G-Series Filter
Hydraulic Suction Scanner Filter Manual
Revision: 1.1, January 2011

OPERATION AND MAINTENANCE MANUAL

IMPORTANT

- Read these instructions thoroughly prior to proceeding with installation and retain for future use.
- Ensure that the installation conforms to all applicable local and national codes.
- These instructions contain important information for the proper maintenance and repair of this equipment.

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electric shock, or other occurrences, which may injure you or damage your property.

- Follow all safety codes.
- Wear safety glasses and work gloves.

Be sure all power to the equipment is shut off before performing maintenance or service. The electrical supply provided by the utility must be sufficient to handle load imposed by this filter.
Refer to the APPENDIX for locations of power inlet, water inlet and outlet piping connections, drain connections and required clearances before setting unit in place.

SERVICE NOTE: PRESSURE IS REQUIRED TO BE RELEASED FROM THE FILTER BEFORE PERFORMING ANY SERVICE OR MAINTENANCE OPERATION ON THE FILTER. WORKING ON A PRESSURIZED VESSEL CAN CAUSE INJURY AND SHOULD NEVER BE ATTEMPTED FOR ANY REASON. SERVICE FEE BASED SUPPORT BY RAIN BIRD AUTHORIZED SERVICE PROVIDERS IS AVAILABLE IN MOST AREAS.

1. CONSTRUCTION

Bodies of Rain Bird ORG/A & ORG Series Filters are constructed of carbon steel and protectively finished inside and out with an epoxy powder coating that is baked-on over a zinc phosphate primer. The bodies have flanged or threaded inlets, outlets and rinse ports for ease of assembly to the supply line, process line and drain line. All wetted components are constructed of either engineered plastics or non-corrosive metals, allowing for extended service life. Stainless steel bodies are also available.

The standard control system consists of an OMNI 400 Controller, Differential Pressure Switch (DPS) and Solenoid Valve. The DPS comes factory preset to 7 psi. The Solenoid Valve supplied is a 3-way normally open valve activated by 24 Vac from the Controller.

Note: Filters that are integrated with a Rain Bird Pump Station utilize 110 VAC solenoids and are controlled via the Pump Station PLC.

2. OPERATING PRINCIPLES

Normal Flow Pattern - Clean Screen - The raw water enters the filter inlet from the bottom and enters the filtration chamber. Water passes through a stainless steel screen from the inside out.

This fine screen is fabricated from 316 stainless steel wire mesh in the form of a cylinder and supported by a perforated PVC shell. As the water passes through the screen, solids accumulate, creating a layer of contaminate on the surface of the screen. This layer performs finer filtration than the screen itself, which results in increased filter efficiency.

The layer of contaminant also creates a pressure differential across the screen. The DPS, that is mounted and wired to the enclosure of the Controller, monitors this differential pressure via hydraulic tubing. A rinse cycle is activated once the preset differential pressure is reached.

Rinse Cycle Flow Pattern - Once the preset differential pressure is reached, a delay is imposed on the signal from the DPS to the Controller. This delay serves to eliminate any false rinse cycles that may be activated due to pressure fluctuations. If the differential pressure persists beyond this delay, the Controller energizes the Solenoid Valve. This activation relieves pressure on the Rinse Valve causing it to open. This pressure relief also relaxes the Piston to allow the Dirt Collector Assembly to move upward. The Dirt Collector Assembly consists of a closed PVC tube with projecting nozzles on one end and a hydraulic motor on the other end. Opening the Rinse Valve causes the hydraulic motor to rotate the Dirt Collector Assembly, and the Piston allows the Dirt Collector Assembly to

move axially exposing the entire screen surface to a concentrated spot cleaning action from the nozzles that are in close proximity to the screen's surface.

During the rinse cycle, incoming water still passes through the screen. Some filtered water is drawn back through the screen to the dirt collector nozzles, while the remaining filtered water maintains flow to the outlet.

The rinse cycle duration is from set to last for between 8 to 16 seconds, depending on the filter model. See the OMNI Manual for programming instructions.

Upon completion of the rinse cycle, the Solenoid Valve is de-energized. Pressure is restored to the Rinse Valve causing it to close, and restored pressure to the Piston returns the Dirt Collector to its normal position.

3. INSTALLATION PROCEDURES

Assembly - The filter is typically shipped pre-assembled with an OMNI 400 Controller, DPS, Solenoid Valve, and a 3-Position Mini-Valve and Pressure Gauge both mounted on the Pressure Gauge Enclosure which is attached to the filter's mounting bracket. The hydraulic tubing lines have already been connected. The Piston and the Rinse Valve may or may not have been assembled. If they have not assembled, thread the St/St Piston into the port at the filter's top and thread the Rinse Valve onto the threaded extension off the top portion of the filter. Make the hydraulic connections as shown in the drawings in the APPENDIX using the tubing supplied.

NOTE: The larger 4'', 6'', 8" and 10'' models use 8 mm tubing & fittings, while the smaller filters use 6 mm tubing and fittings.

NOTE: Some systems are supplied with different OMNI Controllers or with the Controller and DPS detached from the Pressure Gauge Enclosure, to allow for remote mounting separately.

Piping Connections – Typical installation layouts are shown in the APPENDIX and are provided as a guide for a correct installation.

Unit Positioning - Rain Bird "G Series" Water Filters must be installed in the upright position, as shown, with the inlet port facing down.

