



**AURORA<sup>®</sup>**

# **VERTICAL WET PIT PUMP**

## **INSTRUCTION AND INSTALLATION MANUAL**

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

### CALIFORNIA PROPOSITION 65 WARNING:

**▲ WARNING** This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

**GENERAL.** The life of your Aurora Pump can be extended considerably by carefully following the installation instructions contained herein. Each step of the pump installation instructions plays a vital part in assuring long life, efficient operation and reduced maintenance, from the initial location of the pump through starting directions.

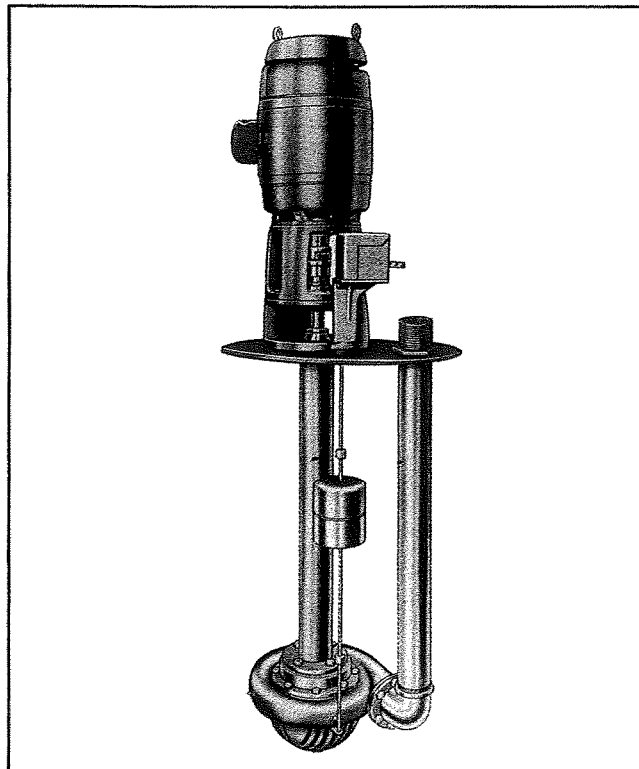


FIGURE 1. TYPICAL SUMP PUMP UNIT

**UNPACKING YOUR PUMP.** The crates containing your pump should be opened immediately upon receipt from the factory and the pump generally inspected for damage and shortage of parts. Look particularly for such damage as bent lengths of shafting, piping, damaged electrical components, and castings. Particular attention should be given to the discharge and suction nozzle threads or flanges. Any damage or shortage of parts should be reported to the carrier immediately.

**CLEANING.** If the pump is to be installed immediately, it will be necessary to clean the exposed metal parts thoroughly with white gasoline or other suitable solvent to remove the preservative coating, and to remove the protective covers from all openings. Cleaning of the pump should not be accomplished

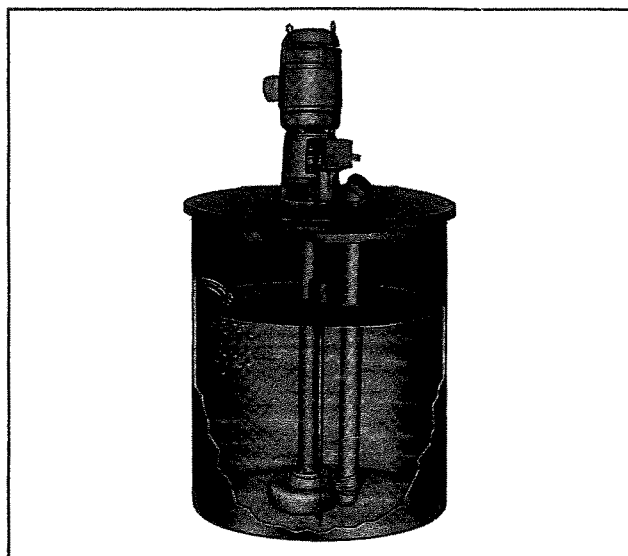


FIGURE 2. TYPICAL SEWAGE EJECTOR  
IN A BASIN

until the basin and the outlet connections are completed and ready for the pump.

**PLANNING THE PUMP LOCATION.** It is important to know that your pump has been manufactured to your specific application, therefore you know where the pump will be located, where the outlet piping will run, and other pertinent data. However, you may have overlooked a factor which may affect your pump's operation, installation, or efficiency.

