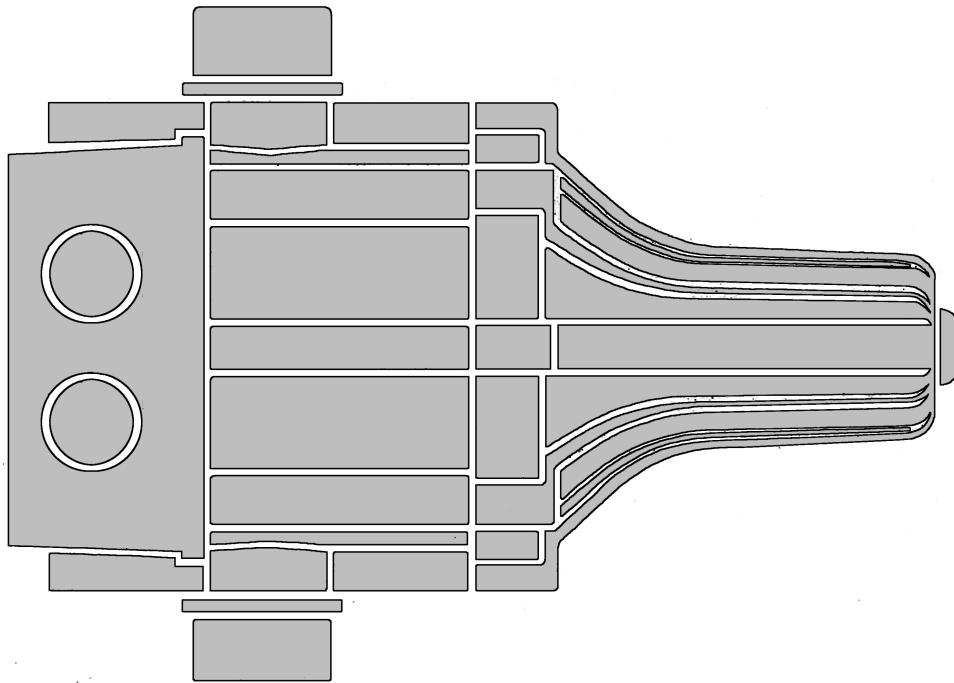


MASCONTROL®

115/230 V Mod. MCA DUAL VOLTAGE UNIT

INSTALLATION AND OWNER'S MANUAL

READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLATION



INSTALLER - PLEASE LEAVE THIS MANUAL WITH THE UNIT OR GIVE TO END USER.

The installer and consumer must comply with all local and National Electric Code requirements when installing this unit.

The manufacturer is not responsible nor liable for damage due to improper installation or use. Unit must be installed according to the instructions provided and due professional care and practices.



**PLEASE READ BEFORE
PROCEEDING WITH INSTALLATION**

**FAILURE TO READ AND CONSIDER SAFETY INSTRUCTIONS
IN THIS MANUAL OR ON MASCONTROL®
MAY RESULT IN PERSONAL INJURY OR SERIOUS
DAMAGE TO PIPING OR FIXTURES !**



This is the safety alert. When you see this symbol in this manual, look for one of the following signal words and be alert to the potential for personal injury:



warns about hazards that **will** cause serious personal injury, death or major property damage if ignored.



warns about hazards that **can** cause serious personal injury, death or major property damage if ignored.



Hazardous pressure. Under certain conditions, submersible pumps can develop extremely high pressure. Install a reducing valve to limit pressure to safe levels for application. Be sure well is equipped with a pressure relief valve.



Do not allow pump, Mascontrol®, piping, or any other system component containing water to freeze. Freezing may damage system, leading to injury or flooding. Allowing Mascontrol® or system components to freeze will void warranty.



Hazardous voltage. Can shock, burn or cause death.



Install, ground and wire Mascontrol® according to local code and National Electrical Code requirements.



Depressurize the system and disconnect power supply before installing or servicing Mascontrol®.



Make sure line voltage and frequency of power supply match motor nameplate voltage and frequency and Mascontrol® voltage and frequency.

3. Install Mascontrol[®] according to all plumbing, pump and well code requirements.
4. Pipe joint compound can cause cracking in plastics. Use only Teflon tape when sealing joints in plastic pipe or connecting pipe to thermoplastic pumps and Mascontrol[®].

5.  **DANGER** Hazardous Pressure.

Under certain circumstances, submersible and some other pumps develop extremely high pressure. This pressure needs to be reduced to a SAFE psi for the application's piping and fixtures. We recommend that a pressure reducing valve ALWAYS be installed in-line AHEAD of the Mascontrol[®] to reduce water pressure to safe levels for the application. The Mascontrol[®] is rated with a maximum working pressure of 145 psi. However, this maximum pressure rating is much higher than normal domestic household pressures. If you are in doubt as to the surface pressure, please verify system pressure before installing the Mascontrol[®].

If installing Mascontrol[®] on a bypass in a high flow situation such as a 4 or 8 inch main, it is also advisable to check the water pressure before proceeding. If pressure exceeds Mascontrol[®]'s maximum rating of 145 psi, install reducing valve ahead of the bypass on the main piping to reduce the pressure below 145 psi.

All wells with submersible pumps should have a pressure relief valve installed behind the Mascontrol[®]. If the application involves a submersible pump, be certain the system is equipped with a properly sized pressure relief valve.



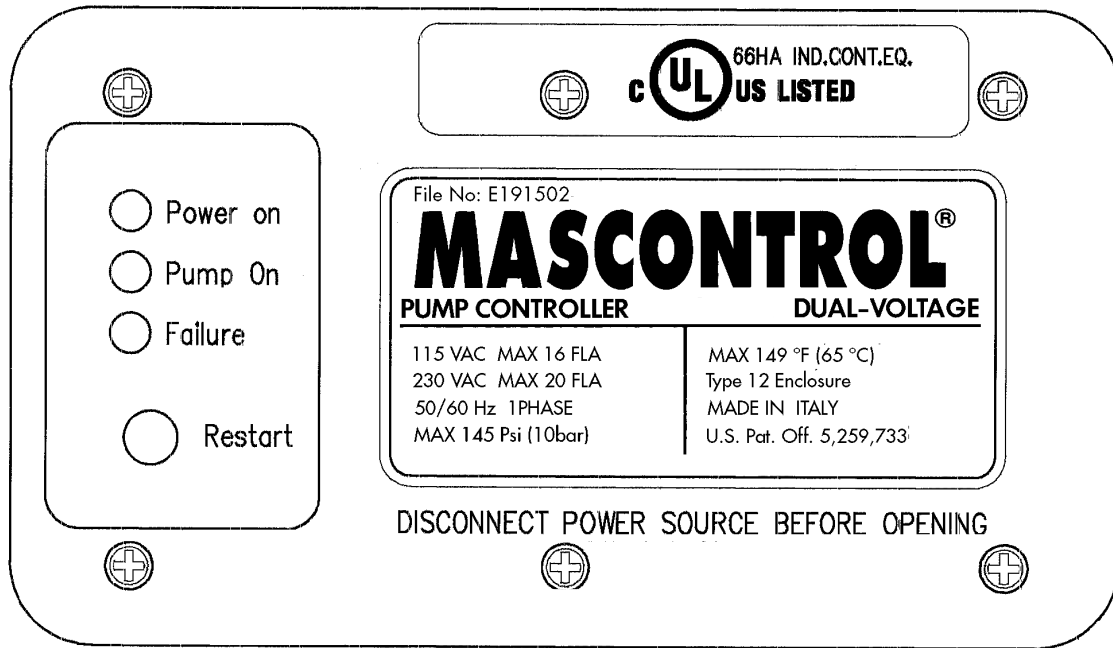
WARNING ! ELECTRICAL DEVICE. UNIT SHOULD BE INSTALLED BY A LICENSED PROFESSIONAL IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND NATIONAL ELECTRIC CODE REQUIREMENTS AND SAFETY RULES.

ALWAYS TURN OFF POWER BEFORE INSTALLING OR PERFORMING MAINTENANCE ON THIS DEVICE.

OBSERVE ALL SAFETY RULES AND PRACTICES WHEN DEALING WITH ELECTRICITY

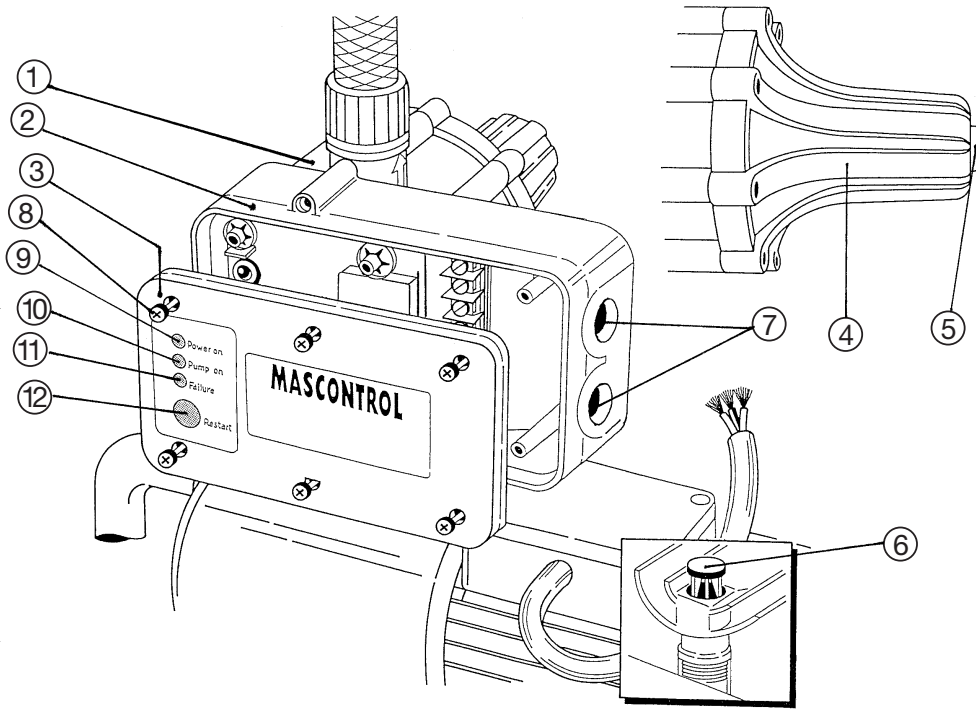
UNIT MUST BE PROPERLY GROUNDED FOR SAFE OPERATION. DO NOT INSTALL UNLESS PROPERLY GROUNDED.