Guidelines - For proper operation, the following guidelines should be observed:

1. The filter should be installed as near as possible to the system it is required to protect. However, if low filter inlet pressure is a concern, either before or during rinse, the filter may need to be installed closer to the pressure source.
2. Ensure that the filter inlet pressure will not fall below 30 psig during the rinse cycle with the Solenoid Valve open. Suggested minimum pressure is 30 psig for consistent operation.
3. Ensure that the upstream pipe size from the pressure source to the filter is equal to or greater than the filter inlet size.
4. Inlet and outlet isolation valves must be used for all installations.
5. Inlet, outlet and bypass valves must be installed in situations where a constant supply of water is required downstream during filter servicing.
6. A drain line must be connected from the rinse valve to a suitable drain. This line must be horizontal or sloped downward, with no more than 2 elbows & terminate to the atmosphere in order to minimize backpressure.
7. The drain line should have a quick disconnect union near the rinse valve discharge to allow easy separation of the drain line during maintenance on the drain valve.
8. The Solenoid Valve's vent line should also be directed to a suitable drain.

Differential Pressure Switch (DPS) Connections – Refer to one of the tubing drawings in the APPENDIX and verify that the control tubing to the mounted DPS has been connected as follows:

1. The high side of the DPS must be connected to the inlet port at the filter housing's bottom.
2. The low side of the DPS must be connected to the outlet port on the filter housing's side.
3. The DPS has been factory preset to a 7-psi differential.

Pressure Gauge & 3-Position Mini-Valve

A Pressure Gauge & 3-Position Mini-Valve are provided with each Rain Bird filter to assist in troubleshooting and commissioning of the filter. The 3-Position Mini-Valve allows for three independent pressure sources to be individually monitored with the use of the Pressure Gauge. The 3-Position Mini-Valve serves as a selector for three ports located on alternating sides of the hex body of the 3-Position Mini-Valve, one port for inlet pressure, one port for hydraulic motor chamber pressure and one port for outlet pressure. A common port is connected to the Pressure Gauge. The three ports are clearly labeled.

The procedure for reading the three pressures is as follows:

- To read inlet pressure: Rotate knob until the arrow points to **HIGH PRESSURE**.
- To read hydraulic motor chamber pressure: Rotate knob until the arrow points to **CHAMBER PRESSURE**.

- **Note:** During normal operation, the hydraulic motor chamber pressure should be equal to the inlet pressure. During the rinse cycle, the hydraulic motor chamber pressure should drop to 25-40% of the inlet pressure.
- To read outlet pressure: Rotate knob until the arrow points to **LOW PRESSURE**.
- **Note:** With a clean screen, the outlet pressure should be the same or slightly less than the inlet pressure. As particulates build up on the screen the outlet pressure will decrease. To determine differential pressure across the filter, subtract the outlet pressure from the inlet pressure.

4. FIRST COMMISSIONING/ROUTINE START-UPS

NOTE: The DPS has been factory preset to 7 psi.

DO NOT ADJUST!!

First Commissioning - Check the following prior to startup:

1. Check that the line pressure will always be at least 30 psig at the filter inlet during the rinse cycle.
2. Check that there are no upstream pipeline restrictions.
3. Check that the filter is mounted upright in the correct flow orientation as indicated by the arrows on the filter body.
4. Check that the Rinse Valve's drain & Solenoid Valve's vent lines are routed to suitable atmospheric drains.
5. Check that all tubing connections are completed as shown in the attached drawings.
6. Check that the Solenoid Valve has been properly wired as indicated in the schematic provided with the OMNI Manual.
7. Check that the filter inlet and outlet isolation valves are closed, and the bypass valve is open.
8. Refer to the OMNI Manual and set the rinse duration between 8 and 10 seconds for 1-1/2'' & 2'' filters, or 12-16 seconds for 3'', 4'', 6", 8'' & 10'' filters, depending on which model OMNITROL has been supplied.

Routine Start-Ups

1. Slowly open the inlet isolation valve to the filter, allowing the filter to pressurize.
2. Check for any external leakages and eliminate.
3. Check to ensure that the filter inlet pressure is higher than 30 psig.
4. Slowly open the outlet isolation valve of the filter. Close the bypass valve.
5. Initiate a manual rinse cycle as described in the following section.
6. Observe the build-up of the pressure differential across the filter. It is recommended that at least one automatic rinse cycle be observed to ensure that the system is operating properly.

5. MANUAL RINSING PROCEDURES

Periodically, it may be necessary to activate a manual rinse cycle of the filter. Some typical reasons are:

- Routine inspection of proper filter operation.
- Emergency cleaning of the filter.
- Troubleshooting/start-up.
- Drainage of the filter prior to maintenance.

Using the OMNI 400 - The manual rinse is activated with the Controller by pressing the **RESET** button on the side of the enclosure.

Using the OMNI 150 - Pressing the pushbutton on the side of the enclosure activates the manual rinse.

Using the OMNI 500 - The manual rinse is activated with the Controller by rotating the right knob to **MANUAL.**

Using the OMNI 2000 - The manual rinse is activated with the Controller by depressing the black center keypad button when the **MANUAL START** screen is being displayed.

For complete control system information, refer to the OMNI Manual, which was supplied with your filter. Contact Rain Bird, Inc. if you have any questions.

6. WINTER SHUT DOWN & DRAIN PROCEDURE

The filter may have to be shut down periodically, for several reasons, including servicing, winterizing, etc. When the filter is to be shut down for a long period of time, such as protection for the winter, it is required that the filtration chamber, Rinse Valve, Solenoid Valve and all control tubing be emptied of water. The screen should also be removed, cleaned, dried and reinstalled.

