

## TB Series Installation and Operation Manual

A1 - 1.5 x 1 x 6  
AL - 1.5 x 1 x 6 LF  
E1 - 50mm x 50mm  
EL - 50mm x 32mm  
E3 - 65mm x 50mm  
A3 - 3 x 1.5 x 6  
A4 - 3 x 2 x 6  
B1 - 1.5 X 1 x 8  
BL - 1.5 x 1 X 8 LF  
F1 - 50mm x 32mm  
FL - 50mm x 32mm  
B3 - 3 x 2 x 6S  
B4 - 3 x 1.5 x 8  
F4 - 65mm x 40mm  
B5 - 3 x 2 x 6 Tall  
B6 - 4 x 3 x 6  
C1 - 3 x 2 x 8  
C2 - 4 x 3 x 8  
G2 - 100mm x 65mm  
C3 - 2 x 1 x 10  
CL - 2 x 1 x 10 LF  
C4 - 3 x 1.5 x 10  
C5 - 3 x 2 x 10  
C6 - 4 x 3 x 10  
C7 - 4 x 3 x 10 H  
C8 - 6 x 4 x 10 H  
C9 - 6 x 4 x 8  
V1 - 2 x 1.5 x 6V  
W1 - 2 x 1.5 x 8V  
W3 - 3 x 2 x 6V



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## Section A - Safety

For your protection, and the protection of others, learn and always follow the safety rules outlined in this booklet. Observe warning signs on machines and act accordingly. Form safe working habits by reading the rules and abiding by them. INSTALLATION, OPERATION AND MAINTENANCE MUST BE DONE BY THOROUGHLY QUALIFIED PERSONNEL IN STRICT ACCORDANCE WITH THIS MANUAL AND MUST COMPLY WITH ALL LOCAL, STATE AND FEDERAL CODES. Keep this booklet handy and review it from time to time to refresh your understanding of the rules.

Techniflo have designed this pump for safe and reliable operation. However, like any other mechanical device, the proper and safe performance of this equipment depends upon using sound and prudent operating maintenance and servicing procedures performed by properly trained personnel. Instructions and safety procedures contained herein must always be followed. As such, Techniflo shall not be liable for any damages or delays caused by failure to observe any instructions or warnings in this manual.

### DANGER

The use of the word "DANGER" always signifies an immediate hazard with a high likelihood of severe personal injury or death if instructions, including recommended precautions, are not followed.

### MAGNETIC

The use of the word "MAGNETIC" indicates the persistent presence of a magnetic field. Such fields present immediate danger to individuals having electronic medical devices, metallic heart valves, metallic prosthetics or metallic surgical clips.

### WARNING

The use of the word "WARNING" signifies the presence of hazards or unsafe practices which could result in severe personal injury or death if instructions, including recommended precautions, are not followed.

### CAUTION

The use of the word "CAUTION" signifies possible hazards or unsafe practices which could result in minor injury product or property damage if instructions, and recommended precautions are not followed



## Section A - Safety

Enhance the protection of yourself, as well as your new TB-mag pump, by following and using accepted engineering practices in the installation, operation and maintenance of this equipment. Listed below are some basics you should keep in mind in addition to your own company rules regarding installation, operation and maintenance.

Always pay constant attention to safety Remember all pumps have the potential for danger. Be aware of the following factors:

- HIGH TEMPERATURES may be present.
- HIGH PRESSURES may be present.
- NEVER start this pump without proper prime (casing must be full of liquid).
- NEVER run this pump dry.
- NEVER operate this pump with the suction and /or discharge valve closed.
- NEVER use heat (risk of explosion) to disassemble any portion of the pump.
- NEVER change conditions of service without approval of Global Pumps.
- NEVER remove "Warnings" that are displayed on the pump.
- Parts are rotating at HIGH SPEEDS.
- HIGHLY CORROSIVE and/or toxic chemicals may be present.
- NEVER operate pump if there are visible signs of leakage.
- NEVER loosen flange connection while system is under pressure.
- ALWAYS make certain pressure gauges, indicating lights and safety devices are working.
- ALWAYS know the EMERGENCY STOP for this pump.

### Cleaning Precautions

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- NEVER attempt cleaning while pump is operating.
- ALWAYS remove casing drain and purge casing of liquid before service.
- ALWAYS perform "Tag & Lockout" to power source before service.
- ALWAYS have Service Manual available during any Installation or maintenance.
- ALWAYS make certain that no toxic or flammable fumes / vapours remain in the pump casing or surrounding area.
- ALWAYS clean up any spills immediately according to any local, state or federal codes.



## Section B - Receiving the Pump

All Techniflo Pumps are inspected prior to shipping and are well crated for safe transportation. Techniflo cannot, however, guarantee the safe arrival at the user's plant. Therefore, upon receipt of this equipment:

### PACKING LIST ENCLOSED

Check the received items against the packing list for missing parts or damage. Check the packing material thoroughly for small parts.

If there are any parts missing or if the pump is damaged, a claim must be filed against the carrier immediately.

If the pump will be stored in sub-freezing temperatures, the pump must be completely dried first.

NOTE: Pump ends without motors require assembly of the outer magnet drive and motor. Refer to drive end assembly procedures in this manual.

### WARNING

These pumps use ceramic silicon carbide components. Do not drop pump or subject to shock loads, this may damage internal ceramic components.

### DANGER

Failure to properly lift and support equipment could result in serious injury or damage to pumps.

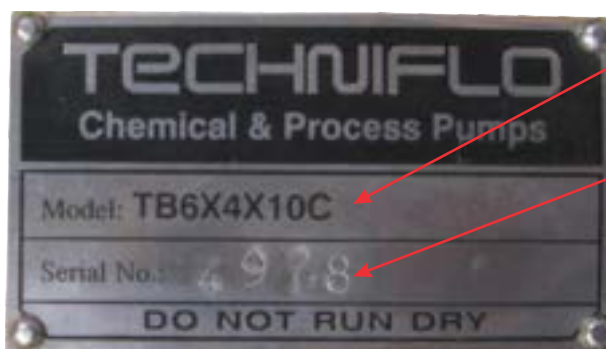


## Section C - Pump Identification Tag

### Reading your nameplate

Every Techniflo pump unit has a nameplate to provide information on your pump. The nameplates are located on the side of each casing. It is recommended that the purchaser record the serial number and use it for reference when requesting information or service parts from Techniflo.

Permanent records for this pump are kept by the serial number and it, therefore, must be used with all correspondence and spare parts orders.



Pump Model Number:  
TB Mag A,B or C

Serial Number:  
Example - 4978

## Section D - Piping

Techniflo pumps are designed with all the necessary strength factors for long, reliable service life. Some general guidelines are described here for your pump installation needs.





## Section D - Piping

### General guidelines

Piping should be arranged to allow pump flushing prior to removal of the unit on services handling corrosive liquids.

When PTFE or similar lined pipe is used, flange alignment should be carefully checked, Spacer ring gaskets are recommended to assure pat-al-el alignment of pipe and pump flanges. The following flange bolt torque values should be used

- 25-50mm (12.5 to 16.6 N/m)
- 50mm (24.9 to 33.2 N/m)
- 75mm (31.8 to 41.5 N/m)
- 100mm (37.3 to 49.8 N/m)

Piping should be supported independently from the pump and line up naturally to the pump flanges.

Properly sized pressure gauges should be installed in both the suction and discharge piping. The gauges will enable the operator to easily observe the operation of the pump, and determine if the pump is operating in conformance with the performance curve. If cavitation or other unstable operation should occur, widely fluctuating discharge pressure will be noted.

### Suction piping

Reducers, if used, should be eccentric and installed at the pump suction flange with eccentric side on the bottom.

The length of the suction pipe should be kept to a minimum.

Suction piping should be installed with a gradual rise to the pump to eliminate any air pockets.

The diameter of the suction pipe should always be as large or larger than the pump suction.

Elbows or fittings should be avoided at suction flange. Allow at least 10 pipe diameters in length for straight run into the pump.

If a valve is used in the suction, use only full flow valves. These valves should be for shut-off only when the pump is not running, not for throttling or controlling flow. A valve designed for flow control should be installed in the discharge. This valve line can be used for throttling.

Suction strainers, when used, must have a net free area of at least three times the suction pipe area.

An isolation valve should be installed in the suction line at least two pipe diameters from the suction to permit closing of the line for pump inspection and maintenance.

### Discharge piping

Isolation and check valves should be installed in discharge line. Isolation valve allows regulation of flow and for inspection of the pump. Check valve prevents pump damage due to water hammer.

### CAUTION

It is good practice to install a throttling type shut off valve in the discharge piping. Throttling the discharge during initial start-up is recommended to protect against "water hammer," which is most likely when using long pipe runs at high flow velocity.

## Section E - Operation

### Electrical

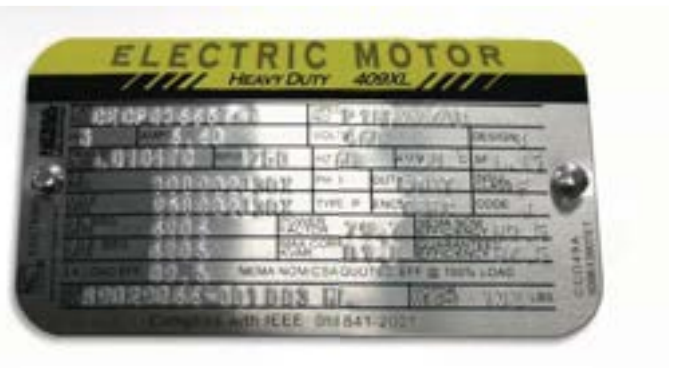
#### DANGER

Only a qualified electrician should make the electrical connections to the pump drive motor.

Thoroughly read motor manufacturers instructions before making installation.



Install motor according to NEC requirements and local electrical codes. Check all connection to motor and starting device with wiring diagram. Check voltage, phase, and frequency on motor nameplate with line circuit.



Check motor nameplate data to be certain that all wiring, switches, starter and overload protection are correctly sized.

### Special electrical requirements

Install a flexible electrical coupling on the motor. Allow movement of at least 300mm. This requirement is important to service and inspect the pump.

## Section E - Operation

### Start up

1. Fully open suction valve. Pump requires a flooded suction.

#### **WARNING**

Do not operate pump with suction valve closed. Operating pump more than a few minutes after suction valve closed may cause bearing failure.

2. Fully open discharge valve to complete priming. Turn back the discharge valve 1/4 to 1/2 open. Techniflo pumps operate safely with discharge valve partially open.

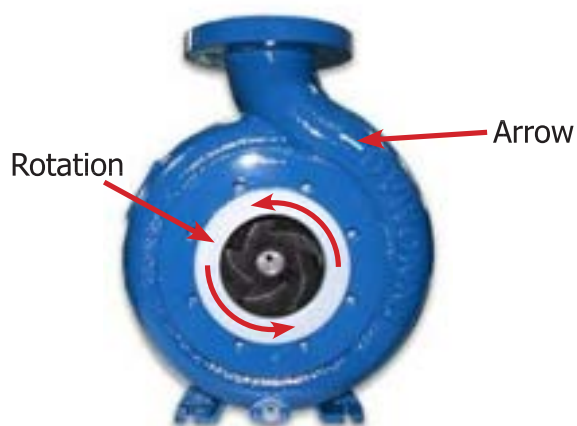
#### **CAUTION**

Continuous operation against a closed discharge valve may cause pump to overheat.

3. Briefly jog the motor long enough to determine the direction of rotation as indicated by arrow on the front of the casing. Improper rotation will not damage the pump however, performance is greatly reduced.

#### **CAUTION**

Immediately observe pressure gauges. If discharge pressure is not quickly attained—stop driver, re-prime and attempt to restart.



Correct rotation viewed from the pump suction is ant-clockwise

1. Start the pump.
2. Set flow rate and pressure by regulating the discharge valve.
3. Check the pump and piping to assure that there are no leaks.
4. Check and record pressure gauge readings for future reference.

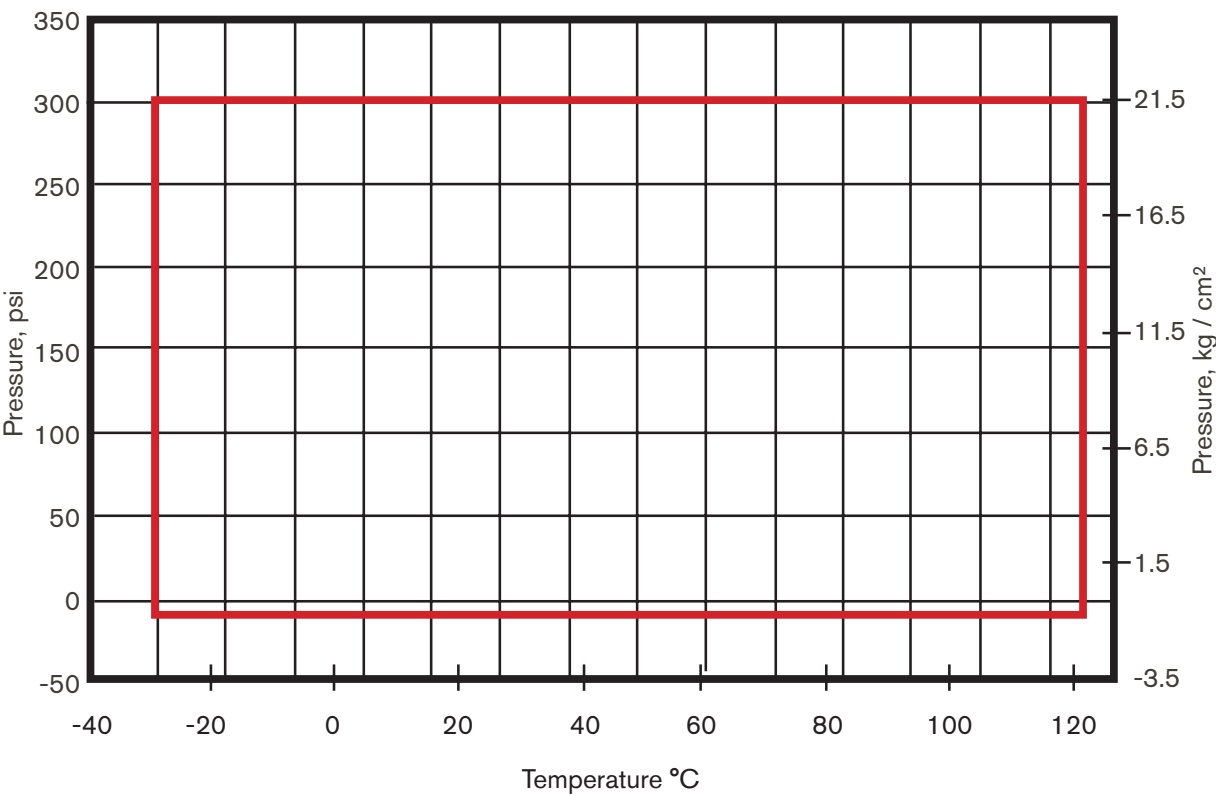
#### **CAUTION**

Never throttle pump using the suction valve.

