Installation, Operation and Maintenance Information
Type LRV & LRV-S Vacuum and Condensate Pumps

Caution: The unit receivers are not designed for internal pressure. DO NOT PRESSURIZE RECEIVERS.

SITE INSPECTION
The unit should be of the proper size and capacity for the proposed installation. Refer to nameplate for rated capacities. Check motor and control voltages with the available power supply.

UNIT LOCATION
Standard units are designed with O.D.P. (Open Drip Proof) Motors and NEMA I controls. Other classifications are available — check unit detail sheet for classification supplied. Locate unit only in areas of the proper classification. The unit should be located to allow for removal of pumps for replacement of seals. If a housekeeping pad is used, do not extend foundation under pump and motor assemblies.

VENT CONNECTION
Install a full sized vent to atmosphere from the vacuum receiver. See Typical Piping Diagram (Figure 2). DO NOT install any shut-off valves or other type of valves in the vent line. Do not plug vent to test system for leaks. Receiver is not made to be pressurized. The vent line should be installed as shown in our Typical Piping Diagram. A priming tee is required for start-up.

RETURN PIPING
Connect condensate return lines to the condensate receiver through a full ported gate valve and an inlet strainer. The return lines should be pitched toward the receiver to insure gravity flow.

CAUTION: Avoid piping restrictions immediately ahead of the condensate receiver, i.e., elbows, tees, etc. Locate these at least 10 times the inlet diameter ahead of the inlet strainer (ex. 3" inlet 30" ahead of strainer).

DISCHARGE PIPING
Install a union immediately beyond the discharge valve. A check valve should be installed in the discharge piping, close to the discharge valve, to prevent back flow into the unit. A throttling valve (ball valves, globe valves or steam cock) MUST be installed after the check valve close to the discharge valve.

ELECTRICAL WIRING
Units are furnished for most popular voltages. Make sure the motor wiring, starters, transformers, etc., match the power supply. Controls, starter coils, etc., should match the control voltages. The control circuit is the secondary side of transformers when furnished.

Single phase motors are usually furnished as dual voltage 115/230/1/60. Motors should be connected according to manufacturer’s instructions for correct voltage.

Three phase motors are usually furnished as tri-voltage 208/230/460/3/60. Motors should be connected according to manufacturer’s instructions for correct voltage.

Control panels furnished with the unit should have the nameplate data match the supply current. Should the nameplate data not match the power supply, consult factory.

Wire in accordance with the National Electrical Code and Local Codes where applicable.

Single phase drip proof motors up to and including 1 HP have built-in thermal overload protection. Magnetic starters are not required on these motors.

Single phase drip proof motors larger than 1 HP and all three phase motors require magnetic starters.

SHORT CIRCUIT PROTECTION
According to the National Electrical Code, branch circuit overcurrent protection must be provided for each contactor or starter. The following table is provided as a guide. DO NOT EXCEED MAXIMUM PROTECTIVE DEVICE RATINGS.

<table>
<thead>
<tr>
<th>Maximum HP</th>
<th>NEMA Size</th>
<th>Single Phase Voltage</th>
<th>Three Phase Voltage</th>
<th>Maximum Voltage</th>
<th>Class K5 or R Fuse (Ampere)</th>
<th>Class K1 or J Fuse (Ampere)</th>
<th>Inverse-Time Circuit Breaker (Ampere)</th>
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<td>1 1/2 1 1/2 2</td>
<td>115v 230v 208v 250v 600v</td>
<td>600</td>
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</table>

FIGURE 1
VACUUM SWITCHES AND ADJUSTMENTS

The vacuum switch(es) are factory preset for proper operation. Should field adjustments be required, the vacuum switch on a single unit and the lead vacuum switch on a duplex unit are set to close at 3" Hg and open at 8" Hg. The lag switch on a duplex unit is set to close at 2" Hg and open at 8" Hg. Refer to manufacturer's instructions for specific details.

