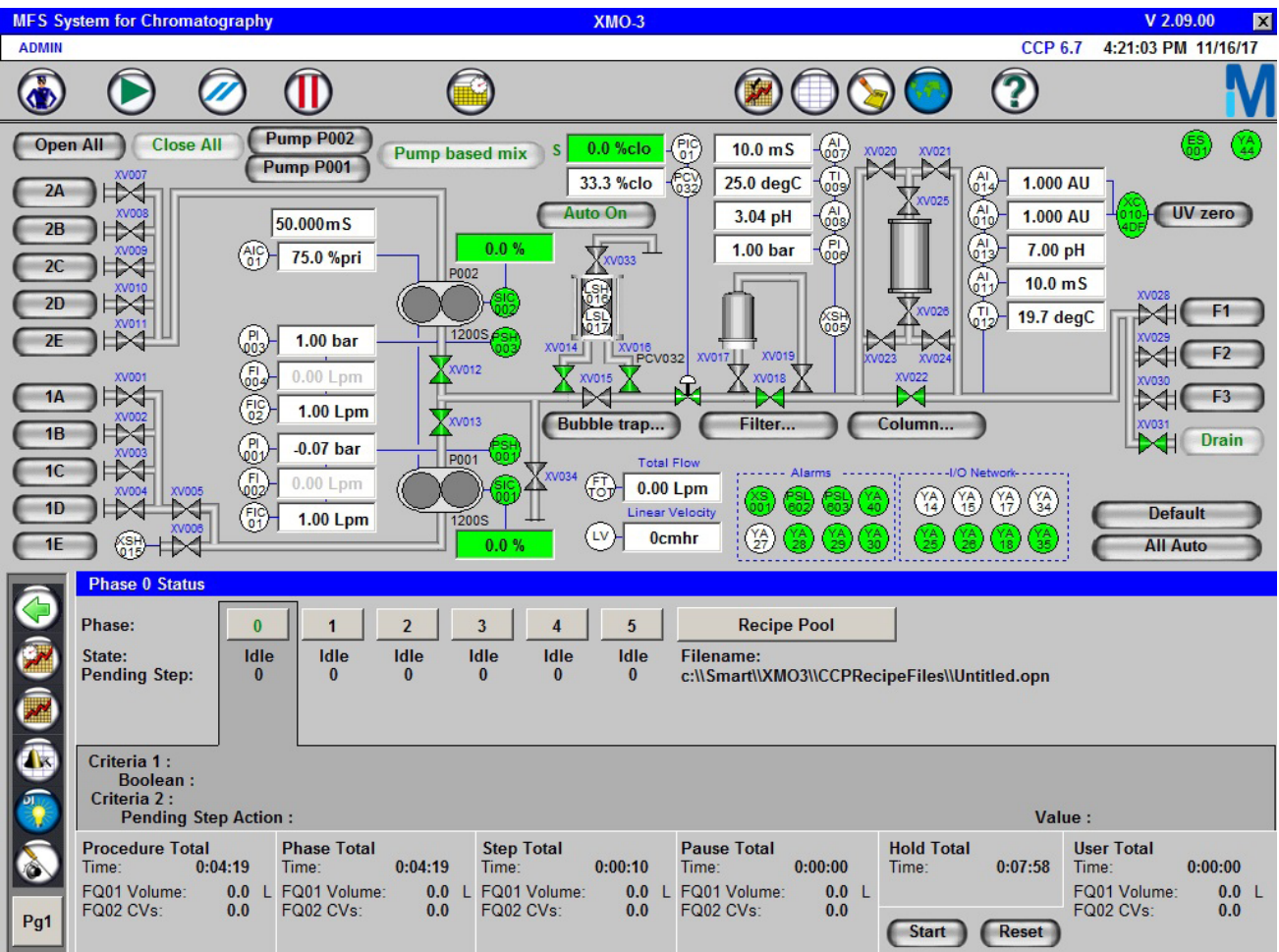
NOTE

The system must be connected to both power and compressed air to remove or install the Clamshell.

Removing the Clamshell in a Smart Cart

Refer to the *Common Control Platform® Overview* section of this manual for instructions on logging in to the system and navigating through the screens.

1. After logging on to the system, select the Operation Status icon .
2. The Phase 0 Status display will appear. Select the Recipe Pool.



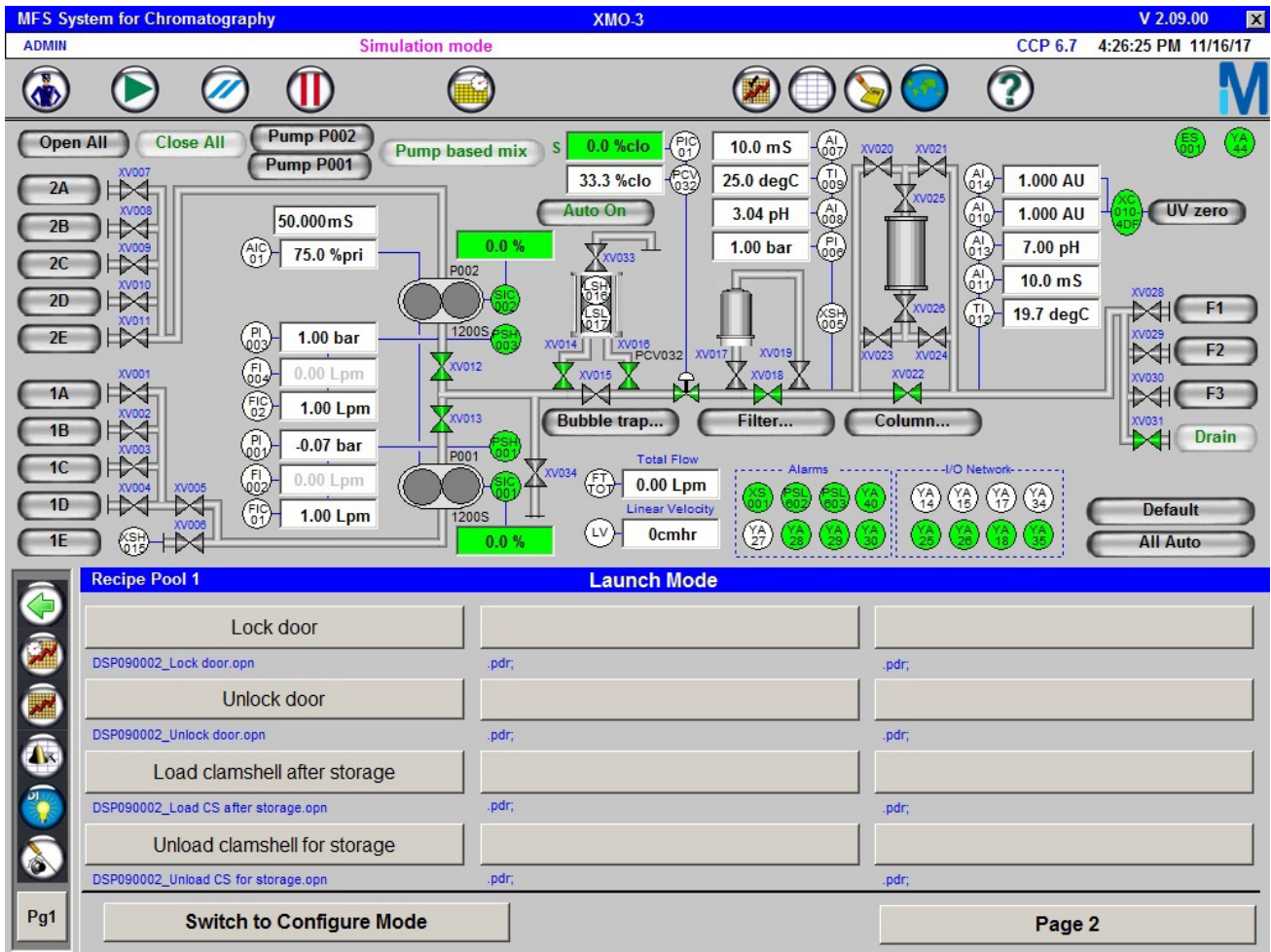
The screenshot displays the MFS System for Chromatography interface. The top bar shows 'MFS System for Chromatography', 'XMO-3', and 'V 2.09.00'. Below this, the 'ADMIN' section includes 'CCP 6.7', '4:21:03 PM', and '11/16/17'. The main interface features a complex process flow diagram with various pumps (P001, P002), valves (XV001-XV034), and sensors (AI, TI, PI, FI, XSH, XSP, XCV, XTO, XTO, XTO). The 'Phase 0 Status' window is open, showing the following information:

Phase:	0	1	2	3	4	5	Recipe Pool				
State:	Idle	Idle	Idle	Idle	Idle	Idle	Filename: c:\Smart\XMO3\CCPRecipeFiles\Untitled.opn				
Pending Step:	0	0	0	0	0	0					
Criteria 1:	Boolean :										
Criteria 2:	Pending Step Action :										
Procedure Total Time:	0:04:19	Phase Total Time:	0:04:19	Step Total Time:	0:00:10	Pause Total Time:	0:00:00	Hold Total Time:	0:07:58	User Total Time:	0:00:00
FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L
FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0

At the bottom of the Phase 0 Status window, there are 'Start' and 'Reset' buttons.

Phase 0 Status display

- The Recipe Pool Launch Mode screen will appear. Select the Unload the Clamshell for Storage recipe.

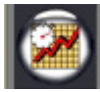


Recipe Pool Launch Mode screen

- Once the door is open, disconnect everything from the Clamshell and remove the Clamshell from the Smart Cart.
- Once the Clamshell is removed and the recipe completed, install the new one following the directions in the *Install the Clamshell into an Empty Smart Cart* section.

Installing the Clamshell into an Empty Smart Cart

The Smart Cart and the Pump Cart must be fully assembled, locked together and connected to an appropriate power and compressed air sources before proceeding. Remove the plug on the Clamshell power cord before installing the Clamshell into the Smart Cart.

- Refer to the *Common Control Platform® Overview* section of this manual for instructions on logging in to the system and navigating through the screens.
- After logging on to the system, select the Operation Status icon .
- The Phase 0 Status display will appear. Select the Recipe Pool.

Phase 0 Status

Phase:	0	1	2	3	4	5	Recipe Pool
State:	Idle	Idle	Idle	Idle	Idle	Idle	Filename: c:\\Smart\\XMO3\\CCPRecipeFiles\\Untitled.opn
Pending Step:	0	0	0	0	0	0	

Criteria 1 :	Boolean :	Criteria 2 :	Pending Step Action :	Value :							
Procedure Total Time:	0:04:19	Phase Total Time:	0:04:19	Step Total Time:	0:00:10	Pause Total Time:	0:00:00	Hold Total Time:	0:07:58	User Total Time:	0:00:00
FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L
FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0

Start Reset

Phase 0 Status display

- 4. The Recipe Pool Launch Mode screen will appear. Select the Load Clamshell After Storage recipe.

Recipe Pool Launch Mode screen

5. Once the door is opened by the recipe, install the Clamshell into the Smart Cart.
6. Once the Clamshell is installed, follow the instructions on the system.
7. Turn the system off by closing the CCP® 6 application, closing the Windows® application and powering down the CPU down.

Connecting Bubble Trap to the Clamshell

Connect the sensors LSL017 and LSH016 on the Bubble Trap Support to the LSL017 and LSH016 connectors on the Clamshell. The height of the sensor should be adjusted during the system start up.

Connecting the Instrumentation to the Clamshell

1. Connect the cable labeled WETH004 from the Column Instrumentation to the Clamshell receptacle ETH004 located on the top right side of the clamshell.
2. Connect the cable labeled WXC004 from the Column Instrumentation to the Clamshell receptacle XC004 located on the top right side of the clamshell.

Power Up the System

Once the Clamshell is installed into the Smart Cart, and all the connections are made, restart the CPU.

TFF Assembling and Setting Up the Hardware

Introduction

The Mobius® FlexReady Smart System for TFF is a modular system that includes the Pump Cart with the manifold, the Tank Cart and the Smart Cart and the Instrumentation Kit. Assemble and connect the carts in the order presented in this chapter.

Assembling the Tank Cart

There are six tank options available for the system:

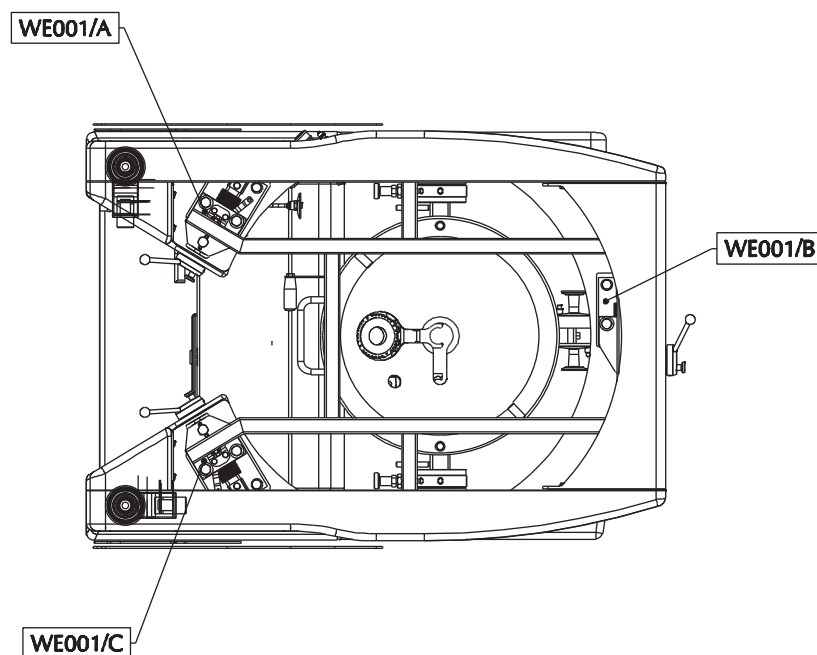
- A 50 L LLDPE tank carrier which can be rotated when installing the Flexware® Assembly.
- A 50 L stainless steel tank carrier with a cooling/heating jacket which can be rotated when installing the Flexware® Assembly.
- A 100 L LLDPE tank carrier which cannot be rotated when installing the Flexware® Assembly.
- A 100 L stainless steel tank carrier with an optional cooling/heating jacket which cannot be rotated when installing the Flexware® Assembly.
- A 200 L LLDPE tank carrier which cannot be rotated when installing the Flexware® Assembly.
- A 200 L stainless steel tank carrier with a cooling/heating jacket which cannot be rotated when installing the Flexware® Assembly.

Unlocking the Feed Container Weight Measurement Load Cells

The tank frame is mounted on three locked load cells (WE001/A, WE001/B, WE001/C) which are mounted on the upper part of the skid frame. Two cells may be accessed through the left side of the cart and the other cell on the right side.

The load cells should be locked when moving the system and unlocked when running the system. If the cart is moved with the load cells unlocked, the load cells must be calibrated before using.

1. Unlock the load cells by rotating the load cell lock to the unlocked position. Unlock the load cells in this order: WE001/B, WE001/A, WE001/C. Once the cells are unlocked, the tank frame should swing freely from left to right.



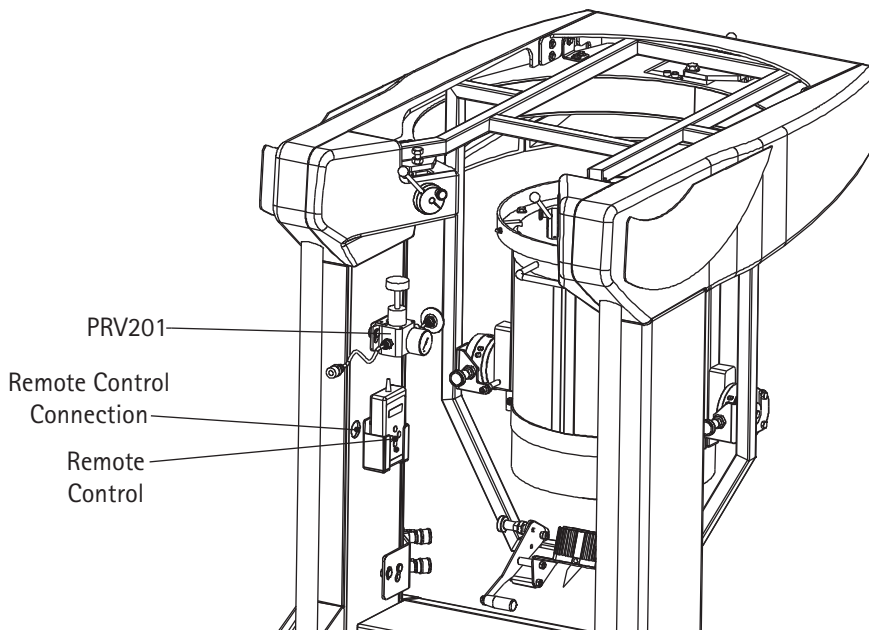
Unlocking the Feed Container Weight Measurement Load Cells

Installing the Feed Container Inflator

The feed container inflator (PRV201) is used to unfold the feed container in the carrier by introducing the air source.

The inflator is located on the left side of the tank cart, just above the electrical box.

Connect the PRV201 inlet to a clean, dry air source using a ½ in. male NPT thread adaptor.



Feed Container Inflator and Remote Control locations.

Installing the Mixer Remote Control Holder

The Mixer Remote Control is used to run the mixer remotely. The holder for the control is located on the left side of the tank cart, just below the Feed Container Inflator.

Connecting the Jacket Fluid Lines

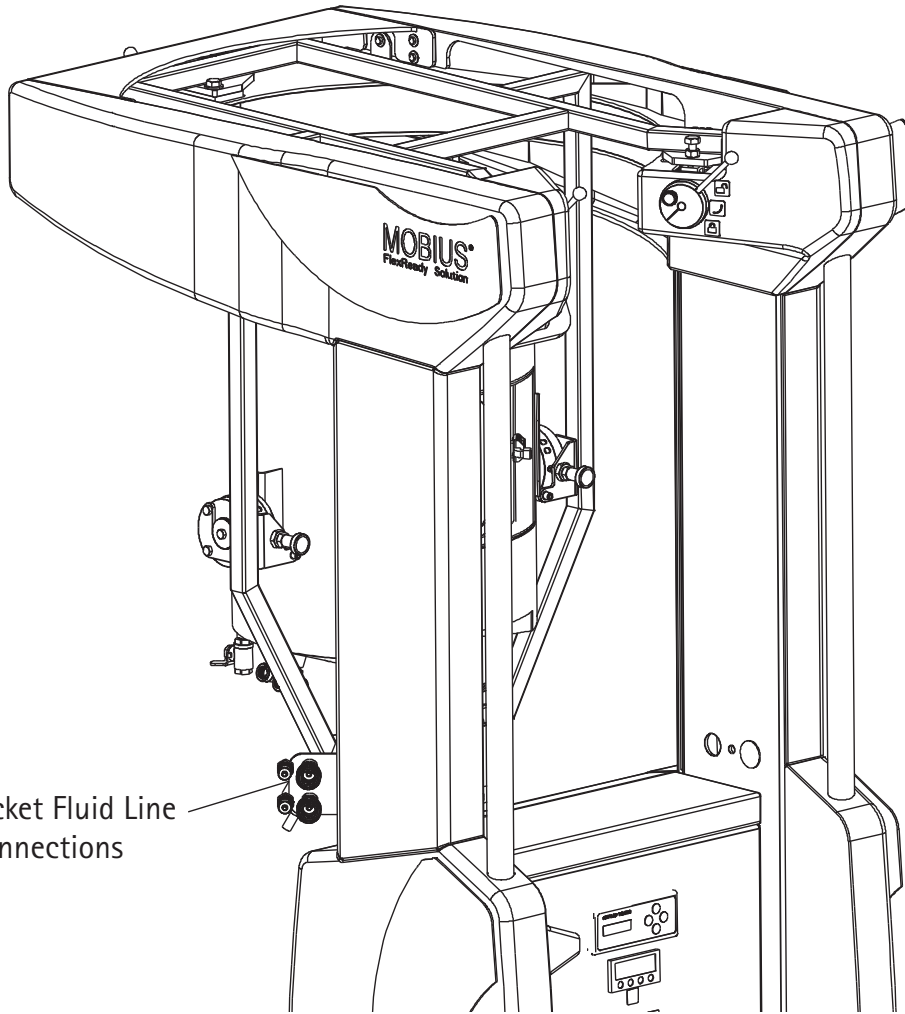
NOTE

The system is not supplied with a pressure safety valve. For ASME compliance, refer to ASME code BPVC section VIII division 1 paragraph 38G-125.

Fill the tank jacket before the Tank Cart is connected to the Pump Cart.

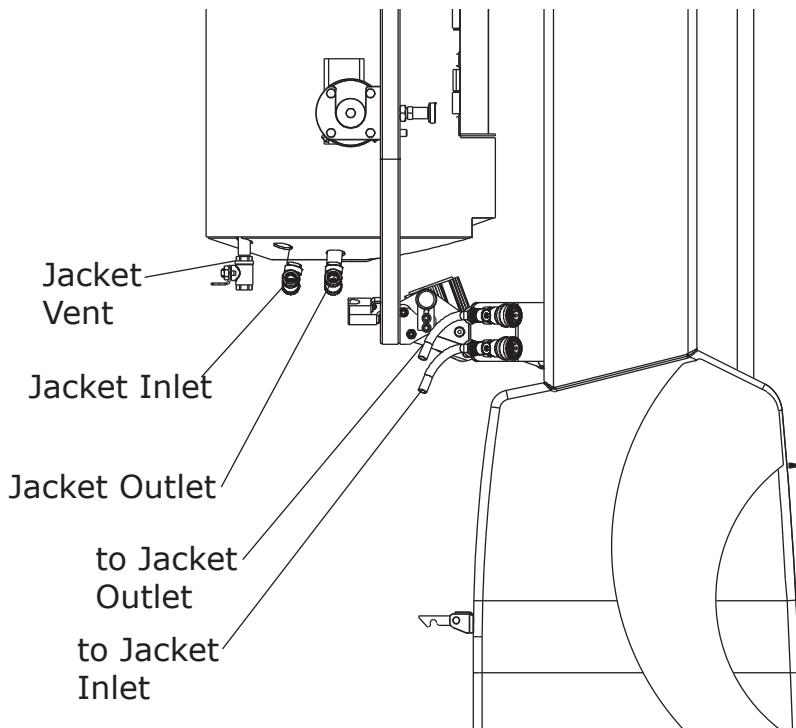
1. Plumb the recirculation heater/chiller to the jacket inlet and outlet connectors.
2. Open the jacket vent and start the flow from the heater/chiller.
3. After flow is steady, the jacket can be completely filled by closing outlet connector. Air in the jacket will exit at the jacket vent port.
4. When liquid is at or near the jacket vent port, open the outlet and close the vent.

At the end of the production, drain the jacket using the outlet port to avoid corrosion of the jacket and vent port clogging.



Jacket Fluid Line Connections

Jacket Fluid Line Location



Jacket Vent

Jacket Inlet

Jacket Outlet

to Jacket Outlet

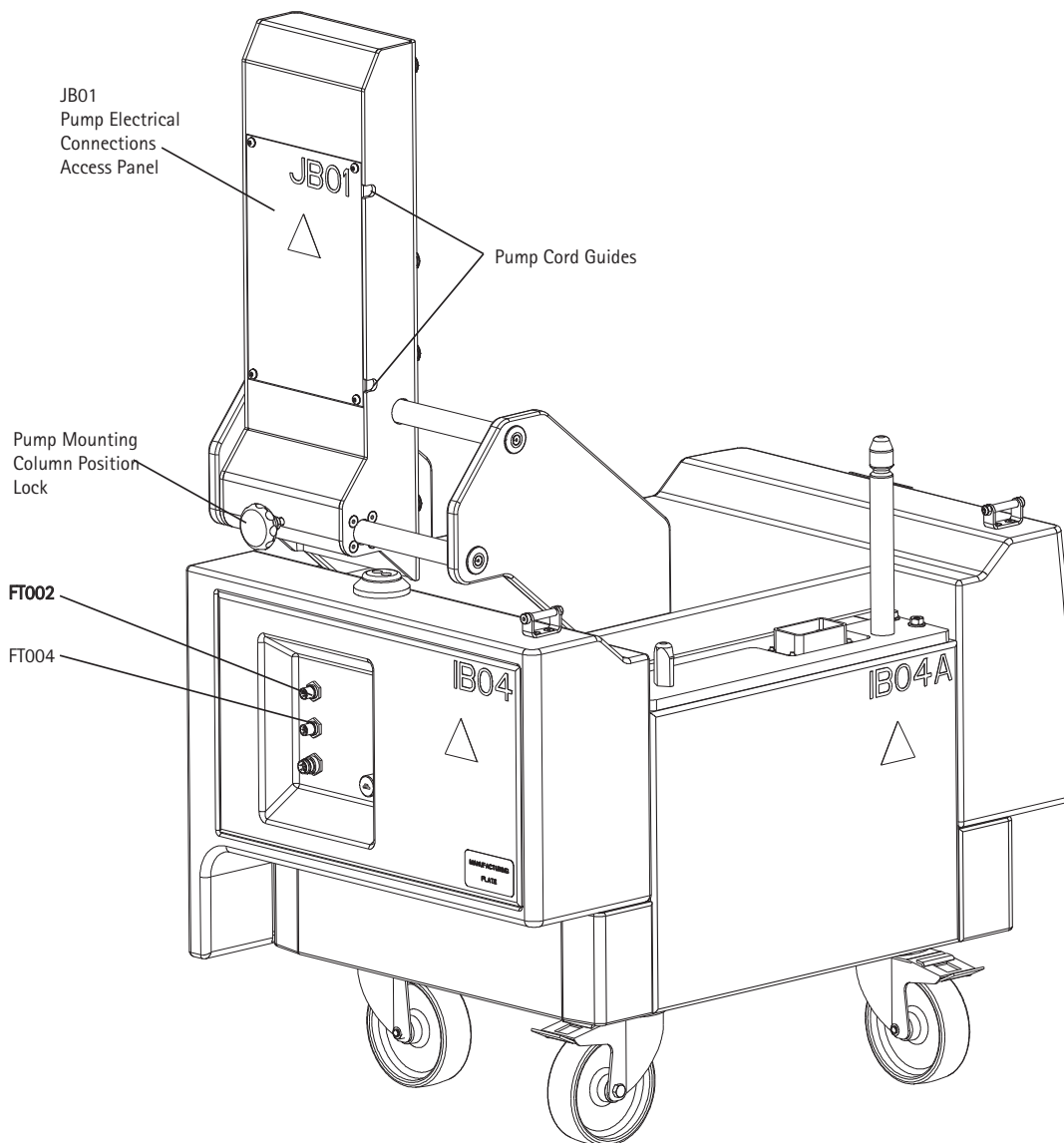
to Jacket Inlet

Jacket Fluid Line Connections

Assembling the Pump Cart

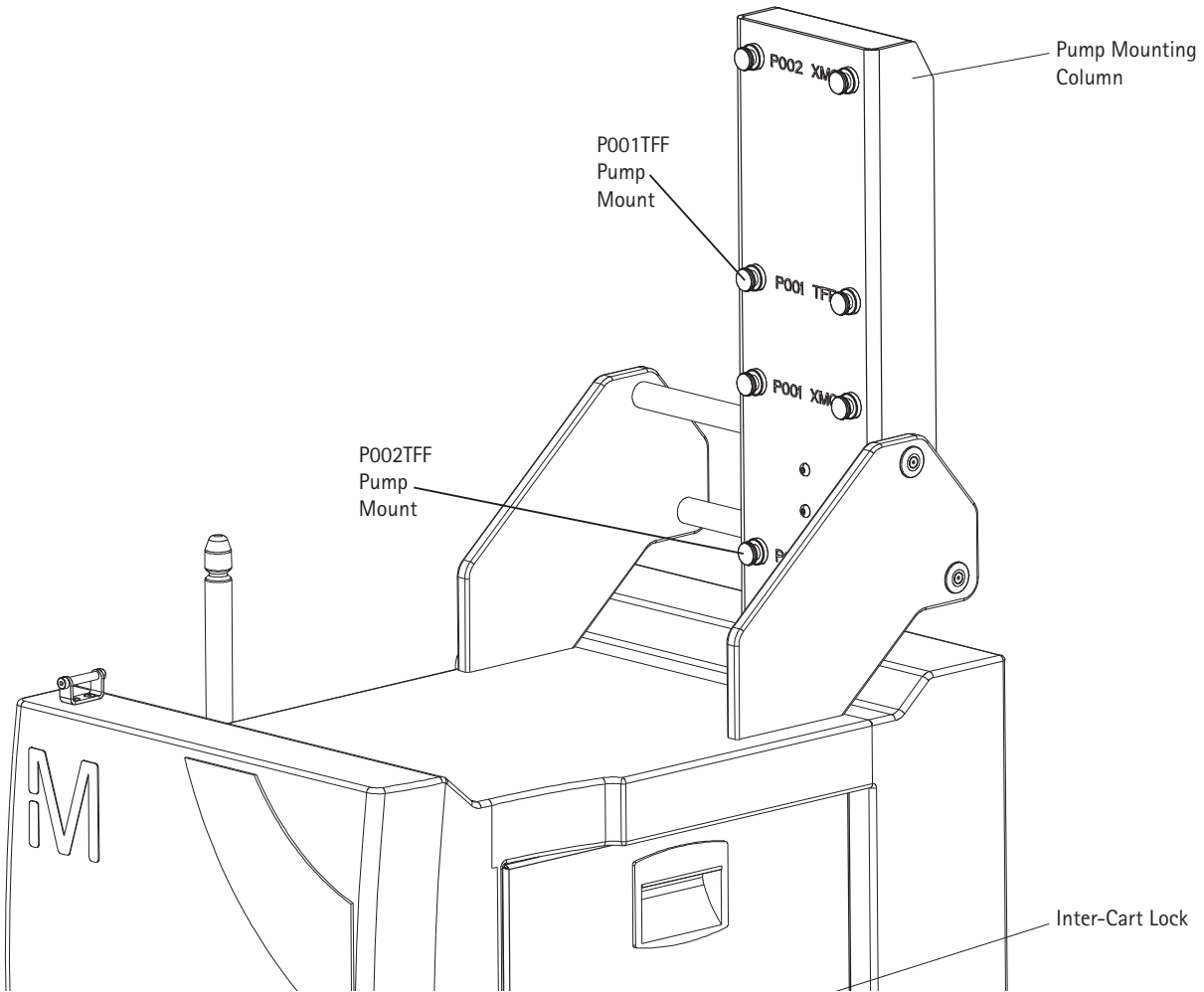
Installing the Pumps – TF2S

1. Position the pump tower on the right side on the pump cart, as shown below, and lock it in place using the knob on the rear of the column.



Locking the pump and flowmeter column into position.

2. Install pump P002 onto the bottom pump position (P002TFF) on the pump column.
3. Install pump P001 in the top pump position (P001TFF) on the pump column.

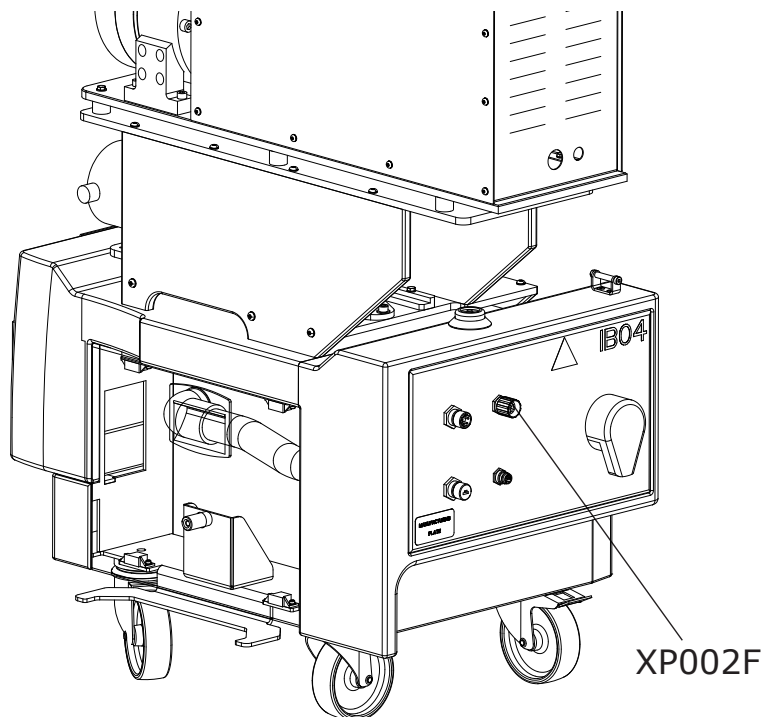


Pump mounting positions

4. Remove the Pump Electrical Connections Access Panel JB01 with a no. 3 Allen wrench. Plug the pumps into the appropriate connectors.
5. Guide the cords through the slot in the top right corner of the panel for P001 and at the bottom corner of the panel for P002.
6. Replace the panel.
7. Replace the screws.

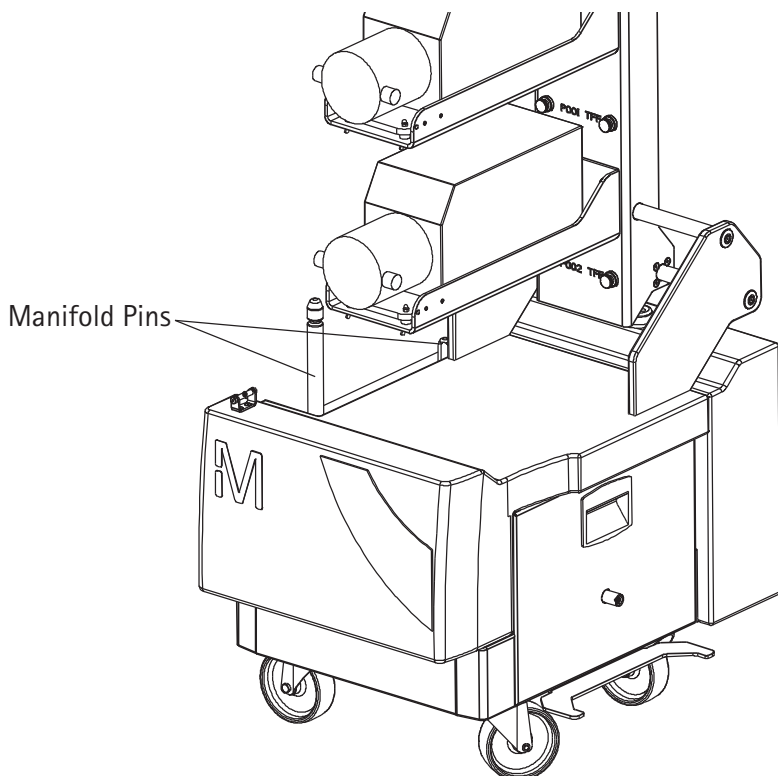
Installing the Pumps – TF3S

Plug the pump P002 into the connector XP002F.

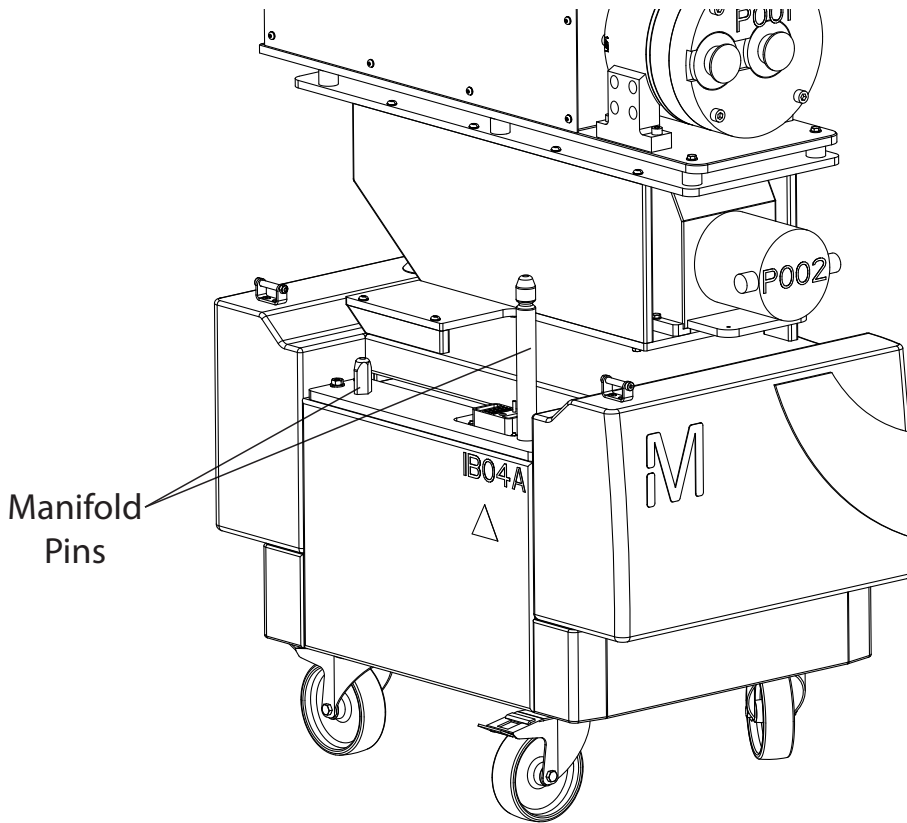


Installing the Manifold

1. Locate the two manifold pins on the pump cart.

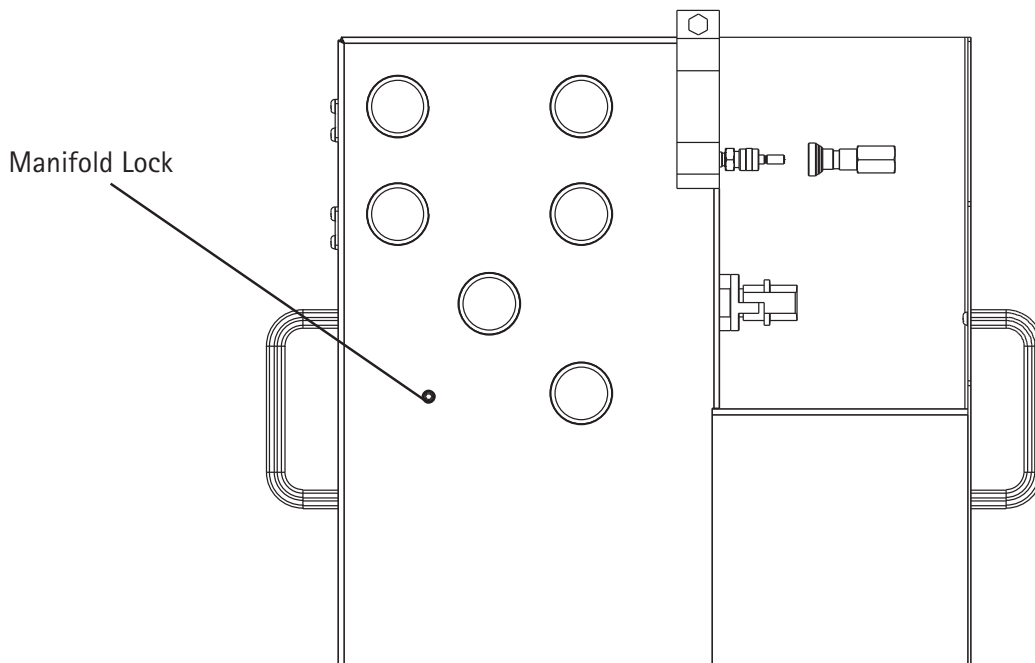


Locating the manifold pins on the TF2S pump cart.



Locating the manifold pins on the TF3S pump cart.

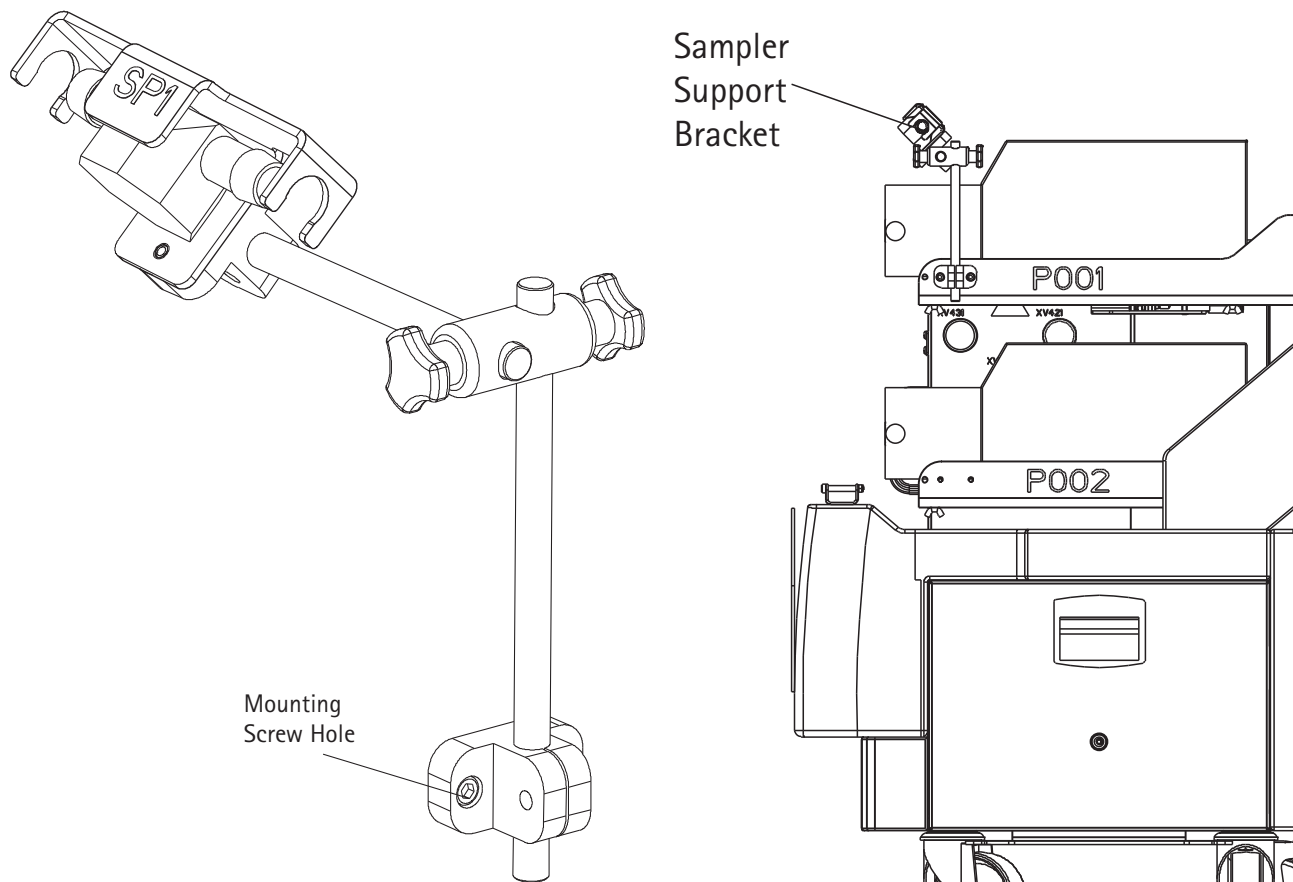
2. Guide the manifold over the pins, with the pinch valves on the manifold towards the pumps, until the manifold is resting on the cart. Lock the manifold in place using a no. 4 Allen wrench.



Manifold to Pump Cart Lock location.

Installing the Sampler Support - TF2S

The sampler support will be installed on the feed pump P001 shelf with screws. If a flowmeter is installed, remove it before installing the sampler support. The lock nut can be used to adjust the position of the Sampler Support.

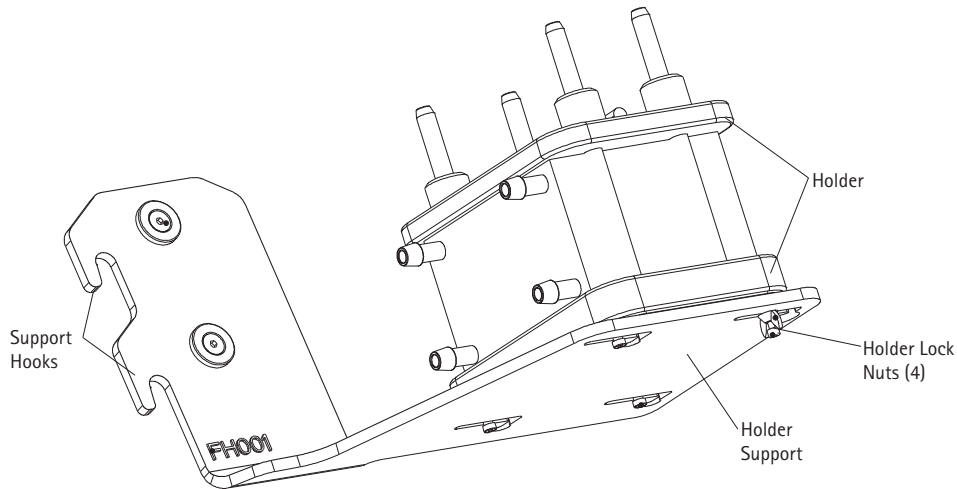


Sampler Support and location

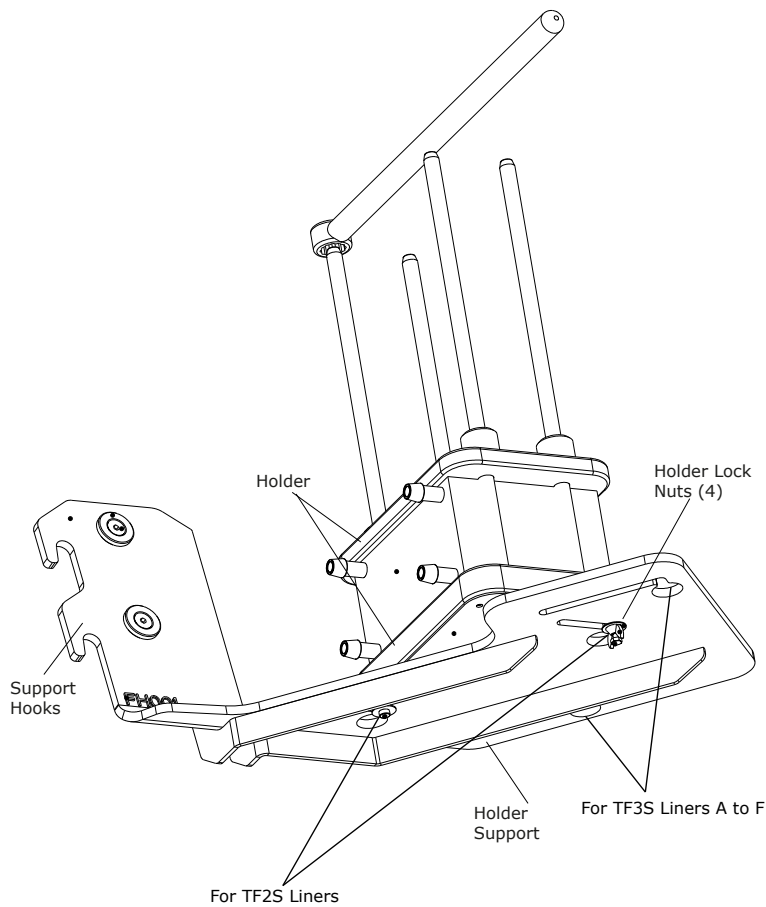
Assembling the Smart Cart

Installing the TFF Cassette Holder Support

1. Hook the holder support onto the pins located on the right side of the Smart Cart.

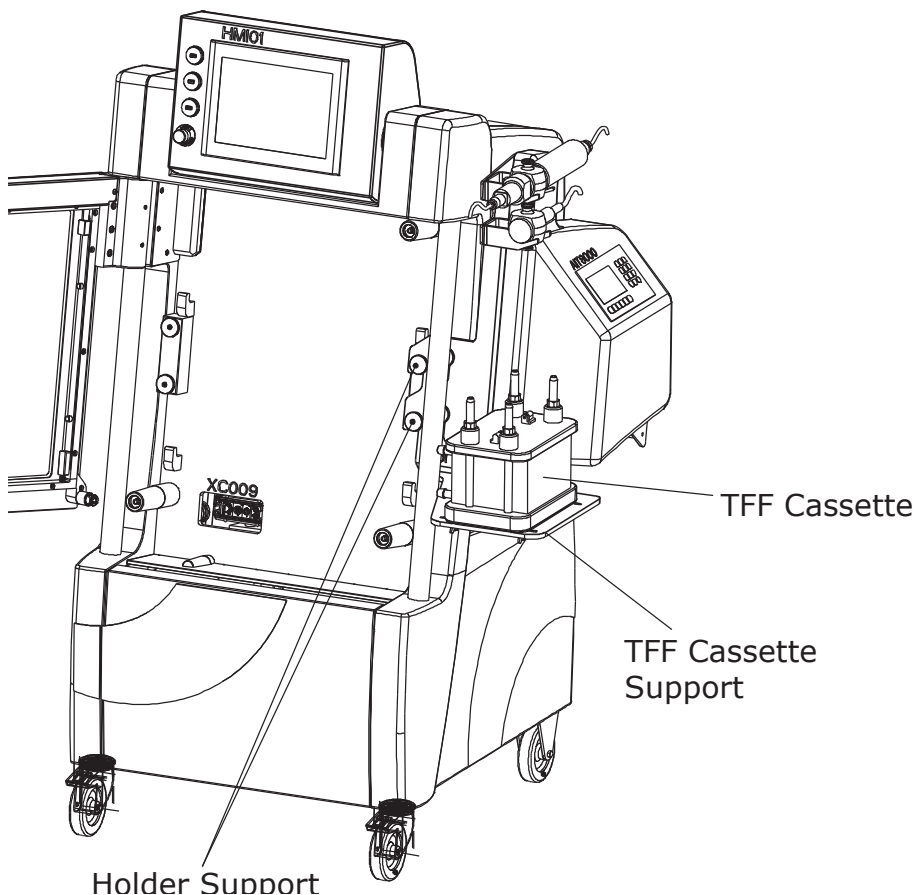


TFF Cassette Support and Holder for TF2S systems.

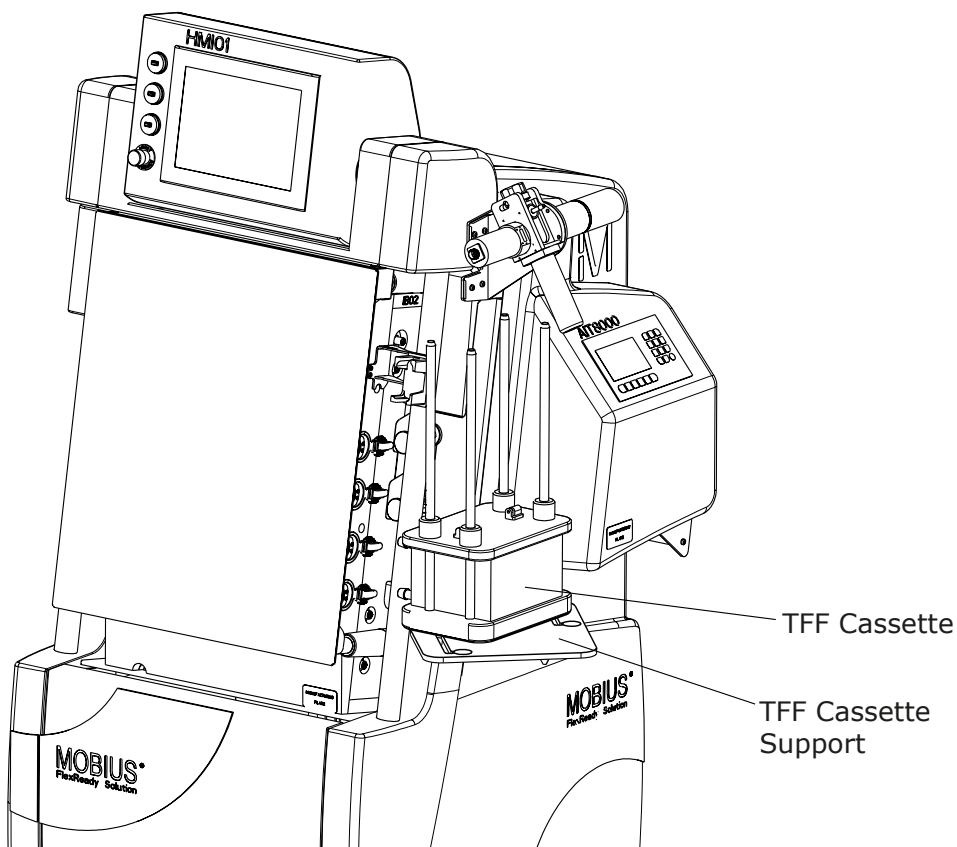


TFF Cassette Support and Holder for TF3S systems.

2. The TFF cassettes will be installed with the Flexware® assemblies.



Installing the TFF Cassette Holder Support on the TF2S



Installing the TFF Cassette Holder Support on the TF3S

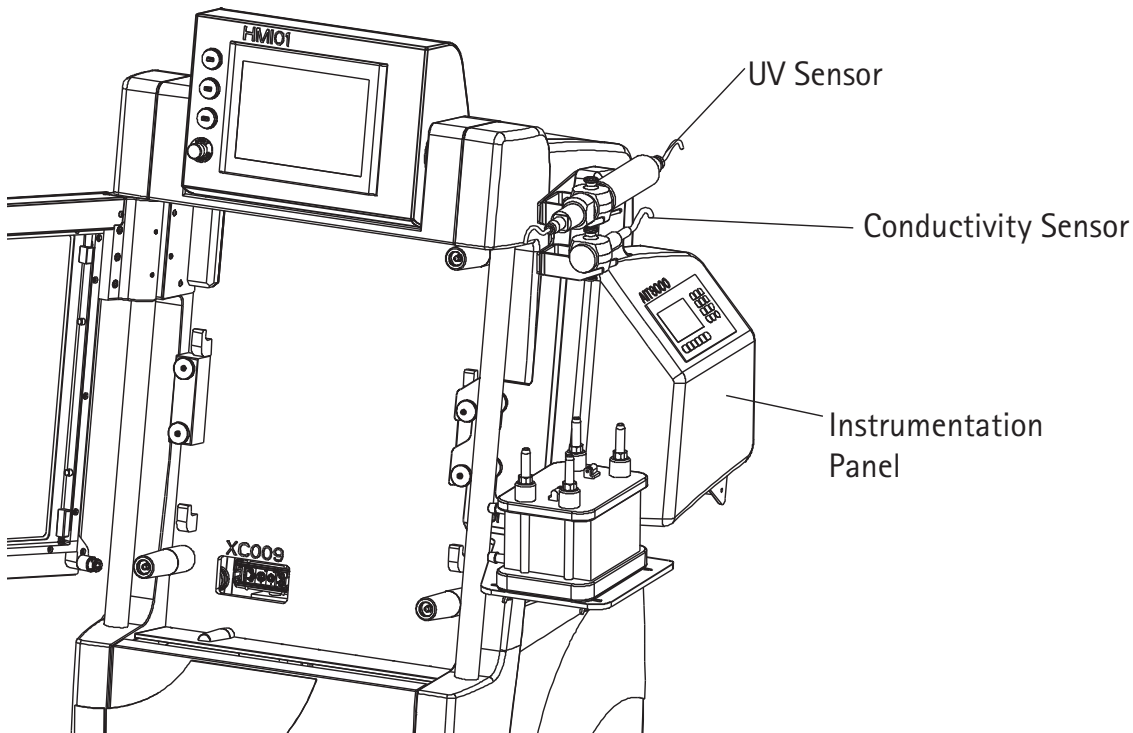
Installing the Filtrate Instrumentation Kit

NOTE

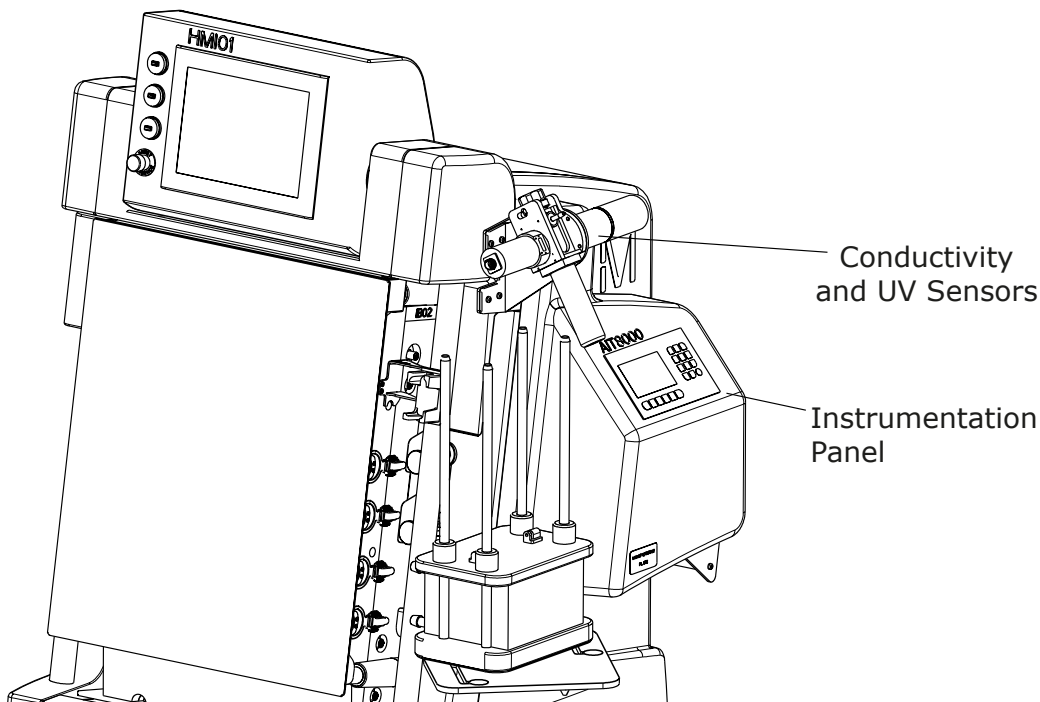
The TFF Cassette Holder Support must be installed before the Filtrate Instrumentation Kit is installed. The TFF Cassette Holder weighs approximately 10 kg.

The Filtrate Instrumentation Kit weighs approximately 15 kg. Follow local regulations regarding lifting limits.

Hook the instrumentation panel support onto the two pins located on the right side of the Smart Cart.



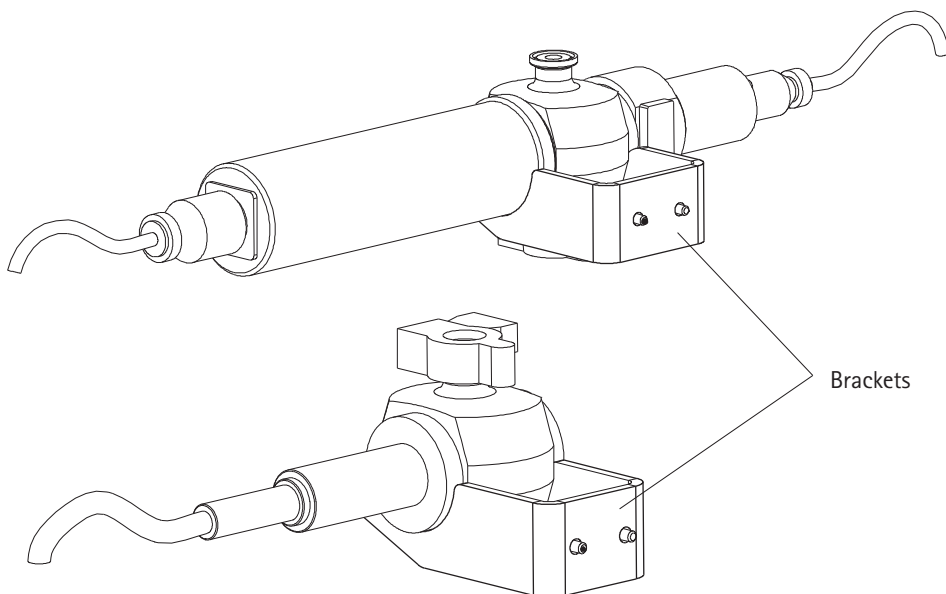
Installing the Instrumentation Panel (shown with Multi-use Instruments) on the TF2S.



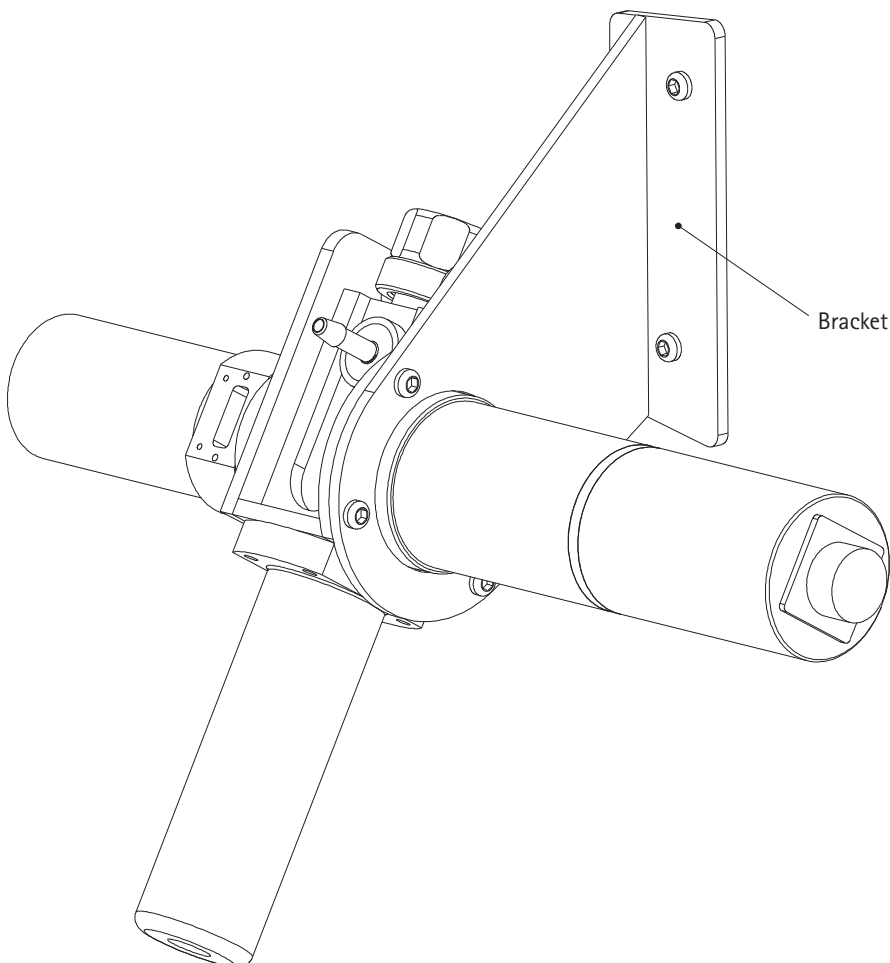
Installing the Instrumentation Panel (shown with Multi-use Instruments) on the TF3S.

Installing the Instrument Brackets

Single and Multi-use instruments require different brackets. The appropriate bracket must be installed on the top of the Instrumentation Panel Support after it is installed on the cart. The brackets are attached to the Instrumentation Panel Support by screws.



Multi-use Instrument Brackets - TF2S



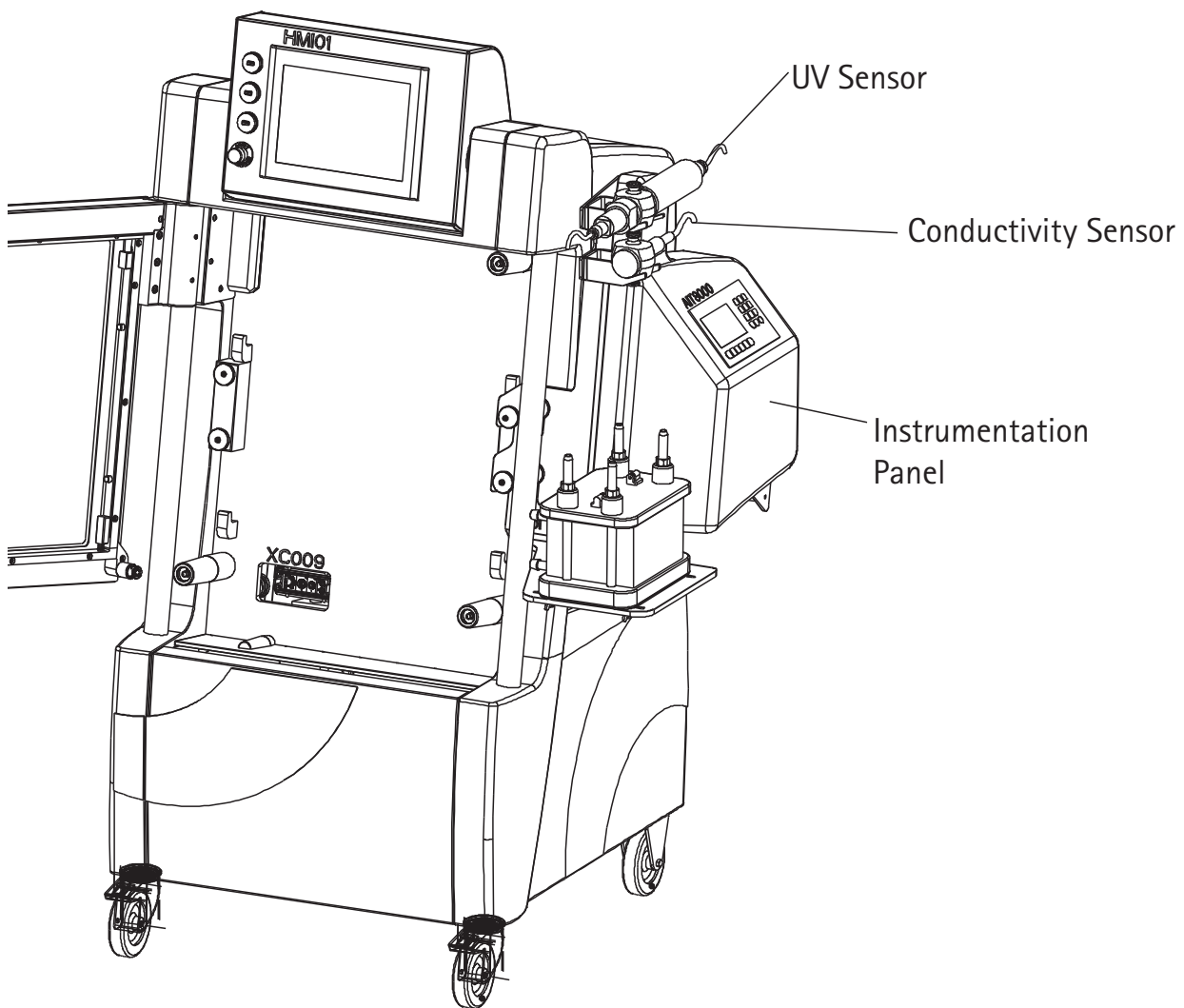
Single Use Instrument Bracket - TF2S

Installing the Multi-use Instrument Flow Cells

NOTE

Three instrument configurations are available: UV and Conductivity, UV only and Conductivity only. The UV and Conductivity option is shown here.

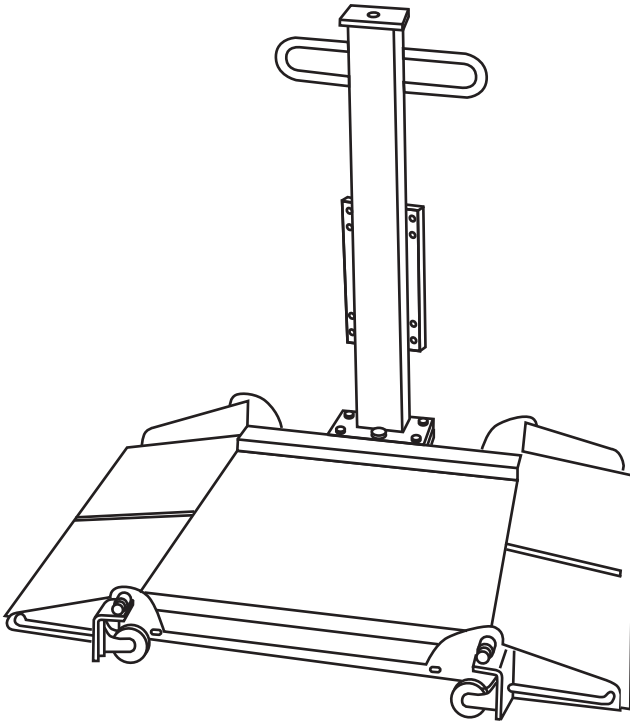
1. Place the Conductivity flow cell onto its bracket on the Instrumentation Panel Support. Note the orientation of the flow cells in the drawing below.
2. Place the UV sensor (top) onto its bracket. Note the orientation of the flow cells in the drawing below.
3. Clamp the outlet of the conductivity flow cell to the inlet of the UV flow cell.
4. Connect the cables from the Instrumentation Panel to the appropriate sensors. Refer to electrical schematic.



Installing the Multi-use Instruments on the TF2S Instrumentation Panel Support

Installing the Filtrate Weight Scale WE101

1. Move the scale to its final position near the Smart Cart.
2. Place the scale on the floor with the hinged ramp in the down position.
3. Connect the plug to the bulkhead connector WE101 located on the back of Smart Cart.
4. Ensure that the cable is properly guided and cannot be twisted.
5. Refer to manufacturer's documentation on the CD for instructions on calibrating the scale.



Weight Scale

NOTE

For information on operating the scale, refer to the manufacturer's documentation on the System Documentation CD.

Installing the User Supplied Filtrate Weight Scale WT102

A user supplied Filtrate Weight Scale may be connected to the Clamshell on WT102 connector. For wiring details refer to the electrical schematics on the System Documentation CD.

1. Move the scale to its final position near the Smart Cart.
2. Connect the plug to the bulkhead connector on the Clamshell. Tighten the plug to the bulkhead with the metal locking nut.
3. Ensure that the cable is properly guided and not twisted.
4. Refer to the manufacturer's documentation for instructions on calibrating the scale.

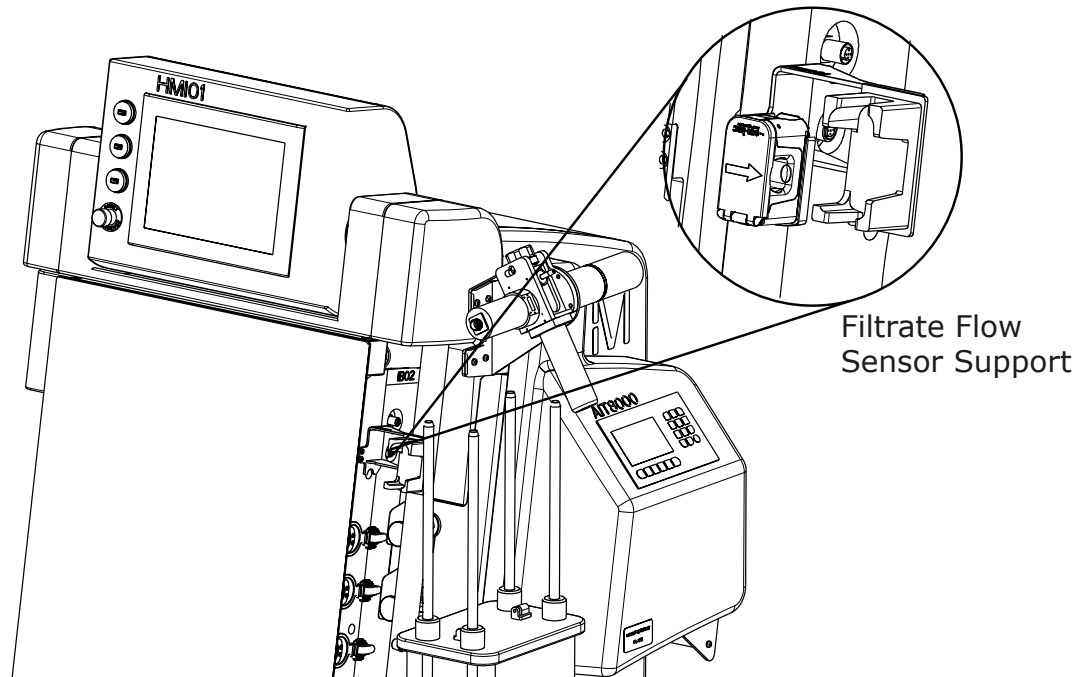
Installing the User Supplied Filtrate Flowmeter FT101

A user supplied Flowmeter may be connected to the Clamshell on the FT101 connector. For wiring details refer to the electrical schematics on the System Documentation CD.

1. Position the flowmeter as close as possible to the instrumentation side of the Smart Cart.
2. Connect the plug to the bulkhead connector on the Clamshell. Tighten the plug to the bulkhead with the metal locking nut.
3. Ensure that the cable is properly guided and not twisted.
4. Refer to the manufacturer's documentation for instructions on calibrating the flowmeter.

Installing the Optional Filtrate Flowmeter FE101

1. Install the clamp-on flow sensor in the support FE101. The flow sensor rotates to the left and right in the support so that the clamp follows the tubing slope once clamped onto the tubing. Ensure the flow direction follows the flow indicator arrow on the sensor.

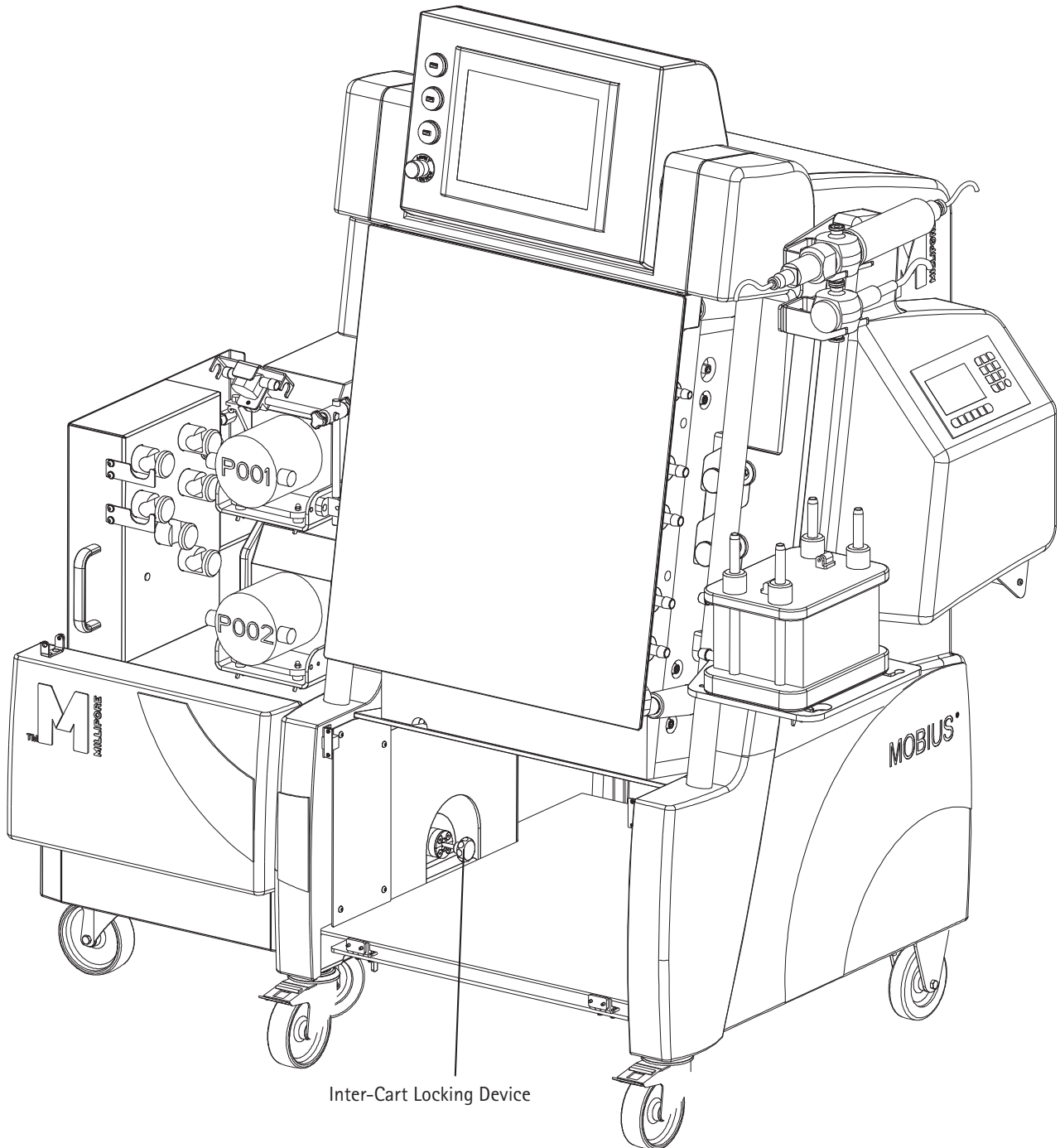


Flow Sensor location

2. Connect the cable from the flow sensor FE101 and the transmitter box FIT101.
3. Connect the cable from the transmitter box FIT101 to the connector FT101 on the clamshell.
4. Install the transmitter box FIT101 in an accessible location.

Connecting the Carts

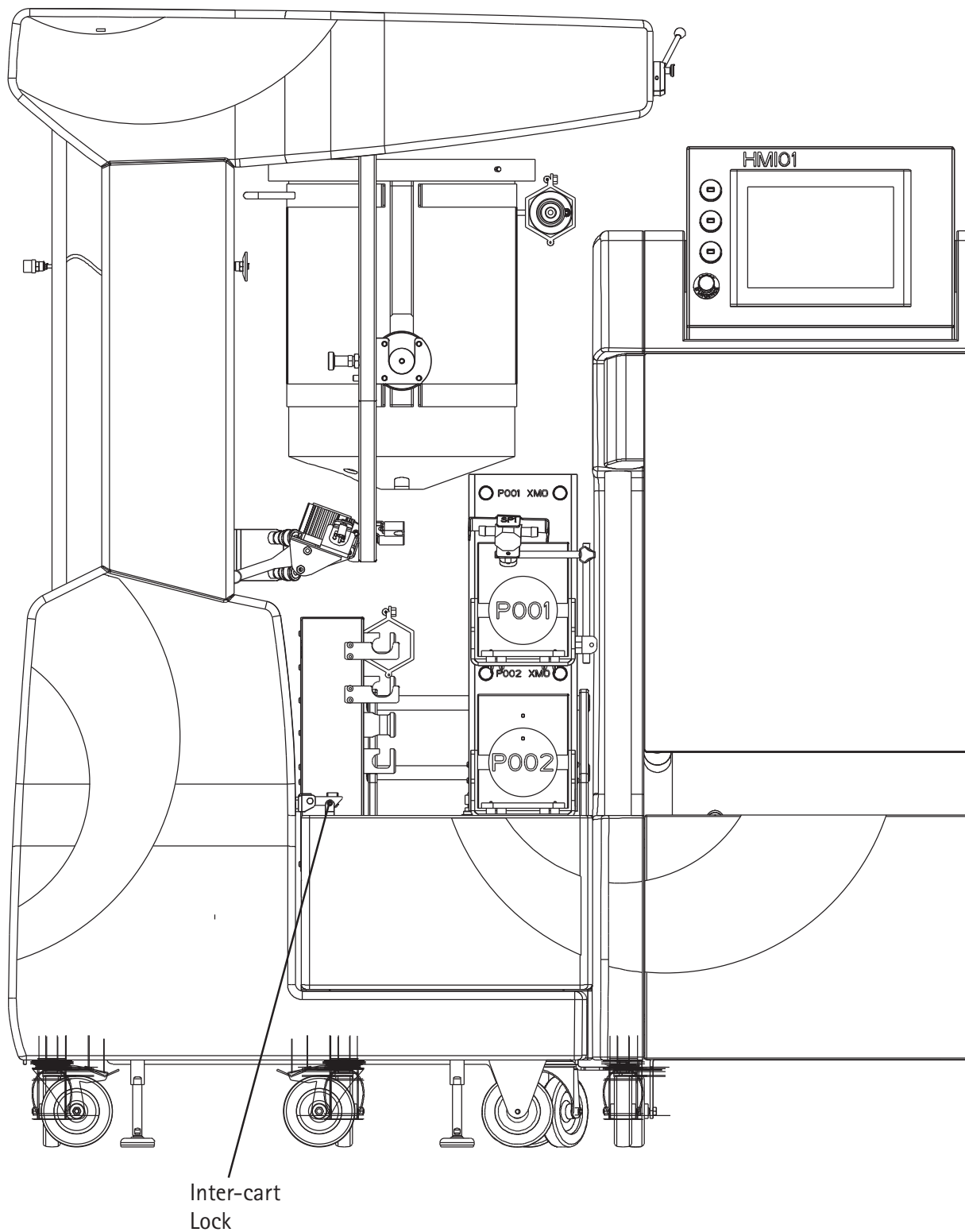
To connect the three carts, position the Smart Cart and lock the wheels. Push the Pump Cart towards the Smart Cart until the inter-cart locks slide together and engage. Turn the thumbscrews on the lock clockwise to tighten. Lock the Pump Cart wheels. Ensure that the wheels on the pump cart are properly aligned so that the tank cart can be positioned correctly.



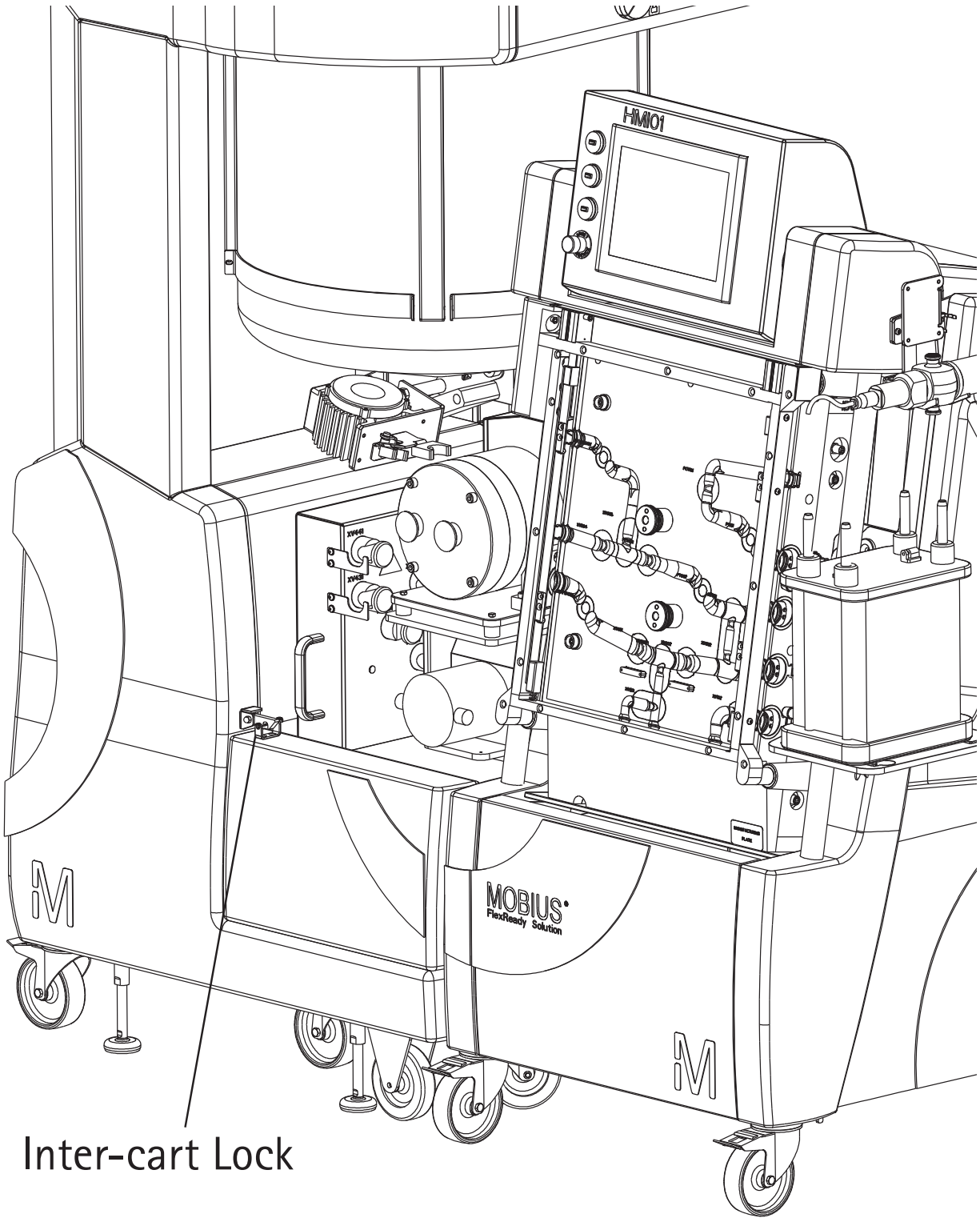
Inter-Cart Locking Device

Connecting the Pump Cart with the Smart Cart

Push the Tank Cart towards the Pump Cart until the inter-cart locks slide together and engage. Lock the Tank Cart wheels.



Connecting the TF2S Pump Cart with the Tank Cart



Inter-cart Lock

Connecting the TF3S Pump Cart with the Tank Cart

Connecting to Power, Pneumatic and Ethernet Sources

1. Connect XP001 on the Smart Cart to an appropriate compressed air source with ≥ 6 bar pressure (see "Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF").
2. Connect XP002A on the Smart Cart to XP002B on the Manifold.
3. Turn 801SP1 on the rear of the Smart Cart ON. Pressure Sensor PI010 should indicate a pressure of ≥ 6 bar.
4. Turn 801SP2 on the manifold ON.
5. Use the ethernet cable to connect ETH002A on the Smart Cart to ETH002B on the Pump Cart.
6. Connect ETH003A on the Smart Cart to ETH003B on the Tank Cart.

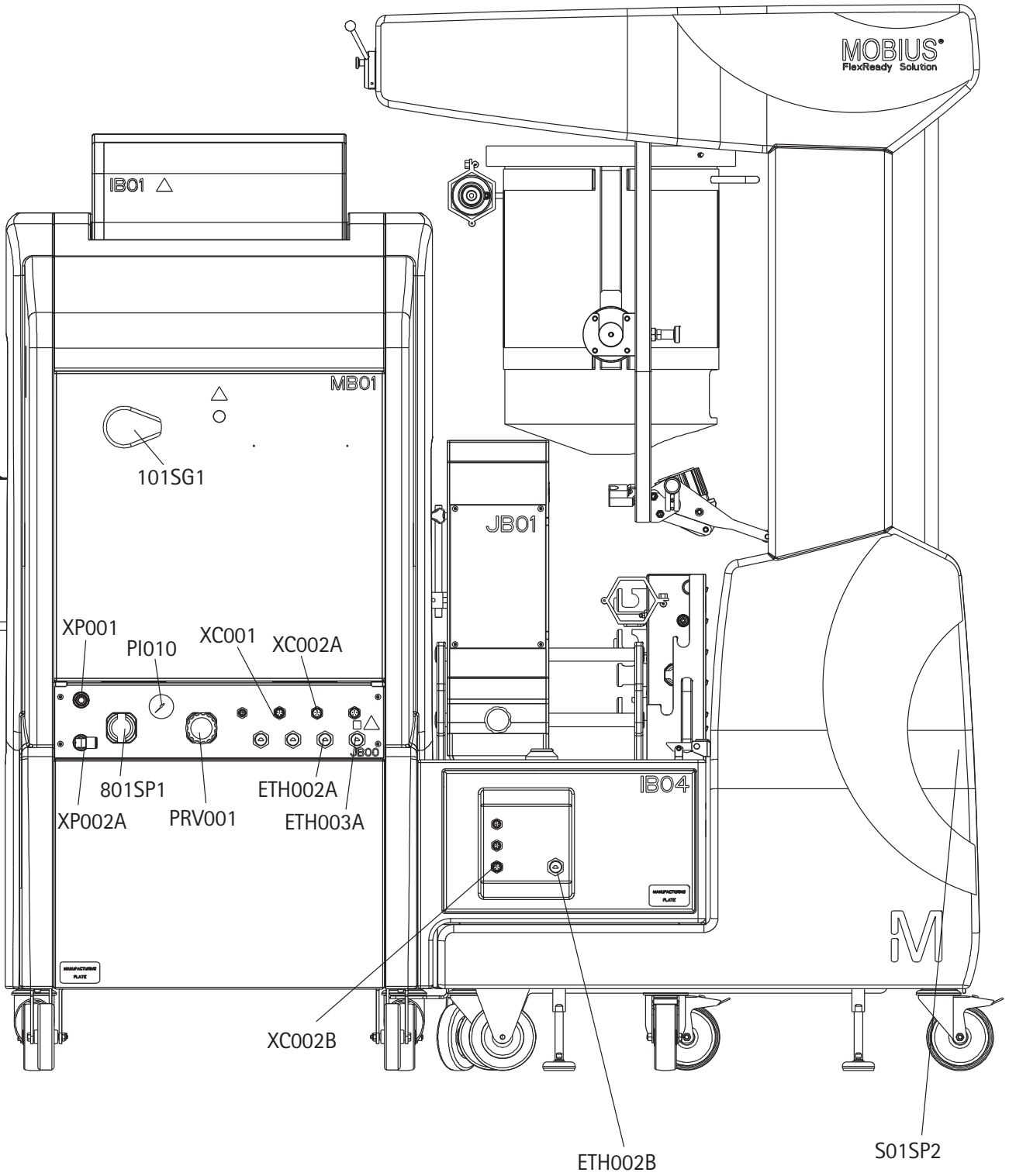
TFF-2.5 m² only:

1. Connect XC002A on the Smart Cart to XC002B on the Pump Cart.
2. Connect XC001 on the Smart Cart to the external power supply.
3. Turn the main power switches 101SG1 on the Smart Cart and 101SG2 on the Tank Cart to the ON position.

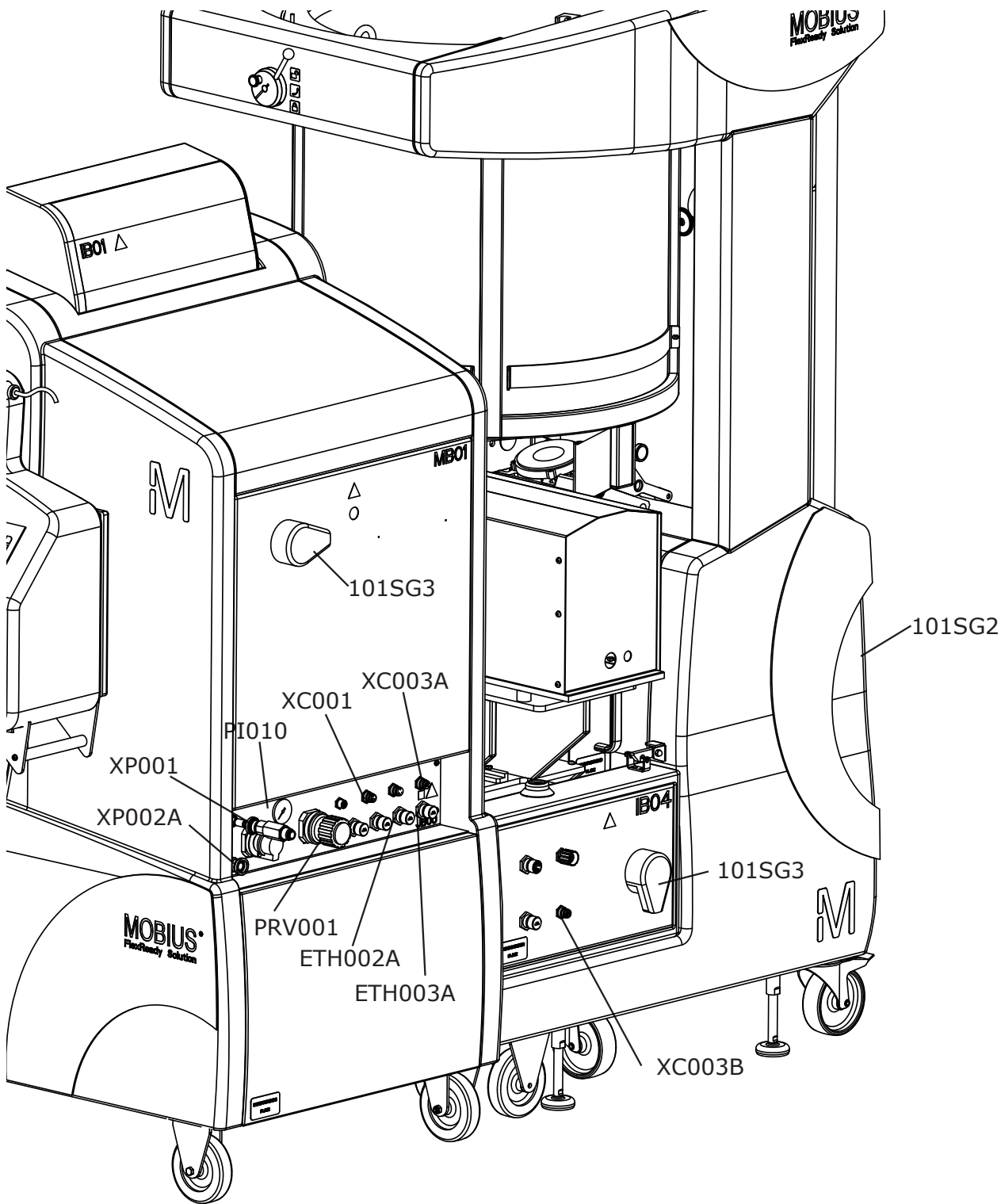
TF3S only:

1. Connect XC011 on the Pump Cart to the external power supply.
2. Connect XC003A on the Smart Cart to XC003B on the Pump Cart.
3. Connect XC001 on the Smart Cart to the external power supply.
4. Connect XC005 on the Tank Cart to the external power supply.
5. Turn the main power switches 101SG1 on the Smart Cart and 101SG2 on the Tank Cart to the ON position.
6. Turn the power switch 101SG03 on the Pump Cart to the ON position.

The following drawings shows the utilities connections for the system.

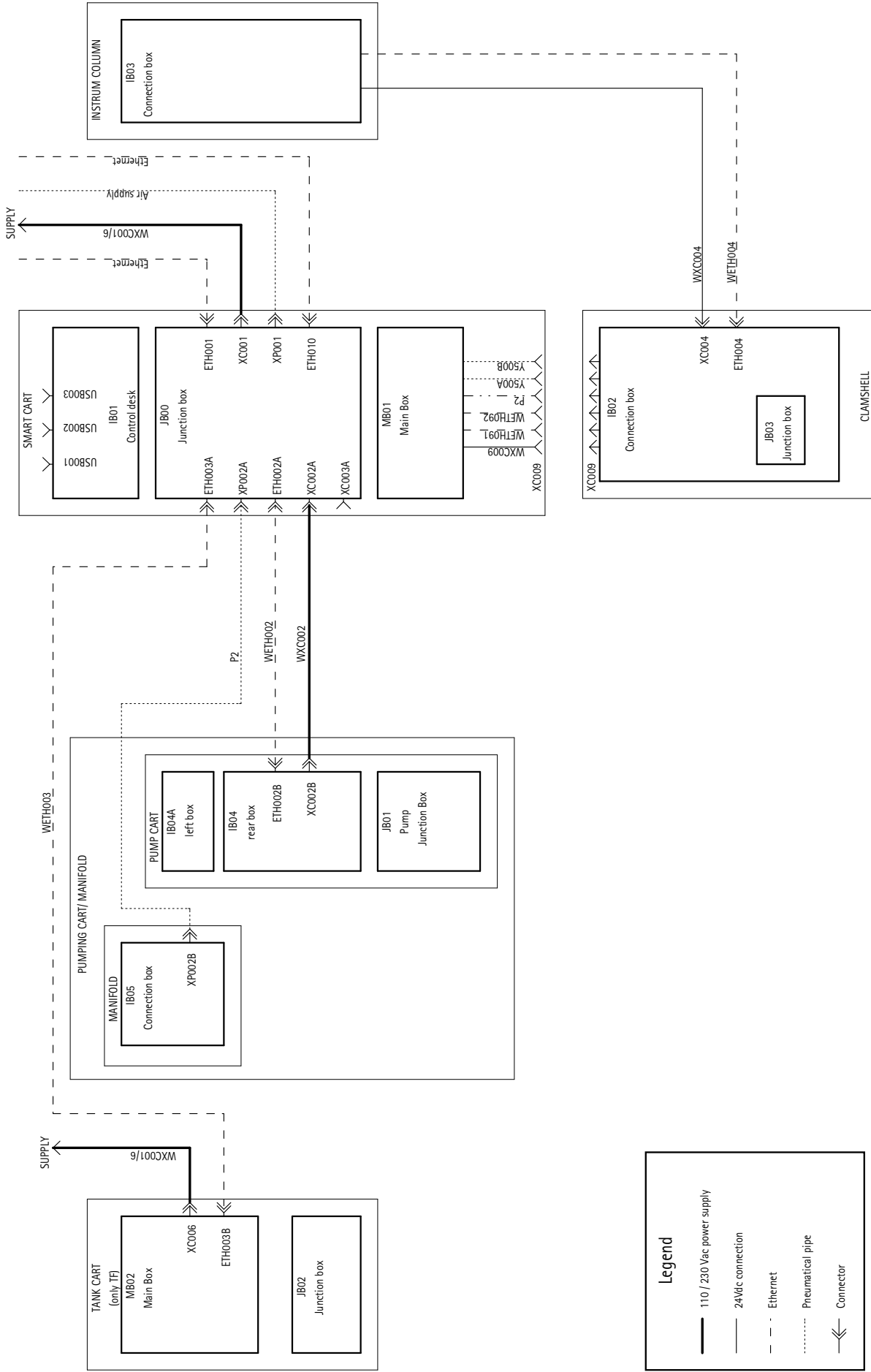


TF2S Utilities Connections

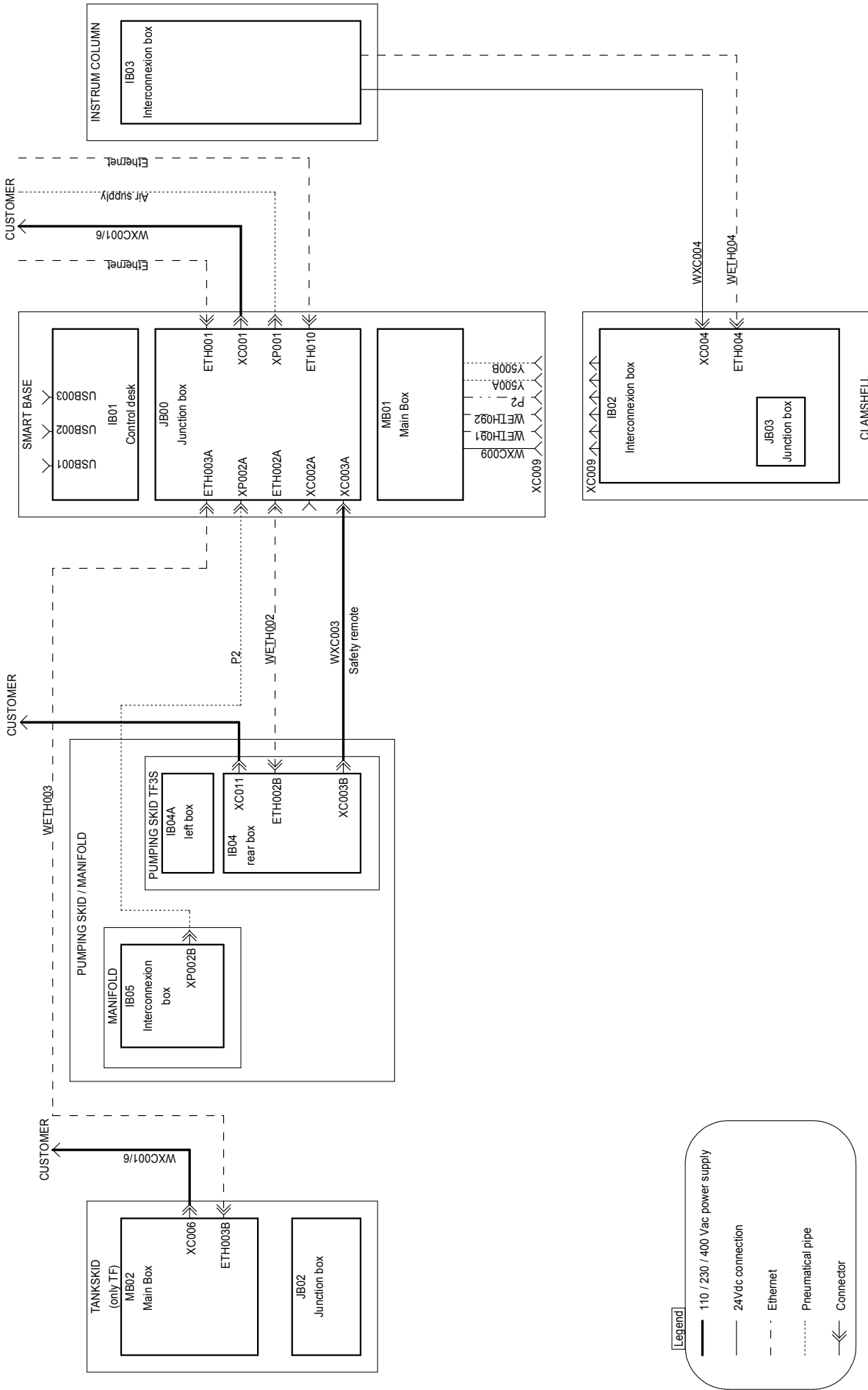


TF3S Utilities Connections

The Mobius® FlexReady Smart System for TFF



TF2S Power, Pneumatic and Ethernet Schematic



TF3S Power, Pneumatic and Ethernet Schematic

Installing the Clamshell

The Smart Cart is delivered with one Clamshell installed. The Clamshell can be removed and replaced with a different unit if required.

All Flexware® Assemblies must be removed from the Clamshell before loading and unloading it onto the system.


The clamshell is heavy (approximately 80 kg). Use the Clamshell Lift to move the clamshell. If the lift is not used, follow local regulations regarding lifting limits.

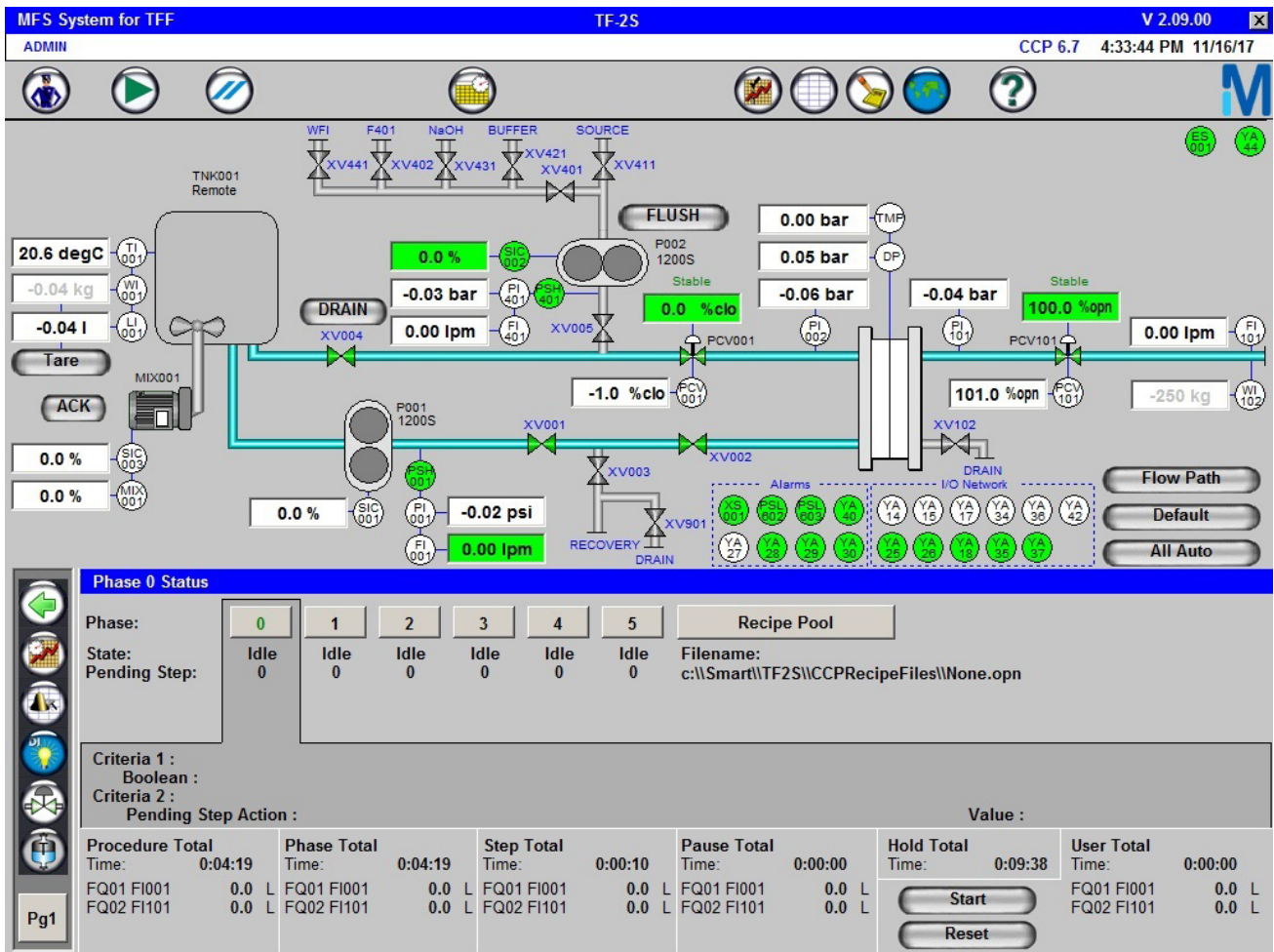
NOTE

The system must be connected to both power and compressed air to remove or install the Clamshell.

Removing the Clamshell in a Smart Cart

Refer to the *Common Control Platform® Overview* section of this manual for instructions on logging in to the system and navigating through the screens.

1. After logging on to the system, select the Operation Status Icon .
2. The Phase 0 Status display will appear. Select the Recipe Pool.



Phase 0 Status

Phase: **0** | 1 | 2 | 3 | 4 | 5 | Recipe Pool

State: Idle | Idle | Idle | Idle | Idle | Idle

Pending Step: 0

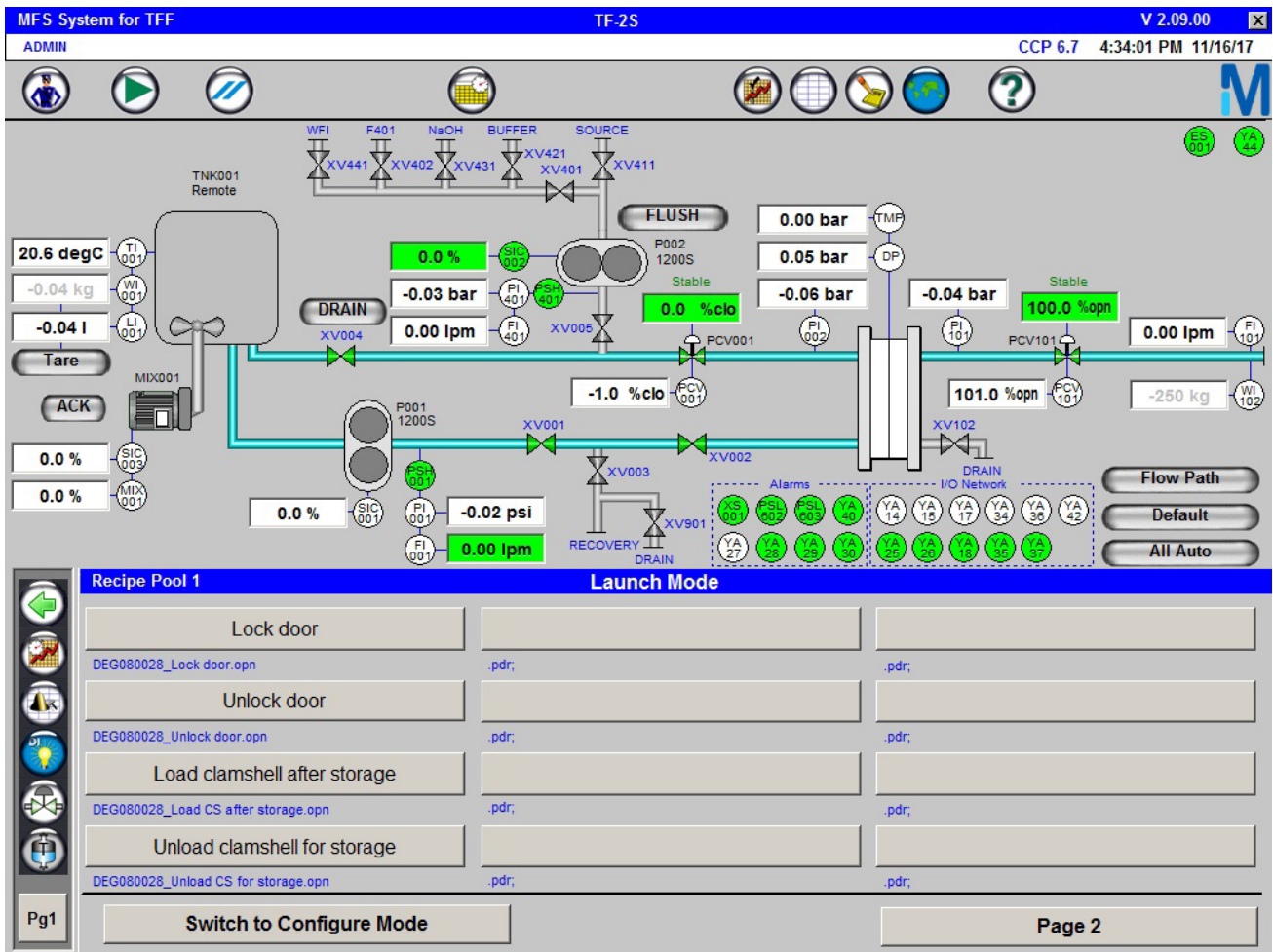
Criteria 1: Boolean

Criteria 2: Pending Step Action

Procedure Total		Phase Total		Step Total		Pause Total		Hold Total		User Total	
Time:	Value:	Time:	Value:	Time:	Value:	Time:	Value:	Time:	Value:	Time:	Value:
0:04:19	0:04:19	0:04:19	0:04:19	0:00:10	0:00:10	0:00:00	0:00:00	0:09:38	0:09:38	0:00:00	0:00:00
FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L
FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L

Phase 0 Status display

3. The Recipe Pool Launch Mode screen will appear. Select the Unload the Clamshell for Storage recipe.




Recipe Pool Launch Mode screen

4. Once the door is open, disconnect everything from the Clamshell and remove the Clamshell from the Smart Cart.
5. Once the Clamshell is removed and the recipe completed, install the new one following the directions in the *Install the Clamshell into an Empty Smart Cart* section.

Installing the Clamshell into an Empty Smart Cart

The Smart Cart and the Pump Cart must be fully assembled, locked together and connected to an appropriate power and compressed air sources before proceeding. Remove the plug on the Clamshell power cord before installing the Clamshell into the Smart Cart.

1. Refer to the *Common Control Platform® Overview* section of this manual for instructions on logging in to the system and navigating through the screens.
2. After logging on to the system, select the Operation Status Icon  .

The screenshot displays the MFS System for TFF interface. At the top, it shows 'MFS System for TFF', 'TF-2S', and 'V 2.09.00'. Below this, there are navigation icons and a status bar with 'ADMIN', 'CCP 6.7', and '4:33:44 PM 11/16/17'. The main area features a detailed process flow diagram with various tanks (e.g., TNK001 Remote), valves (XV001-XV005), pumps (P001, P002), and sensors (FI, PI, SIC, FCV). The diagram includes numerical readouts for temperature (20.6 degC), weight (-0.04 kg), flow rate (0.00 lpm), and pressure (-0.03 bar, -0.06 bar, -0.02 psi). A 'Phase 0 Status' panel is visible at the bottom, showing the current phase (0), state (Idle), and pending step (0). It also includes a 'Recipe Pool' section with a filename and a table of procedure, phase, step, and hold times.

Phase 0 Status

Phase: **0** | 1 | 2 | 3 | 4 | 5 | Recipe Pool

State: Idle | Idle | Idle | Idle | Idle | Idle | Filename: c:\Smart\TF2S\CCPRecipeFiles\None.opn

Pending Step: 0 | 0 | 0 | 0 | 0 | 0

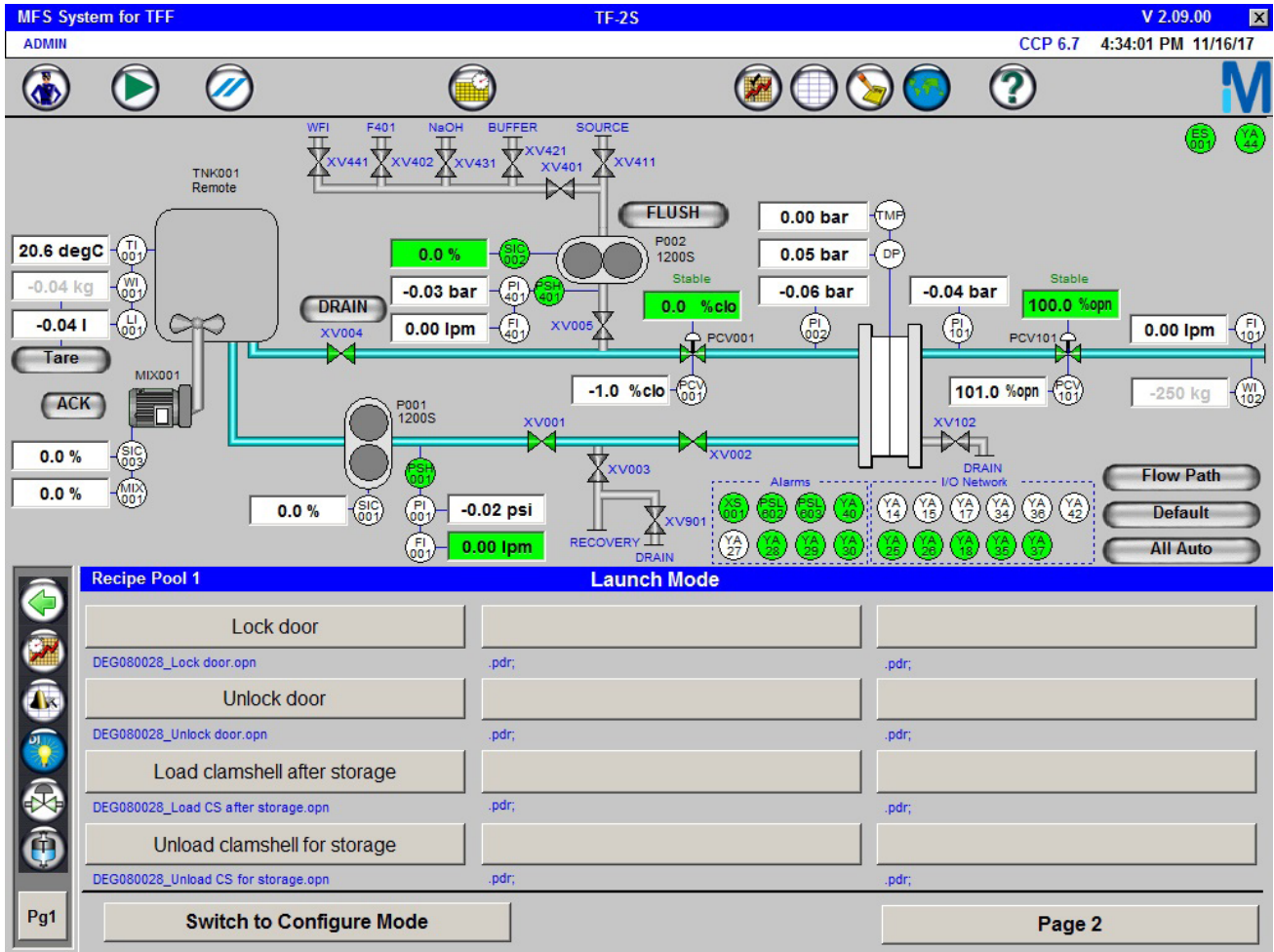
Criteria 1: Boolean :
Criteria 2: Pending Step Action : Value :

Procedure Total Time:	Phase Total Time:	Step Total Time:	Pause Total Time:	Hold Total Time:	User Total Time:
0:04:19	0:04:19	0:00:10	0:00:00	0:09:38	0:00:00
FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L	FQ01 FI001 0.0 L
FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L	FQ02 FI101 0.0 L

Buttons: Start, Reset

Phase 0 Status display

3. The Phase 0 Status display will appear. Select the Recipe Pool.
4. The Recipe Pool Launch Mode screen will appear. Select the Load Clamshell After Storage recipe.



Recipe Pool Launch Mode screen

- Once the door is open by the recipe, install the Clamshell into the Smart Cart.
- Once the Clamshell is installed, close the door and the recipe will complete.
- Turn the system off by closing the CCP® 6 application, closing the Windows® application and powering down the CPU down.

Connecting a User-supplied Weight Scale to the Clamshell

Connect the weight scale to the WT102 connector on the Clamshell.

Connecting a User-supplied Filtrate Flowmeter to the Clamshell

Connect the flowmeter to the FT101 connector on the Clamshell.

Connecting the Instrumentation to the Clamshell

1. Connect the cable labelled WETH004 from the Filtrate Instrumentation Kit to the Clamshell receptacle ETH004 located on the top right side of the clamshell.
2. Connect the cable labelled WXC004 from the Filtrate Instrumentation Kit to the Clamshell receptacle XC004 located on the top right side of the clamshell.

Power Up the System

Once the Clamshell is installed into the Smart Cart, and all the connections are made, power the CPU ON.

Chromatography Installing the Flexware® Assemblies

Introduction

Before installing any Flexware® assembly, verify that the Smart Flexware® Cart and the Pump Cart are located on a level surface, locked together, and wheel locks are engaged. Power to the system should be ON.

Install and connect required and optional Flexware® assemblies in the order presented in this guide.

Tighten all connections prior to each process run

Flexware® assemblies are packed in double polyethylene bags. To open the packages:

1. Place the packaged Flexware® assemblies on a flat surface away from any sharp edges.
2. Cut the packaging on the edge. Do not cut through any of the Flexware® assembly components.

NOTES

End connections are covered with either a plug or a cap to prevent contamination of the flow path. Do not remove the covering until connecting the assemblies on the system.

After installation, ensure that there are no bends or kinks in the tubing.

Installing the Flexware® Assemblies

This section details the installation of the Flexware® Assemblies that must be installed onto the Smart Flexware® Cart before any connections can be made. The next section details connecting all the Flexware® Assemblies used on the system.

Assembly numbers in this section are highlighted in **RED**.

Flexware® connection tags are highlighted **GREEN**.

Flexware® Assemblies

Install core and optional Flexware® assemblies in the order presented here:

Order of Installation/ Connection	Description	Catalog Number	Connection Tag	Core or Option
1	Pump 1 Bottom Manifold Assembly	XM1P1MCP, XM1P1MTC, XM3P1MCP, XM3P1MTC	TO P001	C
2	Pump 2 Top Manifold Assembly	XM3P2MCP, XM3P2MTC, XM1P2MCP, XM1P2MTC	TO P002	O
3	Pump Assembly	DISPUMP1, DISPUMP2	none	C
4	SU Flowmeter Assembly	XM3P1FLWSU, XM3P2FLWSU	V, W	C
5	Bubble Trap Assembly	XM1BUBBL, XM2BUBBL, XM3BUBBL	C, D, F	C
6	Precolumn Filter Assembly	XM1FILT001, XM3FILT001	H, I	O
7	Smart Flexware® Assembly	XM1SMART, XM3SMART	FROM P001 FROM P002 C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S	C
8	Smart Flexware® Assembly	XM3PSMART	V, W, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S	C
9	Precolumn Instrument Assembly	XM1PRECN, XM3PRECN	A, J, K	O
		XM1PRESU, XM3PRESU		
10	Post Column Instrument Assembly	PXM1PSTCN, PXM3PSTCN	B, Q, R	C
		XM1PSTSU-1, XM1PSTSU-2, XM1PSTSU-3, XM3PSTSU-1, XM3PSTSU-2, XM3PSTSU-3		
11	Chromatography Column Assembly	XM1CMASM, XM0CMASM, XM2CMASM, XM2CMASM	L, S, T	O
12	Buffer and Waste Container	MBS0xxxL2TM	M	O
	Product Container	MIX	N, O, P	O

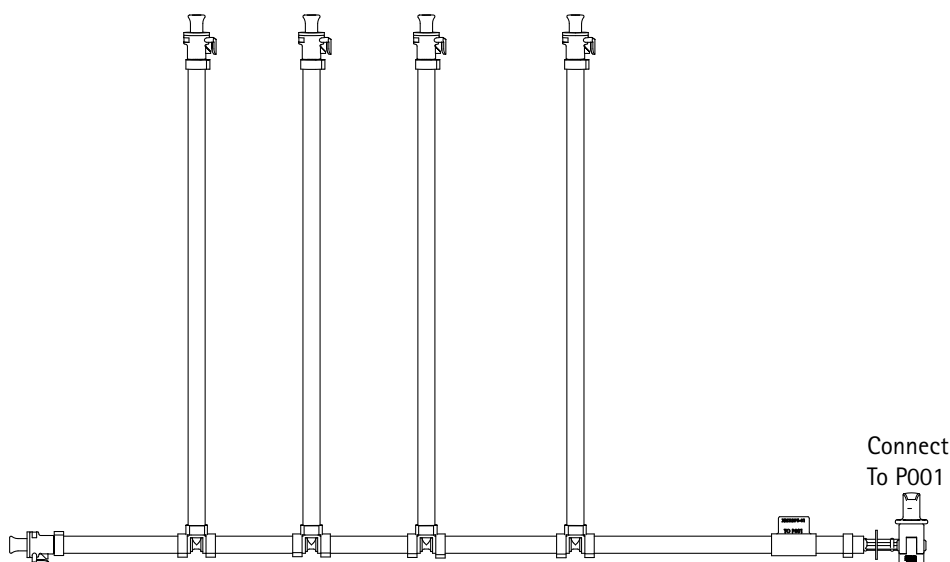
Order of Installation/ Connection	Description	Catalog Number	Connection Tag	Core or Option
14	Pre-use Instrumentation Cleaning Set	XM1INCLN, XM3INCLN	T, L, S	O

Consult your local representative for additional Flexware® assemblies.

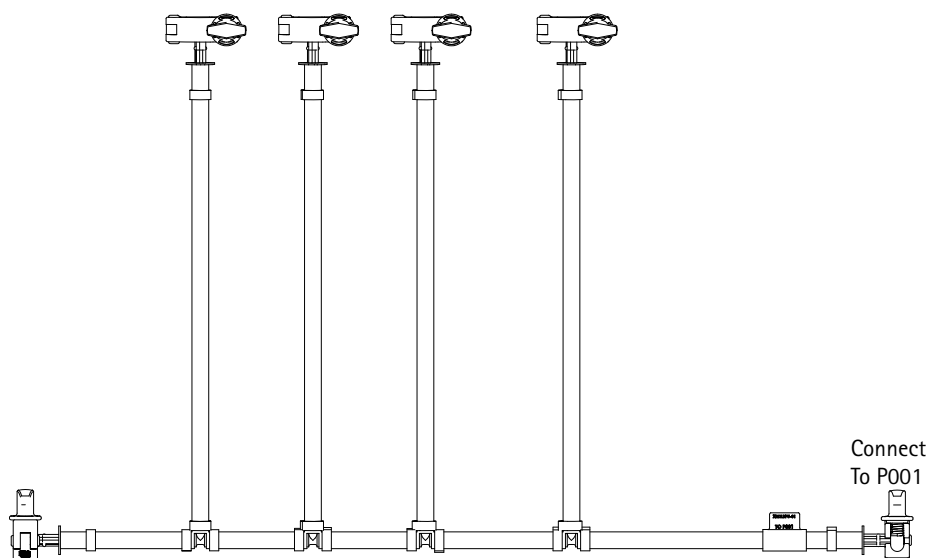
Installing Chrom 2.2 L/min Pump 1 Bottom Manifold Assembly onto the Manifold

XM1P1MCP, XM1P1MTC, XM3P1MCP, XM3P1MTC

The Pump Manifold Assemblies are available with either TC or MPC fittings. All fittings are shipped with either a cap or plug installed. These caps and plugs must be removed when installing the assemblies onto the system.

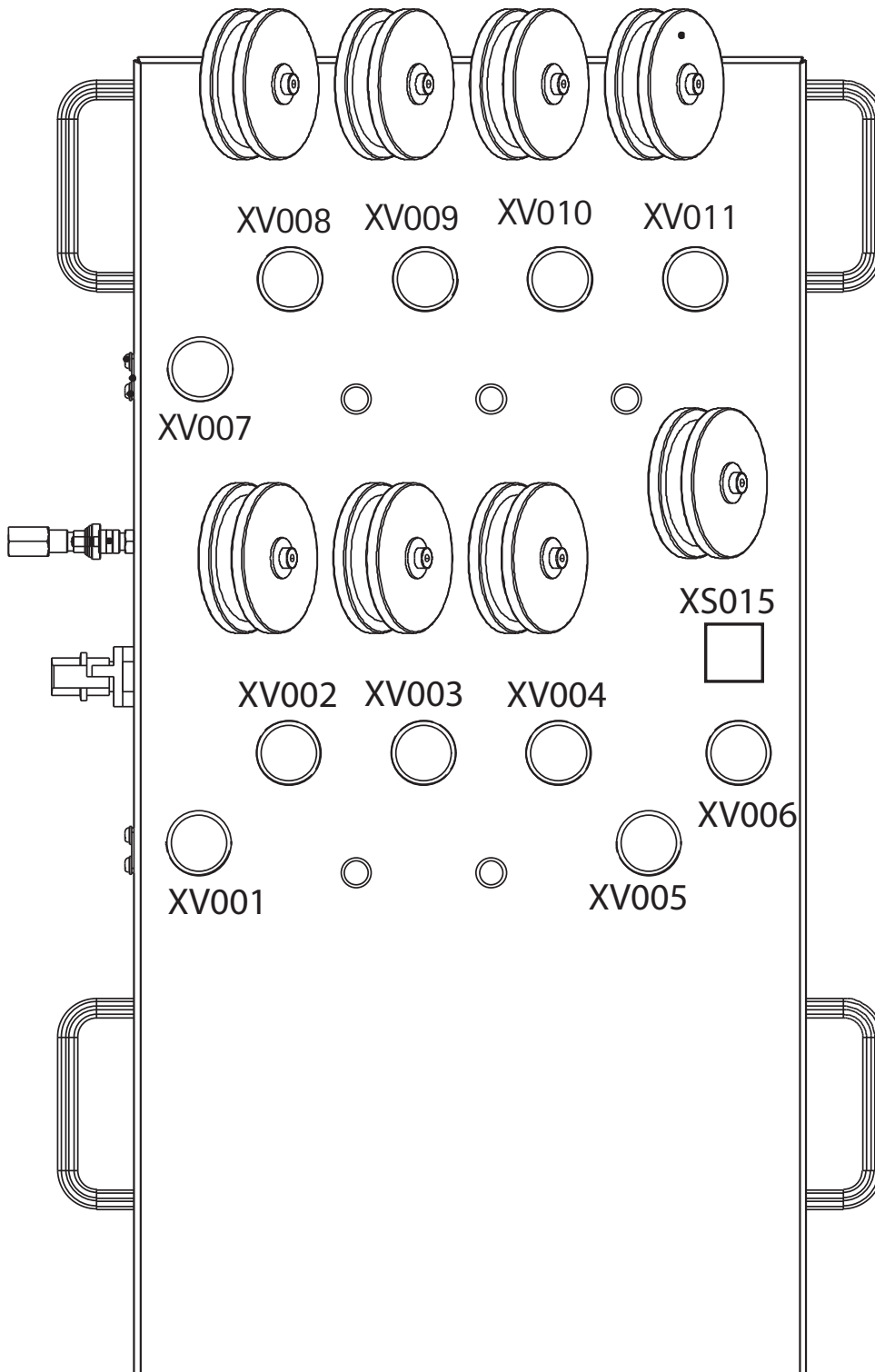


Pump Manifold Assembly XM1P1MCP or XM3P1MCP



Pump Manifold Assembly XM1P1MTC or XM3P1MTC

1. Unpack the manifold assembly



Manifold

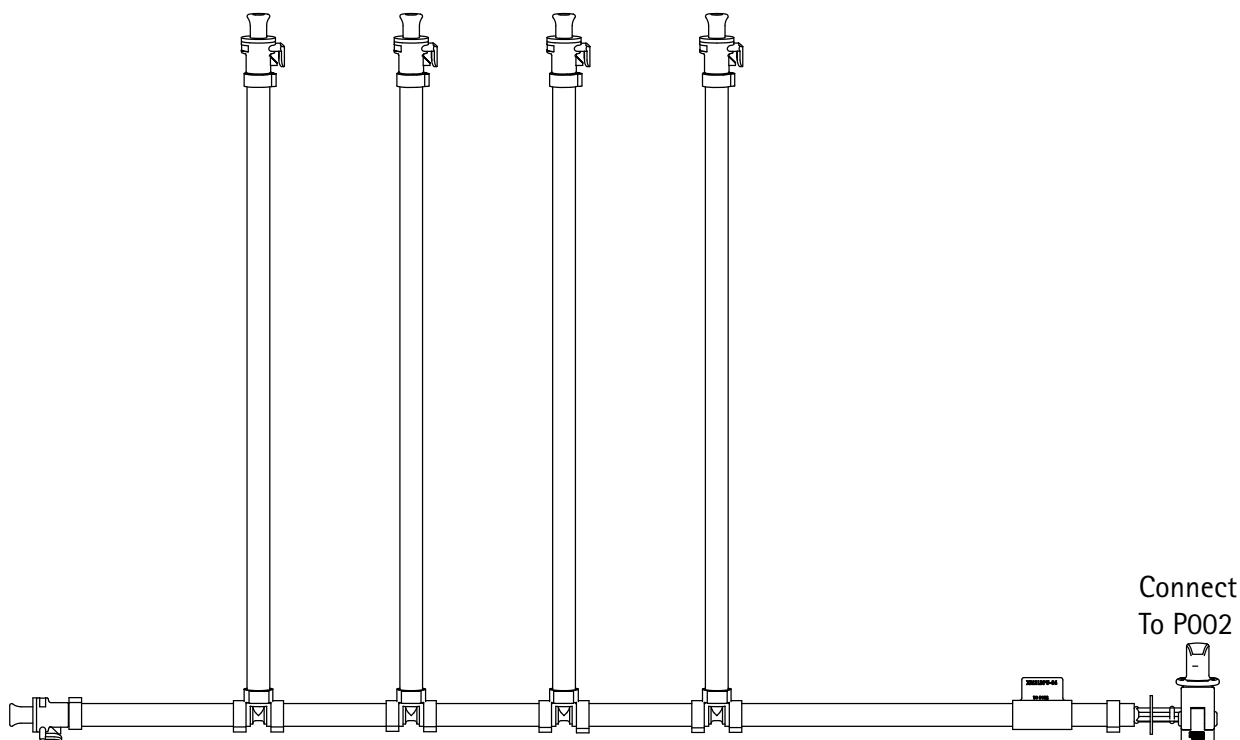
2. Using the touch screen, open valves XV001, XV002, XV003, XV004, XV005, XV006 or use the Open All Valves button.
3. Install the tubing into the opened pinch valves on the manifold from the right to the left
4. Using the touch screen close the pinch valves XV001, XV002, XV003, XV004, XV005, XV006 or use the Close All Valves button.

