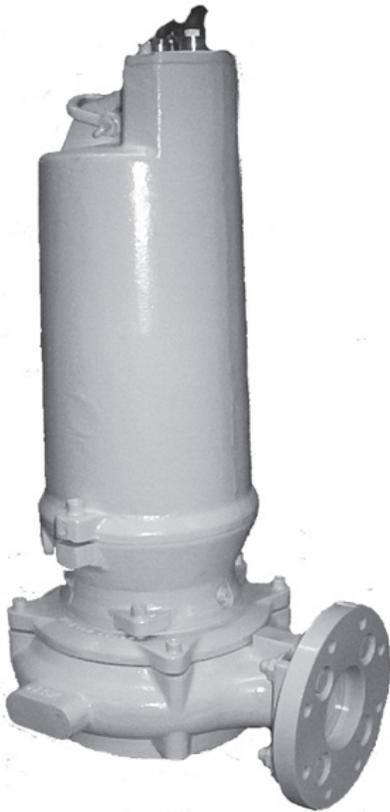


INSTALLATION, SERVICE & PARTS MANUAL



Series: PF4SCC

**4.2/4.8HP, 3PH, 230/460V
1150/1750 RPM, 60 Hz**

Series: PF4SCD

**4.2/4.8/7.1HP, 3PH, 230/460V
1150/1750 RPM, 60 Hz**

Series: PF4SCE

**4.2/12.9/17.7HP, 3PH, 230/460V
1150/1750 RPM, 60 Hz**

Series: PF4SCF

**4.2/8.9/17.7/29.9HP, 3PH, 230/460V
1150/1750 RPM, 60 Hz**



Power-Flo Pumps & Systems

a Power-Flo Technologies company

General Safety Information

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 Power-Flo pump is individually factory tested to insure proper performance. Closely following these instructions will eliminate potential operating problems, assuring years of trouble-free service.

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

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

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

IMPORTANT - Power-Flo Pumps and Systems 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 RECONTAMINATED 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.

* Power-Flo is a registered trademark of Power-Flo Technologies Inc. Other brand and product names are trademarks or registered trademarks of their respective holders. Alteration Rights Reserved. 7/08, 7/09, 9/09, 4/10, 7/10, 12/10, 4/14, 11/14, 8/17, 9/2020, 1/2021

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

⚠ DANGER Keep clear of suction and discharge openings. **Do not** insert fingers in pump with power connected.

⚠ DANGER The cutting mechanism **VERY SHARP!** Be extremely careful when servicing and or repairing the pump.

⚠ WARNING 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.

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

⚠ DANGER Risk of electric shock. To reduce risk of electric shock, always disconnect pump from power source before handling. **Lock out power & tag.**

⚠ WARNING **Do not** use these pumps in water over 104°F. **Do not** exceed manufactures 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, burnes or death. **Never** handle connected power cords with wet hands. Use appropriate lifting device.

⚠ 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.

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

⚠ WARNING Bronze/brass fitted pumps may contain levels higher than considered safe for potable water systems. Government agencies have determined that leaded copper alloys should not be used in potable water applications.

⚠ WARNING: CANCER AND REPRODUCTIVE HARM- WWW.P65WARNINGS.CA.GOV

IMPORTANT! Prior to installation, record Model Number, MFG Date, Amps, Voltage, Phase and HP, from pump name plate for 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: _____
 MFG Date: _____
 PHASE: _____ HP: _____

Specifications



Series: PF4SCC

**4.2/4.8HP, 3PH, 230/460V
1150/1750 RPM, 60 Hz**

Series: PF4SCD

**4.2/4.8/7.1HP, 3PH, 230/460V
1150/1750 RPM, 60 Hz**

Series: PF4SCE

**4.2/12.9/17.7HP, 3PH, 230/460V
1150/1750 RPM, 60 Hz**

Series: PF4SCF

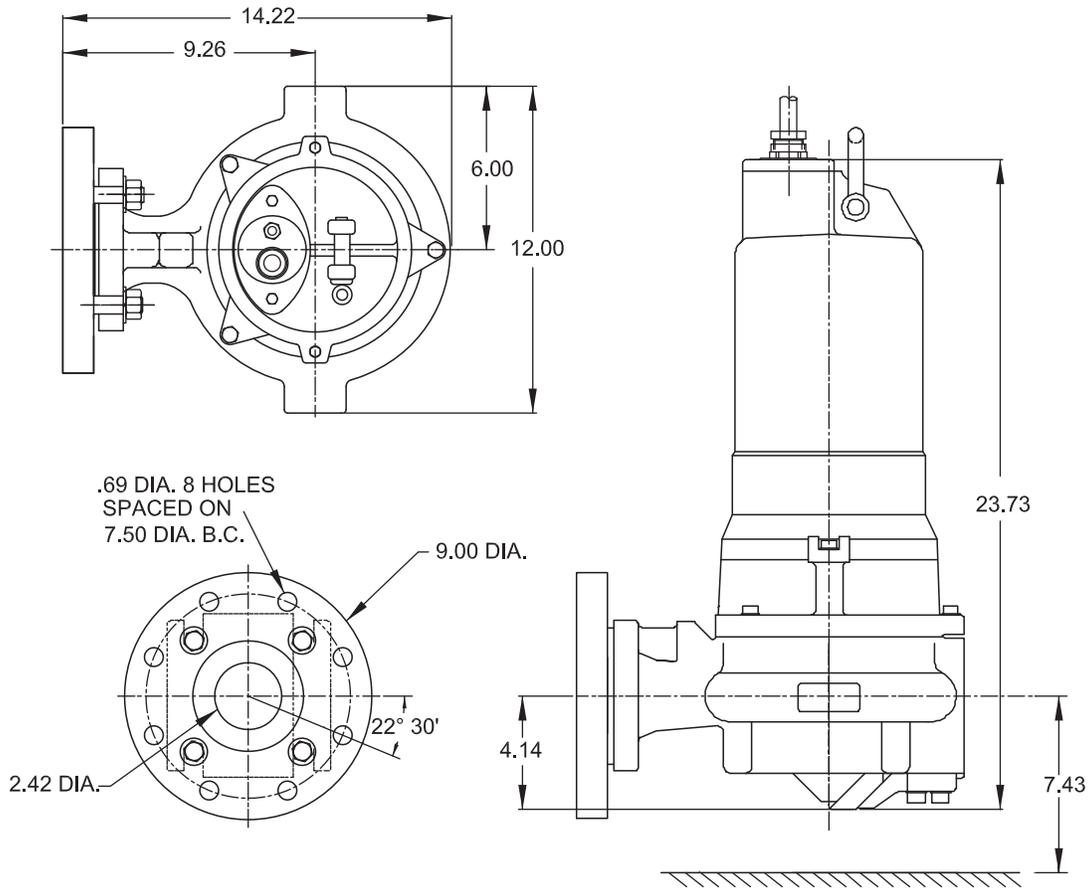
**4.2/8.9/17.7/29.9HP, 3PH, 230/460V
1150/1750 RPM, 60 Hz**

DISCHARGE	4" 125lb Flange, Horizontal
LIQUID TEMPERATURE	104°F Continuous
MOTOR HOUSING	Cast Iron, Class 30
VOLUTE	Cast Iron, Class 30
IMPELLER	2 Port, enclosed Cast Iron
CUTTER CONE	Integral with Impeller Hardened Steel 52/53 Rockwell "C"
CUTTER BLADE	Hardened Steel 45/47 Rockwell "C"
SHAFT	416 Stainless Steel
SEAL PLATE	Cast Iron, Class 30
SQUARE RINGS	Buna-N
HARDWARE	300 Series Stainless Steel
SEAL	Tandem Mechanical, Oil Filled Reservoir Upper: Carbon/Stainless/Buna-N Lower: Tungsten Carbide/Tungsten Carbide/Buna-N
SEAL PLATE	Cast Iron
POWER CORD	30 ft cord, pressure grommet
MOTOR	Nema B - Airfilled Class F, Dual Voltage 230/460 Includes overload protection
UPPER BEARING	Single Row, Ball, Grease Lubricated
LOWER BEARING	Double Row, Ball, Grease Lubricated
MOISTURE SENSOR	N/O, Requires relay in control panel
TEMPERATURE SENSOR	N/C, Requires relay in control panel
OPTIONAL EQUIPMENT	Seal Materials, Additional Cable,

MAX FLOW	4500 GPM
MAX HEAD	295 TDH



Specifications



MODEL	HP	VOLT/PH	RPM	MTR FRAME	FULL LOAD AMPS	LOCKED ROTOR AMPS	WINDING RESISTANCE (in ohms, for 1 coil)	NEMA START CODE	CORD	CORD O.D.
PF4SCC4236	4.2	230/3	1150	100	12.8	63	2.45	G	4G1.5mm ² (14/4, SO)	0.457 (0.57)
PF4SCC4246	4.2	460/3	1150	100	6.4	31.5	2.45	G	4G1.5mm ² (14/4, SO)	0.457 (0.57)
PF4SCC4834	4.8	230/3	1750	100	14.4	80	1.21	H	4G1.5mm ² (14/4, SO)	0.457 (0.57)
PF4SCC4844	4.8	460/3	1750	100	7.2	40	1.21	H	4G1.5mm ² (14/4, SO)	0.457 (0.57)

