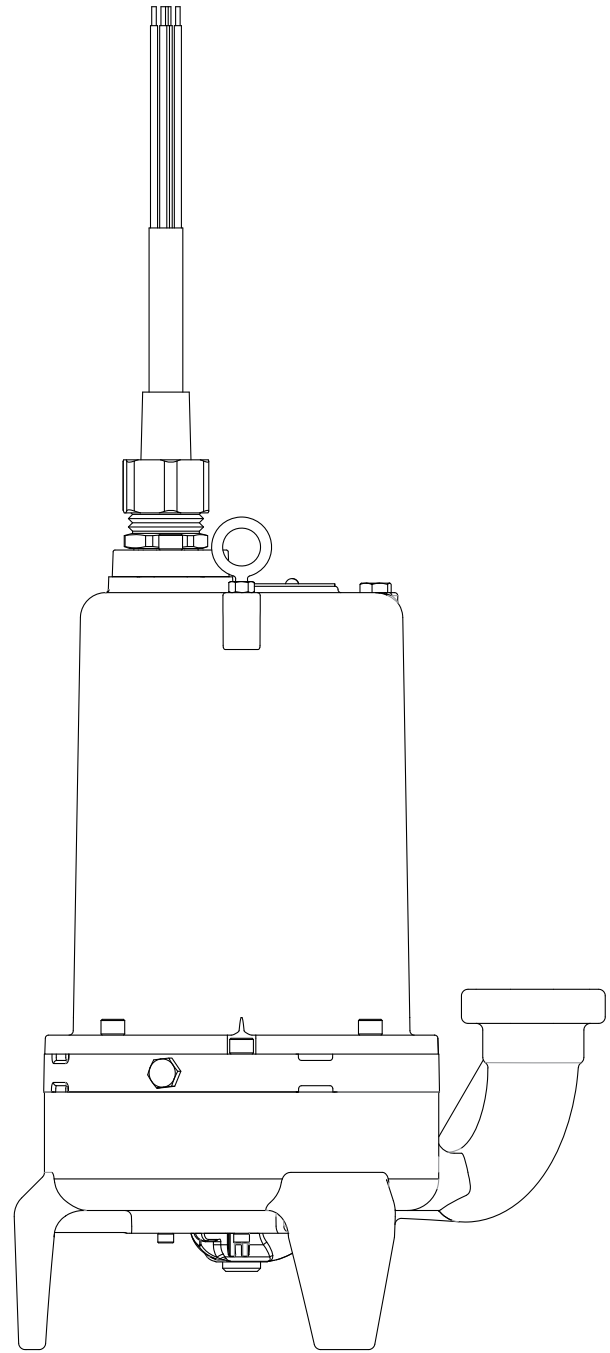




**HYDROMATIC®**



# HV200 SERIES GRINDER PUMPS

INSTALLATION AND SERVICE 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.

## SAFETY WARNINGS:

This manual contains important information for the safe use of this product. Read this manual completely and follow the instructions. Check local codes and requirements before installation.

**DANGER:** Risk of Electrical Shock or Electrocution. May result in serious injury, death or fire hazard. Installer must disconnect all electrical sources prior to installation, handling or servicing. Only qualified personnel may install this system. NFPA 70/ National Electric Code (NEC) or local codes must be followed. System must be properly grounded according to NEC.

**DANGER:** Biohazard Risk. Once wastewater source has been connected to system, biohazard risk exists. Service personnel must use proper personal protective equipment and follow handling procedures per OSHA 29 CFR 1910.1030 when handling equipment after wastewater source has been connected to system.

**DANGER:** Risk of Asphyxiation. Service personnel must use proper personal protective equipment and follow OSHA 29 CFR 1910.146 or OSHA 29 CFR 1926. Pump may be installed in a location classified as a confined space.

**DANGER:** Risk of Fire or Explosion. Do not smoke or use open flames in or around this system. This system is not intended for use in hazardous locations per NFPA 70 National Electric Code. Do not pump flammable liquids.

**DANGER:** Cutting Risk. Risk of serious cutting or amputation exists. Disconnect all power sources prior to servicing pump. Pump may start without warning. Use caution when handling grinder mechanism as it is extremely sharp.

Do not modify the cord strain relief. When wiring to a system control, connect the pump ground lead to the system ground.

Do not run the pump dry. Dry running can overheat the pump causing burns to anyone handling it and will void the warranty.