Section E - Operation

WARNING

Never operate pump above rated temperature of 121°C or rated pressure of 20 bar.



WARNING

Driver may overload and decouple if pump specific gravity is greater than originally assumed. Prolonged running while decoupled will damage driver magnets

Maximum Power		
TB Model	Max. (kW) 2900 rpm	Max. (kW) 1450 rpm
A Series	8.7	4.4
B Series	18.7	9.3
C Series	61.8	30.9

## Section E - Operation

### CAUTION

Techniflo recommends the use of a power monitor to prevent pump damage and inefficiency if for example, a pipe is blocked, a valve is not fully open or the pump is running dry.



### WARNING

Never operate below minimum flow rates.

#### Minimum Flow

TB Model	Size	50 Hertz 2900 rpm (m3/h)	50 Hertz 1450 rpm (m3/h)
A1	1.5 x 1 x 6	1	1
AL	1.5 x 1 x 6LF	1	1
E1	50mm x 32mm	1	1
EL	50mm x 32mm	1	1
E3	65mm x 50mm	1	1
A3	3 x 1.5 x 6	1	1
A4	3 x 2 x 6	1	1
B1	1.5 x 1 x 8	5	3
BL	1.5 x 1 x 8LF	5	3
F1	50mm x 32mm	5	3
FL	50mm x 32mm	5	3
B3	3 x 2 x 6S	5	3
B4	3 x 1.5 x 8	5	3
F4	65mm x 40mm	5	3
B5	3 x 2 x 6T	5	3
B6	4 x 3 x 6	5	3
C1	3 x 2 x 8	15	10
C2	4 x 3 x 8	15	10
G2	100mm x 65mm	15	10
C3	2 x 1 x 10	15	10
CL	2 x 1 x 10LF	15	10
C4	3 x 1.5 x 10	15	10
C5	3 x 2 x 10	15	10
C6	4 x 3 x 10	15	10
C7	4 x 3 x 10H	--	50
C8	6 x 4 x 10H	--	50
C9	6 x 4 x 8	100	50
V1	2 x 1.5 x 6V	1	1
W1	2 x 1.5 x 8V	5	3
W3	3 x 2 x 6V	5	3

For details including performance curves for pumps E1, EL, E3, F1, FL, F4, G2, V1, W1 and W3 please refer to Global Pumps.

## Section F - Drive / Wet End Separation

The preventative maintenance and disassembly procedures are intended for use during standard field inspection or service.

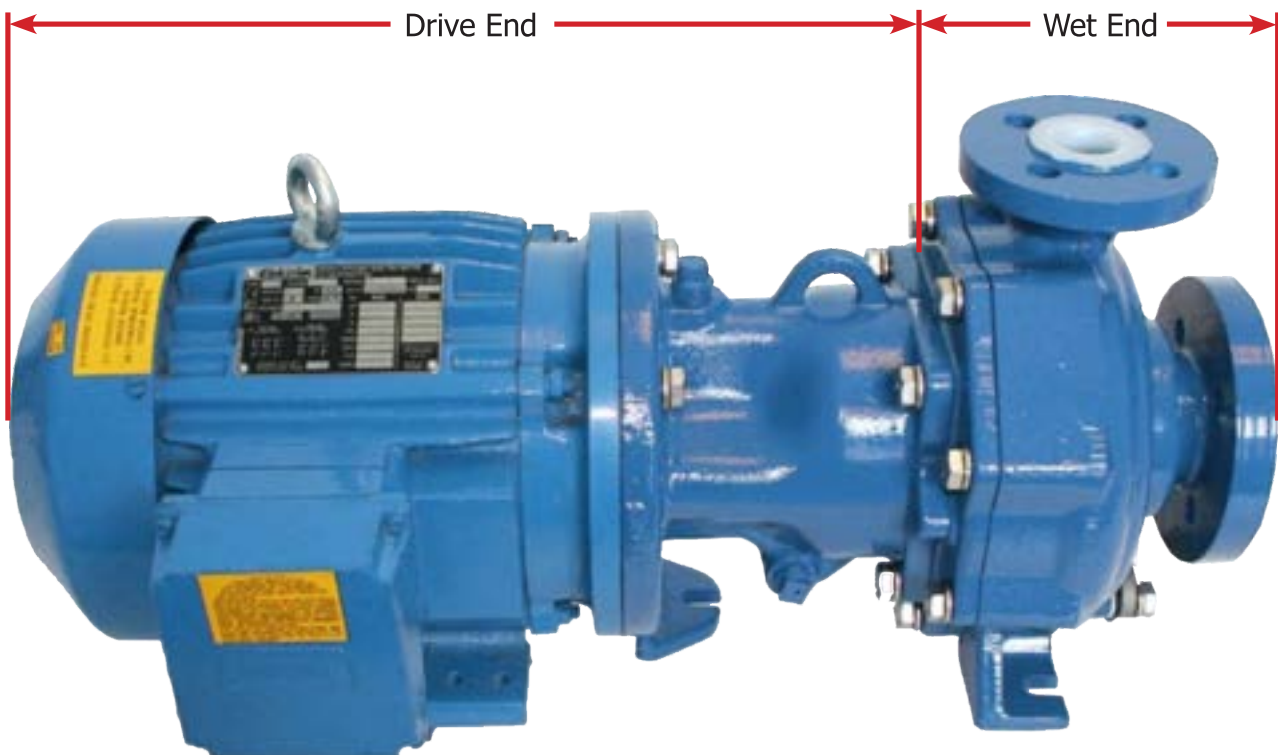
The disassembly can take place while the pump is piped up or in a maintenance shop. If at all possible, we recommend performing all repairs using the shop procedures to reduce the risk of damage to the SiC parts.

### **DANGER**

Lock out driver power to prevent accidental start-up that could result in serious personal injury. Lock out and/or disconnect power.

### **DANGER**

Shut off valves controlling flow to and from the pump. Isolate the pump from the system and relieve any remaining system pressure.





## Section F - Drive / Wet End Separation

Tools needed

- ✓ Wrench
- 19mm (for A series pumps)
- ✓ 24mm (for B-C series pumps)
- Jack bolts (2) 13mm

### MAGNETIC

Techniflo pumps contain extremely strong magnets. The use of non-magnetic tools and work surface is highly recommended. The work area must be free of any ferrous materials.



Separate drive end from wet end by tightening the (2) jack bolts.



Drain pump, individually decontaminate each component in a/w all federal, state, local and company environmental regulations.



Turn the drive end off to the side to allow space for disassembly of the wet end.



Remove the (4) hex bolts on the adapter.

### DANGER

When handling hazardous and/or toxic fluids, skin, eye and respiratory protection are required. If pump is being drained, precautions must be taken to prevent injury or environmental contamination.



Remove bolt connecting the adapter foot to the base and any bolts connecting the motor to the base.



Firmly hold the drive end and quickly pull it away from the wet end. Pull the drive end back at least 150mm.



Insert (2) of the bolts you just removed into the jack bolt holes highlighted above and evenly tighten them until the ring breaks free. Remove all the remaining bolts.

## Section F - Drive / Wet End Separation



Pull the assembly back in a straight line until it's clear of the casing.



Remove the containment shell and impeller from the containment ring. Note: Optional, may be very difficult on pumps in service for long periods of time.



Firmly hold the containment shell and use your index fingers and thumbs to support the containment ring.



Loosen all (8) hex bolts and remove the (4) highlighted above. Leave the other 4 loose but still attached to the casing.

**NOTE:** Visually inspect the containment ring. If it appears loose then you can remove all the bolts and skip the following step. However, if the pump has been in service for a long period of time, it is very common for the containment ring to be stuck to the casing. In this case, use the following procedure:



Lift and remove the impeller from the containment shell.

### CAUTION

For larger pumps we recommend having two people perform the following procedures in order to decrease the chance of breaking the SiC.

## Section G - Wet End Disassembly

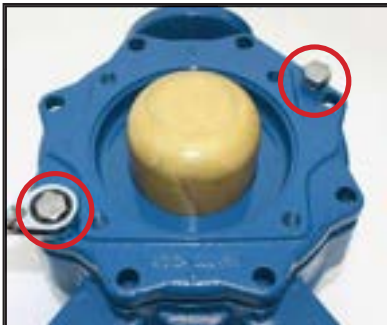


Remove all flange and casing feet bolts. Lay the wet end face down on the suction flange in the work area. Place a piece of cardboard or a shop towel underneath to protect the flange.



Loosen and remove the (8) hex bolts with a wrench.

**NOTE:** Visually inspect the containment ring. If it appears loose then you can remove all the bolts and skip the following step. However, if the pump has been in service for a long period of time, it is very common for the containment ring to be stuck to the casing. In this case, use the following procedure:



Insert (2) bolts into the jack bolt holes highlighted above. Tighten the (2) bolts until the containment ring breaks free. Remove all the remaining bolts.



Slightly rotate the containment ring to make it easier to grab.



Lift the containment ring with your fingers while holding down the containment shell with your thumbs.



Lift the containment ring straight up off of the containment shell and set aside.



Carefully lift and remove the containment shell straight up from the impeller.



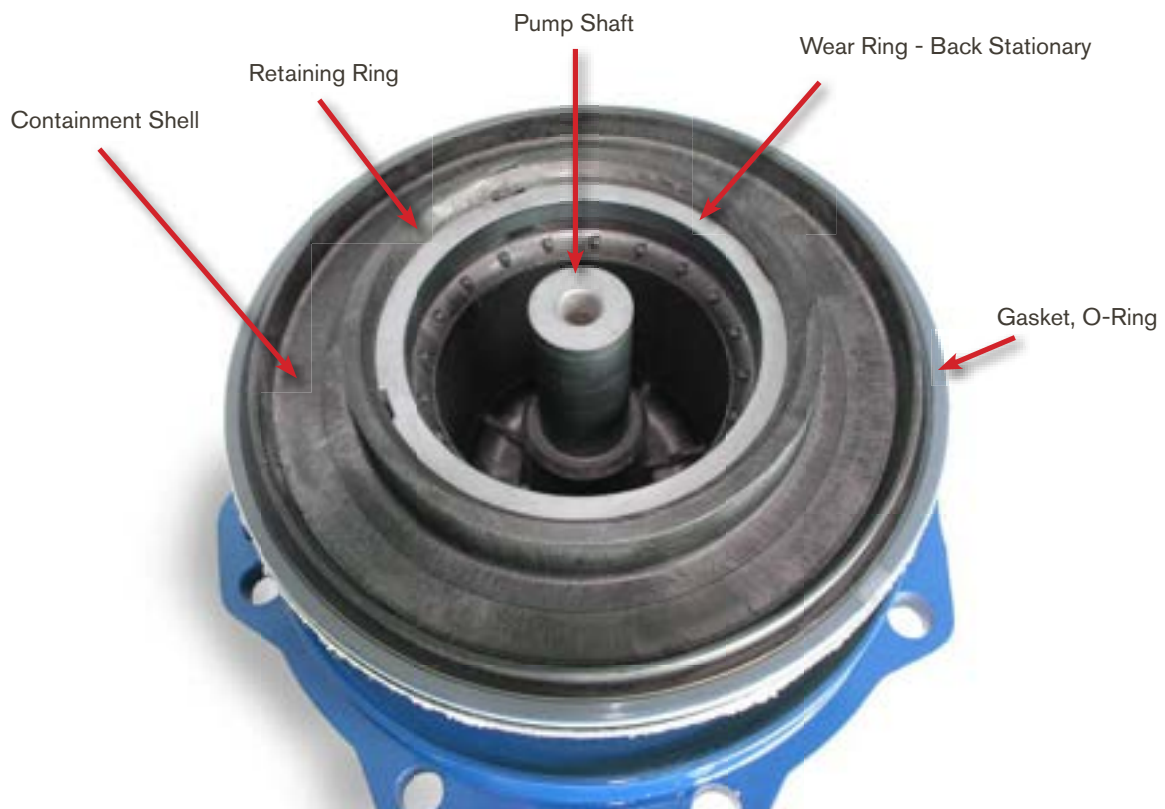
Carefully lift and remove the impeller straight up from the casing.