A hoist capable of lifting the assembled pump should be available to lower the pump into the basin. This will require head room that is at least equal to the depth of the basin plus approximately 3 feet. Considerable time and labor can be saved by preassembling the pump. Also, although the pump can be installed in a flooded pit, it is desirable to empty the basin if at all possible.

Adequate provisions should be made for electrical wiring to the pump motor and other electrical accessories included with your pump. Overload protection should be provided in the pump circuit. Precautions should be taken when the pump is installed to preclude the possibility of moisture entering the conduit or the motor and causing short circuits and grounding.

On applications where an extremely long driveshaft is required, it is advisable to use tie rods or some other means of supporting the pump unit in the basin.

## VERTICAL WET PIT PUMP INSTALLATION

**OUTLET PIPING.** The outlet piping should be short and direct as possible with a minimum of elbows and fittings, to reduce head loss from friction. The outlet piping should be supported as close to the pump as possible, using either pipe hangers or supports. The outlet pipe diameter should be the same as or larger than the discharge pipe diameter. A flanged connection should be provided at the pump discharge pipe to simplify pump removal. An increaser if used, should be installed as close as possible to the discharge pipe. Straight taper increasers are satisfactory in discharge applications.

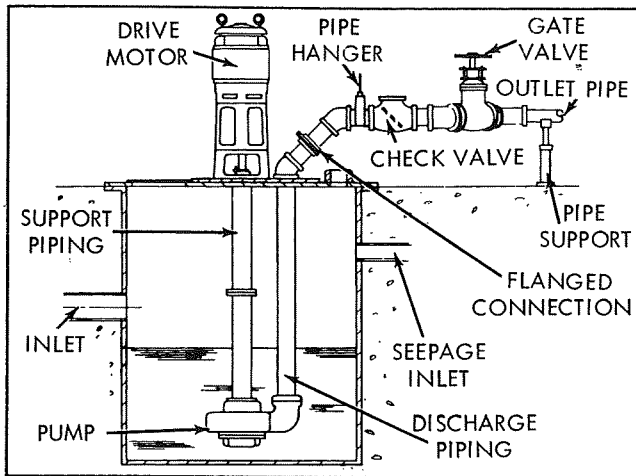


FIGURE 3. TYPICAL OUTLET PIPING

Piping should line up naturally when connected. Forcing pipes into line by using flange bolts can produce strain on the piping and on the shafting of the pump. Flange bolts when used, should be loosely installed, and the pipe alignment checked. When the alignment is satisfactory, tighten the flange bolts alternately until all are firmly secured.

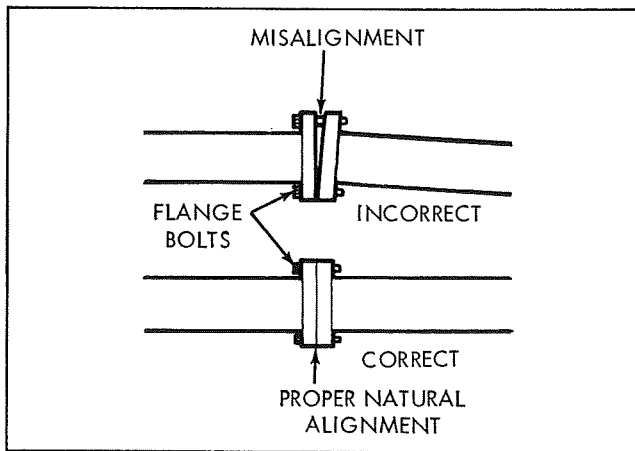


FIGURE 4. PIPE ALIGNMENT

The outlet piping should include a horizontal check valve and a gate valve. The check valve should be located between the gate valve and the pump discharge piping. The check valve protects against a reverse flow of the liquid if the driver fails. The

gate valve provides a means of throttling the pump's discharge. The gate valve should be nearly closed when starting the pump, because a centrifugal pump requires much less power with the gate valve closed than it does with the gate valve open. The gate valve also is closed when the pump is shut down for repairs or inspection.

**MOUNTING THE PUMP.** There are several methods of mounting vertical pumps to the foundations. The method of mounting that you choose will be based on your specific requirements.