### 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.

Submersible grinder 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. This specialized pump is designed to incorporate a grinding mechanism to remove wastewater particulate and pump the resulting slurry.

On single and three-phase pumps, the motor protection must be provided by the installer. All three-phase pumps must be installed with magnetic starters having three-leg overload protection in accordance with the national electric code. For duplex installations, both pump motors must have separate overload protection. Seal leak detectors must be connected to the proper control circuitry.

Examine all lifting devices, rope or chain, for damage before and after each lift. Do not use any lifting devices that are not rated for and designed to lift the weights involved with these pumps.

Keep clear of suction and discharge openings and do not insert fingers in the pump with the power connected. Make sure lifting devices are securely fastened each time before lifting pump and do not lift pump by the power cord. Do not exceed manufacturer's recommendation for maximum performance, as this could cause the motor to overheat. Do not pump without safety devices in place.

**Control Panels and Controls:** All Hydromatic® control panels used on these grinders are UL listed and CSA certified. Intrinsically safe type float controls are recommended for all applications. An intrinsically safe control panel relay will limit the current and voltage to the level controls. Hydromatic control panels can be supplied with this type circuitry.

The float level controls maintain the basin sewage water level by controlling pump turn-on and turn-off level. The lower turn-off control should be set so that the pump stops at approximately the top of the pump. The upper turn-on control should be set above the lower turn-off control. The exact height between the two controls is determined by the number of pump starts desired and the depth of the basin. A maximum of 10 starts per hour should not be exceeded. The override control is set at a specified height above the upper turn-on control. The alarm control is set about 6" to 12" above the override control. No control should be set above the inlet invert.

**Pump:** The HV200 pumps are equipped with 200 and 230 volt single-phase and 200, 230, 460 and 575 volt three-phase with seal leak detector. HV200 Series pumps are available in standard or high head flows. This pump is intended to grind and pump all normal sewage.

**Caution:** Pump is only to be disassembled at Hydromatic factory or an authorized Hydromatic service facility.

Single-phase motors are capacitor start, capacitor run and the relays are mounted in the electrical control box. All single-phase motors must have a special electrical control box by Hydromatic. Installing single-phase motors with controls other than Hydromatic voids warranty.

Pump has two oil-filled chambers, the motor and ball bearings, and the seal chamber. The lower seal above the pump impeller acts as a buffer for the upper seal that holds oil in the motor chamber. The lower seal detection will alarm if water enters the seal chamber.

**Cords:** Pump models with a seal leak detector use a five-conductor cord. The three power conductors are black, white and red. The orange conductor connects to the seal leak probe and the green conductor connects to the ground screw inside the cord cap.

Single-phase pumps use the black and white as main winding leads and the red for the start winding.

**Cutters:** The HV200 grinder is equipped with an axial style cutter, a stationary plate and rotating cutter. To ensure proper operation of the cutting mechanism, the gap between the stationary plate and rotating cutter must be no more than .008". If the pump is ever disassembled, the gap must be checked before the pump can return to service. To check the gap, use a .008" feeler gauge. If the .008" feeler gauge does not fit between the surface of the stationary cutter and rotating cutter and the motor shaft turns freely, the gap is set properly. If the .008" feeler gauge fits between the surfaces, shims must be removed to close the gap.

**Three-Phase Control Box:** Hydromatic three-phase control equipment can be used for simplex or duplex operation. The overload heaters are in accordance with full load amp ratings.

If any amp readings are higher than listed, it indicates voltage may be higher or lower than normal, or that the pump may be clogged.