- Once the assembly is installed, open the cover of the end product air sensor XS015 and push the Flexware® assembly into the sensor. Close the cover.

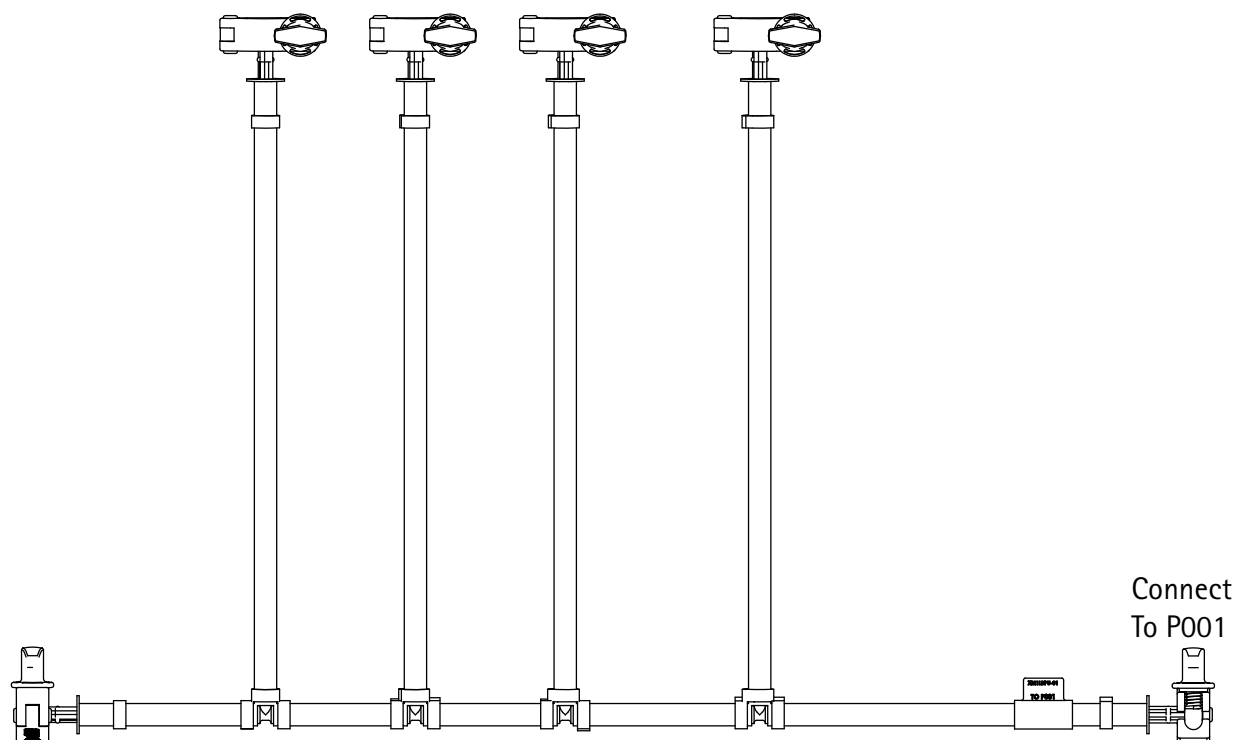
Installing Chrom 2.2 L/min Pump 2 Top Manifold Assembly onto the Manifold

XM3P2MCP, XM3P2MTC, XM1P2MCP, XM1P2MTC

The Pump Manifold Assemblies are available with either TC or MPC fittings. All fittings are shipped with either a cap or plug installed. Remove the covering just before connecting the flow path to the system.

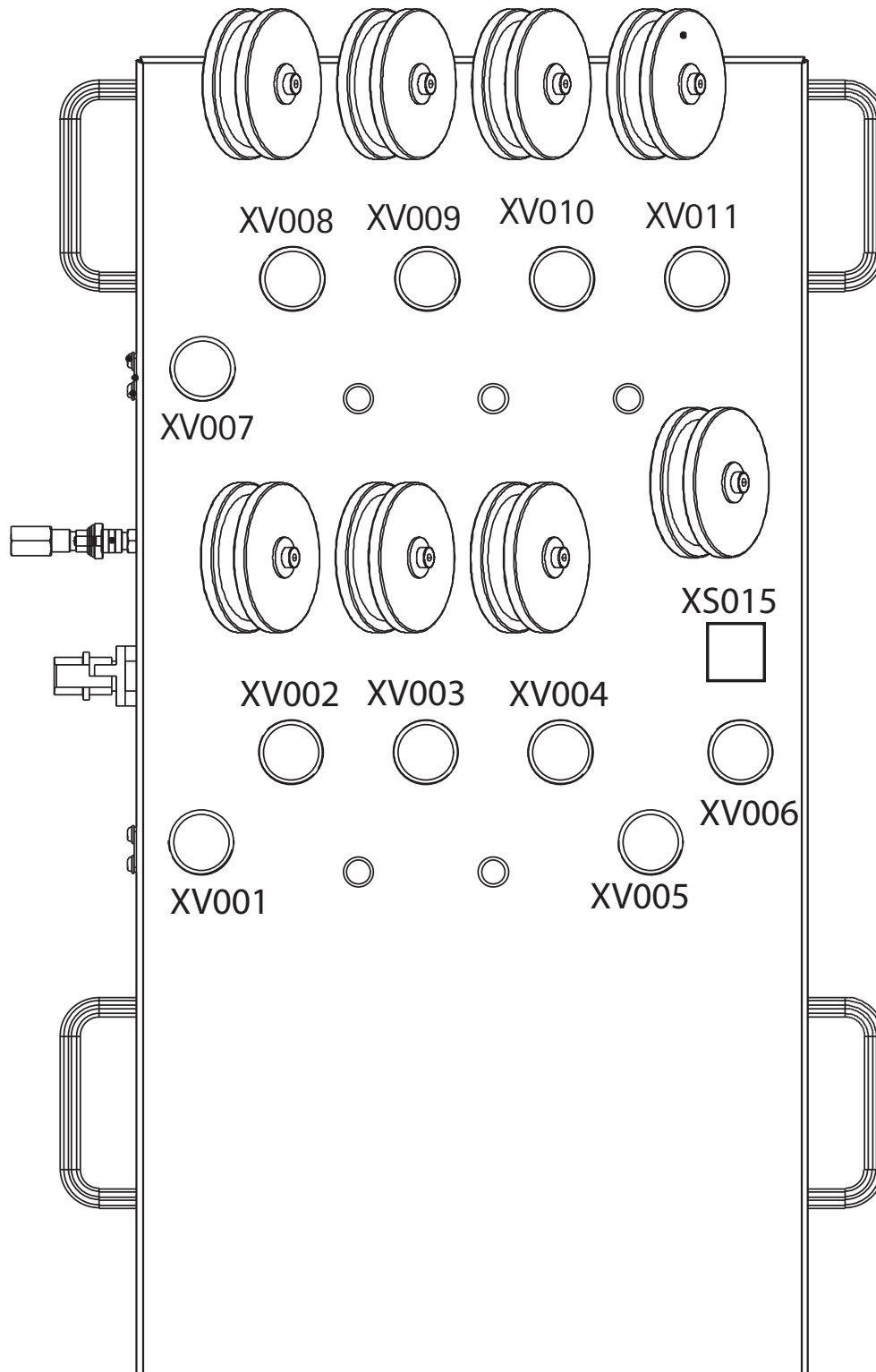


Pump Manifold Assembly XM1P2MCP or XM3P2MCP



Pump Manifold Assembly XM1P2MTC or XM3P2MTC

1. Unpack the manifold assembly



Manifold

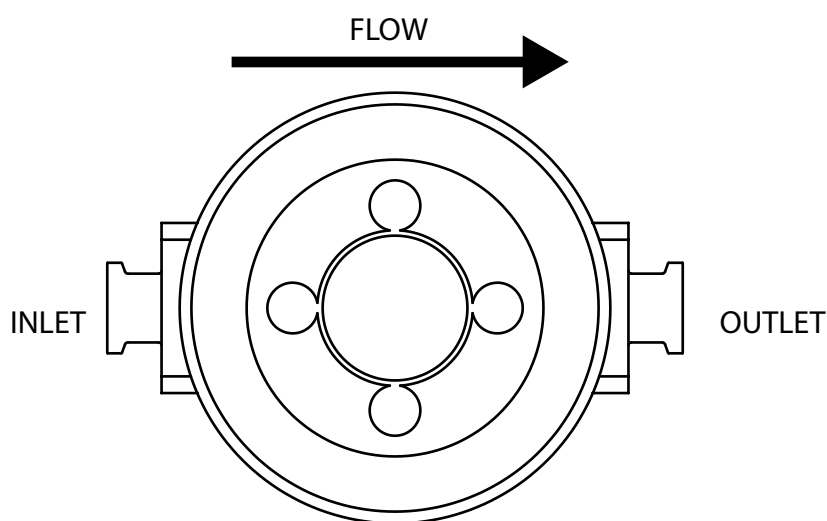
2. Using the touch screen, open valves XV007, XV008, XV009, XV010, XV011, or use the Open All Valves button.
3. Install the tubing into the opened pinch valves on the manifold from the right to the left

- Using the touch screen close the pinch valves XV007, XV008, XV009, XV0010, XV0011 or use the Close All Valves button.

Installing the Pump Heads onto the Pumps

DISPUMP1, DISPUMP2

- Remove the stainless steel flange (if present) from the pumps.
- Note the flow direction on the pump heads and install the pump heads on the pumps so that the inlet is on the left.



Installing the pump heads.

- Place the stainless steel flange on the pump head and install both units onto the pump using the four longer screws that were supplied in a bag with the system.
- Tighten the four screws with no. 2.5 Allen wrench for Chrom 2.2 or no. 5 Allen wrench for Chrom 8.0.
- Tighten the clamping ring screw, located on the right side of pump head DISPUMP1.
- Remove the TC clamp from the pump assembly packaging. With the gasket in place on the inlet of the flowmeter, connect the outlet of the pump to the inlet of the flowmeter. Install the TC clamp over the fittings and tighten the clamp.
- With the gasket in place, connect the manifold tubing labeled **TO P001** to the inlet of pump P001. Install the TC clamp over the fittings and tighten the clamp.

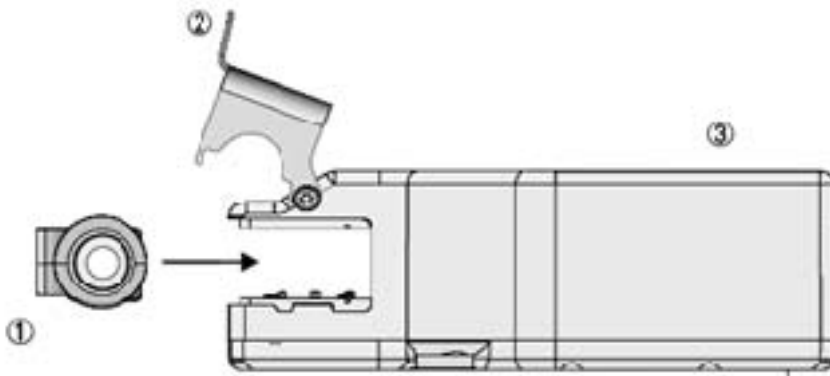
- With the gasket in place, connect the manifold tubing labeled **TO P002** to the inlet of pump P002. Install the TC clamp over the fittings and tighten the clamp.

Installing the SU Flowmeter tube

XM3P1FLWSU, XM3P2FLWSU

The flowmeter supports (including the transmitter) must be installed onto the pump support. The SU flowmeter assemblies will be connected to the Smart Flexware® assembly later. XM3P1FLWSU must be connected to P001 and XM3P2FLWSU to P002.

- Open the clamp (2).
- Move the tube (1) of the SU flowmeter Assembly XM3P1FLWSU in a horizontal direction into the transmitter (3) until the tube is flush with the front side of the transmitter.

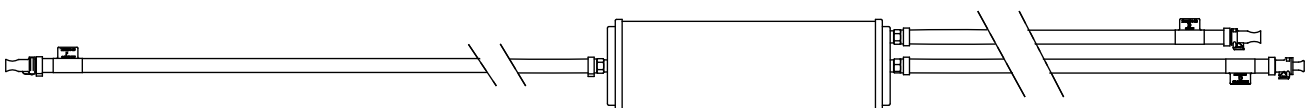


- Turn the clamp (2) downward until the tube is locked by the clamp. This guides the tube to its proper position.
- Remove the TC clamps from the SU flowmeter assembly inlet and outlet. With the gasket in place on the inlet of the flowmeter, connect the tube labeled From P001 to P001 SU pump head outlet.
- Install the TC clamp over the fittings and tighten the clamp.
- Repeat operations 1 to 5 for SU flowmeter on P002.
- Enter both tubes K factor values into the HMI (refer to "Entering the K factor" section).

Installing the Bubble Trap Assembly

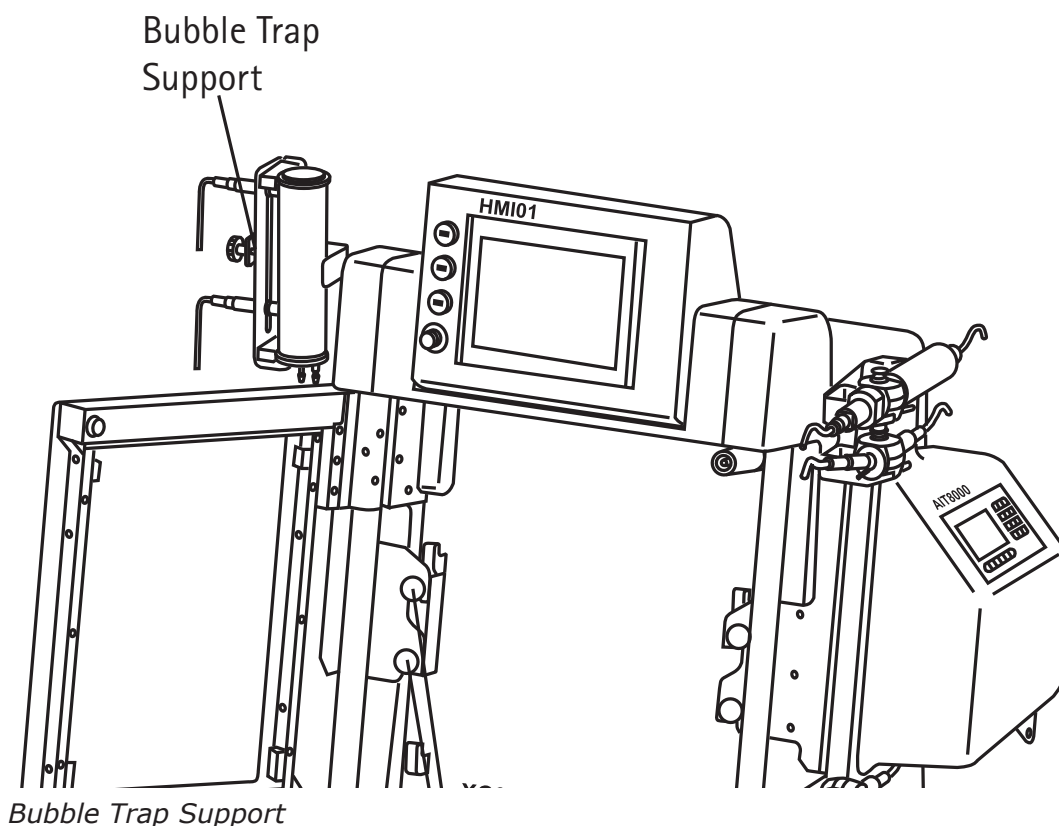
XM1BUBBL, XM2BUBBL, XM3BUBBL

The Bubble Trap Support must be installed onto the Smart Flexware® Cart. The Bubble Trap Assembly will be connected to the Smart Flexware® Assembly later.



The Bubble Trap Assembly

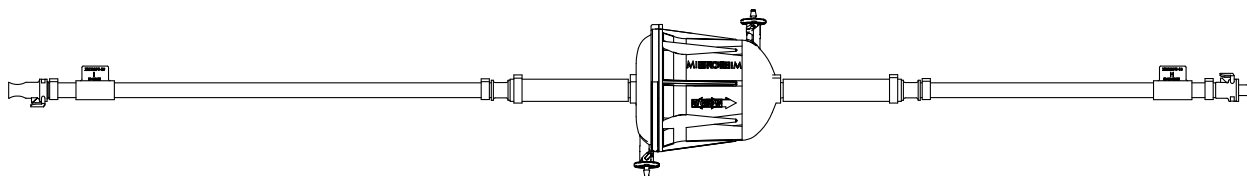
1. Unpack the Bubble Trap assembly
2. Install the assembly in the support mounted on the cart. The bottom of the bubble trap has an inlet port and an outlet port. The top of the bubble trap has one port, a vent port.



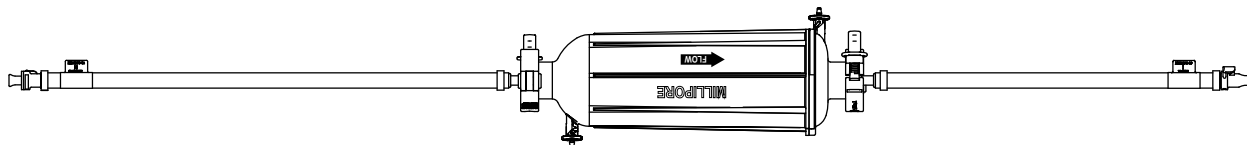
Installing the Precolumn Filter Assembly

XM1FILT001 , XM3FILT001

The Precolumn Filter Assembly must be installed onto the Smart Flexware® Cart. It will be connected to the Smart Flexware® Assembly later.



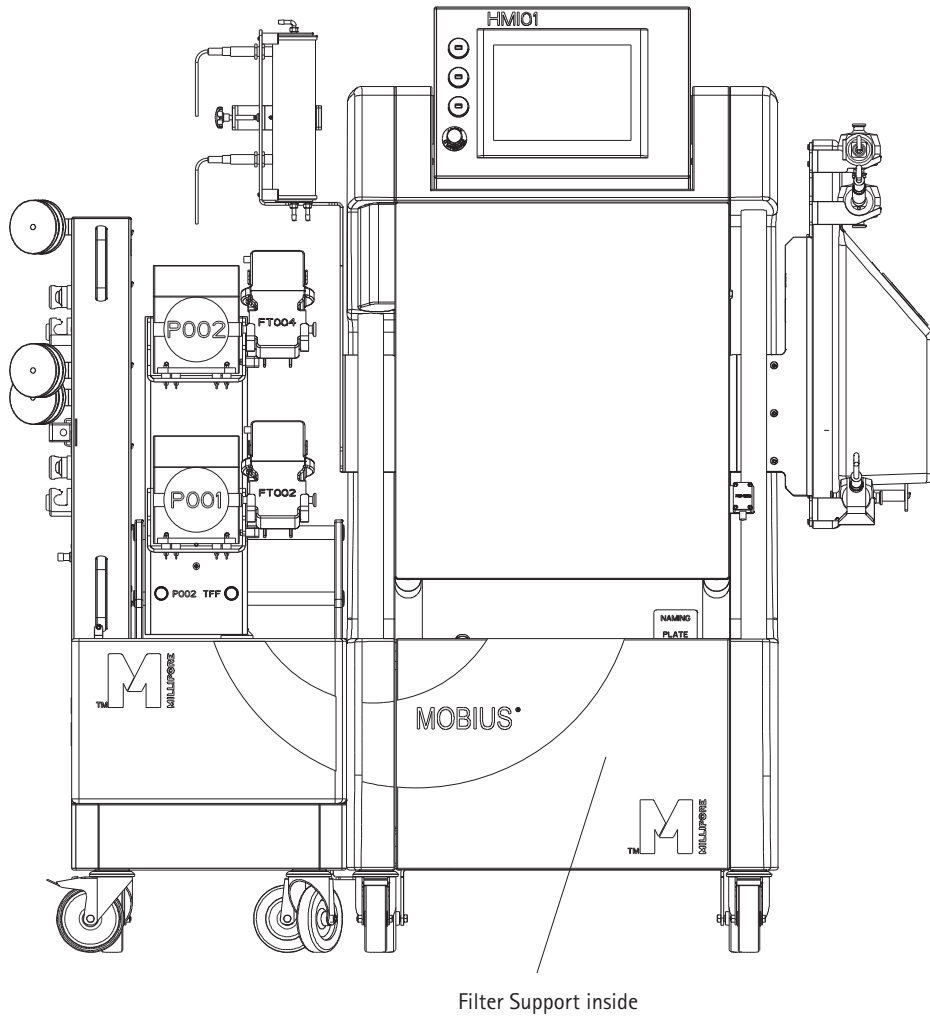
Precolumn Filter Assembly XM1FILT001



Precolumn Filter Assembly XM3FILT001

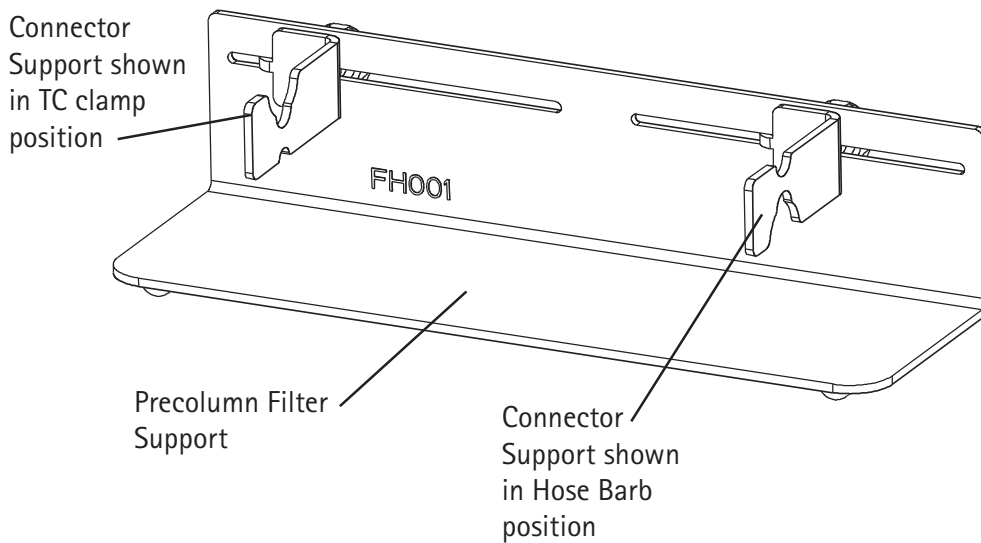
1. Unpack the Precolumn Filter Assembly.

- Note the flow direction indicated on the filter and install the filter on the support located at the bottom of the Smart Flexware® Cart.



Installing the Precolumn Filter Assembly

- Place the filter connectors into the slots of the support.



Precolumn Filter Support.


Installing the Smart Flexware® Assembly Into the Clamshell

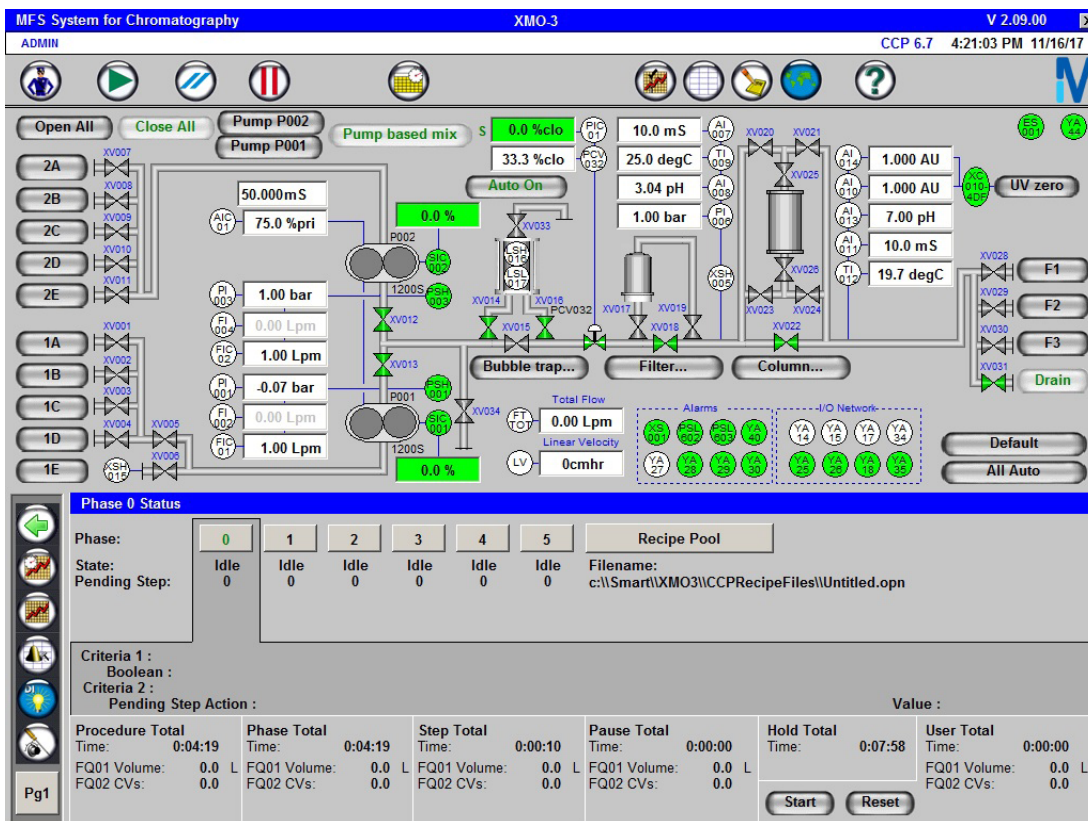
XM1SMART, XM3SMART, XM3PSMART

NOTE

The Smart Flexware® Assembly can be used for 50 cycles (50 valve openings and 50 valve closings) per valve. The integrity of the installation may be compromised if used for more than 50 cycles.

The Smart Flexware® Assembly must be installed onto the Smart Flexware® Cart. It will be connected to the required assemblies later.

1. Refer to the *Common Control Platform® Overview* section of this manual for instructions on logging in to the system and navigating through the screens.
2. After logging on to the system, select the Operation Status Icon .
3. The Phase 0 Status display will appear. Select the Recipe Pool.



The screenshot displays the MFS System for Chromatography interface. At the top, it shows 'MFS System for Chromatography XMO-3 V 2.09.00'. Below this is a control panel with 'Open All' and 'Close All' buttons, and a 'Pump based mix' section with '0.0 %clo' and 'Auto On' indicators. The main area shows a detailed process flow diagram with various pumps (P001, P002), valves (XV001-XV031), and sensors (AI, FI, PI, TIC, TID). A 'Phase 0 Status' window is open at the bottom, showing 'Phase: 0', 'State: Idle', and 'Pending Step: 0'. It also displays a 'Recipe Pool' section with a filename and a table of criteria and totals.

Criteria 1:	Boolean:	Criteria 2:	Pending Step Action:	Value:							
Procedure Total Time:	0:04:19	Phase Total Time:	0:04:19	Step Total Time:	0:00:10	Pause Total Time:	0:00:00	Hold Total Time:	0:07:58	User Total Time:	0:00:00
FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L	FQ01 Volume:	0.0 L
FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0	FQ02 CVs:	0.0

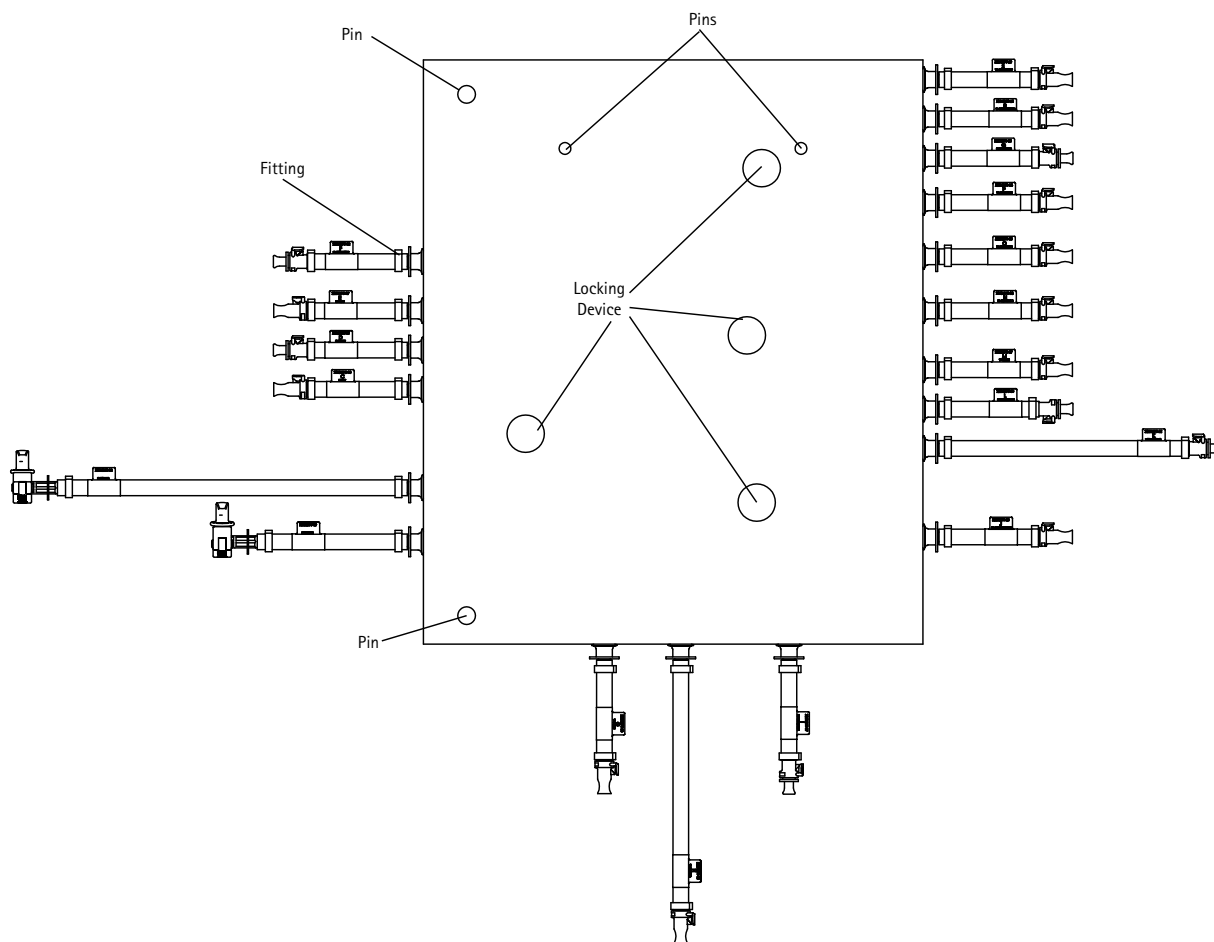
Phase 0 Status display.

4. The Recipe Pool Launch Mode screen will appear. Select the Unlock Door recipe.
5. Click Run and the recipe will start.

Recipe Pool 1		Launch Mode	
Lock door			
DSP090002_Lock door.opn	.pdr;		.pdr;
Unlock door			
DSP090002_Unlock door.opn	.pdr;		.pdr;
Load clamshell after storage			
DSP090002_Load CS after storage.opn	.pdr;		.pdr;
Unload clamshell for storage			
DSP090002_Unload CS for storage.opn	.pdr;		.pdr;
Pg1	Switch to Configure Mode		Page 2

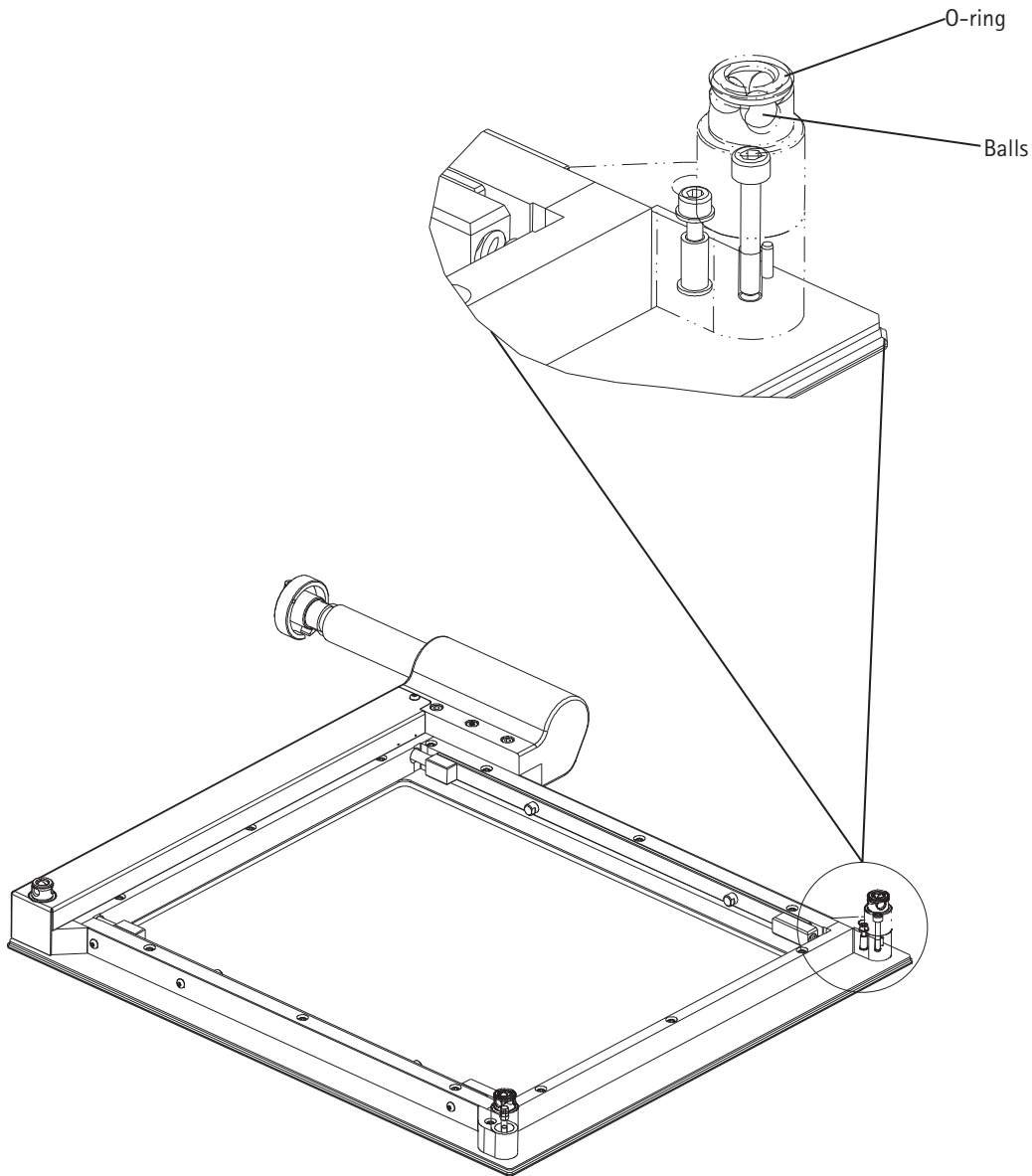
Recipe Pool Launch Mode screen

- Once the door is open and recipe is complete, hang the container on the pins in the clamshell.
- Install all fittings into the clips on the clamshell.




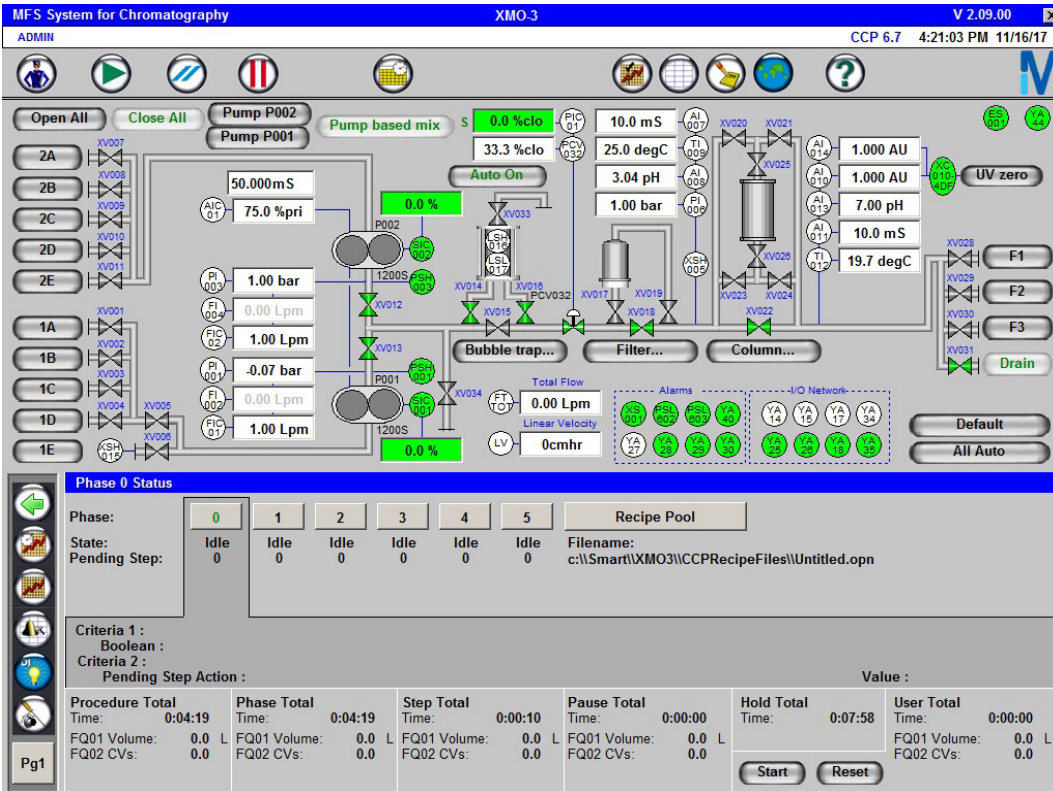
Installing the Smart Flexware® Assembly

8. Open the cover of the Precolumn Bubble Sensor XSH005 and push the Smart Flexware® Assembly tubing tagged **J** into the sensor. Close the cover.
9. Verify that the O-rings and stainless steel balls in the Smart Cart door locks are in place.



Smart Cart door locks

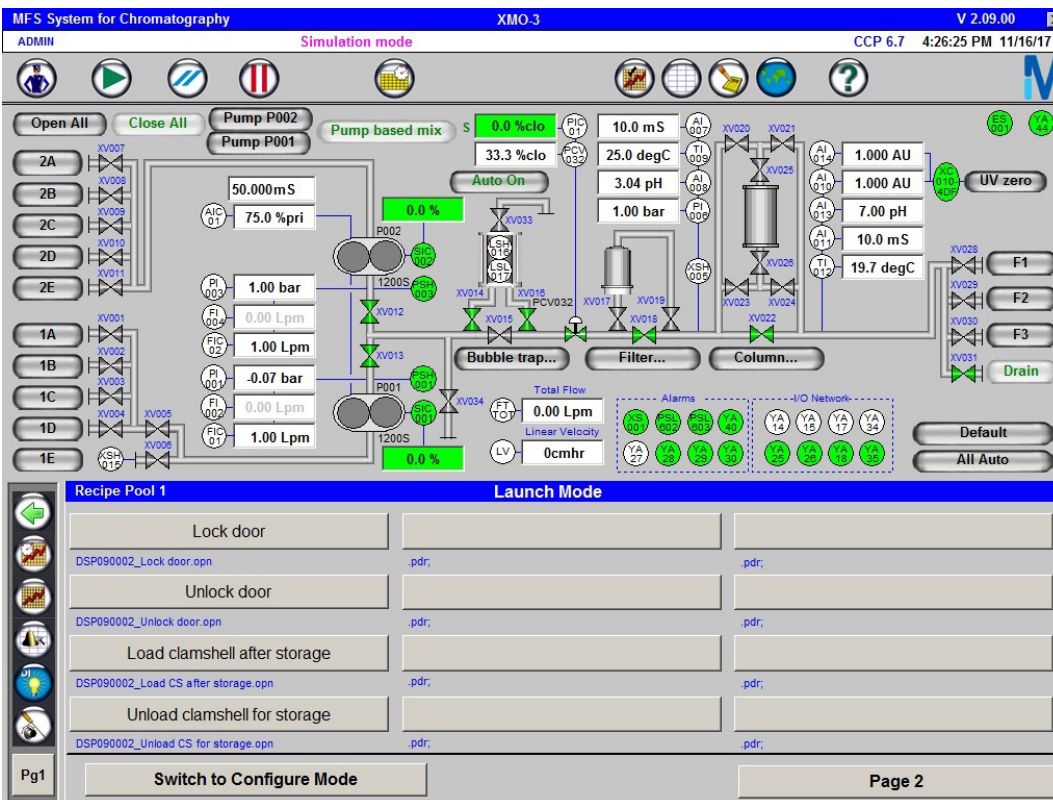
10. Close the Smart Flexware® Cart door using the **Lock Door** recipe on the touch screen.
11. Refer to the *Common Control Platform® Overview* section of this manual for instructions on logging in to the system and navigating through the screens.
12. After logging on to the system, select the Operation Status Icon .
13. The Phase 0 Status display will appear. Select the Recipe Pool.



Phase 0 Status display

14. The Recipe Pool Launch Mode screen will appear. Select the Lock Door recipe.

15. Click Run and the recipe will start.



Recipe Pool Launch Mode screen

16. Close the door and hold it closed on the Hand label, until the recipe completes.

Installing the Single-use Precolumn and Post Column Instrumentation Assemblies

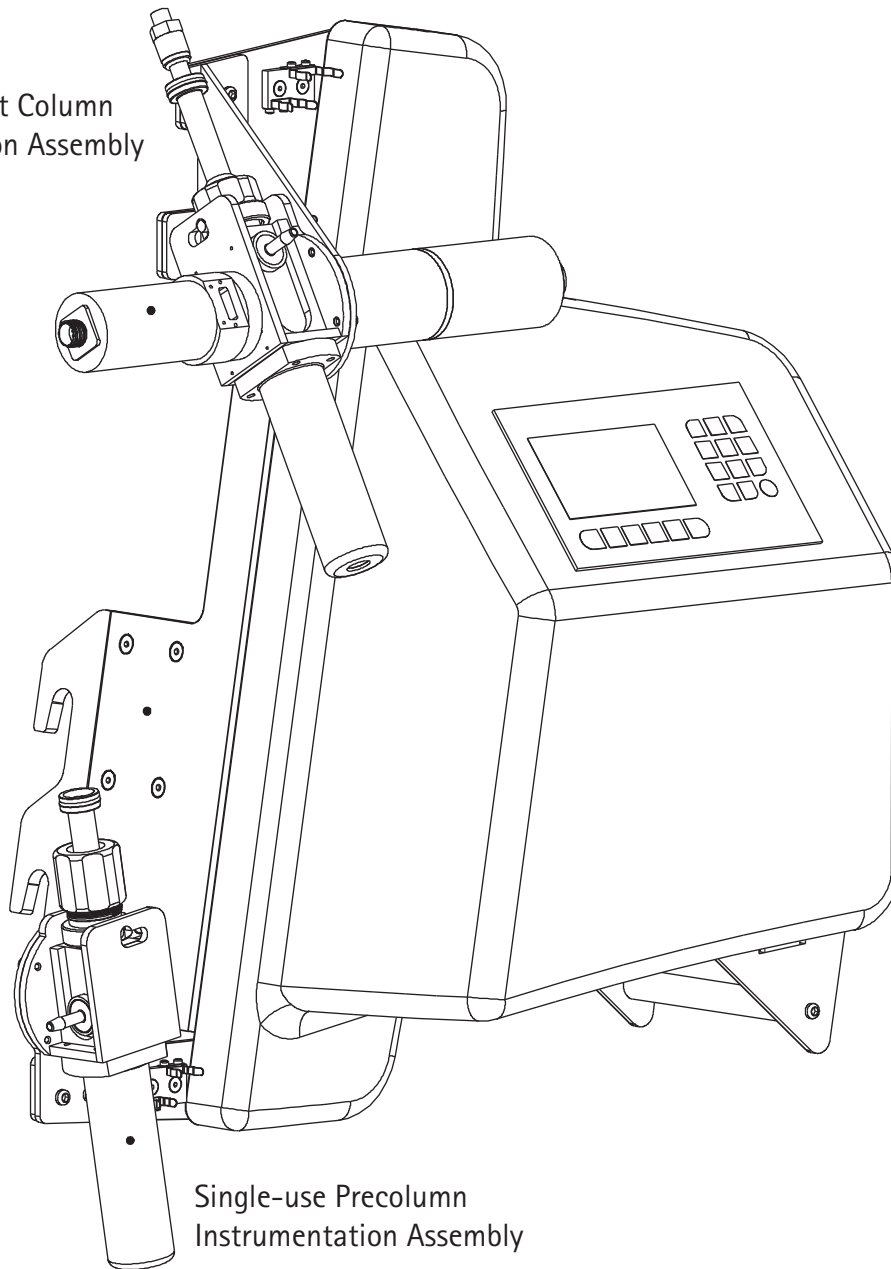
XM1PSTSU-1, XM1PSTSU-2, XM1PSTSU-3, XM3PSTSU-1, XM3PSTSU-2, XM3PSTSU-3, XM1PRESU, XM3PRESU

If the Multi-use Flow Cells are installed, this section is not applicable.

The Single-Use Bracket must be installed before installing the Flexware® Assemblies. The Single-Use Precolumn and Post Column Instrumentation Assemblies must be installed onto the Smart Flexware® Cart. They will be connected to the required assemblies later.

Refer to the assembly manufacturer's user guides for installation instructions.

Single-use Post Column
Instrumentation Assembly



Single-use Precolumn
Instrumentation Assembly

Installing the Single-use Column Inlet and Outlet Assemblies

If a pH probe is required in the assembly, it must be calibrated and cleaned before inserting it into the assembly. Refer to the probe manufacturer's instructions for directions.

Connecting the Flexware® Assemblies

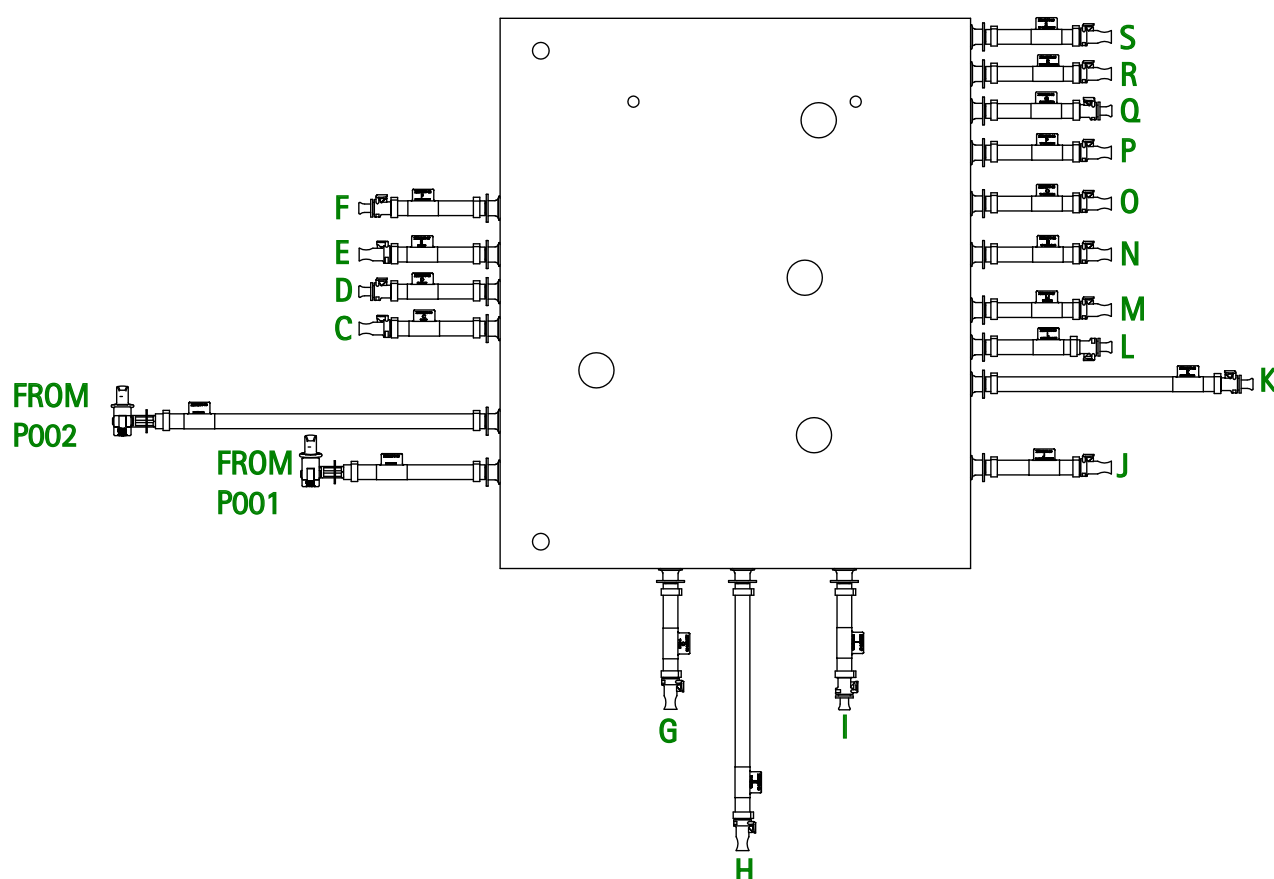
There are a number of Flexware® Assemblies that must be connected to the Smart Flexware® Assembly. The previous section details the installation of these assemblies. This section details connecting all the Flexware® Assemblies used on the system.

Assembly numbers in this section are highlighted in **RED**.

Flexware® connection tags are highlighted **GREEN**.

Connecting the Flexware® Assemblies for systems equipped with Multi-Use Flowmeter

Install and connect the Flexware® Assemblies in the order presented in this section.



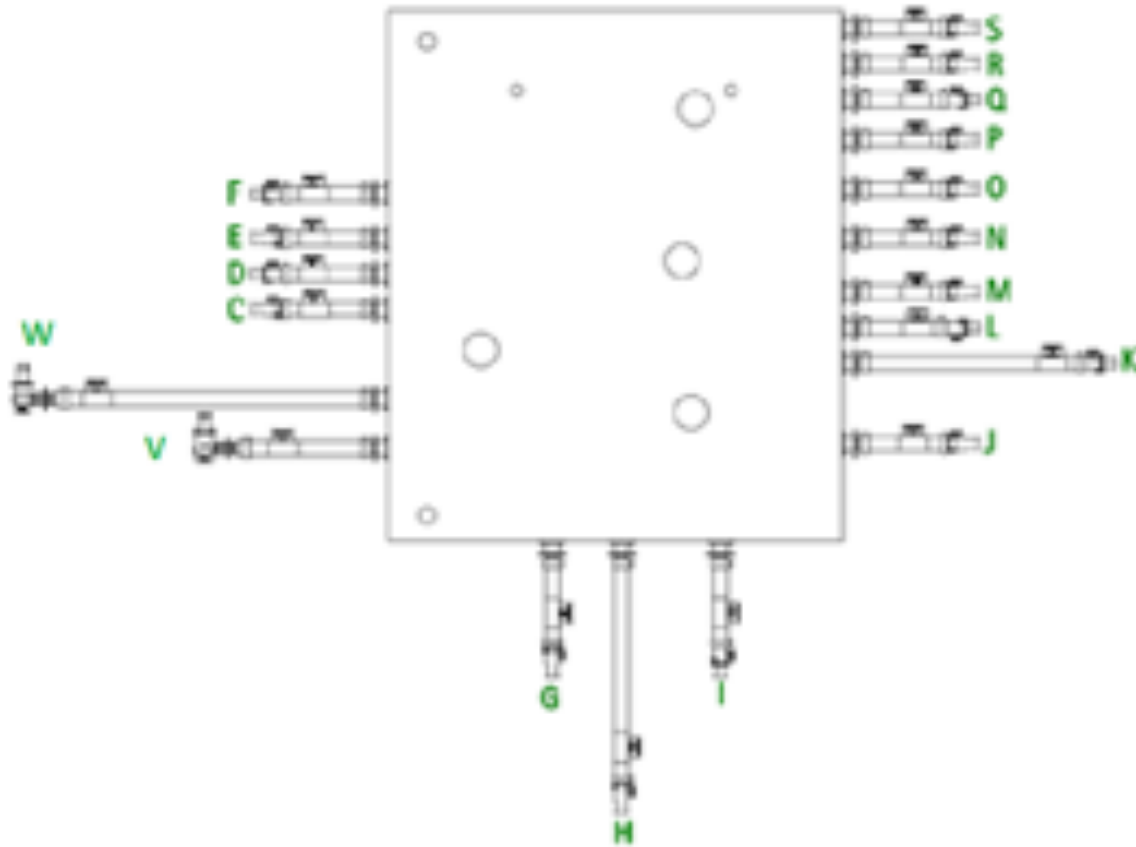
Connecting the Flowmeters

The Flowmeter outlets must be attached to the Smart Flexware® Assembly.

1. Remove the plugs/caps from the connector labeled **FROM P001** on the Smart Flexware® Assembly.
2. Connect **FROM P001** to the outlet of Flowmeter FT002.
3. Remove the plugs/caps from the connector labeled **FROM P002** on the Smart Flexware® Assembly.
4. Connect **FROM P002** to the outlet of Flowmeter FT004.

Connecting the Flexware® Assemblies for XM03 system equipped with Single-Use Flowmeters

Install and connect the Flexware® Assemblies in the order presented in this section.



Connecting the Flowmeters

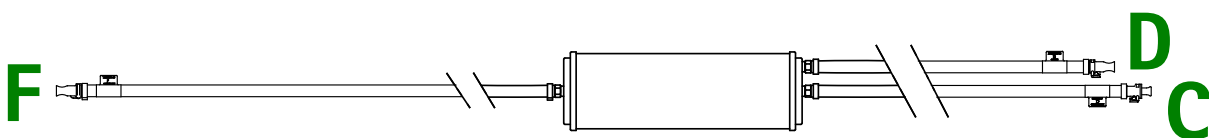
The Flowmeter outlets must be attached to the Smart Flexware® Assembly.

1. Remove the plugs/caps from the connector labeled V on the Smart Flexware® Assembly.
2. Connect V to the outlet of the flowmeter Assembly labeled V.
3. Remove the plugs/caps from the connector labeled W on the Smart Flexware® Assembly.
4. Connect W to the outlet of the flowmeter Assembly labeled W.

Connecting the Bubble Trap Assembly

XM1BUBBL, XM2BUBBL , XM3BUBBL

The Bubble Trap Assembly must be connected to the Smart Flexware® Assembly.



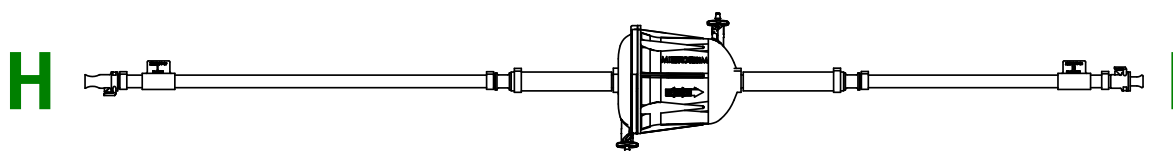
The Bubble Trap Assembly

1. Remove the plugs/caps from the connectors labeled **C** on the Smart Flexware® Assembly and on the Bubble Trap Assembly.
2. Connect **C** to **C**.
3. Remove the plugs/caps from the connectors labeled **D** on the Smart Flexware® Assembly and on the Bubble Trap Assembly.
4. Connect **D** to **D**.
5. Remove the plugs/caps from the connectors labeled **F** on the Smart Flexware® Assembly and on the Bubble Trap Assembly.
6. Connect **F** to **F**.

Connecting the Precolumn Filter Assembly

XM1FILT001, XM3FILT001

The Precolumn Filter Assembly must be connected to the Smart Flexware® Assembly.



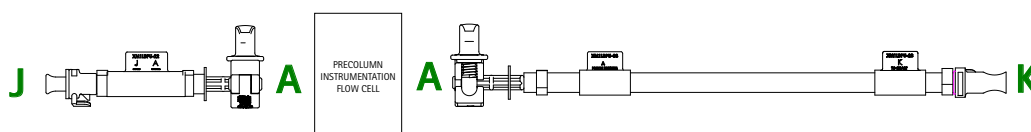
Precolumn Filter Assembly

1. Remove the plugs/caps from the connector labeled **H** on the Smart Flexware® Assembly and on the Precolumn Filter Assembly.
2. Connect **H** to **H**.
3. Remove the plugs/caps from the connector labeled **I** on the Smart Flexware® Assembly and on the Precolumn Filter Assembly.
4. Connect **I** to **I**.

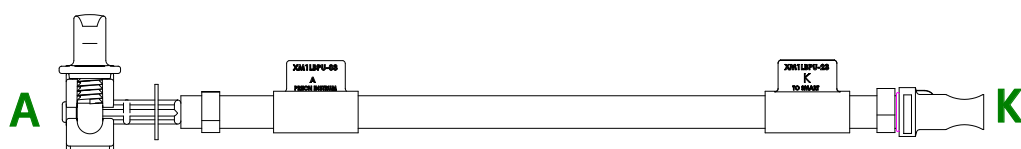
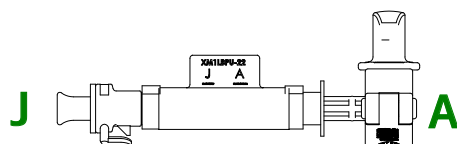
Connecting the Chromatography Precolumn Instrumentation Assembly

XM1PRECN, PXM1PSTCN, XM1PRESU, XM3PRECN, PXM3PSTCN, XM3PRESU

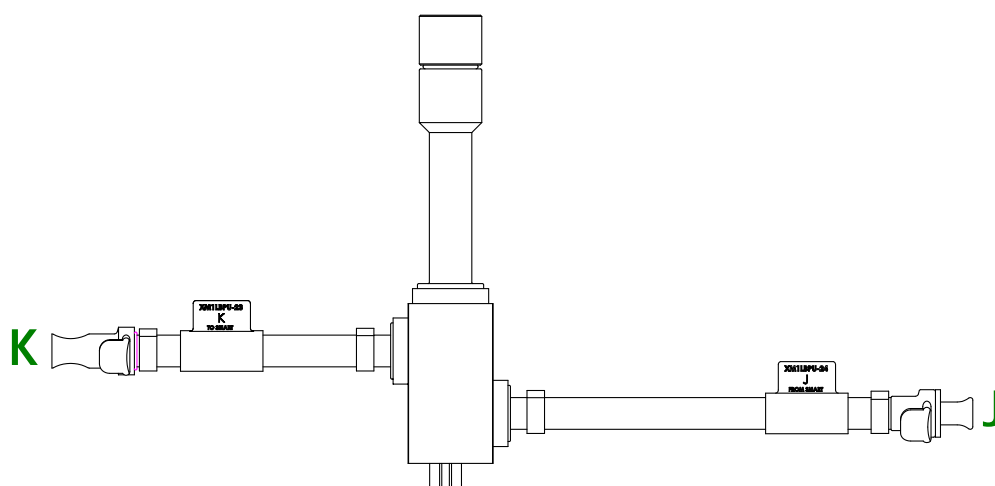
This assembly will be connected to the Precolumn instrumentation. This assembly is either a single-use or multi-use assembly.



Connecting the Multi-use Precolumn Instrumentation Assembly to the Chamber



Multi-use Precolumn Instrumentation Assembly



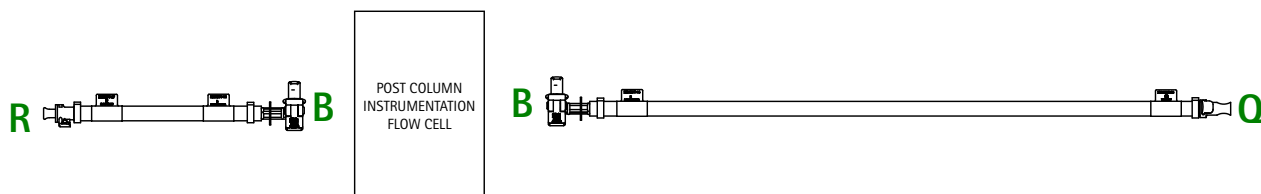
Single-use Precolumn Instrumentation Assembly

1. Multi-use Precolumn Instrumentation Assembly – Remove the plugs/caps from both connectors labeled A and connect them to the Precolumn Instrumentation Flow Cell as shown below. Tighten clamps.
2. Multi-use and Single-use Assemblies – Remove the plugs/caps from the tubing labeled J on the Smart Flexware® Assembly and on the Precolumn Instrumentation Assembly. Connect **J** to **J**.
3. Multi-use and Single-use Assemblies – Remove the plugs/caps from the tubing labeled K on the Smart Flexware® Assembly and on the Precolumn Instrumentation Assembly. Connect **K** to **K**.

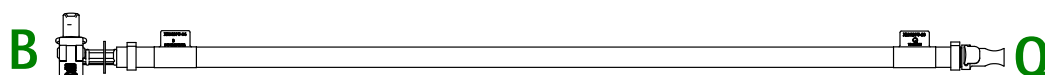
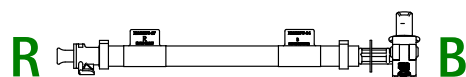
Connecting the Post Column Instrumentation Assembly

XM1PSTASM, XM3PSTASM, XM1PSTSU-1, XM1PSTSU-2, XM1PSTSU-3, XM3PSTSU-1, XM3PSTSU-2, XM3PSTSU-3

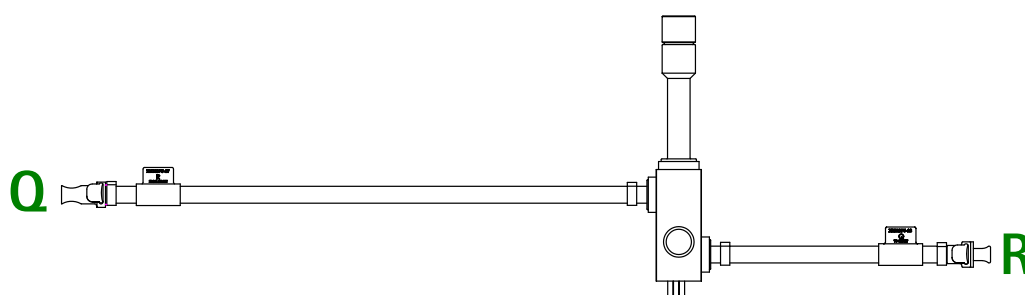
This assembly will be connected to the post column instrumentation. This assembly is either a single-use or a multi-use assembly



Connecting the Multi-use Post Column Instrumentation Assembly to the Chamber



Multi-use Post Column Instrumentation Assembly



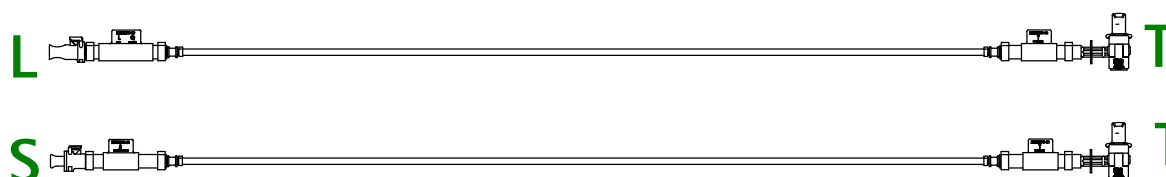
Single-use Post Column Instrumentation Assembly

1. Multi-use Post Column Instrumentation Assembly – Remove the plugs/caps from both connectors labeled B and connect them to the Post Column Instrumentation Flow Cell as shown below. Tighten clamps.
2. Multi-use and Single-use Assemblies – Remove the plugs/caps from the tubing labeled R on the Smart Flexware® Assembly and on the Post Column Instrumentation Assembly. Connect **R** to **R**.
3. Multi-use Post Column and Single-use Assemblies – Remove the plugs/caps from the tubing labeled Q on the Smart Flexware® Assembly and on the Post Column Instrumentation Assembly. Connect **Q** to **Q**.

Connecting the Chromatography Column

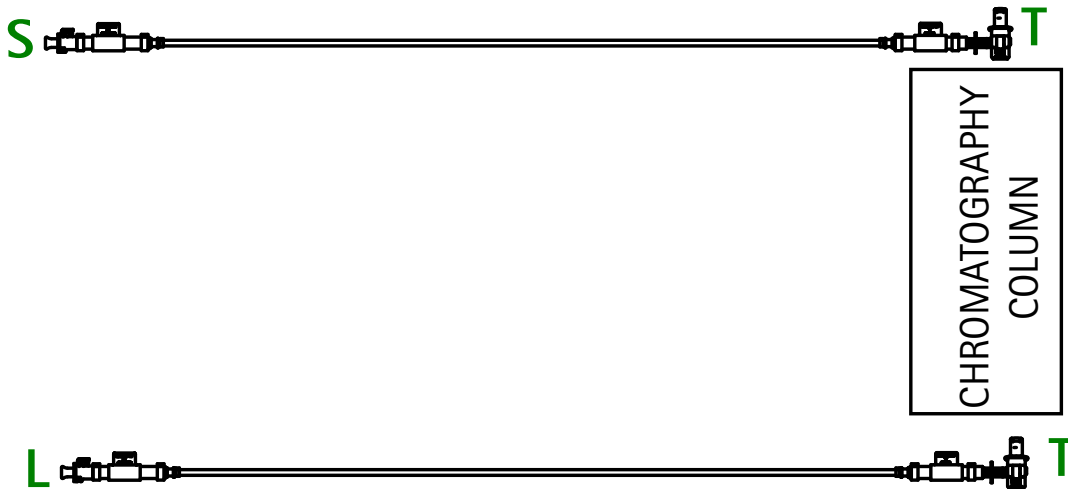
XM1CMASM, XM2CMASM, XM3CMASM

This assembly connects the chromatography column to the Smart Flexware® Assembly.



Column Assembly

1. Remove the plugs/caps from both connectors labeled **T** on the assemblies and connect as shown below. Tighten clamps.



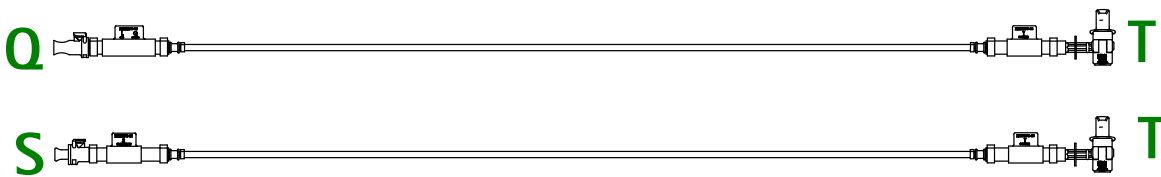
Connecting the Column Assembly

2. Remove the plugs/caps from the connectors labeled **L** on the assembly and on the Smart Flexware® Assembly. Connect **L** to **L**.
3. Remove the plugs/caps from the connectors labeled **S** on the assembly and on the Smart Flexware® Assembly. Connect **S** to **S**.

Connecting the Column Qualification Assembly

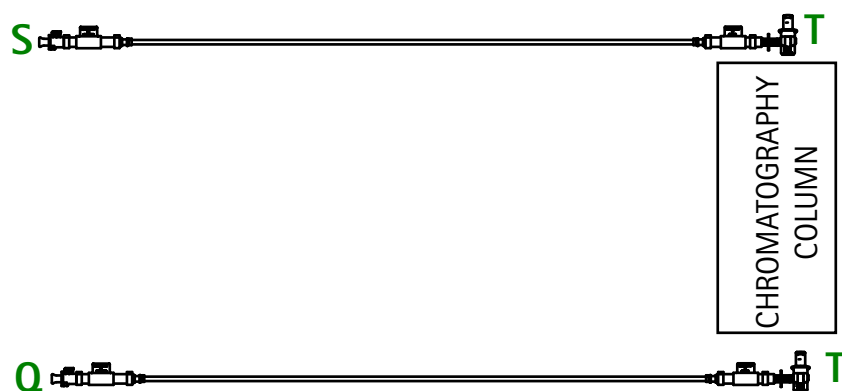
XMOCMASM

This assembly is used to qualify the chromatography column.



Column Qualification Assembly

1. Remove the plugs/caps from both connectors labeled **T** on the assemblies and connect as shown below. Tighten clamps.



Connecting the Column Assembly

2. Remove the plugs/caps from the connectors labeled Q on the assembly and L on the Smart Flexware® Assembly. Connect **Q** to **L**.
3. Remove the plugs/caps from the connectors labeled S on the assembly and on the Smart Flexware® Assembly. Connect **S** to **S**.

Connecting the Collection Containers

The Collection Containers can be attached to the Smart Flexware® Assembly.

1. Remove the plugs/caps from the connectors labeled **N**, **O** and **P** on the Smart Flexware® Assembly.
2. Connect lines **N** and **P** to the appropriate Collection Container.
3. Line **O** may be connected to a Collection Container or to a Sampling Container.

Connecting the Waste

The Smart Flexware® Assembly has a waste outlet that must be directed to the waste container.

1. Remove the plugs/caps from the connector labeled **M** on the Smart Flexware® Assembly.
2. Connect lines **M** to the appropriate waste collection vessel.

Connecting the Drain

The Smart Flexware® Assembly has a drain outlet that must be directed to the drain container.

1. Remove the plugs/caps from the connector labeled **G** on the Smart Flexware® Assembly.
2. Connect **G** to the appropriate drain.

Connecting the Vent

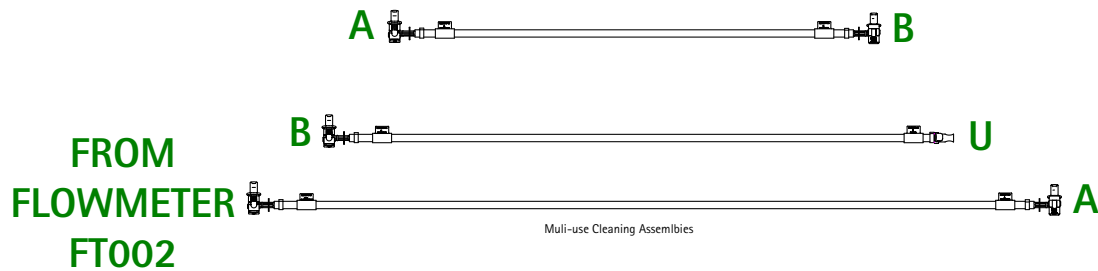
The Smart Flexware® Assembly has a vent that must be directed to an appropriate container.

1. Remove the plugs/caps from the connector labeled **E** on the Smart Flexware® Assembly.
2. Connect **E** to the appropriate container.

Installing the Pre-use Instrumentation Cleaning Set

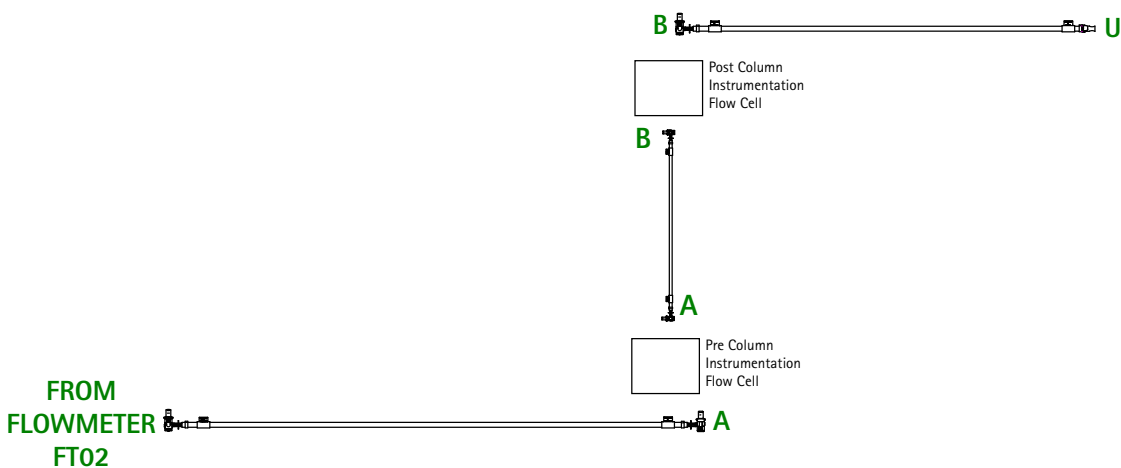
XM1INCLN, XM3INCLN

Multi-use Instruments may need to be cleaned prior to use. Use this assembly to connect the flowmeter outlet directly to the Instrumentation Flow Cell and then to the drain for cleaning:



Pre-use Column Cleaning Set

1. Remove the Pre-use Instrumentation Cleaning Assembly plugs/caps from the connectors labeled **FROM FLOWMETER** and **A** on the Pre-use Instrumentation Cleaning Assembly. Remove the assemblies on the Flowmeter FT02 outlet and on the Precolumn Instrumentation Flow Cell. Connect the Flowmeter FT02 outlet to **FROM FLOWMETER** and connect **A** to the Precolumn Instrumentation Flow Cell. Tighten the clamps.
2. Remove the plugs/caps from the connectors labeled **B** and **U** on the Pre-use Instrumentation Flow Cell. Connect **B** to the Post Column Instrument Flow Cell and direct **U** to the drain. Tighten clamps.
3. Remove the plugs/caps from the connectors labeled **A** and **B**. Connect **A** to the outlet of Pre Column Flow Cell. Connect **B** to the inlet of the Post Column Flow Cell.



TFF Installing the Flexware® Assemblies

Introduction

Before installing any Flexware® assembly, verify that the Smart Flexware® Cart, Tank Cart, and the Pump Cart are located on a level surface, locked together, and wheel locks are engaged. The system power should be ON.

Install and connect required and optional Flexware® assemblies in the order presented in this guide..

Tighten all connections prior to each process run.

Flexware® assemblies are packed in double polyethylene bags. To open the packages:

1. Place the packaged Flexware® assemblies on a flat surface away from any sharp edges.
2. Cut the packaging on the edge. Do not cut through any of the Flexware® assembly components.

NOTES

End connections are covered with either a plug or a cap to prevent contamination of the flow path. Do not remove the covering until connecting the assemblies to the system.

After installation, ensure that there are no bends or kinks in the tubing.

Installing the Flexware® Assemblies

This section details the installation of the Flexware® Assemblies that must be installed onto the Smart Flexware® Cart before any connections can be made. The next section details connecting all the Flexware® Assemblies used on the system.

Assembly numbers in this section are highlighted in **RED**.

Flexware® connection tags are highlighted **GREEN**.

Flexware® Assemblies - TF2S

Install the core and optional Flexware® assemblies in the order presented below. No order number indicates that the assembly order is insignificant.

1	Feed Container Assembly 50L	TF2S050L	P	C
	Feed Container Assembly 100L	TF2S100L	P	C
2	Transfer Pump Assembly	TF2STRANP	N2	C
3	Feed Pump Assembly	DISPUMP2	NONE	C
4	Transfer Pump Manifold Assembly	TF2STRANM	J	C
5	Smart Flexware® Assembly	TF2SSMART	A, B, C, D, E, H, I, M, N	C
6	Cassette Liner Assembly	TF2SLINER	A, B, C, D	C
7	Retentate Sampling Port Assembly	TF2SRETSMP	M2, P	C
8	Product Recovery Assembly			
	Filtration Assembly, XXL, KHGEG006FH3	TF200XXLGE1	B, C, D	O
	Filtrate Assembly (for multi-use instruments)	TF2SFILTCNV1 WITHOUT SAMPLING	E, F, G,	O
		TF2SFILTCNV2 WITH SAMPLING	F, G	O
	Filtrate Assembly (without instruments)	TF2SFILTCNV3 WITHOUT SAMPLING	E, G	O
	Filtrate Assembly (with single-use instruments)	TF2SFILTSUC1	E, F	O
	Filtrate Assembly (without single-use instruments)	TF2SFILTSUC2 WITHOUT SAMPLING	F, G	O
		TF2SFILTSUC3 WITH SAMPLING	G, O	O
	Filtrate Sampling Port Assembly	TF2SFILTSMP	E, F	O

Installation or Connection Order	Description	Catalog Number	Connection Tag	Core or Optional
	Filtrate Sampling Port Assembly (for single-use instruments)	TF2SFILTSMP-SUC	F, O	O
	Flushing Assembly	TF2SFLUSH	J1, M1	C
	Integrity Testing Assembly	TF2SITTEST	N1	O
	Drain Assembly	TF2SDRAIN	H, I	O
	Filtrate Line Assembly	TF2SFILTLN	G	O
	Waste Container Assembly	MBSXXX0L501	NONE	O
	Filtrate Container Assembly	MBS0250L501	NONE	O
	WFI Container Assembly (TC 3/4 in. outlet connection)	MBSXXX0LX01	NONE	O
	NaOH Container Assembly (TC 3/4 in. outlet connection)	MBSXXX0LX01	NONE	O
	Buffer Container Assembly (TC 3/4 in. outlet connection)	MBSXXX0LX01	NONE	O
	Source Container Assembly (3D bag with TC 3/4 in. outlet connection)	MBSXXX0LX01	NONE	O
	Source Container Assembly (2D bag with TC 3/4 in. outlet connection)	MBS0050LX01	NONE	O

Consult your local representative for additional Flexware® assemblies.

Flexware® Assemblies – TF3S

Install the Flexware® assemblies in the order presented below. No order number indicates that the assembly order is insignificant.

Installation or Connection Order	Description	Catalog Number	Connection Tag	Core or Optional
1	Feed Container Assembly 200L	TF3S200L	P	
2	Transfer Pump Assembly	TF3STRANP	N2	
3	Feed Pump Assembly	DISPUMP3	NONE	
4	Feed Assembly	TF3SFEED	K, FROM P001	
5	Transfer Pump Manifold Assembly	TF3STRANM	J	
6	Smart Flexware® Assembly	TF3SPSMART	A, B, C, D, E, K, M, N, TO DRAIN, TO DRAIN, TO FINAL RECOVERY	

Installation or Connection Order	Description	Catalog Number	Connection Tag	Core or Optional
7	Cassette Liner	TF3SPLINER-A	A, B, C, D	
		TF3SPLINER-B		
		TF3SPLINER-C		
		TF3SPLINER-D		
		TF3SPLINER-E		
		TF3SPLINER-F		
8	Retentate Sampling Port Assembly	TF3SRETSMP	M2, P	
9	Filtrate Assembly (for multi-use instruments)	TF3SPFILTCNV1	E, TO FILTRATE INSTRUMENTATION, FROM FILTRATE INSTRUMENTATION	
9	Filtrate Assembly (for single-use instruments)	TF3SFILTSUC1	E, FROM FILTRATE INSTRUMENTATION	
		TF3SPFILTSMP SUC1		
		TF3SFILTSUC2		
		TF3SPFILTSMP SUC3		
		TF3SFILTSUC5		
		TF3SPFILTSMP SUC5		
	Flushing Assembly	TF3SFLUSH	J1, TO P001, M1	
	IT Tester Assembly	TF3SITTEST	TO EXTERNAL IT DEVICE, N1	
	Filtrate Sampling Port Assembly	TF3SFILTSMP	E, TO FILTRATE INSTRUMENTATION	

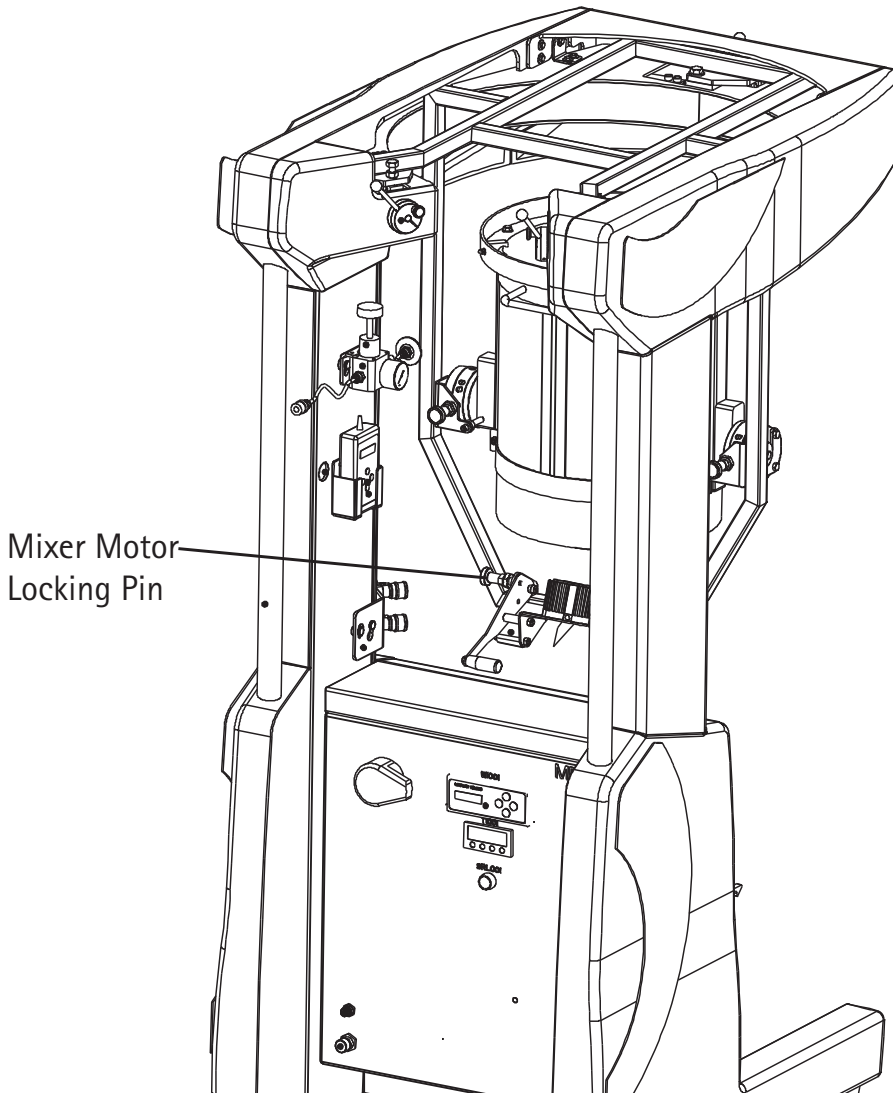
* See [TF3S Cassette Liner Assembly Selection](#) for guidance on liner selection.

Consult your local representative for additional Flexware® assemblies and for assistance with selecting the appropriate TF3S Cassette Liner assembly.

Installing the 50 L Feed Container Assembly

TF2S050L

1. Ensure that the mixer support is in the lower position. To lower the support, unlock the locking pin. Carefully lower the support.

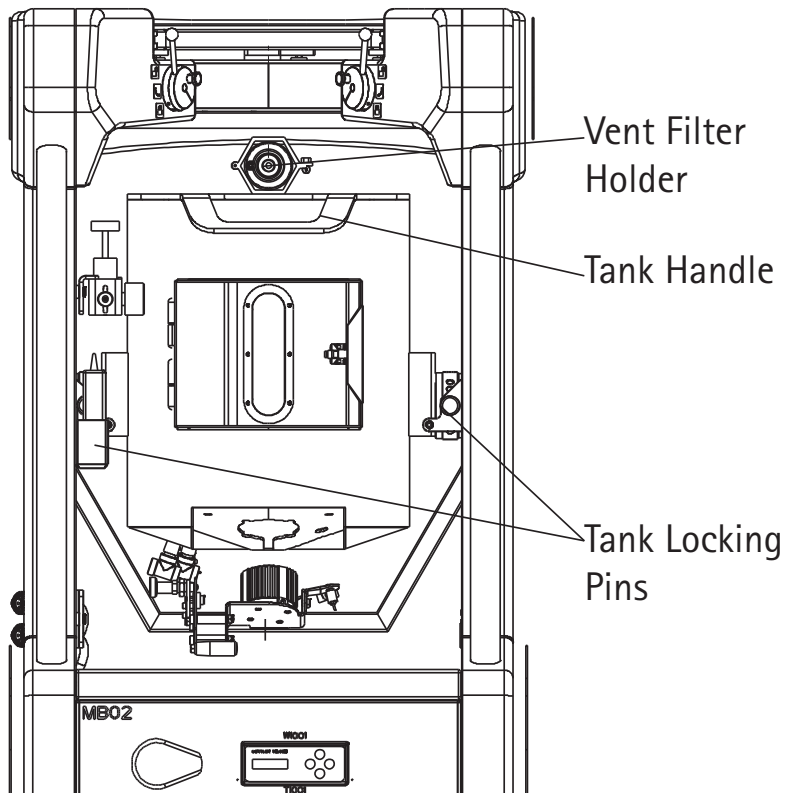


Locking pin location.

2. Holding the tank handle, unlock the locking pins by pulling them out and turning them.
3. Carefully move the feed container carrier into the horizontal position.

CAUTION

Once the pins are unlocked, the tank can toggle; it is highly recommended to hold the tank handle with two hands to prevent being hurt or having hands crushed when moving the tank into horizontal position or when moving it back into vertical position.



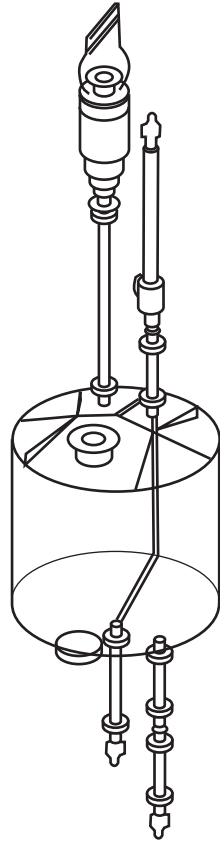
Tank Handle and Locking Pin locations

4. Place the pins into the locked position by pulling them out and turning them.

CAUTION

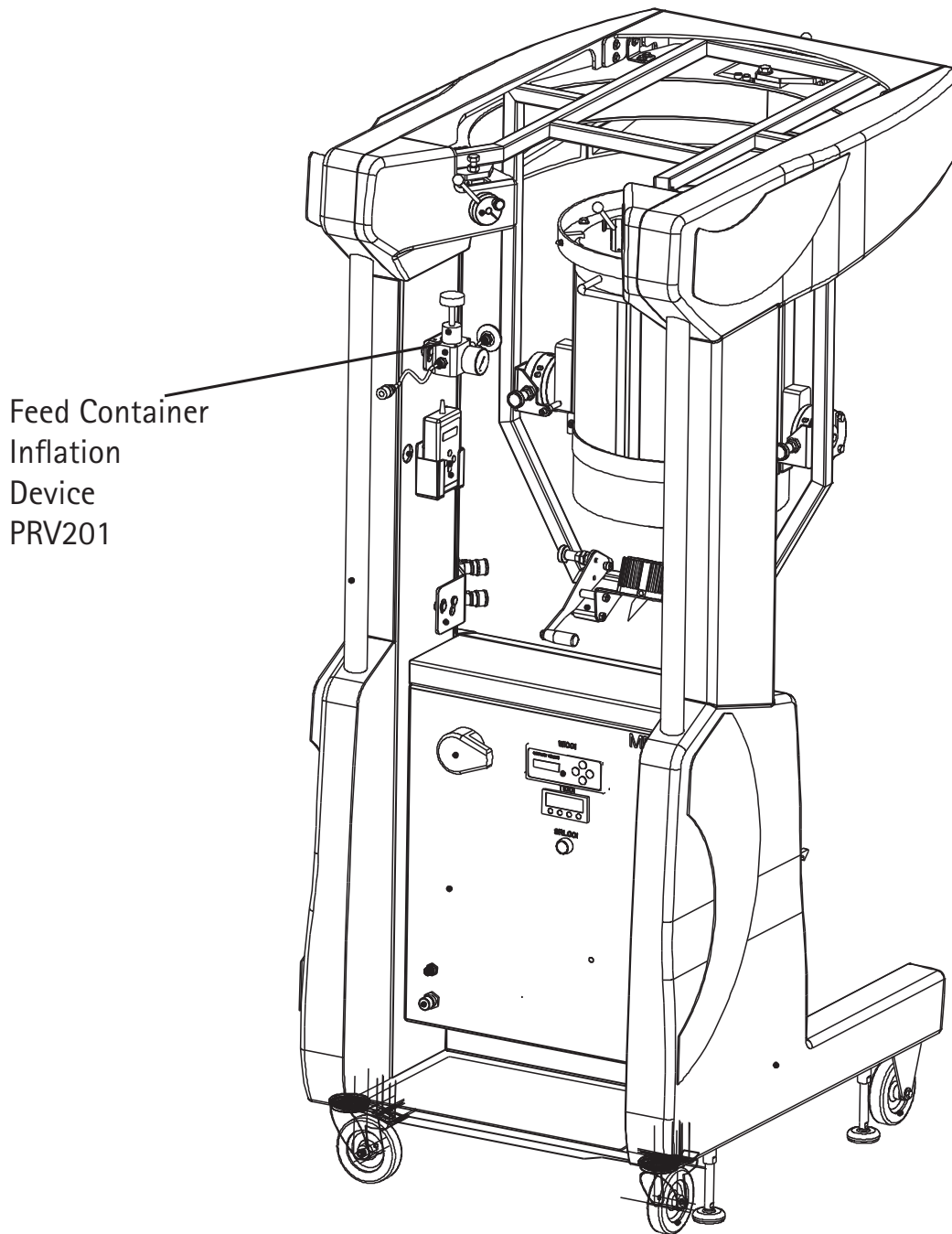
The locking pins hold the feed container carrier in place. The locking pins must be in the locked position once the feed container carrier and mixer support are in position. Do not run the system without the locking pins engaged.

5. Unpack the feed container assembly.



Feed container assembly

6. Insert the Feed container into the top of the tank. Ensure that the impeller cup, the retentate and feed tubing are at the bottom of the container.
7. Insert the retentate inlet tubing (smaller diameter tubing) on the bottom of the container through the center opening in the bottom of the carrier. Slide the tubing into the slot.
8. Insert the feed outlet tubing through the center opening in the bottom of the carrier.
9. Position the impeller cup in the bottom of the carrier.
10. Place the vent filter in the vent filter holder on top of the tank frame and hand-tighten the holder clamp.
11. Unlock the carrier locking pins and move the tank up into the vertical position.
12. Hold the carrier in place and lock it in place using the locking pins.
13. Open the tank door and ensure that the impeller cup of the feed container is in the mixer hole in the carrier.
14. Unlock the locking pin on the mixer motor support. Lift the motor support up until the impeller cup is engaged.
15. Lock the mixer support into position with the locking pin.
16. Coil the additional inlet tubing in the rim of the carrier and clamp it in place. This will improve weight measurement accuracy.
17. Hang the feed container inflation device PRV201 on the feed container carrier support frame. Connect the PRV201 to the vent filter on the feed container.



Feed container inflation device PRV201 location

18. Connect PRV201 to the clean air or nitrogen supply. PRV201 must be installed when inflating the container. Inflate the container with a maximum pressure of $1 \text{ psi} \pm 0.25 \text{ psi}$ (with inlet pressure at 6 bar).

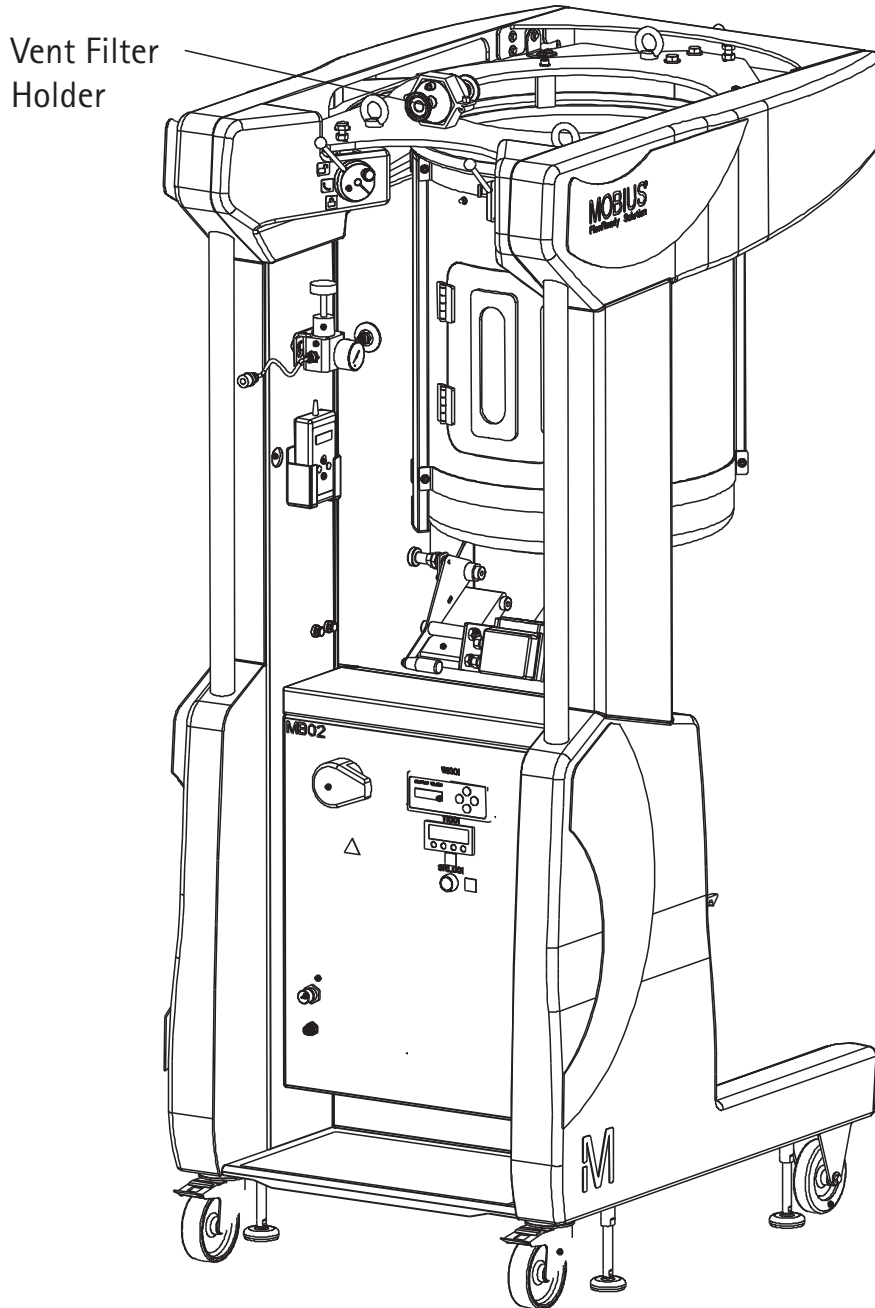
CAUTION

Do not over inflate the container.

19. Disconnect the PRV201 from the vent filter.

Installing the 100 or 200 L Feed Container Assembly

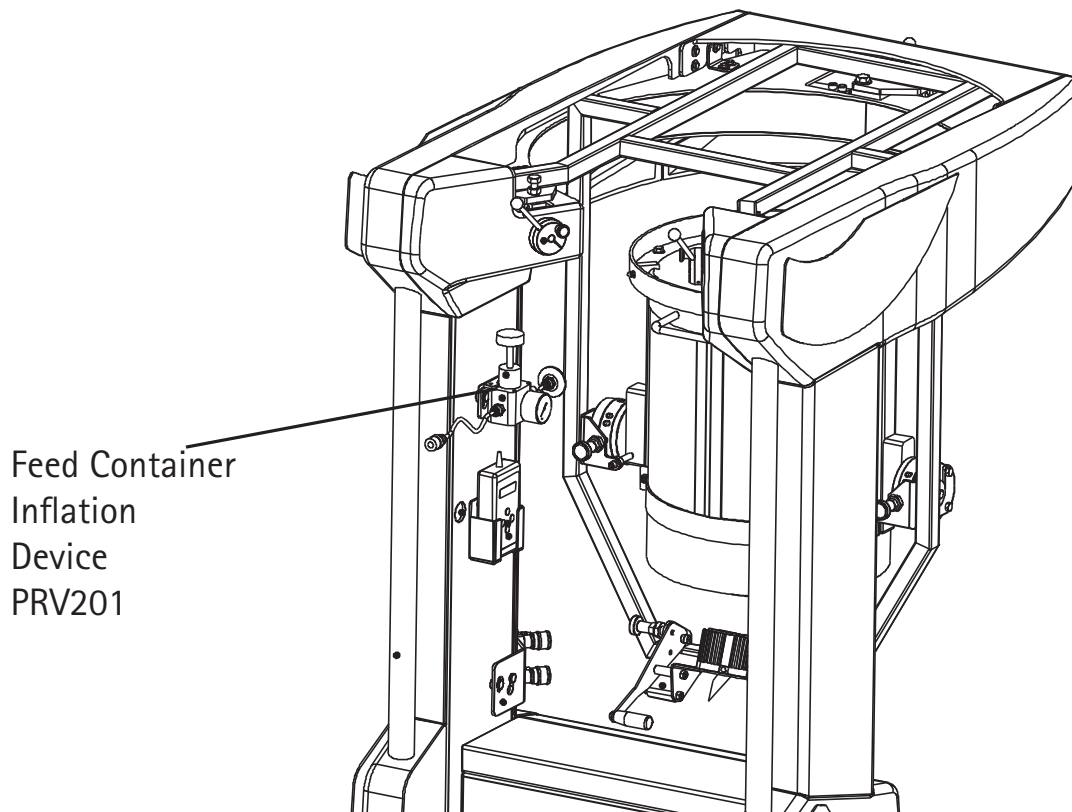
TF2S100L, TF3S200L



100 L Tank

1. Open the tank door.
2. Unpack the feed container assembly.
3. Insert the Feed container through the tank door. Ensure that the mixer, the retentate and feed tubing are at the bottom of the container.
4. Insert the retentate inlet tubing (smaller diameter tubing) on the bottom of the container through the center opening in the bottom of the carrier. Slide the tubing into the slot.
5. Insert the feed outlet tubing through the center opening in the bottom of the carrier.

6. Center the feed container mixing cup in the mixer opening of the carrier.
7. Unlock the locking pin on the mixer motor support. Lift the motor support up until the impeller cup is engaged.
8. Lock the mixer support into position with the locking pin.
9. Place the vent filter in the vent filter holder on top of the tank frame and hand-tighten the holder clamp.
10. Coil the additional inlet tubing in the rim of the carrier and clamp it in place. This will improve weight measurement accuracy.
11. Connect the PRV201 to the vent filter on the feed container.



Feed container inflation device PRV201 location

12. Connect PRV201 to the clean air or nitrogen supply. PRV201 must be installed when inflating the container. Inflate the container with a maximum pressure of $1 \text{ psi} \pm 0.25 \text{ psi}$ (with inlet pressure at 6 bar).

CAUTION

Do not over inflate the container.

13. Ensure that all the tubing on the Feed Container Assembly is not clamped shut.
14. Open the air supply to PRV201, inflate the container until no folds are visible, and close the air supply.
15. Disconnect the PRV201 from the vent filter, and remove it from the feed container carrier support frame.

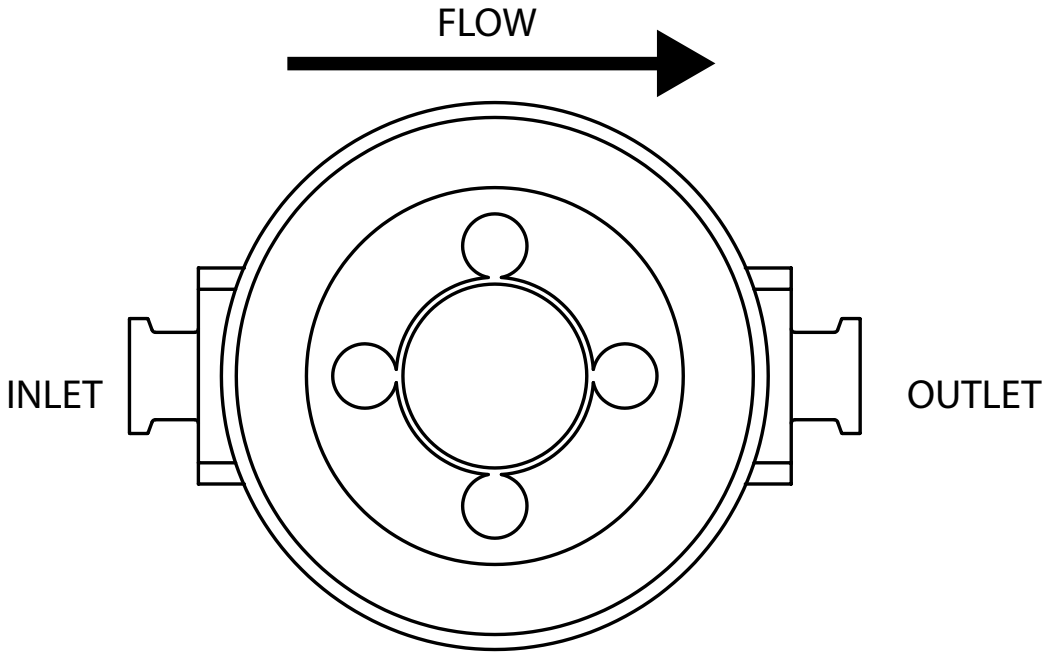
NOTE

When filling the container with fluid, the tank door must be closed when the fluid level in the container is just below the level of the bottom of the door.

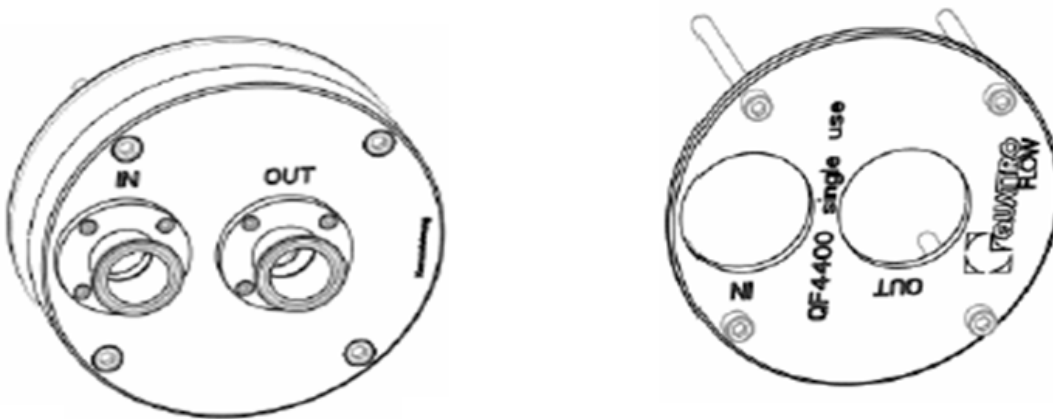
Installing the Pump Head onto the Pump

DISPUMP2, DISPUMP3

1. Remove the stainless steel flange (if present) from the pump.



Installing the TF2S pump head

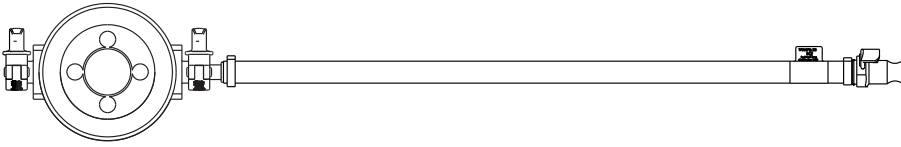


Installing the TF3S pump head on feed pump P001

2. Note the flow direction on the pump head. Install the pump head on the pump so that the inlet is on the left.
3. Place the stainless steel flange on the pump head and install the unit onto the pump using the four longer screws that were supplied in a bag with the system.
4. Tighten the four screws with Allen wrench.
5. TF2S: Connect the outlet of the pump to the inlet of the Smart Flexware® Assembly. Install the TC clamp over the fittings and tighten the clamp.
TF3S: Connect the outlet of the pump to the inlet of TF3SFEED assembly and the outlet of the TF3SFEED assembly to the Smart flow path assembly.

TF2STRANP, TF3STRANP

1. Remove the stainless steel flange (if present) from the pump.



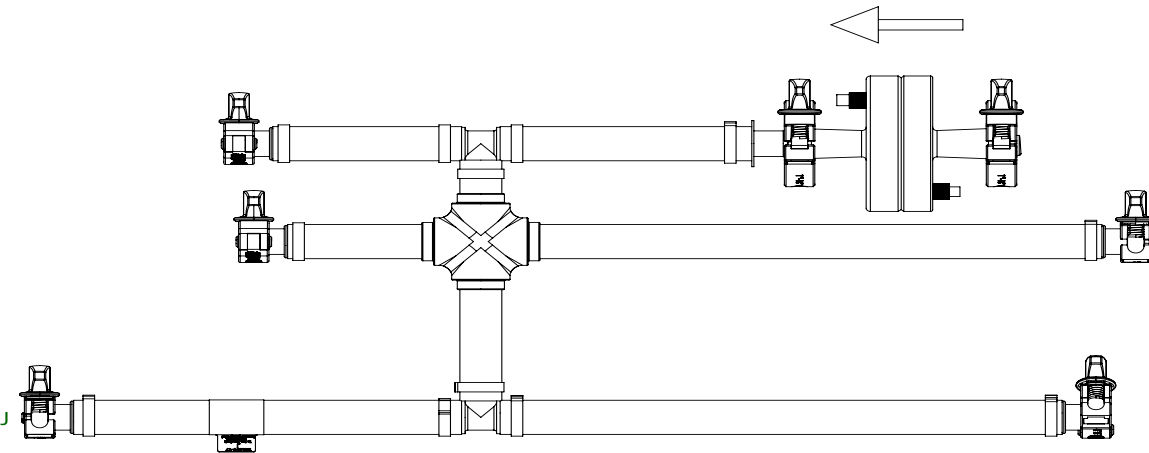
Installing the pump head

2. Note the flow direction on the pump head. Install the pump head on the pump so that the inlet is on the left.
3. Place the stainless steel flange on the pump head and install the unit onto the pump using the four longer screws that were supplied in a bag with the system.
4. Tighten the four screws with Allen wrench.

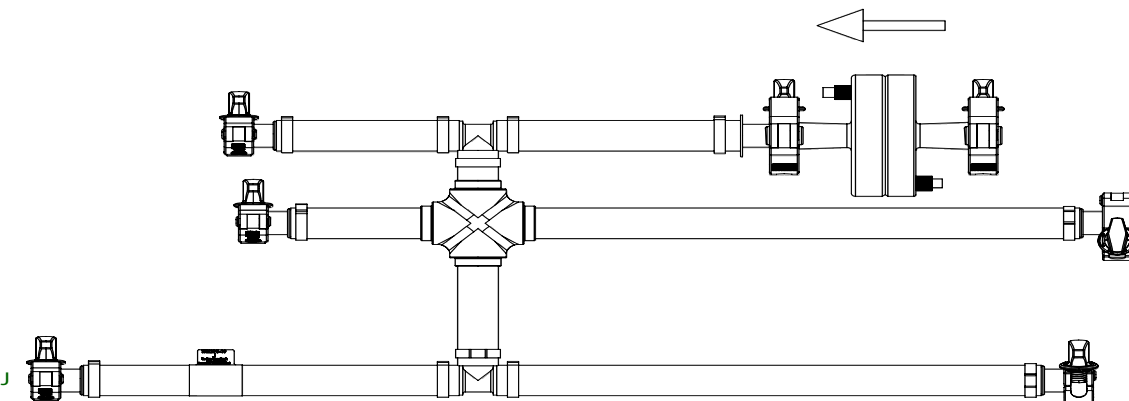
Installing the Transfer Pump Manifold Assembly

TF2STRANM, TF3STRANM

The Transfer Pump Manifold Assembly is shipped with either a cap or plug installed. These caps and plugs must be removed when connecting the assemblies.



Transfer Pump Manifold Assembly TF2STRANM



Transfer Pump Manifold Assembly TF3STRANM

1. Unpack the manifold assembly
2. Using the touch screen, open the pinch valves XV401, XV411, XV421, XV431, XV441 and XV402.
3. Open the air filter holder clamp FH401.
4. Install the manifold in the opened pinch valves on the manifold plate and the air filter in the filter holder clamp. Ensure that all tubing is properly installed in the valves.
5. Close the air filter holder clamp and hand-tighten.
6. Using the touch Panel, close successively the pinch valves XV401, XV411, XV421, XV431, XV441 and XV402.


Installing the Smart Flexware® Assembly Into the Clamshell

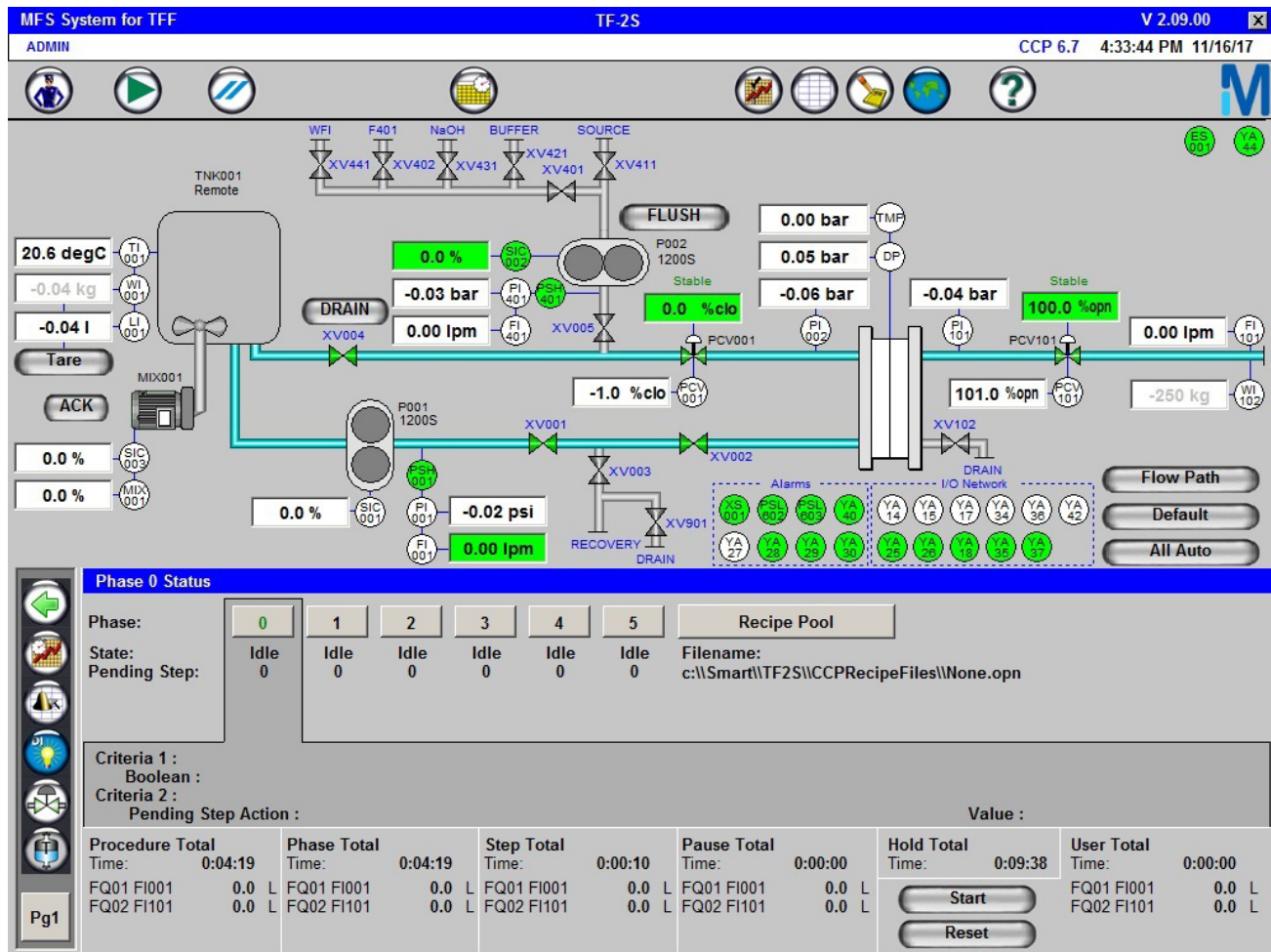
TF2SMART, TF3SPSMART

NOTE

The Smart Flexware® Assembly can be used for 50 cycles (50 valve openings and 50 valve closings) per valve. The integrity of the installation may be compromised if used for more than 50 cycles.

The Smart Flexware® Assembly must be installed onto the Smart Flexware® Cart. It will be connected to the required assemblies later.

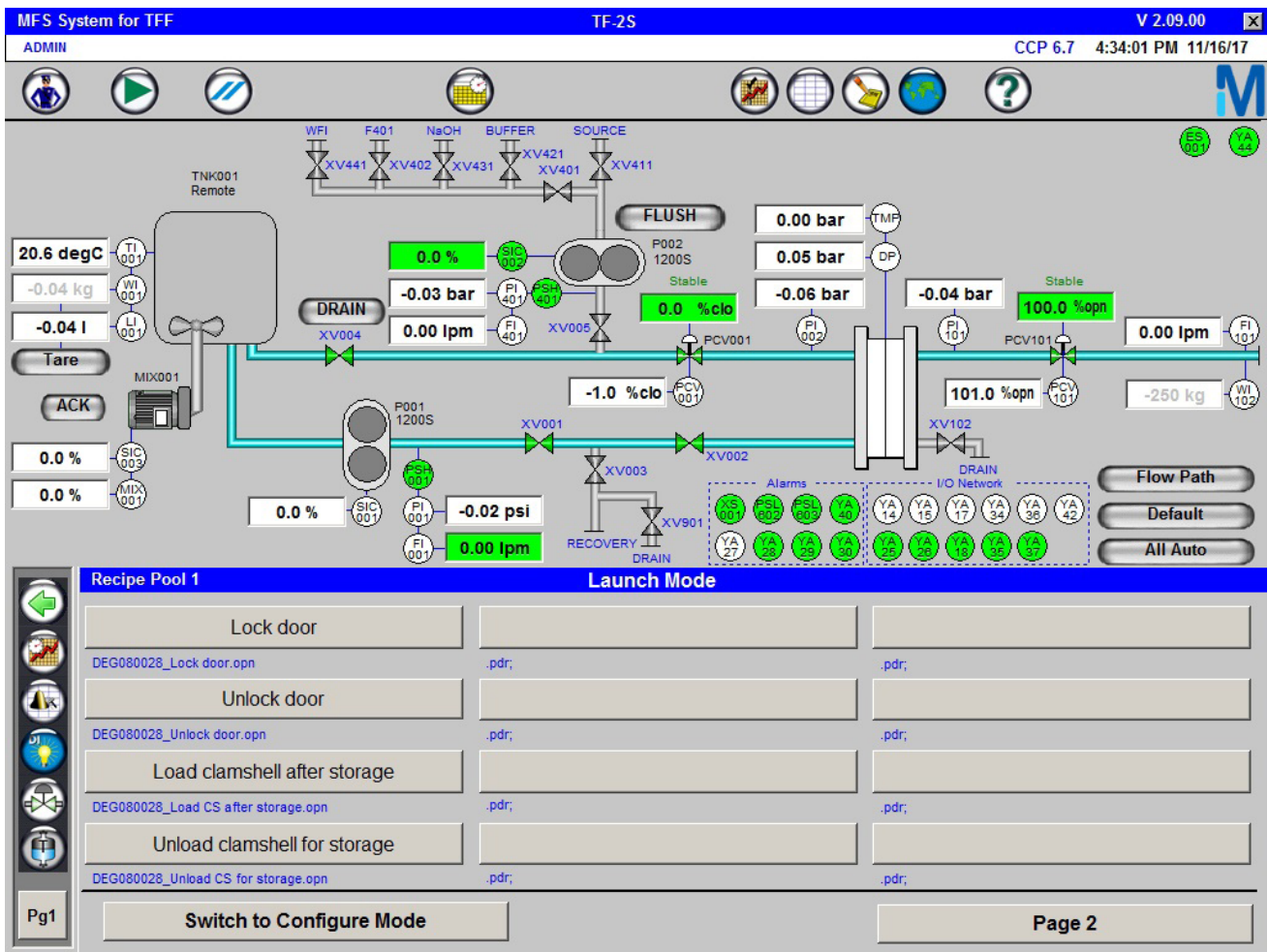
1. Refer to the *Common Control Platform® Overview* section of this manual for instructions on logging in to the system and navigating through the screens.
2. After logging on to the system, select the Operation Status Icon .
3. The Phase 0 Status display will appear. Select the Recipe Pool.




The screenshot displays the MFS System for TFF interface. At the top, it shows 'MFS System for TFF', 'TF-2S', and 'V 2.09.00'. Below this is an 'ADMIN' header with 'CCP 6.7' and '4:33:44 PM 11/16/17'. The main area features a detailed process flow diagram with various components like tanks (TNK001 Remote), pumps (P001, P002), valves (XV001-XV005), and sensors (FI, PI, TIC, WI). The diagram includes data points such as '20.6 degC', '-0.04 kg', '-0.04 l', '0.00 Ipm', '-0.03 bar', '0.00 Ipm', '0.00 Ipm', '-0.02 psi', '0.00 Ipm', '0.00 bar', '0.05 bar', '-0.06 bar', '-0.04 bar', '100.0 %opn', '0.00 Ipm', and '-250 kg'. A 'Phase 0 Status' window is open at the bottom, showing 'Phase: 0', 'State: Idle', and 'Pending Step: 0'. It also displays 'Criteria 1: Boolean', 'Criteria 2: Pending Step Action', and a table with columns for 'Procedure Total Time', 'Phase Total Time', 'Step Total Time', 'Pause Total Time', 'Hold Total Time', and 'User Total Time'. The table contains data for steps FQ01 FI001 and FQ02 FI101. Buttons for 'Start' and 'Reset' are visible at the bottom right of the status window.

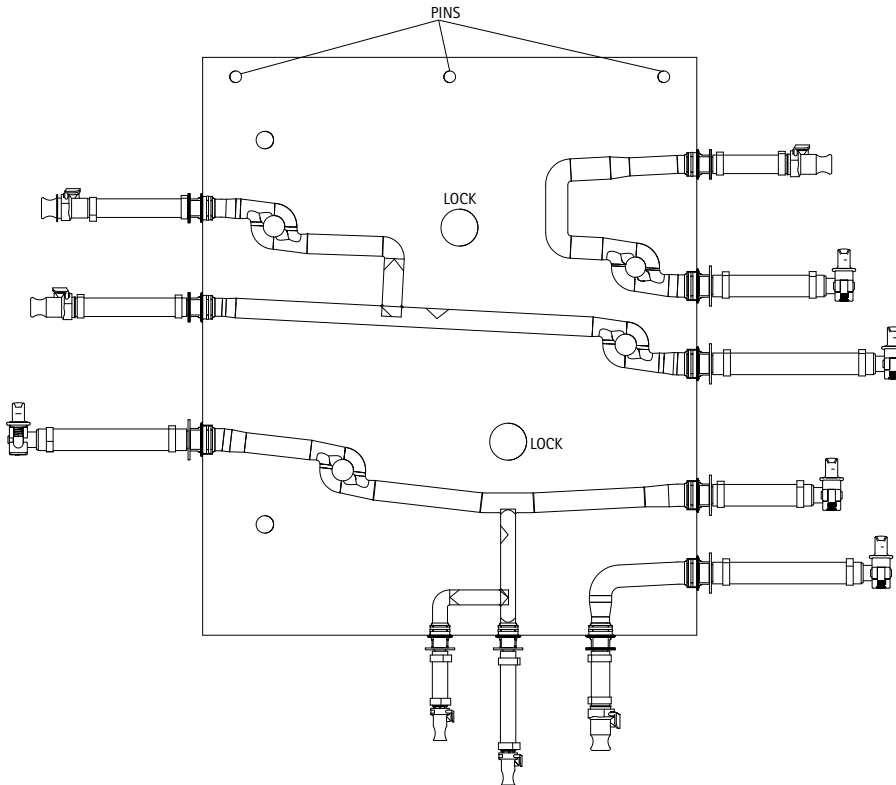
Phase 0 Status display

4. The Recipe Pool Launch Mode screen will appear. Select the Unlock Door recipe.



Recipe Pool Launch Mode screen

- Click Run and the recipe will start.
- Once the recipe is completed and the door is open, unlock and remove the rings of the five Retaining Ring Assemblies on the TF3S.
- Hang the container on the pins in the clamshell.
- Close the Smart Flexware® Cart door using the **Lock Door** recipe on the touch screen.
- Refer to the *Common Control Platform® Overview* section of this manual for instructions on logging in to the system and navigating through the screens.
- After logging on to the system, select the Operation Status Icon .
- The Phase 0 Status display will appear. Select the Recipe Pool.



Installing the TF2S Smart Flexware® Assembly

Installing the TF3S Smart Flexware® Assembly

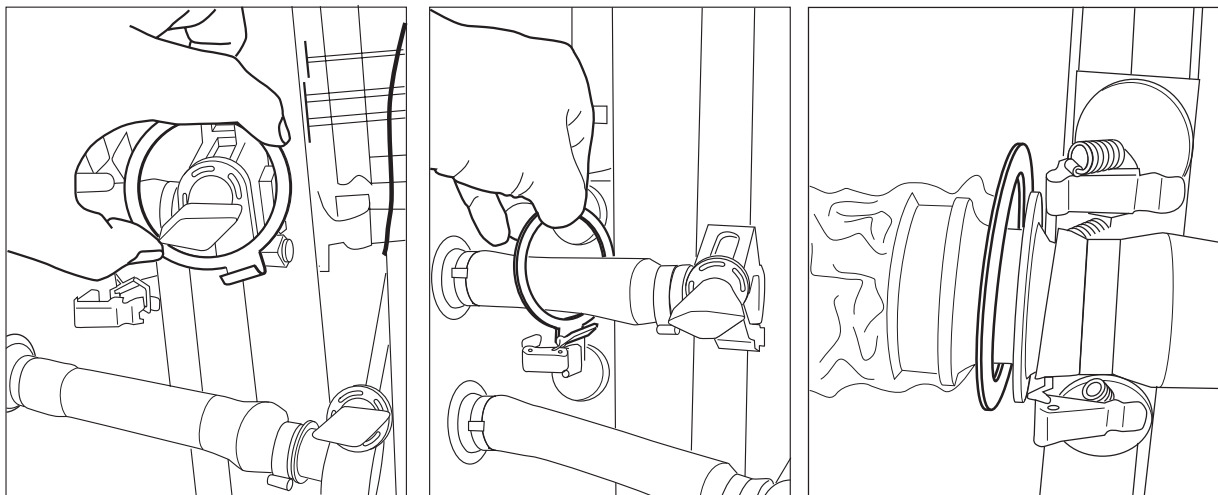
Clips or Retaining Ring Assemblies

Five retaining ring assemblies are installed on the TF3S clamshell, four on the right side, one on the left side. These assemblies retain the 3/4 in. fittings of the Smart Flexware® Assembly when installed in the Clamshell. The assemblies replace the clips that are used for the other fittings sizes.

Key No.	Tag (labeled on the system)	Component
1	none	Flexware® Fitting Collar
2	none	Clamshell Collar
3	none	Locking Ring

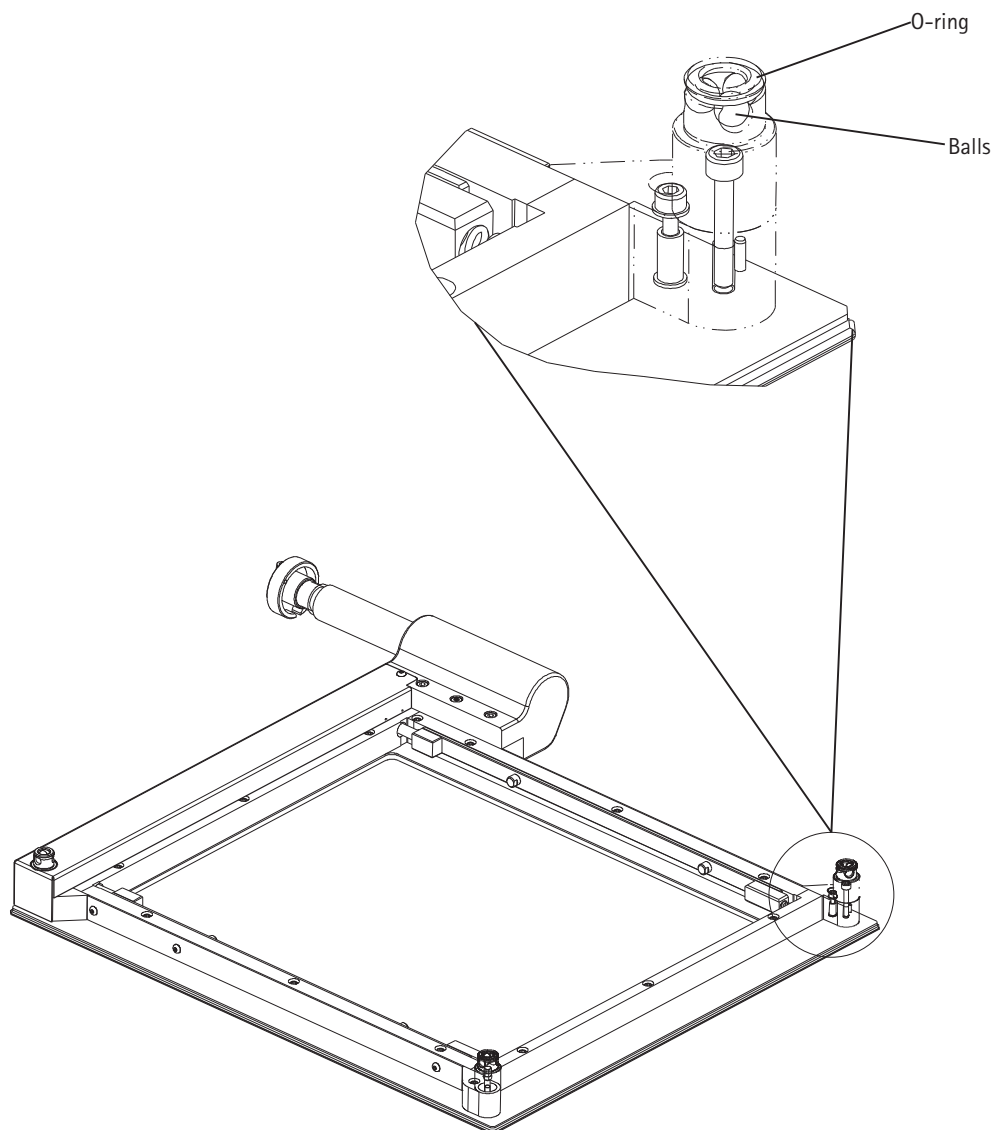
When there is no Flexware® Assembly installed in the clamshell, the Flexware® Fitting Collar is placed into the Clamshell Collar and locked in with the Locking Ring.

1. Install all fittings into the clips on the clamshell, ensuring they are properly seated in the clips.
or
Pass the Locking Ring over the 3/4 inch TC clamp on the Flexware® Assembly and over the tubing so that it rests around the 3/4 inch fitting on the clamshell.



Position the ring between the Flexware® Fitting Collar and the Clamshell Collar. Hold the ring in place and lock it with the lock.

- 2. Verify that the O-rings and stainless steel balls in the Smart Cart door locks are in place.



Smart Cart door locks

Phase 0 Status

Phase: 0 | 1 | 2 | 3 | 4 | 5 | Recipe Pool

State: Idle | Idle | Idle | Idle | Idle | Idle

Pending Step: 0

Filename: c:\Smart\TF2S\CCPRecipeFiles\None.opn

Criteria 1 :	Boolean :	Criteria 2 :	Pending Step Action :	Value :							
Procedure Total Time:	0:04:19	Phase Total Time:	0:04:19	Step Total Time:	0:00:10	Pause Total Time:	0:00:00	Hold Total Time:	0:09:38	User Total Time:	0:00:00
FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L
FQ02 FI101	0.0 L	FQ02 FI101	0.0 L	FQ02 FI101	0.0 L	FQ02 FI101	0.0 L	FQ02 FI101	0.0 L	FQ02 FI101	0.0 L

Buttons: Start, Reset

Phase 0 Status display.

3. The Recipe Pool Launch Mode screen will appear. Select the Lock Door recipe.

Recipe Pool 1 Launch Mode

Lock door		
DEG080028_Lock door.opn	.pdr;	.pdr;
Unlock door		
DEG080028_Unlock door.opn	.pdr;	.pdr;
Load clamshell after storage		
DEG080028_Load CS after storage.opn	.pdr;	.pdr;
Unload clamshell for storage		
DEG080028_Unload CS for storage.opn	.pdr;	.pdr;

Buttons: Pg1, Switch to Configure Mode, Page 2

Recipe Pool Launch Mode screen

4. Click Run and the recipe will start.
5. Close the door and hold it closed on the Hand label, until the recipe completes.
6. If the optional filtrate flow sensor is installed on FE101, open the sensor and insert the tubing labeled **E** into the sensor. Close the sensor lid.

Installing the Cassette Liner Assembly

TF2SLINER, TF3SLINER-A (OR -B, -C, -D, -E, -F)

NOTE

When using more than 6.27m² of Pellicon® 3 cassettes, the spacers are not used.

1. Remove the top plate of the Pellicon® cassette holder.
2. TF2S: The feed liner has the tubing labeled **A/D** attached to it. Install the feed liner in the Pellicon® cassette holder with the ribbed side of the liner toward the filter holder cart plate.

TF3S: The feed liner has the tubing labeled **A/D** attached to it. Install the feed liner in the Pellicon® cassette holder so that the side without holes is toward the filter holder cart plate.

3. All tubing on the liner assembly should be on the same side as the Smart Flexware® container.
4. Install the required Pellicon® cassettes.

5. TF2S: The retentate liner has the tubing labeled **B/C** attached to it. Install the retentate liner in the Pellicon® cassette holder with the ribbed side of the liner facing up.

TF3S: The retentate liner has the tubing labeled **B/C** attached to it. Install the feed liner in the Pellicon® cassette holder so that the side without holes is toward the filter holder cart plate.

6. Place filter holder end plate on the filter holder.
7. Install the washers and spacers onto the tie rods if required.
8. Install the nuts onto the tie rods.
9. Tighten the filter holder according to the installation instructions provided with the Pellicon® cassettes.

