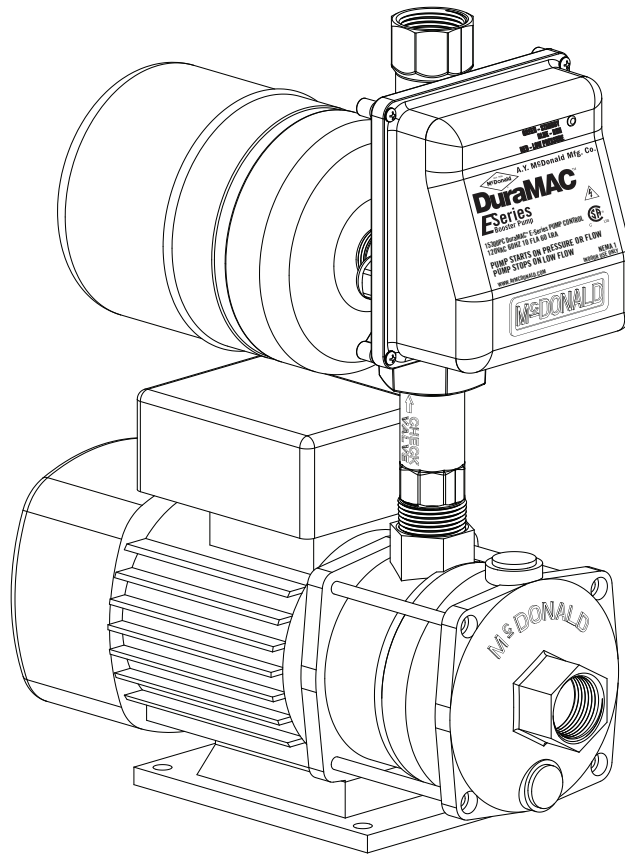




# E-Series DuraMAC™ Residential Water Pressure Booster System



The **E-Series DuraMAC™ Water Pressure Booster System** is designed for residential and small commercial boosting applications.

The pump starts with water flow or pressure drop and stops on low flow.

A constant speed, totally enclosed fan-cooled motor drives the **E-Series DuraMAC™** booster pump with single phase power. It tells you it is working properly by illuminating a single status light.

### ATTENTION!

#### Important information for installers of this equipment!

This equipment is intended for installation by technically qualified personnel. Failure to install it in compliance with national and local electrical codes and with motor suppliers recommendations, may result in electrical shock or fire hazard, unsatisfactory performance, and equipment failure.

### WARNING!

Serious or fatal electrical shock may result from failure to connect the motor, control enclosures, metal plumbing, and all other metal near the motor or cable, to the power supply ground terminal using wire no smaller than motor cable wires. To reduce risk of electrical shock, disconnect power before working on or around the water system.



**WARNING:** It is unlawful in **CALIFORNIA & VERMONT** (effective 1/1/2010); **MARYLAND** (effective 1/1/2012); **LOUISIANA** (effective 1/1/2013) and the **UNITED STATES OF AMERICA** (effective 1/4/2014) to use any product in the installation or repair of any public water system or any plumbing in a facility or system that provides water for human consumption if the wetted surface area of the product has a weighted average lead content greater than 0.25%. This prohibition does not extend to service saddles used in California, Louisiana or under USA Public Law 111-380.

## TABLE OF CONTENTS

SECTION	1	ELECTRICAL INSTALLATION.....	2
SECTION	2	INSTALLATION & LOCATION.....	2-3
SECTION	3	PUMP ASSEMBLY.....	4
SECTION	4	PIPING.....	5-7
SECTION	5	PUMP CONTROL.....	8
SECTION	6	ALTERNATE CONTROL METHODS.....	9
SECTION	7	TROUBLESHOOTING.....	10-11

Before installation, read the following instructions carefully. Each E-Series DuraMAC™ pump is individually factory tested to insure proper performance. Closely following these instructions will eliminate potential operating problems, assuring years of trouble-free service.

