

# **6BSE-LDS** **6BSE-HLDS**

9, 12, 18, 24 & 30 HP @ 1150 RPM

18, 24, 30, 36, 48 & 60 HP @ 1750 RPM



**6BSE-LDS**  
9-30 HP  
18-60 HP



**6BSE-HLDS**  
30-60 HP



**IMPORTANT!** - Read all instructions in this manual before operating or servicing a pump.

Before installation, read the following instructions carefully. Failure to follow instruction and safety information could cause serious bodily injury, death and/or property damage. Each Barmesa product is carefully inspected to insure proper performance. Closely following these instructions will eliminate potential operating problems, assuring years of trouble-free service.

**⚠ DANGER** "Danger" indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

**⚠ WARNING** "Warning" indicates an imminently hazardous situation which, if not avoided, MAY result in death or serious injury.


**⚠ CAUTION** "Caution" indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.


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

**ALL RETURNED PRODUCTS MUST BE CLEANED, SANITIZED, OR DECONTAMINATED PRIOR TO SHIPMENT, TO INSURE EMPLOYEES WILL NOT BE EXPOSED TO HEALTH HAZARDS IN HANDLING SAID MATERIAL. ALL APPLICABLE LAWS AND REGULATIONS SHALL APPLY.**

**⚠ WARNING** Installation, wiring, and junction connections must be in accordance with the National Electric Code and all applicable state and local codes. Requirements may vary depending on usage and location.

**⚠ WARNING** Installation and servicing is to be conducted by qualified personnel only.

 Keep clear of suction and discharge openings. Do not insert fingers in pump with power connected; the rotating cutter and/or impeller can cause serious injury.

 Always wear eye protection when working on pumps. Do not wear loose clothing that may become entangled in moving parts.

**⚠ DANGER** Pumps build up heat and pressure during operation. Allow time for pumps to cool before handling or servicing the pump or any accessory items associated with or near the pump.

**⚠ DANGER** This pump is not intended for use in swimming pools or water installations where there is human contact with pumped fluid.

**⚠ DANGER** Risk of electric shock. To reduce risk of electric shock, always disconnect pump from power source before handling any aspect of the pumping system. **Lock out power and tag.**

**⚠ WARNING** Do not use these pumps in water over 104° F. Do not exceed manufacturers recommended maximum performance, as this could cause the motor to overheat.

**⚠ DANGER** Do not lift, carry or hang pump by the electrical cables. Damage to the electrical cables can cause shock, burns or death. **Never** handle connected power cords with wet hands. Use appropriate lifting device.

**⚠ WARNING** Ground Fault Circuit Interrupter (GFCI) to be used with plug-in type power cord.

**⚠ WARNING** Sump and sewage pumps often handle materials which could cause illness or disease. Wear adequate protective clothing when working on a used pump or piping. Never enter a basin after it has been used.

**⚠ DANGER** Failure to permanently ground the pump, motor and controls before connecting to power can cause shock, burns or death.

**⚠ DANGER** These pumps are not to be installed in locations classified as hazardous in accordance with the National Electric Code, ANSI/NFPA 70.

**⚠ WARNING** The Uniform Plumbing Code (UPC) states that sewage systems shall have an audio and visual alarm that signals a malfunction of the systems, that are required to reduce the potential for property damage.

**IMPORTANT! - Prior to installation, record Model Number, Serial, Amps, Voltage, Phase and HP from pump name plate for the future reference. Also record the Voltage and Current Readings at Startup:**

1 Phase Models	
Amps:	Volts:
3 Phase Models	
Amps L1-2:	Volts L1-2:
Amps L2-3:	Volts L2-3:
Amps L3-1:	Volts L3-1:

Model Number: \_\_\_\_\_

Serial: \_\_\_\_\_

PHASE: \_\_\_\_\_ HP: \_\_\_\_\_

<b>DISCHARGE:</b>	6", 125lb, flange horizontal.
<b>SPHERICAL SLD HNDLG:</b>	3"
<b>LIQUID TEMPERATURE:</b>	104° F (40° C) max.
<b>VOLUTE:</b>	Cast iron ASTM A-48 class 30.
<b>WEAR RING:</b>	Bronze. (Only for 6BSE-HLDS series)
<b>MOTOR HOUSING:</b>	Cast iron ASTM A-48 class 30.
<b>SEAL PLATE:</b>	Cast iron ASTM A-48 class 30.
<b>IMPELLER:</b>	1 vane (2 for 48 and 60 HP and 3 for 6BSE-HLDS series), closed, with vanes on back side. Cast iron ASTM A-48 class 30.
<b>SHAFT:</b>	416 series stainless steel.
<b>SQUARE RINGS:</b>	Buna-N.
<b>PAINT:</b>	Air dry enamel, water based.
<b>SEAL:</b>	Double mechanical, oil filled chamber. Silicon carbide outboard, carbon ceramic inboard seal, Buna-N elastomer and stainless steel hardware.
<b>DIAPHRAGM:</b>	Buna-N.
<b>HARDWARE:</b>	300 series stainless steel.
<b>CORD ENTRY:</b>	25 ft of neoprene cord 2/4 G, sealed against moisture.
<b>UPPER BEARING:</b>	Ball, single row, oil lubricated, for radial load.
<b>LOWER BEARING:</b>	Ball, single row, oil lubricated, for radial and thrust load.
<b>MOTOR:</b>	Three phase, NEMA B, oil filled. Requires overload protection to be included in control panel. Class F insulation.
<b>MOISTURE SENSOR:</b>	Normally open (N/O) included.
<b>TEMPERATURE SENSOR:</b>	Normally closed (N/C) included.
<b>OPTIONAL EQUIPMENT:</b>	Impeller trimming, additional cord, tungsten carbide seal, slide rail coupling (SRC-6).