## Section H - Wet End Inspection



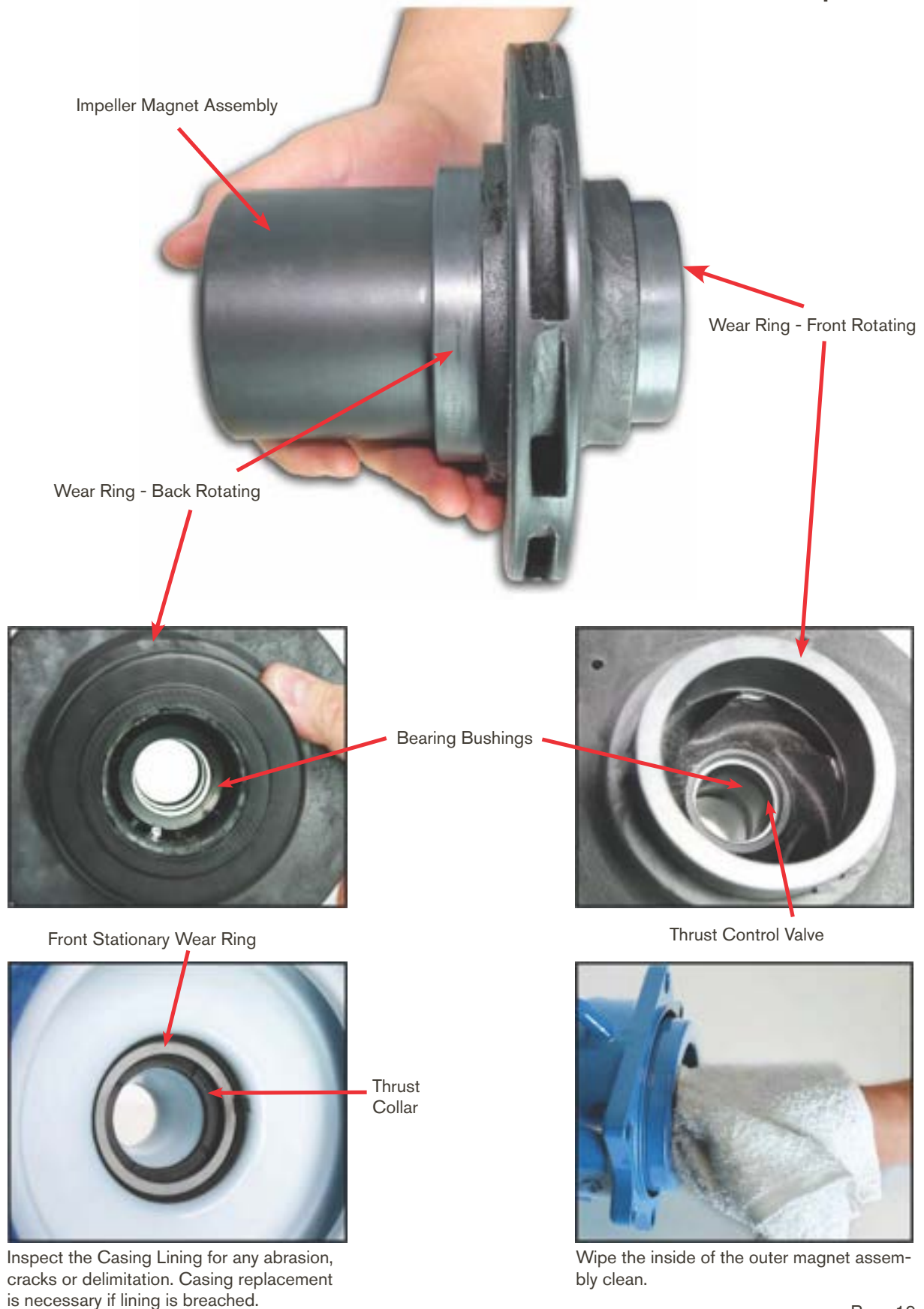
When inspecting the pump internals check all Silicon Carbide (SiC) parts for cracks, chips and scoring marks. Minor chips less than 0.5mm are acceptable. Inspect all plastic parts for scoring and cracks. Minor scratches or cuts less than 1mm are acceptable. Wipe the Gasket clean. If replacement of any part is required, follow the procedures in the repair sections of this manual.

Carefully clean and inspect the following parts:





## Section H - Wet End Inspection



## Section I - Casing Repair Wear Ring Replacement

Tools needed

- ☒ T-Handle Allen key
- ☒ Wire cutter
- ☒ lightweight hammer
- ☒ Soldering Iron



Casing with wear rings

### Removal



Insert a flathead screwdriver into the casing notch opposite the weld and force out the retaining ring.



Lift out the thrust collar and front stationary wear ring with your fingers. Pull the retaining ring free.



Remove the locking pin(s).

### Installation



Insert thrust collar (grooved side up) and align the keyway notch with the casing keyway notch.



insert and align the front stationary (SiC) retaining ring with the keyway notch in the casing.



Insert locking pin(s) into all but one of the keyway.



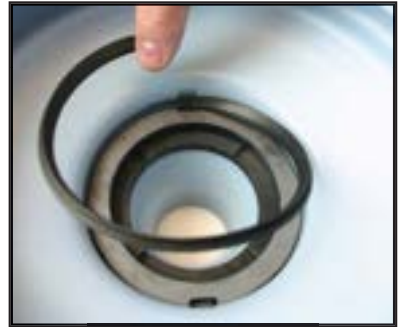
## Section I - Casing Repair Wear Ring Replacement



Casings will have two to six keyways. the example above has four, in this case you must insert (3) locking pins.



Insert keyed end of the retaining ring into the remaining keyway.



Press the retaining ring into the casing groove.



Trim the retaining ring end so it slightly overlaps the drive pin.



Line up the tip of the T-Handle Allen key at the end of the retaining ring.



Gently tap the retaining ring into position.



With a soldering iron, melt the two ends together.



The completed casing.

## Section J - Containment Shell Repair Wear Ring Replacement

Tools needed

- ☒ T-Handle Allen key
- ☒ Wire cutter
- ☒ lightweight hammer
- ☒ Soldering Iron
- ☒ Shaft centering tool



Place the centering tool over the shaft.



Place the wear ring over the centering tool.



Align the wear ring grooves with the containment shell moulded keys.



Insert the keyed end of the retaining ring into the open groove.



Apply pressure with your thumbs to inset the retaining ring.



Trim the retaining ring so it slightly overlaps the key.



Place your T-Handle Allen key on the end of the retaining ring and gently tap it into place.



Remove the centering tool and melt the retaining ring together with a soldering iron.

## Section J - Containment Shell Repair Shaft Removal

Tools needed

- ✓ 6mm Allen key
- ✓ 13mm ratchet spanner
- ✓ lightweight hammer
- ✓ Shaft removal tool  
A Series - #TLG-2017-AA  
B-C Series - #TLG-2018-AA



Secure the containment shell upside down - you can use the adapter for this if nothing else is available.



Place the bottom half of the shaft removal tool over the shaft.



Place the rest over the shaft, lining up the bolts with the indentations on the bottom half.



Using the Allen key, tighten the top half to the shaft.



Evenly tighten the two bolts, alternating between them when you feel resistance.

### CAUTION

Do not use air or power tools. Do not over tighten the bolts or you may crack the shaft.



remove the shaft from the containment shell. Loosen and remove the shaft removal tool.

## Section J - Containment Shell Repair Shaft Installation

Tools needed

- ☒ Aluminium spacer
- ☒ Shaft centering tool
- ☒ Arbor press



Align the moulded key with the pump shaft groove



Place the shaft centering tool over the shaft.



Place the aluminium spacer over the shaft and push the shaft in using the Arbor press until the shaft is flush with the centering tool.



Remove the shaft centering tool.



place the spacer directly on the shaft and press the shaft down the rest of the way down until it is firmly seated.



## Section K - Impeller Repair

### Bushing Removal

Tools needed

- ✓ Arbor press
- ✓ Bushing installation/removal kit  
Part - #TLG-2016-AA



### CAUTION

Make sure the busing removal tool is perfectly centered to prevent damaging the inside of the impeller. we recommend placing a shop towel under the impeller to prevent damage to the SiC when it falls free.



Centre the stepped end of part (E) of the bushing removal tool into the thrust control valve.



With the arbor press, carefully push the bushings down until the first bushing and spacer dislodge.



Lift the impeller and remove the first bushing and spacer to allow room for removing the second bushing and thrust control valve.



Continue pressing down on the arbor press until the second bushing and thrust control valve dislodge.



When the second bushing and thrust control valve are free, remove the impeller.



Remove the second bushing and thrust control valve from the bushing removal tool.

## Section K - Impeller Repair Bushing Installation

Tools needed

- ☒ Arbor press
- ☒ Bushing installation/removal kit  
Part - #TLG-2016-AA



Locate part (C) of the bushing installation tool.



Place the impeller on part (C) of the bushing installation tool.



Locate the moulded key in the impeller. it will be marked with white paint.



On the underside, the thrust control valve groove must line up with the moulded key



Place the thrust control valve over the rubber gasket on the stepped end of bushing installation tool part (E).



Line up the thrust control valve groove with the marked moulded key.



## Section K - Impeller Repair Bushing Installation



Carefully insert the thrust control valve until it stops, making sure that it is perfectly aligned.



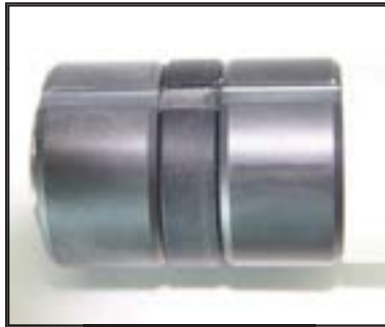
Make sure the bushing installation tool is perfectly centered.



With a slow even pressure, push the thrust control valve into place.



It will stop when it is firmly seated.



Align the large SiC bushings separator by the plastic spacer on the bushing tool.



Add the white plastic spacer and the large top piece of the bushing tool.



Make sure the bushings are held securely by the rubber O-rings on the bushing tool.



Align the bushings with the moulded key.



Press the bushings in until they are firmly seated using the arbor press.

## Section K - Impeller Repair Back Stationary Wear Ring Installation

Tools needed

- ☒ Flathead screwdriver
- ☒ Bench press
- ☒ Aluminium spacer
- ☒ PVC trimming sleeve
- ☒ Soldering iron
- ☒ Needle nose pliers



Place the back rotating wear ring on the impeller. Align the notches.



Place the PVC trimming sleeve over the wear ring.



Place the aluminium spacer over the trimming sleeve and press the wear ring into place with the bench press.



Insert the retaining pin into the slot on the impeller.



Force the pin into place using pliers.



Push the rest of the way with a screwdriver.



Once the pin is completely in, use a soldering iron to melt it into place.



The finished installation.

## Section K - Impeller Repair

### Front Stationary Wear Ring Installation

Tools needed

- ☒ Flathead screwdriver
- ☒ Bench press
- ☒ Aluminium spacer
- ☒ Soldering iron
- ☒ Needle nose pliers



Place the front rotating wear ring on the impeller. Align the notches.



Place the aluminium spacer over the wear ring and press into place with the bench press.



Insert the retaining pin into the slot in the impeller.



Force the pin into place using pliers.



Push the rest of the way with a screwdriver.



The retaining pin properly inserted.



Once the wear ring is completely in, use the soldering iron to solder into place.



The finished installation.

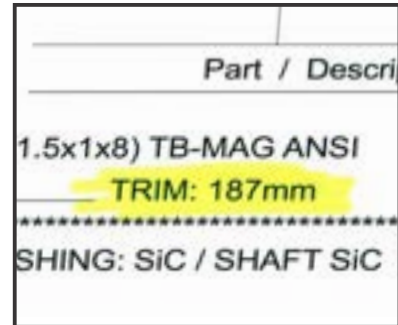
## Section K - Impeller Repair Impeller Trimming

Tools needed

- ☒ Lathe
- ☒ Caliper
- ☒ X-acto knife
- ☒ Trimming sleeve
- ☒ A series - #TLG-2033-AA
- ☒ B-C series - #TLG-2023-AA



Measure the current diameter of the impeller. In this example it is 209.5mm



In this example we need to trim the impeller to 187mm.



Place the trimming sleeve over the impeller to protect it from damage.



Insert the impeller into the lathe and tighten the jaws.



Set the trim 6mm less than the current diameter. If you have never trimmed an impeller before, then we recommend only cutting 3mm at a time.



Trim the first layer at slow speed.



Use the X-acto knife to clean off the loose plastic on the impeller in order to get an accurate measurement.



Check the diameter again with the caliper.



## Section K - Impeller Repair

### Impeller Trimming



Set the lathe for 6mm less than the current diameter measurement.



Trim this layer at slow speed.



Clean off any loose plastic that would interfere with your diameter measurements.



Use the caliper to measure the current diameter.



Repeat the preceeding four steps until you reach the desired diameter.



Chamfer the right edge of the impeller.



Chamfer the same amount off the left edge.



Loosen the jaws and remove the impeller.



Remove the trimming sleeve and trim any remaining loose plastic.

## Section L- Wet End Assembly Piped Up



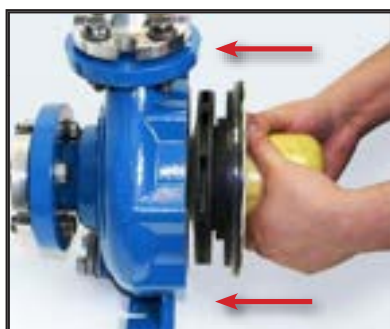
Align and slide the Impeller magnet assembly onto the pump shaft located inside the containment shell.



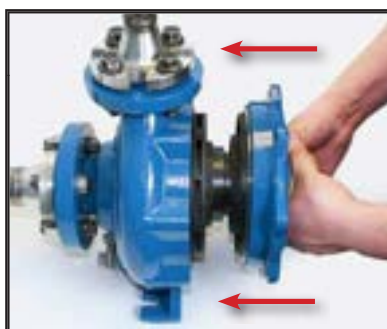
Place the assembly into the containment ring.

