

LOGIC SEAL

OPERATOR'S MANUAL

For all following Models:
LS-100, LS-300, LS-400 & LS-500

www.LogicSeal.com

USA: (800) 325-6442



**FAILURE TO FOLLOW CORRECT OPERATING
PROCEDURES MAY DAMAGE UNIT**

PLEASE READ MANUAL THOROUGHLY ~ Thank you!



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CAUTION:
FAILURE TO FOLLOW OPERATING
INSTRUCTIONS MAY DAMAGE UNIT!
PLEASE READ THIS MANUAL THOROUGHLY.

WARNING: THE FOLLOWING CONDITIONS **WILL** DAMAGE UNIT:

- ❖ Running at temperatures **higher than 180° F**
- ❖ Using **Synthetic Oils** as Coolant Fluid
- ❖ Running with Drain Pressure **less than 5 PSI** or **more than** recommended
- ❖ **Reversing** Pump Rotation

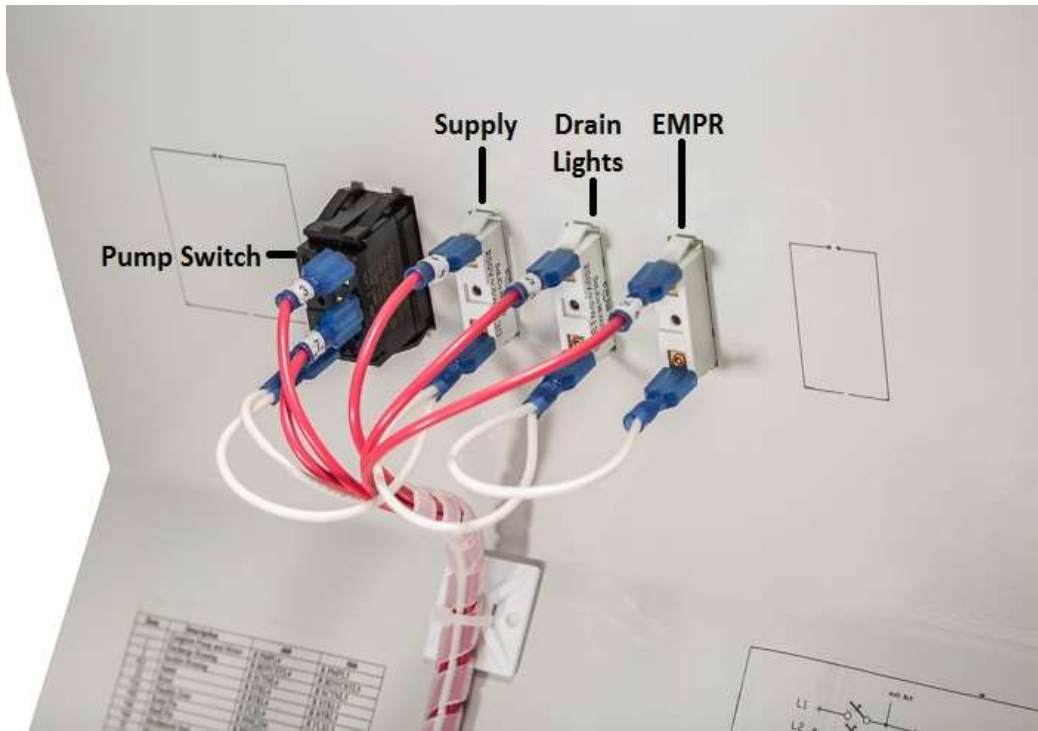


LS 100, 300 & 350 Ports are all 3/4" NPT

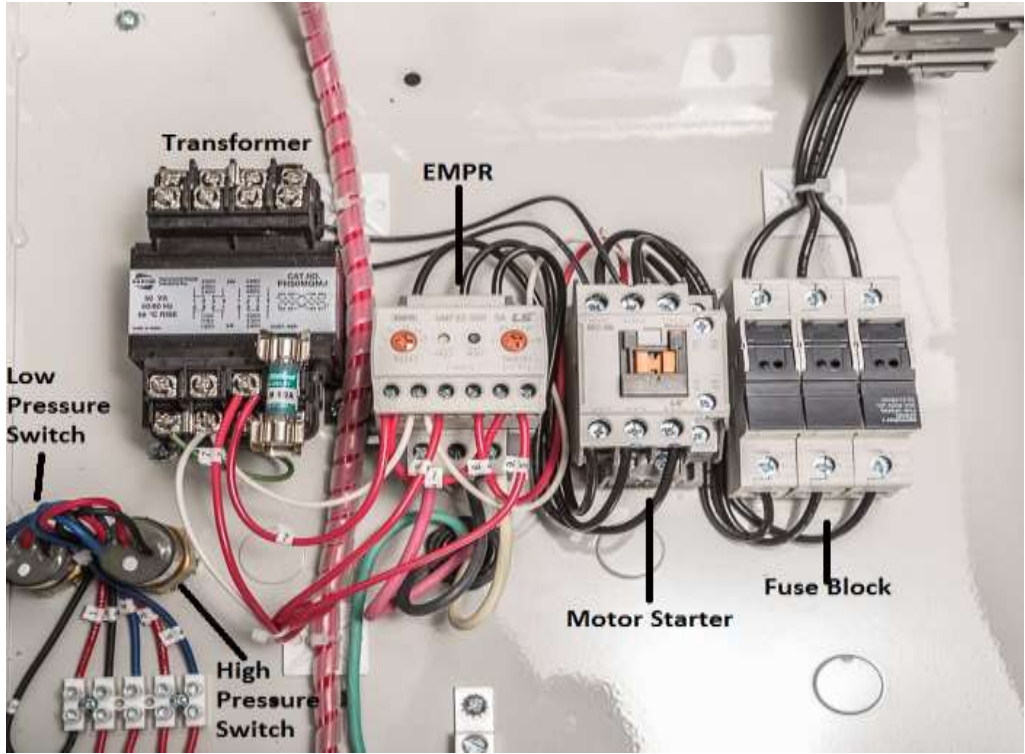
NOTE:

- ❖ Logic Seal **recommends** that there be Ball Valves on the Supply and Drain Ports
- ❖ Logic Seal **requires** that there be Ball Valves on the **TO** and **FROM** Mold Ports





INSIDE VIEW – (THREE PHASE SHOWN) ELECTRIC BOX



CONNECTING A POWER CORD

CAUTION:

ELECTRICAL CONNECTIONS SHOULD ONLY BE DONE BY QUALIFIED PERSONS. SAFETY: ALWAYS USE A PROPERLY GROUNDED CORD.

1) CHOOSING THE CORRECT WIRE

Voltage and Phase of Unit is labeled at power cord mounting hole and inside the electrical box at the terminal block. Electrical diagrams are in back of this Manual.

230 / 460 VAC, Three Phase Units: Use standard **4-wire** cord, 110 / 220 VAC, **Single Phase Units** use standard **3-wire** cord, UL approved and rated for the Full Load Amperage (**FLA**) Plus 25% per electrical code. FLA is recorded on the Motor Serial Plate. 14-Gauge wire is adequate for all Units.

Logic Seal LLC **does not** recommend wiring Unit directly to Fuse Box. Power cord should be mounted with a strain relief and connected to the terminal block located at the inside rear of the electrical box and terminated with an appropriate power connector.

Be sure that the Ground Wire of the power cord is connected to the Ground Connection on the terminal strip.



2. CONNECTIONS TO A MOLD:

For maximum efficiency and life of the Unit, use hoses that are the same diameter as the ports to which they are connected. "Quick Release" fittings are not recommended as they are more restrictive to flow and may open under negative pressure.

When using the Logic Seal as a Leak Stopper you will have maximum coolant flow when the **TO Mold** line is connected to the Mold at the point farthest from the leak.

2A) START-UP & ADJUSTMENTS:

Make all Hose connections to the appropriate ports at the back of the Unit. Begin with **Pump Switch** in the **OFF** position.