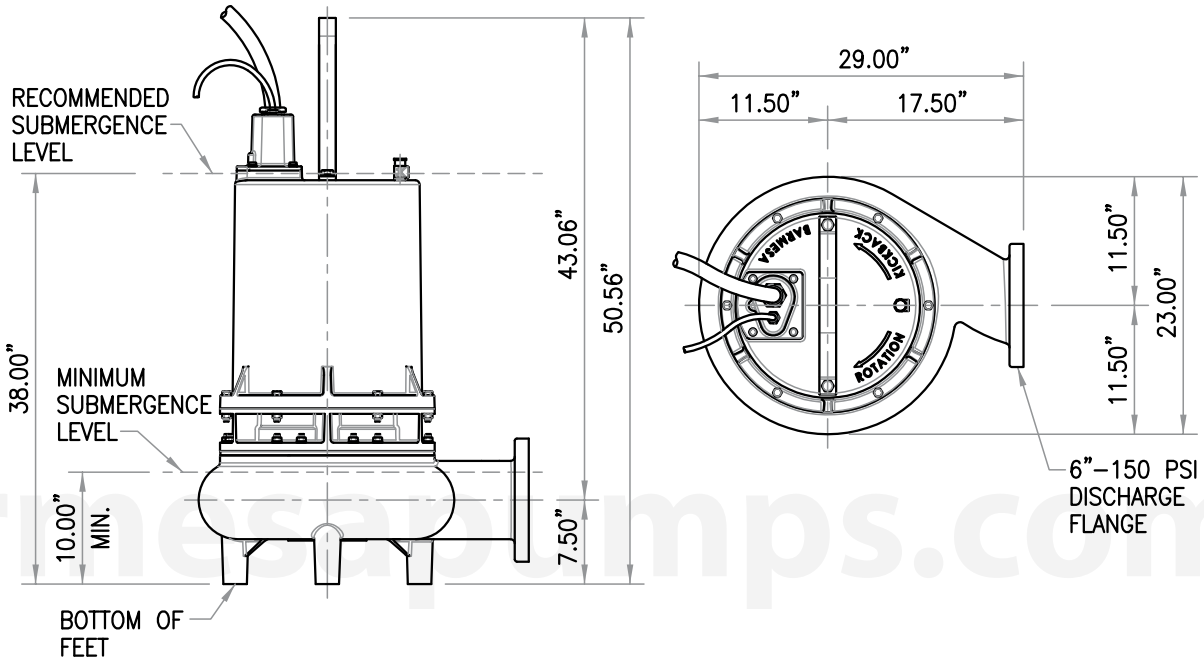
MODEL	HP	VOLTS	PHASE	RPM (Nominal)	MAX AMPS	LOCKED ROTOR AMPS	NEMA CODE	CORD SIZE	CORD TYPE	CORD O. D.	WEIGHT (pounds)
6BSE9036LDS	9	230	3	1150	26	162	F	2/3	G	1.34"	897
6BSE9046LDS	9	460	3	1150	13	81	J	2/3	G	1.34"	897
6BSE12036LDS	12	230	3	1150	36	162	D	2/3	G	1.34"	902
6BSE12046LDS	12	460	3	1150	18	81	F	2/3	G	1.34"	902
6BSE18036LDS	18	230	3	1150	50	232	C	2/3	G	1.34"	917
6BSE18046LDS	18	460	3	1150	25	116	F	2/3	G	1.34"	917
6BSE24036LDS	24	230	3	1150	64	290	C	2/3	G	1.34"	961
6BSE24046LDS	24	460	3	1150	32	145	E	2/3	G	1.34"	961
6BSE30036LDS	30	230	3	1150	82	364	C	2/3	G	1.34"	1008
6BSE30046LDS	30	460	3	1150	41	182	E	2/3	G	1.34"	1008
6BSE18034LDS	18	230	3	1750	50.6	232	F	2/3	G	1.34"	891
6BSE18044LDS	18	460	3	1750	25.3	116	F	2/3	G	1.34"	891
6BSE24034LDS	24	230	3	1750	62.8	290	E	2/3	G	1.34"	928
6BSE24044LDS	24	460	3	1750	31.4	145	E	2/3	G	1.34"	928
6BSE30034LDS	30	230	3	1750	75.8	364	E	2/3	G	1.34"	985
6BSE30044LDS	30	460	3	1750	37.9	182	E	2/3	G	1.34"	985
6BSE36034LDS	36	230	3	1750	90	434	E	2/3	G	1.34"	992
6BSE36044LDS	36	460	3	1750	45	217	E	2/3	G	1.34"	992
6BSE48034LDS	48	460	3	1750	65	290	E	2/3	G	1.34"	1014
6BSE60044LDS	60	460	3	1750	78	363	E	2/3	G	1.34"	1052

The moisture cord and/or temperature cord is size 18/5, type SO, Ø0.485", for all models.

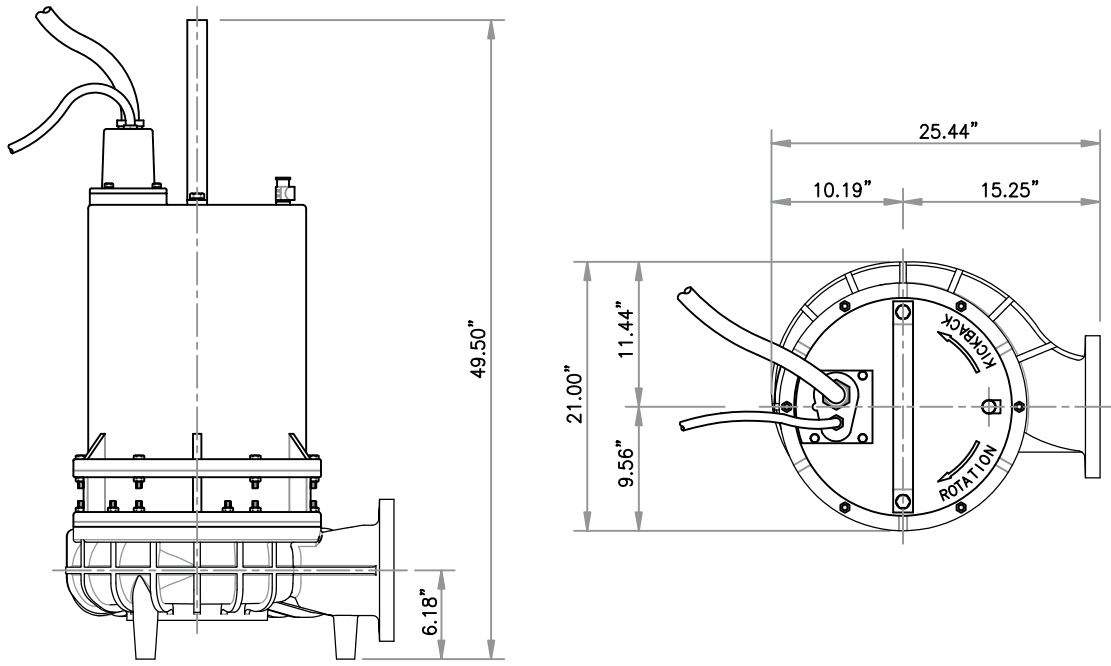
MODEL	HP	VOLTS	PHASE	RPM (Nominal)	MAX AMPS	LOCKED ROTOR AMPS	NEMA CODE	CORD SIZE	CORD TYPE	CORD O. D.	WEIGHT (pounds)
6BSE30034HLDS	30	230	3	1750	76	364	F	2/3	G	1.34"	957
6BSE30044HLDS	30	460	3	1750	38	182	F	2/3	G	1.34"	957
6BSE36034HLDS	36	230	3	1750	90	434	E	2/3	G	1.34"	963
6BSE36044HLDS	36	460	3	1750	45	217	F	2/3	G	1.34"	963
6BSE48044HLDS	48	460	3	1750	65	290	E	2/3	G	1.34"	974
6BSE60044HLDS	60	460	3	1750	78	363	E	2/3	G	1.34"	1005

The moisture cord and/or temperature cord is size 18/5, type SO, Ø0.485", for all models.

► 6BSE-LDS



► 6BSE-HLDS



## ► Receiving inspection

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the company that delivered the pump. If the manual is removed from the packaging, do not lose or misplace.

## ► Storage

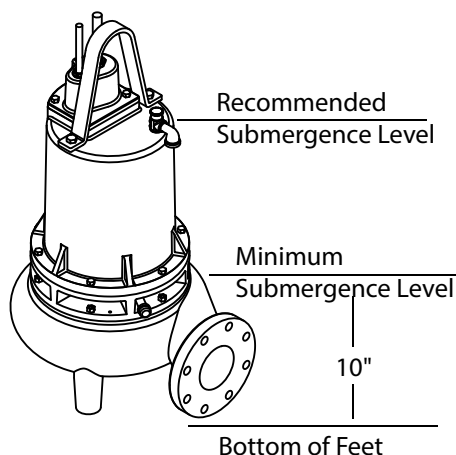
Any product that is stored for a period longer than six (6) months from the date of purchase should be bench tested prior to installation. A bench test consists of, checking the impeller to assure it is free turning and a run test to assure the motor (and switch if provided) operate properly.