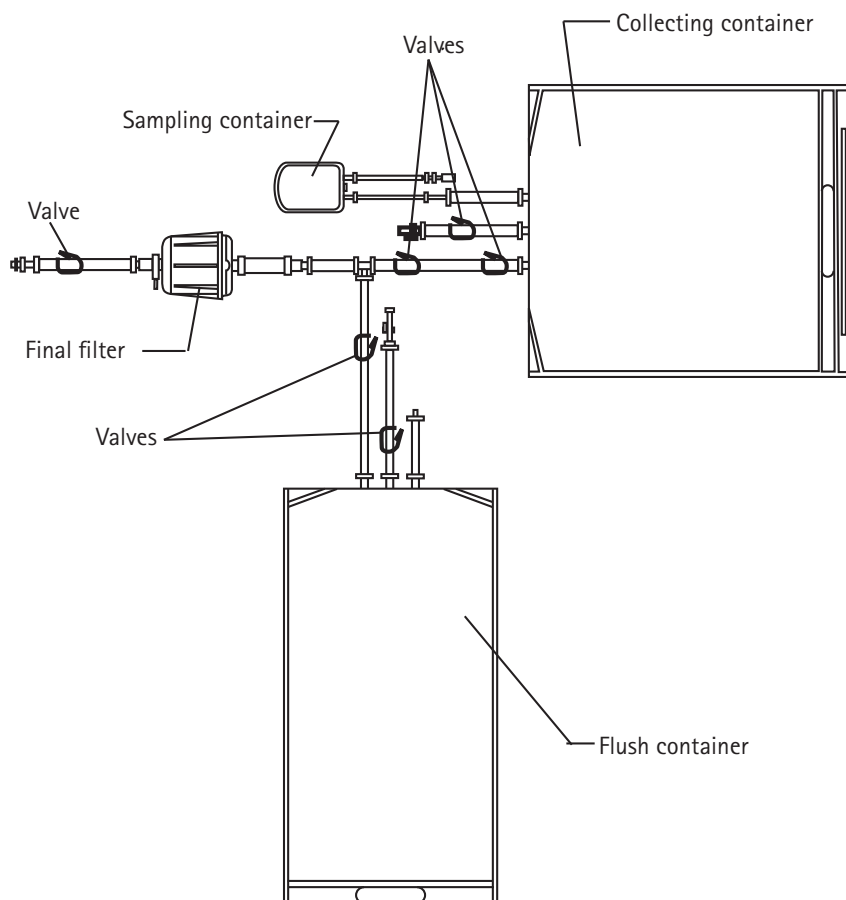
Installing the Retentate Sampling Port Assembly

TF2SRETSMP

Install the Retentate Sampling Port Assembly into the Retentate Sampler Support.

Installing the TFF Filtration Assembly

TF200XXLGE1



TFF Filtration Assembly

1. Unpack the final filter assembly.
2. Place the collecting container, the sampling container and the flushing container on the shelf located at the base of the Smart Cart.
3. Install the final filter assembly. Remove the cap from the connector on the retentate flush assembly just before the filter.
4. Ensure that all valves on the assembly are open.

Connecting the Flexware® Assemblies

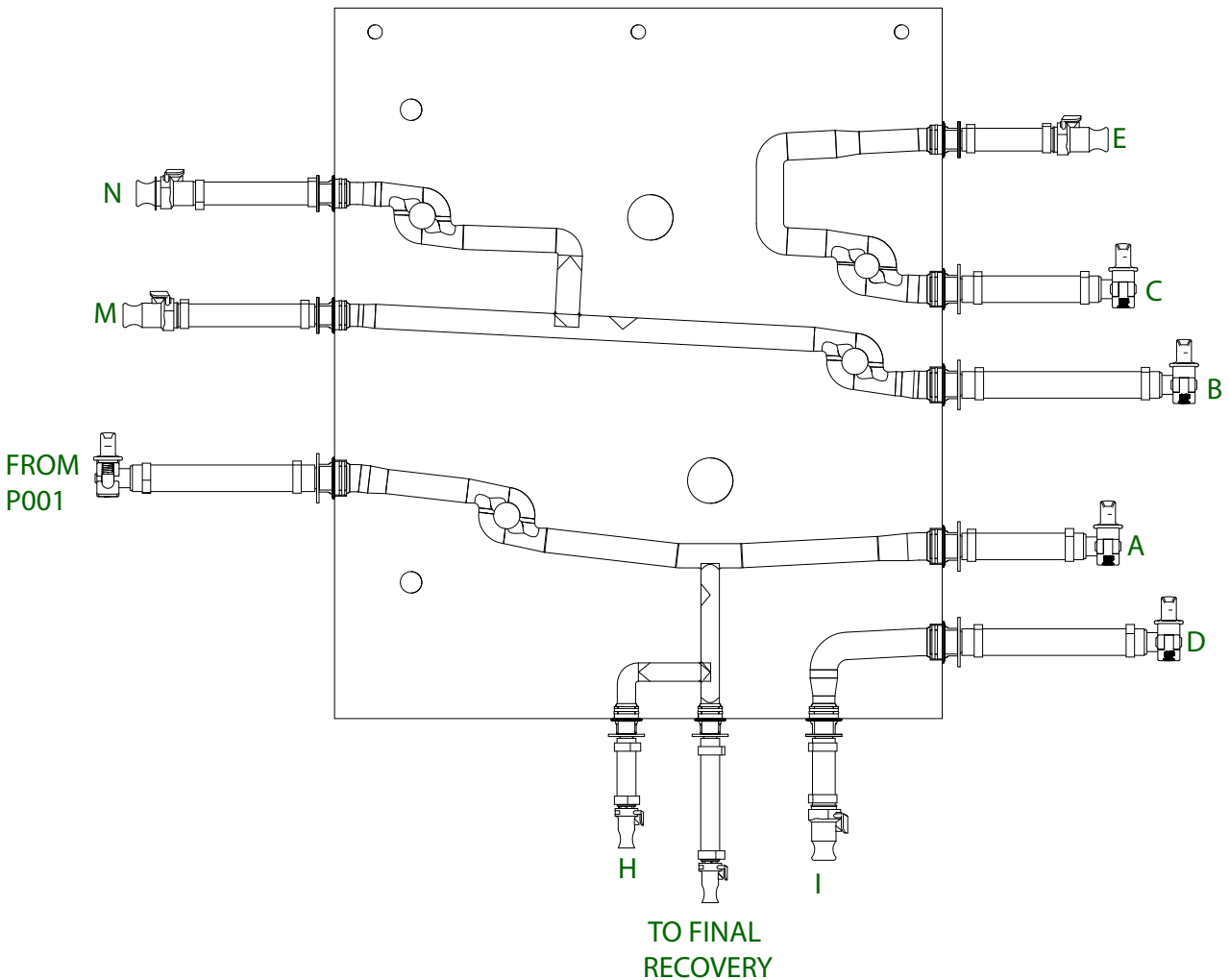
There are a number of Flexware® Assemblies that must be connected to the Smart Flexware® Assembly. The previous section details the installation of these assemblies. This section details connecting all the Flexware® Assemblies used on the system.

Assembly numbers in this section are highlighted in **RED**.

Flexware® connection tags are highlighted **GREEN**.

There are two setups for connecting the Flexware®, one for Flushing the System and one for Processing.

Connect the Flexware® Assemblies in the order presented in this section.



Smart Flexware® Assembly Connection Tags

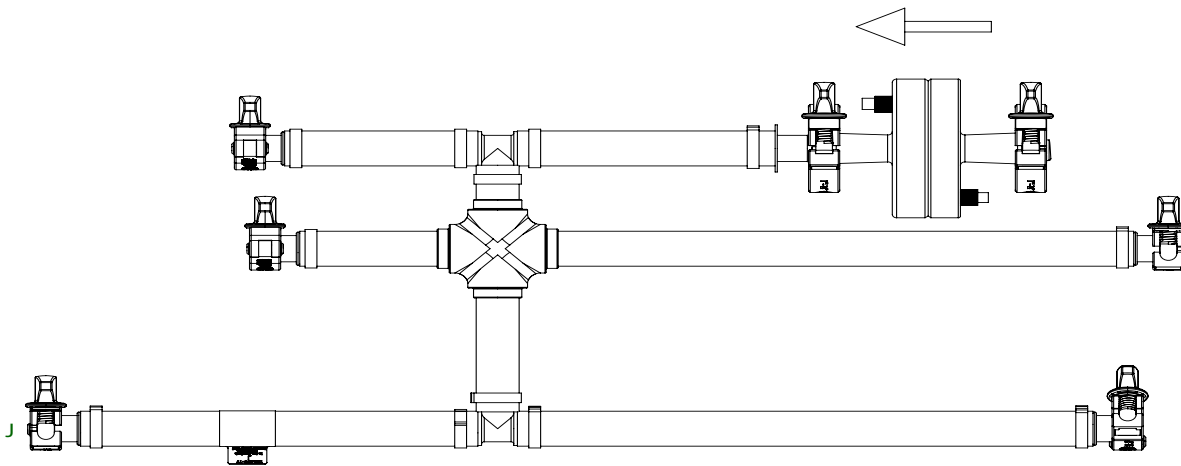
Connecting the Flexware® Assemblies for Flushing the System

The Flushing Assembly is used to flush the TFF membranes before a process run to remove the preservative used in the cassettes for shipping. The Flushing Assembly must be removed from the system after flushing. Reconnect the Feed Container with P001 and reconnect the Transfer Pump Manifold Assembly with Pump P002 before starting the process run.

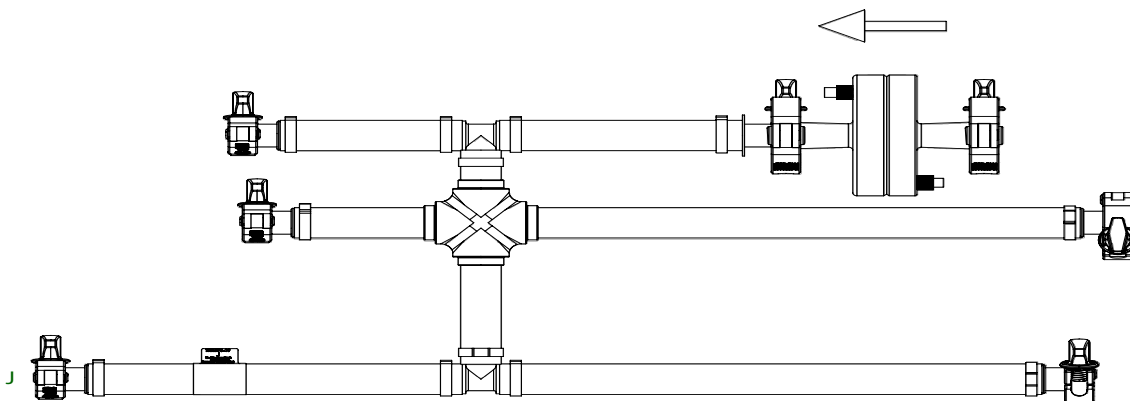
Connecting the Transfer Pump Manifold Assembly

TF2STRANM, TF3STRANM

The Transfer Pump Manifold Assembly is shipped with a cap installed. This cap must be removed when installing the assemblies onto the system.



Transfer Pump Manifold Assembly TF2STRANM

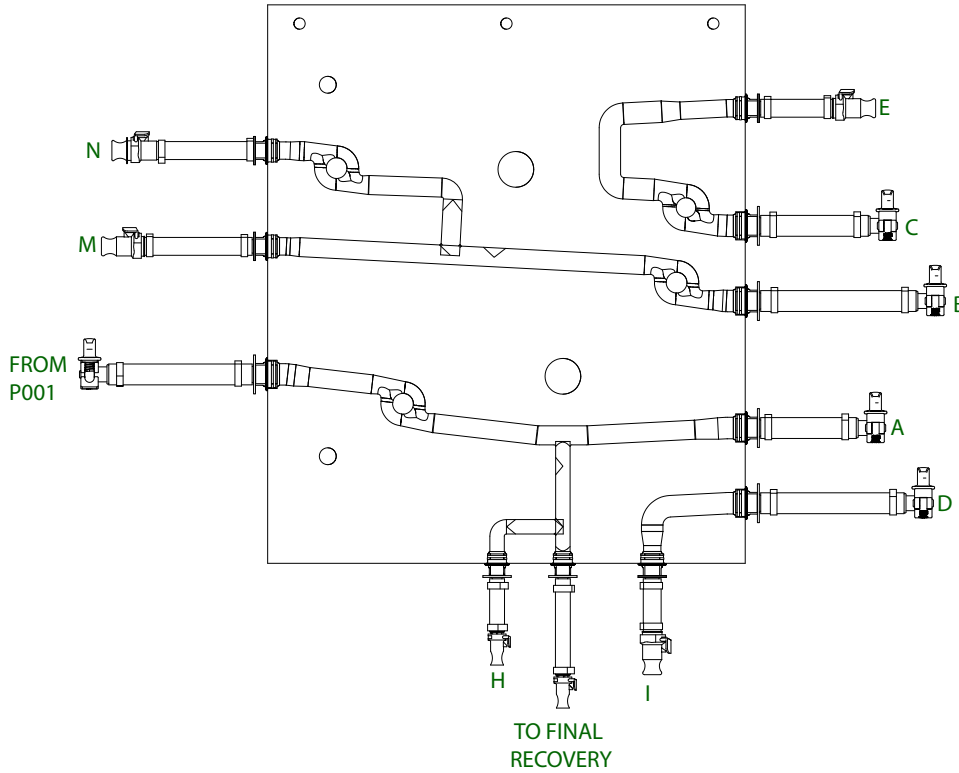


Transfer Pump Manifold Assembly TF3STRANM

Remove the TC clamp from the manifold tubing labelled **J**. Remove the cap from the tubing.

Connecting the Smart Flexware® Assembly

TF2SMART, TF3SPSMART



Smart Flexware® Assembly

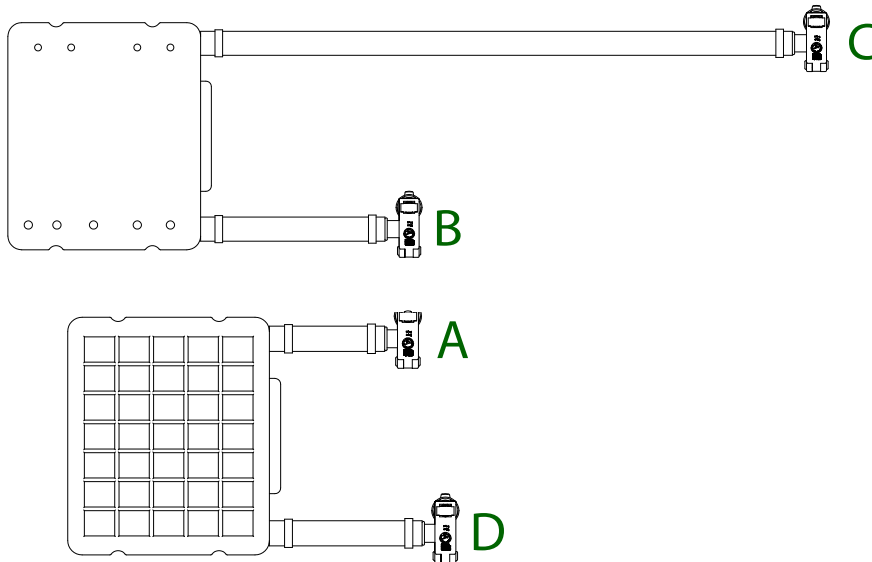
1. TF2S only: Connect the connector labelled **FROM P001** on the Smart Flexware® Assembly to the feed pump outlet.
 TF5S only: Connect the connector labelled **FROM P001** on the Pump Feed Assembly to the feed pump outlet, then connect the connector labelled **K** to the connector labelled **K** on the Smart Flexware® Assembly.
2. Connect the connector labelled **M** on the Smart Flexware® Assembly to the drain.

NOTE If the optional filtrate flowmeter is installed, ensure that the label on the tubing does not interfere with the flowmeter.

Connecting the Filtrate Liner Assembly

TF2SLINER, TF3SPLINER-A (OR -B, -C, -D, -E, -F)

1. Connect the connector labelled **C** on the Smart Flexware® Assembly to the connector labelled **C** on the Filtrate Liner Assembly.



Filtrate Liner Assembly

2. Connect the connector labelled **B** on the Smart Flexware® Assembly to the connector labelled **B** on the Filtrate Liner Assembly.
3. Connect the connector labelled **A** on the Smart Flexware® Assembly to the connector labelled **A** on the Filtrate Liner Assembly.
4. Connect the connector labelled **D** on the Smart Flexware® Assembly to the connector labelled **D** on the Filtrate Liner Assembly.

Connecting the Flushing Assembly

TF2SFLUSH, TF3SFLUSH

1. Connect the connector labelled **TO P001** on the Flushing Assembly to the inlet of P001.
2. Connect the connector labelled **J1** on the Flushing Assembly to the connector labelled **J** on the Transfer Manifold Assembly
3. Connect the connector labelled **M** on the Smart Flexware® Assembly to the connector labelled **M1** on the Flushing Assembly.

4. Direct the other end of the Flushing Assembly to the drain. Do not direct it to the Feed Container.



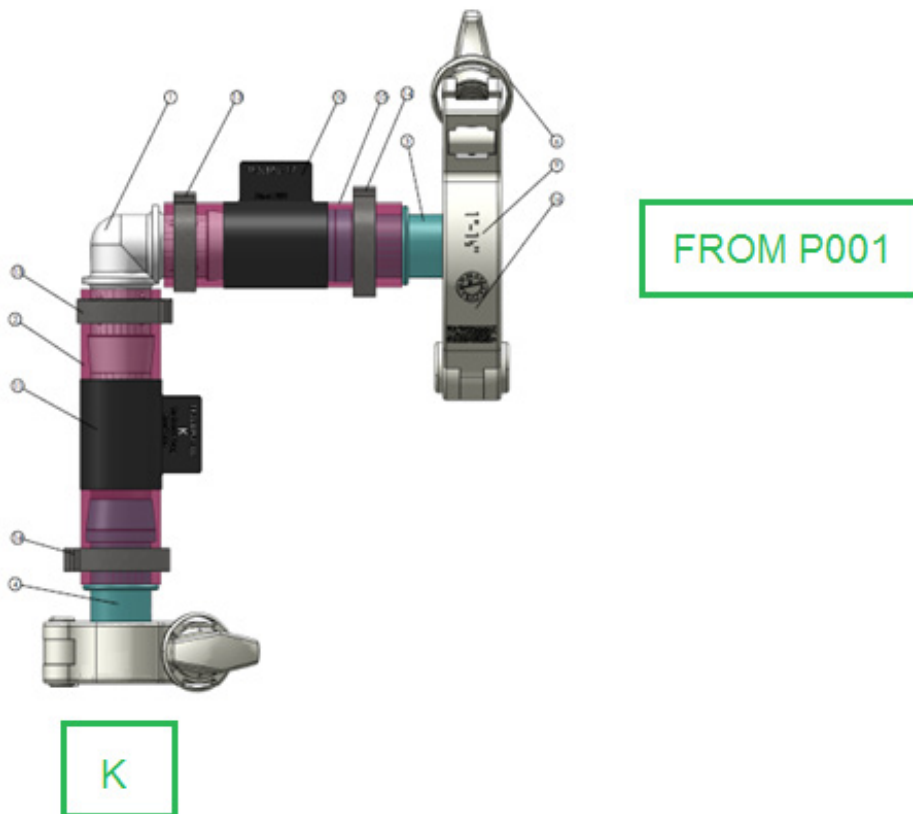
Flushing Assembly

The Flushing Assembly must be removed from the system after flushing. Reconnect the Feed Container with P001 and reconnect the Manifold Assembly with Pump P002 before starting the process run.

Connecting the Feed Assembly

TF3SFEED

1. Remove the TC clamp from the Feed Assembly tubing labelled FROM P001. Remove the cap from the tubing.
2. Remove the TC clamp from the Feed Assembly tubing labelled K. Remove the cap from the tubing.
3. Connect the connector FROM P001 to the outlet of the Feed Pump P001.
4. Connect the connector K to the Smart Flexware® Assembly tubing labelled K.



Feed Assembly TF3SFEED

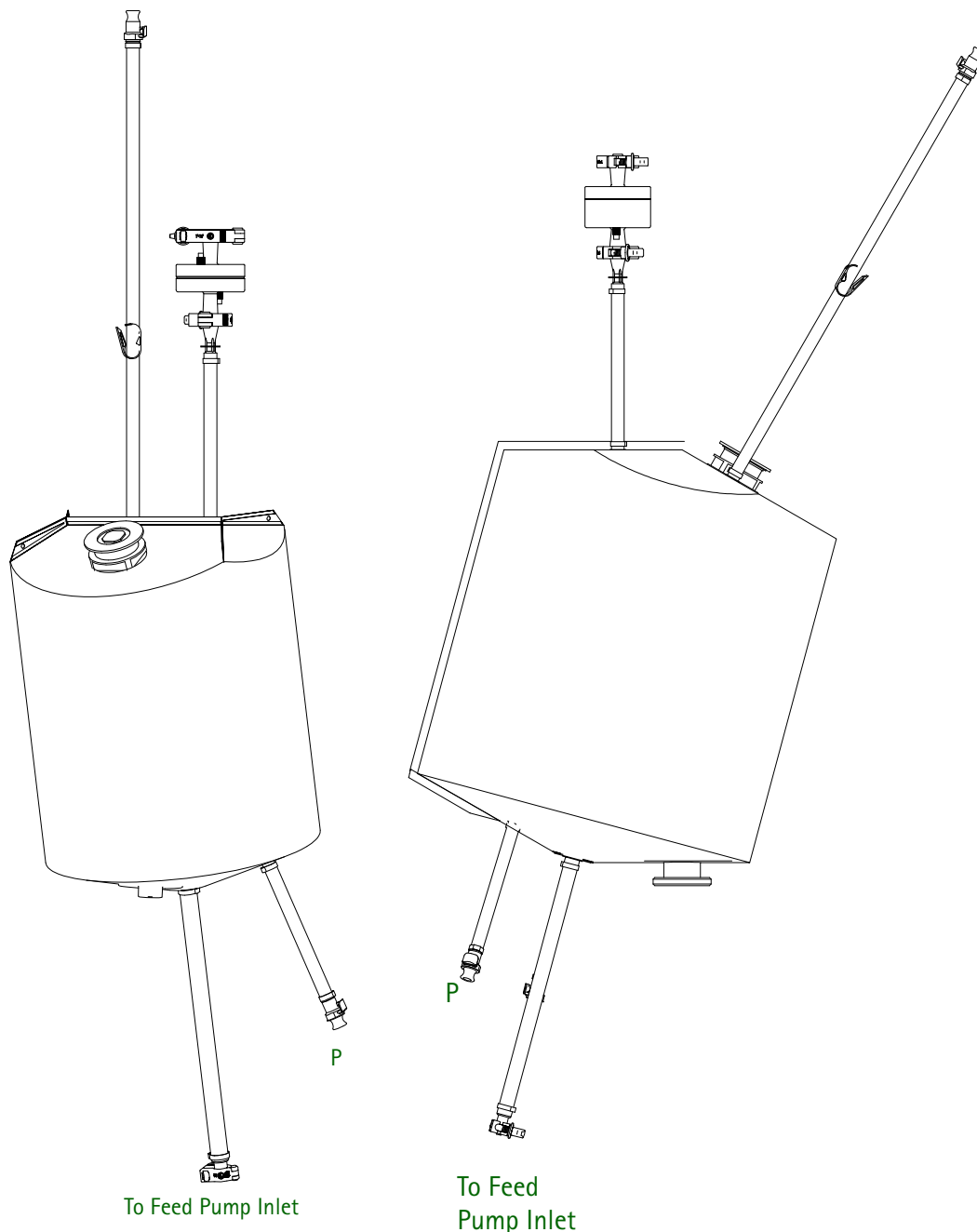
Connecting the Flexware® Assemblies for Processing

The Flushing Assembly must be removed from the system after flushing. Reconnect the Feed Container with P001 and reconnect the Manifold Assembly with Pump P002 before starting the process run.

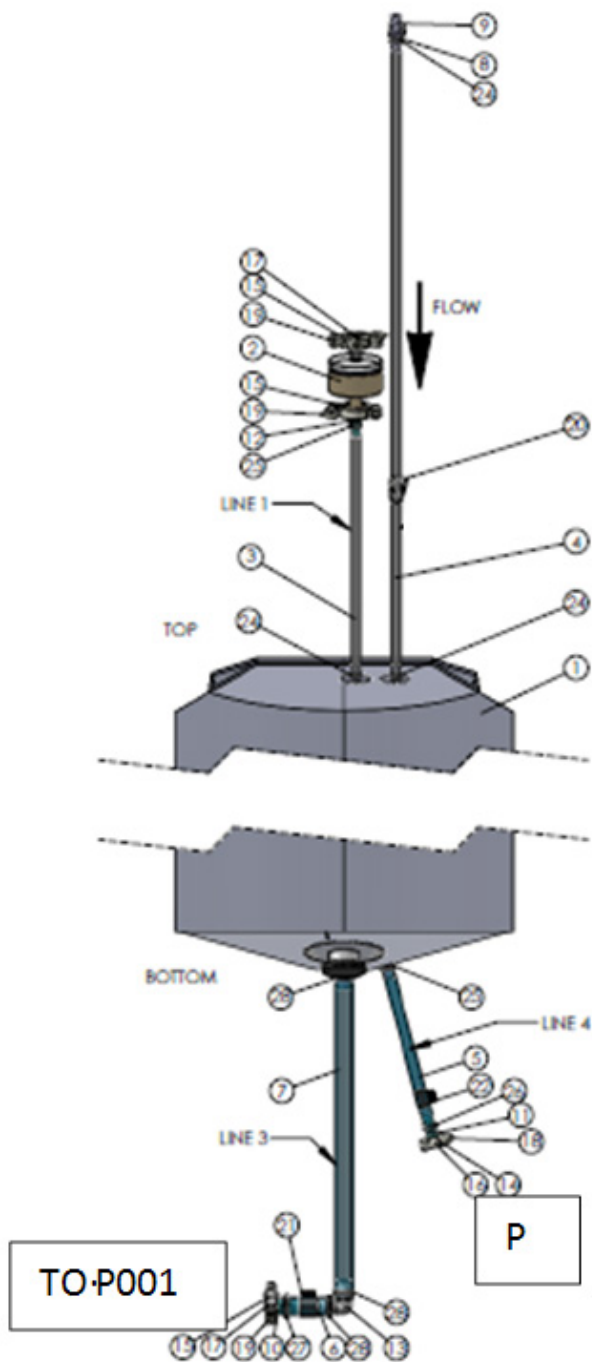
Connecting the Feed Container Assembly

TF2S050L, TF2S100L, TF3S200L

After the system has been flushed, the Feed Container Assembly must be attached to the Feed Pump inlet and to the Retentate Sampling Assembly.



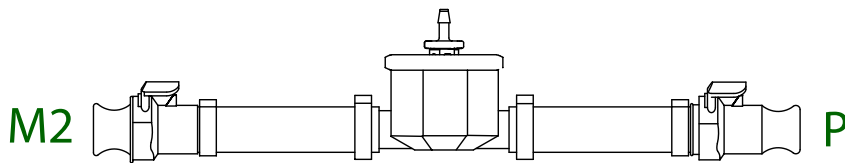
Feed Container Assembly TF2S50L Feed Container Assembly TF2S100L



Feed Container Assembly TF3S200L

1. Remove the plugs/caps from the connector labelled **TO FEED PUMP INLET** or **TO P001** on the Feed Container Assembly and connect it to the inlet of the Feed Pump.

2. Connect the connector labelled **P** to the outlet of Retentate Sampling Assembly labelled **P**.

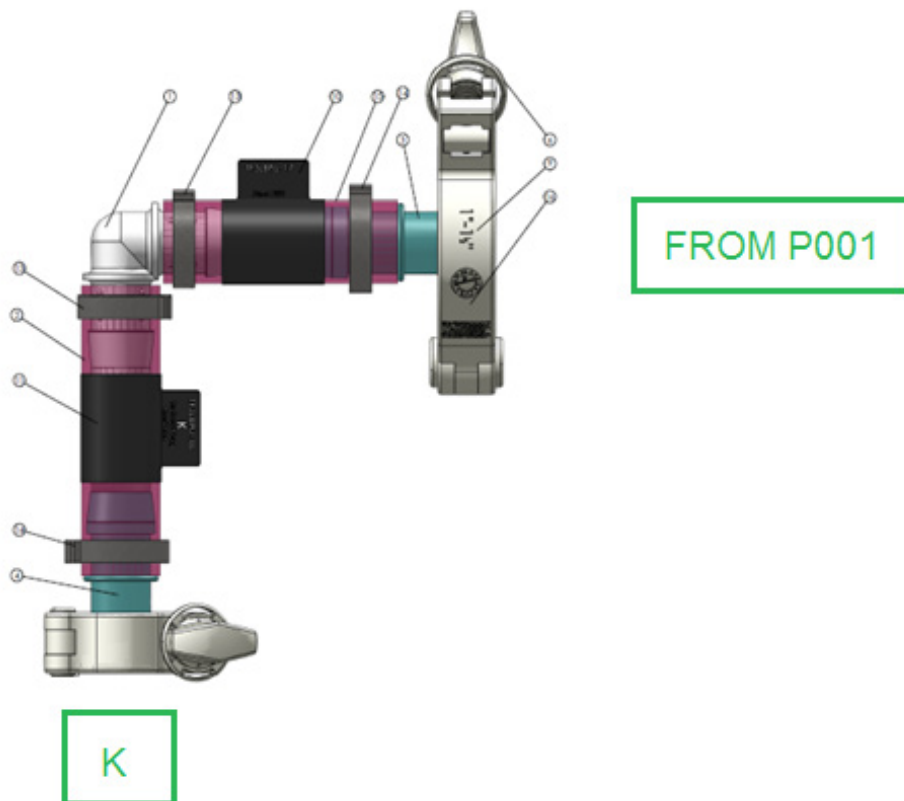


Retentate Sampling Port Assembly

Connecting the Feed Assembly

TF3SFEED

1. Remove the TC clamp from the Feed Assembly tubing labeled FROM P001. Remove the cap from the tubing.
2. Remove the TC clamp from the Feed Assembly tubing labelled K. Remove the cap from the tubing.
3. Connect the connector FROM P001 to the outlet of the Feed Pump P001.
4. Connect the connector K to the Smart Flexware® Assembly tubing labeled K.

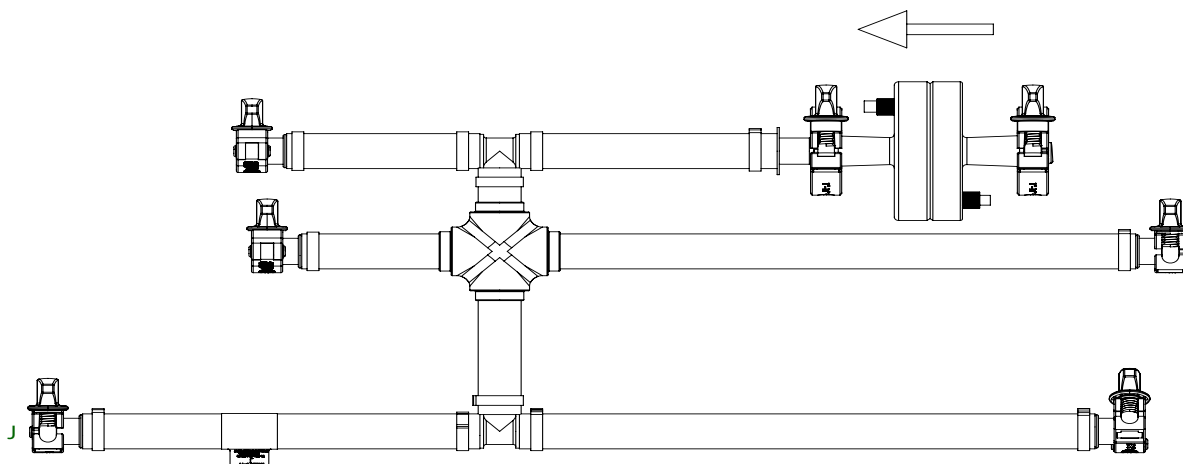


Feed Assembly TF3SFEED

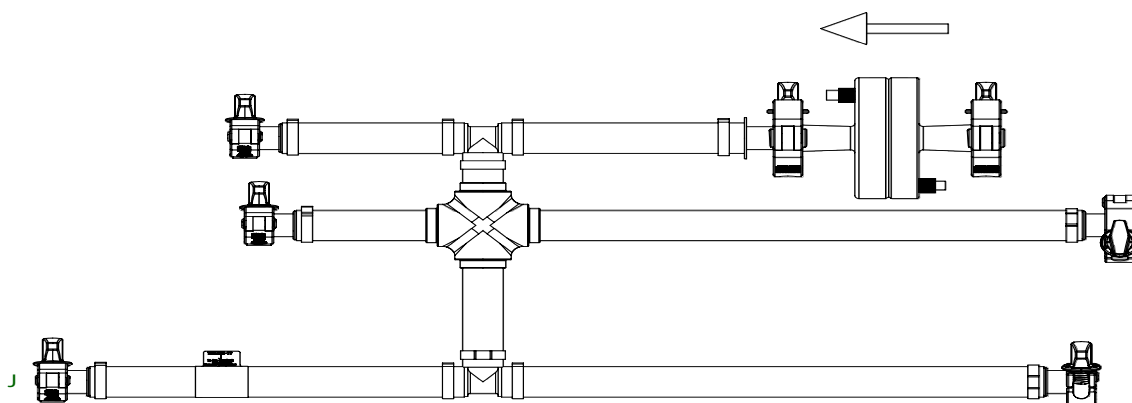
Connecting the Transfer Pump Manifold Assembly

TF2STRANM, TF3STRANM

The Transfer Pump Manifold Assembly is shipped with a cap installed. This cap must be removed when installing the assemblies onto the system.



Transfer Pump Manifold Assembly TF2STRANM

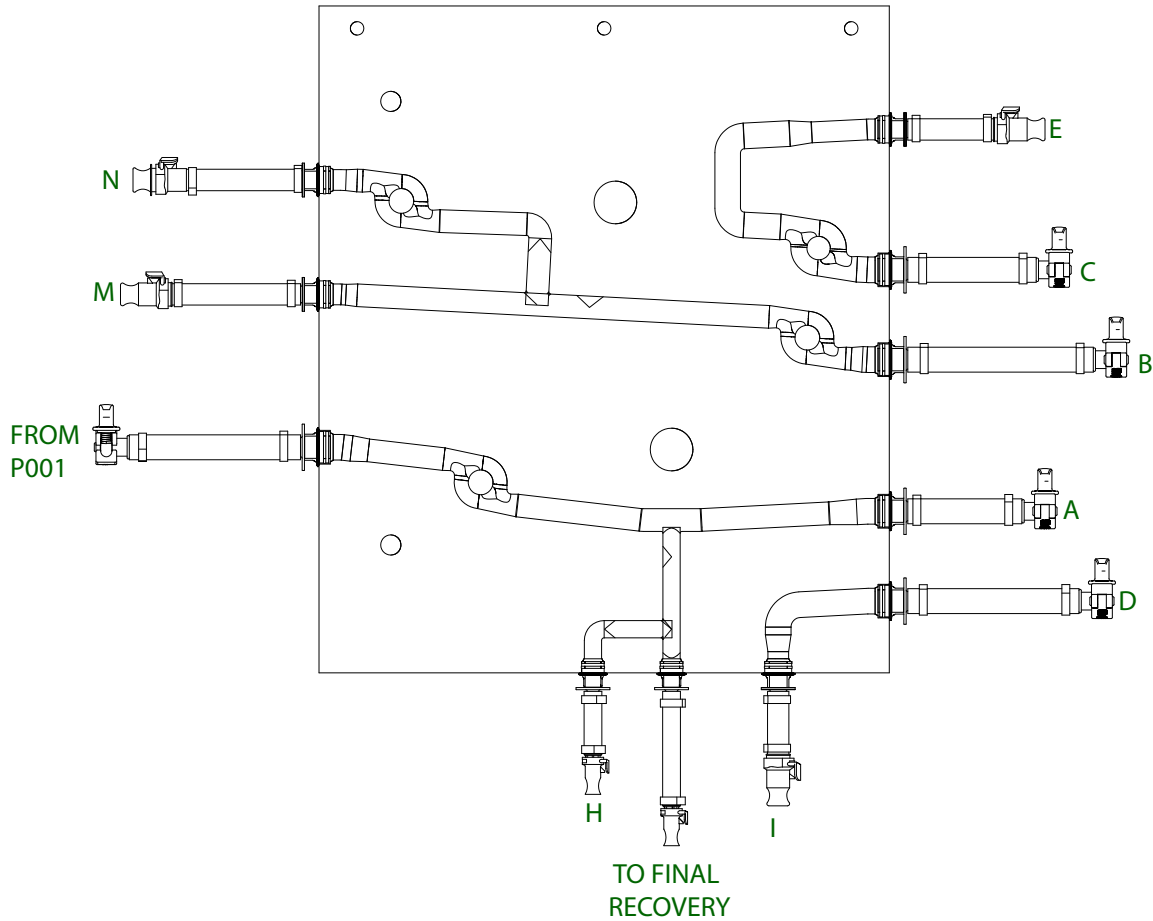


Transfer Pump Manifold Assembly TF3STRANM

Connect the connector **J** to the inlet of the transfer pump P002.

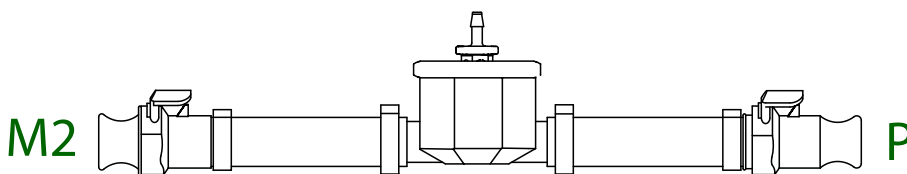
Connecting the Smart Flexware® Assembly

TF2SSMART



TF2S Smart Flexware® Assembly

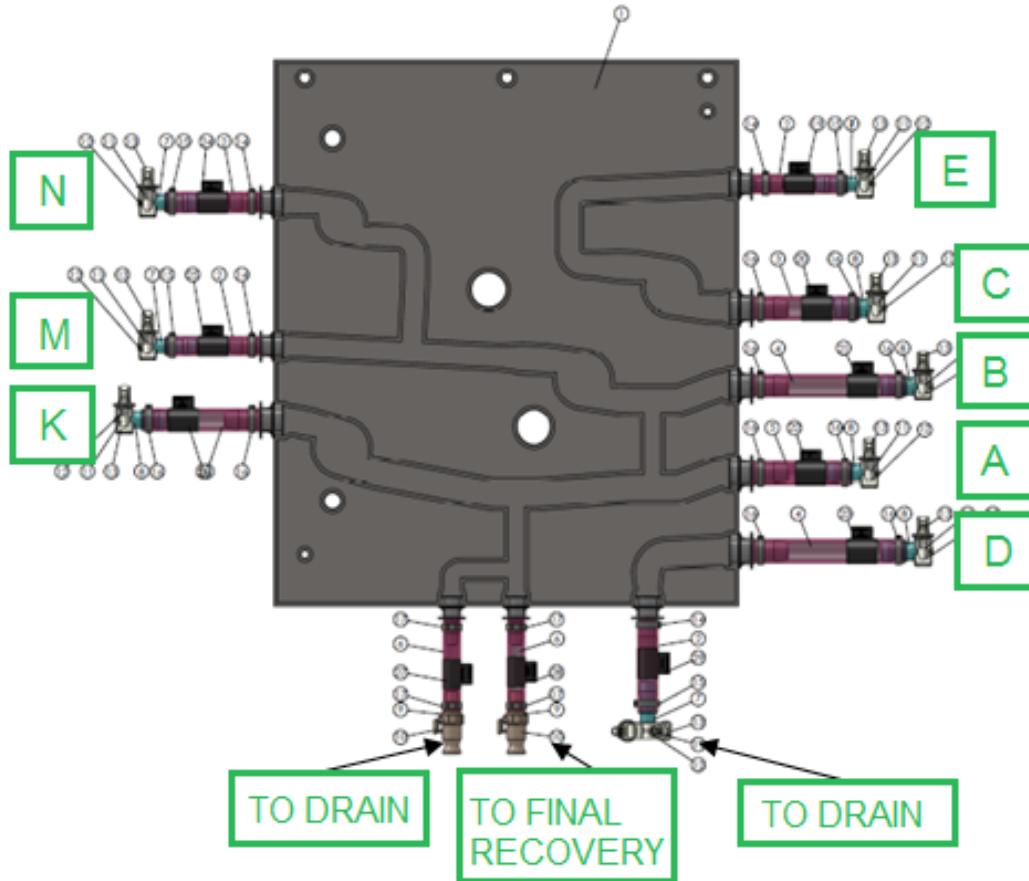
1. Connect the connector labelled **FROM P001** on the Smart Flexware® Assembly to the feed pump outlet.
2. Connect the connector labelled **M** on the Smart Flexware® Assembly to the connector labelled **M2** on the Retentate Sampling Port Assembly.
3. The sampling port should be closed during the production cycle. The sampling port will be only opened during the sampling operation.



Retentate Sampling Port Assembly

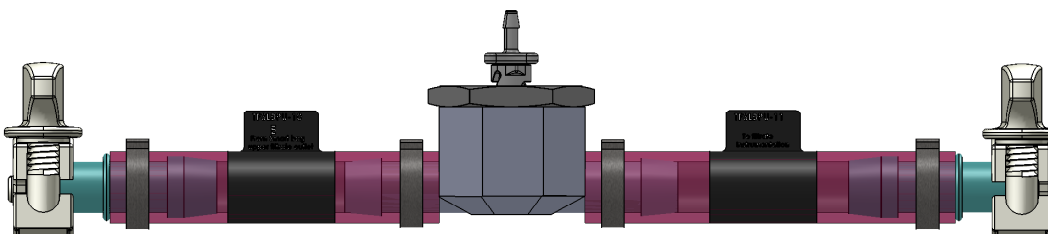
4. Connect the connector labelled **N** on the Smart Flexware® Assembly to the connector labelled **N2** on the Transfer Pump Assembly.

TF3SPSMART



Smart Flexware® Assembly TF3SSMART

1. Connect the connector labelled **K** on the Smart Flexware® Assembly to the Feed Assembly.
2. Connect the connector labelled **M** on the Smart Flexware® Assembly to the connector labelled **M2** on the Retentate Sampling Port Assembly.
3. The sampling port should be closed during the production cycle. The sampling port will be only opened during the sampling operation.



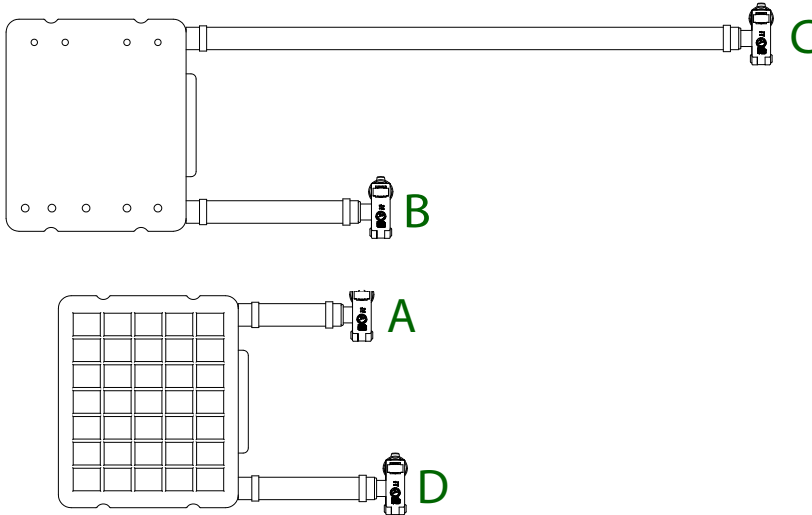
Retentate Sampling Port Assembly TF3SRETSMP

4. Connect the connector labelled **N** on the Smart Flexware® Assembly to the connector labelled **N2** on the Transfer Pump Assembly.

Connecting the Filtrate Liner Assembly

TF2SLINER, TF3SLINER-A (OR -B, -C, -D, -E, -F)

1. Connect the connector labelled **C** on the Smart Flexware® Assembly to the connector labelled **C** on the Filtrate Liner Assembly.



Filtrate Liner Assembly

2. Connect the connector labelled **B** on the Smart Flexware® Assembly to the connector labelled **B** on the Filtrate Liner Assembly.
3. Connect the connector labelled **A** on the Smart Flexware® Assembly to the connector labelled **A** on the Filtrate Liner Assembly.
4. Connect the connector labelled **D** on the Smart Flexware® Assembly to the connector labelled **D** on the Filtrate Liner Assembly.

Connecting the Drain Assembly

TF2SDRAIN

1. Connect the connector labelled **I** on the Smart Flexware® Assembly to the connector labelled **I** on the Drain Assembly **TF2SDRAIN**.



Drain Assembly

2. Connect the connector labelled **H** on the Smart Flexware® Assembly to the connector labelled **H** on the Drain Assembly.

Connecting the Filtrate Assembly

TF2SFILTCNV1, TF2SFILTCNV2, TF2SFILTCNV3, TF2SFILTSUC1, TF2SFILTSUC2, TF2SFILTSUC3, TF2FILTSMP, TF2SFILTLN, TF2SFILTSMPUSC

There are many configurations that can be installed using the various Filtrate Assemblies. The options depend on the type of instruments being used, and are presented in the following tables.

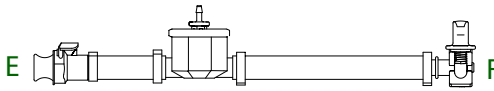
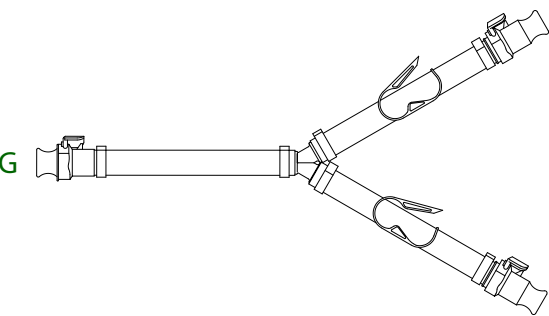
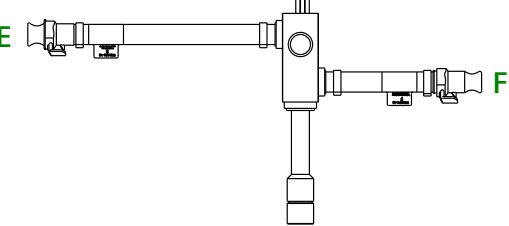
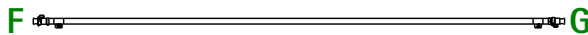
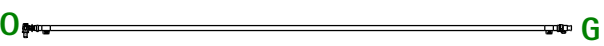
Smart Flexware® Assembly	Connection Tag	Filtrate Sampling Port Assembly	Connection Tag	Instrument Assembly	Connection Tag	Filtrate Line Extension Assembly	Connection Tag	Filtrate Recovery Assembly
Multi-use Instrument Configurations								
TF2SSMART	E	TF2FILTSMP	F	SST FLOW CELL INSTRUM	F	TF2SFILTCNV2	G	TF2SFILTLN
TF2SSMART	E	TF2SFILTCNV1	F	SST FLOW CELL INSTRUM	F	TF2SFILTCNV1	G	TF2SFILTLN
Single Use Instrument Configurations								
TF2SSMART	E	TF2SFILTSUC1	F	TF2SFILTSMPUSC	O	TF2SFILTSUC3	G	TF2SFILTLN
TF2SSMART	E	TF2SFILTSUC1	F	TF2SFILTSUC2	G	TF2SFILTLN		-----
Without Instrument Configurations								
TF2SSMART	E	TF2FILTSMP	F	-----	F	TF2SFILTCNV2	G	TF2SFILTLN
TF2SSMART	E	-----		-----	E	TF2SFILTCNV3	G	TF2SFILTLN
TF2SSMART	E	TF2FILTSMP	F	-----		-----		-----

- After selecting the appropriate configuration from the table above, make the connections listed in the table.

NOTE

Install the tubing in the flow sensor and connect the filtrate single-use assemblies in the order presented here to ensure flow accuracy.

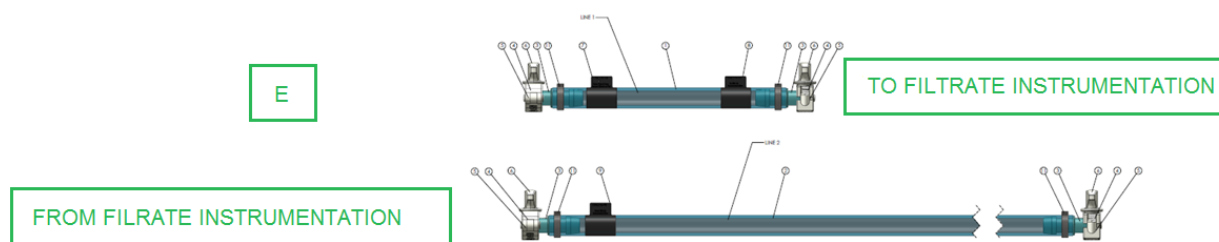
Filtrate Assembly	Diagram
TF2SFILTCNV1 for multi-use instruments without sampling	
TF2SFILTCNV2 for multi-use instruments with sampling	
TF2SFILTCNV3 for no instruments without sampling	
TF2SFILTSMPUSC	

Filtrate Assembly	Diagram
TF2SFILTSMP for single-use instruments with sampling	
TF2SFILTLN	
TF2SFILTSUC1	
TF2SFILTSUC2	
TF2SFILTSUC3	

TF3SPFILTCNV1

1. Remove the TC clamp from the Filtrate Assembly tubing labelled E. Remove the cap from the tubing.
2. Remove the TC clamp from the Filtrate Assembly tubing labelled TO FILTRATE INSTRUMENTATION. Remove the cap from the tubing.
3. Connect the connector E to the tubing labelled E of the Smart Flexware® Assembly.
4. Connect the connector TO FILTRATE INSTRUMENTATION to the inlet of the UV flow cell.
5. Remove the TC clamp from the Filtrate Assembly tubing labelled FROM FILTRATE INSTRUMENTATION. Remove the cap from the tubing.
6. Connect the connector FROM FILTRATE INSTRUMENTATION to the outlet of the Filtrate Flowmeter.

7. Direct the other end of the Filtrate Assembly to the Filtrate Recovery.



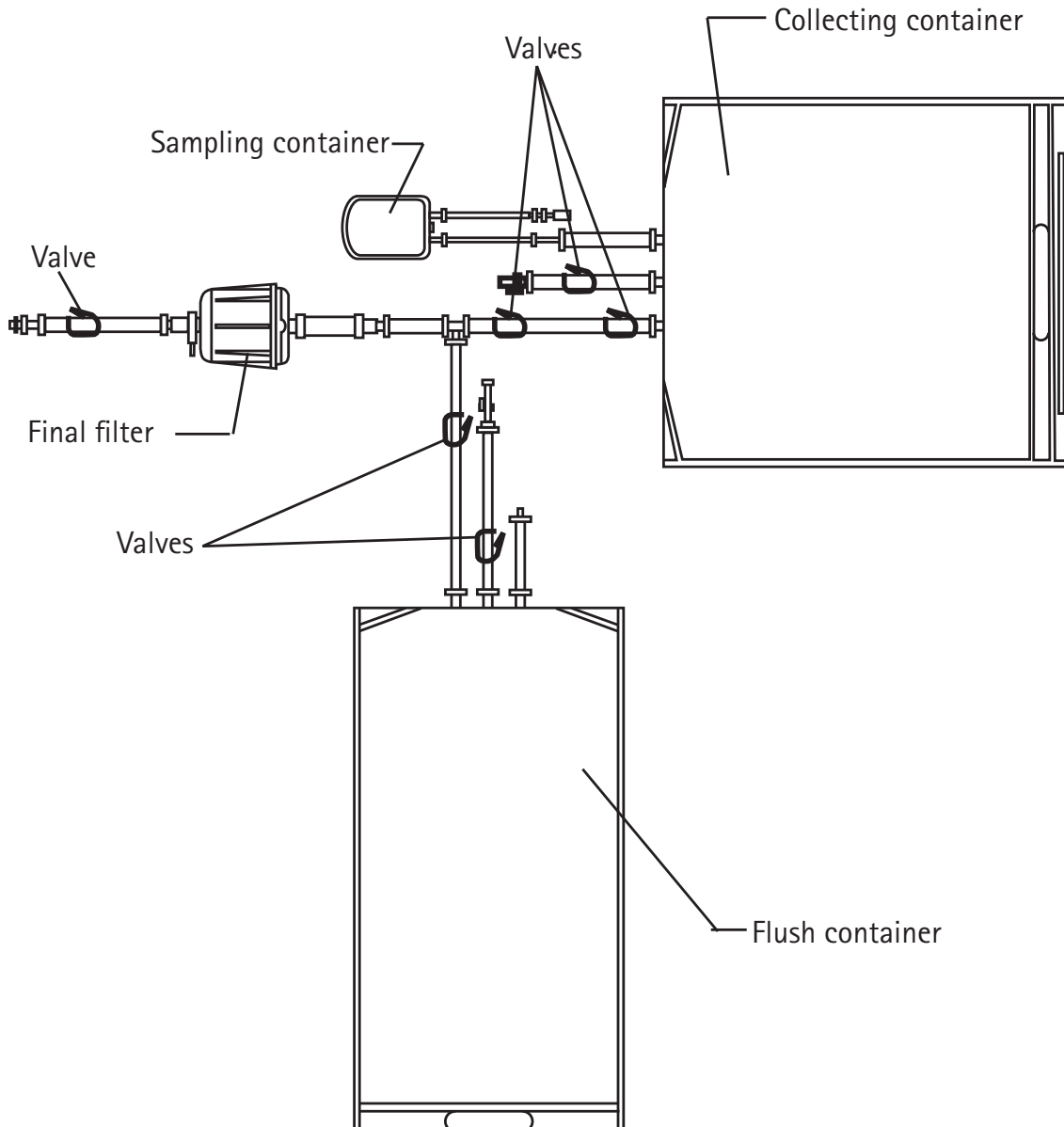
Filtrate Assembly TF3SPFILTCNV1

TF3SFILTSUC1, TF3SPFILTSMP SUC1, TF3SFILTSUC2, TF3SPFILTSMP SUC2, TF3SFILTSUC5, TF3SPFILTSMP SUC5

1. Remove the TC clamp from the Filtrate Assembly tubing labelled E. Remove the cap from the tubing.
2. Remove the SUC into the SUC holder.
3. Connect the connector E to the tubing labelled E of the Smart Flexware® Assembly.

Connecting the TFF Filtration Assembly (optional)

TF200XXLGE1



TFF Filtration Assembly

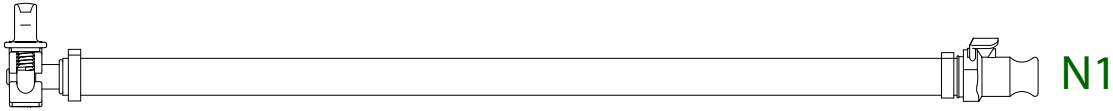
Connect the connector labelled **TO FINAL RECOVERY** on the Smart Flexware® Assembly to the TFF Filtration Assembly.

Connecting the Integrity Testing Assembly

TF2SITTEST, TF3SITTEST

This assembly is to perform the integrity testing of the assembly.

1. Connect the connector labelled **N** on the Smart Flexware® Assembly to the connector labelled **N1** on the Integrity Testing Assembly.
2. Connect the other end of the assembly to the air supply or to an automated integrity tester.



Integrity Testing Assembly

Chromatography Application Information

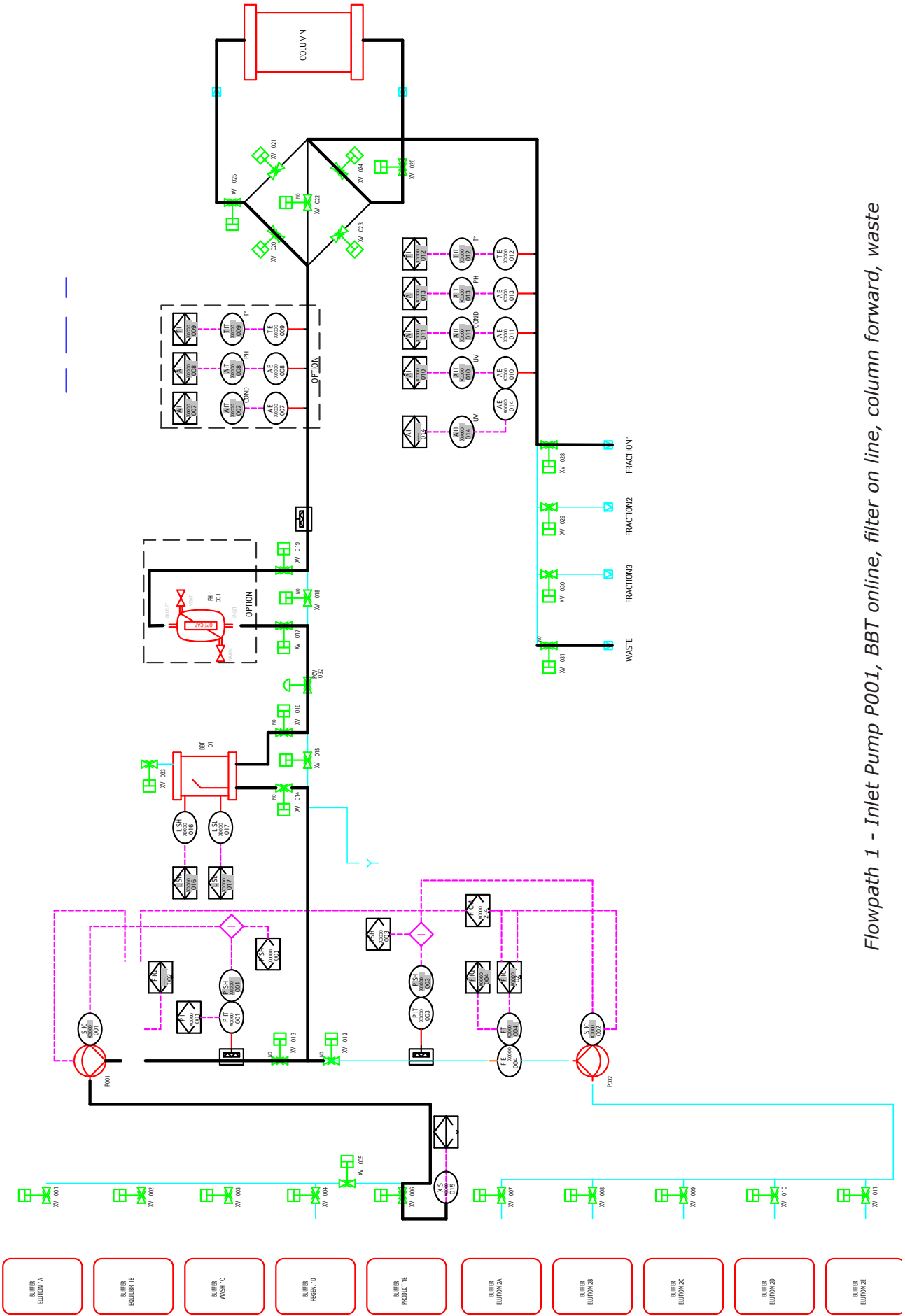
Introduction

This section of the user guide includes Specifications, P&ID drawings for some typical process steps and Flow Rate vs. Pressure curves.

Flow Paths

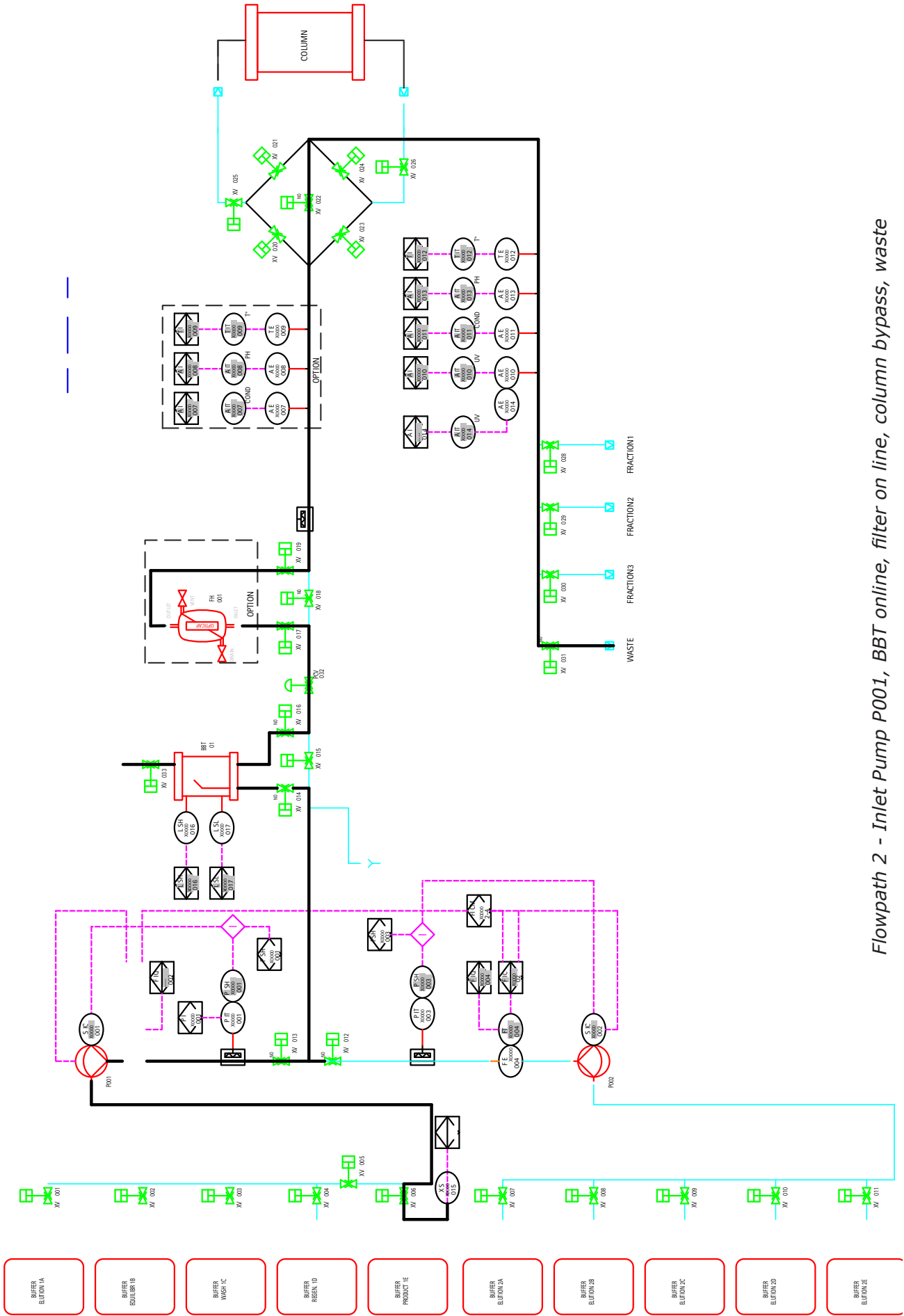
The following pages contain P & ID for the sample flow paths listed here:

Flowpath 1	Inlet Pump P001, BBT online, filter on line, column forward, waste
Flowpath 2	Inlet Pump P001, BBT online, filter on line, column bypass, waste
Flowpath 3	Inlet Pump P001, BBT online, filter on line, column reverse, waste
Flowpath 4	Inlet Pump P002, BBT online, filter on line, column forward, waste
Flowpath 5	Inlet Pump P002, BBT bypass, filter bypass, column forward, waste
Flowpath 6	Inlet Pump P001, BBT online, filter online, column forward, fraction

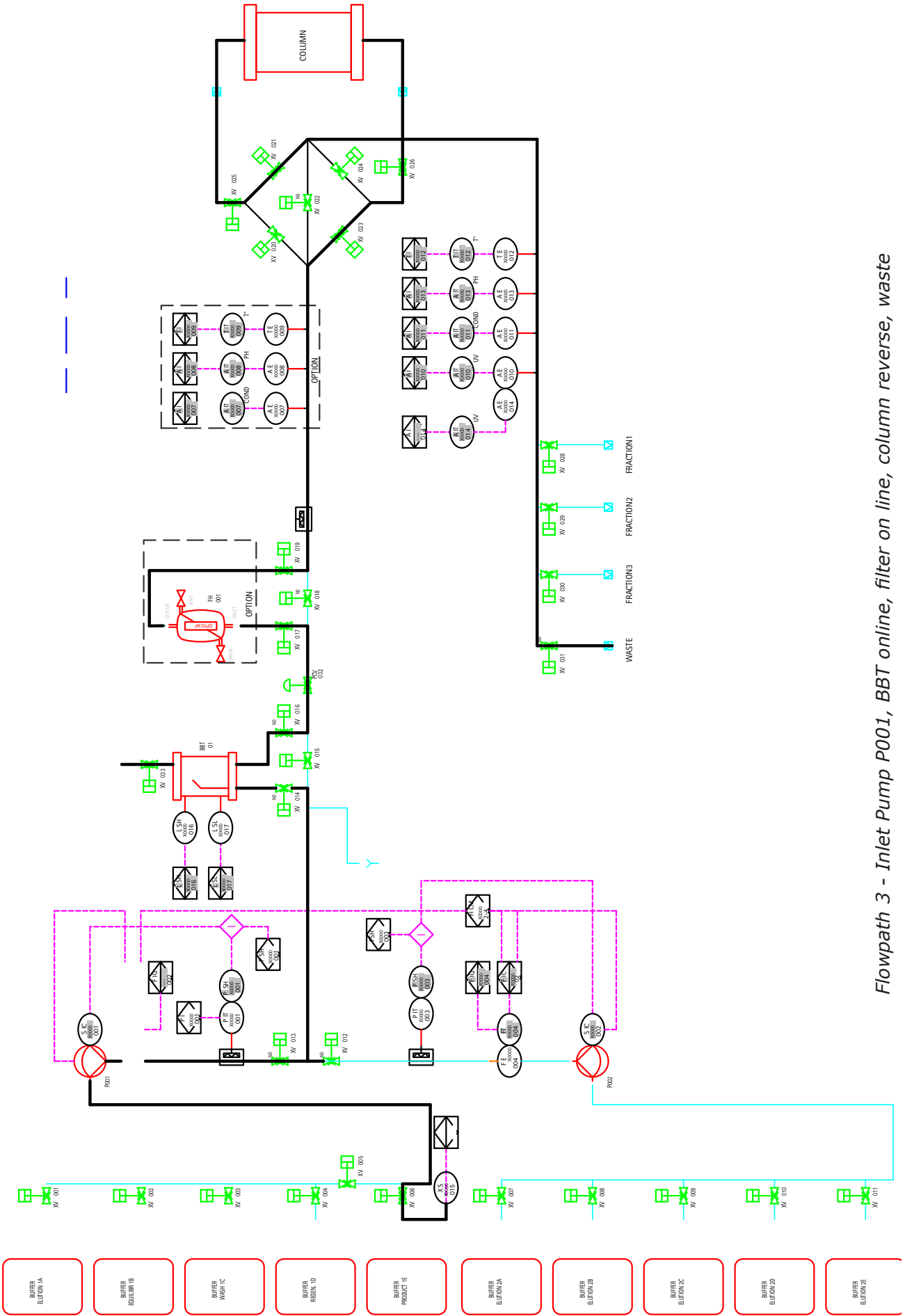


Flowpath 1 - Inlet Pump P001, BBT online, filter on line, column forward, waste

The Mobius® FlexReady Smart System for Chromatography

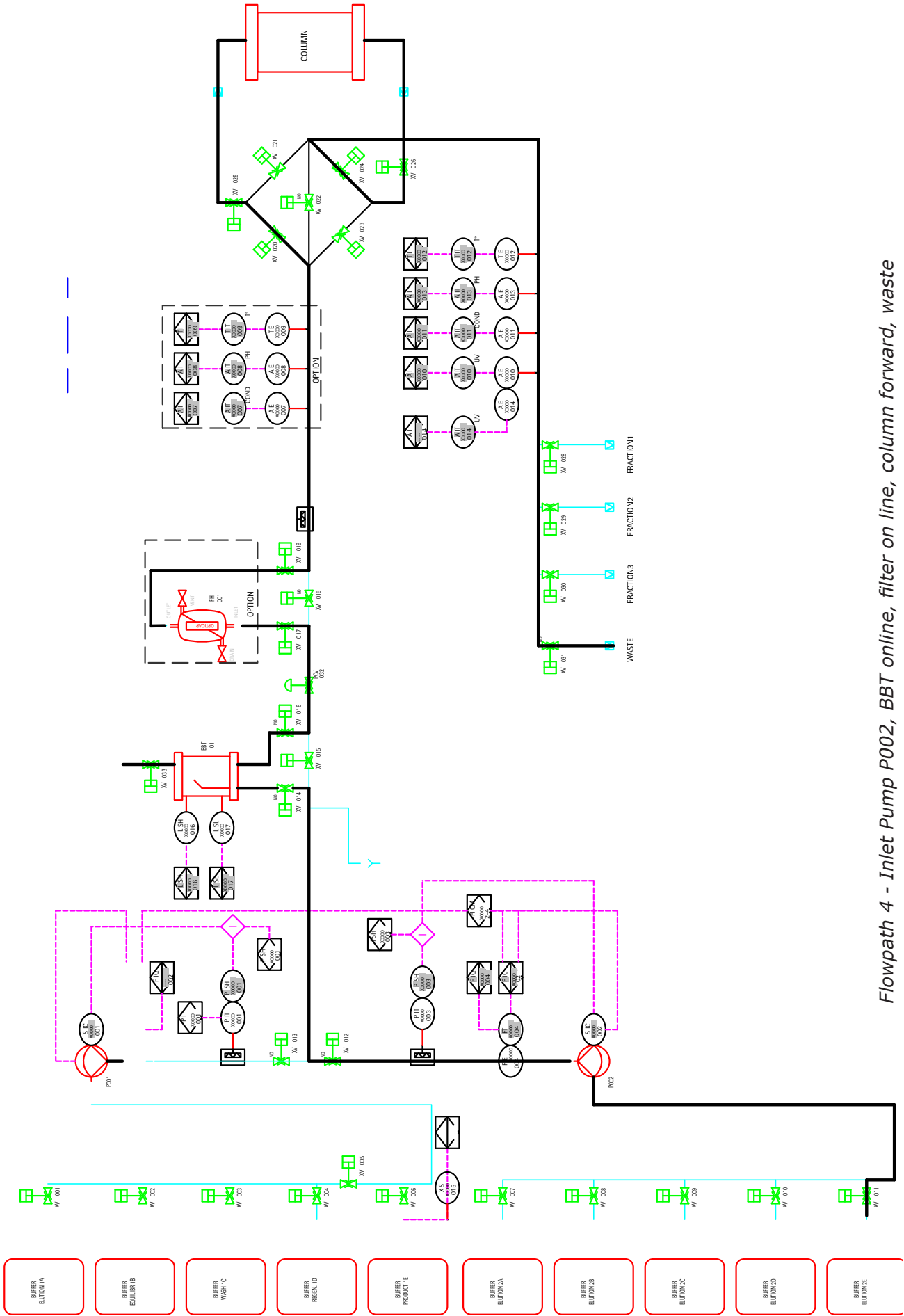


Flowpath 2 - Inlet Pump P001, BBT online, filter on line, column bypass, waste

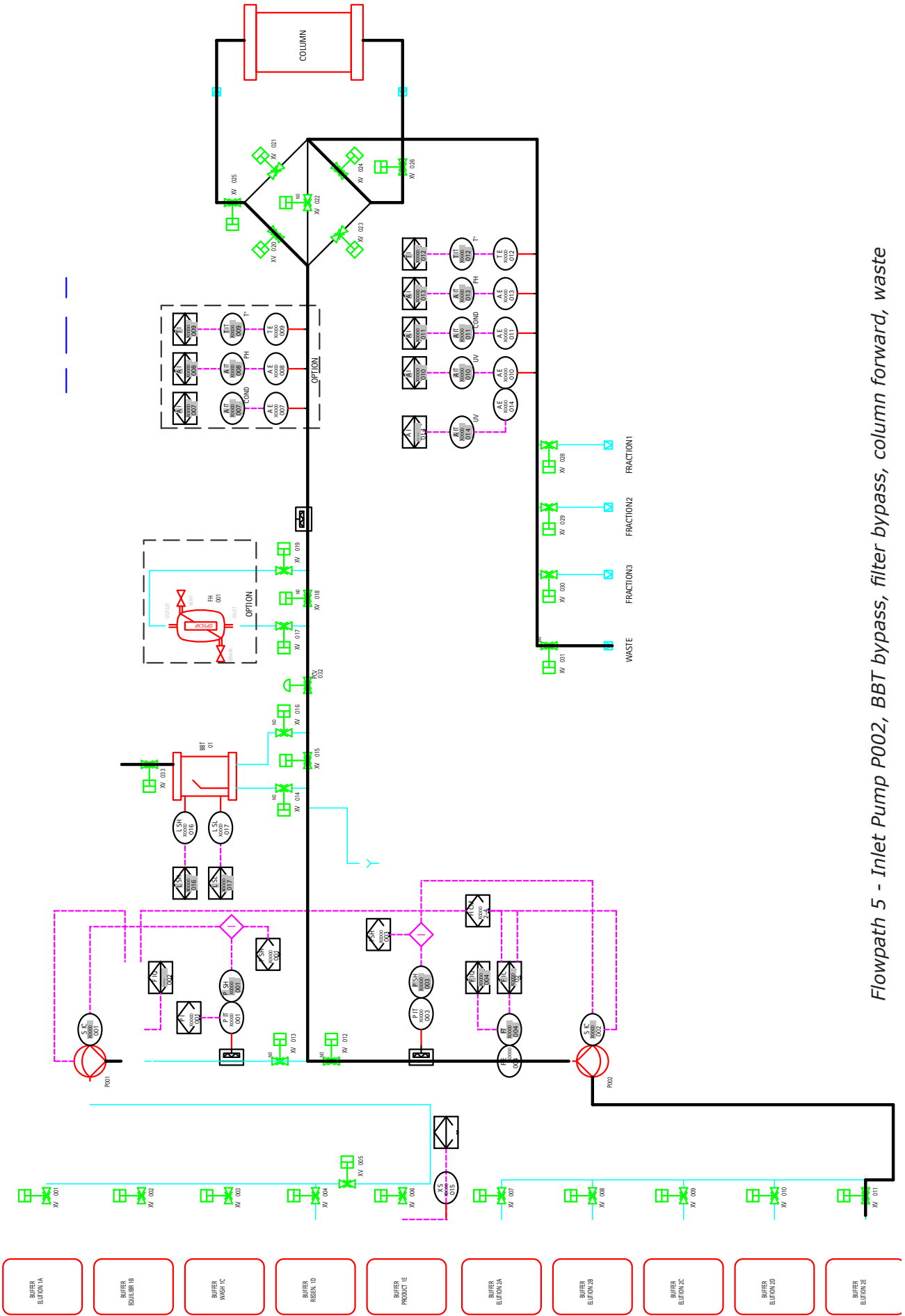


Flowpath 3 - Inlet Pump P001, BBT online, filter on line, column reverse, waste

The Mobius® FlexReady Smart System for Chromatography

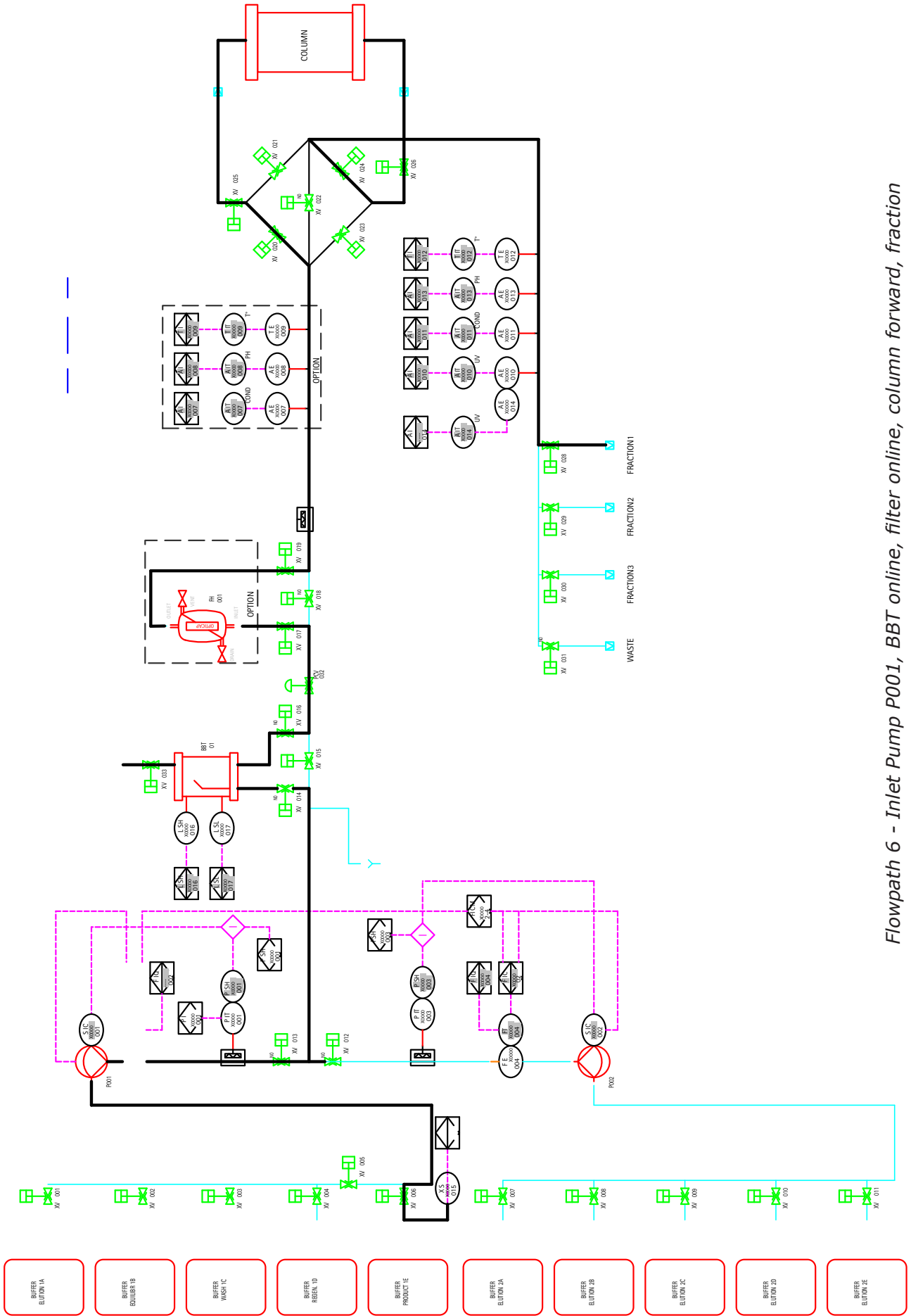


Flowpath 4 - Inlet Pump P002, BBT online, filter on line, column forward, waste



Flowpath 5 - Inlet Pump P002, BBT bypass, filter bypass, column forward, waste

The Mobius® FlexReady Smart System for Chromatography

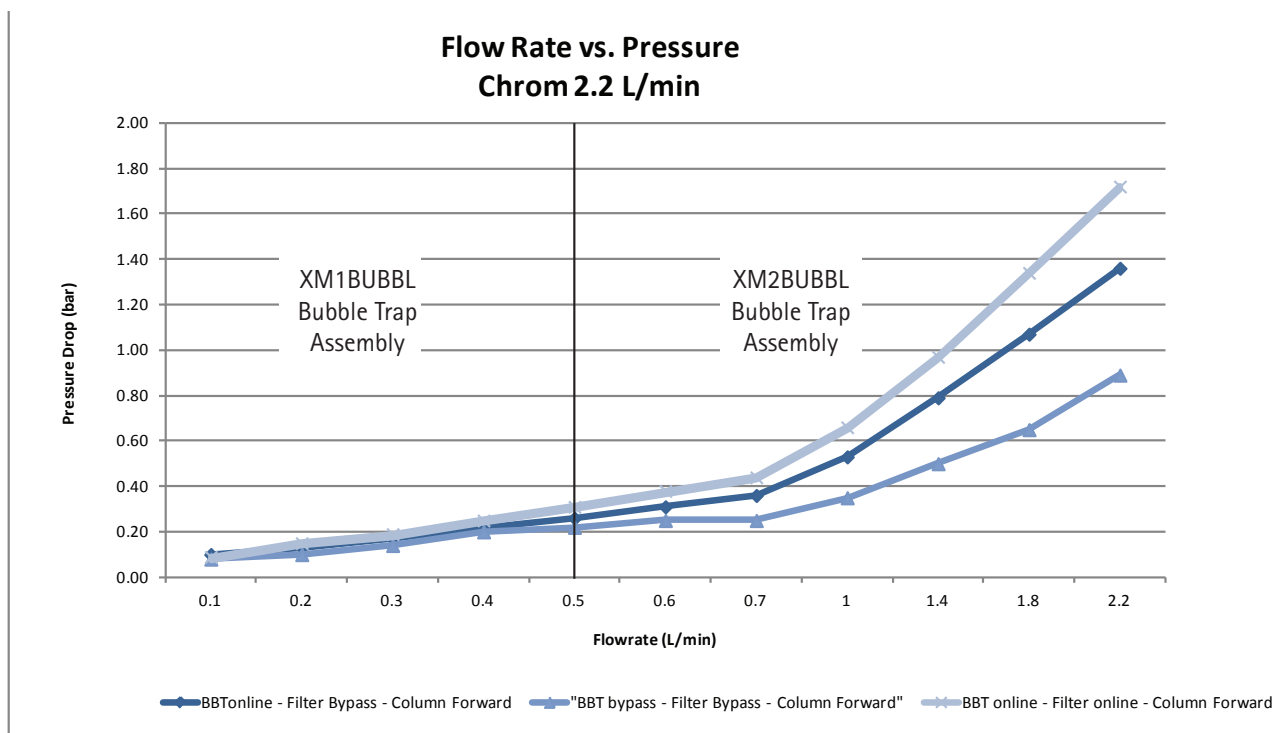


Flowpath 6 - Inlet Pump P001, BBT online, filter online, column forward, fraction

System Pressure Drop

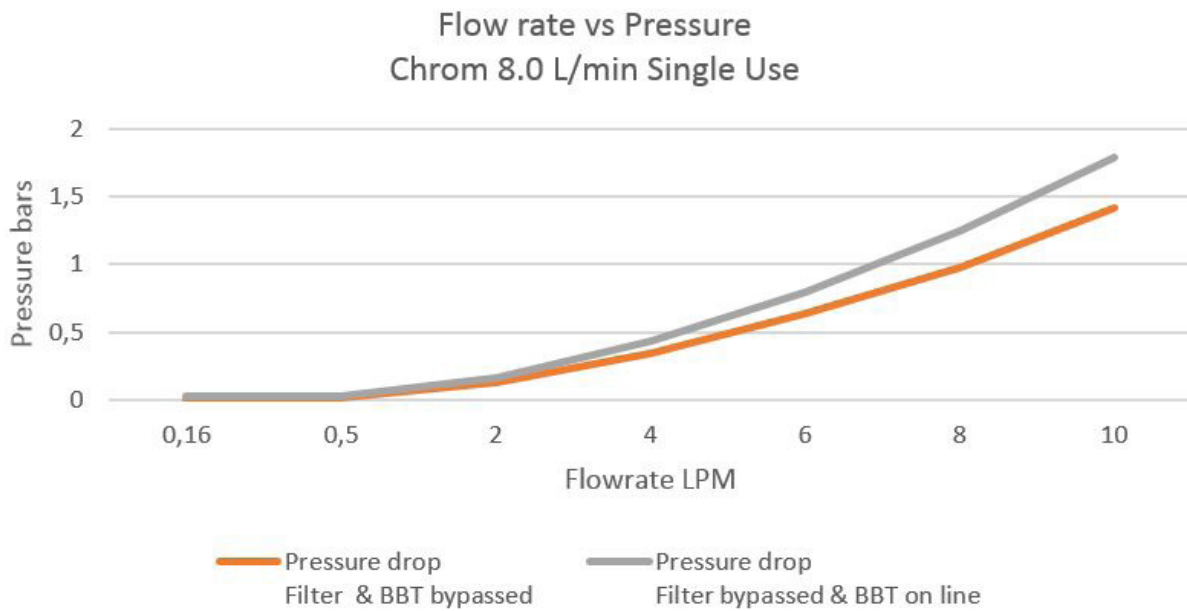
Test were performed with RO water at 20 C and the following parameters:

Parameter	Value
Bubble Trap	XM1BUBBL.
Filter	KHEG 03HH3
Column	None installed. Replaced by 1 M of tubing.
Flow rate	Read from system flowmeter.
Inlet	1A
Pump	P001
Fraction	Waste



Test were performed with RO water at 20 C and the following parameters:

Parameter	Value
Bubble Trap	XM3BUBBL.
Column	None installed. Replaced by 1 M of tubing.
Flow rate	Read from system flowmeter.
Inlet	1A
Pump	P001
Fraction	Waste



TFF Application Information

Introduction

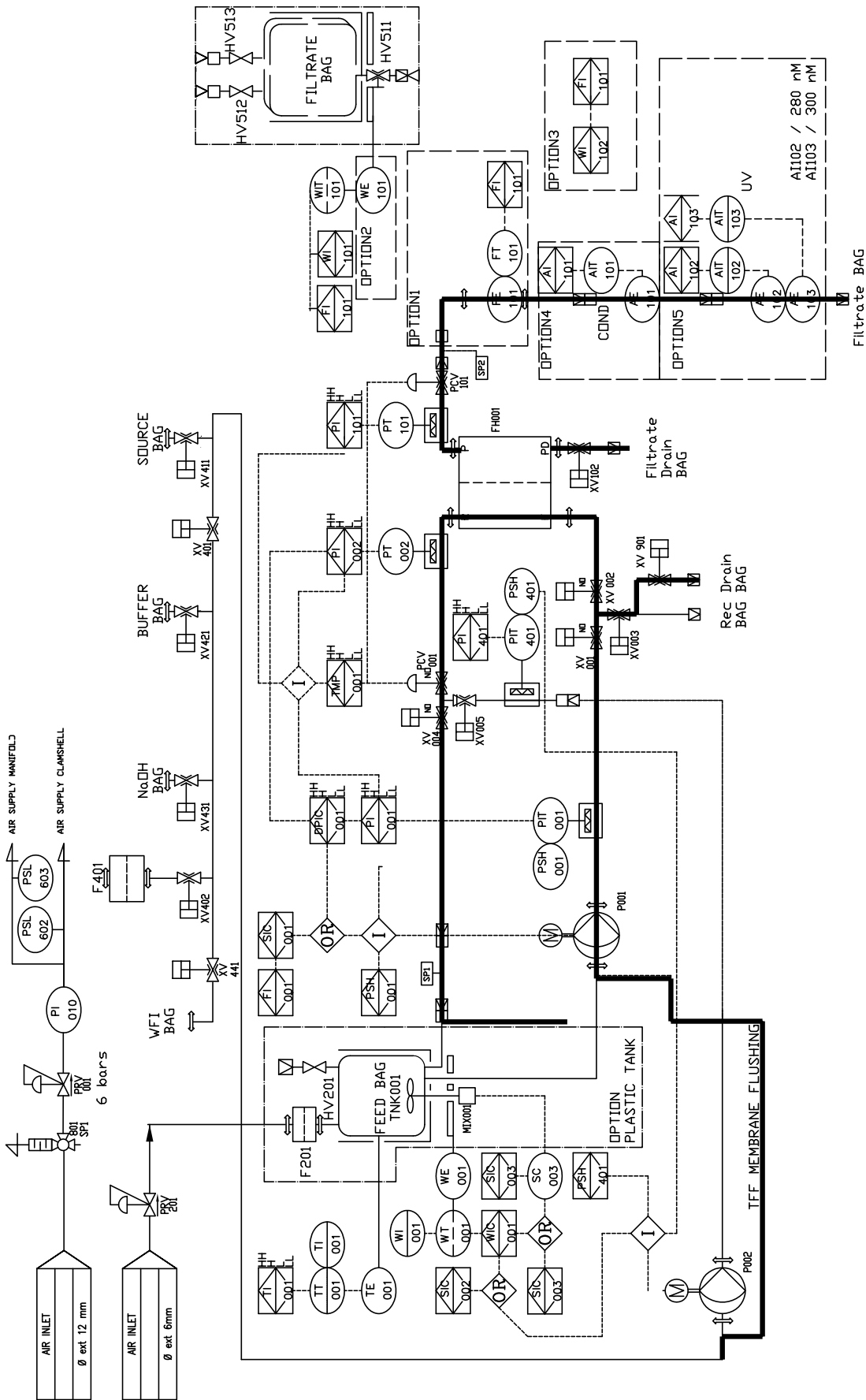
This section of the user guide includes Specifications and P & ID drawings for some typical process steps.

The control valve settings should be reviewed and adjusted for the viscosity or temperature of the fluid being processed. This will ensure optimal performance of the system.

Flowpath	No.	Title	Flowpath		XV-										PCV-				
			Flush Mode button activated (feed comes from inlet manifold, not recycle bag)	Drain Mode button activated (retentate is diverted to drain, not to recycle bag)	001	002	003	004	005	102	901	401	402	411	421	431	441	001	101
9	Recovery Filter Flush	N	N	1	0	1	0	0	0	0	X	X	X	X	X	X	X	0	X
10	Batch UF or Membrane Recycle	N	N	1	1	0	1	0	0	X	X	X	X	X	X	X	X	C	0, 1, or C
11	Fed Batch UF or Diafiltration	N	N	1	1	0	1	1	0	X	X	X	X	X	X	X	C	1 or C	
12	Product Recovery 1&3 - Empty Recycle Bag	N	N	1	0	1	0	0	0	X	X	X	X	X	X	X	0	0	
13	Product Recovery 2 - Empty Retentate Line	N	N	0	0	0	1	1	0	X	X	X	X	X	X	X	0	0	
14	Product Recovery 4 - Empty Membranes	N	N	0	1	1	0	1	0	X	X	X	X	X	X	X	1	0	
15	All Main Flowpath Valves Open	N	N	1	1	1	1	1	1	X	X	X	X	X	X	X	1	1	
16	All Main Flowpath Valves Closed	N	N	0	0	0	0	0	0	X	X	X	X	X	X	X	0	0	
17	Default	N	N	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	
18	All Source Valves Open	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The Mobius® FlexReady Smart System for TFF

Flowpath	No.	Title	Flowpath		XV-										PCV-				
			Flush Mode button activated (feed comes from inlet manifold, not recycle bag)	Drain Mode button activated (retentate is diverted to drain, not to recycle bag)	001	002	003	004	005	102	901	401	402	411	421	431	441	001	101
	19	All Source Valves Closed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	20	Feed Source Open	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	21	Buffer Source Open	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	22	Caustic Source Open	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	23	Water Source Open	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	24	Air Source Open	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1 = Valve in Open Position (regardless of NO/NC)			0 = Valve in Closed Position (regardless of NO/NC)																
C = For control valves only - partially opened in control mode			X = Ignore Valve Position																

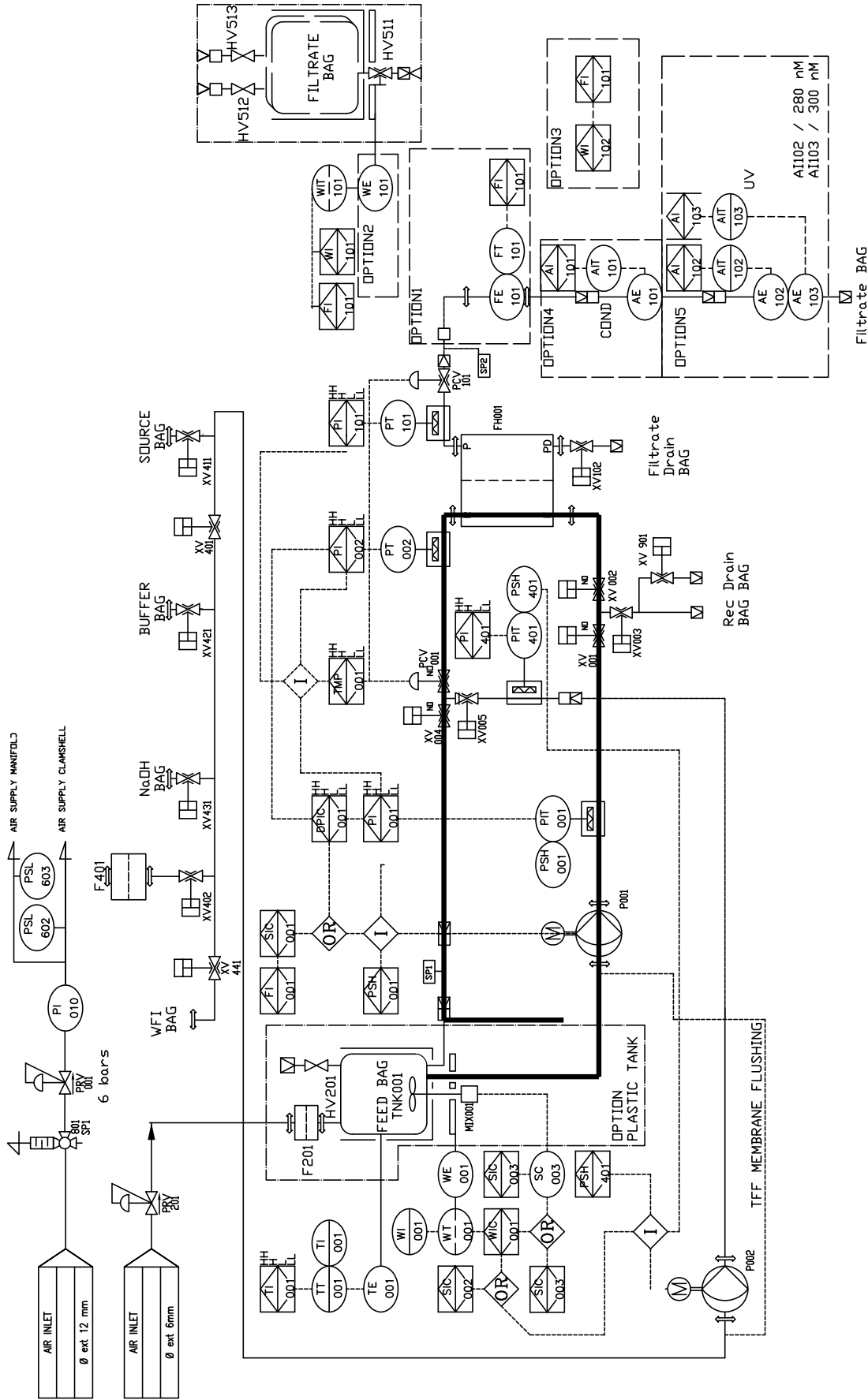


- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 1 - TF-2.5m² Single Pass flush (from inlet manifold)

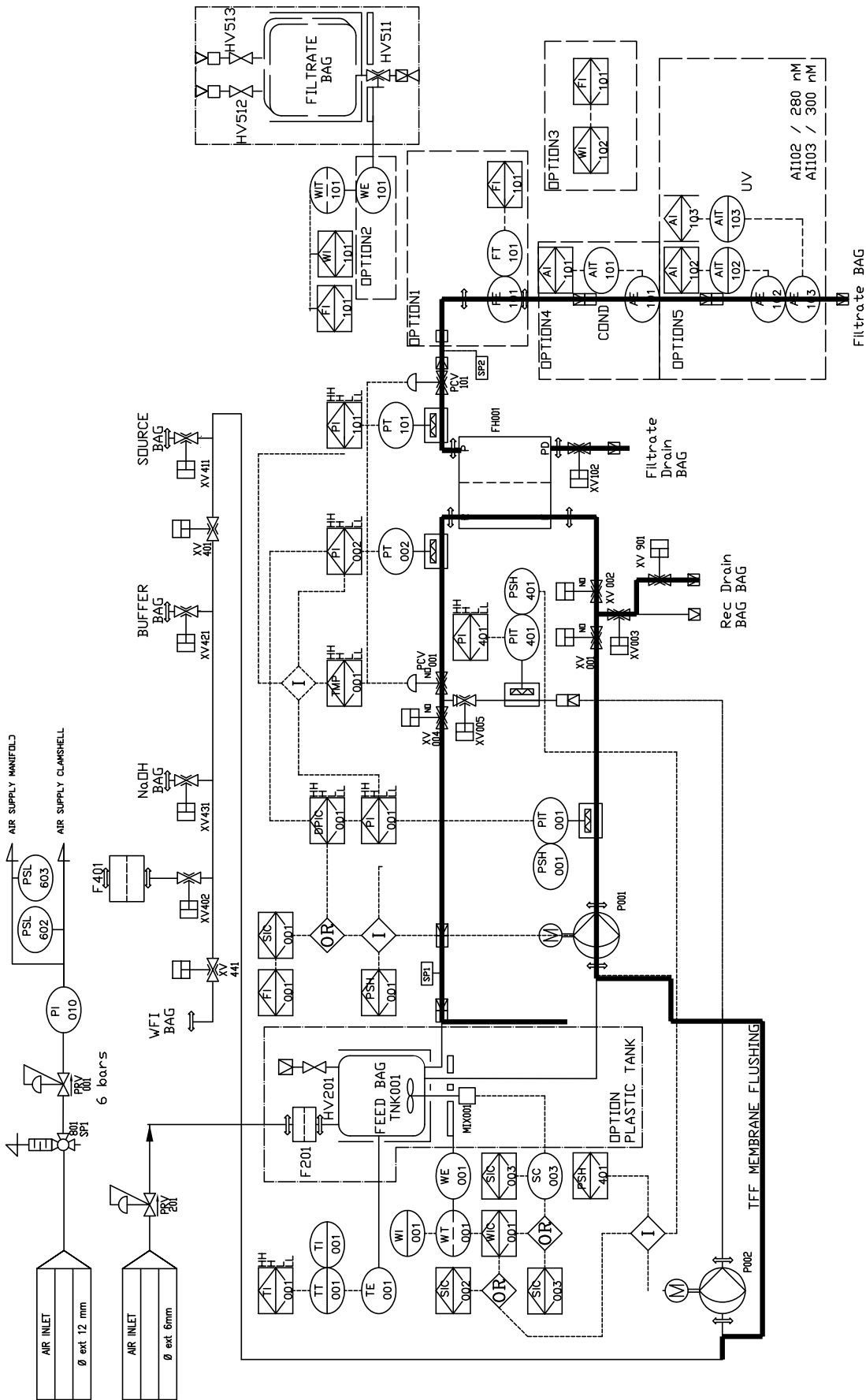
The Mobius® FlexReady Smart System for TFF

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 2 - Single Pass Flush (from recycle bag)

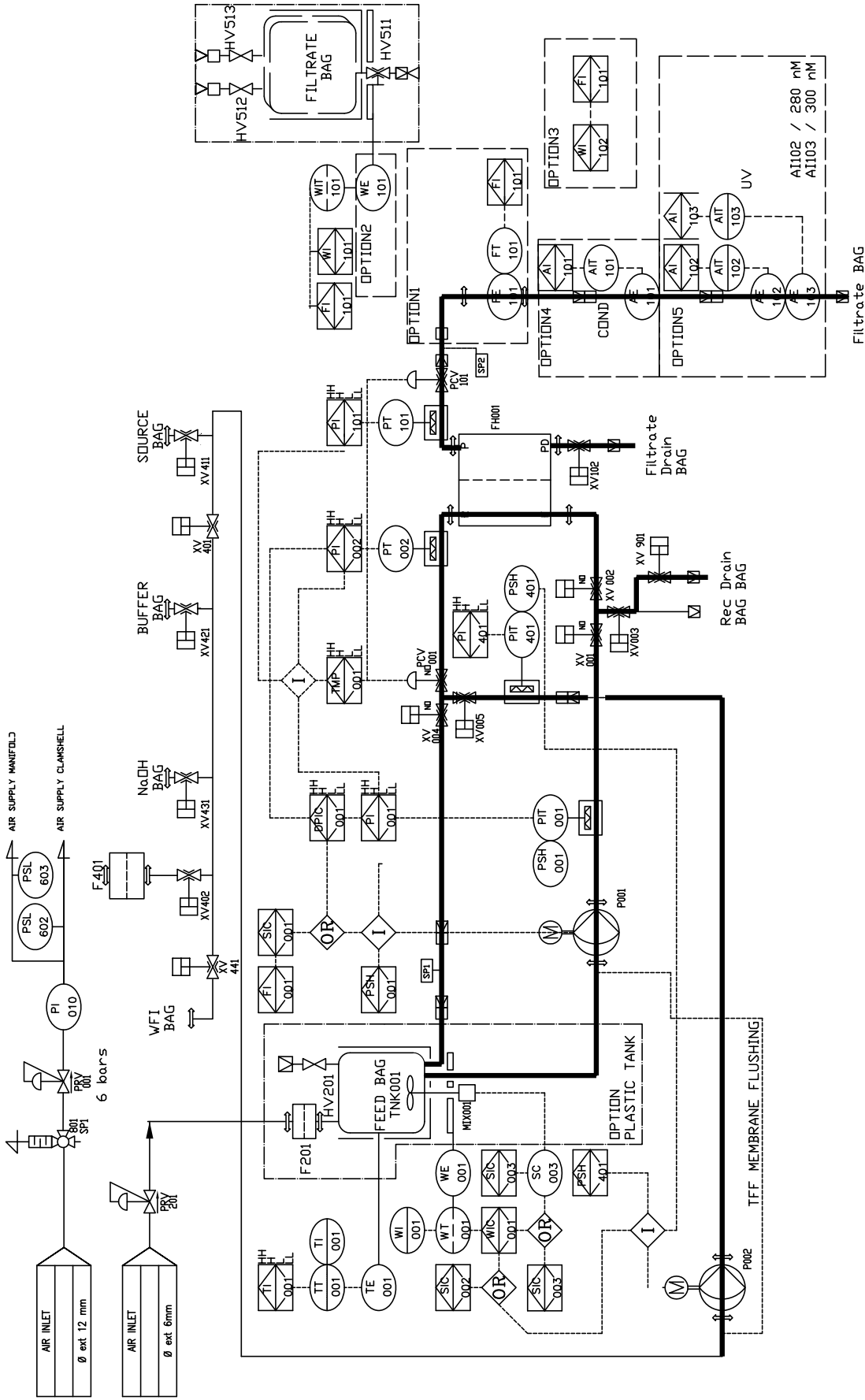


- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 3 - System Drain (without recycle bag)

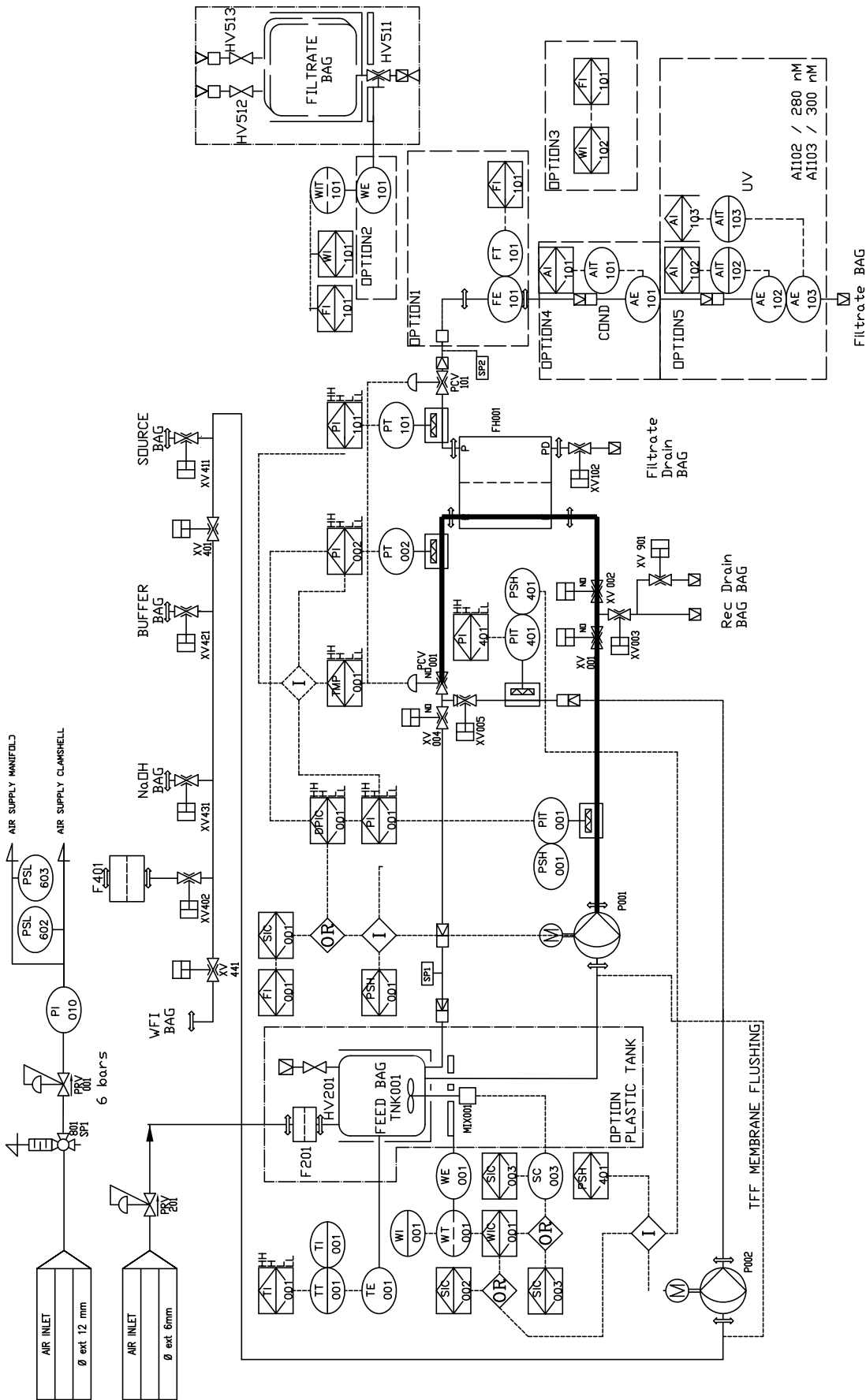
The Mobius® FlexReady Smart System for TFF

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

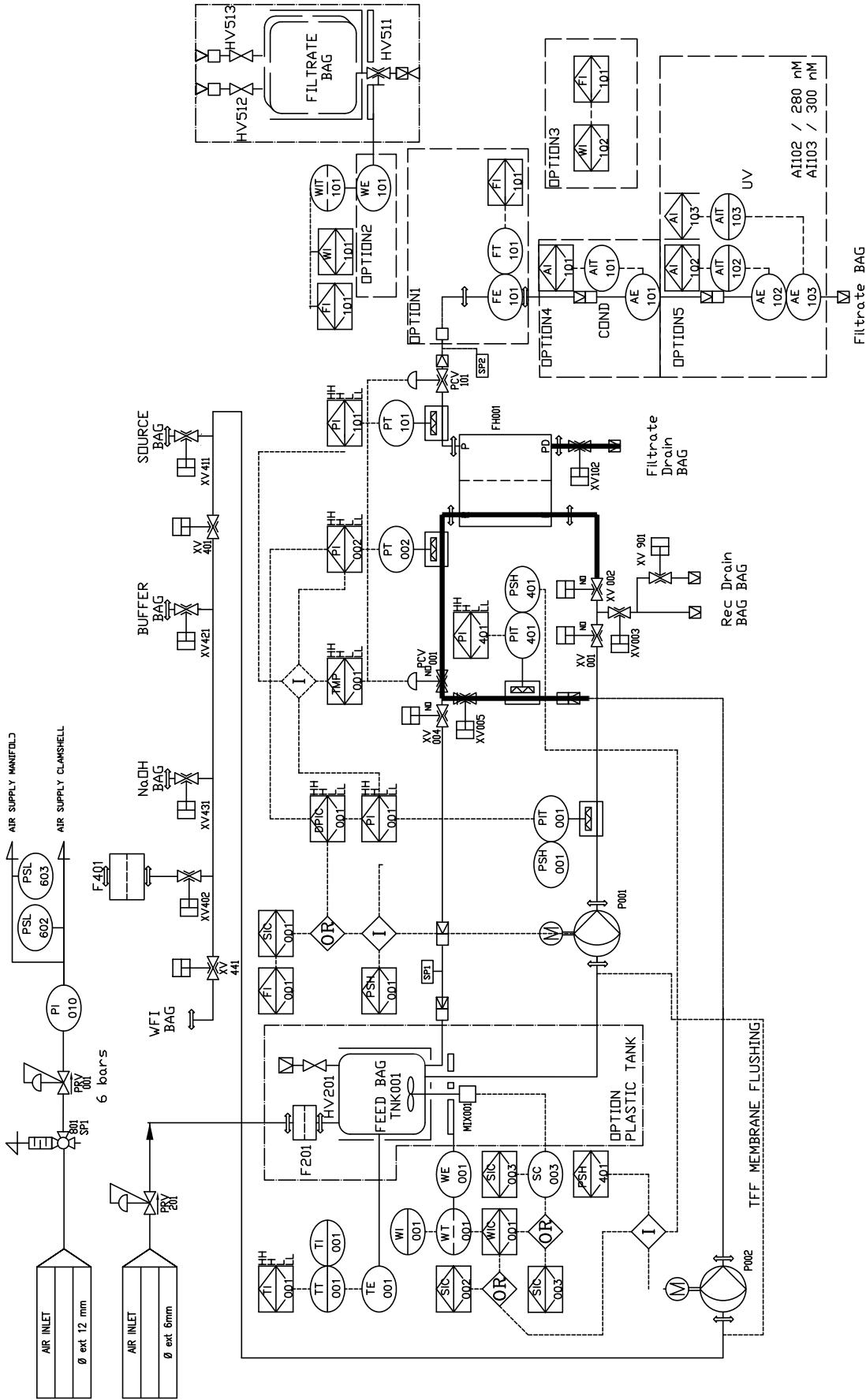
Flowpath 4 - System Drain (from recycle bag)



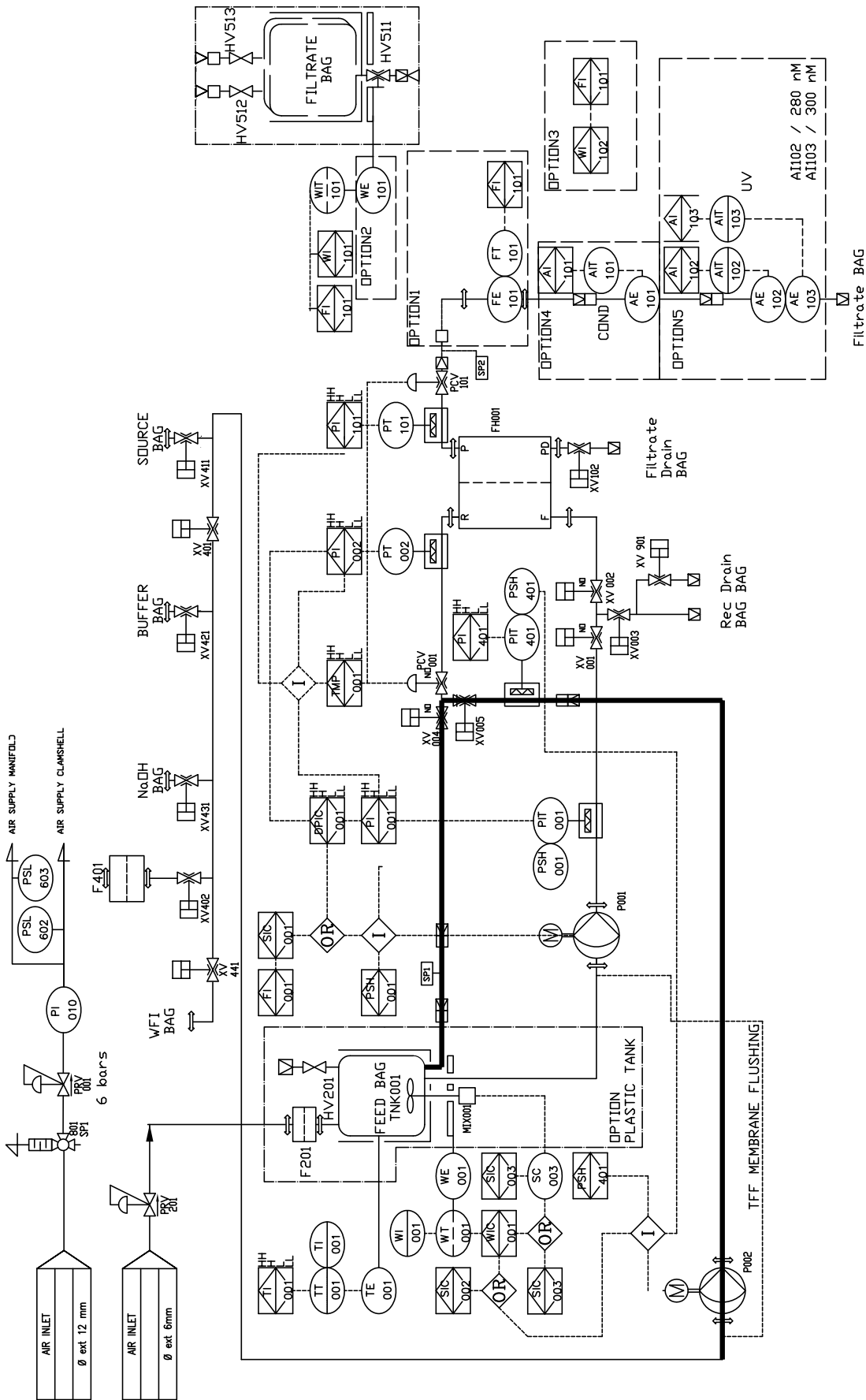
- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 5 - Membrane Soak

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

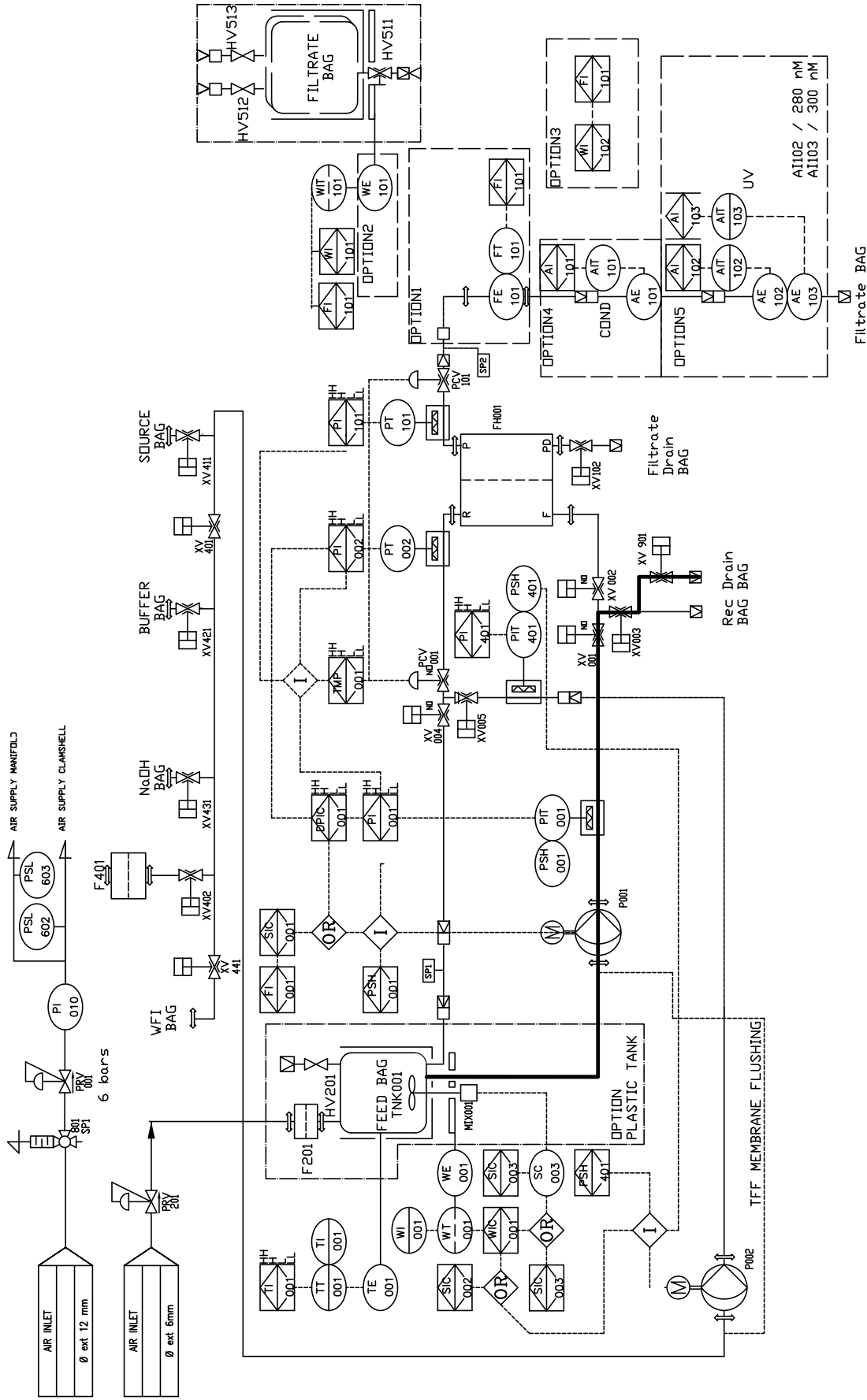


- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 7 - Recycle Bag Fill

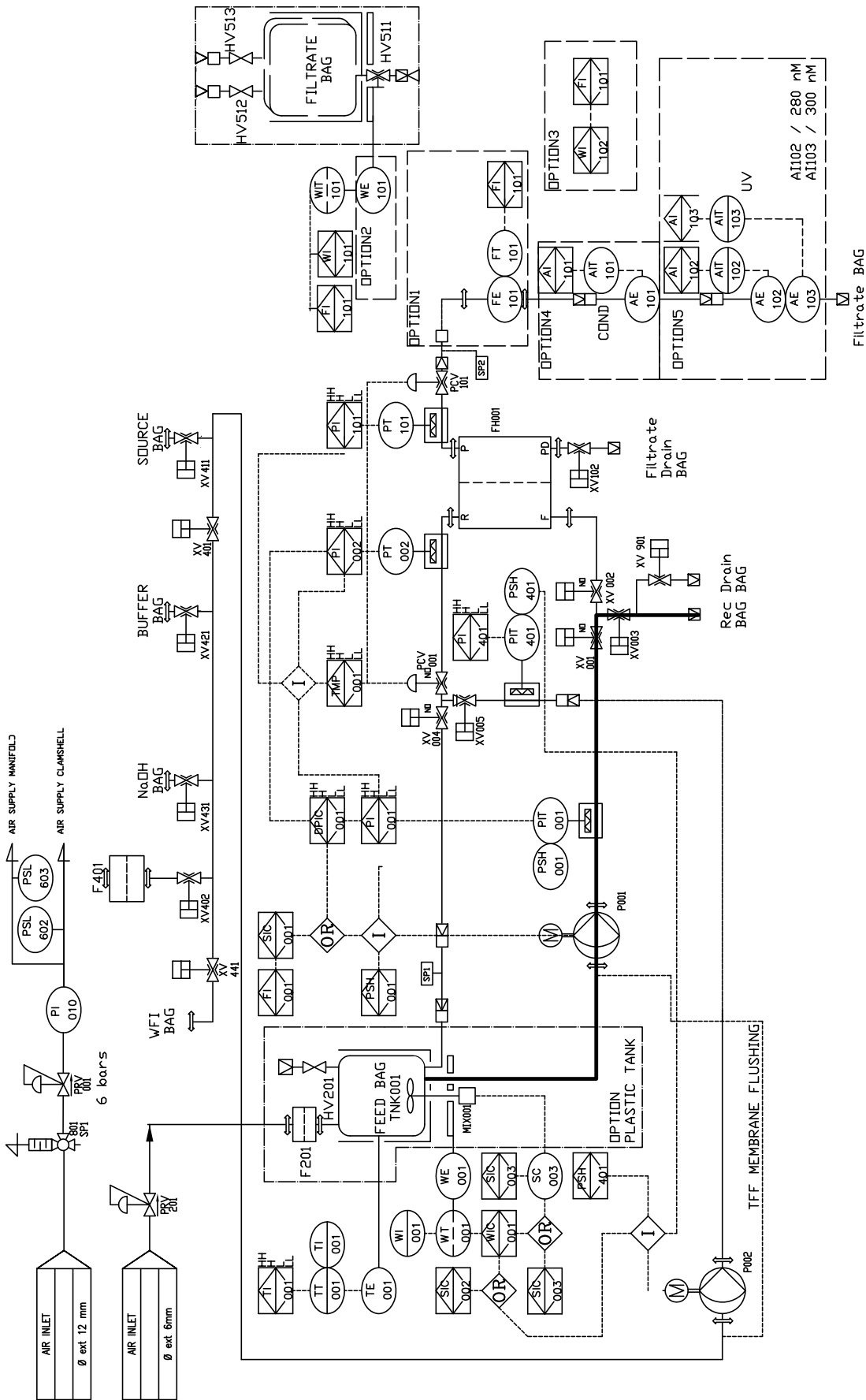
The Mobius® FlexReady Smart System for TFF

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

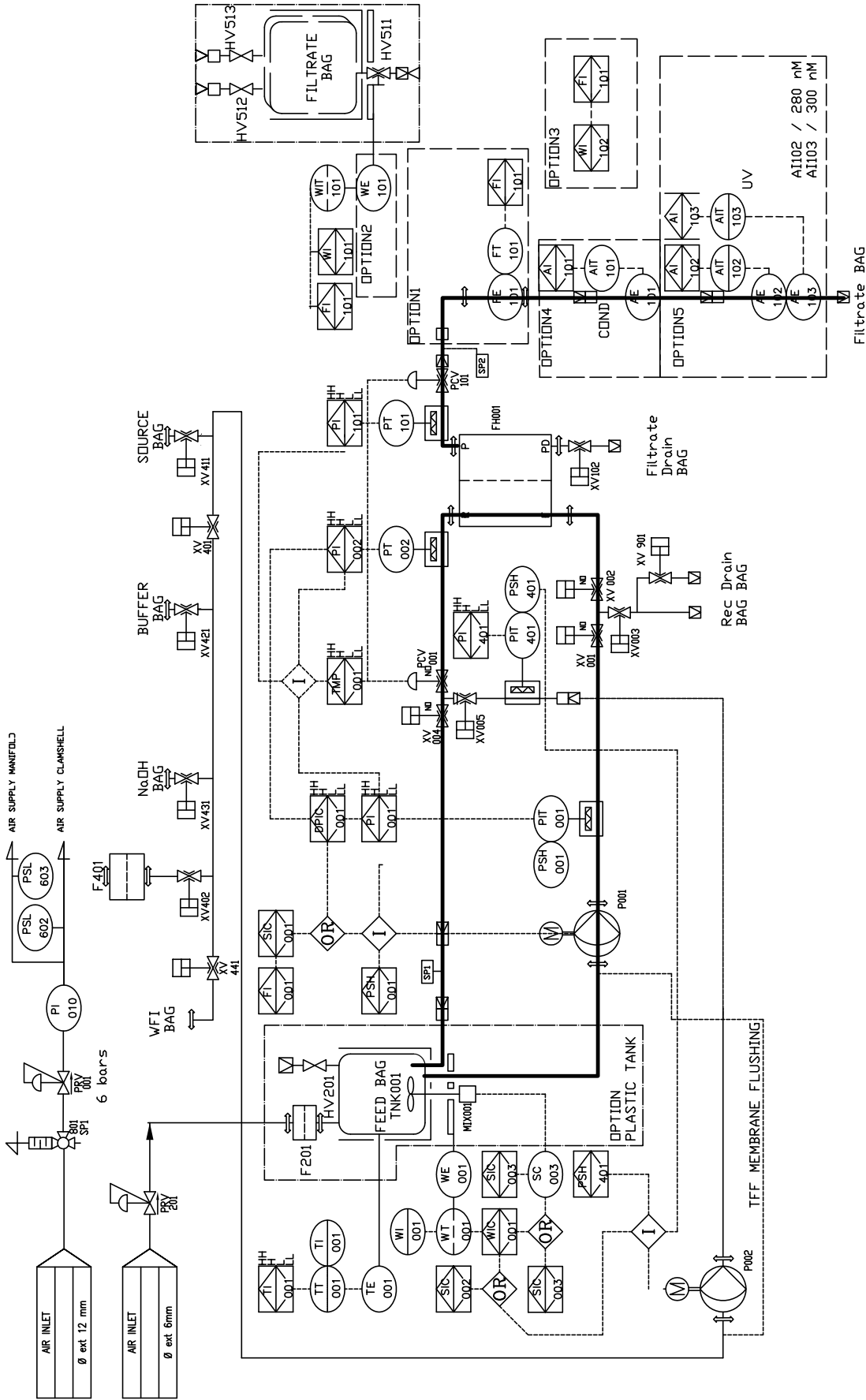
Flowpath 8 - Recycle Bag Drain



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

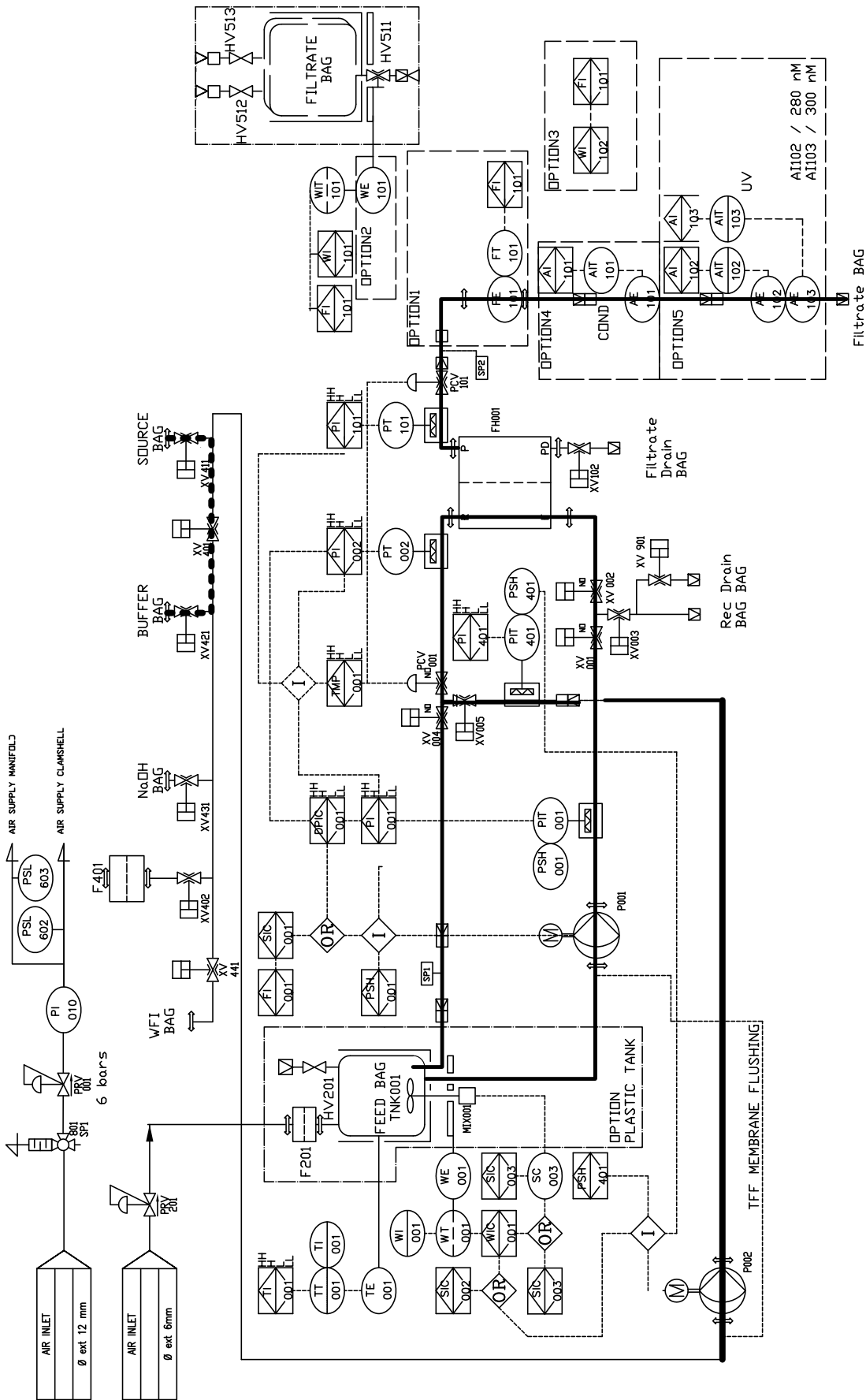
Flowpath 9 - Recovery Filter Flush

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 10 - Batch UF or Membrane Recycle

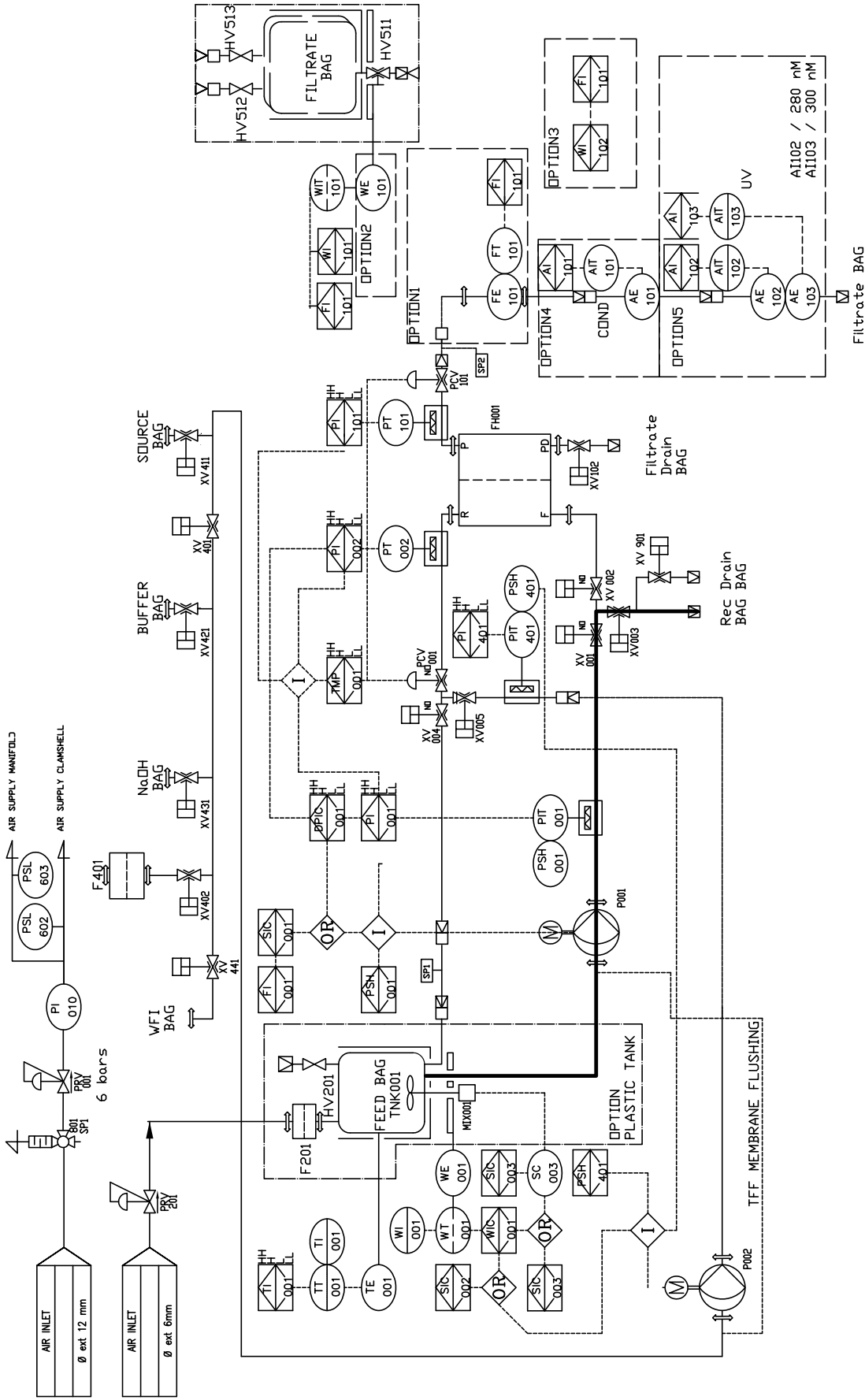


- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 11 - Fed Batch UF or Diafiltration