FOR NEW MOLD SETUP: Back the Regulator Screw all the way out (counter-clock-wise). Then turn the screw in (clockwise) until you feel it just touch the internal diaphragm spring. In this position the Regulator is set for maximum Vacuum. Valve Positions for Supply, Drain, To Mold, and From Mold are all **OFF**. Run-around Circuit Valve is located at the back of Unit and should be in the **OFF** position.

Step 1 Open **Drain Line** – Drain Gauge should read substantially less than 40 psi

Step 2 Open **Supply Line** – Supply Gauge should read NO less than 10 psi.

Step 3 Open **FROM Mold Valve**.

Step 4 Open **TO Mold Valve**.

Step 5 Turn **Circuit Breaker ON**, then turn **Pump Switch ON**. Switch will light up indicating power is supplied to Control Circuit. This will place your Mold and Mold Line under a Vacuum. A drop in Vacuum on the **FROM Mold Gauge** indicates a leak in the Mold and / or hoses.

Step 6 Adjust **Regulator**. Turn Regulator **IN** (Clockwise) until Mold leaks. Back Regulator screw out **SLOWLY** until leak stops. Continue to turn Regulator screw out a ¼ turn. This is your Maximum Vacuum / Flow for your Mold.

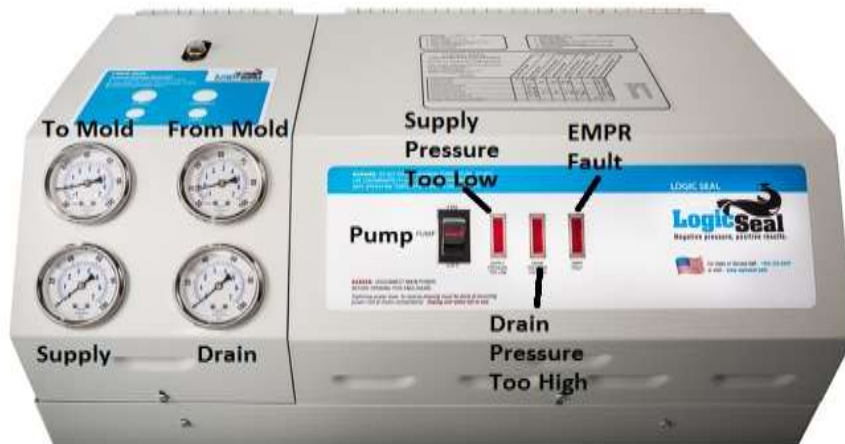
***When adjusting the Unit to a Mold, the Regulator should not be closed more than is necessary to stop the leak. This procedure will maximize the pressure differential across the Mold and provide the maximum coolant flow in the Mold. (If Regulator Screw is turned completely inward, please see Step 7)*

Running your Mold under the least amount of Vacuum will insure the long and trouble free life of your Logic Seal.

NOTE: The Regulator should only need to be adjusted once for a particular Mold. If readjusting has to be done please first look for system changes in this order Drain Pressure, Supply Temperature changes, and then look to trouble shooting.

Step 7 Adjusting the Run-Around Valve. If after you have completed Steps 1-6, And the Regulator is fully open (Regulator screw all the way down), and From Mold Gauge is showing High Vacuum, Slowly open the Run-Around Circuit ball valve, located at the back of the Unit, until Mold begins to leak. Close **slowly** until Mold stops leaking.





2B) PRESSURE INDICATOR LIGHTS

DO NO ATTEMPT TO ADJUST OR DISABLE THE PRESSURE SWITCHES.

“SUPPLY PRESSURE TOO LOW” This indicator light will come on when the Unit has shut itself down because the supply pressure is less than 8 PSI (note this light may go on and off as the supply pressure changes). Units have an internal supply pressure shut off switch to prevent the Pump from being damaged by running dry.

“DRAIN PRESSURE TOO HIGH” This indicator light will come on when the Unit has shut itself down because the drain pressure is greater than 40 PSI (note this light may go on and off as the supply pressure changes). Units have an internal drain pressure shut off switch to prevent the Pump from being damaged by running against high backpressure.

For additional information or problem solving, refer to [TROUBLESHOOTING GUIDE](#) or call [Logic Seal, Inc.](#) at: **800-32-LOGIC (800-325-6442)** in the USA, or **(203) 598-3400**.

2C) SHUT-DOWN & STORAGE

Step 1 – Close **TO Mold Valve**

Step 2 – To purge Mold allow air to enter **TO Mold Hose** until all water is emptied

Step 3 – Turn **Supply OFF**. (Unit will stop running)

Step 4 – Close **Drain**.

Step 5 – Close **FROM Mold Valve**.

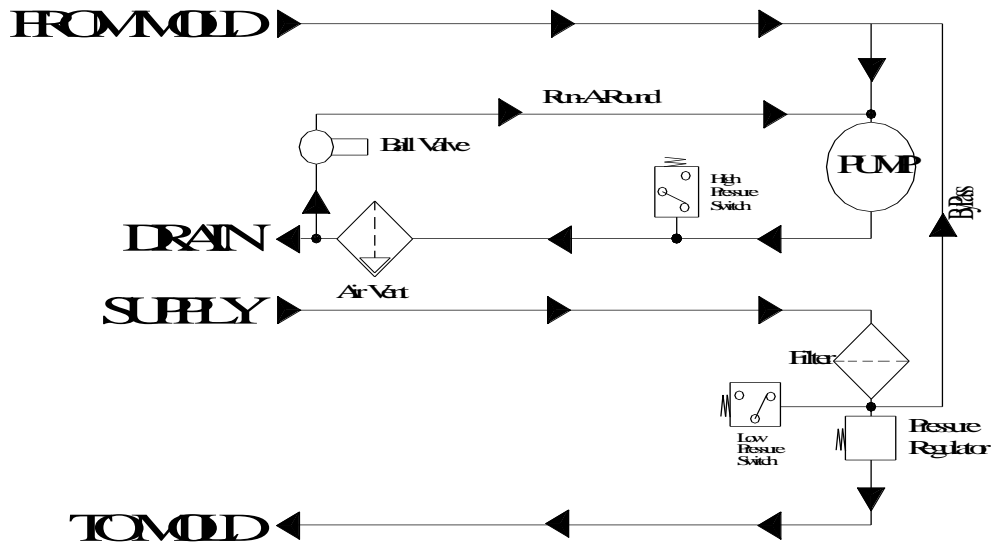
Step 6 – Turn **Pump Switch OFF**, then turn **Circuit Breaker OFF** – Unplug Unit.

Step 7 – Drain the Unit completely for storage of more than six months or for shipping.

Note: If you have been running pure water introduce a Glycol mixture into the Unit this will help to keep the Rotor from adhering to the Stator. ***It is important to drain the Unit when not in use for extended periods.***



3A) Logic Seal, Inc. Flow Diagram



3B) PRESSURE DROP ACROSS A MOLD

The reason water leaks out of anything is pressure, water has to overcome the pressure of the air holding it in. If you had a small hole in a hose, for example, and the pressure of the air pushing in on it was great enough, it would keep the water inside the hose. Since it is impossible to increase the pressure of the atmosphere, the Unit decreases the pressure of the water to the point where the air pressure holds it in.

When using our Unit, the water is pulled through a Mold at a lowered pressure. In all other circulating systems the water is pushed through, which increases pressure.

The pressure Regulator inside the Unit is used to limit the incoming water pressure to the leak. Regulating the flow to a Mold does not necessarily reduce the flow when using our Unit. Because the Logic Seal Unit draws a Vacuum on the from Mold line, the over-all pressure drop remains the same or even increases. This means that in many cases there is no loss of cooling flow and in some cases it may even be improved.

Logic Seal Units use a progressive cavity Pump because it can pump both water and air that may be drawn in from a leak. The air is then vented from the system before the water leaves the Unit.



