INSTRUCTION MANUAL

Leakmaster Negative Pressure System

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MOK5002 3/15

Table of Contents

Section 1 – Warnings and Cautions

Please read and understand this section before operating the system!

1.1 Electrical warning

The Mokon Leakmaster negative pressure system, as with all high voltage electrical equipment, should be connected according to all local and national codes. All installation, maintenance, service, repair, adjustment, and operation should be done only by qualified trained electrical personnel who have read and completely understood this instruction manual. To the upper right is a symbol for **ELECTRICAL DANGER**. When it is seen on the following pages of this manual as well as on the system, care should be taken to avoid possible electric shock. All maintenance and service should be performed with the power isolated and locked out except where noted.

1.2 Hot fluid warning

Exercise **EXTREME CAUTION** while working on or in the area of the Mokon Leakmaster negative pressure system. The high temperature of the fluid will cause the process lines, the system components, and the metal cabinetry to become **VERY HOT** and therefore should **NOT** be touched. To the upper right is a symbol for **SURFACE MAY BE HOT, HIGH TEMPERATURE**. When it is seen on the following pages of this manual, care should be taken to avoid possible burns. All maintenance and service must be performed with the system completely cooled.

1.3 Cold weather caution

If the Mokon Leakmaster negative pressure system will be moved from your plant or placed into storage, where it could be subjected to freezing temperatures; the system must be completely drained of water and completely filled with antifreeze. This will keep the pump lubricated and preserve the pump seal as well as protect the system from freezing temperatures. Failure to follow this precaution can result in serious system damage.

1.4 Quick disconnect fitting caution

Quick disconnects should **NOT** be used on any of the Mokon Leakmaster negative pressure system connections. Quick disconnects do not seal well under negative pressure. These fittings will allow additional air to enter into the system that will prevent your unit pulling enough vacuum. Under these conditions the unit will appear to be undersized and unit will leak excessively.

1.5 Pump rotation caution

Check the pump rotation on initial start up and if the unit has been moved from one power source to another. Running the pump backwards can severely damage the pump **immediately**.

1.6 Maximum temperature warning

The maximum operating temperature of the Mokon Leakmaster negative pressure system is **180°F.**

1.7 Supply water and drain water pressure warning

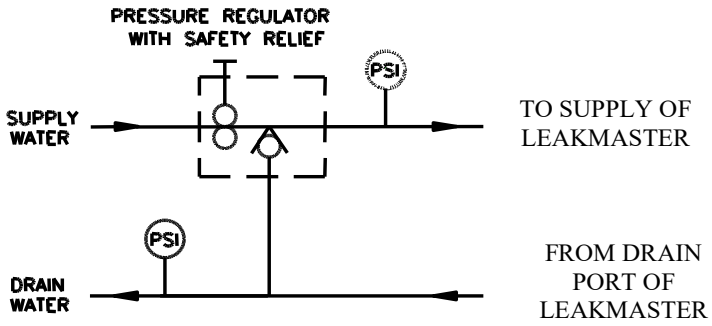
- To achieve proper operation of the Mokon Leakmaster negative pressure system, **a minimum fluid supply pressure of 20 PSI** must be supplied to the unit at all times. A factory set low-pressure safety switch in the Mokon Leakmaster negative pressure system will shut the unit off in the event of insufficient supply pressure. This switch is factory set at 4-8 PSI and protects the pump from running dry, which would quickly damage it.

- **Maximum recommended supply water pressure is 45 PSI on the 9 GPM systems and 60 PSI on the 24 GPM systems.**

- **Maximum recommended drain backpressure is 0 PSI.** The drain line must always be fully open and non-restricting. ALWAYS open the drain line PRIOR to opening the water supply line.

  If the system is run with the drain line restricted or fully closed, excessive pressure will build and will damage the system's pump.

- If your supply pressure is higher than the maximum recommended pressure please install the following regulator kits part number 400144 for a 9-GPM system or part number 400047 for the 24-GPM system.



- If your drain line has high backpressure the Mokon Leakmaster negative pressure system may not be able to pull the required vacuum, the system may shut down on high pressure. There is a high-pressure safety switch in the Mokon Leakmaster negative pressure system that shuts the system off in the event of excessive pressure this switch is factory set a 50 PSI.

1.8 Short circuit current rating caution

Equipment supplied with a safety door disconnect is design rated for a short circuit current rating (SCCR) of 5,000 amperes RMS if protected with a class "RK5" fuse and, equipment supplied with a power cord is design rated for a short circuit current rating (SCCR) of 10,000 amperes RMS if protected with a class "J" fuse.

Section 2 – Installation

2.1 Unpacking

Upon arrival inspection should be done to assure there was no damage during shipping.

The **maximum** weights of the Mokon Leakmaster negative pressure when drained of water are:

NP1000, NP2000, and NP4000 – 110 lbs.
NP1100, NP2100, and NP4100 – 170 lbs.

Properly rated equipment should be used to move this machinery.

When removing system from pallet, lift from bottom only. Care should be taken to ensure that the system will not tip. After removing from pallet, the system should only be placed on a level surface.

2.2 Location

Mokon systems should be located in an area that provides adequate space for pedestrian and vehicle traffic. If this is not feasible, owner should provide additional safeguards including safety signs.

For optimum system performance, allow adequate space and ventilation around entire system, as well as a means to direct vapors away from work area.

There should be a minimum of four (4) feet of clearance around the entire Mokon system (all sides) for adequate ventilation and operation of the system.

If braking casters are included, they must be in the locked position when system is in the operating position. Prior to moving, unlock the casters.

Customer supplied and installed air vents (mechanical or electrical) should be placed at the highest point in the process for application where the process height is greater than eight (8) feet above Mokon system.

2.3 Warnings

Owner should ensure by adequate supervision that correct safety, installation, maintenance and operating procedures described in this manual, as well as recognized industry practice, are followed by all personnel.

All panels must be in place during normal operation.

The top of the machinery should not be used for storage.

Power sources or energy types referred to in this manual are water and electricity.

This machinery is not for use in hazardous or explosion proof environments.

Under normal operating conditions, the decibel level of the machinery is 67 db or lower.

Any alteration, additions or modifications to any part of the system must receive prior written approval from Mokon's Engineering or Customer Service Departments.

Refer to serial tag for motor and heater electrical information and schematic drawing number.

2.4 Electrical connections

WARNING: The Mokon Leakmaster negative pressure system, as with all high voltage electrical equipment, should be connected according to all applicable state and local codes. All installation, maintenance, service, repair, adjustment, and operation should be done only by qualified trained electrical personnel who have read and completely understood this instruction manual.

Before operating the Mokon Leakmaster negative pressure system, the grounding wire must be connected. The grounding wire is the green or green and yellow wire connected to the frame of the system.

Connect ground wire to the ground screw (labeled GND or PE) located in the electrical box. Connect power lines L1, L2, L3, to the terminal blocks marked L1, L2, and L3 respectively, inside the electrical box for three phase models. 110 Volt models require a standard three-wire extension cord that must be U.L. approved and rated for 15 amps. Customer supplied main disconnect switch should be fused for proper amp draw.

2.5 Water connections

Exercise extreme caution while working on or in the area of the Mokon negative pressure system. The high temperature of the fluid will cause the process lines, the system components, and the metal cabinetry to become very hot and therefore, they should not be touched.

The Mokon Leakmaster negative pressure system may be used alone, in conjunction with a Mokon temperature control system (or other temperature control system), or as a booster/assist pump. The following is a description of how to make the water connections on the Mokon Leakmaster negative pressure system depending on how it is being used.

There are four (4) or five (5) convenient and clearly marked connections, "Supply Water," "To Process," "From Process," "Drain Water" and "Air Vent Drain" (24 GPM system only).