## 1. GROUNDING & ELECTRICAL INSTALLATION



**The pump and control is supplied with a 3-conductor grounding cord. Connect the control only to a properly grounded, dedicated GFCI protected circuit. Do not lift the pump by the electrical cord.**

Follow local and national plumbing, building and electrical codes when installing the pump. Maintain this pump in compliance with the National Electrical Code (NEC) or the Canadian Electrical Code (CEC) and with all local codes and ordinances that apply. Consult your local building inspector for local code information.



Use copper conductors only and be certain wire and fuses of the correct size are installed.  
**DO NOT GROUND TO GAS OR FUEL LINES**

## 2. INSTALLATION & LOCATION

The pump should be installed in a dry, accessible area protected from freezing temperatures. Proper ventilation must be provided for proper cooling of the electrical equipment.



Follow local plumbing codes. In some cases a dual check valve, reduced pressure zone device, or other equipment may be required.



If your new boosted pressure is greater than 80 PSI\*, you must install a pressure reducing valve before your pump. Consult local plumbing codes and pressure ratings on your water appliances.





A pressure relief valve or expansion tank is recommended downstream of device if thermal expansion conditions are possible.





\*See table on Page 3 for maximum incoming pressure.

E-Series DuraMAC™ Model	Pump Boost	Amps	Voltage	Power	*Maximum incoming pressure
18035R020PC1	35 PSI	5.5	120 - 60 Hz	½ HP	45 PSI
18052R020PC1	52 PSI	7.0	120 - 60 Hz	¾ HP	28 PSI

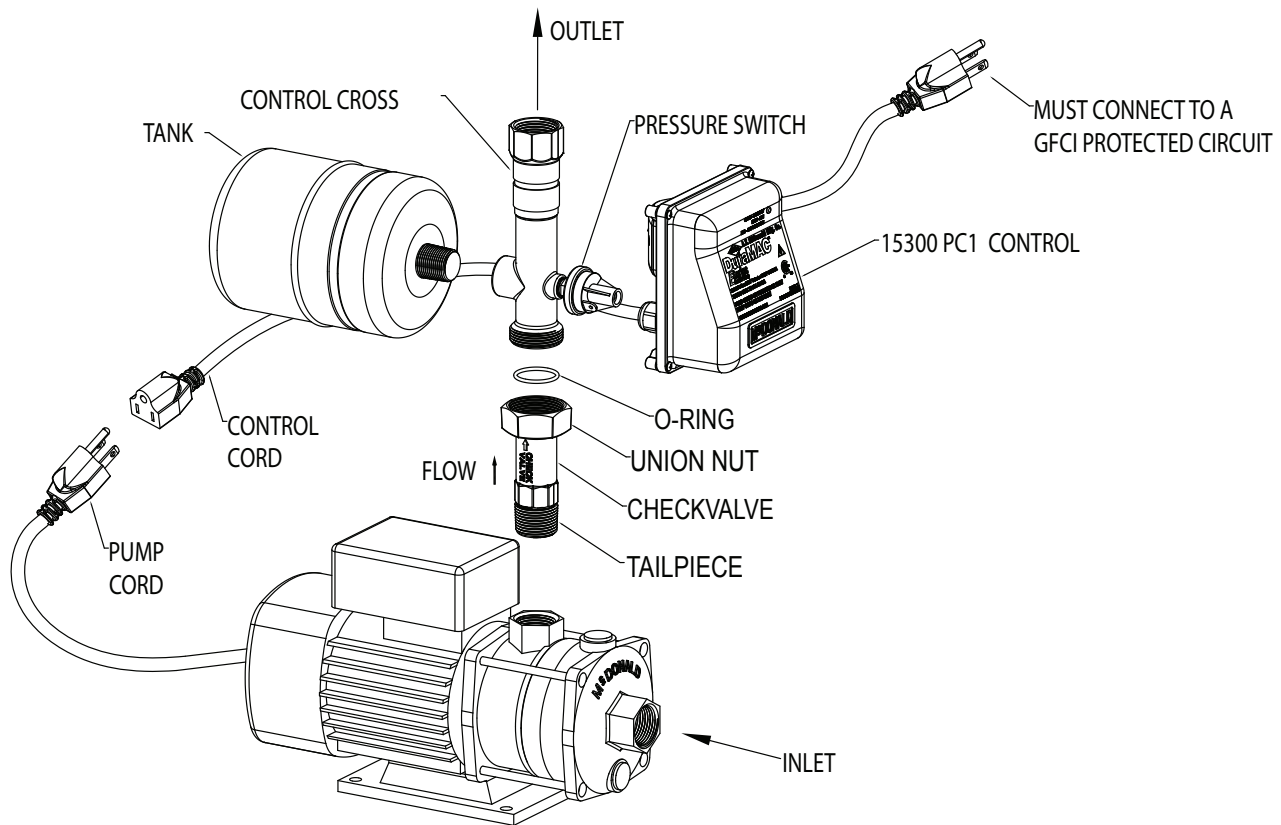
Total static pressure E-Series DuraMAC™ pump

