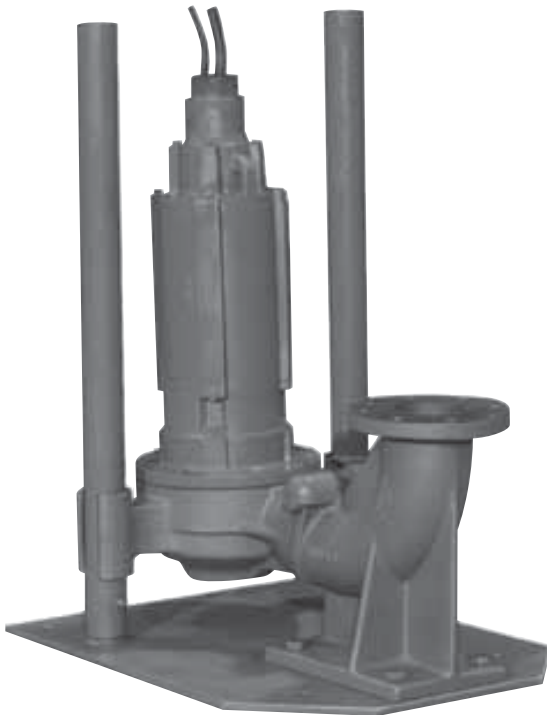


# DEMING<sup>®</sup>

## INSTALLATION, OPERATION & MAINTENANCE MANUAL Demersible Solids Handling Wet Pit Pumps With Guide Rails



Series: 7370  
Section 43

**IMPORTANT!**

***Read all instructions in this manual before operating pump.  
As a result of Crane Pumps & Systems, Inc., constant product improvement program,  
product changes may occur. As such Crane Pumps & Systems reserves the right to  
change product without prior written notification.***

**CRANE**<sup>®</sup>

A Crane Co. Company

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Form No. 120031-Rev. E

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# SAFETY FIRST!

Please Read This Before Installing Or Operating Pump.  
This information is provided for **SAFETY and to PREVENT EQUIPMENT PROBLEMS**. To help recognize this information, observe the following symbols:



**IMPORTANT!** Warns about hazards that can result in personal injury or Indicates factors concerned with assembly, installation, operation, or maintenance which could result in damage to the machine or equipment if ignored.

**CAUTION !** Warns about hazards that can or will cause minor personal injury or property damage if ignored. Used with symbols below.

**WARNING !** Warns about hazards that can or will cause serious personal injury, death, or major property damage if ignored. Used with symbols below.



Hazardous fluids can cause fire or explosions, burns or death could result.



Extremely hot - Severe burnes can occur on contact.



Biohazard can cause serious personal injury.



Hazardous fluids can Hazardous pressure, eruptions or explosions could cause personal injury or property damage.



Rotating machinery Amputation or severe laceration can result.



Hazardous voltage can shock, burn or cause death.

Only qualified personnel should install, operate and repair pump. Any wiring of pumps should be performed by a qualified electrician.



**WARNING !** - To reduce risk of electrical shock, pumps and control panels must be properly grounded in accordance with the National Electric Code (NEC) or the Canadian Electrical Code (CEC) and all applicable state, province, local codes and ordinances.



**WARNING!** - To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Lock out power and tag.



**WARNING!** Operation against a closed discharge valve will cause premature bearing and seal failure on any pump, and on end suction and self priming pump the heat build

may cause the generation of steam with resulting dangerous pressures. It is recommended that a high case temperature switch or pressure relief valve be installed on the pump body.



**CAUTION !** Never operate a pump with a plug-in type power cord without a ground fault circuit interrupter.



**CAUTION!** Pumps build up heat and pressure during operation-allow time for pumps to cool before handling or servicing.



**WARNING!** - **DO NOT** pump hazardous materials (flammable, caustic, etc.) unless the pump is specifically designed and designated to handle them.



Do not block or restrict discharge hose, as discharge hose may whip under pressure.



**WARNING!** - **DO NOT** wear loose clothing that may become entangled in the impeller or other moving parts.



**WARNING!** - Keep clear of suction and discharge openings. **DO NOT** insert fingers in pump with power connected.



Always wear eye protection when working on pumps.



Make sure lifting handles are securely fastened each time before lifting. **DO NOT** operate pump without safety devices in place. Always replace safety devices that have been removed during service or repair. Secure the pump in its operating position so it can not tip over, fall or slide.



**DO NOT** exceed manufacturers recommendation for maximum performance, as this could cause the motor to overheat.

**DO NOT** remove cord and strain relief. Do not connect conduit to pump.



**WARNING!** Cable should be protected at all times to avoid punctures, cut, bruises and abrasions - inspect frequently. Never handle connected power cords with wet hands.



**WARNING!** To reduce risk of electrical shock, all wiring and junction connections should be made per the NEC or CEC and applicable state or province and local codes. Requirements may vary depending on usage and location.

**WARNING!** 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.



**WARNING!** Products Returned Must Be Cleaned, Sanitized, Or Decontaminated As Necessary Prior To Shipment, To Insure That Employees Will Not Be Exposed To Health Hazards In Handling Said Material. All Applicable Laws And Regulations Shall Apply.

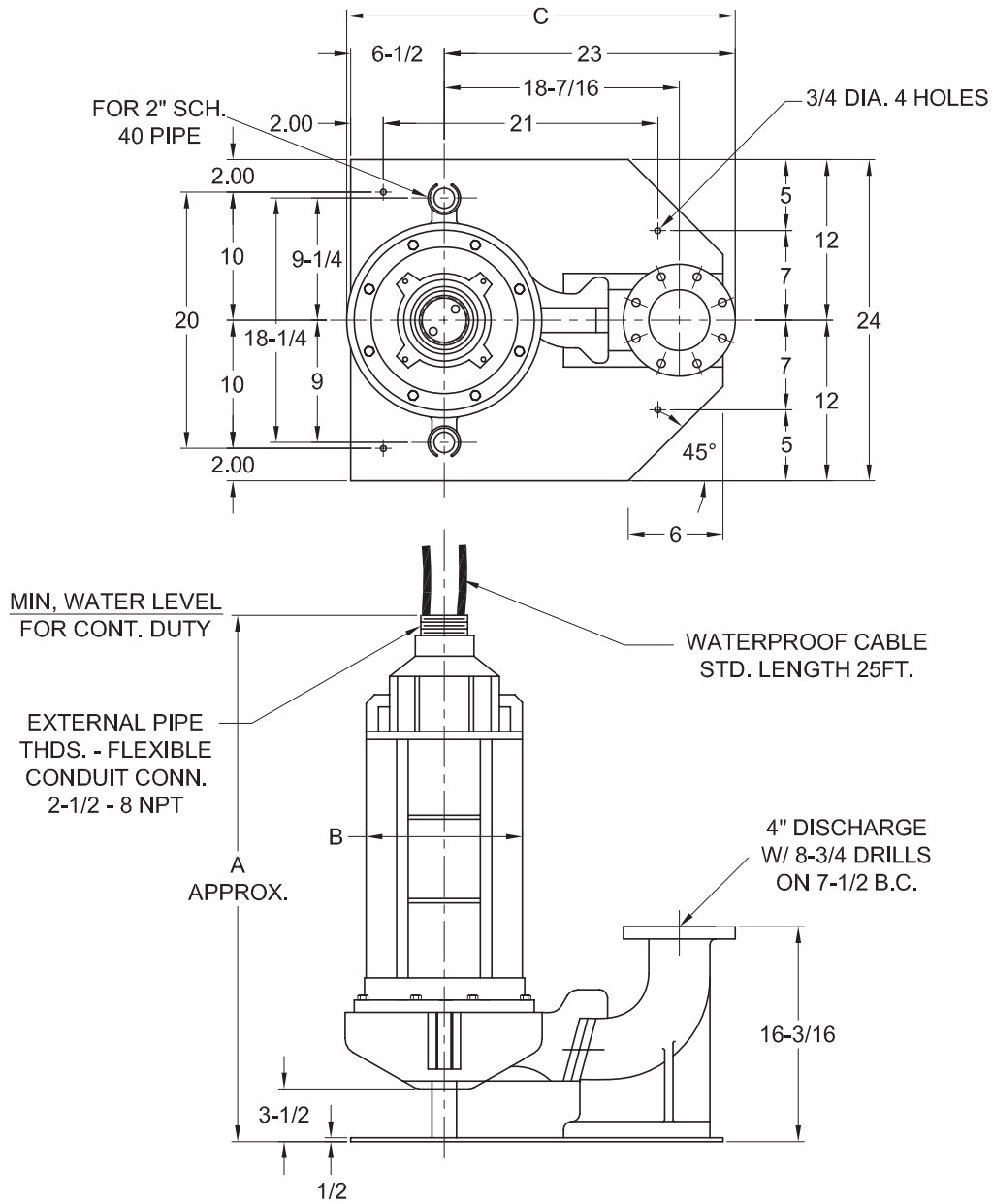


Bronze/brass and bronze/brass fitted pumps may contain lead levels higher than considered safe for potable water systems. Lead is known to cause cancer and birth defects or other reproductive harm. Various government agencies have determined that leaded copper alloys should not be used in potable water applications. For non-leaded copper alloy materials of construction, please contact factory.