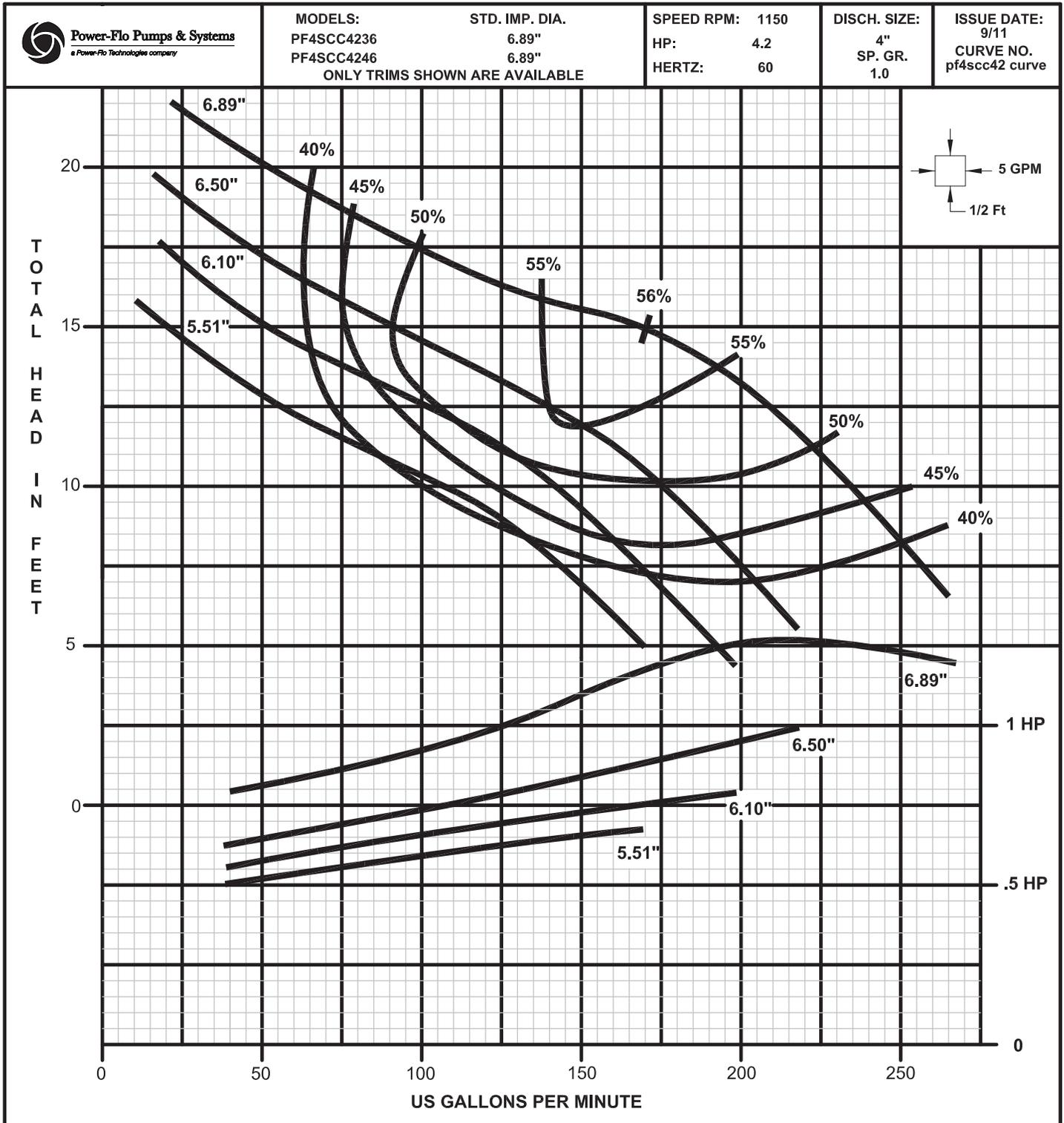
Control cable sizes for all models is, 4G1.5mm², 0.457 O.D. (14/3, SO, 0.53 O.D.)

NOTE: The use of a 4" Break Away Fitting is required with these pumps.

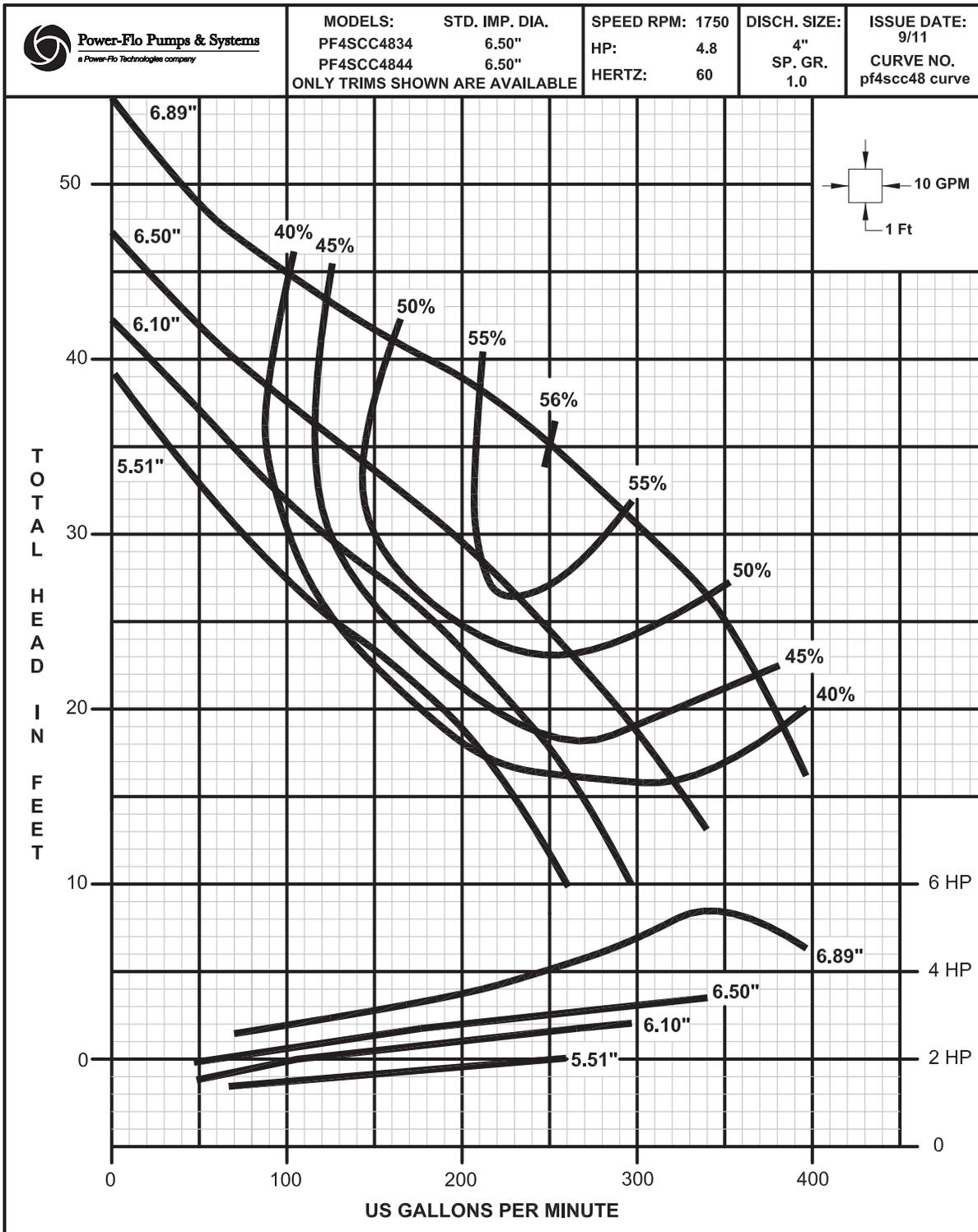
NOTE: A relay is required for use with Moisture Sensor, see page 25.



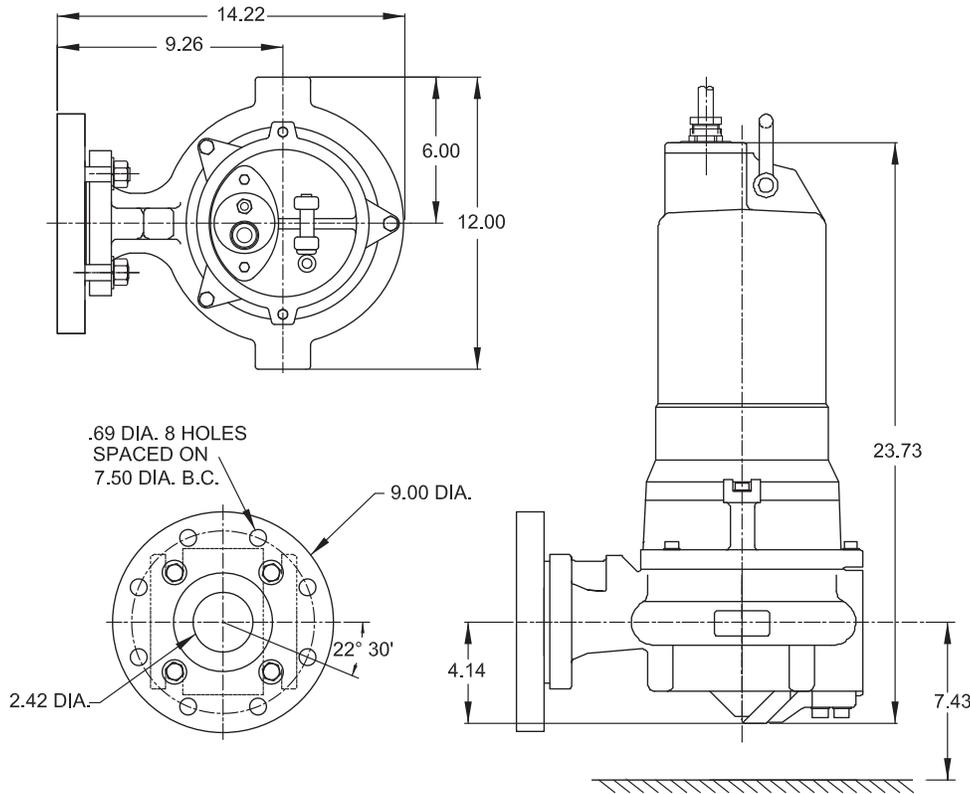
Performance



Performance



Specifications



MODEL	HP	VOLT/ PH	RPM	MTR FRAME	FULL LOAD AMPS	LOCKED ROTOR AMPS	NEMA START CODE	WINDING RESISTANCE (in ohms, for 1 coil)	CORD	CORD O.D.
PF4SCD4236	4.2	230/3	1150	100	12.8	63	G	2.45	4G1.5mm ² (14/4, SO)	0.453 (0.57)
PF4SCD4246	4.2	460/3	1150	100	6.4	31.5	G	2.45	4G1.5mm ² (14/4, SO)	0.453 (0.57)
PF4SCD4834	4.8	230/3	1750	100	14.4	80	H	1.21	4G1.5mm ² (14/4, SO)	0.453 (0.57)
PF4SCD4844	4.8	460/3	1750	100	7.2	40	H	1.21	4G1.5mm ² (14/4, SO)	0.453 (0.57)
PF4SCD7134	7.1	230/3	1750	100	19.4	114	H	1.65	4G1.5mm ² (14/4, SO)	0.453 (0.57)
PF4SCD7144	7.1	460/3	1750	100	9.7	57	H	1.65	4G1.5mm ² (14/4, SO)	0.453 (0.57)