3C) MOLD LEAK SIMULATION (Demo & Operation check)

Follow the Hook-up procedures in Section 2A, but substitute the Mold with a Jumper Hose. With the Jumper Hose between the **To Mold** and **From Mold** ports, pinch the Jumper Hose closed. The **From Mold** Gauge should show a Vacuum of more than 24 inches of mercury. With the Jumper Hose still pinched, you may now disconnect the Jumper Hose from the **From Mold** port. If you place your finger over the **From Mold** port you will feel the suction of the Pump. Reconnect your Jumper Hose now. To simulate a Mold leak, cut about half way through the diameter of the Jumper Hose. Notice that no water leaks from the Jumper Hose.

Open the Regulator (turn screw clock-wise) until water begins to leak from the cut Jumper Hose. The farther you open the Regulator, the more water will leak from the Jumper Hose. Slowly close the Regulator (turn screw counter-clock-wise) until the leak stops. The farther you close the Jumper Hose, the more air will be drawn in. (If you used a clear Jumper Hose, you will see the amount of air being sucked in at the leak.)

CONCLUSION: You have thoroughly checked the operation of the Logic Seal negative pressure Unit. Following and understanding the procedures outlined in “How a Logic Seal Works” will help in the future when dealing with Negative Pressure cooling. Remember that a Mold is much more complex than the simple Jumper Hose used in the “Mold Leak Simulation;” yet in general the same procedure should be followed.

RECAP: Start with Regulator adjusting screw turned out for maximum Vacuum, then turn in (clock-wise) until you notice a leak. Then back the screw out ¼ turn past where the leak stops. **Each time you make an adjustment, pause for a few seconds to allow the System to come to equilibrium before making another turn.**

LOGIC SEAL UNITS ARE GUARANTEED TO STOP MOLD LEAKS.

QUESTIONS or TECHNICAL PROBLEMS?

CALL LOGIC SEAL, INC.

800-32-LOGIC = (800) 325-6442

(203) 598-3400



3D) USING MOLD HEATERS WITH LOGIC SEALS

WARNING: Temperatures higher than 180°F, will damage Pump!

For proper operation of a Mold Heater with a Logic Seal, it is essential to make all connections as shown in the diagram. See "Connections for Logic Seal Unit Used with Mold Heater" on page 18.

Mold Heaters are pressurized by their open supply line; the return remains closed except for cooling. Therefore the incoming supply pressure becomes the minimum pressure of the system. In this situation, if the system pressure exceeds the back-pressure Pumping capabilities of the Logic Seal, the supply pressure must be reduced. As in the diagram, the purpose of the external Regulator on the Mold Heater supply line is to control the total pressure in the system. The Flow Control Valve allows a constant relief of pressure downstream of the Regulator even when the Mold Heater does not need cooling or the Return is shut off.

START-UP PROCEDURE – MOLD HEATER WITH LOGIC SEAL

- 1) Set Mold Heater to lowest temperature.
- 2) Turn power on to the Mold Heater. If necessary, increase pressure delivered by Mold Heater supply Regulator until there is sufficient pressure to start the Mold Heater.
- 3) Set the Logic Seal Regulator to the minimum pressure to Mold (screw backed out).
- 4) Adjust the Mold Heater Regulator as high as possible without overloading the Logic Seal.
- 5) Fully open the flow control by-pass valve.
- 6) Open the supply and return valves on the Mold Heater.
- 7) Turn power on to the Logic Seal.
- 8) Open the **Drain** line on the Logic Seal.
Always open the Drain before the Supply on Logic Seal Units
- 9) Open the **Supply** line on the Logic Seal.
- 10) Adjust the Logic Seal Regulator for minimum Vacuum required to stop the Mold leak. **DO NOT OVER-ADJUST**
- 11) Slowly close the flow control by-pass for the minimum amount that allows the Logic Seal to run continuously.

Never leave the Flow Control completely closed!



3E) FIXING PROBLEM LEAKS (multiple leaks into a Mold cavity)

MULTIPLE LEAKS ON A SINGLE MOLD CIRCUIT

If there are two or more leaks on one Mold circuit and they are grouped toward one end, they should be treated as a single large leak. However, if they are distributed almost evenly throughout the circuit, the flow cannot be maximized for any particular direction.

LEAKS INTO A MOLD CAVITY

In a few cases, if the leak is directly into the Mold cavity or core, the draw of the part when the Mold opens, or upon ejection, will cause a temporary high suction. This suction may draw out coolant into the cavity, if the Unit is not adjusted for a high enough Vacuum. In these cases, the ***tool must be in production*** for final adjustments.

In extreme cases, it becomes necessary to shut the flow off just prior to opening the Mold, eliminating such a leak. This can be done by installing a solenoid on the **To Mold** line which is closed by one of several methods: the clamp open signal from the Molding press, a cycle timer, or a parting switch between the Mold halves. The most efficient signaling method will depend on the type of cavity leak.

3F) OTHER PRODUCTS & SERVICES FROM LOGIC

Water Transfer Timer & Package

Includes all necessary plumbing and electronics to adapt your Logic Seal for Water Transfer Timer functions.

Vac-U-Temp Units

Need a Leak Stopper and Mold Heater with higher temperature and heat transfer fluid capability? This Unit has it all. Available in three models.

VT-1800 Water / Glycol up to 200°F

VT-2600 Water / Glycol up to 260°F

VT-3000 Oil up to 300°F

To receive detailed Sales Literature, please call us at: (800) 325-6442 or visit our website at: www.logicseal.com



4) TROUBLESHOOTING GUIDE:

CAUTION: Procedures in this Section that require accessing electrical components MUST BE DONE BY A QUALIFIED PERSON, who has proper electrical knowledge and will FOLLOW ALL SAFETY PROCEDURES.

4A) UNIT WILL NOT START – POWER LIGHT OFF (PRESSURE LIGHTS OFF)

Check all power connections. Check the power cords for breaks. Check the Motor Starter Overload.

THREE PHASE Units: If you have just installed a new power cord or plug, be sure that the phasing is correct. Check the transformer fuse. A blown fuse indicates an electrical fault in the control circuitry of the Unit. All electrical components, wires and terminal connections should be thoroughly checked before restarting the Unit. In very *rare* cases, the transformer itself may be bad. Use a meter to check for secondary coil output voltage.

4B) UNIT WILL NOT START – POWER LIGHT ON (PRESSURE LIGHTS OFF)

If the power light is on and both pressure lights are off, and the Unit is not running, the Motor starter coil may be defective.

- **SINGLE PHASE:** Check Motor capacitor.
- **THREE PHASE:** Check **EMPR** (Electronic Motor Protection Relay). **EMPR** Fault is determined by the **EMPR FAULT** Light on electric lid or the LED on the **EMPR**.
- **EMPR LED** will flash **RED** on and off, this indicates a Motor Overload. Check Motor Amperage. It may be necessary to adjust the **EMPR RC (A)** Dial slightly to alleviate nuisance tripping.
- **EMPR LED** will alternate **RED / GREEN** to indicate a Phase Fault. Switch two of the incoming lines.
- **NEVER SWITCH THE OVERLOAD OR MOTOR WIRES:** Pump Wires should *always* be **Black 1 / Red 2 / White 3**. The **EMPR** Overload is *always* **Red 1 / Black 2 / White 3**.



Example shown is 4.4 – 22.

4C) UNIT TURNS ON AND OFF – PRESSURE LIGHT ON

- **Supply Pressure Too Low:** There is insufficient supply volume to maintain the minimum pressure required to run the Pump. The filter screen inside the internal in-line supply strainer may be clogged. With constant use, check screen at least once a week. **DO NOT RUN WITHOUT A STRAINER SCREEN.**
- **Supply Line is restricted or shut off:** Check for blockage and closed valves.
- **Supply Hose may be too small:** Hose should be the same size as the Supply Port on the Unit.
- **Drain Pressure Too High:** Drain Line is restricted or shut off. Check for blockage and closed valves. Drain Hose may be too small (it should be the same size as the return port on the Unit). Your in-house water systems back pressure on the drain line may be greater than the Unit can safely handle without Pump or Motor damage. If this is the case, Back Pressure on the Logic Seal may be significantly reduced by connecting the drain output of the Unit to a Chiller or Mold Heater which will act as a booster Pump.