FLOAT SWITCH(ES)

The float switch(es) has been factory set for maximum condensate receiver capacity. Should an alternate setting be required, refer to the float switch manufacturer's instructions.

EQUALIZING LINES

A vacuum can be formed on the radiation side of a system when the steam stops flowing and the lines cool. In some cases, this vacuum may be greater than the vacuum in the return lines. The higher vacuum would prevent the condensate from flowing to the receiver. To correct this in an unzoned system, an equalizing line is installed as shown in our Typical Piping Diagram (Figure 2). In a zoned system, an equalizing line must be installed after the zone valve in each zone. A vacuum breaker may be installed after the zone valve on the radiation side in lieu of an equalizing line.

PUTTING THE PUMPS INTO SERVICE

Flush unit to Drain to remove any debris from receiver(s). Reinstall Drain Plug(s).

A. Check piping in system with Typical Piping Diagram (Figure 2) in this manual.
B. Remove shipping bracket from each float switch as per manufacturer's instructions. (See instruction tag attached to switch.)
C. Prime the pump. The LRV Receiver is divided into two compartments. The upper compartment is used to produce the vacuum and allows the water to the centrifugal pump. On initial start-up, pour water into the priming opening shown on the piping diagram until the gauge glass, for the upper compartment, shows one-half (1/2) full. DO NOT PRESSURIZE RECEIVER. DO NOT RUN PUMPS DRY.
D. Three Phase Units — Energize the power circuits and immediately check the direction of rotation of each pump. If unit is furnished with test push buttons, these should be utilized to momentarily check the direction of shaft rotation. Pump should rotate clockwise when viewed from motor end. If rotation is backward, interchange any two of the three power wires to the particular pump.

NOTE: Bleed line shut-off valve MUST remain open unless pump is being serviced.

DESCRIPTION OF OPERATION

The LRV unit is designed to produce a vacuum on the system with a multi-jet nozzle-venturi arrangement as shown in the typical cut away drawing below. The centrifugal pump forces water through the multi-jet nozzle. The streams of water passing across the air gap between the nozzle and venturi draw air from the lower compartment and force the air and water into the venturi, producing a vacuum.

Water is transferred from the lower compartment of the receiver to the upper compartment by means of a vacuum lift. The float switch in the lower compartment starts the pump and causes it to run until the condensate drops to the preset level. The condensate, being transferred to the upper compartment, then raises the float switch in the upper compartment to the preset level, when it actuates the discharge valve, causing the valve to open and the pump to run until the water level in the upper compartment drops to a preset level.

The vacuum switch senses the vacuum in the system and causes the pump to run and produce a vacuum until the preset vacuum level is obtained.

SELECTOR SWITCH SETTINGS

Selector switches are normally set on the Float & Vacuum position. This position allows the pumps to operate on a signal from the float switch, in the lower compartment, for high water or the vacuum switch sensing a low vacuum condition in the system.

The off position breaks the control circuit for putting the pump out of service. NOTE: Disconnects must be turned off for servicing pumps. This position allows pumps to be turned “off” during short shut-down periods.

The float only position allows the pump to operate on a signal from the float switch in the lower compartment for high water. This position is used when the unit is only operating as a condensate transfer unit.

The continuous position allows the pump to run continuously when a continuous vacuum or lift is required.

REPRESENTATIVE SERVICING

If trouble occurs that cannot be rectified, contact your local Shipco® representative. He will need the following information in order to give you assistance:
1. Complete nameplate data of pump and motor.
   SEE RATING NAMEPLATE.
2. Suction and discharge pipe pressure gauge readings.
3. Ampere draw of the motor.
4. A sketch of the pump hook-up and piping.
TROUBLESHOOTING CHECKLIST

PUMP WILL NOT RUN
1. Inadequate condensate has returned from the system to activate float switch.
2. Vacuum on the system is not low enough to activate the vacuum switch.
3. The power supply has been interrupted, disconnect switch is open or a selector switch is not in the proper position.
4. Wiring to the control panel is incorrect or connection requires tightening.
5. Voltage supplied to unit is wrong. Check voltage and wiring with motor and panel specifications.
7. Overload relays in the starter have tripped and require resetting. Ambient temperature may be too high.