### CAUTION

With larger pumps, we highly recommend following the shop assembly procedure on the following page to eliminate the chance of damaging the SiC. Due to the brittle nature of SiC, all assemblies must be handled with care to avoid chipping or cracking. Thoroughly clean all parts before assembly. Make sure all parts are free of dirt, metallic particles, etc.



Insert the assembled impeller and containment shell. Carefully align the impeller and casing wear rings. Hold the assembly and install the containment ring.



If you cannot separate the containment shell and ring, you can insert the assembly as one piece. Make sure the arrow on the ring points upward.



Tighten (8) hex cap screws with lock washer.



Apply torque the bolts to the specification in the torque table on the following page.



Extend the jack screws on the drive end. Align the drive end and push it in until the jack screws meet the wet end.



Retract the jack screws until the two pump halves are mated. Insert and tighten the (4) adapter hex bolts to the torque given in torque table on the following page.



## Section L - Wet End Assembly In Shop



With the casing face down, insert the impeller.



When the impeller is in place, rotate it by hand to make sure it spins freely.



Align the shaft in the containment shell with bushings.



Lower the containment shell into place.



Place the containment ring over the containment shell and align the bolt holes.



Make sure the arrow on the containment ring points toward the discharge flange.



Insert and hand tighten the (8) casing bolts with lock washers.



Tighten the bolts with a wrench and then torque them to the following rating.

TORQUE TABLE	
Bolt Size	Torque (Nm)
3/8 - 16	27
1/2 - 13	61
5/8 - 11	122

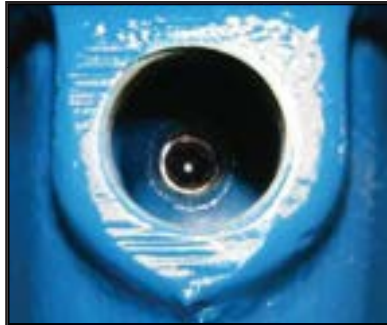
## Section M - Drive End Disassembly

### MAGNETIC

The outer magnet assembly contains very strong magnets. Use caution inserting the jack screws and plate. Under normal circumstances a visual inspection and wiping clean the inside of the outer magnet is sufficient.



Remove the metal pipe plug from the top of the adapter.



Locate the (2) set screws on the outer magnet assembly.



Loosen the (2) set screws.



Locate the (2) screw holes inside the outer magnet assembly.



Attach the jack screw plate with two screws.



Insert a jack screw into the jack screw plate and tighten the jack bolt to free the outer magnet assembly.



Carefully remove the outer magnet assembly.



Remove (4) bolts from the adapter.



Remove the adapter from the motor.

## Section N - Drive End Assembly

Tools needed

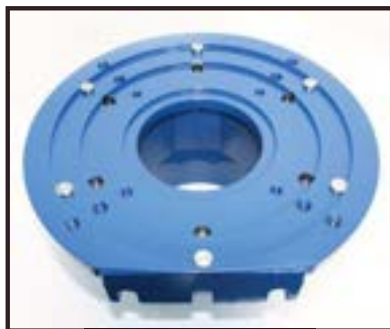
- ☒ Hammer
- ☒ Wrench  
19mm (A), 24mm (B-C)
- ☒ T-Handle Allen key  
5mm (A), 6mm (B-C)
- ☒ Ruler or straight edge



Pound the (5) dowel pins in with a hammer until they are firmly seated. The installation is permanent. Check the configuration for your motor before you begin.



The properly installed dowel pin will be flush with the adapter.



Adapter ADP-1005-S, configured for IEC 132.



Adapter ADP-1005-SI, configured for IEC 100 or IEC 112.



Adapter ADP-1015-S, configured for IEC 132.



Adapter ADP-1015-SI, configured for IEC 100 or IEC 112.



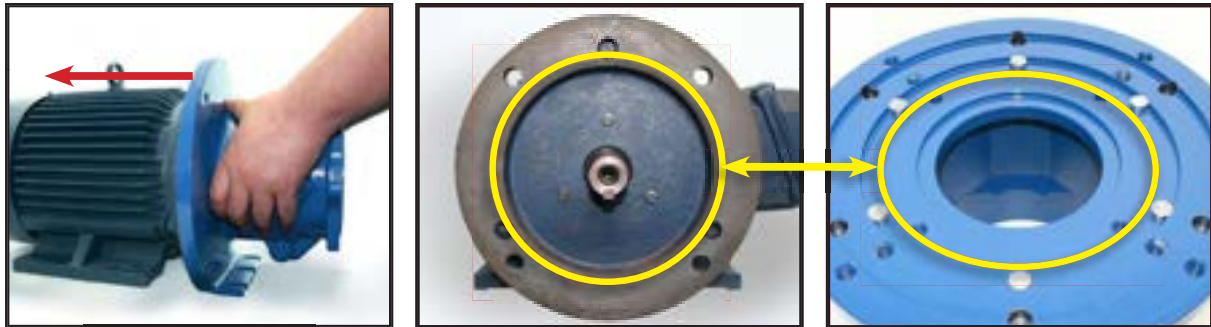
Motors larger than IEC 132 require an adapter plate. To install, align the inner holes on the adapter plate with the holes on the bottom of the adapter.



Insert and tighten the (4) bolts to the adapter plate as shown above.



## Section N - Drive End Assembly



Place the adapter on the motor, the ring on the motor flange will align with the adapter (IEC 112 shown). Dowel pin (or lack thereof) configurations will vary depending on the motor frame.



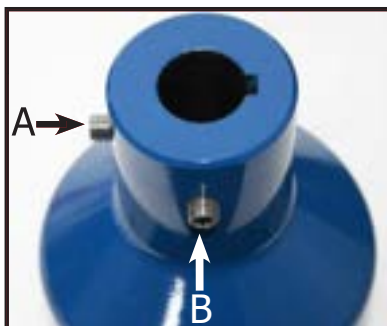
Align the screw holes on the motor with the threaded holes on the adapter.



Insert and hand tighten the (4) bolts with lock washers.



Tighten the bolts with a wrench.



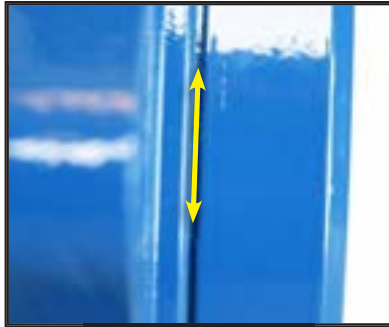
Note the placement of the set screws in relation to the key notch before installation.



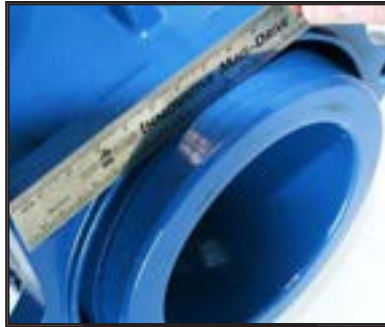
Align the key groove on the outer magnet assembly with the key on the motor shaft and install.



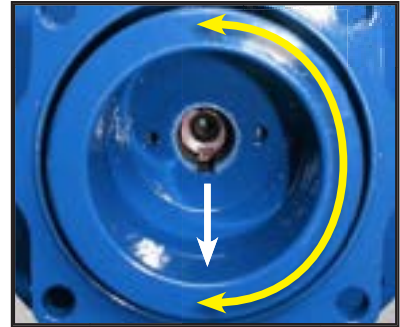
## Section N - Drive End Assembly



Locate the alignment groove on the outer drive.



Use a ruler, straight edge or visually align the groove with the adapter.



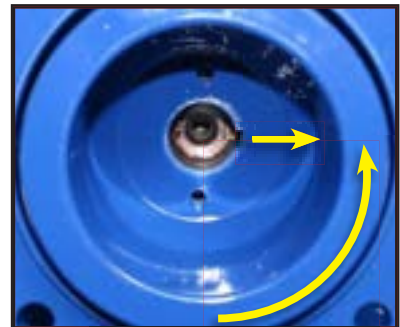
Rotate the outer drive until the motor key points down.



Locate the first set screw (A).



Tighten the first set screw with the T-Handle Allen key.



Rotate the outer drive until the motor key points to the right.



locate the second set screw (B).



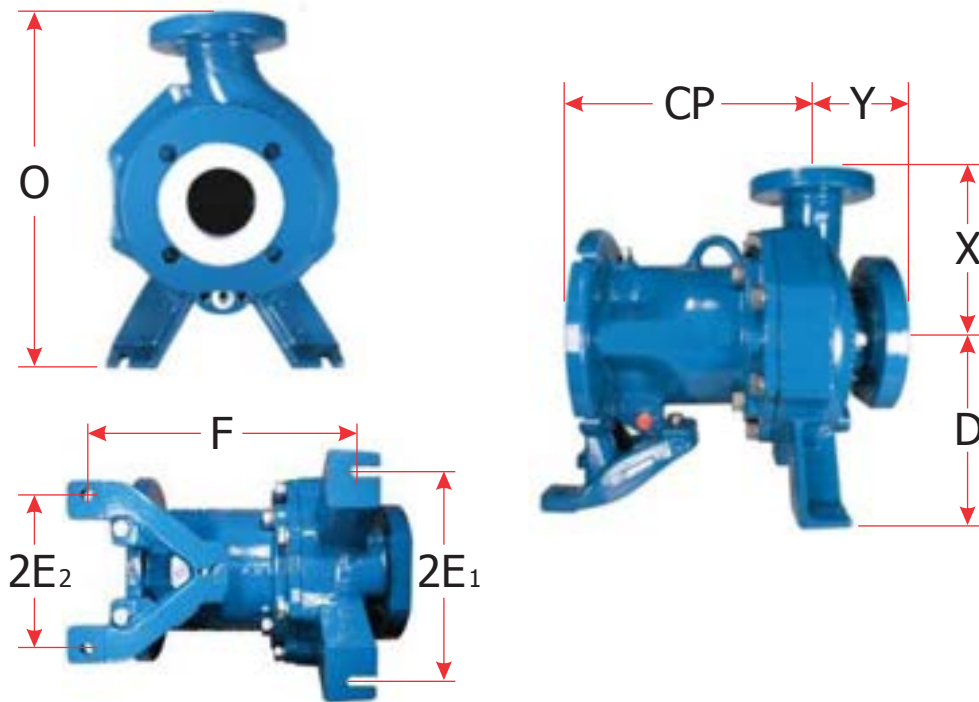
Tighten the second set screw with the T-Handle Allen key.



Replace the metal plug on the adapter and drive end assembly is complete.



## Section O - Dimensions



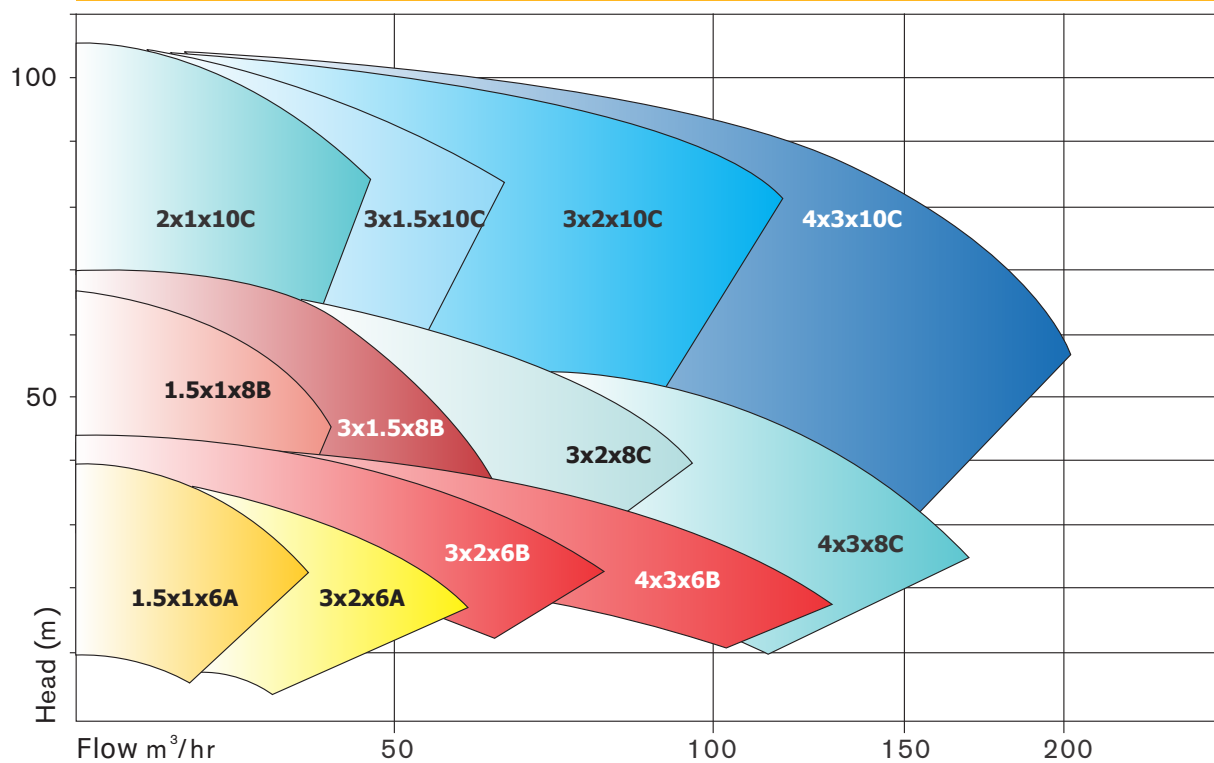
TB-Mag Series	Model (Size)	ANSI No.	D	2E <sub>1</sub>	2E <sub>2</sub>	F	O	X	Y	CP	SF	DF	kg				
A	A1 - (1.5 x 1 x 6)	AA	133	152	0	184	298	165	102	221	38	25	36				
	AL - (1.5 x 1 x 6 LF) Low Flow	AA												76	38	41	
	A3 - (3 x 1.5 x 6)	AB									51						
	A4 - (3 x 2 x 6)	--															
B	B1 - (1.5 x 1 x 8)	AA	210	248	184	318	425	216		287	38	25	57				
	BL - (1.5 x 1 x 8 LF) Low Flow	AA					76							51	70		
	B4 - (3 x 1.5 x 8)	A50						419			65						
	B5 - (3 x 2 x 6) Tall 16.75"	A10						102			76	84					
	B6 - (4 x 3 x 6)	--						76		51	72						
C	C1 - (3 x 2 x 8)	A60					254					451	241		102	76	88
	C2 - (4 x 3 x 8)	A70										489	279		51	25	79
	C3 - (2 x 1 x 10)	A05										425	216	76	38	85	
	CL - (2 x 1 x 10 LF) Low Flow	A05							451			241	51		86		
	C4 - (3 x 1.5 x 10)	A50							489			279	102	76	99		
	C5 - (3 x 2 x 10)	A60													99		
	C6 - (4 x 3 x 10)	A70	597	343	152	102			122								
	C7 - (4 x 3 x 10 H)	A70															
	C8 - (6 x 4 x 10 H)	A80															
	C9 - (6 x 4 x 8)	A80															

For details including performance curves for pumps E1, EL, E3, F1, FL, F4, G2, V1, W1 and W3 please refer to Global Pumps.