4D) UNIT TURNS ON AND OFF – PRESSURE LIGHTS OFF

If the lighted power switch is flashing, you have an intermittent power supply. Check power cord and voltage supply for breaks and loose connections.

- **LOW PRESSURE SWITCH CHECK:** Logic Seals have a low Pressure Switch to protect from running dry and damaging the Pump. When there is insufficient supply pressure (less than 6 PSI.), the Pump will shut off, the indicator light “Supply Pressure Too Low” will light. Quick test of the Low Pressure Switch - simply shut off the Supply line with an external valve. Unit should shut down. Reopen Supply line, Unit should automatically restart.
- **HIGH PRESSURE SWITCH CHECK:** Some Units have a high Pressure Switch because they require additional safety to protect from excessive back pressure on the drain line. The shut-off point of the high Pressure Switch is 40 PSI.
 - **CAUTION: When doing the following test, Valve must be connected directly to the Unit**
- **Quick test of the High Pressure Switch:** Simply shut off the Drain Line with an external valve. Unit should shut down. Re-open Drain Line, Unit should automatically restart.

4E) UNIT LOSES VACUUM:

- To check Logic Seal for an internal leak. Turn off Unit and close the **TO Mold, FROM Mold** and **Drain Valves**, leaving the **Supply Valve** open. This will pressurize the Unit and any leaks will quickly become evident so they can be repaired. If leaks are **not** found in the Unit, open the **To Mold Valve**. This will pressurize the Mold Circuit and leaks in any of the hoses or connections will become evident.



4F) EXCESSIVE AIR IN DRAIN LINE

- If ethylene glycol (anti-freeze) is being used, the action of the Pump may cause the fluid to “foam” inside the Pump. Air trapped in foam cannot be properly removed by the internal air-vent system. Reduce the percentage of ethylene glycol if possible.
- The system will run best if the ethylene glycol is 25% or less.
- Some Mold leaks are so large that more air may be sucked into the Unit than the standard Unit can expel. An auxiliary air vent can be installed externally on the drain port.

4G) NO COOLANT FLOW: HIGHER MOLD TEMPERATURE IN UNITS LINE

- Check the Mold circuit with compressed air to see if it is blocked. Reset the Vacuum; do this by turning the Regulator adjusting screw clock-wise until the Mold leaks, then slowly turn screw counter-clock-wise until leak stops plus ¼ turn. There should now be maximum flow across the Mold.
- Mold coolant channels can be blocked by small pieces of rust, plastic pellets or other debris that can often be dislodged by reverse flushing the Mold.

CAUTION: Never run the Logic Seal Motor backwards! Instead reverse the TO Mold and FROM Mold connections, allowing the water to flow through the Mold in the opposite direction. *However*, it should be kept in mind that operating the Mold with this setup may result in *less than optimum pressure drop* across the Mold.

4H) UNIT LEAKS AT PUMP OR MOTOR HOUSING

- **Motor:**
 - If the bolts that hold the Pump housing to the Motor are tight and it is still leaking, the seal may be damaged and should be replaced.
- **Pump:**
 - If the Pump halves and bolts are tight and it still leaks, the Stator may be damaged and should be replaced.

4I) HOSE COLLAPSES

Be sure that there are no sharp turns or loops in the hose. Hose must be rated for Vacuum **and** temperature.

4J) WATER DRAINS CONSTANTLY FROM VENT

The mechanical float or needle valve inside the air vent may have become clogged with sediments or worn out from use. If cleaning does not solve the problem, replace the vent.

4K) WATER BOILS

Water is at a temperature too high for the Vacuum being pulled. Reduce temperature or Vacuum to correct this issue.



5) BASIC MAINTENANCE PROCEDURES:

TO CLEAN SCREEN:

With constant use the Supply Line Strainer Screen should be cleaned at least once a week. A clogged Strainer Screen will restrict the water supply **and** reduces **both** Cooling and Leak Stopping efficiency, eventually causing the Unit to shut down to protect itself from running dry and damaging the Pump. **NEVER RUN WITHOUT SCREEN: Running without a screen can allow abrasive sediments to destroy internal parts of the Pump.**

DRAIN FOR STORAGE: Drain the Unit completely for storage periods exceeding 6 months.

SPECIFICATIONS AND PERFORMANCE DATA:

MODEL	Max	Capacity GPM	Supply	Port Size		
	Return PSI			Return	TO Mold	FROM Mold
LS-100	100	4.7	3/4"	3/4"	3/4"	3/4"
LS-300	40	14.6	3/4"	3/4"	3/4"	3/4"
LS-350	150	15.1	3/4"	3/4"	3/4"	3/4"
LS-400	40	24	1"	1"	1 1/4"	1 1/4"
LS-500	40	53	1"	1"	1 1/4"	1 1/4"

DIMENSIONS

Model	Weight	H	W	D
LS-100	120 lbs.	33"	24"	14"
LS-300	130 lbs.	33"	24"	14"
LS-350	200 lbs.	34"	36"	14"
LS-400	200 lbs.	33"	24"	14"
LS-500	250 lbs.	34"	36"	14"

OPERATING TEMPERATURE: 10°F or -12.2°C to a maximum 180°F or 82°C

CAUTION: *Electrical connections and Voltage changes should only be done by QUALIFIED PERSONNEL.*

CHANGING VOLTAGE:

- ❖ Replace Circuit Breaker with one rated for the appropriate amperage
- ❖ Adjust EMPR RC (A) setting for new Pump Amperage requirements (LS-400 & LS-500 will require an EMPR change)
- ❖ Change the jumper connections on the primary side of the transformer as indicated on the transformer
- ❖ Change the wiring on the Motor as per the diagram on the Motor plate
- ❖ Replace the voltage sticker labels to indicate the new voltage. This is an important step to help prevent correct power connections later on

Transformer jumpers and Voltage stickers will be supplied free of charge, but must be requested when placing an order.



SETTING & RESETTING OVERLOAD:

Logic Seal, Inc. presets the Trip Amperage RC(A) on all shipped Units. When installing a new EMPR the trip adjustment should be set to .1 over the FLA (Full Load Amperage) of the Unit. The FLA of each Unit is marked on the Motor Plate.

An Amp Meter may also be used to take a reading at the incoming power connection. A properly set Overload will trip and shut the Unit down when the Motor is over-stressed or malfunctioning. Be sure the Unit is in proper working order **before** pressing the Reset Button.

REASONS FOR OVERLOAD TO TRIP:

- ❖ Phase loss
- ❖ Clogged Strainer will cause repeated cycling from improper supply or drain pressures
- ❖ Motor has exceeded normal life expectancy

6) COMMON CAUSES OF PARTS FAILURE:

Failures usually occur in circumstances that can be avoided. It is important to completely read this Owner's Manual and familiarize yourself with the proper running and maintenance of the Unit. See the Cause of Parts Failure using the lists below. Finding these basic problems and correcting will help you to avoid having a recurrence of component failure in the future.

NOTE: This is only a check-list and is not intended to be a complete Troubleshooting Guide. Some Parts failure may occur for reasons not listed. Please refer to the Troubleshooting, Assembly and Disassembly of the Pump pages in this manual for additional information or call us at (800) 325-6442 xt 2 for Technical Support.

A) MOTOR – Cause of Failure:

- 1) Drain pressure too high, exceeds *40 PSI, check high Pressure Switch
*Except 100 PSI for LS100
- 2) Thermal overload has been set higher than the FLA of Motor, or the reset selector is not on the hand or manual position.
- 3) Improper attempt to change voltage.