PUMP DOES NOT OPERATE ADEQUATELY (SYSTEM FLOODS)
1. Pump may be running backwards. Rotation of 3 phase motors can be corrected by interchanging any 2 of the 3 wires. Pump should run clockwise.
2. Steam traps are failing, causing condensate to return at excessive temperatures. If 160°F is exceeded the capacity of the pump may be reduced below its rating. Traps should be repaired or replaced.
3. A valve in the discharge line between the vacuum pump and the boiler feed unit is closed or throttled too tightly. A check valve may be installed incorrectly.
4. The total back pressure at the pump discharge is greater than the rated discharge pressure of the pump. Check the total pressure including lift, pipe friction loss and any system pressure.
5. The inlet strainer is dirty. Clean the strainer.
6. The eye of the impeller is clogged. Unclog the impeller.
7. Pump is too small for the system.
8. Condensate is held up in the system periodically by induced vacuum in the boiler or radiation. After the pump starts, the condensate is released in a “surge.” Install an equalizing line.
9. The discharge solenoid valve fails to open. This may be caused by the solenoid valve failing in the closed position.

PUMP IS NOISY
1. Balancing valve not installed or not adjusted, causing pump to operate too far out on the pump curve. Install balancing valve per I.O.M. and adjust to the rated discharge pressure of the pump.
2. Excessive condensate temperature. Correct system condition.
3. Starters chatter. Trouble is caused by low line voltage, poor connection, defective starter coil, or burned contacts.
4. Hum or bearing noise in motor. Consult motor manufacturer’s authorized service station nearest pump location.
5. Pump is running backwards.

VACUUM PUMP RUNS CONTINUOUSLY OR FAILS TO PRODUCE SUFFICIENT VACUUM
1. Selector switch is set on “continuous.”
2. A vacuum breaker is set too low. It should not allow air at a vacuum within the range of the vacuum switch settings.
3. The temperature of the condensate is too high. Normal operating condensate temperature should not exceed 160°F for rated capacities. Correct the cause for the high temperature condensate.
4. There are excessive leaks in the system piping preventing the pump from achieving sufficient vacuum to satisfy the vacuum switch setting. To confirm this, isolate the unit from the system and observe the vacuum pump, achieving required vacuum to satisfy vacuum switches.
5. The vacuum or float switch electrical contacts remain in closed position. Adjust controls.
6. Check valve in equalizing line or air vent line from receiver or the accumulator tanks leak, or is installed backwards.
7. One nozzle body check valve, on a duplex pump arrangement, remains open permitting air to recirculate.
8. Pump is too small for the system.
9. Lower float switch does not turn off. Float resting on the bottom of the receiver and should be raised.

PUMP STARTS AND STOPS IN RAPID SUCCESSION
1. A check valve is in the return line. Remove the check valve.
2. The inlet valve is partially closed. The inlet valve should be a gate valve rather than a globe valve.
3. Inlet strainer is clogged with dirt. Clean strainer.
4. Equalizing line improperly connected.
5. A lift in return line at or near the pump. Low return lines will fill with condensate between pump operations. The inertia of the collected water may be great, and before the vacuum suddenly produced by starting of the pump can set the water in motion, the vacuum at the pump may reach the cut-off point of the vacuum switch, thus stopping the pump.

