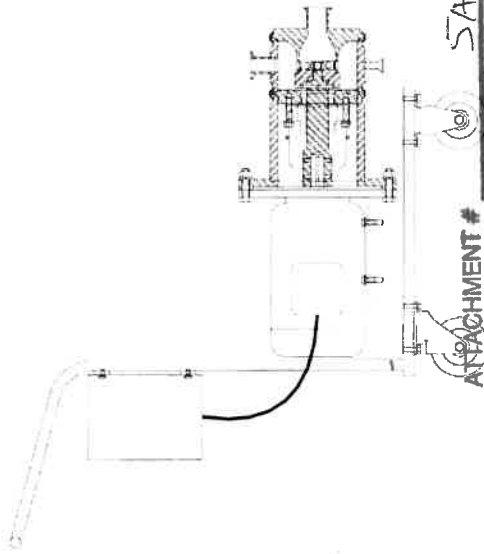


HSM-401S

S/N: 116570

ROSS

CHARLES ROSS
& SON COMPANY
NEW YORK



SA

10

ATTACHMENT #

PAGE 1 OF 31

MAINTENANCE & INSTRUCTION INITIAL DATE 11/16/02

MANUAL FOR:

AMRI BURLINGTON

Dec 10/16/02

Website: www.mixers.com

Manual Contents

- 1. Parts List
- 2. Assembly Drawing
- 3. Operating Instructions
- 4. Motor Installation, Operation & Maintenance Instructions
- 5. Mechanical Seal Information
- 6. Quality Documentation

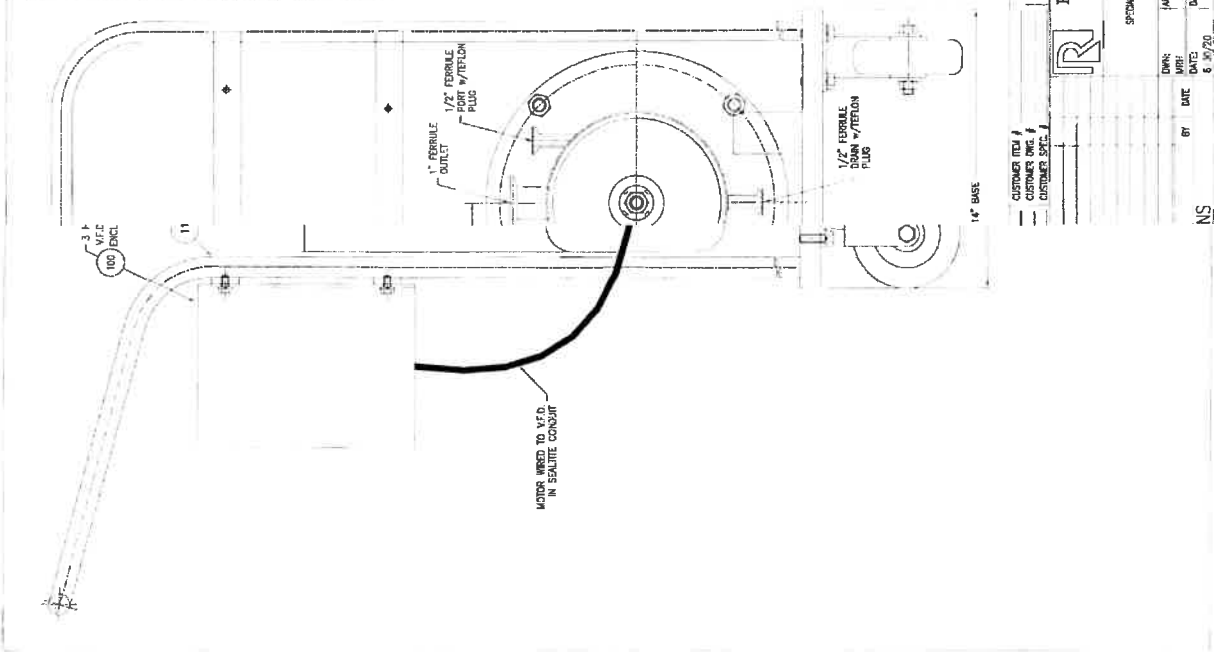
**Parts List for High Shear Mixer
Model HSM-401 Sanitary
(1 pc. Inlet/Stator)**

Part No.	Description	Quantity
1	Motor	1
*4	O-ring	2
*6	Mechanical Seal	1
9	Clamp	2
10	Base	1
13	Rotor Nut	1
14	Hex Head Bolt	4
16	Lock Washer	4
17	Rotor Drive Pin	1
18	Hex Head Nut	4
22	Rotor Shaft	1
*23D	Inlet/Disintegrating Stator	1
*23E	Inlet/Slotted Stator	1
*23F	Inlet/Fine Hole Stator	1
24	Hex Head Bolt	4
25	Lock Washer	4
27	Mix Chamber	1
29	Mechanical Seal Plate	1
*31	Rotor	1
32	Motor Adapter	1
35	Motor Key	1
36	Set Screw	4
42	Hex Head Nut	4
43	Hex Head Nut	4
48	Threaded Rod	4
49	Plain Washer	4
60	Guard	2
61	Hex Head Bolt	4
62	Lock Washer	4

* Denotes Recommended Spare Parts

P/N	DESCRIPTION	QTY
1	MOTOR	1
4	O-RING	2
*6	Mechanical Seal	1
9	CLAMP	2
10	BASE	1
13	ROTOR NUT	1
14	HEX HEAD BOLT	4
16	LOCK WASHER	4
17	ROTOR DRIVE PIN	1
18	HEX HEAD NUT	4
22	ROTOR SHAFT	1
*23D	DISINTEGRATING STATOR/INLET	1
24	HEX HEAD BOLT	4
25	LOCK WASHER	4
27	MIX CHAMBER	1
29	Mechanical Seal Plate	1
31	ROTOR	1
32	MOTOR ADAPTER	1
35	MOTOR KEY	1
36	SET SCREW	4
42	HEX HEAD NUT	4
43	HEX HEAD WASHER	4
48	THREADED ROD	4
49	HEX HEAD BOLT	4
60	GUARD	2
61	HEX HEAD BOLT	4
62	LOCK WASHER	4

* DENOTES RECOMMENDED SPARE PARTS



<input type="checkbox"/> APPROVAL COPY	<input type="checkbox"/> CHECKED COPY
CUSTOMER NO. / CUSTOMER DATE /	DATE
Ross Engineering, Inc. 32 WESTGATE BLVD. SUNNYSIDE, CA 94086	
SPECIAL HSM-401 SANITARY INLET GENERAL ASSEMBLY DRAWING	
APP: CAD FILE: 118570-01	DATE: 0-118570-01
DWN: MRP: SCALE: 8" = 1'-0"	REV: 0
BY: DATE: 6/30/20	

OPERATING INSTRUCTIONS

FOR

SERIES 400S HIGH SHEAR MIXERS

IMPORTANT SAFETY REMINDERS

1. Always disable or lock out electrical power prior to performing any maintenance on unit.
2. NEVER operate blender with guards or safety features removed or disconnected.
3. Do not operate blender if it makes a strange or unfamiliar sound.
4. Keep hands and fingers away from rotating or mixing parts.

IMPORTANT

All persons involved in the installation and operation of this equipment must study these instructions thoroughly before starting.

Because of danger to personnel or property from accidents resulting from the improper use of this equipment, it is essential that correct procedures be followed. The equipment must be used for its intended purpose and in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operational procedures must be observed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Guards, limit switches and other safety devices as desired or specified in safety codes must be in place and operational before starting the equipment.

Retain these instructions for future reference.

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>
1	GENERAL
2	INSTALLATION
3	OPERATION
4	STATOR HEADS
5	MAINTENANCE
6	LUBRICATION
7	SPARE PARTS

Charles Ross & Son Company
710 Old Williets Path
P. O. Box 12308
Hauppauge, New York 11788
Tel. 631-234-0500
Fax. 631-234-0691

Carefully uncrate machine. Do not discard the shipping crate or any packing materials until the contents of the crate have been carefully compared with the shipping documents. If any material is unsatisfactory or missing, please notify Charles Ross and Son Company and hold for resolution.

2.2 MOUNTING

The Inline High Shear Mixer is designed to be installed directly into the pipeline. Although the Inline High Shear Mixer produces a positive head, it is not self-priming. You must provide the inlet with a positive head (feed) in order for the unit to function. The user must ensure that the piping does not impose excessive forces on the mix chamber.

2.3 ELECTRICAL

- A. The standard drives are suitable for operation on 230/460 volt, 3 phase, 60 Hz current. Check the nameplate on the nameplate on the motor for electrical characteristics and connection instructions. All motors must be connected to the proper OSHA/National Electrical Code recommended starting equipment with overload protection. All work should be performed in accordance with national and local codes by a licensed electrician.
- B. Check the direction of rotation of the rotor by very briefly jogging the motor (turn the motor on and off once quickly to observe the direction of rotation). The direction of rotation must be clockwise as viewed from behind the chamber (CCW looking into the inlet). If the direction is incorrect, reverse the connection of any two of the three hot lines. Jog the motor again just to be sure the direction of rotation is correct.

1.0 GENERAL

The Ross High Shear Mixers are a proven alternative to slow speed impeller mixing or high pressure homogenization for a wide range of processing requirements. The high speed mechanical and hydraulic shear forces produced by this machine enable it to perform a variety of mixing applications including particle size reduction, solubilization, dispersion and emulsification.

The close clearance between the rotor and stator induces into the material being processed thousands of shearing actions each minute. This results in short process cycles and a more uniform and high quality product.

To obtain maximum efficiency and performance from your machine, follow the operating and maintenance instructions in this manual for special situations not covered in this manual, consult the factory.