## ► Controls

Manual models require a separate approved pump control device or panel for automatic operation. Be sure the electrical specification of the control selected properly match the electrical specifications of the pump.

## ► Submergence

The pump should always be operated in the submerged condition. The minimum sump liquid level should never be less than above the pump's volute (See Figure 1).



**Figure 1**

## ► Installation

These pumps are recommended for use in a sump, basin or lift station. The sump, basin or lift station shall be sealed and vented in accordance with local plumbing codes. **This pump is designed to pump sewage, effluent or wastewater, non-explosive and non-corrosive liquids and shall NOT be installed in locations classified as hazardous in accordance with the National Electrical Code (NEC) ANSI/NFPA 70 or Canadian Electric Code (CEC).** The pump should never be installed in a trench, ditch, or hole with a dirt bottom. The legs will sink into the dirt and the suction will become plugged.

The installation should be at a sufficient depth to ensure that all plumbing is below the frost line. If this is not feasible, remove the check valve and size the basin to accommodate the additional backflow volume.

Pumps are most commonly installed in simplex or duplex stations or basins with a slide rail system (Barmesa SRC), which allows the pump(s) to be installed or removed without requiring personnel to enter the station, or resting on the basin floor.

## ► Discharge Piping

Discharge piping should be as short as possible and sized no smaller than the pump discharge. **Do not reduce the discharge pipe size below that which is provided on the pump.** Both a check valve and a shut-off valve are recommended for each pump. The check valve is used to prevent backflow into the sump. The shut-of valve is used to manually stop system low during pump servicing.

## ► Liquid Level Controls

The level control(s) should be mounted on the discharge piping, a cable rack or float pole. The level control should have adequate clearance so it cannot hang up in it's swing and that the pump is completely submerged when the level control is in the "Off" mode. By adjusting the cord tether the control level can be changed. One cycle of operation should be observed, so that any potential problems can be corrected.

It is recommended that the level control float should be set to insure that the liquid in the sump never drops below the top of the motor housing or a minimum level of 10 inches above the basin floor.

## ► Electrical Connections

### Power cable:

The power cable mounted to the pump must not be modified in any way except for shortening to a specific application. Any splice between the pump and the control panel must be made in accordance with the electric codes. It is recommended that a junction box, if used, be mounted outside the sump or be of at a minimum Nema 4 construction if located within the wet well. **DO NOT USE THE POWER CABLE TO LIFT PUMP.**

Always rely upon a Certified Electrician for installation.

### Overload Protection:

**Single Phase** - The stator in-winding overload protector used is referred to as an inherent overheating protector and operates on the combined effect of temperature and current. This means that the overload protector will trip out and shut the pump off if the windings become too hot, or the load current passing through them becomes too high.

**IMPORTANT!** - The overload will then automatically reset and start the pump up after the motor cools to a safe temperature. In the event of an overload, the source of this condition should be determined and corrected immediately.

**⚠ WARNING DO NOT ALLOW THE PUMP TO CYCLE OR RUN IF AN OVERLOAD CONDITION OCCURS.**

**Three Phase** - The Normally Closed (N/C) thermal sensor is embedded in the motor windings and will detect excessive heat in the event an overload condition occurs. The thermal sensor will trip when the windings become too hot and will automatically reset when the pump motor cools to a safe temperature. It is recommended that the thermal sensor be connected in series to an alarm device to alert the operator of an overload condition, and/or the motor starter coil to stop the pump. In the event of an overload, the source of this condition should be determined and repaired.

**⚠ WARNING DO NOT ALLOW THE PUMP TO CYCLE OR RUN IF AN OVERLOAD CONDITION OCCURS.**

**Moisture Sensors** - A normally open (N/O) sensor rated of 1 watt @330K ohms, 500 volt, is installed in the pump seal chamber which will detect any moisture present. It is recommended that this detector be wired in series to an alarm device or motor starter coil to alert the operator that a moisture detect has occurred. In the event of a moisture detect, check the individual moisture sensor probe leads for continuity, ( $\infty$  resistance = no moisture) and the junction box/control box for moisture content.

These situations may induce a false signal in the moisture detecting circuit. If none of the above test prove conclusive, the pump(s) should be pulled and the source of the failure repaired. **IF A MOISTURE DETECT HAS OCCURRED MAINTENANCE SHOULD BE PERFORMED AS SOON AS POSSIBLE!**

If current through the temperature sensor exceeds the values listed, an intermediate control circuit relay must be used to reduce the current or the sensor will not work properly.

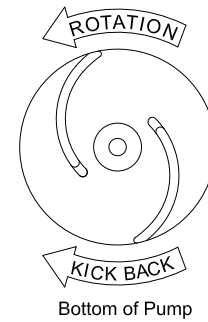
TEMPERATURE SENSOR ELECTRICAL RATINGS		
Volts	Continuous Amperes	Inrush Amperes
110-120	3.00	30.0
220-240	1.50	15.0
440-480	0.75	7.5
600	0.60	6.0

**Wire Size:**

If longer power cable is required consult a qualified electrician for proper wire size.

**► Pre-Operation**

- 1. Check Voltage and Phase** - Compare the voltage and phase information stamped on the pump name plate.
- 2. Check Pump Rotation** - Improper motor rotation can result in poor pump performance and can damage the motor and/or pump. Check rotation on three phase units by momentarily applying power and observe the "kickback".



Kickback should always be in a counter-clockwise direction as viewed from motor end or opposite to impeller rotation. Impeller rotation is counter-clockwise as viewed from bottom of pump.

**3. Name Plate** - Record the information from the pump name plate to drawing in front of manual for future reference.

**4. Insulation Test** - An insulation (megger) test should be performed on the motor. Before the pump is put into service. The resistance values (ohms) as well as the voltage (volts) and current (amps) should be recorded.

**5. Pump-Down Test** - Be sure pump has been properly wired, lowered into the basin, sump or lift station, check the system by filling with liquid and allowing the pump to operate through its pumping cycle. The time needed to empty the system, or pump-down time along with the volume of water, should be recorded.

**► Maintenance**

No lubrication or maintenance is required. Perform the following checks when pump is removed from operation or when pump performance deteriorates:

- a) Inspect motor chamber for oil level and contamination.
- b) Inspect impeller and body for excessive build-up or clogging.
- c) Inspect motor, bearings and shaft seal for wear or leakage.

► **Servicing**

NOTE: Item numbers in ( ) refer to Figure 6.

**Cooling Oil** - Anytime the pump is removed from operation, the cooling oil in the motor housing should be checked visually for oil level and contamination. To check oil, set unit upright. Remove cap screws (6), lift conduit box assembly (4) from motor housing (3), **Do Not** disconnect wiring from motor leads. With a flashlight, visually inspect the oil in the motor housing (3) to make sure it is clean and clear, light amber in color and free from suspended particles. Milky white oil indicates the presence of water. Oil level should be just above the motor when pump is in vertical position.