**IMPORTANT!** - Crane Pumps & Systems, 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.

**Fig. 7370 Pumps with Tandem-Seal Submersible Motors  
for GUIDE RAIL SYSTEMS**



MAX. SPHERES	PUMP SIZE	CODE	MOTOR FRAME	DIMENSIONS IN INCHES		
				A	B	C
3"	4 x 8 x 3	433 435	EB180TY	34.63	9.63	29.50
	4 x 9.5 x 3	437	EB180TY	34.88	9.63	30
	4 x 10 x 3	438	EB210TY	39.88	11.50	30.63

SUBMERSIBLE MOTOR FRAMES				
HP	THREE PHASE		SINGLE PHASE	
	1750RPM	1150RPM	1750RPM	1150RPM
.75		EB180TY		EB180TY
1	EB180TY	EB180TY	EB180TY	EB180TY
1.5	EB180TY	EB180TY	EB180TY	EB180TY
2	EB180TY	EB180TY	EB180TY	EB210TY
3	EB180TY	EB180TY	EB180TY	EB210TY
5	EB180TY	EB180TY	EB210TY	
7.5	EB180TY	EB210TY		
10	EB210TY	EB210TY		
15	EB210TY			
20	EB210TY			

## GENERAL INFORMATION

### TO THE PURCHASER

Congratulations! You are the owner of one of the finest pumps on the market today. These pumps are products engineered and manufactured of high quality components. With years of pump building experience along with a continuing quality assurance program combine to produce a pump which will stand up to the toughest applications.

Check local codes and requirements before installation. Servicing should be performed by knowledgeable pump service contractors or authorized service stations.

### APPLICATION

This pump is designed for pumping raw or treated sewage, light sludge, slurries, industrial wastes and similar liquids containing solids. They are for use with the Demersible Guide Rail System which is installed in a pit or sump having firm, level floor. The pump must operate in a vertical position as shown and must be fully submerged in the liquid at all times.

### RECEIVING

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 crating, do not lose or misplace. The main items to look for are: (a) damaged crate; (b) broken or cracked motor castings, pump casing, support feet, and flanges; (c) oil leakage from base of motor or bottom of pump; (d) injury to the power cables; (e) missing items from the shipment.

### STORAGE

**Short Term** - Pumps are manufactured for efficient performance following long inoperative periods in storage. For best results, pumps can be retained in storage, as factory assembled, in a dry atmosphere with constant temperatures for up to six (6) months.

**Long Term** - Any length of time exceeding six (6) months, but not more than twenty four (24) months. The units should be stored in a temperature controlled area, a roofed over walled enclosure that provides protection from the elements (rain, snow, wind blown dust, etc.), and whose temperature can be maintained between +40 deg. F and +120 deg. F. Pump should be stored in its original shipping container and before initial start up, rotate impeller by hand to assure seal and impeller rotate freely.

### SERVICE CENTERS

For the location of the nearest Deming Service Center, check your Deming representative or Crane Pumps & Systems Service Department in Piqua, Ohio, telephone (937) 778-8947 or Crane Pumps & Systems Canada, Inc., Bramton, Ontario, (905) 457-6223.

### POWER SUPPLY

The power supply voltage, phase, and hertz must match those (within the range stated below) stamped on the motor nameplate. For three-phase motors, the only connection of the motor power lead cable is to the power supply. For single phase motors, the motor power lead cable and power supply must be properly connected at the control box.

Motors will operate successfully with a frequency variation of not more than 5 percent and at a voltage not more than 10 percent above or below the nameplate rating. Performance within this range will not necessarily be the same as the established performance at the correct rated voltage and frequency.

### EQUIPMENT

Three phase units consist of the following:

- A. Pumping unit(s) including motor with 30' of water-proof power and control cables and pump lift handle.
- B. Discharge elbow(s) with base and 4", Class 125 discharge flange.
- C. Moisture sensing relay(s)
- D. Heavy steel plate(s) with lower guide rail anchors
- E. Lift chain and split link (for each pump) with door and frame fitting assembly
- F. Fabricated steel access frame (simplex or duplex)
- G. Other auxiliary equipment as ordered, see Packing List

Single phase units consist of the items listed above, plus motor control (capacitor) box.

The pump and motor have been assembled and adjusted at the factory prior to shipment. The motor seal chamber has been filled with proper type and grade of oil and no further adjustment, venting or lubrication is required prior to the installation and start-up.

### MOTORS

A. Motors are Class I, Group D explosion-proof construction and rated for continuous duty while completely submerged in liquid or for 15 minutes in air. Excessive number of starts may cause overheating. Motors should not be started more than three times per minute with full submerged cooling.

B. Motors are factory connected, inside the sealed motorcap, for the voltage shown on the nameplate. Three-phase motors are dual voltage - 230/460 volts - and are normally wired for 230 volts unless specified for 460 volts. If it is necessary to operate on the alternate voltage, leads inside the sealed cap or conduit box may be reconnected. Single-phase motors are 115/230 volt and are connected for 230 volt when shipped. Five horsepower motors are available in 230 volt only. Always check the voltage of the power supply against final nameplate connection voltage before starting the pump.

C. Built in thermal protection switches are provided in all motors to protect the motor windings against excessive temperatures due to insufficient cooling or overload. To be operative, the two thermal protection leads, P1 and P2, must be connected to the magnetic starter control circuit, as shown on the wiring diagrams. Thermal switch resets automatically when the motor has cooled.

**Caution! Do not connect these leads in the power supply circuit carrying current to the main motor terminals. The thermal switches are not designed for breaking the main power supply.**

D. Motors are equipped with two moisture sensing probes to detect any leakage of water between the outer and inner seals at the base of the motor and warn of impending motor trouble. The moisture sensing relay, furnished with the pump, will indicate the presence of water in the oil chamber. Leads from the sensors are W1 and W2. See wiring diagram for proper connection. See Figure 5.

E. The motor lead cable are brought through an epoxy sealed connector at the top of the motor providing a mechanically strong, water-tight seal. If it is necessary to remove the casting at the top of the motor, when replacing it, care must be taken not to damage the O-ring seal. Replace any damaged or nicked O-rings when re-assembling the motorcap.

#### DIRECTION OF ROTATION

Pumps must rotate in a counter-clockwise direction when viewed from the suction (the bottom) opening. Rotation must be checked before final installation to be sure of the pump rotating in the proper direction.

To check rotation, place pump in a position so that the impeller can be viewed through the suction opening. Connect motor leads to the motor control terminals and jog starter momentarily, checking for pump rotation.

A. Three-phase units — If rotation is incorrect, rotation may be reversed by interchanging any two main leads at the starter. When proper rotation is established, mark the cable leads for the correct starter terminals.

B. Single-phase motors — Factory wired internally for the proper direction of rotation, but should be verified as above before making installation. If it is necessary to reverse rotation, the proper connections must be made in the motor conduit box at the top of the motor. Refer to wiring diagram in the conduit box of the motor and in the control box furnished with single-phase units.