NOTE: If a SINGLE PHASE is running at less than full speed, check the capacitor.

B) OVERLOAD – Cause of Failure:

- 1) Particulate contaminants have jammed moving parts or shorted the contacts.
- 2) Repeated on/off cycling has fused the contacts.
- 3) Check the strainer screen and hoses for restrictions

C) MECHANICAL SEAL – Cause of Failure:

- 1) Abrasive particles in the water, check internal filter screen is clean and in place
- 2) Worn Motor Bearings
- 3) Boiling water, steam in Pump (Stator often fails first)
- 4) Oil in circulation water (Note: some oils will attack rubber)
- 5) Improper replacement procedures



D) STATOR – Cause of Failure

- 1) From Mold Line is pressurized: when running ,the Gauge on this Line should always show a negative reading
- 2) Drain pressure is too low: less than 6 PSI, check low Pressure Switch. Unit ran dry
- 3) Drain pressure exceeds 45 PSI: make adjustments, check Pressure Switch where applicable
- 4) Boiling water: steam in Pump, Stator often fails first
- 5) Stator Stop has been removed*
- 6) Abrasive particles in the system water: Check that internal filter screen is in place and clean
- 7) Oil in circulation water: Some oils will attack the rubber
- 8) Improper replacement procedures

****WARNING: STATOR STOP MUST BE IN PLACE OR FURTHER DAMAGE MAY RESULT!***

E) FLEX JOINT – Cause of Failure

- 1) Abrasive particles in the system water. Check that internal filter screen is in place and clean
- 2) Boiling water, steam in Pump. (Stator often fails first)
- 3) Oil in circulation water. (some oils will attack the rubber)
- 4) No Stator stop present. (Stator can be sucked back over flex joint)
- 5) Loose pins
- 6) Improper replacement procedures

WARNING: Pins are NOT REUSABLE and must be replaced.

Reused Pins will not hold. They will eventually come loose and can damage the Pump. The Pins are tapered; if they cannot be easily hammered out, try going at it from the other end.

F) ROTOR – Cause of Failure

- 1) Abrasive particles in the system water. (Pitted Rotor) Check that internal filter screen is clean and in place
- 2) Unit ran dry (Stator burned into Rotor)
- 3) Oil or corrosives in the circulation water. (Stator breaks down and damages the surface of Rotor)
- 4) Improper replacement procedures



FOR REPLACEMENT PARTS:

Please have your **Model & Serial Number** when you call us for your
Repair/Replacement Parts:
(800) 325-6442, that's (800) 32-LOGIC in USA & Canada.

Logic Seal Units Replacement Parts

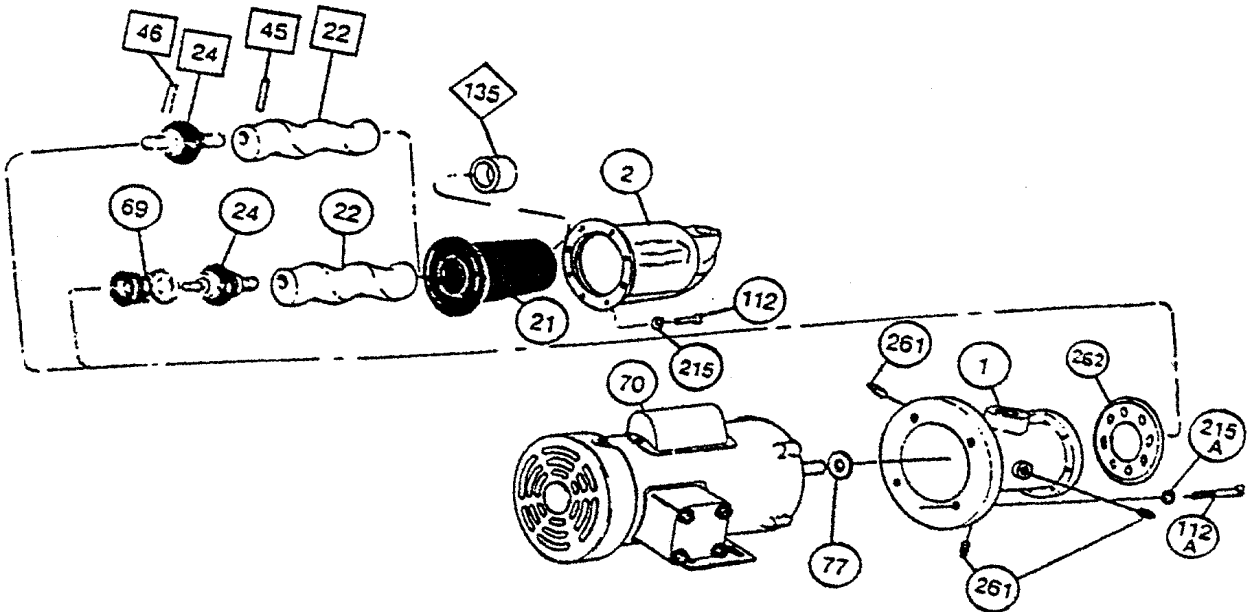
Description	Part #
Motor Starter.....	E CNTR-3-110
EMPR	E EMPR 1-5
EMPR (L 350/400/500 240 Volts)	E EMPR 4.4-22
1 Pole Fuse Block.....	E FUSBLCK 1POLE
3 Pole Fuse Block.....	E FUSBLCK 3POLE
Red Rectangle Light	E P-LGTRECT RED
Rocker Switch.....	E SW-ROCKER
Safety Disconnect Switch	E SW DCON-32
Safety Disconnect Switch Handle	E SW DCON-H
Low Pressure Switch	E SW L PRS
High Pressure Switch (Not in 100 / 350)	E SW H PRS
1/4" Solenoid (400/500 before 2014)	E SLND1/4 NC110
Single Float (400/500 before 2014).....	E SW1FLT
Control Transformer (3 Phase Only)	E TRNS-V050
2" Swivel Caster	H CSTR2
2" Rigid Caster.....	H CSTR2NS
3" Swivel Caster (350/500 Only)	H CSTR3
3" Rigid Caster (350/500 Only)	H CSTR3NS
30-0-100 2 1/2" Gauge (To & From Mold).....	P GA30-100
0-100 2 1/2" Gauge (Supply & Drain).....	P GA0-100
30-0-150 2 1/2" Gauge (350 To & From Mold).....	P GA30-150
3/4" Watts Regulator (100/300/350).....	P REG-3/4-WR
1" Watts Regulator (400/500).....	P REG-1-WR
Air Vent (All Logic Seals Starting 2014)	P VENT-L2/L3