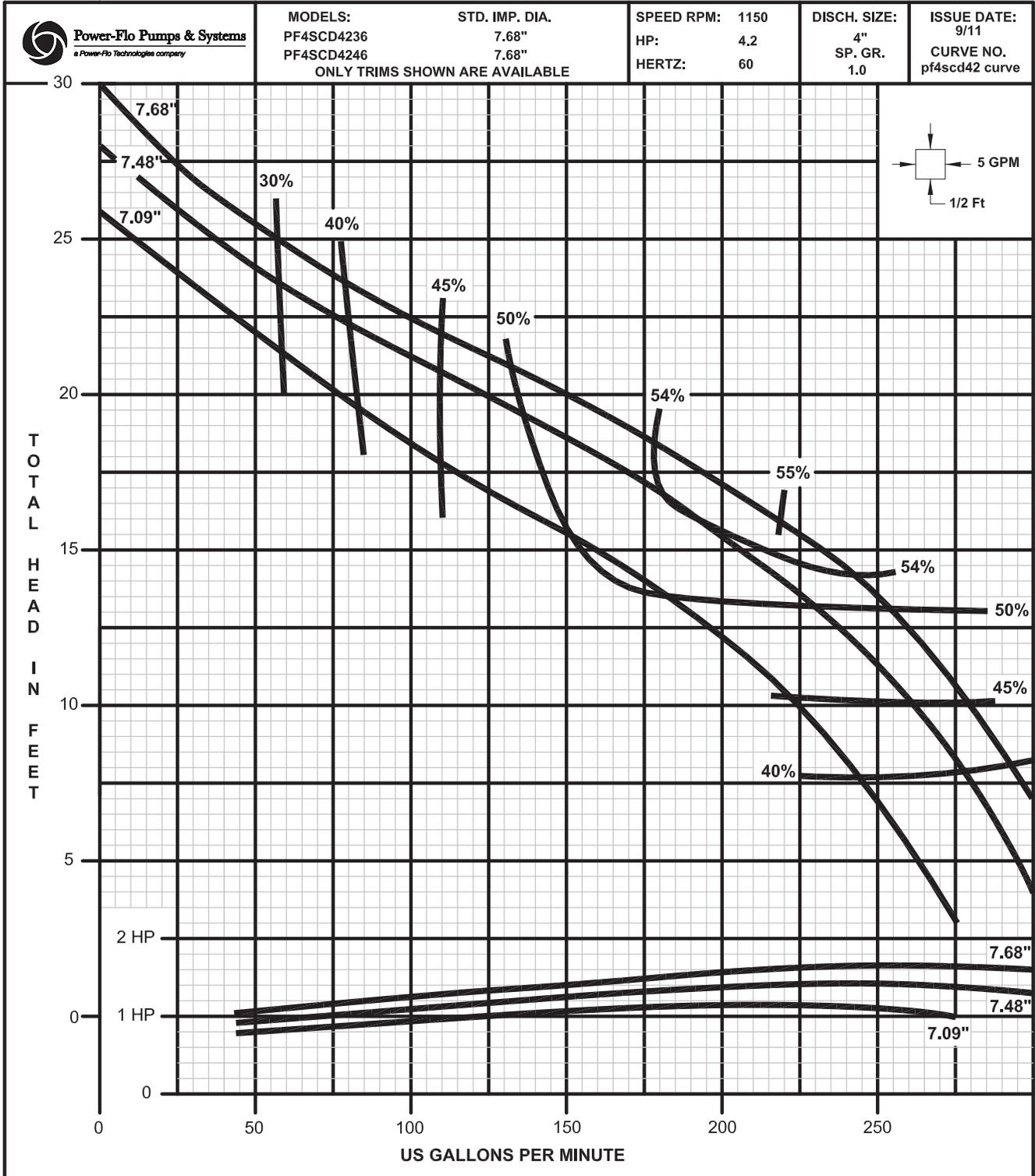
Control cable sizes for all models is, 4G1.5mm², 0.457 O.D. (14/3, SO, 0.53 O.D.)

NOTE: The use of a 4" Break Away Fitting is required with these pumps.

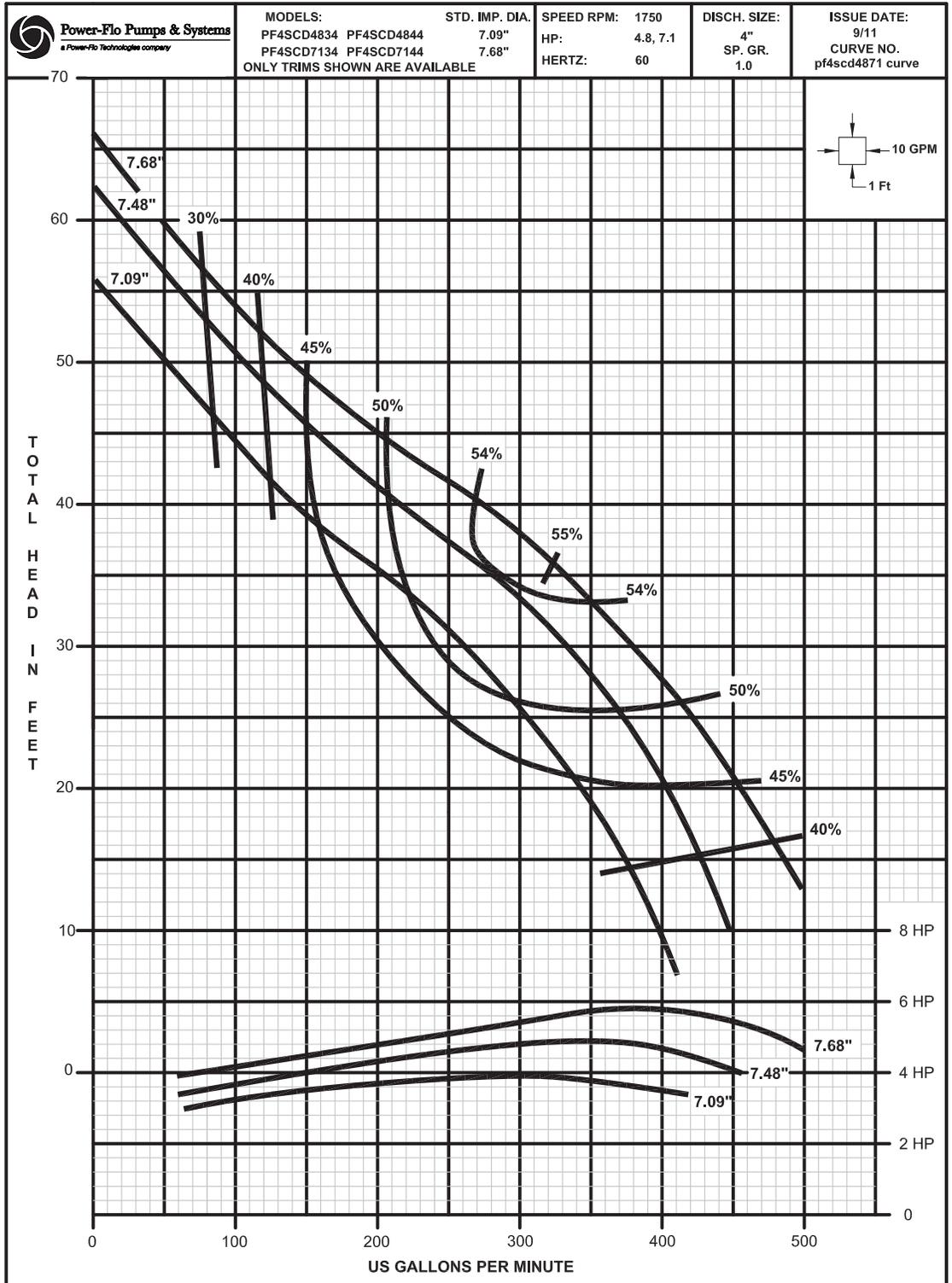
NOTE: A relay is required for use with Moisture Sensor, see Page 25.



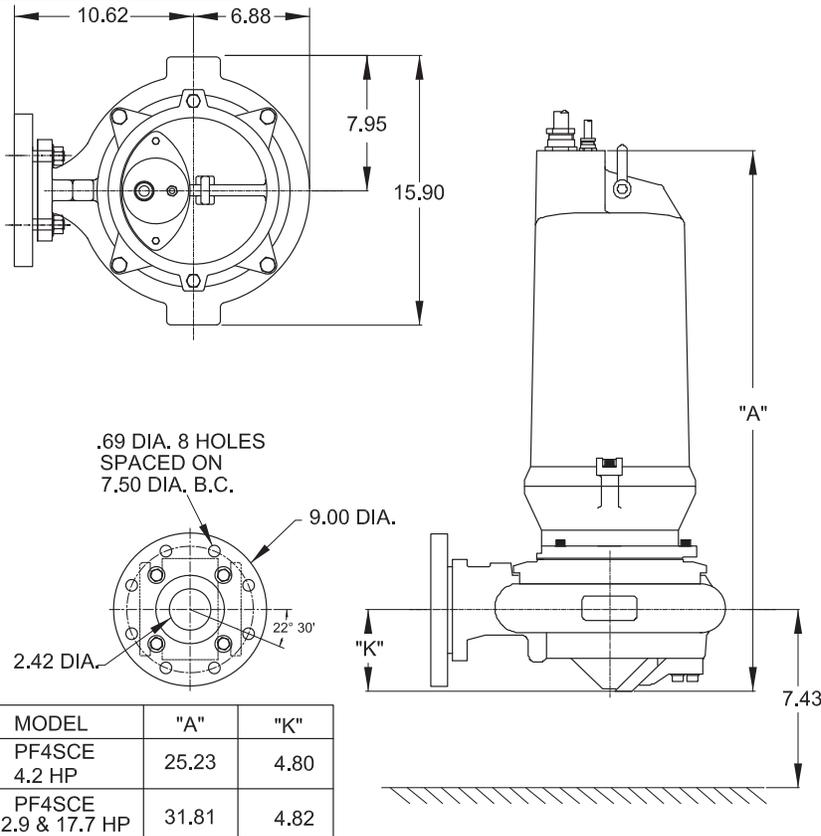
Performance



Performance



Specifications



MODEL	HP	VOLT/ PH	RPM	MTR FRAME	FULL LOAD AMPS	LOCKED ROTOR AMPS	NEMA START CODE	WINDING RESISTANCE (in ohms, for 1 coil)	CORD	CORD O.D.
PF4SCE4236	4.2	230/3	1150	100	12.8	63	G	2.45	4G1.5mm ² (14/4, SO)	0.453 (0.57)
PF4SCE4246	4.2	460/3	1150	100	6.4	31.5	G	2.45	4G1.5mm ² (14/4, SO)	0.453 (0.57)
PF4SCE12934	12.9	230/3	1750	132	35.4	230	J	0.48	4G6mm ² (10/4, SO)	0.67 (0.75)
PF4SCE12944	12.9	460/3	1750	132	17.7	115	J	0.48	4G6mm ² (10/4, SO)	0.67 (0.75)
PF4SCE17734	17.7	230/3	1750	132	45.8	292	H	0.41	4G6mm ² (10/4, SO)	0.67 (0.75)
PF4SCE17744	17.7	460/3	1750	132	22.9	146	H	0.41	4G6mm ² (10/4, SO)	0.67 (0.75)