#### ACCESS FRAME ASSEMBLY

The access frame assembly, when ordered, is furnished with single door for simplex units or with double doors for duplex units and includes the items shown below for each type. See Figures 8 & 9 page 12 for dimensions and placement of accessories.

#### SIMPLEX UNIT

A. Access frame assembly with single door.

- B. Access frame fitting assembly including:
- 2- Upper guide rail brackets, 5½" x 3" (No.1)
  - 2 - 1/2" x 1½" capscrow, nut and washer to mount above
  - 2 - Upper guide rail inserts (2) with 7/16" nut and washer
  - 1- Sensor support bracket mounting lug (3)
  - 1- Cable holder and chain hook (4)
  - 4 - 5/16" x 3/4" capscrows, nuts and washers.
  - 2 - 1/4" x 1" capscrows and nuts.
- Galvanized steel lifting chain and split link.

#### DUPLEX UNIT

- A. Access frame assembly with double doors.
- B. Access frame fitting assembly, including:
- 2 - Upper guide rail brackets, 5½" x 3" (1) - Outside
  - 2 - Upper guide rail brackets, 2¼" x 3" (1A) - Center
  - 4 - 1/4" x 1½" capscrows, nuts and washers
  - 4 - Upper guide rail inserts (2) with 7/16" nut and washer
  - 1- Sensor support bracket mounting lug (3)
  - 1 - Cable holder and chain hook (4)
  - 8 - 5/16" x 3/4" capscrows, nuts and washers
  - 4 - 1/4" x 1" capscrows and nuts
- Galvanized steel lift chain and split link for each pump.

#### INSTALLATION

The following steps are the recommended procedure for making installation of the Guide Rail System. See Figures 8 & 9 on Page 12, Dimensions and Positions of the items mentioned above.

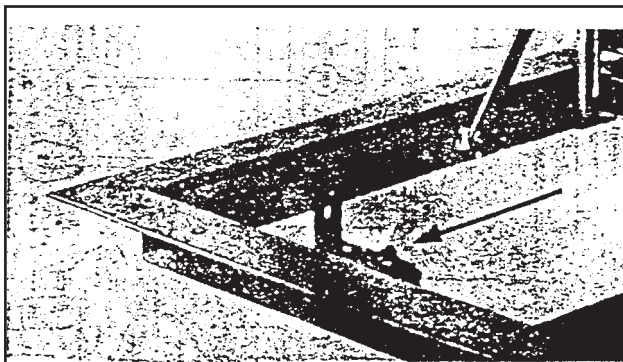


Figure 1

#### SIMPLEX UNITS

- A. Access Frame Fitting Assembly
1. Upper guide rail assembly - Assemble the two upper guide rail inserts (2) onto the two upper guide rail brackets (1), tighten nuts finger tight.
  2. Mount one upper guide rail assembly on each side of the access frame where slots are provided, as shown in Figure 1, using 1/2" and 1½" capscrows, nuts and washers furnished. Tighten nuts finger tight.
  3. Attach sensor support bracket mounting lug (3), also the cable holder and chain hook (4) to the access frame where nuts are welded to the frame, as shown in the drawings.
  4. Lower sole plate (296) and discharge elbow (295) into the sump.
  5. Place the assembled access frame assembly onto the sump or pit cover and securely fasten to cover in the final position.
- B. Sole Plate (296)
1. Drop a plumb line from the center of each upper guide rail insert, as previously mounted on the access frame assembly, so that the sole plate can be positioned on the sump floor.



2. Lay sole plate (296) on the sump floor and position so that the plumb weights are centered over each 1½" diameter lower guide rail anchor on the sole plate and with the tapered end of the sole plate toward the discharge pipe location.  
See Plan View Figure 7 on Pages 10 & 11.
3. Mark the position of the anchor bolt holes and install four 5/8" expansion bolts required to mount sole plate on the sump floor. Level the sole plate with shims and grout where necessary.
4. Remove the plumb lines.

#### C. Discharge Elbow (295)

1. Place the discharge elbow on the sole plate and temporarily fasten into position with the four 3/4" x 1¼" capscrews (104) provided. Tighten cap screws finger tight.

#### D. Guide Rails (298)

1. Guide rails are 2" galvanized pipe, plan end, two required per pump. Cut length of pipe approximately 5¼" shorter than the depth of the pump measured from the under side of the door of the access frame assembly.
2. Drill 7/16" diameter hole in one end of each pipe 2" from the end of the pipe. Place this end of the guide rail pipe vertically over the 1½" lower guide rail anchor on the sole plate. Align holes in the anchor and guide rail and insert the 3/8" x 2¾" stainless steel cap screws (302) furnished through pipes. Place hex nut (furnished) on the cap screws and tighten securely. Repeat above, installing the second guide rail.
3. Remove the pipe anchor and insert assemblies previously mounted on the access frame. Place insert disc into top end of guide rail pipe, then replace pipe anchor assemblies on access frame. Adjust the position of the guide rails so that the rails are 18¼" apart on center and are vertically plumb. Then secure all nuts.

#### DUPLEX UNITS

Installation is the same as above, except it must be repeated for both pumps. The two guide rail assemblies with pipe anchors 2¼" x 3" (1A), are to be mounted on each of the center supports on the slots provided. The other two anchors (1) are mounted on the outer supports of the access frame assembly. See Figure 9, Page 12.

#### INSTALLING THE PUMP

Pump lifting bail (299) is attached to motor when shipped. Attach one end of the split link (furnished) to the eye of the lifting bail and insert end link of the lifting chain into the opposite end of the split link and secure the link.

**CAUTION! Motor cables must be protected during installation. They may be temporarily secured to the lifting chain. Do not permit the cables to scrape on sharp edges or bend sharply, as this may damage the waterproof insulation.**

1. Lift pump over pit and place on guide rails with pump discharge in proper position to engage discharge elbow (295). Slowly lower pump into the sump until the yoke on the discharge flange engages connecting flange on the discharge elbow. See cross section drawing Figure 10 on Page 13. Verify proper engagement of yoke and seating of gasket (107), then tighten capscrews (104) in base of discharge elbow.
2. Raise and lower pump several times to verify guide rail spacing and that pump does not bind on rails, also that the discharge engagement is correct. Adjust elbow (295) or upper guide rail assemblies as needed.

#### PIPING

Assemble and connect metal or plastic discharge pipe to flange of discharge elbow. Note: Pipe and valves must be properly supported independent of the pump discharge elbow to prevent distortion of the pump-to-discharge elbow connection. A discharge check valve and gate valve, capable of passing solids, should be installed to prevent reverse flow on pump shutdown that can cause pump cycling. Brief reverse rotation is not damaging to the pump providing motor does not start while pump is turning in reverse rotation.

Raise and lower pump several times after piping is installed to check for proper engagement at the discharge elbow and for free movement of the pump on the guide rails. Adjust discharge elbow or upper guide rail bracket assembly as necessary. Straighten lift chain and attach the chain to the upper end of the cable holder and chain hook provided, attached to the access frame assembly. Carefully lift power and control cables and securely attach cables to the cable holder and chain hook (4).

#### THREE PHASE INSTALLATION

- A. Motor Control — An across-the-line magnetic starter, providing overload and low voltage protection for the motor, is required for installation with each pump. This is in addition to the built-in thermal protection provided in the motor. Each starter must include a Hand-Off-Auto selector switch and overload relays with proper size heater elements for size of motor and voltage at pump site. Required starters may be obtained from Crane Pumps & Systems.
- B. Motor—Refer to motor description and cable identification on Page 4. Connect the leads of power cable to the power terminals of the starter and the ground wire to ground. Connect the two leads marked P1 and P2 of the control cable to the CONTROL CIRCUIT of the starter. See wiring diagrams, Figures 2 & 3, for simplex or duplex installations.
- C. Liquid Level Control System — See Page 8.
- D. See Starting, page 9.