**CURB RINGS AND SOLE PLATES.** In some applications, it may be desirable to use a curb ring for mounting your pump.

A curb ring can be either rectangular or circular. The curb ring should have sufficient clearance at the inside diameter to allow passage of all sections of the pump located below the support plate.

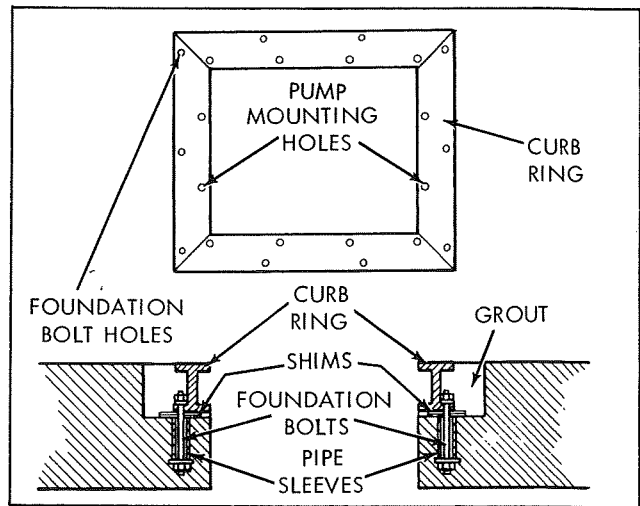


FIGURE 5. INSTALLATION OF RECTANGULAR CURB RING

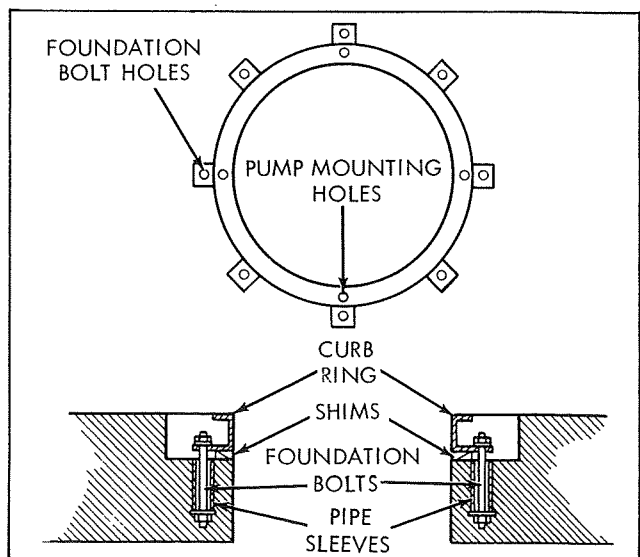


FIGURE 6. INSTALLATION OF CIRCULAR CURB RING

## VERTICAL WET PIT PUMP INSTALLATION

**FOUNDATION.** The foundation for your pump should be heavy enough to withstand any vibration or stress encountered during pump operation.

The mounting bolts or studs for the curb ring should be imbedded in concrete and accurately located per the applicable Aurora dimension sheet. Foundation bolts should be inclosed by a sleeve two to four diameters larger than the bolt to allow movement for proper alignment with the curb ring.

**LEVELING THE CURB RING.** The curb ring should be set in place and leveled with shims. The mounting face of the curb ring is machined to an even flat surface and can be easily leveled with a spirit level. When the curb ring is leveled the foundation bolts should be tightened, but not too firmly. Waste material should be stuffed into the sleeves around the foundation bolts, to prevent grout from filling the sleeves during grouting.

**GROUTING THE INSTALLATION.** Grouting the curb ring prevents lateral movement of the ring and improves the vibration absorbing characteristics of the foundation. A wooden dam should be constructed around the sole plate to contain the grout while it is being poured. When a curb ring is to be used above the floor line it is necessary to construct a dam around the outside diameter of the ring to contain the grout. The entire area around the outside diameter of a curb ring should be filled with a non-shrinkable grout. The grout should be puddled frequently to remove any air bubbles from it.

The leveling shims should be grouted in place. Allow time for the grout to set, usually from 42 to 72 hours after pouring, before proceeding with the installation. After the grout has set, the curb ring levelness should again be checked and the foundation bolts firmly tightened down.

**BASIN COVERS.** Basin covers may be set in concrete either with or without a curb ring or they may be bolted to the top flange of a cast iron or steel basin. The pump may be mounted directly to the basin cover on installations where the cover is not too large. On installations where the basin cover is large, the pump normally is mounted on an oval pump plate which permits removal of the pump from the basin without removing the entire basin cover.