Shut Down - To shut down the filter, use the following procedure:

1. Open the bypass valve.
2. Close the isolating valve on the outlet of the filter.
3. Initiate a manual rinse.
4. Close the isolating valve on the inlet of the filter.
5. Initiate an additional manual rinse cycle to relieve the pressure in the filter.

Drainage Procedure - To empty the filter:

1. Perform the shut down procedure as described above.
2. Check the pressure in the filter housing to ensure that it is atmospheric. If not, initiate

manual rinses until the pressure is atmospheric.

3. Remove the TEE fitting and brass mini-filter at the filter inlet to allow any remaining water in the filter to drain.

7. SCHEDULE OF PREVENTIVE MAINTENANCE AND INSPECTIONS

Annually:

1. Remove screen and clean / power wash any stubborn or deeply embedded particles that may be in the screen's mesh.
2. Inspect the screen for damage and replace if required.
3. Re-assemble and trigger a manual rinse cycle and check for proper filter function.

8. ELECTRICAL CONTROL SYSTEMS

The ***OMNI 400*** is a powerful yet simple Controller that provides control for a single filter. Power is 110 Vac or 220 Vac. Most "G Series" filters are supplied with this controller.

The ***OMNI 150*** is a powerful, yet simple Controller, Power is from four (4) 1.5 V "C" batteries. The controller energizes a latch solenoid.

The ***OMNI 500*** is a powerful Controller that provides for control of up to two, four, or six filters in parallel. Power is 110 Vac or 220 Vac.

The ***OMNI 2000*** is a powerful Controller that provides for control of up to ten filters in parallel. Power is 110 Vac or 220 Vac.

9. TROUBLESHOOTING

Listed below are steps to be followed in troubleshooting the filter to determine the cause of the situation. Prior to proceeding with the following, all tubing connections should be verified against the schematics provided in the APPENDIX.

The Filter Does Not Experience Rinse Cycles (automatic or manual).

1. Check the differential pressure across the filter versus the preset on the differential pressure switch. If the differential is higher than the preset, go to step 5. (NOTE: All differential pressure switches are factory preset for 7 psi increasing).
2. If the differential is lower than the preset, monitor the differential pressure across the filter to determine whether it is increasing. If it is increasing, allow the differential to increase to the preset value and monitor operation.
3. If it is not increasing, or is increasing very slowly, shut down the filter and extract the fine screen. Carefully inspect the screen and O-rings for damage. Replace parts as necessary. When reinstalling the screen, check to ensure that it is seated properly and that the dirt collector rotates freely.

4. If the screen is intact and was seated properly, then the screen openings (micron size) may be too large for the particular application. Contact your Rain Bird representative for assistance.
5. If the differential is higher, check to ensure that the Controller power switch is on.
6. Close the isolation valve on the filter outlet and allow the inlet and outlet pressures to equalize. Initiate a manual rinse cycle by depressing the rinse cycle button. If the filter rinses, check the differential pressure switch and connections and repair or replace as necessary. Recheck operation. Go to step 11.
7. If the filter does not rinse, check to ensure that the solenoid valve is being energized. (Most standard valves have a small light illuminated when energized). Repair or replace as necessary.
8. Check to ensure that the solenoid valve is attempting to drain the top of the rinse valve and piston by observing its vent line flow to the drain. If not, check for blockages in the solenoid valve.
9. If the solenoid valve is draining, but the rinse valve does not open, then remove the tubing from the top of the rinse valve or from the piston and observe whether the valve opens. If the valve opens, check for blockages in the tubing or fittings connecting the solenoid, piston and rinse valve.
10. If the valve still does not open, remove the tubing from the rinse valve and check for flow from this tube. If there is low flow or pressure, check for blockages in the tubing. If flow is present at line pressure, shut down the filter, remove rinse valve and replace as necessary then recheck operation.
11. If the filter rinses, open the outlet valve and recheck the differential. If the differential has recovered, the filter was probably blocked due to an influx of dirt. Allow the differential to buildup and monitor for proper filter operation.
12. If the differential has not recovered, check to ensure that the inlet pressure during the rinse cycle is greater than the recommended 30 psi.
13. Check the inlet pressure versus the hydraulic motor chamber pressure for sufficient pressure drop as indicated in Section 3. If not sufficient, check for restrictions or sources of backpressure in the rinse valve drain line.
14. If the pressure drop is sufficient and the differential is not recovering after several additional manual rinse cycles with the outlet valve closed, the filter must be shut down and the screen extracted and cleaned manually. Also check the dirt collector nozzles for damage or excessive wear.

The Filter Rinses Continuously (rinse valve opens but do not close).

1. Check the solenoid valve to determine if it is being energized continuously by the Controller. If not, go to step 4.
2. If the solenoid is continuously energized, check the time setting for the length of the rinse cycle to ensure that it is set properly (this time should be set between 8-16 seconds, depending on filter model). Change, if incorrectly set.
3. The problem could be the controller. Check wiring.
4. If the solenoid valve is not continuously energized, disconnect the tubing at the top of the rinse valve and check for flow from this tube. If there is low flow or pressure, the tubing or fittings from the solenoid and piston might be clogged. Clear any clogs.
5. If flow is present at line pressure, the rinse valve should be repaired or replaced.