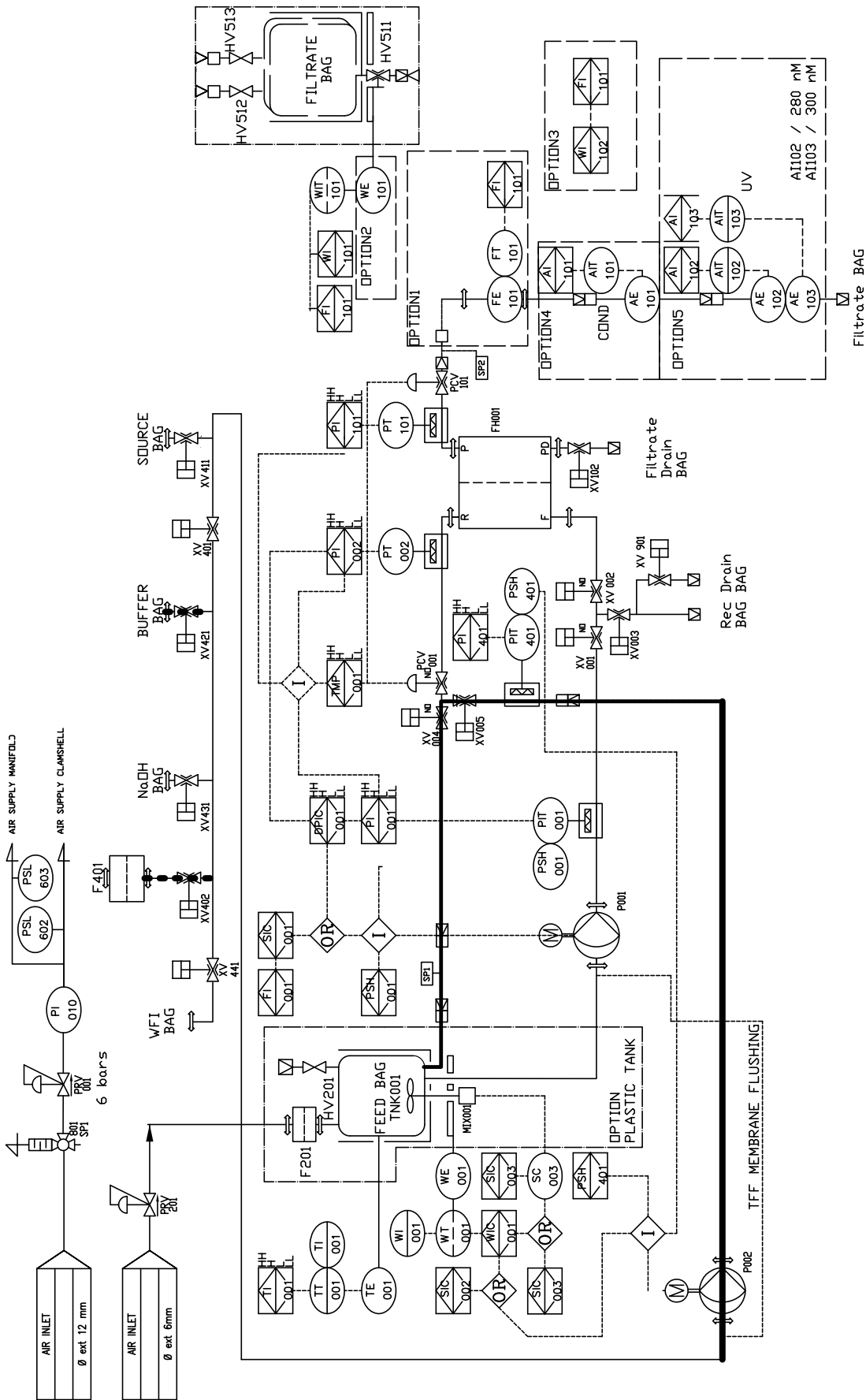
The Mobius® FlexReady Smart System for TFF

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 12 - Product Recovery 1&3 - Empty Recycle Bag

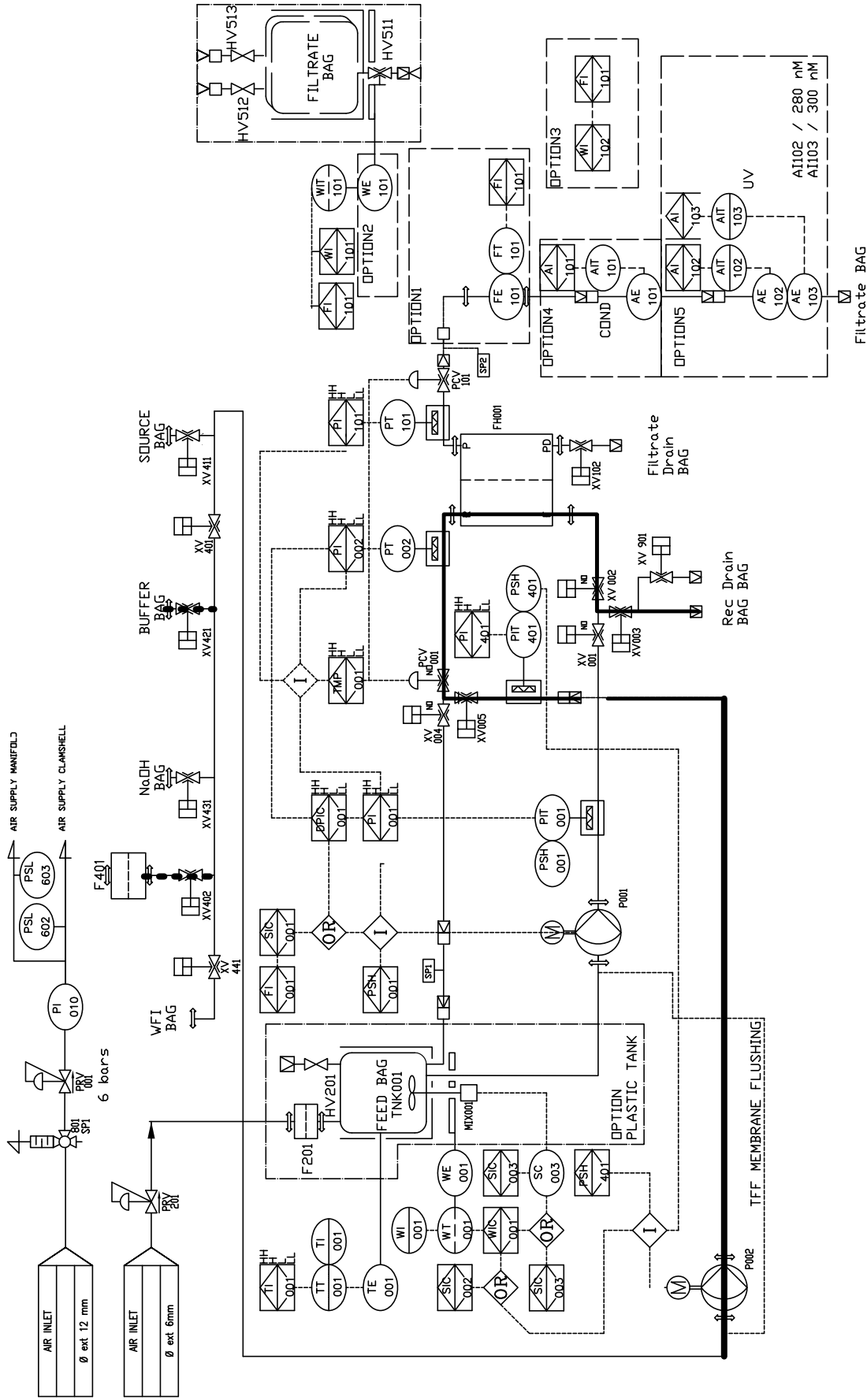


- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 13 - Product Recovery 2 - Empty Retentate Line

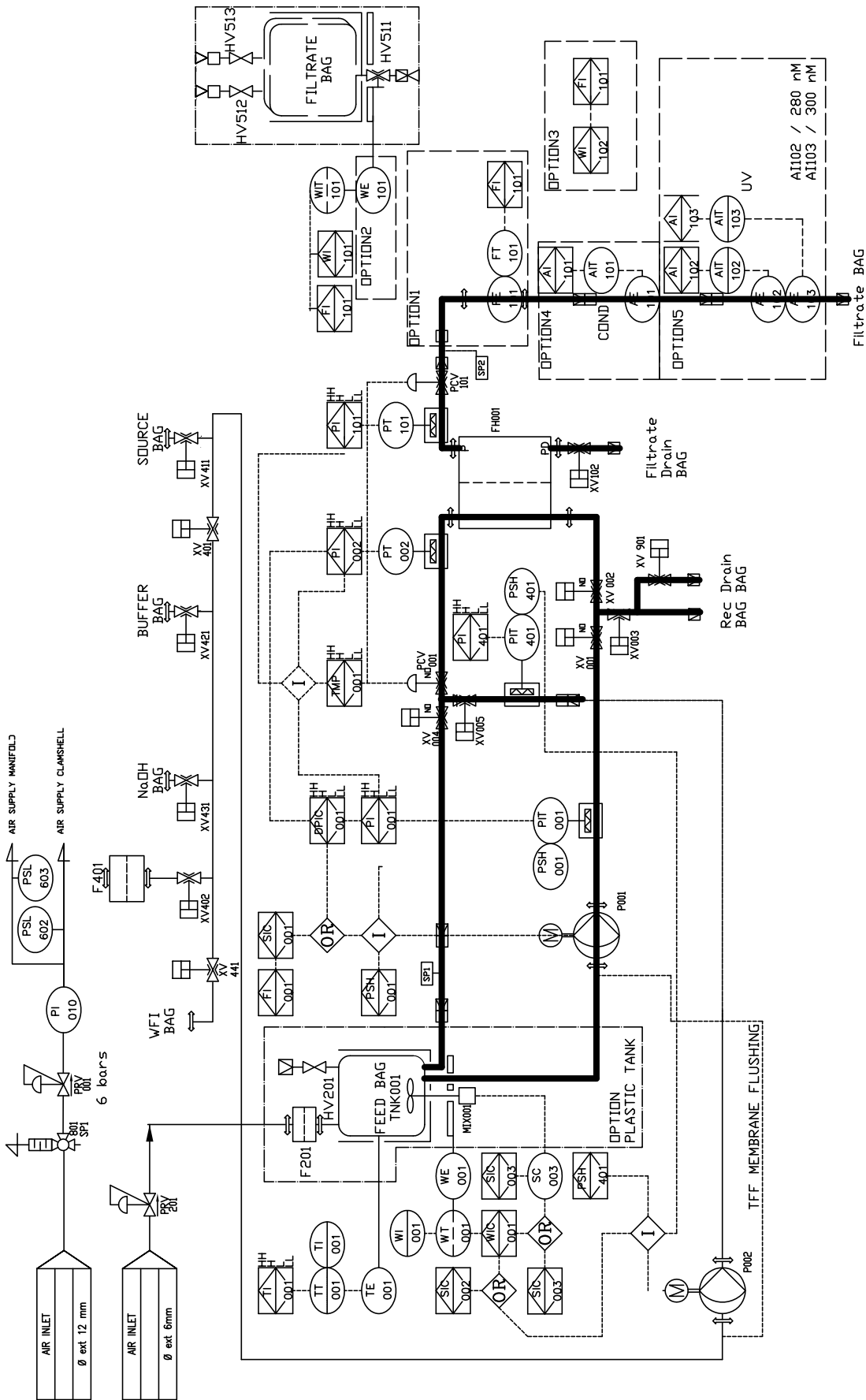
The Mobius® FlexReady Smart System for TFF

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 14 - Product Recovery 4 - Empty Membranes

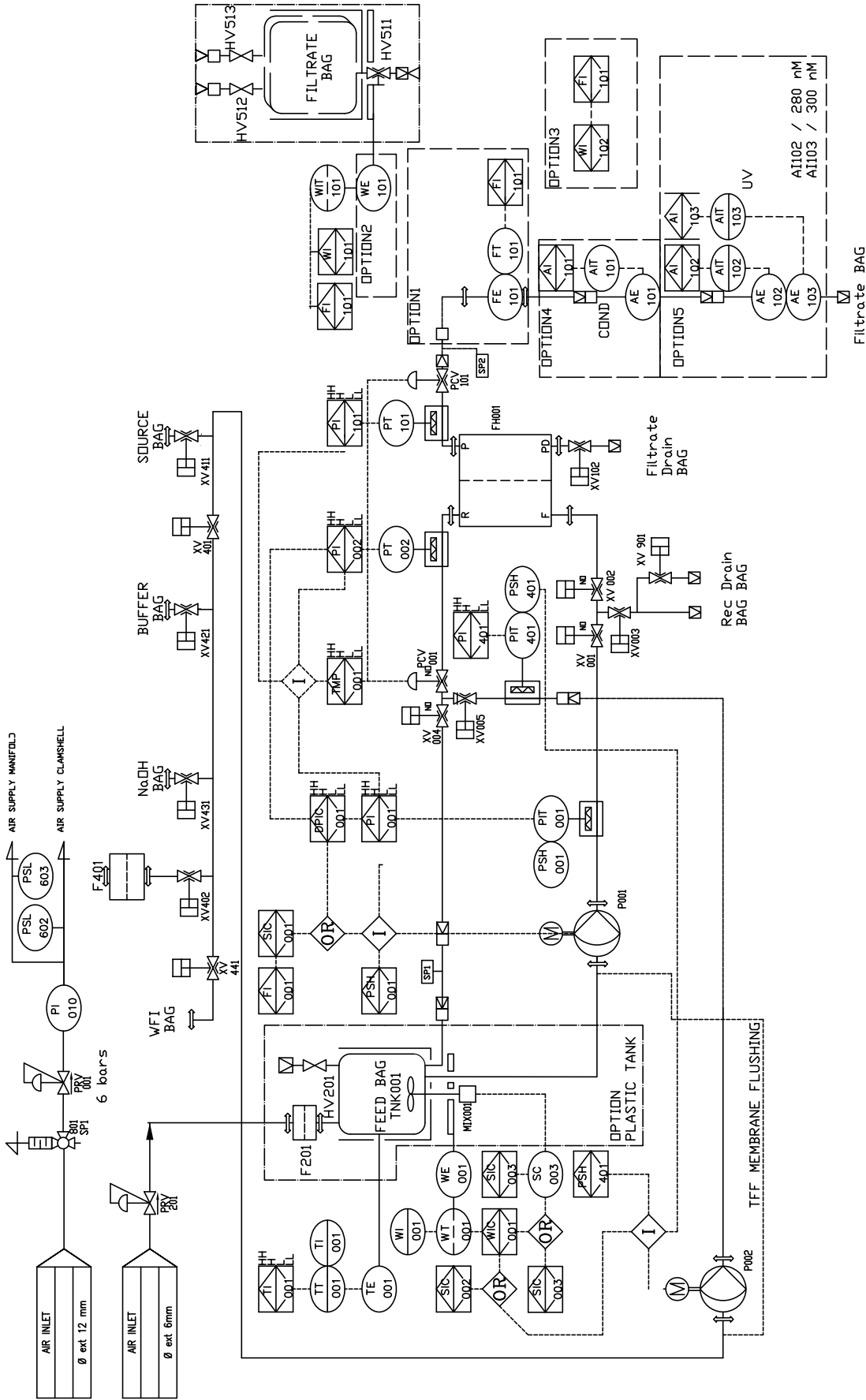


- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 15 - All Main Flowpath Valves Open

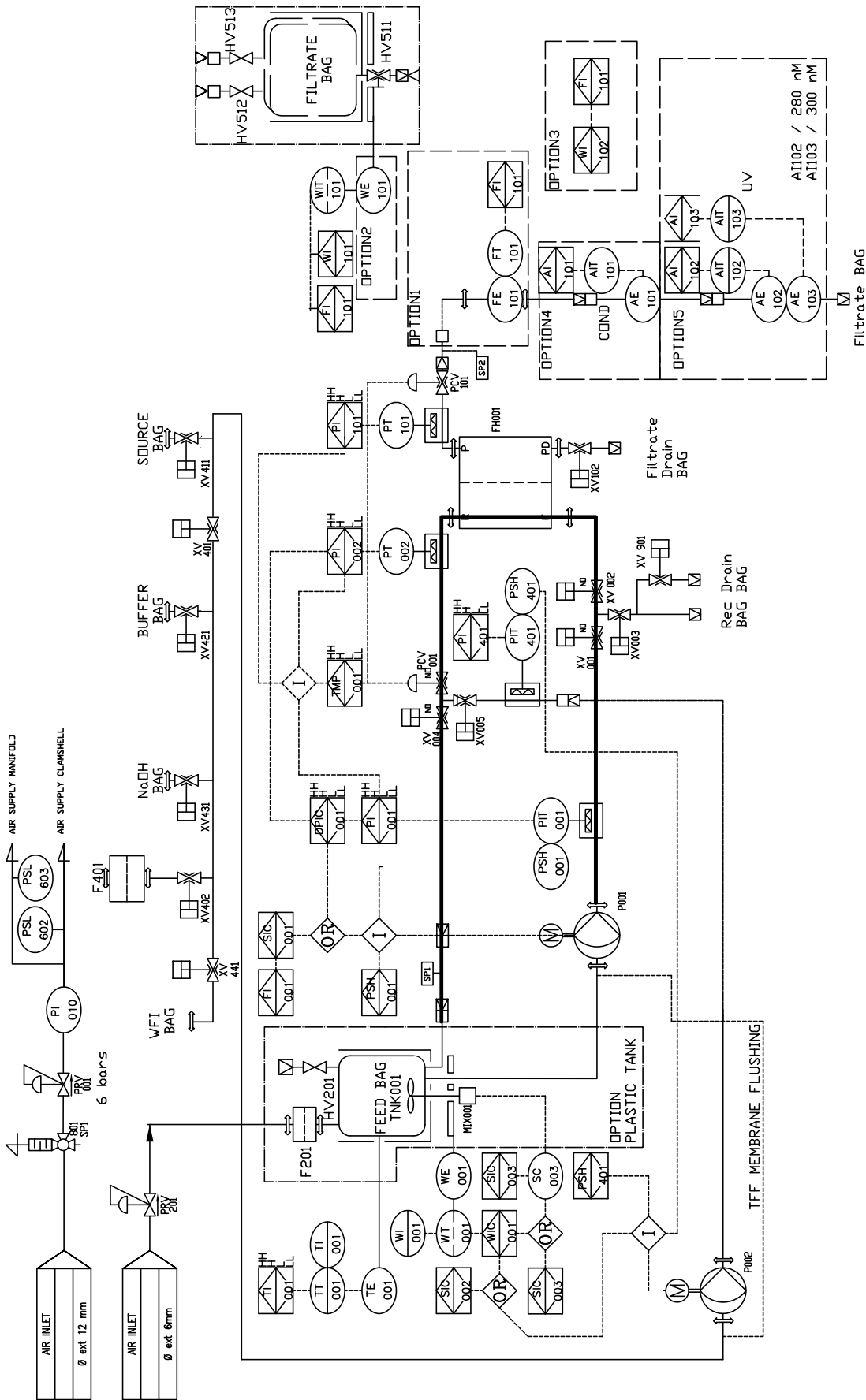
The Mobius® FlexReady Smart System for TFF

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- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

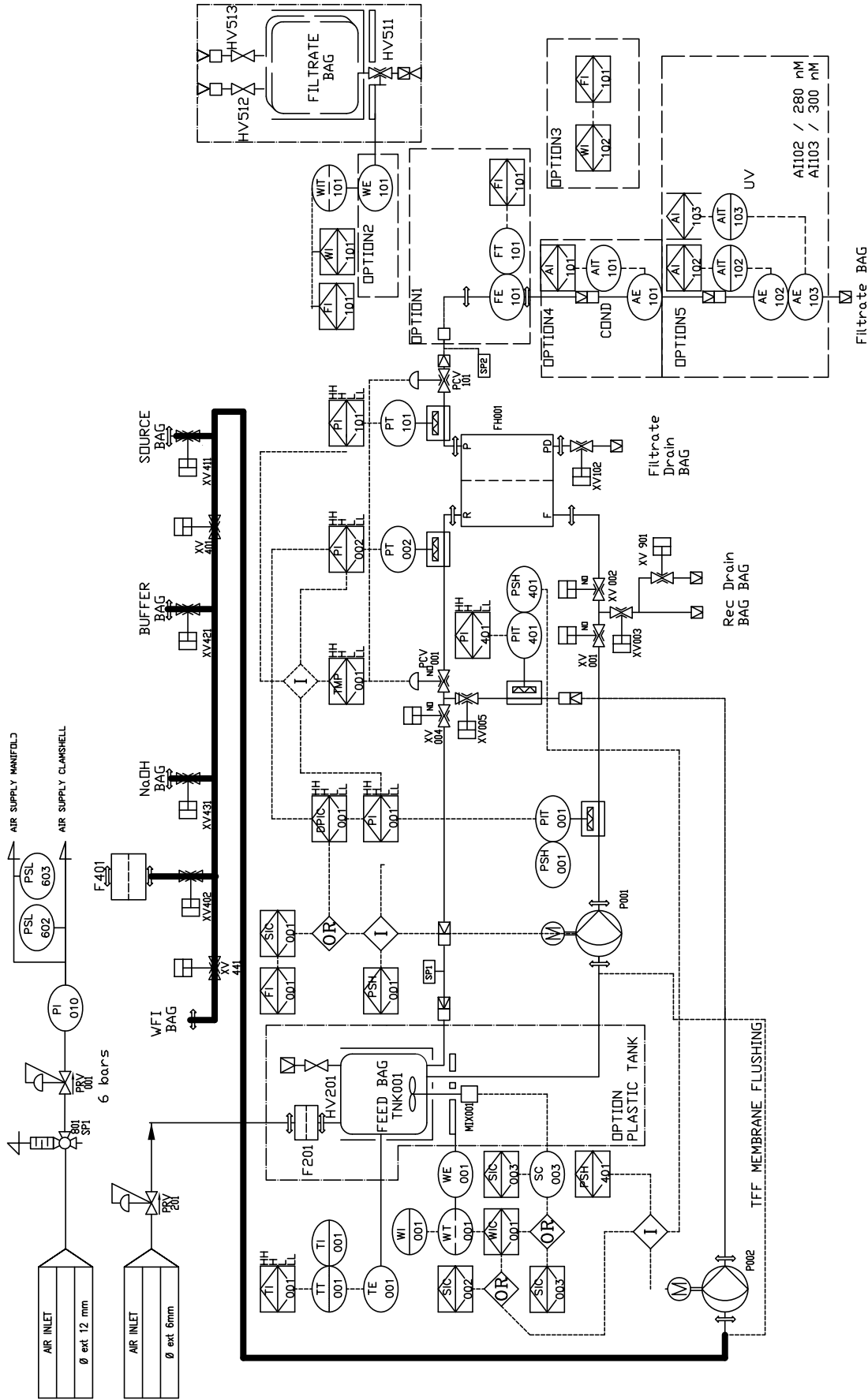
Flowpath 16 - All Main Flowpath Valves Closed



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

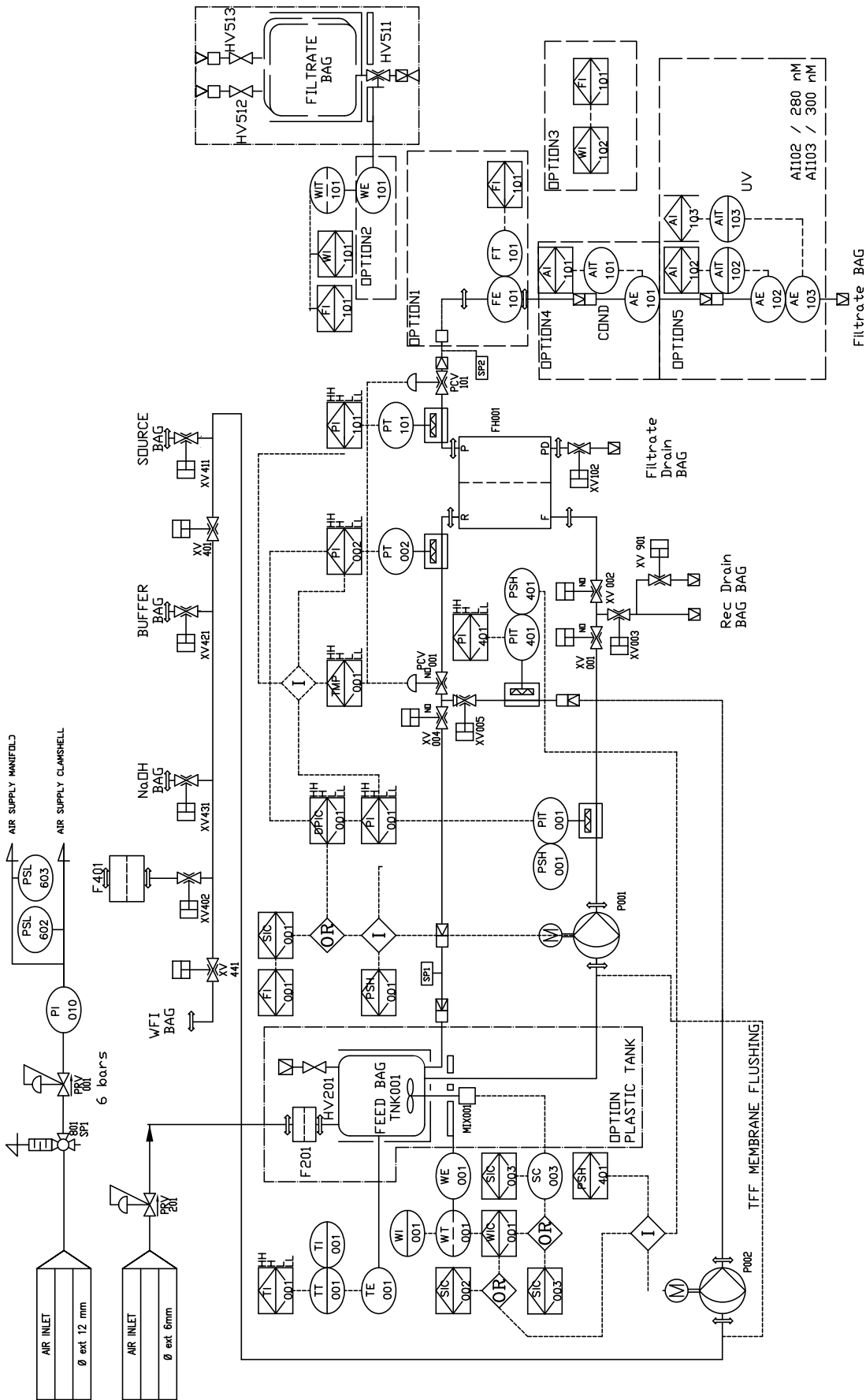
Flowpath 17 - Default

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 18 - All Source Valves Open

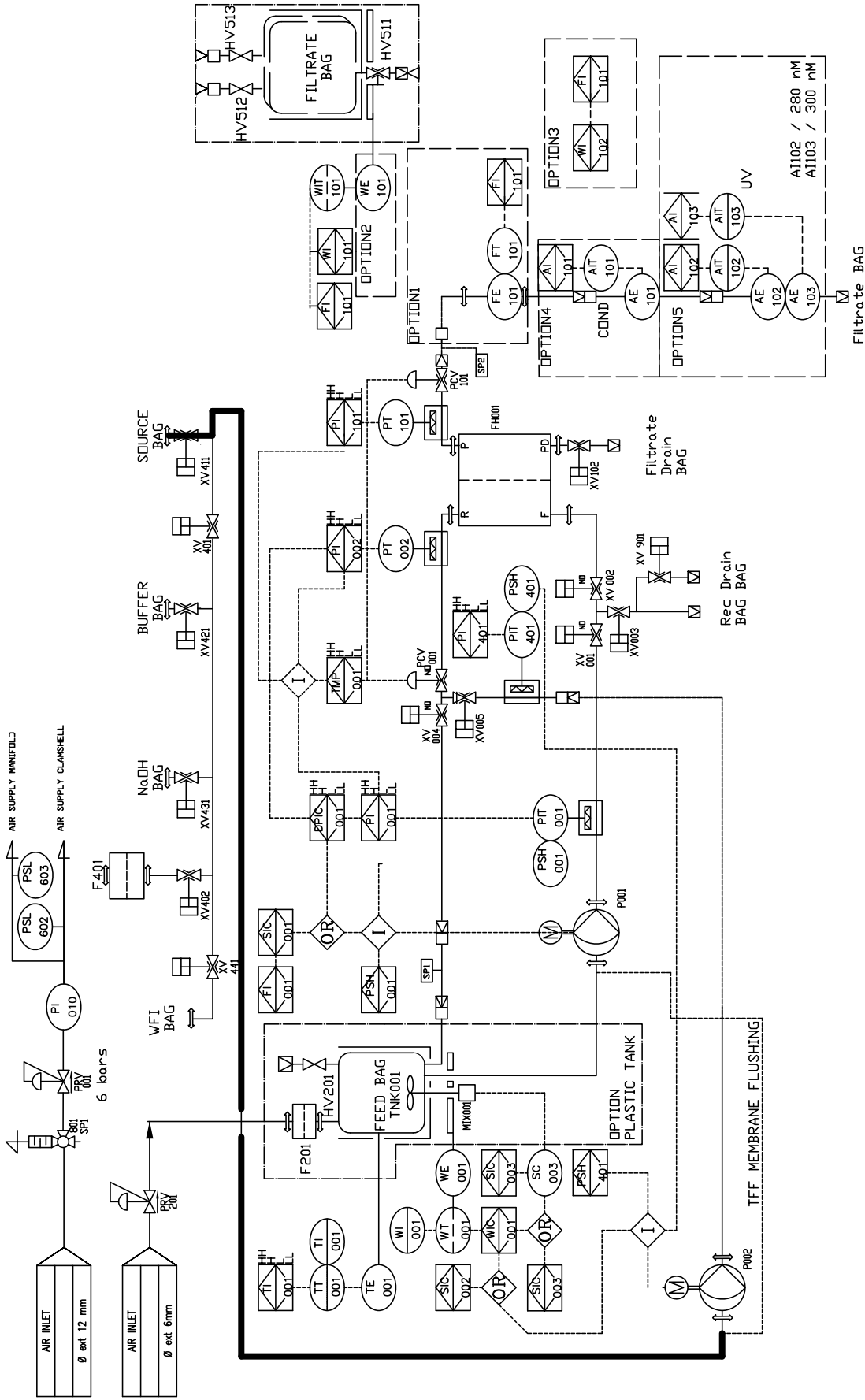


- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

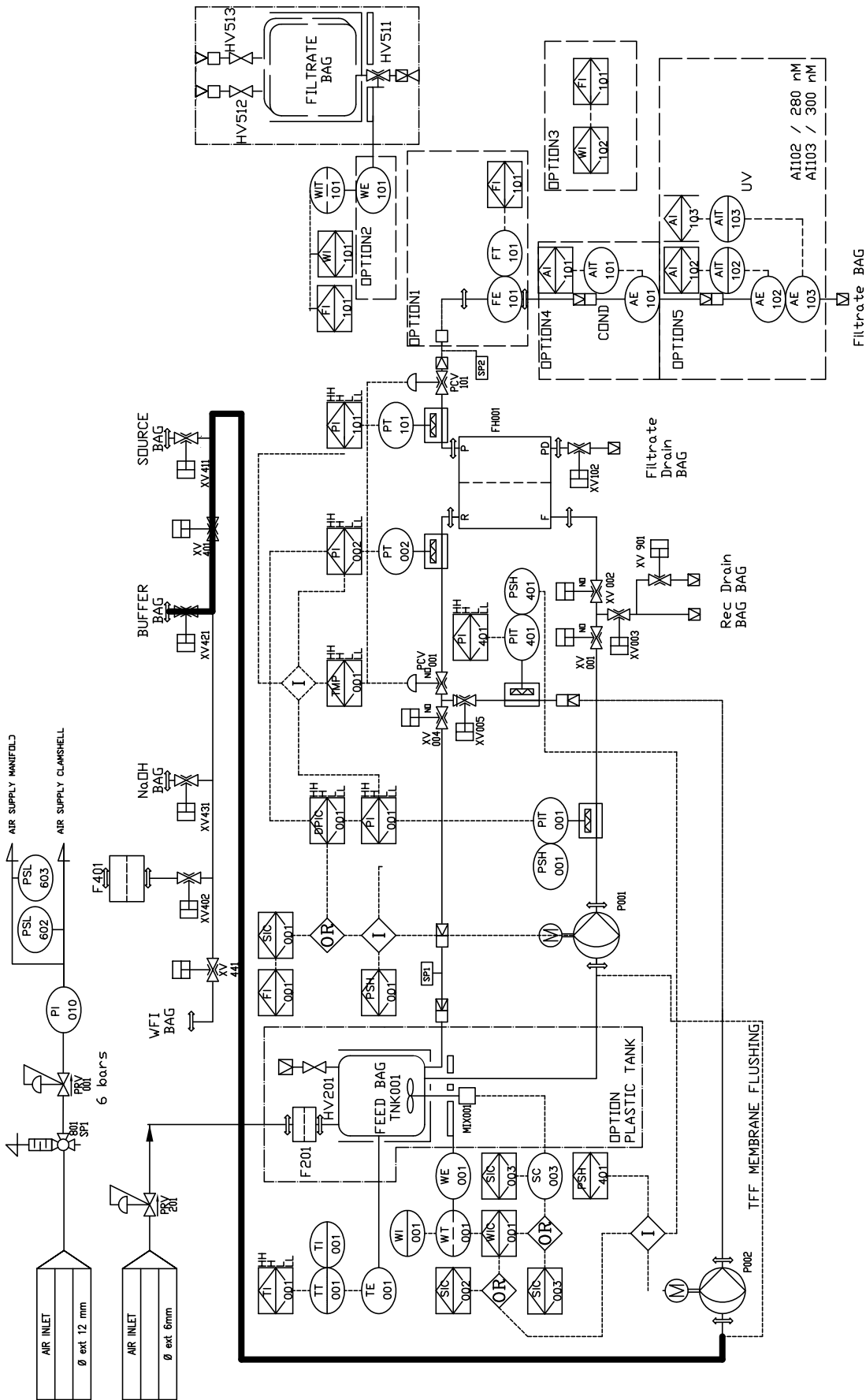
Flowpath 19 - All Source Valves Closed

The Mobius® FlexReady Smart System for TFF

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

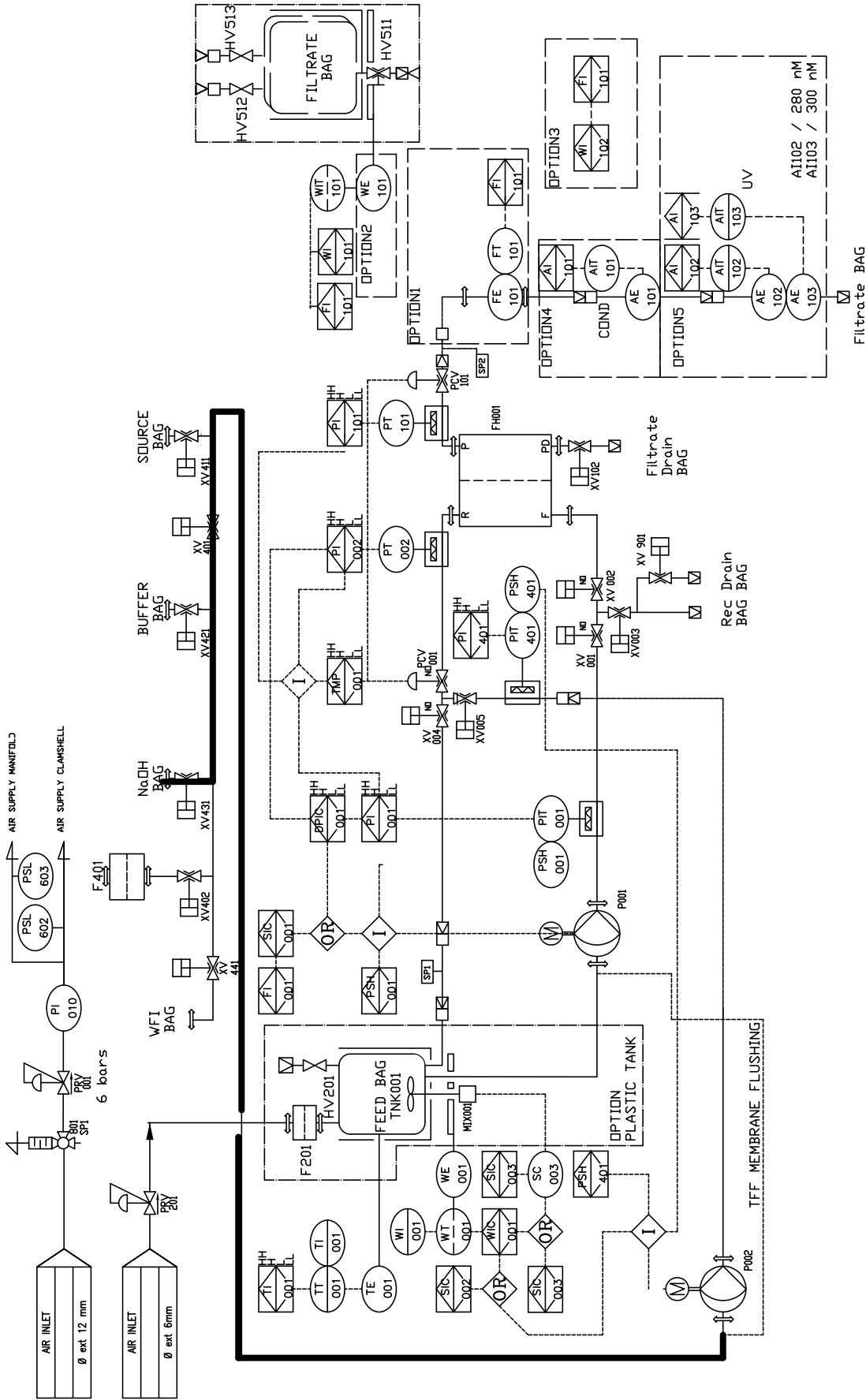


- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 21 - Buffer Source Open

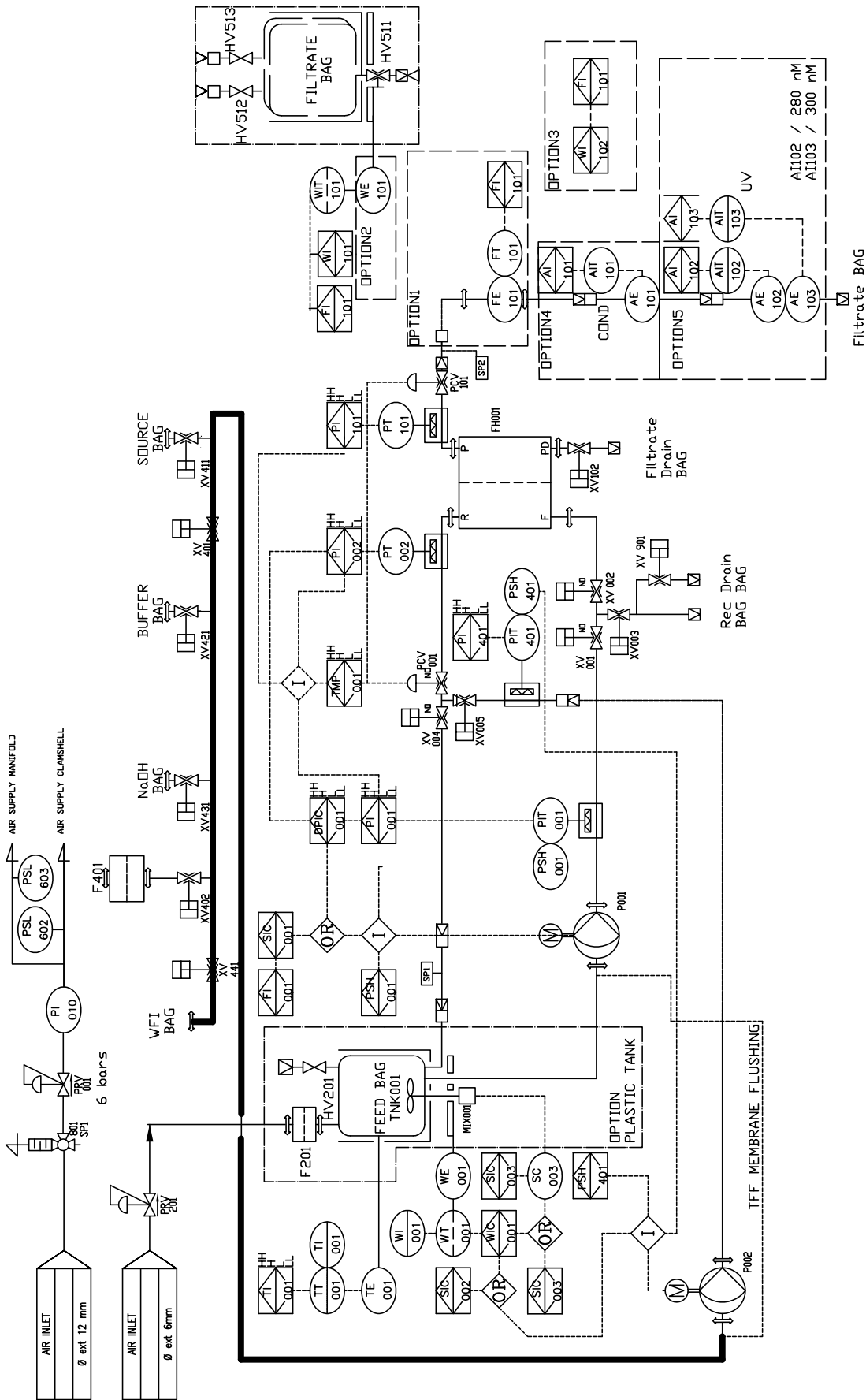
The Mobius® FlexReady Smart System for TFF

The Mobius® FlexReady Smart System for TFF



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 22 - Caustic Source Open



- OPTION 1: Filtrate Flowmeter
- OPTION 2: Filtrate Weight Scale
- OPTION 3: Custom Filtrate Weight Scale
- OPTION 4: Filtrate Conductivity
- OPTION 5: Filtrate UV

Flowpath 23 - Water Source Open

Single Pass Flush (from inlet manifold)

In this flow path configuration the Flushing Assembly TF3SFLUSH is installed.

In the flush configuration, the feed flow rate FI001 is calculated using a specific algorithm that is linked to the activation of the FLUSH flow path, making it necessary to select the FLUSH flow path before flushing.

The selection of the FLUSH flow path can be done in different ways:

By activating the FLUSH button in the process view:

The screenshot displays the MFS System for TFF interface. The top bar shows 'MFS System for TFF', 'TF-3S', and 'V 2.09.00'. The user is logged in as 'ADMIN' on 'CCP 6.7' at '2:46:35 PM 10/20/17'. The main area is a process flow diagram with various components like tanks (TNK001), pumps (P001, P002), valves (XV001-XV005), and flow meters (FI001, FI002). A 'FLUSH' button is highlighted. The bottom panel shows 'Phase 0 Status' with a table of phases and a 'Recipe Pool' section.

Phase:	0	1	2	3	4	5	Recipe Pool
State:	Idle	Idle	Idle	Idle	Idle	Idle	Filename: c:\\Smart\\TF3S\\CCPRecipeFiles\\test.opn
Pending Step:	0	0	0	0	0	0	

Criteria 1 :		Criteria 2 :		Value :	
Procedure Total Time:	0:00:50	Phase Total Time:	0:00:50	Step Total Time:	0:00:40
FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L
Pause Total Time:	0:00:00	Hold Total Time:	2:20:28	User Total Time:	0:00:00
FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L

OR

By selecting the predefined flowpath Single Pass Flush (from inlet manifold) in the drop-down Flow Path menu in the process view:

The screenshot displays the 'MFS System for TFF' control interface. At the top, it shows 'TF-3S' and 'V 2.09.00'. The interface includes a process flow diagram with various tanks (e.g., TNK001 Remote), pumps (P001, P002), and control valves (XV001-XV005). A 'Flow Path Control' dialog box is open, showing a list of predefined flow paths. The 'Single Pass Flush (from inlet manifold)' option is selected. Below the diagram, there is a 'Phase 0 Status' section with buttons for Phase 0-4 and State indicators. A table at the bottom shows 'Procedure Total', 'Phase Total', 'Step Total', 'Pause Total', 'Hold Total', and 'User Total' times. A 'Pg1' button is visible in the bottom left corner.

Flow Path Control

- Buffer Source Open
- Caustic Source Open
- Water Source Open
- Air Source Open
- Single Pass Flush (from inlet manifold)**
- Single Pass Flush (from recycle bag)
- System Drain (without recycle bag)
- System Drain (from recycle bag)

Phase 0 Status

Phase:	0	1	2	3	4
State:	Idle	Idle	Idle	Idle	Idle
Pending Step:	0	0	0	0	0

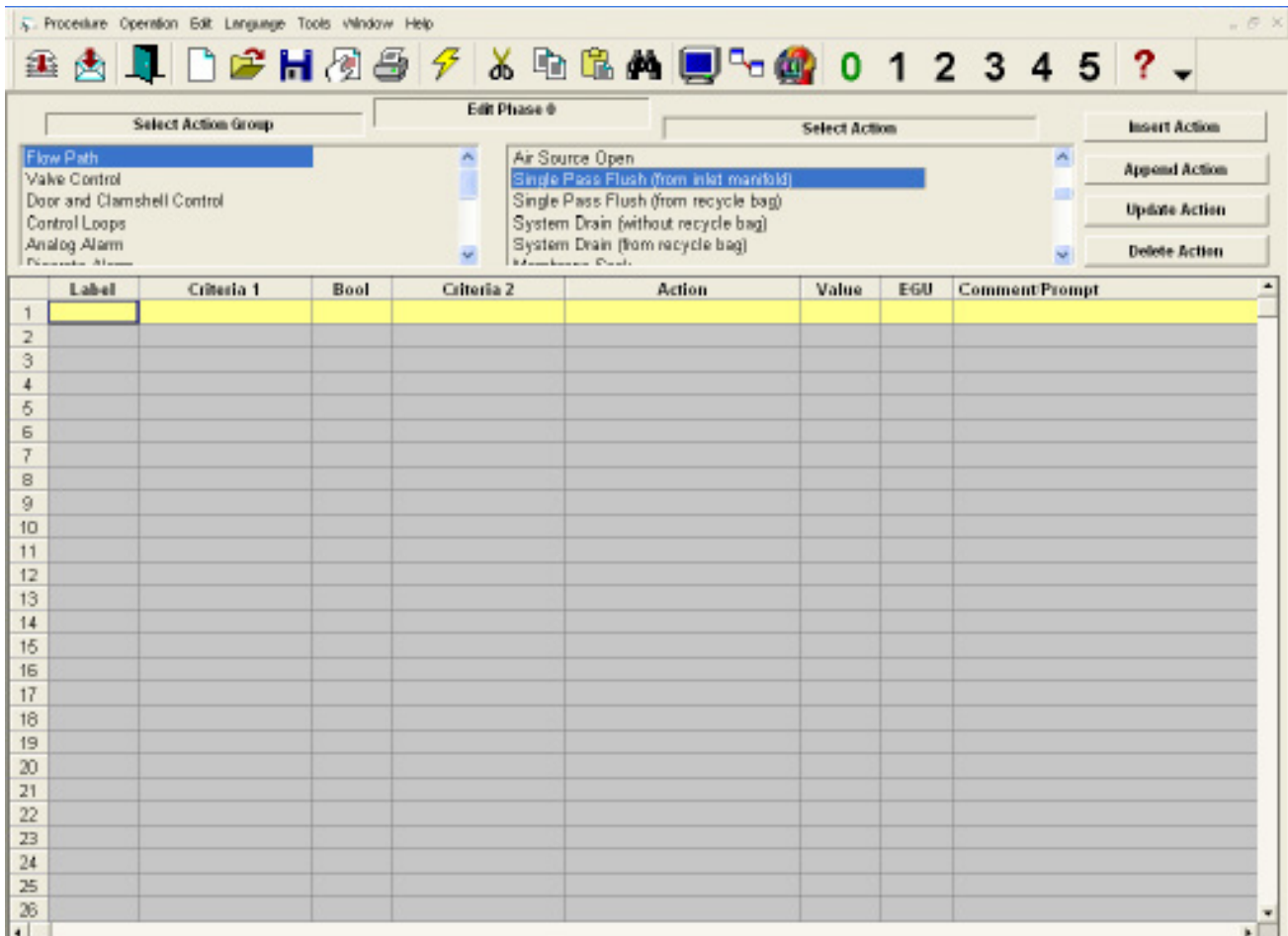
Criteria 1: Boolean :
Criteria 2: Pending Step Action : Value :

Procedure Total Time:	0:00:50	Phase Total Time:	0:00:50	Step Total Time:	0:00:40	Pause Total Time:	0:00:00	Hold Total Time:	2:20:28	User Total Time:	0:00:00
FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L	FQ01 FI001	0.0 L

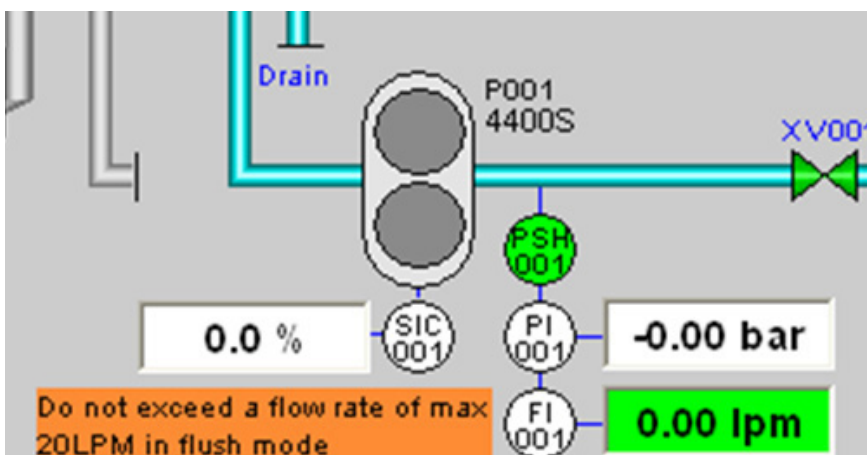
Buttons: Start, Reset

OR

By selecting the predefined flowpath Single Pass Flush (from inlet manifold) in the drop-down “Flow Path” menu in the recipe editor:

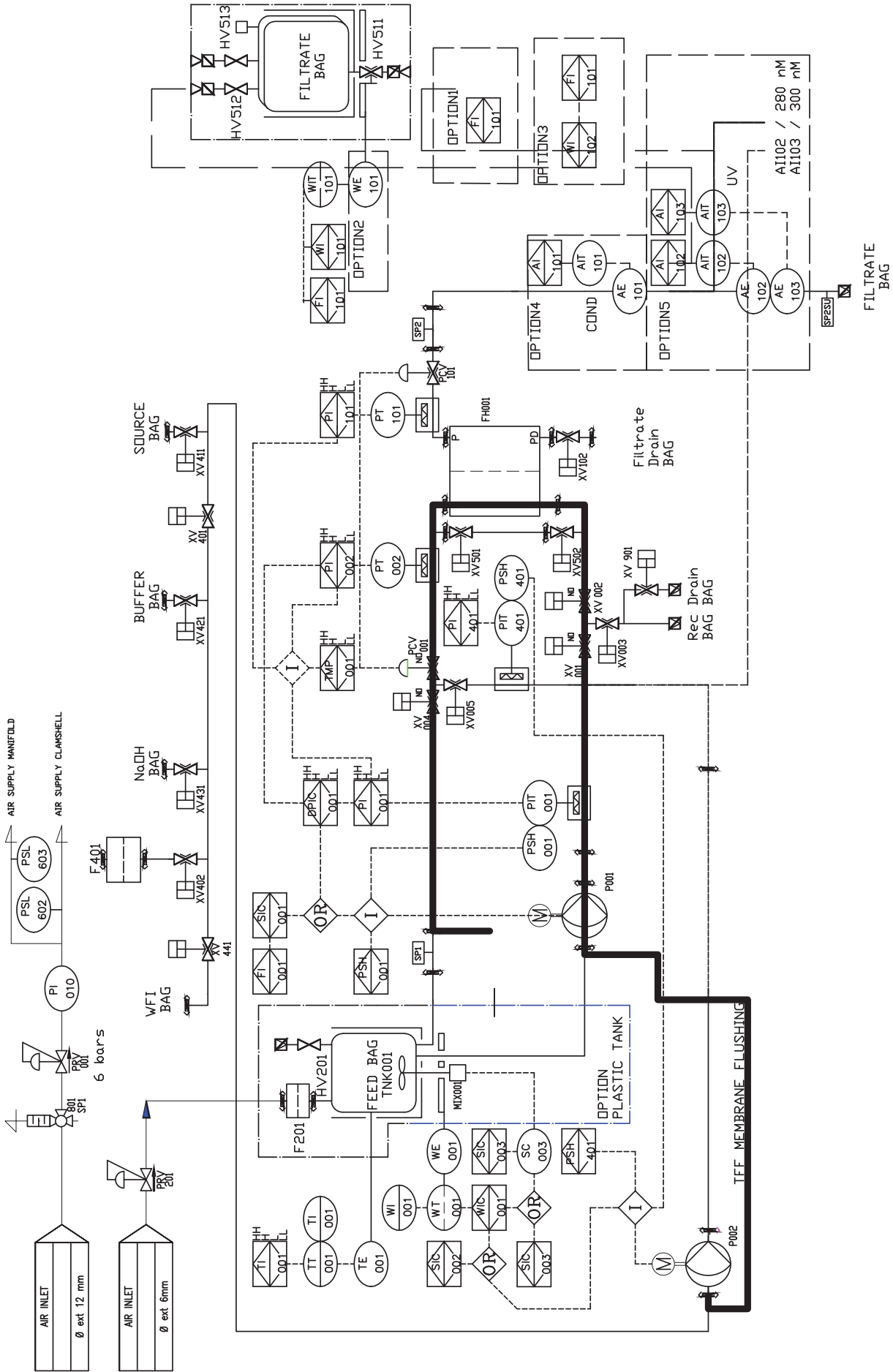


When the predefined flow path Single Pass Flush (from inlet manifold) and/or the FLUSH button are activated, the FLUSH flowpath is highlighted in the process view and the message do not exceed a max flow rate of 20 LPM in flush mode is displayed close to the FI001 tag.

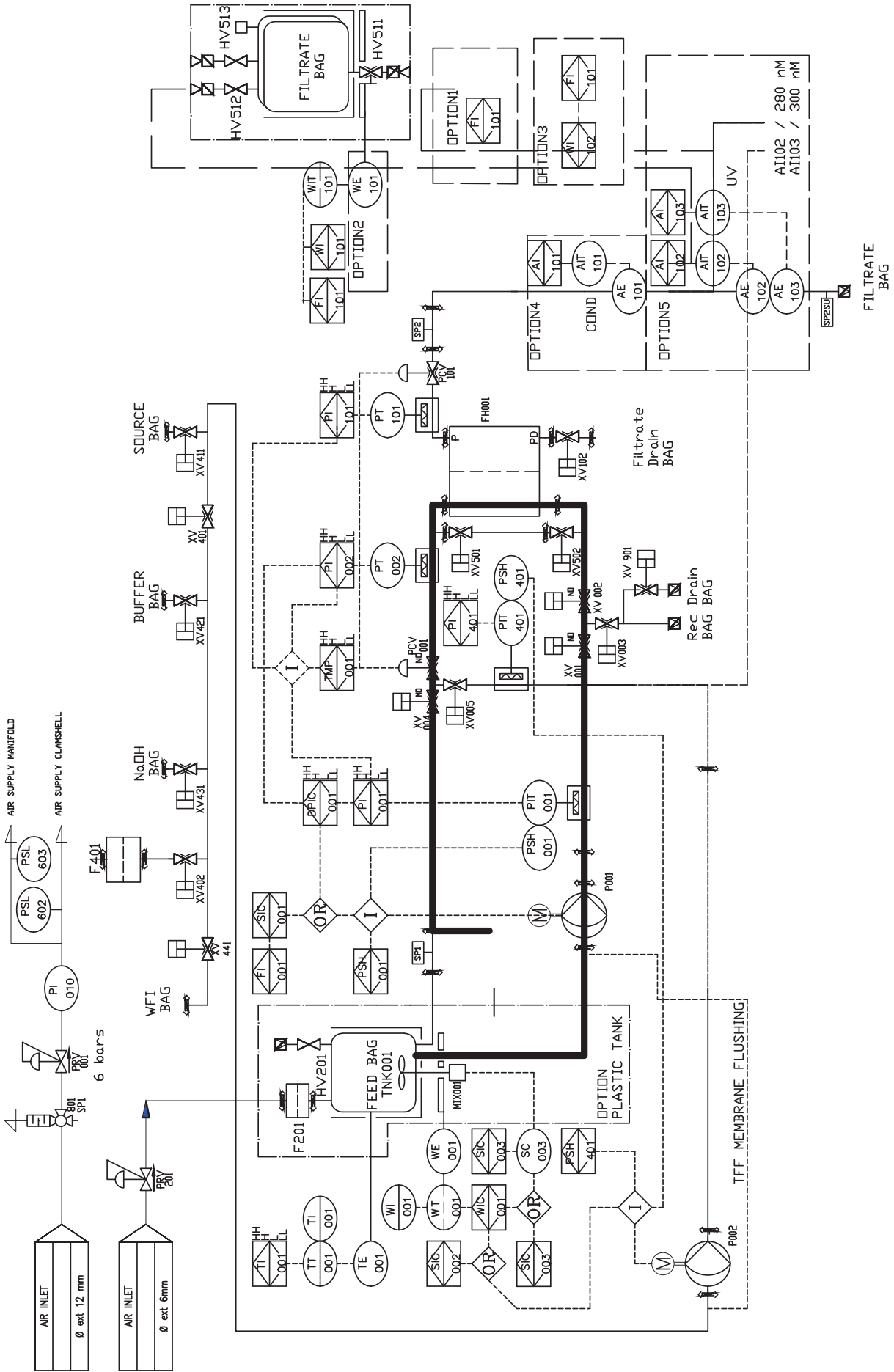


The maximum FLUSH flow rate is 20 LPM.

The Mobius® FlexReady Smart System for TFF

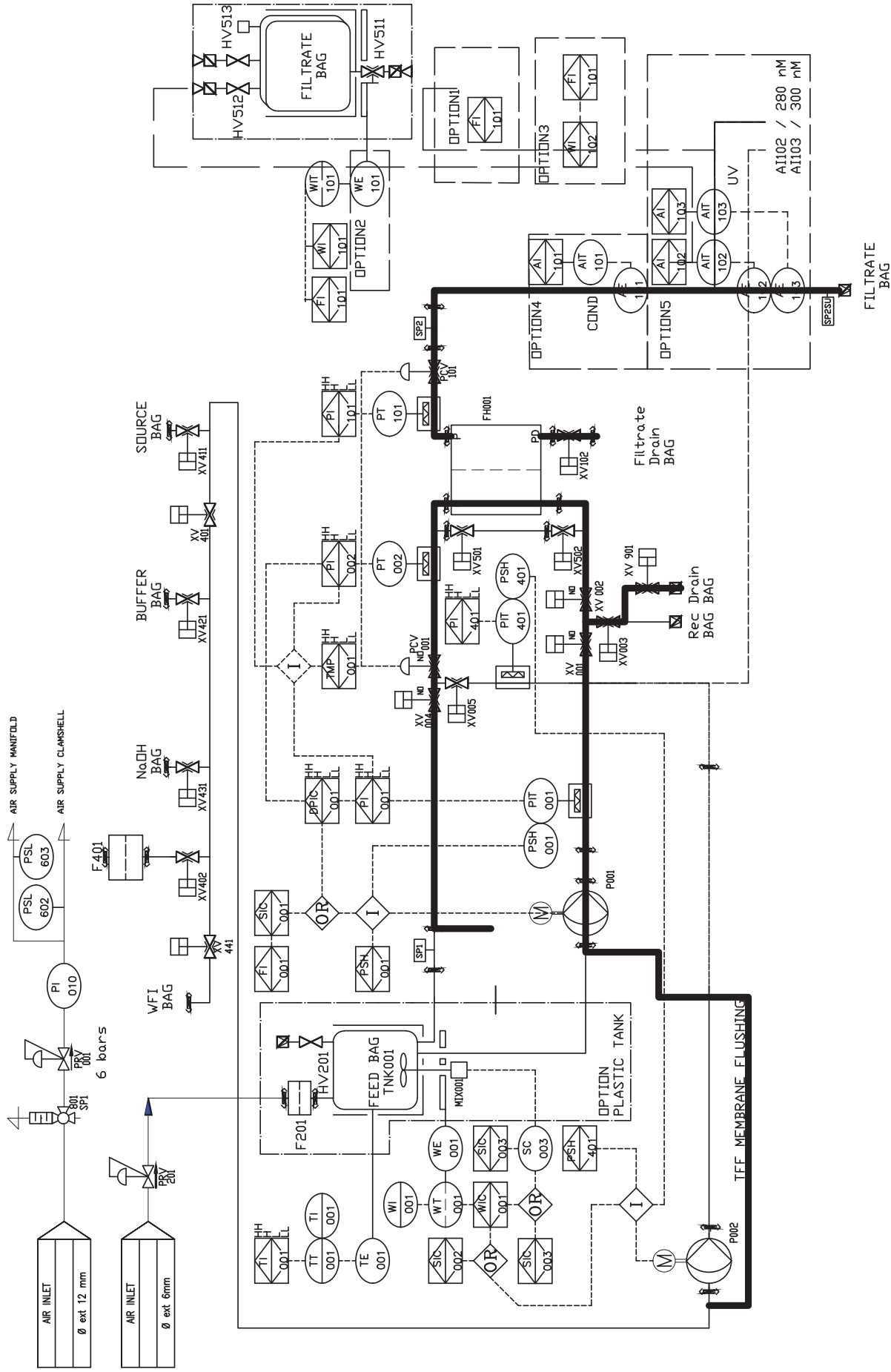


TFF3S Flowpath 1 - Single Pass Flush (from inlet manifold)

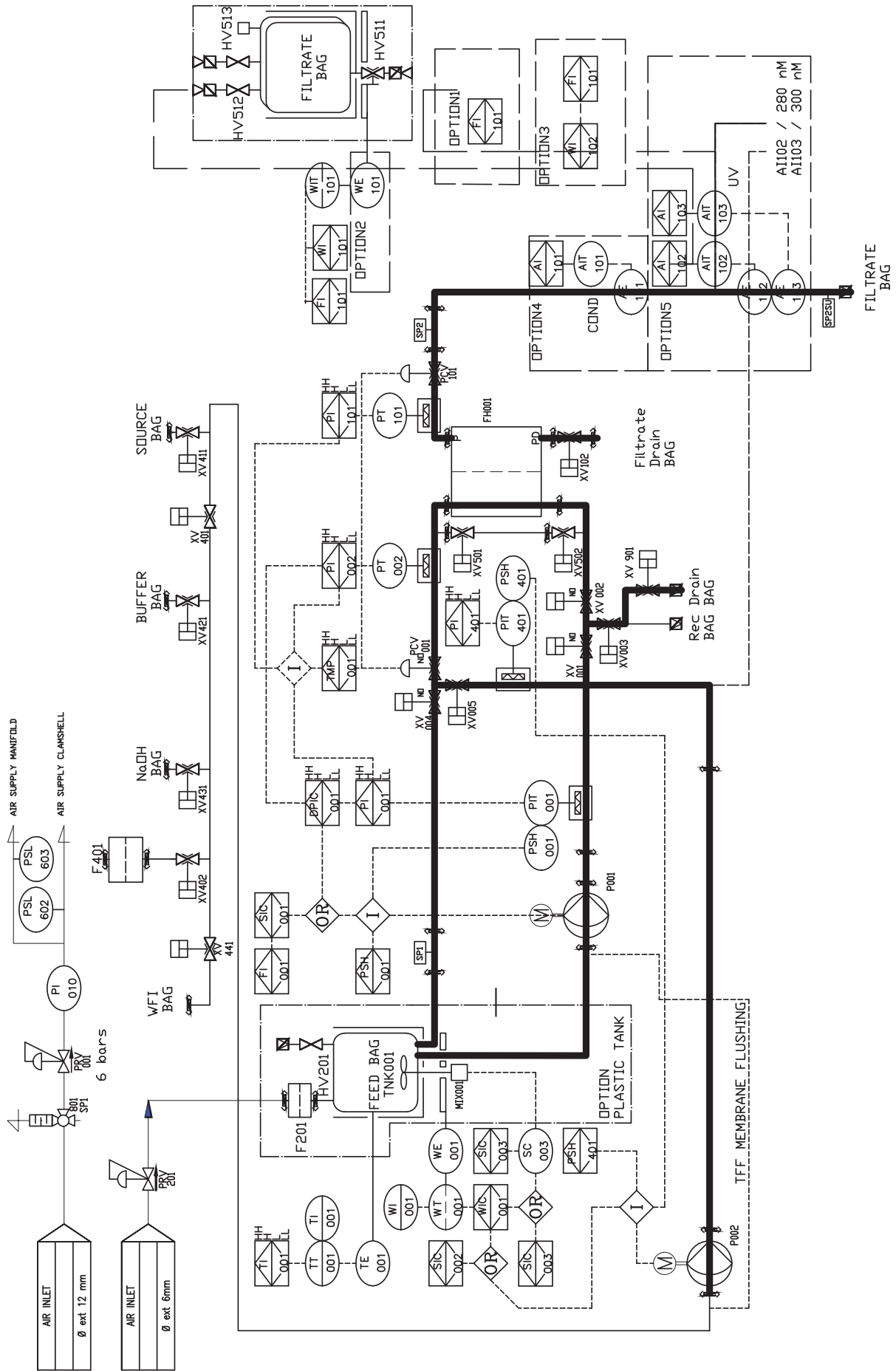


TF3S Flowpath 2 - Single Pass Flush (from recycle bag)

The Mobius® FlexReady Smart System for TFF

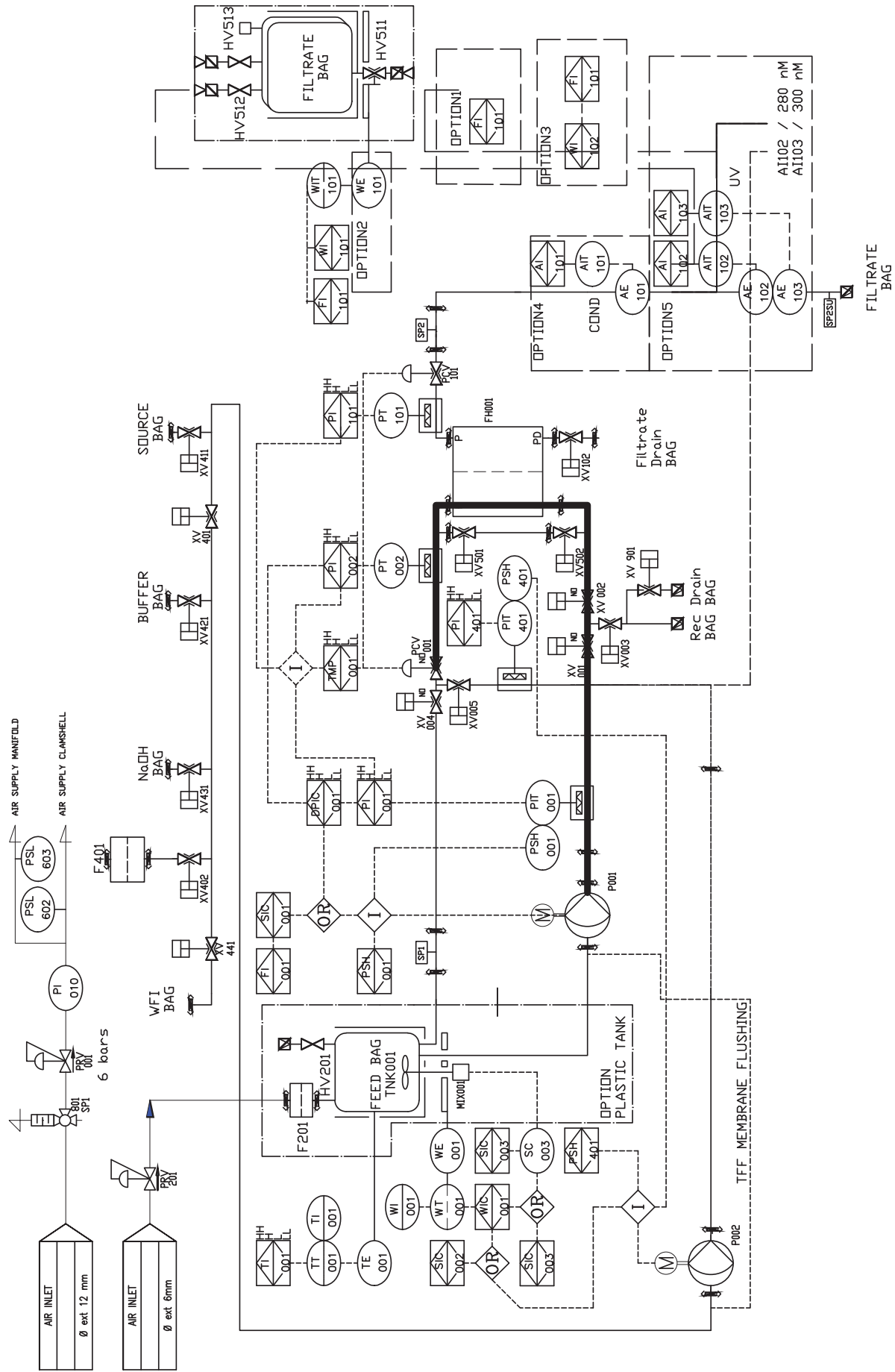


TFF3S Flowpath 3 - System Drain (without recycle bag)

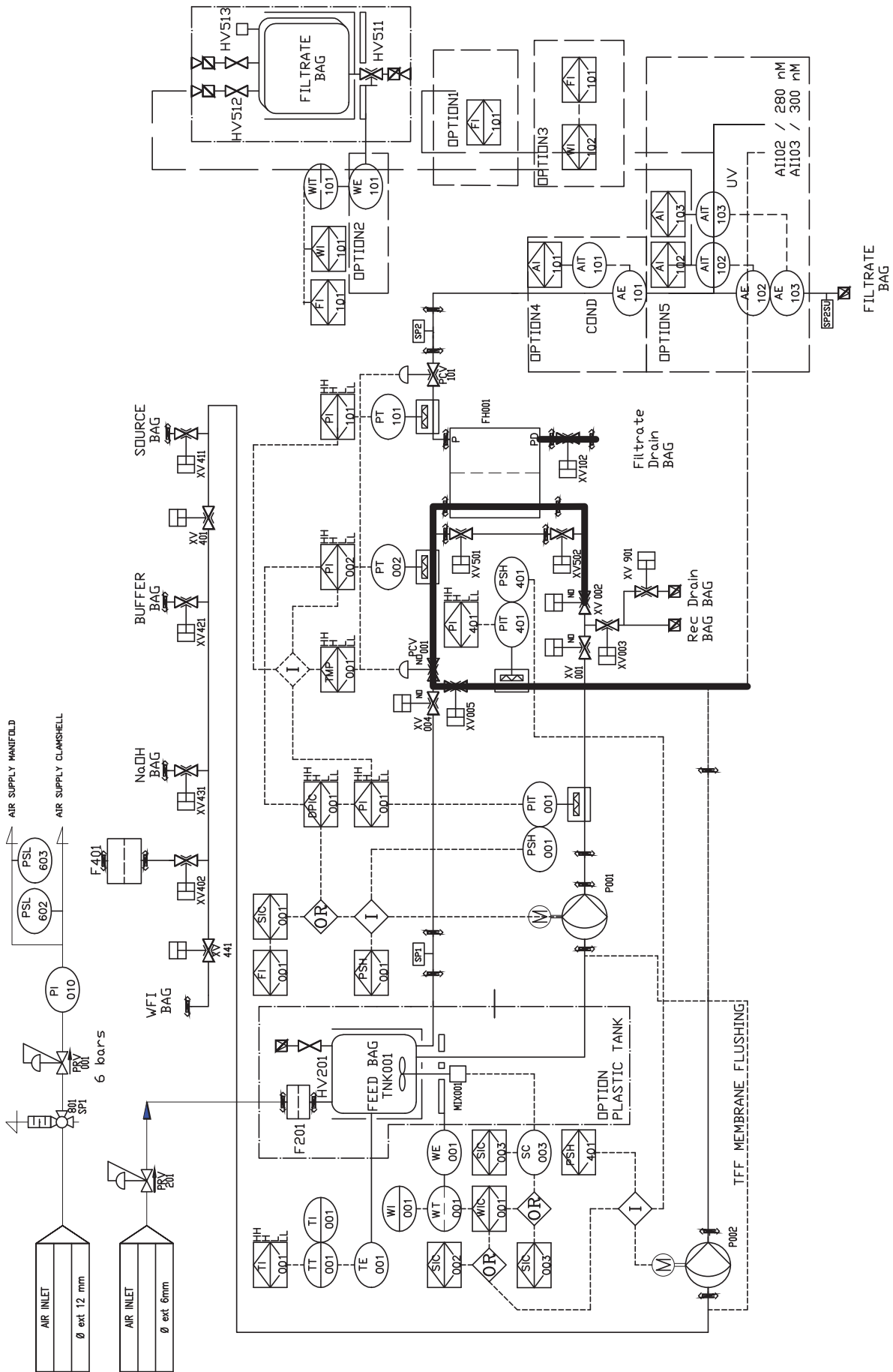


TF3S Flowpath 4 - System Drain (from recycle bag)

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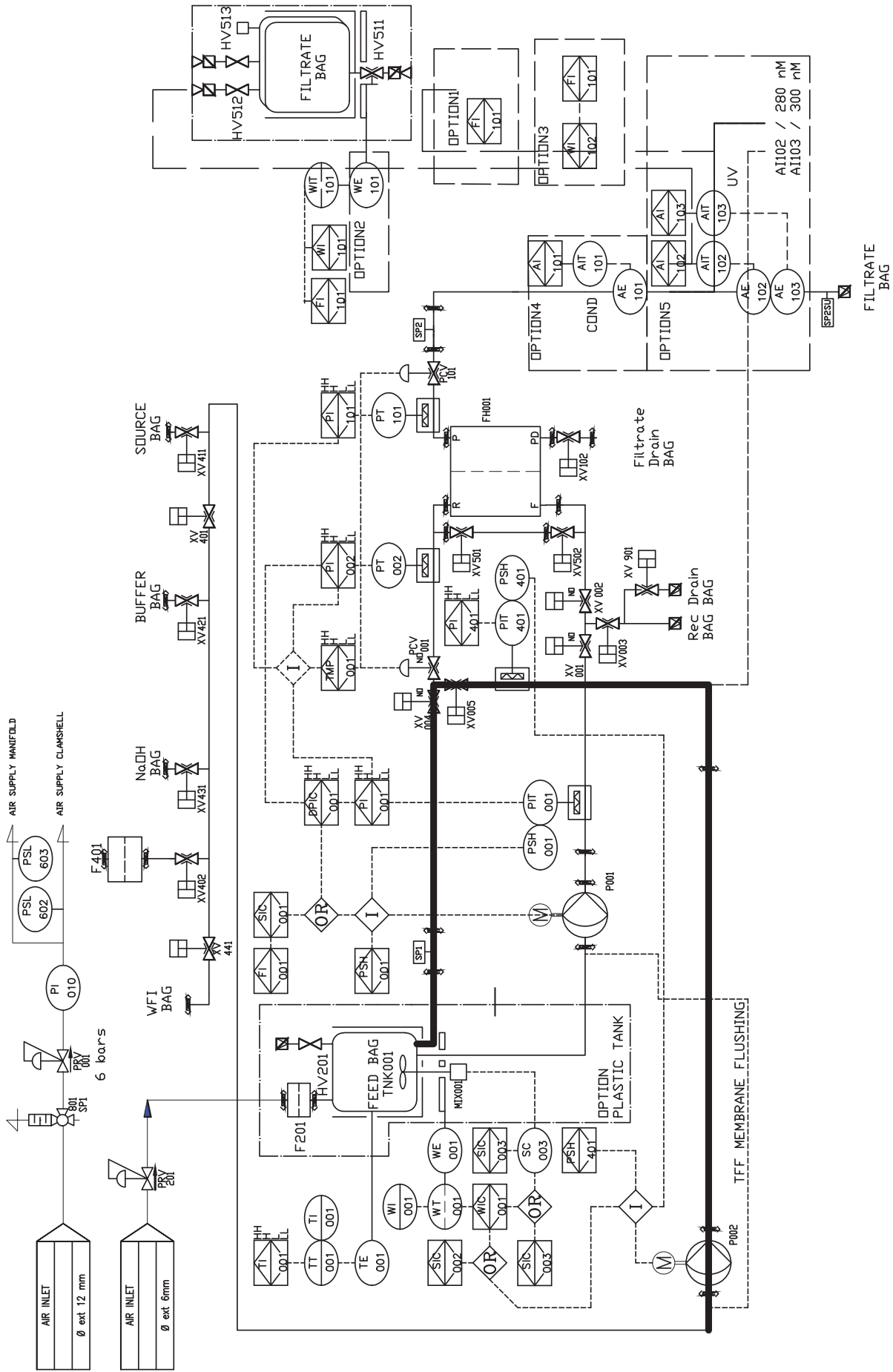


TFF3S Flowpath 5 - Membrane Soak

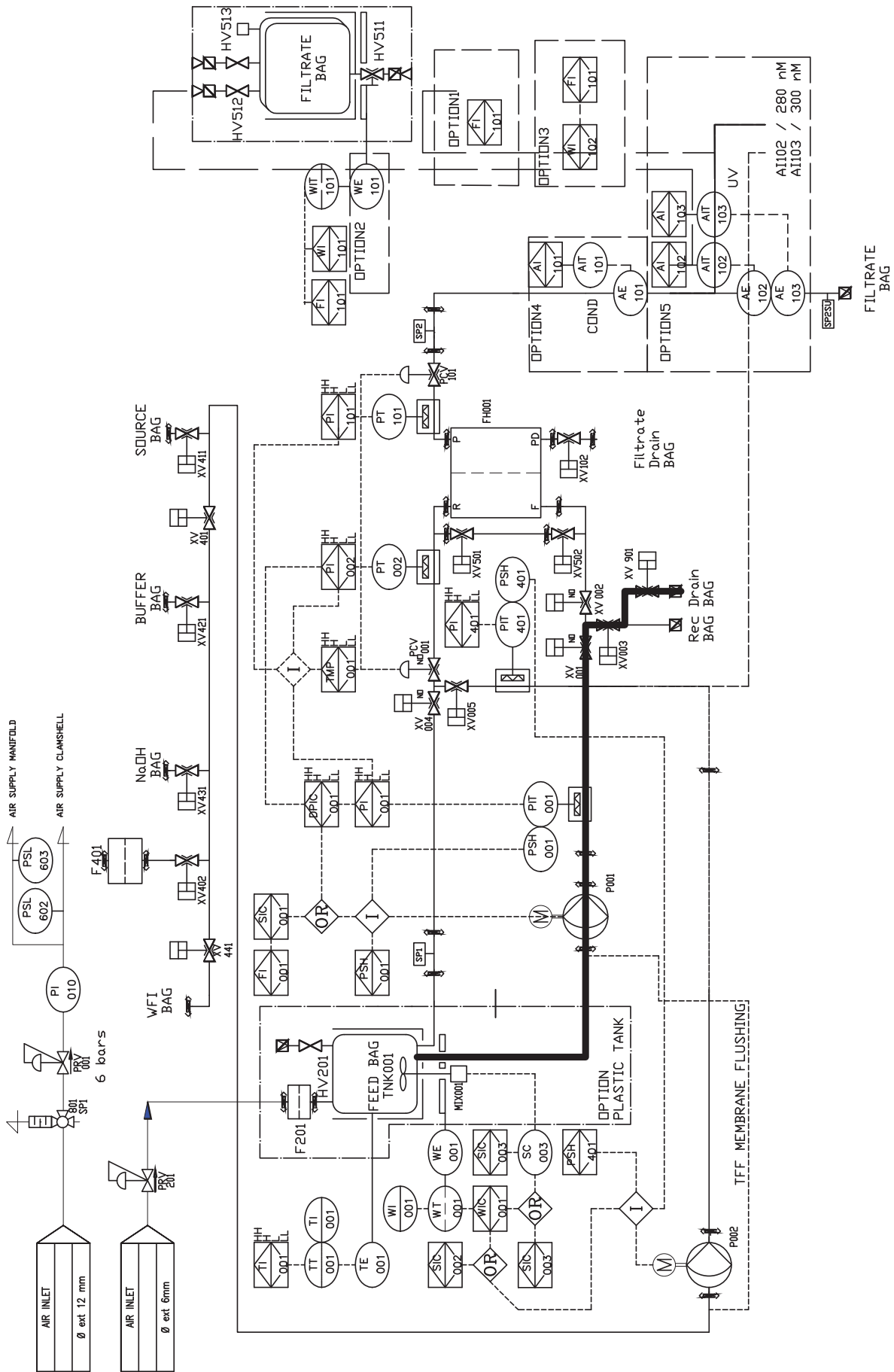


TFFS Flowpath 6 - Integrity Test

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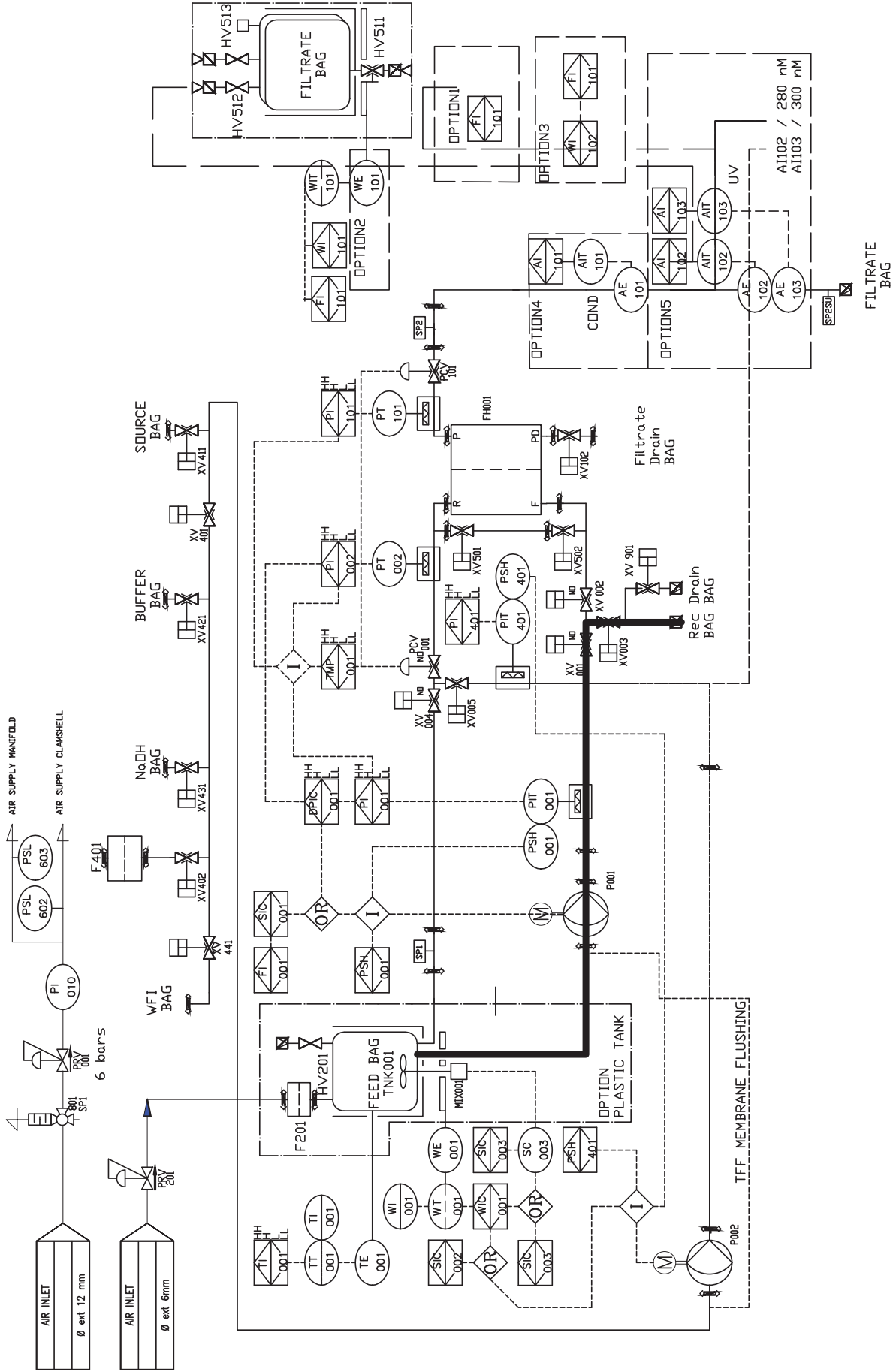


TFFS Flowpath 7 - Recycle Bag Fill

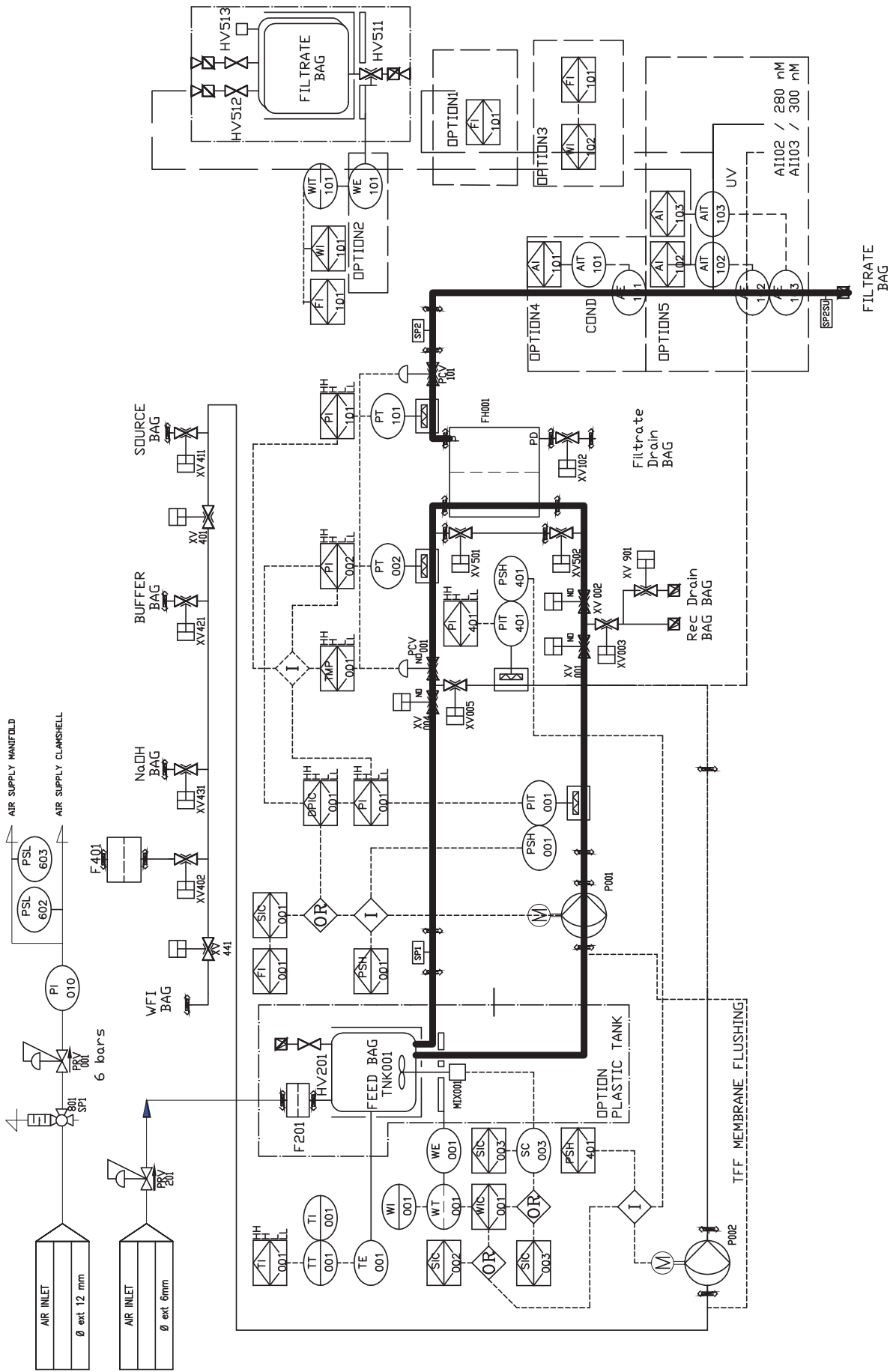


TFF3S Flowpath 8 - Recycle Bag Drain

The Mobius® FlexReady Smart System for TFF



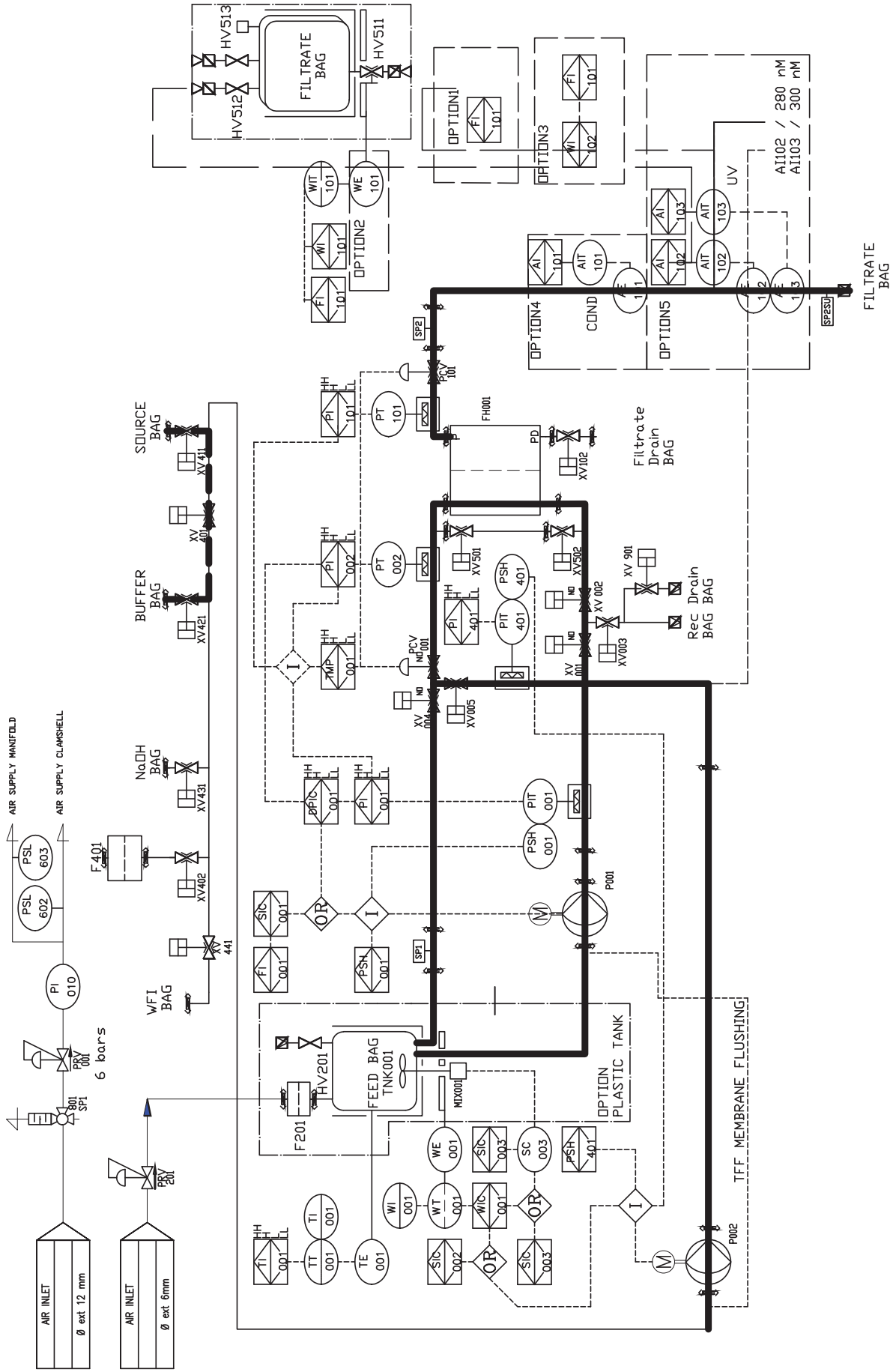
TF3S Flowpath 9 - Recovery Filter Flush



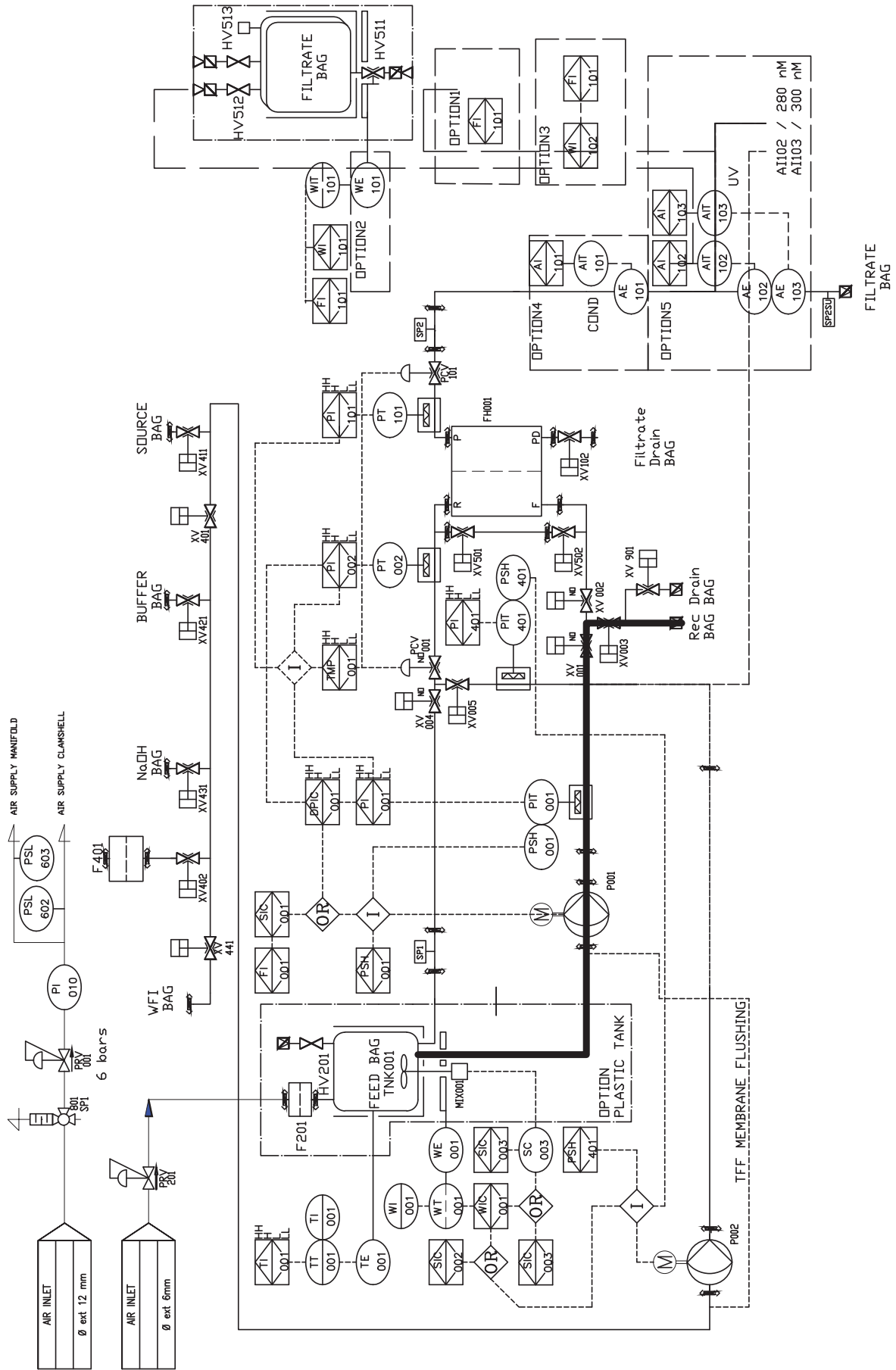
TF3S Flowpath 10 - Batch UF or Membrane Recycle

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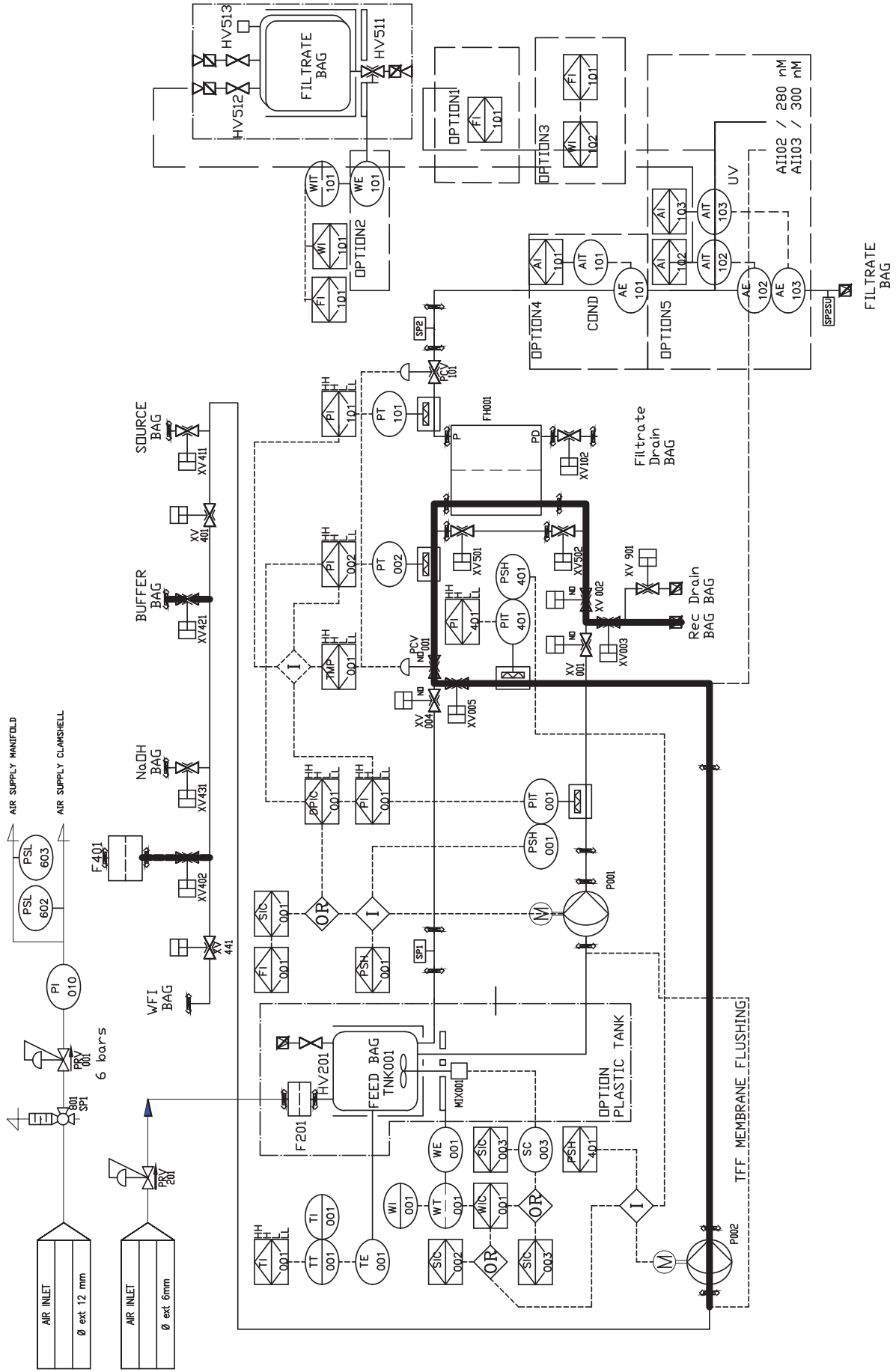


TFF3S Flowpath 11 - Fed Batch UF or Diafiltration

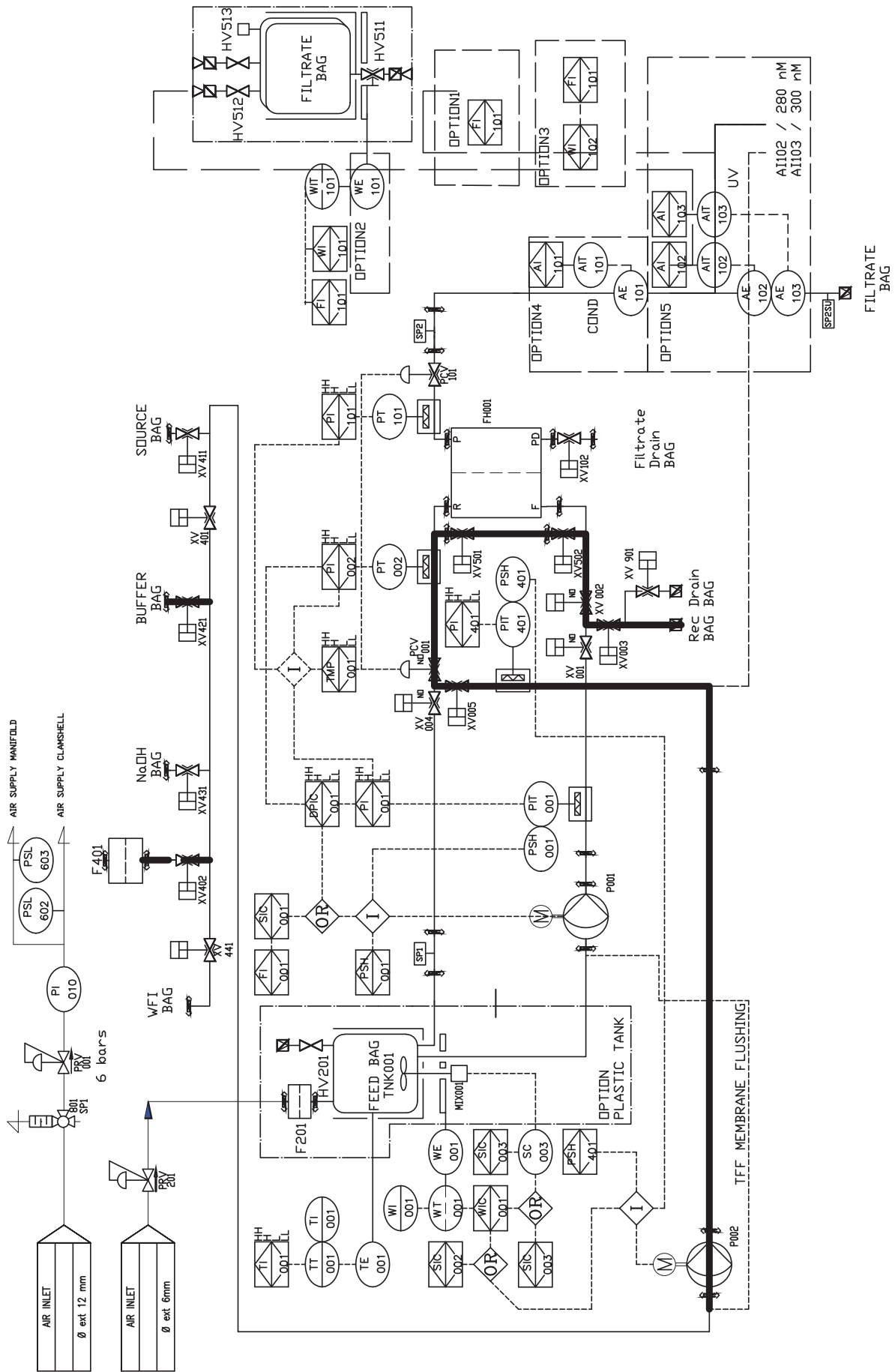


TF3S Flowpath 12 - Product Recovery 1&5 - Empty Recycle Bag

The Mobius® FlexReady Smart System for TFF

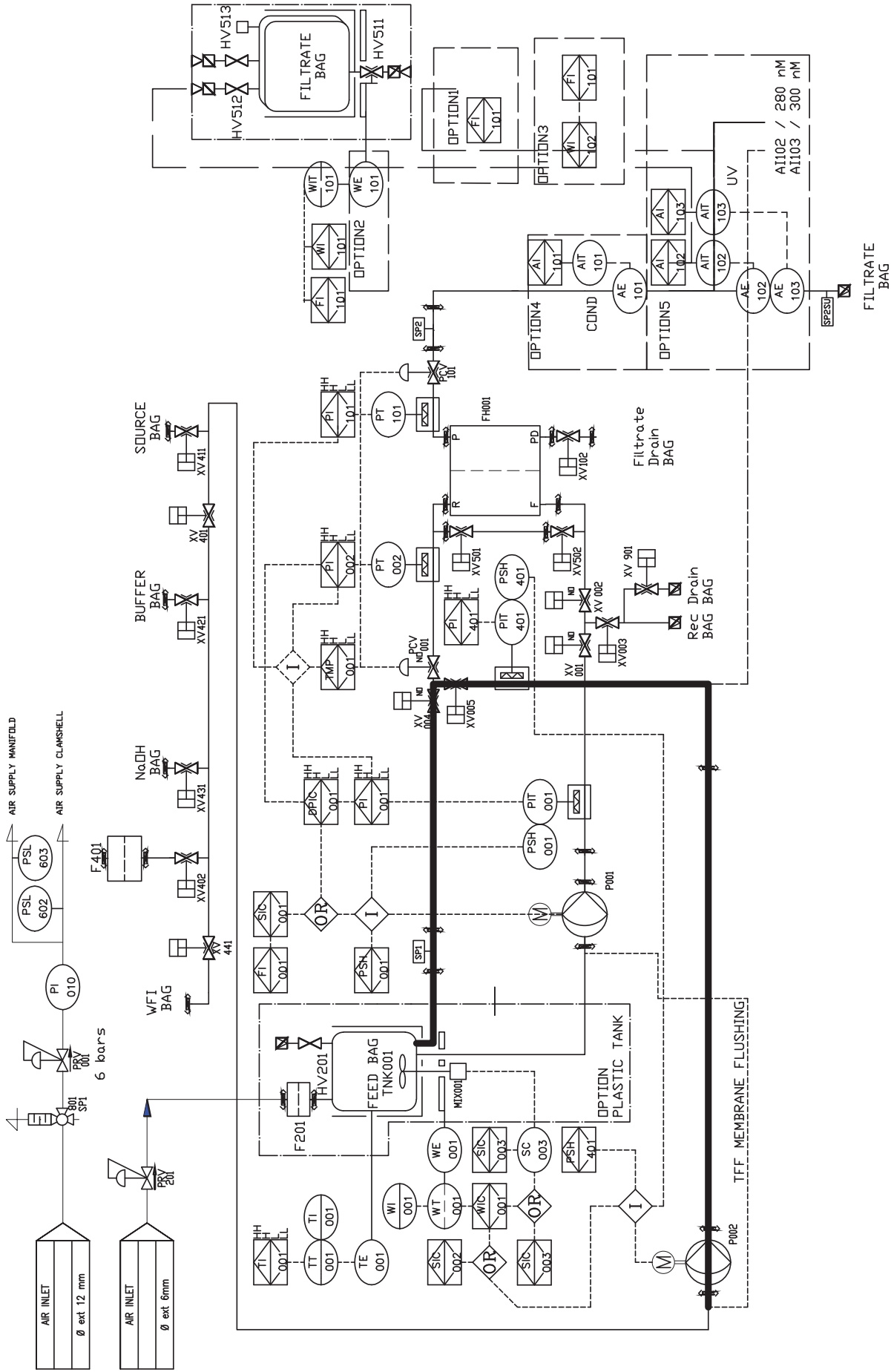


TF3S Flowpath 13 - Product Recovery 2 - Empty Retentate Line

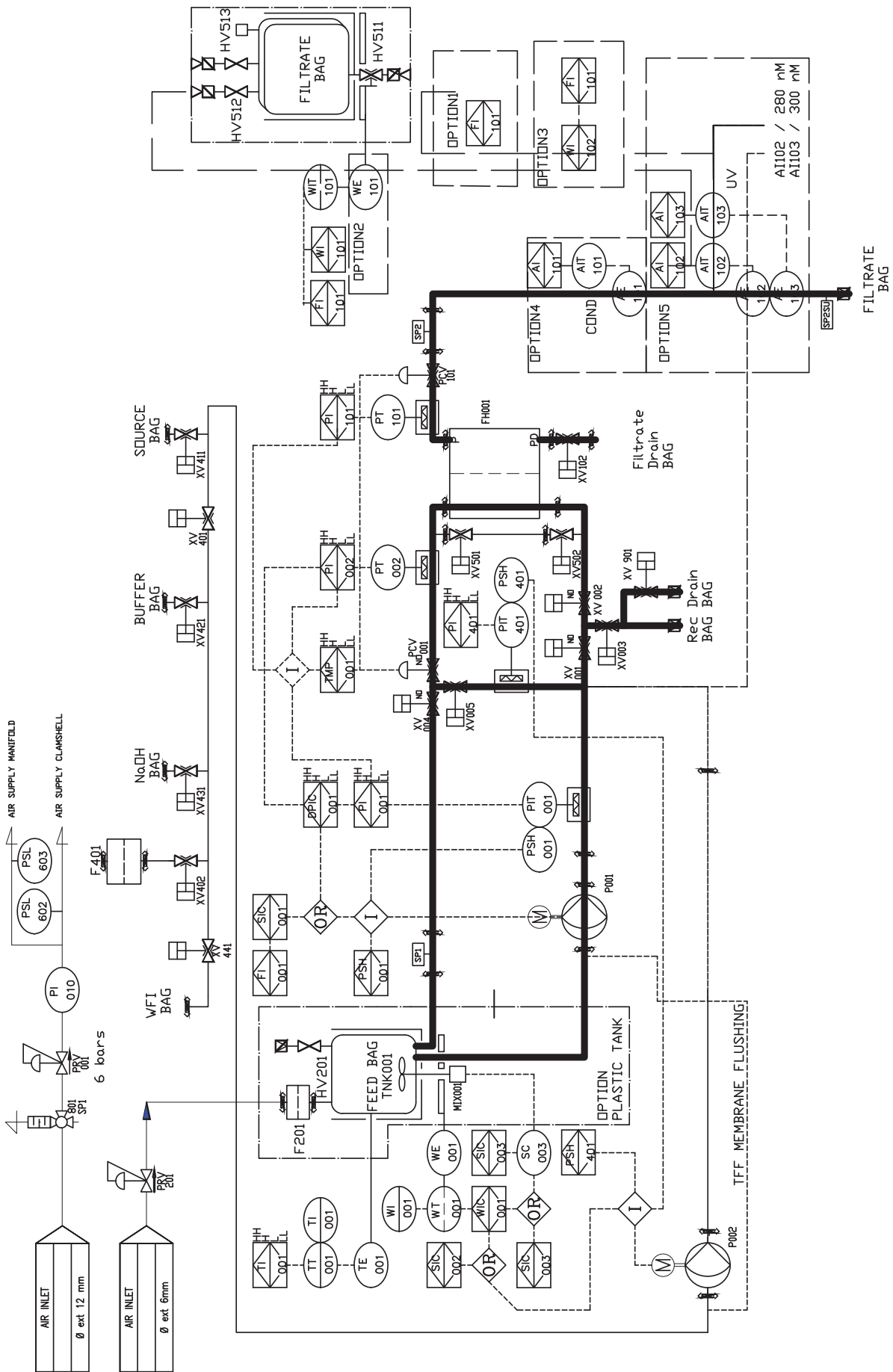


TFF3S Flowpath 14 - Product Recovery 3&g - Empty Bypass

The Mobius® FlexReady Smart System for TFF

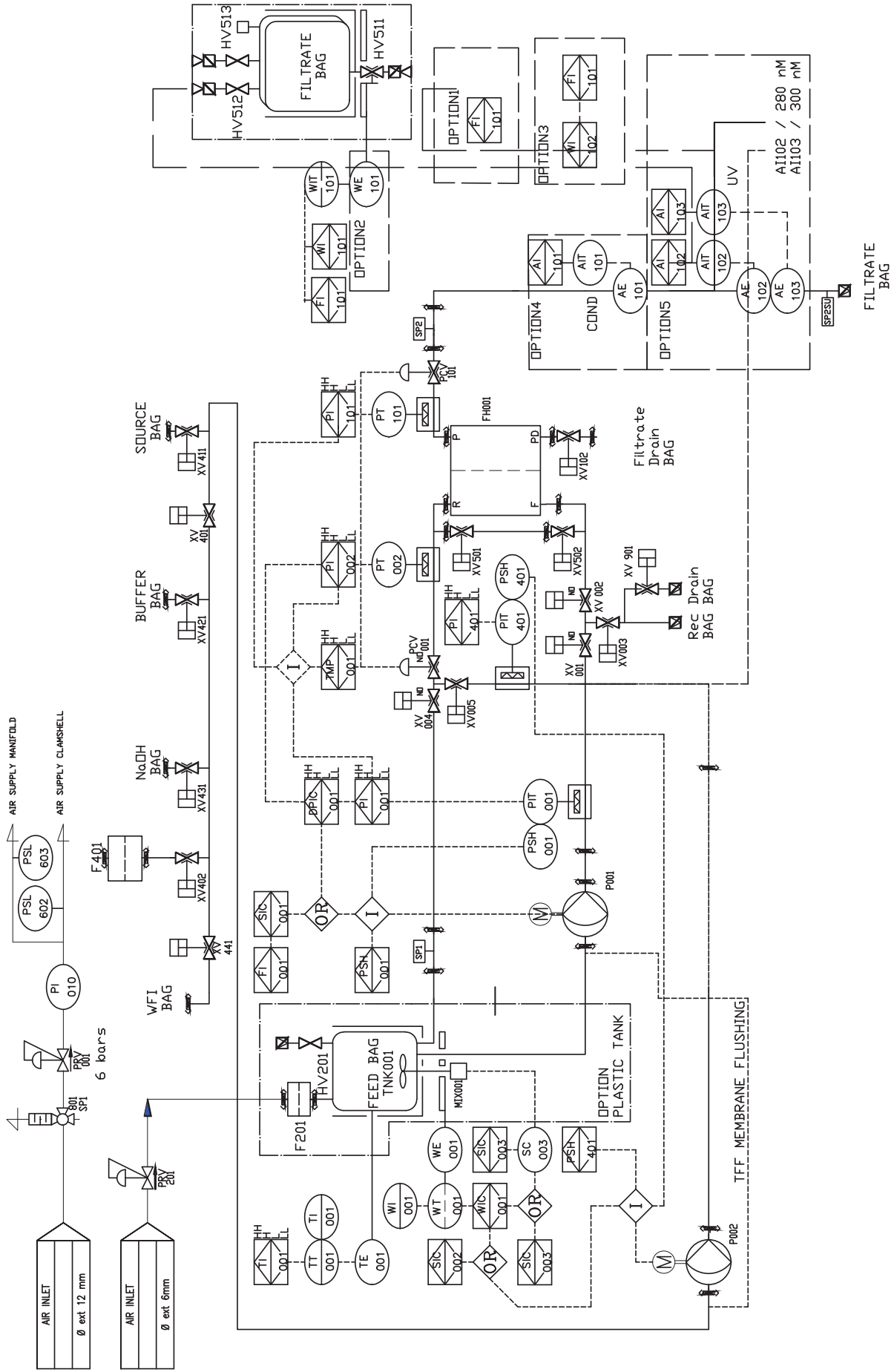


TF3S Flowpath 15 - Product Recovery 4 - Empty Retentate Line

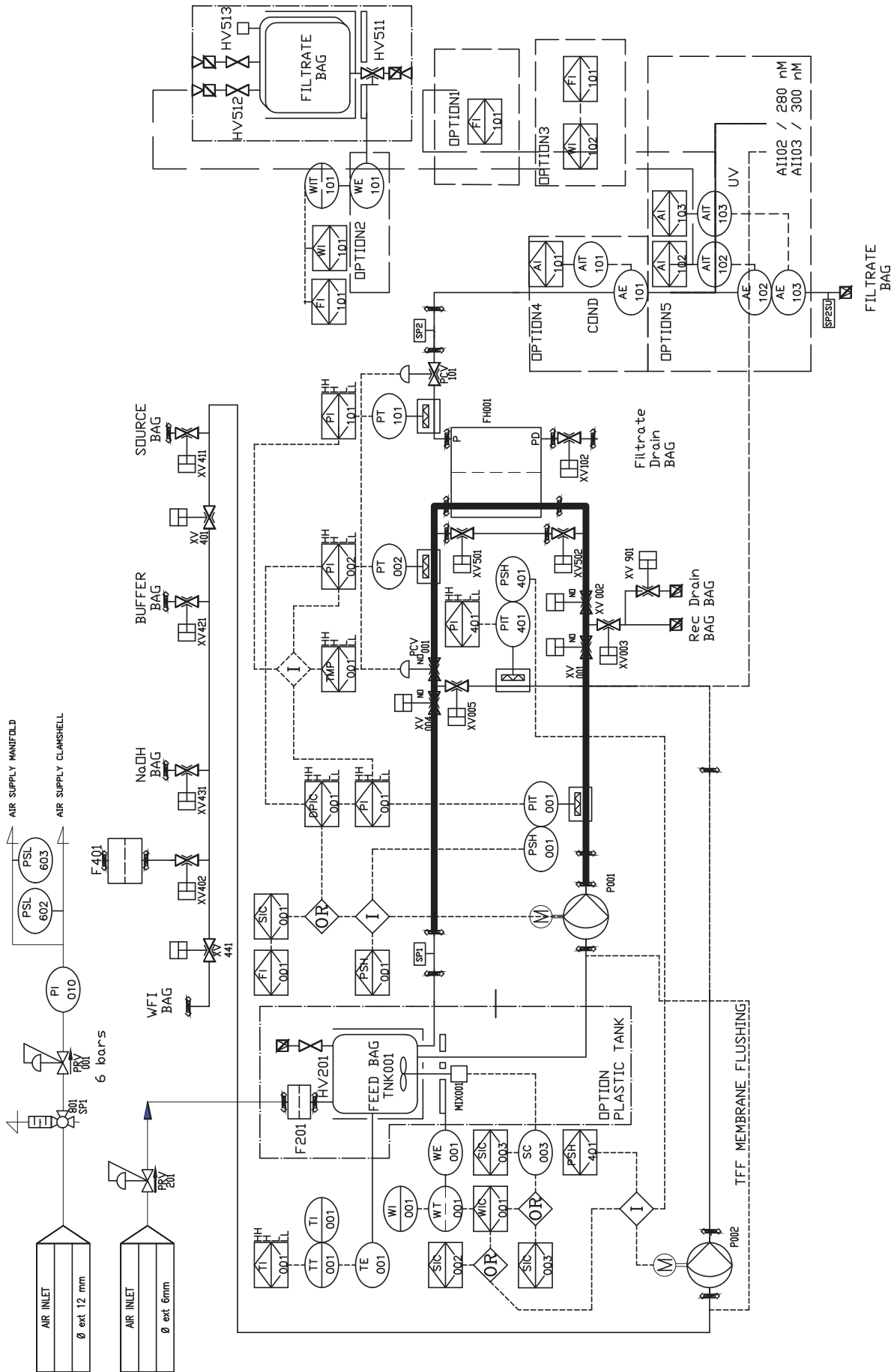


TFFS Flowpath 16 - All Main Flowpath Valves Open

The Mobius® FlexReady Smart System for TFF

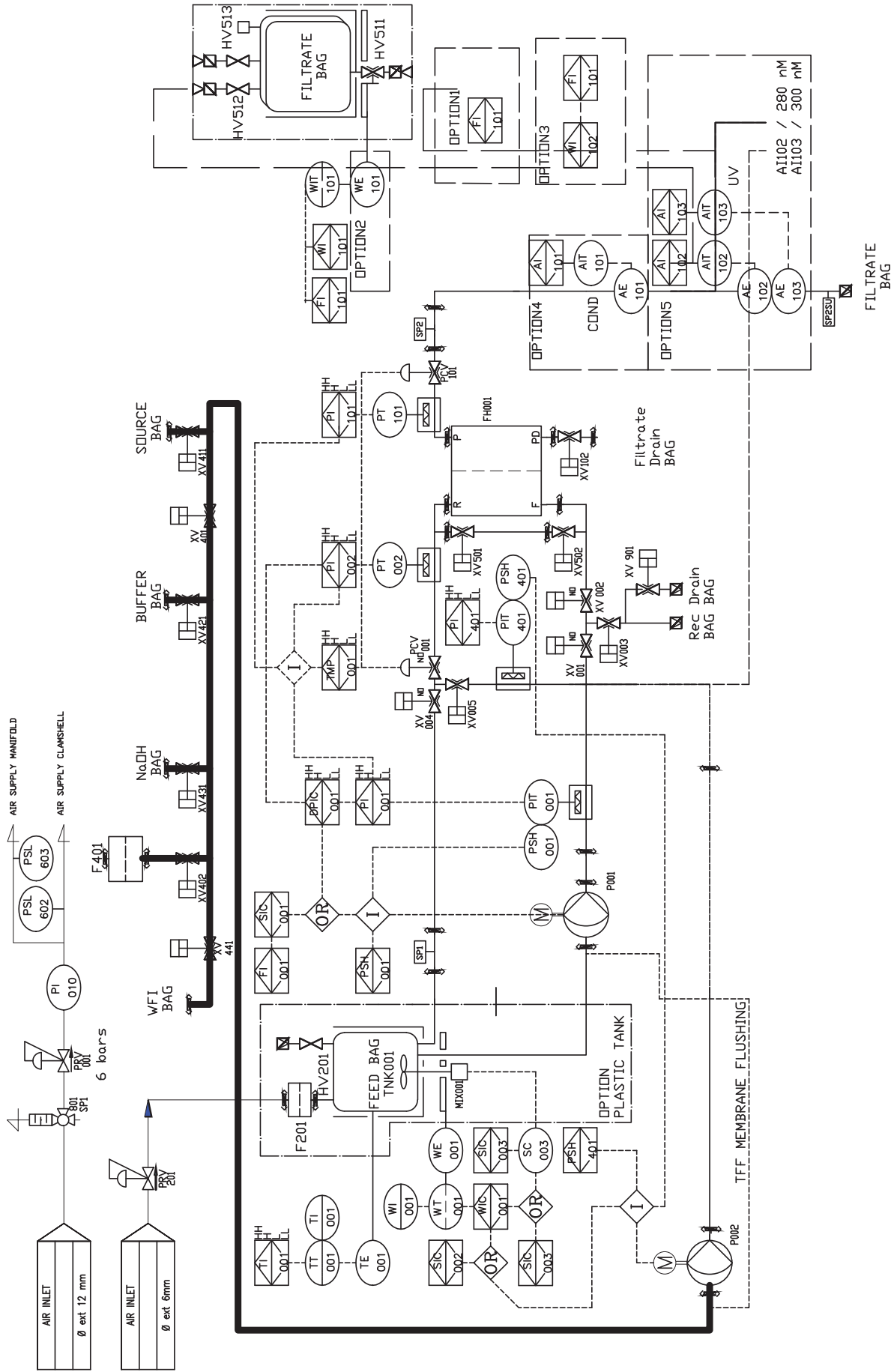


TFF3S Flowpath 17 - All Main Flowpath Valves Closed

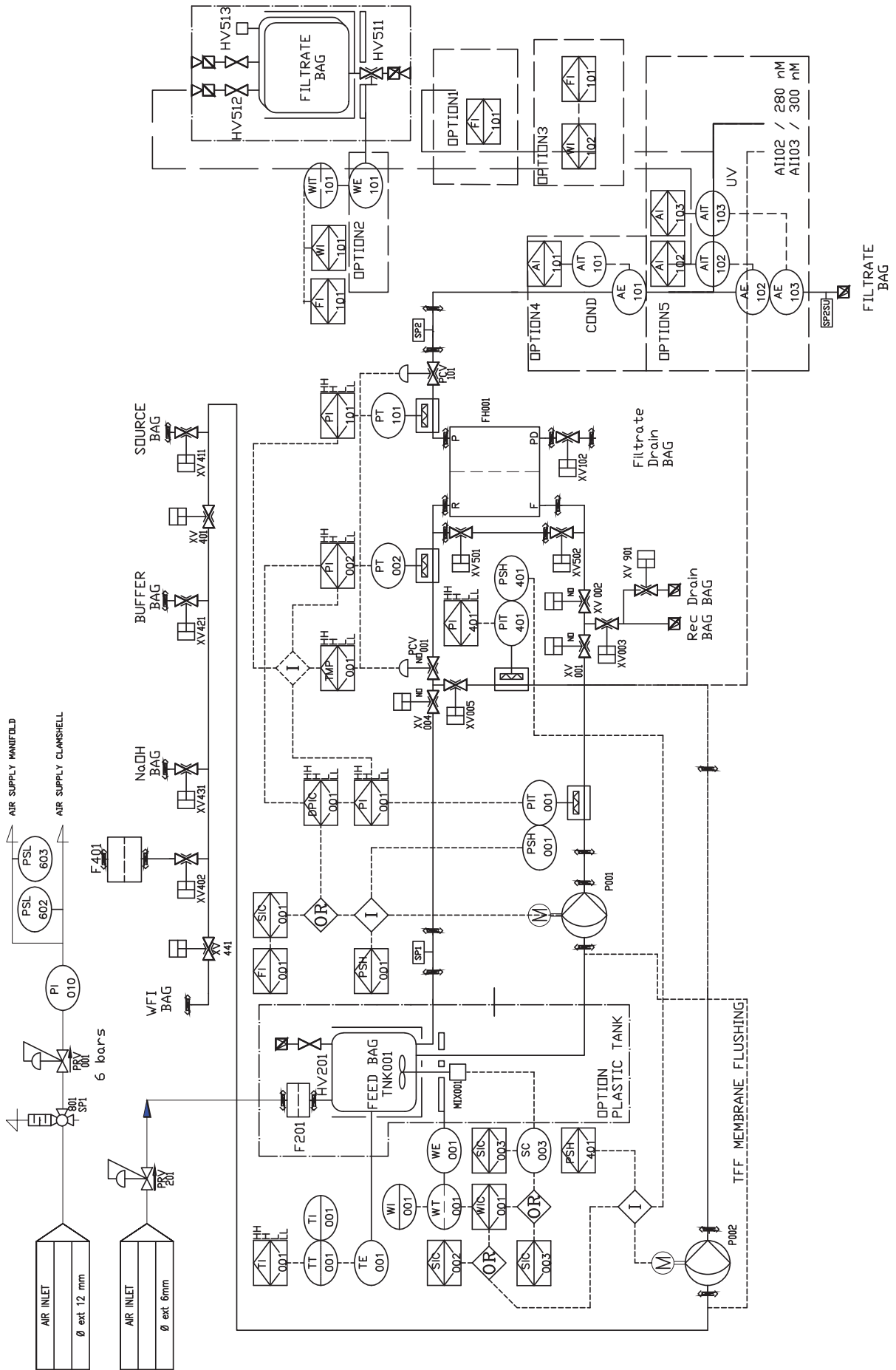


TF3S Flowpath 18 - Default

The Mobius® FlexReady Smart System for TFF



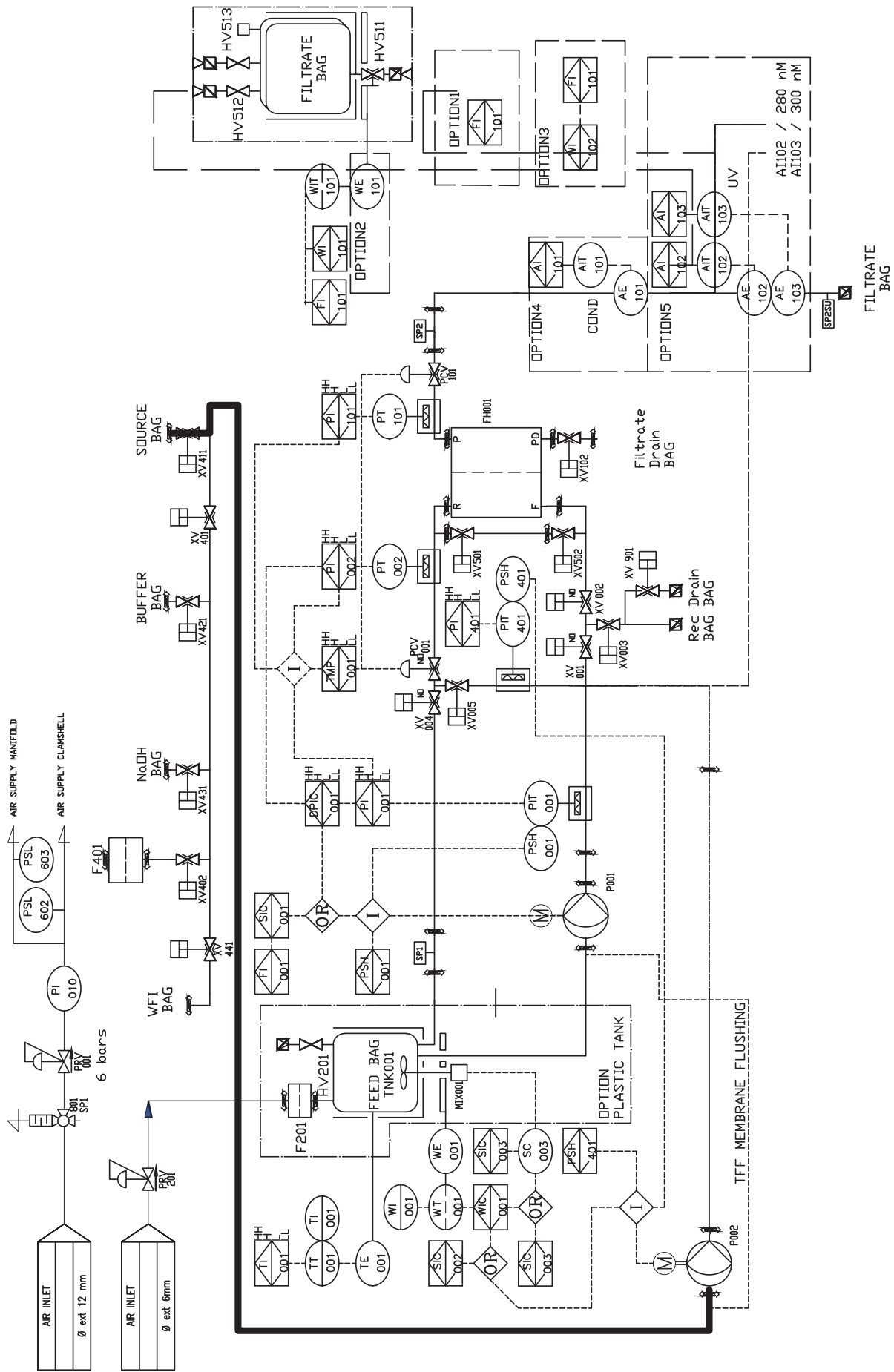
TFF3S Flowpath 19 - All Source Valves Open



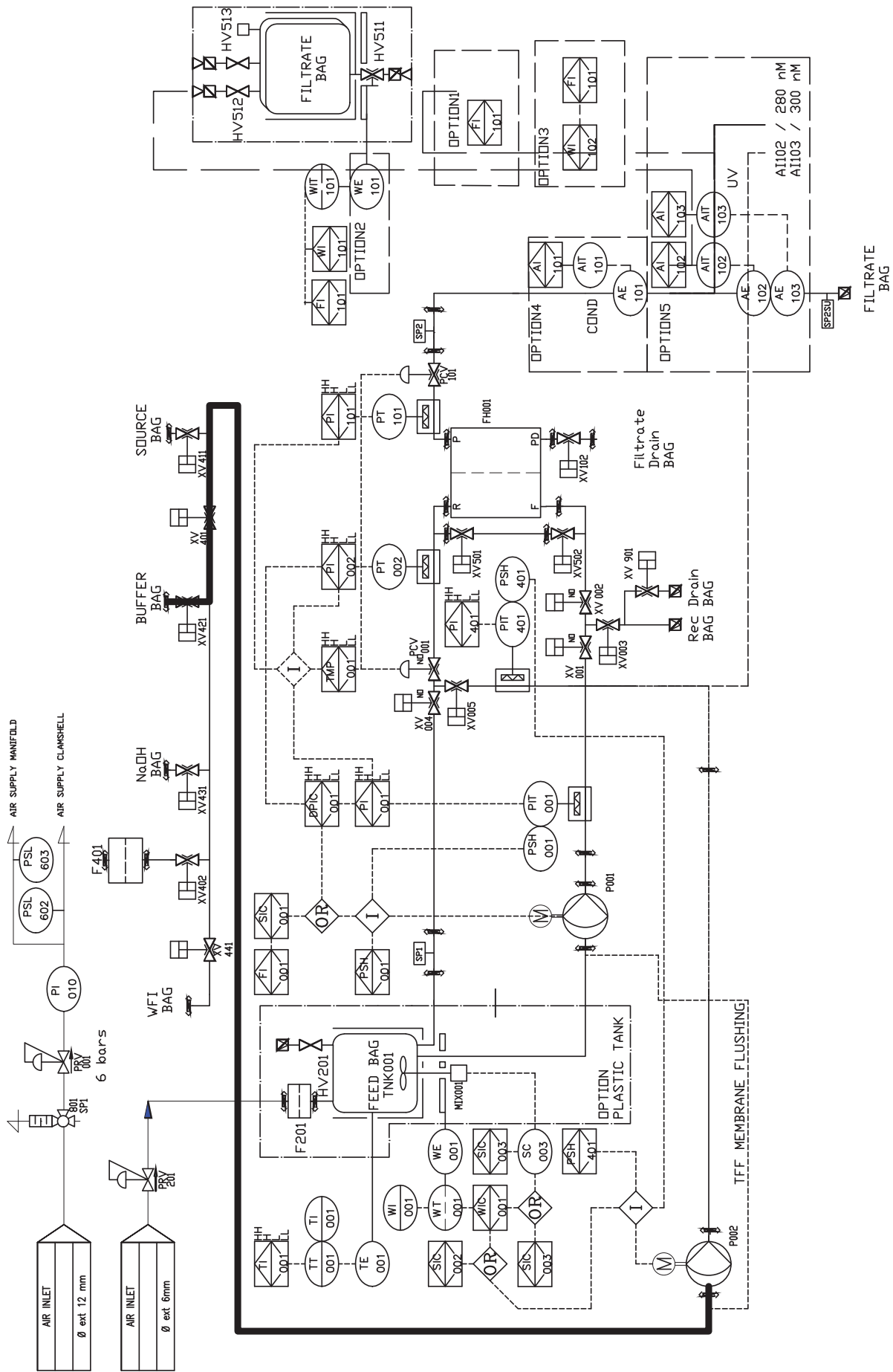
TF3S Flowpath 20 - All Source Valves Closed

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The Mobius® FlexReady Smart System for TFF

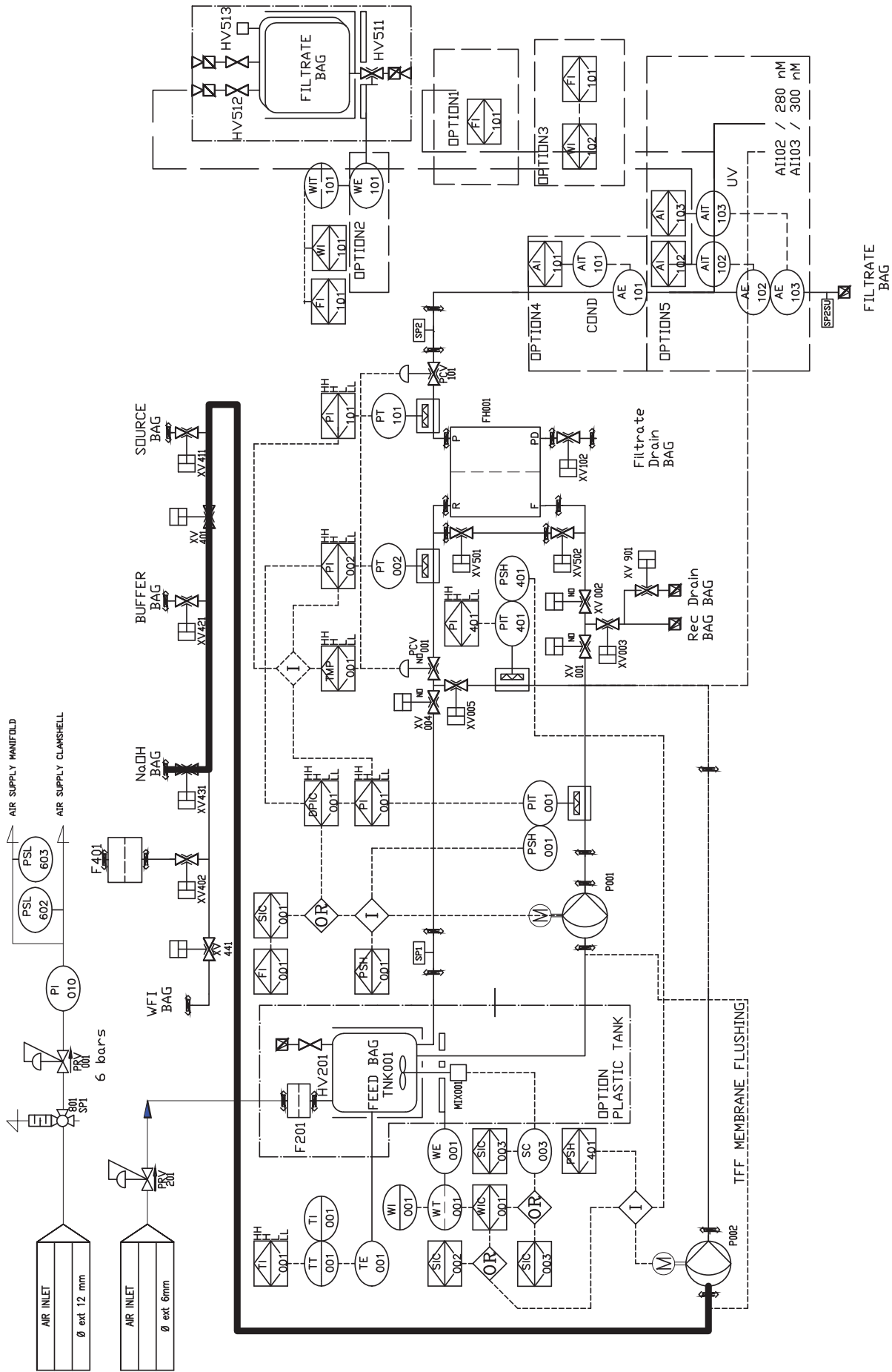


TF3S Flowpath 21 - Feed Source Open

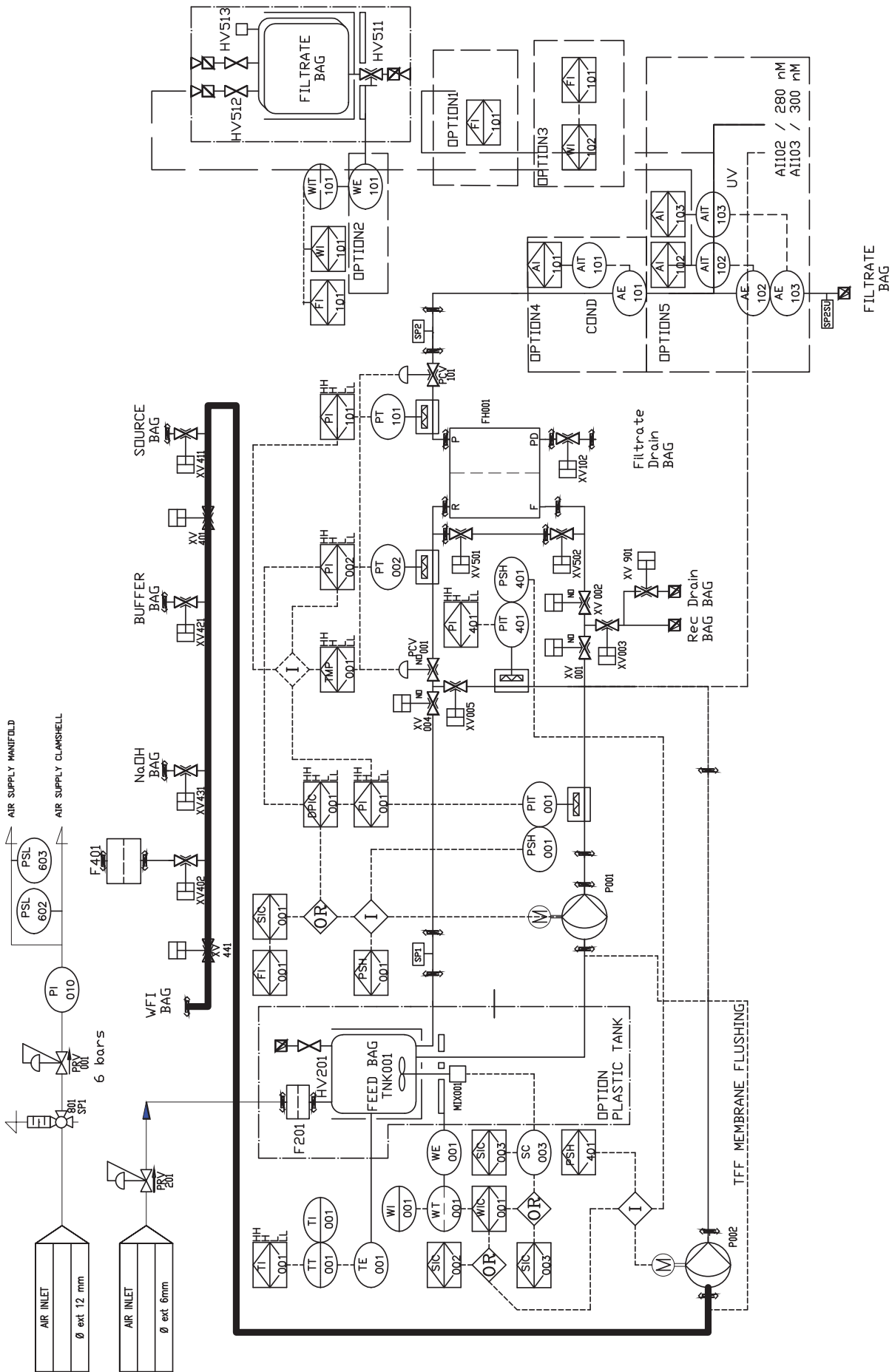


TF3S Flowpath 22 - Buffer Source Open

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TFFS Flowpath 23 - Caustic Source Open



TFF3S Flowpath 24 - Water Source Open

Chromatography Using the System

Introduction

This section provides instructions on the use and functionality of the Mobius® FlexReady Smart System for Chromatography. Please review this section, in its entirety, before operating the system.