IMPORTANT SAFETY REMINDERS

- 1. Always disable or lockout electrical power prior to performing any maintenance on the unit.
- 2. Never operate the mixer with any guards or safety features removed or disconnected.
- 3. Do not operate mixer if it makes a strange or unfamiliar sound.
- 4. Keep hands and fingers away from rotating or moving parts.
- 5. Read this manual carefully before operating the mixer.

2.0 INSTALLATION

2.1 UNPACKING

Inspect the crate and mixer for signs of damage during transit. Since all mixers are normally shipped F.O.B. our factory, any such damage is the responsibility of the carrier and should be reported to them immediately. If terms of sale are F.O.B. destination, contact your Ross representative and mail one copy of the carrier's inspection report and one copy of the delivery receipt indicating exception at time of delivery to:

3.0 OPERATION

- A. Check to see that the rotor shaft can rotate freely by hand.
- B. Check the tightness of the bolts that hold the stator head in place and be sure they are secure.
- C. Do not block off the ventilation openings of the motor housing. These openings are essential for proper air cooling of the motor.

The Ross High Shear Mixer X-Series is designed to provide high shear agitation with little or no pumping action. Power draw increased linearly with density and logarithmically with viscosity.

Since most motors have a service factor of 1.0, the motor must not be run for extended periods in excess of the motor full load amperage. You can experiment with flow throttling to increase the amount of work per unit volume if increased shear is desired.

4.0 ROTOR & STATOR HEADS

The 400S Series High Shear Mixer uses a proprietary rotor and stator design. The multiple rows of teeth in the rotor and stator combine to produce thousands of mechanical, hydraulic and cavitation shears per second. This extremely high shearing action results in emulsion and dispersion with extremely small droplet or particle size.

5.0 MAINTENANCE

A. Mechanical Seal

Always remember that a mechanical seal is a precision piece and must be handled carefully. Any scratches or dents on the seal faces will cause leakage after assembly. An appendix describing the seal included in your machine is attached. Be sure to familiarize yourself with its contents before using mixer.

B. General Cleaning

The machine should be completely flushed out after each usage to prevent subsequent batch contamination and seal fouling. This can be done without disassembling the unit by simply attaching a purge line to the inlet. Be careful not to exceed the maximum internal operating pressure of the mechanical seal. The machine may also be taken apart for cleaning as follows:

1. Drain inlet and outlet lines of all fluids.
2. Be sure to close off the appropriate valves.
3. Unbolt the unit from the pipeline.
4. Remove the clamp holding the inlet flange to the chamber.
5. Pull the flange, along with the stator head, off of the mixer and remove the screws which hold the stator head to the flange.
6. The rotor may be removed by holding the shaft steady while untightening the nut which holds the rotor to the shaft.
7. Rinse out the machine with water or solvent and wash all removed parts.

Reassembly is done as follows:

1. Place the rotor back on the rotor shaft and tighten the nut over it while holding the shaft motionless. Make sure it is as tight as possible.
2. Place the stator back on the flange. The flange has a register to assure proper alignment. Tighten the screws that attach the two parts.
3. Bolt the head holding device onto the main housing. Be sure the rotor turns freely by hand.

4. Clamp the flange onto the pipeline securely, making sure that the appropriate gaskets are in place.
5. Flood the line and alleviate any leaks.

6.0 LUBRICATION

In general, the mechanical seal is lubricated by the fluid itself. The only parts that require external lubrication are the motor bearings and the rotor shaft supports bearings. Refer to motor manufacturer's instructions for motor lubrication.

The motor shaft support bearing should be relubricated as follows:

Standard Conditions	Severe Conditions	Extreme Conditions
6 months	3 months	1 month

LUBRICATION PROCEDURE

1. Stop machine and disconnect or lock out power.
2. Remove bearing seal caps and clean old grease from bearings and seal cap housings.
3. Carefully repack bearings with grease and fill seal caps one-third full.
4. Replace caps but remove vent and drain plugs from cap.
5. Run unit for approximately one hour. Wipe any drained grease and replace vent and drain plugs.

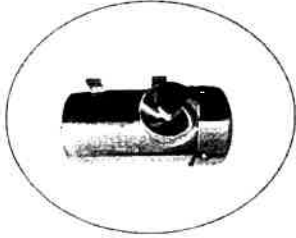
The bearings were factory lubricated with Chevron SRI 2. Only this grease or equivalent should be used.

7.0 SPARE PARTS

The only recommended spare part we list is the mechanical seal. You will know when it requires replacement because it will leak. Follow the installation instructions included in your manual. If you have a recurring mechanical seal problem, contact the factory about alternate seal configurations.

STAINLESS MOTORS, INC.

Motor Operating & Maintenance Manual



- Installation
- Mounting
- Wiring
- Maintenance
- Warranty

505-867-0224

www.stainlessmotors.com

Warranty

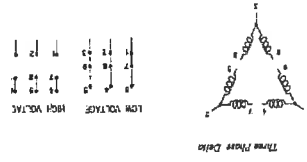
Stainless Motors, Inc. manufactures products that are not intended for use in hazardous or explosive environments. Stainless Motors, Inc. does not warrant its products for use in such environments. If you are using our products in such environments, you agree to hold Stainless Motors, Inc. harmless from any claims, damages, or expenses that may be incurred by you or others. Stainless Motors, Inc. does not warrant its products for use in such environments. If you are using our products in such environments, you agree to hold Stainless Motors, Inc. harmless from any claims, damages, or expenses that may be incurred by you or others.

If a Stainless Motors, Inc. manufactured product is thought to be defective, the customer should contact the nearest authorized distributor or contact Stainless Motors, Inc. directly. The distributor or Stainless Motors, Inc. will determine if the product is defective and if so, will provide a replacement or repair. The distributor or Stainless Motors, Inc. is not responsible for the cost of shipping, handling, or return to the customer, or any incidental or consequential damages resulting from the defect, removal, re-transportation, and shipment of other parts. Performance problems can be due to a variety of causes not covered by the warranty. Such as improper installation, use of incorrect materials, or the use of the product in an environment not intended for the product. If the problem is determined not to be due to the distributor or Stainless Motors, Inc., the customer will be responsible for the cost of any necessary repairs or testing.

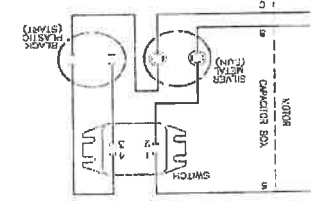
In instances where the customer is unable to ship the product back to Stainless Motors, Inc. factory, Stainless Motors, Inc. at its sole discretion, may authorize the distributor to provide repair or replacement of the product. The distributor's authorization and policy regarding replacement of the product, the cost of shipping, and the cost of any necessary repairs or testing. This limited warranty and service policy represents Stainless Motors, Inc. and its products. Stainless Motors, Inc. does not warrant its products for use in hazardous or explosive environments. If you are using our products in such environments, you agree to hold Stainless Motors, Inc. harmless from any claims, damages, or expenses that may be incurred by you or others.

STAINLESS MOTORS INC.
7601 NITA PL, NE
RIO RANCHO, NM 87144
505-867-0224
www.stainlessmotors.com

WIRING DIAGRAMS-Three Phase (Continued)



WIRING DIAGRAMS- Single Phase





www.stainlessmotors.com

(505) 867-0224

Operating and Maintenance Instructions

INSTALLATION

Only qualified, trained personnel should install the motor/gear motor and with NEMA-MPTC. Installation in accordance with the National Electrical Code, local codes and with NEMA-MPTC. Equipment should be installed in accordance with the manufacturer's instructions.

MOUNTING

Foot mounted motors should be mounted to a rigid foundation to prevent excessive vibrations. Flange mounted motors should be properly aligned. NPTTE requires attention to flanges to be dimensioned to the back, check machine prior to connecting the motor to the load.

ENVIRONMENT

Stainless motors are suitable for extreme weather environments. They are not intended for refrigeration service. Outdoor installation should be carefully reviewed as a precaution to motor weathering.

INSTALLATION OF MOTORS

The motor must be grounded in accordance with the National Electrical Code and any local codes. Size any motor to exceed the motor nameplate rating. The motor is a three-phase motor. Motor connections should be made in accordance with the motor nameplate and allow motor to reach ambient prior to starting. Do not bypass or render inoperative any protective device.

WIRING INSTRUCTIONS

Connect the motor in accordance with the connection diagram listed on the nameplate. Three phase motor is connected to the load and neutral. Ground the motor frame and motor enclosure. Do not connect the motor to the power source and interconnect the center ground wires. Verify the voltage (all three legs in a three-phase motor) motor connection matches to the voltage (across phase load, etc.).

All three-phase Stainless Motors are suitable for use on variable frequency drives and are guaranteed standard. Contact Sanifan Motors, Inc. regarding if run-down below 4:1 is required for your application. The motor, when applied, is suitable for control systems provided. The motor, when applied, is suitable for control systems provided. The motor, when applied, is suitable for control systems provided.

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NEMA	Frame	Shaft End	Bearing	End Bearing
48	TENV	6204	6204	6203
56	TENV	6204	6204	6203
58	TENV	6205	6205	6204
60	TENV	6205	6205	6204
62	TENV	6205	6205	6204
63	TENV	6205	6205	6204
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96	TENV	6205	6205	6204
97	TENV	6205	6205	6204
98	TENV	6205	6205	6204
99	TENV	6205	6205	6204
100	TENV	6205	6205	6204

Please contact Sanifan Motors for bearing size for certain motors.

MAINTENANCE

Stainless motors are fitted with double sealed bearings lubricated with Polytek EP2 medium resistant high temperature grease.

OPERATION

It is the customer's responsibility to ensure that adequate and compatible cooling liquid is used with the motor and an external heat exchanger for proper operation.

INSTALLATION

Verify the voltage (all three legs in a three-phase motor) motor connection matches to the voltage (across phase load, etc.).

ENVIRONMENT

Stainless motors are suitable for extreme weather environments.

MOUNTING

Foot mounted motors should be mounted to a rigid foundation to prevent excessive vibrations.