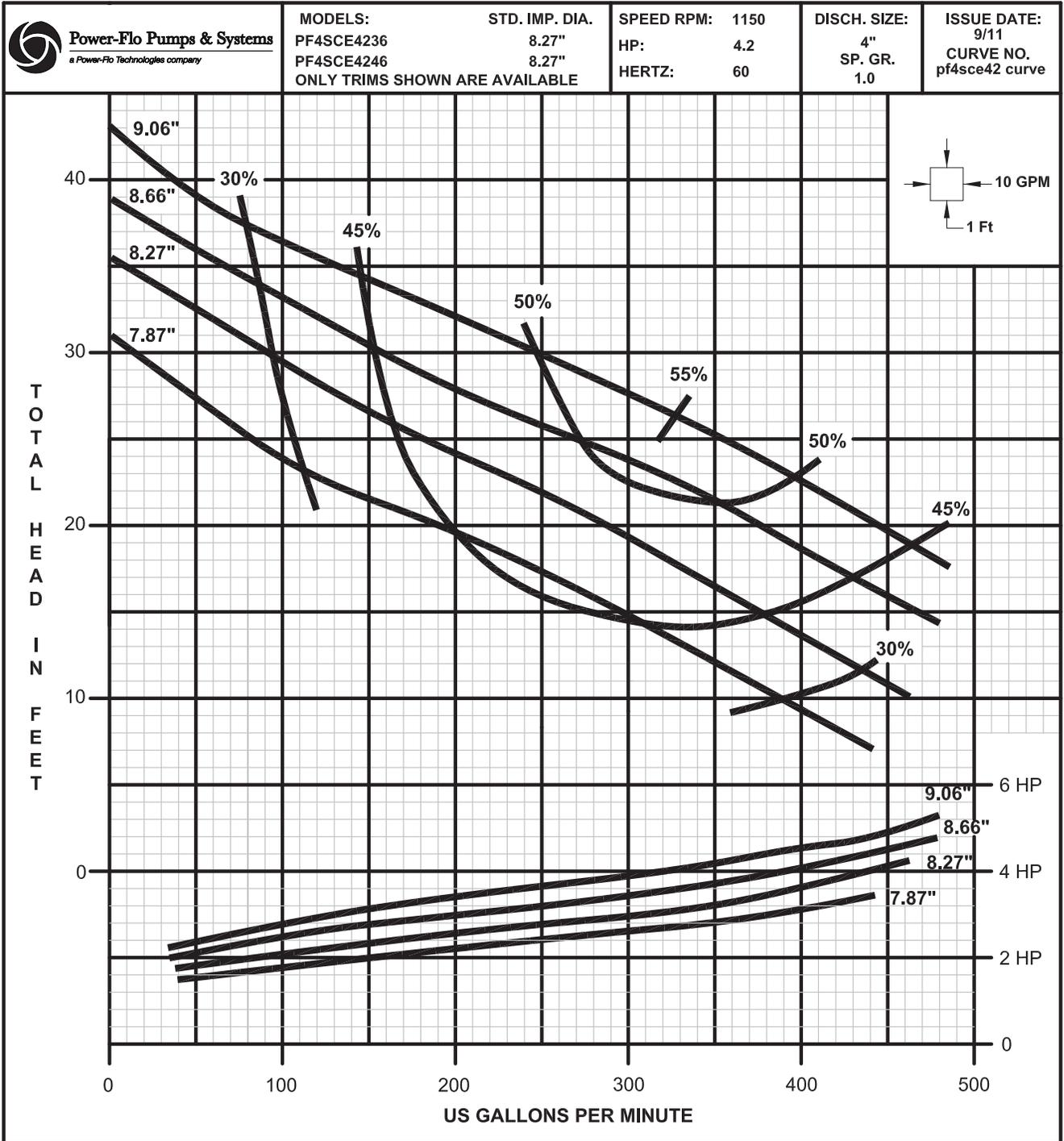
Control cable sizes for all models is, 4G1.5mm², 0.457 O.D. (14/3, SO, 0.53 O.D.)

NOTE: The use of a 4" Break Away Fitting is required with these pumps.

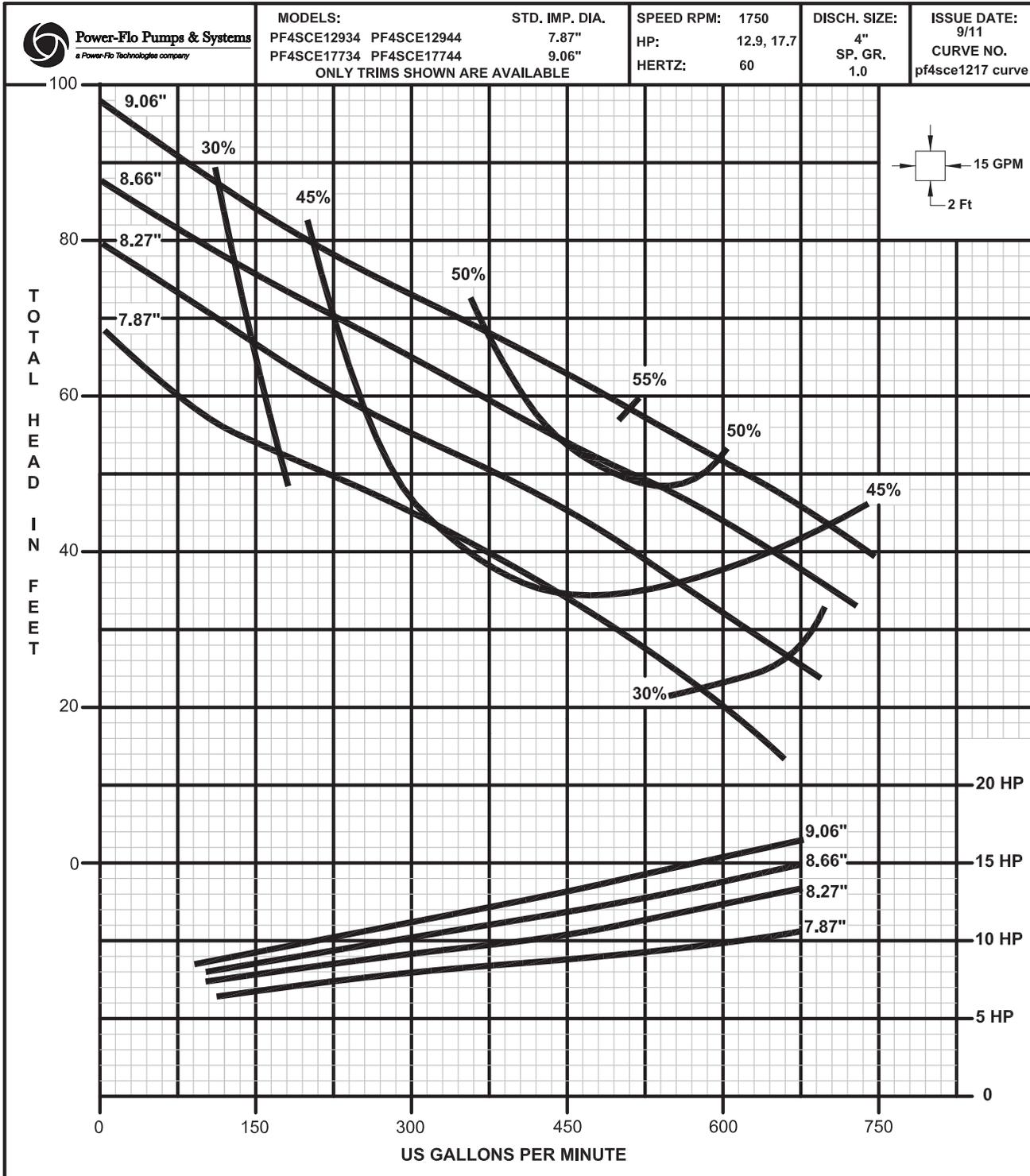
NOTE: A relay is required for use with Moisture Sensor, see Page 25.



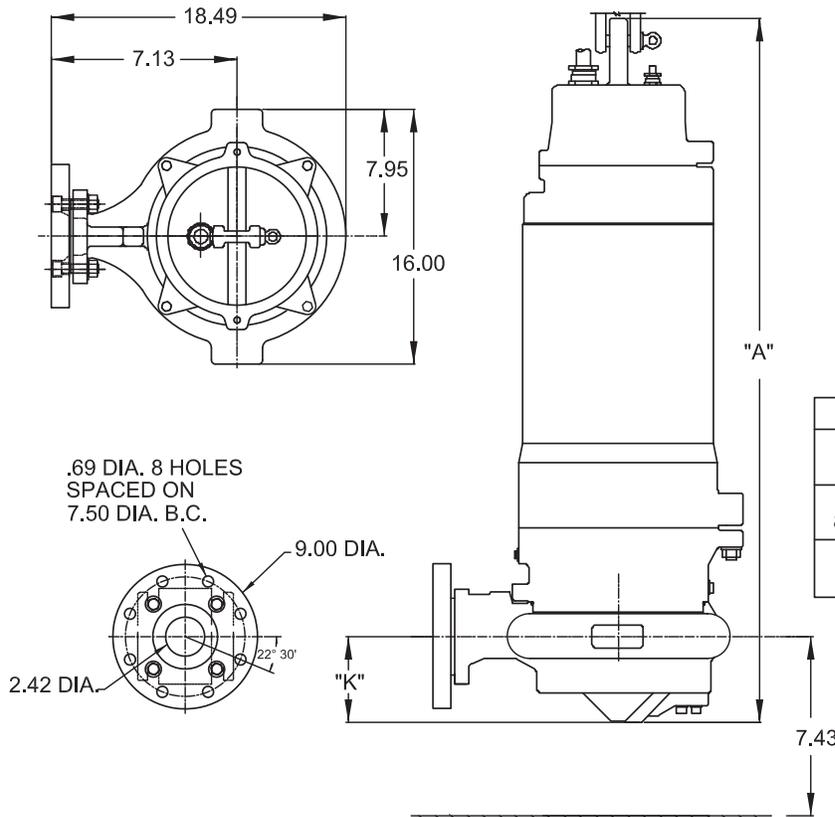
Performance



Performance



Specifications



MODEL	"A"	"K"
PF4SCF 4.2 HP	25.90	5.38
PF4SCE 8.9 & 17.7 HP	32.48	5.38
PF4SCF 29.7 HP	44.64	4.82

MODEL	HP	VOLT/ PH	RPM	MTR FRAME	FULL LOAD AMPS	LOCKED ROTOR AMPS	NEMA START CODE	WINDING RESISTANCE (in ohms, for 1 coil)	CORD	CORD O.D.
PF4SCF4236	4.2	230/3	1150	100	12.8	63	G	2.45	4G1.5mm ² (14/4, SO)	0.453 (0.57)
PF4SCF4246	4.2	460/3	1150	100	6.4	31.5	G	2.45	4G1.5mm ² (14/4, SO)	0.453 (0.57)
PF4SCF8936	8.9	230/3	1150	132	25.5	150	H	0.64	4G6mm ² (8/4, SO)	0.67 (0.78)
PF4SCF8946	8.9	460/3	1150	132	12.8	75	H	0.64	4G6mm ² (8/4, SO)	0.67 (0.78)
PF4SCF17734	17.7	230/3	1750	132	45.8	292	H	0.41	4G6mm ² (8/4, SO)	0.67 (0.78)
PF4SCF17744	17.7	460/3	1750	132	22.9	146	H	0.41	4G6mm ² (8/4, SO)	0.67 (0.78)
PF4SCF29734	29.7	230/3	1750	180	71.6	473.6	H	0.40	4G10mm ² (4/4, SO)	0.89 (1.10)
PF4SCF29744	29.7	460/3	1750	180	35.8	236.8	H	0.40	4G10mm ² (4/4, SO)	0.89 (1.10)

Control cable sizes for all models is, 4G1.5mm², 0.457 O.D. (14/3, SO, 0.53 O.D.)