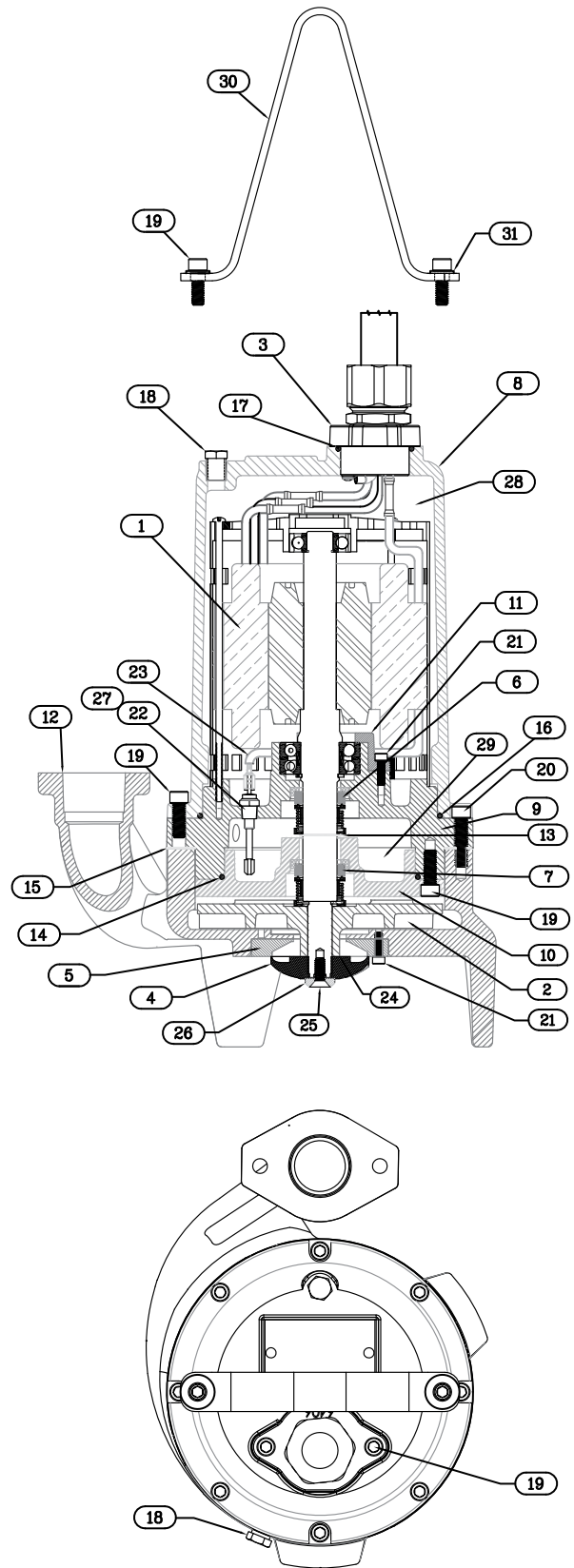
**Resistance of Winding:** Every motor winding has a fixed resistance and windings must check close to the specification values. This winding resistance also indicates if the motor is connected for the voltage being used. Use ohmmeter to test and read output directly in ohms.

## TROUBLESHOOTING

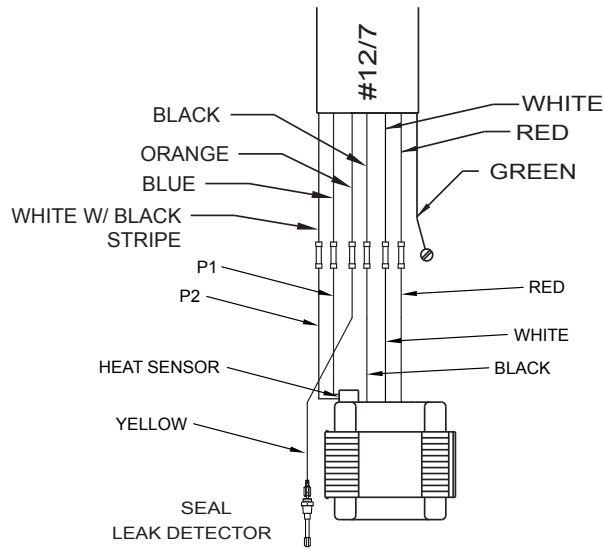
| <b>CONDITION</b>   | <b>PROBABLE CAUSE</b>  |
|--|--|
| <b>Pump runs but does not pump liquid from basin.</b>                                    | <p>Pump impeller may be air locked; this occasionally occurs in a new installation. Start and stop pump several times to purge air.</p> <p>Run additional water into basin so that the pump will be submerged deeper to clear air.</p> <p>If air does not clear, it may be necessary to lift pump out of sealing elbow and start motor to allow pump to pump for a few seconds. If discharge is piped in with union, slightly break union and start pump to clear air.</p> <p>If pump has been installed for some time and does not pump, it may be clogged at grinder inlet.</p> <p>Discharge gate valve may be closed.</p> <p>Discharge check valve may be clogged or have a broken clapper.</p> <p>Discharge head may be too high. Check elevation.</p> |
| <b>Red light comes on at control box.</b>  | <p>This indicates some water has leaked past the lower seal and has entered the seal chamber and made contact with the electrode probe. Pump must be removed from basin immediately for replacement of lower seal.</p>   |
| <b>Overload trips and high water level alarms.</b>                                       | <p>Push in red reset button to reset overload. If overload trips again after short run, remove pump and check for damage.</p> <p>Check grinder for clogged material as this can cause an overload condition on the motor</p> <p>A faulty component in the control box could exist.</p>   |