NOTE

Within the software, the following references are used:

Chrom 2.2 L/min system is referred to as XMO-1/2

Chrom 8.0 L/min system is referred to as XMO-3


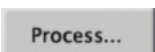
Starting the System

Once the system has been installed and all the Flexware® has been connected, the system may be powered up. Powering up the system starts up the Common Control Platform® (CCP® Software). The Start-up window displays after the system has completed the start-up process. This screen contains the Login button and the Process button. If a clamshell is installed, the clamshell type is shown at the top of the screen. The system screen shots used throughout this chapter are from the Chrom 8.0 L/min system.



Start-up Window (XMO-3)

The functions of the buttons in the Start-up window are summarized below.

Icon	Function	Description
	Login	Opens the Login dialog box, which prompts for a username and a password. The access level granted after login depends on the login information entered. This is the only button active when the system is locked.
		After logging in, clicking this button will open the User Interface.

Log into the User Interface by clicking on the Login icon and then entering a username and password into the Login Prompt. Every user should have a unique login name and password assigned to them by the system administrator. Enter the username and password and click the Login button.

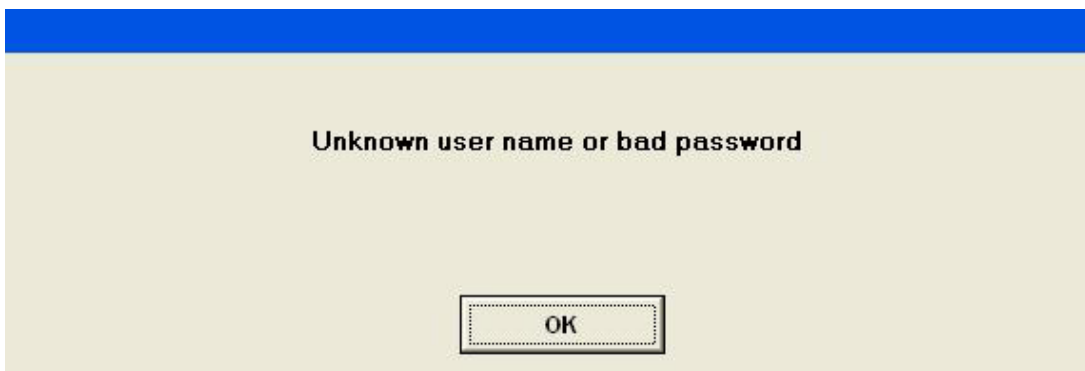


Login Prompt

The Logout button logs out the current user. The More button opens a new popup window that gives users access to a screen to change the user’s password.

Group accounts assign commonly used application features and security areas shared by several users. Refer to the *Security Overview* section in this chapter for general information and to the *Security* chapter of this manual for details on access control, group accounts and usernames.

If the login fails, the Unknown User Name or Bad Password message will appear.



Unknown User Name or Bad Password

If an attempt is made to gain access to the User Interface with unauthorized login information, an unauthorized access message will appear.



Unauthorized Access Message

After logging in, the Login Prompt closes and the Process button is activated. Click on the Process button to access the User Interface and operate the system.

Preparing the System for Operation

Installing the Clamshell

The system must be powered on to install the clamshell. See the following section *Door and Clamshell Control* for details on clamshell control.

The system automatically detects the type of clamshell installed based upon a unique IP address assigned to that piece of hardware. For IP addresses, see section, *IP Address*.



Signature and Confirmation Setup

The *Signature and Confirmation* section of the Maintenance screen allows the user to select Signature and Confirmation options. To launch the Maintenance screen, click on the Maintenance icon in the Navigation Tool Bar.

Maintenance		V 2.09.00.00
Analog / Digital	Flowpath Config	Holdup Volume 0.1 L
Save Recipe Signature Off	Cal Touchscreen	Qmax factor pump P001 flow 14.000
Acrobat Digital Signature Off		Qmax factor pump P002 flow 14.000
Confirmation Required	Clear Download State	
Electronic Signatures	Cfg Form	
Off		Option State
Preconfigured Comments		Pre-Col Instruments Enabled
		Pump 2 Enabled

Signature and Confirmation Section of the Maintenance–Discrete Screen

NOTE

The Analog/Digital button at the top left of the Maintenance Screen is not related to Signature and Confirmation Setup.

Button	Function
Save Recipe Signature On/Off	When Save Recipe Signature is On, an electronic signature is required to save a recipe.
Acrobat Digital Signature On/Off	Click the button to turn the Adobe Acrobat digital signature functionality On or Off. When this is on, the Digital Signatures item on the Tools menu is enabled.
Confirmation Required	Click the appropriate button to select Confirmation Required or Confirmation Not Required. When Confirmation Required is selected, any input to the User Interface will trigger a prompt for confirmation.
Electronic Signatures	Select configuration of the Electronic Signatures Form. To enable the Electronic Signatures function, Confirmation Required must be selected. Click the button to select one of the following: OFF: Turn off Electronic Signatures Perform Only: Require an Electronic Signature (user name and password) for any action performed Verify and Perform: Require a second Electronic Signature (user name and password), for verification, for any action performed
Preconfigured comments	Comments from the drop down list or custom comments can be entered in the comments section. Saving the text file is required to save any comments added or changed.

Electronic Signatures

Description
XV022 Close

Performed By

User Name: ADMIN
Password:

Comments

Comment test one

OK Cancel

Electronic Signatures Form – Perform Only

Electronic Signatures

Description
XV022 Close

Performed By

User Name: ADMIN
Password:

Comments

Verified By

User Name:
Password:

Comments

OK Cancel

Electronic Signatures Form – Perform and Verify

Manually Controlling the System

The process can be manually controlled using the User Interface. The process is automatically controlled when it is being run by a recipe. See the *Using the Recipe Editor* section of this document for details on configuring automatic runs.

NOTE

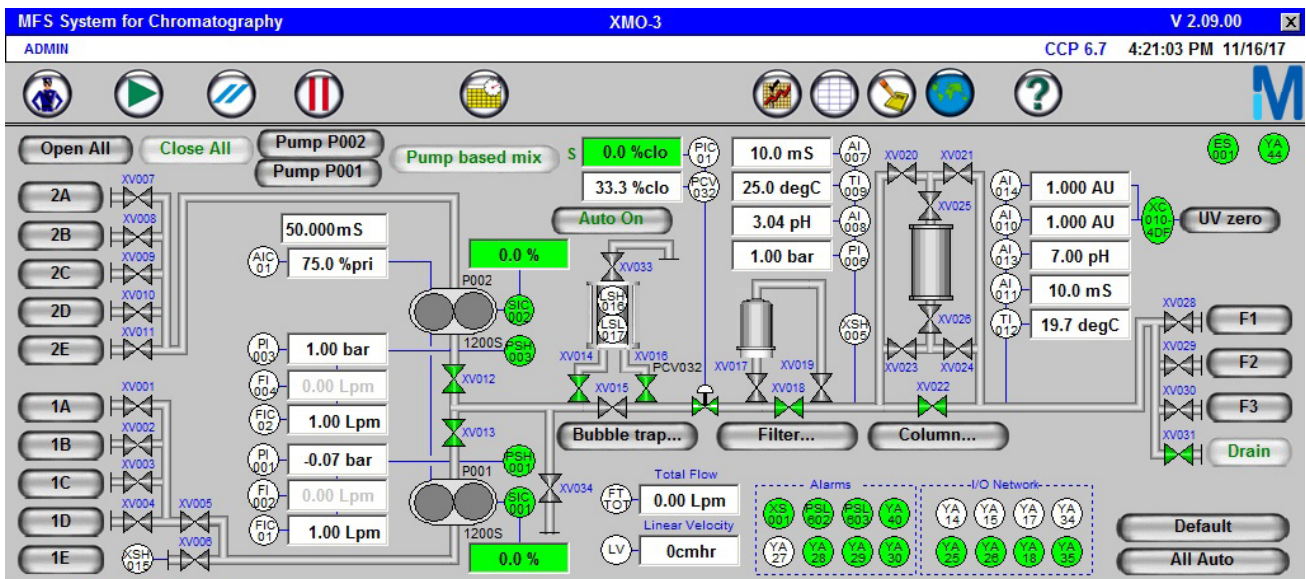
The user should be comfortable with all aspects of manual operation of the system before attempting to write operations using the Recipe Editor.

For example, to manually control a valve, the user can click on a valve and select Open or Close. Or to manually control the flow path of the filter, the user can click on the Filter FP button and select the desired flow path for the filter.

I/O Network and Additional Alarms

Before the system can be used, all of the I/O Network and Additional Alarm states must NOT be in alarm. See the *Alarm Control* section of this chapter for more details on the behavior of alarms in this system.

All of these icons must be green for the system to operate properly. In **the figure below**, some of the icons are not green, therefore the system will not operate properly.



I/O Network and Additional Alarms

I/O Network Alarms		Additional Alarms	
Label	Description	Label	Description
YA14	Smart Station Communications Failure	XS001	Door Closed
YA15	Clamshell Station Communications Failure	PSL602	Valves Air Defect
YA17	Pump Station Communications Failure	PSL603	Manifold Valves Air Defect
YA34	Instrument Station Communications Failure	YA40	SQL Server Write Fail
YA25	Smart Station Defect	YA27	Clamshell Locking Defect
YA26	Clamshell Station Defect	YA28	Historical Data Collection Failure

I/O Network Alarms		Additional Alarms	
YA28	Pump Station Defect	YA29	HMI to PLC Communication Failure
YA35	Instrument Station Defect	YA30	CCP® Runtime Communication Failure
		YA44	SQL database corrupted failure

I/O Network and Additional Alarms

Process Display: Options

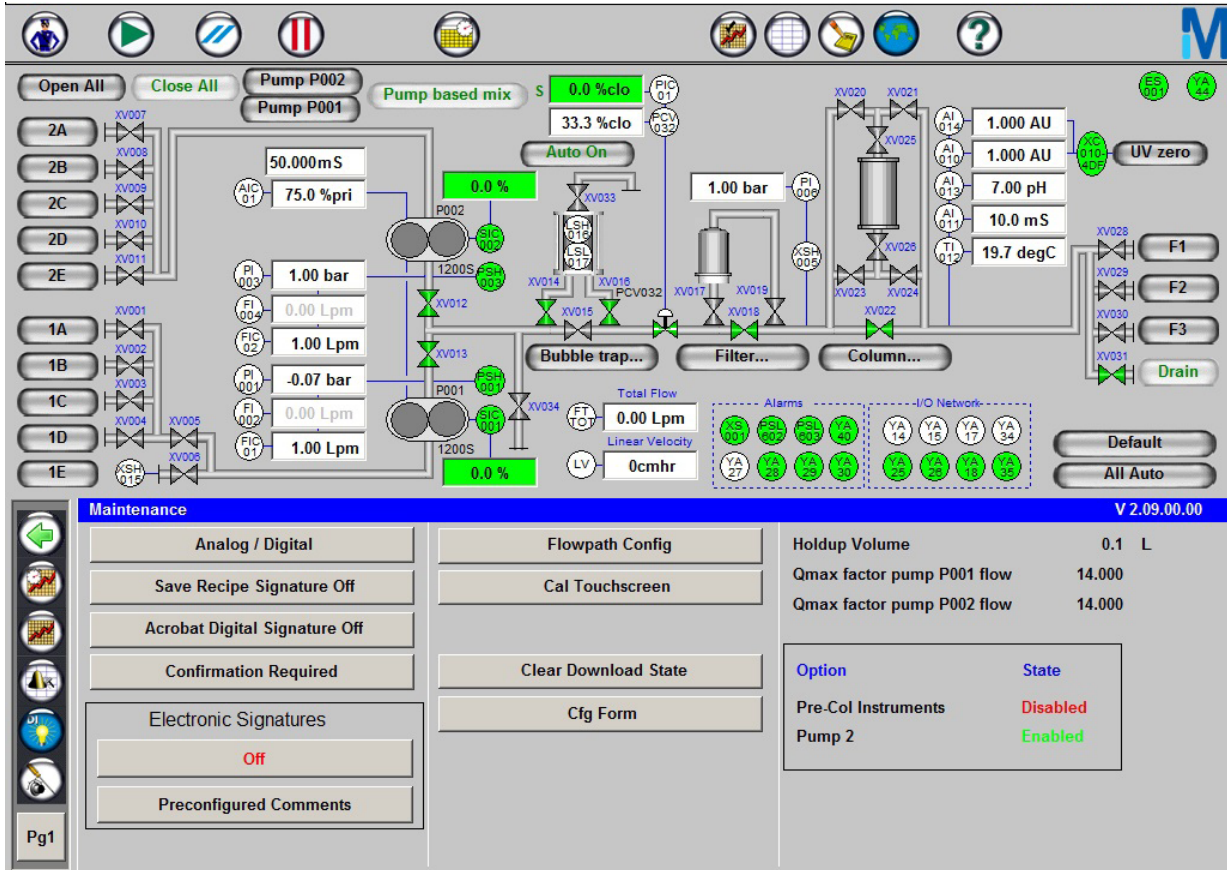
Before starting a process run, the optional equipment must be set in the Maintenance Status Display to match the equipment that will be used in the process.

The two options that need to be enabled or disabled are the pre-column instruments and pump 2. The enabled state puts the option in the system and the disabled state removes the option from the system.

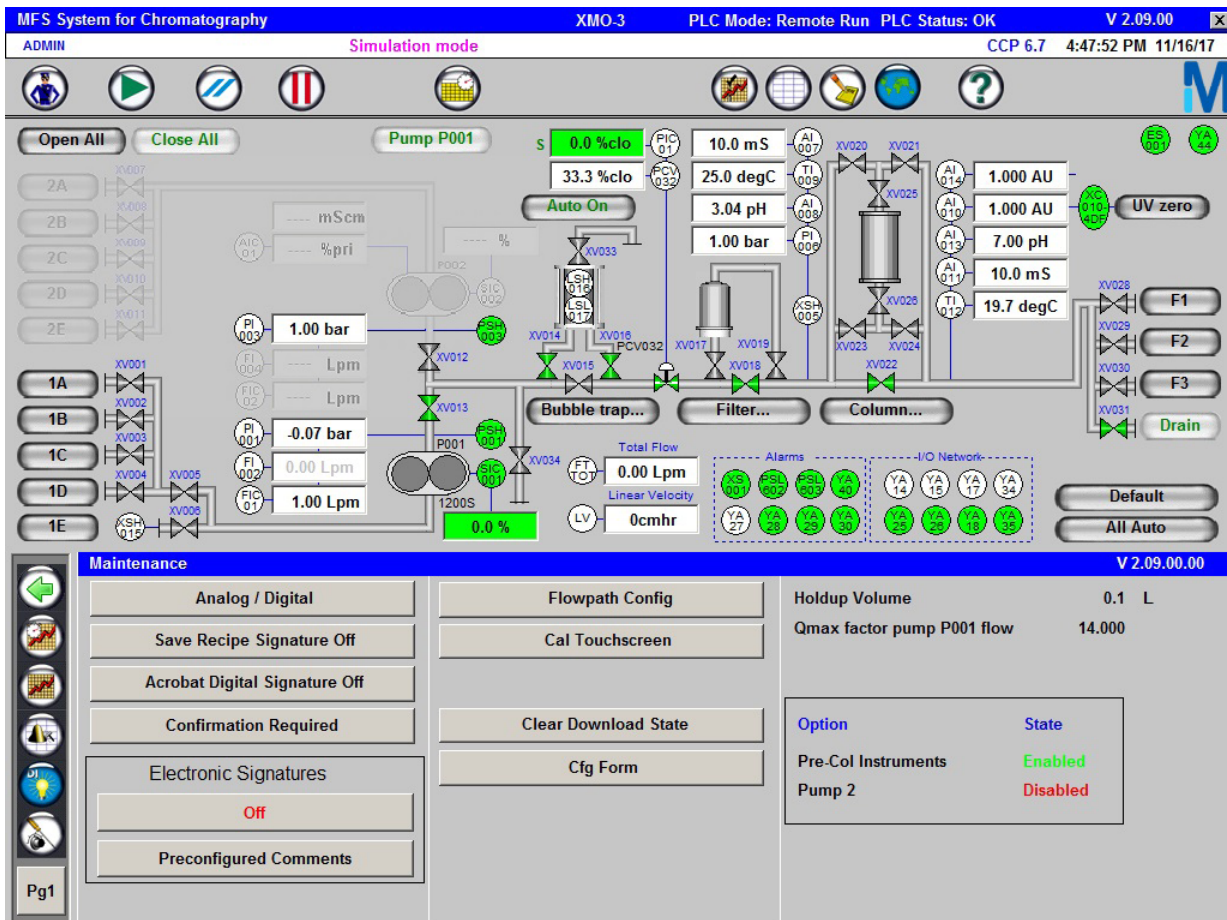
The following figures show the Process Display and the Maintenance Status Display with both options enabled, pre-column instruments disabled and pump 2 disabled, respectively. Both options can be disabled at the same time. This would remove both the pre-column instruments and pump 2 from the Process Display.

The screenshot displays the 'MFS System for Chromatography' interface. The top status bar shows 'XMO-3', 'PLC Mode: Remote Run', 'PLC Status: OK', and 'V 2.09.00'. The main area features a detailed process flow diagram with two pumps (P001 and P002), various valves (XV001-XV031), and sensors (PI, FIC, AI, TI). A 'Maintenance' panel is open at the bottom, showing configuration options for 'Pre-Col Instruments' and 'Pump 2', both of which are currently 'Enabled'. Other maintenance options include 'Analog / Digital', 'Flowpath Config', 'Save Recipe Signature Off', 'Acrobat Digital Signature Off', 'Confirmation Required', 'Electronic Signatures', and 'Preconfigured Comments'. The right side of the maintenance panel shows 'Holdup Volume' at 0.1 L and 'Qmax factor' for both pumps at 14.000.

Both Options Enabled



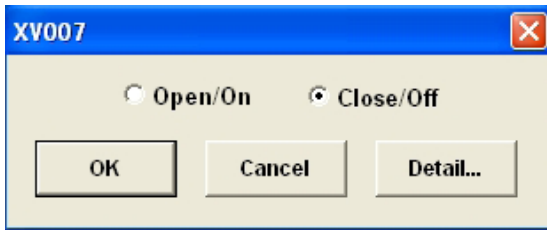
Pre-Column Instruments Disabled



Pump 2 Disabled



Process Display: Valve Control

All valves are two-way valves. When a valve is clicked on the Process Display, the Valve Control Prompt appears.



Valve Prompt

The prompt opens with the opposite of the current valve state selected. This simplifies the valve control process by allowing the user to select OK to change the state of the valve.

Valves that are closed are gray . Valves that are open are green .

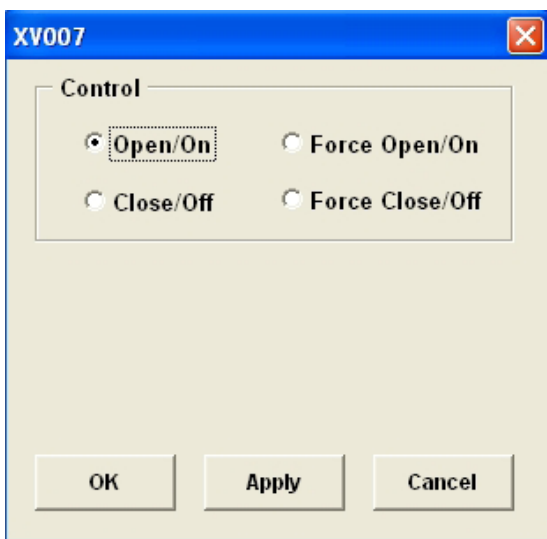
Auto or Manual Valve Control

Valves can be in two control states: Auto or Manual.

When in Auto, the initial valve state is defined by the recipe. The user can change the state of the valve through the Valve Control Prompt but the valve is still in Auto mode. That means that when the next Step of the recipe is initiated, the valve will enter the state defined by the recipe.

When in Manual, the valve state is defined by the user and will not change based upon any recipe defined state. For example, if a user Force Closes a valve but in the next step of the recipe that valve is called to be open, that valve will not respond to the recipe's defined valve state. When a valve is in the manual control state, its background flashes white to alert the user that the valve is being manually controlled and will not respond to recipe commands.

To put a valve in manual control, select the Detail button on the Valve Control Prompt. This opens the Valve Control Detail Prompt.



Valve Control Detail Prompt

This prompt allows the user to open and close the valves, just as in the regular Valve Control Prompt, and to force the valves opened or closed. It is the selection of the Force Open or Force Close command that puts the valve in manual control.

Default Button

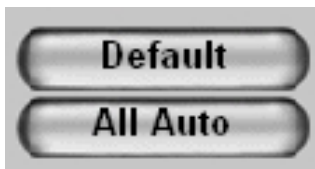
The Default button will set the system to default state (confirmation required). The default state includes control of valves and flow path:

- Pump off
- All manifold inlets closed
- Bubble trap online
- Filter bypassed
- Column bypassed
- Waste outlet on-line
- All other fractions closed
- **Valves in the manual control state, remain manually controlled**

The Pressure Control Valve (PCV032) is NOT affected by the Default button.

All Auto Button

Clicking the All Auto button returns all valves and pumps to auto control and to the state defined by the recipe, undoing any manual changes.



Default and All Auto Buttons

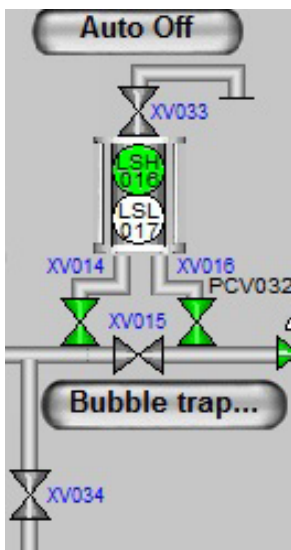
Process Display: Flow Path

The flow path changes colors based upon the state of the valves and the state of the pump. These variables combine to create three unique flow path states, each state being indicated by the flow path's color.

Flow Path Closed

The states of the valves between inlets and the outlets do not allow for an open flow path.

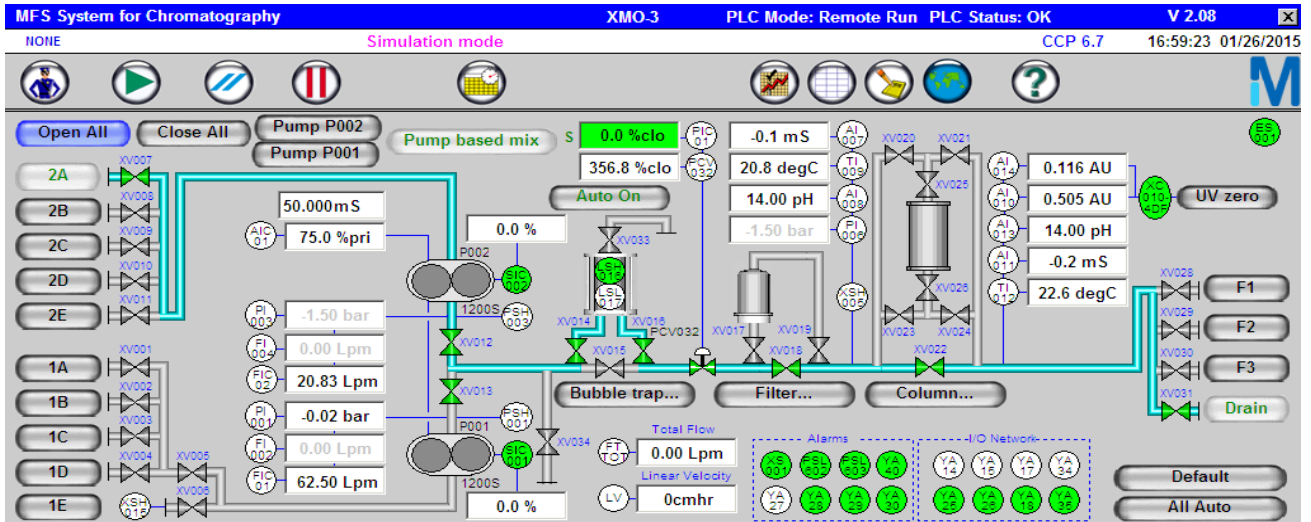
Flow Path Color: Gray



Flow Path Open with Pumps Off

The states of the valves between inlets and the outlets allow for an open flow path but the pumps are off

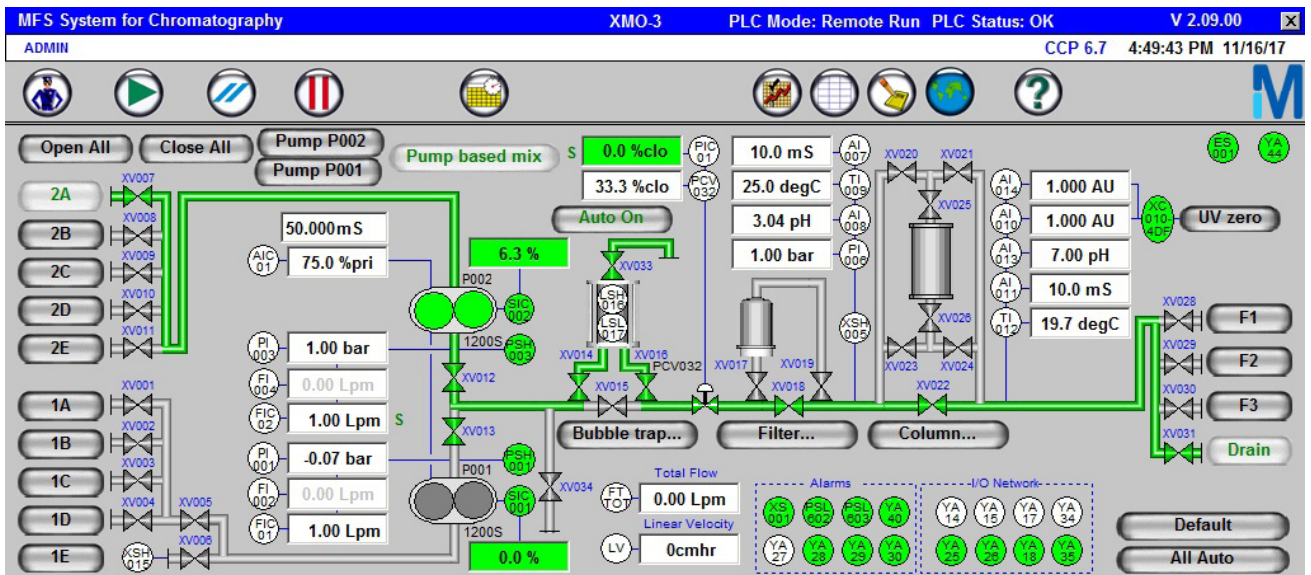
Flow Path Color: Blue



Flow Path Open and Pumps On

The states of the valves between inlets and the outlets allow for an open flow path and the pumps are on. Material is flowing through the system.

Flow Path Color: Green



Process Display: Inlets Section

Inlet Flow Path Buttons

To place an inlet on-line, click on the desired inlet button (labeled 1A-1E or 2A-2E). To indicate the change in flow path, the letters on the button will become green, as will the corresponding valve. The flow path color responds as described in the *Process Display: Flow Path* section.

When Gradient Control is Off and an inlet is clicked to open, the related flow path is selected and all other inlets are closed.

When Gradient Control is On and an inlet is clicked to open, the related flow path is selected and the other inlets in that section (1 or 2) are closed but the inlets in the other section are unaffected.

Open Inlets, Close Inlets Buttons

The Open Inlets button opens all inlets, after a user confirmation. The Close Inlets button closes all inlets, after a user confirmation.

CAUTION

The valves are a pinching hazard. Be sure they are clear of fingers to avoid serious physical damage.

XS015 – Product Inlet Air Detection

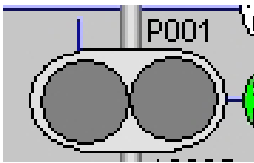
This icon displays the state of the Product Inlet Air Detector. It is green when feed is detected.

Process Display: Pump Section

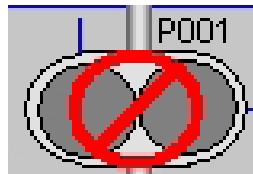
Pump Graphics

The two pumps available with the system are labeled P001 and P002 in the Process Display. P001 is the primary pump and P002 is the secondary (optional) pump. The pumps' graphic displays change depending on the state of the pump run and interlock statuses.

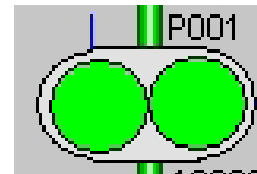
Pump Stopped with No Interlock



Pump Stopped with Interlock On



Pump Running



Pump Graphics

The pump is interlocked when it is called to run (determined by auto/manual mode and setpoint) but the flow path is not opened or the process is held. The pump will not run until the interlock is cleared.

Other Instruments in the Pump Section

Label	Description
FIC	Displays the flow setpoint in liters per minute. Clicking on the instrument icon or value opens the Pump Control Status Display Screen.
FI	Displays the current flow in liters per minute. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
PI	Displays the current pump outlet pressure in bar. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
AIC	Displays the Conductivity in μScm and % of primary pump setpoints for Gradient Control. Clicking on the instrument icon opens the Gradient Control Status Display.
SIC	Displays the status of the Pump Defect alarm. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section. The attached % is the Pump Output %. Clicking on the value opens the Pump Control Status Display Screen.
PSH	Displays the status of the Pump High Pressure alarm. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section.

Pump Control Overview

The two pumps can operate in multiple different configurations. This section provides a broad overview of the pump controls. Detailed instructions are included in following sections.

Flow Path Selection

The flow path can be open for an individual pump or for both pumps. This is controlled by the Pump P001, Pump P002 and Pump Mix buttons at the top of the pump section. All associated valves are automatically put in the state needed to open the chosen pump flow path.

Auto or Manual Control

The pumps can be put in Auto or Manual Control. In Auto mode, the pumps turn on and off based on recipe and setpoints. In Manual mode, the pumps turn on and off only by direct user input. Like the valves, the All Auto button will reset the pump control mode to Auto.

In either mode, the pump output % is dependent on the loop mode and setpoints configured in the associated Pump Control Status Display Screen.

Loop Modes and Pump Setpoints

The system has three different methods, called Loop Modes, for controlling pump output speeds using setpoints.

Fixed Speed

This sends a fixed output speed to the pump. This is not controlled by a P & ID loop.

Flow

The pump output speed is the calculated output (CV) of a P & ID control loop that uses flow as the setpoint (SP) and process variable (PV). The pump output speed varies depending on the PV, SP and tuning parameters.

Linear Velocity

The pump output speed is the calculated CV of a P & ID control loop that uses linear velocity as the SP and PV. The pump output speed varies depending on the PV, SP and tuning parameters. These Loop Modes and Setpoints are configured in the Pump Control Status Display Screen.

Gradient Control

Gradient Control allows for the two pumps to mix their flows at specified ratios based on either percentage of setpoint sent to the primary pump (pump 1) or conductivity.

Pump Auto/Manual Control

The pumps can be put in Auto or Manual Control. In Auto mode, the pumps turn on and off based on the recipe and setpoints. In Manual mode, the pumps turn on and off only by direct user input. Like the valves, the All Auto button will reset the pump control mode to Auto.

In either mode, the pump output % is dependent on the loop mode and setpoints configured in the associated Pump Control Status Display Screen. See the next section for details on the Pump Control Status Display Screen and configuring the setpoints.

To set a pump to Auto or Manual, the Gradient Control Loop Configuration must first be off. This is set in the Gradient Control Status Display, the icon and overview of which was presented in the *User Interface – Process Displays* section of this document. The Gradient Control Status Display will be thoroughly discussed in a following section of this document.

With the Gradient Control Loop Configuration Off, click on the pump whose control mode you want to change. One of two pop-up windows is displayed depending on the current control mode. When in Manual mode, clicking the Run or Stop button will control the pump accordingly.

Clicking the Detail button shows the Pump Control Status Display for that pump. Those windows are also accessible by clicking the Run Control button in the Pump Control Status Displays.

Pump Currently in Auto



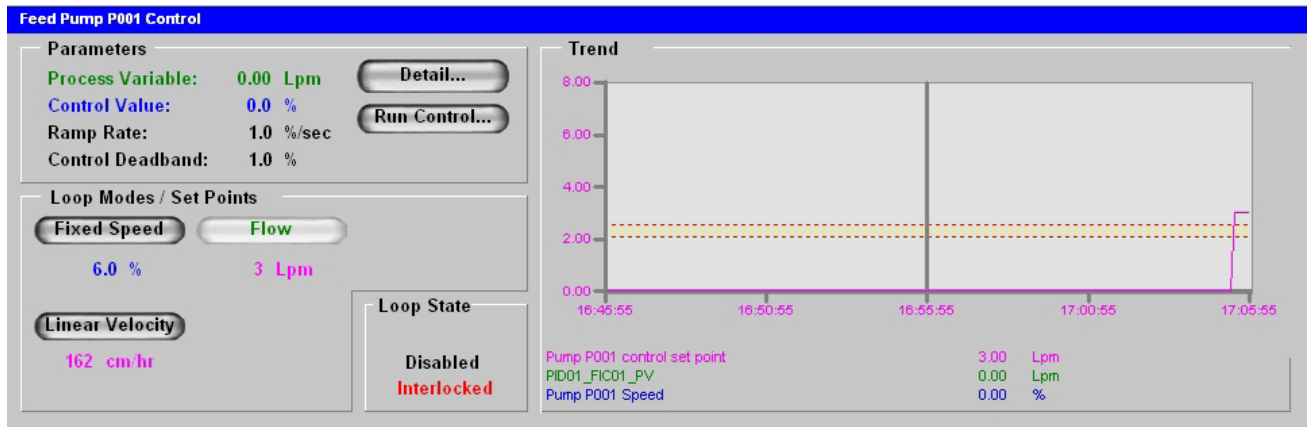
Pump Currently in Manual



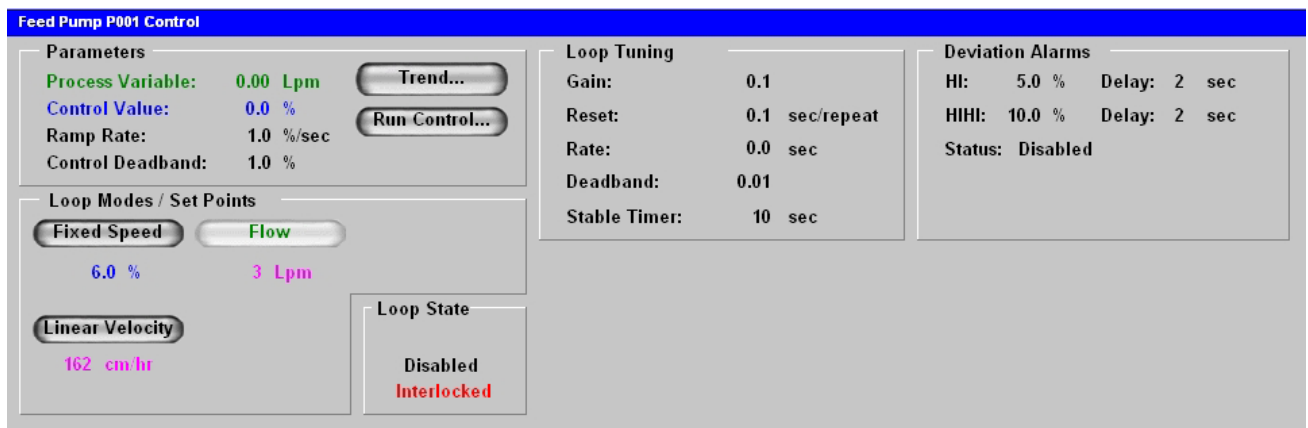
Pump Control Mode Pop-Up

Pump Control Status Display

The Pump Control Status Display is accessed either by clicking the Detail button on the Pump Control Mode pop-up windows or by selecting the Pump P00X Control Icon on the Navigation Tool Bar.



Pump 1 Control Status Display with Trend



Pump 1 Control Status Display with Details

Loop Modes and Setpoints

The system has three Loop Modes that control the pump output speed: Fixed Speed, Flow and Linear Velocity. The Loop Mode and associated Setpoints are configured in the *Loop Modes/ Setpoints* section of the Pump Control Status Display.

Loop Mode	Description	Range/Units	P & ID Control?
Fixed Speed	Sends a fixed output speed to the pump	0-100%	No
Flow	Pump output speed is the calculated CV of a PID control loop that uses Flow as the SP and PV	0-10 Liters per min (L/min)	Yes
Linear Velocity	Pump output speed is the calculated CV of a PID control loop that uses linear velocity as the SP and PV	0-1000 cm/hr	Yes

*See the section *Parameters* and *Loop Tuning* for an explanation of the variables used in PID control

To select a Loop Mode, click the corresponding button. The text will turn green to indicate that mode has been selected.

To change the setpoint (SP) for the current mode, click the current SP value that is located under the button. A data entry dialog box will appear. The setpoint must be within the min and max value cited in the date entry dialog box.

Chromatography Control Parameters

Parameter	Description	Read/Write?
Process Variable (PV)	The current flow rate in Lpm	Read Only
Control Value (CV)	The current pump output speed as a % of maximum speed.	Read Only
Ramp Rate	The rate, in %/sec, at which the CV will increase or decrease to get to the PV to a value equal to the SP ± the control deadband	Writable
Control Deadband	The range, as a % of SP, outside of which the PID control is disabled and the Ramp Rate is in effect. Within this range the PID loop is in control and the Ramp Rate is disabled.	Writable

Loop Tuning Parameters

Parameter	Description	Read/Write?
Gain	Proportional value of PID control equation. The Proportional Gain setting affects all frequencies (unlike Integral and Derivative settings) and is the only setting that affects the middle frequency range.	Writable
Reset	Integral value of PID control equation. The Integral action is responsible for keeping track of where the process has been, in order to correct for any process disturbances. The Integral value dominates the low frequency responses.	Writable
Rate	Derivative value of PID control equation. The Derivative action provides for adequate forecasting of process disturbances, and may improve response time. Derivative dominates the high frequency responses.	Writable
Deadband	The Deadband is used by the PID loop and represents the tolerance of the PID loop. If the PV is within the deadband limit of the SP, the PID does not adjust the CV	Writable
Stable Timer	If the PV is within the Control Deadband for that amount of time, the system is considered to be stable. This value is not used in the PID calculations.	Writable

NOTE

The operator should need to adjust only the setpoints.

Supervisor or Engineer level access is required to alter the PID loop tuning parameter. These settings should be changed only by trained personnel. Individuals who are not well versed in PID loop tuning for process response should NOT alter these settings. Doing so may harm the equipment and may have an adverse effect on a process.

Linear Flow Rate Calculations

The Linear Flow Rate, at any time, depends upon the Volumetric Flow Rate, the Column Bed Height and the Column Volume according to the equation where:

$$L = \frac{FH}{V}$$

where:

F = Volumetric Flow Rate (cm³/hr)

L = Linear Flow Rate (cm/hr)

H = Column Bed Height (cm)

V = Column Volume (cm³)

Under Linear Flow Rate Control, the software automatically converts the linear flow rate setpoint to its corresponding volumetric flow rate setpoint.

NOTE

Column Height and Volume are configured in the Column Data Screen, more information can be found in the *Process Display: Column Section* of this chapter. Depending on the Column Height and Volume, the Linear Velocity setpoint can be set at a value that will cause the Volumetric Flow Rate to be greater than the maximum allowed setpoint.

Gradient Control

Gradient Control allows for the controlled mixing of flows from the two pumps. The degree to which the pump flows are mixed is controlled by the percentage of primary pump setpoint (%pri). The secondary pump is responsible for the remaining percentage (100% - %pri = %secondary).

Gradient based on conductivity is functional only if precolumn instrumentation is available. The conductivity gradient is based on sensor AE007.

Using the Conductivity SP, the pumps still use the %pri to control the % of the Setpoint that each pump will contribute. The PID control loop will use the pre-column conductivity as the PV and the %pri as the calculated CV output.

Gradient Control Fixed Speed Example

If the pump based Loop Mode is set to Fixed Speed with a setpoint of 50% for the total pump speed and Gradient Control is enabled with a Percent Primary setpoint of 60%, Pump 1 would have an individual setpoint of 30% (60% of 50%) and pump 2 would have an individual setpoint of 20% (40% of 50%). The sum of the two pump speeds equaling 50%.

Gradient Control Flow Example

If the pump based Loop Mode is set to Flow with a setpoint of 3.0 Lpm for the total system flow and Gradient Control is enabled with a Percent Primary setpoint of 60%, Pump 1 would have an individual setpoint of 1.8 Lpm (60% of 3.0 Lpm) and pump 2 would have an individual setpoint of 1.2 Lpm (40% of 3.0 Lpm). The sum of the two pump flows equaling 3.0 Lpm.

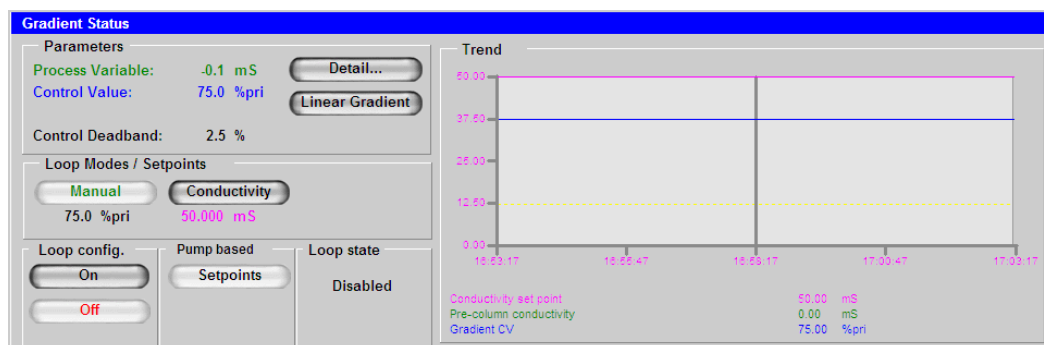
Gradient Control Linear Flow Example

If the pump based Loop Mode is set to Linear Velocity with a setpoint of 300 cm/hr for the total system velocity and Gradient Control is enabled with a Percent Primary setpoint of 60%, Pump 1 would have an individual setpoint of 180 cm/hr (60% of 300 cm/hr) and pump 2 would have an individual setpoint of 120 cm/hr (40% of 300 cm/hr). The sum of the two pump velocities equaling 300 cm/hr.

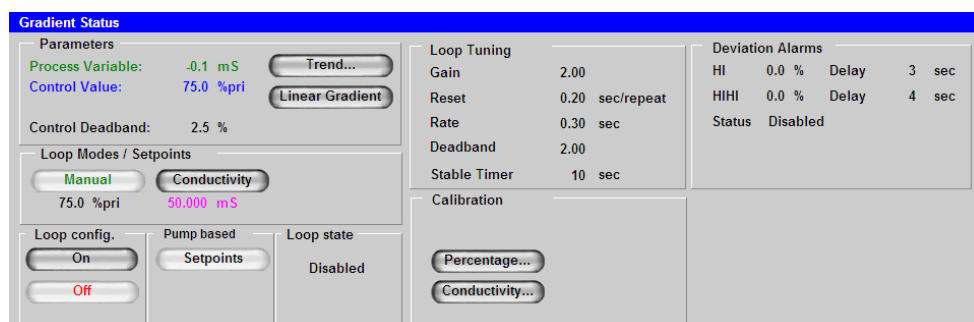
When Gradient Control is enabled, the system prompts the user to set the flow path to Pump Mix and the individual pump loop modes are set to match the configured Gradient Pump Based Modes.

Gradient Control Status Display

The Gradient Control Status Display is accessed by selecting the Gradient Control Icon on the Navigation Tool Bar



Gradient Control Status Display with Trend



Gradient Control Status Display with Details

Gradient Control Configuration and Setpoints

Loop Configuration

Enabling or disabling the Gradient Control is achieved by clicking the On or Off button in the Loop Config. section of the Gradient Control Status Display. The ON button's text will turn green to indicate that it has been selected. The OFF button text will turn red to indicate that it has been selected.

Loop Modes/Setpoints

The Loop Modes and corresponding setpoints are configured in the Loop Modes/Setpoints section of the Gradient Control Status Display. To select a Loop Mode, click the corresponding button. The text will turn green to indicate that mode has been selected.

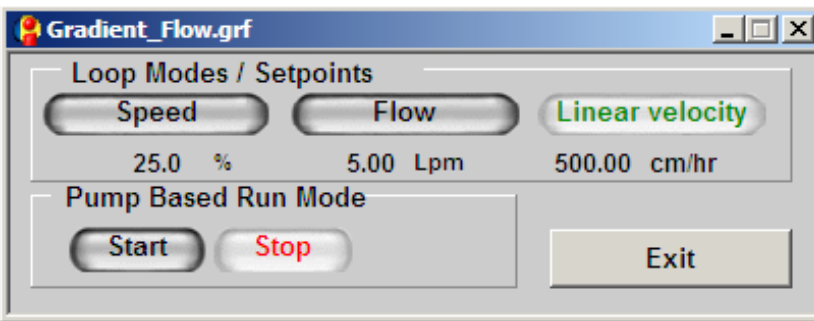
To change the setpoint (SP) for the current mode, click the current SP value that is located under the button. A data entry dialog box will appear and allow the user to edit the setpoint. Note that the setpoint must be within the min and max value cited in the data entry dialog box.

Loop Mode	Description	Range/Units	PID Control?
Percent	Sets the % of the Setpoint that the primary pump will control for.	0-100%pri	Depends on the selected pump based loop mode (see the section "Loop Modes and Setpoints")
Conductivity	Pump output speed is the calculated CV of a PID control loop that uses Conductivity as the SP and PV.	0-50 $\mu\text{S}/\text{cm}$	Yes

*See the section *Parameters and Loop Tuning* for an explanation of the variables used in PID control.

Pump Based Setpoints

The Setpoints button in the Pump Based section of the Gradient Control Status Display opens the Pump Based Setpoints window. This display is used to set the Loop Mode, corresponding Setpoints and the Start/Stop command for the pumps.



Pump Based Setpoints

NOTE

Gradient control uses one set of Loop Modes and Setpoints to control both pumps. Therefore Fixed Speed is the sum of both pump speeds, the flow is total flow from both pumps and the Linear Velocity is total linear velocity from both pumps.

The individual pump controls are not accessible when Gradient Control is enabled.

The Pump Based Setpoints window replaces the individual pump controls and setpoints that were accessible by clicking on a pump on the Process Display screen.

Clicking on Run Control and Loop Modes/Setpoints on the Pump Control Status Display screen.

Control Parameters

Parameter	Description	Read/Write?
Process Variable (PV)	The current conductivity in $\mu\text{S}/\text{cm}$.	Read Only
Control Value (CV)	The current percentage of primary pump (%pri).	Read Only
Control Deadband	The range, as a % of SP, inside of which the process is considered to be stable when the Stable Timer is expired.	Writable

Loop Tuning Parameters

Gain	Proportional value of PID control equation. The Proportional Gain setting affects all frequencies (unlike Integral and Derivative settings) and is the only setting that affects the middle frequency range.	Writable
------	--	----------

Parameter	Description	Read/Write?
Reset	Integral value of PID control equation. The Integral action is, in essence, responsible for keeping track of where the process has been, in order to correct for any process disturbances. The Integral value dominates the low frequency responses.	Writable
Rate	Derivative value of PID control equation. The Derivative action provides for adequate forecasting of process disturbances, and may improve response time. Derivative dominates the high frequency responses.	Writable
Deadband	The Deadband is used by the PID loop and represents the tolerance of the PID loop. If the PV is within the deadband limit of the SP, the PID does not adjust the CV.	Writable
Stable Timer	If the PV is within the Control Deadband for that amount of time, the system is considered to be stable. This value is not used in the PID calculations.	Writable

NOTE

The operator should need to adjust only the setpoints.

Supervisor or Engineer level access is required to alter the PID loop tuning parameter. These settings should be changed only by trained personnel. Individuals who are not well versed in PID loop tuning for process response should NOT alter these settings. Doing so may harm the equipment and may have an adverse effect on a process.

Gradient Calibration

Gradient calibration profiles stored in lookup tables shall be used to correct errors in the gradient mixing. Up to twenty lookup table segments can be defined for each profile. The resulting calibrated mixing value will be interpolated from the data within the lookup table. Different profiles shall be stored for conductivity based gradients and percentage based gradients.

Percentage Calibration

Manual percentage based gradients shall include a gradient calibration profile. This profile can be defined manually during OQ using UV readings to determine actual measured mixing percentages at various manual setpoints. The Gradient Percent Calibration display includes a table with a column for primary percentage values to be corrected and a column for the actual measured values. The number of segments is configurable with a maximum of 20. Calibration can be turned on or off. The profile can also be defined automatically using recipe actions.

Conductivity Calibration

Linear gradient control based on conductivity requires a lookup table to achieve accurate mixing. PID control cannot be used for linear gradients due to the volume of fluid between the inlet valves and the conductivity sensor. The correction shall be implemented by storing actual conductivity values for various mixing percentages in a lookup table. The stored values shall then be used to interpolate the mixing percentage required to achieve the desired conductivity value. The profile can also be defined automatically using recipe actions. The conductivity calibration profile shall also be used for isocratic gradients based on conductivity. This shall be active only until the system holdup volume has been processed. This prevents large errors in the PID control which would normally result in overshoot or undershoot. Once the holdup volume has been processed and the conductivity value has stabilized, the PID loop shall control the primary mixing percentage to achieve the desired conductivity value. This function is reset whenever there is a step change in the conductivity setpoint or the pump is started.

Procedure for Conductivity Calibration

Conductivity calibration can be performed manually from the touch screen or automatically using an operation. Manual actions are performed using the Gradient Conductivity Calibration and Gradient Percentage Calibration windows.

1. Setup the desired flow path.
2. Enable the gradient control loop and select Speed control mode.
3. Run the pumps at 100% primary at a desired speed until the conductivity value stabilizes.
4. Select Save Primary Conductivity from Auto Cal or use the "Gradient Save Primary Inlet Conductivity" recipe action. This will store the conductivity value of the primary solution.
5. Run the system at 0% primary at a desired speed until the conductivity value stabilizes.
6. Select Save Secondary Conductivity from Auto Cal or use the "Gradient Save Secondary Inlet Conductivity" recipe action. This will store the conductivity value of the secondary solution.
7. Enter the total number of segments desired for the calibration profiles or use the "Gradient Percent Total Segments" and Gradient Conductivity Total Segments" recipe actions.
8. Run the system at the first segment percentage until the conductivity value stabilizes.
9. Select Calibrate Segment or use the "Gradient Conductivity Calibrate Segment" recipe action. The system will record the control value and the conductivity value and will automatically enter the values into the conductivity calibration table. The control value and actual percentage value will also be recorded into the percentage calibration table.
10. Repeat step 8 and 9 for each segment percentage.
11. When complete, select conductivity calibration On and percentage calibration On or use the "Gradient Conductivity Calibration On" and "Gradient Percent Calibration On" recipe actions.

Entering the K Factor

To achieve the best accuracy on the flow measurement, it's important to enter the K factor into the HMI for each SU flowmeter tube. The K factor is written on the label attached to each SU flowmeter tube. The operation needs to be performed each time a new SU flowmeter tube is installed into the transmitter.

Calibration Table:

Tag	Zero	Full Scale	Filter	K factor
F1004 Pump P002 Flow	0.00	14.00	50	1.000



Click the K factor value and enter the value indicated on the SU flowmeter tube label.

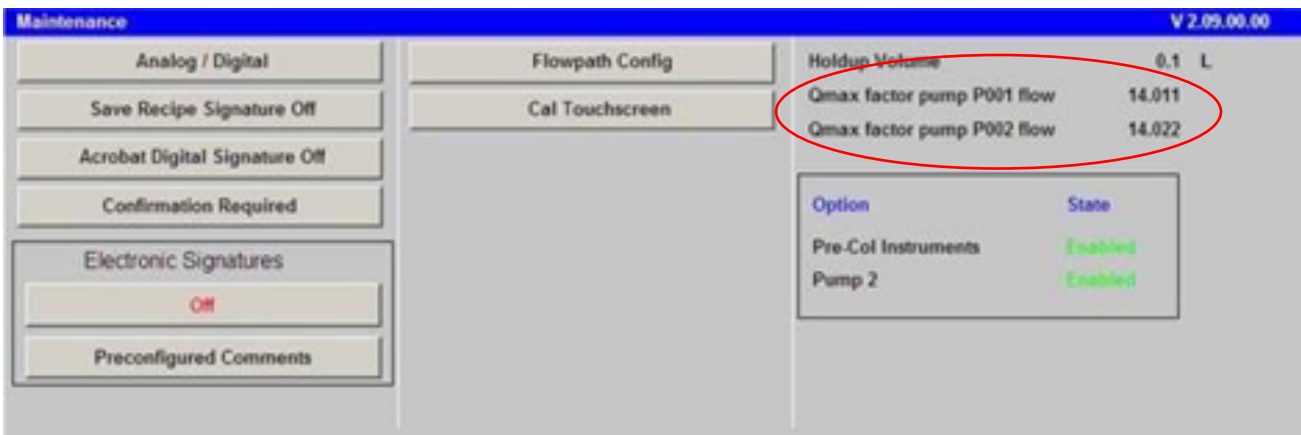
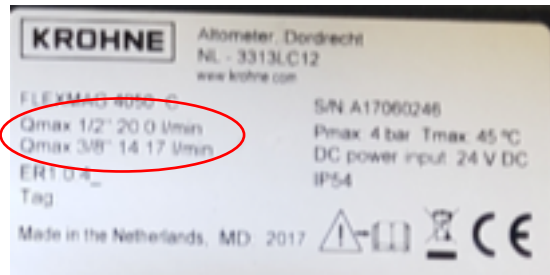
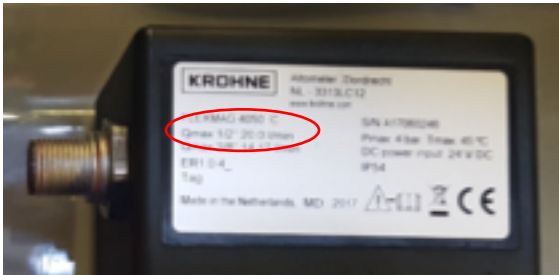
CAUTION

When entering K factor please check that it is the correct flowmeter faceplate.

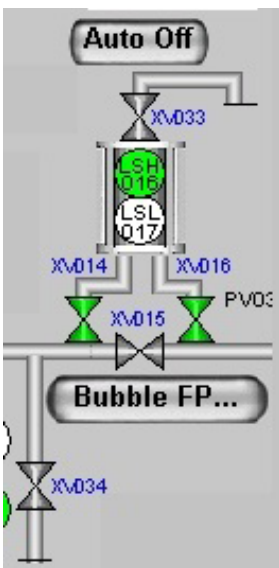
Entering the Qmax Factor

To achieve the best accuracy on the flow measurement, each flowmeter electronic is factory calibrated. It is important to enter the Qmax factor into the HMI each time a new SU flowmeter electronic is changed. The Qmax is on the label attached to each flowmeter.

1. Set up Qmax factor for P001 flow in the maintenance faceplate according to Qmax value written on the nameplate of the flowmeter transmitter FT002 (refer to Qmax 3/8" value).
2. If applicable, set up Qmax factor for P002 flow in the maintenance faceplate according to Qmax value written on the nameplate of the flowmeter transmitter FT004 (refer to Qmax 3/8" value).



Process Display: Bubble Trap Section



Process Display – Bubble Trap Section

Bubble Trap Graphics

Label	Description
LSH016	Displays the status of the bubble trap high level sensor. It is green when the fluid is at the high level and the sensor is on. It is white when the fluid is below the high level and the sensor is off. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section.
LSL017	Displays the status of the bubble trap low level sensor. It is green when the fluid is at the low level and the sensor is on. It is white when the fluid is below the low level and the sensor is off or when the high level sensor is on. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section.

Bubble Trap Control

Bubble Trap Faceplate



Bubble Trap Faceplate

Clicking on the Bubble FP button opens the Bubble Trap Faceplate. This faceplate gives the user the ability to set the flow path depending on the desired function of the bubble trap. It has five preconfigured flow paths (Online, Bypass, Vent, Clean and Drain) and one customizable flow path (User). The valves and flow path will respond accordingly. **The table below** indicates which valves are open in each selected flow path.

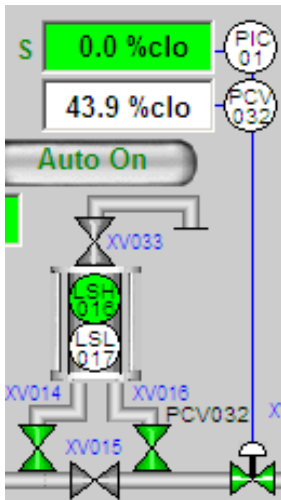
Flow Path	XV014	XV015	XV016	XV033	XV034
Online	OPEN		OPEN		
Bypass		OPEN			
Vent*				OPEN	
Clean	OPEN			OPEN	
Drain	OPEN				OPEN

*Venting can occur in conjunction with other flow paths, therefore the state of other valves may vary.

Bubble Trap Faceplate Button Functions

Online	The Online button changes the flow path to allow for the material to pass through the bubble trap.
Bypass	The Bypass button changes the flow path to prohibit material from passing through the bubble trap.
Vent	Venting the Bubble Trap is necessary when there is excess air in the trap. Venting may occur when the Bubble Trap is online or bypassed. <i>Venting can occur in conjunction with other flow paths, therefore the state of other valves may vary.</i>
Auto On/Auto Off Button	<p>The bubble trap will automatically vent itself if the Auto On/Auto Off button is in the Auto On state. It will not respond to the Vent button when in Auto mode.</p> <p>If manual vent control is desired, click the Auto On/Auto Off button so that it displays Auto Off. Then click the Vent button on the Bubble Trap Faceplate. Automatic venting is controlled by the two level sensors. If the low level sensor is activated, indicating that there is excessive air in the trap, venting is started. Venting continues until the high level sensor is activated. Automatic venting will not occur if the high level sensor is activated or if the low level sensor is not activated.</p> <p>CAUTION</p> <p>Leaving the vent in manual mode may cause undesired effects, including fluid venting from the top of the trap.</p> <p>If the bubble trap level sensors are improperly set, liquid may vent from the top of bubble trap. As a precaution, connect tubing and a container to the top of the bubble trap vent (XV033) to collect fluid and allow fluid to vent safely.</p>
Clean	<p>To clean the Bubble Trap, the Vent control must be in Auto Off mode.</p> <p>Clicking the Clean button changes the flow path to allow fluid to pass through the trap and out the vent.</p> <p>Be prepared for the fluid exiting the vent before initiating a cleaning.</p>
Drain	<p>Clicking the Drain button changes the flow path to allow fluid to drain out of the trap and out the drain valve (XV034).</p> <p>Be prepared for the fluid exiting the drain before initiating a draining.</p>
User	The User button sets the flow path according to the Bubble Trap User Flow Path configured in the Flow Path Config section of the Maintenance Status Display Screen.

Process Display: Pressure Control Valve Section



Process Display – Pressure Control Valve

Pressure Valve Graphics

Label	Description
PIC01	Displays the valve position setpoint. Clicking on the instrument icon and the value display box opens the Pressure Valve Control Status Display screen.
PCV032	The value above the valve is the control value of the valve (% closed that the valve is commanded to be closed). Clicking on that value opens the Retentate Control Status Display. The value below the valve displays the actual valve position in % that the valve is closed. Clicking on the round PCV032 Icon opens the corresponding Analog Point Faceplate in the Status Display section.

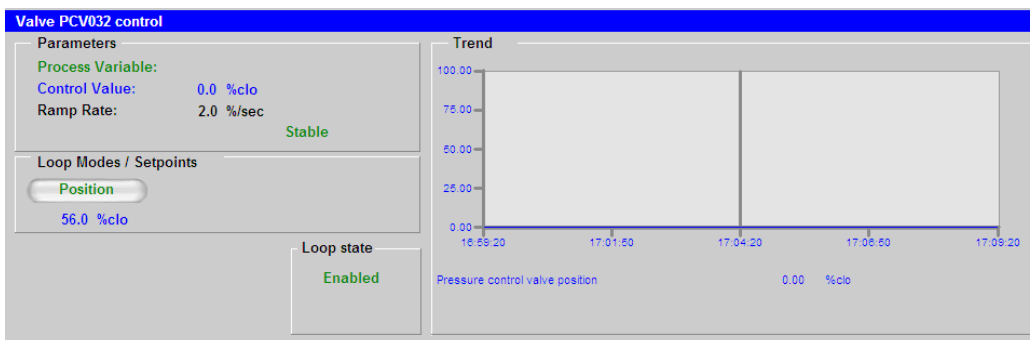
Pressure Control Valve

Pressure Valve Faceplate

The pressure valve provides back pressure to the system. It is manually controlled by setting the percentage of the valve that is open.

When the valve’s position is between 0 and 10% or between 95 and 100%, the response of the valve may be delayed from 30 seconds up to one minute.

Clicking on the PIC01 icon, the displayed value to the left of that icon, the valve itself, or the PV032 Control Icon on the Navigation Toolbar will open the Pressure Valve Control Status Display.



Pressure Valve Control Status Display

Loop Modes/Setpoints

The Pressure Valve has only one mode, Fixed Position. Therefore, that button is always enabled. Clicking on the value below the Fixed Position button opens a dialog box where the Valve Position SP is entered. The Valve Position SP is a percentage with a range of 0-100%.

The parameters in the Pressure Valve Control Status Display are summarized below.

Parameter	Description	Read/Write?
Process Variable (PV)	The Pressure Valve Position in %	Read Only
Control Value (CV)	The Pressure Valve Position CV in %	Read Only
Ramp Rate	The rate, in %/sec, at which the CV will increase or decrease to get the desired PV.	Writable

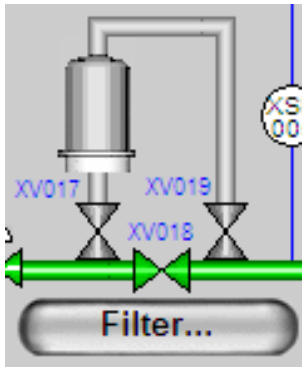
Tuning PCV032

The PCV032 Tuning is available by clicking the Analog/Digital button in the Maintenance Status Display screen.

Maintenance		
	Tag	Value
<input type="button" value="Tune PCV032"/>	SIC001	0.0 %
	SIC002	100.0 %
	PCV032	100.0 %

Pressure Valve Control Status Display

Process Display: Filter Section



Process Display - Filter Section

Filter Control

Clicking on the Filter FP button opens the Filter Trap Faceplate. This faceplate allows the flow path to be set depending on the desired function of the Filter. It has two preconfigured flow paths (Online and Bypass) and one customizable flow path (User). The valves and flow path will respond accordingly.



Filter Faceplate

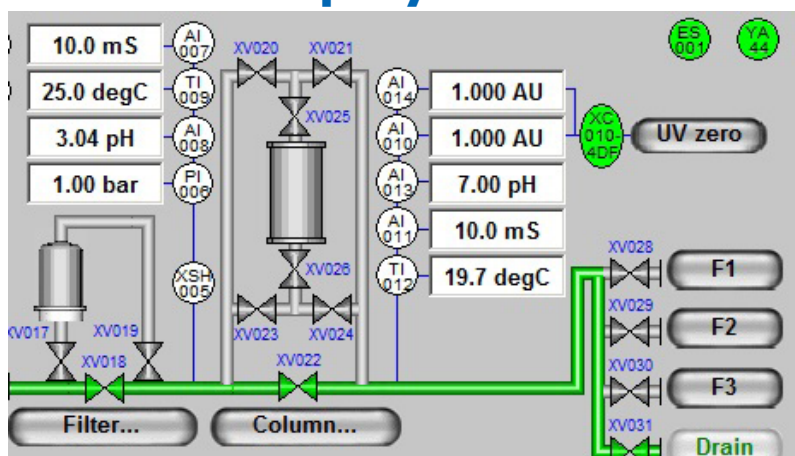
Flowpath settings are shown here:

Flow Path	XV017	XV018	XV019
Online	OPEN		OPEN
Bypass		OPEN	

Button functions are shown here:

Button	Function
Online	The Online button changes the flow path to allow for the material to pass through the filter.
Bypass	The Bypass button changes the flow path to prohibit material from passing through the filter.
User	The User button sets the flow path according to the Filter 1 User Flow Path configured in the Flow Path Config section of the Maintenance Status Display Screen.

Process Display: Column Section



Process Display – Column Section

Column Graphics

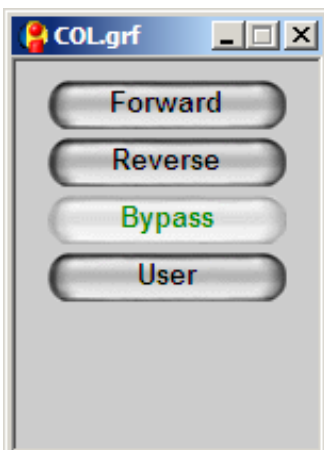
The details and functionality of the instruments in the column section of the Process Display are summarized here:

Label	Description
Pre-Column Instruments - Optional	
AI007	Displays the pre-column conductivity. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
TI009	Displays the pre-column temperature. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
AI008	Displays the pre-column pH. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
Pre-Column Instruments – Not Optional	
PI006	Displays the pre-column pressure. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
XSH005	Displays the state of the pre-column air detector. It is green when feed is detected. The alarm turns on when a pump is running with the column online and air is detected in the system. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section.
Post Column Instruments	
AI014	Displays the post-column UV. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
AI010	Displays the post-column UV. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
AI013	Displays the post-column pH. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
AI011	Displays the post-column conductivity. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
TI012	Displays the post-column temperature. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
XC010-4DF	Displays the state of the C8000 defect. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section. Refer to <i>Troubleshooting</i> for more information

Column Control

Column Faceplate

Clicking on the Column FP button opens the Column Faceplate. This faceplate allows the flow path to be set depending on the desired function of the column. It has three preconfigured flow paths (Forward, Reverse, and Bypass) and one customizable flow path (User). The valves and flow path will respond accordingly.



Column Faceplate

The table below indicates which valves are open in each selected flow path.

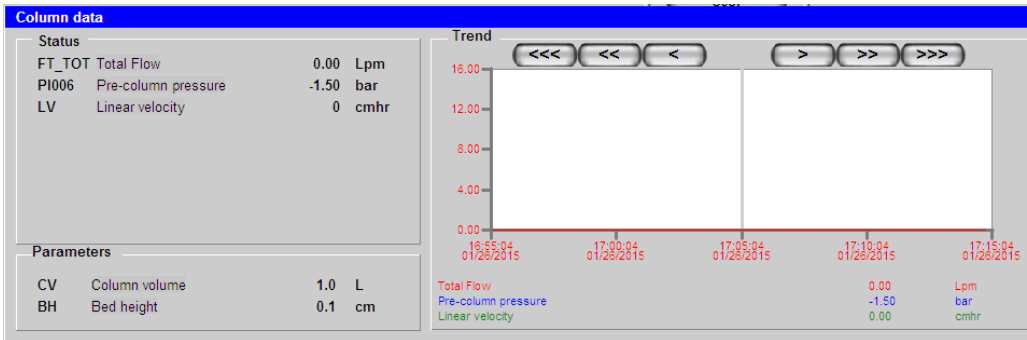
Flow Path	XV020	XV021	XV022	XV023	XV024	XV025	XV026
Forward	OPEN				OPEN	OPEN	OPEN
Reverse		OPEN		OPEN		OPEN	OPEN
Bypass			OPEN				

Button functions are shown here:

Button	Function
Forward	The Forward button changes the flow path to allow for the flow to pass through the column from top to bottom.
Reverse	The Reverse button changes the flow path to allow for the flow to pass through the column from bottom to top.
Bypass	The Bypass button changes the flow path to prohibit the flow from passing through the column.

Column Data Status Display

To open the Column Data Status Display, click on the column in the Process Display.



Column Data Status Display

Status

The status section displays the Total Flow, Pre-Column Pressure and Linear Velocity. All of these values are read-only.

Parameters

The Parameters section displays the Column Volume and Column Bed Height. The system uses these settings to calculate the Pump Settings required for a given linear flow rate. These values can be changed by clicking on the value and entering a new value in the dialog box that opens. The values in the Status and Parameters section in the Column Data Status Display are shown here:

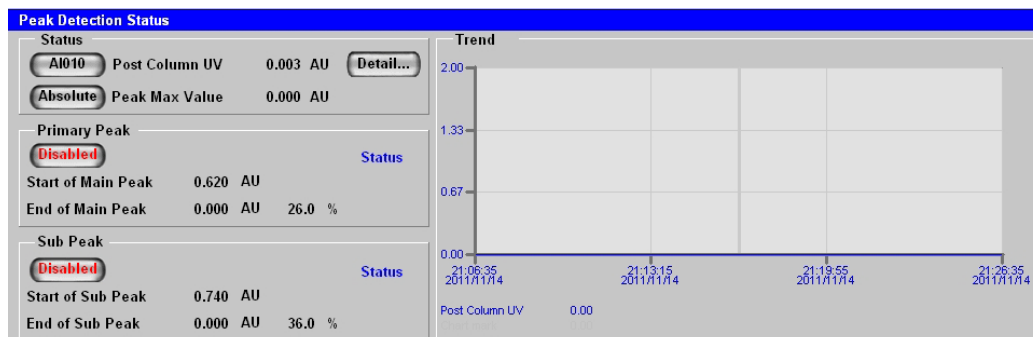
Parameter	Description	Read/Write?
Total Flow (FT_TOT)	The Total Flow through the system in liters per minute (Lpm)	Read-Only
Pre-Column Pressure (PI006)	The System Pressure before the column in bar	Read-Only
Linear Velocity (LV)	The Linear Velocity of the system in cm per hr (cm/hr)	Read-Only
Column (CV)	The Column Volume in liters (L).	Writable
Column Bed Height (BH)	The Column Bed Height in cm.	Writable
Ramp Rate	The rate, in %/sec, at which the CV will increase or decrease to get the desired PV.	Writable

UV Zero Button

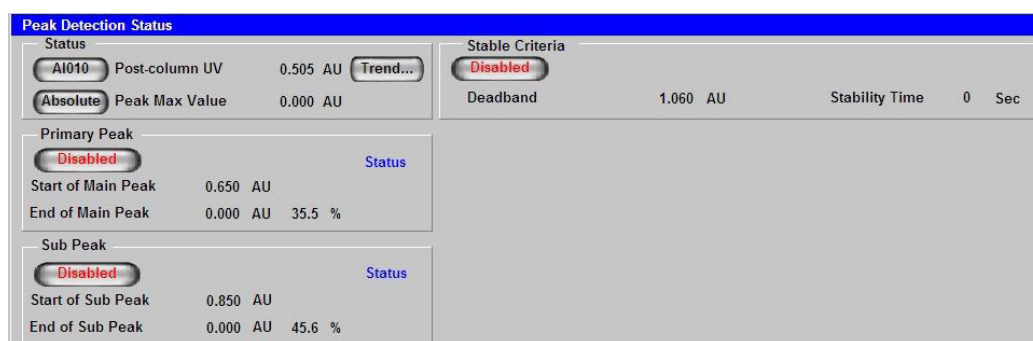
The Zero button toggles the UV auto zero function of the UV Sensor.

Process Display: Peak Detection

The Peak Detection Status Display screen is available by clicking on the Peak Detection Icon on the Navigation Toolbar. This Status Display shows all of the information and configurable parameters associated with peak detection. Clicking the Detail/Trend button toggles the view between the real-time trend screen and the details screen.



Peak Detection Status Display – with Trend



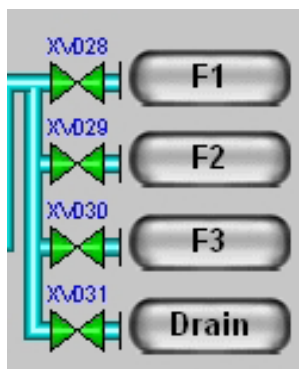
Peak Detection Status Display – with Details

The controls and the values in the Peak Detection Status Display are below:

Parameter	Description	Read/Write?
Status Section		
AI010/AI014 Button	Toggles between the two, redundant, post-column UV sensors, AI010 and AI014.	Writable
Absolute/Percent Button	Toggles between the two modes of End Peak Detection. The Absolute setting forces the user to enter an absolute value, in AU, for the system to use to define the end of the Main or Secondary Peak. The Percent setting allows the user to define the end of the Main or Secondary peak as a percentage of the Peak Max Value. The system calculates the End of the Main or Secondary Peak using the Peak Max Value and the percentage.	Writable
Post Column UV	Displays the current absorption value in Absorbance Units (AU).	Read-Only
Peak Max Value	Displays the value of the max peak in AU.	Writable

Parameter	Description	Read/Write?
Primary Peak Section		
Disabled/Enabled Button	Disables or Enables the Primary (Main) Peak Detection	Writable
Start of Main Peak	Defines the beginning of the Main Peak in AU. The value is set by clicking on the value and entering a new value in the dialog box that appears.	Writable
End of Main Peak	Defines the end of the Main Peak in AU. If the Absolute/Percent Button is in Absolute mode, it is user writable. If the Absolute/Percent Button is in Percent mode, it is read-only and the system calculates the end of Main Peak Value.	Depends
Sub Peak Section		
Disabled/Enabled Button	Disables or Enables the Sub Peak Detection	Writable
Start of Main Peak	Defines the beginning of the Sub Peak in AU. The value is set by clicking on the value and entering a new value in the dialog box that appears.	Writable
End of Main Peak	Defines the end of the Sub Peak in AU. If the Absolute/Percent Button is in Absolute mode, it is user writable. If the Absolute/Percent Button is in Percent mode, it is read-only and the system calculates the end of Sub Peak Value.	Depends
Stable Criteria Section		
Disabled/Enabled Button	Disables or Enables the Stability Criteria	Writable
Stability Deadband	Deadband in AU used to determine the stability of the peak. Peak \pm Stability Deadband = Range of Stability	Writable
Stability Time	The amount of time in seconds that the peak was stable for.	Read-Only

Process Display: Outlets Section



Process Display – Outlets

Controlling the Flow through the Outlets

To open a fraction valve, click on the desired fraction button.

To close all fraction valves, click Drain.

Alarm Control

The system includes alarm logic which provides safety to personnel and equipment, and ensures proper operating parameters are maintained.

General Alarm Behavior

Alarms are classified as non-critical (medium priority) or critical (high priority).




Non-critical alarms provide warnings and critical alarms activate an interlock, which sets the system to a safe shutdown state.

Critical Alarm Actions

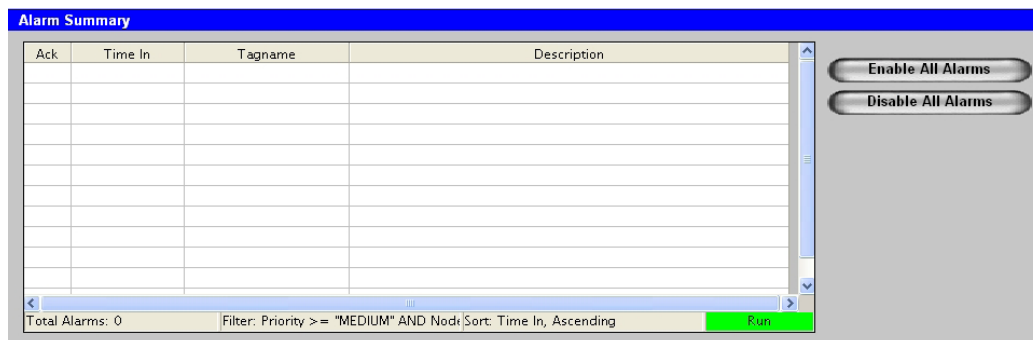
- Sound alarm horn (if installed).
- Activate Critical alarm relay (if installed).
- Indicate "Critical Alarm" in red on the operator interface (flashing unacknowledged).
- Highlight mimic or indicator red on the operator interface (flashing unacknowledged).
- List alarm in the Alarm Summary Screen with red background (flashing unacknowledged).
- Set system to HOLD state.
- Record alarm condition and value in alarm/event report. Table 2-24: Non-Critical Alarm Actions

Non-Critical Alarm Actions

- Sound alarm horn (if installed)
- Activate Non-Critical alarm relay (if installed).
- Turn on yellow panel indicator (flashing unacknowledged).
- Indicate "Non-Critical Alarm" in yellow on the operator interface (flashing unacknowledged).
- Highlight mimic or indicator yellow on the operator interface (flashing unacknowledged).
- List alarm on Alarm Summary Screen with yellow background (flashing unacknowledged).
- Record alarm condition and value in alarm/event report.

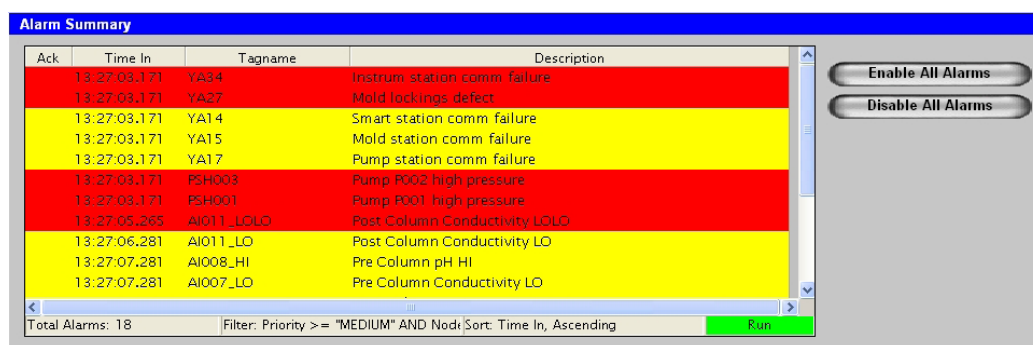
Icon	Function	Description
	Alarm Acknowledgement	Alarms are acknowledged by clicking the Alarm Acknowledge icon on the top of the User Interface. Acknowledging Alarms stops the blinking of the alarm indicators on the User Interface but does not clear them from the Alarm Summary. Alarms remain current until cleared or disabled. System operation cannot be continued until a critical alarm is cleared.
	Alarm Silencing	The Alarm Horn is silenced by clicking the Alarm Silence icon on the top of the User Interface. Silencing the Alarm Horn does not acknowledge or disable alarms, it only silences the alarm horn.
	Alarm Summary Status Display	The Alarm Summary Status Display displays all current unacknowledged and acknowledged alarms. It is accessible by clicking on the Alarm Summary Icon in the navigation bar.

Information displayed on the Alarm Summary includes acknowledged state, date and time the alarm occurred, the tag name that is in alarm and a brief description. The Alarm Summary also has a button to Enable All Alarms and a button to Disable All Alarms.



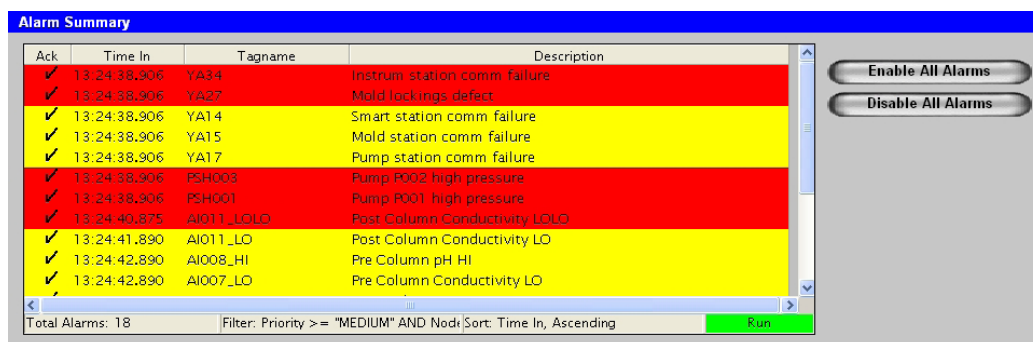
Alarm Summary Display

The Alarm Summary Display populated with unacknowledged alarms is shown below. As earlier described, the Critical Alarms are displayed in red and the Non-Critical Alarms are displayed in yellow.



Alarm Summary Display with Unacknowledged Alarms

The Alarm Summary Display after the alarms have been acknowledged. Note the check in the Ack column of the Alarm Summary. This indicates that the alarms have been acknowledged.



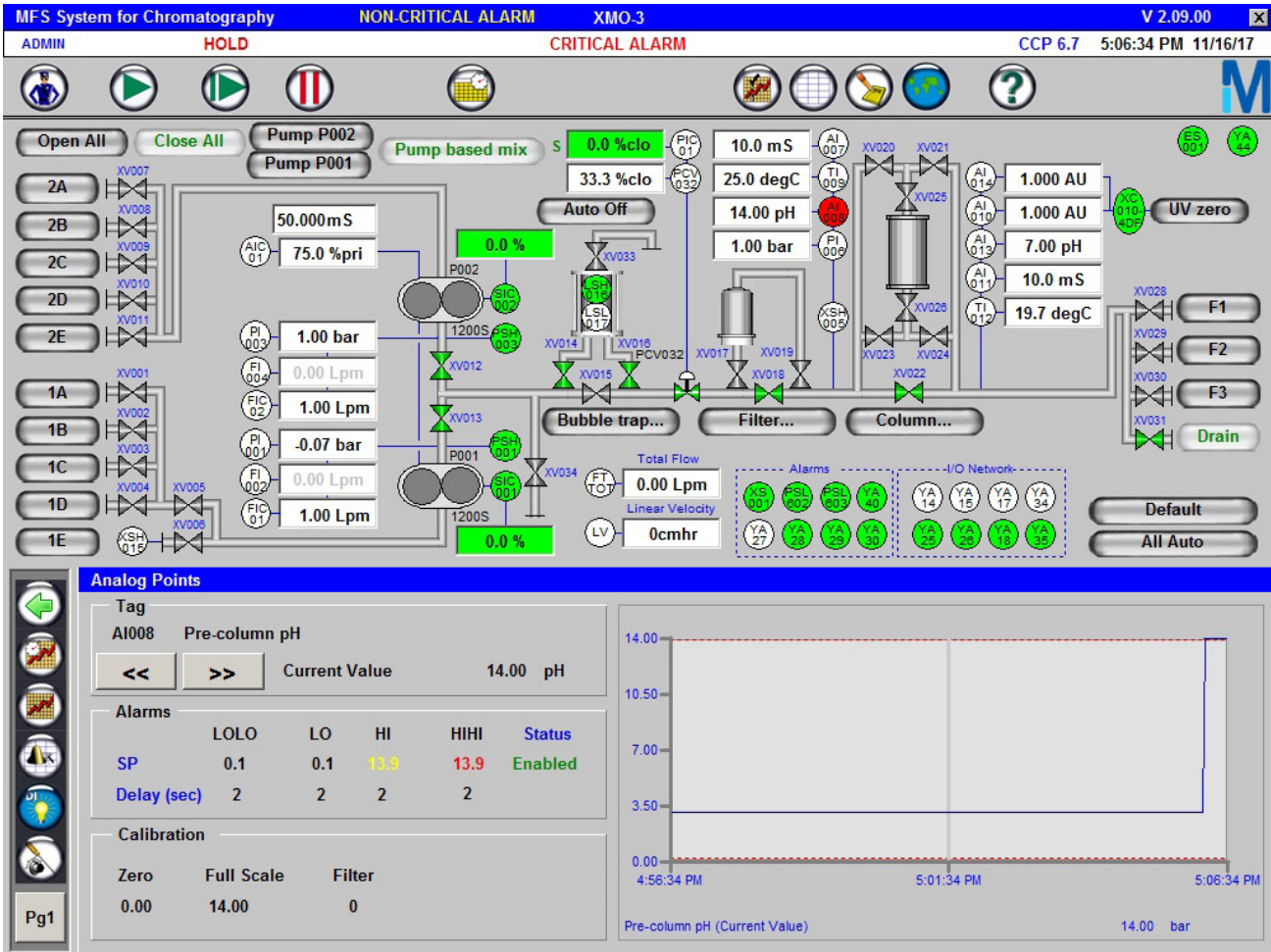
Alarm Summary Display with Acknowledged Alarms

Process (Analog Instrument) Alarms

The Analog Process Alarms have LOLO, LO, HI and HIHI alarm setpoints. If the HI or LO setpoint is violated, a non-critical alarm is triggered; if the HIHI or LOLO setpoint is violated, a critical alarm is triggered.

The Process Display with the Pre-Column pH meter in alarm is shown below. The instrument icon is red because it is in a Critical HIHI alarm.

The Analog Point Faceplate for the instrument is displayed in the Status Display section and was opened by clicking on the AI008 instrument icon.



Process Display with Process Alarm

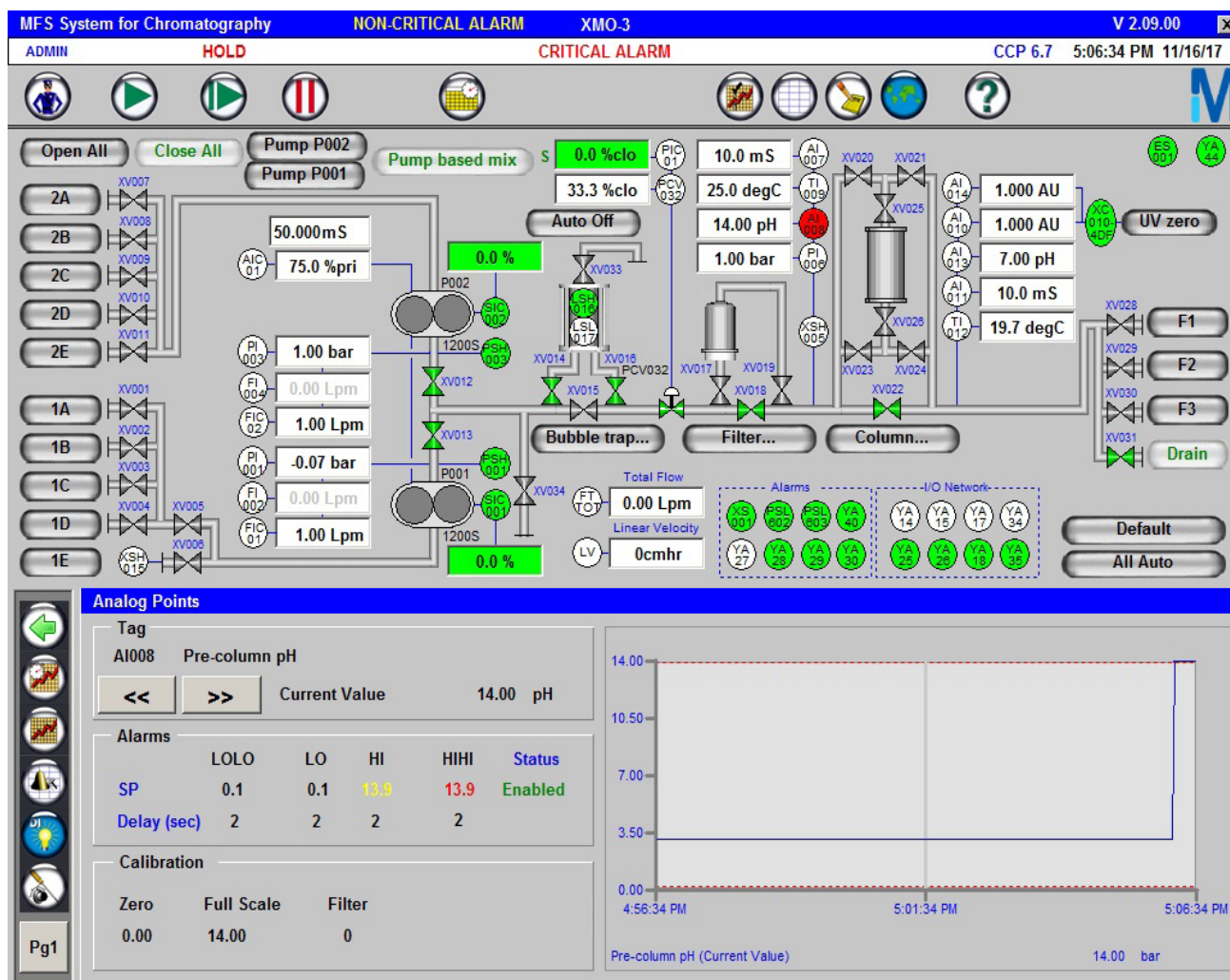
Analog Point Faceplate

Process Alarms for Analog Instruments are controlled through the Analog Point Faceplate for the Instrument. The Analog Point Faceplate is opened by clicking on the instrument. Analog Points can be scrolled through by clicking the left or right arrows that are under the Tag name.

The Analog Point Faceplate lists the tag name, description, current value and alarm limit settings. This display is used to setup the critical alarm (LOLO and HIHI) and non-critical alarm (LO and HI). When the process data reaches the alarm setpoint, the alarm will be turned on and the corresponding alarm setpoint will change colors according to the Critical/Non-Critical status of the alarm.

The Analog Point Faceplate for the Pre-Column pH with the alarms enabled is shown below. Since the Current Value of the pH is 14.00 and is greater than both the Hi and HiHi Alarm Setpoints, both Setpoints have changed color. Hi SP is yellow because it is Non-Critical, HiHi SP is red because it is Critical.

The Analog Point Faceplate for the Pre-Column pH with the alarms disabled is shown below. Even though the Current Value of the pH is 14.00 and is greater than both the Hi and HiHi Alarm Setpoints, neither Setpoints have changed color because the alarm is disabled.



Analog Point Faceplate – Alarm Enabled

MFS System for Chromatography XMO-3 V 2.09.00
 ADMIN HOLD CCP 6.7 5:03:59 PM 11/16/17

Analog Points

Tag: AI008 Pre-column pH

Current Value: 3.04 pH

Alarms	LOLO	LO	HI	HIHI	Status
SP	0.1	0.1	13.9	13.9	Disabled
Delay (sec)	2	2	2	2	

Calibration	Zero	Full Scale	Filter
	0.00	14.00	0

Pre-column pH (Current Value) 3.04 bar

Analog Point Faceplate – Alarm Disabled

To set an alarm setpoint, click on the appropriate value (LOLO, LO, HI or HIHI) and enter a new value in the data entry box that appears.

To Enable or Disable the alarms, click on the Enable or Disable text. A confirmation box appears, click OK to confirm the change of alarm status.

The Delay in seconds is the amount of time that passes between the alarm condition becoming true (i.e. the current value is greater than an alarm setpoint) and the alarm turning on. The Delay is provided to help eliminate nuisance alarms and to ensure that the process value is in a true alarm state. The Delay value for each Alarm Setpoint can be individually set.

Calibration

Scaling

Analog inputs are scaled to engineering units in the PLC. The zero and full scale values for each analog input shall be configurable from the respective Analog Input Status Display. The raw data is not modifiable.

To modify the Zero or Full Scale values, click on the value in the Analog Point Status Display and enter a new value in the Data Entry Prompt that appears.

Input Filtering

Analog inputs can be configured to include filtering of the raw data signal. A value of 0 disables filtering and 99 enables maximum filtering. The PLC computes an actual filter value from $(100 - \text{User Filter Value}) / 100$ which converts the 0-99 user filter value to 1.00-0.01 to be used in the filtering equation.

The filtered raw value is computed once per second using the equation:

$(\text{Raw Value} \times \text{Actual Filter Value}) + (\text{Previous Filtered Raw Value} \times (1 - \text{Actual Filter Value}))$

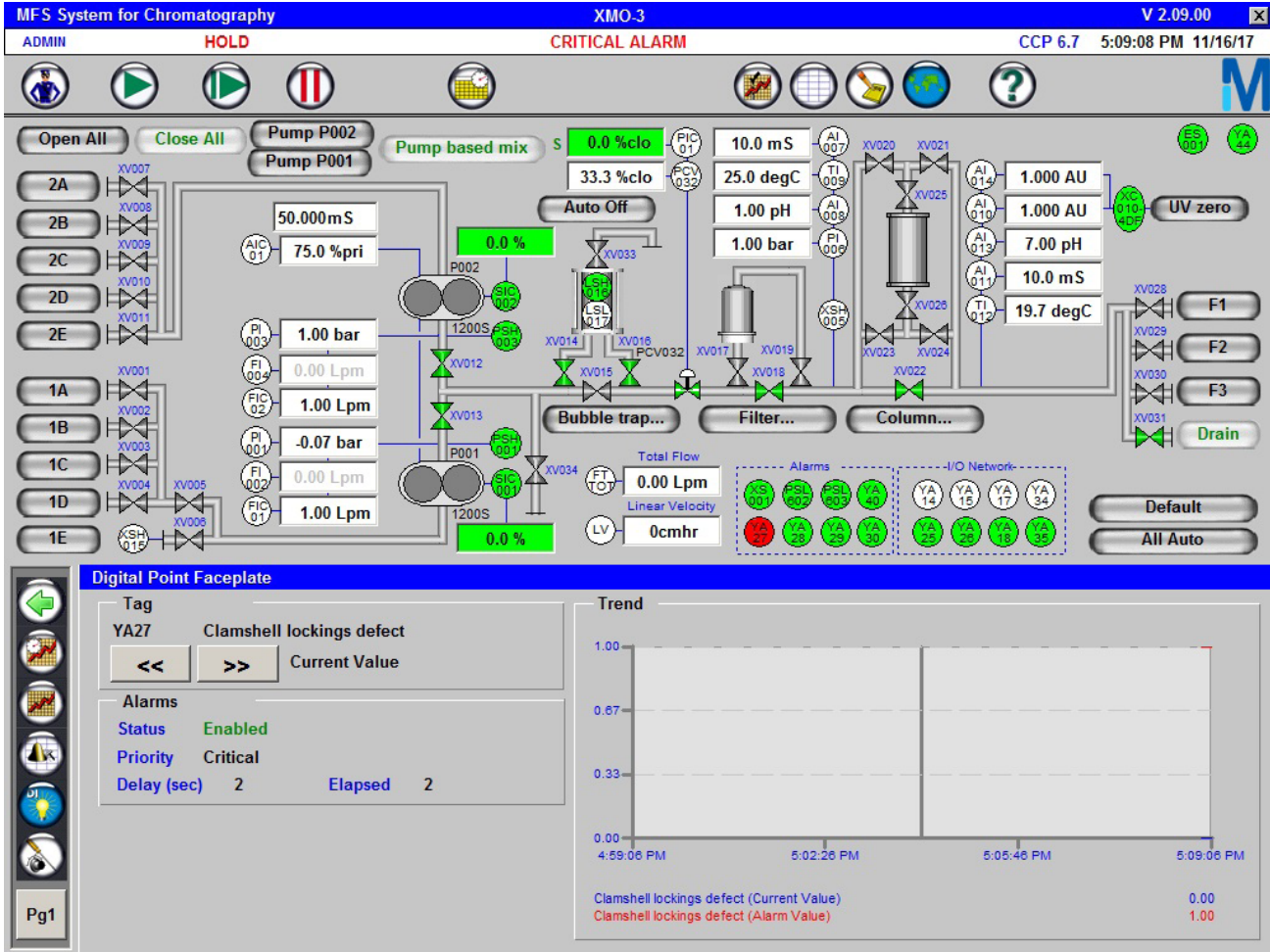
To modify the Filter value, click on the value in the Analog Point Status Display and enter a new value in the Data Entry Prompt that appears.

Discrete Device (Digital) Alarms

Unlike Analog Alarms, Discrete Device Alarms do not have LOLO, Lo, Hi or HiHi alarm states. Their alarms are discrete events, either On or Off. The Criticality of the alarm is set through manual configuration in the Digital Point Faceplate.

The Process Display with the Clamshell Locking Defect discrete alarm active is shown below. The icon is red because it is a Critical alarm.

The Digital Point Faceplate for the Discrete Device is displayed in the Status Display section and was opened by clicking on the YA27 icon.



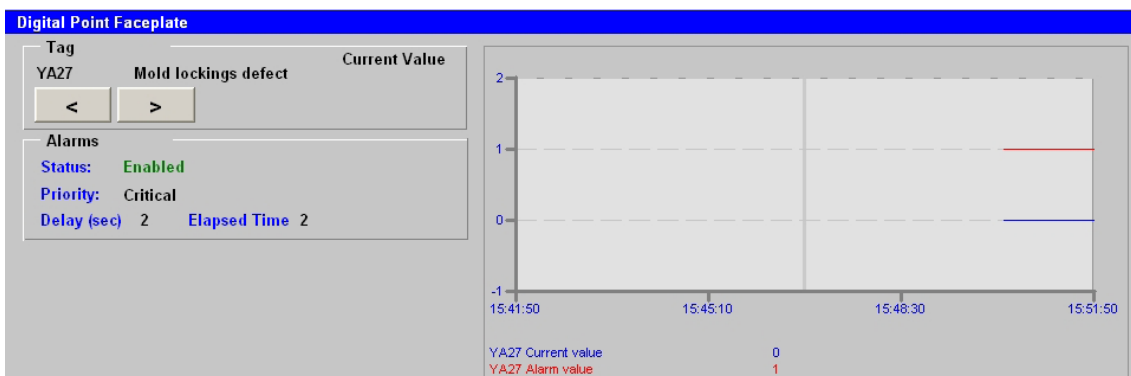
Process Display with Discrete Device Alarm

Digital Point Faceplate

Discrete Alarms are controlled through the Digital Point Faceplate for the Digital Device. The Digital Point Faceplate is opened by clicking on the device or by scrolling through the devices in the Digital Point Faceplate by clicking on the left or right arrows.

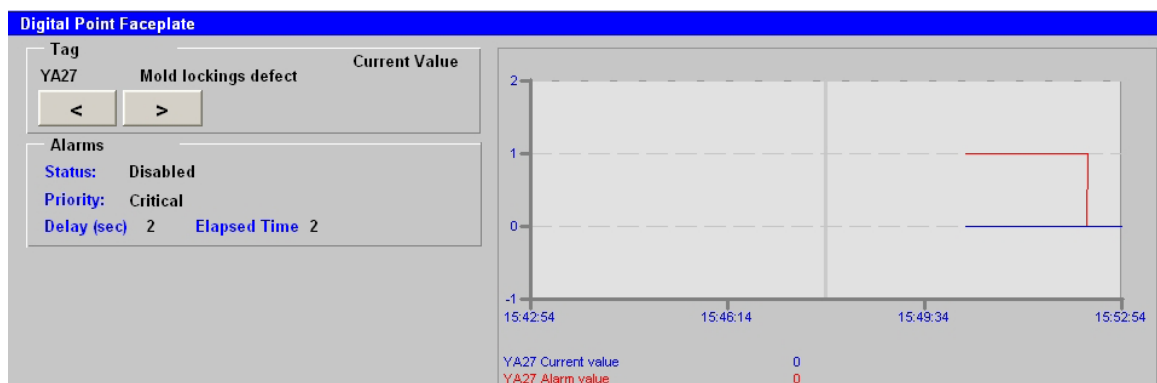
The Digital Point Faceplate lists the tag name, description, current value and alarm settings. When the alarm value is true, the alarm value, shown under the trend in red font, becomes 1. The trend shows the current Discrete Device Value and the Alarm Value.

The Digital Point Faceplate for the Clamshell Locking Defect with the alarm enabled and active is shown below. Note that the YA27 Alarm Value is a 1, indicating that the alarm is on, and that the trend is showing the Alarm Value.



Digital Point Faceplate – Alarm Enabled

The Digital Point Faceplate for the Clamshell Locking Defect with the alarm disabled and inactive is shown below. Note that the YA27 Alarm Value is a 0, indicating that the alarm is off, and that the trend shows the Alarm Value as it transitioned from On to Off.



Digital Point Faceplate – Alarm Disabled

To Enable or Disable the alarms, click on the Enable or Disable text. A confirmation box appears, click OK to confirm the change of alarm status.

To set the Priority of the alarms, click on the Critical or Non-Critical text. A confirmation box appears, click OK to confirm the change of alarm priority.

NOTE

Some critical alarms cannot have their priority changed.

The Delay in seconds is the amount of time that passes between the alarm condition becoming true and the alarm turning on. The Delay is provided to help eliminate nuisance alarms and to ensure that the digital value is in a true alarm state.

The elapsed time, counts the number of seconds since the alarm condition has been true. When the elapsed time equals the delay, the alarm turns on.

Alarms with Conditions

Some Discrete Device Alarms have additional conditions that have to be met for the alarm to become active. If conditions are required, they will be displayed at the bottom of the Digital Point Faceplate along with their current state. The conditions must be ON for the alarm to become active.

Default Critical Discrete Alarms

The following alarms are preconfigured as critical alarms.

Label	Description
ES001	E-Stop *
XSH005	Pre-Column Air*
YA18	Pump Station Defect
XS001	Door Closed *
YA27	Clamshell Locking Defect*
YA34	Instrument Station Communications Failure
SIC001DF	Feed Pump 1 Defect*
SIC002DF	Feed Pump 2 Defect*
PSH001	Pump 1 High Pressure*
PSH003	Pump 2 High Pressure*
YA14	Smart Station Comm Failure
YA15	Clamshell Station Comm Failure
YA17	Pump Station Comm Failure
PSL602	Valves Air Defect
PSL603	Manifold Valves Air Defect
YA29	HMI to PLC Comm Failure
YA30	CCP® Runtime Comm Failure
YA25	Smart Station Defect
YA26	Clamshell Station Defect

*Criticality cannot be changed.

Data Trend Displays

There are two types of data trends that may be displayed: Real Time Trend and Custom Trend.

Real Time Trend Display

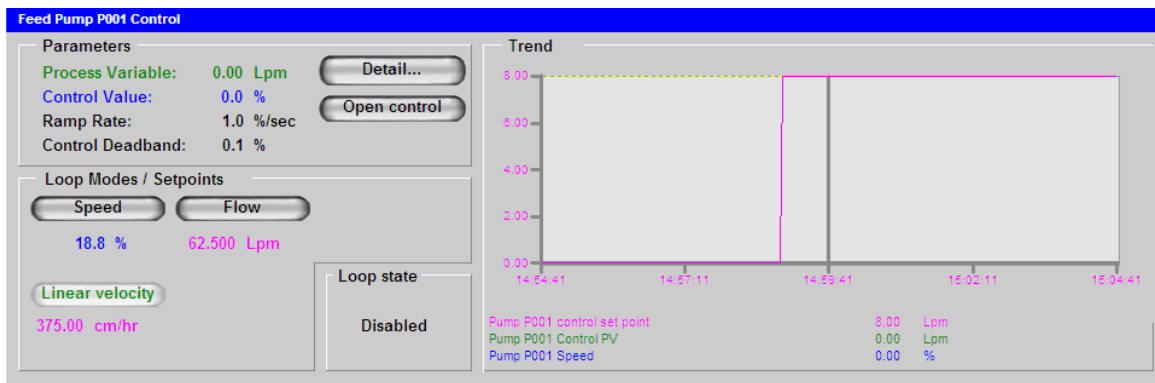
The system includes real time trends that are displayed in each Analog and Discrete Device Status Display or Control Screen. To view the trend, click on the device on the process display or scroll through the Analog or Digital Device Faceplates.

The Real Time Trend Display for Pump 1 is shown below.

NOTE

There are three tags plotted on this trend, some trends may only have one tag plotted.

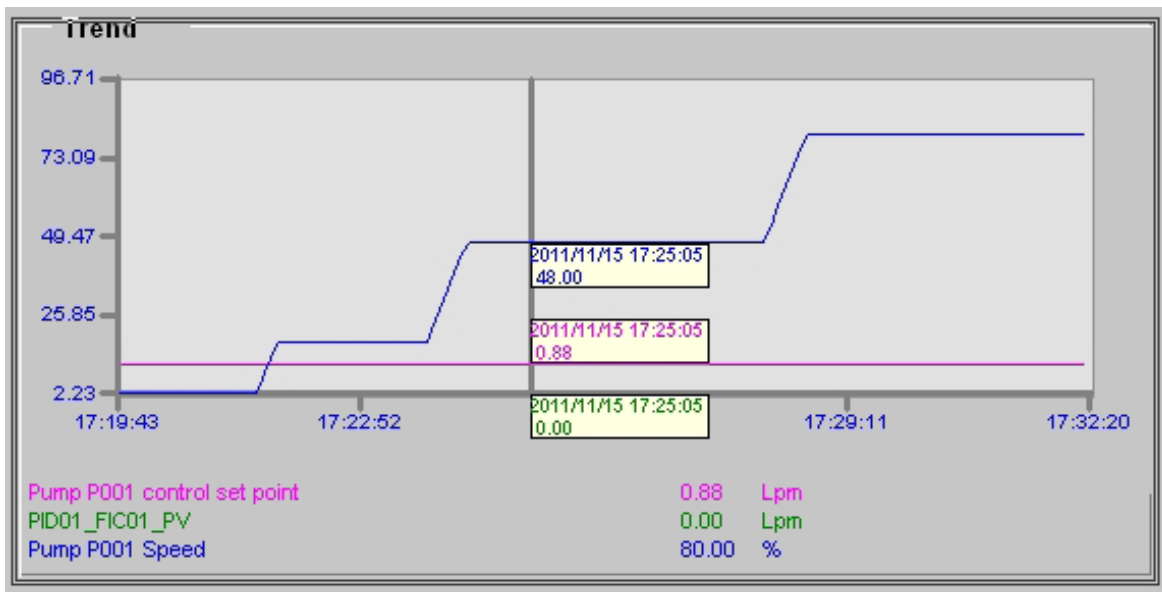
The X-Axis is time and defaults to a range of 20 minutes. The Y-Axis is scaled to match the minimum and maximum engineering units range of the selected tag.



Real Time Trend – Pump 1

Drag Bar

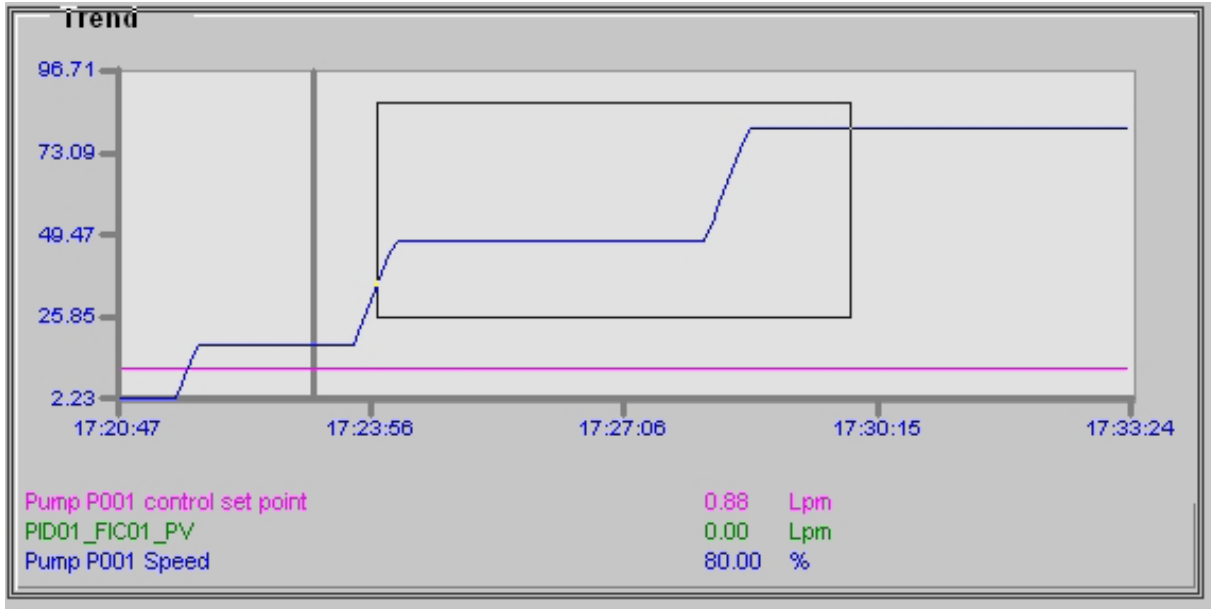
The gray, vertical line in the plotted area is a drag bar. Tag values at specific times can be viewed by clicking and dragging the Drag bar across the trend.



Real Time Trend – Drag Bar

Zoom In, Zoom Out

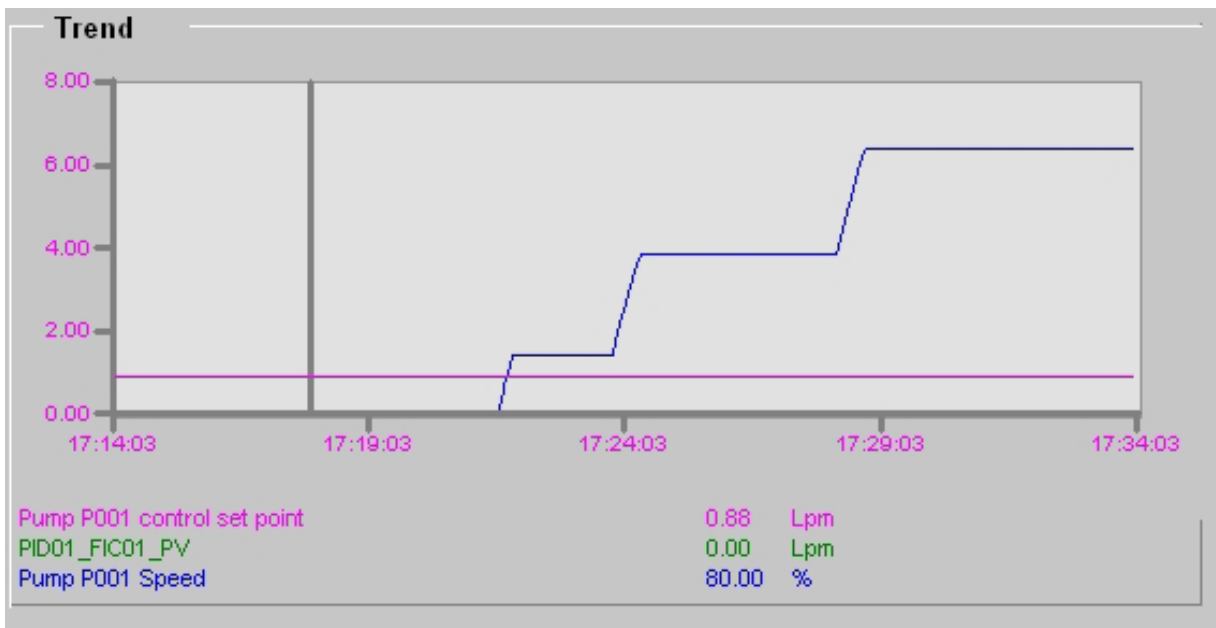
The user can zoom in on a selected plotted area by left clicking on the trend and dragging the box that appears to cover the desired area. Both the X and Y axis adjust to that new range. To zoom out, right click on the trend.



Real Time Trend – Zoom In

Change Y-Axis Scale

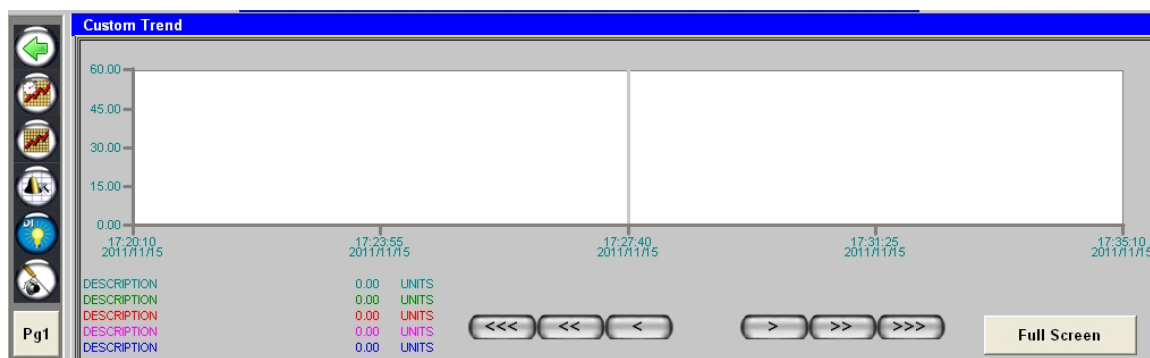
To change the Y-Axis scale to match a different tag in the trend, click on the desired tag under the trend. This will change the color of the axis labels to match the color of the tag name under the trend.



Real Time Trend – Different Y-Axis Scale

Custom Trend Display

The system includes custom trends that are accessed by clicking on the Custom Trend Icon in the Navigation Bar. The blank Custom Trend that is opened when the Custom Trend Icon is clicked is shown below.



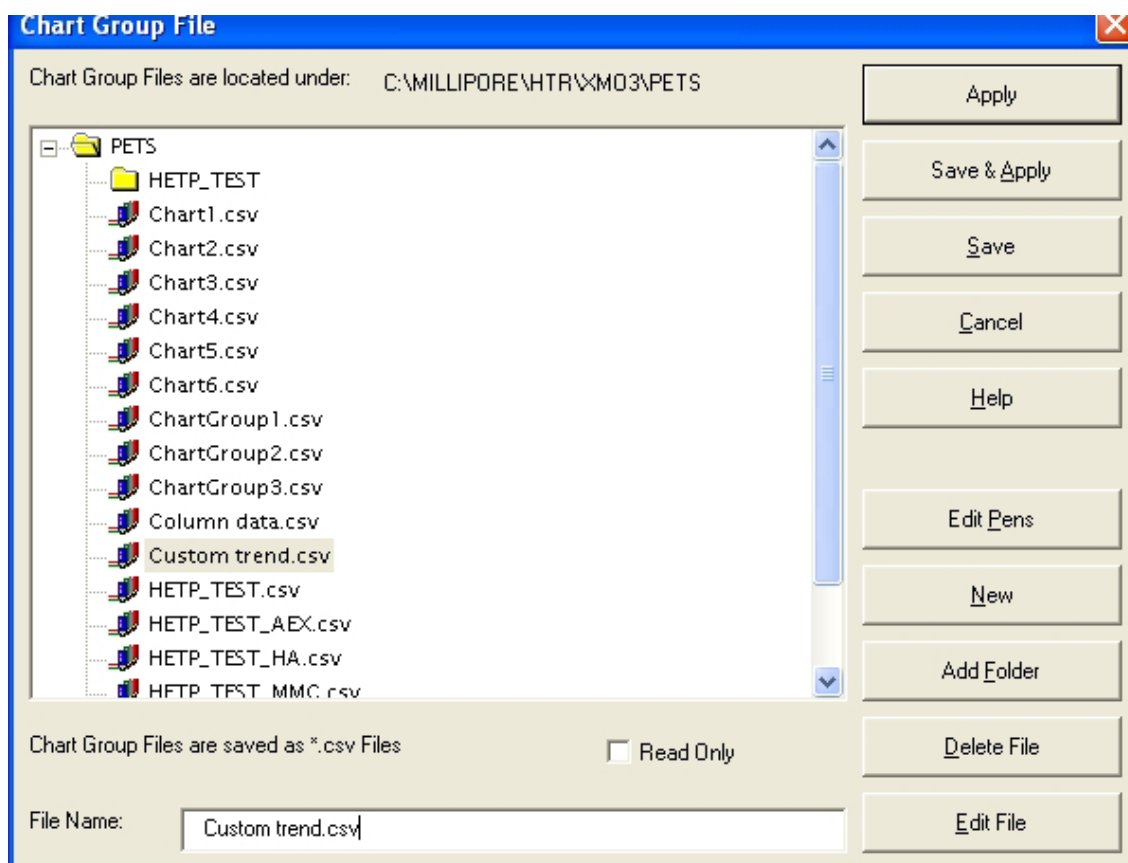
Custom Trend - Blank

Selecting Pre-Configured Trends

Double Clicking on the Plotted Area opens the Chart Group File Selection Screen. Existing Charts can be opened and edited and new charts can be created. Folders can also be created to help organize charts into logical groups.

Selecting a Chart Group File and clicking Apply will open that trend and return the user to the Process Display screen.

Detailed instructions on using the Custom Trend can be found in the Custom Trend Chapter of this document.



Custom Trend – Selecting Chart Group File

Security Overview

The security system consists of group accounts, user accounts and security areas. A typical system uses four group accounts: Operator, Supervisor, Engineer and System Administrator. Each user of the system belongs to a group account corresponding to the user's permitted access level.

The login name and password identify each user account. A user account assigns security privileges to a single user. Group accounts, application features and security areas are assigned to each user account. Login timeouts can also be assigned for each user. Different passwords restrict access to the system and only users belonging to group accounts with appropriate security privileges are permitted access to the security areas of the software. In ascending order of security level, the group accounts are: Operator, Supervisor, Engineer and System Administrator.

Pre-installed Group Accounts include:

- **Group**
- Operator
- Supervisor
- Engineer
- Administrator

The program acknowledges each user as having certain privileges, defined as application features and security areas. Security areas are sections of the software or process that are accessible only if a user account or the user's group account authorizes access to that security area. Application features are also defined for each group or user account. If an attempt is made to gain access to an unauthorized area, an "Unauthorized Access Attempt" message will flash on the screen.

Further detail on the security system is provided for the System Administrator in the Security chapter of this manual.

Standard Application Features

Application Feature	Sys Admin	Engineer	Supervisor	Operator
Database Manager	X	n/a	n/a	n/a
Workspace Runtime	X	X	X	X
Workspace Configure	X	n/a	n/a	n/a
Background Task Exit	X	X	X	n/a
Historical Trend Assign	X	X	n/a	n/a
System Configuration	X	X	n/a	n/a
Security Configuration	X	n/a	n/a	n/a
Runtime VB Editor Access	X	n/a	n/a	n/a
iFIX® – System Shutdown	X	X	X	n/a
Historical Trend Collection	X	X	n/a	n/a
Workspace Runtime Exit	X	X	X	n/a
Enable Task Switching	X	X	n/a	n/a
Enable <Ctrl> <Alt> 	X	X	n/a	n/a

Standard Security Areas

Security Area	Area ID	Sys Admin	Engineer	Supervisor	Operator
Manual Operation	1	X	X	X	n/a
Recipe Editor	2	X	X	X	n/a
Procedure Start	3	X	X	X	X
Procedure Abort	4	X	X	X	n/a
Alarms	5	X	X	X	n/a
PID Tuning	6	X	X	n/a	n/a
Loop Control	7	X	X	X	n/a
Flow Path	8	X	X	X	n/a
Setpoints	9	X	X	X	n/a
Maintenance	10	X	X	n/a	n/a
Configuration	11	X	X	n/a	n/a
Inlets	12	X	X	X	n/a
Calibration	13	X	X	X	n/a
PH Calibration	14	X	X	n/a	n/a
Recipe Parameters	15	X	X	n/a	n/a
Limited Launch	16	X	X	X	X
Process View	17	X	X	X	X
System Shutdown	18	X	n/a	n/a	n/a
EnterCV	19	X	X	X	X
Hardware Operations	20	X	n/a	n/a	n/a

Shutting Down the System

CAUTION

Close all programs and exit the Windows® application before switching off power to the computer. Failure to do so may damage any Historical Data files that are open when the computer loses power.