TECHNICAL SPECIFICATIONS

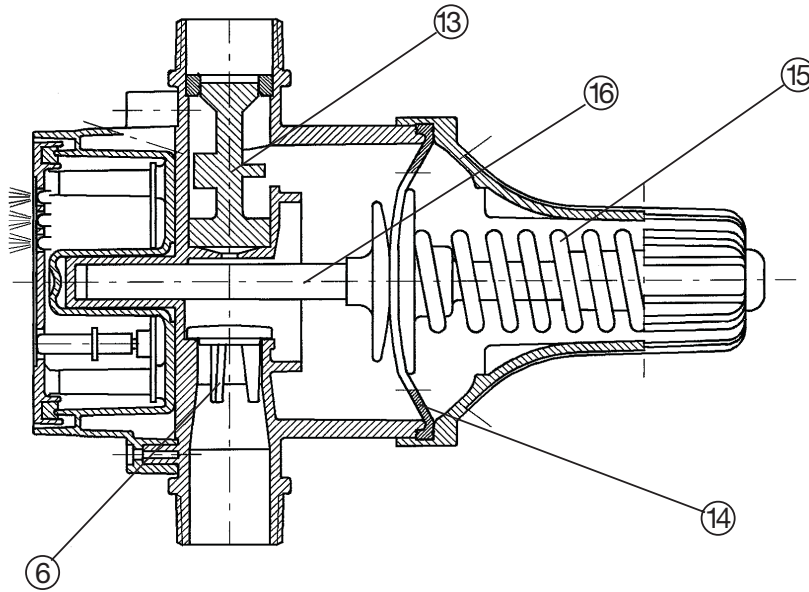


▪ Single phase power-supply voltage	115V or 230V
▪ Voltage variation tolerance	+/-10%
▪ Frequency	50-60 Hz
▪ Full load amp rating 115V(230 V)	16 FLA (20 FLA)
▪ Insulation class	II
▪ Electronic box	NEMA 12 enclosure
▪ Conduit connections	1/2" Threaded
▪ Max working pressure	145 Psi
▪ Max working temperature	149 °F (65°C)
▪ Male connectors	1 NPT
▪ Device dimensions	See page 14

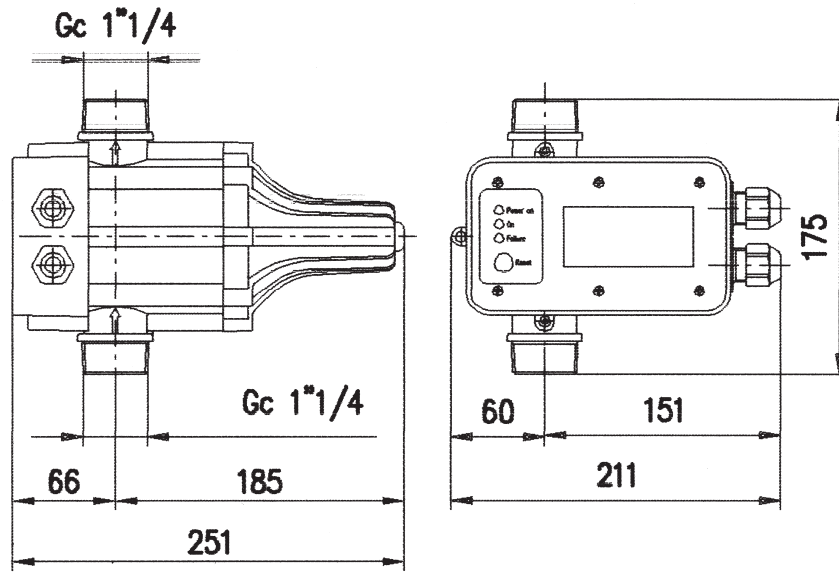
TECHNICAL SPECIFICATIONS



- | | | | |
|--------------------|----------------------------|---------------------|-----------------|
| 1 - Unit body | 5 - Safety valve | 9 - Power on LED | 13 - Flow valve |
| 2 - Electronic box | 6 - Check valve (internal) | 10 - Pump on LED | 14 - Diaphragm |
| 3 - Box cover | 7 - Conduit connections | 11 - Failure on LED | 15 - Spring |
| 4 - Unit rear part | 8 - Cover screws | 12 - Restart button | 16 - Shaft |



OVERALL DIMENSIONS



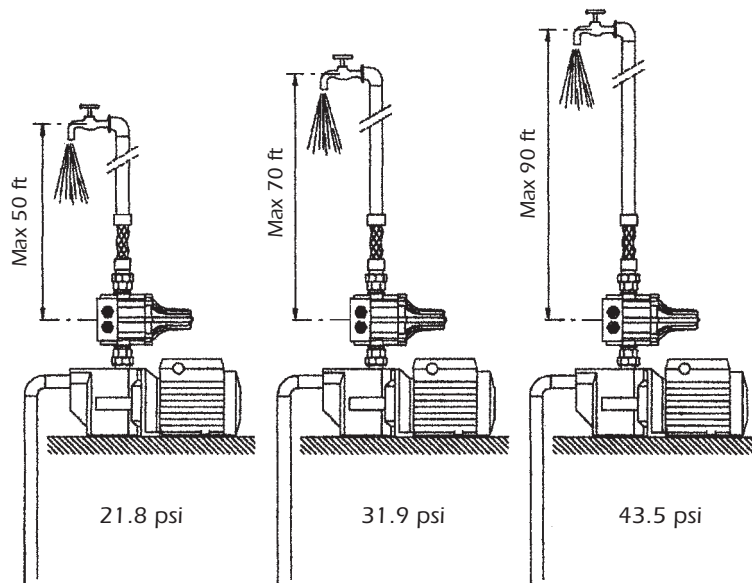
MINIMUM SYSTEM PRESSURE

Static pressure at the unit due to water column height between the unit and the highest tap must not exceed the pre-set cut-in pressure of the model being used. Maximum system pressure generated by the pump must also be at least 11.6 psi over the model's pre-set cut-in pressure. Use the appropriate guidelines below for the specific model being used:

21.8 psi model - max. system pressure generated by pump must be at **least 33.4 psi**, column of water between the unit and the highest tap must **not exceed 50 ft.**

31.9 psi model - max. system pressure generated by pump must be at **least 43.5 psi**, column of water between the unit and the highest tap must **not exceed 70 ft.**

43.5 psi model - max. system pressure generated by pump must be at **least 55.1 psi**, column of water between unit and the highest tap must **not exceed 90 ft.**



INSTALLATION

Attention: Apply all safety rules dictated by professional standards. Always disconnect power before installing unit.

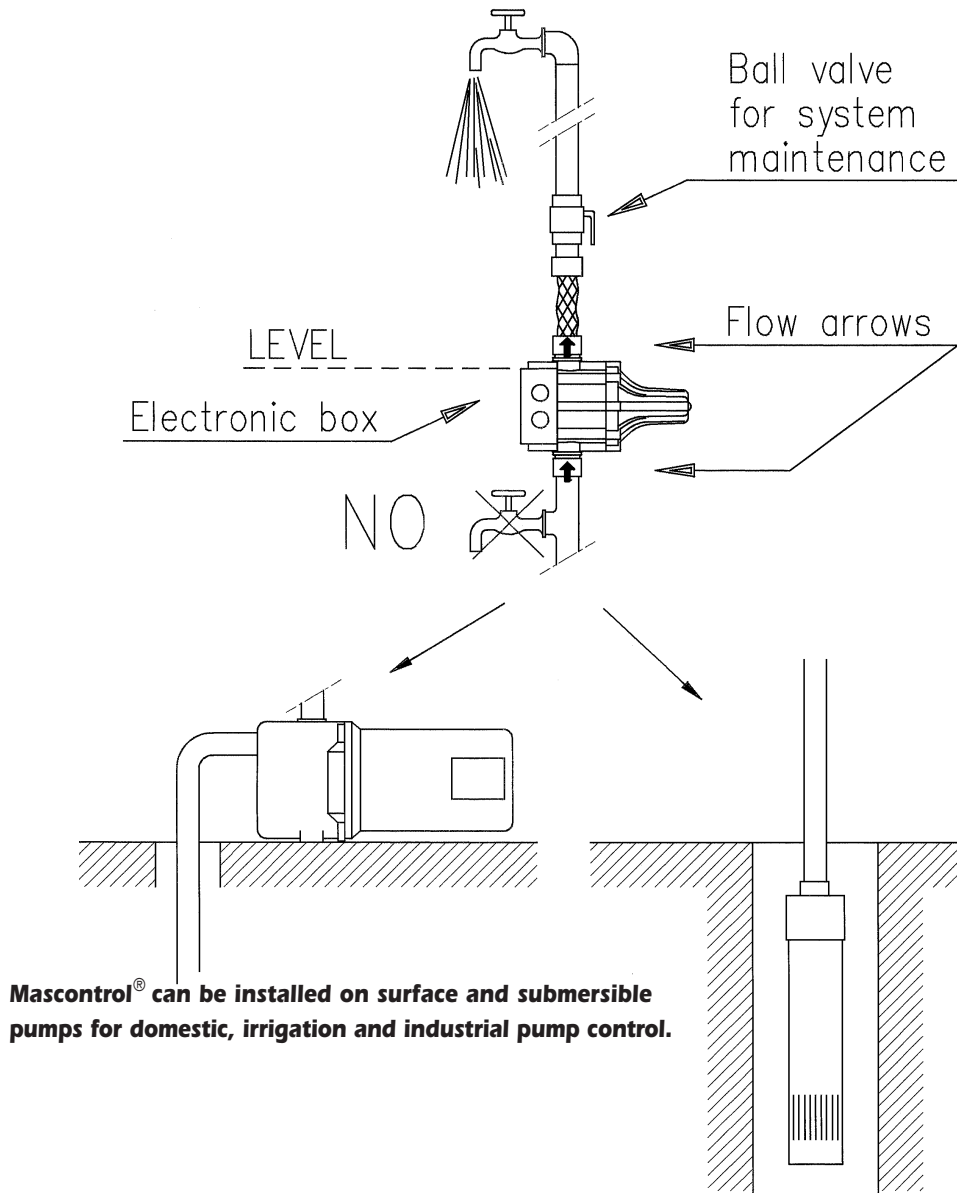
Unit must be mounted on a vertical water column with electronic box level as shown below.

Use only teflon tape for threaded connections.

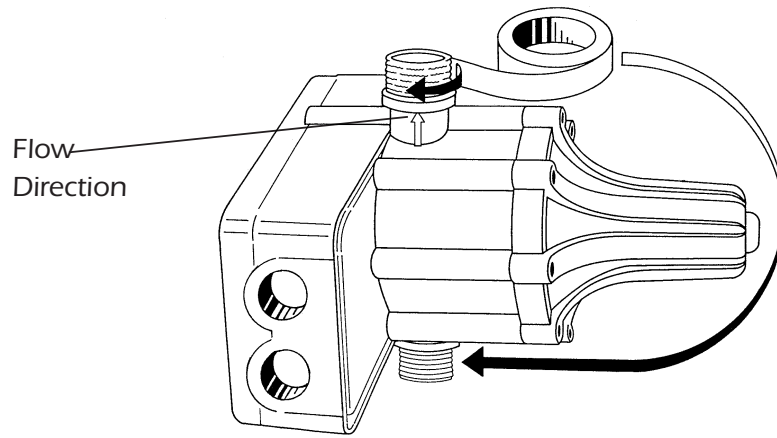
The device may be mounted directly on surface pump outlet or between the pump and the first tap. The device must be mounted vertically with the flow direction arrows pointing upward as shown.

Do not install any tap between the pump and the device.

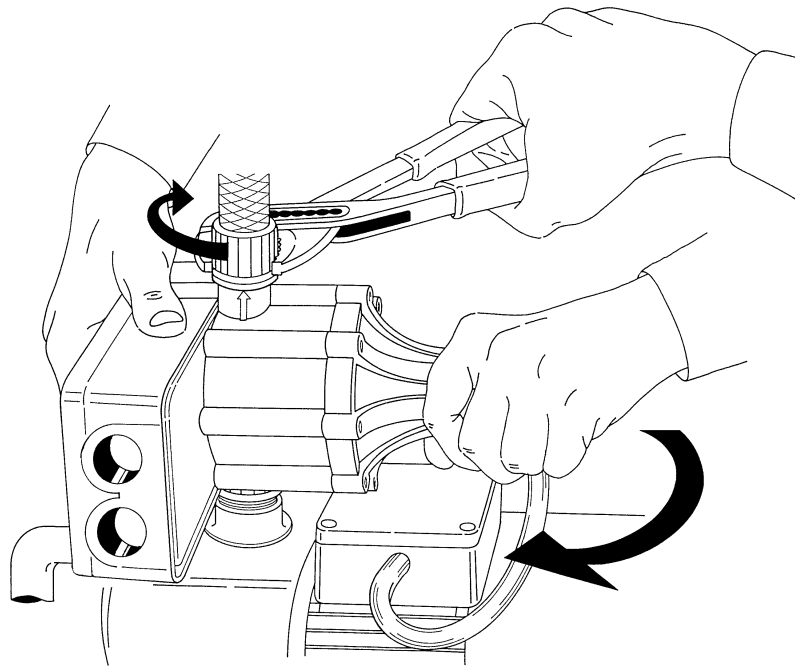
Before using the device, make sure that the pump is primed.