Pump Breakdown for Models LS-100, LS-300 and LS-350

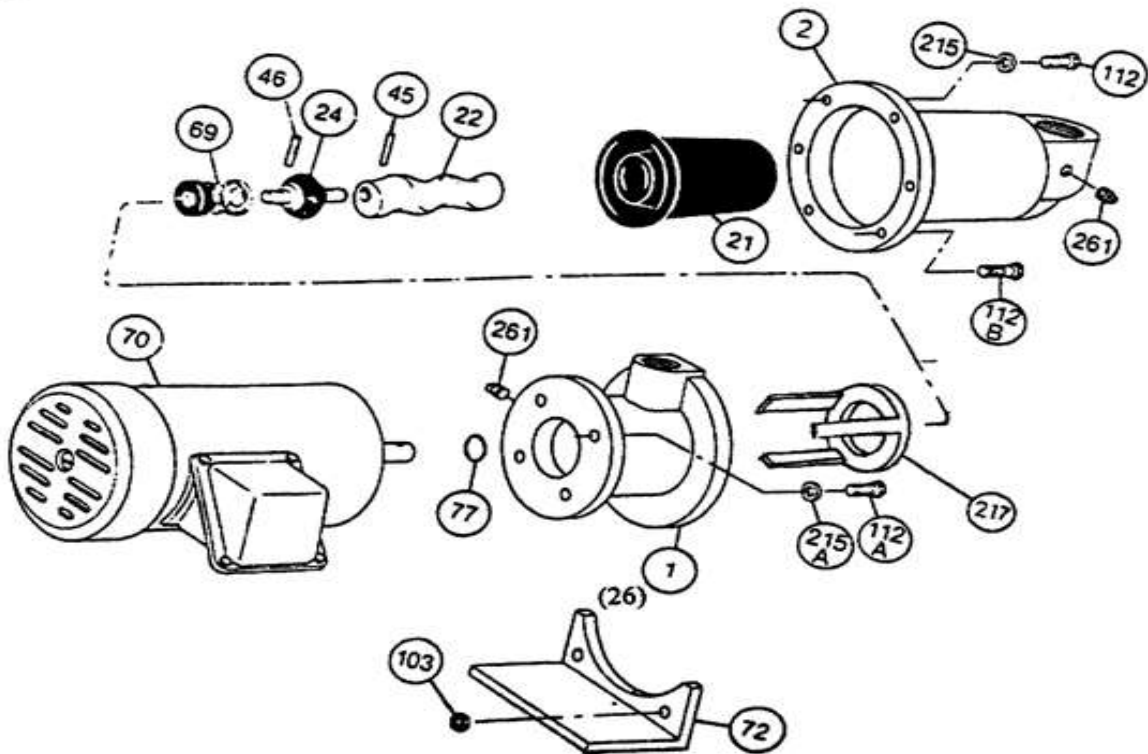
Item	Description	LS-100	LS-300	LS-350***
	Complete Pump & Motor Single Phase	R PMPL1-1	R PMPL3-1	N/A
	Complete Pump & Motor Three Phase	R PMPL1-3	R PMPL3-3	R PMPL350
1	Discharge Housing	R BDYCSTL23FLG	R BDYCSTL23FLG	R BDYCSTL35
2	Suction Housing	R SCTNL23	R SCTNL23	N/A
*21	Stator	R STRL1	R STRL3	R STRL35
*22	Rotor	R RTRL1	R RTRL3	R RTRL35
*24	Flex Joint Threaded	R FLXL23T	N/A	N/A
*24	Flex Joint Pinned	R FLXL23P	R FLXL23P	R FLXL35
*45/46	Rotor/Motor Pin	R PINL234	R PINL234	R PINL35
*69	Mechanical Seal	R SEALL23	R SEALL23	R SEALL354
70	Motor Single phase	R MTRL31RM	R MTRL31RM	N/A
70	Motor Three phase	R MTRL33RM	R MTRL33RM	R MTRL35RM
77	Slinger Ring	R SLNGRNGL23	R SLNGRNGL23	N/A
112	Screw Cap 8 Required	H S10-24x58SPH	H S10-24x58SPH	N/A
112A	Screw Hex 4 Required	H B38-16x1SH	H B38-16x1SH	H B516-18X1SH
135	Stator Ring	R STRRNG1	N/A	N/A
215	Lock Washer #10 8 Required	H W10-LW	H W10-LW	N/A
215A	Lock Washer 4 Required	H W38SL	H W38SL	H W516SL
261	Pipe Plug 1/4 NPT	P P-E-SUNK	P P-E-SUNK	P P-E-SUNK
262	Stator Stop	R STSTOPL23	R STSTOPL23	N/A
*Recommended Spare Parts				

*****Diagram does not fully reflect the LS-350
(Unit out of production but Parts still available)**



Pump Breakdown for Models LS-400 & LS-500

Item #	Descriptions	LS-400	LS-500
	Complete Pump and Motor	R PMPL4	R PMPL5
1	Discharge Housing	R BDYCSTL4	R BDYCSTL5
2	Suction Housing	R SCTNL4	R SCTNL5
*21	Stator	R STRL4	R STRL5
22	Rotor	R RTRL4	R RTRL5
*24	Flexible Joint	R FLXL4	R FLXL5
*45	Rotor Pin	R PINL234	R PINL5
*46	Shaft Pin	R PINL234	R PINL5
*69	Mechanical Seal	R SEALL354	R SEALL5
70	Motor	R MTRL4RM	R MTRL5RM
72	Motor Support	R L4 MOTSUP	N/A
77	Slinger Ring	R SLNGRNGL4	R SLNGRNGL5
103	Nuts 2 Required	H N38-16SH	H N38-16SH
112	Screw, Hex Head	H B38-16X112SH	H B38-16X112SH
112A	Screw, Hex Head 4 Required	H B38-16X1SH	H B38-16X1SH
112B	Screw, Hex Head 2 Required	H B38-16X2SH	H B38-16X2SH
215	Lock Washer	H W38SL	H W38SL
215A	Lock Washer 4 Required	H W38SL	H W38SL
261	Pipe Plug	P PE3X	N/A
217	Stator Stop	R STRSTOPL4	R STRSTOPL5
* Recommended Spare Parts			



We want to help you to **stop buying replacement Parts**. To avoid future replacements understand the **Number One cause of Parts failure** is dirty water!

While some oils, acids or fungi may also cause damage, the primary contaminates are loose particles. Usually small grains of sand or dirt may be carried through the in-house water system. Sometimes the contamination comes from dirty Mold lines. Many Pumps have been returned to us for repair, and upon inspection they are full of sand, plastic regrind, woodscrews, washers, nuts and even small stones. **All of our Units come equipped with an internal In-Line Water Filter**. Please be sure that the screen is in place and clean. If this filter requires excessive cleaning, **add a larger external filter to keep the water as clean as possible**. Also, be sure the Mold lines are clear **before** hook up.

Use this list to help determine the problem/conditions:

<u>Problem</u>	<u>Cause</u>
Rotor/other parts are pitted or scored	Dirt, sand, or other abrasive particles in water
Rotor black/Stator scored/Seal burned	Ran dry; Faulty low Pressure Switch
Stator collapsed (Outside Diameter)	Drain pressure too low
Stator bloated	Drain pressure too high, or chemical contaminate in water
Stator/Flex Joint rubber cracked or disintegrated	Excessive Heat. Boling water, steam in Stator – often fails first. Water will boil at a lower temp while under Negative Pressure (Vacuum).
Flex Joint broken	Rubber nicked during assembly. Oil lost; will wear out in a few hours of running. Stator Stop not in Unit. Flex Joint prevents Stator from moving toward Motor going over Flex Joint and tearing the rubber seal.
Seal mating surface rounded/grooved	Worn Motor bearings
Pin holes become oval	Pins have old or incorrect pins. Holes become damaged as fallen-out pins are knocked out.



The Number Two Cause: Improper Replacement Procedures

Please use the following procedures as needed for Parts replacements:

- **Remove Suction Housing** by removing the 8 screws & lock washers.
- **Remove the Stator**
 - ❖ Remove Stator by sliding it off the Rotor
 - ❖ Clean Stator by using slightly soapy water as this will help to lubricate
- **Remove the Rotor**
 - ❖ To remove a **Pinned Rotor**, use a wooden block to support Rotor. Using a pin punch, tap pin out from the thick side of the Rotor
 - ❖ To remove a **Threaded Rotor**, grasp Rotor and turn counter-clockwise. Note: the slot on the back of the Motor may be used to gain leverage
- **Remove the Flex Joint**
 - ❖ To remove a Pinned Flex Joint gently tap it out. Remember, Pin is tapered
 - ❖ To remove a Threaded Flex Joint, use the hex key slot at front of joint. Slot at back of Motor may be used here as well for leverage
 - ❖ Once the Flex Joint has been removed, remove the 4 hex bolts and lock-washers from discharge housing. Slide housing with Pump Seal Assembly off Motor shaft
 - ❖ With Discharge Housing face down, gently pry out ceramic lower seal & boot
- **Check the Motor bearings**
 - ❖ Using an indicator, check Motor shaft movement. An in/out movement of over 1/16" or an up/down movement of over .003" means the Motor bearings are worn and need to be replaced. Replacement will help avoid seal damage
 - ❖ Make sure all surfaces that will come in contact with the Seal parts are clean and free of burrs
 - ❖ Gently place new rubber boot and ceramic lower seal assembly into recessed section of discharge housing. Using a wooden dowel push lower seal assembly into place
 - ❖ Replace discharge housing on Motor carefully, as not to upset lower seal assembly
 - ❖ Using soapy water as a lubricant, gently slide upper seal assembly onto shaft until firmly against lower seal. Place spring and tension plate into place
 - ❖ With new seal in place, reverse steps 1- 4 & reassemble (*important to make sure to tap Rotor pin into place through the thin side of the Rotor for pin strength*)

LOGIC SEAL Electrical Lid Connections.