The Filter Cycles Continuously (rinse valve opens and closes repeatedly).

1. Confirm the 7-psi preset on the differential pressure switch by subtracting outlet pressure just before a rinse from the inlet pressure. The difference should be 7 psi ,or less.
2. Check the flow rate through the filter to ensure that this value is within the maximum flow rating as indicated on the appropriate FILTER DATA SHEET. If the flow is too high, adjust as necessary.
3. Check the differential pressure across the filter following a rinse cycle. Inlet & outlet pressures should be equal within 2 psi to indicate the Dp has recovered.
4. If the flow is within the operating range of the filter and the Dp recovers, a larger screen and/or additional filter bodies may be required.
5. Verify the flow out of the filter's outlet is under load downstream of the filter. If the outlet water is at atmospheric pressure such as when it empties into an open tank, then the DPS senses a high Dp and continuously signals the Controller that there is a high Dp. To correct this, throttle the outlet valve to create backpressure so the DPS senses true screen Dp.
6. Other possible causes are that the piston does not retract to allow the dirt collector to move laterally, or the dirt collector is stuck and cannot rotate or the screen is clogged.

Controller Inoperative.

1. Check to ensure that power is available to the controller.
2. Check the fuse inside the Controller and replace as necessary.

10. REMOVAL/INSTALLATION OF COMPONENTS

NOTE: Prior to performing any procedures described in this section, it is necessary to first isolate and drain the filter as outlined in Section 6.

Fine Screen Removal and Installation

1. Remove the filter's top section.
2. Removal is accomplished by rocking the open end of the screen in a coning pattern, then reach in and pull the bottom of the screen upward.
3. To reinstall the screen, first ensure that the O-ring(s) are intact and fully seated in their appropriate grooves.
4. The application of silicone grease to the O-rings will make insertion much easier.
5. Carefully insert the screen into the filter body and center.
6. The dirt collector's shaft must now be positioned to pass through the bearing in the center of the screen handle. Care should be taken not to create excessive contact between the fine screen and dirt collector nozzles, as damage may result.

11 - SPARE PARTS ORDERING INFORMATION

Pages in the APPENDIX depict typical filter assemblies and indicate proper part description and location. Please refer to these descriptions when ordering spare parts.

12. SPECIAL INSTALLATIONS

The prior sections of this manual describe typical filters and typical installations. Since every installation is different, this section describes unusual conditions and the special instructions that need to be followed to correctly install filters with special options and special conditions.

Pneumatic Control Conversion

Occasionally, conditions may arise that require the use of compressed air to operate the filter's control system rather than pressurized filtered water. We refer to this system as a pneumatically controlled filter. Typical applications are:

- To provide freeze protection when a filter is to be installed outdoors (this only protects against light freeze events and does not protect the filter vessel itself from freezing).
- To insure proper filter rinsing when available water pressure is too low.
- When water quality precludes the use of water in the Control System.

In this system, dry, filtered compressed air is distributed as the pressure source in the Control System, rather than vessel water. The pneumatic control system utilizes most of the same components as the standard control system, allowing it to be easily retrofitted to existing installations. The following changes occur when installing a pneumatic control system in an "G Series" filter.

- The Normally Open 3-way solenoid valve is supplied with air rather than water at inlet pressure. The air pressure should be approximately 10-15 psig higher than the inlet pressure to the filter for proper operation.
- A fluid filled absorber tank is added to the piston's control tubing line to act as a shock absorber between the air and the piston head.
- The Differential Pressure Switch (DPS) remains as the only component that requires water for proper operation. For freeze protection, precautions must be taken to ensure that these lines are adequately protected against freezing. If the Pressure Gauge & 3-Way Mini-valve are still being used, then they too require protection against freezing. The DPS contains a volume of water on either side of its diaphragm. The volume could freeze, expand and destroy the DPS. The controller should be removed from the filter and placed in an area not subject to freezing.

To install a pneumatic control system on a filter, the following steps should be followed:

1. Disconnect all tubing connections to the 3-way mini valve to disable it, and remove the tubing from the opposite end.
2. Replace the 1/8" TEE fitting on the solenoid's top with a 1/8" elbow.
3. Replace the 1/8" TEE fitting at the filter's inlet with a 1/8" elbow and connect tubing to the high side of the Differential Pressure Switch. For freeze protection, the use of heat traced stainless steel tubing and fittings are recommended.
4. Replace the 1/4" TEE fitting on the filter's lower side with a 1/4" elbow and connect tubing to the low side of the Differential Pressure Switch. For freeze protection, the use of heat traced stainless steel tubing and fittings are recommended.
5. Remove the 1/4" elbow on the filter's upper section and replace it with a 1/4" plug.
6. Connect a dry compressed air line (at least 10-15 psig higher than filter inlet pressure) to the 1/8" elbow fitting at the top of the solenoid valve.
7. Mount the absorber tank with its side fill port facing up. Locate this tank near the piston and slightly higher than the piston.
8. Connect the control tubing to the 1/8" side elbow fitting of the solenoid as per the drawing in the APPENDIX. A TEE fitting from this tubing branches the pressure from the solenoid to the Rinse Valve and the Hydraulic Piston.
9. Connect the Piston in series with the absorber tank (branch of TEE to the top of tank, bottom of tank to the piston).
10. Use a 50/50 water/anti-freeze mixture to fill the absorber tank and piston cylinder. Remove the absorber tank's side fill port plug and slowly fill the tank with the fluid mixture. Plug the port when the fluid overflows.
11. Apply the compressed air supply to the top of the solenoid. This will force some of the fluid in the tank into the line to the piston and will push the piston downward and fill the piston's cylinder with the fluid.
12. Remove the air pressure from the top of the solenoid, then remove the tank's plug and refill the port until overflowing, and plug the port.
13. Continue with the installation of the filter following the instructions in the O&M Manual.