NOTE: The use of a 4" Break Away Fitting is required with these pumps.

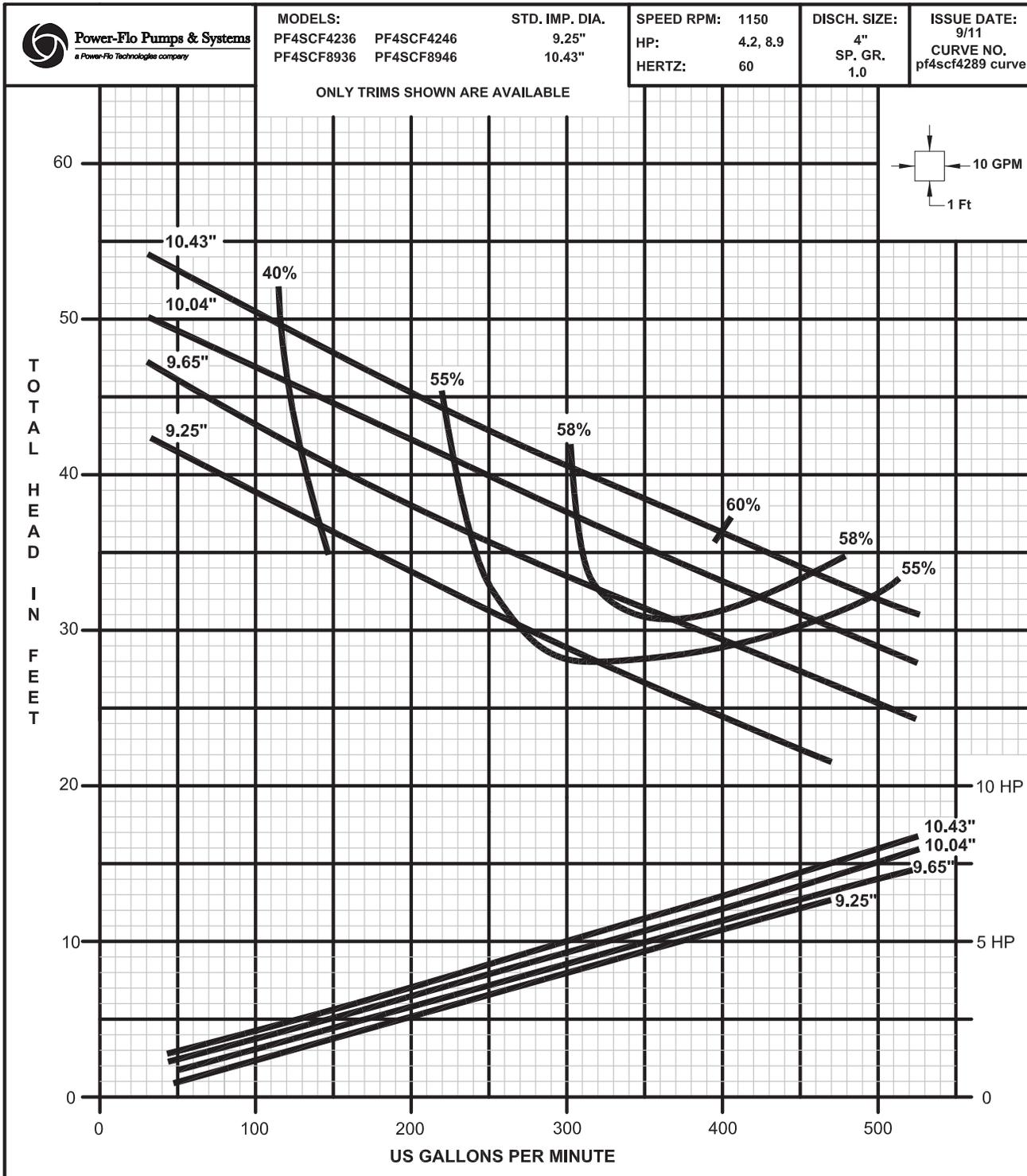
NOTE: A relay is required for use with Moisture Sensor, see Page 25.

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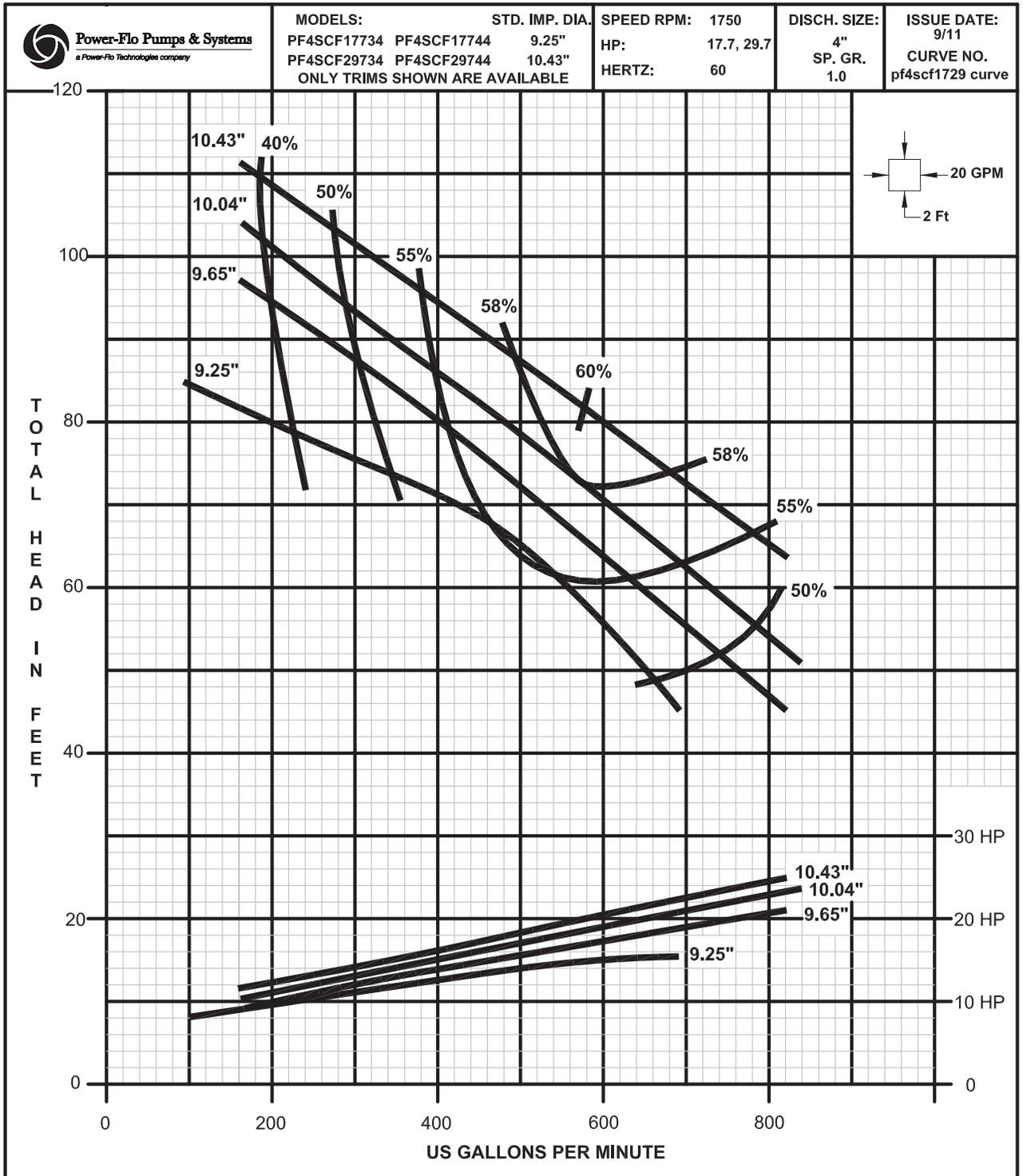


Power-Flo Pumps & Systems
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Performance



Performance



Receiving & Installation

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. Do not pump out of liquid.

Controls

The Cutter pump series 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.

Location

The Cutter pumps are designed for use in sump and lift station applications where water, effluent, and/or raw sewage laden with unscreened solids are present. The cutting mechanism is designed to "cut" hard to handle solids such as linen, gloves, cloth, rubber, plastic and other items into small passable filaments. The cutter pumps are typically used in tough installations such as hospitals, prisons, hotels, retail stores, highway rest areas, etc., where unwanted items are disposed of that could clog a standard sewage pump.

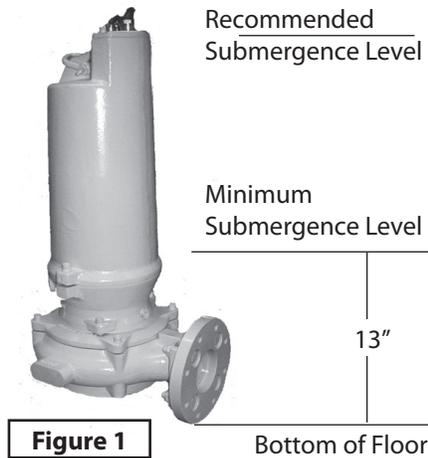


Figure 1

Bottom of Floor



This pump is designed to pump, nonexplosive and noncorrosive 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).

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).

The cutter pumps are NOT designed to run dry. The casing MUST be submerged.

Installation

The cutter pumps can be installed in a wet well utilizing a slide rail assembly. The use of a slide rail assembly provides ease of installation and removal of the pump without requiring personnel to enter the wet well.