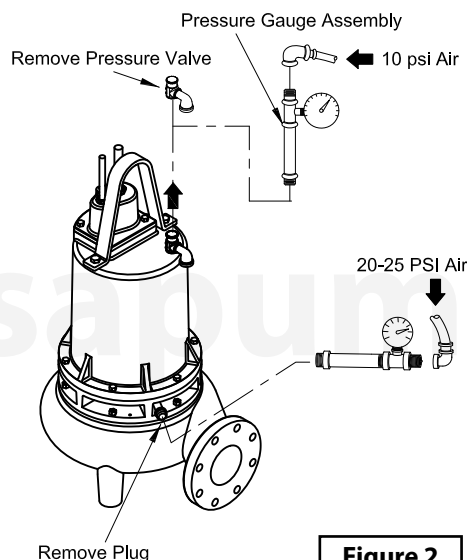
**Seal Chamber** - Drain oil from seal chamber by placing pump on its side with pipe plug (18) downward and remove pipe plug (18). If the oil is found to contain considerable water or other contamination, the shaft seal (19) should be inspected and replaced if required.


**Oil Testing**


- Ÿ Drain oil into a clean, dry container placing pump on it's side, remove cap screws (6), lift conduit box assembly (4) from motor housing (3). In separate container drain seal chamber by removing pipe plug (18).
- Ÿ Check oil for contamination using an oil tester with a range to 30 kV breakdown.

- Ÿ If oil is found to be clean and uncontaminated (measuring above 15 kV breakdown), refill the housing.
- Ÿ If oil is found to be dirty or contaminated (or measures below 15 kV breakdown), the pump must be carefully inspected for leaks at the shaft seal, conduit box, o-rings, pipe plug and pressure valve, before refilling with oil. To locate the leak, perform a pressure test.

After leak is repaired, dispose of old oil properly, and refill with new oil.



 Pressure builds up extremely fast, increase pressure by "TAPPING" air nozzle. Too much pressure will damage seal. **DO NOT exceed 10 PSI in housing and 20-25 PSI in seal chamber.**




**Pressure Test**


**Motor Housing** - Oil should be at normal level. Remove pressure valve (11) from motor housing (3). Apply pipe sealant to pressure gauge assembly and tighten into hole (See Figure 2). Pressurize motor housing to 10 PSI.

Use soap solution around the sealed areas above the oil level and inspect joints for "air bubbles". If, after five minutes, the pressure is still holding constant, and no "bubbles" /oil seepage is observed, slowly bleed the pressure and remove the gauge assembly. Replace oil. Leak must be located and repaired if pressure does not hold.

**Seal Chamber** - Check that seal chamber is full of oil by removing pipe plug (18). Apply pipe sealant to pressure gauge assembly and tighten into hole in bearing housing (15). Pressurize seal chamber to 20-25 PSI and check for leaks.

**Oil Replacement** - Set unit upright and refill with new cooling oil as per table. Fill to just above motor as an air space must remain in the top of the housing to compensate for oil expansion. Reassemble the o-ring (5) and conduit box (4) to motor housing (3). Apply thread locking compound to cap screws (6) and place into holes and torque to 15 ft/lbs.

 **DO NOT overfill oil.** Overfilling of housing with oil can create excessive and dangerous hydraulic pressure which can destroy the pump and create a hazard.

 Overfilling oil voids warranty.

**Oil Replacement:**

**Seal Chamber** - Refill chamber completely full with new cooling oil or reuse the uncontaminated oil.

Cooling Oil Recommended Supplier/Grade	
BP	Enerpar SE100
Conoco	Pale Parafin 22
Mobile	D.T.E. Oil Light
Shell Canada	Transformer-10
Texaco	Diala-Oil-AX

### ► Disassembly

**Impeller and Volute** - Disconnect power. Remove hex nuts (16) and vertically lift motor housing and seal plate assembly from volute (37). Clean out volute (37) if necessary. Inspect gasket (36) and replace if cut or damaged. Clean and examine impeller (32), for pitting or wear and replace if required. To remove impeller (32), remove cap screw (35) and washer (34). With a wheel puller, pull impeller straight off shaft and remove square key. To remove wear ring (33), split it and remove, being careful not to damage volute.

**Moisture Probes** - Drain oil from seal chamber, if not already done. Remove cap screws (9) and lifting handle (8). Set unit upside down on blocks to avoid damaging cables. Remove socket head cap screws (27) and lift seal plate (26), with seal's (19) stationary, vertically from bearing housing (15), **do not** damage seal. Check moisture sensor probes (41) for damage, replace by removing screws (42) and disconnecting wires (40). Then remove probes (41) from bearing housing (15).

**Diaphragm** - with seal plate (26) removed, examine diaphragm (23) for ruptures or cracks. Replace diaphragm by removing cap screws (25) and plate (24). Clean vent holes in seal plate (26).

**Shaft Seal** - Remove outboard rotating member of seal (19), spring and inboard rotating member from shaft. Examine all seal parts.

Inspect seal for signs of uneven wear pattern on stationary members, chips and scratches on either seal face. **DO NOT interchange seal components, replace the entire shaft seal (19).** If replacing seal, remove stationary by prying out with flat screwdriver.

**Motor and Bearings** - Remove volute, impeller, seal plate and seal as previously stated and drain oil from motor housing (3). Position unit upright, using blocks to avoid resting unit on shaft. Remove cap screws (6) o-ring (5) and conduit box assembly (4) from motor housing (3). Note connections and then remove cable lead wires from motor lead wires and moisture and temperature sensor wires from control cable by removing connectors. Remove cap screws (12) and vertically lift the motor housing (3) from bearing housing (15). Replace square ring (14) if damaged or cut. Remove the upper motor bolts and lift upper end bell from motor (1). Remove wave washer. Remove upper bearing (2) with a wheel puller if damaged or worn.

Vertically lift stator (1) from rotor/shaft. Inspect windings for shorts and resistance. Test the temperature sensors by checking for continuity between the black and white wires. If defective contact factory or motor service station. Pull motor rotor/shaft with bearing (13) from bearing housing (15). Remove bearing (13) with a wheel puller if worn or damaged. If rotor or stator windings are defective, replace the complete motor.



**IMPORTANT!** - All parts must be clean before reassembly.

### ► Reassembly

**Bearings** - Replace bearings, being careful not to damage the rotor or shaft. If equipped, fill notch should face the rotor core for both upper and lower bearings.

Apply adhesive compound to the shaft and press bearing (13) onto shaft, position squarely onto the shaft applying force to the inner race of bearing only, until bearing seats on shoulder of the shaft. In the same manner, assemble upper bearing (2) to shaft.

**Motor** - Slide rotor with bearing (13) into bearing housing (15) until bearing seats on the bottom. Position motor housing and stator into pilot, install wave washers in upper end bell.