NOTE: Quick disconnects should not be used on any of the Mokon negative pressure system connections. Quick disconnects do not seal under negative pressure. These fittings will allow additional air to enter into the system that will prevent your system from pulling enough vacuum. Under these conditions the system will appear to be undersized and will leak excessively.

Leakmaster used alone

Caution: The "Supply Water" fluid connection must not be valved in any way. Unless using a pressure regulator supplied by Mokon to reduce high supply pressure.

Supply Water: Connect this port to an adequate source of cold, clean supply water. With a pressure minimum of 20 PSI and a maximum of 45 PSI on 1000 series systems and 60 PSI on 1100 series systems. Do not restrict incoming water to the Mokon Leakmaster negative pressure system for the reasons outlined above. Unless using a pressure regulator supplied by Mokon to reduce high supply pressure.

The supply water should also be connected to the inlet on the non-leaky half of the mold. Use full size unrestricted high temperature hose or pipe.

To Process: Connect this port to the process inlet on the leaky half of the mold. Use full size unrestricted high temperature hose or pipe rated for the proper pressure and temperature.

From Process: Connect this port to the process outlet on the leaky half of the mold. Use full size unrestricted high temperature hose or pipe.

Fluid connections for the Mokon Leakmaster negative pressure system used alone

Caution: The "Drain Water" connection must not be valved in any way. Inplant recirculating systems return line pressure restricts the performance of the Mokon Leakmaster negative pressure system. Maximum allowable backpressure is 0 PSI.

Drain Water: Connect this port to an open drain (or return line in an inplant closed recirculation system). The outlet on the non-leaky half of the mold should also be connected to drain. Use full size unrestricted high temperature hose or pipe.

Air Vent Drain: Connect this port to an open drain. This connection is to purge air from the drain line. Any backpressure on the drain water connection may cause water to come out of this port. If entrapped air will not interfere with the process (i.e. cooling tower), this port may be plugged.

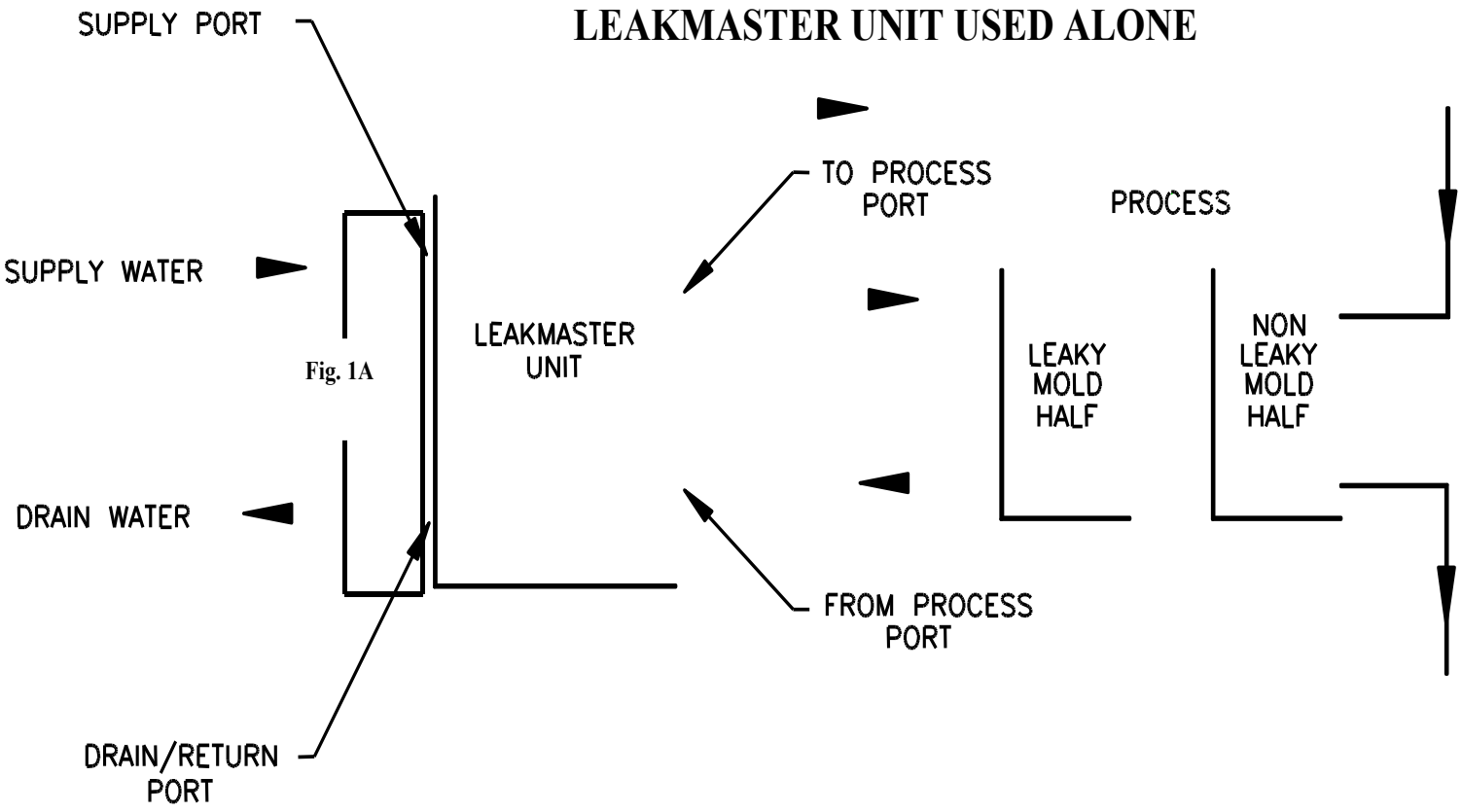
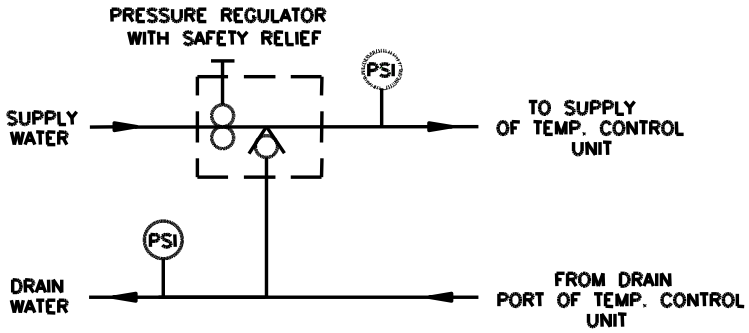


Fig. 1A

Leakmaster used with a Mokon temperature control system

The Mokon Leakmaster negative pressure system was designed to operate best with a Mokon temperature control system, but can be used with any brand name temperature controller. Note that when a Mokon Leakmaster negative pressure system is used in conjunction with a Mokon temperature control system and temperature control systems other than Mokon's that does not have a pressure regulator, a special valve assembly kit is required. The valve kit assembly can be purchased directly from Mokon as an option. The diagram below is the valve kit connections.



NOTE: That even when operating with a temperature control system the maximum operating temperature is still 180°F.

Caution: The "Supply Water" fluid connections must not be valved in any way.

Supply Water: (Leakmaster) Connect this port to the "To Process" port on the temperature controller. The "To Process" port on the temperature controller should also be connected to the inlet of the non-leaky half of the mold. Use full size unrestricted high temperature hose or pipe.

Supply Water: (Temperature Controller) Connect this port to an adequate source of cold, clean supply water. Do not restrict incoming water to the temperature controller. Unless using a pressure regulator supplied by Mokon to reduce high supply pressure. Use full size unrestricted high temperature hose or pipe.

To Process: (Leakmaster) Connect this port to the process inlet on the leaky half of the mold. Use full size unrestricted high temperature hose or pipe.