Incoming Pressure (PSI)	18035R020PC1 <b>+35</b>	18052R020PC1 <b>+52</b>
60		
55	90	
50	85	
45	80	
40	75	
35	70	87
30	65	82
25	60	77
20	55	72
15	50	67
10	45	62

Pump Boost	<b>+35</b> PSI BOOST	<b>+52</b> PSI BOOST
Model #	18035R020PC1	18052R020PC1
Cord Connection	 120V	 120V
Power	1/2 HP	3/4 HP
Max Incoming Pressure	45 psi	28 psi

-  Do not spray water on or near the electric motor or control.
-  Pump only water with this pump. Do not pump flammable liquids or chemicals. Do not use the pump near gas pilot lights or where chemical or gas fumes are present.
-  Use of an electric pump with liquids other than water or in an atmosphere containing chemical or gas fumes may ignite those liquids or gases and cause injury or death due to an explosion and/or fire.
-  Always install near a floor drain where leakage will not cause damage to homes or property.

### 3. PUMP ASSEMBLY



1. Make sure arrow ➔ on tailpiece check valve is in the direction of flow. Push inside the check valve to make sure poppet can move. If the check valve is installed in the wrong direction water will not leave the pump.
2. Apply pipe sealant on the male threads of tailpiece with check valve. Install into outlet of pump. **DO NOT apply any pipe sealant on pump threads.**
3. Make sure the union nut is over the tailpiece before threading into pump.
4. O-ring should be installed in groove on top of tailpiece with check valve. Then tighten union nut to control cross.
5. Apply pipe sealant on tank threads and install into control cross port labeled "Tank". Only tighten with a wrench on the flats of the tank. The 1/2 gallon tank included is required for this product to work properly. The air pressure of the tank must be set at 28 PSI. This is 2 PSI less than the start pressure of the pump.
6. Plug the pump cable into the control cord. **Do not plug the control into wall yet.**  
**⚠** Plugging in the control prior to making plumbing connections and priming the pump will cause the pump to run dry and void warranty.
7. Rotate control so front panel is visible when installed.
8. Mount the pump base firmly and follow piping instructions on next page.

## 4. PIPING

### Pressurized – City supply or flooded suction

The E-Series DuraMAC™ booster pump should be installed after the water meter and before the water softener. If debris is present in the water, a strainer of 40-50 mesh should be installed before the pump and cleaned regularly.

When connecting to a pressurized supply line, make sure the incoming pressure is less than that listed in the table on page 3. The booster pump will stop on low flow not on pressure, so depending on the pump you installed, you will add 35 or 52 PSI (static) to your incoming pressure. Check your local codes for maximum pressure allowed in your area. Damage to water heater or other appliances can occur if the pressure is above the rated pressure of these devices.