HYDRAULIC CONNECTION TO THE SYSTEM



Carefully pack all threads with teflon tape only

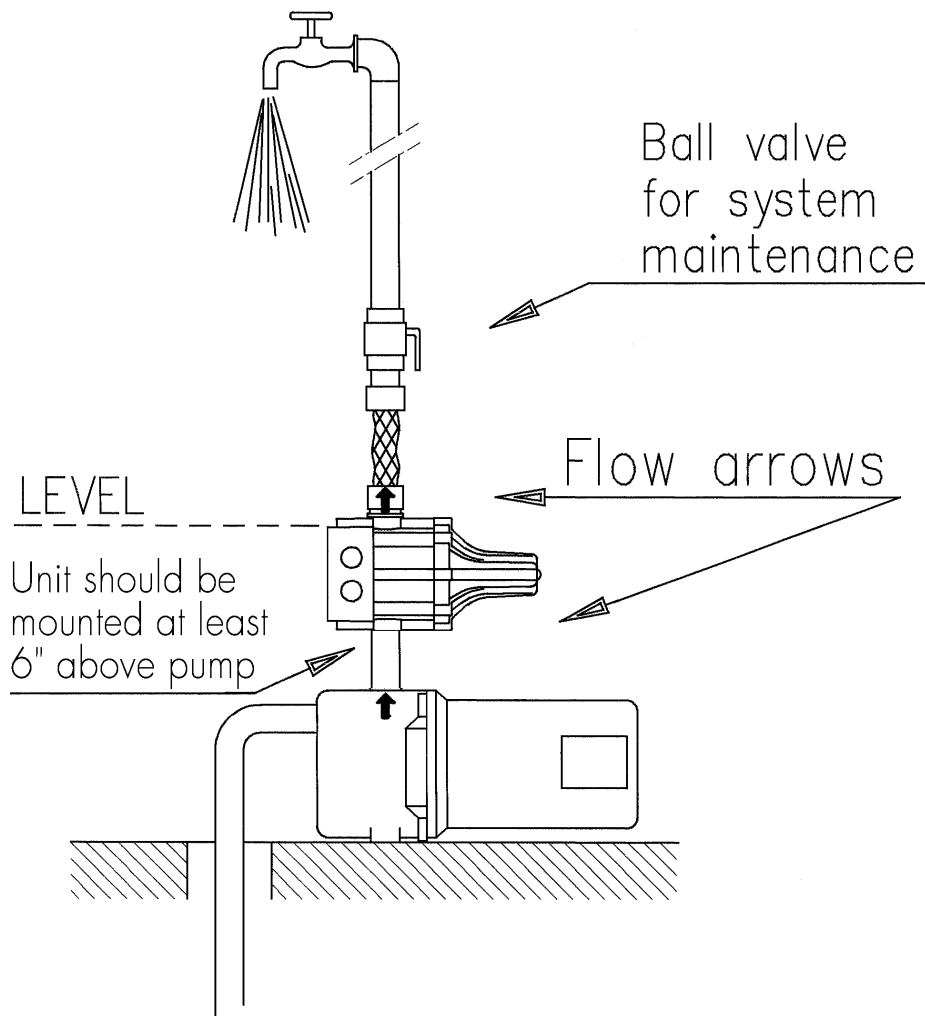


Connect the device directly on pump outlet or between the pump and the first tap.
Always install Mascontrol® with flow arrows in the vertical position.
Electronic box should be level.

**Do not over tighten water connections, especially when
Installing** with metal couplings. Damage to Mascontrol® may result.

INSTALLATION DIAGRAM - SURFACE PUMPS

PLEASE READ SAFETY PRECAUTIONS AND WARNINGS ON PAGE 1 OF INSTRUCTIONS BEFORE PROCEEDING WITH INSTALLATION



UNIT MAY BE MOUNTED DIRECTLY ON THE SURFACE PUMP OR BETWEEN THE PUMP AND THE FIRST TAP

ELECTRICAL CONNECTIONS NOT SHOWN ON THIS DIAGRAM.

IMPORTANT

Remove pressure switch from surface pump and wire Mascontrol® directly to pump.

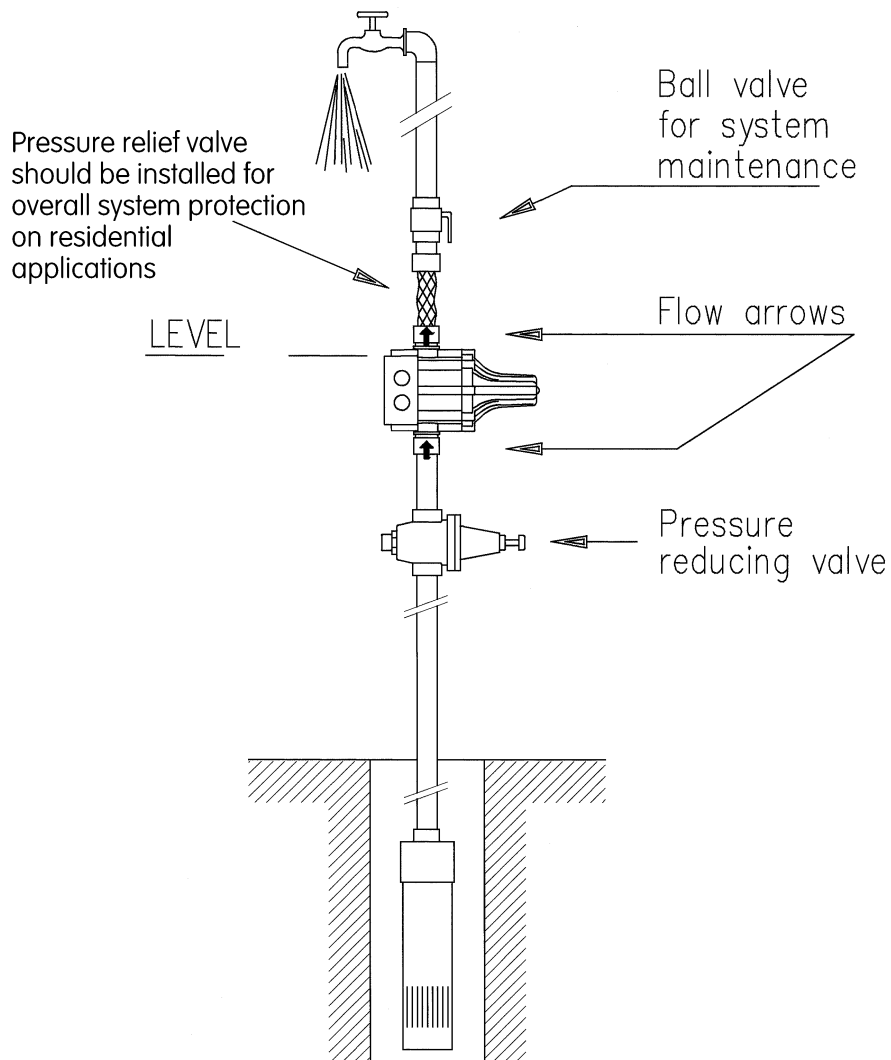
INSTALLATION DIAGRAM - SUBMERSIBLE PUMPS



HIGH PRESSURE !

PLEASE READ PAGE 1 OF INSTRUCTIONS BEFORE PROCEEDING WITH INSTALLATION.

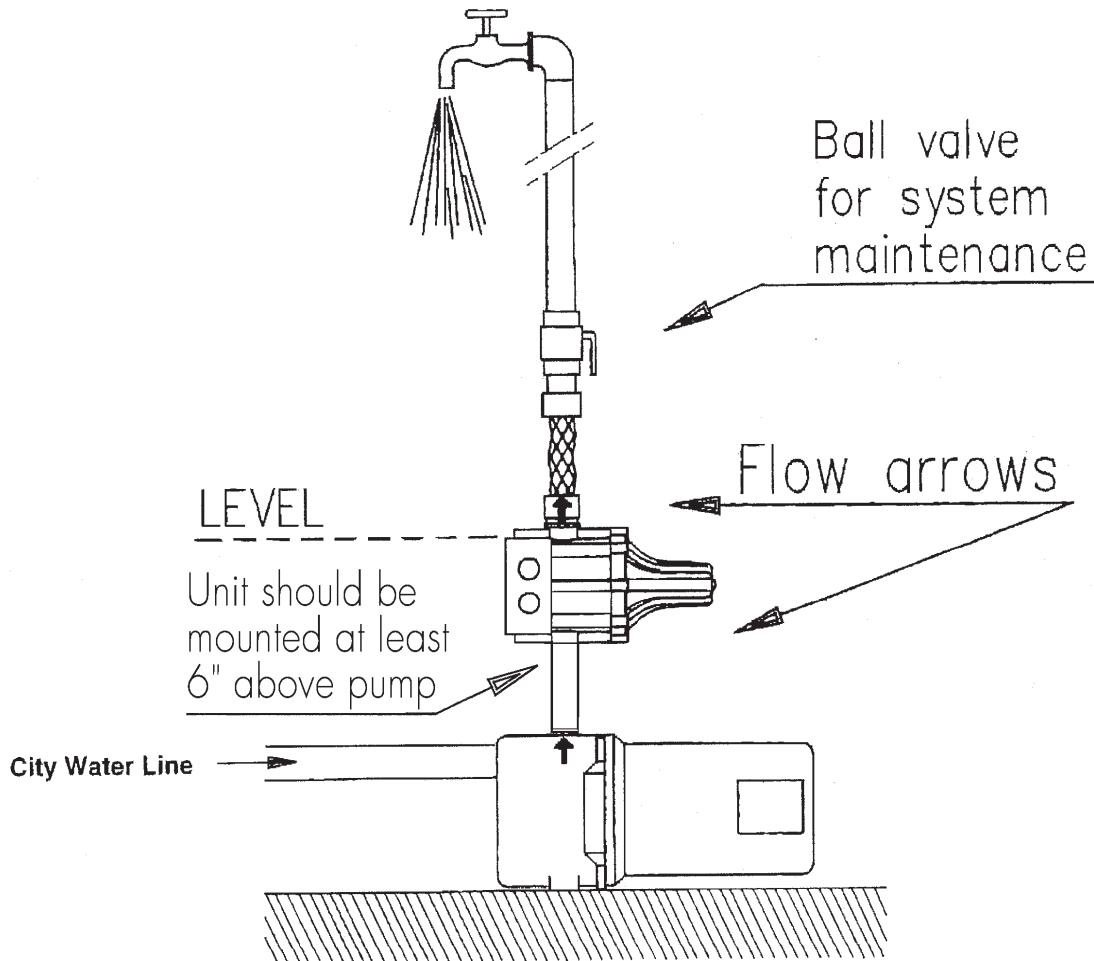
For submersible pump applications, install a pressure regulating valve AHEAD of Mascontrol® to reduce pressure to safe levels for the particular application. For residential applications, we recommend a WILKINS BR 4 SERIES regulator valve or similar. Submersible pump wells should have a pressure relief valve installed. Be certain one is installed BEHIND the pressure regulator valve and Mascontrol®



