



## **MODEL: MSP Series**

**OPERATING INSTRUCTIONS, INSTALLATION & MAINTENANCE  
MANUAL INCLUDING SPARE PARTS LIST**



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## LIFE IS PRECIOUS - THINK SAFETY

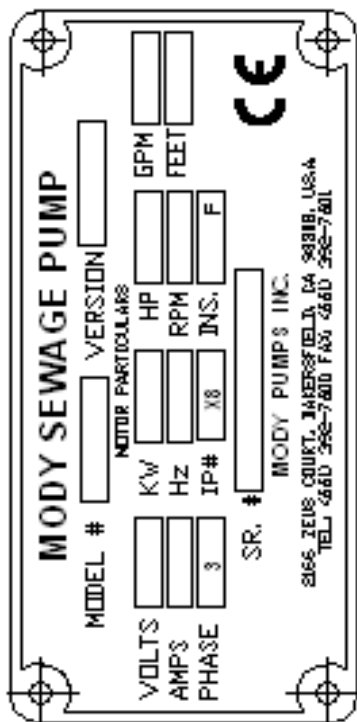
1. Most accidents can be avoided by using COMMON SENSE.
2. Please read the operation and maintenance instruction manual supplied with the pump. If you did not receive one, please call your local distributor before pump installation.
3. Do not wear loose apparel that may become entangled in the impeller or other moving parts.
4. Always use appropriate safety equipment, such as safety glasses, when working on the pump or piping.
5. Pumps build up heat and pressure during operation-allow time for pumps to cool before handling or servicing.
6. Only qualified service personnel should install, operate and repair pump.
7. Keep clear of suction and discharge openings. DO NOT insert fingers in pump with power connected.
8. Do not pump flammable or hazardous materials (gasoline, acids, alkalis, etc.)
9. Do not block or restrict discharge hose, as it may whip or burst catastrophically under pressure.
10. Make sure lifting handles/hooks are securely fastened each time before lifting.
11. Do not lift pump by the power cord under any circumstances.
12. Do not exceed manufacturer's recommendation for optimum performance, as this could cause the motor/pump to overheat and lead to premature wear or failure.
13. Secure the pump in its operating position so it does not tip over, fall or slide.
14. Keep away from impeller when power is connected.
15. Submersible Pumps are not approved for use in swimming pools, recreational water installations, decorative fountains or any installation where human contact with the pumped fluid is common.
16. Do not operate pump without adequate protection and safety devices in place.
17. Always replace safety devices that have been removed during service or repair.
18. To reduce risk of electrical shock, pump must be properly grounded in accordance with the National Electric Code and all applicable state and local codes and ordinances.
19. To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing.
20. Any wiring of pumps should be performed by a qualified electrician.
21. Never operate a pump with a power cord that has frayed or brittle insulation.
22. Cable should be protected at all times to avoid punctures, cuts, and abrasions - inspect frequently.
23. Never handle connected - "hot" power cords with wet hands.
24. Never operate a pump with a plug-in type power cord without a ground fault circuit interrupter, adequate overload and short circuit protection.

**IMPORTANT !!!** Mody Pumps Inc. is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.

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## Identification plate



## General description

The MODY MSP SERIES submersible sewage pumps can be used in a variety of residential, commercial and industrial applications such as:

- Sewage System
- Flood and Pollution control
- Dewatering / Effluent
- Farms
- Hospitals
- Trailer Courts
- Hotels

MODY MSP SERIES pumps are subjected to a thorough inspection before leaving the factory and equipped with operating instructions for fitting, starting, care etc. which conform to international safety regulations. These instructions describe the procedures to

be used for fitting, operation and maintenance of standard submersible waste water pumps.

## Applications

This starting & operation manual are applicable to the electric driven submersible waste water pumps specified on the front page. The pumps are designed to be used for pumping raw sewage water with solid contents. The pumps are suitable for heavy duty drainage applications and clean water too. The manufacturer guaranties that the new pump airborne noise level do not exceed 70 db(A) when submerged. For dry installation the corresponding level is 75 db(A). Be aware that under wrong operated duty points, noise level might be higher.



Caution! This range of pumps is forbidden to handle in flammable liquids nor used in explosive environment.

Do not start the pump if any parts belonging to the pump are missing.

If humans should be in contact with the pumped liquid e.g. construction sites, lifting stations etc. a grounded connection including an earth leakage detector must be used. Never install the pumps in swimming pools, special regulations apply.

## Product description

### Limitations

Immersion depth to max 20m (66 ft ).  
Media temperature up to 40 °C (115 °F ).  
Higher media temperature on request.

### Pump models

Example: MSP3-150.X VX3 6-300

- MSP3 = module range
- 150 = standard outlet discharge in mm
- X = version of volute
- V = vortex impeller or
- C = channel impeller
- X = version of impeller, more than one X can appear to indicate other types.
- 3 = family pumps
- 6 = number of poles (rpm)  
e.g. 6=1,200 rpm
- 300 = diameter of impeller in mm

### Motor

3 phase squirrel cage induction motor for 60 Hz, degree of protection IP68, insulation class H (180°C).

### Motor protection

All stators are equipped with 3 built-in thermal switches and are connected in series which opens at 135°C and closes at approx 90°C and are marked F1 & F2 control cable. To maintain warranty on the pumps, these thermal switches must be

connected in series to control circuit of control panel.

### Cooling system

The MSP1, MSP2, MSP3 and MSP4 product lines are all available with an enclosed, self-contained internal cooling system for use in the 3 available types of installations. Note that if ordered without closed internal cooling system cannot be installed as dry pit

The closed internal cooling system functions as follows:

An internal impeller, located between the two mechanical shaft seal, circulates the cooling liquid in a closed loop through channels to a cooling jacket surrounding the stator housing. Thus, the heat generated by the motor, is transferred to the cooling liquid and finally dissipated to the pumped liquid via a cooling flange (heat exchange), without any physical contact by the pumped sewage media.

Coolant: 70% water and 30% propylene glycol.

### Moisture sensor

All pumps are supplied with 3 moisture sensors made of aluminum.

One sensor is placed in the seal oil chamber; another sensor is placed in the lower motor stator housing and a third sensor is placed inside the motor cable terminal board area.

The moisture detection control cable is marked D. This control cable should be connected to a relay (optional or by others) in the control panel, which is activated by a decrease in resistance to ground. Set the alarm between 20 - 100 kOhm. Voltage output applied to the moisture cable 12 - 24 VAC.

### Power Cable

The pumps are standard equipped with 10m electric cable of the type H07RNF. If longer cable is required, voltage drop must be taken in consideration.

## Handling

When transporting the pumps they must be properly secured. Special attention must be give to the cables; these cannot withstand rolling heavy parts. All pumps must be securely stored in vertical or horizontal positions.

Always protect cable ends from moisture and water as well, so that no moisture will penetrate into the cable.

Before lifting the pump, check to determine if the handle on the pump is properly attached. Always use the lifting handle. Do not use the cables or discharge hose. All fixing screws and bolts must be securely fastened before lifting. Human injury may result if above is not properly secured.

After a long period of storage, the pump must be inspected carefully. Rotate the impeller by hand before start-up and check carefully seals and cable entry



**WARNING!** Never start up the pump without impeller. This will damage (in a few seconds) the O-ring that seals between the rotor-shaft and the sleeve of the mechanical seal cartridge. Both sleeve and rotor shaft could also be damaged due to excessive friction!

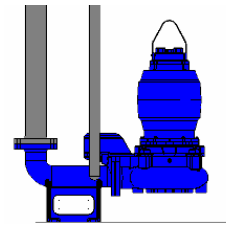
## Installation

When installing the pump, reduce the risk of accidents. Be aware that the machine is extremely heavy and that it contains electrical open wires.

Before starting the installation, check and secure all screws for the lifting handle, stator and volute fixing bolts. Ensure that these are all safety tightened.

Lifting chains, cranes etc. must always be designed to fully accommodate the weight of the complete pump units. For safety reasons never walk under suspended load.

### Discharge base elbow - DBE



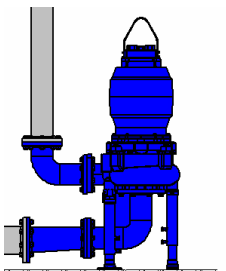
Place the discharge base elbow (DBE) at the bottom of the sump. If one pump is installed, place the pump in the center of the tank. Fit the guide rails to the upper

guide rail bracket so the rails are accurately located in vertical and parallel positions to each other.

Connect the discharge pipe to the DBE. A non return valve and gate valve sized according to the flow velocity from the pump are strongly recommended.

The lifting tackle must be installed directly at the point above the center of gravity of the pump for proper automatic coupling to and release from the DBE, which is appropriately designed for this purpose, when lifting and lowering the pump from and to the DBE.

### Dry pit installation



All MSP1, MSP2, MSP3 and MSP4 modules can be installed dry with adjustable support legs and a separately supplied suction elbow, or a fixed suction base elbow (SBE) unit. Adjustable support consists of

three legs that are telescopic in design. The suction pipe can be connected in any direction by changing the location of the legs.

After elevation adjustment, the legs are set and fixed by two screws that lock the pump arrangement into position. The bottom leg pads can then be secure by bolting and anchoring them in the concrete foundation.

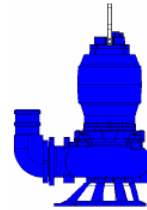
The suction pipe is connected vertically to the pump suction flange.

Note: The motor unit is easier to remove or re-install if the suction pipe is equipped with a drain valve. This can be opened when the motor is going to be or removed or reinstalled.

The discharge pipe should be equipped with a drain valve as well, in order to bleed air from the system during first start-up. Afterwards this valve can be fitted with a manometer to measure the discharge pressure.

Before starting, carefully inspect the cables for defects and check the level of coolant in the cooling jacket.

### Portable version / installation



This version needs extra attention while operating. The pump can be supplied with a support ring.

Place the pump on a firm surface. Keep the cables straight and secure so that they cannot be nipped or cut in any way.



**WARNING!** Never remove the support ring, human contact might occur and make injury.

If there is risk of overturning, place and fit the pump on a steel plate.

When hoses are used as discharge connection, remember that friction losses are higher than in a pipe and flow may be less than expected.

## Electrical connections

The electrical installation must be inspected by authorized electrician before switching-on.



**CAUTION!** All electrical equipment must always be earthed (grounded). This applies both to the pump and to any monitoring equipment.

Make sure that the electrical terminals and starting equipment is installed in such way that it cannot be flooded. The electrical installation must apply to national and local regulations.

All pumps are supplied with built-in thermal switches in the stator windings. These are marked F1, F2 on the control cable and must always be connected in series to the control circuit in the control panel.

The control cable marked D is connected to the moisture sensors. This cable should be connected to a conductive liquid level relay in the control panel. An alarm should be given in event of moisture intrusion. Your local MODY representative can supply you with the conductive liquid level relay as an option.

Make sure that the power supply, voltage, frequency and starting method corresponds to the nameplate data fitted on the pump.

The motor can operate by voltage tolerances at +/- 10%. The motor might be overloaded and burned out if this is exceeded.

For power supply cable, and control cable connections, refer to the motor winding connection schematics in this manual.

- Direct online starting DOL
- Star-Delta starting Y-Δ

Starting equipment in the control panel must be provided with over current protection sensitive to phase failure. A 3-phase asymmetry control relay is recommended, adjusted to 15% phase asymmetry

The power supply should be fused with low-blow fuses.

15 Starts per hour (regularly spaced) are permitted

### Replacing the power cable

If the cable has been compressed or damaged it must be replaced to avoid water entry.

When changing the cable always change the rubber cable seal was well. Never change cable dimensions from the original cable or cable seal dimensions from the original seal, as water may enter the motor if these are not properly sized.

If the same cable is re-used due to any repair work, always cut away a piece at the cable entry in order to seal on a non compressed cable sheath.

For safety reasons the grounded conductor strand should always be longer than all the other conductor strands. If the motor cable is accidentally wrenched off, the grounded conductor should be the last to break away from its terminal. This applies to both ends of the cable.

### Electromagnetic Compatibility, EMC

The pump does not generate any electromagnetic (EMC) that would affect other equipment. However, if the pump power is supplied by a frequency inverter, the power cables may require screening.