Using a Controlled Outlet Valve (COV)

A Controlled Outlet Valve (COV for short) is a valve installed after the outlet of the filter, and is used to control the flow through the filter during the rinsing cycle. A COV is used when inlet pressures are low or drop below the 30-psi minimum with the rinse valve open. In most cases, the Controller will activate the COV prior to rinse valve activation. This throttles the flow out of the filter's outlet, to develop more inlet pressure to better provide adequate pressure for a proper rinse.

A COV is installed on the outlet leg of the filter, usually before the outlet isolation valve. For multiple filter installations, the COV is located at a point on the main line after the multiple filter outlets are rejoined. Drawings in the APPENDIX show typical filter installations with a COV installed.

Using an External Source of Rinse Water & a COV

There are installations where there is insufficient pressure or flow to properly perform a rinse cycle. This can sometimes be overcome by the use of a COV and an external source of water with sufficient pressure and flow. For these installations, a COV is installed as described above, and an external water source is connected in the inlet area of the filter. When a rinse cycle is required, a valve on the external source line is opened after the COV is closed. The filter's flow to the outlet is stopped and the higher-pressure external source water is used to clean the filter. Once the COV is closed, the external water line is opened as the rinse cycle is initiated by energizing the Normally Open solenoid relocated on the external source line. At the end of the rinse, the COV and rinse solenoids are de-energized, the COV is opened and the external source valve is closed to return the filter to normal operation. The drawing in the APPENDIX shows typical external water source installation including a COV, external source control valve with the COV and rinse solenoids moved to the external source line. This drawing also shows check valves on the inlet and external water lines. These valves are highly recommended to prevent flow or contamination problems.

Water Hammer Solutions

Water hammer is a natural phenomenon that can be present in typical water filtration installations. It occurs as a result of the rapid flow of dirty rinse water from the rinse valve suddenly being stopped as the rinse valve closes at the end of the rinse cycle. The results range from a soft tap to a loud bang that echoes throughout the drain line.

Rain Bird has had some success in reducing this offensive noise by adding a vacuum breaker valves to the drain line. Two valves are added to the tops of the ½'' pipe columns extending above the drain line. See the APPENDIX for a typical installation.

APPENDIX

Figure 1: Filter shown without manual by-pass valve.
Figure 2: Filter shown with manual bypass valve.