**IMPORTANT! Special wave washers in upper motor housing are required to compensate for shaft expansion. These washers must be properly reinstalled to give the required constant down force on the motor shaft.**

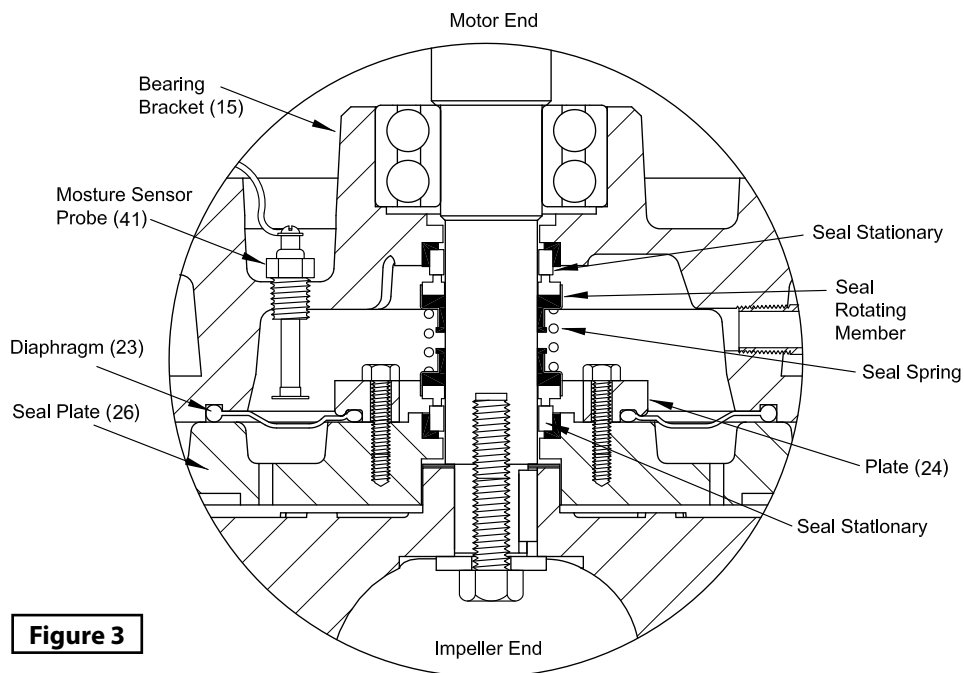
Position upper motor end bell aligning holes and thread cap screws into bearing housing (15) and torque to 16 ft/lbs. Place all motor leads above the motor. Position square ring (14) on bearing housing (15) and lower housing (3) over motor and into pilot, aligning handle so that it is parallel to motor end bell reliefs. Apply thread locking compound to threads on cap screws (12) and install with nuts (16) and torque to 24 ft/lbs.



**Handle seal parts with extreme care. DO NOT damage lapped surfaces.**

**Seal/Diaphragm** - (See Figure 3) Clean and oil seal cavities in bearing housing (15) and seal plate (26). Lightly oil (**Do not use grease**) outer surface of inboard and outboard stationary members of seal (19). Press inboard stationary member firmly into bearing housing (15) and outboard stationary into seal plate (24), using a seal pusher tool. Nothing but the seal pusher tool is to come in contact with seal face.





**Figure 3**



**IMPORTANT! - Hammering on the seal pusher tool will damage the seal face.**

Be sure the stationary members are in straight and that the rubber ring is not out of it's groove. Lightly oil (**Do not use grease**) shaft and inner surface of bellows on rotating member. With lapped surface facing bearing housing (15), slide rotating member onto shaft using seal pusher tool, until lapped faces are together. It is extremely important to keep seal faces clean during assembly. Dirt particales lodged between faces will cause the seal to leak.

Be sure driving lugs in retainer are matched in rotating member of seal (19). Place spring over shaft and in place on rotating member, making sure it is seated in retainer and not cocked or resting on bellows tail. Lightly oil shaft and inner surface of outboard rotating member.

With tail section toward bearing housing (15), slide rotating member onto shaft with seal pusher tool until retainer engages spring and spring is compressed slightly.

Spring should be properly engaged in both retainers.

Reassemble the diaphragm (23) with "bulg" facing seal plate (24). Place plate (24) on diaphragm (23) and insert capscrews (25) into plate and tighten.

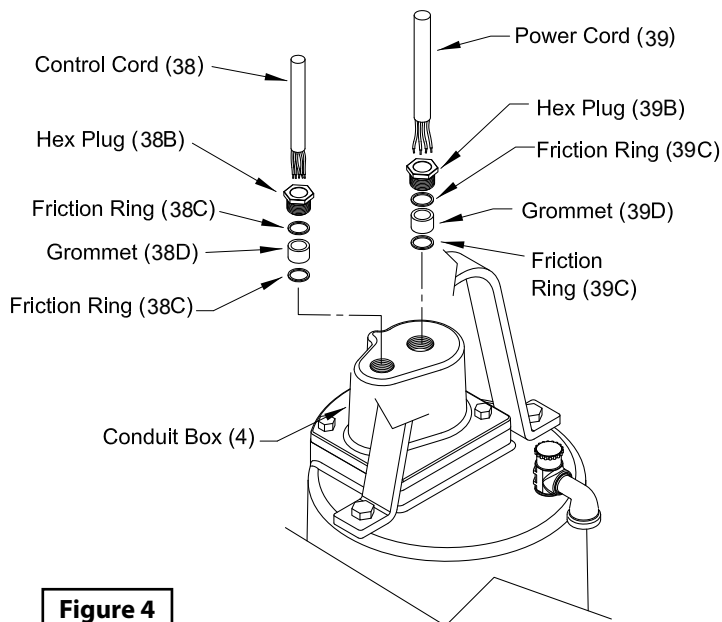
Place seal plate (24) over shaft onto bearing housing (15), being careful not to damage outboard stationary member and align holes for cap screws (25).

Thread cap screws (25) into bearing housing (15) and tighten. Refill chamber with oil.

**Conduit Box Assembly** - Check power (38) and control cables (39) for cracks or damage and replace complete conduit box (4) if required. (See Figure 4) Bring motor wires through opening in top of motor housing (3), check sleeving and replace if damaged. Position square ring (5) in conduit box (4) and reconnect leads using connectors and insulators. See Figures 5, for wiring schematics.

Refill with cooling oil. Position conduit box (4) with square ring (5) on motor housing. Apply thread locking compound to cap screws (6) threads and torque to 16 ft/lbs.

Remove gland nuts (38B) and (39B), friction rings (38C) and (39C), and grommets (38D) and (39D) from conduit box (4), inspect and replace if damaged (See Figure 4). Reassemble by inserting one friction ring, grommet, one more friction ring and gland nut into conduit box. Torque gland nuts to 15 ft/lbs to prevent leakage.



**Figure 4**

**Wear Ring** - Apply retaining compound to the bore of volute (37) and press wear ring (33) into bore until seated.

**Impeller and Volute** - Install impeller (32) by applying a thin film of oil to motor shaft and slide impeller straight onto shaft, keeping keyways lined up. Drive key into keyway. Locate washer (34) and lockwasher (10), apply thread lock primer (such as Loctite® Primer T), let set per manufacturer's directions. Apply thread locking compound to threads on cap screw (35), and thread into shaft and torque to 35 ft/lbs.

Place gasket (36) on volute and install impeller and motor assembly over studs and onto volute (37). Apply thread locking compound to threads of studs (31) and thread nuts (16) onto studs and torque to 24 ft/lbs. Check for binding by rotating impeller. Clearance between the impeller and volute should be approximately 0.012 inch.