ELECTRICAL CONNECTIONS NOT SHOWN ON THIS DIAGRAM

INSTALLATION DIAGRAM - CITY WATER BOOSTER APPLICATION

PLEASE READ SAFETY PRECAUTIONS AND WARNINGS ON PAGE 1 OF INSTRUCTIONS BEFORE PROCEEDING WITH INSTALLATION. INSTALL PRESSURE REDUCING VALVE BEHIND MASCONTROL® IF NECESSARY



**UNIT MAY BE MOUNTED DIRECTLY ON THE SURFACE PUMP
OR BETWEEN PUMP AND THE FIRST TAP**

ELECTRICAL CONNECTIONS NOT SHOWN ON THIS DIAGRAM

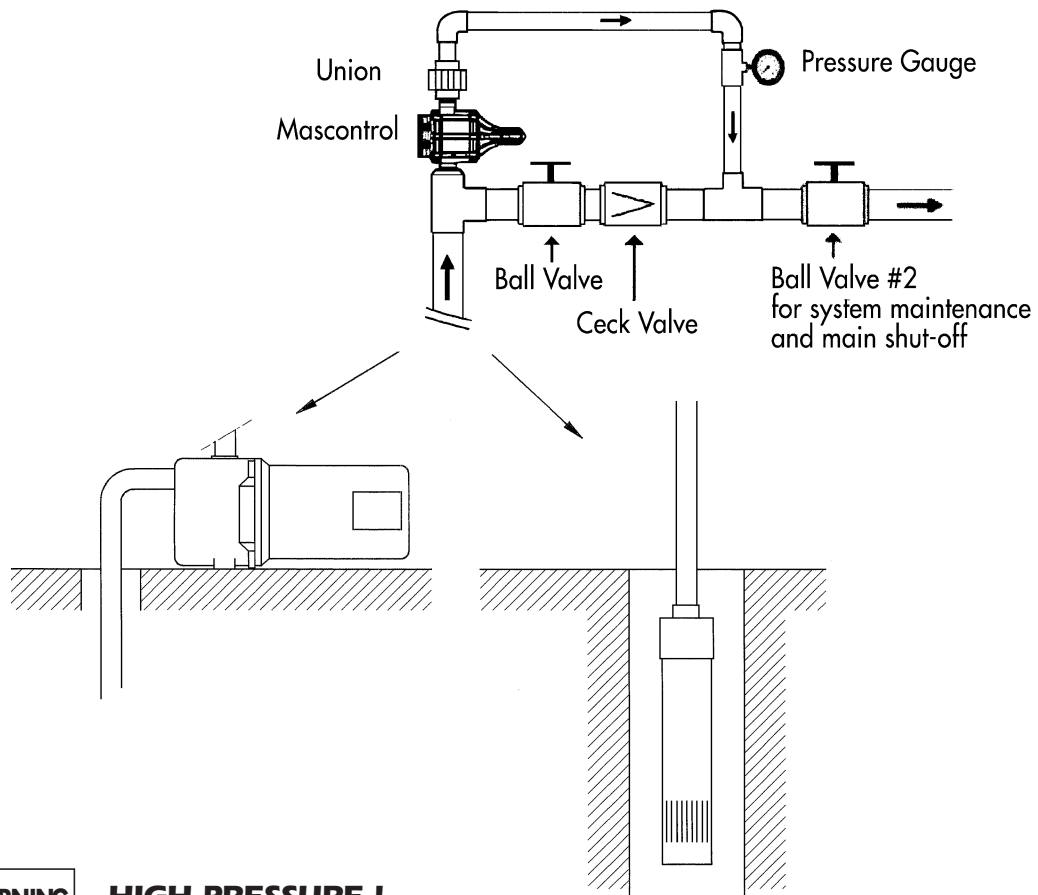
IMPORTANT

Remove pressure switch from surface pump and wire Mascontrol® directly to pump.

INSTALLATION DIAGRAM - BYPASS APPLICATION

MASCONTROL® CAN BE USED TO CONTROL HIGH DELIVERY PUMPS WHEN INSTALLED ON A BYPASS

- Device must be installed in a VERTICAL position with electronic box level. Be sure flow arrows are pointing “up”.
- Flow in the bypass must be at least 0.21 GPM, use ball valve as adjustment to ensure proper water volume flows into the bypass.
- If pump is not equipped with a foot valve, install a check valve ahead of the bypass.

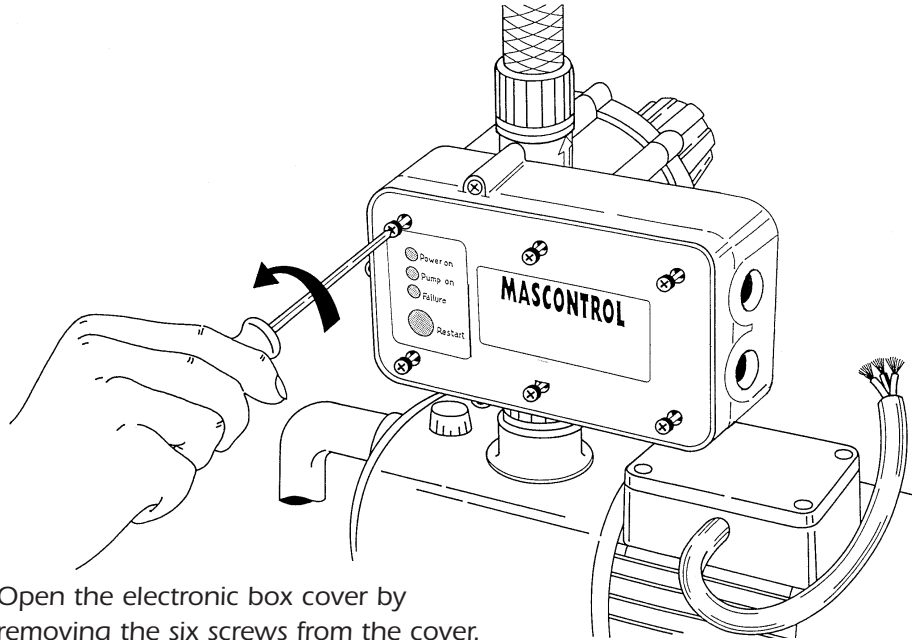


WARNING

HIGH PRESSURE !

If system pressure exceeds 145 psi, install pressure reducing valve on the main piping ahead of the bypass to keep pressure below 145 psi.

CONDUIT CONNECTIONS

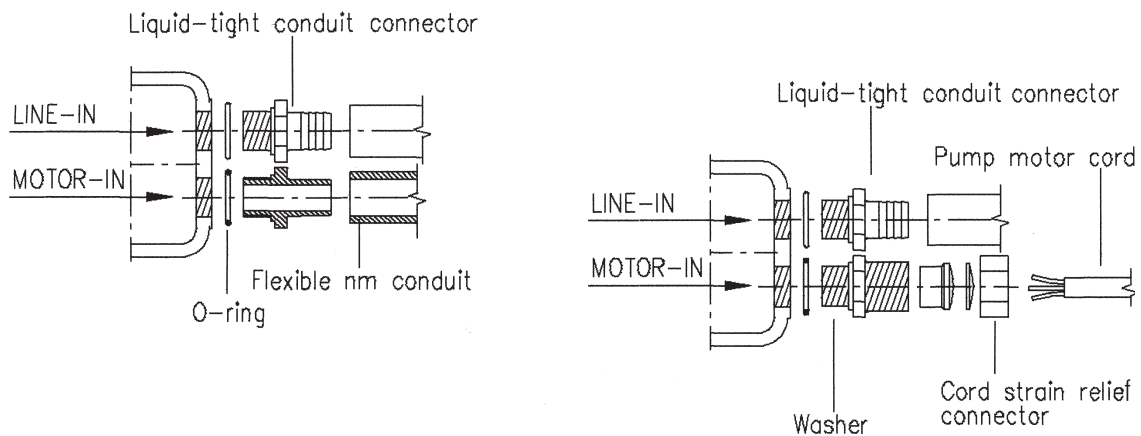


Open the electronic box cover by removing the six screws from the cover.

Line voltage and pump wires to the Mascontrol® should be supplied through “liquid-tight” non-metallic conduit fittings rated “NEMA 12” or “UL type 12” to achieve NEMA Type 12 enclosure rating.

If kit MCCNKIT001 is supplied, it contains two liquid-tight fittings for nonmetallic flexible conduit and one liquid-tight cord strain relief connector. Depending on the application, use these fittings or similar Type 12 fittings to achieve NEMA Type 12 enclosure rating. Use of metallic conduit is not recommended.

The conduit connector should be attached to the conduit then inserted into the electronic box and secured with the supplied locking ring. The rubber O-ring should be on the **outside** of the unit.



ELECTRICAL CONNECTIONS



WARNING

OBSERVE WARNINGS AND PRECAUTIONS LISTED AT THE FRONT OF THIS MANUAL.

Electrical connections should be done by a qualified professional in compliance with applicable local codes and National Electric Code.



DANGER

ALWAYS SHUT OFF POWER TO APPLICATION BEFORE INSTALLATION OR SERVICE.

Check voltage of pump and supply and determine pump motor FLA and follow applicable Mascontrol® wiring diagram. If pump motor FLA exceeds Mascontrol® ratings, use magnetic starter wiring diagram for the applicable voltage.



WARNING

Device must be properly grounded.

IMPORTANT

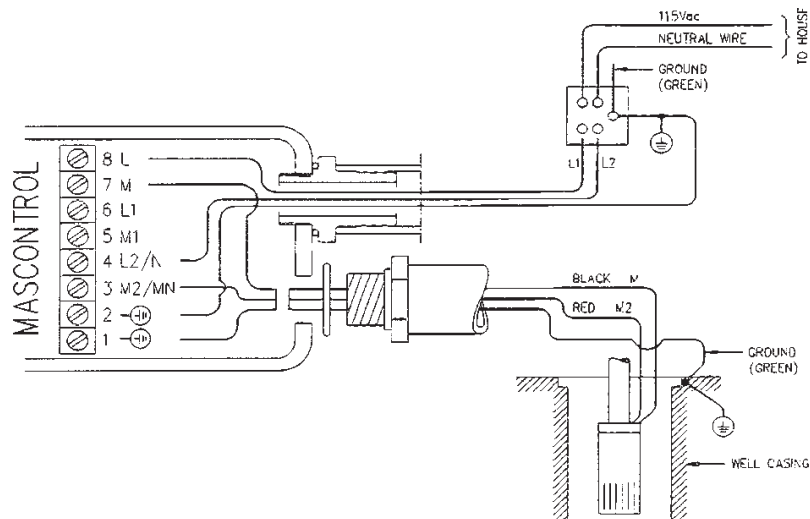
Remove pressure switch from surface pump and wire Mascontrol® directly to pump.

INSTALLATION WIRING DIAGRAM - 115VAC - TWO-WIRE PUMPS



WARNING

For 115 Vac motors exceeding 16 full load amps, use magnetic starter to avoid damage to Mascontrol®. See separate magnetic starter wiring diagram.



When to Use Contactors

Use a contactor when:

- on 115V installations pump motor full load amps exceed 16 FLA;
- on 230V single-phase installations pump motor full load amps exceed 20 FLA;
- on all three-phase applications.