If your new boosted pressure is greater than 80 PSI, you must install a pressure reducing valve before your pump. Consult local plumbing codes and pressure ratings on your water appliances.

It is recommended that a gauge is installed after the pump. This will enable you to view the outlet pressure and troubleshoot if necessary.

It is recommended that you install a gate valve or ball valve with a union before and after the pump. This will enable you to easily disconnect the system to allow for service if required.

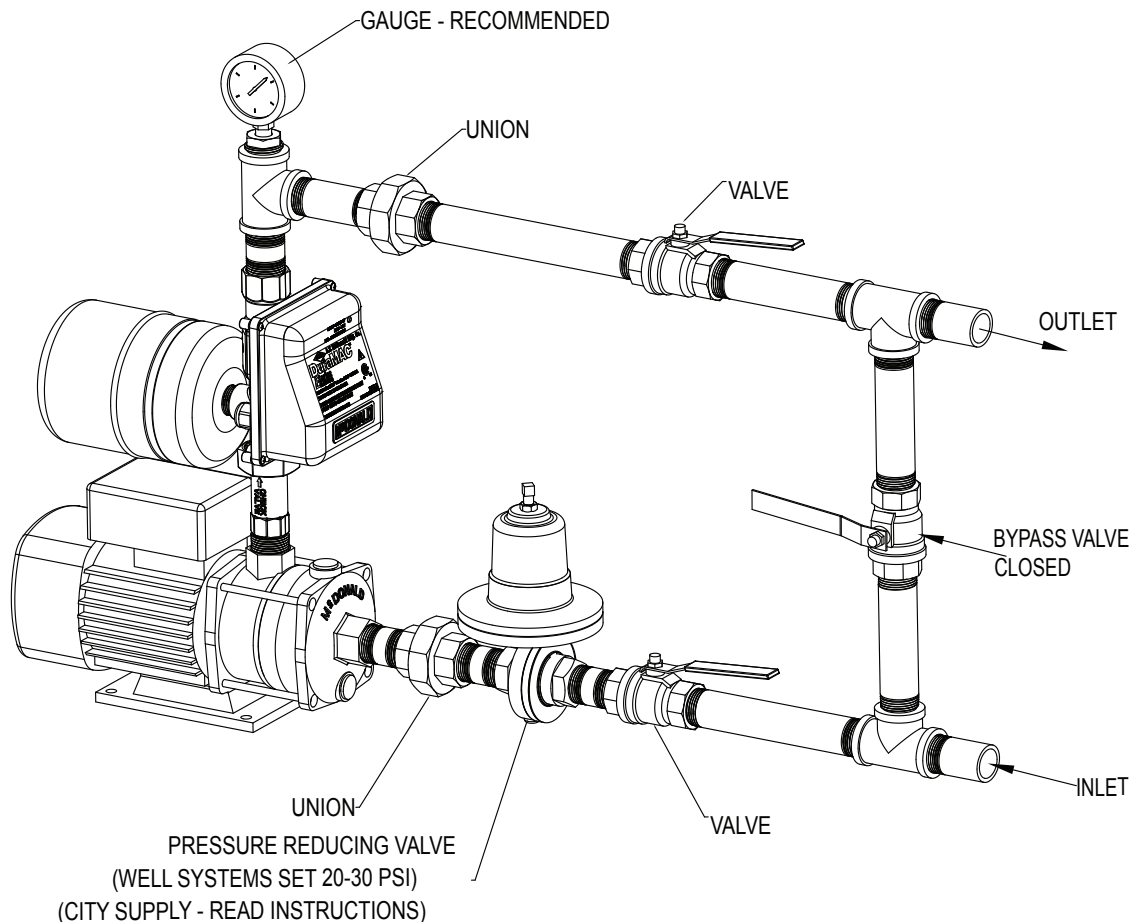
### Well Tank System

The E-Series DuraMAC™ booster pump should be installed after the well tank and before the water softener. Water treatment equipment to increase pH (potential of hydrogen) must be done before the pump. If debris is present in the water, a strainer of 40-50 mesh should be installed before the pump and cleaned regularly.