From Process: (Leakmaster) Connect this port to the process outlet on the leaky half of the mold. Use full size unrestricted high temperature hose or pipe.

Fluid connections for the Mokon Leakmaster negative pressure system used in conjunction with a Mokon temperature control system

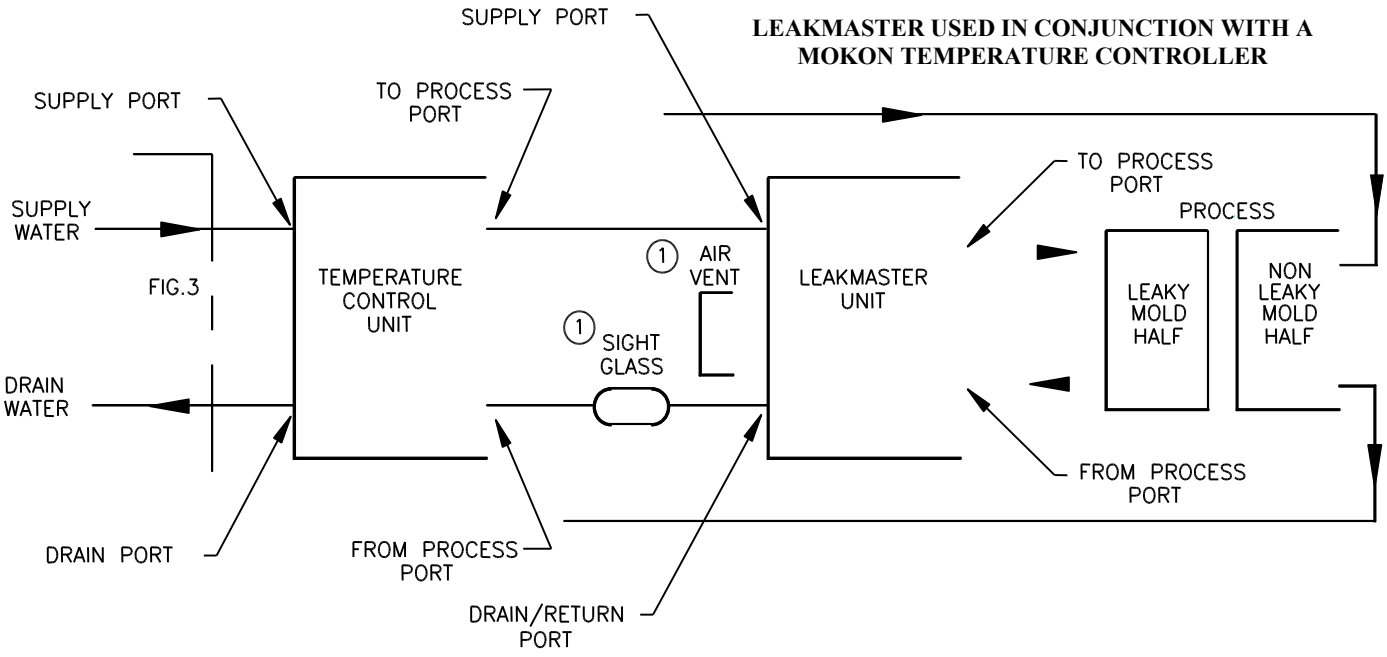
Caution: The "Drain Water" connection must not be valved in any way. Inplant recirculating systems return line pressure restricts the performance of the Mokon Leakmaster negative pressure system and the Mokon temperature control systems. If the plant drainage systems are pressurized in any way the temperature control unit will lose its' cooling capabilities. Consult the Mokon factory for recommendations.

Drain Water: (Leakmaster) Connect this port to the "From Process" port on the temperature controller. Also connect the outlet on the non-leaky half of the mold to the "From Process" port on the temperature controller. Use full size unrestricted high temperature hose or pipe.

Drain Water: (Temperature Controller) Connect this port to drain (or return line in an inplant closed recirculation system). Use full size unrestricted high temperature hose or pipe.

Air Vent Drain: Connect this port to open drain. This connection is to purge air from the drain line. Any backpressure on the drain water connection may cause water to come out of this port. If entrapped air will not interfere with the process (i.e. cooling tower), this port may be plugged.

NOTE: It is recommended that a sight glass be installed (not provided) to check for air in the return line going back to the temperature control system. Dependent upon the leak size, the Mokon Leakmaster negative pressure system may not be able to disperse all the air from the system. If this is the case, an extra air vent should be installed on the line between the "Drain water" port of the Mokon Leakmaster negative pressure system and the "From Process' port on the temperature control system.



Leakmaster used as a booster/assist pump

The Mokon Leakmaster negative pressure system can be used as a booster or an assist pump to increase the pressure differential across a non-leaky process, where low plant water conditions or very restrictive processes are present. The maximum operating temperature of the Mokon negative pressure system is **180°F**.

Caution: The "Supply Water" fluid connection must not be valved in any way. Unless using a pressure regulator supplied by Mokon to reduce high supply pressure.

Supply Water: Connect this port to an adequate source of cold, clean supply water. With a pressure minimum of 20 PSI and a maximum of 45 PSI on (1000 series) and 60 PSI on the (1100 series) units. **Do not restrict incoming water to the Mokon Leakmaster negative pressure system**. Supply water should also be connected to the process inlet. Use full size unrestricted high temperature hose or pipe. Unless using a pressure regulator supplied by Mokon to reduce high supply pressure.

To Process: Plug this port.

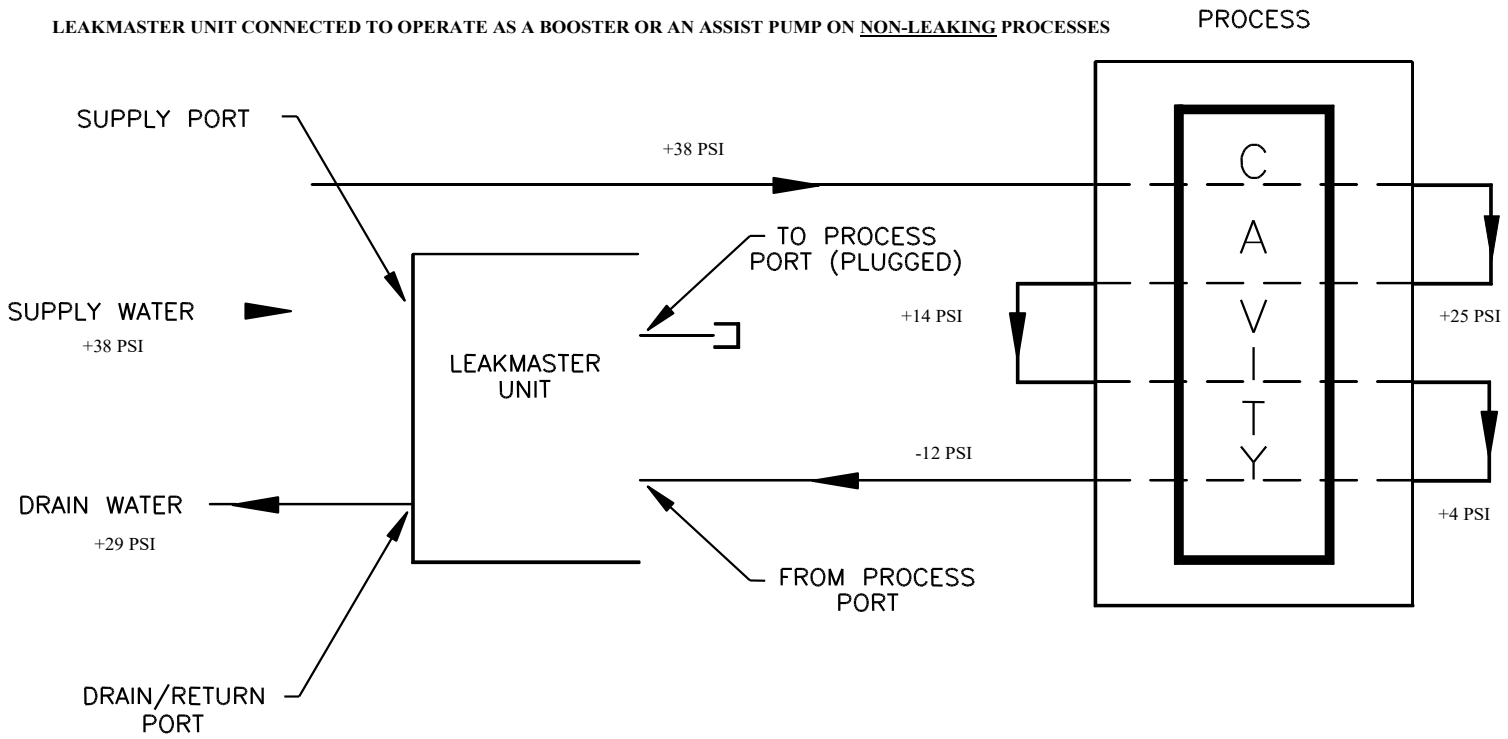
From Process: Connect this port to the process outlet. Use full size unrestricted high temperature hose or pipe.