All MSP1, MSP2, MSP3 and MSP4 pump modules comply with directive EN89/336/EEC regarding EMC.

# Operation

Before initial start-up after repair or in a new installation, always check direction of rotation. The pump must always rotate in an anti-clockwise direction. If the rotation is clock-wise, transpose two phases in the electric control panel so that it will change to proper rotational direction.

Be aware of the starting torque, it may be very strong depending on the size of the pump. Do not hold the pump when checking the rotation. The pump must be heavily supported and never started when hanging in a chain without proper support when performing a rotational check or in operation.



**WARNING!** As the pump will pump up to 70% of the nominal flow at wrong rotation, never use the visual flow rate to determine the direction of rotation. Most times, the pump creates heavy noise and vibration when operates at wrong rotation.



**WARNING!** Do not insert your hand or any other object into the pump volute and impeller if any power supply is connected. Remove physically the cable even if security devices is activated

# Service and maintenance

Regular inspection and preventive maintenance will ensure more reliable operation. The pump should be inspected every six months or more often if the operating conditions are difficult. The cable should be checked more frequently. For a complete overhaul of the pump, please contact an authorized MODY service facility workshop or your MODY dealer.



**CAUTION!** When the pump or motor section has been laid on its side, always secure it with wedges from both sides to prevent it from rolling away.



**CAUTION!** Parts must be replaced by genuine spares, including screws, to ensure correct strength.



**CAUTION!** Before maintenance and repair work, motor leads must first be completely disconnected from the power supply.

Never work on electrical systems during a thunder storm.

All work on the electrical system may only be performed by qualified electricians.



**CAUTION!** Before undertaking any service work, make sure that the pump is thoroughly clean, and bear in mind the importance of observing good personal hygiene. Follow your local safety instructions.

**NOTE!** Old oil should be entrusted to an oil disposal company in accordance with local regulations.

## Inspection

Pump Section	Inspection	Action in the event of a fault.
Cables	Check that the sheath is not damaged.  Check that the cables are not kinked or nipped.	Fit a new cable.  Correct the fault.
Cooling water	Check the cooling water level of coolant	Fill up with cooling liquid.
Visible Parts	Check that all parts are in good condition, and that bolts and nuts are securely tightened.	Replace worn parts.  Tighten any loose bolts and nuts.
Impeller / Wear ring	Check that the parts are not worn to such an extent that the pump performance is affected.	Adjust the wear ring.
Shaft seal	Check that the oil is clean and is not mixed with water.  See under "Changing the oil".	In the event of slight leakage, change the oil.
Hoses, pipes and valves	Check that the equipment does not leak or is otherwise damaged.	Adjust or replace defective parts.

## Changing the oil

Change of oil is done in the same way on cooled and un-cooled pumps. Remove the plug marked "outlet" and let the old oil pour out through the groove under the plug.

Discard of any used oil in accordance with local regulations. Fasten the plug so that the lower but not the top O-ring gasket seals. Loosen the plug marked "inlet" and fill up with oil and then fasten both oil plugs. Use food grade oil of same quality and performance as Enerpar M002, white oil.



**CAUTION!** In the event of inward leakage, the oil housing may be pressurized.

When removing the oil plug, hold a piece of cloth over it to prevent oil from splashing.

## **DISASSEMBLING MSP UNITS**

### **Changing the stator unit**

If the motor protection trips repeatedly, the stator has to be overhauled. Disassemble the cable cover with the motor cable. Check the isolation resistance with a megger. If measuring with a 500 V megger the isolation resistance shall exceed 500 mega ohm. This applies to phase to phase readings, as well as between each phase to ground. If the isolation resistance is less than 500 mega ohm the stator should be cleaned and baked in an oven at approx. 350F for three to four hours. Also check the circuit with the three built-in thermal overload switches using a multimeter.

If the isolation resistance is less than 500 mega ohm the stator has to be checked.

Disconnect the pump from the electric box.

Check the isolation resistance of the motor at the loose end of the cable. Use a megger. If using a 500 V megger the isolation resistance shall exceed 500 mega ohm. Phase to phase readings as well as between each phase to ground. If any problems occurs, disconnect the cable from the stator and measure directly at the stator. If the isolation resistance is less than 500 mega ohm the stator should be dried in an oven. If the circuit is open, probably one of the overload switches is defective and should be located by testing each one.

The defective switch is bypassed according to the adjoining connection scheme. If the stator still cannot be used it has to be replaced. Disconnect the stator from the outgoing cables and disassemble it. Order an exchange stator unit from the nearest Mody Service Center.

The motor unit is connected to the volute with "Latch Bolts" bolts. Loosen the locking screws, turn the latch bolts 90° and lift off the motor unit from the volute.

Inspect the motor housing to see if it is dry by removing the screw marked "motor". Tilt the pump slightly. If water, oil or other debris is present in the motor housing, a full dismantling is required.

### **Changing the Cooling Liquid**

First disassemble the motor unit from the volute.

#### **Pump Without Cooling Jacket:**

Loosen the cooling liquid plug down on the cooling plate. Open the plugs on top of the oil housing and let the old water pour out. Replug the lower plug on the cooling plate. Slowly fill the new cooling liquid into one of the holes on top of the oil housing. Let both plugs on the top open to avoid air bubbles which will obstruct the filling of the coolant.

#### **Pump With Cooling Jacket:**

Loosen the cooling liquid plug down on the cooling plate. Open the plugs on top of the cooling jacket and let the old water pour out into a can. Replug the lower plug on the cooling plate. Slowly fill the new cooling liquid into the hole marked "in" on top of the cooling jacket. Let both plugs on the top open to avoid air bubbles to obstruct the filling.

### **Inspection of the Terminal Board Area**

Remove the four screws that hold the cover in place. Lift the cover carefully. To make it easier, the cable cover can be loosened so that the O-ring gasket does not continue to seal.

### **Disassembling the Terminal Housing**

Disassemble cover as instructed above. Remove the six screws that hold the terminal housing in place. Loosen the cables coming out of the motor unit from the terminal block. The cable lugs have to be removed before cables can be pulled through the cable seals. Lift the housing carefully

### **Disassembling the Cooling Jacket**

Disassemble terminal housing as instructed above. Use the two M10 holes on the top of the cooling jacket to lift off the cooling jacket. If needed, use eyebolts for help

### **Disassembling the Impeller**

The impeller is bolted to the shaft with a flat key and a bolt. Securing the impeller with a pipe or similar tool, remove the impeller bolt with a wrench . To loosen the impeller, it often helps to pry with a couple of strong screwdrivers between the impeller and the cooling plate

### **Disassembling the Seal Cartridge**

Disassemble volute and impeller as instructed above, and empty the pump of cooling liquid and oil. Lay the motor unit on its side. Remove the four screws that holds the seal cartridge. The cartridge can be removed from the oil chamber by inserting two M8 screws (40 mm (1 9/16") long) into the "jacking holes" in the cartridge or a M8 threaded plug, which will force the cartridge from the housing .

### **Disassembling the Rotor and Ball Bearings**

The rotor is mounted in the motor unit with an upper and two lower bearings. Install the eyebolt (M16) into the drilled hole in the shaft . Carefully lift out the rotor with the upper bearing from the oil housing. Bearings that have been in contact with water or are damaged should **always** be replaced. Fasten the rotor in a vice with soft jaws. Clean the shaft and lubricate it. Place the withdrawing tool on the upper bearing and make sure it pulls the inner ring. Remove the bearing. If the lower bearings are on the shaft, pull them off with your hands. Pick up the lower bearings if they are still in the oil housing.

## **ASSEMBLY**

### **Mounting**

While mounting the motor unit, be extremely careful and make sure everything is clean. Clean all O-ring grooves and all other contact surfaces carefully. Use a wire brush when necessary. Lubricate all O-rings with oil or grease to prevent the O-rings from getting stuck or damaged when remounting. Also, lubricate all threads on the screws to facilitate disassembling when servicing next time.

### **Mounting the Ball Bearings**

Check that the shaft is straight and the key slot is not damaged. Polish deep scratches and burrs off. Push the upper bearing into place. If a press is not available, heat the bearing to 100-120°C (212-248°F) in an oil bath. Wipe off the shaft contact surfaces of the bearing and mount it. Mount the lower bearings in the oil housing by using a pipe with the same external diameter as the bearing external diameter in order to keep the bearings in place in the oil housing when the rotor is mounted .

### **Mounting the Stator**

Pull the cables from the stator through the cable seals on the terminal housing. Connect the cables onto the terminal block according to the wiring diagram. Put the terminal housing with the O-ring in their place. Lift the stator unit with a lifting device and carefully lower it over the rotor. Do not forget to reconnect the cable to the moisture sensor in the oil housing. Check that the rotor does not damage the windings or the stator core. Fasten the stator with the screws.

### **Mounting the Seal Cartridge**

Put down the motor unit. Lubricate the shaft and all four O-rings on the seal unit (three external on the seal housing and one internal in the seal sleeve). Push the seal unit onto the shaft, and carefully place it in position. **Do not use hard striking tools.** Tighten the seal unit by fastening the four screws

### **Mounting the Impeller**

Turn the shaft so that the key slot is upward. Put the key in its groove and push the impeller onto the shaft. Lock the impeller to prevent it from rotating with a pipe or similar tool and fasten the impeller washer and screw .

### **Mounting the Cooling Jacket**

Lubricate the O-ring on the oil housing and the O-ring on the upper inside of the cooling jacket. Lower the cooling jacket over the stator housing. The cooling jacket can be placed optionally so that the filling holes are in suitable position.

### **Mounting the Cable Seal**

If water has gotten through the cable seal to the terminal board, the cable seals have to be replaced. The cable seal should be replaced after every disassembly of the cable gland. Measure the cable diameter with a slide gauge and compare it to the holes in the cable seal and the washers so that the dimensions are identical. Pull the seal onto the cable with one washer on each side. Pull the cable through the cover so that the cable and it's cover extends through the cable gland and into the terminal area

when tightening the cable lead-in. After tightening, the strain relief clamp is fastened. Turn the clip's long pin down to prevent the cable lead-in from unthreading.

### **Mounting the Terminal Housing**

Pull the cables through from the stator unit and fasten the terminal housing with screws. Ensure that the cables are not pinched. Connect the cables according to the wiring diagram.

### **Mounting the Cover**

Grease the O-ring on the cover and fasten it with four screws. In order to facilitate mounting the cover, one of the cable covers can be loosened so that air can be pressed out and release the pressure. Tighten the loosened cable cover.

### **Mounting the Motor Unit to the Volute**

Turn the latch bolts so that the motor unit runs free down to the upper edge of the volute. Turn the latch bolts in and fasten the screws alternately.

### **Adjusting the Wear Ring**

Lay the pump down on its side and check the clearance in between the impeller and wear ring. The clearance should be 0.7 mm ( $\frac{1}{32}$ " ) maximum. The wear ring is placed on the bottom side of the volute and is fastened by three screws placed horizontally. Loosen these screws and adjust with the three vertically placed screws. When necessary, tap carefully with a plastic/rubber Mallet. When the distance is adjusted, the horizontally placed screws can be tightened. In case of T/H installation, the wear ring can be adjusted with three vertically placed screws from the inside of the volute. This requires, nevertheless, that the motor unit has been dismantled from the volute.