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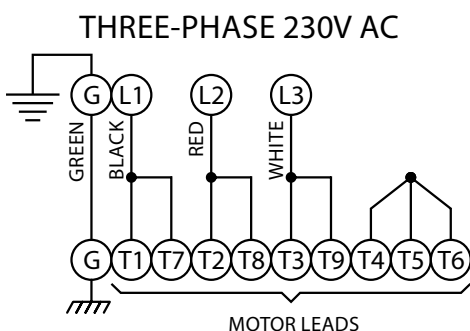


Figure 5	
Cable	Motor Lead Number
Green	Green
Black	1 and 7
Red	2 and 8
White	3 and 9
	4, 5 and 6 together

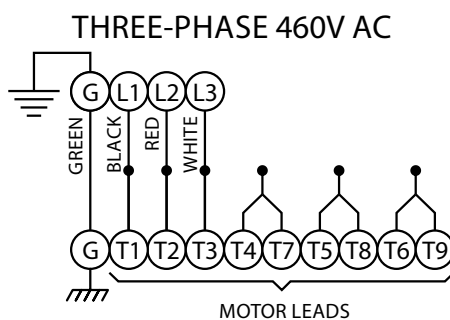


Figure 5	
Cable	Motor Lead Number
Green	Green
Black	1
Red	2
White	3
	4 and 7 together
	5 and 8 together
	6 and 9 together

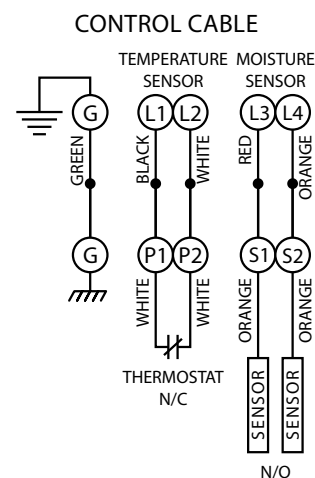
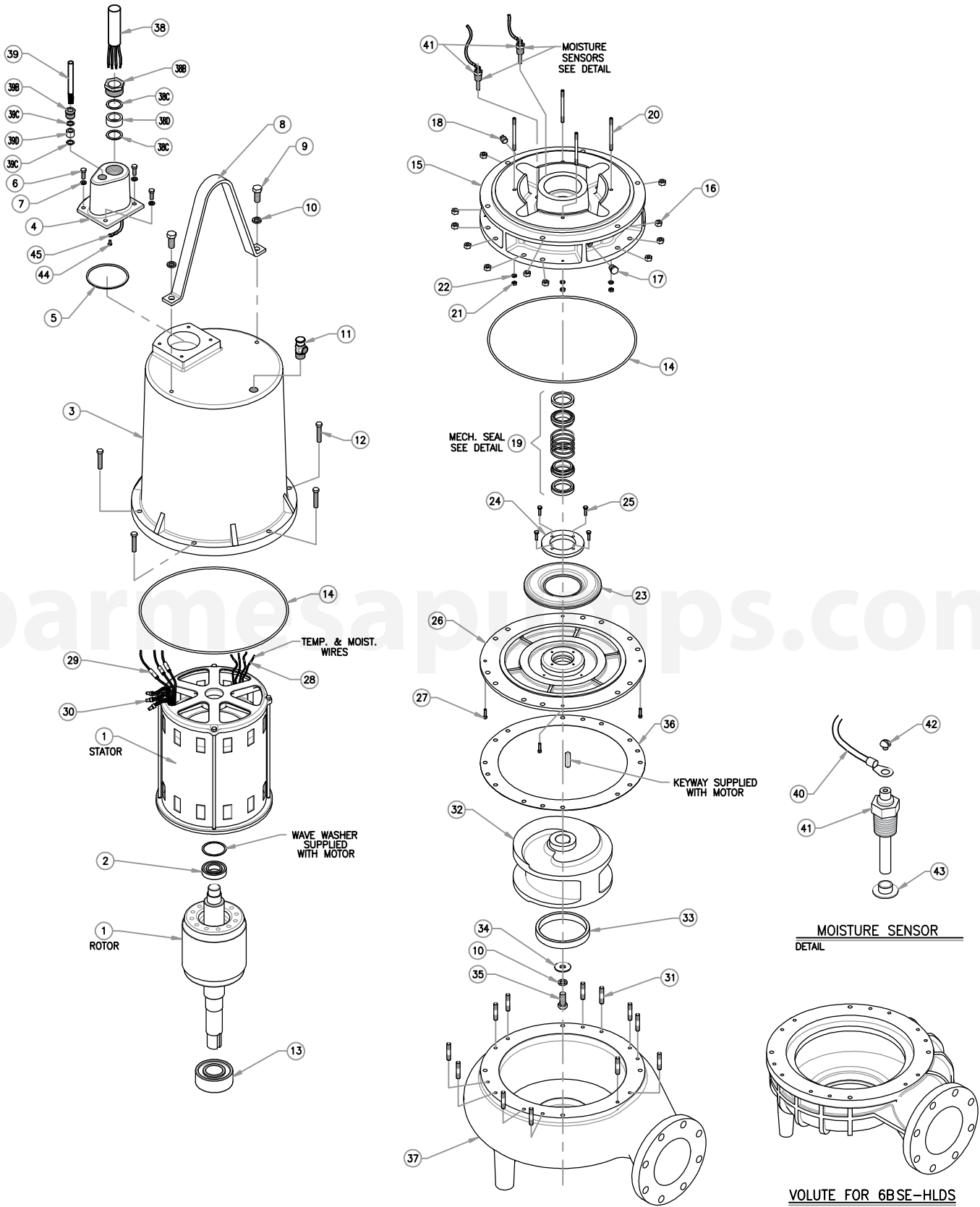


Figure 5	
Control Cable	Lead Number
Black	L1 (Temperature)
White	L2 (Temperature)
Red	L3 (Moisture)
Orange	L4 (Moisture)
Green	Ground

Figure 6



For Repair Part Please supply: Model Number and Serial as shown on Name Plate, and Part Description and Part Number as shown on Parts List.