## Section P - Curves

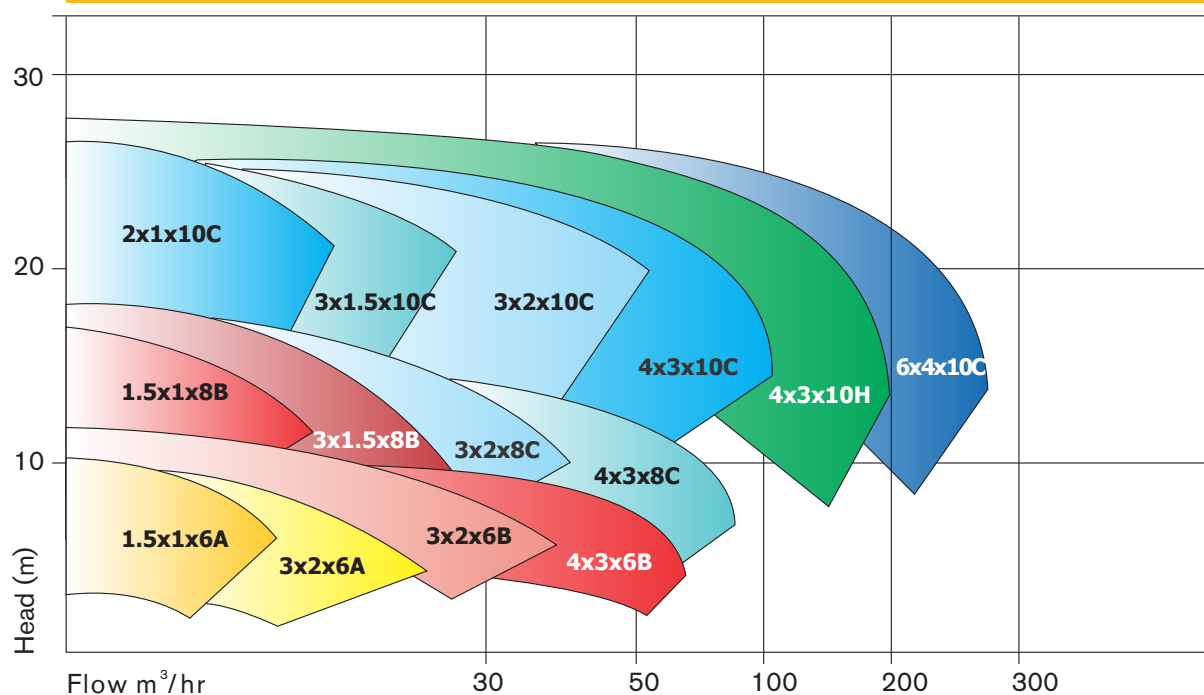
**Performance Curve - TB Series**

**2900rpm**



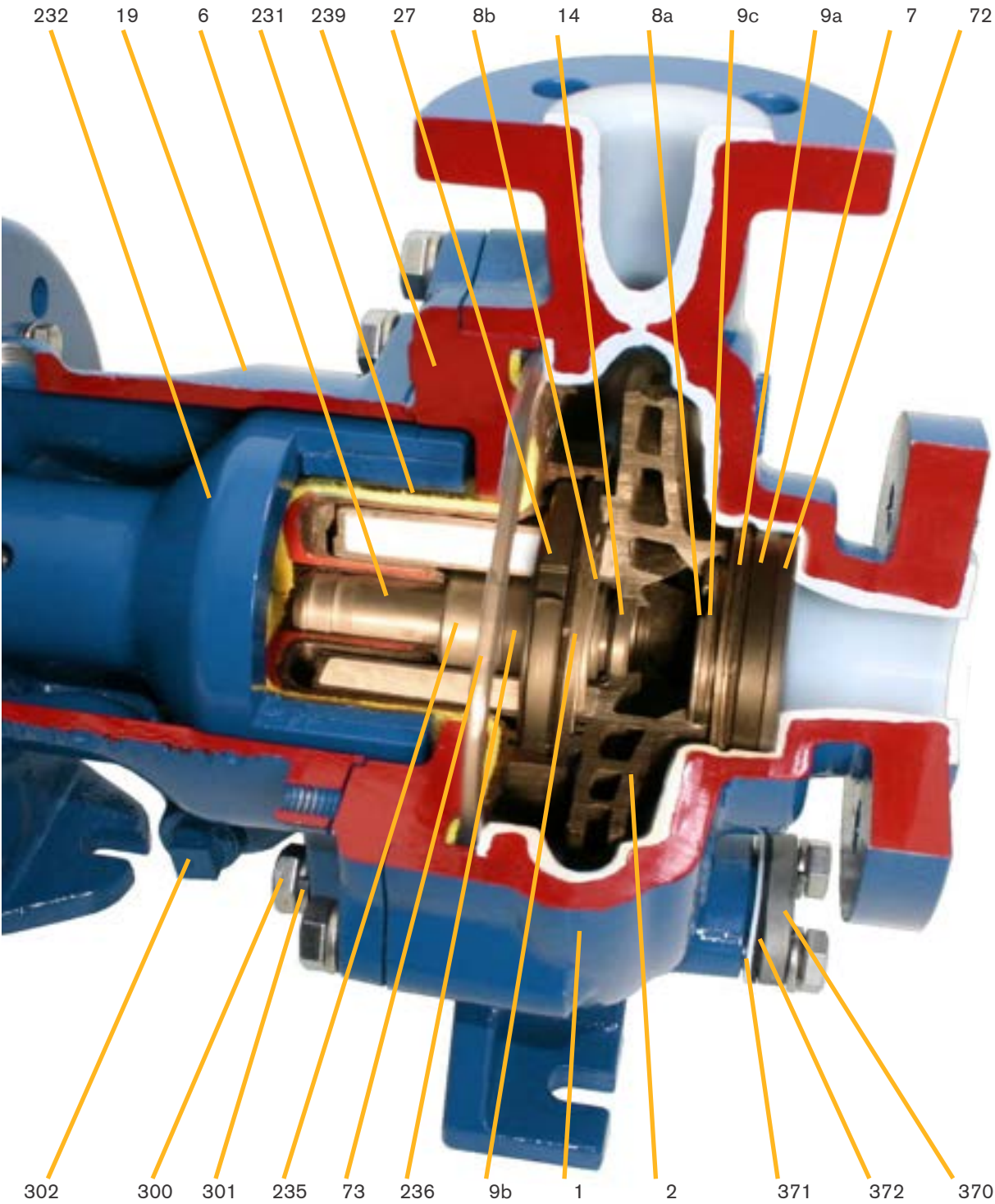
**Performance Curve - TB Series**

**1450rpm**



For details including performance curves for pumps E1, EL, E3, F1, FL, F4, G2, V1, W1 and W3 please refer to Global Pumps.

Section Q - Item List



## Section Q - Item List

Item #	Qty.	Part Name	Material
1	1	Casing	Ductile Iron / ETFE Lining
2	1	Impeller Magnet Assembly	ETFE
6	1	Shaft, Pump	Silicon Carbide
7	1	Wear Ring, Front Stationary	Silicon Carbide
8a	1	Wear Ring, Front Rotating	Silicon Carbide
8b	1	Wear Ring, Back Rotating	Silicon Carbide
9a	1	Retaining Ring, Front Stationary	ETFE
9b	1	Retaining Ring, Rear Stationary	ETFE
9c	2	Retaining Ring, Pin (sets)	ETFE
14	1	Valve, Thrust Control	Silicon Carbide
19	1	Adapter	Ductile Iron
27	1	Wear Ring, Back Stationary	Silicon Carbide
72	1	Collar, Thrust	CFR /PTFE
73	1	Gasket, O-Ring	FEP / FKM (Fluorocarbon) Core
231	1	Shell, Containment	ETFE / Fiber Reinforced Vinyl Ester
232	1	Magnet Assembly, Outer	Ductile Iron / Neodymium Iron
235	2	Bushing, Bearing	Silicon Carbide
236	1	Bushing, Spacer	PTFE
239	1	Ring, Containment	Ductile Iron
300	14	Hex Cap Screw	304 SS
301	14	Lock Washer	304 SS
302	2	Plug	Plastic
370	1	Drain Flange	304 SS
371	1	Drain Gasket	PTFE
372	1	Drain Gasket	Neoprene

### Material Description and Properties

#### CF-ETFE

Carbon Fibre Ethylene tetrafluoro-ethylene (CF-ETFE) is the standard fluoropolymer plastic used to make our impeller and containment shell. In addition to high chemical resistance, this thermoplastic offers greater mechanical strength over other fluoropolymers.

Property	Units	Amount
Specific Gravity	N/A	1.74
Working Temperature Range	°C	-29 to 120
Tensile Strength	MPa	51
Flexural Modulus	MPa	1240

#### Ductile Iron

Ductile Iron is Cast Iron with spheroidal graphite. It's chemical composition and percent of carbon is about the same as grey iron. The transformation to ductile iron occurs when molten grey iron is treated with magnesium. The insertion of magnesium into the pouring ladle transforms the Fe3C flakes into spheroids. These spheroids strengthen the metal by acting as crack arresters.

Property	Units	Amount
Tensile Strength	MPa	65000
Yield Strength	MPa	45000
Elongation	%	12
Hardness	BHN	200

#### Alpha Sintered Silicon Carbide (SiC)

Alpha Sintered Silicon Carbide (SiC) is by far the strongest, hardest, most corrosion resistant ceramic available today. It is produced by pressure-less sintering of ultra-pure micron powder at temperatures above 1980°C. The finished part is a fine grain, lightweight, extremely hard material that can out perform any super alloy.

Property	Units	Amount
Density	g/cm <sup>3</sup>	3.1
Hardness	Kg/mm <sup>2</sup>	2600
Flexural Strength	Mpa	395
Compressive Strength	Mpa	3400

#### CFR / PTFE

Polytetrafluoroethylene (PTFE) is a synthetic fluoropolymer which finds numerous applications. Water-containing substances do not wet PTFE, therefore adhesion to PTFE surfaces is inhibited.

Property	Units	Amount
Specific Gravity	N/A	2.09
Tensile Strength	MPa	24
Compressive Strength	MPa	30
Tensile Elastic Modulus	MPa	88

#### FEP / FKM (Fluorocarbon) Core

FKM is the designation for about 80% of fluorinated elastomers. All FKM's contain vinylidene fluoride as a monomer. Fluoro-elastomers are used for their superior heat and chemical resistance.

Property	Units	Amount
Specific Gravity	N/A	2.15
Working Temperature Range	°C	-29 to 150
Tensile Strength	MPa	28
Compressive Strength	MPa	15
Flexural Modulus	MPa	634

#### Pure ETFE

Ethylene tetrafluoroethylene (ETFE) is the standard fluoropolymer plastic used to line our casings. When rotomoulded, ETFE is mechanically bonded to the ductile iron casing, giving the absolute best connection and durability far superior to conventional blown and compression moulding.