## **3 ~ Direct on -line starting DOL** **Motor connection: Δ**

### **1 Power Supply Cable** **+ 1 Control Cable**

#### Color Coding

Power Supply	<b>U</b>	Red
	<b>V</b>	White
	<b>W</b>	Black
	<b>G</b>	Green

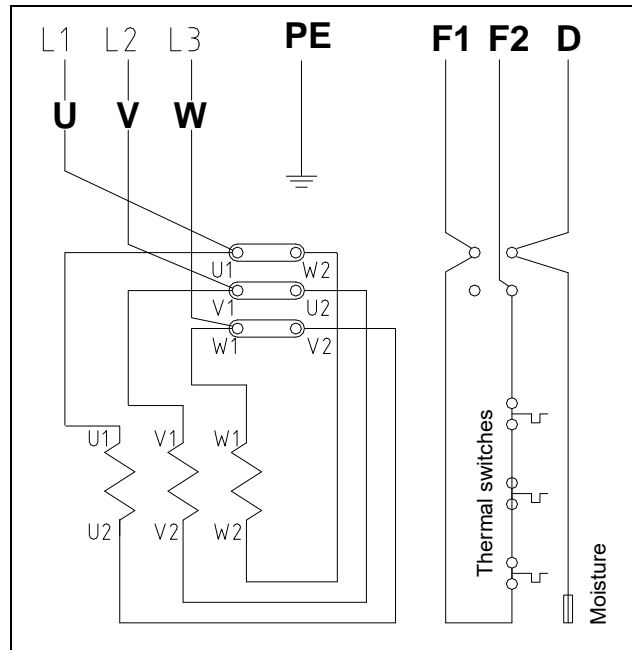
Control	<b>F1</b>	Black
	<b>F2</b>	Red
	<b>D*</b>	White
	<b>G</b>	Green

### **Single Power and Control Cable**

#### Color Coding

<b>U</b>	Red
<b>V</b>	White
<b>W</b>	Black
<b>PE</b>	Green
<b>F1</b>	Orange
<b>F2</b>	Blue
<b>D*</b>	White with Black Stripe

**3~ Direct - on - line starting DOL**  
**Motor connection : Δ**



*\*Not available for MSP1-65.0 Series*

### **Internal Connection on Motor's Terminal Board**

U1,	U2	:	Black
V1,	V2	:	Red
W1,	W2	:	Orange

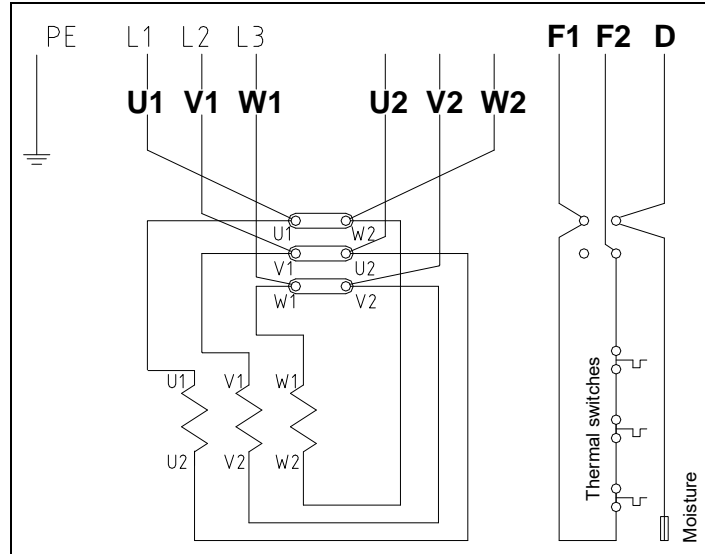
## **3 ~ Star-Delta starting Y- Δ Motor connection: III Δ**

**2 Power Supply Cable  
+ 1 Control Cable**

### Color Coding

Power Supply (cable1)	<b>U1</b>	Red
	<b>V1</b>	White
	<b>W1</b>	Black
	<b>G</b>	Green
Power Supply (cable2)	<b>U2</b>	White
	<b>V2</b>	Black
	<b>W2</b>	Red
	<b>G</b>	Green
Control	<b>F1</b>	Black
	<b>F2</b>	Red
	<b>D</b>	White
	<b>G</b>	Green

3~ Star-Delta starting Y-Δ  
Motor connection : III Δ



### **Internal Connection on Motor's Terminal Board**

U1,	U2	:	Black
V1,	V2	:	Red
W1,	W2	:	Orange

## DUAL WIRED 12 LEAD STATORS

### WIRING CONFIGURATION

460 VOLTS CONN.  
JOIN PERMANANTLY

T7 & T10  
T8 & T11  
T9 & T12

230 VOLTS CONN.

L1 = T1 T6 T9 T10  
L2 = T2 T4 T7 T11  
L3 = T3 T5 T8 T12

LINE

L1 = T1 T6  
L2 = T2 T4  
L3 = T3 T5



## MSP1 and MSP2 Oil and Coolant Service Instructions

### Changing the Oil

#### For MSP1 and MSP2

Remove the oil fill plug (figure 1). Then remove the oil drain plug (figure 2), allowing the old oil to drain into a container. Discard the old oil in accordance with local regulations.

After draining the oil, reinstall and tighten the oil drain plug (figure 2). Replenish oil through the oil fill plug (figure 4) using a small funnel.

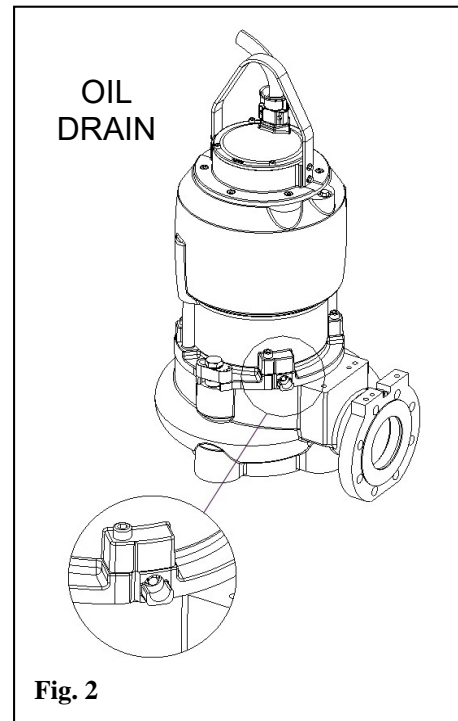
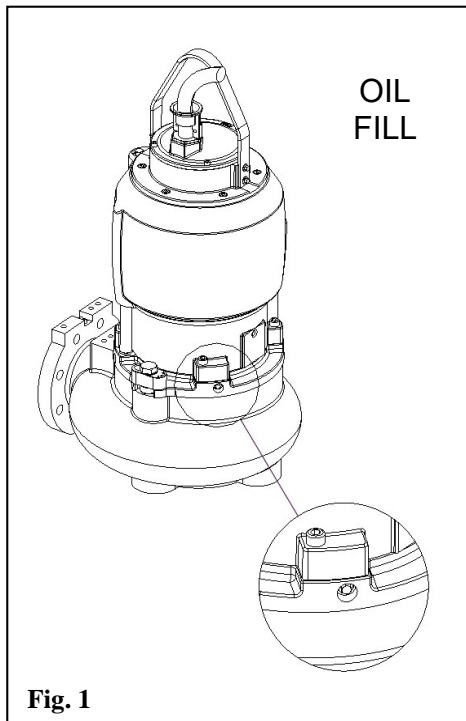
Oil quantity:

- MSP1:0.35L/0.55L\*
- MSP2:0.55L/0.90L\*

\* for Horizontal Installation.

Type of oil: Food grade white oil (Enerpar M002 or equal).

Note! Don't forget to check and tighten the both oil fill and oil drain plugs after filling is complete.





## MSP1 and MSP2 Oil and Coolant Service Instructions

### Changing the Cooling Fluid

Pump with cooling jacket:

Loosen the coolant fluid drain (out) plug at the lower oil housing (figure 3). Open the coolant fill (in) plug on top of the coolant jacket (figure 4) and allow the used cooling fluid to pour out into a container, and discard in accordance with local regulations.

After draining the coolant, retighten the cooling fluid drain plug at the lower oil housing (figure 3). Replenish coolant through the plug on top of the coolant jacket (figure 4) using a funnel.

Cooling fluid quantity without cooling jacket:

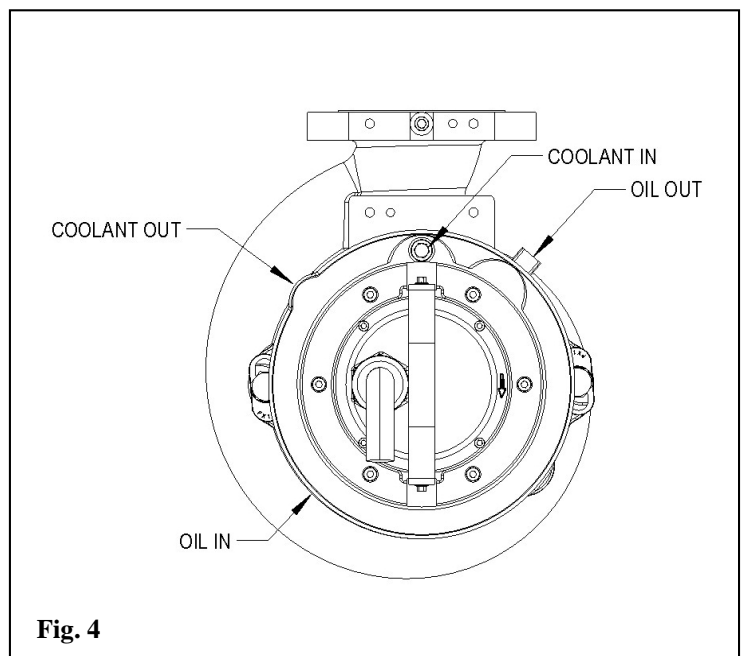
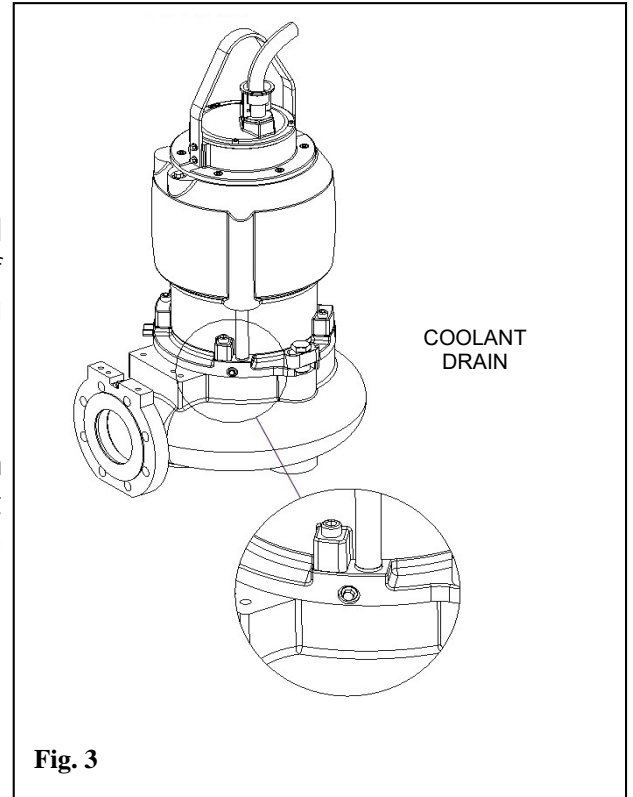
- MSP1:0.4L
- MSP2:1.3L

Cooling fluid quantity with cooling jacket:

- MSP1:3.8L
- MSP2:7.3L

Type of coolant: 70 % water / 30% Propylene Glycol DOWCAL<sup>®</sup> 20 (or equal).

Note! Don't forget to check and tighten both The coolant fill (in) and coolant drain (out) plugs after filling is complete.





February 21, 2011

**MOISTURE DETECTION DESCRIPTION  
MSP Series Pump Product Line**

The Mody moisture detection arrangement for the MSP Series Pump Product Line is extremely simplistic and highly reliable.

An aluminum electrical probe manufactured by Mody is installed in the seal oil cavity, the electrical terminal cavity, and the lower motor housing cavity for detecting the presence of moisture by resistance. These electrical probes are wired in series, identified in the control cable by a single lead with the appropriate ID marking.

A relay device mounted in the pump control panel (by others) or in a separate enclosure (by others) sends a low voltage, low amperage signal to the probes. If liquid should enter the monitored cavities, the probe signals the relay device in the control panel. The relay device then energizes a warning light or a shutdown circuit in the control panel (by others), thus protecting the motor from damage.

If Mody supplies the relay device, it will typically be the Mody Pump Monitor Relay, as described by page 2 of this document. This relay will also monitor motor thermal sensors.



# Pump Monitor Relay



UL FILE #E101681

## OPERATION

**MADE IN THE U.S.A.**

The MPMR provides Motor Over Temperature and Seal Leakage alarm for Mody Submersible Pumps.