### WIRING DIAGRAM — SIMPLEX 3 PHASE

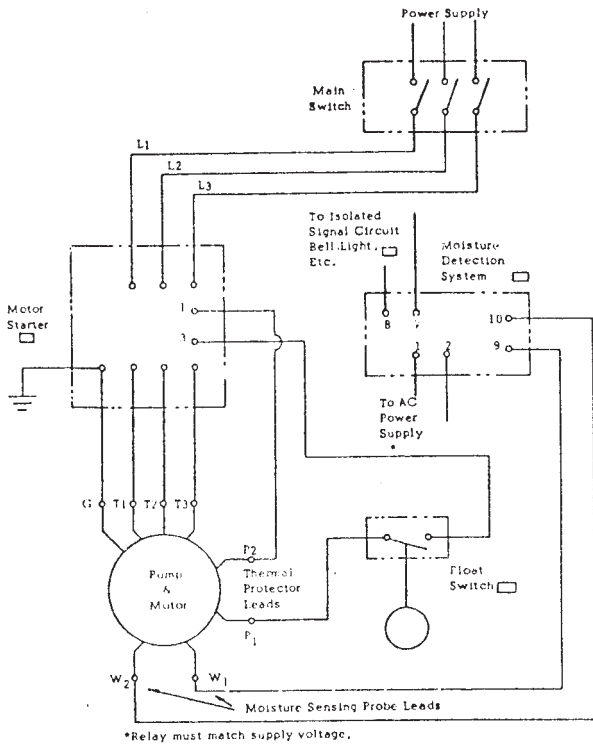


Figure 2

### WIRING DIAGRAM — DUPLEX 3 PHASE

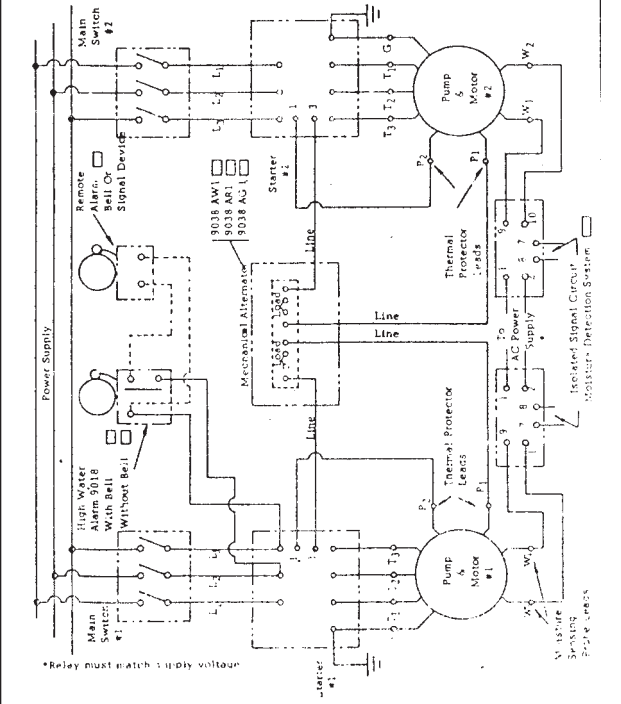


Figure 3

### SINGLE PHASE INSTALLATION

A. **Motor Control** — A motor control (capacitor) box is furnished with single phase pumps, and should be mounted in a convenient location.

- 1) An across-the-line magnetic starter, as described above, is required to provide overload protection for the motor.

B. **Motor** — Refer to motor description and cable identification on Page 4. Connect the three power leads of the power cable to the motor control box and the ground wire to ground. install and connect power leads from the motor control box to the starter.

- 1) Connect the two leads marked P1 and P2 of the control cable to the CONTROL CIRCUIT of the starter. See Wiring diagrams Figures 4 & 5.

C. Liquid Level Control System, see Page 8.

D. See Starting, Page 9.

### WIRING DIAGRAM — SIMPLEX 230 VOLT — SINGLE PHASE

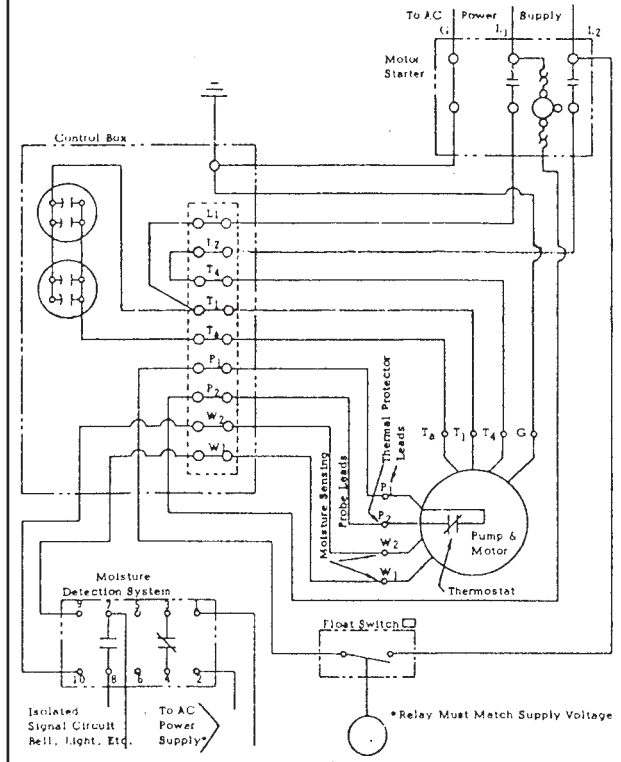
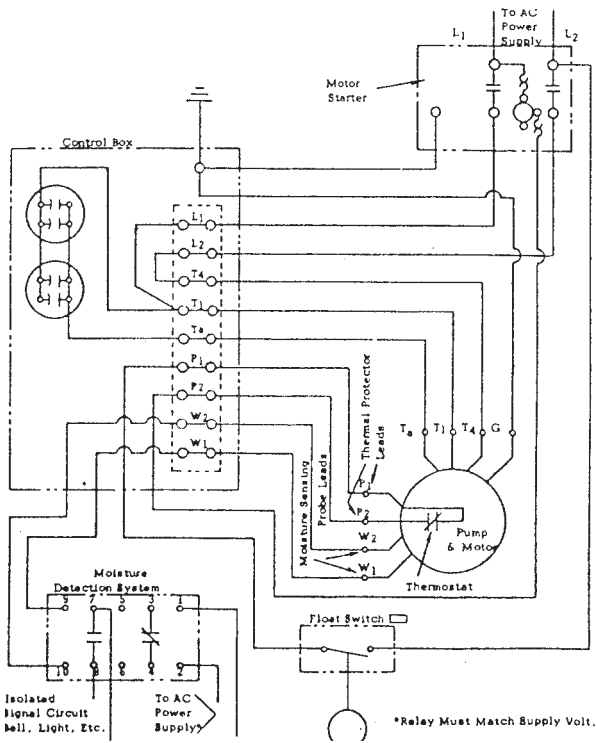


Figure 4



**WIRING DIAGRAM — SIMPLEX  
115 VOLT SINGLE PHASE**



**Figure 5**

**MOISTURE SENSING RELAY**

Moisture sensing relay is a conductance actuated control for detecting moisture in the oil chamber of a submersible motor. It is used as a warning device to indicate a seal leakage and to signal the need for preventive maintenance.

Mount the control box vertically on a wall or other solid structure and complete all indicated wiring as shown in Figure 6, wiring diagram. Terminals on the control are numbered, as shown Terminal Pair 1 and 2 must be continuously energized from an AC supply line of the correct voltage as shown on the control data plate. Contacts 5 and 6 or 7 and 8 are available for connecting audible alarm or light if required and must be wired in series with such device; and that series branch circuit connected across the power source compatible with the load. Terminals 9 and 10 are connected to the moisture sensing probe in the motors marked W1 and W2 by means of the cable provided with the motor. See Figure 6.

**OPERATION**

Normally the oil surrounding the probes is non-conductive and the control and seal leakage indicator light will be de-energized. An influx of moisture past the outer seal and into the oil reservoir will change the conductivity of the oil and this condition will cause the relay to energize and the seal leakage light and/or alarm will energize to indicate a seal leakage. Load contacts 5 and 6 or 7 and 8 will also change from their normally open position to a closed position when the control energizes.