WIRING INSTRUCTIONS

Connect the motor in accordance with the connection diagram listed on the nameplate.

INSTALLATION

The motor must be grounded in accordance with the National Electrical Code and any local codes.

ENVIRONMENT

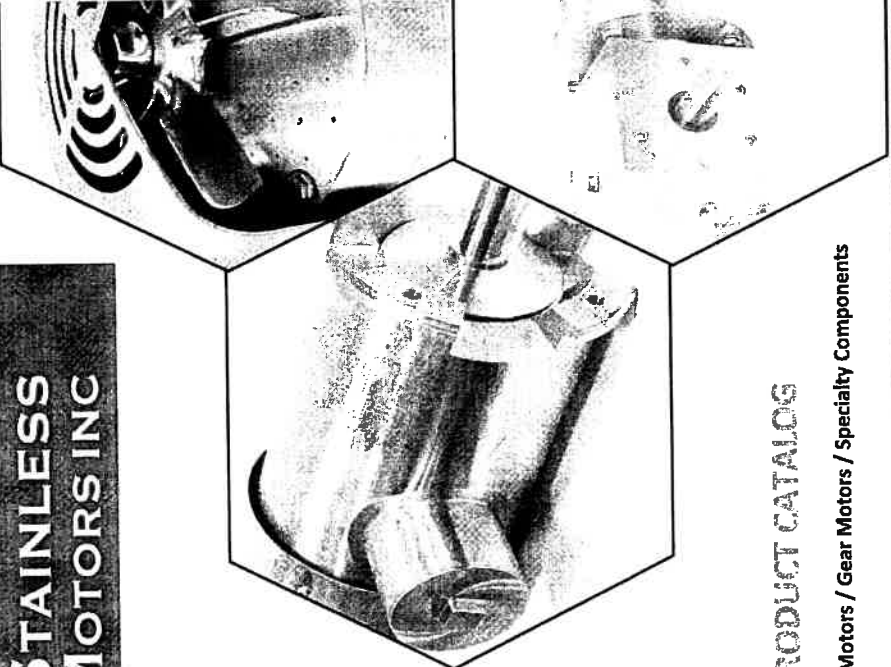
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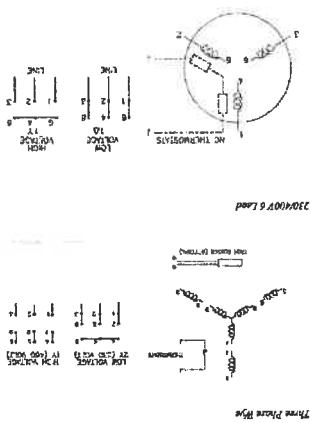
Connect the motor in accordance with the connection diagram listed on the nameplate.



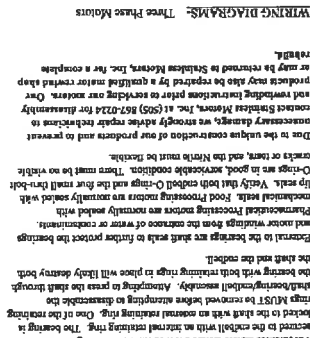
STAINLESS MOTORS INC



WIRING DIAGRAMS: Three Phase Motors



WIRING DIAGRAMS: Three Phase Motors



WIRING DIAGRAMS: Three Phase Motors



WIRING DIAGRAMS: Three Phase Motors



WIRING DIAGRAMS: Three Phase Motors





GENERAL INFORMATION

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WHO WE ARE



Stainless Motors, Inc. was founded in 1988 to provide the Pharmaceutical, Biotech, and Food processing industries with the first stainless steel washdown duty motors and gear reducers. Since inception, our mission has been to create innovative motors and gear reducers with a focus on quality, reliability, sanitation and high efficiency.

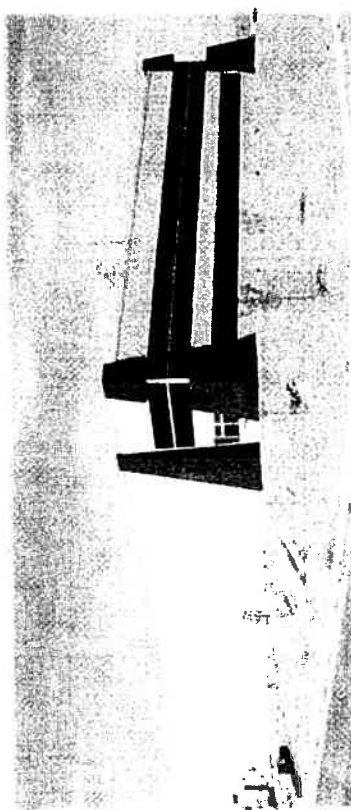
Stainless Motors, Inc. is the exclusive manufacturer of UL approved stainless steel explosion proof hazardous location (XP) motors and Sanifan® Technology motors.

Our reputation is built on providing our customers with solutions for their most difficult and severe processing applications. All of our products meet current Good Manufacturing Practice (GMPs) guidelines for equipment and are designed, manufactured, and supported in the U.S.A. All standard motors meet NEMA MG1, part 31 for inverter performance and are recognized by UL under component file #E135744 for the U.S. and Canada. Hazardous location motors are UL approved under file #E321578.

This catalog presents an overview of our standard product line and is available for download on our website www.stainlessmotors.com. Most product model numbers, drawings and data sheets can be found on our website or you may contact us directly to request this information. Custom solutions are also available by contacting our Applications Engineering Department.

Your partner for a

cleaner, safer, and more sanitary processing environment.





Stainless Motors, Inc. offers a complete line of sanitary stainless steel washdown duty electric motors. All are designed for severe washdown environments and are inverter rated. Sanifan® Technology is standard on all motors and provides a crevice free design that is sanitary and easy to clean. As the original stainless steel motor manufacturer and the exclusive manufacturer of Sanifan® Technology motors, Stainless Motors, Inc. provides quality, performance, reliability and enhanced cleanability.

Our motors are available in a variety of frame sizes and horsepower for most every application. Sanifan® Technology motors are available in 3 phase NEMA TEFC frames up to 50 HP and TENV frames up to 5 HP. We also offer single phase NEMA frames up to 5 HP and 3 phase metric IEC frames up to 22 KW. IEC frames are compliant with EU Legislation and bear the "CE" mark. Our Sanifan® PLUS series offers a spray endbell with various port styles for an even higher level of cleanability. All motors are also available in T316 stainless and can be customized to your unique or specific application.

The Stainless Motors, Inc. Advantage

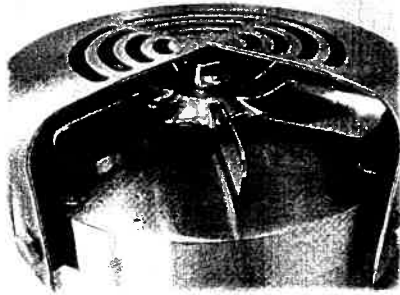
Sanifan® Technology

The following standard features make our motors the most sanitary and easy to clean stainless motors available. Our unique sanitary design along with exceptional performance and reliability are why we are the industry's preferred stainless electric motor manufacturer.

- Sanitary type 304 stainless steel housing, endbells, feet and junction box
- Polished crevice free stainless cooling fan
- EPDM sanitary fan shroud standoffs
- Sanitary fan to shaft mounting
- EPDM slinger
- Junction box and feet smoothly TIG welded to body
- O-ring sealed stainless endbells
- Crevice free fan shroud mounting
- Sanitary seal on junction box cover
- #4 line finish on all exterior surfaces
- Laser engraved nameplate
- Inverter rated Class F or Class H enhanced insulated windings for superior performance
- Double sealed bearings
- Stainless mechanical shaft seals
- IEC Efficiency- Premium efficiency
- Available with integral spray cleaning endbell and multiple port styles/configurations (Sanifan® PLUS Series)
- Available with thermostats or thermistors
- Available with Type 316 construction
- Recognized by UL under component file #EL35744



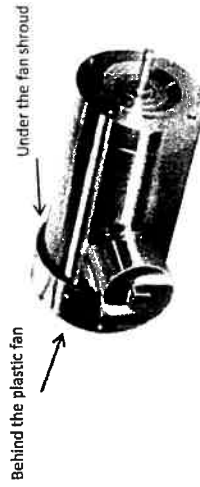
Uncompromised Sanitation and Reliability



Sanifan® Plus Series Spray Endbell



Food, Pharmaceutical and Biotech processing requires the utmost level of sanitation and cleanliness. Sanifan® Technology motors are designed to meet these stringent requirements and are the most sanitary stainless steel washdown motors on the market. **Our patented comprehensive solution dramatically reduces crevices that can collect and hold contaminants.** Screw threads, splines and other hardware create opportunities for contamination. Sanifan® Technology provides a means of cleaning previously inaccessible areas.