**PREPARING TO INSTALL THE PUMP.** Your wet pit pump is usually shipped in more than one crate. The pump is shipped completely assembled along with accessory equipment such as float controls, motor controllers and high water alarms in one crate and the pump motor in another. An exception to this is when the length of the pump or the method of transportation makes it necessary to ship in more than two crates.

The pump and motor should be uncrated at this time. All wrapping materials should be checked for small parts that were shipped separately. Adequate support should be provided at intervals along the length of the pump as the crate is removed.

If your installation requires a basin cover, the cover should be lowered on to the basin properly orientated to the outlet connections and securely bolted in place.

**INSTALLING THE PUMP.** If the pump cannot be lowered into the basin as a complete unit, it is necessary to assemble it by stages. To do this, the liquid end assembly must first be lowered into the basin before the rest of the pump can be assembled. A rope sling should be secured about the pump casing and the liquid end assembly carefully lowered into the basin while guiding the lengths of support piping through the basin cover opening. The liquid end assembly should be lowered far enough to bring the top of the support pipe within a foot or so of the top of the base plate. Additional sections of piping and shafting should be assembled as follows:

a. Slide a line shaft bearing down the pump shaft with the tapped opening toward the upper end, until it seats against the flange of the first section of support piping.

b. Thread a shaft coupling onto the threaded end of one shaft until the shaft is visible through the small hole drilled through the middle of the coupling. Thread the next length of shafting into the coupling.

### NOTE

Do not use pipe wrenches on the shafting; it is not necessary to firmly tighten the shafts in their couplings because the torque of the pump motor will tighten them during operations.

c. If the line shaft bearing is to be lubricated through a oil or grease line, locate the bearing as required to align the tapped opening with the lubricant piping. Install a support pipe gasket against the pipe flange, and lower the next section of support piping into place. Align the vent openings with the tapped opening in the line shaft bearing, and bolt the support pipe together. If required, install a 1/8" nipple in the tap opening of the line bearing and connect it to the lubrication piping.

d. If necessary, assemble a discharge pipe coupling onto the threaded end of the previous section of discharge piping and thread the next section of piping into the coupling. Tighten the discharge piping with a pipe wrench. Each subsequent section of shafting support piping and discharge piping should be installed in this manner. As each successive section of piping and shafting is installed, the pump should be lowered by stages into the basin.

e. At the same time that the additional lengths of piping and shafting are being assembled, the additional sections of float control rod should be assembled. This is accomplished by installing successive lengths onto the threaded rod couplings. The lower float stop should be assembled to the rod with the flat side downward at the required distance from the liquid end. The float should be slipped onto the rod, and the upper float stop, flat side up, installed at the required distance from the bottom of the rod.

f. In a like manner, install lubrication piping and pressurization lines as required by your application.

After all of the piping has been assembled, a locknut should be installed on the upper end of the discharge

## VERTICAL WET PIT PUMP INSTALLATION

pipe and the pump oval plate lowered into position. Position the gaskets on the support pipe flange, and slide the lower head into place. The lower head should be positioned so that access to the grease fitting will not be obstructed by the discharge, lubrication, or pressurization piping, or the float control. Bolt the lower head to the pump oval plate. Assemble the remaining locknut over the upper end of the discharge pipe. Carefully align and position the discharge pipe and tighten down the locknut on either side of the pump oval plate. It is essential that no strain be placed on either the discharge piping or the pump casing. Therefore it is necessary that alignment of the discharge piping should be done with great care. Any strain on the discharge piping may force the support pipe and shafting out of line and result in overloading the pump motor.

Assemble the float control mechanism to the pump oval plate and align the switch arm with the end of the float rod. Set the upper end lower float rod stops approximately 3/4" above and below the arm.

Assemble one-half of the flexible coupling with its key to the motor driveshaft. There is a clearance between the top of the pump shaft and the end face of the motor driveshaft when the motor is installed. Accordingly, the coupling halves must be secured to the motor shaft above the recess surfaces of the lower coupling half. Place the coupling insert in the lower coupling half on the pump shaft, and lower the motor into place engaging the upper coupling half with the lower half and the coupling insert. Locate the motor as required for the most convenient connections of the electrical leads and bolt it in place. Adjust the lower coupling half until the ends of the dogs in the lower half are approximately 1/8" from the recessed surface of the upper half.