Caution: The "Drain Water" connection must not be valved in any way. Inplant recirculating systems return line pressure restricts the performance of the Mokon Leakmaster negative pressure system. Consult the Mokon factory for recommendations.

Drain Water: Connect this port to drain (or return line in an inplant closed recirculation system). Use full size unrestricted high temperature hose or pipe.

Air Vent Drain: Connect this port to open drain. This connection is to purge air from the drain line. Any backpressure on the drain water connection may cause water to come out of this port. If entrapped air will not interfere with the process (i.e. cooling tower), this port may be plugged.

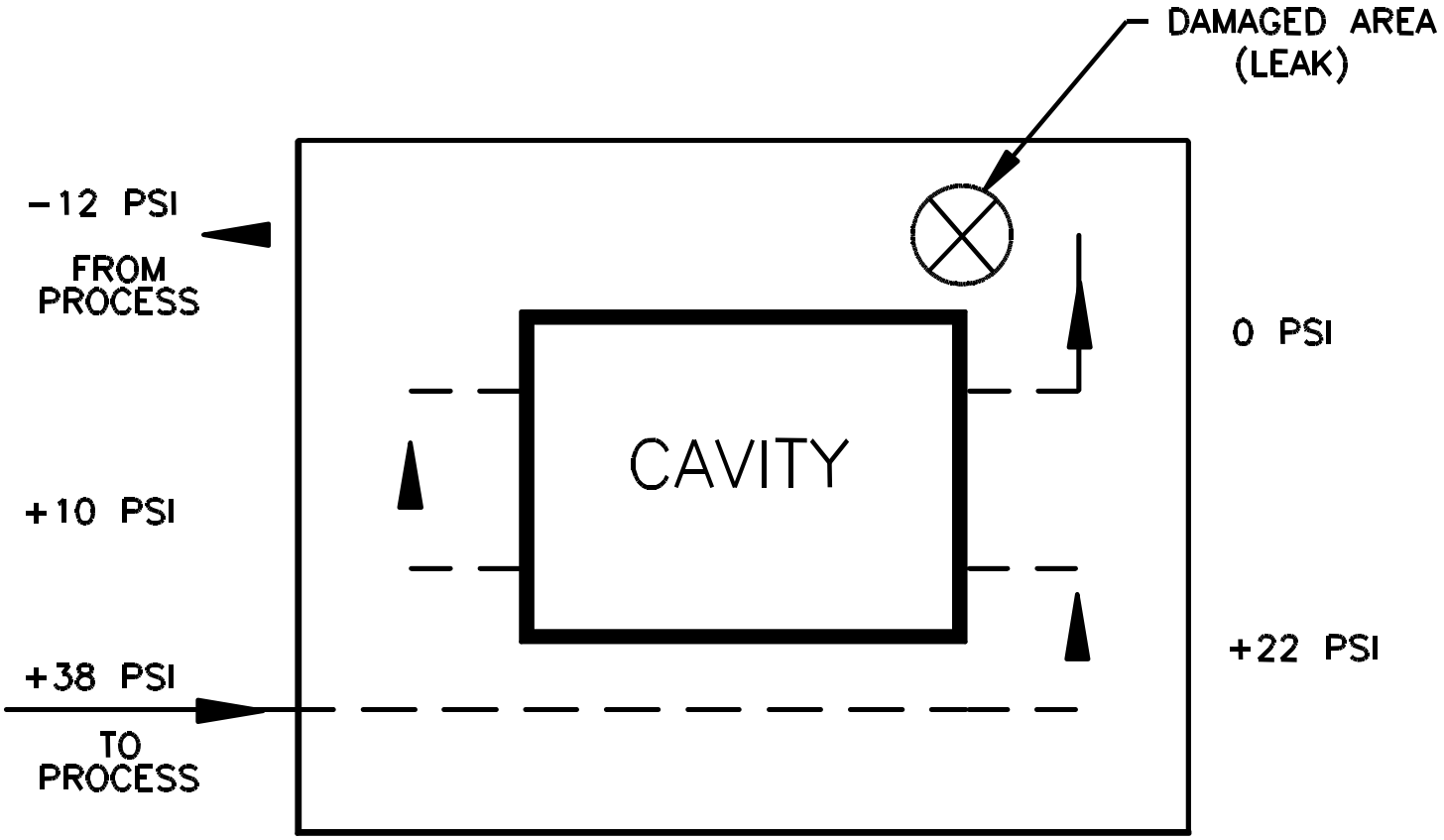
See diagram below



In the example above, by using the Mokon Leakmaster negative pressure system as a booster pump, an increased pressure differential of 50 PSI results.