**Motor Over Temperature Alarm** - The unit applies a low voltage DC signal to the Motor Thermal Sensor to check its status. If the unit detects that the Motor Thermal Sensor contacts are closed (normal condition), the Overtemp indication remains off, and the Overtemp Relay is energized closing the contacts between terminals 2 and 11.

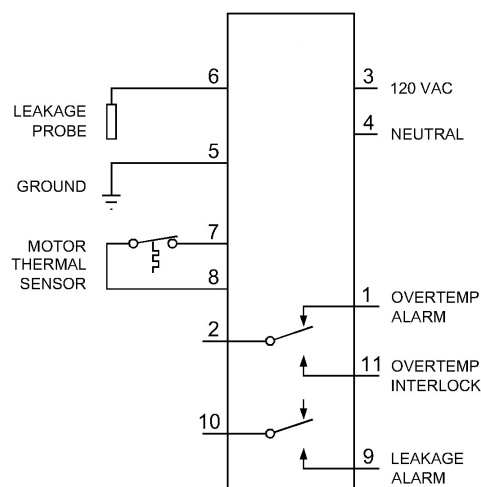
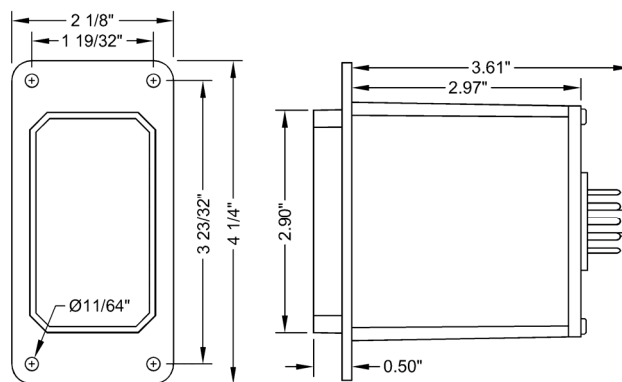
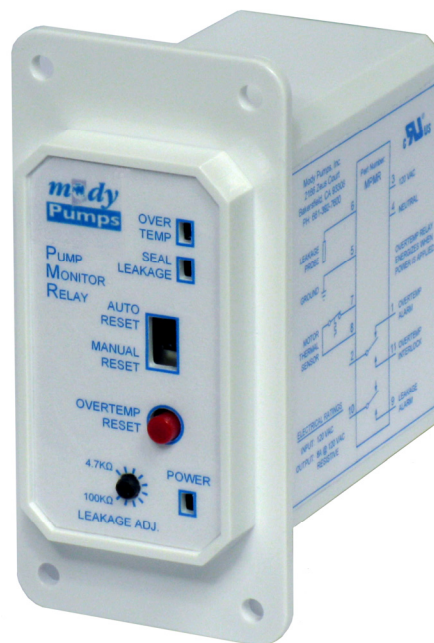
If the Motor Thermal Sensor contacts open (Over Temperature condition), the Overtemp Indication is turned on and the Overtemp Alarm Relay is de-energized opening the contacts between terminals 2 and 11 and closing the contacts between terminals 2 and 1.

When the High Motor Temperature condition has cleared, the unit will reset based on the position of Alarm Reset Mode Select Switch (Auto or Manual). When in the Auto position, the Overtemp Alarm resets automatically. If the switch is in the Manual position, the Overtemp Reset Push-button must be pushed for approximately 1.5 seconds to clear the alarm.

**Seal Leakage Alarm** - The unit applies a low voltage AC signal to the Leakage Probe to detect moisture in the pump motor. A Seal Leakage condition is considered present when the amount of moisture in the motor causes the resistance between the Leakage Probe and the motor housing to drop below the setting on the potentiometer. When this occurs the unit turns on the Leakage Indication and energizes the Leakage Alarm Relay closing the contacts between terminals 9 and 10.

The alarm trip point may be set by the following procedure: Isolate the Leakage Probe from terminal 6. Connect a resistor, with the desired trip value, across terminals 5 and 6. Slowly adjust the potentiometer to the point where the alarm turns on. Remove the resistor and reconnect the Leakage Probe to terminal 6.

**Recommended setting would be approx 20-25KΩ**



## SPECIFICATIONS

Input Power:	120 VAC ±10%, 7.0 VA max
Output Rating:	8A Resistive @ 120VAC
Operating Temp:	-20°C to +65 °C
Storage Temp:	-45°C to +85 °C
Temp Sensor Voltage:	6.6 VDC ±10%
Leak Sensor Voltage:	4.7 VAC ±10%
Enclosure:	White Lexan, NEMA 1
Base:	Phenolic

## ORDERING INFORMATION

**Part Number: 660-900-00**

**Mody Pumps, Inc. • 2166 Zeus Court, Bakersfield, CA 93308 USA**  
**Tel. (661) 392-7600 Fax: 661-392-7601**

[www.modypump.com](http://www.modypump.com) email: [sales@modypump.com](mailto:sales@modypump.com)

03.10.Rev.0

Cartridge Mechanical Seal Description  
Mody MSP Product Line

**Cartridge Mechanical Seal Description**

Each Mody MSP pump is provided with a double mechanical shaft seal system consisting of two totally independent seal assemblies, contained in a single cartridge. The primary seal unit, located between the pump and the lubricant chamber, contains one stationary and one positively driven rotating, silicon or tungsten carbide ring. The secondary seal unit, located between the lubricant chamber and the motor housing, also contains one stationary and one positively drive silicon or tungsten carbide seal ring. Each seal interface is held in contact by its own spring system. The seals do not require maintenance or adjustment, nor do they depend on direction of rotation for sealing.

The cartridge shaft sealing system facilitates ease of maintenance and on site replacement without the need for special tools. It operates in a food grade oil bath, within a lubricant chamber that is designed to prevent overfilling and also provide lubricant expansion capacity. A drain and inspection plug, with a positive anti-leak seal is easily accessible from the outside. The seal system does not rely on pumped media for lubrication and with a cooling jacketed motor the motor is able to operate continuously in air without damage while pumping under load.

**Product Photo**



Cartridge seals contain all components, factory assembled and tested for easy reliable field maintenance.



### MSP MAINTENANCE SUMMARY SHEET

Parts of Pump	Intermediate Service 5,000 Working Hours / Once a Year	Major service 25,000 Working Hours / Every 5 Years	Capable of being Repaired on Site?	Notes
Junction box	Check that it is clean and dry inside.		Yes	The box is equipped with moisture detector. Check for proper connection.
Terminal board	Check that the connections are properly tightened.		Yes	
Insulation check	Check that the resistance between earth and phase leads more than 500 MΩ. Conduct phase to phase resistance check.		Yes	
Cable	Check that the rubber sheathing (jacket) is undamaged.		Yes	
Cooling housing	Fill up with new coolant if necessary. Coolant : 70% water and 30% propylenoglycole.		Yes	
Oil chamber	Check quality of oil and for moisture intrusion. Resistance should be >1 MΩ.		Yes	Check via inspection plug.
O-rings	Always replace the O-rings of the filling plugs and at the junction cover. Always grease new O-rings.		Yes	
Thermal contacts (standard)	Check the resistance. Normally closed circuit interval 0-1 Ω.		Yes	
Thermistor (optional)	Check the resistance 20-250 Ω (measuring voltage max 2 V DC).		Yes	



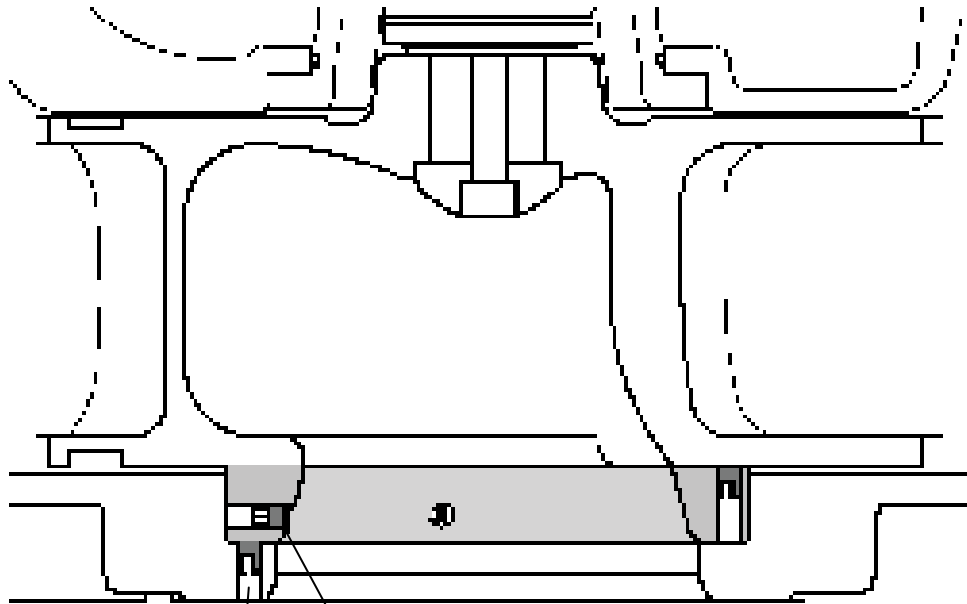
### MSP MAINTENANCE SUMMARY SHEET

Parts of Pump	Intermediate Service 5,000 Working Hours / Once a Year	Major service 25,000 Working Hours / Every 5 Years	Capable of being Repaired on Site?	Notes
Impeller	Check impeller clearance and adjust if necessary.		Yes	Remove pump from volute via "fast lock" mechanism to inspect impeller.
Wearing ring	Check for wear		Yes	Wear ring is adjustable. Recommend maintaining (1) spare wear ring on hand.
Stator housing	Check that is clean and dry		Yes	Check via inspection plug.
Lifting handle	Check the screws and the condition of lifting handle.		Yes	
Lifting device	Check that local safety regulations are followed.		Yes	
Support and main bearing		Replace with new bearings.	No	
Cartridge mechanical sealing system		Replace cartridge seal.	Yes	Recommend maintaining (1) spare cartridge mechanical seal and (1) cartridge mechanical seal repair kit on hand.

### Adjusting the MSP Wear Ring

Lay the pump down on its side and check the clearance in between the impeller and wear ring. The clearance should be approximately 1/32" maximum. The wear ring is placed on the bottom side of the volute and is fastened by three screws placed **horizontally** (see figure below). Loosen these screws and adjust with the three **vertically** placed screws. When necessary, strike carefully with a plastic club or leather mallet. When the distance is adjusted, the horizontally placed screws can be tightened.

**Note:** This Applies Only if Using a Channel Impeller. If using a Vortex Impeller, do not adjust the wear ring.



There are three vertically mounted Allen-Head set screws, 120° apart, for vertical adjustment.

There are three horizontally mounted Allen-Head set screws, 120° apart, for setting wear ring in place after adjustment is made

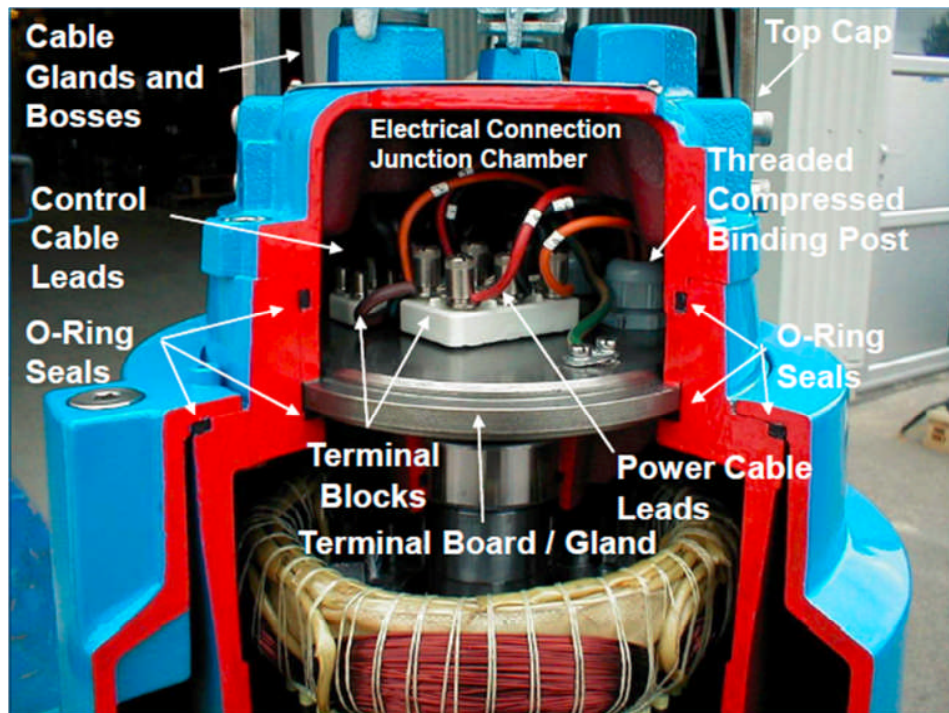
Power and Control Cable Entry Description  
Mody MSP Product Line

**Power and Control Cable Entry Description**

For ease of maintenance, the cable entry design of the Mody MSP product line does not require specific torque requirements to insure a watertight seal when assembling the pump. This cable entry design consists of a cylindrical elastomer grommet, bordered by stainless steel washers, all having close tolerance fits against the cable outside diameter and cable entrance inside diameter. A cable cap incorporating a strain relief mounts to the cable entry boss compressing the grommet ID to the cable, while the grommet OD seals against the bore of the cable entrance location. This entrance system is the same for both the power cable and control cable.