Only users with sufficient access privileges can close the System. If a user is logged into the User Interface with adequate access rights, the User Interface will have a Close button (✕) in the upper right-hand corner that will allow the user to close the User Interface and to get to the Windows® application desktop. When the Close button is selected, a confirmation dialog will appear to prevent accidental closure of the User Interface.

NOTE

If the Close button is not visible, the user must log on to the User Interface with a user ID that has sufficient privileges to shut down the system (see the *Security Overview* section of this chapter of the Security chapter of this document for more information).

Press the Close application button to close the User Interface and get to the Windows® application desktop.

On the Windows® desktop press the Start button and select Shut Down from the menu. A dialog box will appear giving the user several shutdown modes for the system. Make the selection and press the Yes button.

Press Shutdown Windows® to close the User Interface and shut down the Windows® application.

Press Cancel to get back to the User Interface.

TFF Using the System

Introduction

This section provides instructions on the use and functionality of the Mobius® FlexReady Smart Systems. Please review this section, in its entirety, before operating the system.

NOTE

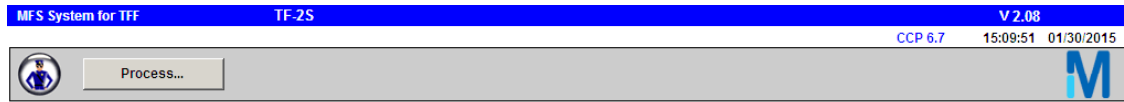
Within the software, the following references are used:

TF2S is referred to as TF2S

TF3S is referred to as TF3S


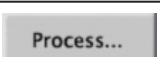
Starting the System

Powering up the system starts up the Common Control Platform® (CCP®) Software. The Start-up window displays after the system has completed the start-up process. This screen contains the Login button and the Process button. If a clamshell is installed, the clamshell type is shown at the top of the screen. The screen shots used throughout this chapter are from the TF2S system.



Start-up Window (TF2S)

The functions of the buttons in the Start-up window are summarized below.

Icon	Function	Description
	Login	Opens the Login dialog box, which prompts for a username and a password. The access level granted after login depends on the login information entered. This is the only button active when the system is locked.
		After logging in, clicking this button will open the User Interface.

Log into the User Interface by clicking on the Login icon and then entering a username and password into the Login Prompt. Every user should have a unique login name and password assigned to them by the system administrator. Enter the username and password and click the Login button.

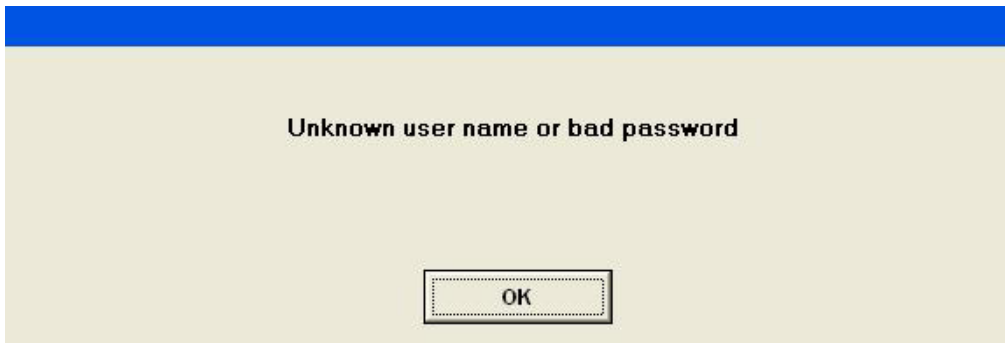


Login Prompt

The Logout button logs out the current user. The More button opens a new popup window that gives users access to a screen to change the user’s password.

Group accounts assign commonly used application features and security areas shared by several users. Refer to the *Security Overview* section in this chapter for general information and to the *Security* chapter of this manual for details on access control, group accounts and usernames.

If the login fails, the Unknown User Name or Bad Password message will appear.



Unknown User Name or Bad Password

If an attempt is made to gain access to the User Interface with unauthorized login information, an unauthorized access message will appear.



Unauthorized Access Message

After logging in, the Login Prompt closes and the Process button is activated. Click on the Process button to access the User Interface and operate the system.

Preparing the System for Operation

Installing the Clamshell

The system must be powered on to install the clamshell. See the following section *Door and Clamshell Control* for details on clamshell control.

The system automatically detects the type of clamshell installed based upon a unique IP address assigned to that piece of hardware. For IP addresses, see section *IP Address*.



Signature and Confirmation Setup

The Signature and Confirmation section of the Maintenance screen allows the user to select Signature and Confirmation options. To launch the Maintenance screen, click on the Maintenance icon in the Navigation Tool Bar.

The screenshot shows a 'Maintenance' screen with a blue header. Below the header are several buttons and sections:

- Analog / Digital
- Save Recipe Signature Off
- Acrobat Digital Signature Off
- Confirmation Required
- Electronic Signatures (with a sub-section containing 'Off')
- Preconfigured Comments

Signature and Confirmation Section of the Maintenance – Discrete Screen

Button	Function
Save Recipe Signature On/Off	When Save Recipe Signature is On, an electronic signature is required to save a recipe.
Acrobat Digital Signature On/Off	Click the button to turn the Adobe® Acrobat® digital signature functionality On or Off. When this is on, the Digital Signatures item on the Tools menu is enabled.
Confirmation Required	Click the appropriate button to select Confirmation Required or Confirmation Not Required. When Confirmation Required is selected, any input to the User Interface will trigger a prompt for confirmation.
Electronic Signatures	<p>Select configuration of the Electronic Signatures Form. To enable the Electronic Signatures function, Confirmation Required must be selected.</p> <p>Click the button to select one of the following:</p> <p>OFF: Turn off Electronic Signatures</p> <p>Perform Only: Require an Electronic Signature (user name and password) for any action performed</p> <p>Verify and Perform: Require a second Electronic Signature (user name and password), for verification, for any action performed</p>
Preconfigured Comments	The button on the Signature and Confirmation section of the Maintenance screen opens a text file in which users can enter comments that can be accessed in the Electronic Signature Forms Comments Drop Down List. Saving the text file is required to save any comments added to the text file.
Off/Perform Only/Verify and Perform	<p>Click the button to select one of the following:</p> <ul style="list-style-type: none"> • OFF to turn off Electronic Signatures. • Perform Only to require an Electronic Signature (user name and password) for any action performed. • Verify and Perform to require a second Electronic Signature (user name and password), for verification, for any action performed. • Depending on the configuration selected, the relevant portions of the Electronic Signatures Form will be displayed when an action is selected. Preconfigured comments from the drop down list or custom comments can be entered in the comments section.

Electronic Signatures

Description
XV022 Close

Performed By

User Name: ADMIN

Password:

Comments

OK Cancel

Electronic Signatures Form – Perform Only

Electronic Signatures

Description
XV022 Close

Performed By

User Name: ADMIN

Password:

Comments

Verified By

User Name:

Password:

Comments

OK Cancel

Electronic Signatures Form – Perform and Verify

Manually Controlling the System

The process can be manually controlled using the User Interface. The process is automatically controlled when it is being run by a recipe. See the Using the Recipe Editor section of this document for details on configuring automatic runs.

NOTE

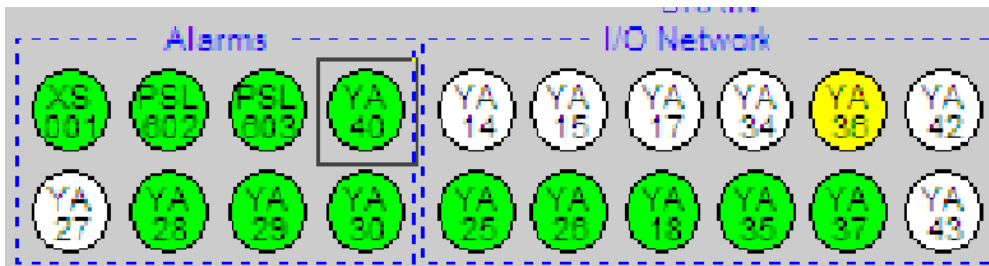
The user should be comfortable with all aspects of manual operation of the system before attempting to write operations using the Recipe Editor.

For example, to manually control a valve, the user can click on a valve and select Open or Close. Or to manually control the flow path of the system, the user can click on the Flowpath button and select the desired flow path to set the valve position.

I/O Network and Additional Alarms

Before the system can be used, all of the I/O Network and Additional Alarm states must NOT be in alarm. See the *Alarm Control* section of this chapter for more details on the behavior of alarms in this system.

All of these icons must be green for the system to operate properly. In the figure below, some of the icons are not green, therefore the system will not operate properly. Refer to the *Troubleshooting* chapter for more information.



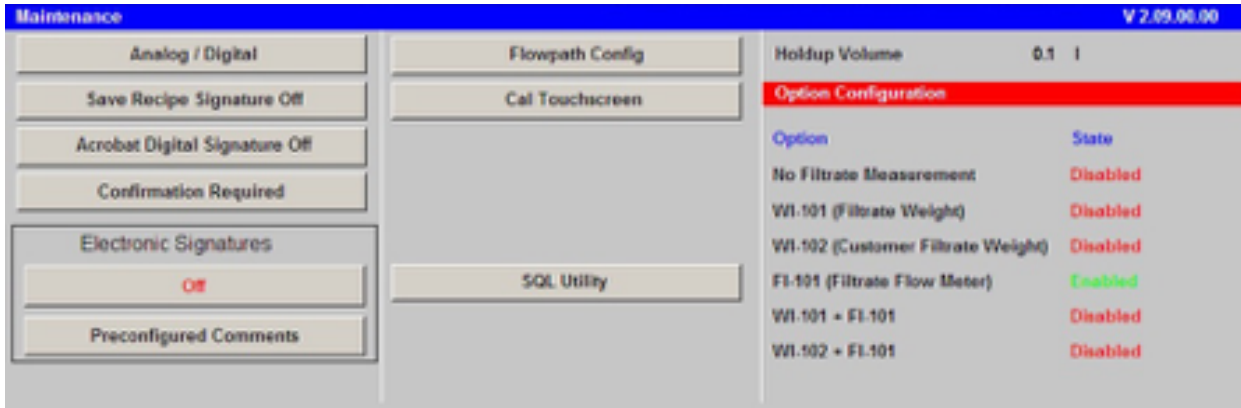
I/O Network and Additional Alarms

I/O Network Alarms		Additional Alarms	
Label	Description	Label	Description
YA14	Smart Station Communications Failure	XS001	Door Closed
YA15	Clamshell Station Communications Failure	PSL602	Valves Air Defect
YA17	Pump Station Communications Failure	PSL603	Manifold Valves Air Defect
YA34	Instrument Station Communications Failure (if UV or conductivity installed on the system)	YA40	SQL Server Write Fail
YA25	Smart Station Defect	YA27	Clamshell Locking Defect
YA26	Clamshell Station Defect	YA28	Historical Data Collection Failure
YA18	Pump Station Defect	YA29	HMI to PLC Communication Failure
YA35	Instrument Station Defect	YA30	CCP® Runtime Communication Failure
YA36	Tank Station Communication Failure	YA42	WI001 Station Communication Failure
YA37	Tank Station Defect	YA43	WI101 Station Communication Failure (if WI101 weight scale option enabled)

I/O Network and Additional Alarms

Process Display: Options

Before starting a process run, the optional equipment must be set in the Maintenance Status Display to match the equipment that will be used in the process.



Maintenance Status Display

The Mobius® FlexReady Smart System for TFF

Six options are available for the measurement of the weight/flow of the filtrate :

- No measurement
- Mobius® FlexReady System weight scale (WI101)
- User-supplied weight scale (WI102)
- Filtrate flowmeter (FI101) (option or user supplied)
- Both Mobius® FlexReady System weight scale (WI101) and filtrate flowmeter (FI101)
- Both user-supplied weight scale (WI102) and filtrate flowmeter (FI101)

Only one of these options can be selected at a time.

When one of the weight scales is in use, the Filtrate Flow is calculated based on the change in volume over time. The formula for calculating the Filtrate Flow is:

$$\text{Flow} = \Delta\text{Volume (L)} / \Delta\text{Time (min)}$$

The formula for calculating the change in Volume is:

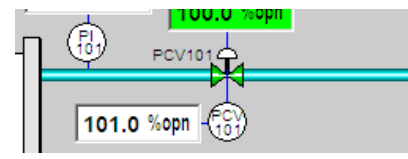
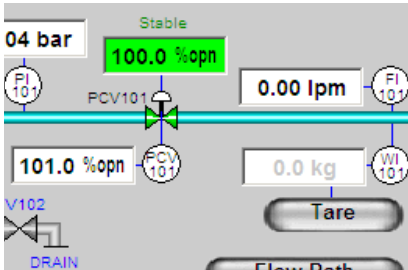
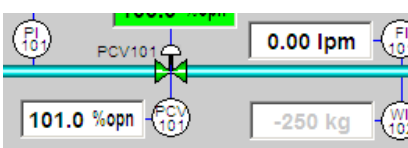
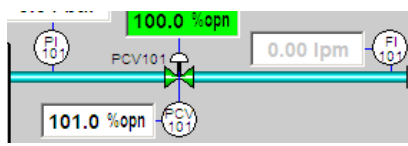
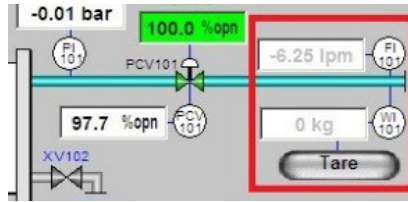
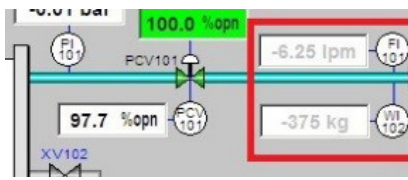
$$\Delta\text{Volume} = \Delta\text{Mass} / \text{Density}$$

The density is configured in the Parameters section of the Membrane Data Faceplate and the ΔMass comes from the weight scale.

To select an option, click on the Enabled/Disabled text on the right of the option. When a selection is made, all of the actions described in the Filtrate Measurement Options Table below will happen automatically and the Process Display will adjust accordingly.

When selecting the WI102 or the Filtrate Flow Meter options, a window appears to remind the user to update the ranges using Analog Setpoints of CCP® Recipe Editor and the alarm setpoints on the faceplate. Failure to update these values may cause undesirable behavior in the system.

Filtrate Measurement Options Table

Selection	Description	Process Display
No Filtrate Measurement	WI101, WI102 and FI101 devices will not be visible on the screen. All alarms for these devices will be disabled.	
WI101 (Filtrate Weight)	Mobius® Weight Scale enabled.	
	WI101 will be enabled, displayed and alarms will be active.	
	WI102 will be disabled, not displayed, and all alarms disabled.	
WI102 (User Supplied Filtrate Weight)	User-supplied weight scale enabled.	
	WI101 will be disabled, not displayed, and all alarms disabled.	
	WI102 will be enabled, displayed on UI and alarms will be active.	
FI101 (Optional or User-Supplied Filtrate Flow Meter)	Filtrate flow meter enabled.	
	WI101 and WI102 will be disabled, not displayed, and all alarms disabled.	
	FI101 will display the measured value from a flow meter and alarms will be active	
WI101 + FI101	Mobius® Weight Scale enabled and Filtrate Flow Meter Enabled.	
	WI102 will be disabled, not displayed, and all alarms disabled	
	WI101 will display the measured value from the weight scale and alarms will be active. FI101 will display the measured value from the flowmeter and alarms will be active.	
WI102 + FI101	User-supplied weight scale enabled and filtrate flow meter enabled.	
	WI101 will be disabled, not displayed, and all alarms disabled.	
	WI102 will display the measured value from the weight scale and alarms will be active. FI101 will display the measured value from the flowmeter and alarms will be active.	

Process Display: Optional IP Equipment

A UV Sensor and a Conductivity Meter can be connected to the system. The presence of these instruments on the Process Display is not configured through the User Interface. The system auto-detects them via the IP address assigned to the instruments when they are connected to the system via an Ethernet cable.

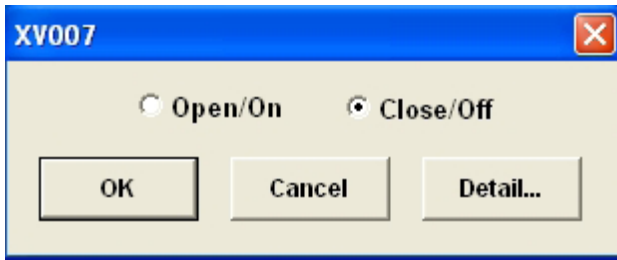
When detected, the instruments are automatically shown on the Process Display. The Optional IP Equipment Table shows how the Process Display changes to reflect the presence of the UV and Conductivity instruments. Please refer to the Maintenance section for IP addresses.

Optional IP Equipment Table

Selection	Description	Process Display
Neither UV or Conductivity Connected	UV and Conductivity Instruments are not visible on the Process Display	
UV Only	UV Instruments are visible. AI102: Primary Filtrate UV AI103: Secondary Filtrate UV XC102-3DF: C8000 Defect UV Zero: Button that turns UV auto zero on and off	
Conductivity Only	Conductivity Instrument is visible AI101: Filtrate Conductivity	
UV and Conductivity	UV and Conductivity instruments are visible.	
Conductivity and pH	Conductivity and pH instruments are visible.	
UV, Conductivity and pH	UV, Conductivity and pH instruments are visible.	



Process Display: Valve Control

All valves are two-way valves. When a valve is clicked on the Process Display, the Valve Control Prompt appears.



Valve prompt

The prompt opens with the opposite of the current valve state selected. This simplifies the valve control process by allowing the user to select OK to change the state of the valve.

Valves that are closed are gray . Valves that are open are green .

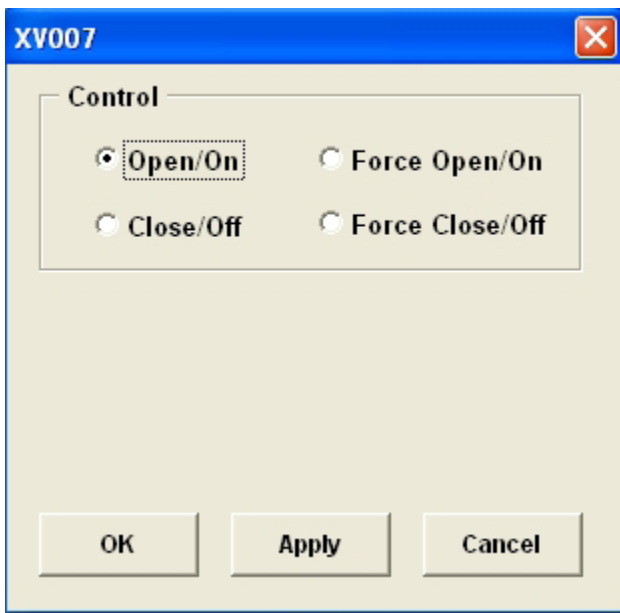
Auto or Manual Valve Control

Valves can be in two control states: Auto or Manual.

When in Auto, the initial valve state is defined by the recipe. The user can change the state of the valve through the Valve Control Prompt but the valve is still in Auto mode. That means that when the next Step of the recipe is initiated, the valve will enter the state defined by the recipe.

When in Manual, the valve state is defined by the user and will not change based upon any recipe defined state. For example, if a user Force Closes a valve but in the next step of the recipe that valve is called to be open, that valve will not respond to the recipe's defined valve state. When a valve is in the manual control state, its background flashes white to alert the user that the valve is being manually controlled and will not respond to recipe commands.

To put a valve in manual control, select the Detail button on the Valve Control Prompt. This opens the Valve Control Detail Prompt.



Valve Control detail prompt

This prompt allows the user to open and close the valves, just as in the regular Valve Control Prompt, and to force the valves opened or closed. It is the selection of the Force Open or Force Close command that puts the valve in manual control.

Default Button

The Default button will set the system to default state (confirmation required). The default state includes control of valves and flow path:

- Pumps off
- Mixer off
- All inlet valves closed
- Valves and pumps in the manual control state, remain manually controlled

The Filtrate and Retentate Pressure Control Valves (PCV001 and PCV101) are NOT affected by the Default button.

All Auto Button

Clicking the All Auto button returns all valves and pumps to auto control and to the state defined by the recipe, undoing any manual changes.



Default and All Auto Buttons

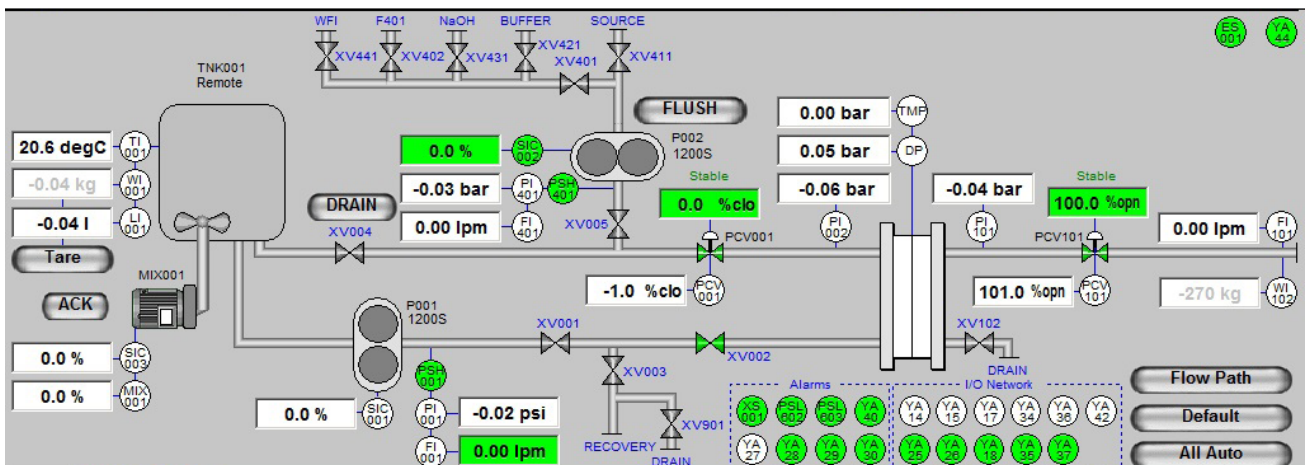
Process Display: Flow Path

The flow path changes colors based upon the state of the valves and the state of the pump. These variables combine to create three unique flow path states, each state being indicated by the flow path's color.

Flow Path Closed

The states of the valves between inlets and the outlets do not allow for an open flow path.

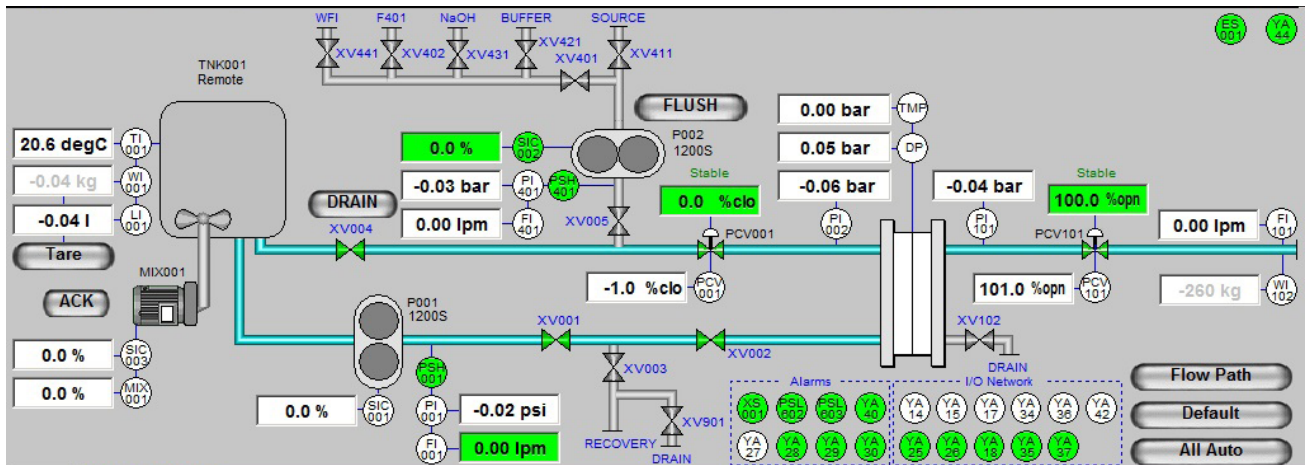
Flow Path Color: Gray



Flow Path Open with Pumps Off

The states of the valves between inlets and the outlets allow for an open flow path but the pumps are off.

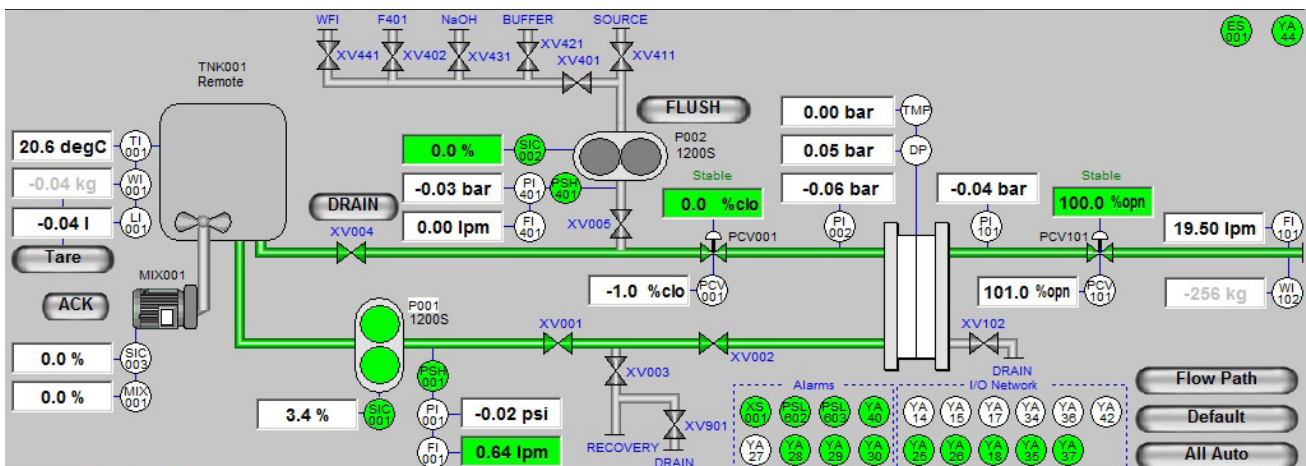
Flow Path Color: Blue



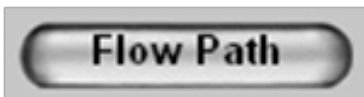
Flow Path Open and Pumps On

The states of the valves between inlets and the outlets allow for an open flow path and the pumps are on. Material is flowing through the system.

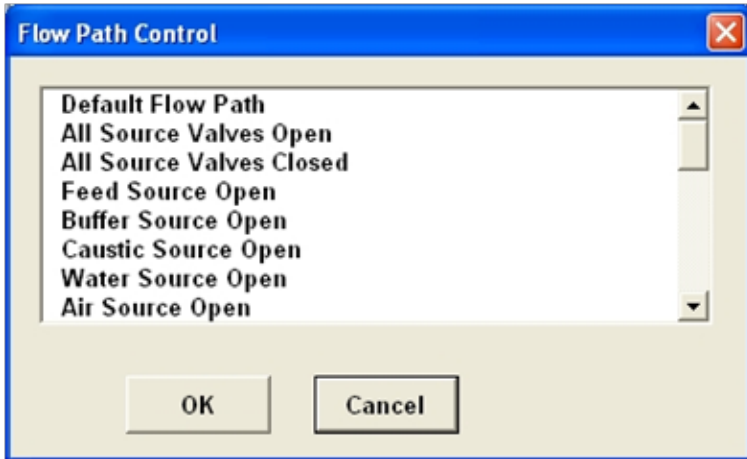
Flow Path Color: Green



Flow Path Button



The Flow Path button opens a menu box where predefined flow paths can be selected. Click on a flowpath and click OK to implement a flowpath.



Flow Path Selection

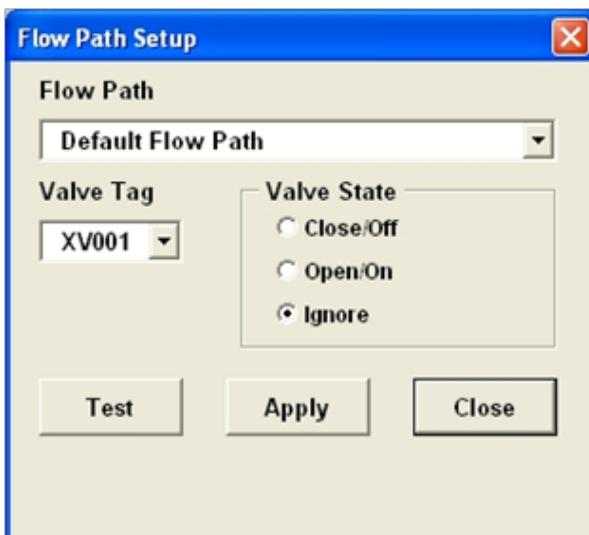
Flow Path Configuration



The flow paths are defined in the Maintenance Status Display by clicking on the Flowpath Config button and then naming and defining a flow path.

To define a flowpath:

1. Select the flowpath from the Flow Path drop-down menu.
2. Select a valve from the Valve Tag drop-down menu.
3. Select the valve state for that flow path:
 Close/Off: puts the valve in the closed state
 Open/On: puts the valve in the opened state
 Ignore: the valve state is not affected when the flowpath is chosen.
4. Click Test to see the new flowpath displayed on the Process Display
5. Click Apply to apply the changes to the selected Flow Path.
6. Click Close to close the Flow Path Setup window.



Flow Path Setup

TF2S Default Flowpath Valve Assignment

The table below shows the original valve states for all of the preconfigured flowpaths.

Flowpath Title	Flush Mode button activated (feed from inlet manifold, not recycle bag)	Drain Mode button activated (retentate is diverted to drain, not to recycle bag)	Feed Pump Outlet Valve (NO) XV-001	Membrane Feed Valve (NO) XV-002	Product Recovery Valve XV-003	Retentate Outlet Valve (NO) XV-004	Transfer Valve XV-005	Lower Filtrate Valve XV-102	Feed Drain Valve XV-901
Single Pass flush (from inlet manifold)	Y	Y	1	1	0	1	0	0	0
Single Pass Flush (from recycle bag)	N	Y	1	1	0	1	0	0	0
System Drain (without recycle bag)	Y	Y	1	1	1	1	0	1	1
System Drain (from recycle bag)	N	Y	1	1	1	1	1	1	1
Membrane Soak	N	N	1	1	0	0	0	0	0
Integrity Test	N	N	0	0	0	0	1	1	0
Recycle Bag Fill	N	N	0	0	0	1	1	0	0
Recycle Bag Drain	N	N	1	0	1	0	0	0	1
Recovery Filter Flush	N	N	1	0	1	0	0	0	0
Batch UF or Membrane Recycle	N	N	1	1	0	1	0	0	0
Fed Batch UF or Diafiltration	N	N	1	1	0	1	1	0	0
Product Recovery 1&3 - Empty Recycle Bag	N	N	1	0	1	0	0	0	0
Product Recovery 2 - Empty Retentate Line	N	N	0	0	0	1	1	0	0
Product Recovery 4 - Empty Membranes	N	N	0	1	1	0	1	0	0
All Main Flowpath Valves Open	N	N	1	1	1	1	1	1	1
All Main Flowpath Valves Closed	N	N	0	0	0	0	0	0	0
Default	N	N	1	1	0	1	0	0	0
All Source Valves Open	X	X	X	X	X	X	X	X	X
All Source Valves Closed	X	X	X	X	X	X	X	X	X
Feed Source Open	X	X	X	X	X	X	X	X	X
Buffer Source Open	X	X	X	X	X	X	X	X	X
Caustic Source Open	X	X	X	X	X	X	X	X	X
Water Source Open	X	X	X	X	X	X	X	X	X
Air Source Open	X	X	X	X	X	X	X	X	X

Flowpath Title	Transfer Line Deadleg Block Valve XV-401	Air Source Valve XV-402	Feed Source Valve XV-411	Buffer Source Valve XV-421	Caustic Source Valve XV-431	Water Source Valve XV-441	Retentate Control Valve (NO) PCV-001	Filtrate Control Valve PCV-101
Single Pass flush (from inlet manifold)	X	X	X	X	X	X	C	0, 1 or C
Single Pass Flush (from recycle bag)	X	X	X	X	X	X	C	0, 1, or C
System Drain (without recycle bag)	X	X	X	X	X	X	1	1
System Drain (from recycle bag)	X	X	X	X	X	X	1	1
Membrane Soak	X	X	X	X	X	X	1	0
Integrity Test	X	X	X	X	X	X	1	0
Recycle Bag Fill	X	X	X	X	X	X	0	X
Recycle Bag Drain	X	X	X	X	X	X	0	X
Recovery Filter Flush	X	X	X	X	X	X	0	X
Batch UF or Membrane Recycle	X	X	X	X	X	X	C	0, 1, or C
Fed Batch UF or Diafiltration	X	X	X	X	X	X	C	1 or C
Product Recovery 1&3 - Empty Recycle Bag	X	X	X	X	X	X	0	0
Product Recovery 2 - Empty Retentate Line	X	X	X	X	X	X	0	0
Product Recovery 4 - Empty Membranes	X	X	X	X	X	X	1	0
All Main Flowpath Valves Open	X	X	X	X	X	X	1	1
All Main Flowpath Valves Closed	X	X	X	X	X	X	0	0
Default	0	0	0	0	0	0	1	0
All Source Valves Open	1	1	1	1	1	1	X	X
All Source Valves Closed	0	0	0	0	0	0	X	X
Feed Source Open	0	0	1	0	0	0	X	X
Buffer Source Open	1	0	0	1	0	0	X	X
Caustic Source Open	1	0	0	0	1	0	X	X
Water Source Open	1	0	0	0	0	1	X	X
Air Source Open	1	1	0	0	0	0	X	X

1 = Valve in Open Position (regardless of NO/NC)

0 = Valve in Closed Position (regardless of NO/NC)

C = For control valves only - partially opened in control mode

X = Ignore Valve Position

Note: Although PCV-001 and PCV-101 states are not modified as part of flowpath alignments, their desired state is indicated in the table for each corresponding flowpath.

TF3S Default Flowpath Valve Assignment

The table below shows the original valve states for all of the preconfigured flowpaths.

Flowpath Title	Flush Mode button activated (feed from inlet manifold, not recycle bag)	Drain Mode button activated (retentate is diverted to drain, not to recycle bag)	Feed Pump Outlet Valve (NO) XV-001	Membrane Feed Valve (NO) XV-002	Product Recovery Valve XV-003	Retentate Outlet Valve (NO) XV-004	Transfer Valve XV-005	Lower Filtrate Valve XV-102	Feed Drain Valve XV-901
Single Pass flush (from inlet manifold)	Y	Y	1	1	0	1	0	0	0
Single Pass Flush (from recycle bag)	N	Y	1	1	0	1	0	0	0
System Drain (without recycle bag)	Y	Y	1	1	1	1	0	1	1
System Drain (from recycle bag)	N	Y	1	1	1	1	1	1	1
Membrane Soak	N	N	1	0	0	0	0	0	0
Integrity Test	N	N	0	0	0	0	1	1	0
Recycle Bag Fill	N	N	0	0	0	1	1	0	0
Recycle Bag Drain	N	N	1	1	1	0	0	0	1
Recovery Filter Flush	N	N	1	0	1	0	0	0	0
Batch UF or Membrane Recycle	N	N	1	1	0	1	0	0	0
Fed Batch UF or Diafiltration	N	N	1	1	0	1	1	0	0
Product Recovery 1&5 – Empty Recycle Bag	N	N	1	0	1	0	0	0	0
Product Recovery 2 – Empty Retentate Line	N	N	0	1	1	0	1	0	0
Product Recovery 3&g – Empty Bypass	N	N	0	1	1	0	1	0	0
Product Recovery 4 – Empty Retentate Line	N	N	0	0	0	1	1	0	0
All Main Flowpath Valves Open	N	N	1	1	1	1	1	1	1
All Main Flowpath Valves Closed	N	N	0	0	0	0	0	0	0
Default	N	N	1	1	0	1	0	0	0
All Source Valves Open	X	X	X	X	X	X	X	X	X
All Source Valves Closed	X	X	X	X	X	X	X	X	X
Feed Source Open	X	X	X	X	X	X	X	X	X
Buffer Source Open	X	X	X	X	X	X	X	X	X
Caustic Source Open	X	X	X	X	X	X	X	X	X
Water Source Open	X	X	X	X	X	X	X	X	X
Air Source Open	X	X	X	X	X	X	X	X	X

Flowpath Title	Lower Bypass Valve V-502	Upper Bypass Valve XV-501	Transfer Line Deadleg Block Valve XV-401	Air Source Valve XV-402	Feed Source Valve XV-411	Buffer Source Valve XV-421	Caustic Source Valve XV-431	Water Source Valve XV-441	Retentate Control Valve (NO) PCV-001	Filtrate Control Valve PCV-101
Single Pass flush (from inlet manifold)	0	0	X	X	X	X	X	X	C	0, 1 or C
Single Pass Flush (from recycle bag)	0	0	X	X	X	X	X	X	C	0, 1, or C
System Drain (without recycle bag)	0	0	X	X	X	X	X	X	1	1
System Drain (from recycle bag)	0	0	X	X	X	X	X	X	1	1
Membrane Soak	0	0	X	X	X	X	X	X	1	0
Integrity Test	0	0	X	X	X	X	X	X	1	0
Recycle Bag Fill	0	0	X	X	X	X	X	X	0	X
Recycle Bag Drain	0	0	X	X	X	X	X	X	0	X
Recovery Filter Flush	0	0	X	X	X	X	X	X	0	X
Batch UF or Membrane Recycle	0	0	X	X	X	X	X	X	C	0, 1, or C
Fed Batch UF or Diafiltration	0	0	X	X	X	X	X	X	C	1 or C
Product Recovery 1&5 – Empty Recycle Bag	0	0	X	X	X	X	X	X	1	0
Product Recovery 2 – Empty Retentate Line	0	0	X	X	X	X	X	X	1	0
Product Recovery 3&g – Empty Bypass	1	1	X	X	X	X	X	X	1	0
Product Recovery 4 – Empty Retentate Line	0	0	X	X	X	X	X	X	0	0
All Main Flowpath Valves Open	0	0	X	X	X	X	X	X	1	1
All Main Flowpath Valves Closed	0	0	X	X	X	X	X	X	0	0
Default	0	0	0	0	0	0	0	0	1	0
All Source Valves Open	0	0	1	1	1	1	1	1	X	X
All Source Valves Closed	0	0	0	0	0	0	0	0	X	X
Feed Source Open	0	0	0	0	1	0	0	0	X	X
Buffer Source Open	0	0	1	0	0	1	0	0	X	X
Caustic Source Open	0	0	1	0	0	0	1	0	X	X
Water Source Open	0	0	1	0	0	0	0	1	X	X
Air Source Open	0	0	1	1	0	0	0	0	X	X

1 = Valve in Open Position (regardless of NO/NC)

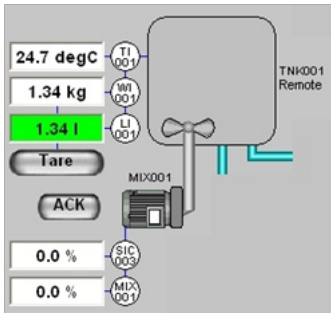
0 = Valve in Closed Position (regardless of NO/NC)

C = For control valves only - partially opened in control mode

X = Ignore Valve Position

Note: Although PCV-001 and PCV-101 states are not modified as part of flowpath alignments, their desired state is indicated in the table for each corresponding flowpath.

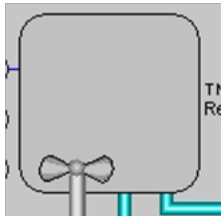
Process Display: Feed Bag Tank and Mixer Section



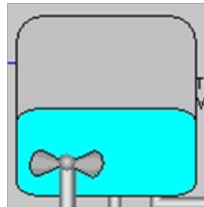
Process Display – Feed Bag Tank and Mixer Section

Feed Bag Tank and Mixer Graphics

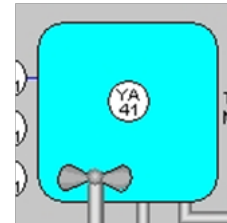
The Feed Bag Tank in the TF2S system is labeled TNK001 in the Process Display. This graphic changes depending on the Feed Bag Volume and state of the Tank Skid Size Mismatch Alarm (YA41).



Tank Empty with No Alarm

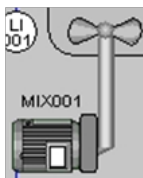


Tank Partially Filled with No Alarm



Tank Filled with Alarm

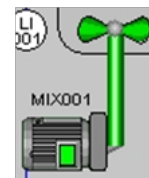
The Mixer in the TF2S system is labeled MIX001 in the Process Display. The mixer’s visual state changes depending on the state of the Mixer run and interlock statuses.



Mixer Stopped with No Interlock



Mixer Stopped with Interlock On



Mixer Running

The Mixer is interlocked when it is called to run (determined by auto/manual mode and setpoint) but the process is Held or the Feed Bag weight is below the minimum weight setpoint. The Mixer will not run until the interlock is cleared.

The Feed Bag and Mixer Objects and Descriptions table summarizes the details and functionality of the other instruments in the pump section of the Process Display

Feed Bag and Mixer Objects and Descriptions

Label	Description
TI001	Displays the status of the Feed Bag Temperature alarm. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section. The attached value is the current temperature in degrees Celsius.
WI001	Displays the status of the Feed Bag Weight alarm. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section. The attached value is the current weight in Kilograms.
LI001	Displays the status of the Feed Bag Volume alarm. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section. The attached value is the current volume in Liters.
SIC003	Displays the status of the Mixer Defect alarm. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section. The attached % is the Mixer Output Setpoint %. Clicking on the value opens the Pump Control Status Display Screen.
MIX001	Clicking on the instrument icon opens the Mixer Speed Point Faceplate in the Status Display section. The attached value is the Mixer Speed in %.
YA41	Displays the status of the Tank Skid Size Mismatch Alarm. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section. The icon is only visible when the alarm is active.
Remote/ Standalone	Displays the Tank Skid Remote/Standalone Status.
Tare	Zeros weight scale WI001.
ACK	Acknowledges alarm on the mixer when LOWLOW level alarm is reached.

Tank Configuration

Tank size, Weight Alarms and Level Alarms are configured in the Tank Configuration Status Display. This display is opened by clicking on the Tank Range Icon in the Navigation Toolbar.

The screenshot shows the Tank Configuration Status Display interface. It is divided into three main sections: 'Current Configuration', 'New Configuration', and 'Select Tank Size'. The 'Current Configuration' and 'New Configuration' sections each contain two tables for 'WI-001 Alarms' and 'LI-001 Alarms'. The 'WI-001 Alarms' table has columns for SP, LOLO, LO, HI, HIHI, and Status. The 'LI-001 Alarms' table has columns for SP, LOLO, LO, HI, HIHI, and Status. The 'Select Tank Size' section has radio buttons for Tank 50, Tank 100, and Tank 200 (which is selected), and an 'Accept' button at the bottom.

Tank Configuration Status Display

The left of the display shows the current configuration of the various tank parameters. The right shows the new configuration that will be applied when the Accept button is clicked.

To change a value, click the value on the right side of the screen and click accept. The values in the Current Configuration will update to reflect those changes.

Details on the Alarm Configuration can be found in the Alarm Control section of this chapter.

The size of the tank is automatically detected by the system upon starting the system through a unique IP address assigned to the tanks. (See the Maintenance section for details on the IP addresses.) Each tank size has its own unique set of setpoints that are automatically updated upon selecting the new tank.

Mixer Control

The mixer can be put in Auto or Manual Control. In Auto mode, the mixer turns on and off based on the recipe and setpoints. In Manual mode, the mixer turns on and off only by direct user input. Like the valves, the All Auto button will reset the mixer control mode to Auto.

In either mode, the mixer output % is dependent on the loop mode and setpoints configured in the associated Mixer Control Status Display Screen. See the next section for details on the Mixer Control Status Display and configuring the setpoints.

To set the mixer to Auto or Manual, click on the mixer. One of two pop-up windows is displayed depending on the current control mode. To switch control modes, click on the desired control mode. When in Manual mode, clicking the Run or Stop button will control the mixer accordingly.

Clicking the Detail button shows the Mixer Control Status Display. That window is also accessible by clicking the Mixer Control Icon on the Navigation Toolbar.



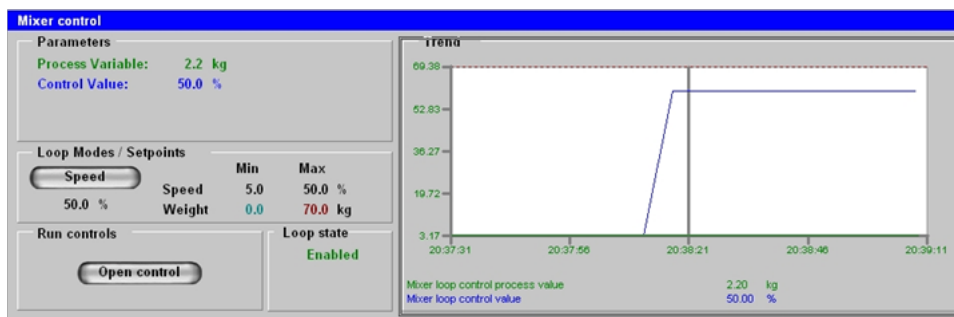
Mixer Control Mode Pop-Up – Mixer Currently in Auto



Mixer Control Mode Pop-Up – Mixer Currently in Manual

Mixer Control Status Display, Loop Modes and Setpoints

The Mixer Control Status Display is accessed either by clicking the Detail button on the Mixer Control Mode pop-up windows or by clicking the Mixer Control Icon on the Navigation Toolbar.



Mixer Control Status Display

Loop Modes and Setpoints

The system has two Loop Modes that control the Mixer output speed: Speed and Auto. The Loop Mode and associated Setpoints are configured in the Loop Modes/Setpoints section of the Mixer Control Status Display.

Loop Modes and Setpoint Summary

Loop Mode	Description	Range/Units	Weight Based Control
Speed	Sends a fixed output speed to the mixer.	0-100%	No
Auto	Mixer Speed is linearly related to the Feed Bag Weight according to the ranges defined for the Speed and Weight.	Speed: 0-100% Weight (depends on tank): 50L = 0-60kg 100L = 0-120kg 200L = 0-240kg	Yes

Mixer Speed Response to Feed Bag Weight Changes

Feed Bag Weight Condition	Action
Rises to low setpoint	Mixer starts and ramps up until low speed setpoint is reached.
Continues to rise	Mixer speed tracks linearly between low and high Setpoints.
High setpoint is reached	Mixer Runs at high speed setpoint.
Rises above high setpoint	Mixer continues to run at high speed setpoint.
Falls below high setpoint	Mixer slows down linearly between high and low Setpoints.
Falls below low Level Setpoint	Mixer stops.

To select a Loop Mode, click the Speed/Auto button. The text will change to indicate the current control mode.

To change the setpoint (SP) for the auto mode, click the current speed or weight SP value that needs to be changed. A data entry dialog box will appear and allow the user to edit the setpoint. The setpoint must be within the min and max value cited in the data entry dialog box.

To change the speed setpoint, click on the value under the Speed/Auto button. A data entry dialog box will appear and allow the user to edit the setpoint. The setpoint must be within the min and max value cited in the data entry dialog box.

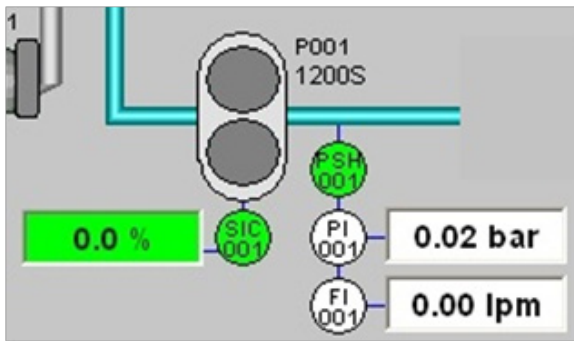
NOTE

The speed setpoint is only visible when in speed mode.

Control Parameters

Parameter	Description	Read/Write?
Process Variable (PV)	The current Feed Bag Weight in kg.	Read Only
Control Value (CV)	The current mixer output as a % of maximum speed.	Read Only

Process Display: Feed Pump Section



Process Display – Pump Section

Feed Pump Graphics

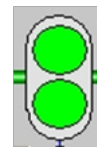
The feed pump is labeled P001 in the Process Display. The pump’s visual state changes depending on the state of the pump run and interlock statuses.



Pump Stopped
with No Interlock



Pump Stopped
with Interlock On



Pump Running

The pump is interlocked when it is called to run (determined by auto/manual mode and setpoint) but the flow path is not opened or the process is Held. The pump will not run until the interlock is cleared.

Pump Section Objects and Descriptions

Label	Description
FI001	Displays the calculated flow in liters per minute. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
PI001	Displays the current pump outlet pressure in bar. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
SIC001	Displays the status of the Pump Defect alarm. Clicking on the instrument icon opens the corresponding Point Faceplate in the Status Display section. The attached % is the Pump Output %. Clicking on the value opens the Pump Control Status Display Screen.
PSH001	Displays the status of the Pump High Pressure alarm. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section.

Feed Pump Auto/Manual Control

The Feed Pump can be put in Auto or Manual Control. In Auto mode, the pump turns on and off based on the recipe and setpoints. In Manual mode, the pump turns on and off only by direct user input. Like the valves, the All Auto button will reset the pump control mode to Auto.

In either mode, the pump output % is dependent on the loop mode and setpoints configured in the associated Pump Control Status Display Screen. See the next section for details on the Pump Control Status Display Screen and configuring the setpoints.

To switch between control modes, click on the Feed Pump. One of two pop-up windows is displayed depending on the current control mode. When in Manual mode, clicking the Run or Stop button will control the pump accordingly.

Clicking the Detail button shows the Pump Control Status Display. That window is also accessible by clicking the Run Control button in the Pump Control Status Display.



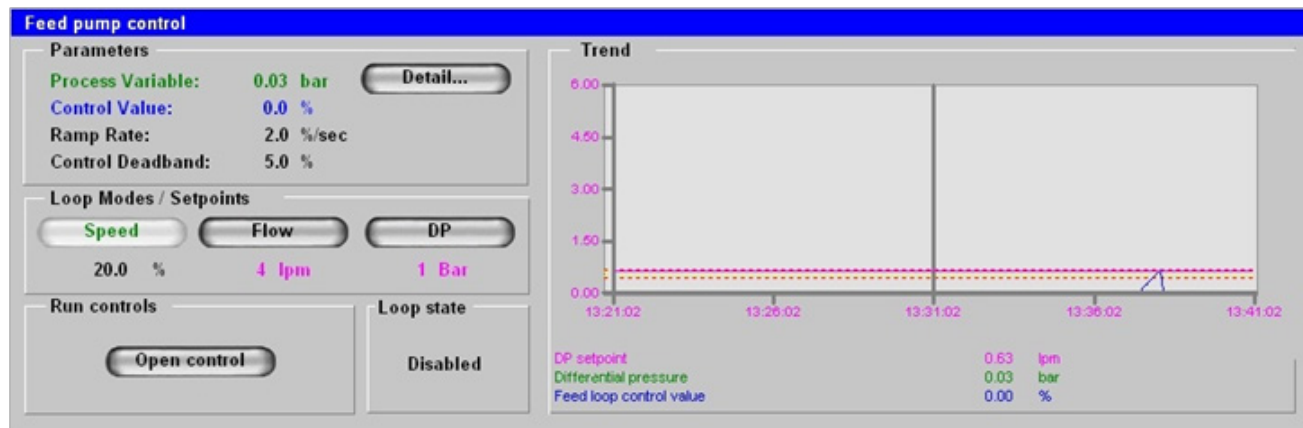
Pump Control Mode Pop-Up – Pump Currently in Auto



Pump Control Mode Pop-Up – Pump Currently in Manual

Pump Control Status Display

The Pump Control Status Display is accessed either by clicking the Detail button on the Pump Control Mode pop-up windows or by selecting the Feed Control Icon on the Navigation Tool Bar.



Feed Pump Control Status Display with the real-time Trend screen open



Feed Pump Control Status Display with the Detail screen open

Switch between the Trend and Details screens by clicking the Detail or Trend button in the Parameters section of the Status Display.

Loop Modes and Setpoints

The system has three Loop Modes that control the feed pump output speed: Speed, Flow and Differential Pressure. The Loop Mode and associated Setpoints are configured in the Loop Modes/Setpoints section of the Pump Control Status Display.

Loop Modes and Setpoints

Loop Mode	Description	Range/Units	PID Control?
Speed	Sends a fixed output speed to the pump.	0-100%	No
Flow	Pump output speed is the calculated CV of a PID control loop that uses Flow as the SP and feed pressure (PI001) as PV.	TF 2.5 m ² : 0-25 LPM TF-5.0 m ² -45 LMP	Yes
DP (Differential Pressure)	Pump output speed is the calculated CV of a PID control loop that uses filter differential pressure as the SP and PV.	0-6 bar	Yes

*See *Parameters and Loop Tuning* for an explanation of the variables used in PID control.

To select a Loop Mode, click the corresponding button. The text will turn green to indicate the mode has been selected.

To change the setpoint (SP) for the current mode, click the current SP value located under the button. A data entry dialog box will appear and allow the user to edit the setpoint. The setpoint must be within the min and max value cited in the data entry dialog box.

Parameters

Control Parameters

Parameter	Description	Read/Write?
Process Variable (PV)	The current PV units depend on the selected Loop Mode. If in Manual mode, no PV is displayed. If in Flow mode, the PV unit is in Lpm. If in Differential Pressure mode, the PV is in bar.	Read Only
Control Value (CV)	The current pump output speed as a % of maximum speed.	Read Only
Ramp Rate	The rate, in %/sec, at which the CV will increase or decrease to get the PV to a value equal to SP ± control deadband.	Writeable
Control Deadband	The range, as a % of SP, outside of which the PID control is disabled and the Ramp Rate is in effect. Within this range the PID loop is in control and the Ramp Rate is disabled.	Writeable

Loop Tuning Parameters

Parameter	Description	Read/Write?
Gain	Proportional value of PID control equation. The Proportional Gain setting affects all frequencies (unlike Integral and Derivative settings) and is the only setting that affects the middle frequency range.	Writable
Reset	Integral value of PID control equation. The Integral action is, in essence, responsible for keeping track of where the process has been, in order to correct for any process disturbances. The Integral value dominates the low frequency responses.	Writable

Parameter	Description	Read/Write?
Rate	Derivative value of PID control equation. The Derivative action provides for adequate forecasting of process disturbances, and may improve response time. Derivative dominates the high frequency responses.	Writable
Deadband	The Deadband is used by the PID loop and represents the tolerance of the PID loop. If the PV is within the deadband limit of the SP, the PID does not adjust the CV.	Writable
Stable Timer	If the PV is within the Control Deadband for that amount of time, the system is considered to be stable. This value is not used in the PID calculations.	Writable

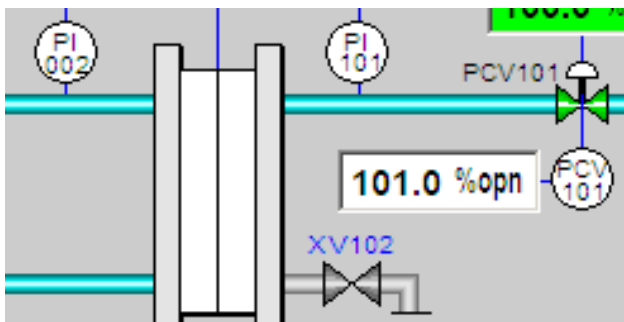
NOTE

The operator should need to adjust only the control setpoints.

Supervisor and Engineer level access is required to alter the PID loop tuning parameter.

These settings should be changed only by trained personnel. Individuals who are not well versed in PID loop tuning for process response should NOT alter these settings. Doing so may harm the equipment and will most probably have an adverse effect on a process.

Filter/Membrane Section



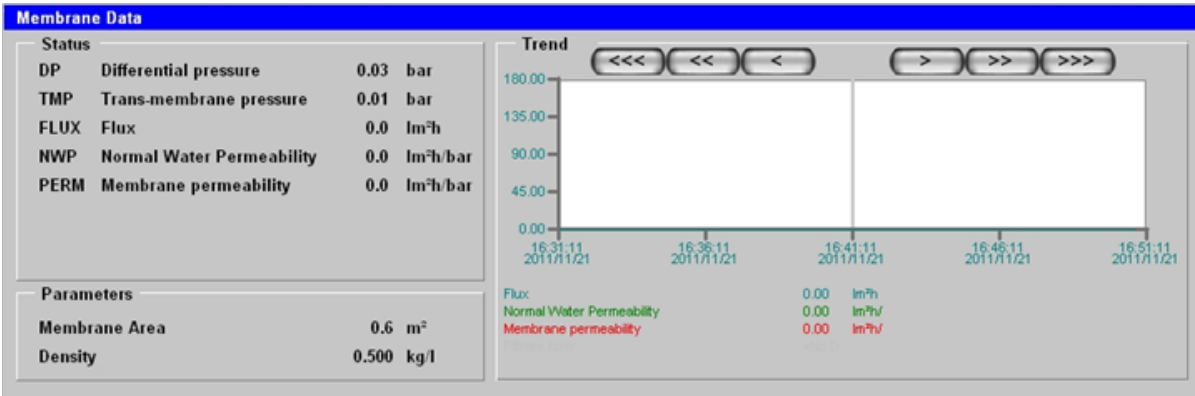
Process Display – Filter/Membrane Section

Filter/Membrane Section Objects and Descriptions

Label	Description
DP	Differential Pressure: Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section. The value on the left of the icon is the differential pressure in bar.
TMP	Trans-Membrane Pressure: Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section. The value on the right of the icon is the trans-membrane pressure in bar.

Membrane Data Status Display

The Membrane Data Status Display is accessed by clicking on the Filter on the Process Display or by selecting the Membrane Data Faceplate Icon on the Navigation Tool Bar. The Membrane Data Status Display has all values and configurable parameters relating to the membrane and a trend of Flux, Normal Water Permeability and Membrane Permeability.



Membrane Data Status Display

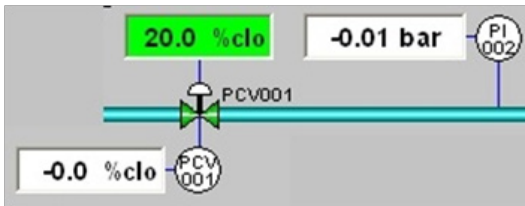
Membrane Data Status and Parameter Values

Value	Description	Units	Read/Write?
DP	Differential Pressure: The difference in pressure between the feed pressure (PI001) and the Retentate pressure (PI002). DP = PI001 - PI002	bar	Read Only
TMP	Trans-Membrane Pressure: TMP = ((PI001 + PI002) / 2) - PI101	bar	Read Only
FLUX	Flux: Volume that passes through the membrane per hour per square meter of membrane area. FLUX = FI101 x 60 / Membrane Area	L/(m ² h) displayed as Lm ² h	Read Only
NWP	Normalized Water Permeability: Calculated permeability, based on Flux, TMP and a Temperature Compensation Factor (TCF) at 25 °C NWP = (FLUX / TMP)* TCF	L/(m ² hbar) displayed as Lm ² h/bar	Read Only
PERM	Membrane Permeability: Calculated permeability based on Flux and TMP. PERM = (FLUX / TMP)	L/(m ² hbar) displayed as Lm ² h/bar	Read Only
Membrane Area	Membrane area in square meters: Used by the system in various calculations.	m ²	Writable
Density	Density: The density of the solution in kilograms per Liter.	kg/L	Writable

To change the value of a writable parameter, click the current numerical value. A data entry dialog box will appear and allow the user to edit the value. Note that the new value must be within the min and max value cited in the data entry dialog box.

Retentate Pressure Control Section

The Retentate Pressure Control Valve controls the Retentate pressure thereby affecting the Trans-Membrane Pressure.



Process Display – Retentate Section

Retentate Objects and Descriptions

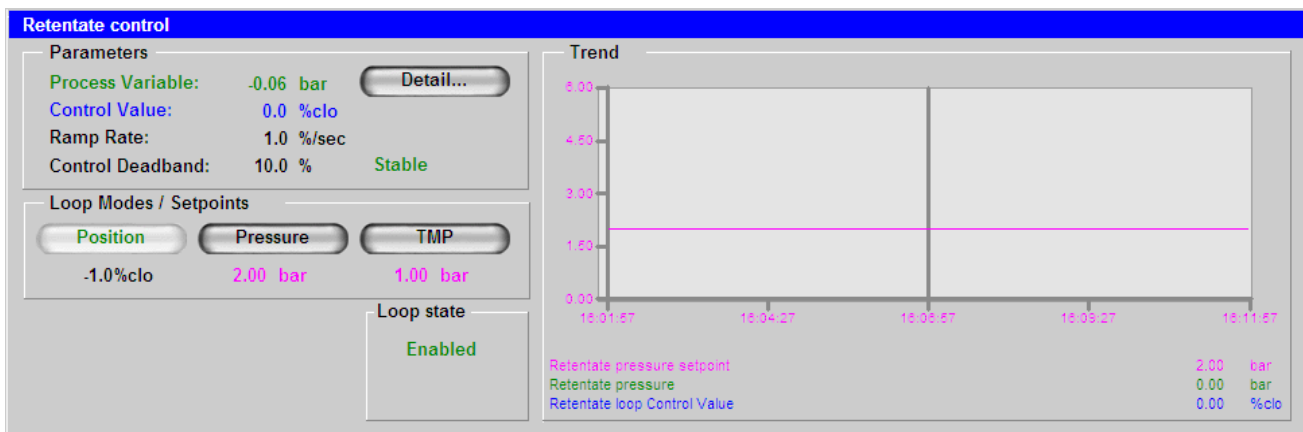
Label	Description
PI002	Retentate pressure indicator. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section. The value on the left of the icon is the retentate pressure in bar.
PCV001	Retentate Pressure Control Valve. The value above the valve is the control value of the valve (% closed that the valve is commanded to be closed). Clicking on that value opens the Retentate Control Status Display. The value below the valve displays the actual valve position in % that the valve is closed. Clicking on the round PCV001 Icon opens the corresponding Analog Point Faceplate in the Status Display section.

NOTE

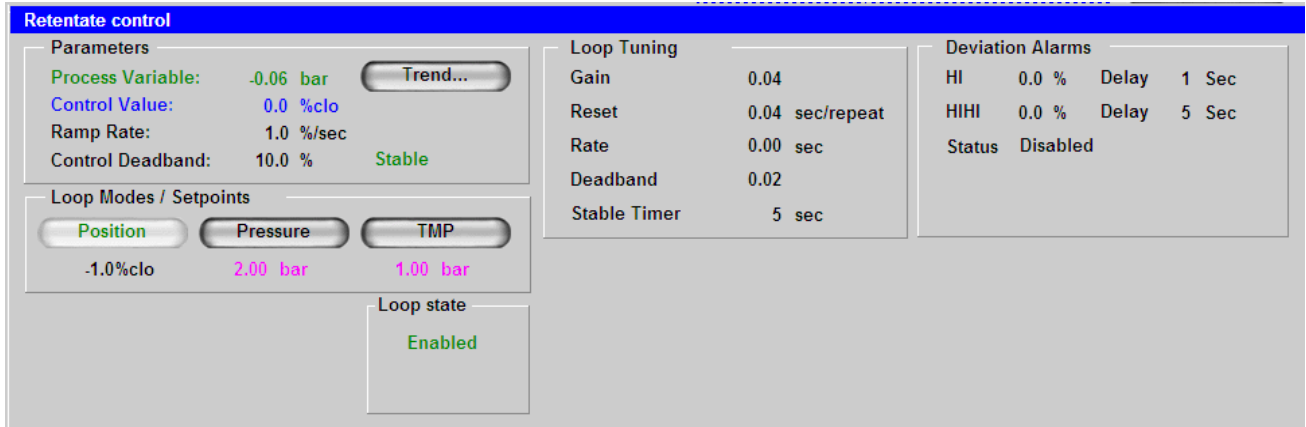
The retentate pressure control valve uses and displays the valve position as % closed, where the filtrate pressure control valve uses and displays the valve position as % open.

Retentate Control Status Display

The Retentate Control Status Display is accessed either by clicking the control value of the valve above the PCV001 valve or by selecting the Retentate Control Icon on the Navigation Tool Bar.



Retentate Control Status Display with the real-time Trend screen open



Retentate Control Status Display with the Detail screen open

Switch between the Trend and Detail views by clicking in the Detail or Trend button in the Parameter section of the Status Display.

Loop Modes and Setpoints

The system has three Loop Modes that control the Retentate Pressure Control Valve position (%closed): Manual, Retentate Pressure and Trans-Membrane Pressure. The Loop Mode and associated Setpoints are configured in the Loop Modes/Setpoints section of the Retentate Control Status Display.

Loop Modes and Setpoint

Loop Mode	Description	Range/Units	PID Control?
Position	Sends a fixed % closed value to the valve.	0-100%	No
Pressure	Valve % closed is the calculated CV of a PID control loop that uses Retentate Pressure as the SP and PV. Pressure PV comes from PI002.	0-6 bar	Yes
TMP	Valve % closed is the calculated CV of a PID control loop that uses Trans-Membrane pressure as the SP and PV.	0-6 bar	Yes

See the section Parameter and Loop Tuning for an explanation of the variables used in PID control.

To select a Loop Mode, click the corresponding button. The text will turn green to indicate that mode has been selected.

To change the setpoint (SP) for the current mode, click the current SP value that is located under the button. A data entry dialog box will appear and allow the user to edit the setpoint. The setpoint must be within the min and max value in the data entry dialog box.

When the valve’s position is between 0 and 10% or between 95 and 100%, the response of the valve may be delayed from 30 seconds up to one minute.

The Permeate loop works without any interlocks.

If the retentive loop is currently being controlled on TMP, and if the Permeate loop is set to be controlled on TMP, the Retentate will be automatically switch to % setpoint.

The Retentate loop has the following TMP interlocks:

- Loop control by TMP is not available under the following conditions:
 - Permeate loops enabled

- Permeate TMP is selected

If the permeate valve is 100% open, irrespective of loop control type

When the Permeate is 100% open, then the Retentate can be controlled on TMP.

The default for the Retentate loop control is by % setpoint. When a recipe ends this will be the loop control type. If the control type is TMP by the end of recipe, it will be disabled, and set to % setpoint type.

Control Parameters

Parameter	Description	Read/Write?
Process Variable (PV)	The current PV unit is in bar. If in Manual or Pressure mode, the PV comes from PI002. If in TMP mode, the PV comes from TMP.	Read Only
Control Value (CV)	The current Valve % closed command, in %.	Read Only
Ramp Rate	The rate, in %/sec, at which the CV will increase or decrease to get the PV to a value equal to the SP \pm the control deadband.	Writeable
Control Deadband	The range, as a % of SP, outside of which the PID control is disabled and the Ramp Rate is in effect. Within this range the PID loop is in control and the Ramp Rate is disabled.	Writeable

Loop Tuning Parameters

Parameter	Description	Read/Write?
Gain	Proportional value of PID control equation. The Proportional Gain setting affects all frequencies (unlike Integral and Derivative settings) and is the only setting that affects the middle frequency range.	Writable
Reset	Integral value of PID control equation. The Integral action is, in essence, responsible for keeping track of where the process has been, in order to correct for any process disturbances. The Integral value dominates the low frequency responses.	Writable
Rate	Derivative value of PID control equation. The Derivative action provides for adequate forecasting of process disturbances, and may improve response time. Derivative dominates the high frequency responses.	Writable
Deadband	The Deadband is used by the PID loop and represents the tolerance of the PID loop. If the PV is within the deadband limit of the SP, the PID does not adjust the CV.	Writable
Stable Timer	If the PV is within the Control Deadband for that amount of time, the system is considered to be stable. This value is not used in the PID calculations.	Writable

NOTE

The operator should need to adjust only the setpoints.

Supervisor and Engineer level access is required to alter the PID loop control parameters. These settings should be changed only by trained personnel. Individuals who are not well versed in PID loop tuning for process response should NOT alter these settings. Doing so may harm the equipment and will most probably have an adverse effect on a process.

Tuning PCV001

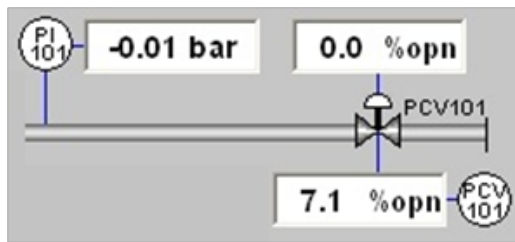
The PCV001 Tuning is available by clicking the Analog/Digital button in the Maintenance Status Display screen. This is used to calibrate the valves when changing the valve pads.

Maintenance		Tag	Value
Tune PCV001		SIC001	0.0 %
Tune PCV101		SIC002	0.0 %
		SIC003	0.0 %
		PCV001	0.0 %
		PCV101	100.0 %

Pressure Valve Control Status Display

Filtrate Pressure Control

The Filtrate Pressure Control Valve provides backpressure to the system and controls the rate at which the filtrate exits the system.



Process Display – Filtrate Section

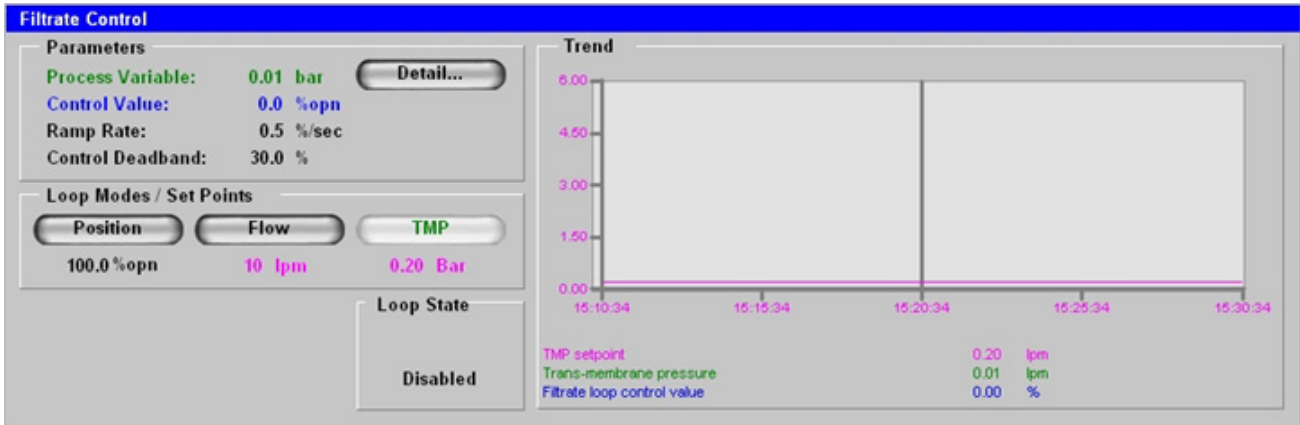
This figure does not show any of the optional equipment available with the TF2S system. See the *Process Display: Direct Connect Options* section of this document for details on the optional equipment and the corresponding changes to the Process Display.

Filtrate Objects and Descriptions

Label	Description
PI101	Filtrate pressure indicator. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section. The value on the right of the icon is the filtrate pressure in bar.
PCV101	Filtrate Pressure Control Valve. The value above the valve is the control value of the valve (% open that the valve is commanded to be open). Clicking on that value opens the Filtrate Control Status Display. The value below the valve displays the actual valve position in % that the valve is open. Clicking on the round PCV101 Icon opens the corresponding Analog Point Faceplate in the Status Display section.

Filtrate Control Status Display

The Filtrate Control Status Display is accessed either by clicking the control value of the valve above the PCV101 valve or by selecting the Filtrate Control Icon on the Navigation Tool Bar.



Filtrate Control Status Display with the Real-time Trend screen open.



Filtrate Control Status Display with the Detail screen open.

The views are switched between the Trend and Details by clicking in the Detail or Trend button in the Parameters section of the Status Display.

Loop Modes and Setpoints

The system has three Loop Modes that control the Filtrate Pressure Control Valve position (%open): Position, Flow and Trans-Membrane Pressure. The Loop Mode and associated Setpoints are configured in the Loop Modes/Setpoints section of the Filtrate Control Status Display.

Loop Modes and Setpoint Summary

Loop Mode	Description	Range/Units	PID Control?
Position	Sends a fixed % open value to the valve.	0-100%	No
Flow	Valve % open is the calculated CV of a PID control loop that uses Filtrate Flow as the SP and PV. Flow PV comes from FI101. NOTE: If the Filtrate Flow Option is disabled, there is no flow value and this loop mode cannot be used as a control.	TF 2.5 m ² : 0-15 LPM TF 5.0 m ² - 25 LPM	Yes
TMP	Valve % open is the calculated CV of a PID control loop that uses Trans-Membrane pressure as the SP and PV.	0-6 bar	Yes

See the section *Parameters and Loop Tuning* for an explanation of the variables used in PID control.

To select a Loop Mode, click the corresponding button. The text will turn green to indicate that mode has been selected.

To change the setpoint (SP) for the current mode, click the current SP value that is located under the button. A data entry dialog box will appear and allow the user to edit the setpoint. Note that the setpoint must be within the min and max value cited in the data entry dialog box.

The TMP mode on the Filtrate side cannot be activated if the TMP on the Retentate side is activated.

Control Parameters

Parameter	Description	Read/Write?
Process Variable (PV)	The current PV units depend on the selected Loop Mode. If in Flow mode, the PV is in Lpm. If in TMP mode, the PV is in bar.	Read Only
Control Value (CV)	The current Valve % open command, in %.	Read Only
Ramp Rate	The rate, in %/sec, at which the CV will increase or decrease to get the PV to a value equal to the SP ± the control deadband.	Writeable
Control Deadband	The range, as a % of SP, outside of which the PID control is disabled and the Ramp Rate is in effect. Within this range the PID loop is in control and the Ramp Rate is disabled.	Writeable

Loop Tuning Parameters

Parameter	Description	Read/Write?
Gain	Proportional value of PID control equation. The Proportional Gain setting affects all frequencies (unlike Integral and Derivative settings) and is the only setting that affects the middle frequency range.	Writable
Reset	Integral value of PID control equation. The Integral action is, in essence, responsible for keeping track of where the process has been, in order to correct for any process disturbances. The Integral value dominates the low frequency responses.	Writable
Rate	Derivative value of PID control equation. The Derivative action provides for adequate forecasting of process disturbances, and may improve response time. Derivative dominates the high frequency responses.	Writable
Deadband	The Deadband is used by the PID loop and represents the tolerance of the PID loop. If the PV is within the deadband limit of the SP, the PID does not adjust the CV	Writable
Stable Timer	If the PV is within the Control Deadband for that amount of time, the system is considered to be stable. This value is not used in the PID calculations.	Writable

NOTE

The operator should need to adjust only the setpoints.

Supervisor and Engineer level access are required to alter the PID loop control parameters. These settings should be changed only by trained personnel. Individuals who are not well versed in PID loop tuning for process response should NOT alter these settings. Doing so may harm the equipment and will most probably have an adverse effect on a process.

Tuning PCV101

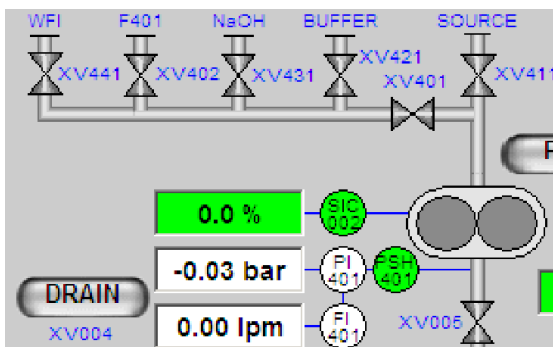
The PCV101 Tuning is available by clicking the Analog/Digital button in the Maintenance Status Display screen. This is used to calibrate the valves when changing the valve pads.

Maintenance	
Tune PCV001	
Tune PCV101	
Tag	Value
SIC001	0.0 %
SIC002	0.0 %
SIC003	0.0 %
PCV001	0.0 %
PCV101	100.0 %

Pressure Valve Control Status Display

Transfer Pump and Inlets Section

The Transfer Pump and the attached Inlets are used to control the level in the feedbag and to add various solutions into the system. Diafiltration is an example of a scenario where the Transfer Pump would be used to maintain the system volume by replacing the volume lost to the filtrate.

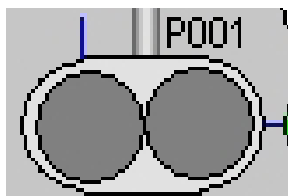


Process Display – Level Control and Inlet Section

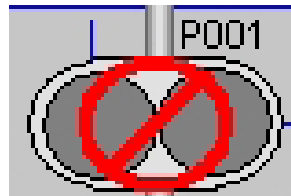
Process Display: Inlets and Pump Section

Pump Graphics

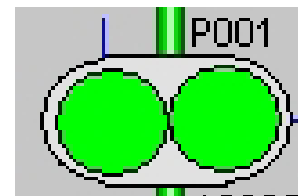
The Transfer Pump in the TF2S system is labeled P002 in the Process Display. The pump's visual state changes depending on the state of the pump run and interlock statuses:



Pump Stopped with No Interlock



Pump Stopped with Interlock On

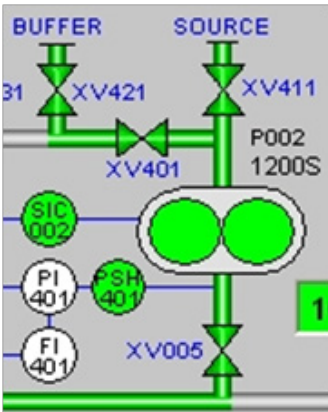


Pump Running

Pump Graphics

The pump is interlocked when it is called to run (determined by auto/manual mode and setpoint) but the flow path is not opened or the process is held. The pump will not run until the interlock is cleared.

The inlet valves behave the same as other valves, they turn green when open and gray when closed.



Inlet Valves Open and Pump Running

Pump Section Objects and Descriptions

Label	Description
FI401	Displays the calculated flow in liters per minute. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
PI401	Displays the current pump outlet pressure in bar. Clicking on the instrument icon opens the corresponding Analog Point Faceplate in the Status Display section.
SIC002	Displays the status of the Pump Defect alarm. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section. The attached % is the Pump Output %. Clicking on the value opens the Pump Control Status Display Screen.
PSH401	Displays the status of the Pump High Pressure alarm. Clicking on the instrument icon opens the corresponding Digital Point Faceplate in the Status Display section.

Inlet Control

Adding solution, such as a buffer or sodium hydroxide (NaOH), to the feedbag is accomplished by opening the appropriate valves.

XV005 must be opened and the pump running for any solution to enter the flow path.

To add volume from the source, XV005 and XV411 must be open.

To add volume from one of the additional chemicals, XV005, XV401 and the corresponding valve under the inlet label must be open

Clicking on the valve opens the valve control prompt, in which the valve state can be selected. See the section Process Display: Valve Control for more details on valve control.

Pump Control

Transfer Pump Auto/Manual Control

The Transfer Pump can be put in Auto or Manual Control. In Auto mode, the pump turns on and off based on the recipe and setpoints. In Manual mode, the pump turns on and off only by direct user input. Like the valves, the All Auto button will reset the pump control mode to Auto.

In either mode, the pump output % is dependent on the loop mode and setpoints configured in the associated Level Control Status Display. See the next section for details on the Level Control Status Display and configuring the setpoints.

To switch between control modes, click on the Transfer Pump. One of two pop-up windows is displayed depending on the current control mode. When in Manual mode, clicking the Run or Stop button will control the pump accordingly.

Clicking the Detail button shows the Level Control Status Display. That window is also accessible by clicking the Level Control button in the Navigation Toolbar.

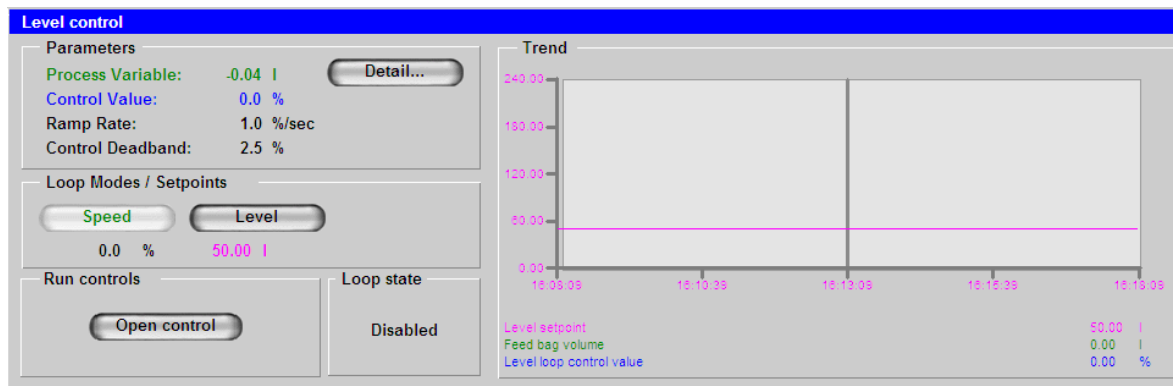


Pump Control Mode Pop-Up

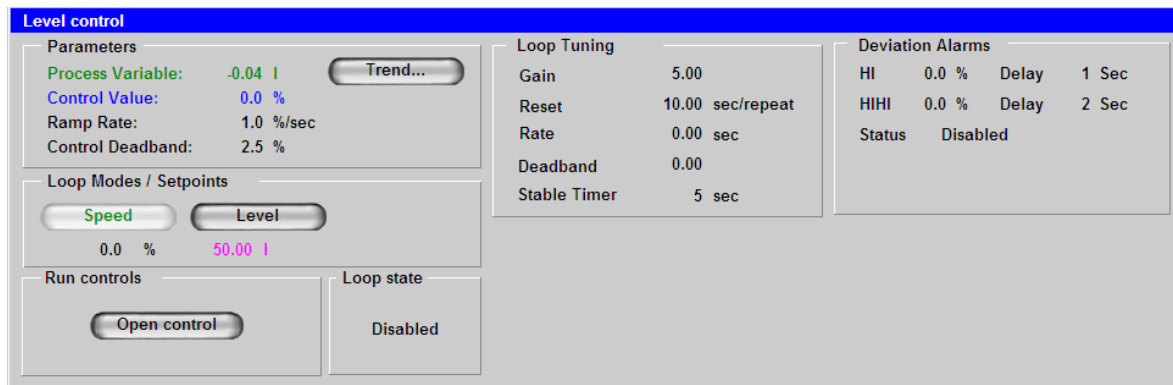
Level Control Status Display, Loop Modes and Setpoints

Level Control Status Display

The Level Control Status Display is accessed either by clicking the Detail button on the Pump Control Mode pop-up window or by selecting the Level Control Icon on the Navigation Tool Bar.



Level Control Status Display with the real-time Trend screen open



Level Control Status Display with the Detail screen open

Switch between the Trend and Details by clicking in the Detail or Trend button in the Parameters section of the Status Display.

Loop Modes and Setpoints

The system has two Loop Modes that control the Transfer Pump output speed: Fixed Speed and Level. The Loop Mode and associated Setpoints are configured in the Loop Modes/Setpoints section of the Level Control Status Display.

Loop Mode	Description	Range/Units	P & ID Control?
Speed	Sends a fixed output speed to the pump	0-100%	No
Level	Pump output speed is the calculated CV of a PID control loop that uses Feedback Level as the SP and PV. Level PV comes from LI001.	Dependent on Tank Size 50 L Tank: 0-50 L 100L Tank: 0-100 L 200 L Tank: 0-200 L	Yes

*See the section *Parameters* and *Loop Tuning* for an explanation of the variables used in PID control

To select a Loop Mode, click the corresponding button. The text will turn green to indicate that mode has been selected.

To change the setpoint (SP) for the current mode, click the current SP value that is located under the button. A data entry dialog box will appear. The setpoint must be within the min and max value cited in the data entry dialog box.

Control Parameters

Parameter	Description	Read/Write?
Process Variable (PV)	The current tank level in liters or pump output speed.	Read Only
Control Value (CV)	The current pump output speed as a % of maximum speed.	Read Only
Ramp Rate	The rate, in %/sec, at which the CV will increase or decrease to get to the PV to a value equal to the SP ± the control deadband	Writable
Control Deadband	The range, as a % of SP, outside of which the PID control is disabled and the Ramp Rate is in effect. Within this range the PID loop is in control and the Ramp Rate is disabled.	Writable

Loop Tuning Parameters

Parameter	Description	Read/Write?
Gain	Proportional value of PID control equation. The Proportional Gain setting affects all frequencies (unlike Integral and Derivative settings) and is the only setting that affects the middle frequency range.	Writable
Reset	Integral value of PID control equation. The Integral action is responsible for keeping track of where the process has been, in order to correct for any process disturbances. The Integral value dominates the low frequency responses.	Writable
Rate	Derivative value of PID control equation. The Derivative action provides for adequate forecasting of process disturbances, and may improve response time. Derivative dominates the high frequency responses.	Writable
Deadband	The Deadband is used by the PID loop and represents the tolerance of the PID loop. If the PV is within the deadband limit of the SP, the PID does not adjust the CV	Writable
Stable Timer	If the PV is within the Control Deadband for that amount of time, the system is considered to be stable. This value is not used in the PID calculations.	Writable

NOTE

The operator should need to adjust only the setpoints.

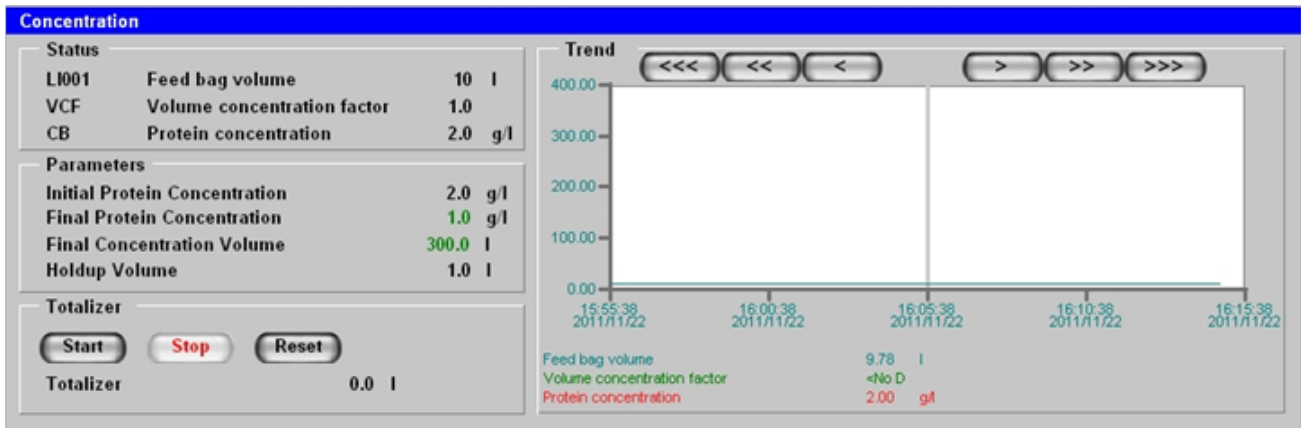
Supervisor or Engineer level access is required to alter the PID loop tuning parameter.

These settings should be changed only by trained personnel. Individuals not trained in PID loop tuning for process response should NOT alter these settings as they may harm the equipment and have an adverse effect on a process.

Concentration Monitoring

The TF 2.5 m² and TF 5.0 m² system has the ability to calculate and monitor protein concentration based upon the starting concentration, starting volumes and total filtrate volume removed from the system.

To access the Concentration Status Display, click on the Concentration Faceplate Icon on the Navigation Toolbar.



Concentration Status Display

Status and Parameter Values

The Status and Parameters sections of the Concentration Status Display contain the values required for concentration monitoring and calculations. Some of the values require a user input while some values are calculated by the system.

NOTE

The system must have a filtrate measurement option configured and a Totalized value to perform the calculations described below. See the section *Process Display: Options* for details on selecting the filtrate measurement options.

Concentration Values

Value	Description	Read/Write?
Feed Bag Volume (LI001)	Current Feed Bag Volume in Liters	Read Only
Volume Concentration Factor (VCF)	Calculated system Volume Concentration Factor based on total Filtrate removed and current system volume. $VCF = \frac{\text{Feed Bag Concentration Volume} + \text{Filtrate Volume}}{\text{Feed Bag Volume} + \text{Holdup Volume}}$	Read Only
Protein Concentration (CB)	Calculated system Protein Concentration, in grams/liter, based on volume concentration factor assuming complete retention. $CB = VCF \times \text{Initial Protein Concentration}$	Read Only
Initial Protein Concentration	User Initial Protein Concentration, in grams/Liters, for concentration calculations	Writeable
Final Protein Concentration	User final Protein Concentration in grams/Liters	Writeable
Final Concentration Volume	User final concentration volume in Liters	Writeable
Holdup Volume	The volume in Liters, held in the system flowpath and membrane.	Writeable

Totalizer

The Totalizer calculates a running total of filtrate volume, in Liters, that has passed through the membrane. The total filtrate volume is based on the filtrate flow (FI101) and is calculated once a second. This value is used to perform the calculations described in the table above.

NOTE

The system must have a filtrate measurement option configured to calculate a totalized filtrate volume. See the section Process Display: Options for details on selecting the filtrate measurement options.

To start the totalizer, click the Start button. To stop the totalizer, click the Stop button. To reset the totalizer to zero, click the Reset button.

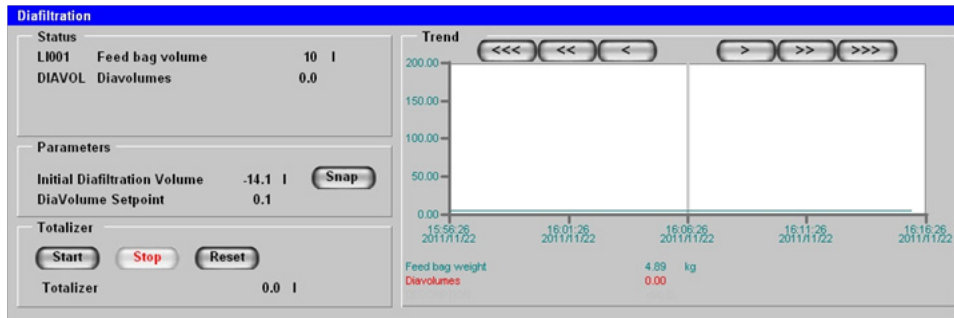
Trend

See the Data Trend Display section of this chapter or the Custom Trend Display chapter for details on working with trends.

The Trend displayed in the Concentration Status Display shows a custom trend of Feed Bag Volume, Volume Concentration Factor (VCF) and Protein Concentration. The user can scroll through time using the arrows at the top of the trend, zoom in on the trend, and move the drag bar across the trend to get values at specific times.

Diafiltration Monitoring

To access the Diafiltration Status Display, click on the Diafiltration Faceplate Icon on the Navigation Toolbar.



Diafiltration Status Display

Status and Parameter Values

The Status and Parameters sections of the Diafiltration Status Display contain the values required for diafiltration monitoring and calculations. Some of the values require a user input while some values are calculated by the system.

NOTE

The system must have a filtrate measurement option configured and a Totalized value to perform the calculations described in table below. See the section Process Display: Options for details on selecting the filtrate measurement options.

Diafiltration Values

Value	Description	Read/Write?
Feed Bag Volume (LI001)	Current Feed Bag Volume in Liters	Read Only
Diavolumes (DIAVOL)	Calculated Diavolumes based on total Filtrate removed. $\text{DIAVOL} - \text{Diafiltration Filtrate Volume} = \text{Filtrate Volume} / (\text{Initial Diafiltration Volume} + \text{Holdup Volume})$	Read Only
Initial Diafiltration Volume	User value of initial level for diafiltration calculations. Clicking the Snap button uses the entered Feed Bag Volume value as this value.	Writeable
Diavolume Setpoint	User final Diavolume setpoint. Green text if diafiltration is reached.	Writeable

Totalizer

The Diafiltration Totalizer calculates a running total of filtrate volume, in Liters, that has passed through the membrane. The total filtrate volume is based on the filtrate flow (FI101) and is calculated once a second. This value is used to perform the calculations described in the table above.

NOTE

The system must have a filtrate measurement option configured to calculate a totalized filtrate volume. See the section Process Display: Options for details on selecting the filtrate measurement options.

To start the totalizer, click the Start button. To stop the totalizer, click the Stop button. To reset the totalizer to zero, click the Reset button.

Trend

See the Data Trend Display section of this chapter or the Custom Trend Display chapter for details on working with trends.

The Trend displayed in the Diafiltration Status Display shows a custom trend of Feed Bag Weight and Diavolumes. The user can scroll through time using the arrows at the top of the trend, zoom in on the trend, and move the drag bar across the trend to get values at specific times.

Alarm Control

The system includes alarm logic which provides safety to personnel and equipment and ensures proper operating parameters are maintained.

General Alarm Behavior

Alarms are classified as non-critical (medium priority) or critical (high priority).

Non-critical alarms provide warnings and critical alarms activate an interlock, which sets the system to a safe shutdown state.

Non-Critical Alarm Actions

- Sound alarm horn
- Turn on yellow panel indicator (flashing if unacknowledged).
- Indicate "Non-Critical Alarm" in yellow on the operator interface (flashing if unacknowledged).
- Highlight mimic or indicator yellow on the operator interface (flashing if unacknowledged).
- List alarm on Alarm Summary Screen with yellow background (flashing if unacknowledged).
- Record alarm condition and value in alarm/event report.

Critical Alarm Actions

- Sound alarm horn
- Activate Critical alarm relay
- Turn on red panel indicator (flashing if unacknowledged)
- Indicate "Critical Alarm" in red on the operator interface (flashing if unacknowledged)
- Highlight mimic or indicator red on the operator interface (flashing if unacknowledged)
- List alarm in the Alarm Summary Screen with red background (flashing if unacknowledged)
- Set system to HOLD state
- Record alarm condition and value in alarm/event report

Alarm Acknowledgment

Alarms are acknowledged by clicking the Alarm Acknowledge icon on the top of the User Interface. Acknowledging Alarms stops the blinking of the alarm indicators on the User Interface but does not clear them from the Alarm Summary. Alarms remain current until cleared or disabled. System operation cannot be continued until a critical alarm is cleared.

Alarm Silencing

The Alarm Horn is silenced by clicking the Alarm Silence icon on the top of the User Interface. Silencing the Alarm Horn does not acknowledge or disable alarms, it only silences the audible alarm.

Alarm Summary Status Display

The Alarm Summary Status Display displays all current unacknowledged and acknowledged alarms. It is accessible by clicking on the Alarm Summary Icon in the navigation bar.

Process (Analog Instrument) Alarms

The Analog Process Alarms have LOLO, LO, HI and HIHI alarm setpoints. If the HI or LO setpoint is violated, a non-critical alarm is triggered; if the HIHI or LOLO setpoint is violated, a critical alarm is triggered.

The screenshot displays the MFS System for TFF interface. At the top, it shows 'MFS System for TFF', 'NON-CRITICAL ALARM', 'TF-2S', and 'V 2.09.00'. Below this, there are status indicators for 'ADMIN', 'HOLD', and 'CRITICAL ALARM'. The main process diagram includes tanks (TKN001 Remote), pumps (P001, P002), valves (XV001-XV005), and flow meters (FI 401, FI 101). A 'DRAIN' instrument (XV004) is highlighted in red, indicating a critical alarm. The 'Analog Points' faceplate for 'TMP' (Trans-membrane pressure) is shown in the bottom left, with a current value of 0.00 bar. The faceplate includes alarm settings for LOLO, LO, HI, and HIHI, all set to 0.0 with a 2-second delay. A graph on the right shows the current value of the TMP instrument over time.

Process Display with the Trans-Membrane Pressure (TMP) in alarm. The instrument icon is red because it is a Critical LoLo alarm.

The Analog Point Faceplate for the instrument is displayed in the Status Display section and was opened by clicking on the TMP instrument icon.

Analog Point Faceplate

Process Alarms for Analog Instruments are controlled through the Analog Point Faceplate for the Instrument. The Analog Point Faceplate is opened by clicking on the instrument. Analog Points can be scrolled through by clicking the left or right arrows that are under the Tagname.

The Analog Point Faceplate lists the tag name, description, current value and alarm limit settings. This display is used to setup the critical alarm (LOLO and HIHI) and non-critical alarm (LO and HI). When the process data reaches the alarm setpoint, the alarm will be turned on and the corresponding alarm setpoint will change colors according to the Critical/Non-Critical status of the alarm.

Analog Points					
Tag		Current Value			
TMP	Trans-membrane pressure	0.01 bar			
<<		>>			
Alarms					
	LOLO	LO	HI	HIHI	Status
SP	1.0	2.0	3.0	4.0	Enabled
Delay (sec)	5	4	3	2	
Calibration					
Zero	Full Scale	Filter			
0.00	6.00	0			

Analog Point Faceplate for the TMP with the alarms enabled. Since the Current Value .01 bar is less than both the Lo and LoLo Alarm Setpoints, both Setpoints have changed color. Lo SP is yellow because it is Non-Critical, LoLo SP is red because it is Critical.

Analog Points					
Tag		Current Value			
TMP	Trans-membrane pressure	0.01 bar			
<<		>>			
Alarms					
	LOLO	LO	HI	HIHI	Status
SP	1.0	2.0	3.0	4.0	Disabled
Delay (sec)	5	4	3	2	
Calibration					
Zero	Full Scale	Filter			
0.00	6.00	0			

Analog Point Faceplate for the TMP with the alarms disabled. Even though the Current Value 0.01 bar is less than both the Lo and LoLo Alarm Setpoints, neither Setpoints have changed color because the alarm is disabled.

To set an alarm setpoint, click on the appropriate value (LOLO, LO, HI or HIHI) and enter a new value in the data entry box that appears.

To Enable or Disable the alarms, click on the Enable or Disable text. A confirmation box appears, click OK to confirm the change of alarm status.

The Delay in seconds is the amount of time that passes between the alarm condition becoming true (i.e., the current value is greater than an alarm setpoint) and the alarm turning on. The Delay is provided to help eliminate nuisance alarms and to ensure that the process value is in a true alarm state. The Delay value for each Alarm Setpoint can be individually set.

Calibration

Scaling

Analog inputs are scaled to engineering units in the PLC. The zero and full scale values for each analog input shall be configurable from the respective Analog Input Status Display. The raw data is not modifiable.

To modify the Zero or Full Scale values, click on the value in the Analog Point Status Display and enter a new value in the Data Entry Prompt that appears.

Input Filtering

Analog inputs can be configured to include filtering of the raw data signal. A value of 0 disables filtering and 99 enables maximum filtering. The PLC computes an actual filter value from $(100 - \text{User Filter Value}) / 100$ which converts the 0-99 user filter value to 1.00-0.01 to be used in the filtering equation.

The filtered raw value is computed once per second using the equation:

$$(\text{Raw Value} \times \text{Actual Filter Value}) + (\text{Previous Filtered Raw Value} \times (1 - \text{Actual Filter Value}))$$

To modify the Filter value, click on the value in the Analog Point Status Display and enter a new value in the Data Entry Prompt that appears.

Discrete Device (Digital) Alarms

Unlike Analog Alarms, Discrete Device Alarms do not have LoLo, Lo, Hi or HiHi alarm states. Their alarms are discrete events, either On or Off. The criticality of the alarm is set through manual configuration in the Digital Point Faceplate.

The screenshot displays the MFS System for TFF interface. At the top, the status bar shows 'HOLD' and 'CRITICAL ALARM'. The main process display includes a flow diagram with various components like tanks, pumps, and valves. A 'Digital Point Faceplate' is open for tag YA14, showing 'Smart station comm failure' with a status of 'Enabled', priority of 'Critical', and a delay of 5 seconds. A trend graph shows the current value at 0.00 and the alarm value at 1.00.

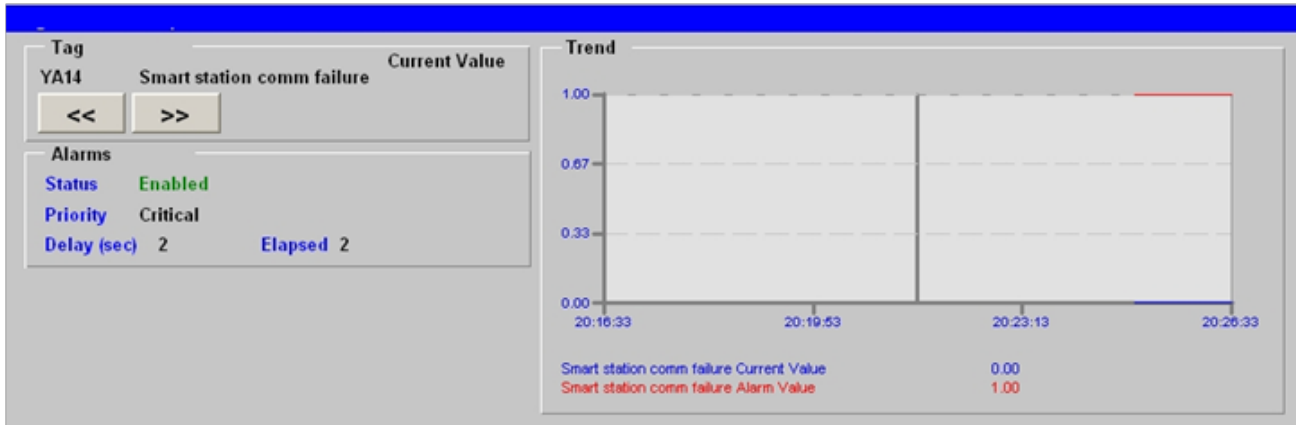
Process Display with the Smart Station Communication Failure discrete alarm active. The icon is red because it is a Critical alarm.

The Digital Point Faceplate for the Discrete Device is displayed in the Status Display section and was opened by clicking on the YA14 icon.

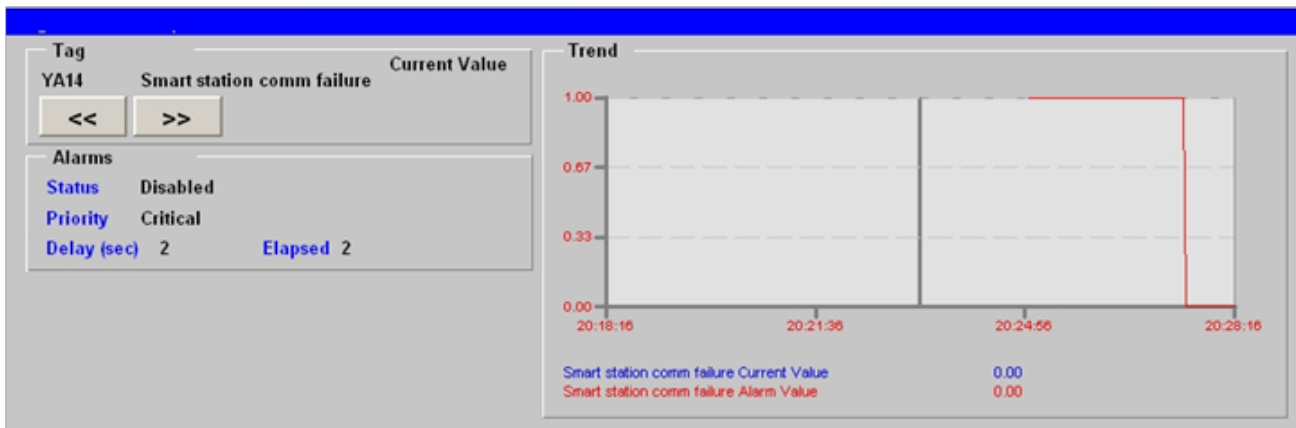
Digital Point Faceplate

Discrete Alarms are controlled through the Digital Point Faceplate for the Digital Device. The Digital Point Faceplate is opened by clicking on the device or by scrolling through the devices in the Digital Point Faceplate by clicking the left or right arrows that are under the Tagname.

The Digital Point Faceplate lists the tag name, description, current value and alarm settings. When the alarm value is true, the alarm value, shown under the trend in red font, becomes 1. The trend shows the current Discrete Device Value and the Alarm Value.



Digital Point Faceplate for the Smart Station Communication Failure with the alarm enabled and active. The YA14 Alarm Value is a 1, indicating that the alarm is on. The trend is showing the Alarm Value.



Digital Point Faceplate for the Smart Station Communication Failure with the alarm disabled and inactive. The YA14 Alarm Value is a 0, indicating that the alarm is off. The trend shows the Alarm Value as it transitioned from On to Off.

To Enable or Disable the alarms, click on the Enable or Disable text. A confirmation box appears, click OK to confirm the change of alarm status.

To set the Priority of the alarms, click on the Critical or Non-Critical text. A confirmation box appears, click OK to confirm the change of alarm priority.

NOTE

Some critical alarms cannot have their priority changed.

The Delay in seconds is the amount of time that passes between the alarm condition becoming true and the alarm turning on. The Delay is provided to help eliminate nuisance alarms and to ensure that the digital value is in a true alarm state.

The elapsed time, counts the number of seconds since the alarm condition has been true. When the elapsed time equals the delay, the alarm turns on.

Alarms with Conditions

Some Discrete Device Alarms have additional conditions that have to be met in order for the alarm to become active. If conditions are required, they will be displayed at the bottom of the Digital Point Faceplate along with their current state. The conditions must be ON for the alarm to become active.

Default Critical Discrete Alarms

The following alarms are preconfigured as critical alarms. Those with the * cannot have their criticality changed.

- ES001: E-Stop (Emergency Stop)*
- SIC001DF: Feed Pump P001 Defect*
- SIC002DF: Feed Pump P002 Defect*
- PSH001: Feed Pump High Pressure*
- PSH401: Transfer Pump High Pressure*
- YA14: Smart Station Communication Failure
- YA15: Clamshell Station Communication Failure
- YA17: Pump Station Communication Failure
- XS001: Door Closed*
- YA27: Clamshell Lockings Defect*
- PSL602: Valves Air Defect
- PSL603: Manifold Valves Air Defect
- YA29: HMI to PLC Communication Failure
- YA30: CCP® Runtime Communication Failure
- YA25: Smart Station Defect
- YA26: Clamshell Station Defect
- YA18: Pump Station Defect
- YA36: Tank Station Communication Failure
- YA37: Tank Station Defect
- YA42: WI001 Station Communication Failure*
- YA43: WI101 Station Communication Failure*
- SIC003DF: Mixer Defect*

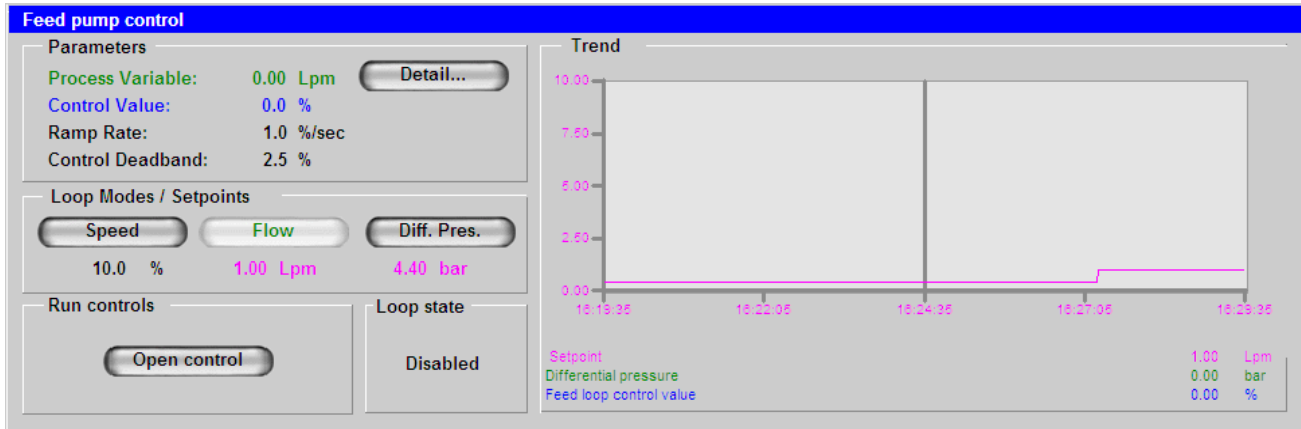
Data Trend Displays

There are two types of data trends that may be displayed:

- Real Time Trend
- Custom Trend

Real Time Trend Display

The system includes real time trends that are displayed in each Analog and Discrete Device Status Display or Control Screen. To view the trend, simply click on the device on the process display or scroll through the Analog or Digital Device Faceplates.



Real Time Trend Display for Pump 1. There are three tags plotted on this trend, some trends may only have one tag plotted. The X-Axis is time and defaults to a range of 20 minutes. The Y-Axis is scaled to match the minimum and maximum engineering units range of the selected tag.

Drag Bar

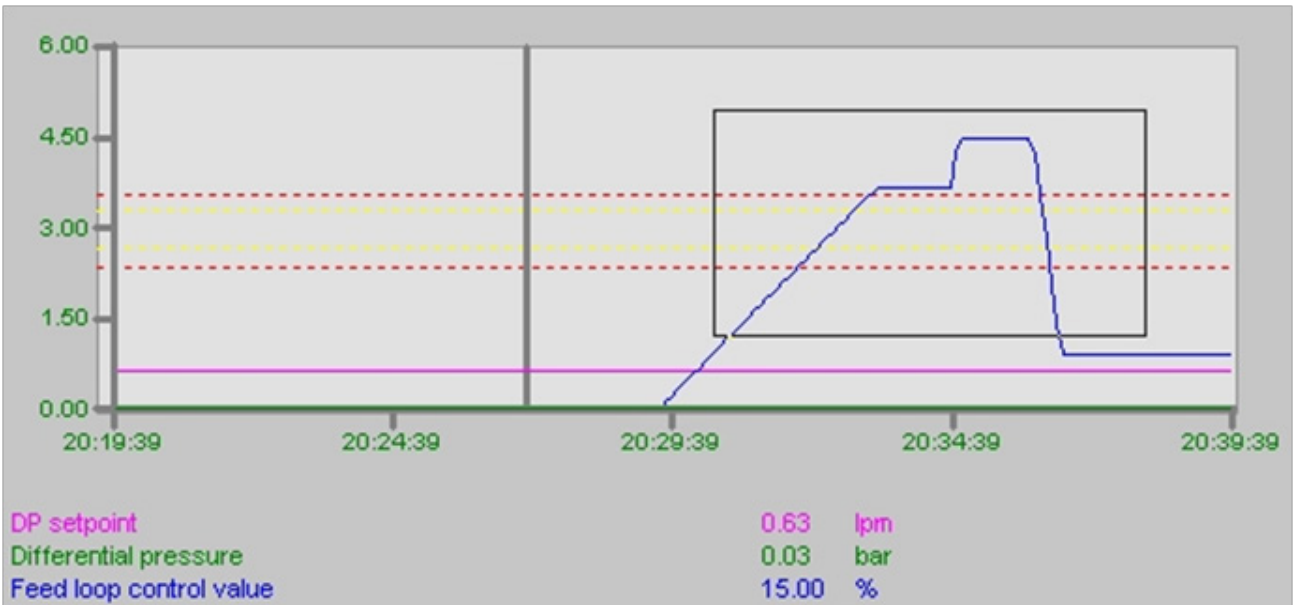
The gray, vertical line in the plotted area is a drag bar. Tag values at specific times can be viewed by clicking and dragging the Drag bar across the trend.



Real Time Trend – Drag Bar

Zoom In, Zoom Out

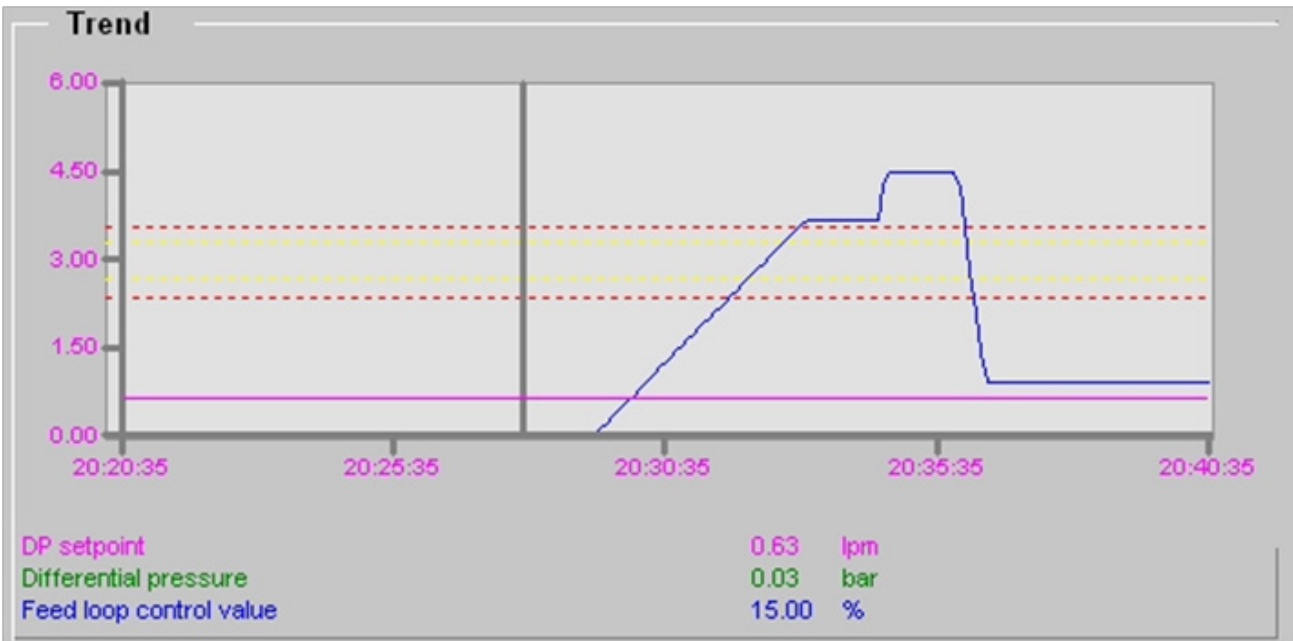
The user can zoom in on a selected plotted area by left clicking on the trend and dragging the box that appears to cover the desired area. Both the X and Y axis adjust to that new range. To zoom out, right click on the trend.



Real Time Trend – Zoom In

Change Y-Axis Scale

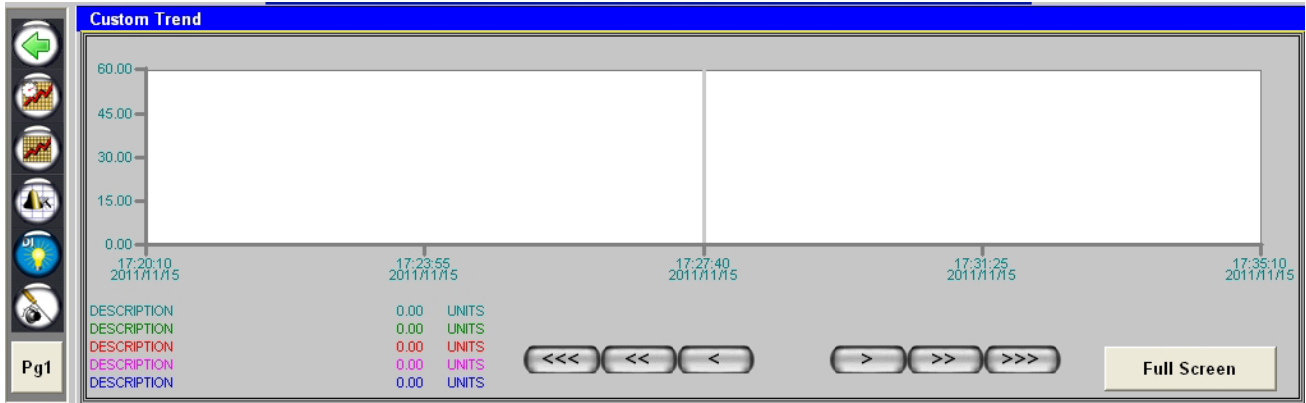
To change the Y-Axis scale to match a different tag in the trend, click on the desired tag under the trend. This will change the color of the axis labels to match the color of the tagname under the trend.



Real Time Trend – Different Y-Axis Scale

Custom Trend Display

The system includes custom trends that are accessed by clicking on the Custom Trend Icon in the Navigation Bar. The blank Custom Trend that is opened when the Custom Trend Icon is clicked is shown below.



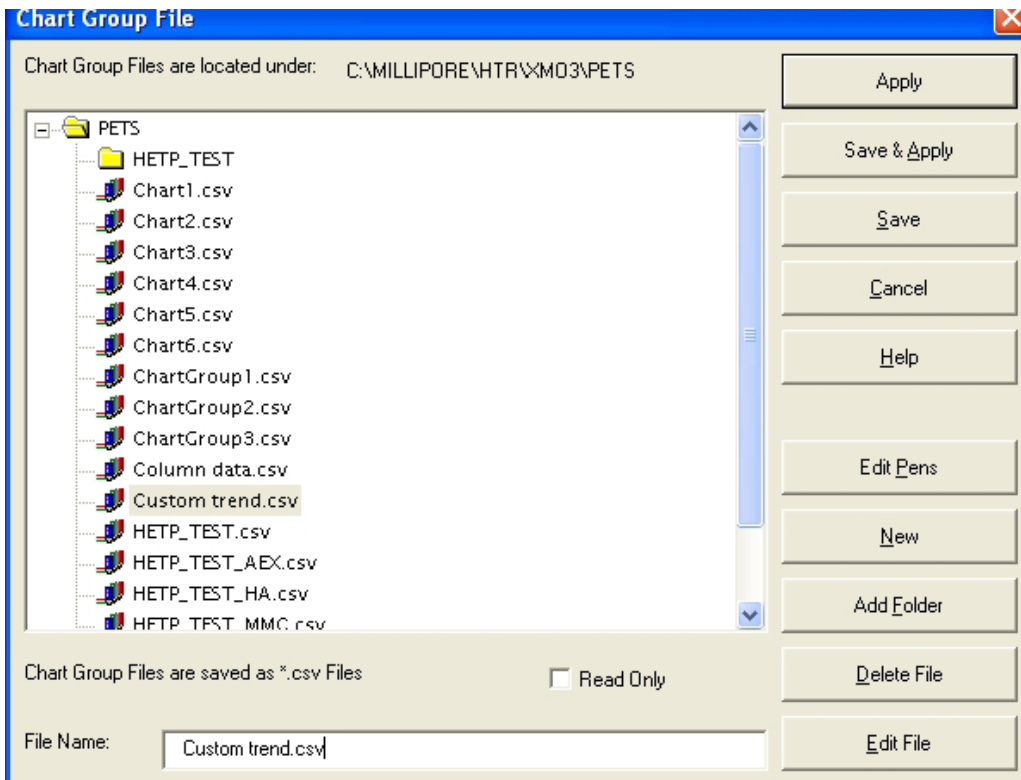
Custom Trend - Blank

Selecting Pre-Configured Trends

Double Clicking on the Plotted Area opens the Chart Group File Selection Screen. Existing Charts can be opened and edited and new charts can be created. Folders can also be created to help organize charts into logical groups.

Selecting a Chart Group File and clicking Apply will open that trend and return the user to the Process Display screen.

Detailed instructions on using the Custom Trend can be found in the Custom Trend Chapter of this document.



Custom Trend – Selecting Chart Group File

Security Overview

The security system consists of group accounts, user accounts and security areas. A typical system uses four group accounts: Operator, Supervisor, Engineer and System Administrator. Each user of the system belongs to a group account corresponding to the user’s permitted access level.

The login name and password identify each user account. A user account assigns security privileges to a single user. Group accounts, application features and security areas are assigned to each user account. Login timeouts can also be assigned for each user. Different passwords restrict access to the system and only users belonging to group accounts with appropriate security privileges are permitted access to the security areas of the software. In ascending order of security level, the group accounts are: Operator, Supervisor, Engineer and System Administrator.

Pre-installed Group Accounts include:

- Operator
- Supervisor
- Engineer
- Administrator

The program acknowledges each user as having certain privileges, defined as application features and security areas. Security areas are sections of the software or process that are accessible only if a user account or the user’s group account authorizes access to that security area. Application features are also defined for each group or user account. If an attempt is made to gain access to an unauthorized area, an “Unauthorized Access Attempt” message will flash on the screen.

Further detail on the security system is provided for the System Administrator in the Security chapter of this manual.

Standard Application Features

Application Feature	Sys Admin	Engineer	Supervisor	Operator
Database Manager	X	n/a	n/a	n/a
Workspace Runtime	X	X	X	X
Workspace Configure	X	n/a	n/a	n/a
Background Task Exit	X	X	X	n/a
Historical Trend Assign	X	X	n/a	n/a
System Configuration	X	X	n/a	n/a
Security Configuration	X	n/a	n/a	n/a
Runtime VB Editor Access	X	n/a	n/a	n/a
iFIX® – System Shutdown	X	X	X	n/a
Historical Trend Collection	X	X	n/a	n/a

Application Feature	Sys Admin	Engineer	Supervisor	Operator
Workspace Runtime Exit	X	X	X	n/a
Enable Task Switching	X	X	n/a	n/a
Enable <Ctrl> <Alt> 	X	X	n/a	n/a

Standard Security Areas

Security Area	Area ID	Sys Admin	Engineer	Supervisor	Operator
Manual Operation	1	X	X	X	n/a
Recipe Editor	2	X	X	X	n/a
Procedure Start	3	X	X	X	X
Procedure Abort	4	X	X	X	n/a
Alarms	5	X	X	X	n/a
PID Tuning	6	X	X	n/a	n/a
Loop Control	7	X	X	X	n/a
Flow Path	8	X	X	X	n/a
Setpoints	9	X	X	X	n/a
Maintenance	10	X	X	n/a	n/a
Configuration	11	X	X	n/a	n/a
Inlets	12	X	X	X	n/a
Calibration	13	X	X	X	n/a
PH Calibration	14	X	X	n/a	n/a
Recipe Parameters	15	X	X	n/a	n/a
Limited Launch	16	X	X	X	X
Process View	17	X	X	X	X
System Shutdown	18	X	n/a	n/a	n/a
EnterCV	19	X	X	X	X
Hardware Operations	20	X	n/a	n/a	n/a

Shutting Down the System

CAUTION

Close all programs and exit the Windows® application before switching off power to the computer. Failure to do so may damage any Historical Data files that are open when the computer loses power.

Only users with sufficient access privileges can close the System. If a user is logged into the User Interface with adequate access rights, the User Interface will have a Close button (✕) in the upper right-hand corner that will allow the user to close the User Interface and to get to the Windows® application desktop. When the Close button is selected, a confirmation dialog will appear to prevent accidental closure of the User Interface.

NOTE

If the Close button is not visible, the user must log on to the User Interface with a user ID that has sufficient privileges to shut down the system (see the Security Overview section of this chapter of the Security chapter of this document for more information).

Press the Close application button to close the User Interface and get to the Windows® application desktop.

On the Windows® desktop press the Start button and select Shut Down from the menu. A dialog box will appear giving the user several shutdown modes for the system. Make the selection and press the Yes button.

Press Shutdown Windows® to close the User Interface and shut down the Windows® application.

Press Cancel to get back to the User Interface.

Priming the System

Introduction

Once the Flexware® Assemblies are installed and before operating the column, the tubing must be free of air and filled with liquid. The user should review *Using the System* to be familiar with the Common Control Platform® (CCP®) Software.

Required Supplies

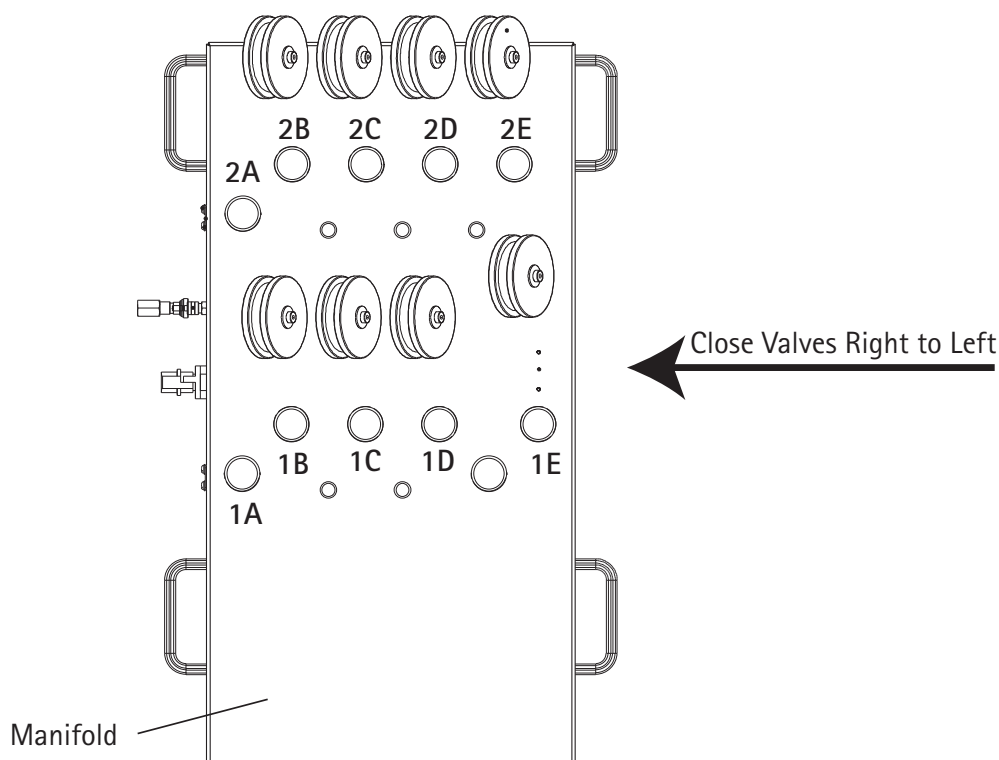
- Vessel to collect the fluid from the drain and the waste
- Tubing to connect drain to the disposal vessel or site
- Tubing to connect filter vent to the disposal vessel or site
- Vessel to collect the fluid from the top of the column

Set-up

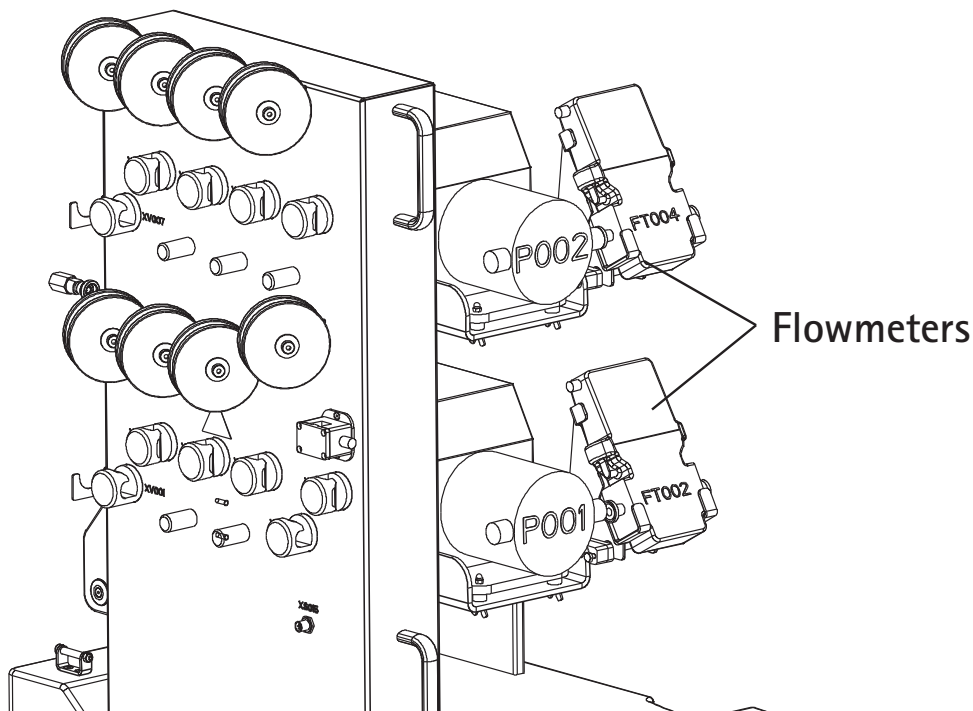
1. Connect the tubing from the source bags to the manifold.
2. If P001 is used, close XV012. If P002 is used, close XV0013.
3. Open valve XV034 (drain valve) and close valves XV014 and XV015. This will allow the fluid to drain out of the system while closing off the rest of the system.
4. Place the bubble trap and filter off line, and set the column to bypass.
5. Open the waste.

Prime the Inlet Paths

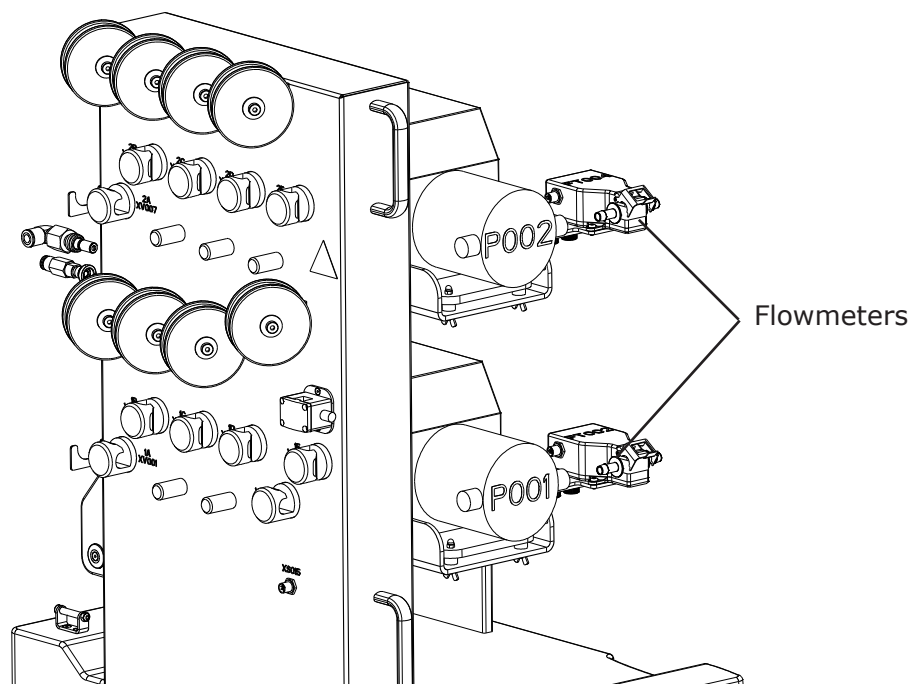
The inlet lines should be primed one at a time, starting with valve 2E in the figure below. If only one pump is being used, go to step 8.