G/A-015-LE Shown
G/A-020- LE is similar

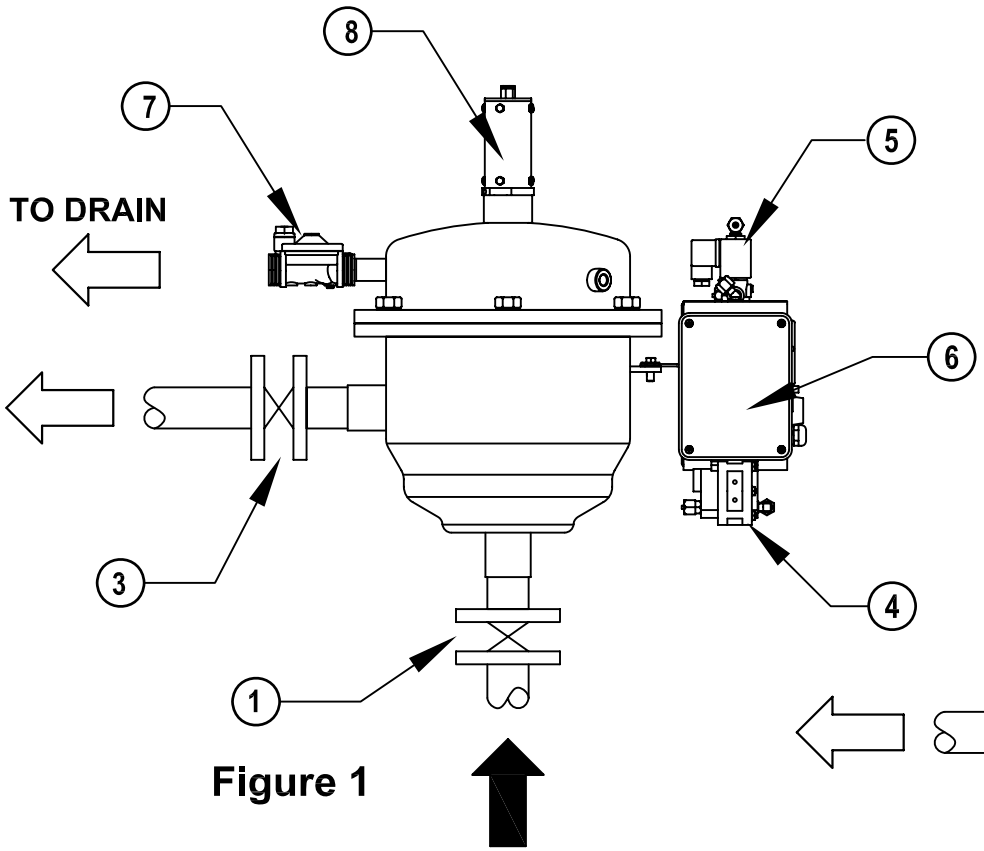


Figure 1

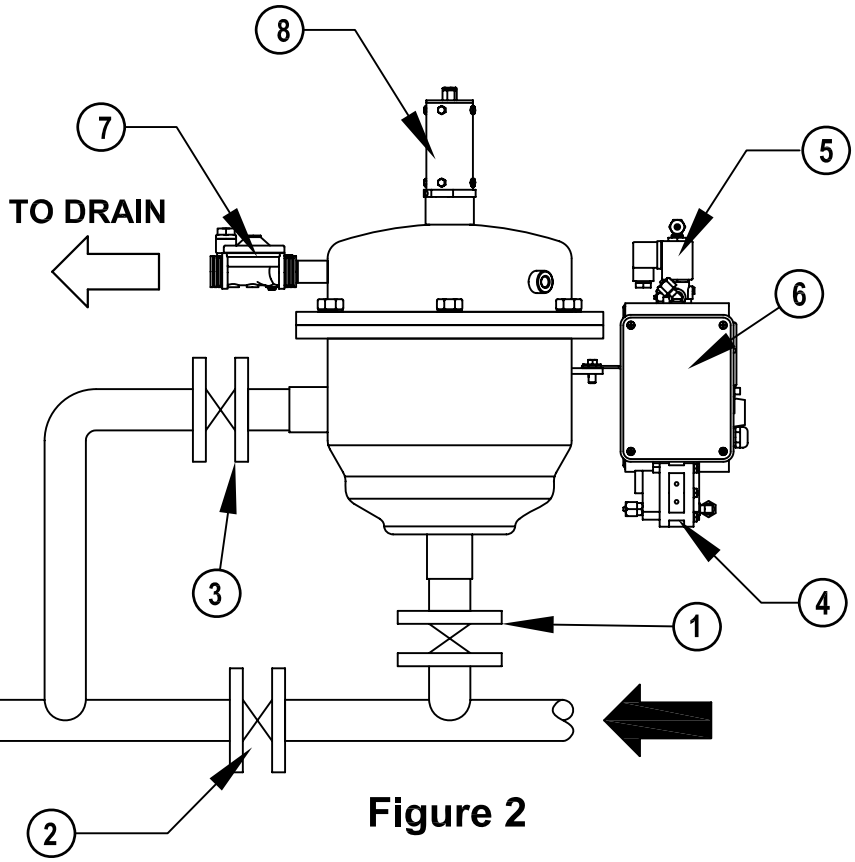


Figure 2

No.	Description	Notes
8	Hydraulic Piston	Connected to Solenoid
7	Rinse Valve	Pipe to Drain
6	Controller	Mounted on Filter Housing Can be Remote Mounted
5	Solenoid Valve	24 V, 60 Hz, 3 way N.O.
4	Differential Pressure Switch	Preset to 7 psi
3	Outlet Valve	Customer Supplied
2	System Bypass Valve	Customer Supplied
1	Inlet Valve	Customer Supplied

NOTE: Drain Line from the Rinse Valve Should have a Coupling to Allow Easy Removal of the Top Section of the Body During Maintenance.

DWG. NO.	SCALE: NONE	**RAIN BIRD CORPORATION** 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	G & G/A SERIES 1-1/2" & 2" FILTERS TYPICAL INSTALLATION LAYOUT

Figure 1: Filter shown without manual by-pass valve.
Figure 2: Filter shown with manual bypass valve.