It is recommended that a gauge is installed after the pump. This will enable you to view the outlet pressure and troubleshoot if necessary.

When installing on a well system, it is recommended that you install a gate valve or ball valve with a union before and after the pump. This will enable you to easily disconnect the system to allow for service if required.

A pressure reducing valve is required and must be installed before the pump to ensure proper operation. Set the pressure reducing valve to the cut in pressure of your well pressure switch. For example if your well pressure switch is set between 30-50 PSI, then set your pressure reducing valve to 30 PSI. This will eliminate the pressure fluctuations from your well tank and give you a constant boost.



## HOLDING TANKS

In holding tank applications, there are two methods for installing the pump. There is Flooded Suction and Suction lift. Both methods require correct sizing of the suction pipe. For the E-Series DuraMAC™ Residential 20 GPM booster, the suction supply pipe must be 1" or larger. Using pipe diameters less than recommended will cause cavitation and the pump to lose prime.

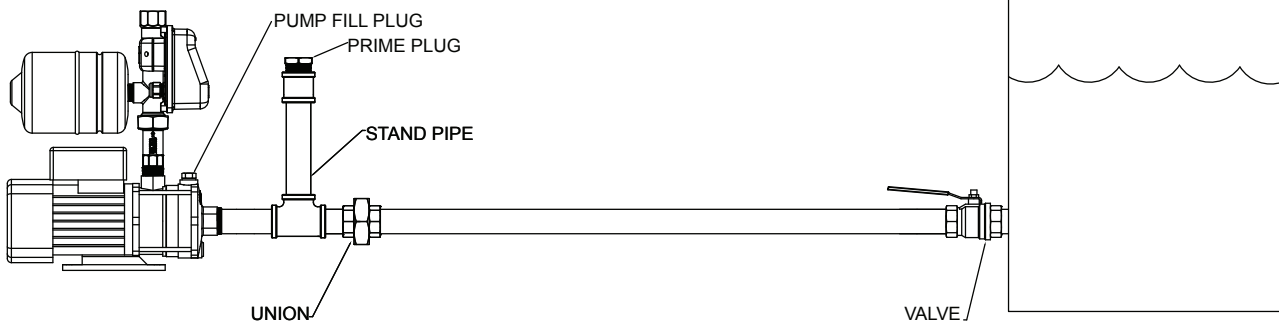
## HOLDING TANKS - FLOODED SUCTION

**Flooded Suction** is the preferred method because the pump will be fed with water under some pressure. The higher the water level is above the pump, the more incoming pressure will come from the tank. Every 28" of water height is equivalent to 1 PSI. If the pump is more than 3 feet away from the tank, a stand pipe with a prime plug will help to prime the system.

### FLOODED SUCTION

#### PRIMING

1. Remove the Pump Fill Plug and Prime Plug.
2. Open tank valve.
3. Fill water into pump until completely full.
4. Install Pump Fill Plug.
5. Fill standpipe with water until completely full.
6. Install Prime Plug in standpipe.
7. Plug in pump and run water. The recommended pressure gauge should read "PUMP BOOST" from table page 3, with discharge valve closed.
8. Repeat priming if pressure is less.



## HOLDING TANKS - SUCTION LIFT

**Suction Lift** has the pump located higher than the level of the water. The E-Series DuraMAC™ booster can work in this application up to 10 feet, as long as the pump is fully primed. Air pockets and suction pipe leaks will cause the pump to accumulate air and will eventually cause a red light low pressure. However, if the pump inlet is the highest point, it is fully primed, a good check or foot valve is installed, a standpipe is installed, and there are no suction leaks, the pump will perform well.