## ► 6BSE-LDS

PART LIST			
ITEM	QTY.	DESCRIPTION	PART. No.
1	1	MOTOR:	
		18 H.P., 3 PHASE, 1750 RPM, 230/460	40040031
		24 H.P., 3 PHASE, 1750 RPM, 230/460	40040032
		30 H.P., 3 PHASE, 1750 RPM, 230/460	40040033
		36 H.P., 3 PHASE, 1750 RPM, 230/460	40040034
		48 H.P., 3 PHASE, 1750 RPM, 230/460	40040035
		60 H.P., 3 PHASE, 1750 RPM, 230/460	40040036
		12 H.P., 3 PHASE, 1150 RPM, 230/460	40040041
		18 H.P., 3 PHASE, 1150 RPM, 230/460	40040042
		24 H.P., 3 PHASE, 1150 RPM, 230/460	40040043
		30 H.P., 3 PHASE, 1150 RPM, 230/460	40040044
2	1	BEARING (UPPER)	31020018
3	1	MOTOR HOUSING	03100006
4	1	CONDUIT BOX & CABLE ASSEMBLY	03100007
5	1	O-RING #51937	92010085
6	4	CAP SCREW 3/8-16UNC x 1" SS	91010345
7	4	LOCKWASHER 3/8" SS	91010061
8	1	LIFTING BAIL	30400845
9	2	SCREW 5/8-11 x 1-1/2"	91010354
10	3	LOCKWASHER 5/8"	91010063
11	1	PRESS RELIEF VALVE	31200021
12	6	SCREW 7/16-14 x 2.25" SS	91010348
13	1	BEARING (LOWER)	31020019
14	2	"O" RING GASKET # 52082	92010051
15	1	BEARING HOUSING	03040013
16	18	HEX NUT 7/16-14 UNC SS	91010434
17	1	HEX HEAD PLUG 3/8" SS # 22932	93010131
18	1	PLUG 3/8"	93010149
19	1	MECHANICAL SEAL # 60818	31030146
20	4	STUD 5/16-18 UNC x 4.5" LG. # 07866	91010373
21	4	HEX NUT 5/16-18 UNC SS	91010432
22	4	LOCKWASHER 5/16" SS	91010060
23	1	DIAPHRAGM # 52093	31040002
24	1	DIAPHRAGM PLATE	03160006
25	4	SCREW 1/4-20 x 1" SS	91010342
26	1	SEAL PLATE	03180016
27	4	SCREW HEAD SOCKET 1/4-20UNC x 1" SS	91010392
28	4	CONNECTOR # 52990	94010021
29	3	CONNECTOR # 56730	94010022
30	3	WIRE CONECTOR # 55844	94010024
31	12	STUD 7/16-14 UNC x 2.25" LG.	91010377
32	1	IMPELLER	
		9 H.P., 1150 RPM (11.50" STD. DIAMETER)	03140053D
		12 H.P., 1150 RPM (12.00" STD. DIAMETER)	03140081
		18 H.P., 1150 RPM (13.00" STD. DIAMETER)	03140081B
		24 H.P., 1150 RPM (14.00" STD. DIAMETER)	03140081C
		30 H.P., 1150 RPM (14.62" STD. DIAMETER)	03140081D
		18 H.P., 1750 RPM (9.50" STD. DIAMETER)	03140053
		24 H.P., 1750 RPM (10.50" STD. DIAMETER)	03140053B
		30 H.P., 1750 RPM (11.00" STD. DIAMETER)	03140053C
		36 H.P., 1750 RPM (11.50" STD. DIAMETER)	03140053D
		48 H.P., 1750 RPM (10.00" STD. DIAMETER)	03140054
		60 H.P., 1750 RPM (11.00" STD. DIAMETER)	03140054B
33	1	WEAR RING	30400314
34	1	IMPELLER WASHER	30400414
35	1	SCREW HEX. HD. 5/8-11 x 1-1/2" SS	91010354
36	1	VOLUTE GASKET # 51936	92010192
37	1	VOLUTE	03090053
38	27 Ft.	POWER CABLE 3/2 # 52283	31030006
38B	1	HEX HEAD PLUG	30400904
38C	2	WASHER SS	30400401
38D	1	GROMMET	92010002
39	27 Ft.	CORD SET, MOIST & TEMP, CABLE 5/18	31030005
39B	1	HEX HEAD PLUG	30400901
39C	2	WASHER # 21531	91010057
39D	1	GROMMET	92010005
40	2	WIRE ASSY, MOISTURE SENSOR	31030011
41	2	MOISTURE SENSOR #39383	31160001
42	2	MACHINE SCREW MOIST, 6-32 x 1/4" SS	91010403
43	2	CAP PLUG	93010101
44	1	GROUND SCREW 1/4" x 1/2"	91010404
45	1	ROUND TERMINAL 5/16"	94010044
46	11.1 Gal.	MOTOR OIL (HOUSING & SEAL CAVITY)	31010031

For Repair Part Please supply: Model Number and Serial as shown on Name Plate, and Part Description and Part Number as shown on Parts List.

## ► 6BSE-HLDS

PART LIST			
ITEM	QTY.	DESCRIPTION	PART. No.
1	1	MOTOR:	
		30 H.P., 3 PHASE, 1750 RPM, 230/460	40040033
		36 H.P., 3 PHASE, 1750 RPM, 230/460	40040034
		48 H.P., 3 PHASE, 1750 RPM, 230/460	40040035
		60 H.P., 3 PHASE, 1750 RPM, 230/460	40040036
2	1	BEARING (UPPER)	31020018
3	1	MOTOR HOUSING	03100006
4	1	CONDUIT BOX & CABLE ASSEMBLY	03100007
5	1	O-RING #51937	92010085
6	4	CAP SCREW 3/8-16UNC x 1" SS	91010345
7	4	LOCKWASHER 3/8" SS	91010061
8	1	LIFTING BAIL	30400845
9	2	SCREW 5/8-11 x 1-1/2"	91010354
10	3	LOCKWASHER 5/8"	91010063
11	1	PRESS RELIEF VALVE	31200021
12	6	SCREW 7/16-14 x 2.25" SS	91010348
13	1	BEARING (LOWER)	31020019
14	2	"O" RING GASKET # 52082	92010051
15	1	BEARING HOUSING	03040013
16	18	HEX NUT 7/16-14 UNC SS	91010434
17	1	HEX HEAD PLUG 3/8" SS # 22932	93010131
18	1	PLUG 3/8"	93010149
19	1	MECHANICAL SEAL # 60818	31030146
20	4	STUD 5/16-18 UNC x 4.5" LG. # 07866	91010373
21	4	HEX NUT 5/16-18 UNC SS	91010432
22	4	LOCKWASHER 5/16" SS	91010060
23	1	DIAPHRAGM # 52093	31040002
24	1	DIAPHRAGM PLATE	03160006
25	4	SCREW 1/4-20 x 1" SS	91010342
26	1	SEAL PLATE	03180016
27	4	SCREW HEAD SOCKET 1/4-20UNC x 1" SS	91010392
28	4	CONECTOR # 52990	94010021
29	3	CONECTOR # 56730	94010022
30	3	WIRE CONECTOR # 55844	94010024
31	12	STUD 7/16-14 UNC x 2.25" LG.	91010377
32	1	IMPELLER	
		30 H.P., 1750 RPM (9.25" STD. DIAMETER)	03140111
		36 H.P., 1750 RPM (9.50" STD. DIAMETER)	03140111B
		48 H.P., 1750 RPM (10.50" STD. DIAMETER)	03140111C
		60 H.P., 1750 RPM (11.25" STD. DIAMETER)	03140111D
33	1	WEAR RING	30400315
34	1	IMPELLER WASHER	30400414
35	1	SCREW HEX. HD. 5/8-11 x 1-1/2" SS	91010354
36	1	VOLUTE GASKET # 51936	92010192
37	1	VOLUTE	03090063
38	27 Ft.	POWER CABLE 3/2 # 52283	31030006
38B	1	HEX HEAD PLUG	30400904
38C	2	WASHER SS	30400401
38D	1	GROMMET	92010002
39	27 Ft.	CORD SET, MOIST & TEMP, CABLE 5/18	31030005
39B	1	HEX HEAD PLUG	30400901
39C	2	WASHER # 21531	91010057
39D	1	GROMMET	92010005
40	2	WIRE ASSY, MOISTURE SENSOR	31030011
41	2	MOISTURE SENSOR #39383	31160001
42	2	MACHINE SCREW MOIST, 6-32 x 1/4" SS	91010403
43	2	CAP PLUG	93010101
44	1	GROUND SCREW 1/4" x 1/2"	91010404
45	1	ROUND TERMINAL 5/16"	94010044
46	11.1 Gal.	MOTOR OIL (HOUSING & SEAL CAVITY)	31010031

For Repair Part Please supply: Model Number and Serial as shown on Name Plate, and Part Description and Part Number as shown on Parts List.