G-040-LS SHOWN -- G-030-LE, G/A-030-LE & G/A-040-LS are Similar

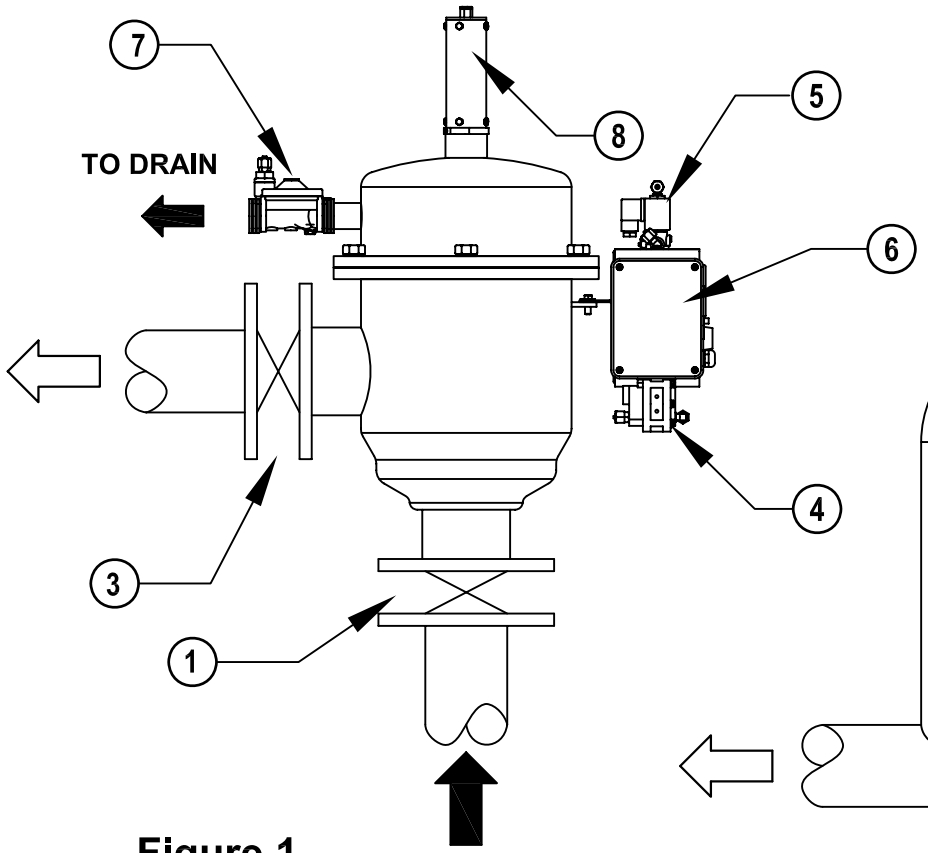


Figure 1

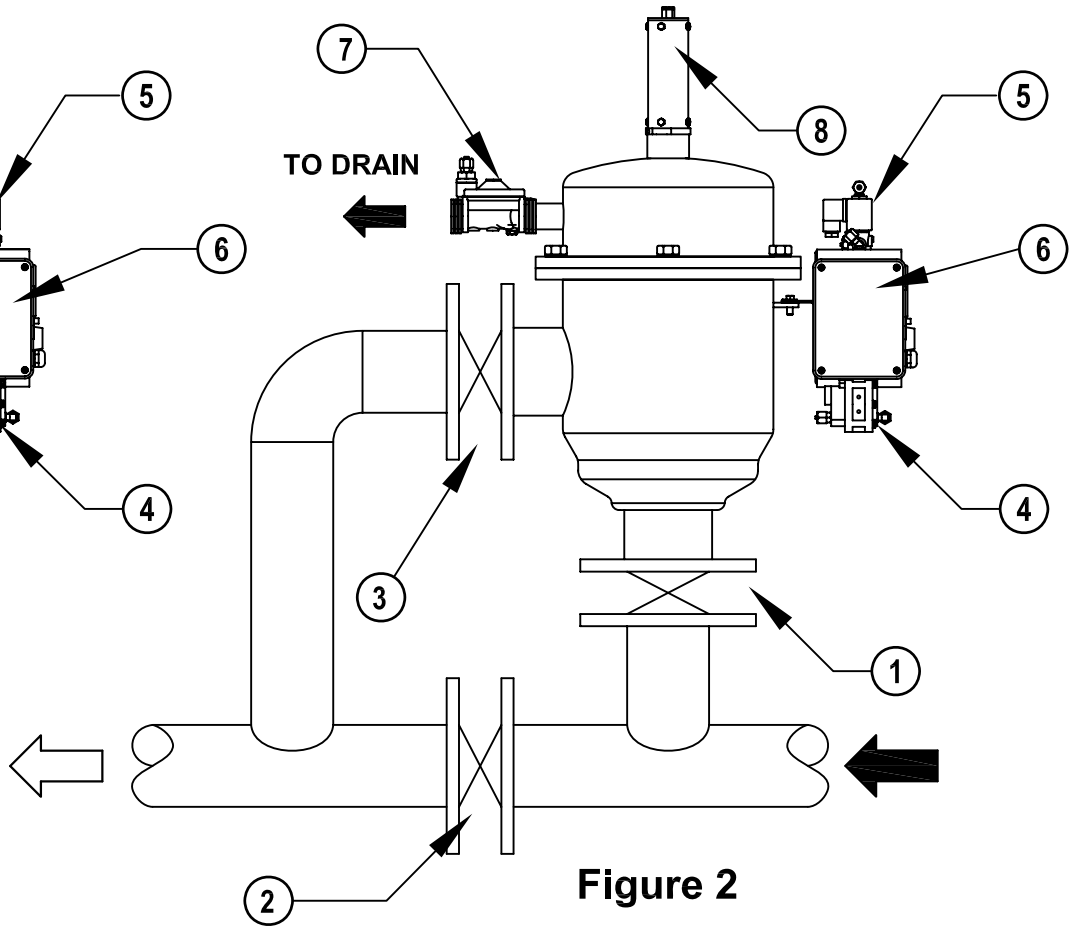


Figure 2

No.	Description	Notes
8	Hydraulic Piston	Connect to the Solenoid
7	1" Rinse Valve	Pipe to 1"or Larger Drain
6	Controller	Mounted on Filter Housing Can be Remote Mounted
5	Solenoid Valve	24 V, 60 Hz, 3 way N.O.
4	Differential Pressure Switch	Preset to 7 psi
3	Outlet Valve	Customer Supplied
2	System Bypass Valve	Customer Supplied
1	Inlet Valve	Customer Supplied

NOTE: Drain Line from the Rinse Valve Should have a Coupling to Allow Easy Removal of the Top Section of the Body During Maintenance.

DWG. NO.	SCALE: NONE	**RAIN BIRD CORPORATION** 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	G & G/A 3" & 4" FILTERS TYPICAL INSTALLATION LAYOUT

Figure 1: Filter shown without manual by-pass valve.
Figure 2: Filter shown with manual bypass valve.