Property	Units	Amount
Specific Gravity	N/A	1.78
Working Temperature Range	°C	-29 to 120
Tensile Strength	MPa	46
Tensile Elongation	%	150 - 300
Flexural Modulus	MPa	1000

## Section R - Parts List



Item # - Casing

Model	Size / Description	Part #
A1	1.5 x 1 - ANSI class 150	CSG-1010-SI
	1.5 x 1 - ANSI class 300	CSG-1011-SI
	50 x 32mm - ISO PN 16	CSG-1012-SI
	50 x 40mm - JIS 10 kg/cm <sup>2</sup>	CSG-1013-SI
AL	1.5 x 1 - ANSI class 150	CSG-1010-LF
	1.5 x 1 - ANSI class 300	CSG-1011-LF
	50 x 32mm - ISO PN 16	CSG-1012-LF
	50 x 40mm - JIS 10 kg/cm <sup>2</sup>	CSG-1013-LF
A3	3 x 1.5 - ANSI class 150	CSG-1070-SI
	3 x 1.5 - ANSI class 300	CSG-1071-SI
	65 x 40mm - ISO PN 16	CSG-1072-SI
	65 x 50mm - ISO PN 16	CSG-1073-SI
	65 x 50mm - JIS 10 kg/cm <sup>2</sup>	CSG-1074-SI
A4	3 x 2 - ANSI class 150	CSG-1075-SI
	3 x 2 - ANSI class 300	CSG-1076-SI
	80 x 50mm - ISO PN 16	CSG-1077-SI
	80 x 65mm - ISO PN 16	CSG-1078-SI
	80 x 65mm - JIS 10 kg/cm <sup>2</sup>	CSG-1079-SI
B1	1.5 x 1 - ANSI class 150	CSG-1030-SI
	1.5 x 1 - ANSI class 300	CSG-1031-SI
	50 x 32mm - ISO PN 16	CSG-1032-SI
	50 x 40mm - JIS 10 kg/cm <sup>2</sup>	CSG-1033-SI

Item # 1 - Casing

Model	Size / Description	Part #
BL	1.5 x 1 - ANSI class 150	CSG-1030-LF
	1.5 x 1 - ANSI class 300	CSG-1031-LF
	50 x 32mm - ISO PN 16	CSG-1032-LF
	50 x 40mm - JIS 10 kg/cm <sup>2</sup>	CSG-1033-LF
B3	3 x 2 - ANSI class 150	CSG-1020-SI
	3 x 2 - ANSI class 300	CSG-1021-SI
	80 x 50mm - ISO PN 16	CSG-1022-SI
	80 x 65mm - JIS 10 kg/cm <sup>2</sup>	CSG-1023-SI
	80 x 65mm - ISO PN 16	CSG-1024-SI
B4	3 x 1.5 - ANSI class 150	CSG-1080-SI
	3 x 1.5 - ANSI class 300	CSG-1081-SI
	65 x 40mm - ISO PN 16	CSG-1082-SI
	65 x 50mm - ISO PN 16	CSG-1083-SI
	65 x 50mm - JIS 10 kg/cm <sup>2</sup>	CSG-1084-SI
B5	3 x 2 (A10) - ANSI class 150	CSG-1090-SI
	3 x 2 (A10) - ANSI class 300	CSG-1091-SI
	80 x 50mm - ISO PN 16	CSG-1092-SI
	80 x 65mm - ISO PN 16	CSG-1093-SI
	80 x 65mm - JIS 10 kg/cm <sup>2</sup>	CSG-1094-SI
B6	4 x 3 - ANSI class 150	CSG-1160-SI
	4 x 3 - ANSI class 300	CSG-1161-SI
	100 x 65mm - ISO PN 16	CSG-1162-SI
	100 x 80mm - ISO PN 16	CSG-1163-SI
	100 x 80mm - JIS 10 kg/cm <sup>2</sup>	CSG-1164-SI
C1	3 x 2 - ANSI class 150	CSG-1050-SI
	3 x 2 - ANSI class 300	CSG-1051-SI
	80 x 50mm - ISO PN 16	CSG-1052-SI
	80 x 65mm - JIS 10 kg/cm <sup>2</sup>	CSG-1053-SI
C2	4 x 3 - ANSI class 150	CSG-1060-SI
	4 x 3 - ANSI class 300	CSG-1061-SI
	100 x 65mm - ISO PN 16	CSG-1062-SI
	100 x 80mm - JIS 10 kg/cm <sup>2</sup>	CSG-1063-SI
	100 x 80mm - ISO PN 16	CSG-1064-SI



## Section R - Parts List



Item # 1 - Casing

Model	Size / Description	Part #
C3	2 x 1 - ANSI class 150	CSG-1100-SI
	2 x 1 - ANSI class 300	CSG-1101-SI
	50 x 32mm - ISO PN 16	CSG-1102-SI
CL	2 x 1 - ANSI class 150	CSG-1100-LF
	2 x 1 - ANSI class 300	CSG-1101-LF
	50 x 32mm - ISO PN 16	CSG-1102-LF
C4	3 x 1.5 - ANSI class 150	CSG-1110-SI
	3 x 1.5 - ANSI class 300	CSG-1111-SI
	65 x 40mm - ISO PN 16	CSG-1112-SI
	65 x 50mm - ISO PN 16	CSG-1113-SI
	65 x 50mm - JIS 10 kg/cm <sup>2</sup>	CSG-1114-SI
C5	3 x 2 - ANSI class 150	CSG-1120-SI
	3 x 2 - ANSI class 300	CSG-1121-SI
	80 x 50mm - ISO PN 16	CSG-1122-SI
	80 x 65mm - JIS 10 kg/cm <sup>2</sup>	CSG-1123-SI
C6	4 x 3 - ANSI class 150	CSG-1130-SI
	4 x 3 - ANSI class 300	CSG-1131-SI
	100 x 65mm - ISO PN 16	CSG-1132-SI
	100 x 80mm - ISO PN 16	CSG-1133-SI
	100 x 80mm - JIS 10 kg/cm <sup>2</sup>	CSG-1134-SI
C7	4 x 3 - ANSI class 150	CSG-1140-SI
	4 x 3 - ANSI class 300	CSG-1141-SI
	100 x 65mm - ISO PN 16	CSG-1142-SI
	100 x 80mm - ISO PN 16	CSG-1143-SI
	100 x 80mm - JIS 10 kg/cm <sup>2</sup>	CSG-1144-SI
	125 x 80mm - ISO PN 16	CSG-1145-SI
C8	6 x 4 - ANSI class 150	CSG-1150-SI
	6 x 4 - ANSI class 300	CSG-1151-SI
	150 x 100mm - ISO PN 16	CSG-1152-SI
	150 x 125mm - ISO PN 16	CSG-1153-SI
	150 x 125mm - JIS 10 kg/cm <sup>2</sup>	CSG-1154-SI
C9	6 x 4 - ANSI class 150	CSG-1155-SI
	6 x 4 - ANSI class 300	CSG-1156-SI
	150 x 125mm - ISO PN 16	CSG-1157-SI
	150 x 125mm - JIS 10 kg/cm <sup>2</sup>	CSG-1158-SI

Item # 2 - Impeller

Model	Size	Part #
A1	(1.5 x 1 x 6)	IMA -1010-SI
AL	(1.5 x 1 x 6) LF	IMA -1010-SI
A3	(3 x 1.5 x 6)	IMA -1070-SI
A4	(3 x 2 x 6)	IMA -1070-SI
B1	(1.5 x 1 x 8)	IMA -1030-SI
BL	(1.5 x 1 x 8) LF	IMA -1030-SI
B4	(3 x 1.5 x 8)	IMA -1040-SI
B5	(3 x 2 x 6)	IMA -1020-SI
B6	(4 x 3 x 6)	IMA -1065-SI
C1	(3 x 2 x 8)	IMA -1050-SI
C2	(4 x 3 x 8)	IMA -1060-SI
C3	(2 x 1 x 10)	IMA -1100-SI
CL	(2 x 1 x 10) LF	IMA -1100-SI
C4	(3 x 1.5 x 10)	IMA -1100-SI
C5	(3 x 2 x 10)	IMA -1120-SI
C6	(4 x 3 x 10)	IMA -1130-SI
	(4 x 3 x 10) UHT	IMA -1132-SI
C7	(4 x 3 x 10H)	IMA -1140-SI
	(4 x 3 x 10H) UHT	IMA -1142-SI
C8	(6 x 4 x 10H)	IMA -1150-SI
	(6 x 4 x 10H) UHT	IMA -1152-SI
C9	(6 x 4 x 8)	IMA -1155-SI
	(6 x 4 x 8) UHT	IMA -1157-SI

## Section R - Parts List



Item # 9b - Retaining Ring, Back Stationary

Model	Size	Part #
A1	(1.5 x 1 x 6 )	RGR-1020-AA
AL	(1.5 x 1 x 6 LF )	RGR-1020-AA
A3	(3 x 1.5 x 6 )	RGR-1020-AA
A4	(3 x 2 x 6)	RGR-1020-AA
B1	(1.5 x 1 x 8)	RGR-1040-AA
BL	(1.5 x 1 x 8 LF)	RGR-1040-AA
B4	(3 x 1.5 x 8)	RGR-1040-AA
B5	(3 x 2 x 6 )	RGR-1040-AA
B6	(4 x 3 x 6)	RGR-1040-AA
C1	(3 x 2 x 8)	RGR-1040-AA
C2	(4 x 3 x 8)	RGR-1040-AA
C3	(2 x 1 x 10 )	RGR-1040-AA
CL	(2 x 1 x 10 LF )	RGR-1040-AA
C4	(3 x 1.5 x 10)	RGR-1040-AA
C5	(3 x 2 x 10 )	RGR-1040-AA
C6	(4 x 3 x 10 )	RGR-1040-AA
C7	(4 x 3 x 10H )	RGR-1070-AA
C8	(6 x 4 x 10H)	RGR-1070-AA
C9	(6 x 4 x 8)	RGR-1040-AA

Item # 7 - Wear Ring, Front Stationary

Model	Size	OD	ID	Part # SIC	CFR/PTFE
A1	(1.5 x 1 x 6 )	3.396	2.645	WRS-1010-SI	WRS-1014-SI
AL	(1.5 x 1 x 6 LF )	3.396	2.645	WRS-1010-SI	WRS-1014-SI
A3	(3 x 1.5 x 6 )	3.765	3.015	WRS-1050-SI	WRS-1054-SI
A4	(3 x 2 x 6)	3.765	3.015	WRS-1050-SI	WRS-1054-SI
B1	(1.5 x 1 x 8)	3.396	2.645	WRS-1010-SI	WRS-1014-SI
BL	(1.5 x 1 x 8 LF)	3.396	2.645	WRS-1010-SI	WRS-1014-SI
B4	(3 x 1.5 x 8)	4.296	3.545	WRS-1020-SI	WRS-1024-SI
B5	(3 x 2 x 6 )	4.296	3.545	WRS-1020-SI	WRS-1024-SI
B6	(4 x 3 x 6)	5.151	4.201	WRS-1030-SI	WRS-1034-SI
C1	(3 x 2 x 8)	4.296	3.545	WRS-1020-SI	WRS-1024-SI
C2	(4 x 3 x 8)	5.151	4.201	WRS-1030-SI	WRS-1034-SI
C3	(2 x 1 x 10 )	3.765	3.015	WRS-1050-SI	WRS-1054-SI
CL	(2 x 1 x 10 LF )	3.765	3.015	WRS-1050-SI	WRS-1054-SI
C4	(3 x 1.5 x 10)	3.765	3.015	WRS-1050-SI	WRS-1054-SI
C5	(3 x 2 x 10 )	4.296	3.545	WRS-1020-SI	WRS-1024-SI
C6	(4 x 3 x 10 )	5.151	4.201	WRS-1030-SI	WRS-1034-SI
C7	(4 x 3 x 10H)	5.989	5.039	WRS-1040-SI	WRS-1044-SI
C8	(6 x 4 x 10H)	7.422	6.400	WRS-1060-SI	WRS-1064-SI
C9	(6 x 4 x 8)				

## Section R - Parts List



**Item # 8a - Wear Ring, Front Rotating**

Model	Size	OD	ID	Part # SIC
A1	(1.5 x 1 x 6 )	2.640	2.140	WRR-1010-SI
AL	(1.5 x 1 x 6 LF )	2.640	2.140	WRR-1010-SI
A3	(3 x 1.5 x 6 )	3.010	2.510	WRR-1050-SI
A4	(3 x 2 x 6)	3.010	2.510	WRR-1050-SI
B1	(1.5 x 1 x 8)	2.640	2.140	WRR-1010-SI
BL	(1.5 x 1 x 8 LF)	2.640	2.140	WRR-1010-SI
B4	(3 x 1.5 x 8)	3.540	3.040	WRR-1020-SI
B5	(3 x 2 x 6 )	3.540	3.040	WRR-1020-SI
B6	(4 x 3 x 6)	4.196	3.696	WRR-1030-SI
C1	(3 x 2 x 8)	4.196	3.696	WRR-1020-SI
C2	(4 x 3 x 8)	4.196	3.696	WRR-1030-SI
C3	(2 x 1 x 10)	3.010	2.510	WRR-1050-SI
CL	(2 x 1 x 10 LF)	3.010	2.510	WRR-1050-SI
C4	(3 x 1.5 x 10)	3.010	2.510	WRR-1050-SI
C5	(3 x 2 x 10)	3.540	3.040	WRR-1020-SI
C6	(4 x 3 x 10)	4.196	3.696	WRR-1030-SI
C7	(4 x 3 x 10H)	5.034	4.440	WRR-1040-SI
C8	(6 x 4 x 10H)	6.395	5.790	WRR-1060-SI
C9	(6 x 4 x 8)	5.034	4.440	WRR-1048-SI

**Item #9a - Retaining Ring, Front Stationary**

Model	Size	Part #
A1	(1.5 x 1 x 6 )	RGR-1010-AA
AL	(1.5 x 1 x 6 LF )	RGR-1010-AA
A3	(3 x 1.5 x 6 )	RGR-1050-AA
A4	(3 x 2 x 6)	RGR-1050-AA
B1	(1.5 x 1 x 8)	RGR-1010-AA
BL	(1.5 x 1 x 8 LF)	RGR-1010-AA
B4	(3 x 1.5 x 8)	RGR-1020-AA
B5	(3 x 2 x 6 )	RGR-1020-AA
B6	(4 x 3 x 6)	RGR-1030-AA
C1	(3 x 2 x 8)	RGR-1020-AA
C2	(4 x 3 x 8)	RGR-1030-AA
C3	(2 x 1 x 10)	RGR-1050-AA
CL	(2 x 1 x 10 LF)	RGR-1050-AA
C4	(3 x 1.5 x 10)	RGR-1050-AA
C5	(3 x 2 x 10)	RGR-1020-AA
C6	(4 x 3 x 10)	RGR-1030-AA
C7	(4 x 3 x 10H)	RGR-1040-AA
C8	(6 x 4 x 10H)	RGR-1060-AA
C9	(6 x 4 x 8)	RGR-1040-AA