1. Set Pump P002 control to manual control. Set the speed setpoint to 20%. The speed should be set at the lowest level that will allow sufficient flow to purge the lines of air.
2. Open the appropriate valves to get a clear flow path from the SINGLE inlet to the drain.
3. Confirm that a collection vessel is properly installed at drain valve XV034.
4. Start pump P002.
5. Purge the air out of the tubing in the flowpath from the solution bags to the inlet white rollers by manually manipulating (raising or lowering) it as required. Do not allow air to get trapped in the tubing over the white rollers. If necessary, remove the tubing from the white roller and lower it to purge the air from the tubing.
6. Tap flowmeter FT004 to get air out of it. Continue tapping until no bubbles exit from the flow meter.



Multi-Use Flowmeters



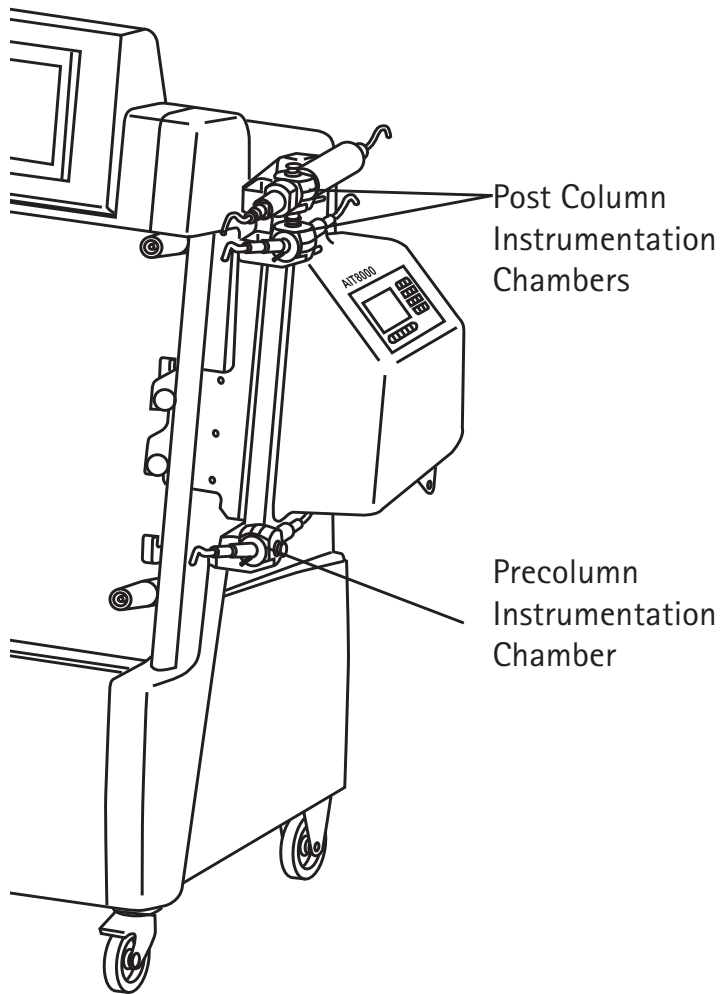
Single-Use Flowmeters (XMO3 only)

7. Repeat steps 1 through 6 above for all inlets, ending with inlet 2A.
8. Set Pump P001 control to manual control. Set the speed setpoint to 20%. The speed should be set at a the lowest level that will allow sufficient flow to purge the lines of air.
9. Open the appropriate valves to get a clear flow path from the SINGLE inlet to the drain.
10. Confirm that a collection vessel is properly installed at drain valve XV034.
11. Start pump P001.
12. Purge the air out of the tubing in the flowpath from the solution bags to the inlet white rollers by manually manipulating (raising or lowering) it as required. Do not allow air to get trapped in the tubing over the white rollers. If necessary, remove the tubing from the white roller and lower it to purge the air from the tubing.
13. Tap flowmeter FT002 to get air out of it. Continue tapping until no bubbles exit from the flow meter.
14. Repeat steps 8 through 13 above for all inlets, ending with inlet 1A.

At this point, the flowpaths from all of the inlets to the drain should be purged of air.

1. Confirm that a collection vessel is properly installed at the waste outlet and at the filter vent.
2. With the pump still running and one inlet open, the bubble trap will be set in auto mode.
3. Bring filter online.
4. The column should be bypassed.
5. With collection vessel in place, manually open the filter vent and tap the filter to remove the air. Once a steady stream of fluid is coming out of the vent, close the vent.
6. The flowpath through the precolumn instrumentation to the waste outlet should be filling up.

7. Lift the precolumn instrumentation flow cell and gently shake it to remove any air in it. Gently shake the chamber until no bubbles exit and a clear stream of fluid flows out of it.



8. Tap the flow cell to remove all of the air from it.
9. Stop the pump.
10. Attach the column tubing to the bottom of the column and open the isolation valve, if applicable. Do not connect the top of the column.
11. The column should be in the Forward Flowpath. Collect the fluid coming out of the tubing that will be connected to the top of the column.
12. Set the pump speed setpoint to 10% and start the pump.
13. When a steady flow of liquid exits the tubing, attach the tubing to the top of the column and open the valve (if applicable).
14. Bring the pump up to an appropriate speed for the column.
15. Manipulate the post column instrumentation flow cell tubing to remove any air that may have accumulated while connecting the column to the system.
16. Once all the air has been purged out of the post column instrumentation and a steady stream exits the waste outlet, turn the pump off. The system is now primed with the equilibration solution.

Priming the Feed Pump (4400S)

Priming the Feed Pump 4400S is required to guarantee an accurate flow rate and to limit the pressure pulsations in the flow path.

Priming of the feed pump is required after installation and connection of the Flexware® assemblies for flushing the cassettes. In this configuration the Flushing Assembly TF3SFLUSH is connected to the Feed Pump inlet.

Priming the feed pump is required after installation and connection of the Flexware® assemblies for Processing. In this configuration the Feed Container Assembly 200L TF3S200L is connected to the Feed Pump inlet.

Once the priming procedure is completed, the feed pump P001 is ready to use.

Priming may be repeated each time there is air introduced at the feed pump inlet to guarantee an accurate flow rate and low pressure pulsations.

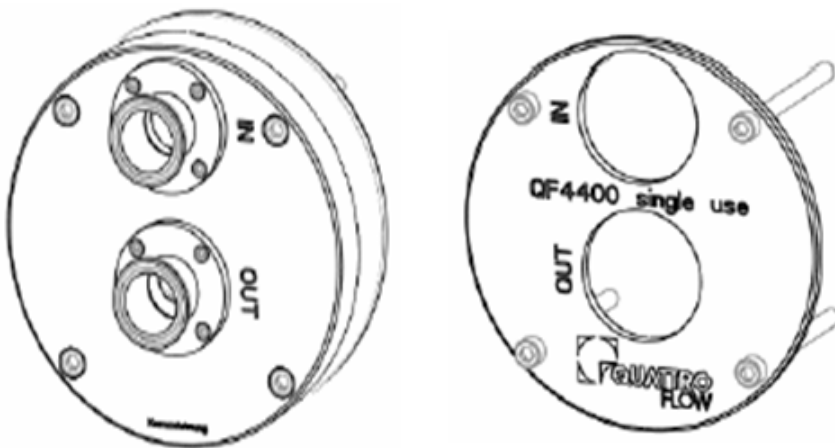
It is possible to prime the pump without disconnecting the Flexware® assemblies. However, if the feed pump outlet must be disconnected after priming, clamp the primed inlet of the feed pump before disconnecting the outlet to avoid air in the pump chamber.

Priming for Flushing

The installation of the flushing flowpath is described in the *INSTALLING THE Flexware® ASSEMBLIES* section of this manual.

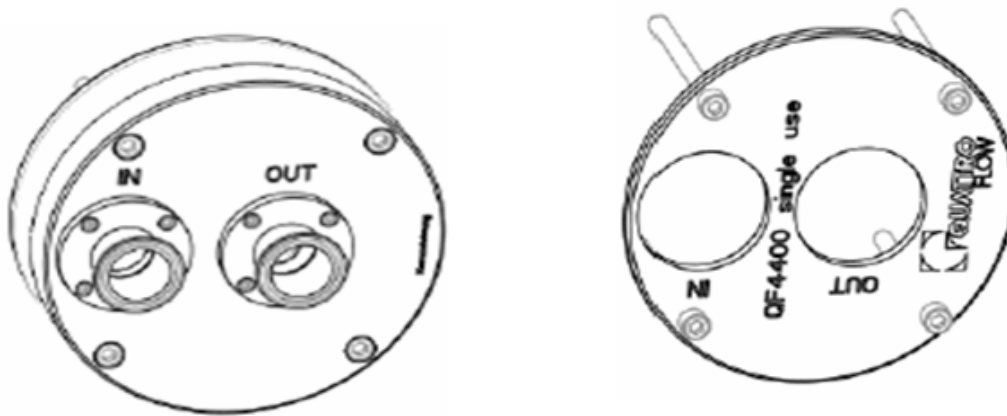
Prime the Feed Pump 4400S using the Flushing Assembly TF3SFLUSH:

1. Access the FLUSH flow path in the process view.
2. Set the P001 speed setpoint to 35% and start the pump P001. Once the control value has reached 35%, run the pump for one minute.
3. Stop the pump.
4. Remove the four long screws from the stainless steel flange of the pump. The stainless steel flange stays on the Feed Pump Assembly DISPUMP3. Do not disconnect the Flexware® assemblies.
5. Rotate the Feed Pump Assembly DISPUMP3 with the stainless steel flange so that the inlet and the outlet are aligned in the upright position as shown below.



Feed Pump Assembly with inlet and outlet ports in the upright position

6. Tighten the four long screws with Allen wrench.
7. Set the P001 speed setpoint to 35% and start the pump P001. Once the control value has reached 35%, run the pump for one minute.
8. Stop the pump.
9. Remove the four long screws from the stainless steel flange of the pump. The stainless steel flange stays on the Feed Pump Assembly DISPUMP3. Do not disconnect the Flexware® assemblies.
10. Rotate the Feed Pump Assembly DISPUMP3 with the stainless steel flange so that the inlet and the outlet are aligned in the horizontal position as shown below.



Feed Pump Assembly with inlet and outlet ports in the horizontal position

11. Tighten the four long screws with Allen wrench.
12. Set the P001 speed setpoint to 35% and start the pump P001. Once the control value has reached 35%, run the pump for one minute.
13. Stop the pump.

Once the priming procedure is complete, the feed pump P001 is ready to use.

The manifold lines at the suction side of the pump must be full of fluid so that no air can be introduced into the feed pump. If air is introduced, the priming procedure must be repeated.

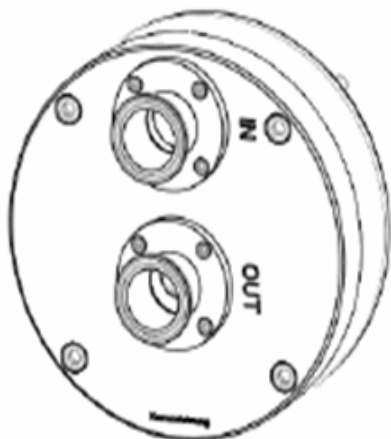
Priming for Processing

The installation of the flushing flowpath is described in the *INSTALLING THE Flexware® ASSEMBLIES* section of this manual.

To prime the Feed Pump 4400S using the Feed Container Assembly 200L TF3S200L:

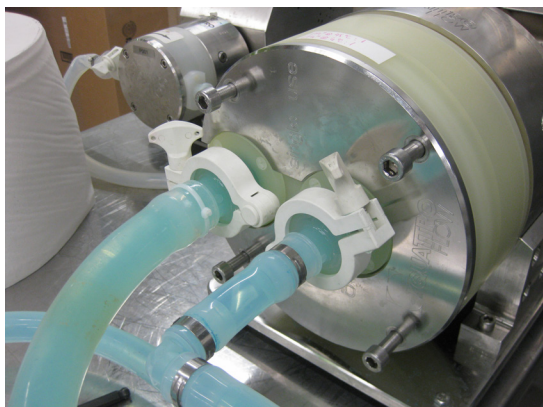
1. Active the DEFAULT flow path in the process view.
2. Set the P001 speed setpoint to 50% and start the pump P001. Once the control value has reached 50%, run the pump for one minute.
3. Stop the pump.
4. Remove the four long screws from the stainless steel flange of the pump. The stainless steel flange stays on the Feed Pump Assembly DISPUMP3. Do not disconnect the Flexware® assemblies

5. Rotate the Feed Pump Assembly DISPUMP3 with the stainless steel flange so that the inlet and the outlet are aligned in the upright position as shown below.



Feed Pump Assembly with inlet and outlet ports in the upright position

6. Tighten the four long screws with Allen wrench.
7. Set the P001 speed setpoint to 50% and start the pump P001. Once the control value has reached 50%, run the pump for one minute.
8. Stop the pump.
9. Remove the four long screws from the stainless steel flange of the pump. The stainless steel flange stays on the Feed Pump Assembly DISPUMP3. Do not disconnect the Flexware® assemblies.
10. Rotate the Feed Pump Assembly DISPUMP3 with the stainless steel flange so that the inlet and the outlet are aligned in the horizontal position as shown below.



Feed Pump Assembly with inlet and outlet ports in the horizontal position

11. Tighten the four long screws with Allen wrench.
12. Set the P001 speed setpoint to 50% and start the pump P001. Once the control value has reached 50%, run the pump for one minute.
13. Stop the pump.

Once the priming procedure is complete, the feed pump P001 is ready to use. If air is introduced, the priming procedure may need to be repeated.

Priming and Zeroing the Flowmeter

The zero adjustment of the flowmeter must be completed before each use to ensure measurement accuracy.

To prime the flowmeter:

1. Clamp the tubing from the transducer closed.
2. Fill the tubing with fluid, restrict flow so that fluid is not moving and ensure there are no air bubbles in the tubing.
3. Click the zero button on the transmitter box to zero the measurement.
4. Allow time for the flowmeter to adjust to temperature.
5. The flowmeter is now ready to use.

Removing the Flexware® Assemblies

System Preparation

Prior to removing the Flexware® assemblies from the system, verify the following:

- The product has been recovered into the collecting container
- The complete flowpath is properly drained and emptied
- All the quick connectors are free from liquid
- Pressure is released from the complete flowpath
- If decontamination is required, the decontamination operation was performed
- All the caps and plugs are available to cap and plug the quick connectors

NOTE

The Flexware assemblies must be removed and replaced after each batch

Removing the Flexware® Assemblies

1. Disconnect the column inlet and outlet.
2. Disconnect the pre column instrumentation flow cell.
3. Disconnect the post column instrumentation flow cell.
4. Remove the three flow cells from their supports.
5. Open the cover of the liquid sensor XS015 and remove the Flexware® Assembly. Close the cover.
6. Disconnect the inlet and outlet of the bubble trap.
7. Disconnect the vent of the bubble trap.
8. Remove the bubble trap with Flexware® assembly from the BBT01 support.
9. Disconnect the outlet of pump P001 from the flowmeter.
10. Disconnect the outlet of pump P002 from the flowmeter
11. Disconnect the inlet of Pump P001
12. Disconnect the inlet of Pump P002
13. Disconnect the outlet of FT002.
14. Disconnect the outlet of FT004.
15. Open the cover of the liquid sensor XS015 and remove the Flexware® Assembly. Close the cover.
16. Open the Valves XV001, XV002, XV003, XV004, XV005, XV006, XV007, XV008, XV009, XV0010, XV011.
17. Remove the manifold line from the manifold.
18. Close the valves XV001, XV002, XV003, XV004, XV005, XV006, XV007, XV008, XV009, XV0010, XV011.
19. Disconnect the precolumn filter FH001 and remove the filter assembly from the filter holder.
20. Ensure that FT004 has been disconnected from the Smart Flexware® Assembly. On the touch screen, navigate to the recipe screen and run the **Unlock door** recipe.
21. Open the door and remove the smart Flexware® bag from the Clamshell.
22. Complete the recipe following the prompts on the screen.
23. Run the **Lock door** recipe.
24. Close the door.
25. Remove the pump head of P001 and P002 as described in the pump manufacturer's instructions.

Removing the Flexware® Assemblies

1. Disconnect the outlet of pump P001 from the Smart Flexware® Assembly.
2. Disconnect the Feed Assembly from the Smart Flexware® Assembly.
3. Disconnect the outlet of pump P002 with the Smart Flexware® Assembly.
4. Disconnect the Inlet TC of the Pump P001.
5. Disconnect the Inlet TC of the Pump P002.
6. Remove the tank skid from the pumping skid to have more flexibility around the skids.
7. Open the valves on the Manifold in the following order: HV401, HV441, HV411, HV421, HV431, and HV402.
8. Open the support of filter F401.
9. Remove the transfer line manifold from the manifold including the F401.
10. Close the valves in the following order: HV402, HV441, HV431, HV421, HV441, and HV401.
11. Disconnect the collecting container assembly from the feed line assembly.
12. Disconnect the feed container Assembly.
13. Cap the connectors on the feed container assembly.
14. Open the holder clamp of the vent filter and remove the vent filter.
15. Remove the spare tubing from the clamps on the top of the tank.
16. With the mixer support in the top position, hold the mixer support on the front side with the right hand and unlock the locking pin. Carefully lower the mixer support.
17. If a 50 L is installed, rotate the tank horizontally and remove the feed bag. Return the tank to the vertical position.
18. If a 100 or 200 L tank is installed, open the door of the carrier and remove the container through the door.
19. Disconnect the filtrate drain assembly from the filtrate drain line assembly.
20. Disconnect the filtrate drain assembly from the filtrate line assembly.
21. Dismantle the Pellicon® cassette holder.
22. Remove all TC from the Pellicon® cassette holder.
23. Remove the Pellicon® cassettes from the Pellicon® cassette holder.
24. Ensure that P001 and P002 have been disconnected from the Smart Flexware® Assembly. From the Recipe screen, run the Unlock Door recipe.
25. When the door opens, remove the Smart Flexware® Assembly from the Clamshell.
26. Remove the pump heads from P001 & P002 as described in the pump manufacturer's instructions.

TFF-5.0 m² only

27. When the door opens, remove the retaining ring, then remove the Smart Flexware® assembly from the Clamshell.
28. Replace the retaining ring in it's location and close it.

Maintenance, System Conversion, and Troubleshooting

Introduction

The Unload Clamshell for Maintenance recipe should be used when performing any maintenance procedures. The Load Clamshell After Maintenance recipe should be used to reinstall the back clamshell after performing any maintenance procedures.

Refer to manufacturer's instructions included with the system for maintenance, calibration and troubleshooting guidelines of OEM parts.

Cleaning the Hardware

NOTE

Read *Operator and Equipment Safety* in this user guide before performing any maintenance or troubleshooting.

All parts of the system should be wiped down with a cloth dampened with a 70% ethanol or isopropyl alcohol solution.

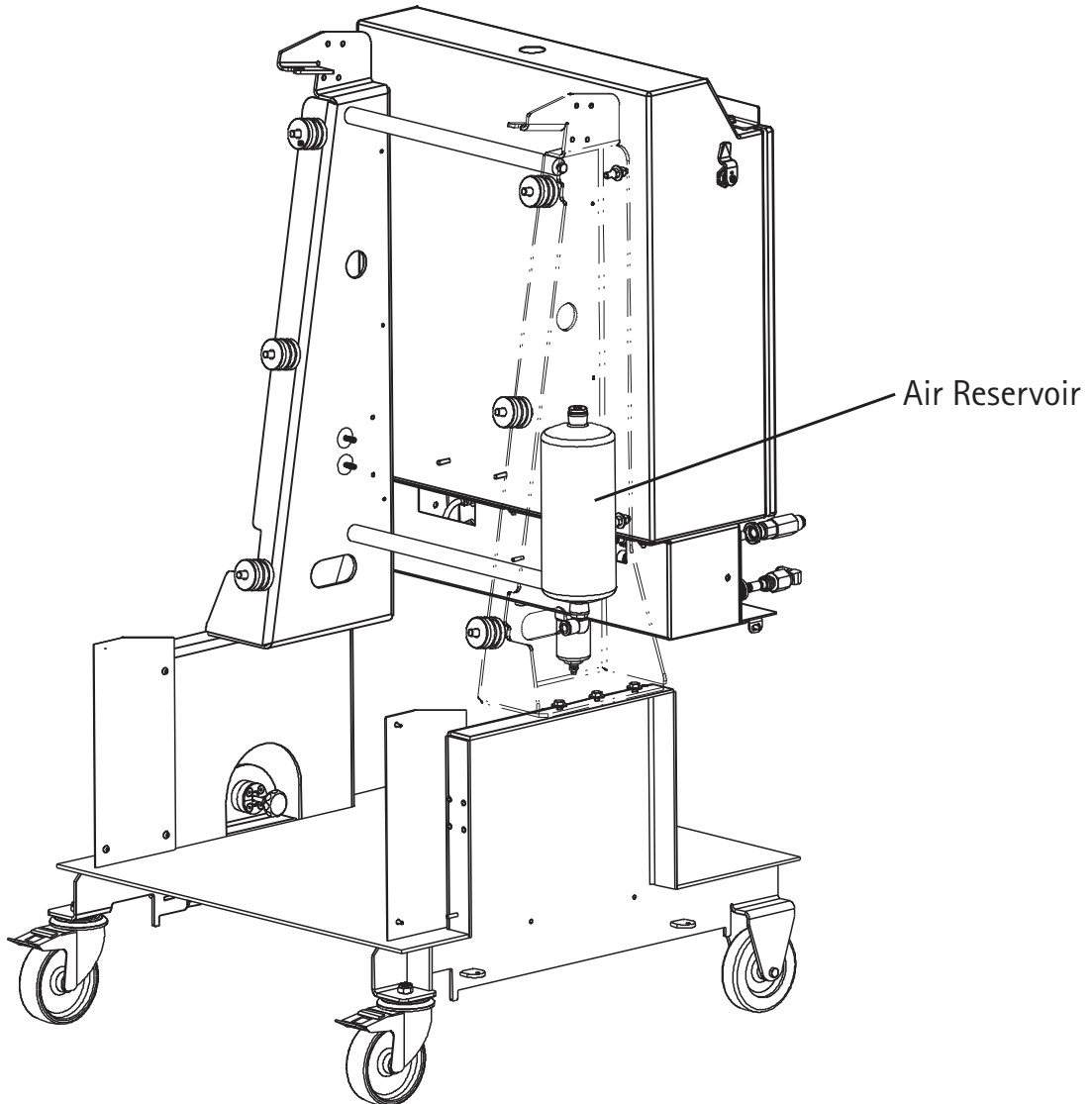
Do not use a water hose or spray gun on the system. Do not expose the system to hydrogen peroxide as this may damage the system. Do not expose the system to decontamination vapors as this may damage the system.

Cleaning the Multi-use Instrumentation

Multi-instrumentation cleaning is under customer responsibility including flowmeters, instruments flowcells and instrument gaskets.

Moving the System

Before moving the system, the air reservoir must be emptied. The reservoir acts as an air buffer when the emergency stop is engaged. The air tank is located inside the front access panel.



1. Turn valve Y102 OFF. Y102 is located just below the Clamshell behind the Access Door.
2. Once air is released, turn valve Y102 ON.

Moving the System on Site

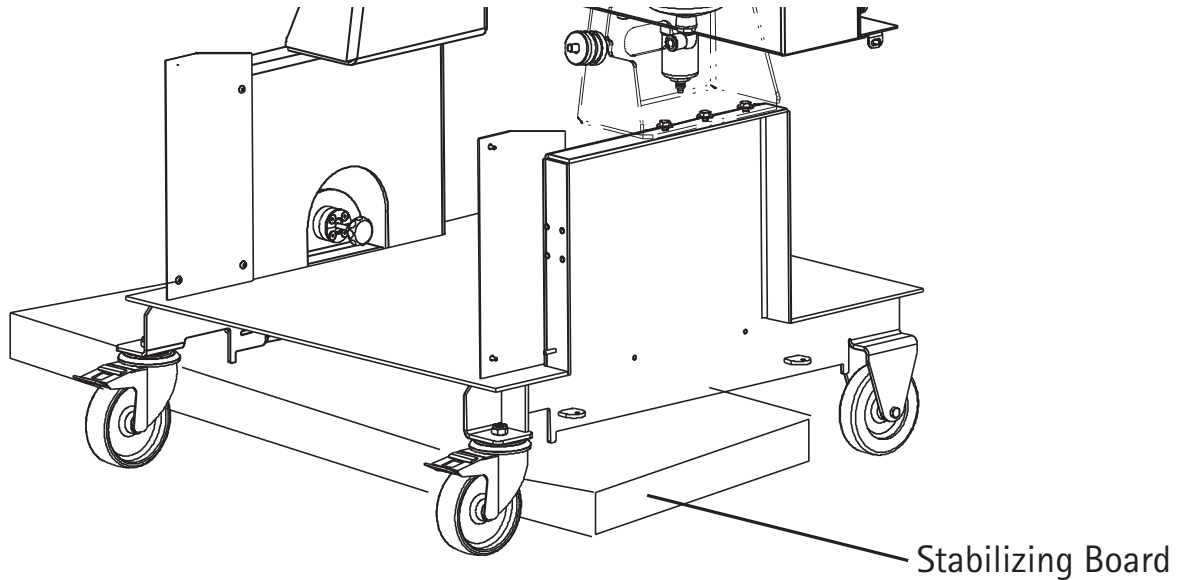
1. Disengage the carts from each other. The carts must be moved individually. Do not move the connected carts.
2. Push each cart using the push handles to the desired location.
3. Reconnect the carts once they are in the new location.

Moving the System to a New Site

1. Disengage the carts from each other. The carts must be moved individually. Do not move the connected carts.
2. To lift the carts using a forklift, the stabilizer board that was installed beneath the wheel cart of the cart during the original shipment must be used.

CAUTION

Lifting the carts with a forklift without the stabilizer board beneath the wheel cart will cause damage to the system and operator.



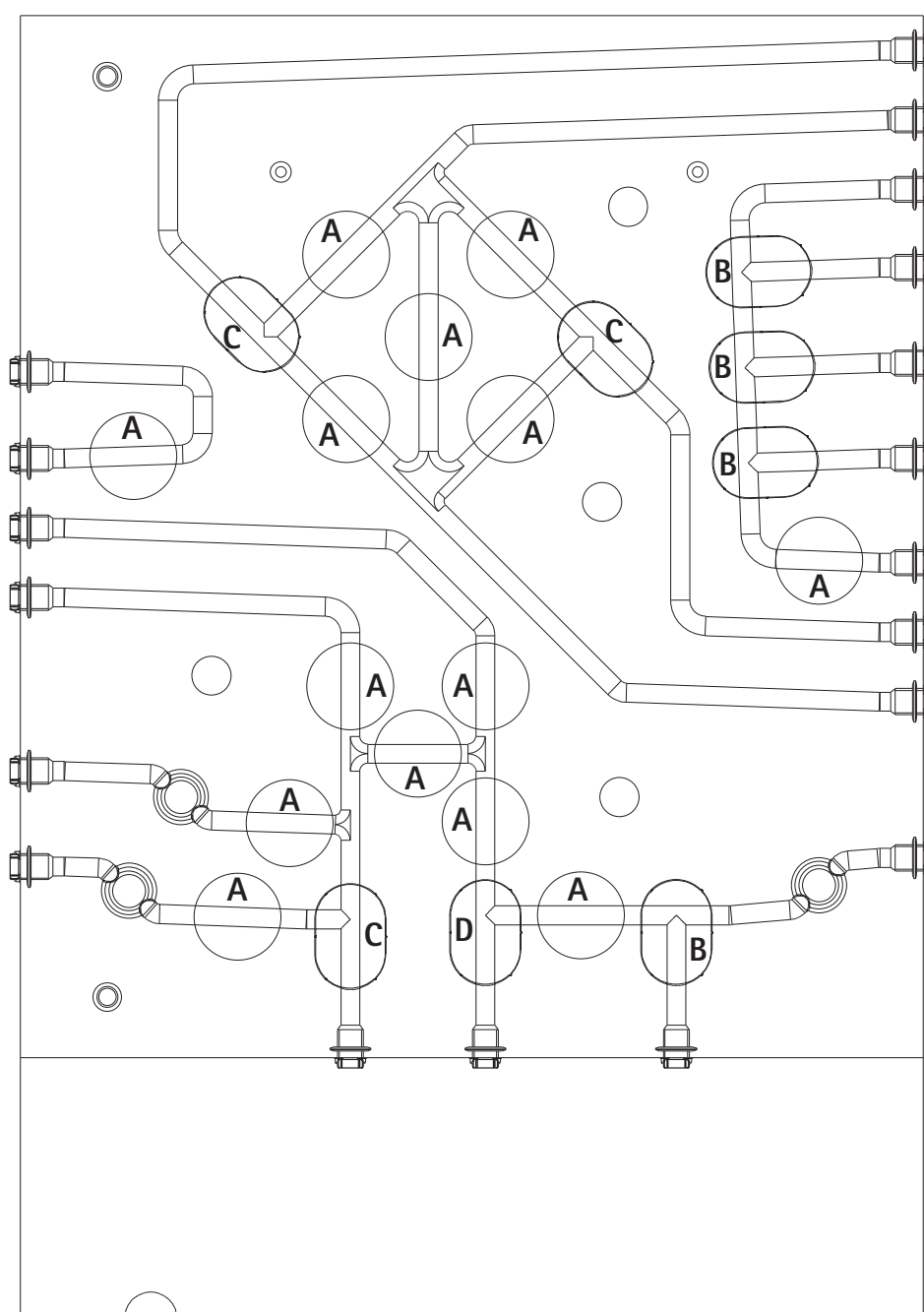
Cart Stabilizer

3. Place the stabilizer in position and move the cart to the desired location.
4. Reconnect the carts once they are in the new location.

Changing the Valve Pads

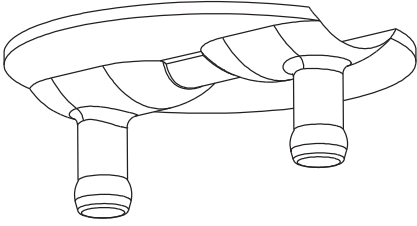
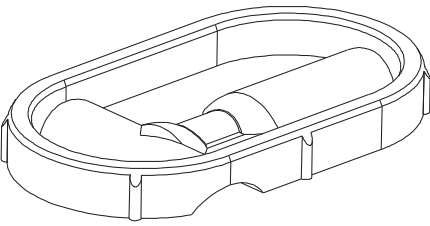
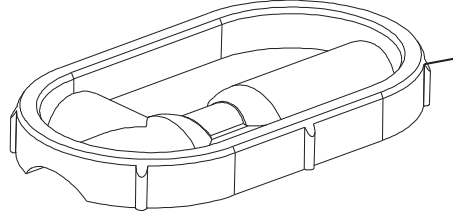
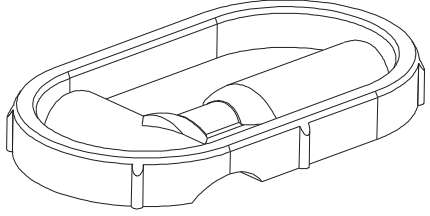
The valve pads in the Clamshell should be changed after 2500 cycles or after six months of use.

1. Run the Unlock Door recipe to open the door and access the valve pads..
2. For Valve Pad A, pull the valve pad out using the stems.
3. For Valve Pads B, C and D, insert the blade of a flat head screwdriver between the valve pads and the Clamshell and pry the valve pads off of the Clamshell.
4. Discard the used pads.
5. Install the new pads by aligning the pins on the pads with the holes in the Clamshell. Push the pins into the holes to secure the pads.
6. Run the Lock Door recipe to close secure the door.



Valve Pad Locations

Valve Pads

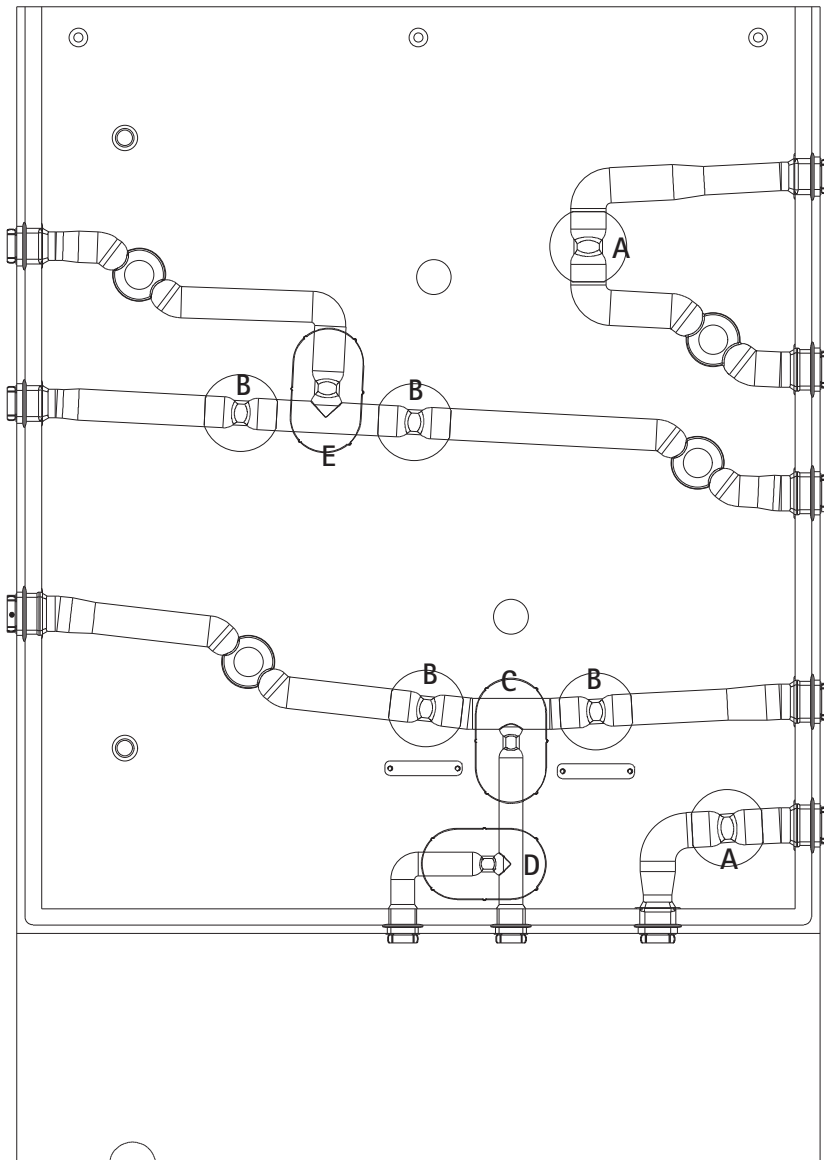
Valve Pad Key	Valve Pad Description	Valve Pad Size
A		
B		1/4 or 3/8 in.
C		
D		

Changing the Valve Pads

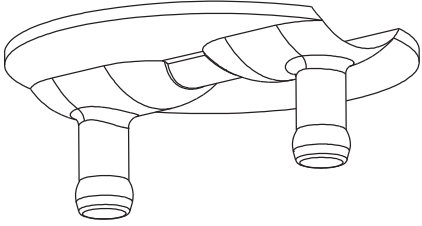
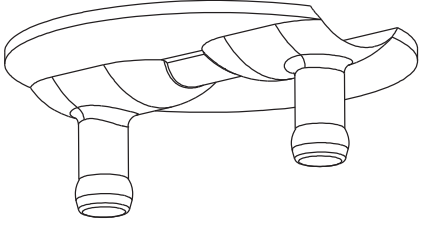
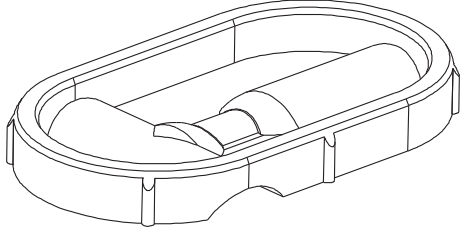
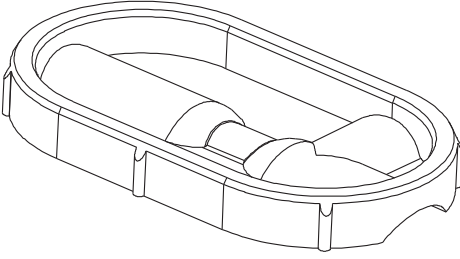
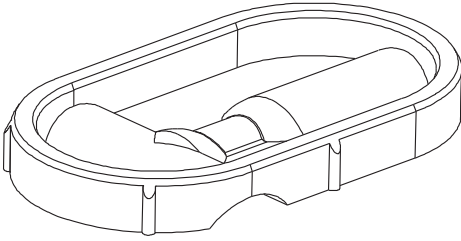
The valve pads in the Clamshell should be changed after 2500 cycles or after six months of use.

1. Run the Unlock Door recipe to open the door and access the valve pads..
2. For Valve Pads A and B, pull the valve pad out using the stems.
3. For Valve Pads C, D and E, insert the blade of a flat head screwdriver between the valve pads and the Clamshell and pry the valve pads off of the Clamshell.
4. Discard the used pads.
5. Install the new pads by aligning the pins on the pads with the holes in the Clamshell. Push the pins into the holes to secure the pads.
6. Run the Lock Door recipe to close secure the door.

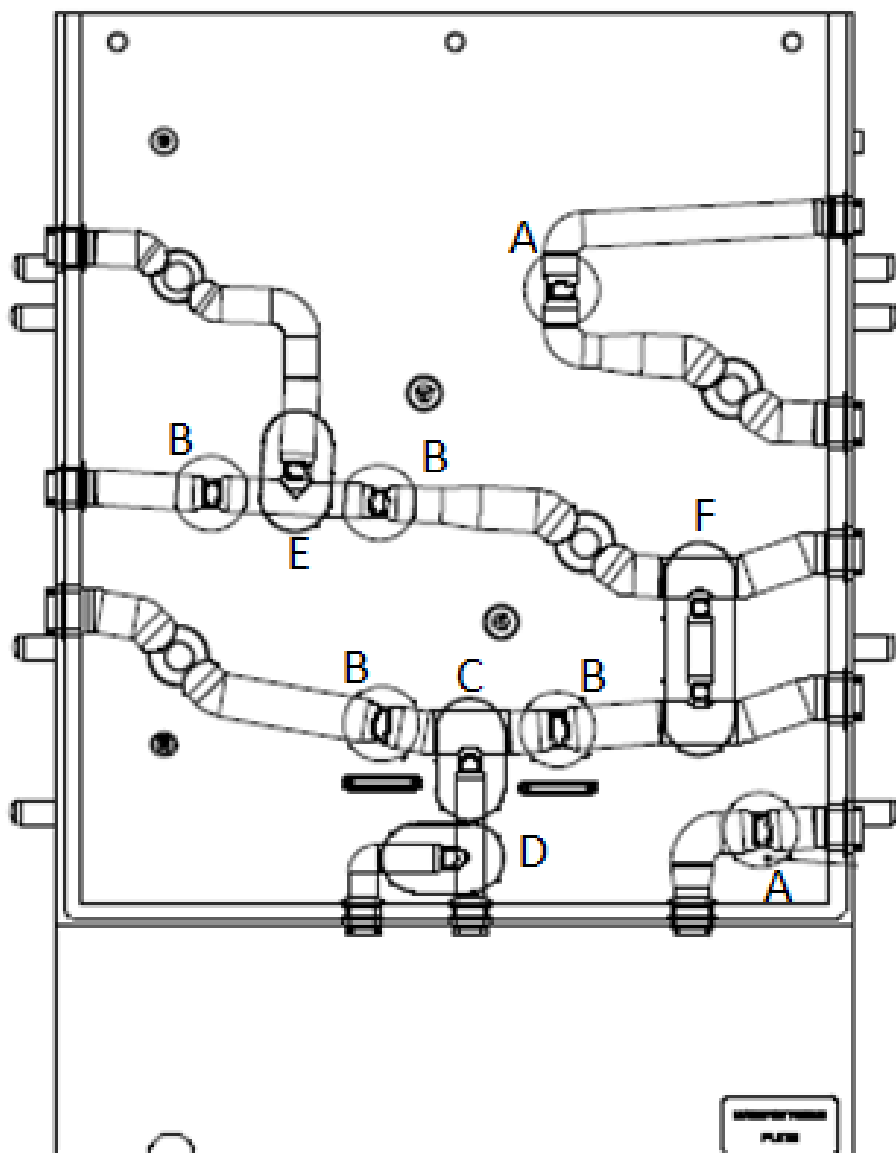
TF2S Valve Pads



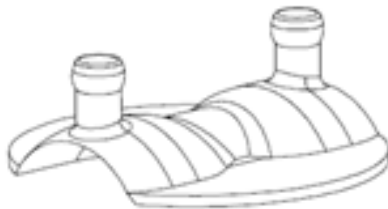
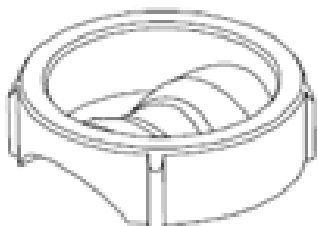
Valve Pad Locations TF2S

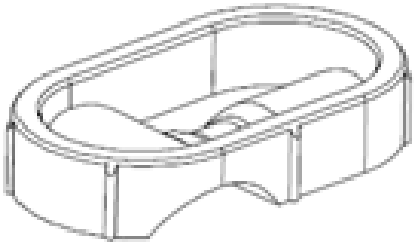
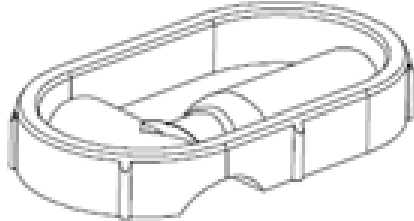
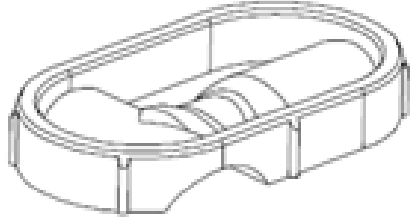
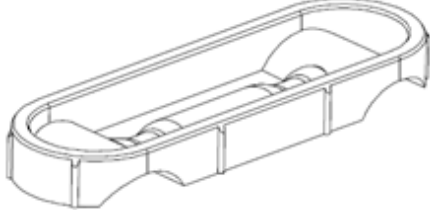
Valve Pad Key	Valve Pad Description	Valve Pad Size
A		5/8 in.
B		14 mm
C		14 mm x 3/8 in.
D		3/8 x 3/8 in.
E		14 mm x 14 mm

TF3S Valve Pads



Valve Pad Locations TF3S

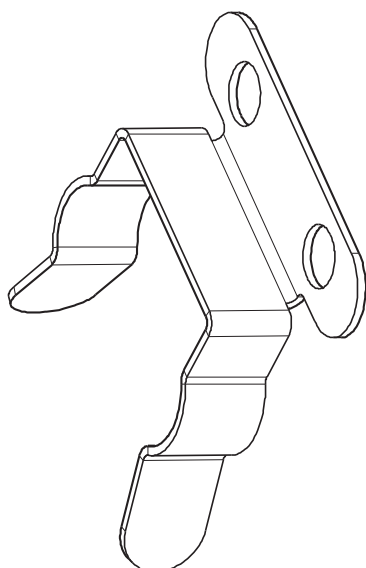
Valve Pad Key	Valve Pad Description	Valve Pad Size
A		5/8 in.
B		3/4 in.

Valve Pad Key	Valve Pad Description	Valve Pad Size
C		3/4 in. x 1/2 in.
D		1/2 in. x 1/2 in.
E		5/8 in. x 5/8 in.
F		3/4 in. x 1/2 in. DBL

Replacing the Fitting Clips

Clamshell	Fitting Clip Size
Chrom 2.2	1/4 inch
Chrom 8.0	3/8 inch
TF-2	3/8 inch
	1/2 inch
	5/8 inch

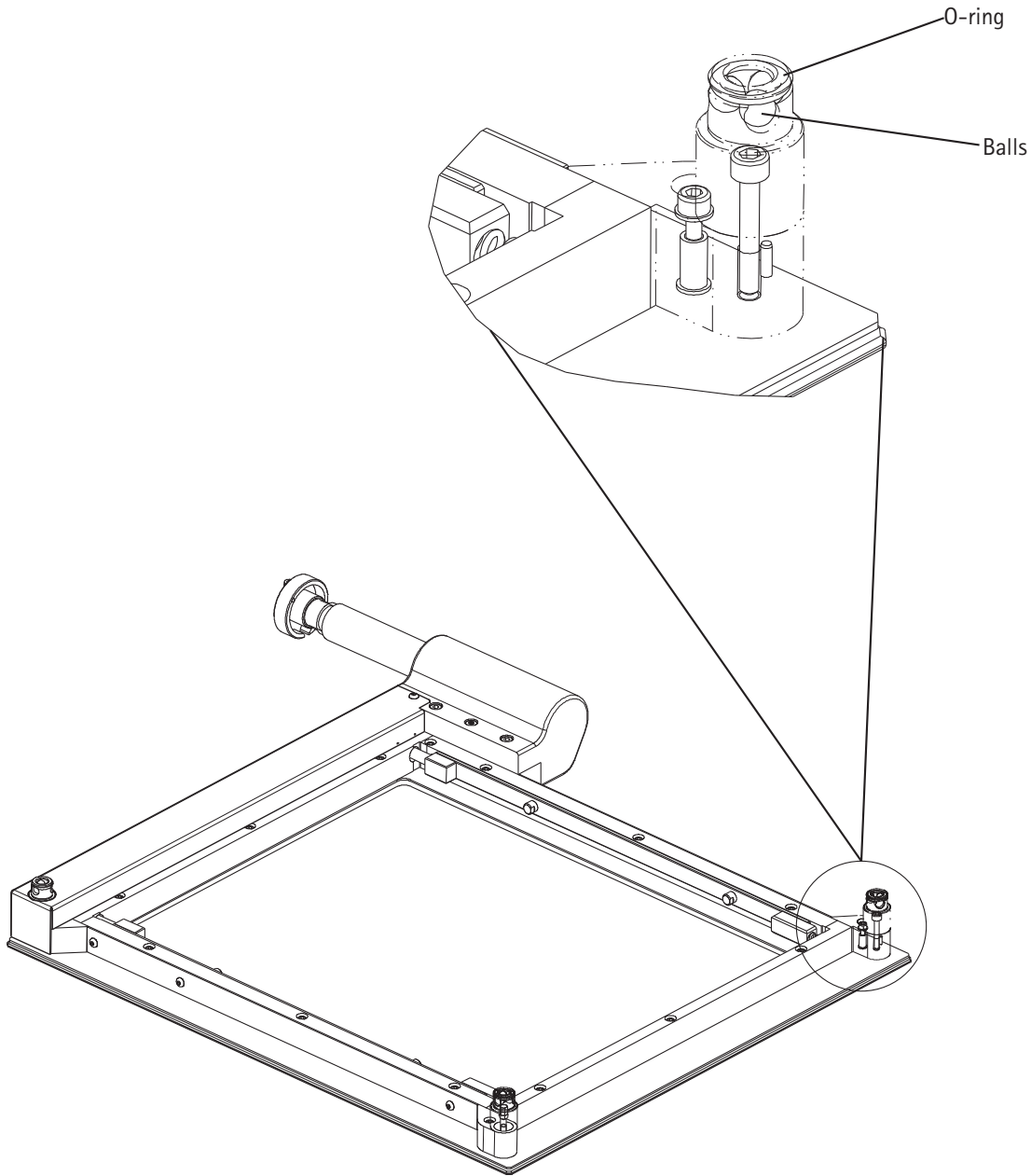
1. Run the Unload Clamshell for Maintenance recipe.
2. Remove the clip from the clamshell by removing the two screws that hold the clip onto the clamshell.
3. Place the new clip in position and fasten it to the clamshell with the screws.



4. Run the Load Clamshell after Maintenance recipe.

Replacing the Clamshell Door O-rings or Balls

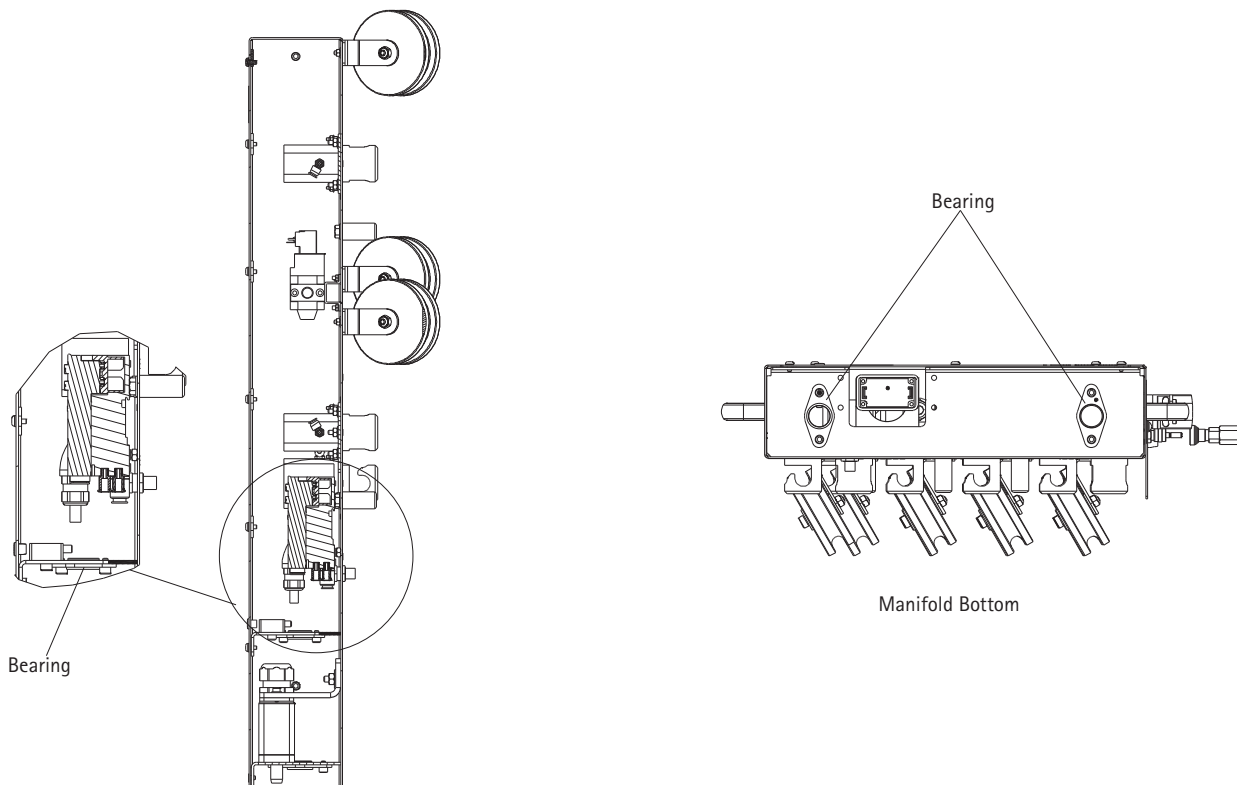
The lock on the Smart Cart door has O-rings and stainless steel balls that may need periodic replacement.



1. Run the Unlock Door recipe to open the door.
2. Remove the O-ring from the lock.
3. Remove the three balls from inside the lock cylinder.
4. Insert the replacement balls into the cylinder.
5. Insert the O-ring in the groove so that it seats completely.
6. Run the Lock Door recipe to close secure the door.

Replacing the Manifold Bearings

There are three bearings on the Manifold that may need replacement. Two bearings are located on the bottom of the Manifold. One bearing is located inside the Manifold and can be accessed by opening the Manifold Access Panel.

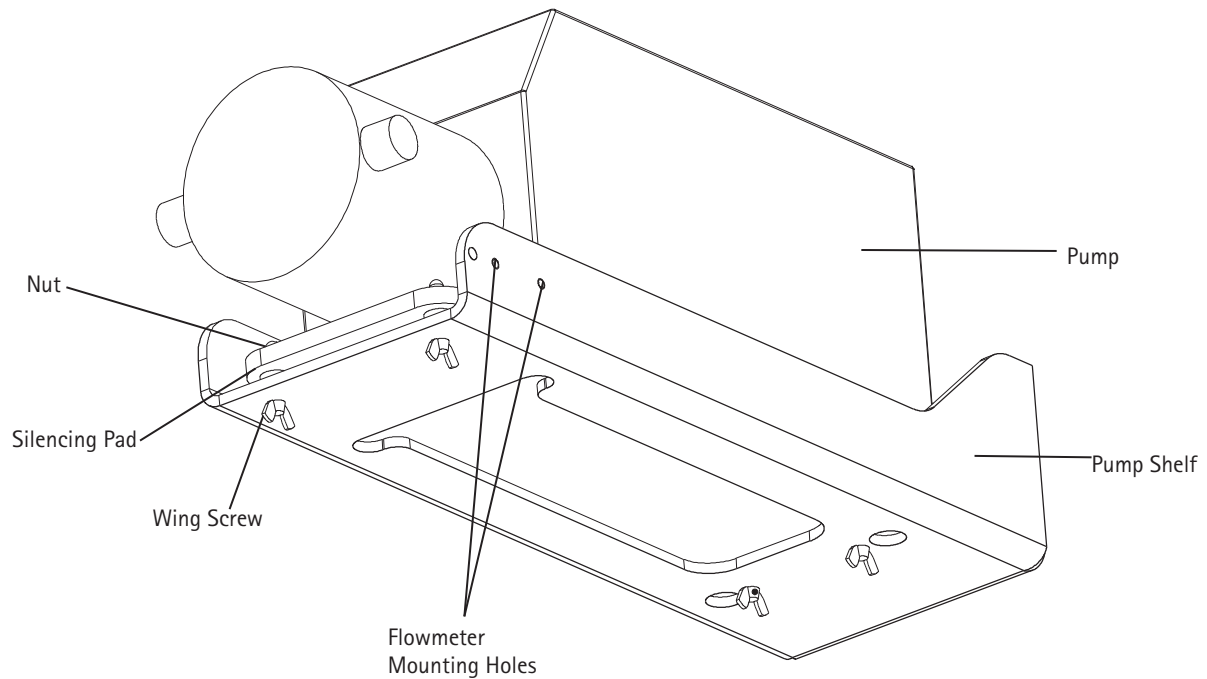


Ensure that the Pump Cart is off. To replace the bearings, remove the screw holding the bearing in place and remove the bearing. Insert the new bearing in place and tighten the screw.

Changing the Pumps

The pump and pump cart must be off before changing the pumps.

1. Remove the pumps and supports from the Pump and Flowmeter Mounting Column.



2. Remove the pumps from the shelves by removing the nuts and wing screws located on the bottom of the support.
3. Separate the pump from the shelf and install the new pump using the nuts and wing screws. Ensure that the silencing pad is in place between the pump and the support. Screw the wing screws into the stoppers on the pump plate.

Changing and Setting the PR Converters

The PR converter is used to convert the flow meter pulses to a proportional 4-20 mA current. This is for the Mobius® FlexReady Solution for Chromatography only.

A PC with the PReset software installed and the PR Loop Link 5909 configuration interface are required for this.

Installing the PR Converters

The PR converters must be changed if converting from Chrom 2.2 to Chrom 8.0. The converters are located in IB04.

1. Unplug the converter and disconnect from the cable.
2. Install the new converter, connect it to the cable.

Replacing and Setting the Bubble Sensors

The End Product Air Sensor must be changed when converting a Chrom 2.2 L/min to a Chrom 8.0 L/min. The End Product Air Sensor is located on the Manifold. Sonotec ABD06.95 or ABD06.90 and a PC with the ABDM software installed are required for this.

Replacing the End Product Air Sensor

1. Unscrew the bubble sensor and remove it from the Manifold.
2. Install the new sensor onto the Manifold with the screws.

Setting the Level Sensors

The level sensors situating on the bubble trap support need to be set. A tip (a pen for example), a bubble trap filled half way with water and the level sensors are required.

1. The system should be powered ON and all emergency stops should be acknowledged.
2. Place the sensors on the support and locate them approximately one-third of the way from the top and bottom of the bubble trap. The stainless steel washers and identification tags must be installed with the sensors.
3. Connect the sensors on the clamshell side and ensure that the sensors are in contact with the bubble trap.
4. Unscrew the sensor LSH016 screw and move it so that it is located in the empty area of the bubble trap.
5. Using the tip, push on the OUT ON button for approximately two seconds until the LED blinks once.
6. Move the sensor so that it is located in the filled area of the bubble trap.
7. Using the tip, push on the OUT OFF button for approximately six seconds until the LED blinks twice.
8. Unscrew the sensor LSH017 screw and repeat the above steps.

LSH017 is active when the sensor is detecting fluid. LSH016 is inactive when the sensor is detecting fluid.

In normal operation, the fluid level must be situated between the two sensors. On the display only the bottom sensor will be green. If the top sensor is green, it means that it is detecting fluid.

System Hardware Door and Clamshell Control

CAUTION

Improper setting of the valves may allow the front clamshell to fall out of the door and cause injury to operator or damage to the clamshell.

Manual control of the clamshell should only be performed by properly trained personnel.

Controls


Controlling the door and clamshell and installing the clamshell is done through the execution of a recipe or through manual control. See the chapter *Using the Recipe Editor* for the specific recipe actions related to door and clamshell control.

Manual Door and Clamshell Control











There are separate controls for the Lock and Unlock processes. To turn a process on/off, click on the valve icon and click OK. Just like the regular valves, the opposite state is selected. The valve icon will be green.

To perform an action, the opposite action's valve must be in the Off/Closed State. The valve icon will be grey.

The user cannot Lock an object if the corresponding Unlock Valve is Open/On. A user cannot Unlock an object if the corresponding Lock Valve is Open/On.

The manual Door and Clamshell Control window is open by clicking on the Door and Clamshell Control Icon  in the Navigation Toolbar.

Door and Clamshell Control

Controls					
Unlock clamshell	Y500A			Lock clamshell	Y500B 
Unlock door	Y501A			Lock door	Y501B 
Unlock clamshell in door	Y502A			Lock clamshell in door	Y502B 
Connect clamshell	Y503A			Disconnect clamshell	Y503B 

Status					
Door closed	XS001	ON		Clamshell locking 1 closed	XS002 OFF
Door to frame locking closed	XS006	ON		Clamshell locking 2 closed	XS003 OFF
				Clamshell locking 3 closed	XS004 OFF
				Clamshell locking 4 closed	XS005 OFF

Door and Clamshell Control Status Display (Chrom shown, TFF does not include XS004 & XS005)

Sample Control Recipe

1. To Unlock and then Lock the Clamshell, assuming the clamshell is in a locked state:
2. Click the Unlock Clamshell Valve.
3. Click OK (Open/On is already selected for the user.) The Valve turns green to indicate the Open/On State and the Clamshell is unlocked.
4. Click the Valve again and click OK. The Valve turns gray to indicate the Closed/Off State. This DOES NOT lock the Clamshell.
5. To lock the Clamshell, click the Lock Clamshell Valve.
6. Click OK. The Valve turns green to indicate the Open/On State and the Clamshell is locked.
7. Click the Valve again and click OK. The Valve turns gray again to indicate the Closed/Off State. This DOES NOT unlock the Clamshell.

Valve Actions

Valve Label on Status Display	Valve Tag on Hardware or Location	Action	Notes
Y500A	XS002, XS003, XS004 (Chrom only), XS005 (Chrom only)	Deactivates the Clamshell Front to Clamshell Rear lock when open so that the rear and front Clamshells are detached.	When the front clamshell and the rear clamshell are unlocked, the balls of the central locking pins, two for TFF or four for Chrom, should be visible in the central core. If one or more locking pins are not locked correctly, the alarm YA27 "Clamshell Locking Defect" is activated and the status of the defective locking pins is set on OFF.
Y500B		Activates the Clamshell Front to Clamshell Rear lock when closed so that the rear and front Clamshells are attached.	
Y501A	XS006	Deactivates the Smart Cart Door lock when open, allowing the door to open.	Three locking pins lock the door. The sensor XS001 detects the door when the door is closed. If the door is not closed correctly the alarm XS001 "Door Closed" is activated and the status of XS001 is on OFF. The sensor XS006 detects that the door is locked. If one of the three locking pin is not locked correctly, the alarm YA27 "Clamshell Locking Defect" is activated and the status of XS006 is set on OFF.
Y501B		Activates the Smart Cart Door lock when closed, allowing the door to close.	
Y502A	Inside edges of Clamshell Door	Deactivates the Smart Cart Door to Clamshell Front lock when open, allowing the door to open without the Clamshell Front attached.	There is no indication of the lock status of the front clamshell in the door.
Y502B		Activates the Smart Cart Door to Clamshell Front lock when closed, allowing the door to open with the Clamshell Front attached.	
Y503A	XC009	Activates the Clamshell to Smart Cart communication when closed so that communication is available.	If the clamshell is not connected, there is no communication possible with the clamshell and the alarm YA15 "Clamshell Station Communication Failure" is activated.
Y503B		Deactivates the Clamshell to Smart Cart communication when open so that communication is not available.	

Status

The Status section of the Door and Clamshell Control Display Status displays the states (ON/OFF) of various physical components.

Safety

Before starting operations in manual control, the following actions will make sure that the system is in a safe state:

1. Disable the alarms XS001, YA27 and YA15 (on the P & ID process display).
2. Open all valves in the clamshell (on the P&ID process display).
3. In the section Controls, open Y502B (green on process display).
4. In the Status section, verify the status of the sensors and that they correspond to the current system state.
5. In the section Controls, close all manual valves (grey on process display).

Before leaving the manual control window, the following actions will make sure that the system is in a safe state:

1. In the Status section, verify the status of the sensors and that they correspond to the current system state.
2. In the section Controls, open Y502B (green on process display).
3. In the section Controls, close all manual valves (grey on process display).
4. Enable the alarms XS001, YA27 and YA15 (on the P&ID process display).

If the system is on hold, select "Resume with current flowpath".

Sample Control Recipe

Unlock Door

1. Before getting started, check that the system is in a safe state as described above.
2. Open Y500A (green) to unlock the front clamshell for the rear clamshell
3. Open Y501A (green) to unlock the door.
4. Open the door.

Lock Door

1. Before getting started, check that the system is in a safe state as described above.
2. Close the door and maintain it closed.
3. Open Y501B (green) to lock the door.
4. Open Y500B (green) to lock the front clamshell to the rear clamshell.
5. Verify the status of the lock sensor XS006 and XS002/XS003/XS004 (for Chrom only)/XS005 (for Chrom only).

Unload Clamshell for Storage

1. Before getting started, check that the system is in a safe state as described above.

2. Open Y500B (green) to lock the front clamshell to the rear clamshell.
3. Open Y502A (green) to unlock the front clamshell from the door.
4. Open Y501A (green) to unlock the door.
5. Open the door.
6. Open Y503B (green) to disconnect the clamshell.
7. Unload the clamshell.

Load Clamshell after Storage

1. Before getting started, check that the system is in a safe state as described above.
2. Load the clamshell.
3. Open Y502A
4. Close the door and keep it closed.
5. Open Y501B (green) to lock the door.
6. Open Y502B (green) to lock the front clamshell into the door.
7. Open Y503A (green) to connect the clamshell.
8. Wait for communication with the clamshell.
9. Once all I/O network are green, system is on "hold", select "Resume with current flowpath".

Default Windows®/iFIX® User Names and Passwords

The system has some preconfigured users. The following table has the default system user names and passwords which allow initial administrator access to configure Windows® and iFIX® Security.

NOTE

After logging in via the default admin user name and password, and after creating password protected administrator accounts with the same security privileges as the default account, delete the default administrator account to help protect system access security.

The Administrator account should be used only by fully trained and authorized users. It gives access to manual control of the equipment that could result in user injury or system damage.

Default Windows®/iFIX® Groups

Three Windows® User Groups are preconfigured:

- CCP® Administrators
- CCP® Users
- CCP® Users on Acrobat® Software

Four iFIX® User Groups are preconfigured:

- System Administrator
- Supervisor
- Engineer
- Operator

The iFIX® Group assignment determines the available privileges within the User Interface.

See the sections *Applications Features and Security Areas* for details on the privileges assigned to members of each iFIX® Group.

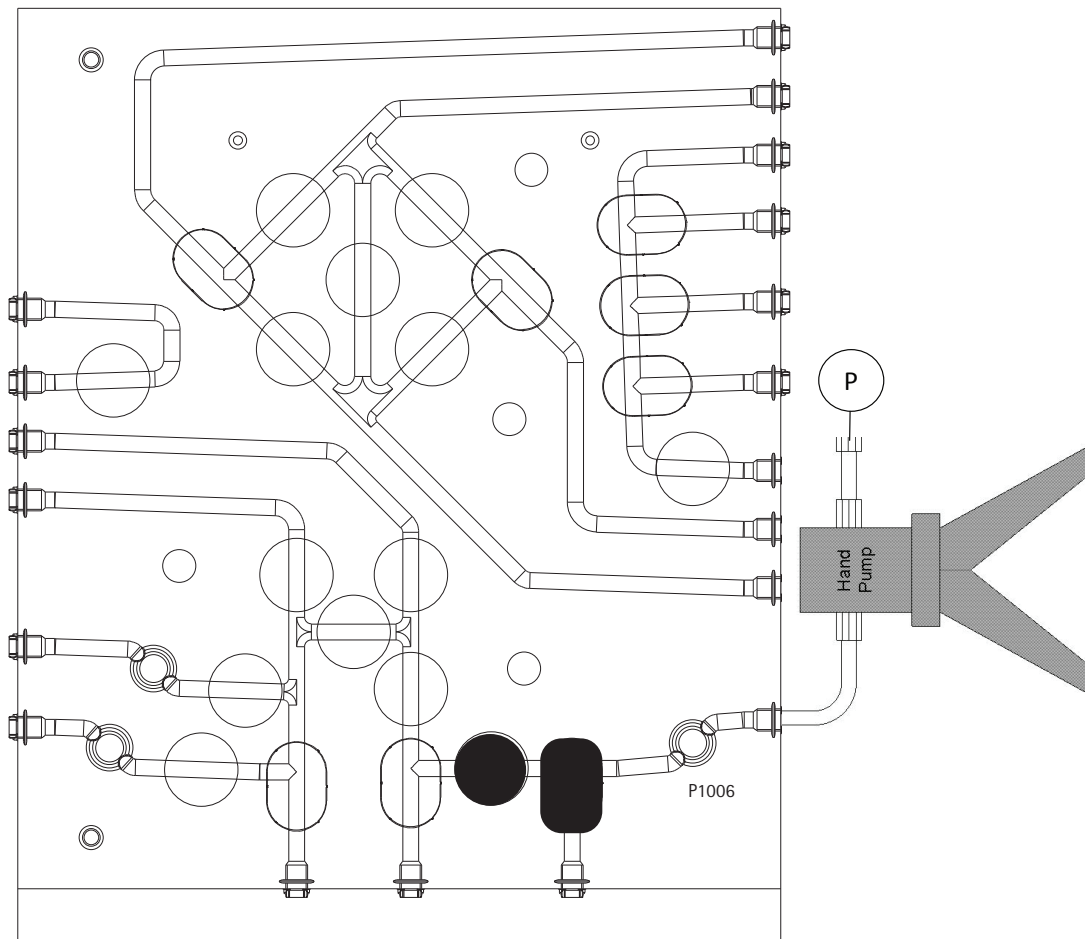
Calibration Verification for the Pressure Sensors in the Clamshell

Material Required

- An air source (a hand pump or compressed air)
- A calibrated pressure sensor
- A Smart Flexware® Assembly for Chromatography Assembly
- The Clamshell must be connected to the Smart Cart

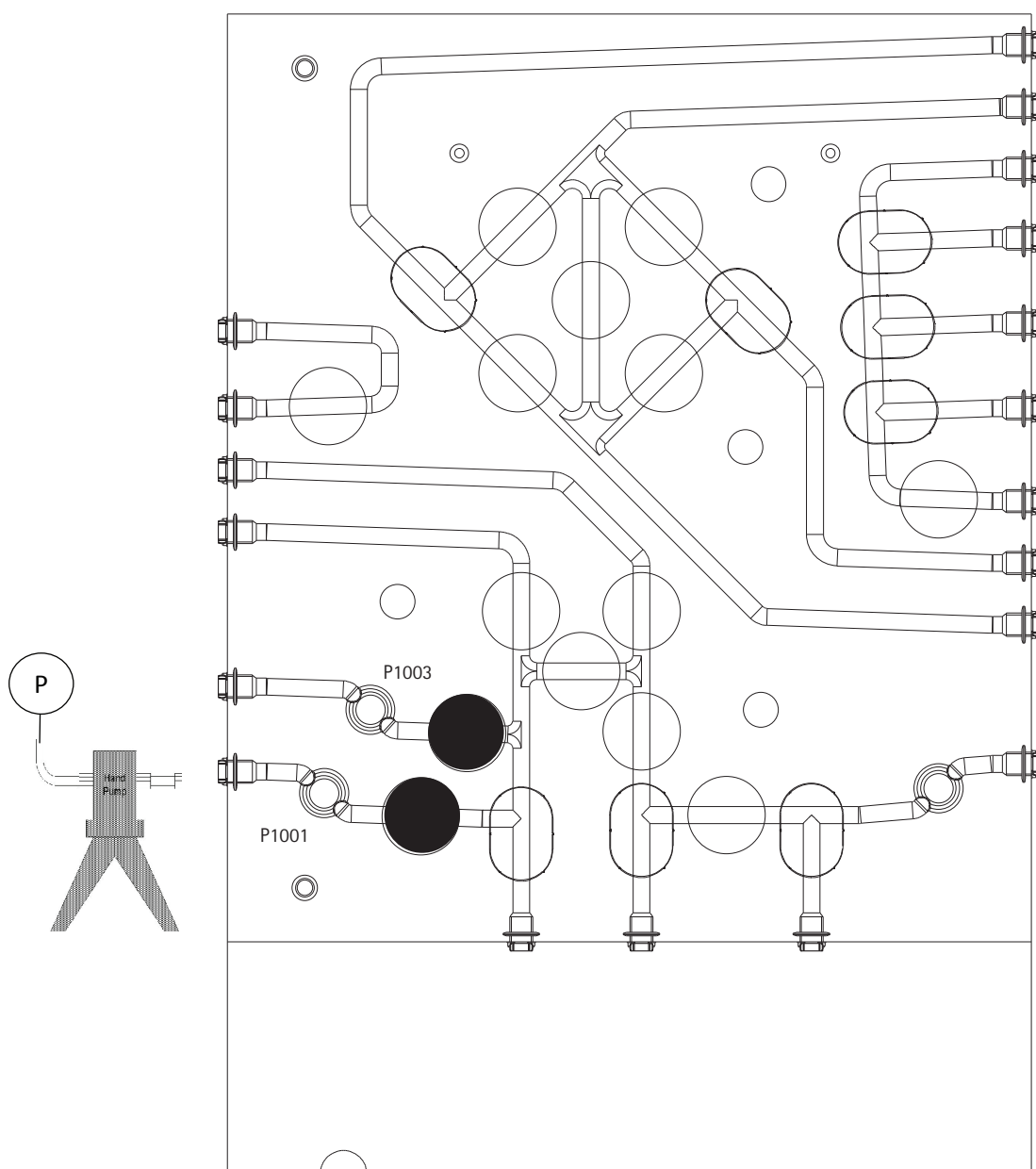
Pressure Sensor PI006

1. Connect the air source to the calibrated pressure sensor and to the Smart Flexware® Assembly as shown.
2. Close the valves as shown.
3. Apply pressure to reach the setpoints 0.00, 2.00 and 4.00 bar.
4. Record the different pressures on the reference pressure sensor and the respective pressures displayed on the system for PI006.
5. Release the pressure.



Pressure Sensors PI001 and PI003

1. Connect the air source to the calibrated pressure sensor and to the Smart Flexware® Assembly as shown.
2. Close the valves as shown.
3. Apply pressure to reach the setpoints 0.00, 2.00 and 4.00 bar.
4. Record the different pressures on the reference pressure sensor and the respective pressures displayed on the system for PI006.
5. Release the pressure.



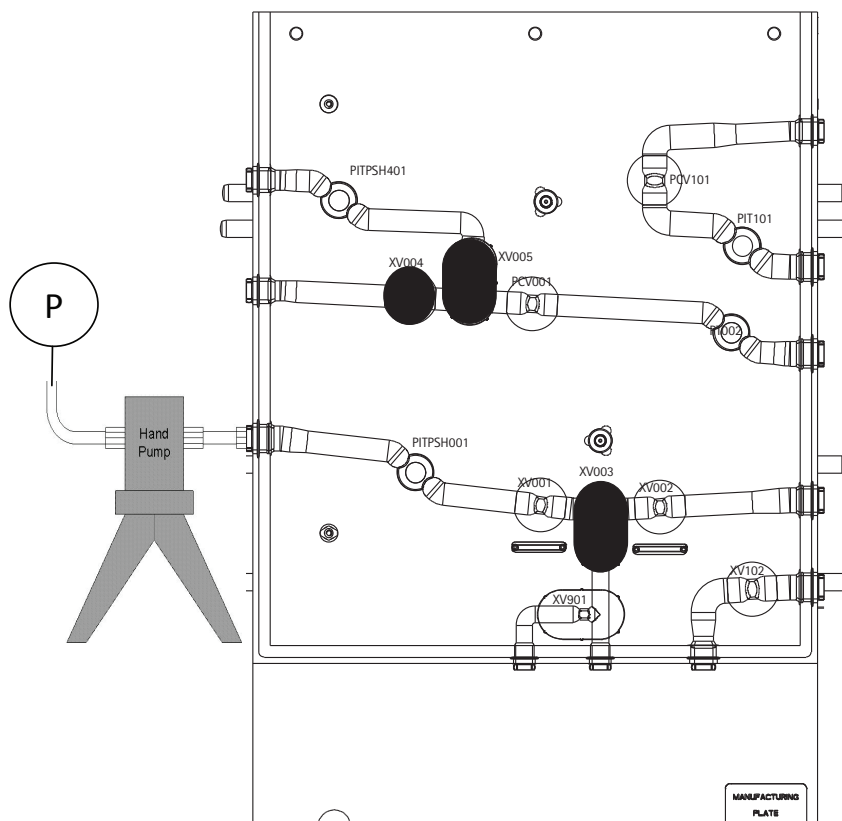
Calibration Verification for the Pressure Sensors in the Clamshell

Material Required

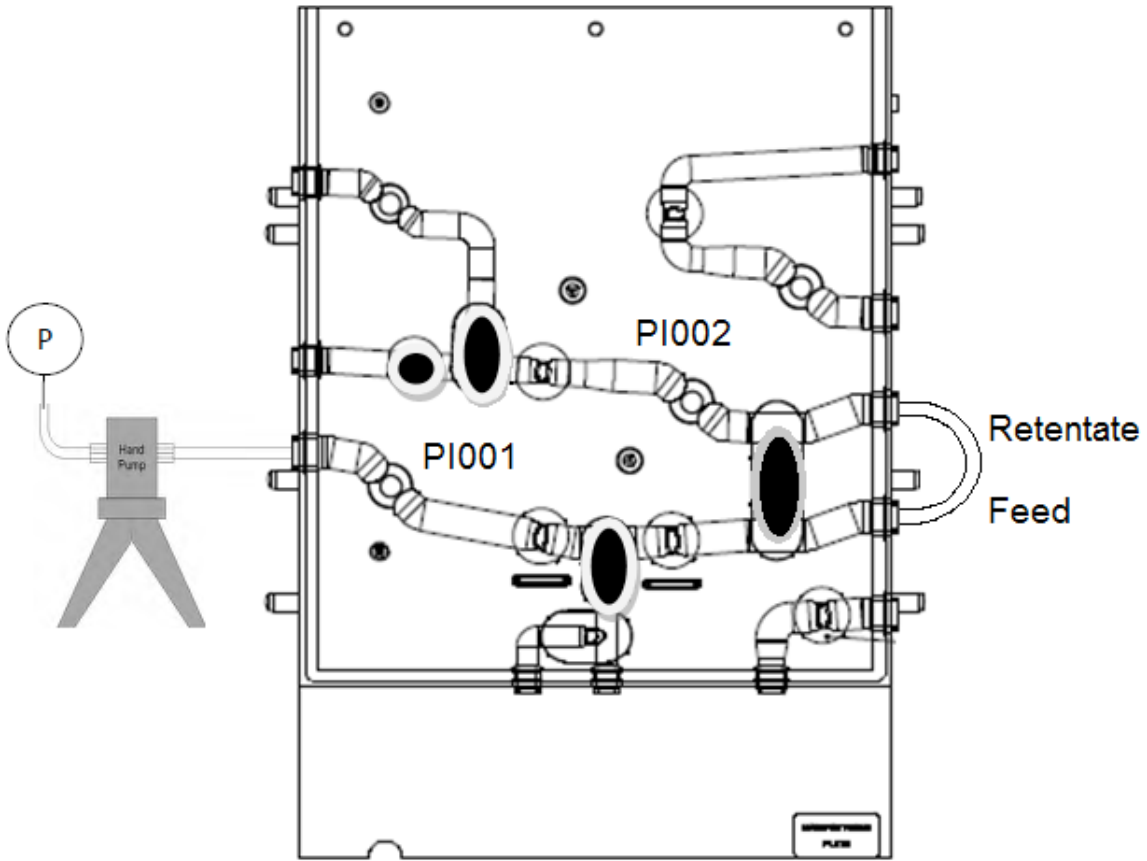
- An air source (a hand pump or compressed air)
- A calibrated pressure sensor
- A Smart Flexware® Assembly for TFF Assembly
- The Clamshell must be connected to the Smart Cart

Pressure Sensors PI001 and PI002

1. Plug the filtrate line as shown.
2. Connect the air source to the calibrated pressure sensor and to the Smart Flexware® Assembly as shown.
3. Close the valves as shown.
4. Apply pressure to reach the setpoints 0.00, 2.00 and 4.00 bar.
5. Record the different pressures on the reference pressure sensor and the respective pressures displayed on the system for PI001 and PI002
6. Release the pressure.



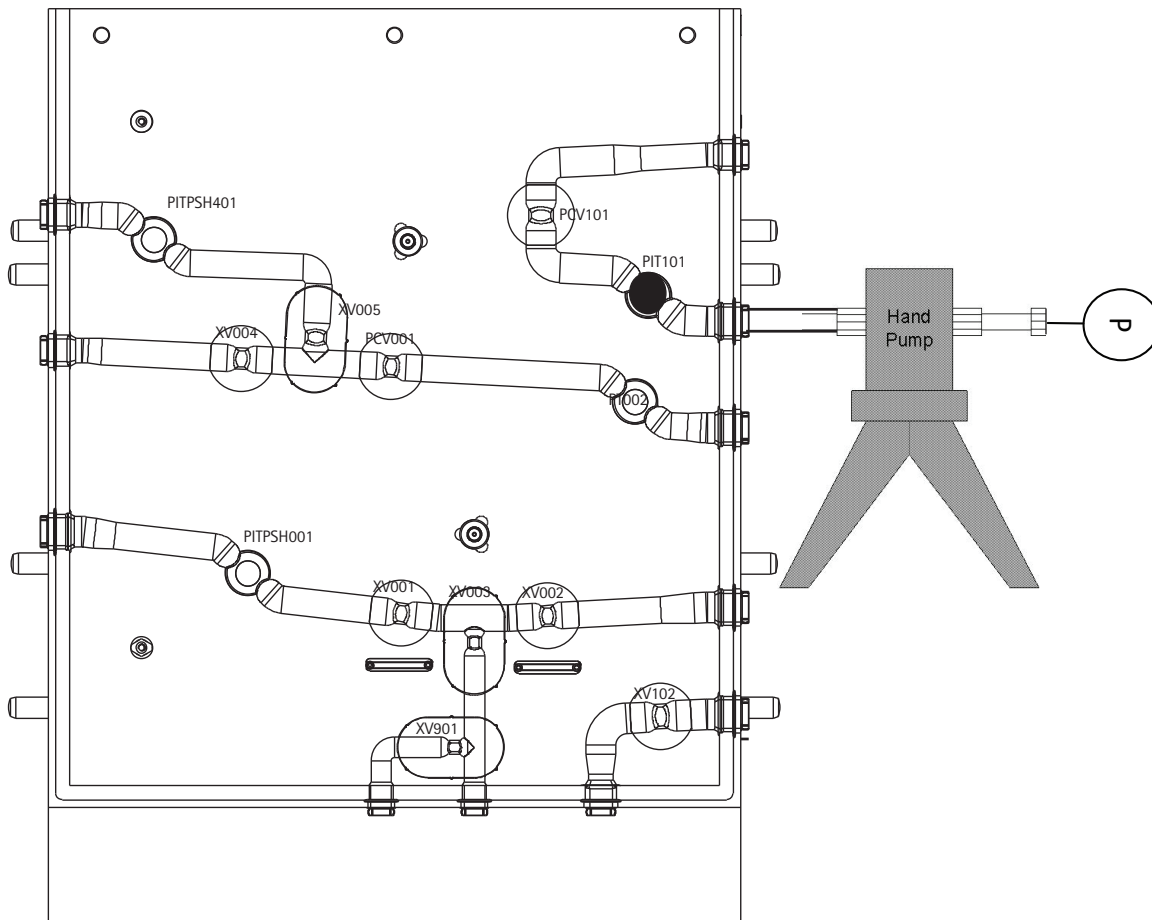
Pressure Sensors for TF-2.5 m



Pressure Sensors for TF-5.0 m

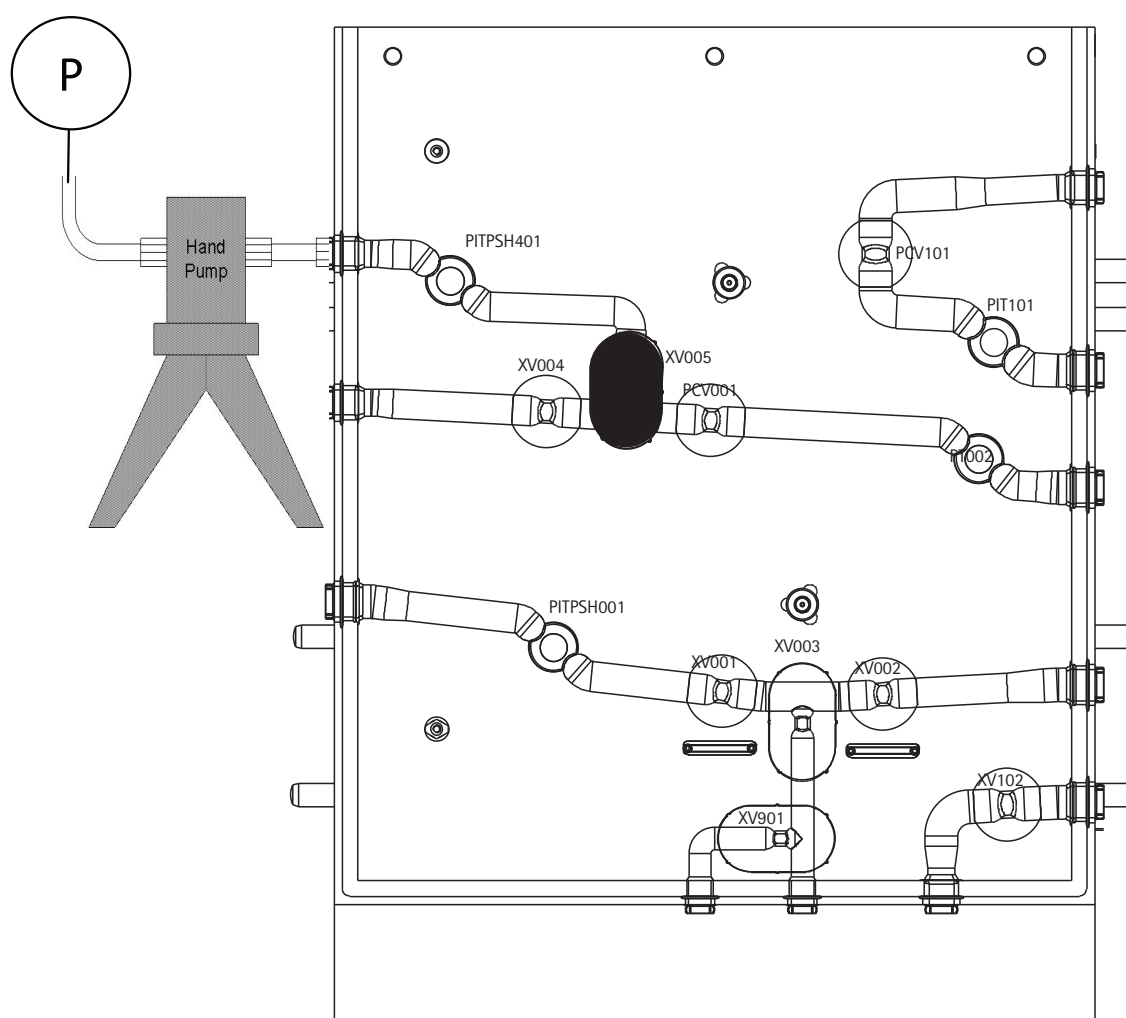
Pressure Sensors PI101

1. Plug the retentate line as shown.
2. Connect the air source to the calibrated pressure sensor and to the Smart Flexware® Assembly as shown.
3. Close the valves as shown.
4. Apply pressure to reach the setpoints 0.00, 2.00 and 4.00 bar.
5. Record the different pressures on the reference pressure sensor and the respective pressures displayed on the system for PI001 and PI002
6. Release the pressure.



Pressure sensors PI401

1. Plug the retentate line as shown on figure below
2. Connect the air source to the calibrated pressure sensor and to the Smart Flexware® Assembly as shown.
3. Close the valves as shown.
4. Apply pressure to reach the setpoints 0.00 and 2.00 bar.
5. Record the different pressures on the reference pressure sensor and the respective pressures displayed on the system for PI401.
6. Release the pressure.



Converting Systems

The modular design of the Mobius® FlexReady Solutions allow for easy conversion from one sized system to another. The Smart Cart can be used for either the Chrom 2.2 L/min system or the Chrom 8.0 L/min system by following these guidelines.

See the *Assembling and Setting Up the Hardware* chapter in this manual for installation details.

Converting a Chrom 2.2 L/min System to a Chrom 8.0 L/min System

Converting a Chrom 8.0 L/min System to a Chrom 2.2 L/min System

Remove all the Flexware® Assemblies from the system.

To convert from one system to the other, the items in the table below must be changed. Refer to *Assembling and Setting Up the Hardware* for instructions.

Component		Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography	
		Chrom. 2.2 L/Min	Chrom. 8.0 L/Min
Smart Cart with Clamshell	Clamshell	CLAMXM1	CLAMXM3
Pump Cart	Flowmeter	FLWXM1	FLWXM3SU or FLWXM3
	End product Air Sensor	SENSXM1BUBL	SENSXM3BUBL
	Pump	PUMP150S	PUMP1200S
Instrumentation Column	MU Instrumentation post column Sensor	SENKXM1-1 SENKXM1-2 SENKXM1-3	SENKXM3-1 SENKXM3-2 SENKXM3-3
	MU Instrumentation pre & post column Sensor	SENKXM1PR	SENKXM3PR

Converting a Chrom 2.2 L/min System to a TFF System

Remove all the Flexware® Assemblies from the system.

To convert from one system to the other, the items in the table below must be changed. Refer to *Assembling and Setting Up the Hardware* for instructions.

Component		Mobius® FlexReady Solution with Smart Flexware® Assembly		
		Chrom. 2.2 L/Min	TFF-2.5 m ²	TFF 5.0m ²
Smart Cart	Clamshell	CLAMXM1	CLAMTF2S	CLAMTF3S
	Bubble Trap support	SPTBUBBL	N/A	
	Filter Support	FILTSPXM	N/A	
	Retentate Sampler	N/A	MBSMTTF2ACC	N/A
Tank Cart	50 L Tank	N/A	MBSMTNK50XX	N/A
	100 L Tank	N/A	MBSMTNK100XX	N/A
	200 L Tank	N/A	MBSMTNK200XX	
Pump Cart	Flowmeter	FLWXM1	N/A	
	Manifold	MNFLDXM	MNFLDTF	MBSMTF3PUMPXXXX (pump cart with pump)
	Pump	PUMP150S	PUMP1200S	
Instrument Column	Multi-Use Instruments	MBSMTXINS1-1	MBSMTTINS1 MBSMTTINS2 MBSMTTINS3	
		MBSMTXINS1-2		
		MBSMTXINS1-3		
		MBSMTXINS2-1		
		MBSMTXINS2-2		
		MBSMTXINS2-3		
	Single-Use Instruments	MBSMTXINS5	MBSMTTINS4	MBSMTTINS7
		MBSMTXINS6		
Weight scale		N/A	MBSACC020U	
Cassette Holder		N/A	Included in MBSMTTF2ACC	FILTSPTF3S

Converting a Chrom 8.0 L/min System to a TFF System

Remove all the Flexware® Assemblies from the system. To convert from one system to the other, the items in the table below must be changed. Refer to *Assembling and Setting Up the Hardware* for instructions.

Component		Mobius® FlexReady Solution with Smart Flexware® Assembly		
		Chrom. 8.0 L/Min	TFF-2.5 m ²	TFF 5.0m ²
Smart Cart	Clamshell	CLAMXM3	CLAMTF2S	CLAMTF3S
	Bubble Trap support	SPTBUBBL	N/A	
	Filter Support	FILTSPXM	NA	
	Retentate Sampler	N/A	MBSMTTF2ACC	N/A
Tank Cart	50 L Tank	N/A	MBSMTNK50XX	
	100 L Tank	N/A	MBSMTNK100XX	
	200 L Tank	N/A	MBSMTNK200XX	
PUMP cart	Flowmeter	FLWXM3SU or FLWXM3	N/A	N/A
	Manifold	MNFLDXM	MNFLDTF	MBSMTF3PUMPXXXX
	Pump	PUMP1200S	PUMP1200S	
Instrument column	Multi Use Instruments	MBSMTXINS3-1	MBSMTTINS1 MBSMTTINS2 MBSMTTINS3	
		MBSMTXINS3-2		
		MBSMTXINS3-3		
		MBSMTXINS4-1		
		MBSMTXINS4-2		
		MBSMTXINS4-3		
	Single Use Instruments	MBSMTXINS5	MBSMTTINS4	MBSMTTINS7
		MBSMTXINS6		
Weight scale		N/A	MBSACC020U	
Cassette Holder		N/A	Included in MBSMTTF2ACC	FILTSPF3S

Adding or Removing Column Instrumentation

Adding Precolumn Instrumentation to a System with Post Column Instrumentation Only

1. Install the precolumn instrumentation hardware. See the *Assembling and Setting Up the Hardware* chapter in this manual for installation details.
2. Connect the conductivity, pH and UV cables.
3. Change the transmitter configuration from XMO1/2PST to XMO1/2PSTPRE or XMO3PST to XMO3PSTPRE, by selecting, PRODUCT CHANGE from the MAIN MENU.

MAIN MENU		
MEASUREMENT DISPLAY		
DATA LOGGER DISPLAY		
SYSTEM INFORMATION DISPLAY		
PRODUCT CHANGE		
PRODUCT CONFIGURATION		
SYSTEM SETTINGS		
MAINTENANCE		
LANGUAGE / SPRACHE		
01.05.2011	P02	11:26:55

Product Change Screen

4. Enter password (222), if prompted.
5. Select the desired product configuration and save it. The selected configuration will be displayed in the center of the bottom of the screen.

Configuration Name	Description	Lamp Voltage
XMO1/2PSTPRE	Chrom 2.2 LPM system with post and pre column instrumentation	ON
XMO1/2PST	Chrom 2.2 LPM system with only post column instrumentation	ON
XMO3PSTPRE	Chrom 8.0 LPM system with post and pre column instrumentation	ON
XMO3PST	Chrom 8.0 LPM system with only post column instrumentation	ON

6. From MAIN MENU select SYSTEM SETTINGS.
7. Enter password if required.

8. Select LAMP VOLTAGE.

SYSTEM SETTINGS		
DISPLAY		
DATE / TIME		
DATA LOGGER		
EVENT LOGGER		
LAMP VOLTAGE		
OPTICAL INPUTS		
SENSOR TF		
SENSOR TEMPERATURE ▼		
01.05.2011	P01	11:26:55

System Settings Menu with LAMP VOLTAGE Selected

9. Set the LAMP VOLTAGE to ON and save it.

SYSTEM SETTINGS		
ADJUST LAMP VOLTAGE:		
LAMP E (VDC): 7.22		
LAMP VOLTAGE : ON		
REJECT	P01	SAVE

Entering LAMP VOLTAGE

10. Select SYSTEM SETTINGS > SENSOR TEMPERATURE. The SENSOR TEMPERATURE menu appears.

SYSTEM SETTINGS		
TEMPERATURE DISPLAY:		° CELSIUS
SENSOR:		TEMP(COND1)
SENSOR ACTIVE:		YES
CALIBRATION:		DEFAULT USER
REJECT	P01	SAVE

Sensor Temperature Menu

11. Set the parameters as follows:

Parameters	Settings			
TEMPERATURE DISPLAY	°CELSIUS			
SENSOR	TEMP (COND1)	TEMP (COND2)	TEMP (pH1)	TEMP (pH2)
SENSOR ACTIVE	YES	YES	YES	YES
CALIBRATION	DEFAULT			

12. Click SAVE.

13. Select SYSTEM SETTINGS > SENSOR CONDUCTIVITY. The SENSOR CONDUCTIVITY menu appears.

SYSTEM SETTINGS		
SENSOR:		COND1
SENSOR ACTIVE:		YES
CALIBRATION:		DEFAULT
TEMP. COMPENSATION:		YES
REFERENCE TEMP. [°C]:		25.0000
TEMP. COEFFICIENT [%]:		2.0000
REJECT	P01	SAVE

Sensor Conductivity Menu

14. Set parameters as follows:

Parameter	Settings	
SENSOR	COND1	COND2
SENSOR ACTIVE	YES	YES
CALIBRATION	USER	
TEMP. COMPENSATION	YES	
REFERENCE TEMP	25.0000	
TEMP. COEFFICIENT	2.0000	

15. Click SAVE.

16. Select SYSTEM SETTINGS > SENSOR pH. The SENSOR pH menu appears.

SYSTEM SETTINGS		
pH-ELECTRODE:	pH1	
SENSOR ACTIVE:	YES	
CALIBRATION:	DEFAULT	
CALIBRATION DATA:		
MAX SL ADJUSTMENT [%]:	50.00	
MAX OFFSET [mV]:	50.00	
TEMP. COMPENSATION:	YES NO	
REJECT	P01	SAVE

Sensor pH Menu

17. Set parameters as follows:

Parameter	Setting	
pH-ELECTRODE	pH1	pH2
SENSOR ACTIVE	YES	YES
CALIBRATION	DEFAULT	
MAX SL ADJUSTMENT [%]	50.0000	
MAX OFFSET [mV]	50.0000	
TEMP. COMPENSATION	YES	
TEMP. COEFFICIENT	2.0000	

18. Click SAVE.

19. Reboot the transmitter. After reboot, the transmitter should be in the XMO1/2PSTPRE configuration.

Converting a Chrom 2.2 L/min System with Post Column Instrumentation to a Chrom 8.0 L/min System with Post Column Instrumentation

or

Converting a Chrom 8.0 L/min System with Post Column Instrumentation to a Chrom 2.2 L/min System with Post Column Instrumentation

No change in hardware is required for this conversion.

1. Change the transmitter configuration from XMO1/2PST to XMO3PST or XMO3PST to XMO1/2PST, by selecting, PRODUCT CHANGE from the MAIN MENU.

MAIN MENU		
MEASUREMENT DISPLAY		
DATA LOGGER DISPLAY		
SYSTEM INFORMATION DISPLAY		
PRODUCT CHANGE		
PRODUCT CONFIGURATION		
SYSTEM SETTINGS		
MAINTENANCE		
LANGUAGE / SPRACHE		
01.05.2011	P02	11:26:55

Product Change Screen

2. Enter password, if prompted.
3. Select the desired product configuration and save it. The selected configuration will be displayed in the center of the bottom of the screen.

Configuration Name	Description	Lamp Voltage
XMO1/2PSTPRE	Chrom 2.2 LPM system with post and pre column instrumentation	ON
XMO1/2PST	Chrom 2.2 LPM system with only post column instrumentation	ON
XMO3PSTPRE	Chrom 8.0 LPM system with post and pre column instrumentation	ON
XMO3PST	Chrom 8.0 LPM system with only post column instrumentation	ON

4. From MAIN MENU select SYSTEM SETTINGS.
5. Enter password if required.
6. Select LAMP VOLTAGE.

SYSTEM SETTINGS		
DISPLAY		
DATE / TIME		
DATA LOGGER		
EVENT LOGGER		
LAMP VOLTAGE		
OPTICAL INPUTS		
SENSOR TF		
SENSOR TEMPERATURE ▼		
01.05.2011	P01	11:26:55

System Settings Menu with LAMP VOLTAGE Selected

7. Set the LAMP VOLTAGE to ON and save it.

SYSTEM SETTINGS		
ADJUST LAMP VOLTAGE:		
LAMP E (VDC): 7.22		
LAMP VOLTAGE : ON		
REJECT	P01	SAVE

Entering LAMP VOLTAGE

8. Click SAVE.
9. Reboot the transmitter. After reboot, the transmitter should be in the XMO3PST configuration.

Adding UV Instrumentation to a TFF System with Conductivity Instrumentation

1. Connect UV sensor to the system.
2. From MAIN MENU select PRODUCT CHANGE.

MAIN MENU		
MEASUREMENT DISPLAY		
DATA LOGGER DISPLAY		
SYSTEM INFORMATION DISPLAY		
PRODUCT CHANGE		
PRODUCT CONFIGURATION		
SYSTEM SETTINGS		
MAINTENANCE		
LANGUAGE / SPRACHE		
01.05.2011	P02	11:26:55

Product Change Screen

3. Enter password, if prompted.
4. Select the defined product configuration TF2S PST and save it. Selected configuration will be displayed in the bottom middle.

Configuration Name	Description	Lamp Voltage
TF2S PST	TF-2S system with UV and conductivity instrumentation	ON
TF2S UV	TF-2S system with only UV instrumentation	ON
TF2S COND	TF-2S system with only conductivity instrumentation	OFF

5. From MAIN MENU select SYSTEM SETTINGS. Enter password if required. Select LAMP VOLTAGE.

SYSTEM SETTINGS		
DISPLAY		
DATE / TIME		
DATA LOGGER		
EVENT LOGGER		
LAMP VOLTAGE		
OPTICAL INPUTS		
SENSOR TF		
SENSOR TEMPERATURE ▼		
01.05.2011	P01	11:26:55

System Settings Menu with LAMP VOLTAGE Selected

6. Set / verify LAMP VOLTAGE = ON and save it.

SYSTEM SETTINGS		
ADJUST LAMP VOLTAGE:		
LAMP E (VDC):	7.22	
LAMP VOLTAGE :	ON	
REJECT	P01	SAVE

Entering LAMP VOLTAGE

7. Select SYSTEM SETTINGS > OPTICAL INPUTS and press [ENTER]. .

SYSTEM SETTINGS		
DISPLAY		▲
DATE / TIME		
DATA LOGGER		
EVENT LOGGER		
LAMP VOLTAGE		
OPTICAL INPUTS		
SENSOR TF		
SENSOR TEMPERATURE ▼		
01.05.2011	P01	11:26:55

Menu System Settings, CHOOSING OPTICAL INPUTS

8. The OPTICAL INPUTS menu appears.

SYSTEM SETTINGS		
THESE DETECTOR INPUTS ARE CONNECTED:		
CHANNEL A:	YES	
CHANNEL B:	YES	
CHANNEL C:	YES	
CHANNEL D:	YES	
01.05.2011	P01	11:26:55

Optical Inputs Menu

9. Set and verify following parameters:

Parameter	Setting
CHANNEL A	YES
CHANNEL B	YES
CHANNEL C	YES
CHANNEL D	YES

10. Reboot the transmitter. After reboot, transmitter must be in TF2S PST configuration.

IP Addresses

Listed here are the unique IP addresses assigned hardware.

Catalog Number	Description	IP Address
CLAMTF2S	FLEXREADY SMART TF2S, CLAMSHELL	10.20.56.123
CLAMTF3S	FLEXREADY SMART TF3S, CLAMSHELL	10.20.56.124
CLAMXM1	FLEXREADY SMART Chrom. 2.2L/Min, CLAMSHELL	10.20.56.121
CLAMXM3	FLEXREADY SMART Chrom. 8.0L/Min, CLAMSHELL	10.20.56.122
MBSMTBTF2SCH	FLEXREADY SMART TFF-2.5M2, SMART CART W/ CLAMSHELL, CN	10.20.56.131
MBSMTBTF2SEU	FLEXREADY SMART TFF-2.5M2, SMART CART W/ CLAMSHELL, EU	10.20.56.131
MBSMTBTF2SJP	FLEXREADY SMART TFF-2.5M2, SMART CART W/ CLAMSHELL, JP	10.20.56.131
MBSMTBTF3SJP	FLEXREADY SMART TFF-5.0M2, SMART CART W/ CLAMSHELL, JP	10.20.56.131
MBSMTBTF2SKR	FLEXREADY SMART TFF-2.5M2, SMART CART W/ CLAMSHELL, KO	10.20.56.131
MBSMTBTF2SNA	FLEXREADY SMART TFF-2.5M2, SMART CART W/ CLAMSHELL, NA	10.20.56.131
MBSMTBTF2SUK	FLEXREADY SMART TFF-2.5M2, SMART CART W/ CLAMSHELL, UK	10.20.56.131
MBSMTBXM1CH	FLEXREADY SMART Chrom. 2.2L/Min, SMART CART W/ CLAMSHELL, CN	10.20.56.131
MBSMTBXM1EU	FLEXREADY SMART Chrom. 2.2L/Min, SMART CART W/ CLAMSHELL, EU	10.20.56.131
MBSMTBXM1JP	FLEXREADY SMART Chrom. 2.2L/Min, SMART CART W/ CLAMSHELL, JP	10.20.56.131
MBSMTBXM1KR	FLEXREADY SMART Chrom. 2.2L/Min, SMART CART W/ CLAMSHELL, KO	10.20.56.131
MBSMTBXM1NA	FLEXREADY SMART Chrom. 2.2L/Min, SMART CART W/ CLAMSHELL, NA	10.20.56.131
MBSMTBXM1UK	FLEXREADY SMART Chrom. 2.2L/Min, SMART CART W/ CLAMSHELL, UK	10.20.56.131
MBSMTBXM3CH	FLEXREADY SMART Chrom. 8.0L/Min, SMART CART W/ CLAMSHELL, CN	10.20.56.131
MBSMTBXM3EU	FLEXREADY SMART Chrom. 8.0L/Min, SMART CART W/ CLAMSHELL, EU	10.20.56.131
MBSMTBXM3JP	FLEXREADY SMART Chrom. 8.0L/Min, SMART CART W/ CLAMSHELL, JP	10.20.56.131
MBSMTBXM3KR	FLEXREADY SMART Chrom. 8.0L/Min, SMART CART W/ CLAMSHELL, KO	10.20.56.131
MBSMTBXM3NA	FLEXREADY SMART Chrom. 8.0L/Min, SMART CART W/ CLAMSHELL, NA	10.20.56.131
MBSMTBXM3UK	FLEXREADY SMART Chrom. 8.0L/Min, SMART CART W/ CLAMSHELL, UK	10.20.56.131

Catalog Number	Description	IP Address
MBSMTF2PUMP	FLEXREADY SMART TFF-2.5M2, PUMP CART	10.20.56.151
MBSMTF3PUMP	FLEXREADY SMART TFF-5.0M2, PUMP CART	10.20.56.151
MBSMTNK100CH	FLEXREADY SMART TFF, TANK CART, 100L, PE, CN	10.20.56.162
MBSMTNK100EU	FLEXREADY SMART TFF, TANK CART, 100L, PE, EU	10.20.56.162
MBSMTNK100JP	FLEXREADY SMART TFF, TANK CART, 100L, PE, JP	10.20.56.162
MBSMTNK100NA	FLEXREADY SMART TFF, TANK CART, 100L, PE, NA	10.20.56.162
MBSMTNK100STCH	FLEXREADY SMART TFF, TANK CART, 100L, JACKETED SST, CN	10.20.56.162
MBSMTNK100STEU	FLEXREADY SMART TFF, TANK CART, 100L, JACKETED SST, EU	10.20.56.162
MBSMTNK100STJP	FLEXREADY SMART TFF, TANK CART, 100L, JACKETED SST, JP	10.20.56.162
MBSMTNK100STNA	FLEXREADY SMART TFF, TANK CART, 100L, JACKETED SST, NA	10.20.56.162
MBSMTNK100STUK	FLEXREADY SMART TFF, TANK CART, 100L, JACKETED SST, UK	10.20.56.162
MBSMTNK100UK	FLEXREADY SMART TFF, TANK CART, 100L, PE, UK	10.20.56.162
MBSMTNK200CH	FLEXREADY SMART TFF, TANK CART, 200L, PE, CN	10.20.56.163
MBSMTNK200EU	FLEXREADY SMART TFF, TANK CART, 200L, PE, EU	10.20.56.163
MBSMTNK200JP	FLEXREADY SMART TFF, TANK CART, 200L, PE, JP	10.20.56.163
MBSMTNK200NA	FLEXREADY SMART TFF, TANK CART, 200L, PE, NA	10.20.56.163
MBSMTNK200STCH	FLEXREADY SMART TFF, TANK CART, 200L, JACKETED SST, CN	10.20.56.163
MBSMTNK200STEU	FLEXREADY SMART TFF, TANK CART, 200L, JACKETED SST, EU	10.20.56.163
MBSMTNK200STJP	FLEXREADY SMART TFF, TANK CART, 200L, JACKETED SST, JP	10.20.56.163
MBSMTNK200STNA	FLEXREADY SMART TFF, TANK CART, 200L, JACKETED SST, NA	10.20.56.163
MBSMTNK200STUK	FLEXREADY SMART TFF, TANK CART, 200L, JACKETED SST, UK	10.20.56.163
MBSMTNK200UK	FLEXREADY SMART TFF, TANK CART, 200L, PE, UK	10.20.56.163
MBSMTNK50CH	FLEXREADY SMART TFF, TANK CART, 50L, PE, CN	10.20.56.161
MBSMTNK50EU	FLEXREADY SMART TFF, TANK CART, 50L, PE, EU	10.20.56.161
MBSMTNK50JP	FLEXREADY SMART TFF, TANK CART, 50L, PE, JP	10.20.56.161
MBSMTNK50NA	FLEXREADY SMART TFF, TANK CART, 50L PE, NA	10.20.56.161
MBSMTNK50STCH	FLEXREADY SMART TFF, TANK CART, 50L, JACKETED SST, CN	10.20.56.161

Catalog Number	Description	IP Address
MBSMTNK50STEU	FLEXREADY SMART TFF, TANK CART, 50L, JACKETED SST, EU	10.20.56.161
MBSMTNK50STJP	FLEXREADY SMART TFF, TANK CART, 50L, JACKETED SST, JP	10.20.56.161
MBSMTNK50STNA	FLEXREADY SMART TFF, TANK CART, 50L, JACKETED SST, NA	10.20.56.161
MBSMTNK50STUK	FLEXREADY SMART TFF, TANK CART, 50L, JACKETED SST, UK	10.20.56.161
MBSMTNK50UK	FLEXREADY SMART TFF, TANK CART, 50L, PE, UK	10.20.56.161
MBSMTXINS1-1	FLEXREADY SMART Chrom. 2.2L/Min, MU PRE & POST INSTRUM SENSOR + XMITTER, OPL 1MM	10.20.56.171
MBSMTTINS2	TFF instrumentation UV	10.20.56.172
MBSMTTINS3	TFF instrumentation Conductivity	10.20.56.173
MBSMTTINS1	TFF instrumentation UV and Conductivity	10.20.56.174
MBSMTTINS4	TFF single-use instrumentation UV and Conductivity	10.20.56.174
MBSMTXINS1-2	FLEXREADY SMART Chrom. 2.2L/Min, MU PRE & POST INSTRUM SENSOR + XMITTER, OPL 2.5MM	10.20.56.171
MBSMTXINS1-3	FLEXREADY SMART Chrom. 2.2L/Min, MU PRE & POST INSTRUM SENSOR + XMITTER, OPL 10MM	10.20.56.171
MBSMTXINS2-1	FLEXREADY SMART Chrom. 2.2L/Min, MU POST INSTRUM SENSOR + XMITTER, OPL 1MM	10.20.56.171
MBSMTXINS2-2	FLEXREADY SMART Chrom. 2.2L/Min, MU POST INSTRUM SENSOR + XMITTER, OPL 2.5MM	10.20.56.171
MBSMTXINS2-3	FLEXREADY SMART Chrom. 2.2L/Min, MU POST INSTRUM SENSOR + XMITTER, OPL 10MM	10.20.56.171
MBSMTXINS3-1	FLEXREADY SMART Chrom. 8.0L/Min, MU PRE & POST INSTRUM SENSOR + XMITTER, OPL 1MM	10.20.56.171
MBSMTXINS3-2	FLEXREADY SMART Chrom. 8.0L/Min, MU PRE & POST INSTRUM SENSOR + XMITTER, OPL 2.5MM	10.20.56.171
MBSMTXINS3-3	FLEXREADY SMART Chrom. 8.0L/Min, MU PRE & POST INSTRUM SENSOR + XMITTER, OPL 10MM	10.20.56.171
MBSMTXINS4-1	FLEXREADY SMART Chrom. 8.0L/Min, MU POST INSTRUM SENSOR + XMITTER, OPL 1MM	10.20.56.171
MBSMTXINS4-2	FLEXREADY SMART Chrom. 8.0L/Min, MU POST INSTRUM SENSOR + XMITTER, OPL 2.5MM	10.20.56.171
MBSMTXINS4-3	FLEXREADY SMART Chrom. 8.0L/Min, MU POST INSTRUM SENSOR + XMITTER, OPL 10MM	10.20.56.171
MBSMTXINS5	FLEXREADY SMART Chrom., SU PRE & POST INSTRUM SUPPORT + XMITTER	10.20.56.171
MBSMTXINS6	FLEXREADY SMART Chrom., SU POST INSTRUM SUPPORT + XMITTER	10.20.56.171
MBSMTXM1PUMP1	FLEXREADY SMART Chrom. 2.2L/Min, PUMP CART 1 PUMP	10.20.56.151
MBSMTXM1PUMP2	FLEXREADY SMART Chrom. 2.2L/Min, PUMP CART 2 PUMPS	10.20.56.151

Catalog Number	Description	IP Address
MBSMTXM3PUMP1	FLEXREADY SMART Chrom. 8.0L/Min, PUMP CART 1 PUMP	10.20.56.151
MBSMTXM3PUMP2	FLEXREADY SMART Chrom. 8.0L/Min, PUMP CART 2 PUMPS	10.20.56.151
PCART1	FLEXREADY SMART, PUMP CART WITHOUT PUMPS	10.20.56.151
PCART3	FLEXREADY SMART TF3S, PUMP CART WITH INSTALLED PUMPS	10.20.56.151
SMTBASECH	FLEXREADY SMART, SMART CART CHINESE AND ENGLISH	10.20.56.131
SMTBASEEU	FLEXREADY SMART, SMART CART EUROPEAN AND ENGLISH (220V)	10.20.56.131
SMTBASEJP	FLEXREADY SMART, SMART CART JAPANESE AND ENGLISH	10.20.56.131
SMTBASEKR	FLEXREADY SMART, SMART CART KOREAN AND ENGLISH	10.20.56.131
TANK100L110V	FLEXREADY SMART TFF, TANK CART, 100L, PE, 110V	10.20.56.162
TANK100LST110V	FLEXREADY SMART TFF, TANK CART, 100L, JACKETED SST, 110V	10.20.56.162
TANK200L110V	FLEXREADY SMART TFF, TANK CART, 200L, PE, 110V	10.20.56.163
TANK200LST110V	FLEXREADY SMART TFF, TANK CART, 200L, JACKETED SST, 110V	10.20.56.163
TANK50L110V	FLEXREADY SMART TFF, TANK CART, 50L, PE, 110V	10.20.56.161
TANK50LST110V	FLEXREADY SMART TFF, TANK CART, 50L, JACKETED SST, 110V	10.20.56.161
TMTRTF	FLEXREADY SMART TFF, TRANSMITTER KIT	10.20.56.172 10.20.56.173 10.20.56.173
TMTRXM	FLEXREADY SMART Chrom., TRANSMITTER KIT	10.20.56.171
SMTBASENA	FLEXREADY SMART, SMART CART EUROPEAN AND ENGLISH (110V)	10.20.56.131
TANK100L220V	FLEXREADY SMART TFF, TANK CART, 100L, PE, 220V	10.20.56.162
TANK100LST220V	FLEXREADY SMART TFF, TANK CART, 100L, JACKETED SST, 220V	10.20.56.162
TANK200L220V	FLEXREADY SMART TFF, TANK CART, 200L, PE, 220V	10.20.56.163
TANK200LST220V	FLEXREADY SMART TFF, TANK CART, 200L, JACKETED SST, 220V	10.20.56.163
TANK50L220V	FLEXREADY SMART TFF, TANK CART, 50L, PE, 220V	10.20.56.161
TANK50LST220V	FLEXREADY SMART TFF, TANK CART, 50L, JACKETED SST, 220V	10.20.56.161
N/A	TANK WEIGHT TRANSMITTER (WI001)	10.20.56.142
N/A	FILTRATE WEIGHT TRANSMITTER (WI101)	10.20.56.141

Date time format

Choosing any format other than the ones listed below could cause errors when using CCP® software:

- MM-DD-YYYY
- DD-MM-YYYY
- YYYY-MM-DD

Once the date format chosen, changing it afterwards may cause damage to the historical data. Before any change, it is recommended to create data backup and to purge the database.

By default, the daylight saving time shift is disabled. Enabling this function may cause damage to the historical data.

Troubleshooting

Component	Symptom	Corrective Action
System	No system components operating and no sign of power in MB01	Verify that 140H001 light is ON
		Verify that Emergency Stop is not engaged.
		150K1 indicates two green lights
		Verify that PLC is in RUN or REM mode
		Verify that all circuit breakers are closed.
	No system components operating and no sign of power in IB04	Verify that all circuit breakers are closed.
		Verify that Ethernet and electrical cables are connected and plugged in properly and not damaged.
		Touch the Acq button in top right corner of the Touchscreen
	No system components operating and no sign of power in IB03	YA 14, YA15, YA 17, YA 34 as red alarm not identified
Verify that Ethernet & electrical cables are connected and plugged in properly and not damaged.		
Pneumatics	No pressure or low pressure	Verify that XP001 and 801SP1 are ON and PI010 shows pressure.
		Regulator filter could be blocked - purge the filter.
		Air leak via pressure regulator PCV001 - purge the filter.
		Verify that the pressure setting is correct (6 bar).
PLC	Touchscreen shows ?, &, and @ symbols for analog data.	Verify that the network connections are connected and plugged in properly and not damaged.
		Verify that the LED is GREEN.
		Ping the PLC to verify it is communicating (PLC IP: 10.20.56.110)
	Error numbers starting with '-214702XXXX'	Verify that the network connections are connected and plugged in properly and not damaged.
		Verify that the LED is GREEN.
		Ping the PLC to verify it is communicating (PLC IP: 10.20.56.110)
	System not responding when clicking on anything	Verify that PLC is in Run mode

Component	Symptom	Corrective Action
Alarms	YA 14 is RED	Verify that there are no other critical alarms on the Touchscreen.
		Verify that the PC and PLC connections and cables are not faulty.
		Verify that the power LCD on the hub is green. If it is orange, the problem is with the hub.
		Verify that diagnostic lights NS or MS are green on Station NOD (500NOD0).
	YA15 is RED	Verify that there are no other critical alarms on the Touchscreen.
		Verify that diagnostic lights NS or MS are green on Station NOD (500NOD1).
		Verify that Ethernet and electrical cables are connected and plugged in properly and not damaged.
		Verify that the Clamshell is connected to the Smart Cart. If not, connect Clamshell via Y503A.
	YA 17 is RED	Verify that there are no other critical alarms on the Touchscreen.
		Verify that diagnostic lights NS or MS are green on Station NOD (200NOD3).
		Verify that the Manifold is locked onto the Pump Cart.
		Verify that the Pumping Cart is connected to the Smart Cart and that the Ethernet & electrical cables are connected and plugged in properly.
	YA 18 is RED	Check the I/O modules of the Pump cart. One of the devices could be defective or there could be an issue with one of the 4 - 20 mA loops.
	YA 25 is RED	Check the I/O modules of the Smart cart. One of the devices could be defective or there could be an issue with one of the 4 - 20 mA loops.
	YA 26 is RED	Check the I/O modules of the Clamshell. One of the devices could be defective or there could e an issue with one of the 4 - 20 mA loops.
YA 29 is RED and message "HMI PLC communication failure" appears	The IP addresses on the system are not configured properly. Call It support. The system just powered up and PLC and PC have not been powered up together, in case of HMI restarted	
YA 34 is RED	Verify that there are no other critical alarms on the Touchscreen.	
	Verify that the Instrumentation Kit is connected to the Smart Cart and that the Ethernet & electrical cables are connected and plugged in properly.	
	Verify that diagnostic lights NS or MS are green on Station NOD (200NOD4)	
YA 35 is RED	Check the I/O modules of the Instrumentation column. One of the devices could be defective or there could be an issue with one of the 4 - 20 mA loops.	

Component	Symptom	Corrective Action
Alarms (continued)	YA 36 is RED	Verify that there are no other critical alarms on the Touchscreen.
		Verify that the Tank Cart is connected to the Smart Cart and that the Ethernet & electrical cables are connected and plugged in properly.
		Verify that diagnostic lights NS or MS are green on Station NOD (200NOD5)
Alarms (continued)	YA 37 is RED	Check the I/O modules of the Tank cart. One of the devices could be defective or there could be an issue with one of the 4 - 20 mA loops.
	YA 40 is RED	SQL server failed to start. Restart the application.
		SQL server failed to start. Restart the application. If it still fails, the datacart is full. Purge the SQL data and restart the application/system.
	YA 42 is RED	Verify that there are no other critical alarms on the Touchscreen.
		Verify that Ethernet and electrical cables of the weight transmitter WI001 are connected and plugged in properly and not damaged.
		Verify that the Tank cart is connected to the Smart Cart.
	YA 43 is RED	Verify that there are no other critical alarms on the Touchscreen.
		Verify that Ethernet and electrical cables of the weight transmitter WI101 are connected and plugged in properly and not damaged.
	YA 44 is RED	An unauthorized write has been done in the SQL database. Only a backup and purge of the SQL database (see Archive and Restore Utilities) will close the alarm

Component	Symptom	Corrective Action
Smart Cart Door	Door could not be opened	Verify that the system is not in critical alarm status
		Recipe Open door is not started, or in hold, or not in the correct step. Start the recipe or wait for the end of the recipes if already started.
		Verify that XS001 is not defective before opening door. Verify that XS001 is operational, using a metallic tool before starting the recipe.
		Check valves are all opened.
	Door could not be closed	System is not in critical alarm status
		Recipe Close door is not started, or in hold, or not in the correct step. Start the recipe or wait for the end of the recipes if already started
		Verify that XS001 is not defective before opening door. Verify that XS001 is operational, using a metallic tool before starting the recipe.
		Check valves are all opened and all fittings are mounted correctly.
		Verify that a ball is not missing in one of the locks. Each lock should contains three balls.
	Verify that a O-ring is not broken in one of the locks. Replace O-ring if needed.	
	Clamshell could not be removed	Verify that the system is not in critical alarm status.
		The "Unload Clamshell " recipe has not started, or is on hold, or not at the correct step. Start the recipe or wait for the end of the recipes if already started.
Verify that YA15 is still active. Disconnect the Clamshell from the Smart Cart by closing Y503A and opening Y503B.		
Smart Cart Door (continued)	Clamshell could not be installed	Verify that the system is not in critical alarm status.
		The "Load Clamshell "recipe has not started, or is on hold, or not at the correct step. Start the recipe or wait for the end of the recipe if already started.
		Verify that the Clamshell seat is clean, especially on the bottom.
		Verify that the window behind the clamshell is correctly installed & closed.
		Connector XC009 is defective. Remove the clamshell, and verify the functionality of the connector XC009 in Manual mode. Close Y503A & open Y503B

Component	Symptom	Corrective Action
Pump	Pump does not operate	Verify that the system is not in critical alarm status.
		Verify that the pump is connected correctly to JB01.
		Verify that the main circuit breaker in the electrical cabinet is ON.
		Pump is not locked because there is no open flowpath. Open the flowpath.
		Verify that there is no alarm on the pump, directly on the drive. Verify SIC001 or SIC002. Verify that the temperature is within the operating temperature range.
		Verify that YA 17 is GREEN. If not, connect to communication port
	Pump flow rate is erratic, or pulsing	Flowmeter is full of liquid, without any air. Prime the flowmeter before starting a batch at the highest flow rate. Do not prime in flow control mode, use the speed setpoint for the pump.
		Pump Head is full of liquid, without any air. Prime the pump head before starting a batch at the highest flow rate. Do not prime in flow control mode, use speed setpoint for the pump.
		If a magnetic flowmeter is used, verify that there is enough salt in the buffer to enable a stable reading.
		Verify that the four screws on the flange on the pump cover are correctly tighten.
		Verify that all connections located before pump are tight.
		Verify that there are no kinks in the tubing.
		Verify that the pump inlet tubing is the correct diameter.
		Verify that the Flowmeter Converter parameters are correct
Verify that the Regulation/ Control parameters are correct		
Single-Use Flowmeter (only applicable to XMO3)	Flow measurement is not accurate	Verify that the right K factor for the SU flowmeter tube is entered into the HMI
		Verify that the right Qmax for the SU flowmeter transmitter is entered into the HMI
		Verify there is no sign of oxidation on the SU flowmeter tube electrodes
		Verify that the correct cable for flowmeter connection is used (black cable with tag WFT002-SU or WFT004-SU).

Component	Symptom	Corrective Action
Valves	Valve does not operate	Verify that YA 14, YA15, YA 17 are not RED
		Verify that the system is not in critical alarm status.
		Verify that the Buffer Air Container valve is open.
	Valve flow rate is erratic	Verify that PCV032 is set at 100%, real position will be closed to 100%.
Pressure Transmitter	Pressure transmitter has no power	Verify that the power indication lamp on signal converter is lit.
Pressure switch	High pressure alarm is activated at incorrect level	Verify that the high pressure alarm is set correctly.
Bubble Trap Level Sensor	Liquid level sensor does not indicate high or low level	Verify that the power to sensor is on.
		Tighten capacitive sensor against bubble trap. Calibrate sensor sensitivity.
		Verify that LSL & LSH are correctly connected
		Verify that the Bubble Trap is not in AUTO ON
pH, UV, Conductivity sensor	See probe manufacturers documentation	Operating in condensating atmosphere is prohibited and may lead to erroneous sensors reading
Manifold	Valve on manifold could not be operated	Verify that the pneumatic connection is done correctly
USB on HMI01	USB ports are not powered	Connect a keyboard and check if power is supplied to keyboard. If no power is supplied, open HMI01 and verify that the connections are connected and plugged in properly.
Tank Cart MIX001	Mixer 001 did not run correctly	Stand alone/remote switch is on stand alone
	Impeller does not turn	Flexware® is not installed correctly
	SIC003 is RED	Flexware is not installed. Ensure that the impeller is correctly installed and that the mixer motor is up.
Tank Cart WI001	Weight increase not being recorded	Load cells are locked
	YA 41 is RED	Tank volume is not set correctly.
C8000 Defect	XC102-3DF is RED	All alarms from the instruments connected to the C8000 transmitter are regrouped is this alarm.
		Check the C8000 transmitter for which alarm in triggered. See probe manufacturers documentation for more information.
	XC010-4DF is RED	All alarms from the instruments connected to the C8000 transmitter are regrouped is this alarm.
		Check the C8000 transmitter for which alarm in triggered. See probe manufacturers documentation for more information.

System Administrator Information for the Common Control Platform® Software

Security

Introduction

The Common Control Platform® (CCP® Software) system security is configured using Windows® 7 Security and the iFIX® Security Configuration programs. This means that there are two security programs working in unison and both must be configured correctly for users to access and operate the system.

NOTE

Follow the instructions in this chapter carefully. Improper security configurations may allow security breaches to occur.

Security Components Overview

The CCP® system security and accessibility is configured using four components:

- User Accounts (Windows® and iFix®)
- Group Accounts (Windows® and iFix®)
- Security Areas (iFix®)
- Application Features (iFix®)

The security components are related in the following general way:

- Each user must have a User Account.
- Each User Account is a member of a specific Group or Groups.
- Groups are given access to specific Security Areas and Application Features.

User and Group Accounts

- Each system user must have both a Windows® user account and an iFIX® user account.
- Each Windows® user account gets assigned to one or more Windows® user groups
- Each iFIX® user account gets assigned to one or more iFIX® user groups
- Each group has access to specific iFIX® security areas and application features.

See the section *Managing User Accounts* for details on creating users and adding them to groups.

Default Windows® /iFIX® User Names and Passwords

The system has some preconfigured users. The following table has the default system user names and passwords which allow initial administrator access to configure Windows® and iFIX® Security.

Default Windows® and iFIX® Users and Passwords

Function	User Name	Password
Administrator	admin	ccp
Operator	op	op
Supervisor	sup	sup
Engineer	eng	eng
ccpadmin (Windows® only)(Never delete or modify this account – required for system startup)	ccpadmin	ccp67seven
System Default (iFIX® only)(Never delete or modify this account)	no username	no password

NOTE

After logging in via the default admin user name and password, and after creating password protected administrator accounts with the same security privileges as the default account, delete the default administrator account to help protect system access security.

Default Windows®/iFIX® Groups

Three Windows® User Groups are preconfigured:

1. CCP® Administrators
2. CCP® Users
3. CCP® Users on Acrobat® Software

Four iFIX® User Groups are preconfigured:

1. System Administrator
2. Supervisor
3. Engineer
4. Operator

The iFIX® Group assignment determines the available privileges within the User Interface.

See the following sections *Applications Features* and *Security Areas* for details on the privileges assigned to members of each iFIX® Group.

Application Features

An Application Feature is an account privilege that allows a user to run an application or access specific features within an application. These application features are defined in the iFIX® security program and can be assigned to group accounts and user accounts.

See the section *Managing User Accounts* for details on creating users and adding them to groups.

The application feature “Workspace Runtime” will be assigned to a default startup user account named “Guest.” This will allow the Workspace application to start and the Startup screen to

open. The user can then login using the Login button in the top banner. Access is limited to the opening display until a user is logged in.

Application Features Available to iFIX® Groups

Application Feature	iFIX® Group			
	Sys Admin	Engineer	Supervisor	Operator
Database Manager	X	n/a	n/a	n/a
Workspace Runtime	X	X	X	X
Workspace Configure	X	n/a	n/a	n/a
Background Task Exit	X	X	X	n/a
Historical Trend Assign	X	X	n/a	n/a
System Configuration	X	X	n/a	n/a
Security Configuration	X	n/a	n/a	n/a
Runtime VB Editor Access	X	n/a	n/a	n/a
iFIX® – System Shutdown	X	X	X	n/a
Historical Trend Collection	X	X	n/a	n/a
Workspace Runtime Exit	X	X	X	n/a
Enable Task Switching	X	X	n/a	n/a
Enable <Ctrl> <Alt> 	X	X	n/a	n/a

Security Areas

A security area is a physical or functional division of the control system or process. These security areas are defined in the iFIX® security program and can be assigned to group accounts and user accounts.

See the section *Managing User Accounts* for details on creating users and adding them to groups.

Security Areas Available to iFIX® Groups

Security Area	iFIX® Group				
	Area ID	Sys Admin	Engineer	Supervisor	Operator
Manual Operation	1	X	X	X	n/a
Recipe Editor	2	X	X	X	n/a
Procedure Start	3	X	X	X	X
Procedure Abort	4	X	X	X	n/a
Alarms	5	X	X	X	n/a
PID Tuning	6	X	X	n/a	n/a
Loop Control	7	X	X	X	n/a
Flow Path	8	X	X	X	n/a
Setpoints	9	X	X	X	n/a
Maintenance	10	X	X	n/a	n/a
Configuration	11	X	X	n/a	n/a
Inlets	12	X	X	X	n/a
Calibration	13	X	X	X	n/a
PH Calibration	14	X	X	n/a	n/a
Recipe Parameter	15	X	X	n/a	n/a
Limited Launch	16	X	X	X	X
Process View	17	X	X	X	X
System Shutdown	18	X	n/a	n/a	n/a
EnterCV	19	X	X	X	X
Hardware operations	20	X	n/a	n/a	n/a

Area Descriptions

The following table provides a brief description of each security area. This is for information only. The actual assignment of each area to a particular button or function is defined in the security section of the screen that uses or calls the function.

Security Area	ID	Description
Manual Operation	1	Allows setting of items such as Default, Hold and Abort buttons and manual valve control
Recipe Editor	2	Allows editing of recipes
Procedure Start	3	Allows starting of procedures

Security Area	ID	Description
Procedure Abort	4	Allows stopping of procedures
Alarms	5	Allows setting of alarm setpoints as well as enable/disable
PID Tuning	6	Allows setting of loop PID setpoints
Loop Control	7	Allows controlling of pid loop modes and setpoints as-well-as discrete pump commands such as Start and Stop
Flow path	8	Allows setting pre-configured flow paths
Setpoints	9	Allows setting of analog setpoints such as pump speed flow and pressure setpoints
Maintenance	10	Allows control of outputs through the Maintenance control screen
Configuration	11	Allows configuration changes of application and operating system parameters such as Hold up volume, Qmax, Flow path settings, and alarm timers
Inlets	12	If applicable, allows control of inlet flow path
Calibration	13	Allows software calibration of analog points and allows user to enter K factor
PH Calibration	14	If applicable, allows calibration of PH signals
Recipe Parameter	15	If applicable, allows editing of recipe parameters
Limited Launch	16	Allows launching of saved operations from the Recipe Pool Faceplate
Process View	17	Allows user to launch process display from start up screen
System Shutdown	18	Allows user to shutdown computer
EnterCV	19	Allows user to enter some parameters as well as Column Volume, Bed Height
Hardware operations	20	Allows user to control door and clamshell

Managing User Accounts

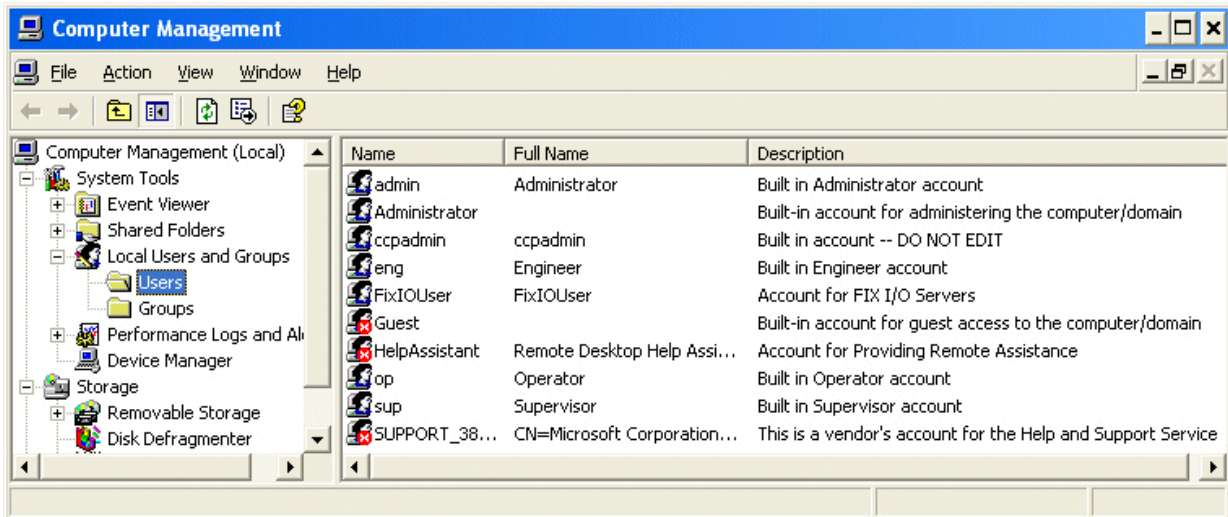
Each user needs a Windows® user account and an iFIX® user account.