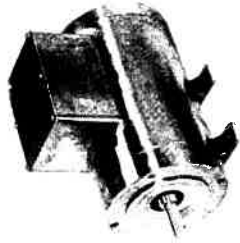
Conventional Design

On conventional motors, contaminants can collect beneath the fan shroud and on the fan. These areas are not accessible for cleaning and can potentially harbor dangerous bacteria. Sanifan Technology's crevice free and easy to clean design helps reduce this risk

NEMA FRAMES

Three Phase 230/460V & 575V

HP	RPM	STANDARD NEMA FRAMES
1/4	3450	48, 48C, 56, 56C
	1725	48, 48C, 56, 56C
	1140	56, 56C
	850	56, 56C
1/2	3450	48, 48C, 56, 56C, 56I
	1740	48, 48C, 56, 56C, 56I
	1150	56, 56C
	850	143T, 143TC
3/4	3450	56, 56C, 56I
	1740	56, 56C, 56I
	1150	143T, 143TC
	850	145T, 145TC
1	3450	56, 56C, 56I, 143T, 143TC, 143JM
	1750	56, 56C, 56I, 143T, 143TC, 143JM
	1150	56, 56C, 145T, 145TC
	850	182, 182C, 182T, 182TC
1 1/2	3450	56, 56C, 56I, 143T, 143TC, 143JM
	1750	56, 56C, 56I, 145T, 145TC, 145JM
	1160	182, 182C, 182T, 182TC
	850	184, 184C, 184T, 184TC
2	3450	56, 56C, 145T, 145TC, 56I, 145JM
	1750	56, 56C, 145T, 145TC, 56I, 145JM
	1160	182, 182C, 182T, 182TC
	865	184, 184T, 184C, 184TC
3	3450	56, 56C, 145T, 145TC, 56I, 145JM
	1760	182, 182C, 182T, 182TC, 182JM
	1160	213, 213T, 213C, 213TC
	865	215, 215T, 215C, 215TC
5	3500	184, 184T, 184C, 184TC, 184JM
	1750	184, 184T, 184C, 184TC, 184JM
	1160	215, 215T, 215C, 215TC
	870	254T, 254TC
7 1/2	3500	184, 184T, 184C, 184TC, 184JM
	3500	213, 213C, 213T, 213TC, 213JM
	1760	213, 213C, 213T, 213TC, 213JM
	1180	254T, 254TC
	870	256T, 256TC



1/2 HP 56C Frame Sanifan Motor with Thru Hole Shaft



NEMA FRAMES

Single Phase 115/230V

HP	RPM	SINGLE PHASE NEMA FRAMES
1/4	3450	56, 56C, 56I
	1750	56, 56C, 56I
1/2	3450	56, 56C, 56I
	1750	56, 56C, 56I
3/4	3450	56, 56C, 56I
	1750	56, 56C, 56I
1	3450	56, 56C, 56I, 143T, 143TC, 143JM
	1750	56, 56C, 56I, 143T, 143TC, 143JM
1 1/2	3450	56, 56C, 56I, 143T, 143TC, 143JM
	1750	56, 56C, 56I, 145T, 145TC, 145JM
2	3450	56, 56C, 56I, 145T, 145TC, 145JM
	1750	182, 182C, 182T, 182TC, 182JM
3	3450	182T, 182TC, 182JM
	1750	184T, 184TC, 184JM
5	3450	184T, 184TC, 182JM
	1750	213T, 213TC, 213JM

IEC FRAMES

230/400V, 50Hz & 230/460V, 60Hz "CE"

HP	RPM	STANDARD IEC FRAMES
.37	2850	90-B3, 90-B5, 90-B14
	1450	90-B3, 90-B5, 90-B14
	950	90-B3, 90-B5, 90-B14
	725	90-B3, 90-B5, 90-B14
.75	2850	90-B3, 90-B5, 90-B14
	1450	90-B3, 90-B5, 90-B14
	950	90-B3, 90-B5, 90-B14
	725	112-B3, 112-B5, 112-B14
1.1	2850	90-B3, 90-B5, 90-B14
	1450	90-B3, 90-B5, 90-B14
	950	112-B3, 112-B5, 112-B14
	725	112-B3, 112-B5, 112-B14
1.5	2850	90-B3, 90-B5, 90-B14
	1450	90-B3, 90-B5, 90-B14
	950	112-B3, 112-B5, 112-B14
	725	132-B3, 132-B5, 132-B14
2.2	2850	90-B3, 90-B14, 112-B5, 112-B14
	1450	112-B3, 112-B5, 112-B14
	950	132-B3, 132-B5, 132-B14
	725	132-B3, 132-B5, 132-B14

HP	RPM	STANDARD IEC FRAMES
3.7	2850	112-B3, 112-B5, 112-B14
	1450	112-B3, 112-B5, 112-B14
	950	132-B3, 132-B5, 132-B14
	725	160-B5, 160-B14
5.5	2850	132-B3, 132-B5, 132-B14
	1450	132-B3, 132-B5, 132-B14
	950	160-B5, 160-B14
	725	160-B5, 160-B14
7.5	2850	132-B3, 132-B5, 132-B14
	1450	160-B5, 160-B14
	950	160-B5, 160-B14
	725	160-B5, 160-B14
11	2850	160-B5, 160-B14
	1450	160-B5, 160-B14
	950	160-B5, 160-B14
	725	160-B5, 160-B14
15	2850	160-B5, 160-B14
	1450	160-B5, 160-B14
	950	160-B5, 160-B14
	725	180-B3, 180-B5
18.5	2850	180-B3, 180-B5
	1450	180-B3, 180-B5
	950	180-B3, 180-B5
	725	180-B3, 180-B5

1/2 HP 56C Frame Sanifan Motor with Thru Hole Shaft



Please visit our website for model numbers, drawings and data sheets.

Please visit our website for model numbers, drawings and data sheets.

MOTOR OPTIONS

Cooling Options

A variety of cooling options are available. TEFC and TENV are the most common for pharmaceutical and food processing applications.

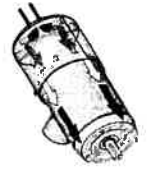
TEFC

TENV

TELC

TEBC

TECAC



- TEFC Totally Enclosed Fan Cooled
- TENV Totally Enclosed Non-Ventilated
- TELC Totally Enclosed Liquid Water Cooled
- TEBC Totally Enclosed Blower Cooled
- TECAC Totally Enclosed Compressed Air Cooled



Foot Options

When a foot mount is necessary, we offer two styles - blind tapped and thru hole mount. The blind tapped foot mount is the most sanitary and easy to clean foot option available. It allows crevices free mounting without exposed hardware. Both styles are sanitary stainless steel and are fully TIG welded to the body.



BLIND TAPPED FOOT MOUNT - MOST SANITARY CHOICE



THRU HOLE FOOT MOUNT



MOTOR OPTIONS

Sanifan® PLUS Series

Sanifan® PLUS Series ensures the highest level of cleanability and can be connected directly to an existing CIP system. With Sanifan® PLUS you have the flexibility to select the water port location and port connection style on the endbell that meets the needs of your particular application.



Water Port Locations & Connection Options

Locations are available at 12:00 orientation, 3:00 orientation, 6:00 orientation and 9:00 orientation. For other water port locations, please contact our engineering department.

WATER PORT CONNECTION OPTIONS



Spring Valve



Pipe



Tri Clamp



CUSTOM MANUFACTURING



Vertical Shaft-Up Motors

In addition to standard motors we offer a selection of motors designed and manufactured to solve even the most difficult applications. Our vertical shaft up, freezer duty, dairy and brake motors meet the special applications found in processing environments. Stainless Motors, Inc. also provides unique custom solutions and manufacturing for these one-of-a-kind applications. Contact us today for more information.

VERTICAL SHAFT UP APPLICATIONS

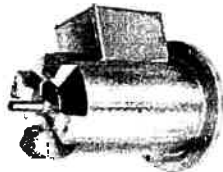
Vertical shaft-up (V8) applications present a special challenge for washdown duty motors. Any recess in the shaft-end endbell will pool water and increase the risk of water entry past the shaft seal. Stainless Motors, Inc. has solved this challenge by developing a motor with an optimized, tapered endbell and an O-ring sealed rotating shield. Together they virtually eliminate shaft seal problems in vertical shaft-up applications. As with all Stainless Motors, Inc. motors, they may be ordered with the junction box in various locations, and the conduit port facing up, down, left or right permitting the cleanest installation.



1 HP 56 Frame Motor, TEVW with Thru Hole Feet



5 HP 184TC Frame Motor TEFC, Footless



1 HP 56C Frame Motor, Single Phase TEVW, Custom Flange



Brake Motors

For applications requiring power-off torque holding, Stainless Motors, Inc. integrates a stainless steel housed, spring set brake with our motors. Our brake motors feature torque ratings from 6-124 ft-lb, power off operation, and an optional manual release that automatically resets. All brake leads are brought out to the junction box allowing for a single conduit electrical connection and enhancing machine integration and cleanability.

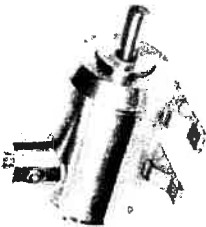


CUSTOM MANUFACTURING



Freezer Duty Motors

When temperatures of -10° C and below are present, unique challenges are created for stainless steel motors. Two possible obstacles include thermal expansion rate of the metals and low temperature elastomer stiffening. Stainless Motors, Inc. has optimized design parameters and materials, including low temperature arctic grease, EPDM O-rings, labyrinth seals with silicon outer O-rings, and tolerance rings for these extreme temperature applications.

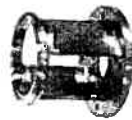


Dairy Motors

These motors meet the strict USDA and 3-A Sanitary Standards for dairy applications. Properly constructed, gasketed junctions and a smooth, stainless steel body with #4 finish free of pits, cracks, folds and other imperfections. There are no exposed threads and the mounting legs are specially designed to meet the USDA requirements.



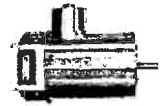
Custom Manufacturing Examples



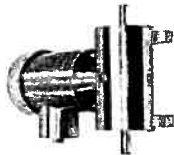
Custom Mounting Adapter



Ham Slicer



Integral Tach Motor



Counter Rotating Motor/Gear Motor

WATER COOLED ENERGY RECOVERY MOTORS



Water cooling an electric motor provides an efficient means for the collection and removal of waste heat. If an application requires hot water or generates steam, the warm water discharge from a water cooled motor can be directly used providing huge energy savings. The stainless steel housing, water jacket, and endbells of our water cooled motor will not rust or impart corrosion debris to the cooling water assuring water chemistry and purity is unchanged. In addition, the uniform and lower temperatures of a water cooled motor winding and bearing substantially increase the motor's service life and reduce bearing maintenance. Remote motor condition monitoring is provided for via internal bearing and winding RTD's. Bearings are re-greased from external fittings or continuously supplied with grease via automatic re-greasers. Excess and waste grease is efficiently removed from the bearings and collected in easily accessible reservoirs.