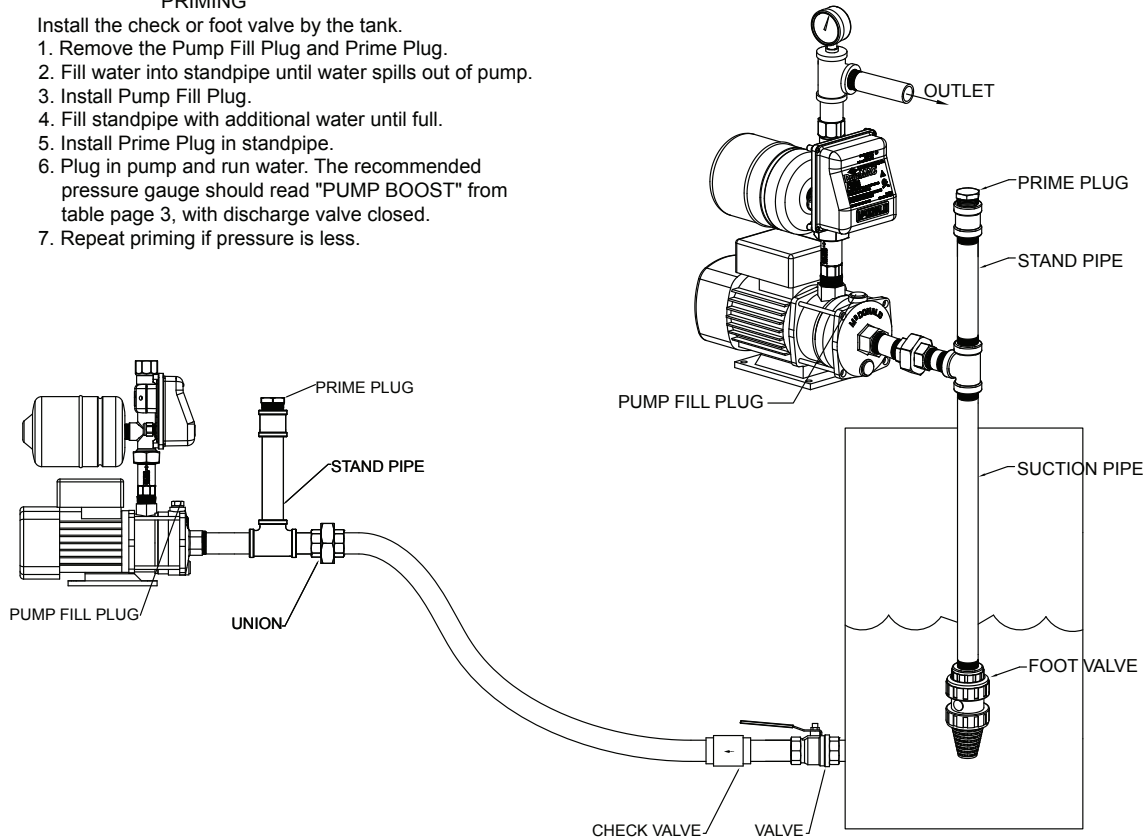
**\*Suction Lift not recommended with the 18035R020PC1 or 18035R020PC1SS**

### SUCTION LIFT - 10 Ft. Max

#### PRIMING

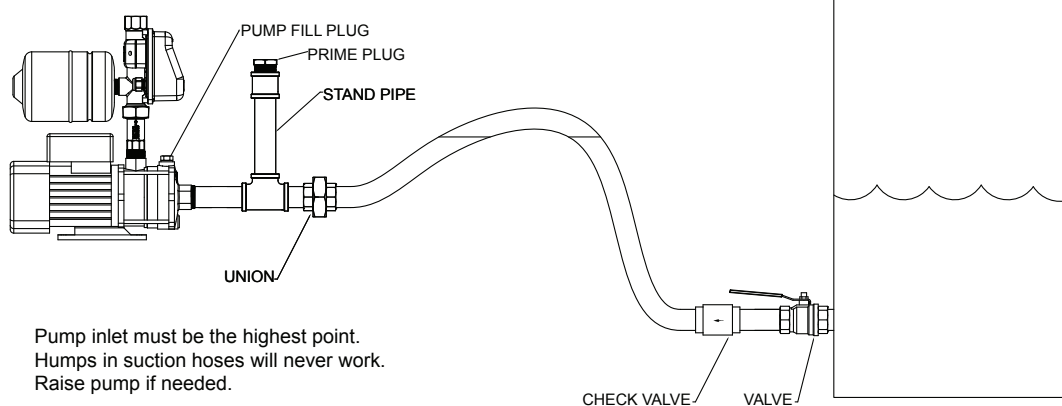
Install the check or foot valve by the tank.