****High Drain Pressure Light
not used on the LS 100 & 350.****

****EMPR Fault Light
not used on Single Phase Units.****



Pump
Switch



Low
Supply
Pressure



High
Drain
Pressure



EMPR
Fault
Light

LS Electrical Base Connections.

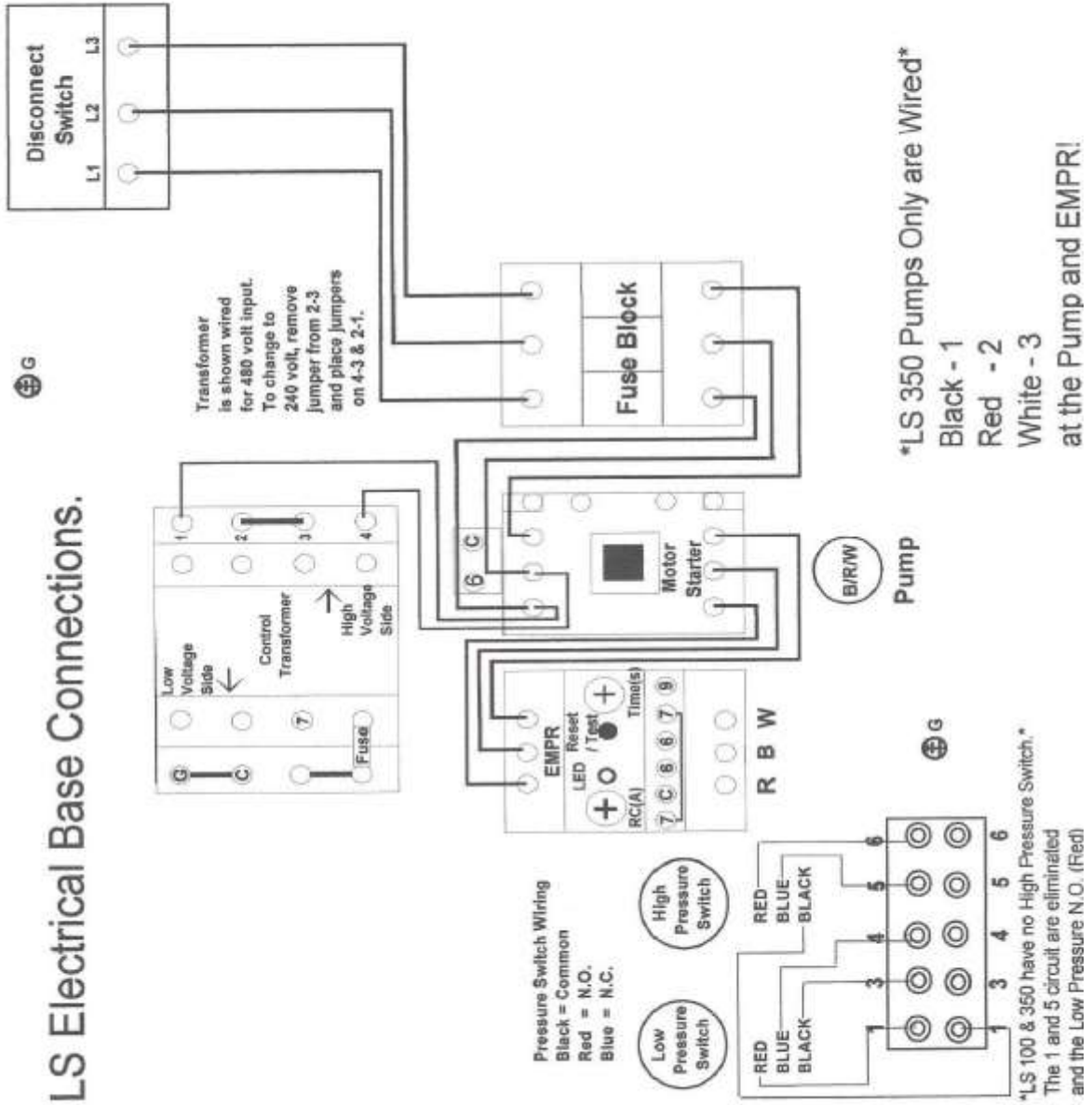
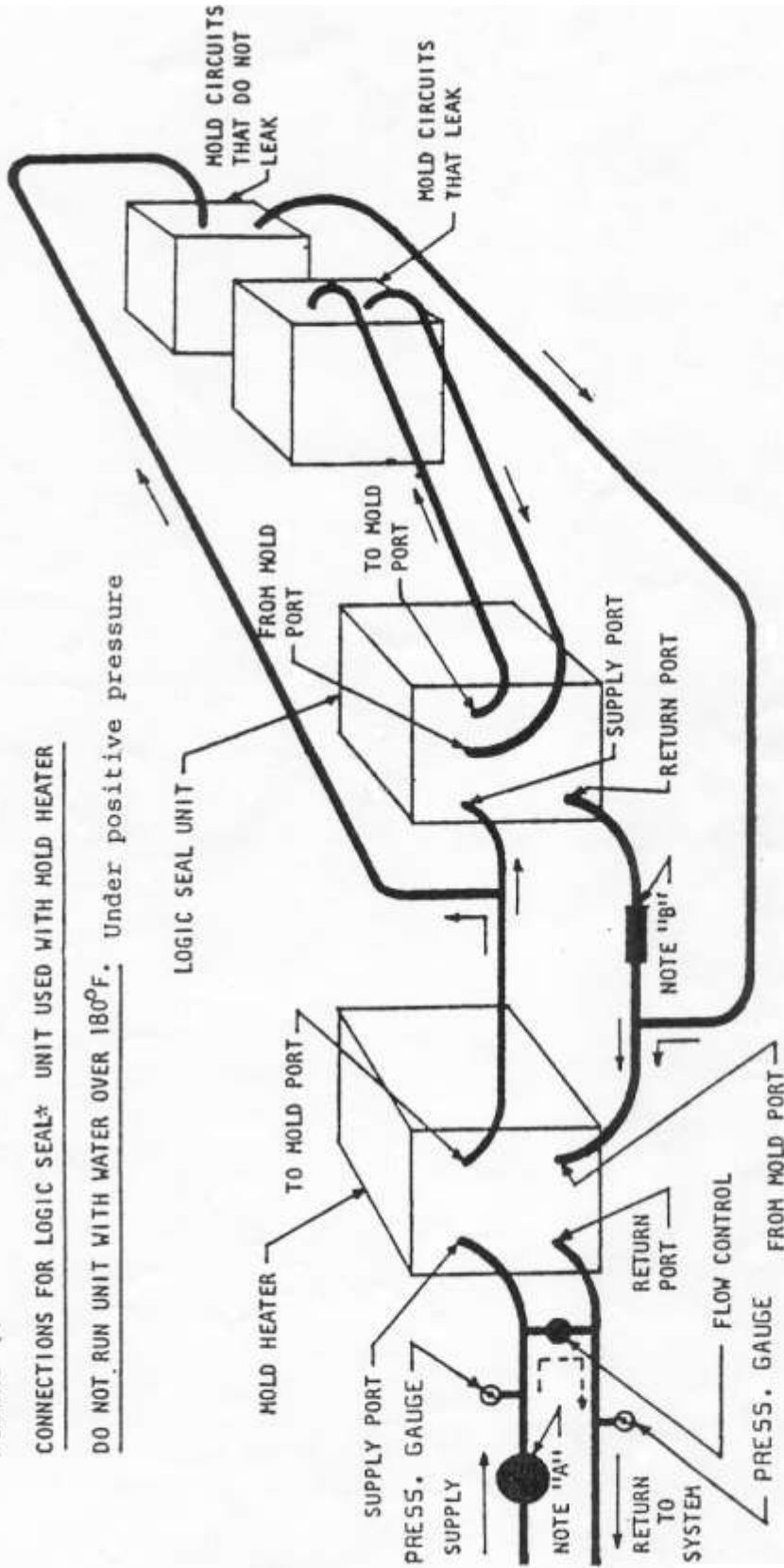


FIGURE 1.