HP	RPM	Standard NEMA Frames 460 & 575V
40	3450	324T, 324TC, 324TS, 324TSC
	1775	324T, 324TC, 324TS, 324TSC
50	3450	326T, 326TC, 326TS, 326TSC
	1775	326T, 326TC, 326TS, 326TSC
60	3560	364T, 364TC, 364TS, 364TSC
	1780	364T, 364TC, 364TS, 364TSC
75	3565	365T, 365TC, 365TS, 365TSC
	1780	365T, 365TC, 365TS, 365TSC
100	3565	365T, 365TC, 365TS, 365TSC
	1780	405T, 405TC, 405TS, 405TSC
	1780	405T, 405TC, 405TS, 405TSC
150	3570	445T, 445TC, 445TS, 445TSC
	1785	445T, 445TC, 445TS, 445TSC
200	3570	447T, 447TC, 447TS, 447TSC
	1785	447T, 447TC, 447TS, 447TSC
250	3570	447T, 447TC, 447TS, 447TSC
	1785	447T, 447TC, 447TS, 447TSC
300	3570	447T, 447TC, 447TS, 447TSC
	1785	449T, 449TC, 449TS, 449TSC
350	3570	449T, 449TC, 449TS, 449TSC
	1785	449T, 449TC, 449TS, 449TSC
400	3580	449T, 449TC, 449TS, 449TSC
	1785	449T, 449TC, 449TS, 449TSC
500	1790	5009S, 5009L, 5011S, 5011L

KW	RPM	IEC Frames 460 & 575V
30	3450	200M-B3, 200M-B5
	1775	200M-B3, 200M-B5
37	3450	200M-B3, 200M-B5
	1775	200M-B3, 200M-B5
45	3560	225S-B3, 225S-B5
	1780	225S-B3, 225S-B5
55	3565	225M-B3, 225M-B5
	1780	225M-B3, 225M-B5
75	3565	250M-B3
	1780	250S-B3
	3570	225M-B3, 225M-B5
110	1785	250M-B3, 280M-B3
	3570	280M-B3
150	1785	280M-B3
	3570	280M-B3
185	1785	280M-B3
	3570	280M-B3
225	1785	280M-B3
	3570	280M-B3
260	1785	280M-B3
	3580	280M-B3
300	1785	280M-B3
	3580	315M-B3
375	1790	315M-B3



HAZARDOUS LOCATION XP MOTORS



Stainless Motors, Inc. developed the first washdown duty stainless steel motors approved for use by UL in Hazardous Locations. These motors are suitable for use in the most critical areas of the Pharmaceutical, Biotech and Food Processing industries where cleanliness, washdown tolerance, and safety concerns due to hazardous liquids, vapors or dust exist. These motors are all approved for use with PWM Inverters.

All of our explosion proof motors have thermostats in the windings for over temperature protection. These motors are rated temperature code T3B (165°C, 329°F).

Our Hazardous Location "xp" motors are approved for Class I, Division 1, Groups C & D and Class II, Division 1, Groups F & G, UL File #E321578.

HP	RPM	Standard NEMA Frames 230/460V
1/2	3450	56, 56C
	1750	56, 56C
1	3450	56, 56C, 143T, 143TC, 143JM
	1750	56, 56C, 143T, 143TC, 143JM
1 1/2	3450	56, 56C, 143T, 143TC, 143JM
	1750	56, 56C, 143T, 143TC, 143JM
2	3450	56, 56C, 145T, 145TC, 145JM
	1750	56, 56C, 145T, 145TC, 145JM
3	3450	182, 182C, 182T, 182TC, 182JM
	1750	182, 182C, 182T, 182TC, 182JM
5	3500	184, 184C, 184T, 184TC, 184JM
	1750	184, 184C, 184T, 184TC, 184JM

KW	RPM	Standard IEC Frames 230/460V
.37	3450	90-B3, 90-B5*, 90-B14
	1750	90-B3, 90-B5*, 90-B14
.75	3450	90-B3, 90-B5*, 90-B14
	1750	90-B3, 90-B5*, 90-B14
1.1	3450	90-B3, 90-B5*, 90-B14
	1750	90-B3, 90-B5*, 90-B14
1.5	3450	90-B3, 90-B5*, 90-B14
	1750	90-B3, 90-B5*, 90-B14
2.2	3500	90-B3, 90-B5*, 90-B14
	1750	112-B3, 112-B5, 112-B14
3.7	3500	112-B3, 112-B5, 112-B14

*90-B5 frame has a 250mm flange



Please visit our website for model numbers, drawings and data sheets.

**MARINE MOTORS
T316 STAINLESS**

MARINE MOTORS IN T316 STAINLESS



Our Marine series motors are designed for the rigorous salt water environments found aboard ships and yachts. These motors provide the ultimate in reliability and appearance whether mounted on a salt-sprayed deck or within the hot confines of an engine room or bilge. Single phase models feature high efficiency capacitor start, capacitor run design and an electronic starting switch which eliminates the failure prone mechanical switch used on general purpose industrial motors. Rugged, high efficiency design ensures reliability and performance while the compact design allows for efficient allocation of space. Common shipboard applications include driving air conditioning recirculation pumps, fuel and oil transfer pumps, macerator pumps and dive compressors. Single Phase marine motors are available up to 5 HP, 115/230V.

HP	RPM	Standard NEMA Frames 230/460V
1/4	3450	48, 48C, 56, 56C, 56J
	1750	48, 48C, 56, 56C, 56J
1/2	3450	48, 48C, 56, 56C, 56J
	1750	48, 48C, 56, 56C, 56J
3/4	3450	56, 56C, 56J
	1750	56, 56C, 56J
1	3450	56, 56C, 56J, 143T, 143TC, 143JM, 143JP
	1750	56, 56C, 56J, 143T, 143TC, 143JM, 143JP
1 1/2	3450	56, 56C, 56J, 143T, 143TC, 143JM, 143JP
	1750	56, 56C, 56J, 145T, 145TC, 145JM, 145JP
2	3450	56, 56C, 56J, 145T, 145TC, 145JM, 145JP
	1750	182, 182T, 182TC, 182JM, 182JP
3	3450	182, 182T, 182TC, 182JM, 182JP
	1750	184, 184T, 184TC, 184JM, 184JP



Please visit our website for model numbers, drawings and data sheets.



RIGHT ANGLE WORM GEARMOTORS

GEARMOTORS

Our Right Angle Worm Drive gear reducers feature hardened and ground worms and aluminum-bronze worm gears for high capacity and long life. Gearboxes are machined and ground to a sanitary #4 finish on all surfaces. Single, double and hollow bore output shafts are available with right-hand, left-hand and vertical assembly options. Larger RA gearboxes with vertical output shafts feature our Positive Pressure Lubrication System ensuring that all bearings and gears are well lubricated even at very low rotational speeds. Purity FG EP-460 (USDA H1) synthetic lubricant provides exceptional lubrication and extended life performance. All RA units can be fitted with optional flange mounts with either standard C-face or customer specified dimensions.

- Compact, Right Angle Drive
- For Ratios between 5:1 and 60:1
- Typical applications - Positive displacement pumps, mixers, and conveyor drives

Ratio	Output RPM	X HP	RA175	RA175	1 HP	1 1/2 HP	2 HP	3 HP	5 HP	7 1/2 HP	10 HP
5	348	RA133	RA175	RA175	RA206	RA206	RA262	RA325	RA325	RA375	RA450
7.5	232	RA133	RA175	RA175	RA206	RA262	RA325	RA375	RA450	RA520	RA520
10	174	RA133	RA175	RA206	RA262	RA262	RA325	RA375	RA450	RA520	RA520
15	116	RA133	RA175	RA206	RA262	RA325	RA375	RA450	RA450	RA520	RA520
20	87	RA133	RA175	RA262	RA262	RA325	RA375	RA520	RA520	RA520	RA520
25	70	RA133	RA175	RA262	RA262	RA375	RA450	RA520	RA520	RA520	RA520
30	58	RA133	RA206	RA325	RA325	RA375	RA450	RA450	RA450	RA450	RA450
40	44	RA175	RA206	RA325	RA375	RA450	RA450	RA450	RA450	RA450	RA450
50	35	RA175	RA206	RA325	RA375	RA450	RA450	RA450	RA450	RA450	RA450
60	29	RA175	RA262	RA325	RA375	RA450	RA450	RA450	RA450	RA450	RA450



Contact Stainless Motors, Inc. for availability of custom ratios

SPIRAL BEVEL GEARMOTORS



Spiral bevel reducers provide high efficiency and quiet operation in low ratios. Spiral bevel gearmotors are built as integral gearmotors, with the pinion gear mounted directly on a modified motor shaft. Right-hand, left-hand and vertical assembly options are available.

- Output shaft at right angle to the input shaft
- Required ratio is between 1:1 and 4:1
- Excellent efficiency
- Furnished with C-face or flange mount output faces
- Typical applications include positive displacement pump drives and tank mounted mixer drives where low headroom exists

Ratio	Output RPM	1/4" HP	1/2" HP	3/4" HP	1 HP	2 HP	3 HP	5 HP	7 1/2" HP	10 HP	15 HP	20 HP
1:1	1740	S856	S856	S856	S856	S856	S8180	S8180	S8210	S8210	S8250	S8250
1.5:1	1160	S856	S856	S856	S856	S856	S8180	S8180	S8210	S8210	S8250	S8250
2:1	870	S856	S856	S856	S856	S856	S8180	S8180	S8210	S8210	S8250	S8250
3:1	580	S856	S856	S856	S856	S856	S8180	S8180	S8210	S8210	S8250	S8250
4:1	435	S856	S856	S856	S856	S856						



INLINE PLANETARY GEARMOTORS



Efficient and compact, our Inline Planetary gearmotors feature cast T304 housings with sanitary foot mounts. GMP design is evident in the smooth, cylindrical shape and integral motor interface. All outer surfaces are fully machined and ground for a superior sanitary finish. Custom modifications such as a flange or C-face mount, or altered shaft dimension are readily produced to order. High ratio units feature unique compound gearing to produce very low output speeds with a compact reducer.