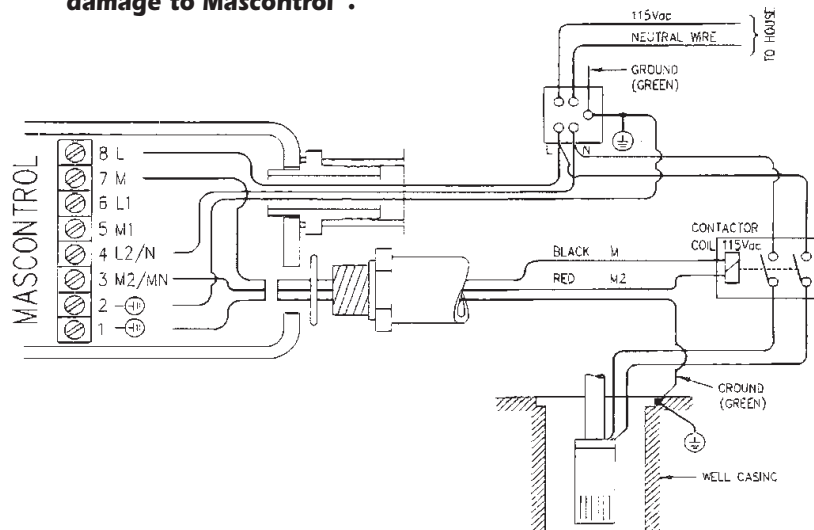
Use of magnetic starters determined by pump motor. If required, use contactor in conjunction with starter.

Remember, match coil voltage on contactor with Mascontrol voltage. Either 115V or 230V coils may be used.

INSTALLATION WIRING DIAGRAM - 115VAC - TWO WIRE PUMPS EXCEEDING 16 FULL LOAD AMPS



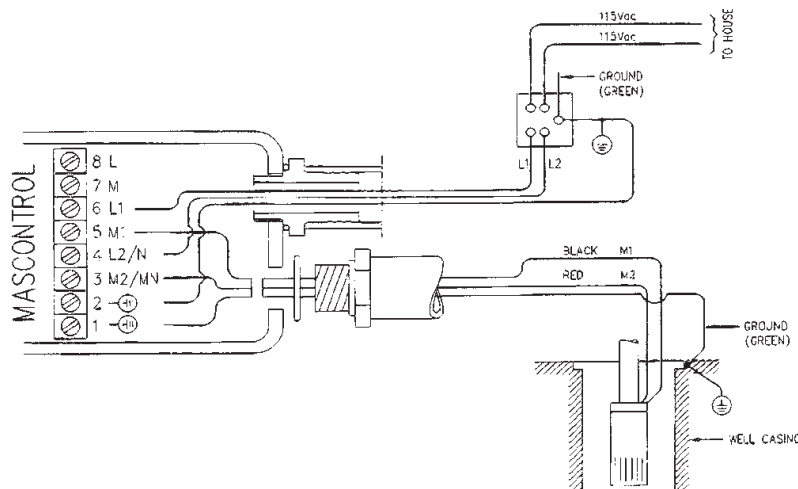
For 115 Vac motors exceeding 16 full load amps, use magnetic starter to avoid damage to Mascontrol®.



INSTALLATION WIRING DIAGRAM - 230VAC - SINGLE PHASE 2 WIRE PUMPS



For 230Vac motors exceeding 20 full load amps, use magnetic starter to avoid damage to Mascontrol®. See separate magnetic starter wiring diagram.

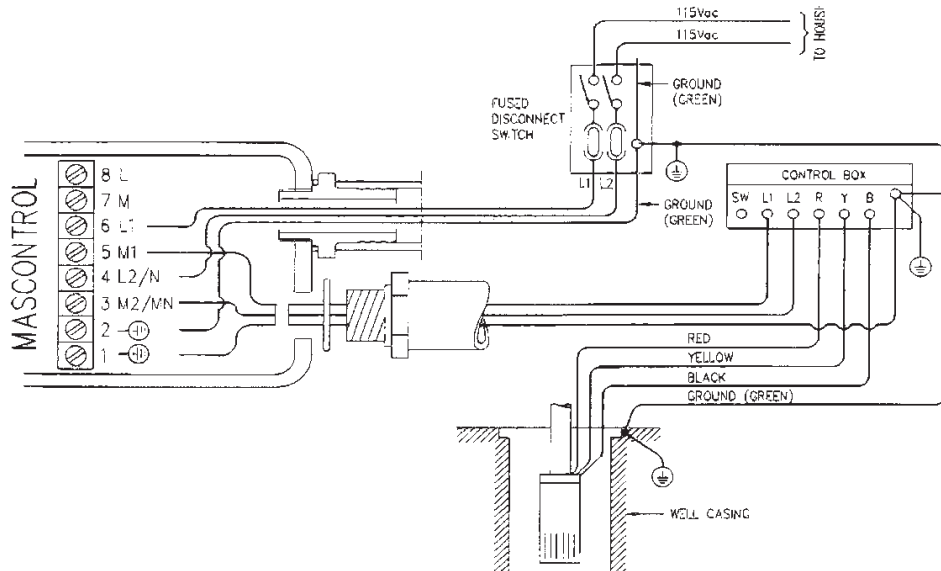


INSTALLATION WIRING DIAGRAM - 230VAC - SINGLE PHASE 3 WIRE PUMPS

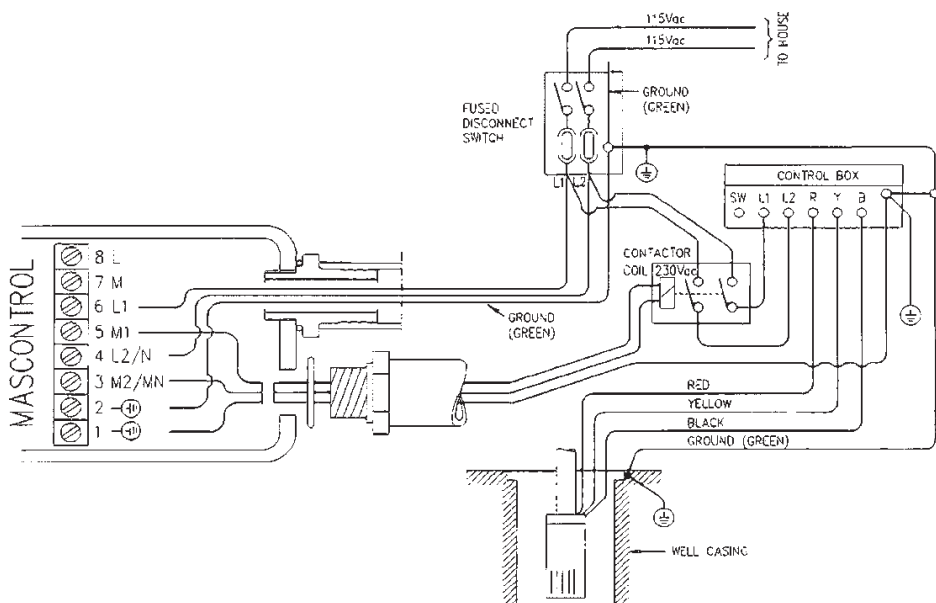


WARNING

For 230Vac motors exceeding 20 full load amps, use magnetic starter to avoid damage to Mascontrol®. See separate magnetic starter wiring diagram.



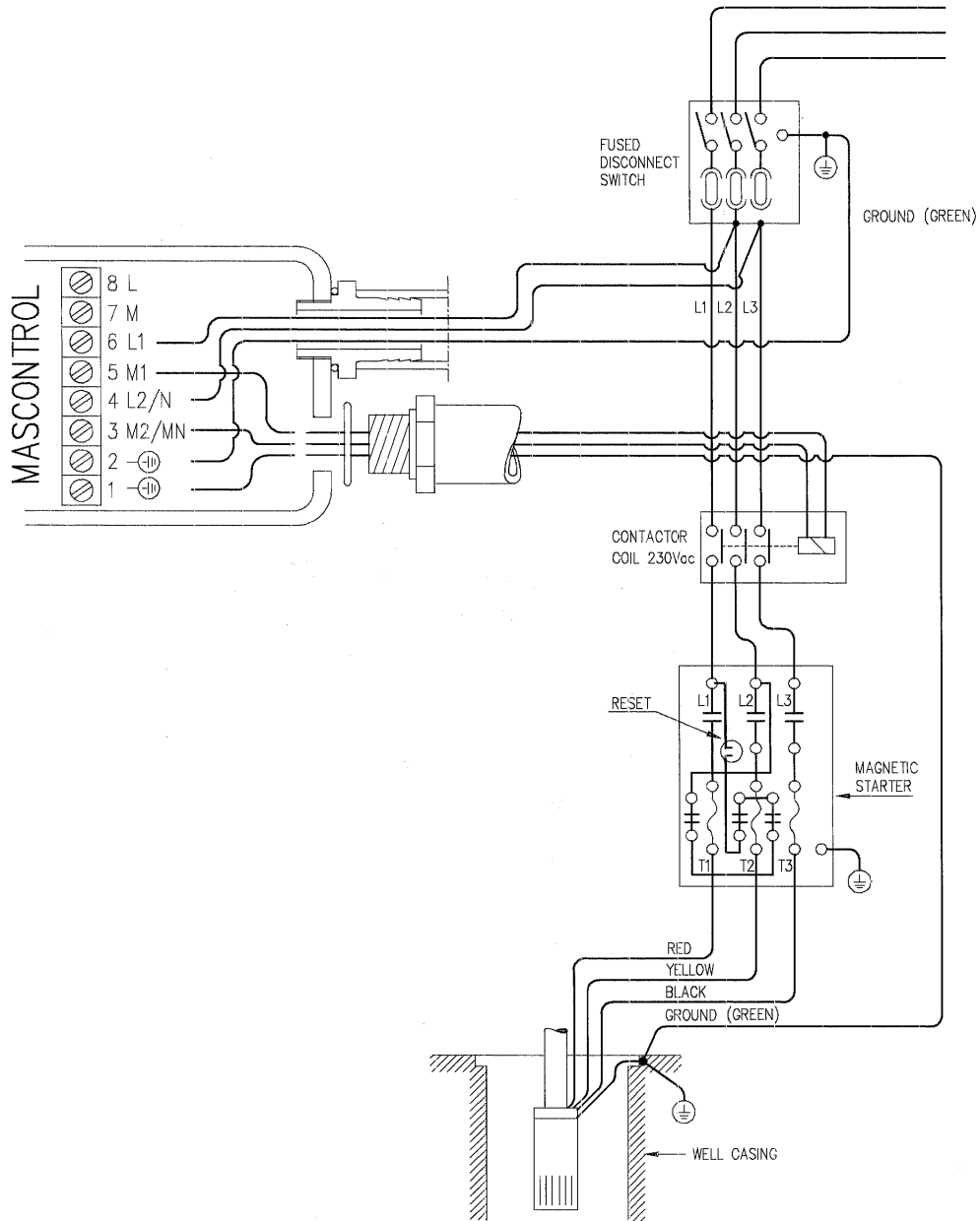
INSTALLATION WIRING DIAGRAM - 230VAC - SINGLE PHASE 3 WIRE PUMPS EXCEEDING 20 FLA



INSTALLATION WIRING DIAGRAM - 208 VAC or 230VAC - THREE PHASE 3 WIRE PUMPS



For 208 Vac or 230 Vac three-phase motors, use magnetic starter to avoid damage to Mascontrol.®