CONNECTIONS FOR LOGIC SEAL® UNIT USED WITH HOLD HEATER

DO NOT RUN UNIT WITH WATER OVER 180°F. Under positive pressure



- NOTES:
- A. WHEN SUPPLY PRESSURE IS GREATER THAN 45 PSI, USE REGULATOR VALVE, AS NOTED. IT MUST BE SET SO THAT COOLANT PRESSURE, DOWNSTREAM OF REGULATOR, IS GREATER THAN SYSTEM BACK PRESSURE AT THE RETURN LINE.
 - B. THE PURPOSE OF THE SIGHT GLASS IS TO CHECK FOR AIR IN THE RETURN LINE. IF THE LEAK IS VERY LARGE, THE LOGIC SEAL UNIT MAY NOT BE ABLE TO EXPEL ALL THE AIR. IF THIS IS THE CASE AN EXTRA AIR VENT SHOULD BE PLACED AT THE RETURN PORT OF THE LOGIC SEAL UNIT, AS AIR RETURNED TO THE MOLD HEATER COULD CAUSE PUMP CAVITATION AND, POSSIBLY, DAMAGE THE HEATERS.

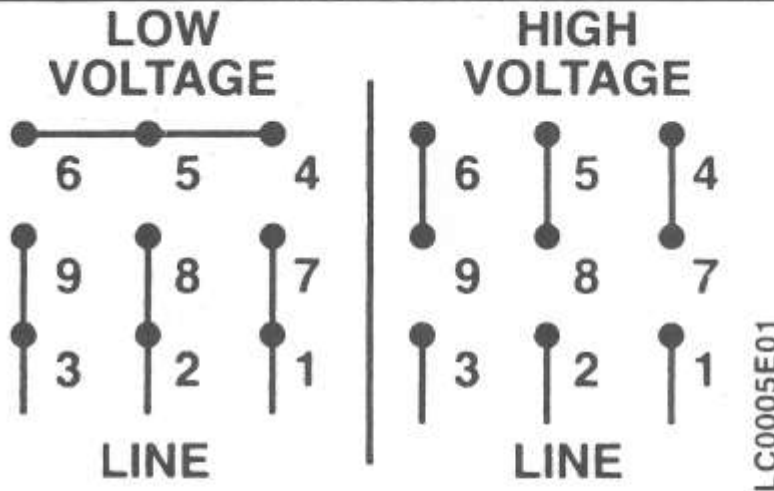
⚡ "LOGIC SEAL" IS A REGISTERED TRADEMARK
 MOLD HEATER ADAPTER PACKAGE AND AUXILIARY TEMPERATURE CONTROLLER ALSO AVAILABLE.




WARNING

MOTOR MUST BE GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODES BY TRAINED PERSONNEL TO PREVENT SERIOUS ELECTRICAL SHOCKS.

TO SERVICE MOTOR, DISCONNECT POWER SOURCE FROM MOTOR AND ANY ACCESSORY DEVICES AND ALLOW MOTOR TO COME TO A COMPLETE STAND STILL.



INTERCHANGE ANY TWO LINE WIRES TO REVERSE ROTATION.

THERMOSTAT LEADS (WHEN PROVIDED) 

***This High/Low Voltage Diagram
is for the LS-400 and LS-500 Units only***

Important Motor Caution for LS-400 Only

Logic Seal Motor Phasing and proper Motor Rotation

LS-400 Pump with Threaded Flex Joint:

DO NOT RUN THIS MOTOR BACKWARDS

If you run the Motor backwards, the Flex Joint will become detached from the Motor.

To insure proper Rotation, please wire Pump per factory specifications.

For LS 400's Equipped with a **BALDOR** Motor the Wiring is as follows:

Motor Side wire: **Black L1** / **Red L2** / White L3

Overload / Phase Monitor (EMPR) wire: **Red T1** / **Black T2** / White T3

For LS 400's Equipped with a **WEG** Motor the Wiring is as Follows:

Motor and Overload (EMPR) wire: **Black L1** / **Red L2** / White L3

If Phase Incorrect Fault occurs (EMPR is flashing **Red** / **Green**), change two of your incoming Power Leads.

Thank you for supporting Made in America!

PATENT INFORMATION:

LOGIC SEAL, U.S. # 4,278,230

VAC-U-TEMP, U.S. # 4,287,941

CLUSTER VALVES, U.S. # 4,257,775

CONTACT COOLING, U.S. # 4,177,238

WATER TRANSFER, U.S. # 4,151,243

WATERLINE VENTING, U.S. # 4,091,069



Important Motor Caution for LS-100, LS-300 & LS-500

To insure proper rotation, please wire Pump
per factory specifications:

Motor Side wire: **Black L1** / **Red L2** / **White L3**

Overload / Phase Monitor (EMPR) wire:

Red T1 / **Black T2** / **White T3**

If Phase incorrect fault occurs (*EMPR is flashing **Red** / **Green***),
change two of your incoming Power Leads.

*Technical questions can be directed to our Production Manager at:
(203) 598-3400 xt 2 between 7am-3pm EST or email:
Gary@LogicSeal.com*



Warranty and Return Policy

Logic Seal, Inc. has a Mission Statement, Code of Honor and Policy in place such that our Customers' satisfaction is of primary importance.

Logic Seal / Vac-U-Temp / Trooper Units, manufactured by *Logic Seal, Inc.* are guaranteed to be free from defects in materials and workmanship for a period of one year from the date of shipment. This Warranty is limited to the repair and/or replacement of Parts, *including* Labor. Any Unit or Part proven defective upon inspection by *Logic Seal, Inc.*, will be replaced or repaired without charge under this Warranty agreement in a prompt and timely manner.

Regarding Returns for repair, exchange or replacement:

All Returns require a Return Goods Authorization (RGA). Please call *Logic Seal, Inc.* at: (800) 325-6442 *before* sending any Items back so that they may be assigned a RGA. There will be a 35% Restock Fee when applicable. This Fee also applies to Spare Parts, unless said Spare Parts are defective and returned against an authorized RGA.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Operations Manuals are provided with each Unit upon day of purchase and can be obtained by our Customers through email or snail mail by calling our home office at (800) 325-6442 or email us at: Logic@LogicSeal.com. If it is deemed not a manufacturing defect, then it is the Customer's responsibility to pay transportation fees to and from *Logic Seal, Inc.*

No allowances, credits or reimbursements will be made for any replacement or repair unless authorized by Senior Management of *Logic Seal, Inc.*

Note: If the equipment is returned outside the warranty period, the customer is responsible for freight and repair costs. Costs will be invoiced to the customer after completion of repair. *Logic Seal, Inc.* will do its best to keep the repair costs to a minimum.

Please keep this page as your Record of Purchase:

Model# _____

Serial# _____

Date Shipped: _____

Warranty Expiration _____