- Output shaft that is concentric with the motor input shaft
- Cylindrical, very aesthetic, compact, and cleanable gearmotor
- Standard ratios are between 3:1 to 25:1
- Extremely high ratios are possible (1000:1 or more)
- Planetary gearmotors available as:
 - Foot mounted (typical for driving positive displacement pumps)
 - C-face or flange-mounted unit, as would be preferred for such applications as tank mounted mixers

RATIO	3.17	3.6	4.25	5.39	10.05	11.41	12.96	13.47	15.3	16.89	18.06	19.18	22.65	28.4
OUTPUT	548	483	409	326	173	152	134	129	113	103	96	90	76	61

Ratio	Output RPM	1/4" HP	1/2" HP	3/4" HP	1 HP	2 HP	3 HP	5 HP	7 1/2" HP	10 HP	15 HP	20 HP	25 HP	30 HP
3	580	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
3.67	474	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
4.2	414	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
5	348	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
6.33	275	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
7.8	223	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
9	193	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
11	158	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
12.6	138	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
15	116	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
17.6	98	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
21	82	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275
25	69	IL650	IL650	IL650	IL650	IL650	IL650	IL680	IL680	IL680	IL1000	IL1000	IL1275	IL1275



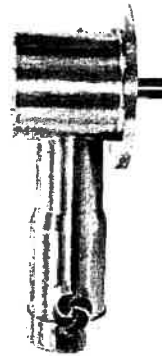
COMPOUND PLANETARY / SPIRAL BEVEL GEAR MOTOR



Our Innovative SBT series combines our proven II planetary series technology with a high capacity spiral bevel gear set in a unique and ultra-cleanable tubular housing. All vertical output shaft models feature our Positive Pressure Lubrication System ensuring that all bearings and gears are well lubricated, even at very low rotational speeds. Purty FG 460 (USDA H1) synthetic lubricant provides exceptional lubrication and extended life performance. SBT units are made to order allowing OEM's and end-users to specify a particular mounting configuration for the best possible integration with new or existing equipment. The tubular housing features smooth, easily cleanable surfaces and is often equipped with a flange or C-face mounting. The output shaft of SBT units is at right angle to the motor shaft.

- Compact and highly efficient
- High ratio, high power applications
- Output shaft at right angle to input shaft
- Output Shafts
 - Solid or Hollow bore
 - Vertical or Horizontal orientation

Output RPM Range	5 HP	7.5 HP	10 HP	15 HP	20 HP	25 HP	30 HP	40 HP
7.1-20.0	SBT1000	SBT1100	SBT1200	SBT1300	SBT1400	SBT1600	SBT1600	SBT2000
51-70	SBT1100	SBT1200	SBT1300	SBT1400	SBT1600	SBT1800	SBT1800	SBT2000
36-50	SBT1200	SBT1300	SBT1400	SBT1600	SBT1600	SBT2000	SBT2000	SBT2200
27-35	SBT1300	SBT1400	SBT1600	SBT1800	SBT2000	SBT2200	SBT2200	SBT2400
17-26	SBT1400	SBT1600	SBT1600	SBT2000	SBT2200	SBT2400	SBT2600	SBT2600
12-16	SBT1600	SBT2000	SBT2000	SBT2400	SBT2600	SBT2600	SBT2800	SBT2800
10-11	SBT1800	SBT2000	SBT2200	SBT2400	SBT2800	SBT2800	SBT2800	SBT2800
9-10	SBT2000	SBT2200	SBT2400	SBT2600	SBT2800	SBT2800	SBT2800	SBT2800



STAINLESS FLEXIBLE COUPLINGS



We offer S-Flex Style flexible couplings with the same corrosion resistance as our motors. Made of stainless steel, they are suitable for washdown locations and can be specially made to fit your application. Hubs are bored to size, inch or metric.

S-Flex Style	Bore Range	Load Rating
SS55	.625-1.125"	.0038
SS65	.625-1.250"	.0071
SS75	.625-1.625"	.012
SS85	1.250-1.875"	.018
SS95	1.250-2.250"	.028
SS105	1.500-2.750"	.046
SS115	1.500-3.250"	.072
SS125	1.500-3.625"	.114
SS135	1.500-4.500"	.18
SS145	1.500-5.000"	.286
SS165	1.500-5.500"	.75

How to determine the Load Rating
Divide the horsepower of the motor by the RPM of the coupling.



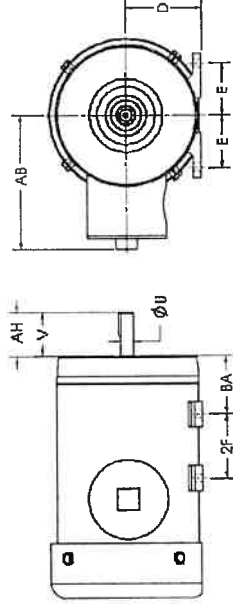
NEMA QUICK REFERENCE CHART



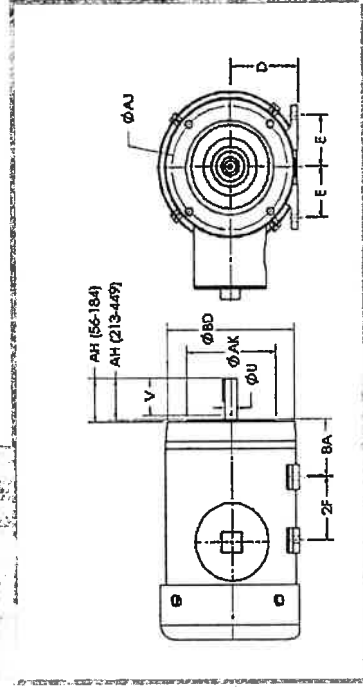
NEMA REFERENCE DRAWINGS

NEMA Frame Designation	Frame Dimensions (Inches)										
	D	E	2F	U	V	C-Face AH	C-Face AJ	AK	BA	BD	RD
48	3	2 1/8	3 3/4	1 1/2	1 1/2	1 1/16	3 3/4	3	2 1/2	5 5/8	
48C	3	2 1/8	3 1/4	1 1/2	1 1/2	1 1/2	3 3/4	3	2 1/2	5 5/8	
56	3 1/2	2 7/16	3	5/8	1 7/8	2 7/16	5 7/8	4 1/2	2 3/4	6 1/2	
56C	3 1/2	2 7/16	3	5/8	1 7/8	1 7/8	5 7/8	4 1/2	2 3/4	6 1/2	
145T	3 1/2	2 3/4	4	7/8	2 1/4	2 1/8	5 7/8	4 1/2	2 1/4	6 3/2	
145TC	3 1/2	2 3/4	4	7/8	2 1/4	2 1/8	5 7/8	4 1/2	2 1/4	6 3/2	
145T	3 1/2	2 3/4	5	7/8	2 1/4	2 1/4	5 7/8	4 1/2	2 3/4	6 1/2	
145TC	3 1/2	2 3/4	5	7/8	2 1/4	2 1/4	5 7/8	4 1/2	2 3/4	6 1/2	
182	4 1/2	3 3/4	4 1/2	7/8	2 1/4	2 1/8	5 7/8	4 1/2	2 3/4	6 1/2	
182C	4 1/2	3 3/4	4 1/2	7/8	2 1/4	2 1/8	5 7/8	4 1/2	2 3/4	6 1/2	
182T	4 1/2	3 3/4	4 1/2	1 1/8	2 3/4	2 5/8	7 1/4	8 1/2	2 3/4	9	
182TC	4 1/2	3 3/4	4 1/2	1 1/8	2 3/4	2 5/8	7 1/4	8 1/2	2 3/4	9	
184	4 1/2	3 3/4	5 1/2	7/8	2 1/4	2 1/8	5 7/8	4 1/2	2 3/4	6 1/2	
184TC	4 1/2	3 3/4	5 1/2	7/8	2 1/4	2 1/8	5 7/8	4 1/2	2 3/4	6 1/2	
184T	4 1/2	3 3/4	5 1/2	1 1/8	2 3/4	2 5/8	7 1/4	8 1/2	2 3/4	9	
184TC	4 1/2	3 3/4	5 1/2	1 1/8	2 3/4	2 5/8	7 1/4	8 1/2	2 3/4	9	
213C	5 1/4	4 1/4	5 1/2	1 1/8	3	2 3/4	5 7/8	8 1/2	3 1/2	9	
213T	5 1/4	4 1/4	5 1/2	1 3/8	3 3/8	3 1/8	7 1/4	8 1/2	3 1/2	9	
213TC	5 1/4	4 1/4	5 1/2	1 3/8	3 3/8	3 3/8	7 1/4	8 1/2	3 1/2	9	
215	5 1/4	4 1/4	7	1 1/8	3	2 3/4	7 1/4	8 1/2	3 1/2	9	
215T	5 1/4	4 1/4	7	1 3/8	3 3/8	3 1/8	7 1/4	8 1/2	3 1/2	9	
215TC	5 1/4	4 1/4	7	1 3/8	3 3/8	3 3/8	7 1/4	8 1/2	3 1/2	9	
254T	6 1/4	5	8 3/4	1 5/8	3 3/4	3 3/4	7 3/4	8 1/2	4 1/4	10	
254TC	6 1/4	5	8 3/4	1 5/8	3 3/4	4	7 1/4	8 1/2	4 3/4	10	
256T	6 1/4	5	10	1 5/8	3 3/4	3 3/4	7 3/4	8 1/2	4 1/4	10	
256TC	6 1/4	5	10	1 5/8	3 3/4	4	7 1/4	8 1/2	4 3/4	10	
284T	7	5 1/2	9 1/2	1 7/8	4 5/8	4 3/8	9	10 1/2	4 3/4	11 1/4	
284TC	7	5 1/2	9 1/2	1 7/8	4 5/8	4 5/8	9	10 1/2	4 3/4	11 1/4	
284TS	7	5 1/2	9 1/2	1 5/8	3 1/4	3	9	10 1/2	4 3/4	11 1/4	
286T	7	5 1/2	11	1 7/8	4 5/8	4 3/8	9	10 1/2	4 3/4	11 1/4	
286TC	7	5 1/2	11	1 7/8	4 5/8	4 5/8	9	10 1/2	4 3/4	11 1/4	
286TS	7	5 1/2	11	1 5/8	3 1/4	3	9	10 1/2	4 3/4	11 1/4	
324T	8	6 1/4	10 1/2	2 1/8	5 1/4	5	11	12 1/2	5 1/4	13 3/8	
324TC	8	6 1/4	12	2 1/8	5 1/4	5	11	12 1/2	5 1/4	13 3/8	
326TS	8	6 1/4	12	1 7/8	3 3/4	3 1/2	11	12 1/2	5 1/4	13 3/8	
364T	9	7	11 3/4	2 3/8	5 7/8	5 5/8	11	12 1/2	5 7/8	13 3/8	
364TS	9	7	11 1/4	1 7/8	3 3/4	3 1/2	11	12 1/2	5 7/8	13 3/8	
365T	9	7	12 1/4	2 3/8	5 7/8	5 5/8	11	12 1/2	5 7/8	13 3/8	
365TS	9	7	12 1/4	1 7/8	3 3/4	3 1/2	11	12 1/2	5 7/8	13 3/8	