The vacuum quickly recedes as the condensate moves into the receiver and the pump “cuts in” on vacuum control again, thus repeating this “hunting action.” Following are two solutions to this difficulty:
A) If the vacuum sensing line can be drained away from the vacuum switch(es), connect this sensing line into the nearest “Dry” point in the return main so that the operation of the unit may be governed by the vacuum in the system.
B) If the nearest “Dry” point on the return main is more than 2 ft. above the vacuum switch, relocate and reconnect the switches to sense the vacuum at this point.
6. Elbow in return line too close to unit inlet. Correct as described in No. 5 above, or if there is no lift in the return line at or near the pump, extend the equalizing line to top of “Dry” point on return main.

Product life and product efficiency are greatly affected by system maintenance. A tight (leak-free) system with properly functioning traps is essential for efficient operation.

NOTE: Bleed line shut-off valve MUST remain open unless pump is being serviced.
MECHANICAL SEAL REPLACEMENT INSTRUCTIONS FOR 56J FRAME MOTORS

Note: Seals will be damaged if operated Dry.

When it is necessary to replace a mechanical seal, refer to the following procedures:

A. Close the isolation valves on the return line to the unit and discharge lines.
B. Open power disconnect to unit. With power off, disconnect the motor power wiring and conduit from the motor.
C. Remove the capscrews (4) fastening the pump head to the pump case.
D. Separate the pump head from the case and lift the motor, pump head, and the impeller out of the pump case.
E. Holding the top end of the motor shaft with a screwdriver or screwdriver socket, turn the impeller counterclockwise by inserting a flat tool between the vanes of the impeller.
F. Remove the rotating portion of the mechanical seal from the end of the motor shaft.
G. Remove the capscrews (4) fastening pump head to motor and remove the pump head.
H. Remove the ceramic or stationary portion of the mechanical seal and cup rubber from the pump head.
I. Install a new seal by thoroughly cleaning the machined recess in the pump head. Apply a thin coating of liquid detergent to the recess and outer edge of the new cup rubber. The new ceramic seal can then be pressed firmly into place by hand. Make sure the seal bottoms evenly. Should you be unable to bottom seal evenly, place a cardboard over the ceramic seal and force into place with a flat tool.
J. With the motor in a vertical position (pump end up), install the pump head over the shaft and install capscrews (4).
K. Clean the mating surfaces of the seal with a lint-free cloth. The carbon or rotating part should not be loose. Hold in place with a small amount of liquid detergent if necessary. Apply liquid detergent to the rubber lightly and install over the shaft with the carbon contacting the ceramic seal.
L. Place the impeller on the shaft and tighten (clockwise rotation). (Install locking jam nut — 3 phase only.)
M. Reassemble by reversing procedures. Install a new head gasket between pump head and case.
N. Reconnect power supply, open isolation valves, fill receiver one-half (1/2) full of water; pump is now ready for operation.

DO NOT RUN PUMP DRY.

O. Pump may be tested for operation by hand operating float switch. Slight leakage may occur until seal surfaces adjust.

Check rotation — 3 phase only units pumps should rotate clockwise.

NOTE: Bleed line shut-off valve MUST remain open unless pump is being serviced.
MECHANICAL SEAL REPLACEMENT INSTRUCTIONS FOR JM INTEGRAL FRAME MOTORS

Note: Seals will be damaged if operated Dry.

When it is necessary to replace a mechanical seal, refer to the following procedures:

A. Close the isolation valves on the return line to the unit and discharge lines.
B. Open power disconnect to unit. With power off, disconnect the motor power wiring and conduit from the motor.
C. Remove the capscrews (4) fastening the pump head to the pump case.
D. Separate the pump head from the case and lift the motor, pump head, and the impeller out of the pump case.
E. Remove the locking capscrew and washer from the motor shaft.
F. Using two thin flat pry bars opposite each other, pry between the head and impeller, being careful to pry only above vanes of the impeller so that the impeller shroud (or upper face) is not dented.
G. Remove the rotating portion of the mechanical seal from the end of the motor shaft.
H. Remove the capscrews (4) fastening pump head to motor and remove pump head.
I. Remove the ceramic or stationary portion of the mechanical seal and cup rubber from the pump head.
J. Install a new seal by thoroughly cleaning the machined recess in the pump head. Apply a thin coating of liquid detergent to the recess and outer edge of the new cup rubber. The new ceramic seal can then be pressed firmly into place by hand. Make sure the seal bottoms evenly. Should you be unable to bottom seal evenly, place a cardboard over the ceramic seal and force into place with a flat tool.
K. With the motor in a vertical position (pump end up), install the pump head over the shaft and install capscrews (4).
L. Clean the mating surfaces of the seal with a lint-free cloth. The carbon or rotating part should not be loose. Hold in place with a small amount of liquid detergent if necessary. Apply liquid detergent to the rubber lightly and install over the shaft with the carbon contacting the ceramic seal.
M. Carefully start the impeller and key onto the motor shaft and push onto the shaft. If it is necessary to drive the impeller, hold the motor with the shaft up and use a steel spacer between the other end of the motor shaft and a solid bench. This is to prevent shock loads and damage to the motor bearings. Drive the impeller on with a wood dowel or large fiber punch in the center of the impeller eye, making sure it is going on straight and the key is going into place properly.
N. Reinstall the locking capscrew and washer.
O. Reassemble by reversing procedures. Install a new head gasket between pump head and case. Install a new gasket between the case and suction housing.
P. Reconnect power supply, open isolation valves, fill receiver one-half (1/2) full of water; pump is now ready for operation.

DO NOT RUN PUMP DRY.

Q. Pump may be tested for operation by hand operating float switch. Slight leakage may occur until seal surfaces adjust.

Check rotation — 3 phase only units pumps should rotate clockwise.

NOTE: Bleed line shut-off valve MUST remain open unless pump is being serviced.

FIGURE 4

Model D • JM Frame

1. Pump Head
2. Pump Case
3. Motor
4. Motor Shaft
5. Water Slinger
6. Impeller
7. Mechanical Seal
8. Pump Suction Gasket
9. Discharge Flange
10. Pump Discharge Gasket
11. Head Gasket
12. Wear Ring
13. Suction Housing
14. Capscrews (Suction Housing to Case)
15. Suction Housing Gasket
16. Impeller Screw
17. Drip Cover
18. Capscrews
19. Capscrews
20. Capscrews
21. Impeller Washer
22. Shaft Sleeve (Mech. Seal)

TO ORDER PARTS
— Refer to Figure 4 —
By Pump Model and Part Name
ORDER ACCEPTANCE

All orders are subject to acceptance by Seller at its general office in Shippensburg, Pennsylvania. Acceptance will be evidenced by Seller issuing its Sales Acknowledgement Form. The Sales Acknowledgement Form, together with any documents incorporated therein, shall constitute the entire agreement and may not be changed except in writing signed by Seller and Buyer. Publication and circulation of current price lists, catalogues and related literature by Seller shall not be deemed an offer to sell, but rather an invitation for offers to buy. Acceptance by Seller of the Buyer's order is expressly limited to the Terms and Conditions stated herein; any additional, inconsistent or different terms and conditions contained in the Buyer's purchase order or other documents supplied by Buyer are expressly rejected.

PAYMENT TERMS — PRICES

Payment terms are 2% - 10 days, net thirty (30) days after date of invoice unless otherwise specifically agreed to in writing. These terms shall apply to partial, as well as complete shipments of Product. Product prices are subject to change without notice and the price is reserved to change and the price prevailing at time of shipment unless otherwise specifically agreed to in writing. All quotations are conditional on 30 days acceptance unless stipulated otherwise in writing, and to approved credit rating or reference, otherwise payment terms are cash with order or C.O.D.