NOTE

Create the administrator accounts with full administrator security privileges, then delete the default admin account to ensure system security.

Creating Windows® User Accounts

1. Log in to the system as an Administrator.
2. Access the Windows® Task Bar and click the Start button. Select Settings > Control Panel > Administrative Tools and click on Computer Management.
3. In the Computer Management window, select the Users folder within the Local Users and Groups category.



Computer Management – Users

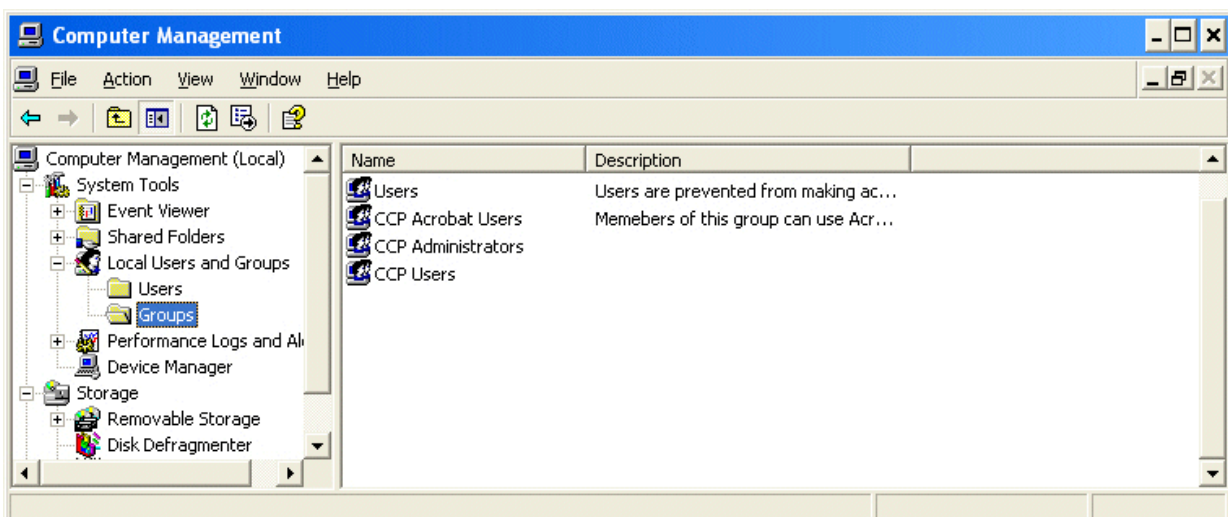
4. Select Action > New User from the main menu (or right-click on Users).
5. In the New User dialog box, enter the desired User name for the new user. (This user name will be used as the user's login name when logging in to the system.)
6. Enter the user's Full Name and Description (both of these are optional).
7. Enter and confirm the user's Password and select the desired password options.
8. Click the Create button to create the account. Repeat this procedure if you have additional new user accounts to create.

Adding Users to Windows® User Groups

After creating Windows® user accounts, add them to appropriate user groups at either the User level or at the Group level.

To add users to Windows® user groups:

1. Select the Users or Groups folder to view the corresponding list.
2. Double-click the user or group to open the Properties window and add users to the appropriate groups.



Computer Management – Groups

NOTE

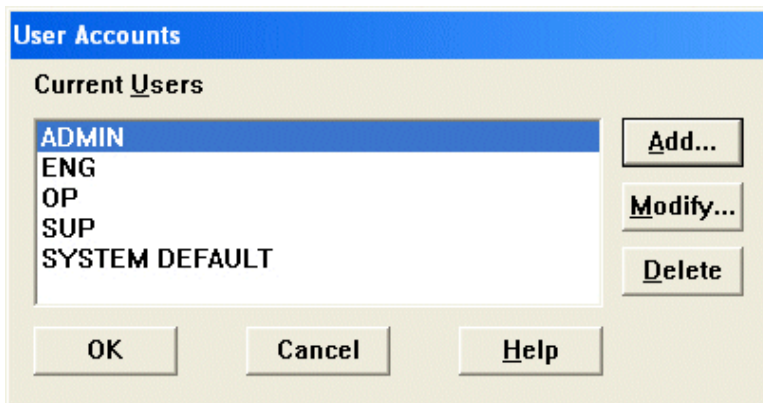
Do not modify or delete the ccpadmin user account. It is required by the CCP® system configuration.

Users with only a Windows® user account do not have access to the system. A corresponding user accounts within the iFIX® Security Configuration must be created to allow access to the system.

Creating iFIX® User Accounts

Once the Windows® user account has been created, follow the instructions below to create and configure the corresponding iFIX® user account.

1. Open the iFIX® Security program by selecting Start -> All Programs -> Proficy HMI SCADA - iFIX® 5.1 -> System Configuration. Click on the Security Icon to open the Security Configuration Screen.
2. Click the User Accounts icon to open the User Accounts dialog box.



User Accounts

This dialog box displays the user accounts currently defined within the iFIX® Security Configuration. There are four preconfigured default user accounts:

- ENG-Engineer
- OP-Operator
- SUP-Supervisor
- ADMIN-Administrator

NOTE

The System Default user is a system required account and is not used for logging in to the system.

3. Click the Add button to open the User Profile dialog box.

User Profile

Use Windows Security

User name:

Domain: Login Timeout:

Group Membership

Security Areas

Application Features

User Profile

4. For each user, select the Use Windows® Security check box. This box MUST be checked. iFIX® Security is designed to work in conjunction with Windows® Security, and will not function correctly if this check box is left blank.
5. In the User name field, enter the same user name assigned to the user for the Windows® user account (see "Creating Windows® User Accounts"). This user name must match the Windows® user name exactly to synchronize the two accounts. (This login name displays in the upper left corner of the user interface when the user logs in, to identify the current user.)
6. The Domain field may be set to CCPCONTROL or left blank (unless a preconfigured Domain name is supplied at time of order, in which case the local computer name should be used).
7. Use the Login Timeout field to specify the length of the time a user may remain logged in. Enter any time interval from 00:00:01 to 23:59:59. A value of 00:00:00 disables this field. This is based on absolute time and not inactivity.
8. The Group list box displays the groups to which the user belongs. To modify this user's group memberships, click the Modify button and use the Group Membership Selection dialog box to add or remove groups from the user's Authorized list. (For information about group account privileges, refer to "User and Group Accounts".)
9. The Security list box should usually be left blank because security areas are assigned at the group level via the Groups list box. It may be used to assign additional security areas to the user, if necessary. For example, if the user is assigned to the Operator group, but also requires access to the Recipe Editor, which is not a standard security area for Operators, it can be added to this user's Authorized list.
10. The Application list box should usually be left blank because application features are assigned at the group level. It may, however, be used to assign additional application features to the user, if necessary.
11. Click the OK button to save the user's configuration.

NOTE

The Help button on this dialog box provides additional information about configuring user profiles.

Modifying iFIX® User Accounts

Modifying a user account is similar to creating one. The changes made to a user account will not take effect until the user logs out and then logs in again. This forces the security system to reread each user's account privileges.

Modify user accounts as follows:

1. Open the iFIX® Security Configuration program and click the User Accounts icon to open the User Accounts dialog box.
2. Select the user account to be modified and click the Modify button (or double-click the user account) to open the User Profile dialog box.
3. Make changes as needed. Field descriptions are provided in the previous section, "Creating iFIX® User Accounts".
4. Click the OK button when changes are complete. Then click the OK button on the User Accounts dialog box to close it.
5. Save all currently defined user accounts by selecting File > Save from the Security Configuration window's main menu.

Deleting iFIX® User Accounts

Delete user accounts as follows:

1. Open the iFIX® Security Configuration program and click the User Accounts icon to open the User Accounts dialog box.
2. Select the user account to be deleted and click the Delete button.
3. Click the YES button to confirm deletion of the user account. After deleting an iFIX® user account, delete the user's account in Windows® by opening the Computer Management utility as described in "Creating Windows® User Accounts", then highlight the user to be deleted and select Action > Delete from the main menu.

Changing/Resetting User Passwords

Users can change their own passwords (if so configured during account setup) after logging in with their current password. Refer to "Changing Your Password" for instructions.

If for some reason, a user's password must be changed or reset (e.g., user has forgotten it) do this via the User Accounts utility within Windows, as follows:

1. Log in to the system as an Administrator.
2. Access the Windows® Task Bar and click the Start button. Select Settings > Control Panel > and click on User Accounts.
3. In the User Accounts dialog box, click the user account to be changed and select Change the password from the list of options.
4. In the dialog box, type and retype the new password and click the Change Password button.

NOTE

Because iFIX® Security is linked to Windows® Security, the user's iFIX® user account will pick up this new password.

Security Reports

Security Report

The Login utility records all system security data and login attempts in an audit trail file called the Security Report. This report includes the user name and login/logout times of everyone who logs in. All successful and unsuccessful login attempts are recorded. Changes to security configuration are also documented in this report.

To obtain a Security Report:

1. Access the Report Client from the User Interface by clicking on the Reports icon in the toolbar.
2. Open the Report Generator by clicking on the Report Generator icon in the toolbar of the Report Client
3. In the Report Selections box, select the Security Report option, then click either the Preview Report, Print Report or Save Report button.

Run ID	Start Date Time	End Date Time	Product ID	Batch ID	Step ID	User Name	State
1	2011/11/16 14:02:53	2011/11/16 14:02:53					In Progress
2	2011/10/28 17:24:51	2011/10/28 17:24:55	Administrator			Administrator	Complete
3	2011/10/27 21:10:56	2011/10/27 21:10:59	Administrator			Administrator	Aborted
4	2011/10/27 20:14:38	2011/10/27 20:14:41	Administrator			Administrator	Aborted

Report Generator

Security Configuration Report

The export feature of the iFIX® Security Configuration program can be used to obtain a Security Configuration Report. The export feature creates an ASCII file that lists configuration information for groups, users, etc.

To obtain a Security Configuration Report:

1. Open the iFIX® Security Configuration program.
2. Select File > Export from the main menu. The export file name defaults to SECURITY.RPT.
3. Select the export location and click the Save button.
4. Use any text editor to open and view the exported report file.



```
SECURITY CONFIGURATION REPORT

Date: 2011/11/23
Time: 17:22:06
Userbased: ENABLED
Use Global Security Paths: ENABLED

Security Area Names
Area: 1,MANUAL OPERATION
Area: 2,RECIPE EDITOR
Area: 3,PROCEDURE START
Area: 4,PROCEDURE ABORT
Area: 5,ALARMS
Area: 6,PID TUNING
Area: 7,LOOP CONTROL
Area: 8,FLOW PATH
Area: 9,SET POINTS
Area: 10,MAINTENANCE
Area: 11,CONFIGURATION
Area: 12,INLETS
Area: 13,CALIBRATION
Area: 14,PH CALIBRATION
Area: 15,RECIPE PARAMETERS
Area: 16,LIMITED LAUNCH
Area: 17,PROCESS VIEW
Area: 18,SYSTEM SHUTDOWN
Area: 19,ENTERCV
Area: 20,HARDWARE OPERATIONS
Area: 21
Area: 22
Area: 23
```

Security Report

Inactivity Timeout (Screen Saver)

The inactivity timeout iFIXScreenSaver is a Windows® screen saver that is accessed via the Desktop Properties. When the system is left without any user activity for more than five minutes, the current user is logged off. When the user tries to access the system, a log in dialog box prompts the user to reenter the username and password.

When logged in as a System Administrator, change the inactivity timeout interval by right-clicking on the Windows® desktop and selecting Properties from the popup menu. On the Screen Saver tab of the Display Properties window, change the Wait time for the iFIXScreenSaver. Click OK to save the new timeout interval.

Archive and Restore Utilities

Overview

The CCP® software provides an Archive Utility to back up and restore the numerical and event data acquired during operation of the unit.

Data backed up by the archive utility include all the data that are stored in the Historian database (trending information) and SQL database (events). This chapter explains how to back up and restore data stored in these two databases.

These two databases are located in the Current Active Data Location. When a backup is run, data from the Current Active Data Location is copied to the Backup File Location. The Backup File Location is where the backup files will be located when the backup process is complete.

Each backup consists of several files which are organized in one directory. That directory will automatically be named to indicate the date and time at which it was generated. These individual backup directories will be located in the Backup File Location.

When you run a Restore operation, files are copied from the Backup File Location and will be copied into the Current Active Data Location. The incoming restored files will replace the files that are in the active data location.

Archiving Intervals

The databases store the data logging files. These files grow in size as new data is collected and logged into the archives. Even if the archives are backed up, their size will not shrink. Since the databases are forever growing, the backup files will grow as time progresses. Monitor the backup files size over a period of routine use and examine the growth rate of these files. From this growth rate and the total size of the hard disk, users should decide at what intervals to back up their archives.

Backup files include data only up to the time of the backing up.

The system is equipped with a warning message to alert users when the data has exceeded 1.8 Gb of the 2 Gb capacity.



Database Warning Message

Starting the Archive Utility

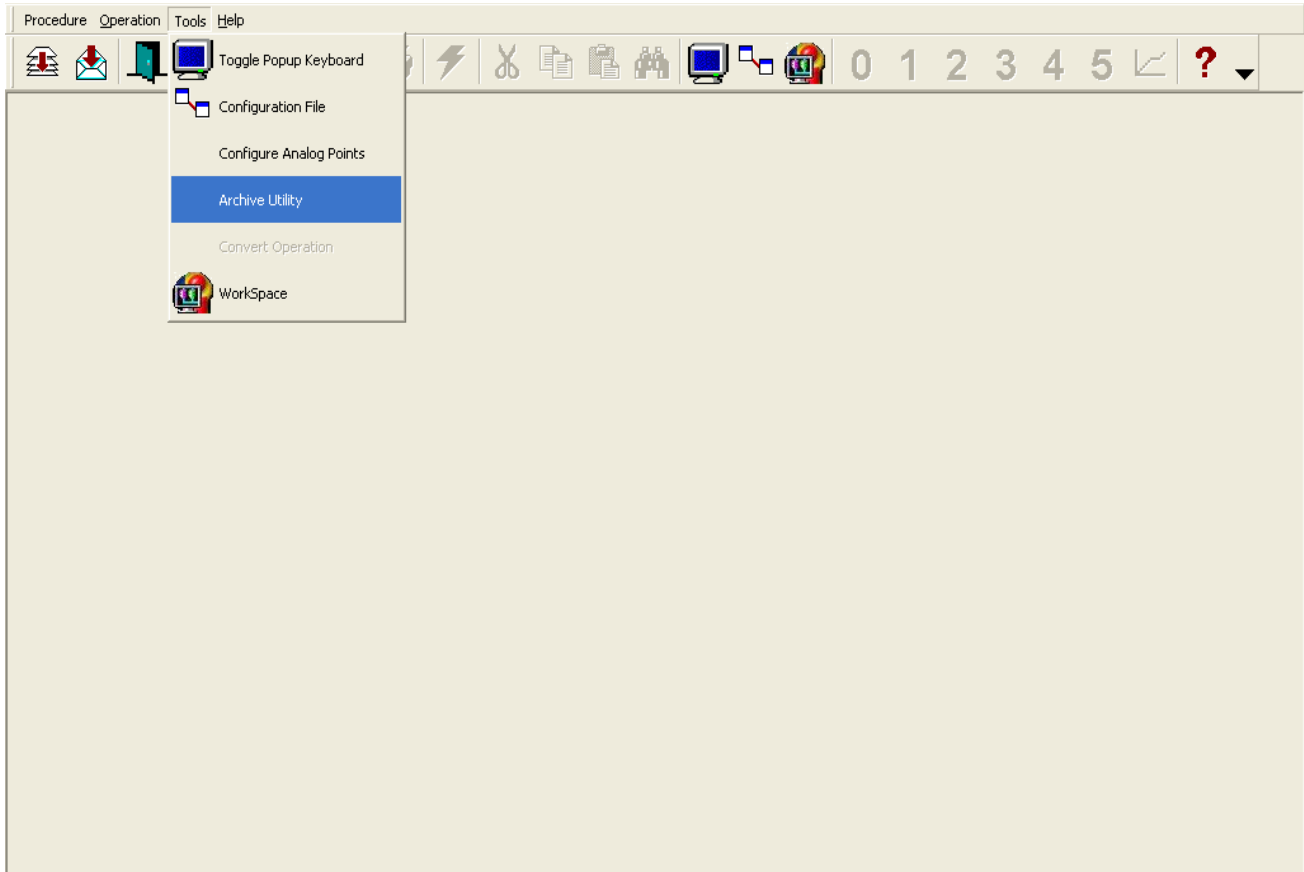
The Archive Utility is launched in the Recipe Editor, with the iFIX® off. An attempt to launch the Archive Utility while iFIX® is still running, results in an error message.

There are two ways to open the Archive Utility:

- Start the Recipe Editor from Windows® Explorer
Find the file named CCPRecipeEditor.exe. Its default location is: c:\Millipore\CCPSystem\.
- Start the Recipe Editor from the User Interface and then close the UI and shutdown iFix®.

Access to Windows® system Internet Explorer® browser, as well as closing down the touchscreen, requires Administrator privileges. Once a specific task has been selected in the Archive Utility, the user name and password prompt for a member of the CCP® Administrators group will appear.

To start the archiving utility, select Archive Utility from the Tools menu on the Recipe Editor tool bar.



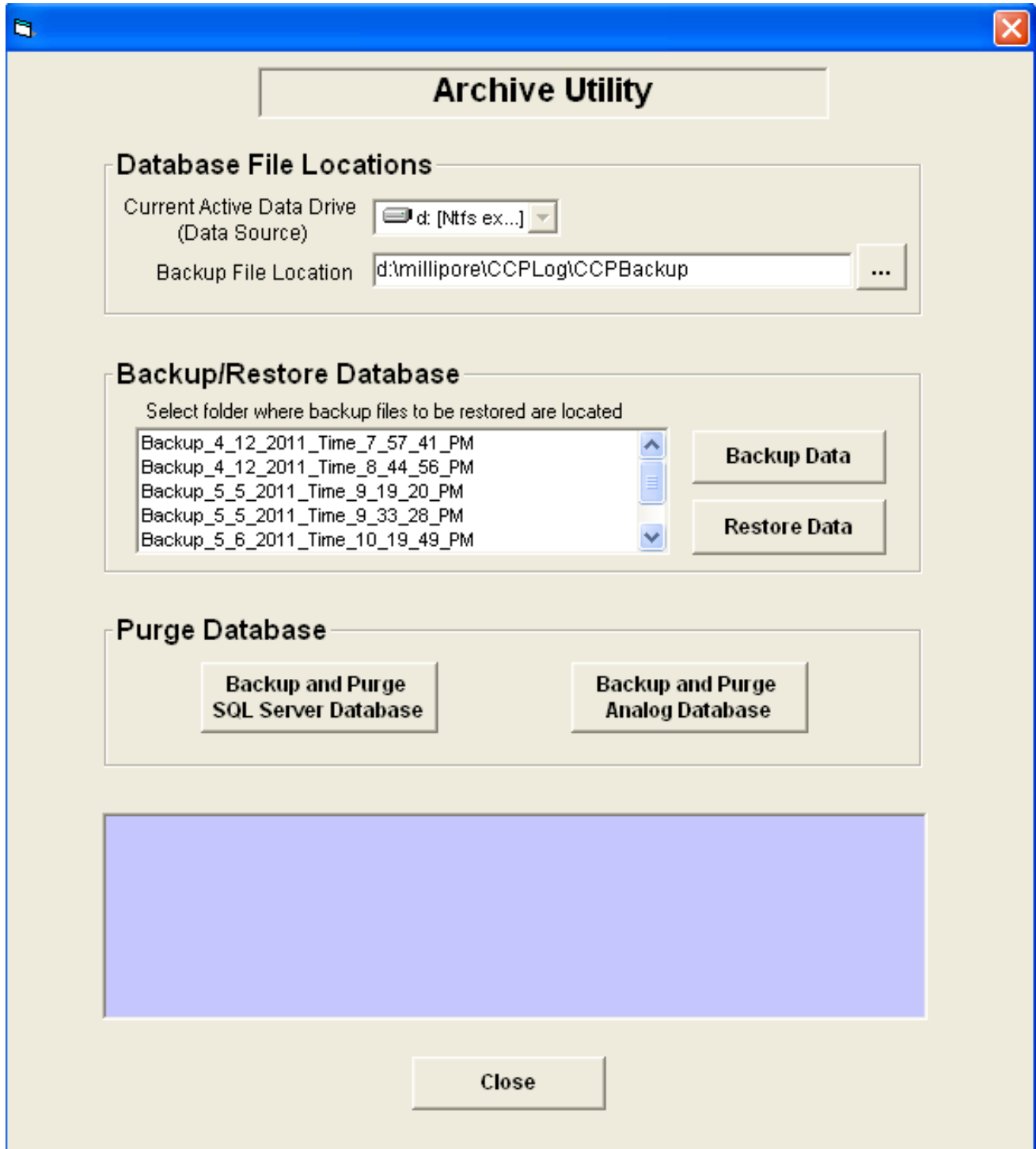
Archive Utility Location

Archive Utility Screen

There are three main parts of the Archive Utility screen:

- Database File Locations
- Backup/Restore Database
- Purge Database.

At the bottom of the screen is a report box for progress and messages.



Archive Utility Screen

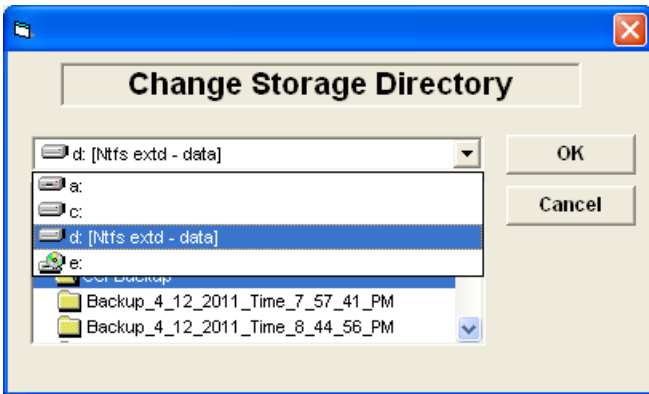
Database File Locations

In this part of the screen you can set the Current Active Data Drive and the Backup File Location. To do so, open the Change Storage Directory window, by clicking on the button labeled "...".

NOTE

The settings made in this part of the screen will determine from where and to where data will be copied during backup and restore. Make sure you have the settings right before you trigger either action.

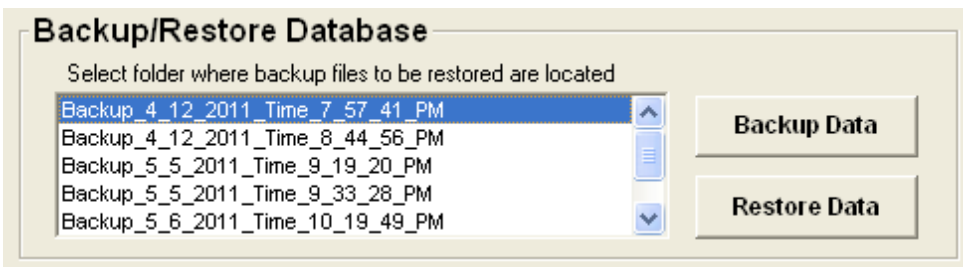
The Change Storage Directory window with the Active Drive being selected from the drop-down menu is shown here:



Select the correct location and click OK. The default location for the backup files is D:\Millipore\ccplog\CCPBackup. The backup file location can be modified by selecting any directory name from any drive on the system. Locations on the local network will appear in this list as additional drives.

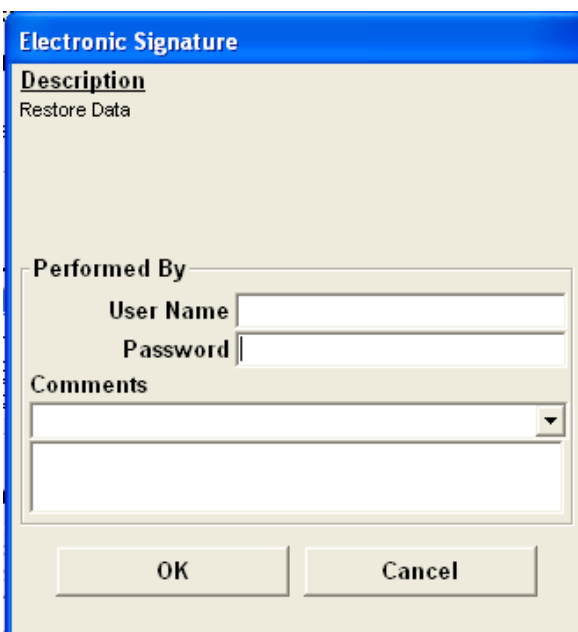
Backing Up or Restoring a Database

When the database file locations are appropriately set, execute either a backup or a restore operation. Start either activity by pressing the buttons on the screen as shown below.



Backup/Restore Database Section

The login prompt will appear. Comments can also be added at this time.



Backing Up a Database

Each backup action generates one backup directory with a unique name. That directory name records the exact time of the backup.

Depending on the size of the archive files and the backup location, the backup process may take considerable time. During the backup the archive utility will display progress messages and message box at the bottom of its interface.

When the backup process is completed, the message "Successfully backed up data!!" will be displayed.

Restoring a Database

Backed up data may be restored by selecting the appropriate data set from the selection box. An error message will be displayed if you do not select any data set at all. After you have selected the appropriate data set, click on the button labeled "Restore Data" to commence the restoration process.

CAUTION

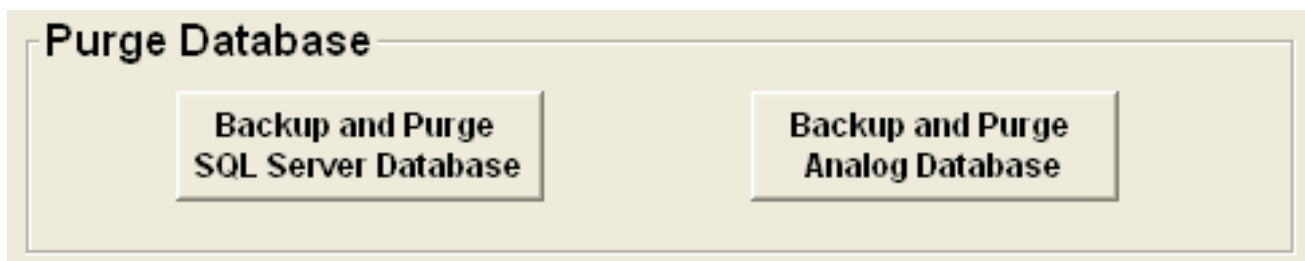
The data from the backup data set will replace any existing database files in the current active data location. Data that are logged in the active data location that are not backed up will be lost and are not recoverable.

Before starting the restoration operation, users will be prompted to confirm the overwrite of their current active databases. Click OK to proceed with the restore, click Cancel to abort the process and keep the currently active databases.

At the end of the successful restore operation the message "Successfully Restored Selected to Backup" will appear.

Purging Databases

The Event Archive and the Historical Archive are ever-growing files. Depending on the size of the hard disk and the growth rate of the equipment, it may be necessary to permanently export data from the archives and reduce their size on the disk. The Purge Database feature of the Archiving Utility performs this task.



The login prompt will appear. Comments can also be added at this time.

The Purge Database function copies the currently active archives to the specified archiving location, and then replaces the currently active archives by empty shells. After the purge, all active archive files are at minimum size and ready to log new data.

To restore the previous contents, go through the restore procedure explained in the previous section, and restore the backup set created during the backup and purge process.

NOTE

The backup set created during the purge database operation will not show up in the list of available backup sets until you leave and reenter the Archive Utility.

Backup and Recovery

Creating a Backup of the Hard Disk

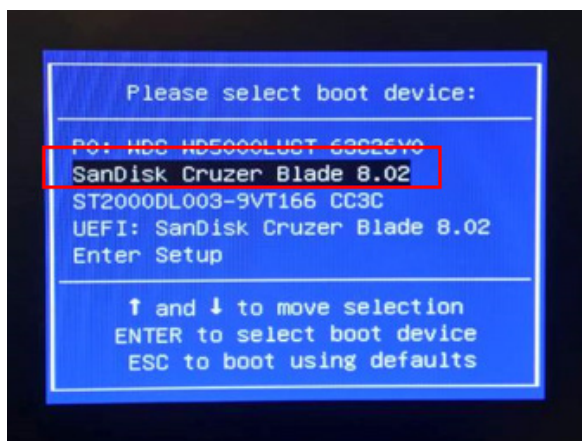
Create an image of hard disk using Acronis® Backup & Recovery

Required material:

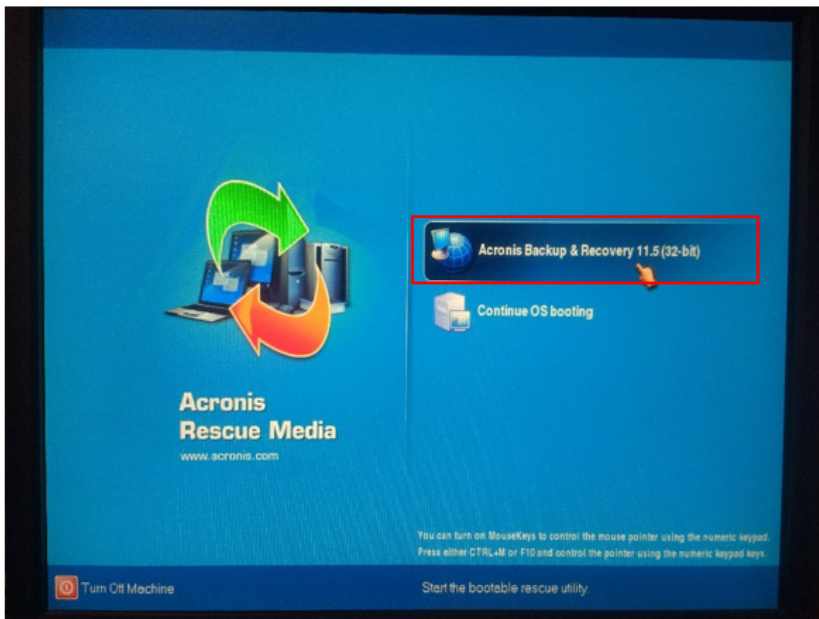
- External USB boot device with Acronis Backup & Recovery
 - Keyboard
 - USB mouse
1. Turn off the computer.
 2. Connect the keyboard, the mouse, and the external USB boot device with Acronis Backup & Recovery on USB port of the computer.
 3. Switch on the PC. When the BIOS splash screen appears press on the F11 key (boot menu). The boot menu appears.



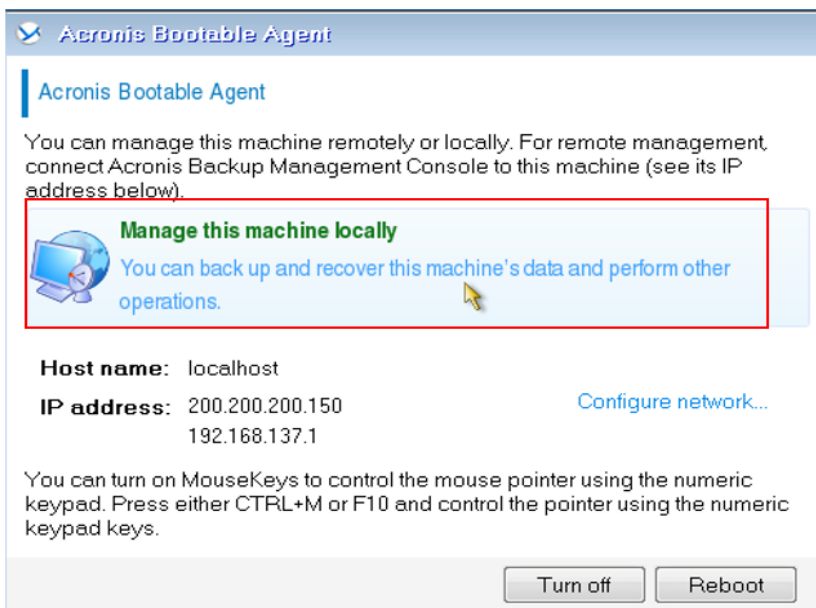
4. Select the appropriate disk player (USB) and press **Enter**.



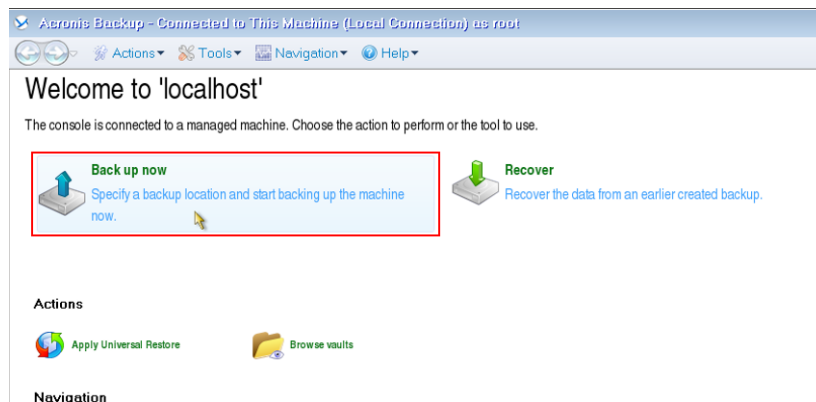
5. If the following popup appears, click **Acronis Backup & Recovery**:



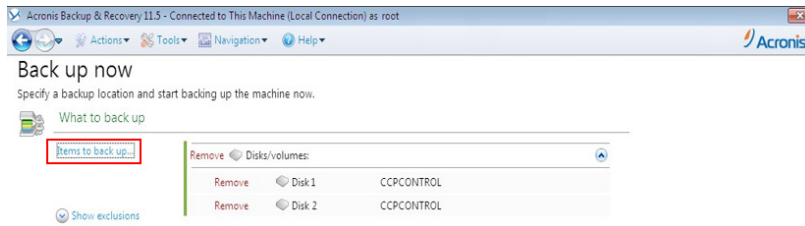
6. If the following popup appears, click **Manage this machine locally**:



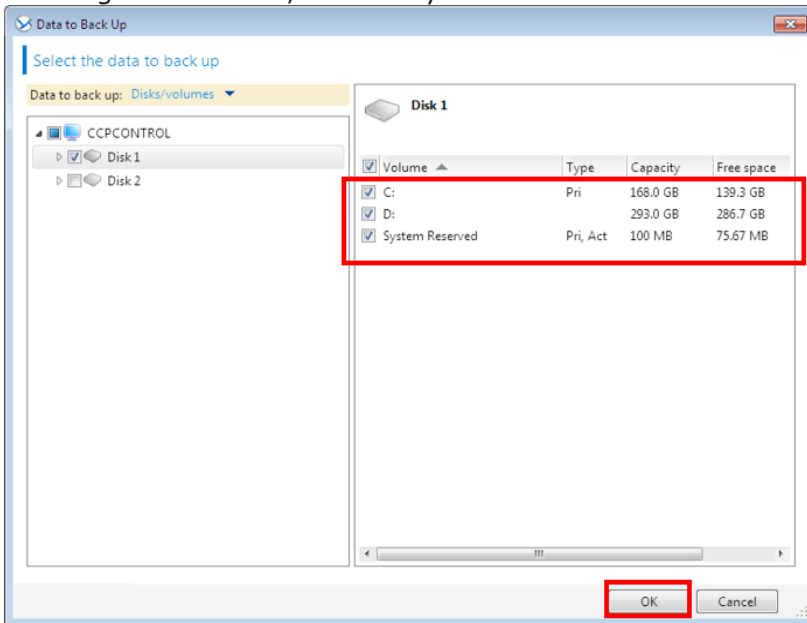
7. Click **Back up now**.



8. Click **Items to back up**.



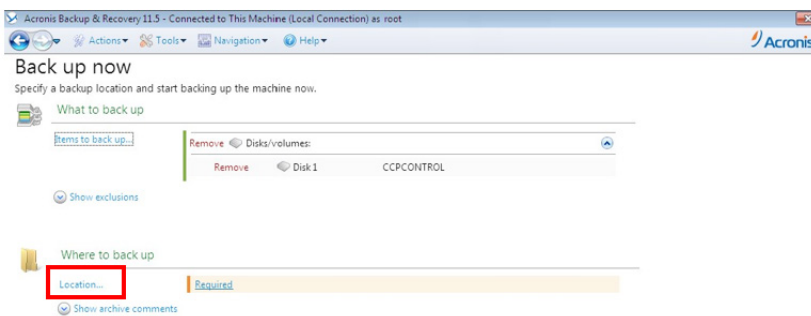
9. Select the disk that contains the Windows 7 operating system. Typically, it contains the following volumes: C:, D: and System reserved.



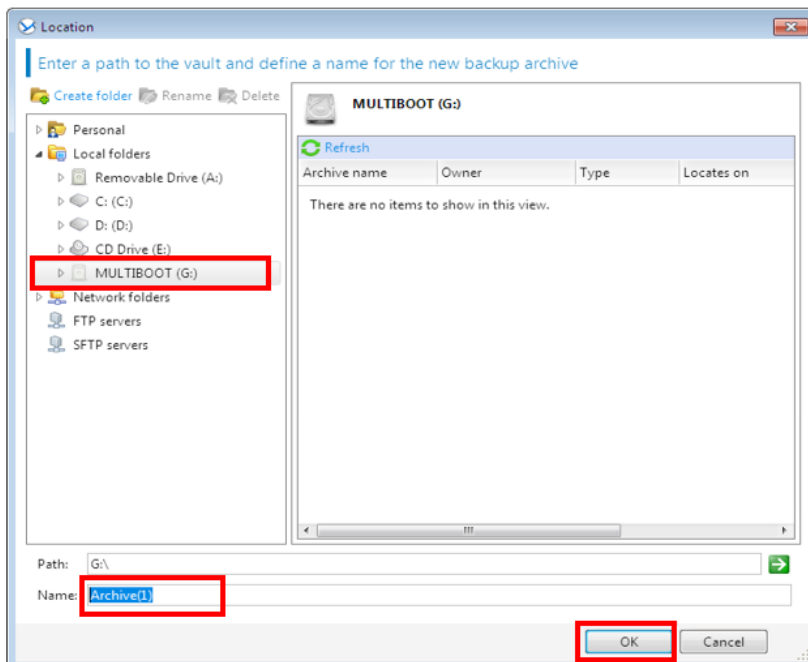
NOTE

If this procedure has been followed correctly, the second disk is the USB key.

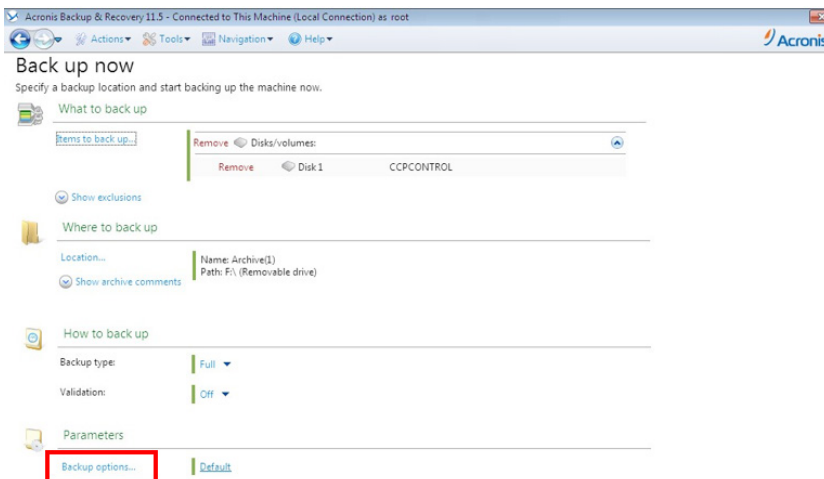
10. Click **Location**.



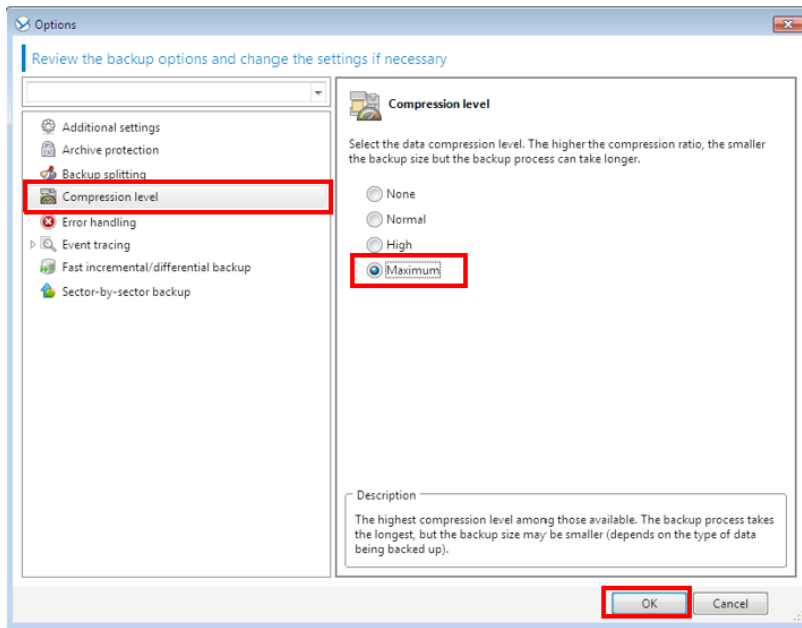
11. Select the USB key. Type the name of the backup. Click **OK**.



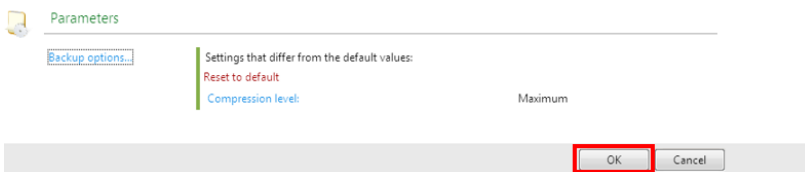
12. Click **Backup options**.



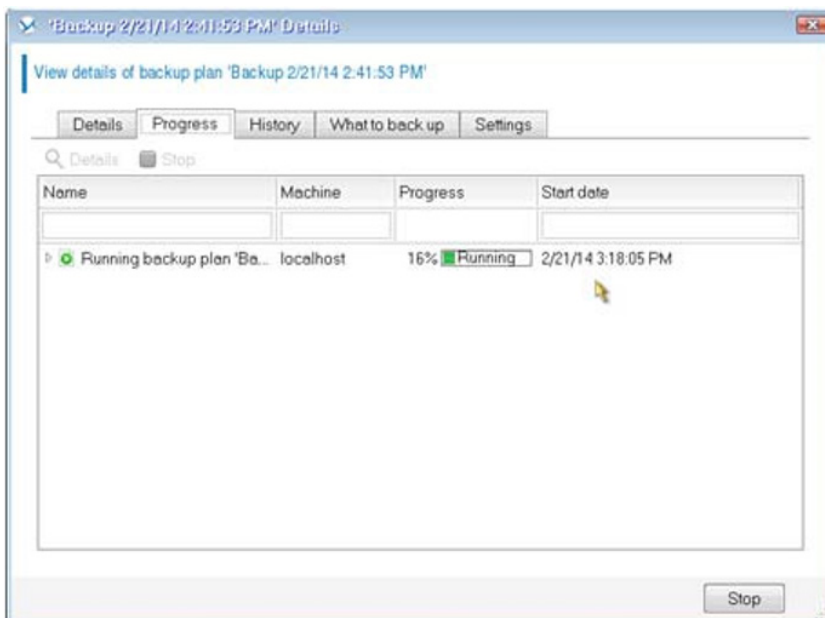
13. Click **Compression level**. Select **Maximum**. Click **OK**.



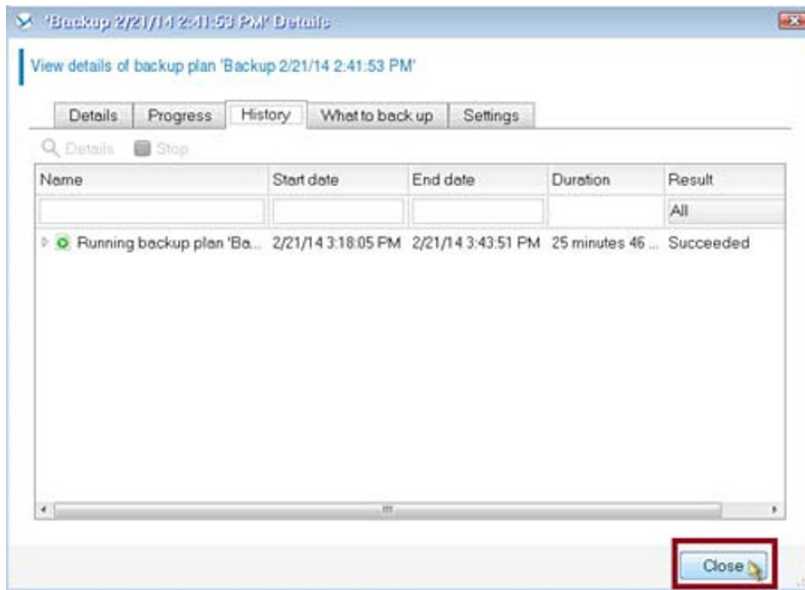
14. Click **OK** to start the backup.



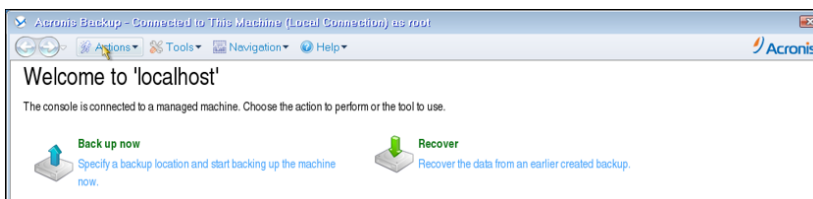
15. Backup begins. Click the **Progress** tab to see progression. Wait until backup is over.



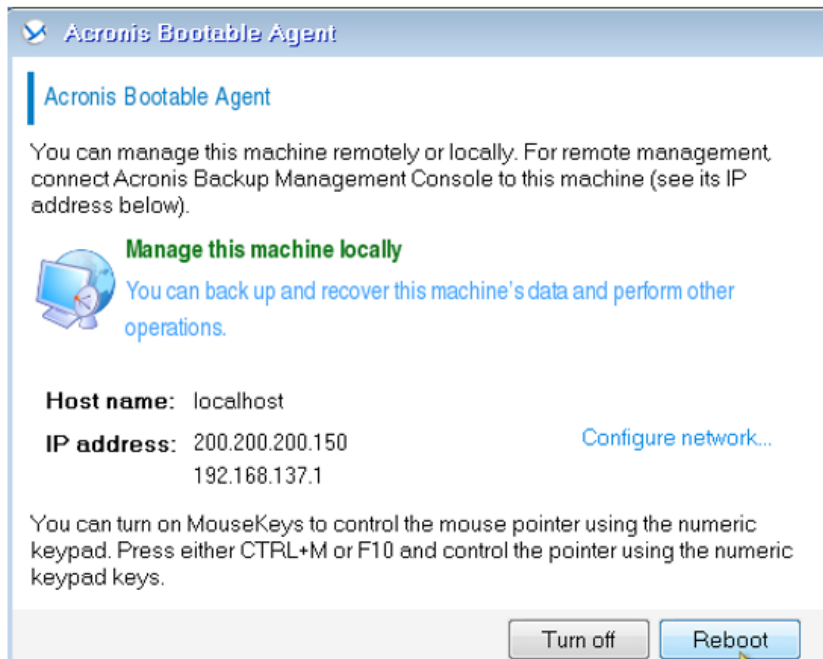
16. When backup is complete, select the **History** tab to check results. Click **Close** if the results are okay; otherwise, redo the backup.



17. Click **Actions**, and click **Exit**.



18. Click **Reboot** to reboot the computer.



Reinstalling from Backup

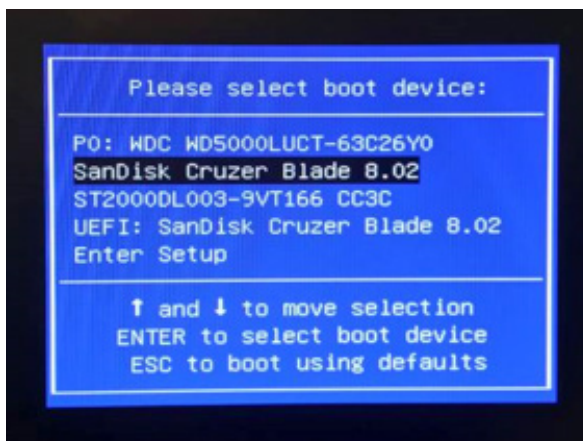
Required material:

- External USB boot device with Acronis Backup & Recovery
- Keyboard
- USB mouse

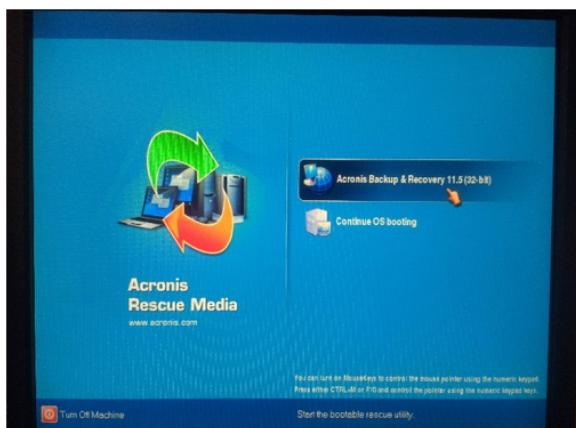
1. Turn off the computer
2. Connect the keyboard, the mouse, and the external USB boot device with Acronis Backup & Recovery on USB port of the computer.
3. Switch on the PC. When the BIOS splash screen appears press on the F11 key (boot menu). The boot menu appears.



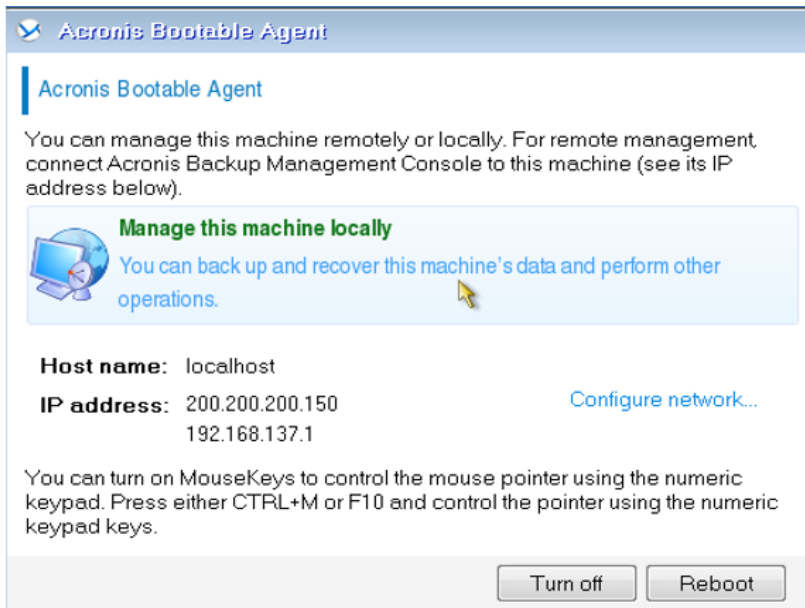
4. The boot menu appears. Select the appropriate disk player (USB) and press **Enter**.



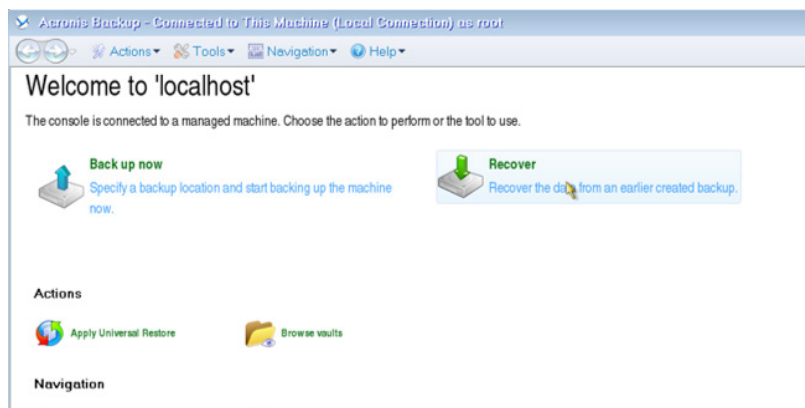
5. If the following popup appears, click **Acronis Backup & Recovery**:



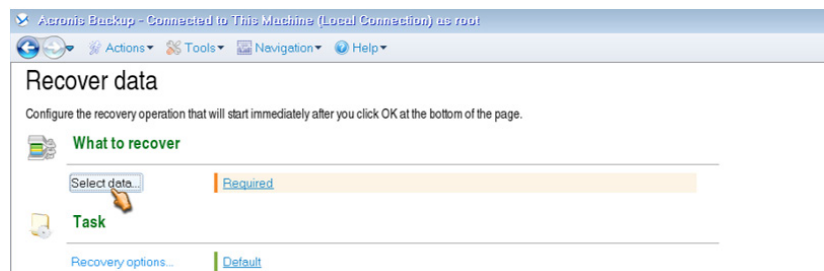
6. If the following popup appears, click **Manage this machine locally**:



7. Click **Recover**.



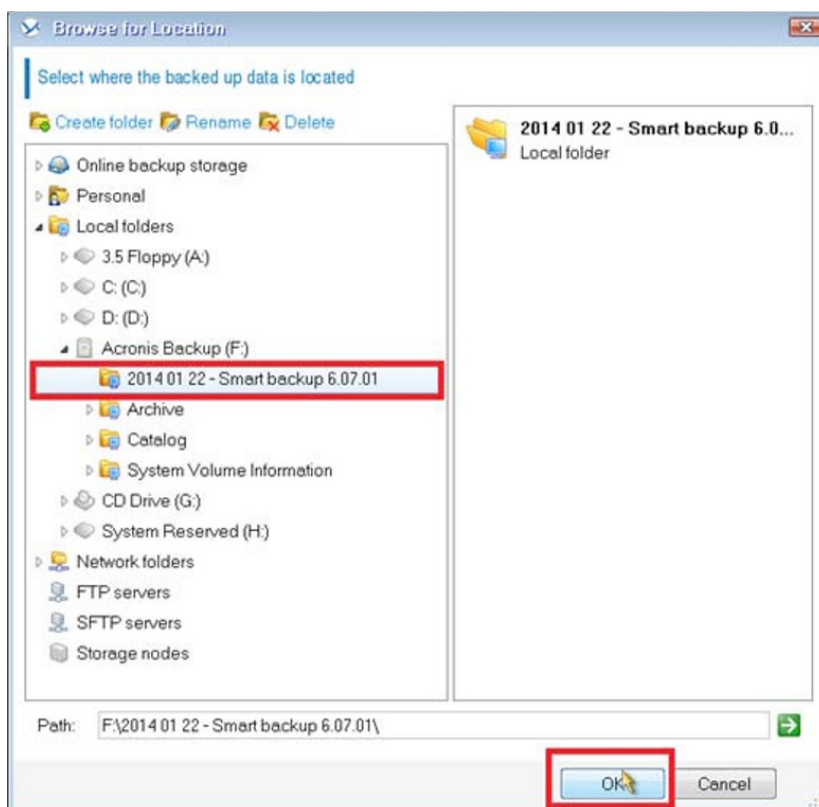
8. In the What to recover section, click **Select data**.



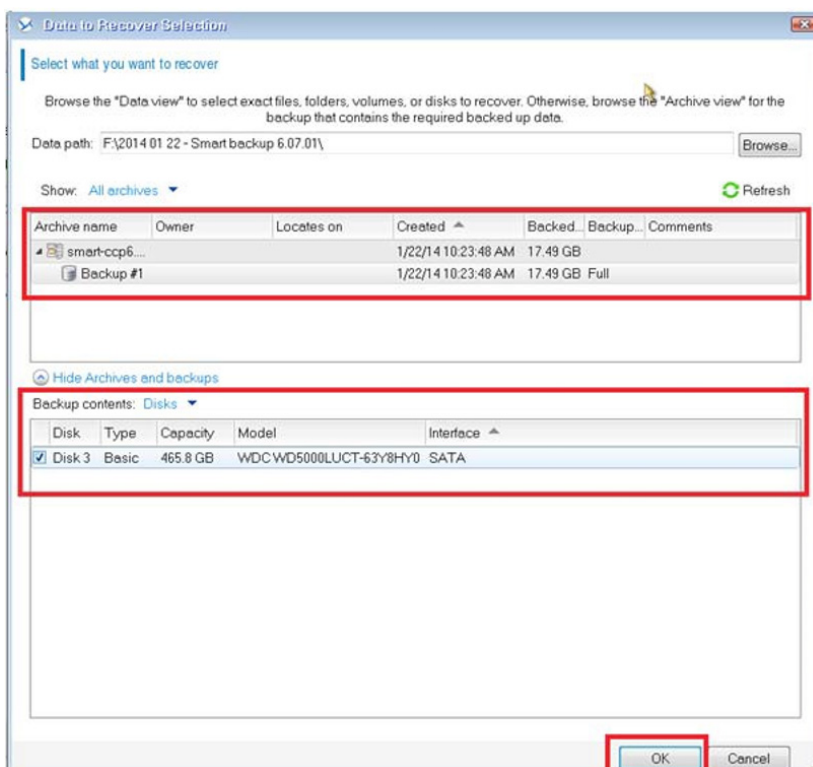
9. Click **Browse**.



10. Select the folder in which the backup image archive is located. Click **OK**.

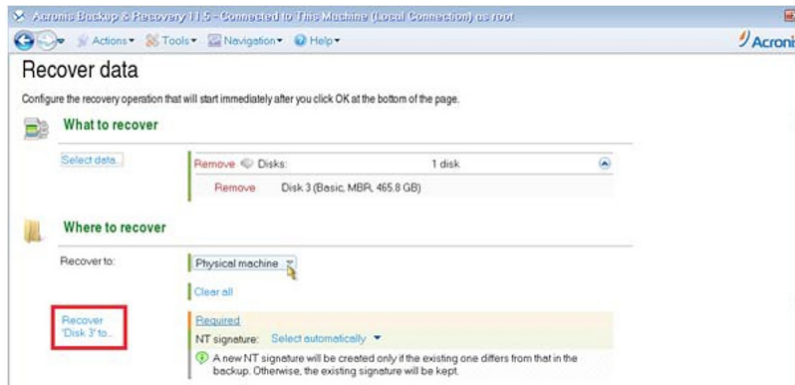


11. Select **Disks** as backup contents and select the backup image. Click **OK**.

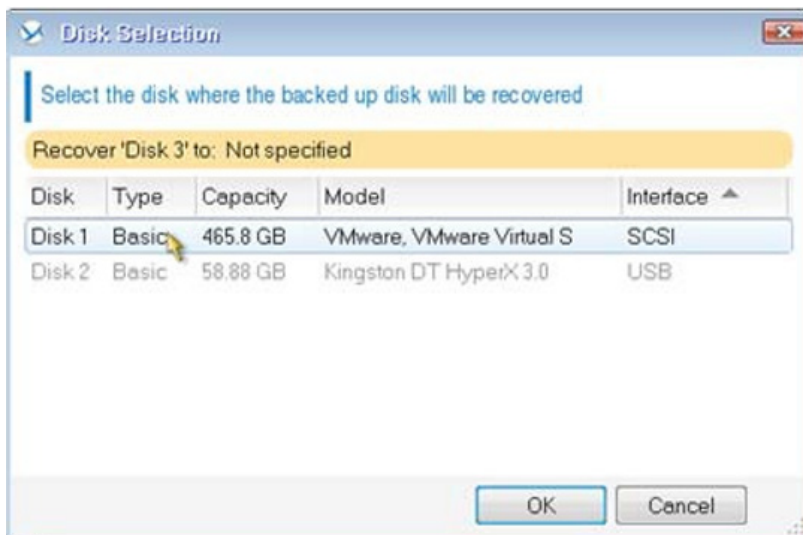


12. In the **Where to recover** section, select **Physical machine**.

13. Recover 'Diskx' to



14. Select the **Disk** from which the backup image archive should be recovered. Click **OK**



15. In the **Universal Restore for Windows** section, select **Do not use**. Click **OK**.

Managing iFIX® Software Data Collection

Historical Assign Program

The data collection software in CCP® software has been configured for customer use. The Historical Assign program is to assign database blocks to be collected for use with the historical trending software. **It should be used only by properly trained and authorized users.**

This Chapter describes how to:

- Start the Historical Assign program
- Select database blocks for a collection group
- Use Historical Assign to set up the group to collect process data and store it in historical data files.

Caution

The data collection settings on the system have been configured at the factory. Only authorized users familiar with iFIX® HTA software with training on this subject should alter these settings.

The CCP® Historical Assign program requires TWO separate operations to save changes to the configuration, as described in the section Saving Changes to Historical Assign Configuration.

Data collection and batch reporting will NOT function as desired unless BOTH operations to save the configuration have been performed.

Default Historical Assign Configuration

The CCP® software data collection will initially be configured as follows:

Chrom 2.2 L/min and 8.0 L/min Data Collection Configuration

Group	Collection Rate (sec)	Phase (sec)
1	2	0
2	2	2
3	2	4
4	2	0
5	2	6

The phase field is used to offset the collection intervals of groups to prevent collection overruns in the event that too much data is being collected in a single scan.

Chrom 2.2 L/min and 8.0 L/min Data Groups

Tag Names				
Group 1	Group 2	Group 3	Group 4	Group 5
PI006.F_CV	FI004.F_CV	AI007.F_CV	CHART_MARK.F_CV	FQ01_OP.F_CV
PI001.F_CV	LV.F_CV	AI008.F_CV		FQ01_PR.F_CV
PI003.F_CV	FI002.F_CV	AI011.F_CV		FQ01_US.F_CV
	FT_TOT.F_CV	AI010.F_CV		FQ02_OP.F_CV
	BH.F_CV	TI009.F_CV		FQ02_PR.F_CV
	CV.F_CV	TI012.F_CV		FQ02_US.F_CV
		PID01_FIC01_CV.F_CV		FQ-1PR.F_CV
		PID02_PIC01_CV.F_CV		FQ-2PR.F_CV
		PID07_AIC01_CV.F_CV		
		PID11_FIC02_CV.F_CV		
		AI013.F_CV		
		AI014.F_CV		
		PCV032.F_CV		

TF3S Data Collection Configuration

Group	Collection Rate (sec)	Phase (sec)
1	10	0
2	10	2
3	10	4
4	2	0
5	10	6

The phase field is used to offset the collection intervals of groups to prevent collection overruns in the event that too much data is being collected in a single scan.

TF3S Data Groups

Tag Names				
Group 1	Group 2	Group 3	Group 4	Group 5
PI001.F_CV	FI101.F_CV	TI001.F_CV	CHART_MARK.F_CV	FQ01_OP.F_CV
PI002.F_CV	FI401.F_CV	LI001.F_CV		FQ01_PR.F_CV

Tag Names				
Group 1	Group 2	Group 3	Group 4	Group 5
PI101.F_CV	FLUX.F_CV	AI101.F_CV		FQ01_US.F_CV
PI401.F_CV	CB.F_CV	AI102.F_CV		FQ02_OP.F_CV
DP.F_CV	DIAVOL.F_CV	AI103.F_CV		FQ02_PR.F_CV
TMP.F_CV	NWP.F_CV	WI001.F_CV		FQ02_US.F_CV
	PERM.F_CV	WI101.F_CV		FQ02_CONC.F_CV
	FI001.F_CV	WI102.F_CV		FQ02_DIAF.F_CV
	VCF.F_CV	PCV001.F_CV		
		PCV101.F_CV		
		MIX001.F_CV		
		AI104.F_CV		

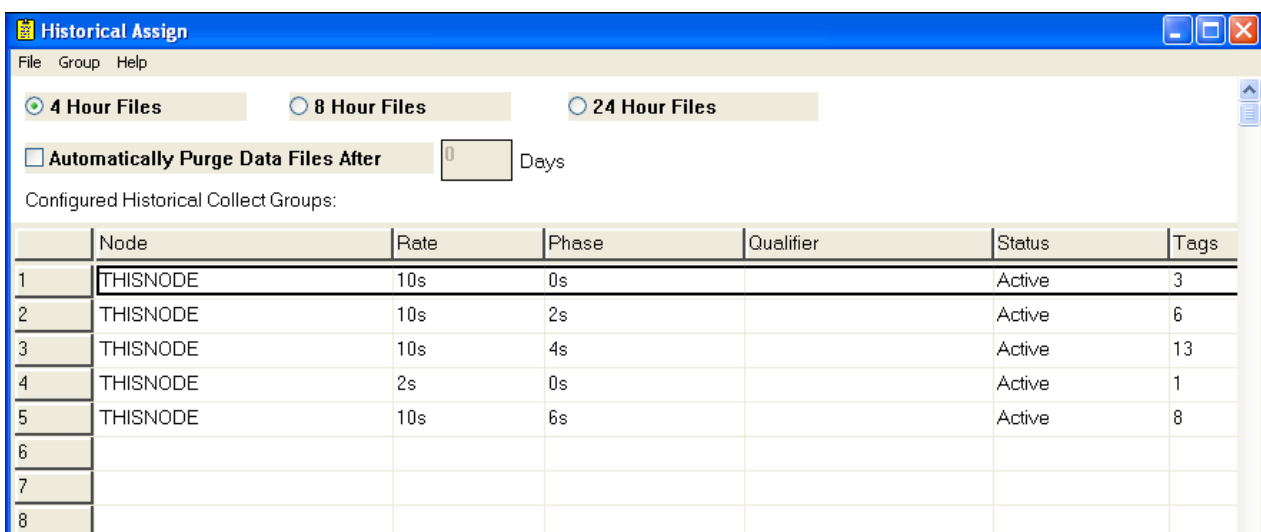
Starting Historical Assign Program

Historical assign is started when iFIX® is started at power up.

To edit Historical Assign a keyboard must be plugged into system user must have administrator access.

To start the Historical Assign program:

1. From the Windows® Start menu, select Run.
2. From the Windows® Start menu, type "hta" in the "search programs and files" window. Select hta in the program list to open the Historical Assign program and open the Historical assign window.



Historical Assign Window

Using the Historical Assign Program

The Historical Assign window displays a list of all the collection groups and group information such as Node, data collection rate, phase, qualifier and status.

Window	Description
File menu	Allows the user to save an assignment file for collection groups, and exit the Historical Assign program.
Group menu	Allows you to add, modify, delete, activate and deactivate collection groups.
Help menu	Provides access to various iFIX® software documentation.

Creating a New Collection Group

To create a historical collection group from the Historical Assign window, select Add from the Group menu. The Group Configuration dialog box opens. The Group Configuration dialog box lists the tag names and the collection parameters for the group being created.

The screenshot shows the 'Group 6 Configuration' dialog box. It features a blue title bar with a question mark icon and a close button. The main area is light gray and contains several input fields and buttons. At the top, there are fields for 'Node' (containing 'THISNODE'), 'Rate' (containing '30s'), 'Qualifier', and 'Phase' (containing '0s'). Below these are three buttons: 'Add', 'Modify', and 'Delete'. A large, empty rectangular box labeled 'Tagname' is positioned to the right of these buttons. At the bottom of the dialog, there are two more input fields: 'Tagname' and 'Limit' (containing '0.500000'). Finally, there are three buttons at the very bottom: 'Save Changes', 'Cancel', and 'Help'.

Group Configuration Dialog Box

Group Configuration Parameters

Parameter	Description
Node	The name of the node that contains the database blocks that this collection group uses during collection
Qualifier	Optional database block that determines whether data collection for the group is on or off.
Rate	Determines how often you want data collected for the block tag names in the collection group
Phase	Determines how the system distributes the data collection load
Tag name List	Displays the database block from where the data is collected
Tag name Field	Used to find tags to add to the Tag name List
Limit	Provides a deadband limit to eliminate recording data within a specified range of the last recorded value.

Parameter	Description
Add, Modify, Delete Buttons	Apply to the tag names listed in the tag name area. First select a tag name and then select the button to perform the action.
Save	Saves the changes you made in the Group Configuration dialog box and closes the window.

To populate the fields in the Group Configuration dialog box.

1. Select a Node

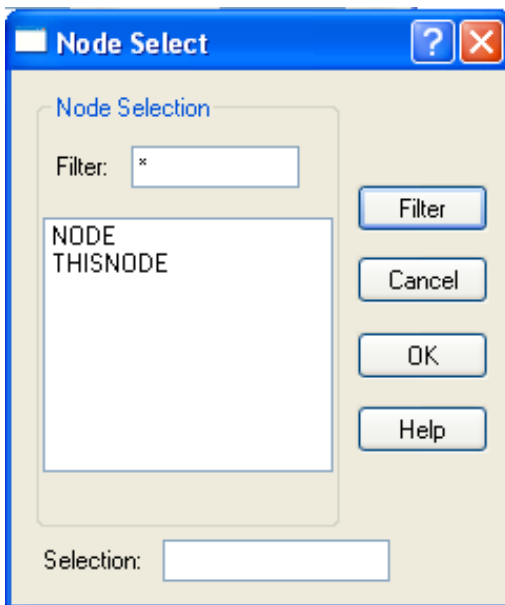
In the Node field in the Group Configuration dialog box, enter the name of the SCADA software node that contains the block tag names for the collection group.

Or

To display a list of the SCADA software nodes being communicated with, click the "..." button next to the Node field to display the standard Node Select dialog box.

To search the node list for a particular node, enter a character in the Filter field. For example, to search the list for all nodes that begin with N, type "N*" and then select the Filter button to display a list of nodes beginning with N.

Select a node from the list in the Node Select dialog box click the OK button. The node is entered in the Node field in the Group Configuration dialog box.



Node Select

NOTE

All tag names in a collection group must be located on the same node.

2. Enter a Qualifier Block for On/Off Collection State (Optional)

Specify an optional Qualifier block to collect data for a specific interval when process data has changed. In the Qualifier field, enter the block name that determines when the data collection state for the group is on or off. The Qualifier block is usually a Digital Input or Digital Output block. A Digital Register block cannot be used as a qualifier block. When the digital block goes from Open to Closed, data collection starts for the group. When the digital block goes from Closed to Open, data collection stops.

- If the qualifier block is a block other than a digital block, a value of 0 stops collection. Any value other than 0 starts collection.
- If a non-digital block is assigned as a qualifier, the following message appears:

The qualifier is not a digital point. Use anyway?

- If a non-existent block is assigned as a qualifier, the following message appears:

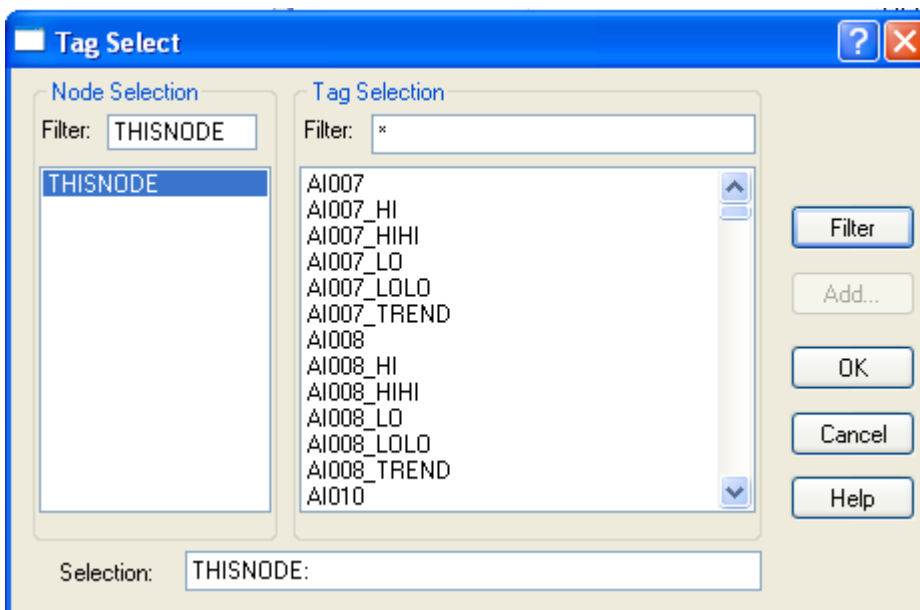
This qualifier not found in database. Use anyway?

When starting Historical Collect, an operator message is generated warning that the qualifier is not found.

To choose the qualifier block from a list of tag names for the node entered in the Node field select the "..." button to the right of the Qualifier field.

The tag names for the node displayed in the Node field are shown in the standard Tag Select dialog box.

To quickly search through a tag list for the node, enter the initial letters of a tag name in the Filter field. For example, type **C***, and then select the Filter button to display a list of tags beginning with C.



Tag Select Dialog Box

Select a Qualifier tag from the list in the Tag Select dialog box by tapping on the touchscreen. It will appear in the Selection field next to the collection node.

Select the OK button. The qualifier tag is entered in the Qualifier field in the Group Configuration dialog box.

3. Enter a Data Collection Rate

In the Rate field in the Group Configuration dialog box, enter how often values should be collected for the tag names in the collection group.

Select the "..." button to display a list of available rate values. The Rate field defaults to 30 seconds.

Select a collection rate from the list and then select the OK button. The selected rate is entered in the Rate field in the Group Configuration dialog box.

NOTE

For remote nodes, the minimum recommended collection rate is 10 seconds. The 1 and 2 second collection rates are recommended for use only on local nodes.

The collection rate operates off of the system clock time rather than when Historical Collection is started. Time increments (hours, minutes, and seconds) for clock time are maintained from midnight (00:00:00) to the present, so no matter when the Historical

Collection Program starts, the rate function runs off the system clock and begins its collection process in relation to the clock setting.

4. Enter Phase Value

Phasing offsets the collection process for a group by the amount of time entered in the field. When collection starts, it waits for the phase period to elapse once. Thereafter, data is collected according to the rate defined for the group.

The main benefit of phasing collection rates is to prevent overruns. A historical collection overrun occurs when the Historical Collect program cannot collect all the data at the rate specified. When an overrun occurs, the collection program does not collect values for some tag names.

If a Phase time of 2 seconds and a Rate time of 10 seconds are assigned, then once collection starts, data will be collected at 2 seconds, 12 seconds, 22 seconds, 32 seconds and every 10 seconds thereafter.

NOTE

A total of 80 tag names can be assigned to a collection group. The Historical Collect program uses less CPU time to process one group containing 80 tag names than it does to process eight different groups with ten tag names per group.

In the Phase field, enter the number of seconds by which the collection will be staggered.

Select the "..." to display a list of available phase values.

The Phase value choices are in two second increments from 0 to 58 seconds. The Phase field defaults to 0 seconds for the first group added in Historical Assign, and then increments by two seconds for each additional group added.

NOTE

The Phase value entered must always be smaller than the Rate value.

Select a Phase value from the list and then select OK. The selected phase value is entered in the Phase field in the Group Configuration dialog box.

5. Select Tag names

In the Tag name field in the Group Configuration dialog box, enter the tag name you want to add to the collection group.

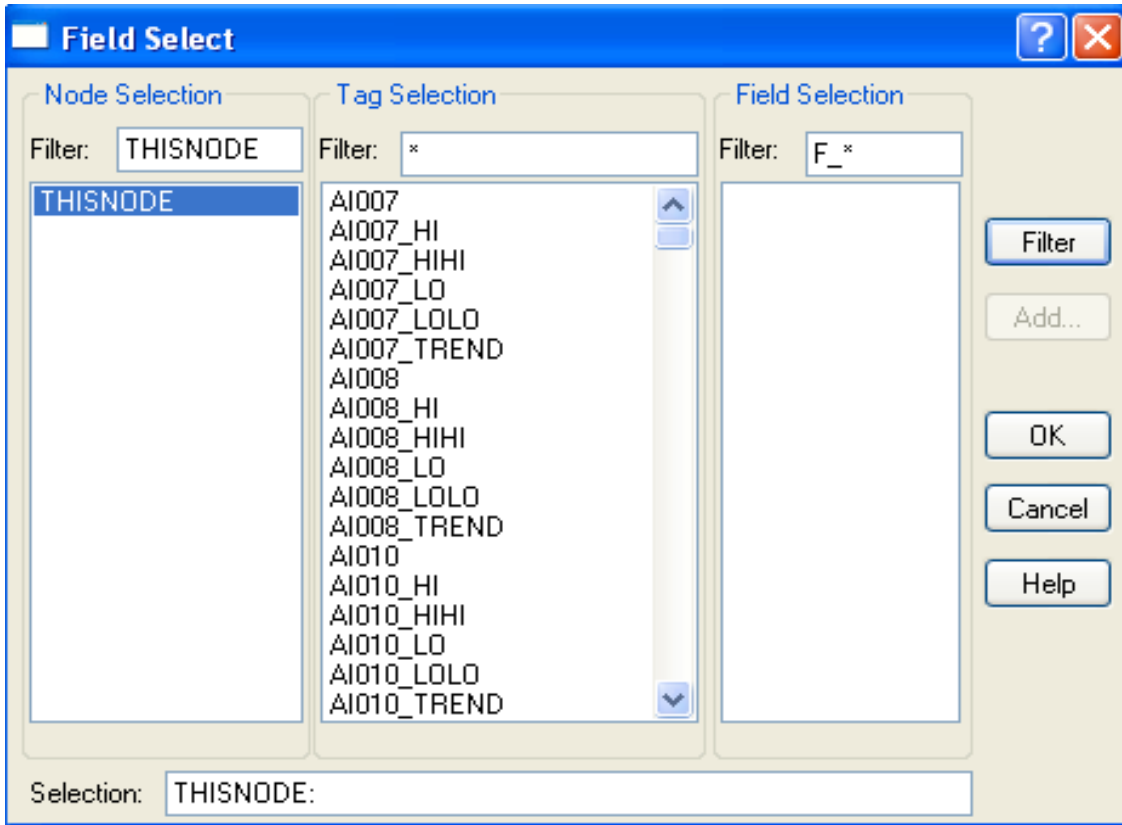
To choose from a list of tag names for the selected node click the "..." button. The standard Field Select dialog box displays with a list of tag names and fields for the node.

To quickly search through the tag list for a specific tag, enter the beginning letters for a tag in the Filter field. For example, if "A*" is entered, then the Filter button is selected, a list of tags beginning with "A" is displayed.

To quickly search through the fields for a tag, select the tag, and then follow the same procedure as in Step 2. For Historical Assign, all the tags have the same field: F_CV

When the tag and field have been selected select the OK button in the Field Select dialog box. The tag you chose to trend is shown in the Tag name field in the Group Configuration dialog box.

Click the Add button to add the tag to the list of Tag names.



Field Select Dialog Box

NOTE

Only floating point fields (F_) can be trended.

6. Enter a Deadband Limit for Data Collection

Using a deadband limit is a convenient and powerful way to compress data. During times when process values change by insignificant amounts, the deadband limit can improve system performance and decrease the amount of disk space used by historical data files. The deadband limit accomplishes this by controlling how much the current value can deviate from the last recorded value before Historical Collect records the value in the historical data file. See the next section Limit Example for an example of data collected using a deadband limit.

NOTE

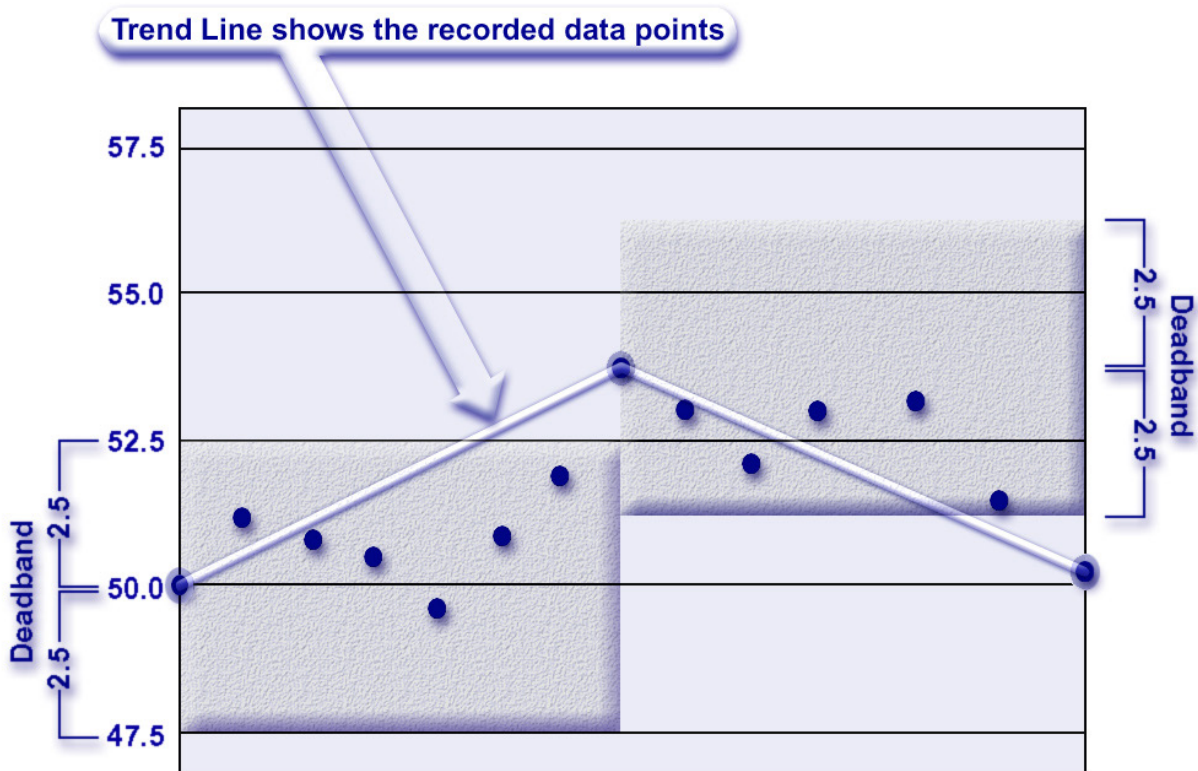
If the limit value is 0, the system saves every sample. Tag names with a limit value of 0 use the maximum amount of disk space available.

7. Save Changes

When completed with defining a collection group in the Group Configuration dialog box, select the Save Changes button to save the group. The dialog box closes and the user is returned to the Historical Assign window.

Limit Example

The following diagram illustrates how setting the Limit field reduces the amount of data collected by Historical Collect. In this example the Limit field is set to 2.5. Of the 16 data points shown, Historical Collect records only three. Data points within the shaded areas are not recorded because they fall within the 2.5 deadband limit.



Deadband Limit Example

The first recorded value shown is 50. The next value that Historical Collect records must be greater than or equal to 52.5 or less than or equal to 47.5.

The second value recorded is 54. The deadband limit now applies to the current value of 54. Therefore, the third value that Historical Collect records must be greater than or equal to 56.5 or less than or equal to 51.5.

The third value recorded is 51. The deadband limit now applies to the current recorded value of 51.

Suspending a Collection Group

A collection group can be suspended temporarily if the current data does not need to be viewed, or if the data is taking up too much disk space on the system.

To suspend a group, select the group in the Historical Assign window. Then select Deactivate from the Group menu. The Status field for the group changes to Inactive.

To reactivate a group, select the group and then select Activate from the Group menu.

Modifying a Collection Group

To change the collection parameters for a group at a later date, select the group in the Historical Assign window and double-click or select Modify from the Group menu. The Group Configuration dialog box opens. Changes can be made to the group by following the instructions in the *Creating a New Collection Group* section of this chapter.

NOTE

If changes are made to a collection group in the Historical Assign program (such as adding new tags to a group) after the Historical Collection program has started, stop and restart Historical Collect so the system can read the new configuration.

Deleting a Tag

To delete a tag name in the Tag name list:

1. Select the tag in the Tag name list.

2. Select the Delete button.

Modifying a Tag

To modify a tag name in the Tag name list:

1. Select the tag to be modified. The tag is shown in the Tag name field below.
2. Modify the tag in the Tag name box. To select a new tag for trending from a list, select the "?" button.
3. After the tag has been changed, select the Modify button. The new tag is shown in the Tag name field and list.

Deleting a Collection Group

To delete a group, select the group in the Historical Assign window and then select Delete from the Group menu. The following message appears:

Are you sure you want to delete this group?

Select the Yes button to delete the collection group, or the No button to cancel the deletion.

Saving Changes to Historical Assign Configuration

To save changes to the Historical Assign program, two separate operations are required.

1. Select Save from the File menu. This operation saves the changes made, to support data collection.
2. Select Save As from the File menu. In the File name field in the Save As window, enter the following path and filename:

XMO3 — C:\millipore\ccpsystem\XMO3\ini\hta-cfg.csv

XMO12 — C:\millipore\ccpsystem\XMO12\ini\hta-cfg.csv

TF3S — C:\millipore\ccpsystem\TF3S\ini\hta-cfg.csv

This operation saves the changes made, to support batch reporting.

Data collection and batch reporting will not function as desired unless both operations to save the configuration have been performed.

Exiting the Historical Assign Program

To exit the Historical Assign program, select Exit from the File menu and the window will close. If changes have not been saved, the system prompts the user to do so before exiting.

NOTE

Do NOT exit the Historical Assign Program until BOTH operations described under Saving Changes to Historical Assign Configuration, above, have been performed.

Data collection and batch reporting will not function as desired unless both operations to save the configuration have been performed.

Historical Collect Program

Starting the Historical Collect Program

Starting the Historical Collect application enables data collection. Historical Collect starts automatically when the system starts up and collects data, as configured in the Historical Assign program. If any changes are made in Historical Assign, the system should be rebooted.

Data File Storage and Backup

Historical Data is collected using the iFIX® Historian software. The iFIX® Historian is a component that is embedded into iFIX® software. The Historian Server logs the assigned data into databases. An Archiving Utility that performs Backup and Restore Operations on both the Event Log and the Historical data are included in the CCP® Software. Please see the chapter on Backup and Restore for more details.

Reopening the Workspace after Closing

When the application is closed using the close button on the top of the screen, the application user is logged out of the application and iFIX® software has no user associated at this point.

To restart the workspace, use the login button on the desktop and login using valid iFIX® software user information. Start the workspace from the desktop.

Catalog Numbers, Accessories, and Spare Parts

System Catalog Numbers

Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography

Description	Catalog Number
SMART Cart with Clamshell, Chrom. 2.2 L/min, China	MBSMTBXM1CH
SMART Cart with Clamshell, Chrom. 2.2 L/min, Europe	MBSMTBXM1EU
SMART Cart with Clamshell, Chrom. 2.2 L/min, Japan	MBSMTBXM1JP
SMART Cart with Clamshell, Chrom. 2.2 L/min, Korea	MBSMTBXM1KR
SMART Cart with Clamshell, Chrom. 2.2 L/min, North America	MBSMTBXM1NA
SMART Cart with Clamshell, Chrom. 2.2 L/min, United Kingdom	MBSMTBXM1UK
SMART Cart with Clamshell, Chrom. 8.0 L/min, China	MBSMTBXM3CH
SMART Cart with Clamshell, Chrom. 8.0 L/min, Europe	MBSMTBXM3EU
SMART Cart with Clamshell, Chrom. 8.0 L/min, Japan	MBSMTBXM3JP
SMART Cart with Clamshell, Chrom. 8.0 L/min, Korea	MBSMTBXM3KR
SMART Cart with Clamshell, Chrom. 8.0 L/min, North America	MBSMTBXM3NA
SMART Cart with Clamshell, Chrom. 8.0 L/min, United Kingdom	MBSMTBXM3UK
SMART Pump Cart with 1 Pump, Chrom. 2.2 L/min	MBSMTXM1PUMP1
SMART Pump Cart with 2 Pumps, 2.2 L/min	MBSMTXM1PUMP2
SMART Pump Cart with 1 Pump, 8.0 L/min	MBSMTXM3PUMP1
SMART Pump Cart with 1 Pump, SU Flowmeter, 8.0 L/min	MBSMTXM3PUMP1SU
SMART Pump Cart with 2 Pumps, 8.0 L/min	MBSMTXM3PUMP2
SMART Pump Cart with 2 Pumps, SU Flowmeters, 8.0 L/min	MBSMTXM3PUMP2SU
SMART Chrom Manifold	MNFLDXM

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF

Description	Catalog Number
SMART Cart with Clamshell, TF2S, China	MBSMTBTF2SCH
SMART Cart with Clamshell, TF2S, Europe	MBSMTBTF2SEU
SMART Cart with Clamshell, TF2S, Japan	MBSMTBTF2SJP
SMART Cart with Clamshell, TF2S, Korea	MBSMTBTF2SKR
SMART Cart with Clamshell, TF2S, North America	MBSMTBTF2SNA
SMART Cart with Clamshell, TF2S, United Kingdom	MBSMTBTF2SUK
SMART Cart with Clamshell, TF3S, China	MBSMTBTF3SCH
SMART Cart with Clamshell, TF3S, Europe	MBSMTBTF3SEU
SMART Cart with Clamshell, TF3S, Japan	MBSMTBTF3SJP
SMART Cart with Clamshell, TF3S, Korea	MBSMTBTF3SKR
SMART Cart with Clamshell, TF3S, North America	MBSMTBTF3SNA
SMART Cart with Clamshell, TF3S, United Kingdom	MBSMTBTF3SUK
SMART TF2S Pump Cart	MBSMTF2PUMP
SMART TF3S Pump Cart, 200V	MBSMTF3PUMP200V
SMART TF3S Pump Cart, 400V	MBSMTF3PUMP400V
SMART TFF, Tank Cart, 50L, PE, CN	MBSMTNK50CH
SMART TFF, Tank Cart, 50L, PE, EU	MBSMTNK50EU
SMART TFF, Tank Cart, 50L, PE, JP	MBSMTNK50JP
SMART TFF, Tank Cart, 50L, PE, NA	MBSMTNK50NA
SMART TFF, Tank Cart, 50L, PE, UK	MBSMTNK50UK
SMART TFF, Tank Cart, 50 L, Jacketed Stainless Steel, CN	MBSMTNK50STCH
SMART TFF, Tank Cart, 50 L, Jacketed Stainless Steel, EU	MBSMTNK50STEU
SMART TFF, Tank Cart, 50 L, Jacketed Stainless Steel, JP	MBSMTNK50STJP
SMART TFF, Tank Cart, 50 L, Jacketed Stainless Steel, NA	MBSMTNK50STNA
SMART TFF, Tank Cart, 50 L, Jacketed Stainless Steel, UK	MBSMTNK50STUK
SMART TFF, Tank Cart, 100 L, PE, CN	MBSMTNK100CH
SMART TFF, Tank Cart, 100 L, PE, EU	MBSMTNK100EU
SMART TFF, Tank Cart, 100 L, PE, JP	MBSMTNK100JP

Description	Catalog Number
SMART TFF, Tank Cart, 100 L, PE, NA	MBSMTNK100NA
SMART TFF, Tank Cart, 100 L, PE, UK	MBSMTNK100UK
SMART TFF, Tank Cart, 100 L, Jacketed Stainless Steel, CN	MBSMTNK100STCH
SMART TFF, Tank Cart, 100 L, Jacketed Stainless Steel, EU	MBSMTNK100STEU
SMART TFF, Tank Cart, 100 L, Jacketed Stainless Steel, JP	MBSMTNK100STJP
SMART TFF, Tank Cart, 100 L, Jacketed Stainless Steel, NA	MBSMTNK100STNA
SMART TFF, Tank Cart, 100 L, Jacketed Stainless Steel, UK	MBSMTNK100STUK
SMART TFF Tank Cart, 200 L, PE CN	MBSMTNK200CH
SMART TFF Tank Cart, 200 L, PE EU	MBSMTNK200EU
SMART TFF Tank Cart, 200 L, PE JP	MBSMTNK200JP
SMART TFF Tank Cart, 200 L, PE NA	MBSMTNK200NA
SMART TFF Tank Cart, 200 L, PE UK	MBSMTNK200UK
SMART TFF Tank Cart, 200 L, Jacketed Stainless Steel, CN	MBSMTNK200STCH
SMART TFF Tank Cart, 200 L, Jacketed Stainless Steel, EU	MBSMTNK200STEU
SMART TFF Tank Cart, 200 L, Jacketed Stainless Steel, JP	MBSMTNK200STJP
SMART TFF Tank Cart, 200 L, Jacketed Stainless Steel, NA	MBSMTNK200STNA
SMART TFF Tank Cart, 200 L, Jacketed Stainless Steel, UK	MBSMTNK200STUK
SMART TFF Manifold	MNFLDTF

Accessories

Mobius® FlexReady Solution with Smart Flexware® Assemblies

Description	Catalog Number
Clamshell Accessories	
SMART Clamshell Lift, 110 VAC (including power cords for Japan and North America)	CLAMLIFT110V
SMART Clamshell Lift, 230 VAC (including power cords for European Union, China, United Kingdom)	CLAMLIFT230V
SMART Clamshell Storage Rack (up to 4 Clamshell)	CLAMSTOR
SMART Clamshell to SMART Cart Maintenance Cable	CLAMMAINTCABLE
Power Cables	
SMART power cable for China CN	PWRSMTCH
SMART power cable for European Union EU	PWRSMTEU
SMART power cable for Japan JP	PWRSMTJP
SMART power cable for North America NA	PWRSMTNA
SMART power cable for United Kingdom UK	PWRSMTUK

Mobius® FlexReady Solution with Smart Flexware® Assemblies for Chromatography

Description	Catalog Number
SMART Chrom. 2.2 L/min Clamshell	CLAMXM1
SMART Chrom. 8.0 L/min Clamshell	CLAMXM3
SMART Flowmeter with Support, Chrom. 2.2 L/min	FLWXM1
SMART Flowmeter with Support, Chrom. 8.0 L/min	FLWXM3
SMART SU Flowmeter with Support, Chrom. 8.0 L/min	FLWXM3SU
SMART Pump and Support, 1200S	PUMP1200S
SMART Pump and Support, 150S	PUMP150S
Pre and Post Column Instrumentation Kits These kits include Sensors, Probes and Transmitters	
SMART Chrom. 2.2 L/min, Multi Use Pre & Post sensors & Transmitter OPL 1 mm	MBSMTXINS1-1

Description	Catalog Number
SMART Chrom. 2.2 L/min, Multi Use Pre & Post sensors & Transmitter OPL 2.5 mm	MBSMTXINS1-2
SMART Chrom. 2.2 L/min, Multi Use Pre & Post sensors & Transmitter OPL 10 mm	MBSMTXINS1-3
SMART Chrom. 8.0 L/min, Multi Use Pre & Post sensors & Transmitter OPL 1 mm	MBSMTXINS3-1
SMART Chrom. 8.0 L/min, Multi Use Pre & Post sensors & Transmitter OPL 2.5 mm	MBSMTXINS3-2
SMART Chrom. 8.0 L/min, Multi Use Pre & Post sensors & Transmitter OPL 10 mm	MBSMTXINS3-3
Post Column Instrumentation Kits These kits include Sensor, Probes and Transmitter	
SMART Chrom. 2.2 L/min, Multi Use Post sensors & Transmitter OPL 1 mm	MBSMTXINS2-1
SMART Chrom. 2.2 L/min, Multi Use Post sensors & Transmitter OPL 2.5 mm	MBSMTXINS2-2
SMART Chrom. 2.2 L/min, Multi Use Post sensors & Transmitter OPL 10 mm	MBSMTXINS2-3
SMART Chrom. 8.0 L/min, Multi Use Post sensors & Transmitter OPL 1 mm	MBSMTXINS4-1
SMART Chrom. 8.0 L/min, Multi Use Post sensors & Transmitter OPL 2.5 mm	MBSMTXINS4-2
SMART Chrom. 8.0 L/min, Multi Use Post sensors & Transmitter OPL 10 mm	MBSMTXINS4-3
Single Use Sensor	
SMART Chrom. Single use Pre and Post Column Instrumentation Support and Transmitter Kit	Custom Assembly
SMART Chrom. Single use Post Column Instrumentation Support and Transmitter Kit	MBSMTXINS6
SMART Chrom. Single use Post Column UV, Conductivity and pH Sensor Support	Custom Assembly
SMART Chrom. Single use Precolumn Conductivity and pH Sensors Support	SENSXMSUPR
Sensors	
SMART Chrom. 2.2 L/min, End Product Air Sensor	SENSXM1BUBL
SMART Chrom. 2.2 L/min, Multi Use Pre Column Conductivity and pH Sensor, 2.2 L/min	SENSXM1PR
SMART Chrom. 8.0 L/min, End Product Air Sensor	SENSXM3BUBL
SMART Chrom. 2.2 L/min, Multi Use Pre Column Conductivity and pH Sensors 8.0 L/min	SENSXM3PR
Post Column UV, Conductivity and pH Sensors	
SMART Chrom. 2.2 L/min, Multi Use Post Column UV, Cond, pH sensors OPL 1 mm	SENKXM1-1

Description	Catalog Number
SMART Chrom. 2.2 L/min, Multi Use Post Column UV, Cond, pH sensors OPL 2.5 mm	SENKXM1-2
SMART Chrom. 2.2 L/min, Multi Use Post Column UV, Cond, pH sensors OPL 10 mm	SENKXM1-3
SMART Chrom. 8.0 L/min, Multi Use Post Column UV, Cond, pH sensors OPL 1 mm	SENKXM3-1
SMART Chrom. 8.0 L/min, Multi Use Post Column UV, Cond, pH sensors OPL 2.5 mm	SENKXM3-2
SMART Chrom. 8.0 L/min, Multi Use Post Column UV, Cond, pH sensors OPL 10 mm	SENKXM3-3
Supports	
SMART Chrom. Pre Column Filter and Bubble Trap Support Kit	MBSMTXMACC
SMART Chrom. Bubble Trap Support	SPTBUBBL
SMART Chrom. Pre Column Filter Support	FILTSPXM

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF

Description	Catalog Number
SMART Clamshell TF2S	CLAMTF2S
SMART Clamshell TF3S	CLAMTF3S
SMART TFF Tank mixer bag Inflator	INFLMXTF
SMART Pump and Support, 1200S	PUMP1200S
Weight Scale, 0 to 600 kg	MBSACC020U
Sensors and Sensor Assemblies	
SMART Multi-use UV and Conductivity Sensor and Transmitter, TF2S	MBSMTTINS1
SMART Multi-use UV Sensor and Transmitter, TF2S	MBSMTTINS2
SMART Multi-use Conductivity Sensor and Transmitter, TF2S	MBSMTTINS3
SMART Single Use UV and Conductivity Sensor and Transmitter, TF2S	Custom Assembly
SMART Single Use UV and Conductivity Sensor and Transmitter, TF3S	SENSUTF3S
SMART Single Use UV and Conductivity Sensor and Support, TF2S	SENSUTF
SMART TFF, TF3, Single Use UV, Conductivity Sensor	MBSMTTINS7
SMART Multi-use Conductivity Sensor and Support, TF2S	SENTF2CN

Description	Catalog Number
SMART Multi-use UV Sensor and Support, TF2S	SENTF2UV
TF2S-SU Permeate Sensor Support and Transmitter	MBSMTTINSSUFMTX2
TF3S-SU Permeate Sensor Support and Transmitter	MBSMTTINSSUFMTX3
Supports	
Filter Support TF2S	FILTSPTF2S
Filter Support TF3S	FILTSPTF3S
Filter Holder and Sampler Support	MBSMTTF2ACC
Retentate Sampling Port Support, TF2S	SPTSMPTF2S
Extended Tie Rods, 380 mm, Set of 4	XXTIER0DEXT
Tie Rods, TF3, 10 m ² & Single Use Support	SPKMBSMTFILT002
TF3S Holder support plate	SPKMBSMTFILT003

Flexware[®] Assemblies

Mobius[®] FlexReady Solution with Smart Flexware[®] Assemblies for Chromatography

Description	Catalog Number
Chrom. 2.2 L/min Pump 1 Manifold CPC	XM1P1MCP
Chrom. 2.2 L/min Pump 1 Manifold TC	XM1P1MTC
Chrom. 2.2 L/min Pump Assembly	DISPUMP1
Chrom. 2.2 L/min Pump 2 Manifold CPC	XM1P2MCP
Chrom. 2.2 L/min Pump 2 Manifold TC	XM1P2MTC
Chrom. 0.5L/min Bubble Trap Assembly	XM1BUBBL
Chrom. 2.2 L/min Bubble Trap Assembly	XM2BUBBL
Chrom. 2.2 L/min Smart Flexware [®] Assembly	XM1SMART
Chrom. 2.2 L/min Filter Assembly	XM1FILT001
Chrom. 2.2 L/min Post Instrument Assembly (Multi-use)	XM1PSTCN
Chrom. 2.2 L/min Post Instrument Assembly (SU) - 1 mm OPL	XM1PSTSU-1
Chrom. 2.2 L/min Post Instrument Assembly (SU) - 2.5 mm OPL	XM1PSTSU-2
Chrom. 2.2 L/min Post Instrument Assembly (SU) - 10 mm OPL	XM1PSTSU-3
Chrom. 2.2 L/min Pre Instrument Assembly (Multi-use)	XM1PRECN
Chrom. 2.2 L/min Pre Instrument Assembly (SU)	XM1PRESU
Chrom. 2.2 L/min Pre-use Instrumentation Cleaning Set	XM1INCLN
Chrom. 2.2 L/min Column Assembly	XM2CMASM
Chrom. 0.5 L/min Column Assembly	XM1CMASM
Chrom. 0.5 L/min Column Qualification Assembly	XM0CMASM
Chrom. 8.0 L/min Pump 1 Manifold CPC	XM3P1MCP
Chrom. 8.0 L/min Pump 1 Manifold TC	XM3P1MTC
Chrom. 8.0 L/min/TF2S Pump Assembly	DISPUMP2
Chrom. 8.0 L/min SU Flowmeter P001	XM3P1FLWSU
Chrom. 8.0 L/min SU Flowmeter P002	XM3P2FLWSU
Chrom. 8.0 L/min Pump 2 Manifold CPC	XM3P2MCP
Chrom. 8.0 L/min Pump 2 Manifold TC	XM3P2MTC

Description	Catalog Number
Chrom. 8.0 L/min Bubble Trap Assembly	XM3BUBBL
Chrom. 8.0 L/min Smart Flexware® Assembly	XM3SMART
Chrom. 8.0 L/min Filter Assembly	XM3FILT001
Chrom. 8.0 L/min Post Instrument Assembly (Multi-use)	XM3PSTCN
Chrom. 8.0 L/min Post Instrument Assembly (SU) - 1 mm OPL	XM3PSTSU-1
Chrom. 8.0 L/min Post Instrument Assembly (SU) - 2.5 mm OPL	XM3PSTSU-2
Chrom. 8.0 L/min Post Instrument Assembly (SU) - 10 mm OPL	XM3PSTSU-3
Chrom. 8.0 L/min Pre Instrument Assembly (Multi-use)	XM3PRECN
Chrom. 8.0 L/min Pre Instrument Assembly (SU)	XM3PRESU
Chrom. 8.0 L/min Pre-use Instrumentation Cleaning Set	XM3INCLN
Chrom. 8.0 L/min Column Assembly	XM3CMASM

Mobius® FlexReady Solution with Smart Flexware® Assemblies for TFF

Description	Catalog Number
Feed Container Assembly 50L	TF2S050L
Feed Container Assembly 100L	TF2S100L
Transfer Pump Assembly	TF2STRANP
Pump Assembly	DISPUMP2
Transfer Pump Manifold Assembly	TF2STRANM
Smart Flexware® Assembly	TF2SSMART
TF2S Cassette Liner Assembly	TF2SLINER
Retentate Sampling Port Assembly	TF2SRETSMP
Filtration Assembly, XXL, KHGEG006FH3	TF200XXLGE1
Filtrate Assembly (for multi-use instruments)	TF2SFILTCNV1 without sampling
	TF2SFILTCNV2 with sampling
Filtrate Assembly (without instruments)	TF2SFILTCNV3 without sampling
Filtrate Assembly (with single-use instruments)	TF2SFILTSUC1
Filtrate Assembly (without single-use instruments)	TF2SFILTSUC2 without sampling
	TF2SFILTSUC3 with sampling

Description	Catalog Number
Filtrate Sampling Port Assembly	TF2SFILTSMP
Filtrate Sampling Port Assembly (for single-use instruments)	TF2SFILTSMP SUC
Flushing Assembly	TF2SFLUSH
Integrity Testing Assembly	TF2SITTEST
Drain Assembly	TF2SDRAIN
Filtrate Line Assembly	TF2SFILTLN
TF3S Feed Container Assembly 200L	TF3S200L
TF3S Transfer Pump Assembly	TF3STRANP
TF3S Feed Pump Assembly	DISPUMP3
TF3S Transfer Pump Manifold Assembly	TF3STRANM
TF3S Smart Flexware® Assembly	TF3SPSMART
TF3S Cassette Liner Assembly	TF3SPLINER-A*
TF3S Cassette Liner Assembly	TF3SPLINER-B*
TF3S Cassette Liner Assembly	TF3SPLINER-C*
TF3S Cassette Liner Assembly	TF3SPLINER-D*
TF3S Cassette Liner Assembly	TF3SPLINER-E*
TF3S Cassette Liner Assembly	TF3SPLINER-F*
TF3S Retentate Sampling Port Assembly	TF3SRETSMP
TF3S Filtrate Assembly	TF3SPFILTCNV1
TF3S Filtrate Instrument Assembly SUC UV/COND without sampling	TF3SFILTSUC1
TF3S Filtrate Instrument Assembly SUC UV/COND with sampling	TF3SPFILTSMP SUC1
TF3S Filtrate Instrument Assembly SUC pH/UV/COND without sampling	TF3SFILTSUC2
TF3S Filtrate Instrument Assembly SUC pH/UV/COND with sampling	TF3SPFILTSMP SUC2
TF3S Filtrate Instrument Assembly SUC pH/COND without sampling	TF3SFILTSUC5
TF3S Filtrate Instrument Assembly SUC pH/COND with sampling	TF3SPFILTSMP SUC5
TF3S Flushing Assembly	TF3SFLUSH
TF3S Integrity Testing Assembly	TF3SITTEST
TF3S Filtrate Sampling Port Assembly	TF3SFILTSMP

* See [TF3S Cassette Liner Assembly Selection](#) for guidance on liner selection.

Please consult your local representative for additional Flexware® assemblies.

TF3S Cassette Liner Assembly Selection

This table is for guidance when selecting cassette liners. Other combinations may deliver the desired surface and fit the recommended set of liners.

Select the combination that uses the largest number of cassettes with the largest surface area available, complemented if necessary, by the lowest number of cassettes with a smaller surface area.

TF3S Cassette Liner Assembly Selection - Pellicon 2 Cassettes

Liner Assembly Catalog Number	Height Range Between Liners (cm)	Surface Area (m ²)			No. of Cassettes*	
		Screen			0.5 m ²	2.5 m ²
		A	C	V		
TF3SPLINER-A	6 to 11	2 to 3.5		2	Any Combination	
TF3SPLINER-B	11 to 16	4 to 5		2.5 to 3.5	Any Combination	
TF3SPLINER-C	16 to 19.5	5.5 to 6		4	Any Combination	
TF3SPLINER-D	19.5 to 27	6.5 to 8.5		4.5 to 6	Any Combination	
TF3SPLINER-E	27 to 30.5	9 to 10		n/a	0	4
		n/a		6.5	Any Combination	
TF3SPLINER-F	30.5 to 39	10		n/a	20	0
		n/a		7 to 8.5	Any Combination	

*Any combination of cassettes that the combined surface area equals the surface area listed.

TF3S Cassette Liner Assembly Selection - Pellicon 3 Cassettes

Liner Assembly Catalog Number	Height Range Between Liners (cm)	Surface Area (m ²)			No. of Cassettes		
		Screen			0.57 m ²	1.14 m ²	
		A	C	D			
TF3SPLINER-A	6 to 11	2.28		n/a	4	0	
		2.85		n/a	0	2	
		3.42	n/a	n/a	1	2	
		3.42	n/a	n/a	0	3	
TF3SPLINER-B	11 to 16	2.85		n/a	5	0	
		n/a	n/a	2.85	1	2	
		3.42				6	3
		3.99	n/a	n/a	7	0	
			n/a	n/a	1	3	
		n/a	3.99			1	3
TF3SPLINER-C	16 to 19.5	4.56		n/a	4	0	
		n/a	3.99		0	7	
		4.56	n/a	n/a	8	0	
		n/a	n/a	4.56	0	4	
		5.13				1	4
5.7	n/a	n/a	5	0			

Liner Assembly Catalog Number	Height Range Between Liners (cm)	Surface Area (m ²)			No. of Cassettes	
		Screen				
		A	C	D	0.57 m ²	1.14 m ²
TF3SPLINER-D	19.5 to 27	n/a	4.56		8	0
		5.13			9	0
		5.7			10	0
		n/a	5.7		0	5
		6.27	n/a	n/a	11	0
		6.27			1	5
		6.84	n/a	n/a	12	0
		6.84			0	6
		7.41		n/a	1	6
		7.98	n/a	n/a	0	7
TF3SPLINER-E	27 to 30.5	n/a	6.27		11	0
		n/a	6.84	n/a	12	0
		7.41	n/a	n/a	13	0
		n/a	n/a	7.41	1	6
		n/a	7.98		0	7
		8.55		n/a	1	7
		9.12	n/a	n/a	0	8
TF3SPLINER-F	30.5 to 39	n/a	n/a	6.84	12	0
		n/a	7.41		13	0
		7.98			14	0
		8.55		n/a	15	0
		n/a		8.55	1	7
		9.12	n/a	n/a	16	0
		n/a	9.12		0	8
		9.69	n/a	n/a	17	0
		9.69			1	8
		10.26			0	9

The Liners listed above are supplied as part of a Flexware® assembly. Liners may be ordered separately using the catalog numbers listed below.

TF3S Cassette Liners

Liner Catalog Number	Height Range Between Liners (cm)
TF3SPLINER-A1	6 to 11
TF3SPLINER-B1	11 to 16
TF3SPLINER-C1	16 to 19.5
TF3SPLINER-D1	19.5 to 27
TF3SPLINER-E1	27 to 30.5
TF3SPLINER-F1	30.5 to 39

Spare Parts

The following pages contain the list of spare parts for the Mobius® FlexReady Solution with Smart Flexware® Assemblies.

The Maintenance Category specifies whether a part is considered:

- Preventative and should be replaced at scheduled intervals
- Critical and should be maintained in an on site spare part supply
- Other and should be ordered as required.

The Field Service Required column specifies whether or not a replacement needs to be made by an trained technician.

The Location column specifies where the part is located or where in this manual to find a drawing that will specify the location of the part.

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART Cart, Set of 5 Air Filter Cartridges	SPKMBSMTBASE023	X	X	Preventive	Yes	N/A	Every 12 months
SMART Chrom. 8.0L/Min, Clamshell, Valve Pads Kit	SPKMBSMTCS019	X		Preventive	No	See Clamshell Diagram	Every 6 months
SMART Chrom. 2.2L/Min, Clamshell, Valve Pads Kit	SPKMBSMTCS014	X		Preventive	No	See Clamshell Diagram	Every 6 months
SMART, UV Lamp	SPKMBSMTSEN001	X	X	Preventive	No	See instrumentation user guide	Every 12 months
SMART, Instrumentation Gaskets Kit	SPKMBSMTSEN002	X	X	Preventive	No	See instrumentation user guide	After each batch or every 12 months if the gaskets are cleaned after each batch
SMART Cart, Long Ball Pin A	SPKMBSMTBASE004	X	X	Critical	Yes	N/A	As required
SMART Cart, Long Ball Pin B	SPKMBSMTBASE005	X	X	Critical	Yes	N/A	As required
SMART Cart, Connector Jack	SPKMBSMTBASE006	X	X	Critical	Yes	N/A	As required
SMART Cart, Automatic Connector	SPKMBSMTBASE007	X	X	Critical	Yes	N/A	As required
SMART Cart, Door Kit	SPKMBSMTBASE009	X	X	Critical	Yes	N/A	As required
SMART Cart, Mold Unlock Jack Kit	SPKMBSMTBASE010	X	X	Critical	Yes	N/A	As required
SMART, Set of Balls And O-Rings For Locking Device	SPKMBSMTBASE015	X	X	Preventive	No	See Clamshell Diagram	Every 6 months
SMART, Power Supply, 100-230Vac / 24Vdc, 10A	SPKMBSMTBASE020	X	X	Critical	No	See Electrical Schematic	As required
SMART Cart, Valve Terminal Mpa	SPKMBSMTBASE021	X	X	Critical	Yes	N/A	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART Cart, Computer	SPKMBSMTBASE022	X	X	Critical	Yes	N/A	As required
SMART Cart, Plc Cpu With Memory Card	SPKMBSMTBASE025	X	X	Critical	Yes	N/A	As required
SMART, I/O Modules Replacement Kit 1	SPKMBSMTBASE026	X	X	Critical	Yes	N/A	As required
SMART, Cube67 Bus Nodes Ethernet Ip	SPKMBSMTBASE027	X	X	Critical	Yes	N/A	As required
SMART Cart, Plc Power Supply	SPKMBSMTBASE028	X	X	Critical	No	See Electrical Schematic	As required
SMART Cart, Weight Transmitter	SPKMBSMTBASE029	X	X	Critical	Yes	N/A	As required
SMART Cart, ETH/IP Weight Transmitter	SPKMBSMTBASE035	X	X	Critical	Yes	N/A	As required
SMART Cart, Hmi	SPKMBSMTBASE030	X	X	Critical	Yes	N/A	As required
SMART Cart, Proximity Sensors Kit	SPKMBSMTBASE031	X	X	Critical	Yes	N/A	As required
SMART Cart, Manageable Ethernet Switch 8 Channel	SPKMBSMTBASE032	X	X	Critical	No	See Electrical Schematic	As required
SMART Cart, Male Combifac Connector	SPKMBSMTBASE033	X	X	Critical	Yes	N/A	As required
SMART Cart Chrom., Bubble Trap Support, Level Sensor Kit	SPKMBSMTBBL001	X		Critical	Yes	N/A	As required
SMART CLAMSHELL, Automatic Connector	SPKMBSMTCS001	X	X	Critical	Yes	N/A	As required
SMART, Clamshell, Nc/No Pinch Valve 3/8	SPKMBSMTCS006	X	X	Critical	Yes	N/A	As required
SMART Chrom. 8.0L/Min, Clamshell, Connector Clips Kit	SPKMBSMTCS018	X		Critical	No	See Clamshell Diagram	As required
SMART Chrom. 2.2L/Min, Clamshell, Connector Clips Kit	SPKMBSMTCS013	X		Critical	No	See Clamshell Diagram	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART Chrom. 2.2L/Min, Clamshell, Nc/No Pinch Valve 1/4	SPKMBSMTCS015	X		Critical	Yes	N/A	As required
SMART Chrom. 2.2L/Min, Clamshell, No Pcv Pinch Valve 1/4	SPKMBSMTCS016	X		Critical	Yes	N/A	As required
SMART Chrom. 2.2L/Min, Clamshell, Front Mold	SPKMBSMTCS017	X		Critical	Yes	N/A	As required
SMART Chrom. 8.0L/Min, Clamshell, No Pcv Pinch Valve 3/8	SPKMBSMTCS020	X		Critical	Yes	N/A	As required
SMART Chrom., Clamshell, Valve Terminal Mpa	SPKMBSMTCS022	X		Critical	Yes	N/A	As required
SMART, Clamshell, Control Valve Kit	SPKMBSMTCS024	X	X	Critical	Yes	N/A	As required
SMART, Clamshell, Pressure Transmitter And Switch Kit	SPKMBSMTCS025	X	X	Critical	Yes	N/A	As required
SMART, Clamshell, Pressure Transmitter	SPKMBSMTCS026	X	X	Critical	Yes	N/A	As required
SMART, Clamshell, Magnetic Detector	SPKMBSMTCS027	X	X	Critical	Yes	N/A	As required
SMART, Clamshell, Female Combitec Connector	SPKMBSMTCS028	X	X	Critical	Yes	N/A	As required
SMART, Clamshell, Precision Pressure Regulator	SPKMBSMTCS029	X	X	Critical	Yes	N/A	As required
SMART, Pump Cart, Power Supply, 100-240Vac / 24Vdc, 2.5A	SPKMBSMTPCART005	X	X	Critical	No	See Electrical Schematic	As required
SMART, Pump Cart, Power Supply, 100-240Vac / 48Vdc, 12.5 A	SPKMBSMTPCART006	X	X	Critical	No	See Electrical Schematic	As required
SMART, Pump Cart, Female Combitec Connector	SPKMBSMTPCART007	X	X	Critical	Yes	N/A	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART, Pump Cable For Pump 1200S	SPKMBSMTPUMP002	X	X	Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART, Pump 1200S Kit	SPKMBSMTPUMP003	X	X	Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART, Pump Cable For Pump 150S	SPKMBSMTPUMP004	X	X	Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART, Pump 150S Kit	SPKMBSMTPUMP005	X	X	Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom., Flowmeter Cable	SPKMBSMTFLW002	X		Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom. 2.2L/Min, Flowmeter Kit	SPKMBSMTFLW003	X		Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART Chrom. 2.2L/Min, Flowmeter Converter Kit	SPKMBSMTFLW004	X		Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom. 8.0L/Min, Flowmeter Kit	SPKMBSMTFLW005	X		Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom. 8.0L/Min, Flowmeter Converter Kit	SPKMBSMTFLW006	X		Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom. 8.0L/Min, SU Flowmeter Cable	SPKMBSMTFLW007	X		Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom. 8.0L/Min, SU Flowmeter Converter Kit	SPKMBSMTFLW008	X		Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom. 8.0L/Min, SU Flowmeter Kit	SPKMBSMTFLW009	X		Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom., Manifold, Valve Terminal Mpa	SPKMBSMTMNFLLD006	X		Critical	Yes	N/A	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART Chrom., Manifold, Pneumatic Valve Kit	SPKMBSMTMNFLD007	X		Critical	Yes	N/A	As required
SMART, Manifold, Male Combifac Connector	SPKMBSMTMNFLD009	X	X	Critical	Yes	N/A	As required
SMART, Converter C8480 Kit	SPKMBSMTTMTMTR001	X	X	Critical	Yes	N/A	As required
SMART, Instrumentation Cables Kit	SPKMBSMTTMTMTR002	X	X	Critical	Yes	N/A	As required
SMART, UV Sensor	Custom Spare Part	X	X	Critical	No	See instrumentation user guide	As required
SMART Chrom., Ph Holder	SPKMBSMTSEN004	X		Critical	No	See instrumentation user guide	As required
SMART, Conductivity Sensor	SPKMBSMTSEN005	X	X	Critical	No	See instrumentation user guide	As required
SMART, Single Use Holder Post	SPKMBSMTSEN006	X	X	Critical	No	See Clamshell Diagram	As required
SMART Chrom., Ph Probe	SPKMBSMTSEN007	X		Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART, I/O Modules Replacement Kit 2	SPKMBSMTGEN003	X	X	Critical	Yes	N/A	As required
SMART, Set of 2 Wheels With Brakes	SPKMBSMTBASE001	X	X	Other	Yes	N/A	As required
SMART, Set of 2 Wheels	SPKMBSMTBASE002	X	X	Other	Yes	N/A	As required
SMART Cart, Locking Device	SPKMBSMTBASE003	X	X	Other	No	See Clamshell Diagram	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART Cart, Door Axis Kit	SPKMBSMTBASE008	X	X	Other	Yes	N/A	As required
SMART Cart, Mold Lock Slide	SPKMBSMTBASE011	X	X	Other	Yes	N/A	As required
SMART Cart, Door Glass	SPKMBSMTBASE012	X	X	Other	Yes	N/A	As required
SMART Cart, Front Trapdoor	SPKMBSMTBASE013	X	X	Other	Yes	N/A	As required
SMART Cart, Hmi Pivot Device	SPKMBSMTBASE014	X	X	Other	Yes	N/A	As required
SMART Cart, Pneumatic Components Kit	SPKMBSMTBASE034	X	X	Other	Yes	N/A	As required
SMART, Clamshell, Ball Pin	SPKMBSMTCS004	X	X	Other	Yes	N/A	As required
SMART, Clamshell, Set of 4 Fasteners	SPKMBSMTCS005	X	X	Other	Yes	N/A	As required
SMART, Clamshell, Connector Cover	SPKMBSMTCS011	X	X	Other	No	See Connecting the Carts	As required
SMART Chrom. 8.0L/Min, Clamshell, Front Mold	SPKMBSMTCS021	X		Other	Yes	N/A	As required
SMART, Magnetic Catches Kit	SPKMBSMTPCART001	X	X	Other	No	See Clamshell Diagram	As required
SMART, Pump Cart, Set of 2 Wheels	SPKMBSMTPCART002	X	X	Other	Yes	N/A	As required
SMART, Pump Cart, Right Trapdoor	SPKMBSMTPCART003	X	X	Other	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART, Pump Cart, Column Kit	SPKMBSMTPCART004	X	X	Other	Yes	N/A	As required
SMART, Pumps Mechanical Spare Kit	SPKMBSMTPUMP001	X	X	Other	No	See Electrical Schematic	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART Chrom., Flowmeter Mechanical Spare Kit	SPKMBSMTFLW001	X		Other	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom. 8.0L/Min, SU Flowmeter Mechanical Spare Kit	SPKMBSMTFLW010	X		Other	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART Chrom., Manifold, Roller Kit	SPKMBSMTMNFLD001	X		Other	No	See Clamshell Diagram	As required
SMART, Manifold, Set of 3 Bearings	SPKMBSMTMNFLD002	X	X	Other	No	See Electrical Schematic	As required
SMART Chrom., Manifold, Set of 5 Supports For Flexware	SPKMBSMTMNFLD003	X		Other	No	See Clamshell Diagram	As required
SMART, Manifold, Air Supply Kit	SPKMBSMTMNFLD004	X	X	Other	No	See Clamshell Diagram	As required
SMART, Manifold, Pneumatic Kit	SPKMBSMTMNFLD008	X	X	Other	Yes	N/A	As required
SMART, Manifold, Locking Screw Kit	SPKMBSMTMNFLD012	X	X	Other	No	See Clamshell Diagram	As required
SMART Chrom., Transmitter Kit, Connector Clips Kit	SPKMBSMTMTXM001	X		Other	No	See Assembling and Setting Up the Hardware	As required
SMART, Electrical Components Kit	SPKMBSMTGEN001	X	X	Other	No	See Electrical Schematic	As required
SMART, Interconnection Cables Kit	SPKMBSMTGEN002	X	X	Other	No	See Electrical Schematic	As required
SMART TFF-5.0M2, Electrical Components Kit	SPKMBSMTGEN004		X	Other	No	See Electrical Schematic	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART TFF-5.0M2, Cart Cable Kit	SPKMBBSMTGEN005		X	Other	No	See Electrical Schematic	As required
SMART TFF-2.5M2, Clamshell, Connector Clips Kit	SPKMBBSMTCS002		X	Critical	No	See Clamshell Diagram	As required
SMART TFF-2.5M2, Clamshell, Valve Pads Kit	SPKMBBSMTCS003		X	Preventive	No	See Clamshell Diagram	Every 6 months
SMART TFF-2.5M2, Clamshell, Nc/ No Pinch Valve 14Mm	SPKMBBSMTCS007		X	Critical	Yes	N/A	As required
SMART TFF-2.5M2, Clamshell, Nc Pinch Valve 5/8	SPKMBBSMTCS008		X	Critical	Yes	N/A	As required
SMART TFF-2.5M2, Clamshell, Nc Pcv Pinch Valve 5/8	SPKMBBSMTCS009		X	Critical	Yes	N/A	As required
SMART TFF-2.5M2, Clamshell, No Pcv Pinch Valve 14Mm	SPKMBBSMTCS010		X	Critical	Yes	N/A	As required
SMART TFF-2.5M2, Clamshell, Front Mold	SPKMBBSMTCS012		X	Other	Yes	N/A	As required
SMART TFF-2.5M2, Clamshell, Valve Terminal Mpa	SPKMBBSMTCS023		X	Critical	Yes	N/A	As required
SMART TFF-2.5M2, Manifold, Supports Kit For Flexware	SPKMBBSMTMNFLD005		X	Other	No	N/A	As required
SMART TFF-2.5M2, Manifold, Valve Terminal Mpa	SPKMBBSMTMNFLD010		X	Critical	Yes	See Pump Cart Diagram	As required
SMART TFF-2.5M2, Manifold, Pneumatic Valve Kit	SPKMBBSMTMNFLD011		X	Critical	Yes	N/A	As required
SMART, Clamshell Lift Mold Guides Kit	SPKMBBSMTSTRG001	X	X	Other	No	N/A	As required
SMART, Storage Rack, Set of 2 Wheel Plates	SPKMBBSMTSTRG002	X	X	Other	No	See Clamshell Lift User Guide	As required
SMART TFF, Tank Cart, Left Weigh Module Lock Cam	SPKMBBSMTTANK001		X	Other	Yes	N/A	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART TFF, Tank Cart, Right Weigh Module Lock Cam	SPKMBSMTTTANK002		X	Other	Yes	N/A	As required
SMART TFF, Tank Cart, Front Weigh Module Lock Cam	SPKMBSMTTTANK003		X	Other	Yes	N/A	As required
SMART TFF, Tank Cart, Pump Cart Hook Kit	SPKMBSMTTTANK004		X	Other	No	See Pump Cart Diagram	As required
SMART TFF, Tank Cart, Set of 4 Leveling Feet	SPKMBSMTTTANK005		X	Other	No	See Tank Cart Diagram	As required
SMART TFF, Tank Cart, Weigh Module Lever A	SPKMBSMTTTANK006		X	Other	Yes	N/A	As required
SMART TFF, Tank Cart, Weigh Module Lever B	SPKMBSMTTTANK007		X	Other	Yes	N/A	As required
SMART TFF, Tank Cart, 50L, Mixer Support Kit	SPKMBSMTTTANK008		X	Other	Yes	N/A	As required
SMART TFF, Tank Cart, Cam Roller Kit	SPKMBSMTTTANK009		X	Other	Yes	N/A	As required
SMART TFF, Tank Cart, Piping Clips Kit	SPKMBSMTTTANK010		X	Other	No	N/A	As required
SMART TFF, Tank Cart, 100L_200L, Pe, Mixer Support Kit	SPKMBSMTTTANK011		X	Other	Yes	See Tank Cart Diagram	As required
SMART TFF, Tank Cart, 50L, Power Supply, 100-230Vac / 24Vdc, 5A	SPKMBSMTTTANK012		X	Critical	No	N/A	As required
SMART TFF, Tank Cart, 50L, Mixer Controller	SPKMBSMTTTANK013		X	Critical	Yes	See Electrical Schematic	As required
SMART TFF, Tank Cart, 50L, Mixer	SPKMBSMTTTANK014		X	Critical	Yes	N/A	As required
SMART TFF, Tank Cart, Mixer User Interface	SPKMBSMTTTANK015		X	Critical	Yes	N/A	As required
SMART TFF, Tank Cart, Temperature Display	SPKMBSMTTTANK017		X	Critical	No	See Electrical Schematic	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART TFF, Tank Cart, Temperature Sensor And Transmitter	SPKMBSMTTANK018		X	Critical	Yes	See Electrical Schematic	As required
SMART TFF, Tank Cart, Load Cell	SPKMBSMTTANK019		X	Critical	Yes	N/A	As required
SMART TFF, Tank Cart, Load Cell Junction Box	SPKMBSMTTANK020		X	Critical	Yes	N/A	As required
SMART TFF, Tank Cart, Weighing Terminal And Display	SPKMBSMTTANK021		X	Critical	Yes	N/A	As required
MART TFF, Tank Cart, ETH/IP Weighing Terminal And Display	SPKMBSMTTANK028		X	Critical	Yes	N/A	As required
SMART TFF, Tank Cart, 100L_200L, Power Supply, 110-230Vac / 48Vdc, 12.5A	SPKMBSMTTANK022		X	Critical	No	See Electrical Schematic	As required
SMART TFF, Tank Cart, 100L_200L, Mixer	SPKMBSMTTANK023		X	Critical	Yes	N/A	As required
SMART TFF, Tank Cart, 100L_200L, Mixer Controller	SPKMBSMTTANK024		X	Critical	Yes	N/A	As required
SMART TFF, Tank Cart, 50L, Tank Rotation Kit	SPKMBSMTTANK025		X	Other	Yes	N/A	As required
SMART TFF, Tank Cart, 100L, Jacketed Sst, Mixer Support Kit	SPKMBSMTTANK026		X	Other	Yes	N/A	As required
SMART TFF, Tank Cart, 200L, Jacketed Sst, Mixer Support Kit	SPKMBSMTTANK027		X	Other	Yes	N/A	As required
SMART TFF-2.5M2, Transmitter Kit, Connector Clips Kit	SPKMBSMTTMTTF001		X	Other	No	See Clamshell Diagram	As required
SMART TFF-5.0M2, Clamshell, Valve Pads Kit	SPKMBSMTCS030		X	Preventive	No	See Clamshell Diagram	Every 6 months
SMART TFF-5.0M2, Clamshell, Nc/ No Pinch Valve 3/4	SPKMBSMTCS031		X	Critical	Yes	N/A	As required
SMART TFF-5.0M2, Clamshell, Nc/ No Pinch Valve 1/2	SPKMBSMTCS032		X	Critical	Yes	N/A	As required

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
SMART TFF-5.0M2, Clamshell, Front Mold	SPKMBSMTCS033		X	Critical	Yes	N/A	As required
SMART TFF-5.0M2, Clamshell, Connector Clips Kit	SPKMBSMTCS034		X	Critical	No	N/A	As required
SMART TFF-5.0M2, Clamshell, Valve Terminal Mpa	SPKMBSMTCS035		X	Critical	Yes	N/A	As required
SMART TFF-5.0M2, Clamshell, 3/4 Fitting Maintaining Kit	SPKMBSMTCS036		X	Critical	No	N/A	As required
SMART TFF-5.0M2, Pump Kit 1200S	SPKMBSMTPUMP006		X	Critical	No	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART, Pump 4400 Frequency Controller 200V	SPKMBSMTPUMP008		X	Critical	Yes	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
SMART, Pump 4400 Mechanical Spare Kit	SPKMBSMTPUMP009		X	Critical	No	See Electrical Schematic	As required
SMART, Pump 4400 Frequency Controller 400V	SPKMBSMTPUMP011		X	Critical	Yes	See Electrical Schematic & Assembling and Setting Up the Hardware	As required
Pump QF150, shaft bearing cap unit	SPKMBSMTPUMP012	X		Preventive	Yes	See pump user guide	Every 1000h or at least once a year

Description	Catalog Number	System		Maintenance Category	Field Service Required	Location	Frequency
		Chromatography	TFF				
Pump QF1200-5, shaft bearing cap unit	SPKMBSMTPUMP013	X	X	Preventive	Yes	See pump user guide	Every 1000h or at least once a year
Pump QF4400-3, shaft bearing cap unit	SPKMBSMTPUMP014		X	Preventive	Yes	See pump user guide	Every 1000h or at least once a year

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