STANDARD



C-FACE



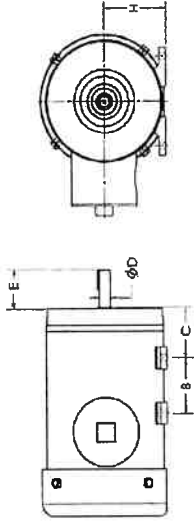
IEC QUICK REFERENCE CHART



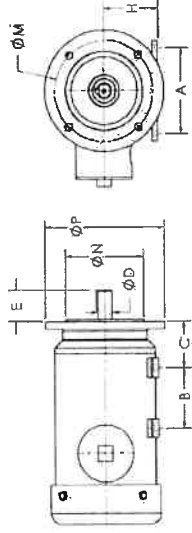
IEC QUICK REFERENCE DRAWINGS

IEC Frame Designation	Frame Dimensions (millimeters)																																	
	Footed						B5 Flange						B14 Face						General															
	A	B	H	D	E	L	A	B	H	D	E	L	A	B	H	D	E	L	T	M	N	P	S	T	T	AC	AD	HC	XX					
80	125	100	50	19	40	13	165	130	200	11	3.5	100	80	120	M6	3	145	116	153	22														
90S	140	100	56	24	50	13	165	130	200	12	3.5	115	95	140	M8	3	119	130	173	22														
90L	140	125	56	24	50	13	165	130	200	12	3.5	115	95	140	M8	3	119	130	173	22														
100S	160	112	63	28	60	14	215	180	250	14	4	130	110	160	M8	3.5	102	149	180	27														
100L	160	140	63	28	60	14	215	180	250	14	4	130	110	160	M8	3.5	102	149	180	27														
112S	190	114	70	28	60	14	215	180	250	14	4	130	110	160	M8	3.5	116	149	214	27														
112L	190	140	70	28	60	14	215	180	250	14	4	130	110	160	M8	3.5	116	149	214	27														
132S	216	140	89	38	80	14	265	230	300	14	4	165	130	200	M8	3.5	149	187	256	27														
132L	216	178	89	38	80	14	265	230	300	14	4	165	130	200	M8	3.5	149	187	256	27														
160M	254	210	108	42	110	20	300	250	350	19	5	215	180	250	M12	4	329	242	329	35														
160L	264	254	108	42	110	20	300	250	350	19	5	215	180	250	M12	4	329	242	329	35														
180M	279	241	121	48	110	20	300	250	350	19	5																							
180L	279	279	121	48	110	20	300	250	350	19	5																							
200M	318	267	133	55	110	27	350	300	400	19	5																							
200L	318	305	133	55	110	27	350	300	400	19	5																							
225S	356	286	149	60	140	19	400	350	450	19	6																							
225M	356	311	149	60	140	19	400	350	450	19	6																							
250S	406	311	168	70	140																													
250M	406	349	168	70	140																													
280S	457	368	190	80	170																													
80M	457	419	190	80	170																													
315S	508	406	216	85	170																													
315M	508	457	216	85	170																													
355S	610	500	254	85	170																													
355L	610	630	254	85	170																													

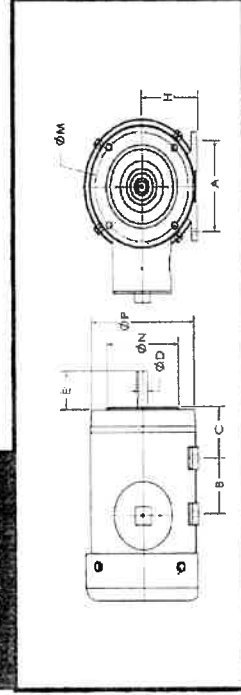
FOOTED



B5 FLANGE



B14 FACE



CORPORATE INFORMATION

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Please visit our website for model numbers, drawings and data sheets.

S10/S20 LOCK RING ASSEMBLY / TORQUE TABLE

S10/S20 XS/Small Lock Ring		S10/S20 Large Lock Ring		Set Screw/Bolting Torques Table	
SEAL SIZE	UP TO 2.50" (64 mm)	SEAL SIZE	UP TO 4.75" (120 mm)	DN POINT SET SCREWS	DN POINT SET SCREWS
				50-80 lbf-ft (67-108 Nm)	20-30 lbf-ft (27-40 Nm)
				85-75 lbf-ft (115-102 Nm)	25-35 lbf-ft (34-48 Nm)
				1,000" - 1,500"	55 - 85 lbf-ft (7.5 - 11.5 Nm)
				1,800" - 2,800"	90 - 144 lbf-ft (12 - 19 Nm)
				2,75" - 4,25"	192 - 240 lbf-ft (26 - 33 Nm)

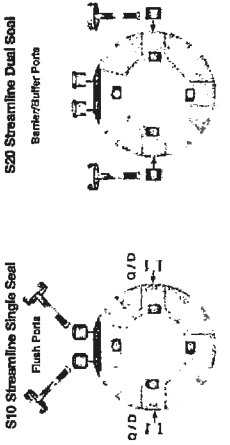
* See marks on the lock ring for the Drop Point Set Screws

S10 SEAL GLAND / CASSETTE MATERIAL COMPATIBILITY

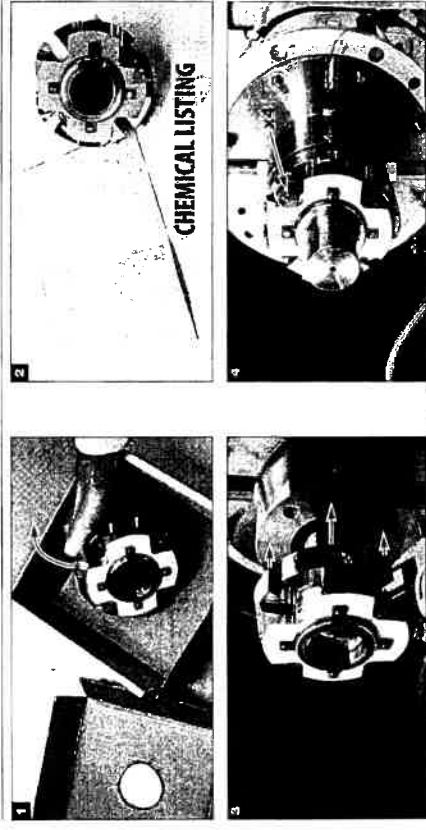
NOTE: The Gland and Cassette must be the same material. See S10 Gland / Cassette Material Chart to the right.

GLAND	CASSETTE
S10	S10
Inconel C ¹	Inconel C ¹
Titanium	Titanium
HB	HB
Monel ²	Monel ²