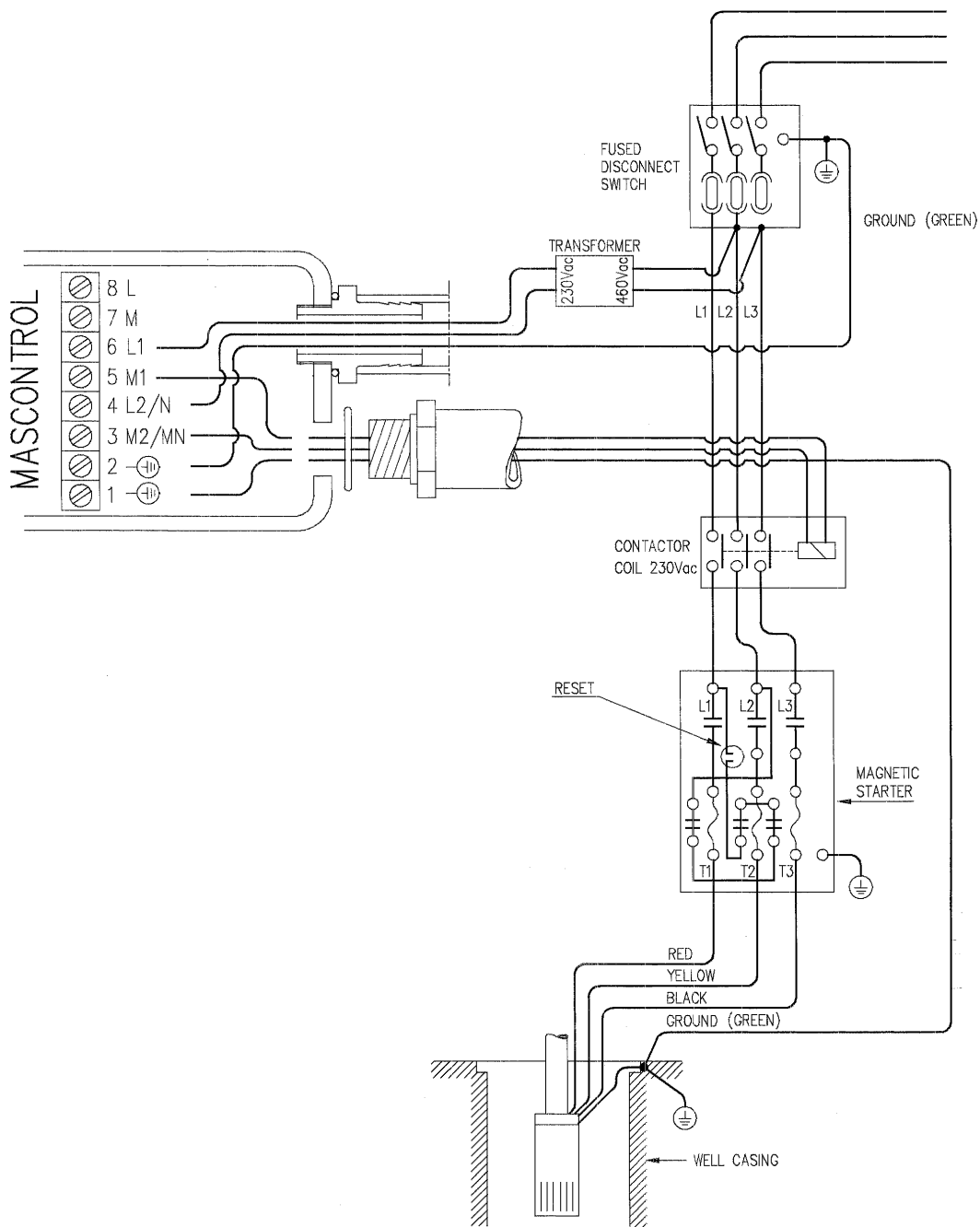


INSTALLATION WIRING DIAGRAM - 460VAC

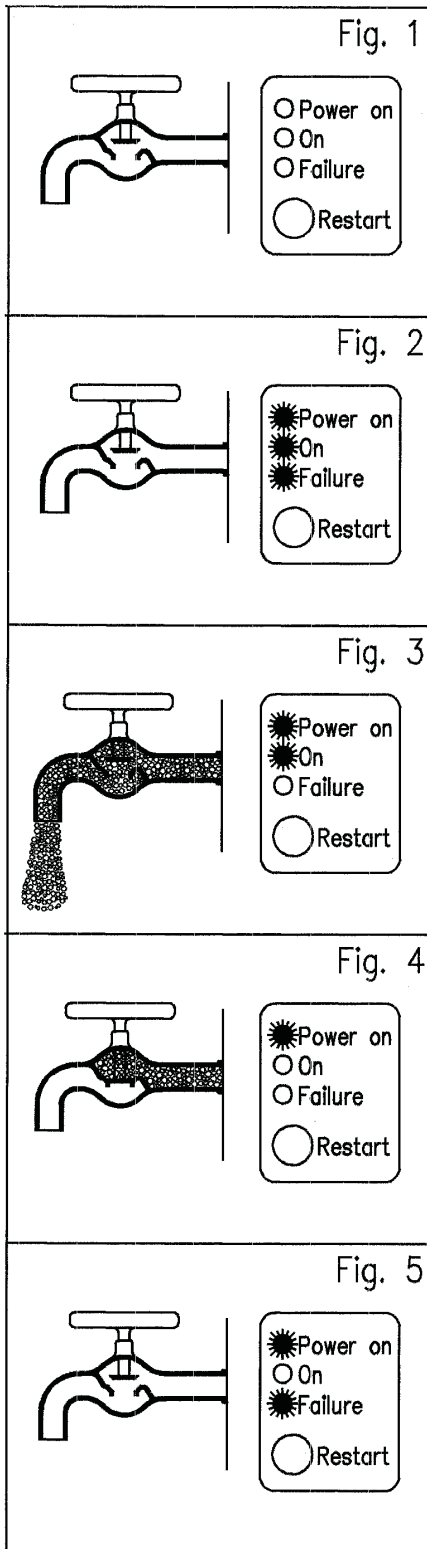


WARNING

For 460Vac motors, use magnetic starter to avoid damage to Mascontrol®.



START-UP AND OPERATION



WARNING

IF USING A SUBMERSIBLE PUMP, A PRESSURE REDUCING VALVE RATED TO A SAFE PSI FOR PIPING IN YOUR APPLICATION MUST BE INSTALLED IN LINE AHEAD OF THE MASCONTROL®. FAILURE TO INSTALL VALVE MAY RESULT IN DELIVERING DAMAGING HIGH WATER PRESSURE TO PIPING AND FIXTURES.

A small panel on the front of the of the device displays all system operating cycles, by means of indicator lights.

If pump is not primed, read and follow pump manufacturers directions for pump priming.

When Mascontrol® is first installed on the system all indicator lights are off (fig. 1). Open a tap to allow air to escape, then turn on power to the Mascontrol®. All indicator lights illuminate (fig. 2). The green POWER ON light indicates the presence of power in the Mascontrol®, the yellow PUMP ON light indicates that the pump is on, the red FAILURE light will illuminate until water passes through the Mascontrol® and flows from the tap (fig. 3). Once the tap is closed, the pump will shut off after a few seconds and the Mascontrol will go to the “standby” mode with POWER ON light illuminated (fig. 4). The Mascontrol® is correctly installed and the system is ready to work.

In case of prime or suction problems.

When Mascontrol® is first powered on, all the indicator lights illuminate (fig. 2), the pump will run for few seconds and will stop automatically, the yellow PUMP ON light will shut off. The Mascontrol® will have POWER ON and FAILURE lights on (fig. 5). Additional time is needed to pressurize the system. Keep the red RESTART button depressed until the water flows from the tap, then release the button. The pump will continue to run until the tap is closed. If water does not flow after 20/30 seconds, SHUT OFF POWER to the unit. Follow pump manufacturer directions for pump priming and make sure no suction line obstructions exist and the water table is at a suitable level. Then turn on power to the Mascontrol® and repeat the above starting operation.

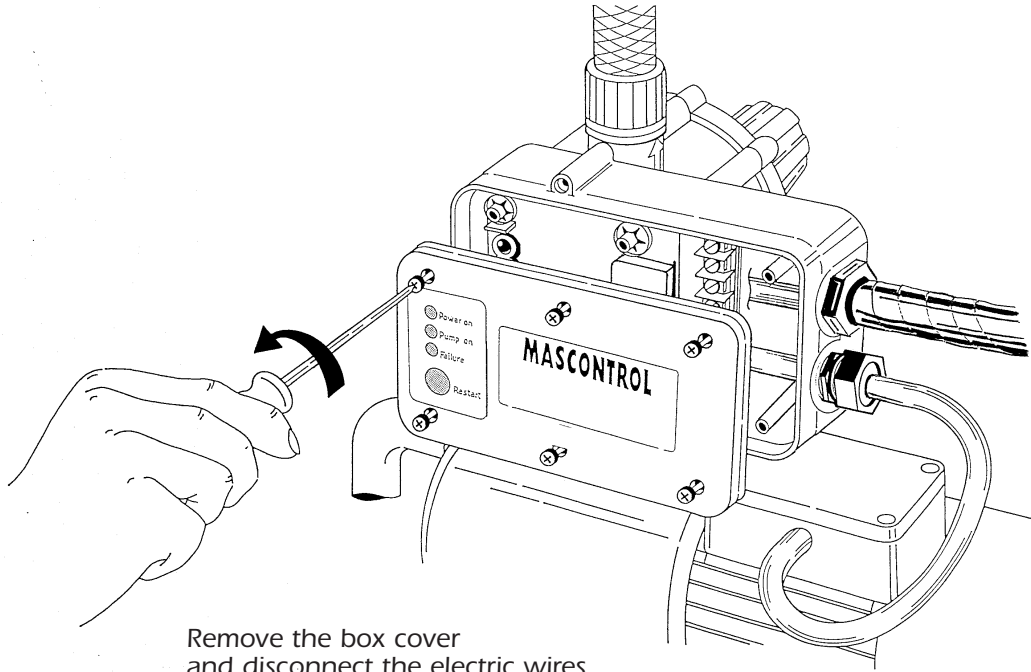
CAUTION

RESET/RESTART button: This button overrides the circuit and powers the pump. When priming or restoring water after a run-dry condition, the RESTART button must be depressed for a suitable length of time to allow the pump to pressurize the system, thus overriding the run-dry protection of the Mascontrol®. Especially after a run-dry failure be certain water level is sufficient to properly operate pump. Do not override the circuit and run the pump until the proper water level is confirmed and no suction line obstructions exist.