2.6 Pressure drops

Leakmaster system connected incorrectly

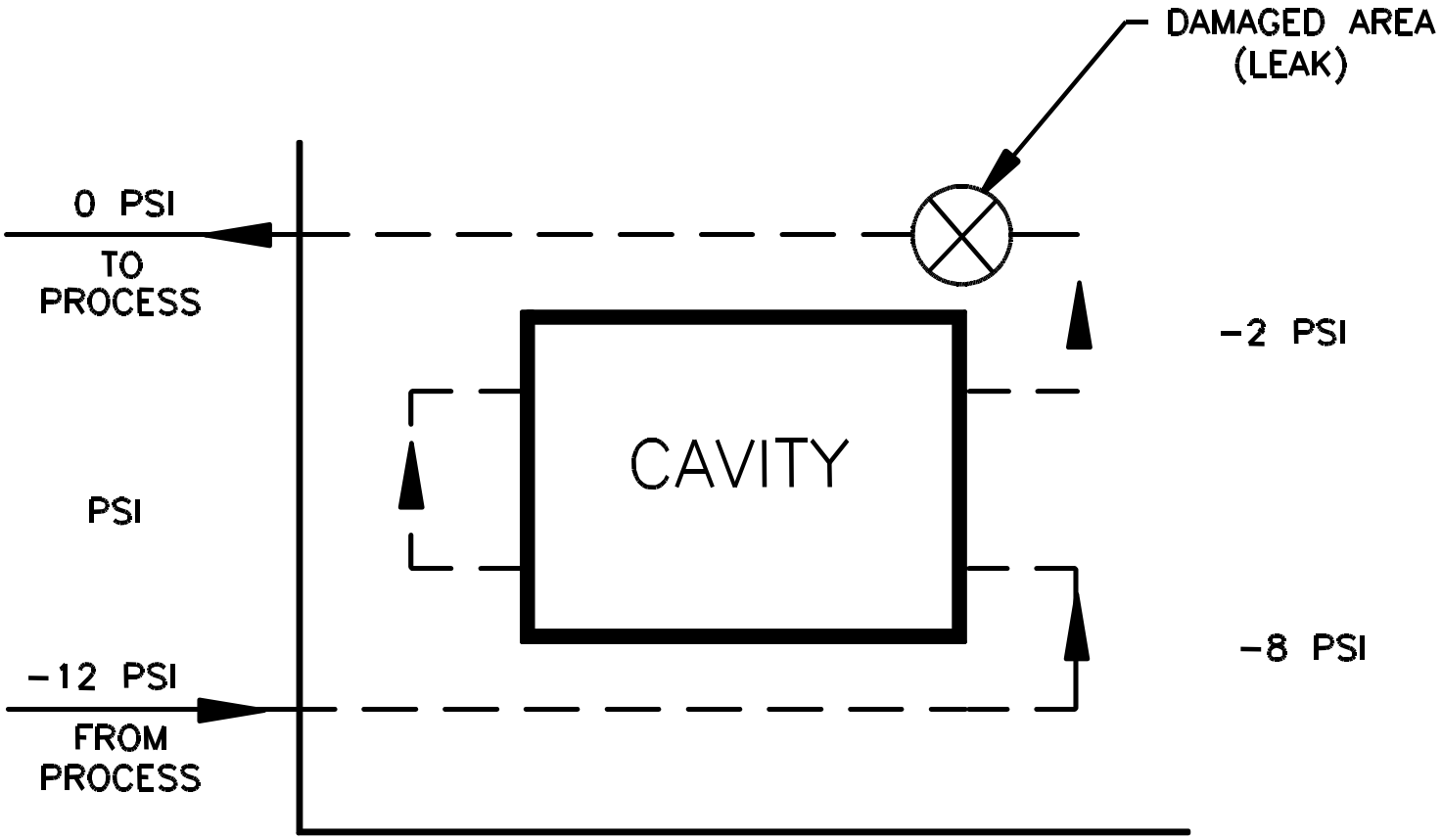


Here the direction of flow results in an overall pressure drop of 48 PSI.

As stated previously, the fluid pressure need be zero only at the point of leak. Therefore, by having the fluid enter the mold farthest from the leak, much of the pressure drop takes place before the damaged area. Which means that a much higher incoming pressure can be used. Here, an incoming pressure of 36 PSI enters the mold and drops as the fluid is flowing through the mold, gradually coming to zero PSIG just before the point of leak.

Since the Mokon Leakmaster negative pressure system is capable of pulling –12 PSIG on the from process side, a total pressure differential of 48 PSI results.

Leakmaster system connected correctly



Here, the direction of flow results in a pressure drop across the mold of 12 PSI.

Because the fluid pressure must only be zero or less at the point of leak, so that fluid does not leak out. In the example above, as the fluid enters the mold near the leak, the incoming pressure must be adjusted close to zero so that it does not leak out of the damaged area.

An overall pressure drop of 2 PSI results, primarily due to the fact that the Mokon Leakmaster negative pressure system pulls a maximum vacuum of –12 PSIG of the from process line.

Section 3 – Operation

3.1 Initial starting procedure

- Turn the regulator valve hand wheel clockwise all the way in to pull minimum vacuum.

- Turn on the electrical main disconnect switch. (See Section 2.4)

Warning: The drain line must always be fully open and non-restricted. Always open the drain line prior to opening the water supply line. If the unit is run with the drain line restricted or fully closed excessive pressure will build and damage the system's pump.

- Open the drain line.

- Turn on the water supply connected to the Mokon Leakmaster negative pressure system. (See Section 2.5)

Warning: Do not omit step 5. Running the pump/motor backwards can damage the pump *immediately.*

- 1 Phase systems: Not Applicable

  3 Phase systems: 3 Phase systems have a phase monitor. Start the Mokon Leakmaster negative pressure system. If upon starting the system the phase indicator LED goes on, **immediately** turn the system off and reverse any two power cord leads (see Section 2.4) to change the pump rotation. If a problem is suspected with the phase monitor, **CONSULT THE MOKON FACTORY.**

NOTE: The next step only applies if the Mokon Leakmaster negative pressure system is being used in conjunction with a temperature controller system.

- Check the pump rotation of the temperature control system as outlined in the system's instruction manual. This step may not apply for temperature control systems other than Mokon temperature control systems. The Mokon Leakmaster negative pressure system should not be on for this step.

- Restart the Mokon Leakmaster negative pressure system if it is off (if you had to correct the Mokon Leakmaster negative pressure system pump rotation or if you had to check the pump rotation on the temperature control system). Restart the temperature control system if in use.

- Go to Section 3.2 to adjust the vacuum.

- Follow the directions for operation of the temperature control system outlined in the system's instruction manual. A Mokon Leakmaster negative pressure system has a maximum operating temperature of 180°F regardless of the type of temperature control system it is used with.

NOTE: The filter screen needs to be cleaned after the first few hours of initial operation, refer to section 4.7 for directions.

3.2 Adjusting the vacuum

Vacuum control is made by turning the hand wheel on the regulator valve counterclockwise out (to increase the vacuum and decrease the fluid flow) or clockwise in (to decrease the vacuum and increase the fluid flow.) Each time an adjustment is made, pause for a few seconds to allow the system to come to equilibrium before making another adjustment. Do not turn the adjustment more than one full revolution without allowing the system to respond.

Increasing pressure differential (booster/assist pump)

The Mokon Leakmaster negative pressure system must be started with the regulator valve set to minimum vacuum (hand wheel turned clockwise all the way in) as described in Section 3.1. To increase the vacuum and the pressure differential across the mold, turn the hand wheel counter clockwise out.

Specific leak size (alone or with a temperature control system)

The Mokon Leakmaster negative pressure system must be started with the regulator valve set to minimum vacuum (hand wheel turned counter clockwise all the way in) as described in Section 3.1. Proceed as follows to increase the vacuum:

- Slowly turn hand wheel counter clockwise just until leak stops. This will enable the system to suck in air from the point of the leak.

NOTE: Do not turn the hand wheel out more than necessary to stop the leak. Doing so will increase the pressure differential across the mold and thus reduce the water flow in the mold. Use the minimum amount of vacuum to stop the leak, this will maximize the flow through your mold.

3.3 Shut down procedure

- Turn off the water supply.
- Turn off the temperature control system (if in use).
- Turn off the Mokon Leakmaster negative pressure system by pressing the "On/Off" switch to "Off".

The main electrical power to the Mokon Leakmaster negative pressure system may be turned off if desired but is not necessary unless the system is being relocated or for prolonged shut down.

If the system is to be shut down and put in storage any longer than one (1) week, the pump in this system should be completely flooded with fluid to ensure it does not dry out. If it is allowed to dry out, severe damage can be done to the internal parts of the pump.

3.4 Restarting procedure

If the water lines and main electrical power has not been disconnected:

- Turn the regulator valve hand wheel counter clockwise all the way in to pull minimum vacuum.

- Make certain the drain line is still open.

- Reopen the water supply.

- Restart the Mokon Leakmaster negative pressure system by switching the On/Off switch to the "On." Restart the temperature control system (if in use).

- Go to Section 3.2 to adjust the vacuum.

- Follow the directions for operation of the temperature control system as outlined in the system's instruction manual.

If the water lines and/or the main electrical power have been disconnected:

- Go to Section 2.4 for the electrical connections.

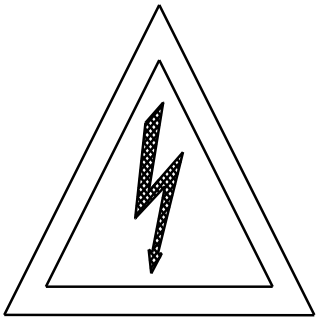
- For Mokon Leakmaster negative pressure systems used alone, in conjunction with a temperature control system or as a booster/assist pump, go to Section 2.5 for the water connections.