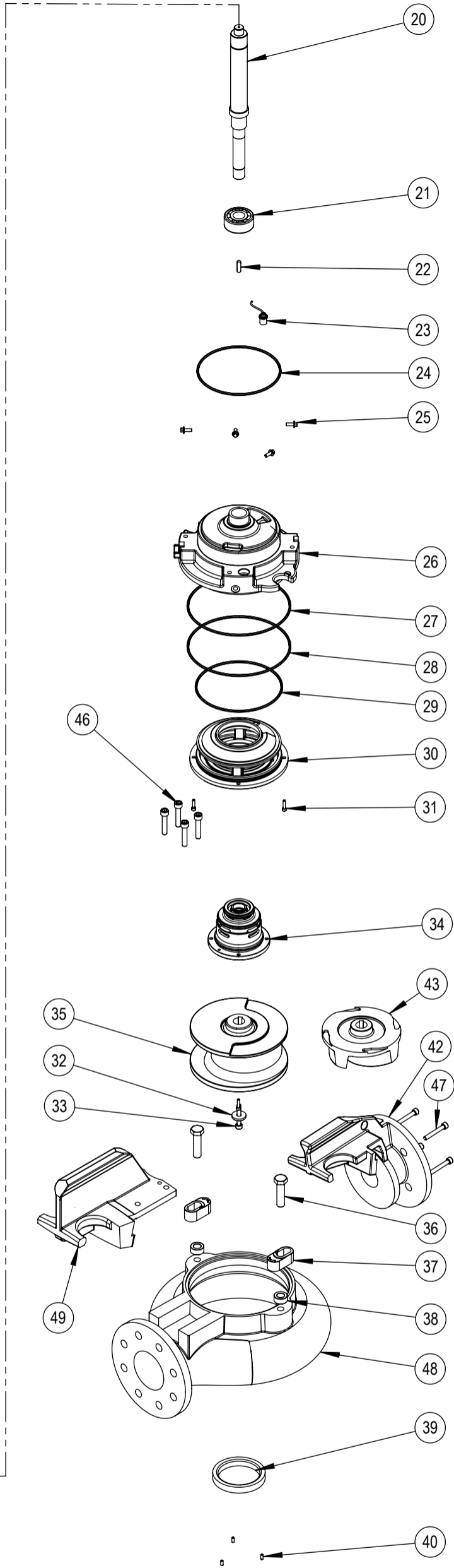
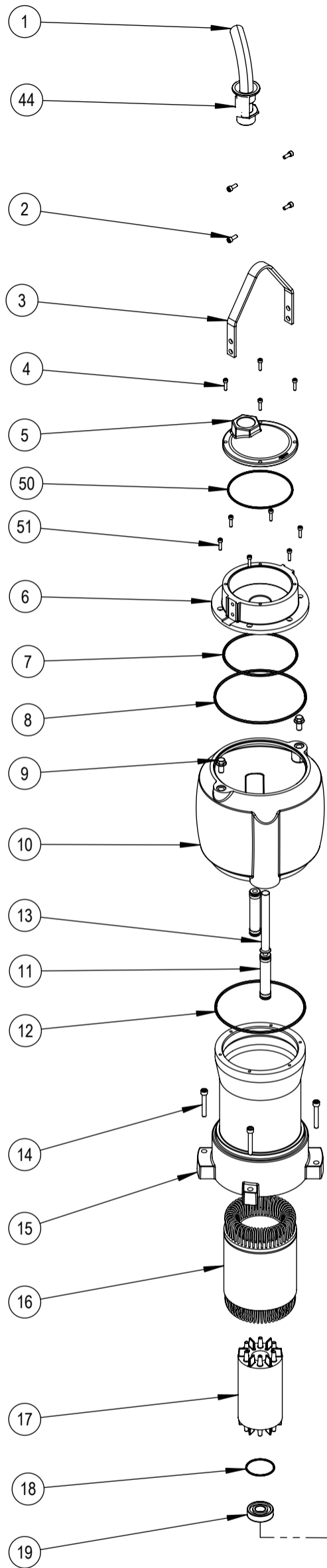
The cable entry junction chamber is equipped with a threaded compressed binding “post” type terminal block to accommodate leak proof electrical connections between the main motor leads and power cables. To prevent foreign matter from entering the motor when the motor top is opened, the terminal blocks are isolated and sealed from the motor by means of a stator lead terminal board /sealing gland and elastomeric compression O-rings.

**Product Photo**



## MSP1 PARTS LIST

ITEM NO.	PART DESCRIPTION	QTY	MATERIAL
1	CABLE		H07RN-F
2	BOLT	4	AISI 304 STAINLESS STEEL
3	HANDLE	1	AISI 304 STAINLESS STEEL
4	BOLT	10	AISI 304 STAINLESS STEEL
5	MOTOR COVER	1	ASTM A48 CLASS 35 CAST IRON
6	UPPER BEARING HOUSING	1	ASTM A48 CLASS 35 CAST IRON
7	O-RING	1	NITRILE RUBBER
8	O-RING	1	NITRILE RUBBER
9	PLUG	2	A2
10	COOLING JACKET	1	ASTM A48 CLASS 35 CAST IRON
11	COOLANT HOSE ASSEMBLY	2	RUBBER STAINLESS STEEL
12	O-RING	2	NITRILE RUBBER
13	COOLAND TUBE	1	STEEL
14	BOLT	4	AISI 304 STAINLESS STEEL
15	STATOR HOUSING PX1-1	1	ASTM A48 CLASS 35 CAST IRON
16	WIRE CORE	1	SIEMENS
17	ROTOR BODY	1	SIEMENS
18	O-RING	1	NITRILE RUBBER
19	BEARING UPPER	1	
20	SHAFT ROTOR PX1-1	1	AISI 304 STAINLESS STEEL
21	BEARING LOWER	1	
22	KEY	1	AISI 304 STAINLESS STEEL
23	MOISTURE SENSOR	1	ALUMINUM / RUBBER
24	O-RING	1	NITRILE RUBBER
25	BOLT	2	AISI 304 STAINLESS STEEL
26	LOWER BEARING HOUSING	1	ASTM A48 CLASS 35 CAST IRON
27	O-RING	1	NITRILE RUBBER
28	O-RING	1	NITRILE RUBBER
29	O-RING	1	NITRILE RUBBER
30	LOWER COOLING FLANGE	1	ASTM A48 CLASS 35 CAST IRON
31	BOLT	4	AISI 304 STAINLESS STEEL
32	IMPELLER WASHER	1	AISI 304 STAINLESS STEEL
33	BOLT	1	AISI 304 STAINLESS STEEL
34	PX1 SEAL CATRIDGE ASSEMBLY	1	
35	IMPELLER CHANNEL CX1-80	1	ASTM A395 DUCTILE IRON, GRADE 60-40-18
36	BOLT	2	AISI 304 STAINLESS STEEL
37	LATCH BOLT (FAST LOCK) (SMALL)	2	AISI 304 STAINLESS STEEL
38	WASHER SPACER	2	TEFLON
39	WEAR RING PX1-80	1	ASTM A48 CLASS 35 CAST IRON
40	SET SCREW	3	AISI 304 STAINLESS STEEL
41	BOLT	4	AISI 304 STAINLESS STEEL
42	ADAPTER PX1-83	1	ASTM A395 DUCTILE IRON, GRADE 60-40-18
43a	IMPELLER VORTEX VX1-80	1	ASTM A395 DUCTILE IRON, GRADE 60-40-18
43b	IMPELLER VORTEX VX1-83 (VXX1)	1	ASTM A395 DUCTILE IRON, GRADE 60-40-18
44	CABLE SEAL compl. PG29 (16) for 7x1,5mm <sup>2</sup>	1	ASTM A48 CLASS 35 CAST IRON
45	BOLT	2	AISI 304 STAINLESS STEEL
46	BOLT (for adapter)	4	AISI 304 STAINLESS STEEL
47	SCREW (for adapter)	4	AISI 304 STAINLESS STEEL
48a	VOLUTE PX1-80	1	ASTM A48 CLASS 35 CAST IRON
48b	VOLUTE PX1-83	1	ASTM A48 CLASS 35 CAST IRON
49	ADAPTER PX1-80 (PX2/3)	1	ASTM A395 DUCTILE IRON, GRADE 60-40-18
50	O-RING	1	NITRILE RUBBER
51	BOLT	6	AISI 304 STAINLESS STEEL



UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN MILLIMETERS  
 SURFACE FINISH:  
 TOLERANCES:  
 LINEAR:  
 ANGULAR:

FINISH:

DEBUR AND  
 BREAK SHARP  
 EDGES

**MODY PUMPS, INC**  
**Bakersfield, CA**

	NAME	SIGNATURE	DATE
DESIGN	STELIOS		
CHK'D			
APPV'D			
MFG			
Q.A			
PRINT			17/02/09

MATERIAL:

TITLE:

**MSP1 Assembly**

DWG NO.

**001-400-500**

A3

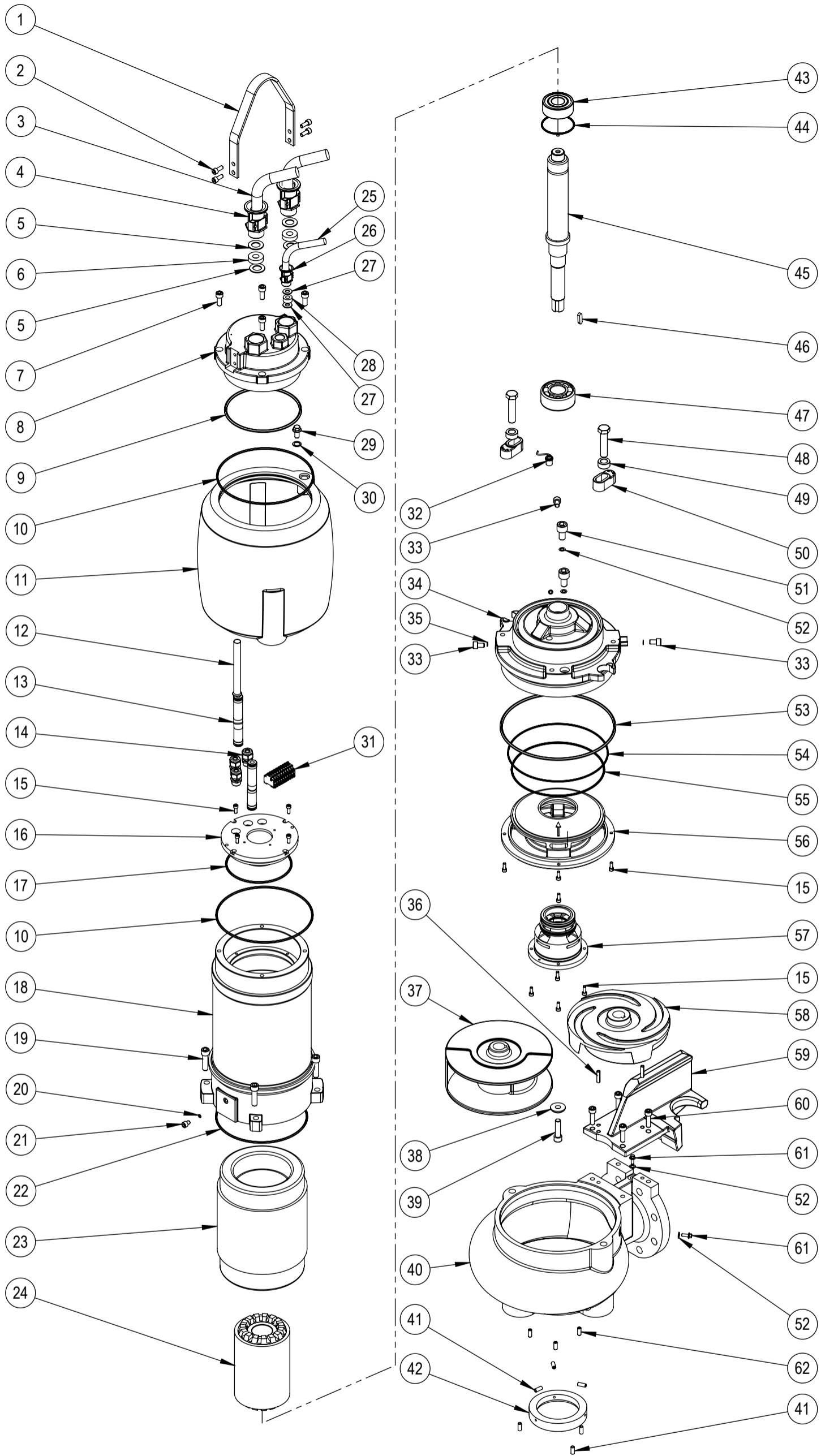
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SHEET 1 OF 1