The pump motor, upper head, and lower head have register fits which combined with accurate location of the pump base plate, make it unnecessary to align the flexible coupling at installation of the pump.

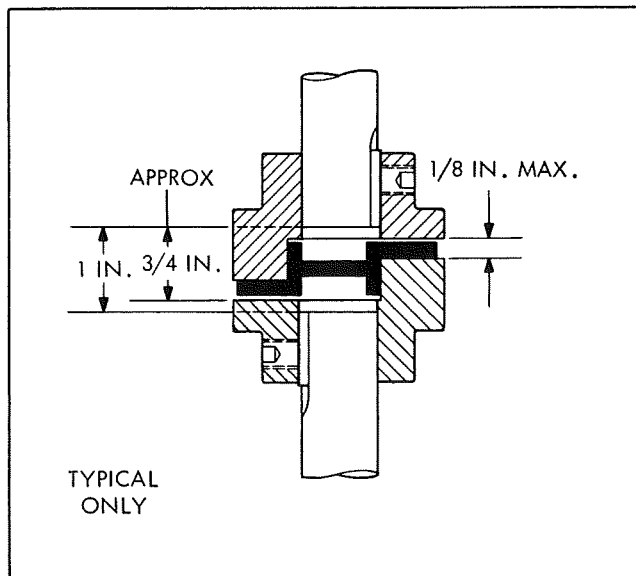


FIGURE 7. INSTALLING FLEXIBLE COUPLING

Connect the outlet piping to the pump discharge piping. For above ground discharge, two 45° elbows and flange connection are satisfactory. Check the outlet piping to make sure it is properly supported and lines up correctly before connecting it to the discharge of the pump. Misalignment of the piping can impose unnecessary loads on the discharge elbow and can cause distortion and strain of the support piping and shafting of the pump which can result in vibration, uneven bearing wear, or damage to the pump.

Connect the electrical wiring to the pump motor, the motor controller, float control and any other electrical accessories that were provided with your pump. Wiring instruction provided with the components should be followed exactly.

Connect flushing or pressurization water lines if required. Connect any vent piping to the basin cover.

Refer to the applicable maintenance manual for lubrication of liquid end bearings, head bearings, and intermediate shaft bearings.

**PRESTARTING INSTRUCTION.** Close the gate valve in the outlet piping. Rotate the pump shaft by hand to see that it turns freely without binding. Fill the basin to a depth at least sufficient to raise the float off the lower float stop and to cover the pump casing. Activate the float control arm and, as the pump motor starts, check the direction of rotation. The correct rotation is shown by the arrow on the lower head. As the pump motor approaches full speed open the outlet piping gate valve slowly.

Measure the effective discharge head by inserting a pressure gauge in any convenient place in the discharge head piping near the pump discharge outlet. The pounds per square inch (P.S.I.) reading can be converted to feet or head by multiplying by 2.31 and adding the height of the gauge above the basin liquid level as measured in feet. The result should be within 10% of the name plate head feet reading. Any wide variation from the head feet reading, can cause early failure of pump bearings, and should be corrected immediately. Refer to the applicable trouble shooting chart for your pump.

After several minutes of operation, the pump should be operating a quiet, vibrationless speed and neither the head bearing nor the motor casing should be exceedingly warm to the touch.

Shut down the pump and make sure that all bolts securing the pump, the pump oval plate and the basin cover are firmly tightened down.