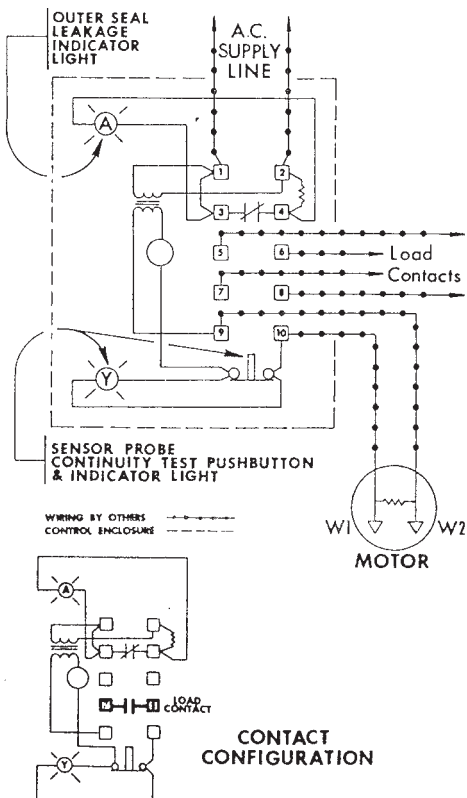
**TEST PROCEDURES**

A normally closed push-button and neon indicating light are provided as a part of the control for testing the moisture sensing components. The motor manufacturer has provided a resistor across the probes inside the motor to complete the test. When the test button is depressed the neon indicating lamp and alarm if installed will be activated to indicate:

- A) Power is supplied to the control;
- B) Control is operative;
- C) The wiring to the moisture sensing probe in the motor is intact.

This check does not stimulate a seal leakage, but indicates that the circuit is operative should a leak occur.

**Caution: The voltage will be present at all terminals on the control when this test is being made.**



**Figure 6**

**LIQUID LEVEL CONTROL SYSTEM**

A liquid level control system, to automatically start and stop the pump(s), such as float switch, mercury switches, or electrode probes with proper relay must be installed with the pump. The actuating switch for such controls is connected in the control circuit of the magnetic starter.

Liquid level controls must be adjusted to stop the motor if liquid level in the sump lowers to a point uncovering the motor. If sump is to be drained—that is, motor uncovered—some means, such as an automatic timing device, must be used to limit uncovered operation to 10 minutes with sufficient time allowed for cooling of the motor before restarting.

## STARTING

On the initial start-up, the motor and pump must be checked for proper rotation prior to final installation. See section on "Direction of Rotation". The motor should under no conditions be operated for any appreciable length of time unless submerged in the liquid as indicated above.

## OPERATION

After the pump is in position, discharge piping has been completed and all electrical connections made, the unit may be started as follows:

1. Adjust liquid level controls. Make certain that the controls will stop the pump when the liquid level reaches the level shown on the Dimension Print on Page 3. This minimum level is for continuous operation and results in the motor being completely submerged at all times.
2. Open discharge valve, if used.
3. Allow liquid to enter sump or pit.
4. Energize motor, either by automatic control device or manually.
5. Check liquid level operation as described in Step #1.

## GENERAL MAINTENANCE AND REPAIRS

### Pump Disassembly:

- A. Remove motor screw's (212) or (219).
- B. Remove the casing (1) from motor.
- C. Unscrew impeller screw (26) counterclockwise from motor shaft. It may be necessary to block the impeller to keep it from turning while removing this screw.
- D. Remove the impeller (2) and shim (294) from motor shaft.
- B. Inspect and clean all parts. Replace any defective parts.

### Reassembly:

- A. Clean motor shaft and bore of impeller hub with emery cloth. Apply a drop of Loctite #601 to motor shaft and spread on shaft.

Seat shim (294) and impeller (2) onto motor shaft. **DO NOT** drive impeller onto motor shaft as this action may damage motor seals. If fit of impeller onto shaft is tight, it may be necessary to heat the impeller in an oven to 200°F to 250°F before assembly.

- B. Replace impeller washer (24) and screw (26). Draw the impeller screw tight against the impeller washer. Block the impeller to keep it from turning. Replace gasket (73) on casing.
- C. Place motor on casing (1).
- D. Measure the clearance between casing (1) and impeller (2) at suction eye. Use a set of feeler gauges. If the clearance is more than .060, place shims on motor shaft behind impeller. Clearance should be between 0.13 and .060. If required, add or remove shims to obtain proper clearance (av. .030).

- E. Insert motor screws (212) and tighten down after proper impeller clearance has been established.

### Motor Repair:

Should it become necessary to replace seals or bearings or make repairs to the motor, please contact the nearest office of Reliance Electric Company for address of Authorized Service Station in your area. See Motor Warranty.

### Motor Warranty:

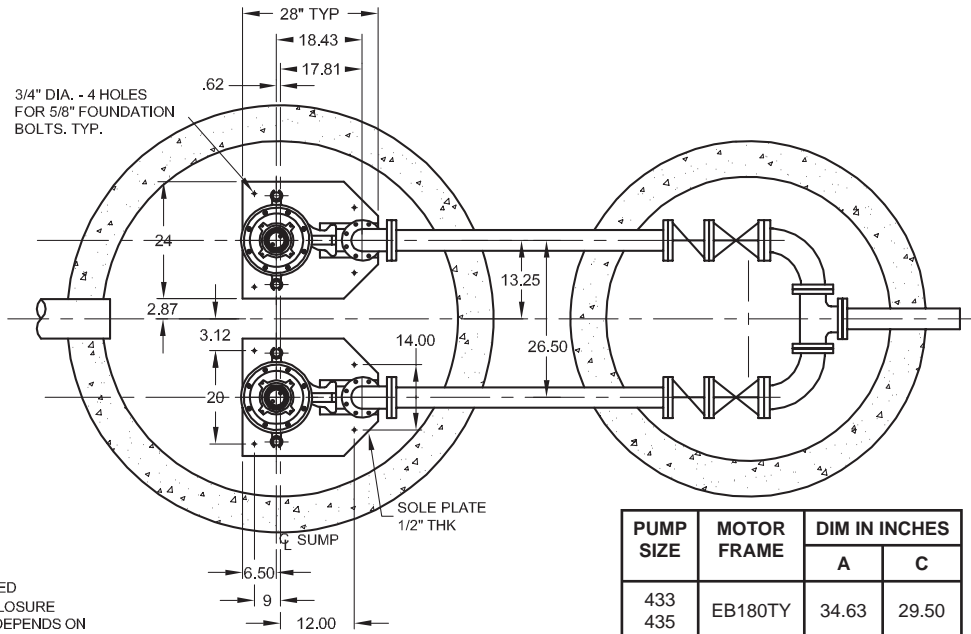
The submersible type motor, furnished with this pump, is warranted for a period of one year from date of installation or 18 months from the date code on the motor, whichever occurs first.

The above warranty is in effect provided the Moisture Detection Relays and Thermal Protection System are properly connected and operable. Failure to utilize the Moisture Detection System may void the warranty.

## LOCATING TROUBLE

1. No Water Delivered.
  - a. Discharge head too high.
  - b. Impeller completely plugged.
  - c. Wrong direction of rotation.
2. Not Enough Water Delivered.
  - a. Impeller partially plugged.
  - b. Wrong direction of rotation.
  - c. Mechanical defects.
    1. Impeller or casing worn or damaged.
    2. Improper impeller adjustment.
  - d. Impeller diameter too small.
3. Not Enough Pressure.
  - a. Discharge head lower than expected.
    1. Impeller or casing worn.
    2. Improper impeller adjustment.
  - b. Air in water.
  - c. Mechanical defects.
  - d. Impeller diameter too small.
  - e. Wrong direction of rotation.
4. Pump takes too much Power.
  - a. Head lower than rating.
  - b. Liquid either viscous or heavier than water or both.
  - c. Impeller binds in casing.

# PLAN VIEW - TYPICAL DUPLEX INSTALLATION



WHEN SPECIFIED  
CONTROL ENCLOSURE  
ACTUAL SIZE DEPENDS ON  
TYPE OF CONTROLS SPECIFIED

DOOR SHOWN  
OPEN

PUMP SIZE	MOTOR FRAME	DIM IN INCHES	
		A	C
433	EB180TY	34.63	29.50
435	EB210TY	40.38	
437	EB180TY	34.88	30.50
	EB210TY	41.38	
438	EB210TY	39.88	29.88

DIMENSIONS NOT FOR CONSTRUCTION PURPOSE.