## Section R - Parts List



Item # 8b - Wear Ring, Back Rotating

Model	Size	OD	ID	Part # SIC
A1	(1.5 x 1 x 6 )	3.540	3.040	WRR-1020-SI
AL	(1.5 x 1 x 6 LF )	3.540	3.040	WRR-1020-SI
A3	(3 x 1.5 x 6 )	3.540	3.040	WRR-1020-SI
A4	(3 x 2 x 6 )	3.540	3.040	WRR-1020-SI
B1	(1.5 x 1 x 8 )	5.034	4.440	WRR-1040-SI
BL	(1.5 x 1 x 8 LF)	5.034	4.440	WRR-1040-SI
B4	(3 x 1.5 x 8 )	5.034	4.440	WRR-1040-SI
B5	(3 x 2 x 6 )	5.034	4.440	WRR-1040-SI
B6	(4 x 3 x 6 )	5.034	4.440	WRR-1040-SI
C1	(3 x 2 x 8 )	5.034	4.440	WRR-1040-SI
C2	(4 x 3 x 8 )	5.034	4.440	WRR-1040-SI
C3	(2 x 1 x 10 )	5.034	4.440	WRR-1040-SI
CL	(2 x 1 x 10 LF)	5.034	4.440	WRR-1040-SI
C4	(3 x 1.5 x 10 )	5.034	4.440	WRR-1040-SI
C5	(3 x 2 x 10 )	5.034	4.440	WRR-1040-SI
C6	(4 x 3 x 10 )	5.034	4.440	WRR-1040-SI
C7	(4 x 3 x 10H)	7.520	6.920	WRR-1070-SI
C8	(6 x 4 x 10H)	7.520	6.920	WRR-1070-SI
C9	(6 x 4 x 8 )	5.034	4.440	WRR-1048-SI



Item # 27 - Wear Ring, Back Stationary

Model	Size	OD	ID	Part # SIC
A1	(1.5 x 1 x 6 )	4.296	3.545	WRS-1020-SI
AL	(1.5 x 1 x 6 LF )	4.296	3.545	WRS-1020-SI
A3	(3 x 1.5 x 6 )	4.296	3.545	WRS-1020-SI
A4	(3 x 2 x 6 )	4.296	3.545	WRS-1020-SI
B1	(1.5 x 1 x 8 )	5.989	5.039	WRS-1040-SI
BL	(1.5 x 1 x 8 LF)	5.989	5.039	WRS-1040-SI
B4	(3 x 1.5 x 8 )	5.989	5.039	WRS-1040-SI
B5	(3 x 2 x 6 )	5.989	5.039	WRS-1040-SI
B6	(4 x 3 x 6 )	5.989	5.039	WRS-1040-SI
C1	(3 x 2 x 8 )	5.989	5.039	WRS-1040-SI
C2	(4 x 3 x 8 )	5.989	5.039	WRS-1040-SI
C3	(2 x 1 x 10 )	5.989	5.039	WRS-1040-SI
CL	(2 x 1 x 10 LF)	5.989	5.039	WRS-1040-SI
C4	(3 x 1.5 x 10 )	5.989	5.039	WRS-1040-SI
C5	(3 x 2 x 10 )	5.989	5.039	WRS-1040-SI
C6	(4 x 3 x 10 )	5.989	5.039	WRS-1040-SI
C7	(4 x 3 x 10H)	8.574	7.525	WRS-1070-SI
C8	(6 x 4 x 10H)	8.574	7.525	WRS-1070-SI
C9	(6 x 4 x 8 )	5.989	5.309	WRS-1040-SI



Item # 6 - Shaft, Pump

Model	Size / Description	Part #
TB	A-Series - O.D. = 25.4mm	STP-1005-SI
	B/C-Series - O.D. = 38.1mm	STP-1015-SI



Item # 9d - Key, Locking

Model	Size / Description	Part #
TB	A/B/C (7.9mm Wide)	RGR-1005-SI
	C-H (11.1mm Wide)	RGR-1206-SI



Item # 9c - Retaining Pin, Impeller

Model	Size	Part #
TB	A / B/C Series	RGR-1200-SI



Item # 20 - Foot, Adapter

Model	Size / Description	Part #
TB	B Series / C Series	FTA-1000-SI



Item # 231 - Containment Shell, Complete

Model	Size / Description	Part #
TB	A	SLC-1000-AA
	B/C 203.2mm	SLC-1010-AA
	C 254mm	SLC-1020-AA
	C 254mm H	SLC-1030-AA

## Section R - Parts List



Item # 235 - (2) Bushing, Bearing

Model	Size	Part #
TB	A – 25.5mm I.D.	BGB-1005-SI
	B/C – 38.1mm I.D.	BGB-1015-SI



Item # 236 - Bushing, Spacer

Model	Size	Part #
TB	A Series	BGB-1050-SI
	B/C Series	BGB-1060-SI



Item # 14 - Valve, Thrust Control

Model	Size	Part #
TB	A Series	VTC-1000-SI
	B/C Series	VTC-1010-SI



Item # 231 - Shell, Containment

Model	Size / Description	Part #
TB	A	SLC-1000-SI
	B/C 203.2mm	SLC-1010-SI
	C 254mm	SLC-1020-SI
	C 254mm H	SLC-1030-SI



## Section R - Parts List



Old Style Thrust Collar 1998 - 2006



New Style Thrust Collar 2006 +

Item # 72 - Collar, Thrust

Model	Size	1998-2006	2006+ CFR/PTFE	2006+ SiC
A1	(1.5 x 1 x 6 )	CRT-1010-SI	CRT-1011-SI	CRT-1012-SI
AL	(1.5 x 1 x 6 LF )	CRT-1010-SI	CRT-1011-SI	CRT-1012-SI
A3	(3 x 1.5 x 6 )	CRT-1050-SI	CRT-1051-SI	CRT-1052-SI
A4	(3 x 2 x 6 )	CRT-1050-SI	CRT-1051-SI	CRT-1052-SI
B1	(1.5 x 1 x 8 )	CRT-1010-SI	CRT-1011-SI	CRT-1012-SI
BL	(1.5 x 1 x 8 LF)	CRT-1010-SI	CRT-1011-SI	CRT-1012-SI
B4	(3 x 1.5 x 8 )	CRT-1020-SI	CRT-1021-SI	CRT-1022-SI
B5	(3 x 2 x 6 )	CRT-1020-SI	CRT-1021-SI	CRT-1022-SI
B6	(4 x 3 x 6 )	Style B Only	CRT-1031-SI	CRT-1032-SI
C1	(3 x 2 x 8 )	CRT-1020-SI	CRT-1021-SI	CRT-1022-SI
C2	(4 x 3 x 8 )	CRT-1030-SI	CRT-1031-SI	CRT-1032-SI
C3	(2 x 1 x 10 )	Style B Only	CRT-1051-SI	CRT-1052-SI
CL	(2 x 1 x 10 LF )	Style B Only	CRT-1051-SI	CRT-1052-SI
C4	(3 x 1.5 x 10 )	Style B Only	CRT-1051-SI	CRT-1052-SI
C5	(3 x 2 x 10 )	CRT-1020-SI	CRT-1021-SI	CRT-1022-SI
C6	(4 x 3 x 10 )	Style B Only	CRT-1031-SI	CRT-1032-SI
C7	(4 x 3 x 10H)	Style B Only	CRT-1040-SI	CRT-1042-SI
C8	(6 x 4 x 10H)	Style B Only	CRT-1060-SI	CRT-1062-SI
C9	(6 x 4 x 8 )	Style B Only		CRT-1048-SI



Item # 19 - Adapter

Model	Size / Description	Part #
TB	TB-mag-A, NEMA, 143 – 254/6 Frame	ADP-1000-\$
	TB-mag-A, IEC, 80 – 132 Frame	ADP-1005-SI
	TB-mag-B/C, NEMA, 143 – 286 Frame	ADP-1010-SI
	TB-mag-B/C, IEC, 90 – 132 Frame	ADP-1015-\$
	B/C, Mounting Plate, NEMA, 326 - 405 Frame	ADP-1100-SI
	B/C, Mounting Plate, IEC, 160 - 180 Frame	ADP-1125-SI
	B/C, Mounting Plate, IEC, 200 Frame	ADP-1135-\$
	B/C, Mounting Plate, IEC, 225 Frame	ADP-1145-\$

## Section R - Parts List



Item # 73 - Gasket, O-Ring

Model	Size (mm)	FEP/FKM	FKM	EPDM
TB	A	GTO-1003-SI	GTO-1004-SI	GTO-1005-SI
	B/C 203	GTO-1013-SI	GTO-1014-SI	GTO-1015-SI
	C 254	GTO-1023-SI	GTO-1024-SI	GTO-1025-SI



Item # 302 - Adapter Plugs

Model	Size / Description	Part #
TB	A/B/C - 1/2" NPT, Top of Adapter, 18-8 Stainless Steel	HDW-1230-SI
TB	A/B/C - 1/2" NPT, Bottom of Adapter, Red, PP.	HDW-1500-SI



Item # 239 - Ring, Containment

Model	Size / Description	Part #
TB	A - ANSI	RGC-1000-SI
	A - ISO / JIS	RGC-1005-SI
	B/C - ANSI 203mm	RGC-1010-SI
	B/C - ISO / JIS 203mm	RGC-1015-SI
	Secondary Sealed Unit 203mm	RGC-2110-SI
	B/C - ANSI 10"	RGC-1020-SI
	B/C - ISO / JIS 10"	RGC-1025-SI
	Secondary Sealed Unit - 10"	RGC-2120-SI



Item # 300 - Hex Cap Screw

Model	Size / Description	Part #
TB-A	1/2"-13 x 1.25"	HDW-1021-SI
	M12-1.75 x 30mm	HDW-1035-SI
TB-B/C	5/8"-11 x 1.50"	HDW-1042-SI
	M16-2.0x40mm	HDW-1049-SI



Item # 301 - Lock Washer

Model	Size / Description	Part #
TB-A	1/2"	HDW-1140-SI
	13 mm	HDW-1145-SI
TB-B/C	5/8"	HDW-1160-SI
	17 mm	HDW-1165-SI



Item # 370 - Drain Flange

Model	Size / Description	Part #
TB	A/B/C - Flange	SUB-1350-SI



Item # 371 - PTFE Drain Gasket

Model	Size / Description	Part #
TB	A/B/C - Drain Gasket	GTO-1040-SI



Item #372 - Neoprene Drain Gasket

Model	Size / Description	Part #
TB	A/B/C - Drain Gasket Backing	GTO-1050-SI

## Section R - Parts List



Item # 2 - Impeller Magnet, Complete

Model	Size / Description	Part #
A1	(1.5 x 1 x 6 )	IMA -1010-AA
AL	(1.5 x 1 x 6 LF )	IMA -1010-AA
A3	(3 x 1.5 x 6 )	IMA -1070-AA
A4	(3 x 2 x 6 )	IMA -1070-AA
B1	(1.5 x 1 x 8)	IMA -1030-AA
BL	(1.5 x 1 x 8 LF)	IMA -1030-AA
B4	(3 x 1.5 x 8)	IMA -1040-AA
B5	(3 x 2 x 6 )	IMA -1020-AA
B6	(4 x 3 x 6 )	IMA -1065-AA
C1	(3 x 2 x 8)	IMA -1050-AA
C2	(4 x 3 x 8)	IMA -1060-AA
C3	(2 x 1 x 10)	IMA -1100-AA
CL	(2 x 1 x 10 LF)	IMA -1100-AA
C4	(3 x 1.5 x 10)	IMA -1100-AA
C5	(3 x 2 x 10)	IMA -1120-AA
C6	(4 x 3 x 10) (4 x 3 x 10 UHT)	IMA -1130-AA IMA -1132-AA
C7	(4 x 3 x 10 H) (4 x 3 x 10 UHT)	IMA -1140-AA IMA -1142-AA
C8	(6 x 4 x 10 H) (6 x 4 x 10 UHT)	IMA -1150-AA IMA -1152-AA
C9	(6 x 4 x 8) (6 x 4 x 8 UHT)	IMA -1155-AA IMA -1157-AA



Item # 1 - Casing, Lined Completed Sub Assemblies

Model	Size / Description	Part #
A1	1.5 x 1 - ANSI class 150	CSG-1010-AA
	1.5 x 1 - ANSI class 300	CSG-1011-AA
	50 x 32mm - ISO PN 16	CSG-1012-AA
	50 x 40mm - JIS 10 kg/cm <sup>2</sup>	CSG-1013-AA
AL	1.5 x 1 - ANSI class 150	CSG-1010-LB
	1.5 x 1 - ANSI class 300	CSG-1011-LB
	50 x 32mm - ISO PN 16	CSG-1012-LB
	50 x 40mm - JIS 10 kg/cm <sup>2</sup>	CSG-1013-LB
A3	3 x 1.5 - ANSI class 150	CSG-1070-AA
	3 x 1.5 - ANSI class 300	CSG-1071-AA
	65 x 40mm - ISO PN 16	CSG-1072-AA
	65 x 50mm - ISO PN 16	CSG-1073-AA
A4	65 x 50mm - JIS 10 kg/cm <sup>2</sup>	CSG-1074-AA
	3 x 2 - ANSI class 150	CSG-1075-AA
	3 x 2 - ANSI class 300	CSG-1076-AA
	80 x 50mm - ISO PN 16	CSG-1077-AA
B1	80 x 65mm - ISO PN 16	CSG-1078-AA
	80 x 65mm - JIS 10 kg/cm <sup>2</sup>	CSG-1079-AA
	1.5 x 1 - ANSI class 150	CSG-1030-AA
	1.5 x 1 - ANSI class 300	CSG-1031-AA
B1	50 x 32mm - ISO PN 16	CSG-1032-AA
	50 x 40mm - JIS 10 kg/cm <sup>2</sup>	CSG-1033-AA