1. Remove the Pump Fill Plug and Prime Plug.
2. Fill water into standpipe until water spills out of pump.
3. Install Pump Fill Plug.
4. Fill standpipe with additional water until full.
5. Install Prime Plug in standpipe.
6. Plug in pump and run water. The recommended pressure gauge should read "PUMP BOOST" from table page 3, with discharge valve closed.
7. Repeat priming if pressure is less.



The pump inlet must also be the highest point. There can be no humps in the line as shown here:

### WILL NOT WORK - AIR POCKET IN HOSE



The E-Series DuraMAC™ has the advantage over a Jet pump of being more efficient and quieter, however a Jet pump has the advantage of always priming itself.

When installed and primed properly, the E-Series DuraMAC™ booster will work well in holding tank applications.

## 5. PUMP CONTROL - STANDARD MODE



### STANDARD MODE

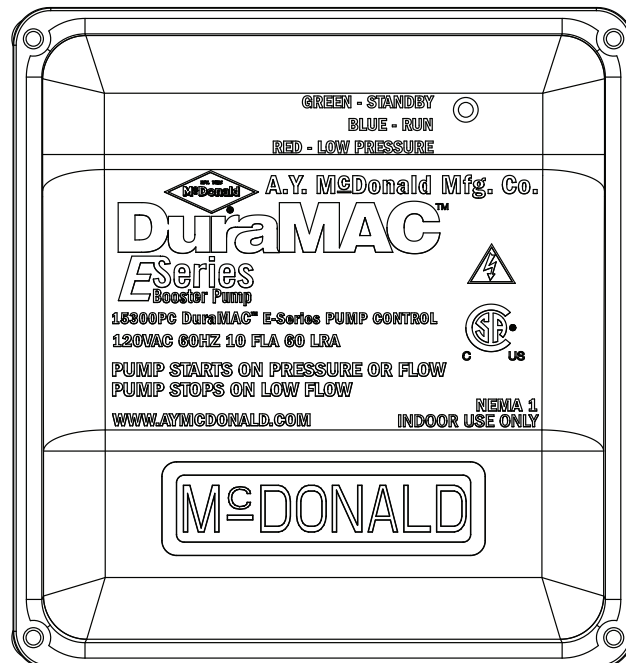
**START METHOD:** Water Flow or Pressure Drop

**STOP METHOD:** Low Flow

The control starts the pump automatically when flow greater than 1/2 a gallon per minute, or the pressure drops to 30 PSI. The pump will stop when the flow is less than 1/2 a gallon per minute.


This smart system will only run the pump when water is in use. There is a preset 7 second delay after water is not flowing past the internal flow sensor to fully pressurize your system and eliminate water hammer.

If the pump fails to build pressure and the red low pressure light is on, there is an automatic feature that will try to restart the pump every 15 minutes after a failure. This will occur automatically 4 times. This will protect your pump from running dry if the water supply is in adequate.