DUPLEX GUIDE-RAIL SEWAGE PUMPING SYSTEM WITH  
DEMING DEMERSIBLE PUMPS HAVING  
QUICK-DISCONNECT PUMP DISCHARGE FLANGE.

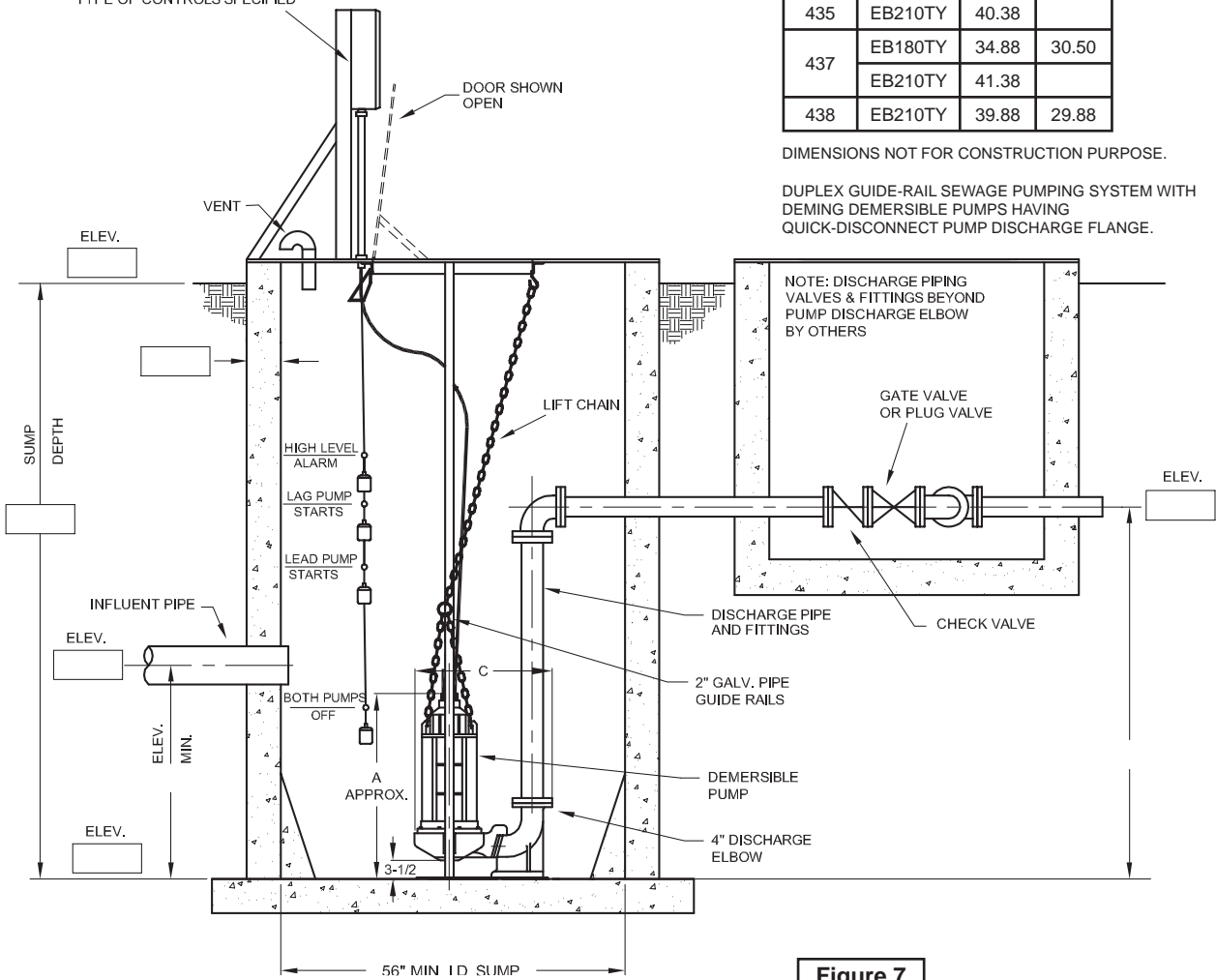


Figure 7

# PLAN VIEW - TYPICAL DUPLEX INSTALLATION

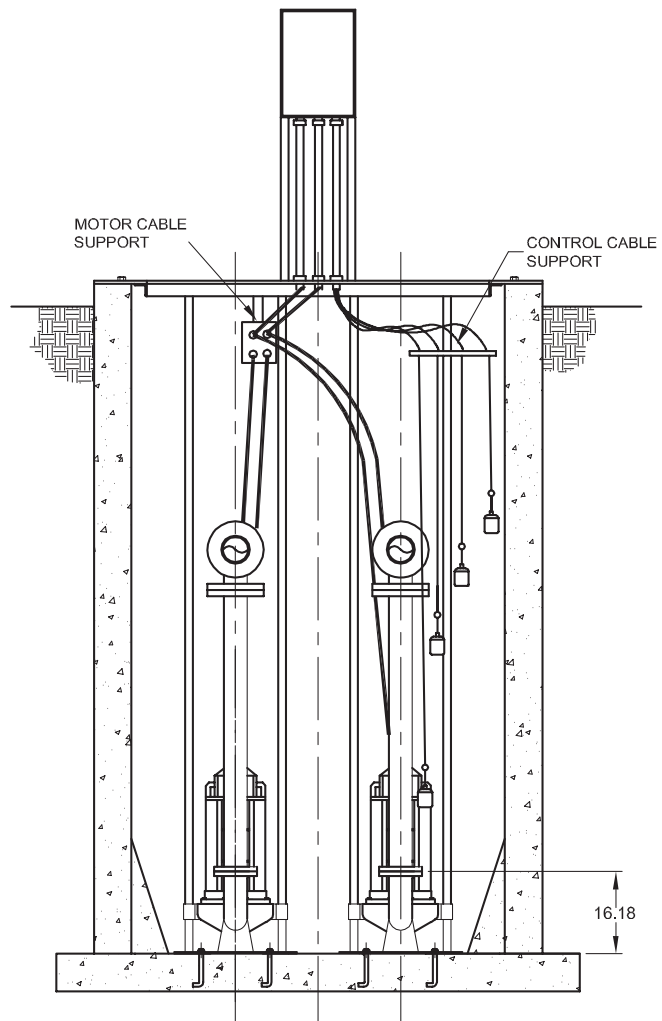
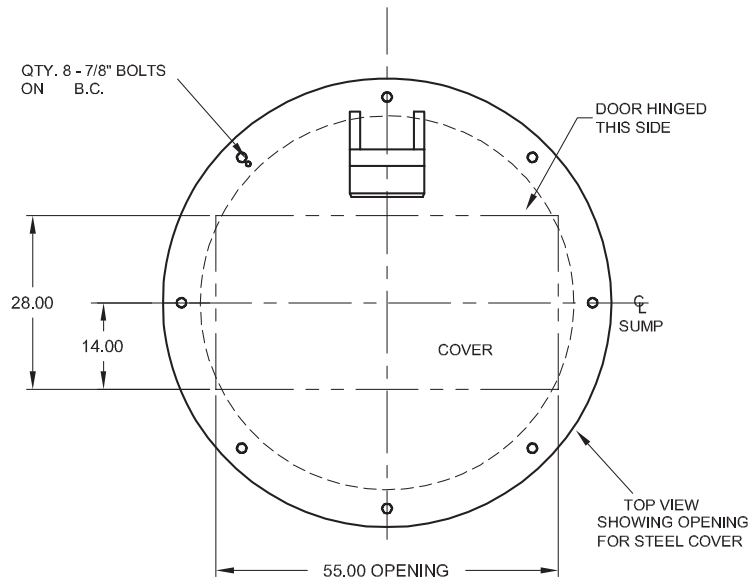
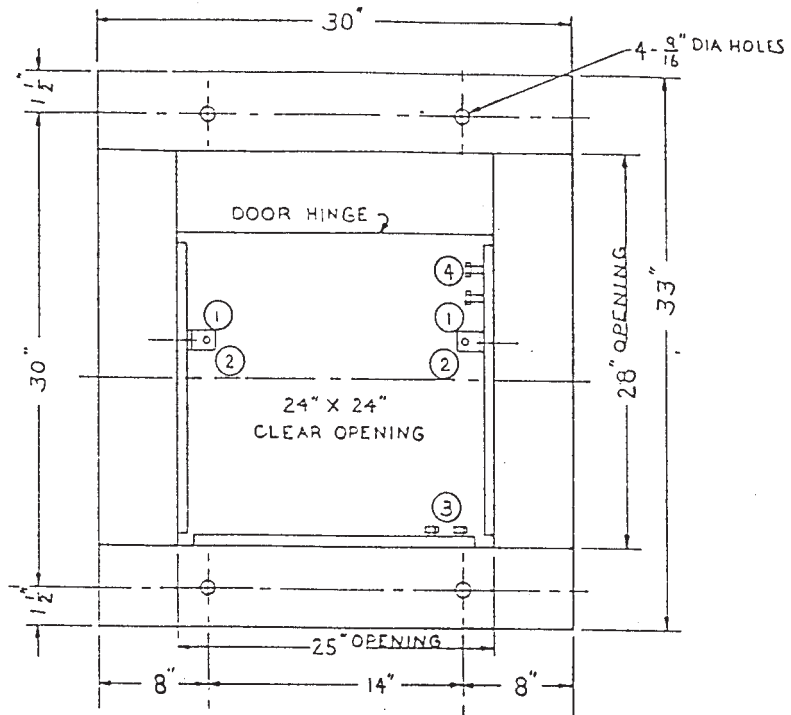
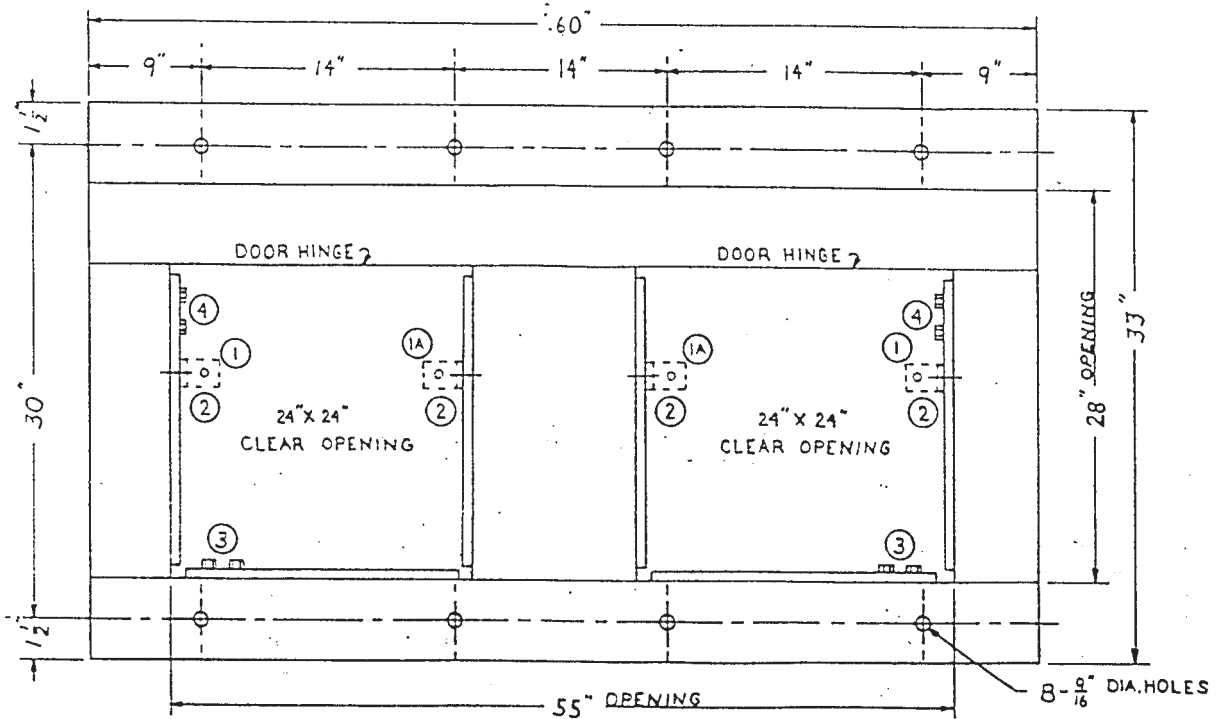


Figure 7

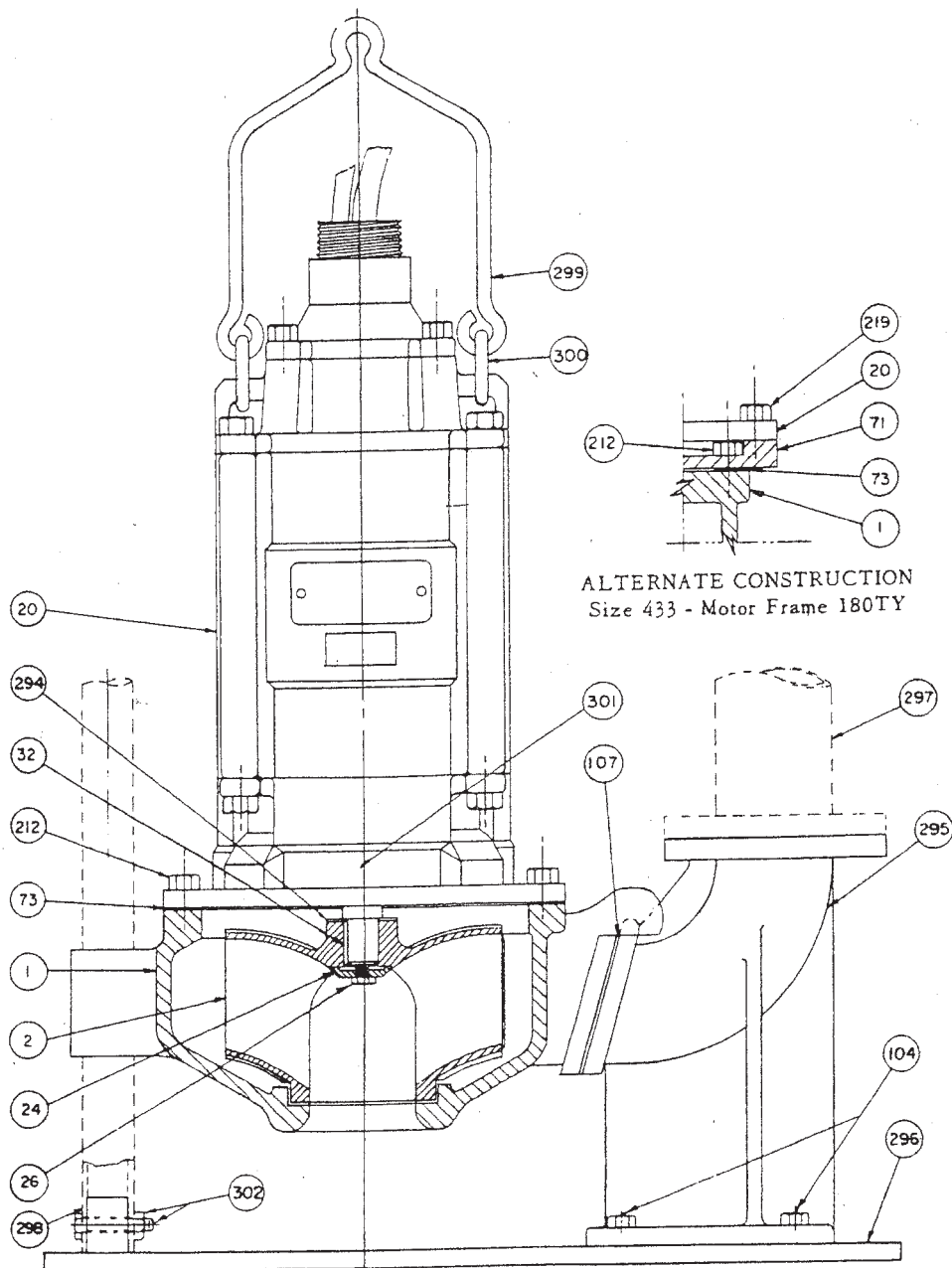
# DIMENSION AND POSITION OF ACCESS FRAME ASSEMBLY



**Figure 8**



**Figure 9**



**Figure 10**

ITEM No.	DESCRIPTION	MATERIAL
1	Casing	Cast Iron
2	Impeller	Cast Iron
20	Motor	Submersible w/Tandem Seal
24	Impeller Washer	Type 302 Stainless
26	Impeller Screw	Type 302 Stainless
32	Impeller Key	Type 410 Stainless
71	Motor Adapter	Cast Iron
73	Motor Gasket	Treated Fiber
104	Cap Screws	Steel
107	Discharge Gasket	Rubber
212	Capscrew or Stud	Steel