DELIVERY — DELAYS

Shipping dates represent estimates only and are based on projected production schedules and commitments by suppliers. Seller shall not be liable for failure or delay in manufacturing or shipping Products, nor shall such failure or delay constitute grounds for cancellation if such failure or delay is directly or indirectly due to shortages of fuel or energy; acts of omissions of the Buyer; acts of God; war, riot, civil disturbances; labor difficulties; accident; inability to reasonably obtain materials; acts of transporters; or causes of any kind whatever beyond the control of the Seller. In the event of such delays, Seller reserves the right to make adjustments in price and delivery schedules.

FREIGHT TERMS

Prices are F.O.B. factory unless otherwise stated. Seller's responsibility ceases upon delivery to the transportation company at shipping point. It is the Buyer's responsibility to examine shipment upon arrival to determine if it is in good order. Any shortage or damage claims must be presented to Buyer. As weights shown on price sheets and literature are approximate. All packaging is standard domestic box, slat and wire crating and/or skidding. An additional charge will be made for export packing (full wooden crating) or special packaging when so specified on the order. Seller will make every effort to consolidate orders and backorders wherever possible. Seller will not be responsible for excess charges due to their inability to consolidate shipments. When requested by Buyer, shipments may be routed using premium carriers such as express or air-freight or may specify the method or route of shipment. In such cases the shipment will be made on a “collected” basis and where applicable the freight allowance will appear as a separate line item on the product invoice. Seller reserves the right to select the transportation company where freight is allowed.

TAXES

In addition to the price stated, the amount of any present or future sales, use, excise or other similar tax applicable to the production, sale, use or transportation of the Products shall be paid by Buyer. In lieu of paying such taxes to Seller, Buyer may furnish Seller a Tax Exemption Certificate or Certificates acceptable to the appropriate taxing authorities at any time prior to Seller's shipment of the Products.

CANCELLATIONS

Any order placed with Seller may be cancelled by the Buyer only upon payment of reasonable cancellation charges, which shall include but not be limited to expenses already incurred, as well as material and labor commitments made by Seller.

SHIPMENT — TITLE — RISK OF LOSS

All prices quoted are F.O.B. Seller's facility unless otherwise specifically agreed to in writing. Notwithstanding the granting of any allowances for shipping, title to and risk of loss for Products will pass to the Buyer when delivered to the common carrier at the Seller's facility.

BACK CHARGES

All invoices shall be due and payable when submitted for payment in accordance with the provision entitled “Payment Terms — Prices.” No withholding of funds, backcharges, or credits against amounts otherwise due Seller will be permitted unless specifically agreed to in writing by Seller. Settlement of any amounts due Buyer will be negotiated as separate items and not as offsets against amounts otherwise due Seller from Buyer for Products sold hereunder.

RETURNED GOODS

Unused material of current manufacture can only be returned for credit with the written consent of Seller, under return goods policies existing at the date of the return. Products which are obsolete or

shall have the right to substitute for any such Product or any part thereof claiming to infringe the patent right of others, non-infringing Products which will give equally good service. If the use of any such Product or any part thereof should be enjoined, Seller shall have the right at its own expense, to take any of the following courses of action:

(i) To procure for Buyer the right to continue using such Product;
(ii) To replace said Product with a non-infringing Product;
(iii) To modify the Product so that it becomes non-infringing;
(iv) To remove said Product and refund the purchase price, transportation costs and installation costs thereof.

b. Limitation

The foregoing provisions as to patent protection by Seller to Buyer shall not apply to any of the following:

(i) To any Product manufactured to the design of specification furnished by the Buyer;
(ii) To orders for special or commodity-products which Seller has not sold or offered for sale to the public on the open commercial market;
(iii) To any infringement occasioned by modification by Buyer of any Product without Seller's written consent, or any infringement arising from the use of a Product with any adjunct or device added by the Buyer without Seller's written permission.

c. Patent Indemnity by Buyer to Seller

To the extent that Products delivered hereunder are manufactured pursuant to detailed designs furnished by Buyer, Buyer agrees to indemnify Seller and hold Seller harmless from all legal expenses which may be incurred, as well as all damages and costs, which may finally be assessed against Seller in any action for infringement of any United States Letters Patent by the Products delivered hereunder. Buyer agrees to promptly inform the Buyer of any claim for liability made against Seller with respect to such Products, and Seller agrees to co-operate with the Buyer in every way reasonably available to facilitate the defense against any such claim.