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## WARRANTY

Seller warrants equipment (and its component parts) of its own manufacture against defects in materials and workmanship under normal use and service for one (1) year from the date of installation or start-up, or for eighteen (18) months after the date of shipment, whichever occurs first. Seller does not warrant accessories or components that are not manufactured by Seller; however, to the extent possible, Seller agrees to assign to Buyer its rights under the original manufacturer's warranty, without recourse to Seller. Buyer must give Seller notice in writing of any alleged defect covered by this warranty (together with all identifying details, including the serial number, the type of equipment, and the date of purchase) within thirty (30) days of the discovery of such defect during the warranty period. No claim made more than 30 days after the expiration of the warranty period shall be valid. Guarantees of performance and warranties are based on the use of original equipment manufactured (OEM) replacement parts. Seller assumes no responsibility or liability if alterations, non-authorized design modifications and/or non-OEM replacement parts are incorporated. If requested by Seller, any equipment (or its component parts) must be promptly returned to Seller prior to any attempted repair, or sent to an authorized service station designated by Seller, and Buyer shall prepay all shipping expenses. Seller shall not be liable for any loss or damage to goods in transit, nor will any warranty claim be valid unless the returned goods are received intact and undamaged as a result of shipment. Repaired or replaced material returned to customer will be shipped F.O.B., Seller's factory. Seller will not give Buyer credit for parts or equipment returned to Seller, and will not accept delivery of any such parts or equipment, unless Buyer has obtained Seller's approval in writing. The warranty extends to repaired or replaced parts of Seller's manufacture for ninety (90) days or for the remainder of the original warranty period applicable to the equipment or parts being repaired or replaced, whichever is greater. This warranty applies to the repaired or replaced part and is not extended to the product or any other component of the product being repaired. Repair parts of its own manufacture sold after the original warranty period are warranted for a period of one (1) year from shipment against defects in materials and workmanship under normal use and service. This warranty applies to the replacement part only and is not extended to the product or any other component of the product being repaired. Seller may substitute new equipment or improve part(s) of any equipment judged defective without further liability. All repairs or services performed by Seller, which are not covered by this warranty, will be charged in accordance with Seller's standard prices then in effect.

THIS WARRANTY IS THE SOLE WARRANTY OF SELLER AND SELLER HEREBY EXPRESSLY DISCLAIMS AND BUYER WAIVES ALL OTHER WARRANTIES EXPRESSED, IMPLIED IN LAW OR IMPLIED IN FACT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Seller's sole obligation under this warranty shall be, at its option, to repair or replace any equipment (or its component parts) which has a defect covered by this warranty, or to refund the purchase price of such equipment or part. Under the terms of this warranty, Seller shall not be liable for (a) consequential, collateral, special or liquidated losses or damages; (b) equipment conditions caused by normal wear and tear, abnormal conditions of use, accident, neglect, or misuse of said equipment; (c) the expense of, and loss or damage caused by, repairs or alterations made by anyone other than the Seller; (d) damage caused by abrasive materials, chemicals, scale deposits, corrosion, lightning, improper voltage, mishandling, or other similar conditions; (e) any loss, damage, or expense relating to or resulting from installation, removal or reinstallation of equipment; (f) any labor costs or charges incurred in repairing or replacing defective equipment or parts, including the cost of reinstalling parts that are repaired or replaced by Seller; (g) any expense of shipment of equipment or repaired or replacement parts; or (h) any other loss, damage or expense of any nature.

The above warranty shall not apply to any equipment which may be separately covered by any alternate or special warranties.

**PERFORMANCE:** In the absence of Certified Pump Performance Tests, equipment performance is not warranted or guaranteed. Performance curves and other information submitted to Buyer are approximate and no warranty or guarantee shall be deemed to arise as a result of such submittal. All testing shall be done in accordance with Seller's standard policy under Hydraulic Institute procedures.

**LIABILITY LIMITATIONS:** Under no circumstances shall the Seller have any liability under the Order or otherwise for liquidated damages or for collateral, consequential or special damages or for loss of profits, or for actual losses or for loss of production or progress of construction, regardless of the cause of such damages or losses. In any event, Seller's aggregate total liability under the Order or otherwise shall not exceed the contract price.

**ACTS OF GOD:** Seller shall in no event be liable for delays in delivery of the equipment or other failures to perform caused by fires, acts of God, strikes, labor difficulties, acts of governmental or military authorities, delays in transportation or procuring materials, or causes of any kind beyond Seller's control.

**COMPLIANCE WITH LAW:** Seller agrees to comply with all United States laws and regulations applicable to the manufacturing of the subject equipment. Such compliance shall include: The Fair Labor Standards Acts of 1938, as amended; Equal Employment Opportunity clauses of Executive Order 11246, as amended; Occupational Safety and Health Act of 1970 and the standards promulgated thereunder, if applicable. Since compliance with the various Federal, State, and Local laws and regulations concerning occupational health and safety, pollution or local codes are affected by the use, installation and operation of the equipment and other matters over which Seller has no control, Seller assumes no responsibility for compliance with those laws and regulations, whether by way of indemnity, warranty, or otherwise. It is incumbent upon the Buyer to specify equipment which complies with local codes and ordinances.



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