ITEM No.	DESCRIPTION	MATERIAL
219	Capscrew or Stud	Steel
294	Impeller Shim	Type 302 Stainless
295	Discharge Elbow	Cast Iron
296	Sole Plate	Steel
298	Guide Rails	Supplied By Others
299	Lift Handle	Steel
300	Shackle Connector	Steel
302	Cap Screw & Nut	302 Stainless
---	Motor Shaft	Stainless



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DEMING®

PROSSER®

## Limited 24 Month Warranty

Crane Pumps & Systems warrants that products of our manufacture will be free of defects in material and workmanship under normal use and service for twenty-four (24) months after manufacture date, when installed and maintained in accordance with our instructions. 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 factory 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, F.O.B. 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 us, 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. **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) excessive sand or other abrasive material (e) scale or corrosion build-up due to excessive chemical content. 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 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 TRAVEL EXPENSES, RENTED EQUIPMENT, OUTSIDE 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, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

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.



A Crane Co. Company

### PUMPS & SYSTEMS

420 Third Street  
Piqua, Ohio 45356  
Phone: (937) 778-8947  
Fax: (937) 773-7157  
www.cranepumps.com

83 West Drive, Brampton  
Ontario, Canada L6T 2J6  
Phone: (905) 457-6223  
Fax: (905) 457-2650

**IMPORTANT!  
WARRANTY REGISTRATION**

Your product is covered by the enclosed Warranty.  
To complete the Warranty Registration Form go to:

<http://www.cranepumps.com/ProductRegistration/>

If you have a claim under the provision of the warranty, contact your local  
Crane Pumps & Systems, Inc. Distributor.

**RETURNED GOODS**

**RETURN OF MERCHANDISE REQUIRES A "RETURNED GOODS AUTHORIZATION".  
CONTACT YOUR LOCAL CRANE PUMPS & SYSTEMS, INC. DISTRIBUTOR.**



**Products Returned Must Be Cleaned, Sanitized,  
Or Decontaminated As Necessary Prior To Shipment,  
To Insure That Employees Will Not Be Exposed To Health  
Hazards In Handling Said Material. All Applicable Laws  
And Regulations Shall Apply.**



**START-UP REPORT**

**General Information**

Pump Owner's Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Location of Installation: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_  
Purchased From: \_\_\_\_\_

**Nameplate Data**

Pump Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_  
Part #: \_\_\_\_\_ Impeller Diameter: \_\_\_\_\_  
Voltage: \_\_\_\_\_ Phase: \_\_\_\_\_ Ø Hertz: \_\_\_\_\_ Horsepower: \_\_\_\_\_  
Full Load Amps: \_\_\_\_\_ Service Factor Amps: \_\_\_\_\_  
Motor Manufacturer: \_\_\_\_\_

**Controls**

Control panel manufacturer: \_\_\_\_\_  
Model/Part number: \_\_\_\_\_  
Number of pumps operated by control panel: \_\_\_\_\_  
Short circuit protection? YES\_\_\_ NO\_\_\_ Type: \_\_\_\_\_  
Number and size of short circuit device(s): \_\_\_\_\_ Amp rating: \_\_\_\_\_  
Overload Type: \_\_\_\_\_ Size: \_\_\_\_\_ Amp rating: \_\_\_\_\_  
Do protection devices comply with pump and motor Amp rating? YES\_\_\_ NO\_\_\_  
Are all electrical and panel entry connections tight? YES\_\_\_ NO\_\_\_  
Is the interior of the panel dry? YES\_\_\_ NO\_\_\_  
Liquid level Control Brand and Model: \_\_\_\_\_

**Pre-Startup**

**All Pumps**

Type of equipment: NEW\_\_\_ REBUILT\_\_\_ USED\_\_\_  
Condition of equipment at Start-Up: DRY\_\_\_ WET\_\_\_ MUDDY\_\_\_  
Was Equipment Stored? YES\_\_\_ NO\_\_\_ Length of Storage: \_\_\_\_\_  
Liquid being pumped: \_\_\_\_\_ Liquid Temperature: \_\_\_\_\_  
Supply Voltage/Phase/Frequency matches nameplate? YES\_\_\_ NO\_\_\_  
Shaft turns freely? YES\_\_\_ NO\_\_\_  
Direction of rotation verified for 3Ø motors? YES\_\_\_ NO\_\_\_  
Debris in piping or wet well? YES\_\_\_ NO\_\_\_  
Debris removed in your presence? YES\_\_\_ NO\_\_\_  
Pump case/wet well filled with liquid before startup? YES\_\_\_ NO\_\_\_  
Is piping properly supported? YES\_\_\_ NO\_\_\_

**Non-Submersible Pumps**

Is base plate properly installed / grouted? YES\_\_\_ NO\_\_\_ N/A\_\_\_  
Coupling Alignment Verified per I&O Manual? YES\_\_\_ NO\_\_\_ N/A\_\_\_  
Grease Cup/Oil Reservoir Level checked? YES\_\_\_ NO\_\_\_ N/A\_\_\_

**Submersible Pumps**

Resistance of cable and pump motor (measured at pump control):

Red-Black: \_\_\_\_\_ Ohms(Ω) Red-White: \_\_\_\_\_ Ohms(Ω) White-Black: \_\_\_\_\_ Ohms(Ω)

Resistance of Ground Circuit between Control Panel and outside of pump: \_\_\_\_\_ Ohms(Ω)

MEG Ohms check of insulation:

Red to Ground: \_\_\_\_\_ White to Ground: \_\_\_\_\_ Black to Ground: \_\_\_\_\_

**Operational Checks**

Is there noise or vibration present? YES\_\_\_ NO\_\_\_ Source of noise/vibration: \_\_\_\_\_

Does check valve operate properly? YES\_\_\_ NO\_\_\_ N/A\_\_\_

Is system free of leaks? YES\_\_\_ NO\_\_\_ Leaks at: \_\_\_\_\_

Does system appear to operate at design flow rate? YES\_\_\_ NO\_\_\_

Nominal Voltage: \_\_\_\_\_ Phase: 1Ø 3Ø (select one)

Voltage Reading at panel connection, Pump OFF: L1, L2 \_\_\_\_\_ L2, L3 \_\_\_\_\_ L1, L3 \_\_\_\_\_

Voltage Reading at panel connection, Pump ON: L1, L2 \_\_\_\_\_ L2, L3 \_\_\_\_\_ L1, L3 \_\_\_\_\_

Amperage Draw, Pump ON: L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

**Submersible Pumps**

Are BAF and guide rails level / plumb? YES\_\_\_ NO\_\_\_

Is pump seated on discharge properly? YES\_\_\_ NO\_\_\_

Are level controls installed away from turbulence? YES\_\_\_ NO\_\_\_

Is level control operating properly? YES\_\_\_ NO\_\_\_

Is pump fully submerged during operation? YES\_\_\_ NO\_\_\_

**Follow up/Corrective Action Required**

YES\_\_\_ NO\_\_\_

**Additional Comments:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Startup performed by: \_\_\_\_\_ Date: \_\_\_\_\_

**Present at Start-Up**

( ) Engineer: \_\_\_\_\_ ( ) Operator: \_\_\_\_\_

( ) Contactor: \_\_\_\_\_ ( ) Other: \_\_\_\_\_

**All parties should retain a copy of this report for future trouble shooting/reference**



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