### Boosting- Start Up

**Do not plug in the control power cord into the wall outlet until Step 2 below is complete.**

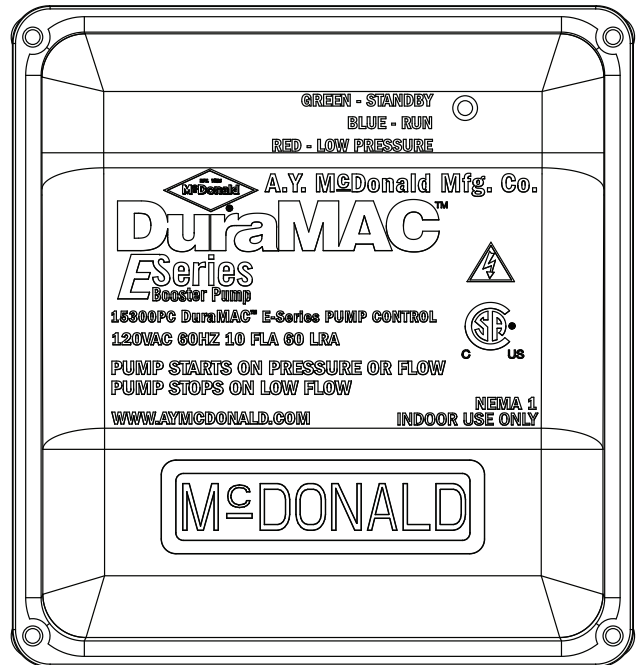
-  After all the pipe connections are made as shown in Section 4:
1. Open water main shutoff valve slowly and check for leaks.
  2. Open a nearby faucet and let water flow through for about 1 minute or until all the air is purged from the pipes. This is necessary to prime the pump.
  3. With the faucet open, plug in the control power cord. The pump should run and the blue light should be on.
  4. Close faucet. The pump will run for 7 seconds after the flow has stopped. The green stand by light should be on.
  5. The air pressure in the tank should be 28 PSI. This is 2 PSI less than low pressure setting. If the tank is not mounted on the brass control tee, it should be no further than 10 feet away.
  6. In order to check the air pressure in the tank, shut off the water supply main valve, open a faucet. The pressure gauge on the control should be reading zero. With a tire pressure gauge, check the pressure on the end of the tank. Pressurize the tank as required with a tire pump or air compressor.
  7. Check for leaks.



## 6. TROUBLESHOOTING

### RED light on (or flashing) and pump will not start:

1. No water - make sure water is available to the system
2. Water cannot flow through pump to build pressure. Make sure all suction valves are open and the check valve is in the correct orientation.
3. If installed in a suction lift application, prime could be lost. Re-prime and check for leaks on suction side. Unplug the power cord for 5 seconds then plug back in. Watch pressure gauge to make sure that the pressure is increasing.
4. Make sure all filters are installed after the pump. Change the filter cartridges regularly.
5. This can occur if the water supply has been interrupted. The pump will automatically try a restart 15 minutes after a failure. This will occur automatically 4 times.



### BLUE light on and pump will not stop:

1. Pump stops on a flow rate less than ½ GPM. This is normal if flow is higher.
2. Possible leaks in systems such as running toilets, humidifiers, water softeners, ice makers...
3. If the pump has a bypass valve installed, make sure it is closed for normal operation (see diagram page 5).
4. To check for water leakage in the house, close the valve after pump. If pump stops, then water is leaking somewhere after this valve. Fix leaks and open valves again.

### Pump starts and stops without obvious use:

1. Small leaks in the system can cause this.

### Pump stops at a pressure higher than 80 PSI.

1. This can happen if your incoming pressure is higher than the value in the table on page 3. A pressure reducing valve should be installed before the pump.

### **Pump will not start and no lights are on.**

1. Make sure the pump is plugged into the control and the control is plugged into a GFCI circuit. Test wall power receptacle with a light or multi-meter.

### **If pump is noisy:**

1. Be sure the pump is bolted to a substantial foundation. Pipes should be firmly mounted and all connections tight.
2. Total suction lift or flow is beyond the pump capability and the pump is starved for water.

### **Pump will not stay primed (suction lift).**

1. Check foot valve. Make sure it is clean and sufficiently submerged but is not in sand or mud.
2. Be sure pump is sufficiently primed.
3. Check for possible leaks in suction piping.
4. Total suction lift may be beyond the pump capability of 10 feet.