- Follow the initial starting procedures in Section 3.1.

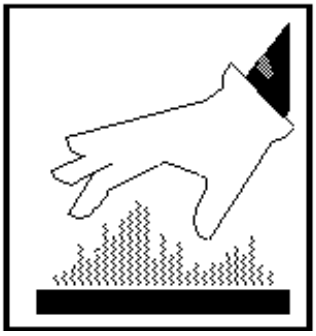
Section 4 – Maintenance and Service

Warning: The maintenance and service procedures included in sections 4.1 – 4.7 require that all power sources to the Mokon Leakmaster negative pressure system be shut off, isolated and locked out (exceptions noted) and that the system be completely cooled (if used in conjunction with a temperature control system). Follow all local and national codes and procedures for working on electrical equipment. Failure to do so could result in injury or death. Only qualified electrical personnel should install, maintain, repair, adjust, and operate Mokon Leakmaster negative pressure systems. The instruction manual furnished with the system should be completely read and understood before system maintenance.

The following hazard warning symbols will be used to denote a specific hazard associated with a procedure.



Electrical Danger



High Temperature
Surface May Be Hot

High Voltage &
Hot Surface

4.1 Preventative maintenance

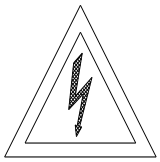
Mokon Leakmaster negative pressure systems are designed for a long, trouble-free service life under a variety of conditions, with a minimum of maintenance. Performing the following preventative procedures will extend the life of your system. Refer to Section 4.1 – 4.7 in the instruction manual for specific adjustment or service procedures. Refer to the condensed parts list included in section 6 of the instruction manual for proper replacement parts if required.

The preventative maintenance section is broken into weekly, monthly, and every three months checks. Associated with each check are a series of corrective procedures that may solve a problem detected in the check. If the corrective procedures do not resolve the problem, see the trouble shooting guide in section 5 to find a complete list of corrective measure.

Electrical preventative maintenance

Weekly Checks	Corrective Procedures
Check electrical box interior components for any discoloration, or any burn marks	Correct component wiring
	Verify voltage and frequency stamped on system matches customer supply voltage and frequency
	Correct excessive system load (current draw)
	Verify customer supply voltage is balanced and fluctuations are within 15% of nominal
	Verify wire gauge for main power hookup is properly sized
	Replace components if needed
Slightly tug on each conductor to make sure it makes a solid contact to its attached component. Pay close attention to the green grounding wires.	Tighten with proper tooling
Monthly Checks	**Corrective Procedures**
Check that a set of N.O. and N.C. contacts exist on the high pressure switch	Verify switch is properly wired
	Replace switch if necessary
Check that a set of N.O. and N.C. contacts exist on the low pressure switch	Verify switch is properly wired
	Replace switch if necessary
Every 3 Months Checks	**Corrective Procedures**
Check that the interior electrical and mechanical components are securely fastened to the back panel, and/or to the sides of the electrical box	Tighten with proper tooling
Check that the ratings of overload protection (such as fuses and circuit breakers) adequately protect the line's maximum current carrying capacity	Inspect/replace fuses
	Inspect/replace motor starter overloads

Pump/motor preventative maintenance

Weekly Checks	Corrective Procedures
Check for foreign materials obstructing airflow in the motor and pump area	Remove all dust, lint, grease or oil with a cloth and/or brush
Monthly Checks	**Corrective Procedures**
Check that all bolts and screws are securely tightened	Tighten with proper tooling
 Check for plumbing leaks	Repair solder joints
	Replace necessary parts if leaks persist
Check that compression fittings are securely tightened. Pay close attention to the pumps suction side, since any air drawn in may cause a noisy pump, or a reduction in capacity.	Tighten with proper tooling
	Replace necessary parts if leaks persist
Check that electrical conduit fittings are securely tightened, and there is not evidence of cracked, burned, or discolored conduits	Tighten with proper tooling
	Replace conduit
Check that the motor current draw matches the serial tag rating	Correct motor wiring
	Verify supply voltage is balanced and fluctuations are within 15% of nominal
 Check gauge readings on the cabinet (Power On)	Verify suction or discharged line not partially clogged
	Verify no restrictions in process or supply lines
	Replace gauge(s) if needed

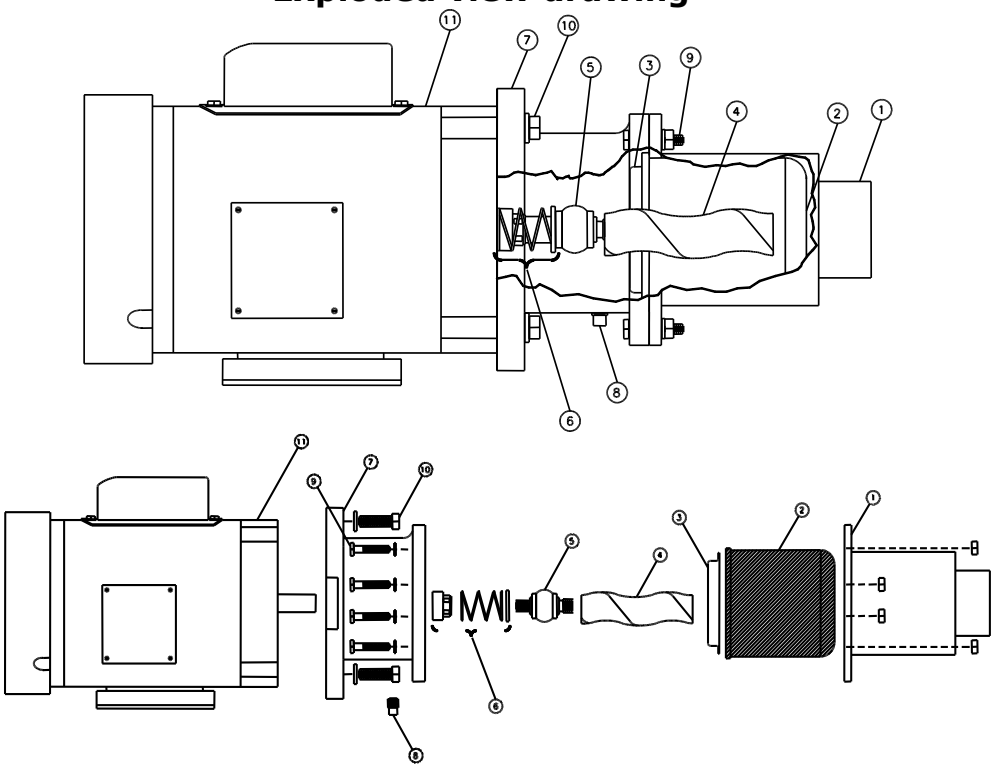
Miscellaneous preventative maintenance

Weekly Checks	Corrective Procedures
Check the filter screen for debris	Remove the screen and clean
Monthly Checks	**Corrective Procedures**
 Check that all applicable lights, gauges, and optional indicators are functioning properly (Power On)	Replace necessary components
Check that the "Warning," "High Voltage," "Caution" and other labeling are adhering to their correct locations	Replace torn, damaged or missing labels

4.2 Pump maintenance

These pumps have been designed for a minimum of maintenance. The main elements are readily accessible, and the unit requires very few tools to disassemble. There is not periodic lubrication needed. Simply keep your pump flushed of the pumping material when not in use. Do not allow material to harden and build-up inside the housings. The flexible joint is pre-lubricated and sealed at the factory. It never needs to be re-lubricated. The mechanical seal is self –adjusting for wear.