GOVERNING LAW

The validity, interpretation and performance of any order shall be governed by the Uniform Commercial Code (“UCC”) as adopted by the state in which the Products are manufactured by Seller.

WARRANTY AND LIMITATION OF LIABILITY

Seller warrants for a period of eighteen (18) months from date of shipment from its factory or one (1) year from date of installation, whichever occurs first, that all Products furnished by it are free from defects in materials and workmanship. Seller's liability for any breach of this Warranty shall be limited solely to replacement or repair, at the sole option of Seller, of any part or parts to be defective during the warranty period providing the Products are properly installed and is being used as originally intended. Buyer must notify Seller of any breach of this Warranty within the aforementioned Warranty period; defective parts must be shipped by Buyer to Seller, transportation charges prepaid.

IT IS EXPRESSLY AGREED THAT THIS SHALL BE THE SOLE AND EXCLUSIVE REMEDY OF THE BUYER UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR ANY COSTS, LOSS, EXPENSE, DAMAGES, SPECIAL DAMAGES, INCIDENTAL DAMAGES OR CONSEQUENTIAL DAMAGES ARISING DIRECTLY OR INDIRECTLY FROM THE DESIGN, MANUFACTURE, SALE, USE OR REPAIR OF THE PRODUCT WHETHER BASED UPON WARRANTY, CONTRACT, NEGLIGENCE OR STRICT LIABILITY. IN NO EVENT WILL LIABILITY EXCEED THE PURCHASE PRICE OF THE PRODUCT.

THE WARRANTIES AND LIMITS OF LIABILITY CONTAINED HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED BY SELLER AND EXCLUDED FROM THIS WARRANTY.

Seller neither assumes nor authorizes any person to assume for it, any other Warranty obligation in connection with the sale of the Product. This Warranty shall not apply to any Product or parts of Products which (a) have been repaired or altered outside of Seller's facilities; or (b) have been subject to misuse, negligence or accident; or (c) have been used in a manner contrary to Seller's instructions. In the case of the Products not manufactured by Seller, there is no Warranty form Seller, but Seller will extend to the Buyer any Warranty of Seller's supplier of such Products.

FORCE MAJEURE

Seller shall have no liability in respect of failure to deliver or perform, or delay in delivering or performing any obligations due to causes such as acts of omissions of Buyer; acts of God, fire, flood, war and civil disturbances; riot, acts of governments, currency restrictions, labor shortages or disputes, unavailability of materials, fuel, power, energy or transportation facilities, failures of suppliers or subcontractors to deliver on time and every other circumstance outside the reasonable control of Seller.

MODIFICATIONS

Unless otherwise provided, Seller reserves the right to modify the specifications of Products ordered by the Buyer providing that the modification will not materially affect the performance.

STORAGE CHARGE

If Buyer is unable to accept products in accordance with the applicable shipping schedule then Seller may arrange to store ordered Products and the cost of storage will be charged to Buyer.

ENTIRE CONTRACT

These provisions constitute all the terms and conditions agreed upon by the parties and shall replace and supersede any provisions on the face and reverse side of Purchase Order and any attachment thereto, or any prior general agreement inconsistent with the provisions hereof except that orders by Representatives with whom Seller has an Agreement shall be subject to the provisions of the Agreement. No modification hereof shall be valid unless in writing and duly signed by a person authorized by Seller. The provisions hereof shall not be modified by any usage of trade, or any course of prior dealings or acquiescence in any course of performance.