**Risk of electric shock. Always disconnect the pump from the power source before handling inspections or repairs.**

Symptom	Possible Cause(s)	Corrective Action
Pump will not run	<ol style="list-style-type: none"> <li>1. Poor electrical connection, blown fuse, tripped breaker or other interruption of power; improper power supply</li> <li>2. Motor or switch inoperative (go to manual operation)                             <ol style="list-style-type: none"> <li>2a. Float movement restricted</li> <li>2b. Switch will not activate pump or is defective</li> <li>2c. Defective motor</li> </ol> </li> <li>3. Insufficient liquid level</li> </ol>	<ol style="list-style-type: none"> <li>1. Check all electrical connections for security. Have electrician measure current in motor leads, if current is within <math>\pm 20\%</math> of locked rotor Amps, impeller is probably locked. If current is 0, overload may be tripped. Remove power, allow pump to cool, then re-check current.</li> <li>2a. Reposition pump or clean basin as required to provide adequate clearance for float</li> <li>2b. Disconnect level control. Set ohmmeter for a low range, such as 100 ohms full scale and connect to level control leads. Actuate level control manually and check to see that ohmmeter shows zero ohms for closed switch and full scale for open switch. (Float Switch)</li> <li>2c. Check winding insulation (Megger Test) and winding resistance. If check is outside of range, dry and re-check. If still defective, replace per service instructions.</li> </ol>
Pump will not turn off	<ol style="list-style-type: none"> <li>2a. Float movement restricted</li> <li>2b. Switch will not activate pump or is defective</li> <li>4. Excessive inflow or pump not properly sized for application</li> <li>9. Pump may be air locked causing pump not to flow</li> <li>14. H-O-A switch on panel is in "HAND" position</li> </ol>	<ol style="list-style-type: none"> <li>3. Make sure liquid level is above the pump</li> <li>4. Re-check all sizing calculations to determine proper pump size.</li> <li>5. Check discharge line for restrictions, including ice if line passes through or into cold areas.</li> <li>6. Remove and examine check valve for proper installation and freedom of operation</li> <li>7. Open valve</li> <li>8. Check impeller for freedom of operation, security and condition. Clean impeller cavity and inlet of any obstruction</li> <li>9. Loosen union slightly to allow trapped air to escape. Verify that turn-off level of switch is set so that the suction is always flooded. Clean vent hole</li> </ol>
Pump hums but doesn't run	<ol style="list-style-type: none"> <li>1. Incorrect low voltage</li> <li>8. Impeller jammed or loose on shaft, or inlet plugged</li> </ol>	<ol style="list-style-type: none"> <li>10. Check rotation. If power supply is three phase, reverse any two of three power supply leads to ensure proper impeller rotation</li> <li>11. Repair fixtures as required to eliminate leakage</li> <li>12. Check pump temperature limits and fluid temperature</li> <li>13. Replace portion of discharge pipe with flexible connector or tighten existing piping.</li> </ol>
Pump delivers insufficient capacity	<ol style="list-style-type: none"> <li>1. Incorrect low voltage</li> <li>4. Excessive inflow or pump not properly sized for application</li> <li>5. Discharge restricted</li> <li>6. Check valve partially closed or installed backwards</li> <li>7. Shut-off valve closed</li> <li>8. Impeller jammed or loose on shaft, or inlet plugged</li> <li>9. Pump may be air locked causing pump not to flow</li> <li>10. Piping fixtures leaking or discharge before the nozzle</li> </ol>	<ol style="list-style-type: none"> <li>14. Turn to automatic position</li> <li>15. Check for leaks around basin inlet and outlets</li> </ol>
Pump cycles too frequently or runs periodically when fixtures are not in use	<ol style="list-style-type: none"> <li>6. Check valve partially closed or installed backwards</li> <li>11. Fixtures are leaking</li> <li>15. Ground water entering basin</li> </ol>	
Pump shuts off and turns on independent of switch, (trips thermal overload protector). <b>CAUTION!</b> Pump may start unexpectedly. Disconnect power supply.	<ol style="list-style-type: none"> <li>1. Incorrect low voltage</li> <li>4. Excessive inflow or pump not properly sized for application</li> <li>8. Impeller jammed or loose on shaft, or inlet plugged</li> <li>12. Excessive water temperature (internal protection only)</li> </ol>	
Pump operates noisily or vibrates excessively	<ol style="list-style-type: none"> <li>2c. Worn bearings, motor shaft bent</li> <li>5. Debris in impeller cavity or broken impeller</li> <li>10. Pump running backwards</li> <li>13. Piping attachments to building structure too loose or rigid</li> </ol>	

**NOTE:** Barmesa Pumps assumes no responsibility for damage or injury due to disassembly in the field. Disassembly of the pumps or supplied accessories other than at Barmesa Pumps or its authorized service centers, automatically voids warranty.

# BARMESA PUMPS FACTORY WARRANTY

Barmesa Pumps warrants that products of our manufacture will be free of defects in material and workmanship under normal use and service for 18 months from date of manufacture or 12 months from installation date whichever occurs first. This warranty gives you specific legal rights, which vary from state to state.

This warranty is a limited warranty, and no warranty related claims of any nature whatsoever shall be made against Barmesa Pumps, until the ultimate consumer or his/her successor notifies us in writing of the defect and delivers the product and/or defective part(s) freight prepaid to our factory or nearest authorized service station as instructed by Barmesa Pumps. THERE SHALL BE NO FURTHER LIABILITY, WHETHER BASED ON WARRANTY, NEGLIGENCE OR OTHERWISE. PRODUCT SHALL BE EITHER REPLACED OR REPAIRED AT THE ELECTION OF BARMESA PUMPS. Guarantees relating to performance specifications provided in addition to the foregoing material and workmanship warranties on a product manufactured by Barmesa Pumps, if any, are subject to possible factory testing. Any additional guarantees, in the nature of certified performance specifications or time frame must be in writing and such writing must be signed by our authorized factory manager at time of order placement and/or at time of quotation. Due to inaccuracies in field testing and should a conflict arises between the results of field testing conducted by or for the user, Barmesa Pumps reserves the right to have the product returned to our factory for additional testing.

This warranty shall not apply when damage is caused by (1) improper installation, (2) improper voltage, (3) lightning, (4) excessive sand or other abrasive material, (5) corrosion build-up due to excessive chemical content or (6) uncontrollable acts of god. Any modification of the original 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 pumps, parts or systems. Barmesa Pumps will not 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 TRAVEL EXPENSES, CONTRACTOR FEES, UNAUTHORIZED REPAIR SHOP EXPENSES, 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 DAMAGE OR DELAYS IN SHIPMENT. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY. No rights extended under this warranty shall be assigned to any other person, whether by operation of law or otherwise, without our prior written approval.

## IMPORTANT!

If you have a claim under the provision of the warranty, contact Barmesa Pumps or your authorized Barmesa Pumps Distributor:  
[warranty@barmesapumps.com](mailto:warranty@barmesapumps.com)  
[www.barmesapumps.com](http://www.barmesapumps.com)