Exploded view drawing



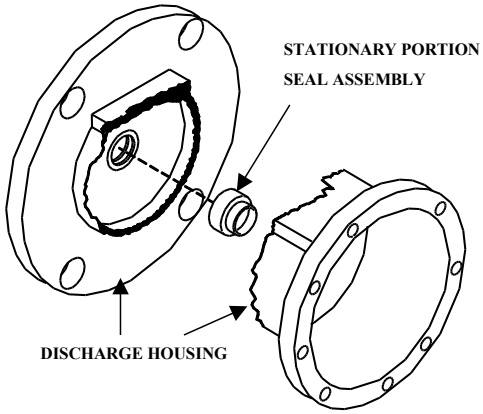
Ref No	Mokon part #	9 GPM pump	24 GPM pump	Description
1	CF			Suction housing
2	042019	✓		Stator
2	042039		✓	Stator
3	042025	✓		Stator stop
3	042031		✓	Stator stop
4	042027	✓		Rotor
4	042058		✓	Rotor
5	042026	✓		Flexible joint
5	042046		✓	Flexible joint

Ref No	Mokon part #	9 GPM pump	24 GPM pump	Description
6	042022	✓		Seal assembly (rotary portion, spring, and spring retainer)
6	042038		✓	Seal assembly (rotary portion, spring, and spring retainer)
7	CF			Discharge housing
8	CF			Port plug
9	CF			Suction/Discharge Housing Screws
10	CF			Discharge Housing/Motor Screws
11	042047	✓		Pump/motor assembly
11	042050		✓	Pump/motor assembly

Seal replacement

WARNING: Before disassembling the pump, disconnect the power source and thoroughly bleed the pressure from system. Failure to do so could result in electrical shock or serious bodily injury.

- Turn off the electric power and the water supply to the unit.
- Disconnect the suction and discharge piping.
- Remove the screws (9) holding the suction housing (1) to the discharge housing (7). Remove the suction housing (1), the stator (2) and the stator stop (3).
- Remove the rotor (4) from the flexible joint (5) by using a suitable punch to remove the rotor pin. Remove the flexible joint (5) from the drive shaft in a similar manner, removing the pin through the discharge port.
- Carefully slide the seal assembly (6) (rotary portion, spring and the spring retainer) off the motor shaft.
- Remove the screws (10) holding the discharge housing (7) to the motor (11). Remove the discharge housing (7) from the motor.
- Carefully pry the stationary portion of the seal assembly from the seal seat cavity in the discharge housing (7). See the figure below. Inspect all the parts of the seal assembly. If any of the parts are worn or broken, the complete seal assembly should be replaced. Seal components are matched parts and are not interchangeable.
- Using glycol or dish detergent (not oil), lubricate the outer surfaces of the stationary portion of the new seal assembly (6) and insert it into the seal seat cavity in the discharge housing (7) seating it firmly and squarely. See the figure below.



- Reattach the discharge housing (7) to the motor (11) using the screws (10). Be sure to center the seal bore on the motor shaft.
-
- Lubricate the motor shaft with glycol or dish detergent and slide the rotary portion of the seal assembly (6) on to the motor shaft inside the discharge housing (7) until it meets the stationary portion of the seal assembly.

- Slide the seal spring and the spring retainer of the seal assembly (6) onto the motor shaft.

- While compressing the seal assembly spring, slide the flexible joint (5) onto the motor shaft. Install the motor pin.

- Slide the rotor (4) onto the flexible joint (5). Install the rotor pin.

- Secure the stator (2), the stator stop (3) and the suction housing (1) to the discharge housing (7) using screws (9).

- Lubricate the rotor (4) and the stator (2) by filling the suction housing and the discharge housing with the fluid to be pumped.

- Reconnect the suction and discharge piping and the power source.

4.3 Phase indication

The phase monitor is designed to protect motors from phase reversal, single phasing, low voltage, and voltage unbalance.

Set the line voltage knob at the measured line voltage. The adjustment automatically sets the low voltage trip point.

NOTE: Adjusting the line voltage knob has no affect on the % voltage unbalance or the trip delay. These are both factory fixed.

Operation: The output relay is energized and the LED glows when all voltage parameters are acceptable and the phase sequence is correct. The relay and the LED de-energize immediately when phase reversal or single phasing is sensed. If low voltage or voltage unbalance is sensed for a full trip delay, the relay and LED will be de-energized. The relay and LED are re-energized automatically upon correction of the fault condition.

4.4 Low pressure safety shut off switch

Mokon Leakmaster negative pressure systems are equipped with a low pressure safety switch which shuts the system off in the event of an insufficient supply pressure situation. The switch is non-adjustable and factory set at 4 PSI to protect the pump from running dry which would quickly damage it.

To check the operation of this switch, **carefully** restrict the water supply just until the pump shuts down. If the low pressure switch is functioning correctly the system will shut off until the supply line is unrestricted.

If this situation is encountered during operation, the system is receiving insufficient water supply. Refer to the trouble shooting guide for possible solution to this situation.

If the low pressure switch is not functioning correctly, **TURN THE SYSTEM OFF AND CONSULT THE MOKON FACTORY.**

4.5 High pressure safety shut off switch

Mokon Leakmaster negative pressure systems are equipped with a high pressure safety switch which shuts the system off in the event of excessive pressure build up in the pump. The switch is non-adjustable and factory set at 50 PSI. As specified in the starting procedure in section 3, **the drain line must always be opened prior to the water supply line to prevent excessive pressure build up in the pump.**

To check the operation of this switch, **carefully** restrict the drain line just until the pump shuts down. If the high pressure safety switch is functioning correctly the system will shut off, but will very quickly start again and occasionally cycle on/off until the drain line is unrestricted.

If this situation is encountered during operation, the system backpressure is too high or there is a restriction in the drain line. Refer to the troubleshooting guide for possible solutions to this situation.

If the high pressure switch is not functioning correctly, **TURN THE SYSTEM OFF AND CONSULT THE MOKON FACTORY.**

4.6 Air vent

Mechanical air vent

If a problem is suspected with the mechanical air venting system it may need cleaning. To clean a mechanical air venting system proceed as follows:

- Turn off the electric power and the water supply to the unit. 
- Remove air vent top.
- Remove and clean the float inside the air vent.
- Replace the cleaned float inside the air vent.
- Replace the air vent top.

If cleaning the air venting system does not resolve the problem it may need replacing. Contact the Mokon service department.

4.7 Filter/strainer

The filter screen must be thoroughly cleaned regularly, once after the first few hours of operation and at least once a week or sooner if required thereafter. To clean the filter screen remove it from strainer port located on the right side of the unit and rinse off thoroughly with clean fresh tap water. After the screen is clean, reinsert it into the strainer housing.