| <b>Yellow run light stays on continuously.</b>   | <p>Indicates H-O-A switch may be in the Hand position.</p> <p>Level control switch may have failed causing pump to continue to operate when water is below lower float.</p> <p>Grinder assembly may be partially clogged causing pump to operate at very reduced capacity.</p> <p>Check valve may be clogged causing low pump flow. Gate valve may be in Off position.</p> <p>Pump may be air locked.</p>  |
| <b>Circuit breaker trips.</b>  | <p>Reset breaker by pushing clear down on the handle, then put back to the On position. If breaker trips again in a few seconds, that indicates excessive load probably caused by a short in the motor or control box.</p> <p>If condition happens after an electrical storm, motor or control box may be damaged by lightning.</p> <p>A resistance reading of the motor with the lead wires disconnected from the control box can determine if the trouble is in the motor or control box.</p>  |
| <b>Pump is noisy and pump rate is low.</b>   | <p>Grinder assembly may be partially clogged with foreign objects causing overload on the motor.</p> <p>Grinder impeller may be rubbing due to bent shaft or misalignment.</p>   |
| <b>Grease and solids have accumulated around pump and will not pump out of the basin</b> | <p>Pump On switch may be set too high.</p> <p>Run pump on Hand operation for several minutes with small amount of water running into basin to clean out solids and grease. This allows pump to break suction and break up the solids.</p> <p>Trash may have accumulated around lower weight causing pump to turn off too soon. Clean the trash from the weight and suspension cable.</p>   |