The sump or basin shall be sealed and vented in accordance with local plumbing codes.

The pump should never be installed in a trench, ditch, or hole with a dirt bottom. 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.

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-off valve is used to manually stop system flow 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 just above the pump's volute.



Receiving & Installation

Electrical Connections

Power/control cables - The power and control cables 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.

Thermal Protection:

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 that an overtemperature condition and/or motor starter coil to stop pump.

In the event of an overtemperature, the source of this condition should be determined and repaired immediately. Thermal protection shall not be used as a motor overload device. A separate motor overload device must be provided in accordance with NEC code.



WARNING! - DO NOT LET THE PUMP CYCLE OR RUN IF AN OVERLOAD CONDITION OCCURS!

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

Moisture Sensor:

To detect any moisture present a normally open (N/O) probe is installed in the seal chamber. The probe should be connected in series to an alarm device or motor starter coil to alert the operator that moisture has been detected. A Gems Warrick® (or equal) moisture detection relay, part number IDIEO, is an acceptable relay. (See Fig 2) Check the probe leads for continuity, (∞ resistance = no moisture). Also check the junction box and control panel for moisture content as this may induce a false signal. **IF MOISTURE DETECTION OCCURS, MAINTENANCE SHOULD BE DONE TO IDENTIFY AND REPAIR.**

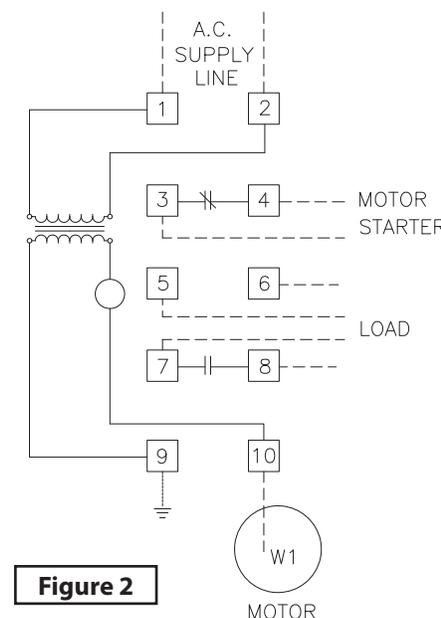


Figure 2

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. Incorrect rotation for Single-Phase pumps is unlikely. If the rotation is incorrect contact factory.
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.



Service

Maintenance

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

- a). Inspect seal chamber for oil level and contamination.
- b). Inspect impeller, adjust cutter knife and blade.
- c). Inspect motor and bearings.
- d). Inspect lower seal for wear or leakage.

Servicing

NOTE: Item numbers in () refer to Figures 6 & 7.

Seal Chamber Oil - Anytime the pump is removed from operation, the oil in the seal chamber should be checked visually for oil level and contamination.

To check oil, set unit on its side with pipe plug (23) downward, remove pipe plug (23) and drain oil from seal chamber. Make sure it is clean and clear, light amber in color and free from suspended particles. Milky white oil indicates the presence of water and lower seal should be inspected or replaced.

Oil Testing

- Check oil for contamination using an oil tester with a range to 30 Kilovolts breakdown.
- If oil is found to be clean and uncontaminated (measuring above 15 KV. breakdown), refill seal chamber.
- If oil is found to be dirty or contaminated (or measures below 15 KV. breakdown), the pump must be carefully inspected for leaks.

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

Oil Replacement:

Seal Chamber - Drain all oil (if not already done so) from seal chamber and dispose of properly per Local and Environmental Standards. Refill with approx. 51 oz. with new oil, see chart.

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

⚠ DANGER Before any service work is done, disconnect and lock out electrical power to pump.



Disassembly

Cutter & Impeller - Remove cap screws (45) and washer (47) from volute (40). Lift motor from volute (40). Clean out volute and check impeller for pitting or wear. To replace impeller (41), remove plug (50), screw (48) and washer (49). Pull impeller straight off shaft with a wheel puller.

Carefully remove impeller (41) so as not to damage the lower seal. **NOTE:** Seal spring relaxes when impeller is removed and may cause oil to leak through.

⚠ DANGER Impeller and knife assemblies are **EXTREMELY SHARP!** Handle with care.



To install impeller, check that lower seal is in place, apply a thin film of oil to motor shaft and slide impeller straight onto shaft. Apply thread locking compound to screw (45), and with washwe (11) place into shaft and tighten. Check impeller for binding. Assemble volute (40) onto motor assembly with screws (45) and washers (47). Apply thread locking compound on screws (45).

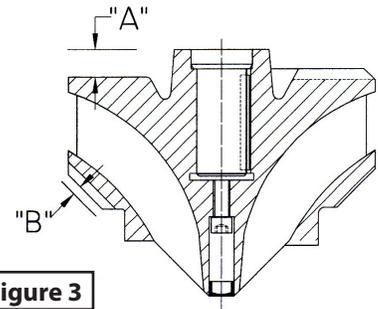


Figure 3

Check the gap (A) between the intermediate and upper portion of impeller with a feeler gauge which should be between .012" - .059". Gap (B) between the lower portion of impeller and volute should be between .012" - .059". See Figure 3.

Cutter Height Adjustment - Loosen two screws (51) and bring the upper surface of the blade as close as possible to the lower heel of the impeller without touching and tighten firmly.

Cutter Angle Adjustment - Loosen two screws (45) and move the knife (42) across so as to bring blade flush up to the point of the impeller, permitted play between .002" - .005" and tighten firmly.

Cable Assembly - Loosen cable connectors (32) and (35), replace if required. Remove cap screws (19), washers (20) and cable box cover (5) from motor housing (1). Remove cable lead wires from motor lead wires and sensor wires from control cable by unscrewing connectors (31) and (32). Note wiring connections for reassembly. Remove screw (26), washer (27) and ground wire (30) from cover plate (5).

Service

Reassemble by first making wire connections per Figure 4. Attach ground wire (30) to cover plate (5) with screw (26) and washer (27). Apply thread locking compound to cap screws (19), and along with washers (20) and cover plate, assemble to motor housing (1). Torque to 16 ft lbs. Tighten cable connectors (32) and (36) to 15 ft lbs to prevent water leakage.

Wiring Connections - Check power cable (29) and control cable (34) for cracks or damage and replace if damaged. Bring motor wires through opening in top of motor housing (1) and reconnect motor leads to power cable and sensor leads to control cable using connectors (31) and (33) per Figure 4.

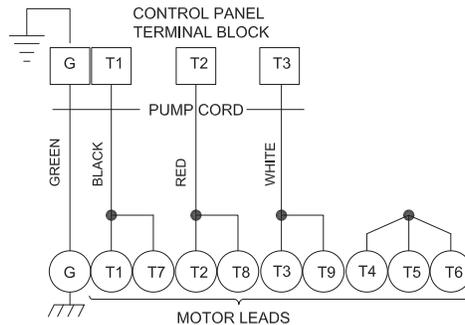


FIGURE 4 - THREE PHASE 230 VOLT AC

Power Cable	Motor Lead Number
G (Ground)	G
L1 or W1	1 & 7
L2 or W2	2 & 8
L3 or W3	3 & 9
	T4, T5 & T6 Together

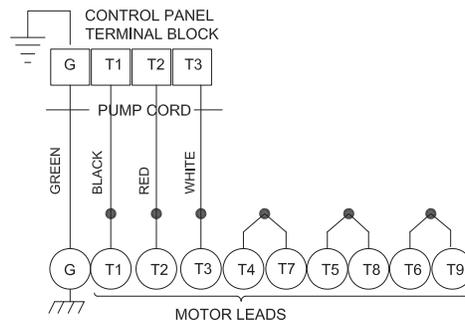


FIGURE 4 - THREE PHASE 460 VOLT AC

Power Cable	Motor Lead Number
Green (Ground)	Green
L1 or W1	1
L2 or W2	2
L3 or W3	3
	T4 & T7 Together
	T5 & T8 Together
	T6 & T9 Together

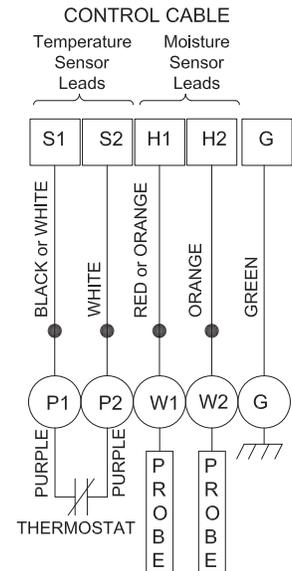


FIGURE 4 MOISTURE & TEMPERATURE SENSORS

Control Cable	Lead Number
G (Ground)	Green
S1	P1 (Temp Sensor) In series with starter coil
S2	P2 (Temp Sensor) In series with starter coil
W1	W1 (Moisture Sensor)

IMPORTANT! - WIRE COLORS MAY VARY. USE IDENTIFICATION TAG ON EACH LEAD.

IMPORTANT! - All parts must be clean before reassembly. Handle seal parts with extreme care. DO NOT damage lapped surfaces.

Shaft Seal Service:

Lower Seal - With oil drained, expose lower shaft seal (10) for inspection, by first disconnecting power, remove cap screws (45) and washers (47) from volute (40). Lift motor assembly from volute and remove impeller.

Service

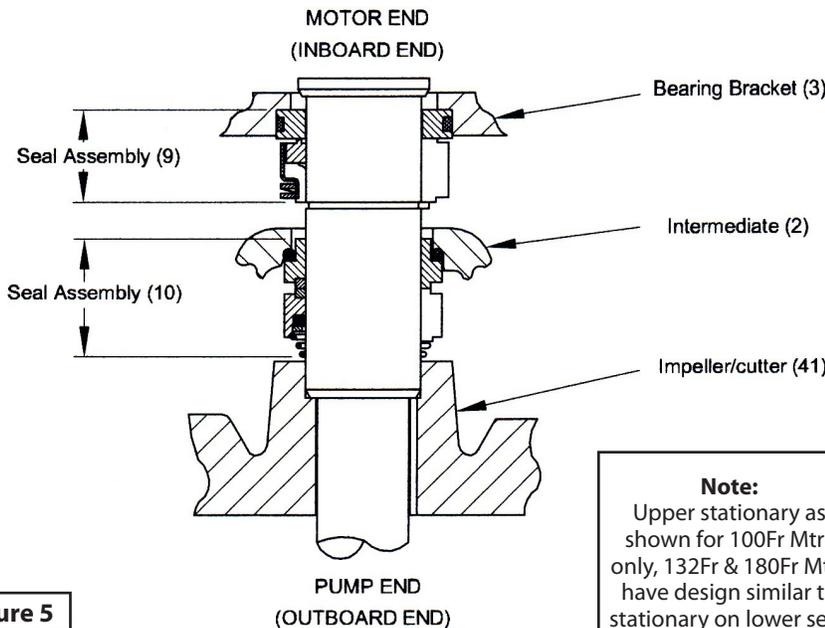


Figure 5

Remove retaining ring (10D), spring (10C) and rotating member (10B) from shaft (See Figure 5). Inspect seal for signs of uneven wear pattern on stationary, chips and scratches on either face. **DO NOT** interchange seal components, replace the entire shaft seal (10). If replacing seal, remove stationary (10A) from intermediate (2) by prying out with flat screw driver.