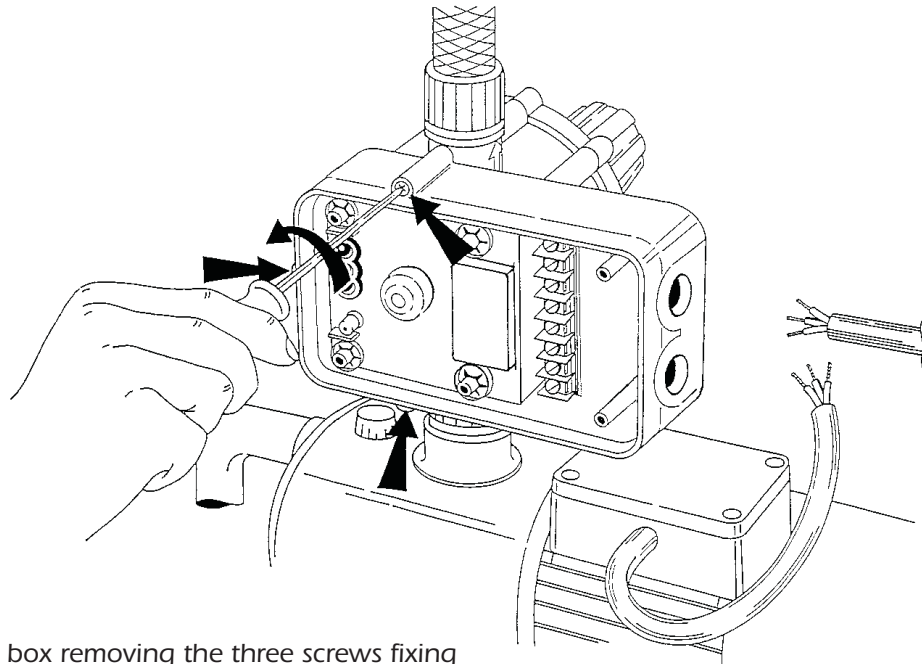
ELECTRONIC BOX REPLACEMENT



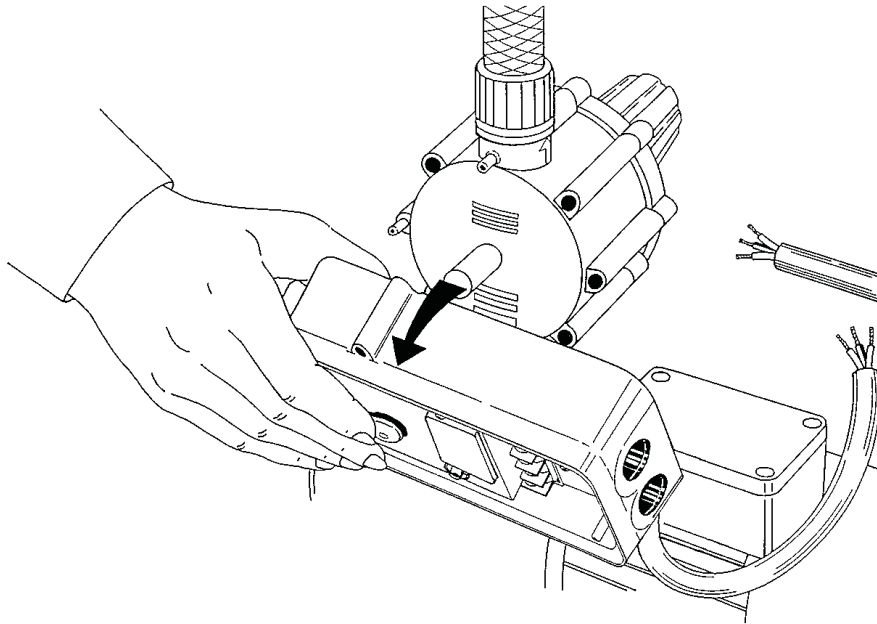
Prior to removing the electronic box ensure that power to unit is off and unit is depressurized.



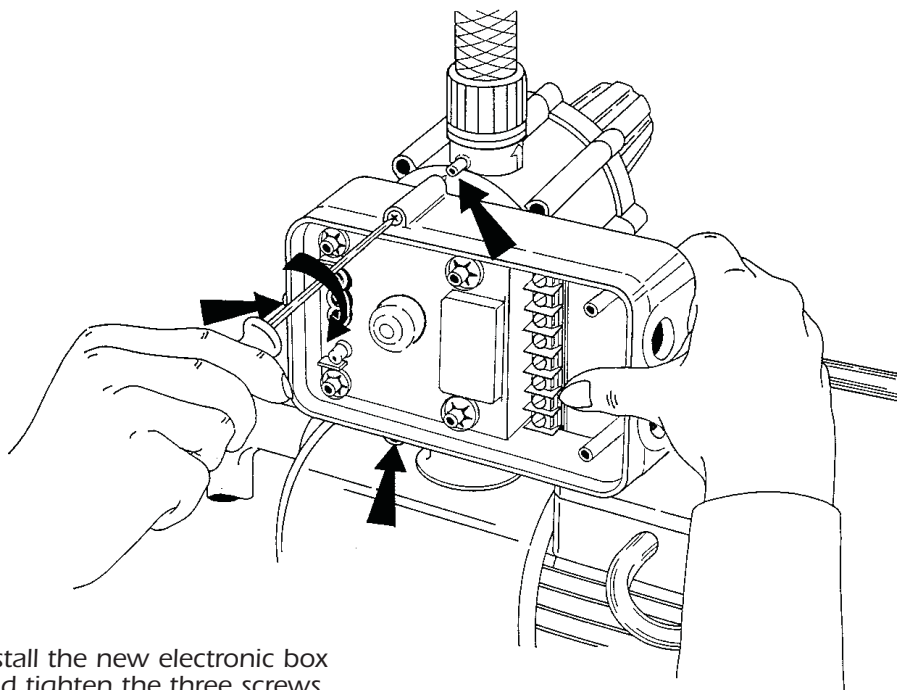
Remove the box cover and disconnect the electric wires



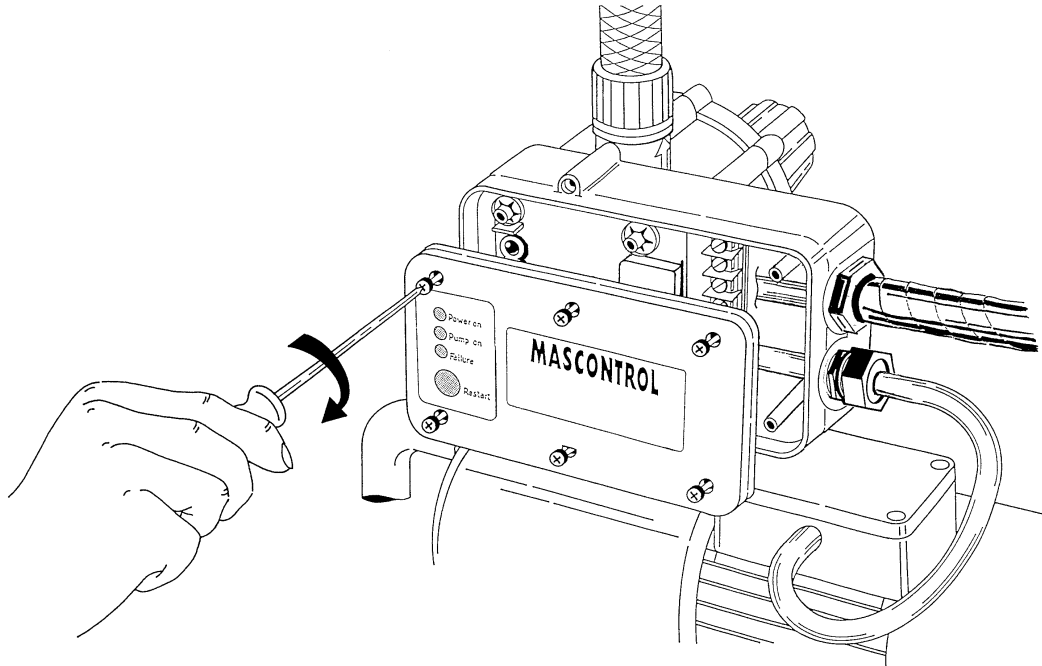
Take off the box removing the three screws fixing the electronic box to the unit body.



Remove the electronic box



Install the new electronic box and tighten the three screws. Do not overtighten or damage to threads may result.

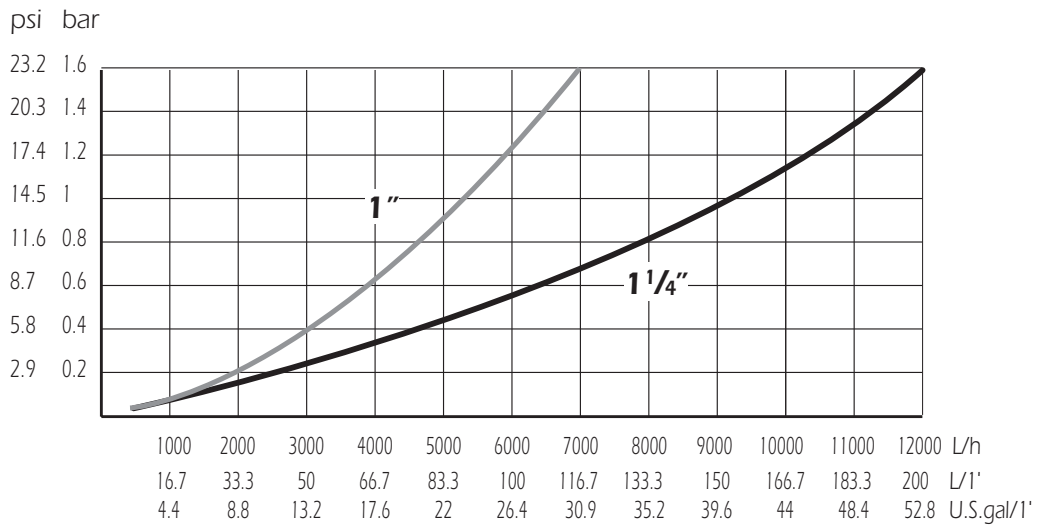


Tighten the six screws on the cover of the electronic box to ensure water tight seal.
 If cover is not securely fastened, RESET button will not operate.

WARNING: Do not turn on power until the box cover has been securely fastened.

PRESSURE LOSS TABLE

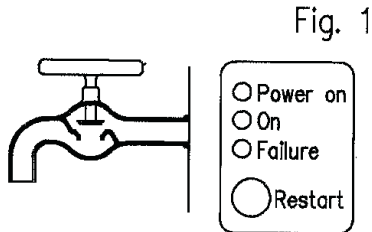
PRESSURE LOSS DIAGRAM
 (Water at 59° F)



Pressure Regulator Troubleshooting

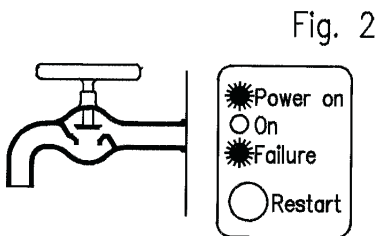
- 1. Pressure Creep** - If system pressure "creeps" above the set point of the pressure regulator, the regulator seal/o-ring has dirt or sand particles embedded in it. Remove the seal or "o" ring according to manufacturer's instructions, and clean and rub finger around surface to ensure no dirt particles remain. Reassemble regulator according to manufacturer's instructions. On new pump or new well applications this is a rather common occurrence due to the dirt and particles being flushed through the system.
- 2. Screens** - Before leaving the job, clean the regulator screen to ensure it is not clogged with sediment from the new pump or well.

MASCONTROL TROUBLESHOOTING MANUAL



POWER ON, PUMP ON and FAILURE light all off. Tap opened, no flow, pump off. (fig. 1).

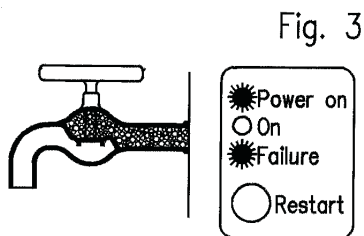
Power supply is on but no lights are lit. Turn off power supply to Mascontrol and remove the electronic box cover. Check all electrical connections to be certain they are tightly fastened to the proper terminals for the voltage needed (115V or 230V). Refer to the schematic in the electronic box. If all electrical connections are secure and correct, test electrical terminals with meter to ensure power is present at the terminals. If power is at the terminals, the electrical box has failed and must be replaced (power must be on to unit to test terminals).



POWER ON and FAILURE light on, PUMP ON light off. Tap opened, no flow, pump off. (fig. 2).

The unit has detected one of the following:

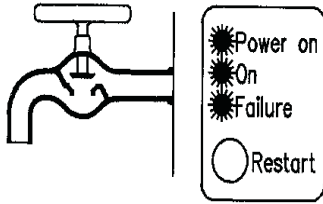
1. Loss of suction from low water table - check water supply.
2. Blockage in pipe from water supply to pump and Mascontrol - remove blockage.
3. If a pump has a thermal protection switch, check to make sure this switch has not been tripped by the pump. If pump has been switched off due to the thermal switch, check pump for proper operation and condition and reset thermal switch. Press RESET button on Mascontrol. Pump should start up.
4. The pump capacitor has failed or is not adequate.
5. Electronic box failure - replace box (Rare occurrence).