S10/S20 GLAND PLUG INSTALLATION

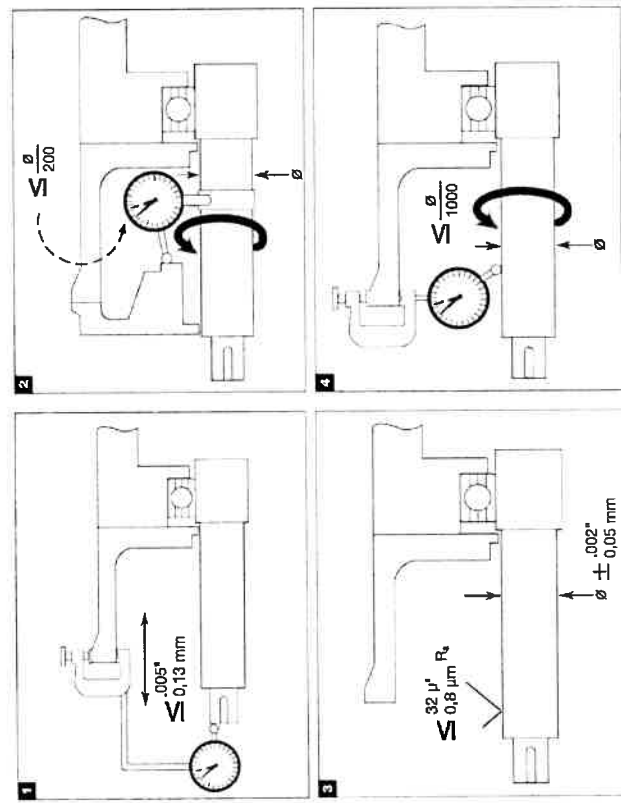


INSTALLATION



S10/S20 Installation Instructions

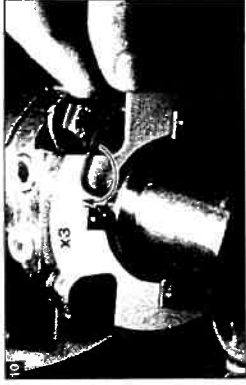
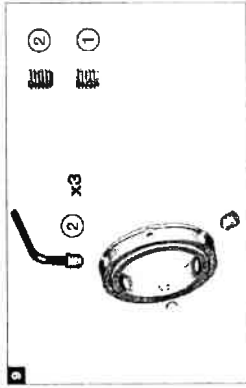
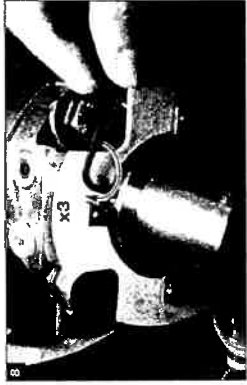
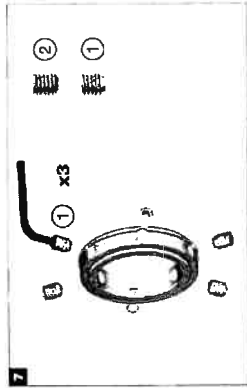
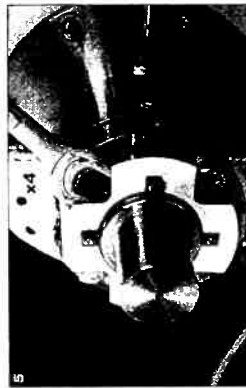
PREPARATION



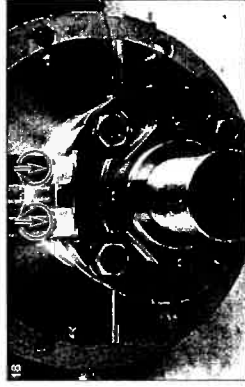
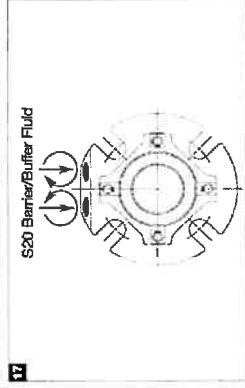
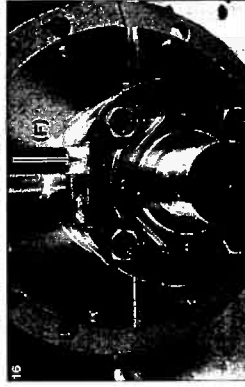
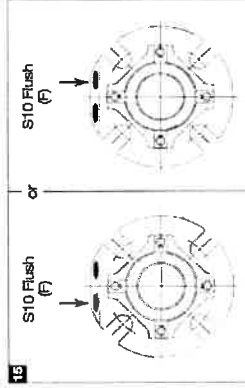
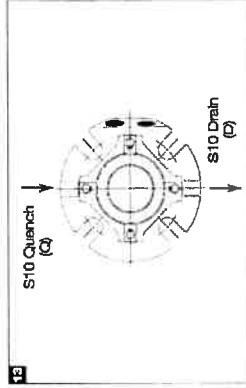
CAUTIONS

These instructions are general in nature. It is assumed that the installer is familiar with seals and certainly with the requirements of their plant for the successful use of mechanical seals. If in doubt, get assistance from someone in the plant who is familiar with seals or delay the installation until a seal representative is available. All necessary auxiliary arrangements for successful operation (heating, cooling, flushing) as well as safety devices must be employed. These decisions are to be made by the user. The chemical listing is intended as a general reference for this seal only. The decision to use this seal or any other Chesterton seal in a particular service is the customer's responsibility.

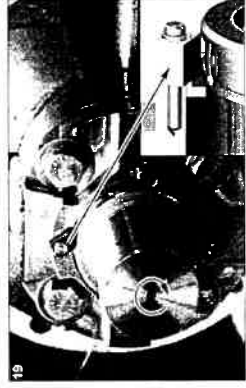
INSTALLATION



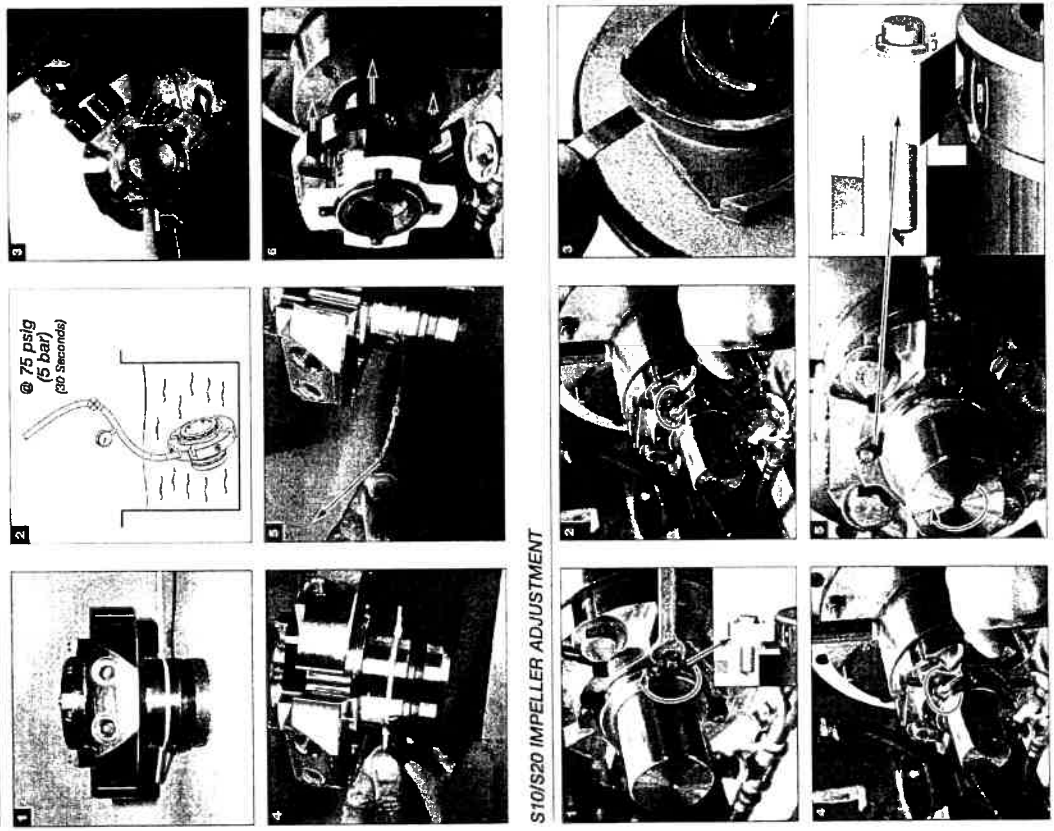
ENVIRONMENTAL CONTROLS



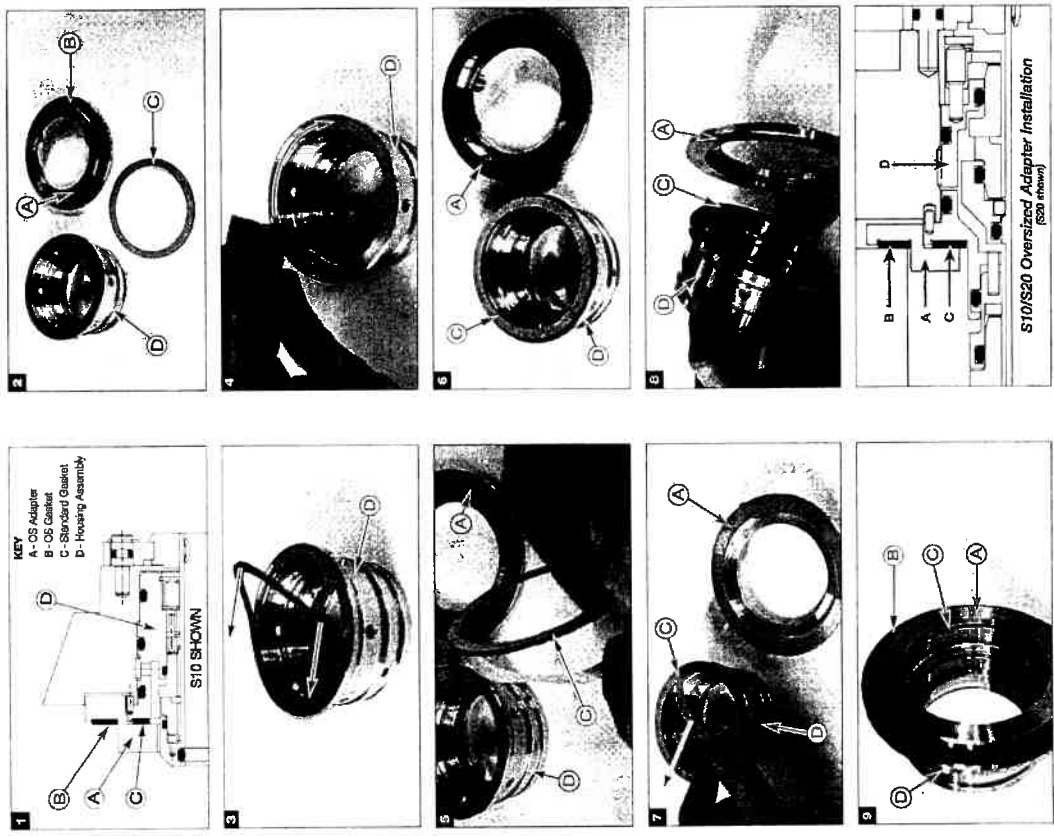
START-UP



S20 PRESSURE TEST



S10/S20 OVERSIZE GASKET KIT ASSEMBLY INSTRUCTIONS



S10/S20 Oversized Adapter Installation
(30% shown)