## Section R - Parts List

Item # 1 - Casing, Lined Completed Sub Assemblies

Model	Size / Description	Part #
BL	1.5 x 1 - ANSI class 150	CSG-1030-LB
	1.5 x 1 - ANSI class 300	CSG-1031-LB
	50 x 32mm - ISO PN 16	CSG-1032-LB
	50 x 40mm - JIS 10 kg/cm <sup>2</sup>	CSG-1033-LB
B4	3 x 1.5 - ANSI class 150	CSG-1080-AA
	3 x 1.5 - ANSI class 300	CSG-1081-AA
	65 x 40mm - ISO PN 16	CSG-1082-AA
	65 x 50mm - ISO PN 16	CSG-1083-AA
	65 x 50mm - JIS 10 kg/cm <sup>2</sup>	CSG-1084-AA
	80 x 50mm - ISO PN 16	CSG-108A-AA
B5	3 x 2 (A10) - ANSI class 150	CSG-1090-AA
	3 x 2 (A10) - ANSI class 300	CSG-1091-AA
	80 x 50mm - ISO PN 16	CSG-1092-AA
	80 x 65mm - JIS 10 kg/cm <sup>2</sup>	CSG-1093-AA
	80 x 65mm - ISO PN 16	CSG-1094-AA
B6	4 x 3 - ANSI class 150	CSG-1160-AA
	4 x 3 - ANSI class 300	CSG-1161-AA
	100 x 65mm - ISO PN 16	CSG-1162-AA
	100 x 80mm - ISO PN 16	CSG-1163-AA
C1	3 x 2 - ANSI class 150	CSG-1050-AA
	3 x 2 - ANSI class 300	CSG-1051-AA
	80 x 50mm - ISO PN 16	CSG-1052-AA
	80 x 65mm - JIS 10 kg/cm <sup>2</sup>	CSG-1053-AA
C2	4 x 3 - ANSI class 150	CSG-1060-AA
	4 x 3 - ANSI class 300	CSG-1061-AA
	100 x 65mm - ISO PN 16	CSG-1062-AA
	100 x 80mm - ISO PN 16	CSG-1063-AA
	100 x 80mm - JIS 10 kg/cm <sup>2</sup>	CSG-1064-AA
C3	2 x 1 - ANSI class 150	CSG-1100-AA
	2 x 1 - ANSI class 300	CSG-1101-AA
	50 x 32mm - ISO PN 16	CSG-1102-AA

Item # 1 - Casing, Lined Completed Sub Assemblies

Model	Size / Description	Part #
CL	2 x 1 - ANSI class 150	CSG-1100-LB
	2 x 1 - ANSI class 300	CSG-1101-LB
	50 x 32mm - ISO PN 16	CSG-1102-LB
C4	3 x 1.5 - ANSI class 150	CSG-1110-AA
	3 x 1.5 - ANSI class 300	CSG-1111-AA
	65 x 40mm - ISO PN 16	CSG-1112-AA
	65 x 50mm - ISO PN 16	CSG-1113-AA
	65 x 50mm - JIS 10 kg/cm <sup>2</sup>	CSG-1114-AA
C5	3 x 2 - ANSI class 150	CSG-1120-AA
	3 x 2 - ANSI class 300	CSG-1121-AA
	80 x 50mm - ISO PN 16	CSG-1122-AA
C6	80 x 65mm - JIS 10 kg/cm <sup>2</sup>	CSG-1123-AA
	4 x 3 - ANSI class 150	CSG-1130-AA
	4 x 3 - ANSI class 300	CSG-1131-AA
	100 x 65mm - ISO PN 16	CSG-1132-AA
	100 x 80mm - ISO PN 16	CSG-1133-AA
C7	100 x 80mm - JIS 10 kg/cm <sup>2</sup>	CSG-1134-AA
	4 x 3 - ANSI class 150	CSG-1140-AA
	4 x 3 - ANSI class 300	CSG-1141-AA
	100 x 65mm - ISO PN 16	CSG-1142-AA
	100 x 80mm - ISO PN 16	CSG-1143-AA
C8	100 x 80mm - JIS 10 kg/cm <sup>2</sup>	CSG-1144-AA
	125 x 80mm - ISO PN 16	CSG-1145-AA
	6 x 4 - ANSI class 150	CSG-1150-AA
	6 x 4 - ANSI class 300	CSG-1151-AA
C9	150 x 100mm - ISO PN 16	CSG-1152-AA
	150 x 125mm - ISO PN 16	CSG-1153-AA
	150 x 125mm - JIS 10 kg/cm <sup>2</sup>	CSG-1154-AA
	6 x 4 - ANSI class 150	CSG-1155-AA
	6 x 4 - ANSI class 300	CSG-1156-AA
	150 x 125mm - ISO PN 16	CSG-1157-AA
	150 x 125mm - JIS 10 kg/cm <sup>2</sup>	CSG-1158-AA

## Section R - Parts List

### Item # 232 - Magnet Assembly, Outer



Model	Size / Description	Part #
TB-A	NEMA 56C (15.8mm dia.)	MAO-1000-SI
	NEMA 143/5TC (22.2mm dia.)	MAO-1010-SI
	NEMA 182/4TC (28.6mm dia.)	MAO-1020-SI
	NEMA 213/5TC (34.9mm dia.)	MAO-1030-SI
	NEMA 213/5TC, High Torque (15.8mm dia.)	MAO-1031-SI
	NEMA 254/6TC, High Torque (41.3mm dia.)	MAO-1032-SI
	IEC 80 (19mm dia.)	MAO-1005-SI
	IEC 90 (24mm dia.)	MAO-1015-SI
	IEC 100/112 (28mm dia.)	MAO-1025-SI
	IEC 132 (138mm dia.)	MAO-1035-SI
	IEC 132, Hi Torque (33mm dia.)	MAO-1036-SI
TB-B/C	NEMA 143/5TC (22.2mm dia.)	MAO-1040-SI
	NEMA 182/4TC (28.6mm dia.)	MAO-1050-SI
	NEMA 213/5TC (34.9mm dia.)	MAO-1060-SI
	NEMA 254/6TC (41.3mm dia.)	MAO-1070-SI
	NEMA 213/6TC (1750 rpm, 4pole) (34.9mm dia.)	MAO-1080-SI
	NEMA 284/6TSC (47.6mm dia.)	MAO-1080-SI
	NEMA 284/6TSC (47.6mm dia.)	MAO-1090-SI
	NEMA 284/5TSC, Ni Torque (47.6mm dia.)	MAO-1100-SI
	NEMA 284/6TC (47.6mm dia.)	MAO-1110-SI
	NEMA 284/6TC, Hi Torque (47.6mm dia.)	MAO-1111-SI
	NEMA 324TC, High Torque (53.9mm dia.)	MAO-1120-SI
	NEMA 326TC/405 TSC, Ultra High Torque (53.9mm dia.)	MAO-1122-SI
	Long Couple Drive – Single	MAO-2100-SI
	Long Couple Drive – Double	MAO-2110-SI
	Long Couple Drive – High Torque	MAO-2120-SI
	Long Couple Drive – Ultra High Torque	MAO-2121-SI
	IEC 90S/L (24mm dia.)	MAO-1055-SI
	IEC 100L/112 (28mm dia.)	MAO-1065-SI
	IEC 132S/M (38mm dia.)	MAO-1075-SI
	IEC 132S/M, 7.5kW @ 1450 rpm (38mm dia.)	MAO-1076-SI
	IEC 160M, 12.5kW @ 2900 rpm (42mm dia.)	MAO-1085-SI
	IEC 160M/L (42mm dia.)	MAO-1095-SI
	IEC 180M/L (48mm dia.)	MAO-1105-SI
	IEC 200L (55mm dia.)	MAO-1115-SI
	IEC 180M/L, Hi Torque (48mm dia.)	MAO-1106-SI
	IEC 200L, High Torque (55mm dia.)	MAO-1116-SI
	IEC 225M, High Torque (55mm dia.)	MAO-1116-SI
	IEC 225M, Ultra High Torque (55mm dia.)	MAO-1117-SI



## Section S - Troubleshooting Guide

Problem	Symptoms	Cause	Remedy
Liquid is not being pumped	No suction or discharge pressure. Pump power usage is very low.	Pump not primed	Re-prime pump and verify that suction pipe is full of liquid. Check the suction pipe for high points that can trap air
	Suction gauge reads much lower than normal.	Suction pipe clogged	Confirm that any suction valves or control valves are not stuck shut. Inspect suction pipe for blockage.
	Suction gauge reads normal. Pump generates full discharge pressure but no flow.	Discharge pipe clogged	Confirm that any discharge valves or control valves are not stuck shut. Inspect discharge pipe for blockage.
	Discharge pressure is only slightly higher than suction pressure.	Clogged impeller	Open pump and clear blockage from impeller
	No discharge pressure. Pump makes a loud buzzing noise. Increased vibration	De-coupled impeller	Shut off pump. Verify that the motor spins smoothly by hand. If motor will not spin by hand, open pump for inspection. If motor spins by hand, confirm that the impeller is sized for operating conditions and liquid specific gravity. Verify the viscosity of the liquid is not too high. Impeller or outer magnet may be weakened if overheated.
	Pump generates full discharge pressure but no flow. Pump casing and pipes immediately before and after pump heat up.	Head requirement higher than anticipated / Undersized impeller	Confirm that discharge line is not blocked or valve is not stuck shut. Pump may require a larger impeller to overcome system head.
Pump not delivering desired head or flow.	Suction pressure is negative. (Gauge pressure) Discharge pressure is lower than normal.	Air leak in suction line	Locate and seal the air leak.
	Discharge pressure is lower than normal. Flow rate is decreased. Pump is noisy. Increased vibration.	Insufficient NPSH	Check liquid level in suction tank. Check suction piping for restrictions, or obstructions. Verify vapor pressure and temperature of process liquid. Pump should be located as close to the source as possible.
	Discharge pressure is lower than normal. Flow is reduced.	Backwards rotation	Verify motor rotation and correct if necessary.
	Pump does not reach desired flow rate.	Head requirement higher than anticipated / Undersized impeller	Increase impeller size or motor speed
	Suction gauge is very low.	Strainer device is full / clogged (if equipped).	Clean / empty strainer basket.
Pump starts, then stops pumping	Discharge pressure rises then falls. Pump power usage is very low after pressure drops.	Pump not properly primed	Re-prime pump and verify that suction pipe is full of liquid. Verify there are no high points in suction pipe that can trap air
	Discharge pressure rises then falls. Pump makes a loud buzzing noise. Increased vibration	De-coupled impeller	Confirm that the impeller is sized for operating conditions and liquid specific gravity. Verify the viscosity of the liquid is not too high. Impeller assembly or outer magnet may be weakened if overheated.
	Pump operated normally but stops pumping & loses prime. Pump will not run until priming chamber is refilled.	Suction pipe volume too large for priming chamber	Calculate volume of the suction pipe. It is recommended that the priming chamber volume should be 3 times the suction pipe volume. Decrease suction pipe volume. Move pump closer to source

## Section S - Troubleshooting Guide

Problem	Symptoms	Cause	Remedy
Pump uses excessive power	Burning smell coming from back of pump	Outer magnet installed improperly	Confirm that the groove on the outer drive lines up with the edge of the adapter and is properly tightened.
	Decreased flow. High power consumption. High vibration. Noisy operation	Damaged or broken wear rings	Inspect the pump and replace damaged components.
	Pump delivers the required flow and head but power consumption is high. High discharge pressure.	Specific Gravity of viscosity higher than expected.	Determine liquid viscosity and specific gravity. Verify the actual power consumption is correct.
	Pump delivers the required head, operates normally. Discharge pressure will be lower if head requirement is lower than anticipated.	Flow is higher than expected. Required head is lower than rated head.	Verify flow with instrumentation or batch cycle time and adjust as needed.
	Pump will produce the rated flow. Discharge head may be decreased. Power will be higher	Clogged thrust balancing passages in impeller	Open pump and clean blockage from grooves in between the impeller and bushings.
Pump is noisy or vibrates	No discharge pressure. Pump makes a loud buzzing noise. Increased vibration	De-coupled impeller	Shut off pump. Verify that the motor spins smoothly by hand. If motor will not spin by hand, open pump for inspection. If motor spins by hand, confirm that the impeller is sized for operating conditions and liquid specific gravity. Verify the viscosity of the liquid is not too high. Impeller or outer magnet may be weakened if overheated.
	Flow and head are normal, Pump or pipes vibrate	Piping or pump not properly anchored	Tighten mounting bolts on pump feet and base plate. Confirm that the suction and discharge pipes are properly supported per Hydraulic Institute recommendations.
	Discharge pressure is lower than normal. Flow rate is decreased. Pump is noisy. Increased vibration.	Insufficient NPSH / pump is cavitating	Check liquid level in suction tank. Check suction piping for restrictions, or obstructions. Verify vapor pressure and temperature of process liquid. Pump should be located as close to the source as possible.
	Discharge pressure may be lower than normal. Flow rate may be decreased. Increased vibration.	Partially clogged impeller is unbalanced	Open pump and clear blockage from impeller

*Manufacturers Warranty*

All TECHNIFLO pumps are covered by a 12 month warranty, from invoice date, against defects in materials or workmanship.

The warranty is conditional upon the pump being used in a manner, and under conditions, for which it is designed.

Pump damage caused by user negligence will void this warranty.

No liability shall apply for incidental or consequential damages, however caused, such as loss of use, loss of anticipated profit or revenues, facility down time, cost to remove pump from services, cost to reinstall pump into service or responsibility for transportation to or from our plant.

No express warranties and no implied warranties, whether of merchantability or fitness for any particular purpose or

INVOICE NO \_\_\_\_\_

PUMP MODEL NO \_\_\_\_\_

INVOICE DATE \_\_\_\_\_

JOB NO \_\_\_\_\_



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