Upper Seal - Remove screws (17), washers (18) and intermediate (2) from motor housing (1). Do not damage o-ring (21) or sensor probe (36). Remove snap ring (25), retaining ring (9D), spring (9C) and rotating member (9B) from shaft. If replacing seal, remove stationary (9A) from bearing bracket (3) by prying out with flat screw driver.

Reassembly:

Lower seal - Clean and oil seal cavity in intermediate (2).

Lightly oil (**The use of grease is NOT recommended**) outer surface of stationary member (10A), press stationary member (10A) firmly into intermediate (2) using a seal tool, nothing but the seal tool is to come in contact with seal face.



Important! Hammering on the seal pusher will damage the seal face.

Make certain the stationary member is in straight and that the rubber ring is not out of its groove. Lightly oil (**The use of grease is NOT recommended**), shaft and inner surface of bellows on rotating member (10B). With lapped surface facing intermediate (2), slide rotating member (10B) onto shaft using the seal tool until lapped faces of (10B) and (10A) are together.

Place spring (10C) over shaft and in place on rotating member (10B) making certain it is seated in the retainer and not cocked or resting on bellows tail. Slide retaining ring (10D) over shaft and let rest on spring (10C).

Upper Seal - Clean and oil seal cavity in bearing bracket (3). Lightly oil (**The use of grease is NOT recommended**) outer surface of stationary member (9A), press stationary member (9A) firmly into bearing bracket (3), using seal tool, nothing but the seal tool is to come in contact with seal faces. Be certain the stationary member is in straight and that the rubber ring is not out of its groove.

Lightly oil (**The use of grease is NOT recommended**) the shaft and inner surface of bellows on rotating member (9B). With lapped surface facing bearing bracket (3), slide rotating member (9B) onto shaft, using seal tool until lapped faces of (9B) and (9A) are together. Place spring (9C) over shaft and in place on rotating member (9B), being certain it is seated in retainer and not cocked or resting on bellows tail. Slide retaining ring (9D) over shaft and let rest on spring (9C) and replace snap ring (25) onto shaft.

Motor & Bearing Service:

Bearings - Slide motor assembly from motor housing (1). Remove bearing (12) from motor shaft using a wheel puller. Remove snap ring (8) or screws (19) with washers (20) and bearing bracket (3). Remove snap ring (15) from shaft. Remove bearing (11) from shaft, if required, using a wheel puller.

Bearing Reassembly - Be careful Not to damage the rotor or the shaft threads. *On some models*, first slide bearing cap (4) onto shaft. Apply adhesive compound to the shaft and press lower bearing (11) on the motor shaft.



Service

Position bearing squarely onto the shaft applying force to the inner race of the bearing only, until bearing seats against shoulder of the shaft. Replace retaining rings (15) onto shaft. Replace top bearing (12) in the same manner.

Motor - Inspect windings for shorts and resistance. Check the continuity between the black and white wires of the temperature sensor. If found to be defective contact factory. Check rotor for wear, if rotor (6) or the stator (7) windings are defective, the complete motor must be replaced. Check that moisture sensor wires are secured to the electrode (36).

Motor Reassembly - Slide lower bearing and motor assembly into the bearing bracket (3) until bearing seats on the bottom. Position bearing cap (*on some models*) on bearing bracket, insert screws (19) with washers (20) and tighten to 16 ft. lbs.

On other models, insert retaining ring (8) into bearing bracket (3). Position motor and bearing assembly into pilot in motor housing (1) while feeding motor leads through opening in top of motor housing. Assemble upper seal as outlined above.

Place o-ring (21) on motor housing (1) then intermediate (2), being careful not to damage o-ring. Insert screws (17) with washers (18) and tighten. Assemble lower seal as outlined above. Reassemble remainder of pump and fill with cooling oil.

Discharge Flange - Remove or replace discharge flang (56) by removing socket head screws (55), hex nuts (53) and washers (54).



Repair Parts

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

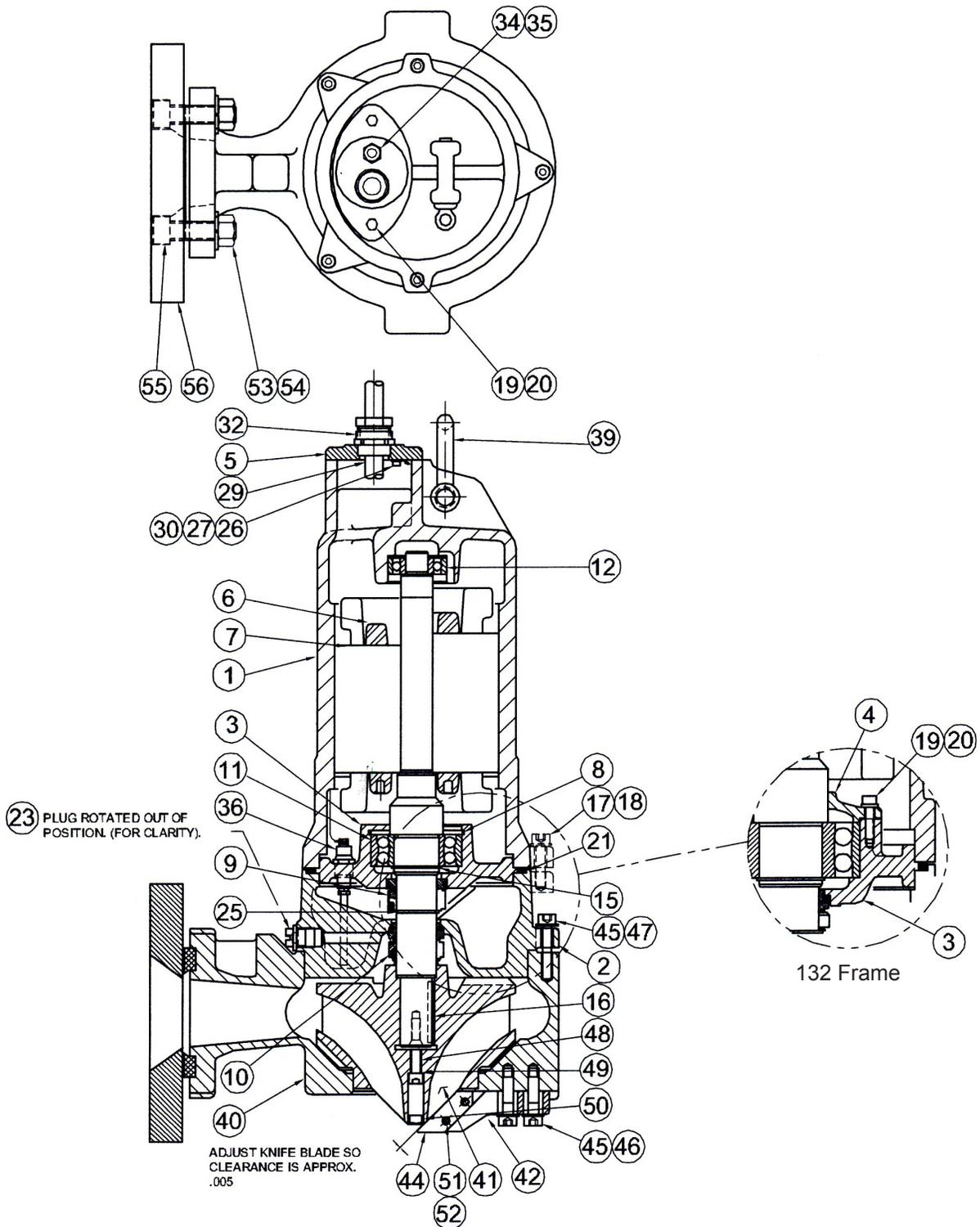


Figure 6



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

Repair Parts

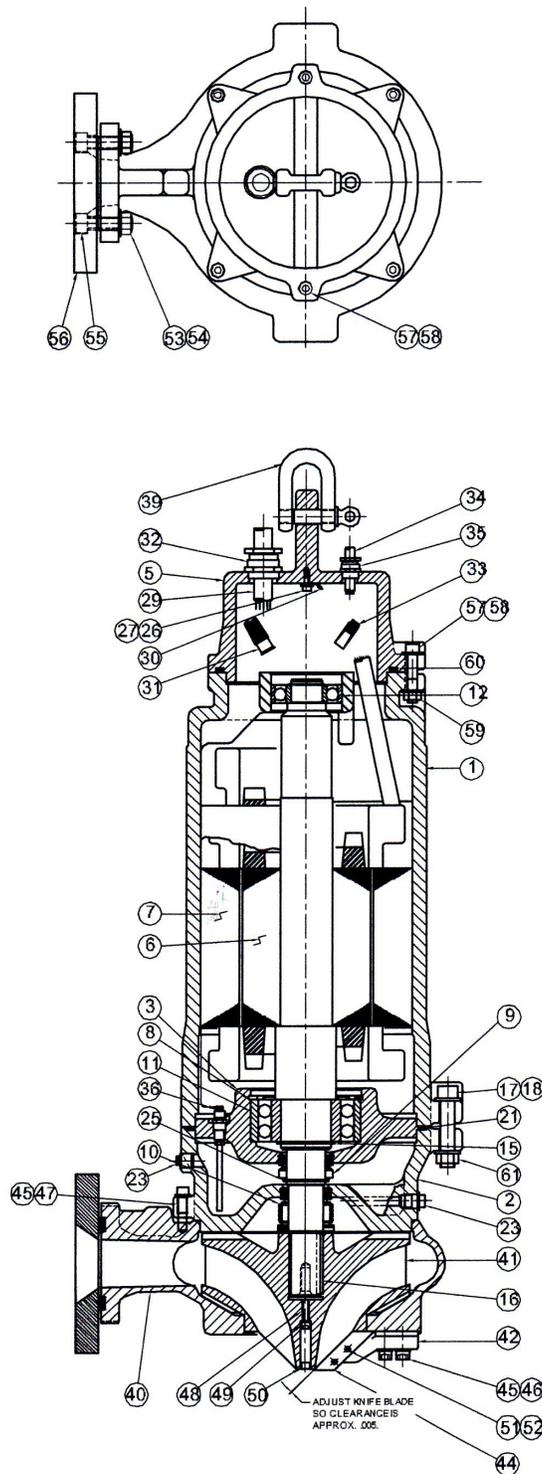


Figure 7



Repair Parts

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

Knife Kit: (†) items 42, 44, 45, 46, 51, 52

- P/N: PF095064** - PF4SCC, PF4SCD
- P/N: PF095065** - PF4SCE, PF4SCF
- P/N: PF095065** - PF4SCF, 180 Mtr Frame

Bearing Kit: (◇) items 11, 12

- P/N: PF095474** - 100Mtr Frame; PF4SCC, PF4SCD, PF4SCE, PF4SCF
- P/N: PF095475** - 132 Mtr Frame; PF4SCE, PF4SCF
- P/N: PF095476** - PF4SCF, 180 Mtr Frame

Seal & O-ring Kit: (♠) items 9, 10, 21

- P/N: PF095471** - 100 Mtr Frame; PF4SCC, PF4SCD, PF4SCE, PF4SCF
- P/N: PF095472** - 132 Mtr Frame; PF4SCE, PF4SCF
- P/N: PF095473** - PF4SCF, 180 Mtr Frame

Impellers (41) will include; (⊗) Locking screw (48), washer (49), plug (50), key (16). See Page 25 for Kit Part numbers.