POWER ON and FAILURE light on, PUMP ON light off. Tap closed, pump off. (fig. 3).

1. Pump cannot attain at least 34 psi - check pump pressure reading with pressure gauge. Pump must be able to attain at least 34 psi to work properly with the Mascontrol unit.
2. Electronic box failure - replace box (Rare occurrence).

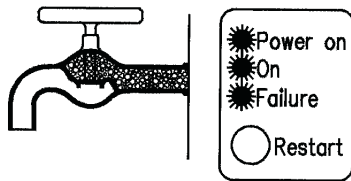
Fig. 4



**POWER ON, PUMP ON and FAILURE lights all on.
Tap opened, no flow, pump off. (fig. 4).**

The tap is open and the pump is not operating. Check the wiring in the electronic box to make sure all wires are securely fastened to the proper terminals. Also recheck voltage for correct application (115V or 230V). Press the RESET button. If all lights remain on and the pump still does not operate, the electronic box has failed and should be replaced.

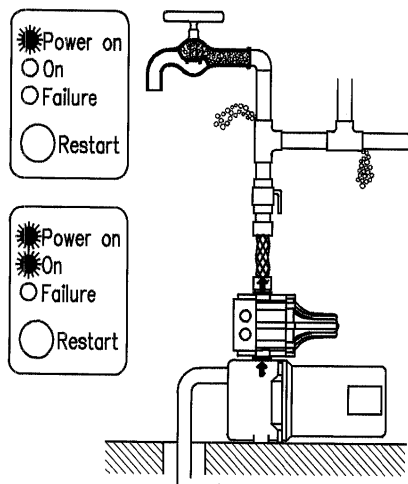
Fig. 5



**POWER ON, PUMP ON and FAILURE lights all on.
Tap closed, pump on. (fig. 5)**

The pump is operating and all taps are closed, the electronic box has failed and must be replaced.

Fig. 6



**POWER ON light on, FAILURE light off and PUMP ON light short cycles on and off.
Tap closed, pump cycles on/off. (fig. 6)**

1. Leakage **less than** 0.21 gpm may be present in piping. The higher the leakage rate (but less than 0.21 gpm) the faster the pump cycles. Make sure all taps are closed and all toilet valves are functioning properly. After tap inspection check all piping and valves connected to the system for leakage. To help determine leak location, close the shut-off valve after the Mascontrol. If pump cycling stops, leak is located after the Mascontrol in the water supply. Shut-off power to the Mascontrol and locate and fix leak. Restore power to Mascontrol (Mascontrol will start pump automatically) and monitor system to determine that leak has been corrected.
2. If pump cycling still occurs after closing the shut-off valve behind the Mascontrol, the bottom check valve is obstructed from closing properly (see Fig. 10b on page. 23).

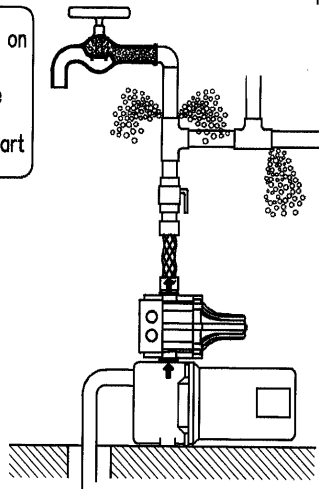
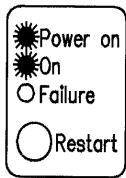


Fig. 7

POWER ON and PUMP ON light on, FAILURE light off. All taps closed, pump runs continuously. (fig. 7)

1. The condition may be similar to condition 1 (fig. 6) above but the leak flow rate is **greater than 0.21 gpm**. In this case the leak obviously simulates an open tap condition. Follow instructions in condition 1, figure 6, above.
2. The top flow valve of the Mascontrol is obstructed.
3. The electronic box has failed and should be replaced.

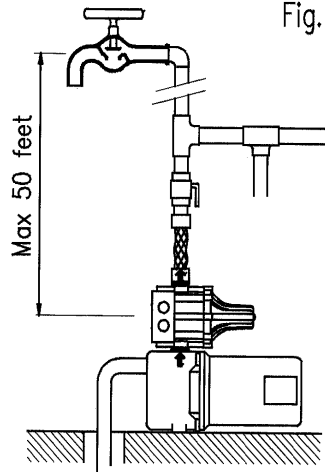
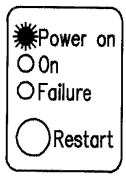


Fig. 8

POWER ON light on, PUMP ON and FAILURE light off. Tap open, no flow, pump off. (fig. 8)

The column of water between Mascontrol and the highest tap exceeds 50 feet, therefore the column of water has created a pressure higher than the cut-in pressure of the Mascontrol (21.8 psi). This prevents the unit from working properly. Reposition the Mascontrol higher so the water column height is less than 50 feet.

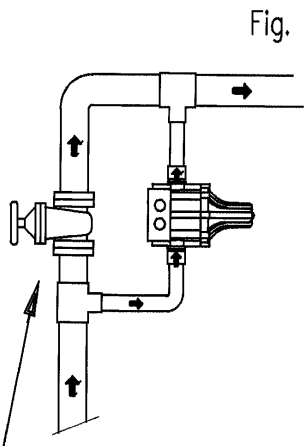
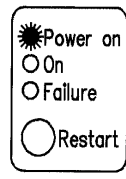


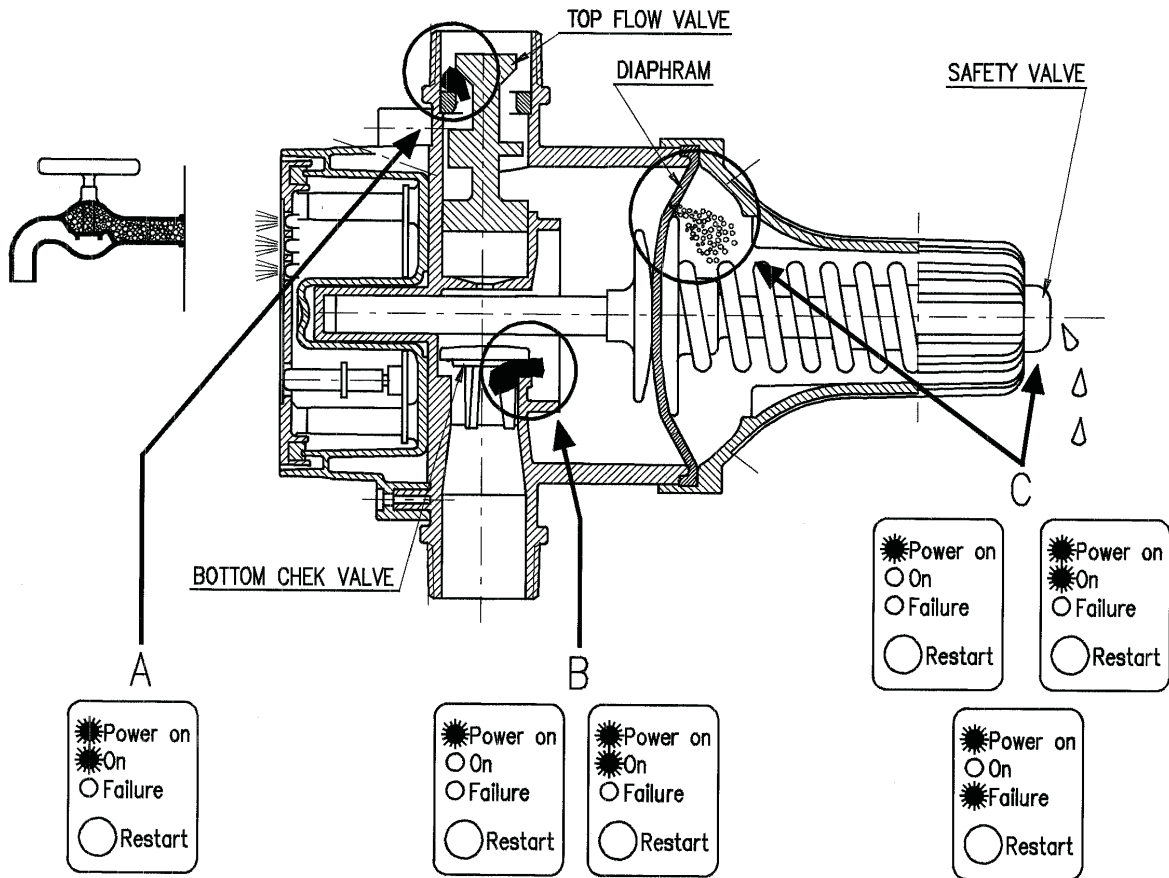
Fig. 9

MASCONTROL USED IN BYPASS INSTALLATION. POWER ON light on, FAILURE light off, PUMP ON light turns on and off intermittently. Tap open, Intermittent flow, pump cycles on/off. (fig. 9)

The flow rate into the bypass is less than 0.21 gpm. Close the gate valve slightly to throttle enough water (at least 0.21 gpm) into the bypass. Test the system and further adjust the gate valve until enough water flows into the bypass and system operates correctly.

Gate valve

FAILURE AND MALFUNCTIONING OF THE HYDRAULIC PART OF MASCONTROL



POWER ON and PUMP ON lights on, FAILURE light off. All taps closed, pump runs continuously.

The top flow valve is obstructed by metal sediment (from pipe threads etc.) attaching to the magnetic surface of the valve assembly or by natural sediment such as small stones lodging in the valve seat. Open and close the tap quickly several times to remove the sediment. If problem still exists, disconnect the unit, tap on the Mascontrol near the top flow valve to free object and allow valve to seat properly. If this does not clear the obstruction, rinse inner cavity with water, dumping out any sediment that may be present. Reconnect the unit, restore power, and monitor for correct operation. Although this condition is rare, service persons and/or installers should note the possibility of sediment obstructions.

POWER ON light on, FAILURE light off and PUMP ON light short cycles on and / off. Tap closed, pump cycles on/off.

The bottom check valve is obstructed from closing properly by a small stone, filament etc.. In this case the cycles are very fast. Disconnect the unit, tap on the Mascontrol near the bottom check valve to free object and allow valve to seat properly. If this does not clear the obstruction, rinse inner cavity with water, dumping out any sediment that may be present. Reconnect the unit, restore power, and monitor for correct operation. Although this condition is rare, service persons and/or installers should note the possibility of sediment obstructions.

POWER ON light on, FAILURE light off, PUMP ON light turns on and off for few times then turns off definitively and FAILURE light comes on. Tap closed, pump cycles a few times and then stops definitively.

The diaphragm is compromised. If a small drop of water appears at the Mascontrol safety valve on the end of the unit, the diaphragm has broken and unit must be replaced. This condition is very rare.

MARKINGS AND WARRANTY

THE WARRANTY PERIOD IS 2 YEARS FROM INSTALLATION DATE.

WARRANTY AND DISCLAIMER OF WARRANTY

The following warranty for the product is in lieu of all other conditions or warranties, whether express, implied or statutory, including but not limited to any implied conditions or warranties of merchantability or fitness for a particular purpose and on any other condition or warranty obligation on the part of Presscontrol or its distributors, which are hereby expressly disclaimed. Mascontrol® is warranted to be free of defects occurring either in hydraulic or electronic parts for a period of two years from date of installation when installed by a licensed professional in accordance with the product manual and due professional care. Presscontrol reserves the right to inspect and evaluate defective units prior to warranty claim settlement. Improper installation, application or mishandling of unit voids the warranty.

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U.S. Patent 5,259,733.



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