## COMMON PARTS LIST

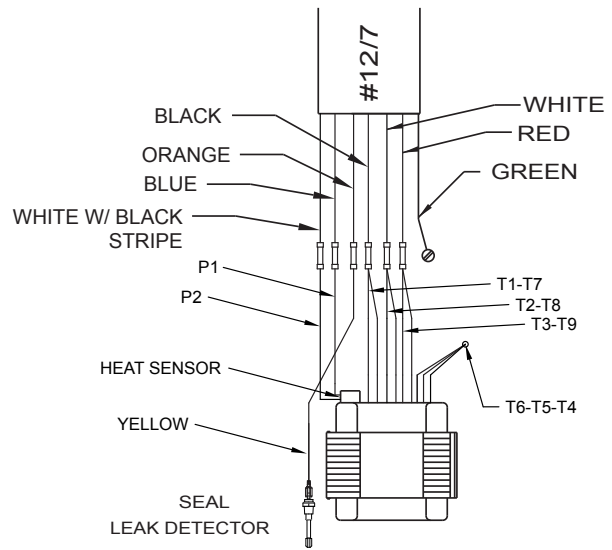
| Item      | Engineering No. | Description                        | Qty.                          |   |
|-----------|-----------------|------------------------------------|-------------------------------|---|
| 1         | 28139B000       | HVH200M2-2 Motor Assembly          | 1                             |   |
|           | 28139B001       | HVH200M6-2 Motor Assembly          | 1                             |   |
|           | 28139B002       | HVH200M3-2 Motor Assembly          | 1                             |   |
|           | 28139B002       | HVH200M4-2 Motor Assembly          | 1                             |   |
|           | 28139B004       | HVH200M5-2 Motor Assembly          | 1                             |   |
|           | 28139B000       | HVS200M2-2 Motor Assembly          | 1                             |   |
|           | 28139B001       | HVS200M6-2 Motor Assembly          | 1                             |   |
|           | 28139B002       | HVS200M3-2 Motor Assembly          | 1                             |   |
|           | 28139B002       | HVS200M4-2 Motor Assembly          | 1                             |   |
|           | 28139B003       | HVS200M7-2 Motor Assembly          | 1                             |   |
|           | 28139B004       | HVS200M5-2 Motor Assembly          | 1                             |   |
|           | 2               | 28228B000                          | Impeller, HVH200, 6.25" O.D.  | 1 |
|           |                 | 28228B001                          | Impeller, HVS200, 5.313" O.D. | 1 |
|           | 3               | 144240025                          | Cord Cap, Standard, 20' 12-7  | 1 |
| 144240115 |                 | Cord Cap, Standard, 35' 12-7       | 1                             |   |
| 4         | 28145B000       | Rotating Cutter                    | 1                             |   |
| 5         | 28227B000       | Stationary Cutter                  | 1                             |   |
| 6         | 21576A010       | Seal, 7/8" Shaft, Upper            | 1                             |   |
| 7         | 21576A010       | Seal, 7/8" Shaft, Lower            | 1                             |   |
| 8         | 28132B000       | Motor Dome                         | 1                             |   |
| 9         | 28135D000       | Seal/Bearing Housing               | 1                             |   |
| 10        | 28136D000       | Lower Seal Plate                   | 1                             |   |
| 11        | 28154B000       | Bearing Cap                        | 1                             |   |
| 12        | 28133D001       | Volute                             | 1                             |   |
| 13        | 12558A006       | Ring, Retaining                    | 1                             |   |
| 14        | 001500131       | O-Ring, 1/8" X 4.12 I.D.           | 1                             |   |
| 15        | 28229A000       | Volute Shim; HV Wet End            | 4                             |   |
| 16        | 05876A125       | O-Ring, 1/8" X 5.859 I.D.          | 1                             |   |
| 17        | 05876A244       | O-Ring, 3/32" X 1.737 I.D.         | 1                             |   |
| 18        | 05022A088       | Plug, 1/4" Pipe                    | 2                             |   |
| 19        | 001780081       | Screw, Socket Head, 5/16" X .875"  | 12                            |   |
| 20        | 001780051       | Screw, Socket Head, 5/16" X 1.25"  | 4                             |   |
| 21        | 048200061       | Screw, Socket Head, 10-24 X .625"  | 7                             |   |
| 22        | 109010001       | Probe, Seal Fail                   | 1                             |   |
| 23        | 22578A102       | ELECTRODE ASSY HV GRINDER          | 1                             |   |
| 24        | 006280571       | Shim, 1.00 O.D. X .625 I.D. X .002 | 1                             |   |
|           | 006280581       | Shim, 1.00 O.D. X .625 I.D. X .005 | 2                             |   |
| 25        | 011300021       | SCREW-MACH(FL HD)1/4-20 X 3/4      | 1                             |   |
| 26        | 21583A000       | Washer, Retaining                  | 1                             |   |
| 27        | 000870081       | Plug, 1/8" Pipe                    | 1                             |   |
| 28        | 132531001       | Premium Oil, Motor                 | 1.92 qts.                     |   |
| 29        | 132531001       | Premium Oil, Seal Chamber          | .32 qts.                      |   |
| 30        | 25371B010       | BAIL-LIFTING HV GRINDER            | 1                             |   |
| 31        | 001560231       | WASHER-FLAT 5/16" 18-8 SST         | 2                             |   |