Section 5 – Troubleshooting guide

Problem	Possible Cause	Corrective Measure
System will not start (Illuminated "On" light does not light)	System unplugged / power off	Plug system in / turn power on
	Low pressure on supply side (water off)	Turn water on
	Improper power source wiring	Check wiring (electrical schematics) and correct
	Blown fuse at power supply	Isolate open fuse and replace
	Blown control circuit fuse	Replace and check for ground condition
	Low voltage	Measure incoming voltage, if too low correct
	Overload on pump/motor starter	Consult factory
	On/off switch	Inspect/replace switch
Loss of vacuum control or no vacuum at all	Incorrect pump rotation	See section 3.1 to check and/or correct pump rotation
	Leak in the "To process" or "From process" hoses	Identify/repair leak (Turn power OFF and leave supply water ON to identify leaks)
	Incorrect use of quick disconnect fittings	Replace all quick disconnect fittings with standard fittings
	"From process" pressure gauge	Inspect/replace component
	High system back pressure	Reduce back pressure/ pump drain to an open tank back into recirculation system
Excessive air in "Drain" (return) line	Air vent needs cleaning	See section 4.6
	More air in system than air vent can handle	Add another air vent
Fluid not flowing through mold	Plugged flow paths, inadequate circulation through process and connecting lines	Inspect; if plugged, dislodge
	Use of quick disconnect fittings	Discontinue use of quick fittings
	Vacuum set too high for specific leak	See section 3.2 to adjust vacuum
Leaking water around the pump/motor shaft	Shaft seal	Inspect/replace seal, see section 4.2
Fluid draining constantly from vent line	Air vent float stuck	See section 4.6
	High system back pressure	Reduce backpressure/pump drain to an open tank then back into recirculation system

Problem	Possible Cause	Corrective Measure
Pump shuts off or cycles on and off	Incorrect use of quick disconnect fittings	Replace all quick disconnect fittings with standard fittings
	Loose power/extension cord	Tighten all power connections
Pump shuts off or cycles on and off due to Low Pressure	Clogged filter screen in strainer	See section 4.7 to clean filter screen
	Supply line diameter too small	Inspect/replace supply line. Replace supply line with line equivalent to port size.
	Supply line too long	Inspect/replace supply line. Replace supply line with line no longer than 20 ft.
Pump shuts off or cycles on and off due to High Pressure	Excessive backpressure on the return line	Inspect/replace return line. Return line must be unrestricted, the same diameter as the port and no longer than 20-30ft.
Hose line collapsing	Hose thickness too thin	Inspect/replace hose. Replace hose with reinforced hose with a thickness of at least 1/8 in.

Section 6 – Condensed parts list

All units:

Part No	Description
006256	Motor starter/24 amp heater contactor 110V coil
006366	1.0 – 5.0 amp overload
006367	3.2 – 16 amp overload
042061	Low pressure switch
042062	High pressure switch

Series 1000, 2000, and 4000:

Part No	Description
042009	Air vent
042019	Stator
042020	Motor pin
042021	Rotor pin
042022	Seal assembly
042025	Stator stop
042026	Flexible joint
042027	Rotor

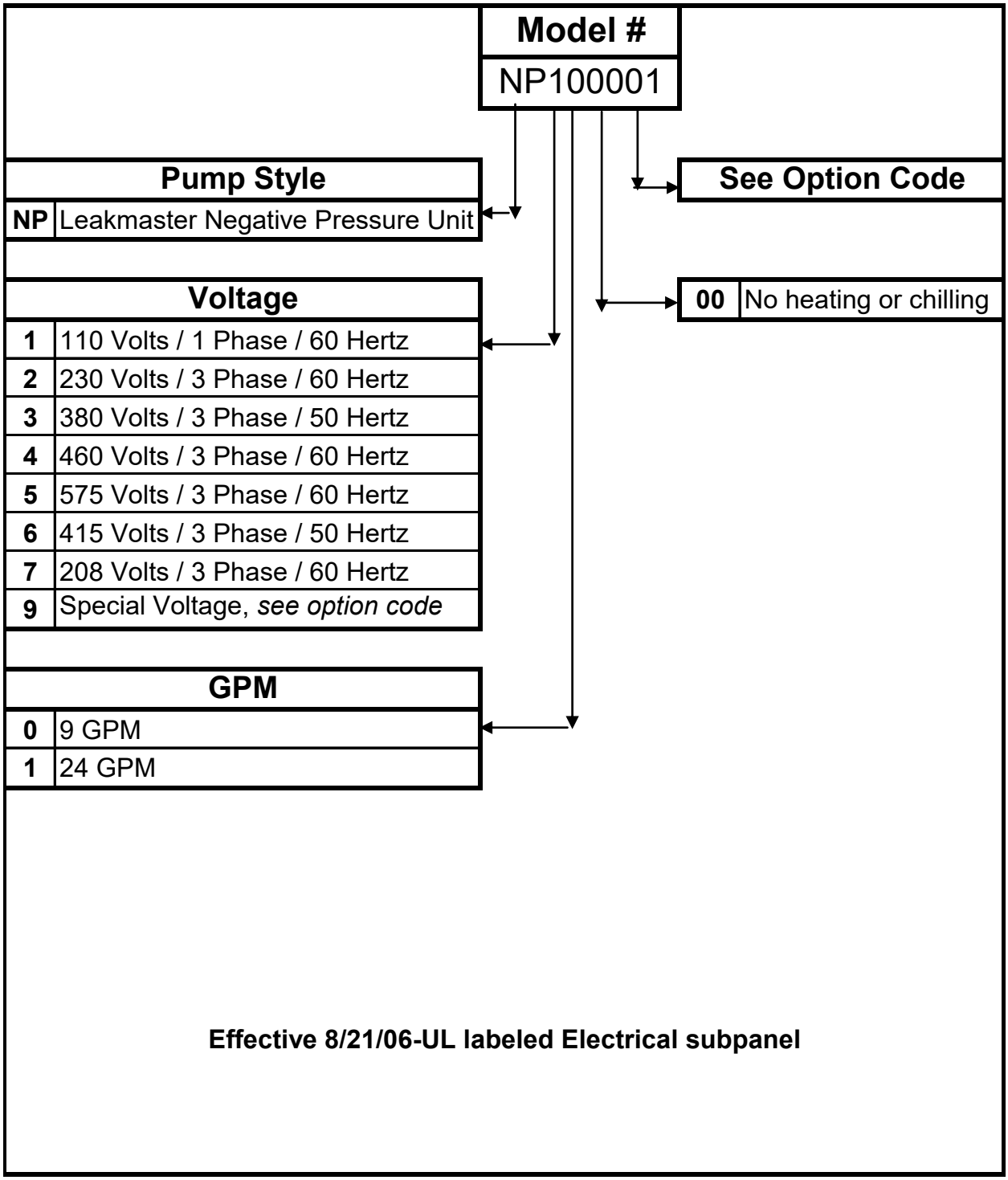
Series 1100, 2100, 4100, and 5100:

Part No	Description
042031	Stator stop
042038	Seal assembly Stator
042039	Stator
042021	Rotor pin
042072	Air vent
042046	Flexible joint
042020	Motor pin
042058	Rotor

For additional part numbers refer to the specific section in the instruction manual or consult the Mokon factory (716) 876-9951.

Section 7 – Model Codes

Leakmaster Model Codes



Section 8 – Warranty

LEAKMASTER NEGATIVE PRESSURE SYSTEM

All new LEAKMASTER systems manufactured by MOKON are guaranteed to be free from defective material or workmanship for one (1) year from the date of purchase. MOKON'S obligation under the WARRANTY SHALL BE LIMITED, TO THE ORIGINAL CUSTOMER, TO REPAIR OR REPLACE DEFECTIVE PART(S) OF THE LEAKMASTER SYSTEM, UPON CUSTOMER COMPLIANCE WITH THE INSTRUCTIONS CONTAINED HEREIN. Upon discovery of any alleged defect, it is the responsibility of the customer to contact the MOKON Service Department with the complete model number, serial number and the date of purchase. MOKON'S obligation under this warranty is limited to make good, from or at its factory, any parts that are returned to the company (prepaid) and deemed to defective, within the time frame of the warranty. The customer also has the option of forwarding the system to MOKON (Buffalo, NY), prepaid by the customer and with a return authorization from MOKON for inspection and component replacement or repair. Repair or replacement in any manner provided above shall constitute a fulfillment of all liabilities of MOKON concerning the quality of the LEAKMASTER system.

No allowances, credits or reimbursements will be made for any replacement or repair made or provided for by the customer unless authorized in advance, in writing, by MOKON.

The warranty set forth above is in lieu of any and all other warranties expressed or implied including warranties of merchantability and fitness for a particular purpose. Mokon shall in no event be liable for any consequential damages or for any breach of warranty in an amount exceeding the original price of the unit.

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