Ref. No.	Qty		Name	100 Frame	132 Frame	180 Frame
1	1		Motor housing	PF41054330	PF41154230	PF42010401
2	1		Intermediate	PF41054001	PF41154001	PF42010101
3	1		Bearing bracket	PF41054011	PF41154010	PF42010201
4	1		Bearing cap			
5	1		Junction box cover	PF41044150	PF43134150	PF42010501
6	1		Rotor			
7	1		Stator			
8	1		Snap ring	80 dia - PF01350080	---	
9	1	♠	Upper shaft seal	35 dia	50 dia - #01570065	50 dia - #01570065
10	1	♠	Lower shaft seal	35 dia	45 dia - #01570032	45 dia - #01570032
11	1	◇	Lower bearing			
12	1	◇	Upper bearing			
15	1		Snap ring	40 dia	55 dia	65 dia
16	1	⊗	Key	01340236 (8x7x55)	8x7x55	10x8x75
17	2		Screw	CHc M10 x 40	CHc M12 x 55	CHc M6 x 100
18	2		Washer	W10	W12	
19	6		Screw	M6 x 20	M8 x 30	----
20	6		Washer	W6	W8	----
21	1	♠	O-ring	180 dia int x 5 thk	227.97 dia int. x 6.99 thk	291.47 dia int x 6.99 dia
23	1		Drain plug	PF0-1406052	PF0-1406052	PF0-1406052
25	1		Snap ring	35 dia - PF01350008	50 dia	50 dia
26	1		Screw	H M4 x 6	H M4 x 6	H M4 x 6
27	1		Washer	M 4 N	M 4 N	M 4 N
29	1		Power cable	PF0-1852301 11X4G1.5	PF0-1852322 4G6	PF0-1852341 4G10
30	1		Ground			
31	3		Wire connector			
32	2		Cable connector	PF0-1861304	PF0-1861720 N21M	PF0-186N29M
33	1		Wire connector			
34	1		Control cable	PF0-1852301 11X4G1.5	PF0-1852301 4G1.5	PF0-1852301

Description sizes in Metric

Acquire hardware locally.



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

Repair Parts

35	1		Cable connector	PF0-1861304	PF0-1461304 N13M	PF0-1860201 N13M
36	1		Moisture sensor probe	PF44054071	PF44054071	PF44054071
39	1		Lifting yoke			
40	1		Volute	SCC/175, SCD/195 SCE/230, SCF/265	SCE/230 SCF/265	SCF/265
41	1	⊗	Cutter Impeller	51270201		
42	1	†	Knife	51120102	51490102	
43	1		Adapter plate - Motor/volute	SCE, SCF	SCE, SCF	SCF
44	1	†	Knife blade	51270103	51480103	
45	9	†	Screw - CHc M10 x 40	22324010		
46	2	†	Washer - M 10N	22112010		
47	7		Washer	W10	W10	W10
48	1	⊗	Screw - Class 12.9	23324508 (M8 x 45)	M8 x 45	M10 x 50
49	1	⊗	Washer	22122508 (W8)	W8	W10
50	1	⊗	Plug	02470104		
51	2	†	Screw - CNc M6 x 30	22323006		
52	2	†	Washer - M 6 N	22111206		
53	4		Hex nut			
54	4		Washer			
55	4		Socket Head Screw			
56	1		Discharge flange	5000018	5000018	5000018
60	1	●	O-ring	None	64.77 dia int x 2.62 thk	215.27 dia int x 6.99 thk

Cutter Impeller - item 41				Impeller Kits ⊗
Pump Model	Motor Frame Size	Impeller Dia	Impeller Part No.	Part Number
PF4SCC4236, 4246	100	6.89	PF095487	PF095487-KT
PF4SCC4834, 4844	100	6.50	PF095487TA	PF095487TA-KT
PF4SCD4236, 4246 PF4SCD7134, 7144	100	7.68	PF095488	PF095488-KT
PF4SCD4834, 4844	100	7.09	PF095488TB	PF095488TB-KT
PF4SCE4236, 4246	100	8.27	PF095489TB	PF095489TB-KT
PF4SCE12934, 12944	132	7.87	PF095491TC	PF095491TC-KT
PF4SCE17734, 17744	132	9.06	PF095491	PF095491-KT
PF4SCF4236, 4246	100	9.25	PF095490TC	PF095490TC-KT
PF4SCF8936, 8946	132	10.43	PF095492	PF095492-KT
PF4SCF17734, 17744	132	9.25	PF095492TC	PF095492TC-KT
PF4SCF29734, 29744	180	10.43	PF095493	PF095493-KT

Recommended Moisture & Temperature Sensor Relays for control panel (or equal):

P/N: PF0861 - B/W 1500-D-L1-S90C rated for 25 volt amperes, 115 volt input, 500 volt output (one per pump).

P/N: PF0876 - Siemens 3TX7114-5DF13 (one per pump).

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Trouble Shooting Chart



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"> 1. Poor electrical connection, blown fuse, tripped breaker or other interruption of power; improper power supply 2. Motor or switch inoperative (go to manual operation) <ol style="list-style-type: none"> 2a. Float movement restricted 2b. Switch will not activate pump or is defective 2c. Defective motor 3. Insufficient liquid level 	<ol style="list-style-type: none"> 1. Check all electrical connections for security. Have electrician measure current in motor leads, if current is within $\pm 20\%$ 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. 2a. Reposition pump or clean basin as required to provide adequate clearance for float 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)
Pump will not turn off	<ol style="list-style-type: none"> 2a. Float movement restricted 2b. Switch will not activate pump or is defective 4. Excessive inflow or pump not properly sized for application 9. Pump may be air locked causing pump not to flow 14. H-O-A switch on panel is in "HAND" position 	<ol style="list-style-type: none"> 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. 3. Make sure liquid level is above the pump 4. Re-check all sizing calculations to determine proper pump size.
Pump hums but doesn't run	<ol style="list-style-type: none"> 1. Incorrect low voltage 8. Impeller jammed or loose on shaft, or inlet plugged 	<ol style="list-style-type: none"> 5. Check discharge line for restrictions, including ice if line passes through or into cold areas. 6. Remove and examine check valve for proper installation and freedom of operation 7. Open valve 8. Check impeller for freedom of operation, security and condition. Clean impeller cavity and inlet of any obstruction
Pump delivers insufficient capacity	<ol style="list-style-type: none"> 1. Incorrect low voltage 4. Excessive inflow or pump not properly sized for application 5. Discharge restricted 6. Check valve partially closed or installed backwards 7. Shut-off valve closed 8. Impeller jammed or loose on shaft, or inlet plugged 9. Pump may be air locked causing pump not to flow 10. Pump running backwards 	<ol style="list-style-type: none"> 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 10. Check rotation. If power supply is three phase, reverse any two of three power supply leads to ensure proper impeller rotation 11. Repair fixtures as required to eliminate leakage 12. Check pump temperature limits and fluid temperature 13. Replace portion of discharge pipe with flexible connector or tighten existing piping.
Pump cycles too frequently or runs periodically when fixtures are not in use	<ol style="list-style-type: none"> 6. Check valve partially closed or installed backwards 11. Fixtures are leaking 15. Ground water entering basin 	<ol style="list-style-type: none"> 14. Turn to automatic position 15. Check for leaks around basin inlet and outlets
Pump shuts off and turns on independent of switch, (trips thermal overload protector). CAUTION! Pump may start unexpectedly. Disconnect power supply.	<ol style="list-style-type: none"> 1. Incorrect low voltage 4. Excessive inflow or pump not properly sized for application 8. Impeller jammed or loose on shaft, or inlet plugged 12. Excessive water temperature (internal protection only) 	
Pump operates noisily or vibrates excessively	<ol style="list-style-type: none"> 2c. Worn bearings, motor shaft bent 5. Debris in impeller cavity or broken impeller 10. Pump running backwards 13. Piping attachments to building structure too loose or rigid 	

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



LIMITED WARRANTY

Manufacturer warrants, to the immediate purchaser and subsequent initial owner during the warranty period, every new pump to be free from defects in material and workmanship under normal use and service, when properly used and maintained, for a period of eighteen (18) months from date of manufacture or twelve (12) months from date of installation (which ever comes first). Failure due to wear due to excessive abrasives is not covered. The initial owner is the purchaser who first uses the pump after its initial installation, or for non-permanent installation, the first owner who uses the pump. The date of installation shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump. Product will be repaired, replaced or remanufactured at Manufacturer's option. No allowance will be made for shipping charges, damages, labor or other charges that may occur due to product failure, repair or replacement. This warranty does not apply to and there shall be no warranty for any material or product that has been disassembled without prior approval of Manufacturer, subjected to misuse, misapplication, neglect, alteration, accident or act of God; that has not been installed, operated or maintained in accordance with Manufacturer's installation instructions; that has been exposed to outside substances including but not limited to the following: sand, gravel, cement, mud, tar, hydrocarbons, hydrocarbon derivatives (oil, gasoline, solvents, etc.), or other abrasive or corrosive substances, wash towels or feminine sanitary products, etc. in all pumping applications. The warranty set out in the paragraph above is in lieu of all other warranties expressed or implied; and we do not authorize any representative or other person to assume for us any other liability in connection with our products. Contact Manufacturer at: 1-877-24PUMPS or www.powerflo pumps.com, Attention: Customer Service Department, to obtain any needed repair or replacement of part(s) or additional information pertaining to our warranty.

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