## MSP2 PARTS LIST (VER. 2.1C)

ITEM NO.	PART DESCRIPTION	QTY	MATERIAL
1	HANDLE	1	AISI 304 STAINLESS STEEL
2	BOLT	4	AISI 304 STAINLESS STEEL
3	POWER CABLE	2	NEOPRENE JACKETED
4	GLAND-POWER CABLE	2	ASTM A48 CLASS 35 CAST IRON
5	WASHER- CABLE SEAL PG29(13-16)	4	TEFLON
6	RUBBER FOR CABLE SEAL PG29(13-16)	2	RUBBER
7	BOLT	4	AISI 304 STAINLESS STEEL
8	MOTOR COVER	1	ASTM A48 CLASS 35 CAST IRON
9	O-RINGS	1	NITRILE RUBBER
10	O-RINGS	2	NITRILE RUBBER
11	COOLING JACKET M2.1C	1	ASTM A48 CLASS 35 CAST IRON
12	COOLANT TUBE	1	RUBBER / STAINLESS STEEL
13	Cooling pipe (compl) M2.1C	2	RUBBER / STAINLESS STEEL
14	GLAND CABLE INNER	3	ASTM A48 CLASS 35 CAST IRON
15	BOLT	12	AISI 304 STAINLESS STEEL
16	UPPER BEARING HOUSING M2.1C	1	ASTM A48 CLASS 35 CAST IRON
17	O-RINGS	1	NITRILE RUBBER
18	STATOR HOUSING MSP2-M2.1C	1	ASTM A48 CLASS 35 CAST IRON
19	BOLT	4	AISI 304 STAINLESS STEEL
20	WASHER	1	POLYAMIDE
21	BOLT	1	AISI 304 STAINLESS STEEL
22	O-RINGS	1	NITRILE RUBBER
23	STATOR WIRE	1	SIEMENS
24	ROTOR	1	SIEMENS
25	CONTROL CABLE	1	NEOPRENE JACKETED
26	GLAND-CONTROL CABLE	1	ASTM A48 CLASS 35 CAST IRON
27	WASHER-CABLE SEAL PG16 (9-12)	2	TEFLON
28	RUBBER FOR CABLE SEAL PG16 (9-12)	1	RUBBER
29	BOLT PLUG	1	AISI 304 STAINLESS STEEL
30	WASHER	1	TEFLON
31	RAIL ELECTRICAL TERMINAL	1	
32	SENSOR MOISTURE PROBE (SET)	1	
33	BOLT	3	AISI 304 STAINLESS STEEL
34	LOWER BEARING HOUSING M2.1C	1	ASTM A48 CLASS 35 CAST IRON
35	WASHER	3	POLYAMIDE
36	PIN GUIDE	2	STEEL
37	IMPELLER CHANNEL	1	ASTM A395 DUCTILE IRON, GRADE 60-40-18
38	IMPELLER WASHER MSP2	1	AISI 304 STAINLESS STEEL
39	IMPELLER BOLT MSP2	1	AISI 304 STAINLESS STEEL
40	VOLUTE	1	ASTM A48 CLASS 35 CAST IRON
41	BOLT	6	AISI 304 STAINLESS STEEL
42	WEAR RING MSP2	1	ASTM A48 CLASS 35 CAST IRON
43	BEARING UPPER	1	6306
44	O-RINGS	1	VITON
45	SHAFT M2.1C	1	AISI 304 STAINLESS STEEL
46	KEY FLAT MSP2	1	AISI 304 STAINLESS STEEL
47	BEARING LOWER	1	3307
48	BOLT	2	AISI 304 STAINLESS STEEL
49	SPACER FAST LOCK	2	TEFLON
50	LATCH BOLT (FAST LOCK)	2	AISI 304 STAINLESS STEEL
51	Plug	2	AISI 304 STAINLESS STEEL
52	WASHER	4	POLYAMIDE
53	O-RINGS	1	NITRILE RUBBER
54	O-RINGS	1	NITRILE RUBBER
55	O-RINGS	1	NITRILE RUBBER
56	COOLING FLANGE LOWER PX2	1	ASTM A48 CLASS 35 CAST IRON
57	Cartridge seal MSP2 (SiC/SiC ,SiC/SiC)	1	
58	IMPELLER VORTEX	1	ASTM A395 DUCTILE IRON, GRADE 60-40-18
59	ADAPTER	1	ASTM A395 DUCTILE IRON, GRADE 60-40-18
60	BOLT	4	AISI 304 STAINLESS STEEL
61	BOLT PLUG	2	AISI 304 STAINLESS STEEL
62	SET SCREW	3	AISI 304 STAINLESS STEEL



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 TOLERANCES:  
 LINEAR:  
 ANGULAR:

FINISH:

DEBUR AND  
 BREAK SHARP  
 EDGES

	NAME	SIGNATURE	DATE
DESIGN	STELIOS		
CHK'D			
APPV'D			
MFG			
Q.A			
PRINT			24/6/15

MATERIAL:

TITLE:

Mody Pumps Inc.  
 Bakersfield, CA  
 ASSEMBLY MSP2 M2.1C

DWG NO.

002-400-496

A3

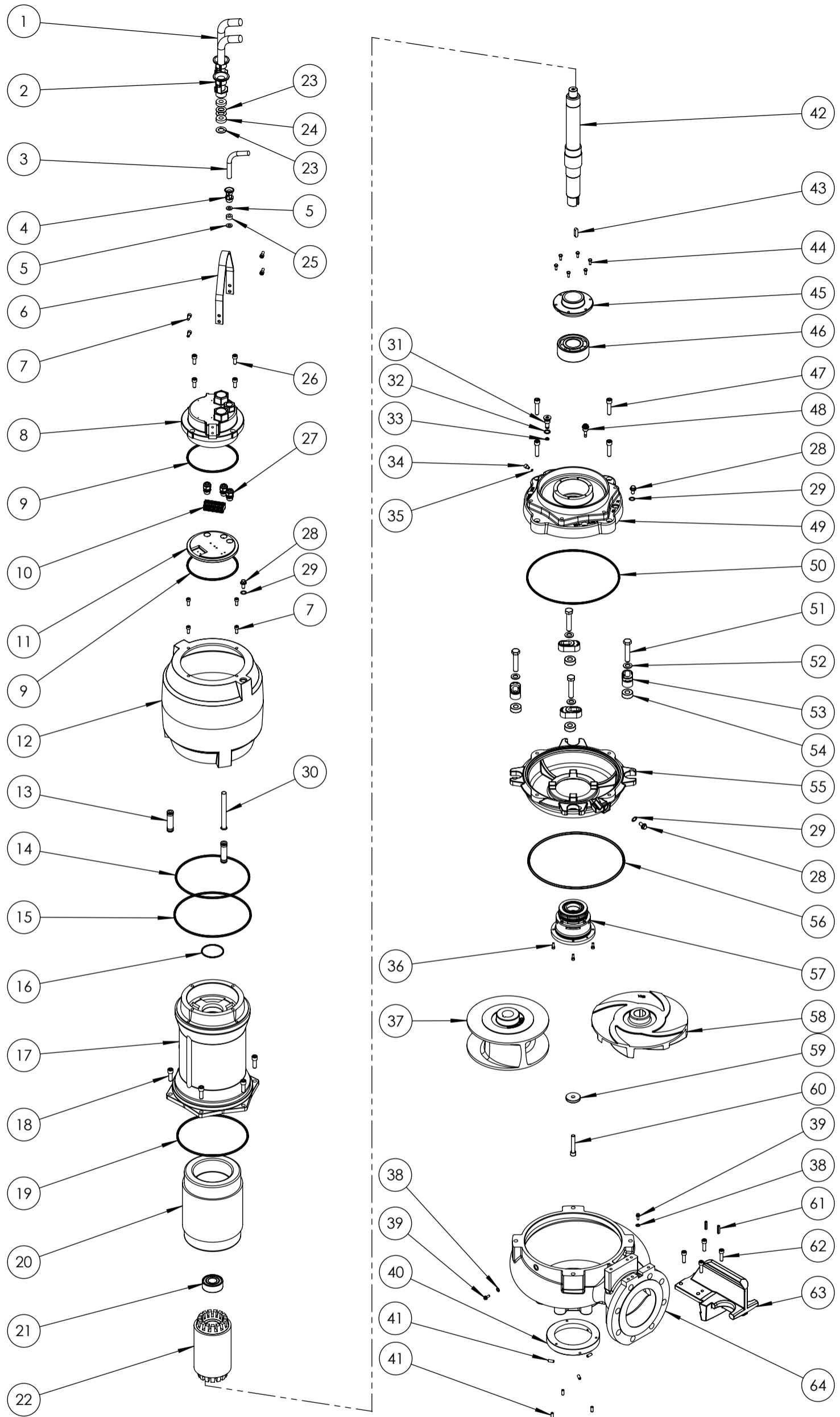
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SHEET 1 OF 2

### MSP3 10HP - 17HP (VER3.1C)

ITEM NO.	PART DESCRIPTION	QTY	ITEM NO.	PART DESCRIPTION	QTY
1	CABLE POWER	2	37	IMPELLER CHANNEL CX3-100	1
2	GLAND POWER CABLE	2		IMPELLER CHANNEL CXX3-150	
3	CABLE, POWER	1		IMPELLER CHANNEL CXXX3-150	
4	GLAND CONTROL CABLE	1	38	WASHER POLYAMIDE 14/18X1.5	2
5	WASHER CABLE SEAL	2	39	BOLT PLUG 1/4in	2
6	HANDLE	1	40	WEAR RING MSP3-100	1
7	ALLEN M8X20 (A2)	8		WEAR RING MSP3-150	
9	ORING	2	41	ALLEN SOCKET M8X20 (A2)	6
10	RAIL ELECTRICAL TERMINAL	1	42	SHAFT M3.1C	1
11	PLATE FOR TERMINALS	1	43	KEY	1
12	JACKET COOLING M3.1C	1	44	BOLT HEX M6	6
13	ASSEMBLY COOLING PIPE	2	45	BEARING COVER	1
14	ORING	1	46	BEARING	1
15	ORING	1	47	ALLEN M12	4
16	ORING	1	48	SENSOR MOISTURE PROBE	1
17	HOUSING STATOR M3.1C	1	49	HOUSING LOWER BEARING	1
18	ALLEN M12	6	50	ORING	1
19	ORING	1	51	BOLT HEX M16X75	4
20	STATOR WIRE	1	52	WASHER INOX $\Phi$ 16	4
21	BEARING UPPER	1	53	FAST LOCK PX3/4	4
22	ROTOR 170	1	54	SPACER FAST LOCK DIA. 38mm	4
23	WASHER CABLE SEAL	4	55	COOLING FLANGE CHAMBER LOWER	1
24	RUBBER FOR CABLE SEAL	2	56	ORING	1
25	RUBBER FOR CABLE SEAL	1	57	ASSEMBLY CARTRIDGE SEAL PX3	1
26	ALLEN M10X25 (A2)	4	58	IMPELLER VORTEX VX3-80	1
27	GLAND CABLE INNER	3		IMPELLER VORTEX VX3-100/150	1
28	BOLT PLUG M18 (ALLEN-8)	3		IMPELLER VORTEX VXX3-150	1
29	WASHER	3	59	WASHER, IMPELLER PX3	1
30	TUBE, RETURN COOLANT	1	60	BOLT	1
31	PLUG, FOR OIL	1	61	GUIDING PIN	2
32	ORING	1	62	ALLEN M10X35 (A2)	4
33	ORING	1	63	ADAPTER PX1,2,3	1
34	ALLEN M8	1	64	VOLUTE MSP3-100	1
35	WASHER POLYAMIDE	1		VOLUTE MSP3-150	1
36	BOLT ALLEN M6	6		VOLUTE MSP3-80	1



UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN MILLIMETERS  
 SURFACE FINISH:  
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MFG				
Q.A				MATERIAL:
PRINT			18/10/15	

**MODY PUMPS, INC**  
**Bakersfield, CA**

TITLE:  
**ASSEMBLY MSP3 M3.1C**

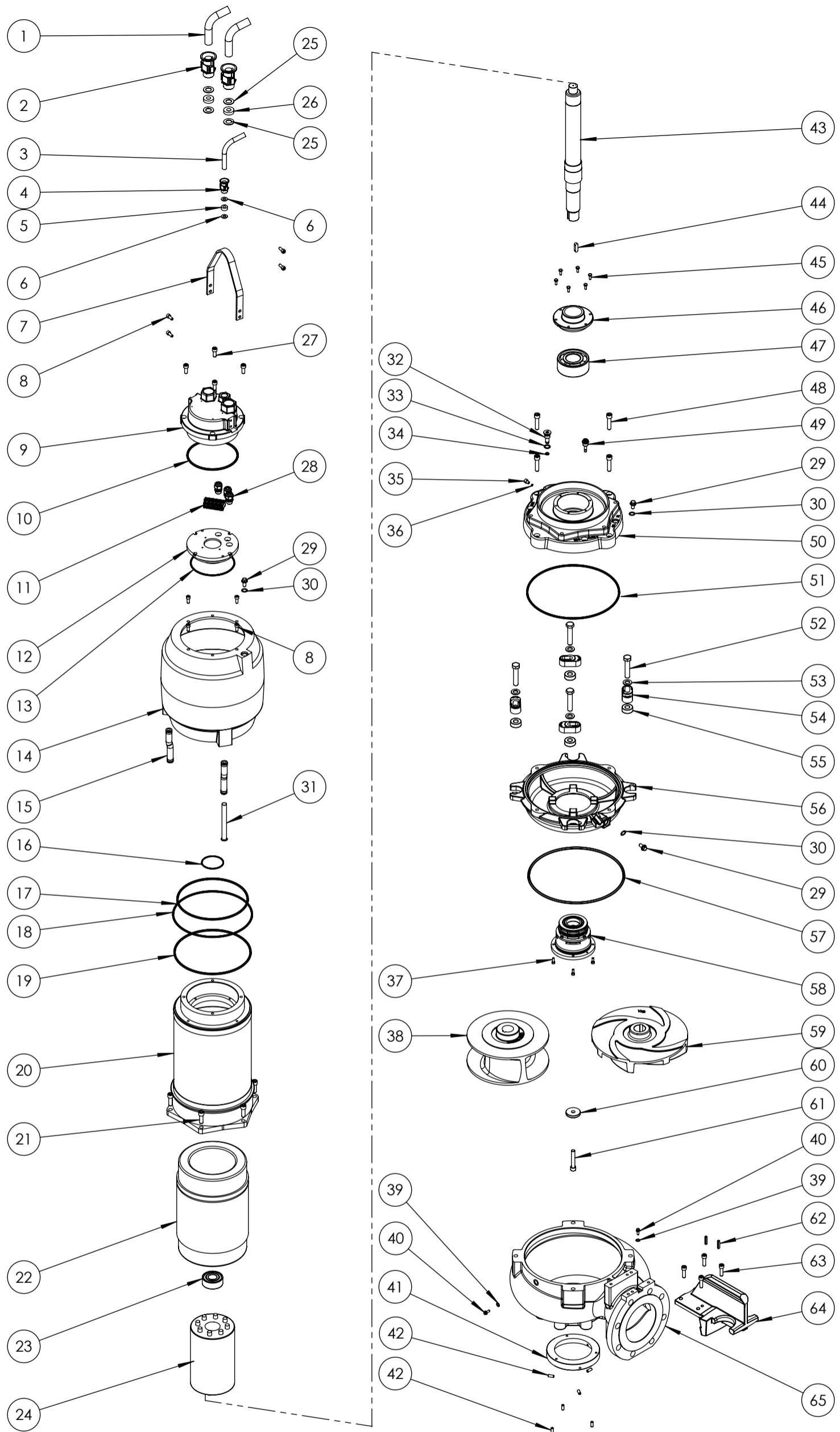
DWG NO. **003-400-493**

SCALE: SHEET 1 OF 1

A3  
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**MSP3 20HP-55HP (VER. 3.1D)**

ITEM NO.	PART DESCRIPTION	QTY	ITEM NO.	PART DESCRIPTION	QTY
1	CABLE POWER	2	37	BOLT ALLEN M6	6
2	GLAND POWER CABLE	2	38	IMPELLER CHANNEL CX3-100	1
3	CABLE, POWER	1		IMPELLER CHANNEL CXX3-150	
4	GLAND CONTROL CABLE	1		IMPELLER CHANNEL CXXX3-150	
5	RUBBER FOR CABLE SEAL	1	39	WASHER POLYAMIDE 14/18X1.5	2
6	WASHER CABLE SEAL	2	40	BOLT PLUG 1/4in	2
7	HANDLE	1	41	WEAR RING MSP3-100	1
8	ALLEN M8	8		WEAR RING MSP3-150	
9	MOTOR COVER	1	42	ALLEN SOCKET M8	6
10	ORING	2	43	SHAFT M3.1D	1
11	RAIL ELECTRICAL TERMINAL	1	44	KEY	1
12	UPPER BEARING HOUSING	1	45	BOLT HEX	6
13	ORING		46	BEARING COVER	1
14	JACKET COOLING M3.1C	1	47	BEARING, BEARING 3310	1
15	COOLING PIPE ASSEMBLY	2	48	ALLEN M12	4
16	ORING	1	49	SENSOR MOISTURE PROBE (SET) PX3,4	1
17	ORING	1	50	HOUSING LOWER BEARING	1
18	ORING	1	51	ORING	1
19	ORING	1	52	BOLT HEX	4
20	HOUSING STATOR M3.1D	1	53	WASHER	4
21	ALLEN M12	6	54	FAST LOCK MSP3/4	4
22	STATOR WIRE	1	55	SPACER FAST LOCK	4
23	BEARING UPPER	1	56	COOLING FLANGE CHAMBER LOWER	1
24	ROTOR	1	57	ORING	1
25	WASHER CABLE SEAL	4	58	ASSEMBLY CARTRIDGE SEAL	1
26	RUBBER FOR CABLE SEAL	2	59	IMPELLER VORTEX VX3-80	1
27	ALLEN M10X25 (A2)	4		IMPELLER VORTEX VX3-100/150	1
28	GLAND CABLE INNER	3		IMPELLER VORTEX VXX3-150	1
29	BOLT PLUG M18	3	60	WASHER, IMPELLER PX3 (50x19)	1
30	WASHER	3	61	BOLT ALLEN	1
31	TUBE, RETURN COOLANT	1	62	PIN GUIDING	2
32	PLUG, FOR OIL	1	63	ALLEN M10	4
33	ORING	1	64	ADAPTER PX1,2,3	1
34	ORING	1	65	VOLUTE MSP3-100	1
35	ALLEN M8	1		VOLUTE MSP3-150	1
36	WASHER POLYAMIDE	1		VOLUTE MSP3-80	1



UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN MILLIMETERS  
 SURFACE FINISH:  
 TOLERANCES:  
 LINEAR:  
 ANGULAR:

FINISH:

DEBUR AND  
 BREAK SHARP  
 EDGES

	NAME	SIGNATURE	DATE
DESIGN			
CHK'D			
APPV'D			
MFG			
Q.A			
PRINT			18/10/15

MATERIAL:

TITLE:

**MODY PUMPS, INC**  
**Bakersfield, CA**

ASSEMBLY MSP3 M3.1D

DWG NO.

**003-400-492**

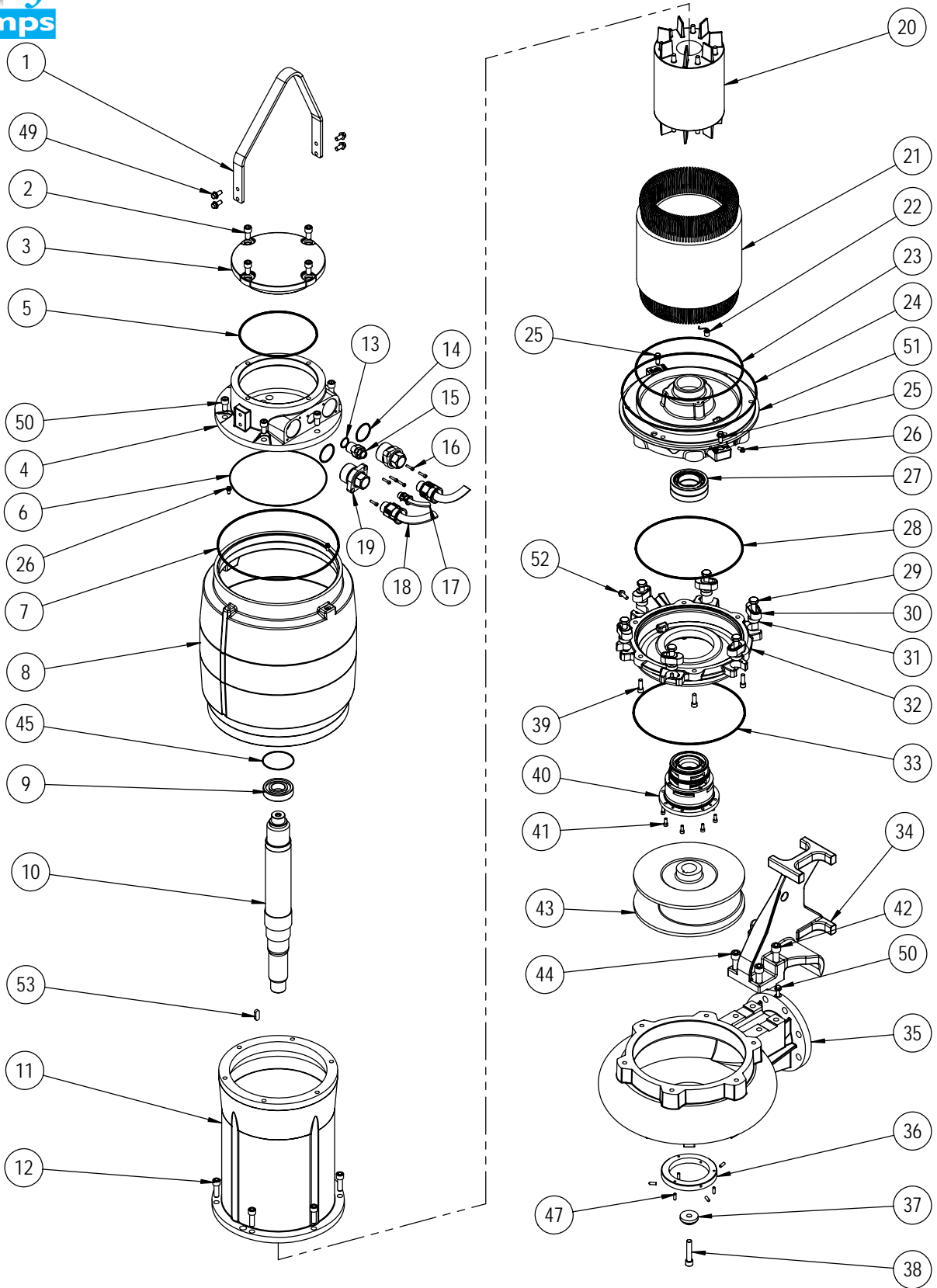
A3  
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SCALE:

SHEET 1 OF 1

ITEM NO.	DRAWING NUMBER	MSP4 PARTS LIST	QTY	STD MAT'L OF CONSTRUCTION
1	004-000-039	HANDLE	1	stainless steel 304
2	004-000-404	screw	4	stainless steel 304
3	004-000-019	MOTOR COVER	1	cast iron GG25
4	004-000-013	UPPER BEARING HOUSING	1	cast iron GG25
5	004-000-043	O-RINGS	1	NBR
6	004-000-043	O-RINGS	1	NBR
7	004-000-043	O-RINGS	1	NBR
8	004-000-007	COOLING JACKET	1	cast iron GG25
9	004-000-402	BEARING UPPER	1	6309DDUCM
10	004-000-038	SHAFT ROTOR PX4-1	1	stainless steel 304
10a	004-000-014	SHAFT ROTOR PX4-2		
11	004-000-017	STATOR HOUSING PX4-1	1	cast iron GG25
11a	004-000-006	STATOR HOUSING PX4-2	1	cast iron GG25
12	004-000-413	screw	6	stainless steel 304
13	004-000-043	O-RINGS	1	NBR
14	004-000-043	O-RINGS	2	NBR
15	004-000-031	CABLE COVER for control cable	1	cast iron GG25
16	004-000-417	screw	6	stainless steel 304
17	004-000-046	CONTROL CABLE	1	
18	004-000-047	POWER CABLE	2	
19	004-000-032	CABLE COVER for power cable	2	cast iron GG25
20	004-000-011	ROTOR BODY	1	siemens
21	004-000-008	WIRE CORE	1	siemens
22	002-000-062	MOISTURE SENSOR	1	Aluminium/rubber
23	004-000-043	O-RING	1	NBR
24	004-000-043	O-RING	1	
25		plug(for w/o cooling jacket version)	2	stainless steel 304
26	004-000-403	plug	1	stainless steel 304
27	004-000-419	screw	1	stainless steel 304
27	004-000-401	BEARING	2	7214 BEAT85SUN
28	004-000-043	O-RING	1	
29	004-000-405	BOLT	6	stainless steel 304
30	003-000-032	LATCH BOLT (FAST LOCK)	6	stainless steel 304
31	003-000-034	FAST LOCK WASHER (LARGE)	6	TEFLON
32	004-000-009	LOWER COOLING FLANGE	1	cast iron GG25
33	004-000-043	O-RING	1	
34	004-000-024	ADAPTER	1	cast iron GG25
35	004-000-029	VOLUTE MSP4-150.0	1	cast iron GG25
35a		VOLUTE MSP4-200.0	1	cast iron GG25
35b		VOLUTE MSP4-80.0	1	cast iron GG25
35c		VOLUTE MSP4-300.0	1	cast iron GG25
36	004-000-023	WEAR RING MSP4-150	1	cast iron GG25
36a		WEAR RING MSP4-200	1	cast iron GG25
36b		WEAR RING MSP4-300	1	cast iron GG25
37	004-000-033	IMPELLER WASHER	1	stainless steel 304
38	004-000-414	screw	1	stainless steel 304
39	004-000-409	screw	6	stainless steel 304

ITEM NO.	DRAWING NUMBER	MSP4 PARTS LIST	QTY	STD MAT'L OF CONSTRUCTION
40	004-500-001	SEAL CATRIDGE ASSEMBLY	1	
41	004-00-411	screw	8	stainless steel 304
42	004-000-415	screw	2	stainless steel 304
43	004-000-026	IMPELLER CX4-151	1	Ductile Iron GGG40
43a		IMPELLER CXX4-151	1	Ductile Iron GGG40
43b		IMPELLER VX4-151	1	Ductile Iron GGG40
43c		IMPELLER CXX4-201	1	Ductile Iron GGG40
43d		IMPELLER VXX4-201	1	Ductile Iron GGG40
44	004-000-416	screw	2	stainless steel 304
45	004-000-043	O-RINGS	1	NBR
47	004-000-420	screw	6	stainless steel 304
49	004-000-431	screw	4	stainless steel 304
50	004-000-421	plug	1	stainless steel 304
51	004-000-002	LOWER BEARING HOUSING PX4-1	1	cast iron GG25
51a		LOWER BEARING HOUSING PX4-2	1	cast iron GG25
52		plug	1	stainless steel 304
53		KEY	1	stainless steel 304



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:			FINISH:	DEBUR AND BREAK SHARP EDGES	<b>MODY PUMPS, INC.</b> <b>Bakersfield, CA USA</b>
DESIGN:	NAME STELIOS	SIGNATURE	DATE	TITLE:  MSP4 ASSEMBLY	
CHK'D:					
APP'VD:					
MFG:					
Q.A.				MATERIAL:	
PRINT			16/07/08		
				DWG NO.	004-400-500
				SCALE:	A3
				SHEET 1 OF 2	



## MSP OIL - COOLANT CAPACITY

### NEW VERSIONS 2019

Pump Type	Motor Series	OIL	Without Cooling Jacket	With Cooling Jacket
MSP1	M1.1A	0,35L/0,55L*	0,4L	3,2L
MSP2	M2.1B	0,55L/0,90L*	1,3L	6,8L
	M2.1C	0,55L/0,90L*	1,3L	8L
MSP3	M3.1C	0,25L	4,6L	11,5L
	M3.1D	0,25L	4,6L	10,8L
	M3.1E	0,25L	4,6L	48,2L
MSP4	M34.1C	0,25L	5,6L	12,5L
	M34.1D	0,25L	5,6L	11,8L
MSP4	M4.1E	0,35L	6L	49,5L
MSP4	M4.2B	0,35L	6L	37L
MSP4 & MSP5	M4.2C	0,35L	6L	22,6L
MSP4 & MSP5	M4.2D	0,35L	6L	40.5L

\*For Horizontal Installation  
US Gal=0.264\*L (liter)

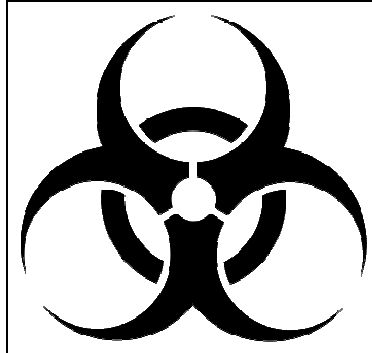
### OLD VERSIONS 2007

Pump Type	Motor Series	OIL	Without Cooling Jacket	With Cooling Jacket
MSP1	M1-1	0,35L/0,55L*	0,4L	3,8L
MSP2	M2-1	0,55L/0,90L*	1,3L	7,3L
	M2-2	0,55L/0,90L*	1,3L	6,7L
MSP3	M3-1	0,25L	4,6L	12,5L
	M3-2	0,25L	4,6L	12L
	M3-3	0,25L	4,6L	12L
	M34-1	0,25L	5,6L	13,5L
	M34-2	0,25L	5,6L	13L
	M34-3	0,25L	5,6L	13L
MSP4	M4-1	0,35L	6L	49,5L
	M4-2/M4.2B	0,35L	6L	37L
	M4-3/M4.2C	0,35L	6L	22,6L

\*For Horizontal Installation  
US Gal=0.264\*L (liter)

**RETURNED GOODS POLICY:**

RETURN OF MERCHANDISE REQUIRES A "RETURNED GOODS AUTHORIZATION" OR RGN NUMBER. CONTACT YOUR LOCAL MODY PUMPS INC. DISTRIBUTOR OR THE FACTORY DIRECTLY.



PRODUCTS THAT ARE RETURNED MUST BE PRESSURE WASHED, CLEANED, SANITIZED AND DECONTAMINATED AS NECESSARY PRIOR TO SHIPMENT. THIS ENSURES THAT EVERYONE IN CONTACT WITH RETURNED UNITS ARE NOT EXPOSED TO HEALTH HAZARDS. ALL APPLICABLE LAWS AND REGULATIONS SHALL APPLY.



# *LIMITED WARRANTY*

We warrant to our immediate customer and to the ultimate consumer that products of our manufacture will be free of defects in material and workmanship under normal use and service for the following time periods, when installed and maintained in accordance with our instructions.

PUMPS: One (1) year from date of installation or (18) months from date of shipment, whichever occurs first. As used herein, "the ultimate consumer" is defined as the purchaser who first uses the product after its initial installation or, in the case for product designed for non-permanent installation, the first owner who uses the product. It is the purchaser's or any sub-vendor's obligation to make known to the ultimate consumer the terms and conditions of this warranty. This warranty gives you specific legal rights, and there may also be other rights which vary from state to state. In the event the product is covered by the Federal Consumer Product Warranties Law (1) the duration of any implied warranties associated with the product by virtue of said law is limited to the same duration as stated herein, (2) this warranty is a LIMITED WARRANTY, and (3) no claims of any nature whatsoever shall be made against us, until the ultimate consumer, his successor, or assigns, notifies us in writing of the defect, and delivers the product and/or defective part(s) freight prepaid to our facility or nearest authorized service station. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply. **THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY AND ALL WARRANTIES WITH RESPECT TO ANY PRODUCT SHALL BE TO REPLACE OR REPAIR AT OUR ELECTION, FOB POINT OF MANUFACTURE OR AUTHORIZED REPAIR STATION, SUCH PRODUCTS AND/OR PARTS AS PROVEN DEFECTIVE. THERE SHALL BE NO FURTHER LIABILITY, WHETHER BASED ON WARRANTY, NEGLIGENCE OR OTHERWISE.** Unless expressly stated otherwise, guarantees in the nature of performance specifications furnished in addition to the foregoing material and workmanship warranties on a product manufactured by *Mody Industries Pvt. Ltd.*, if any, are subject to laboratory tests corrected for field performance. Any additional guarantees, in the nature of performance specifications must be in writing and such writing must be signed by our authorized representative. Due to inaccuracies in field testing if a conflict arises between the results of field testing conducted by or for user, and laboratory tests corrected for field performance, the latter shall control. Components or accessories supplied by us but manufactured by others are warranted only to the extent of and by the terms and conditions of the original manufacturer's warranty. **RECOMMENDATIONS FOR SPECIAL APPLICATIONS OR THOSE RESULTING FROM SYSTEMS ANALYSES AND EVALUATIONS WE CONDUCT, WILL BE BASED ON OUR BEST AVAILABLE EXPERIENCE AND PUBLISHED INDUSTRY INFORMATION. SUCH RECOMMENDATIONS DO NOT CONSTITUTE A WARRANTY OF SATISFACTORY PERFORMANCE AND NO SUCH WARRANTY IS GIVEN.**

This warranty shall not apply when damage is caused by (a) improper installation, (b) improper voltage, (c) lightning, (d) sand or other abrasive materials, (e) scale or corrosion build-up due to excessive chemical content. Any modification of the equipment will also void the warranty. We will not be responsible for loss, damage or labor cost due to interruption of service caused by defective parts. Neither will we accept charges incurred by others without our prior written approval. This warranty is void if our inspection reveals the product was used in a manner inconsistent with normal industry practice and/or our specific recommendations. The purchaser is responsible for communication of all necessary information regarding the application and use of the product. **UNDER NO CIRCUMSTANCES WILL WE BE RESPONSIBLE FOR ANY OTHER DIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOST INCOME, LABOR CHARGES, DELAYS IN PRODUCTION, IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY ANY DEFECTS IN MATERIAL, AND/OR WORKMANSHIP AND/OR DELAYS IN SHIPMENT. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

No rights extended under this warranty shall be assigned to any person, whether by operation or otherwise, without our prior written approval.