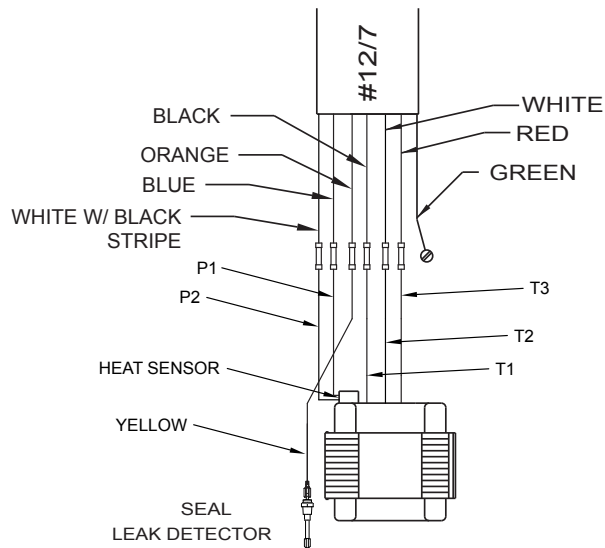
# MOTOR WIRING DIAGRAM



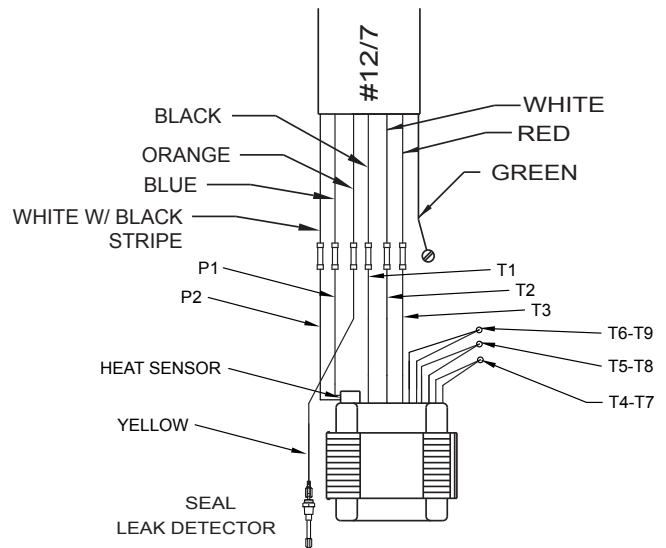
2HP, 200V AND 230V 1PH  
WITH SEAL LEAK DETECTOR  
& 12/7 COND. CORD



2HP, 230V 3PH WITH  
WITH SEAL LEAK DETECTOR  
& 12/7 COND. CORD



2HP, 200V AND 575V 3PH  
WITH SEAL LEAK DETECTOR  
& 12/7 COND. CORD



2HP, 460V 3PH WITH  
WITH SEAL LEAK DETECTOR  
& 12/7 COND. CORD

| Motor    | Resistance Main (Ohms) | Resistance Start (Ohms) |
|----------|------------------------|-------------------------|
| 230/1/60 | 1.27                   | 7.35                    |
| 200/3/60 | 1.74                   | -                       |
| 230/3/60 | 2.23                   | -                       |
| 460/3/60 | 8.67-8.80              | -                       |
| 200/1/60 | 1.03                   | 3.58                    |
| 575/3/60 | 8.55-8.80              | -                       |

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# HYDROMATIC® HV200 SERIES LIMITED WARRANTY

Pentair Hydromatic® warrants its HV and HVR series grinders against defects in material and workmanship for a period of 24 months from the manufacturing date, or 36 months from the manufacturing date with completion of a start-up report within 30 days of installation. Product must be properly installed, serviced and operated in compliance with the manufacturer's instruction manuals.

During the warranty period and subject to the conditions set forth, Pentair Hydromatic, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Hydromatic reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Start-up reports and electrical schematics may be required to support warranty claims. Submit at the time of start-up through the Pentair Hydromatic website: <http://forms.pentairliterature.com/startupform/startupform.asp?type=h>. All seal fail and heat sensing devices must be connected, functional and monitored or this warranty will be void. Pentair Hydromatic will cover only the lower seal and labor thereof for all dual seal pumps. Under no circumstance will Pentair Hydromatic be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Hydromatic service facility.

This limited warranty will not apply:

- a) To defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided;
- b) To failures resulting from abuse, accident or negligence;
- c) To failures resulting from excessive sand, lime, cement, gravel or other abrasive materials
- d) To failures caused by scale or corrosion build-up due to excessive hydrocarbons or chemical content
- e) To normal maintenance services and parts used in connection with such service;
- f) To units that are not installed in accordance with applicable local codes, ordinances and good trade practices;
- g) If the unit is moved from its original installation location;
- h) If unit is used for purposes other than for what it is designed and manufactured;
- i) To any unit that has been repaired or altered by anyone other than Pentair Hydromatic or an authorized Pentair Hydromatic service provider;
- j) To any unit that has been repaired using non factory specified/OEM parts.

**Warranty Exclusions:** PENTAIR HYDROMATIC MAKES NO EXPRESS OR IMPLIED WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. PENTAIR HYDROMATIC SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE.

**Liability Limitation:** IN NO EVENT SHALL PENTAIR HYDROMATIC BE LIABLE OR RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES RESULTING FROM OR RELATED IN ANY MANNER TO ANY PENTAIR HYDROMATIC PRODUCT OR PARTS THEREOF. PERSONAL INJURY AND/OR PROPERTY DAMAGE MAY RESULT FROM IMPROPER INSTALLATION. PENTAIR HYDROMATIC DISCLAIMS ALL LIABILITY, INCLUDING LIABILITY UNDER THIS WARRANTY, FOR IMPROPER INSTALLATION. PENTAIR HYDROMATIC RECOMMENDS INSTALLATION BY PROFESSIONALS.

Some states do not permit some or all of the above warranty limitations or the exclusion or limitation of incidental or consequential damages and therefore such limitations may not apply to you. no warranties or representations at any time made by any representatives of Pentair Hydromatic shall vary or expand the provision hereof.