G-040-LE SHOWN -- G-060-LS,G-060-LE, G-080-LS & G-100-LS are Similar

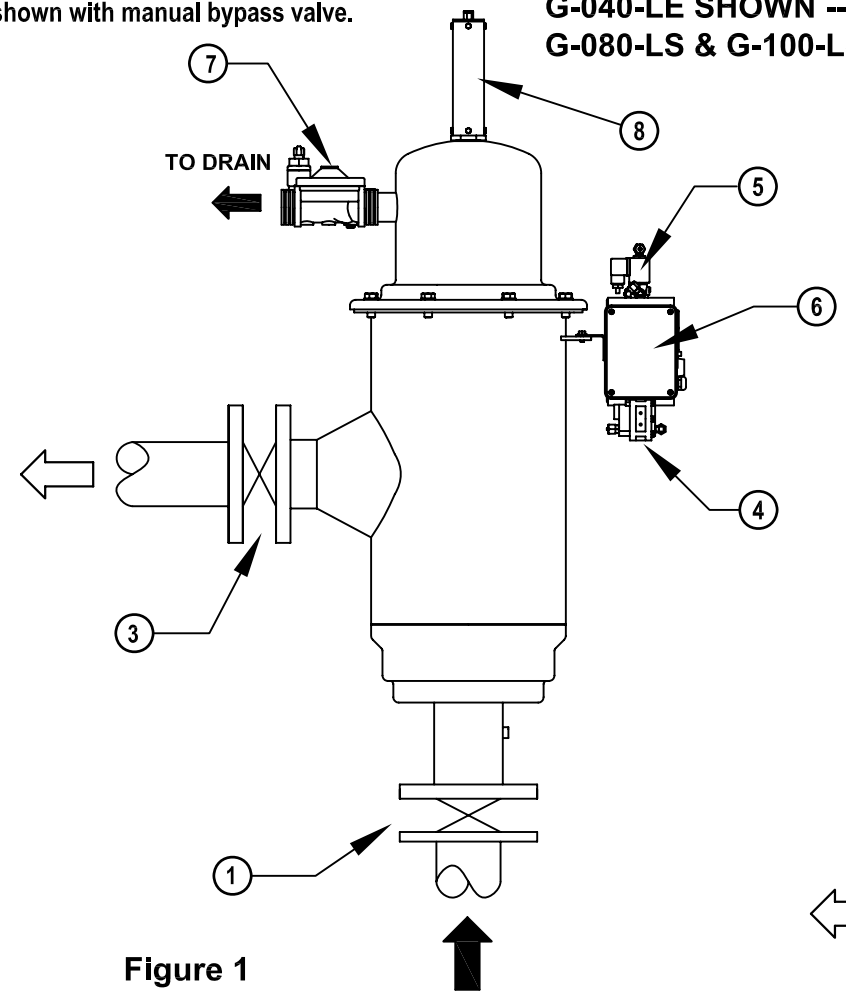


Figure 1

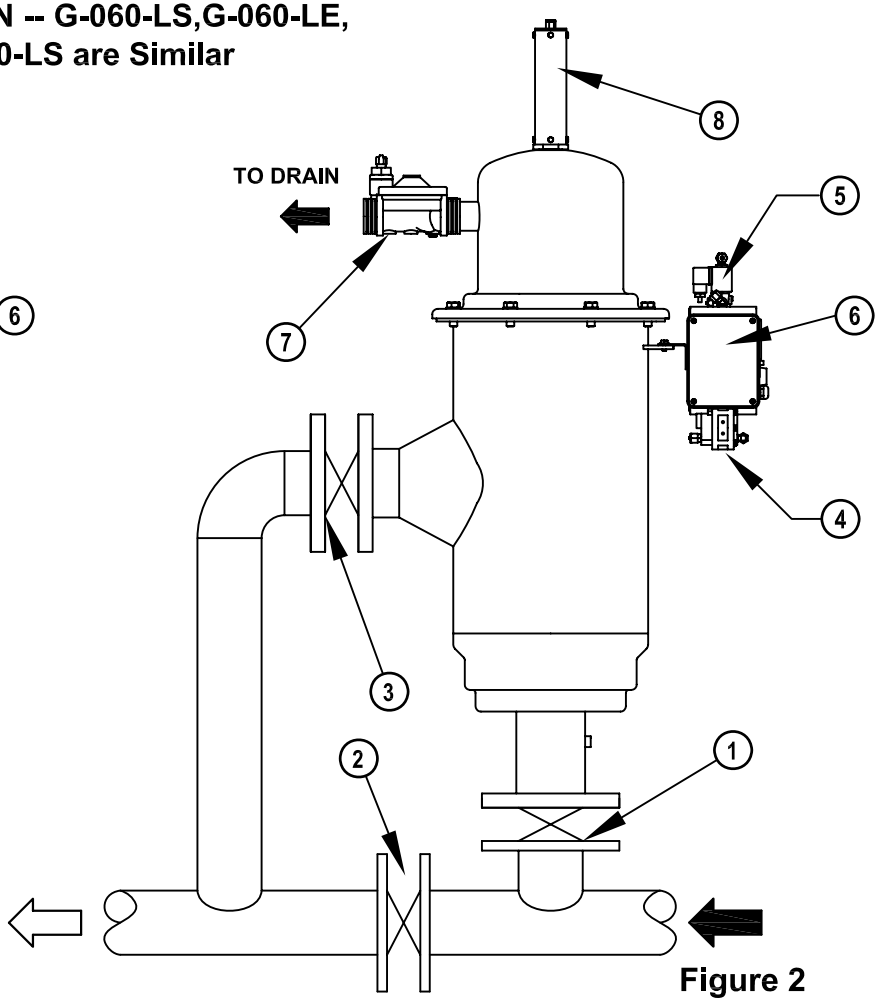
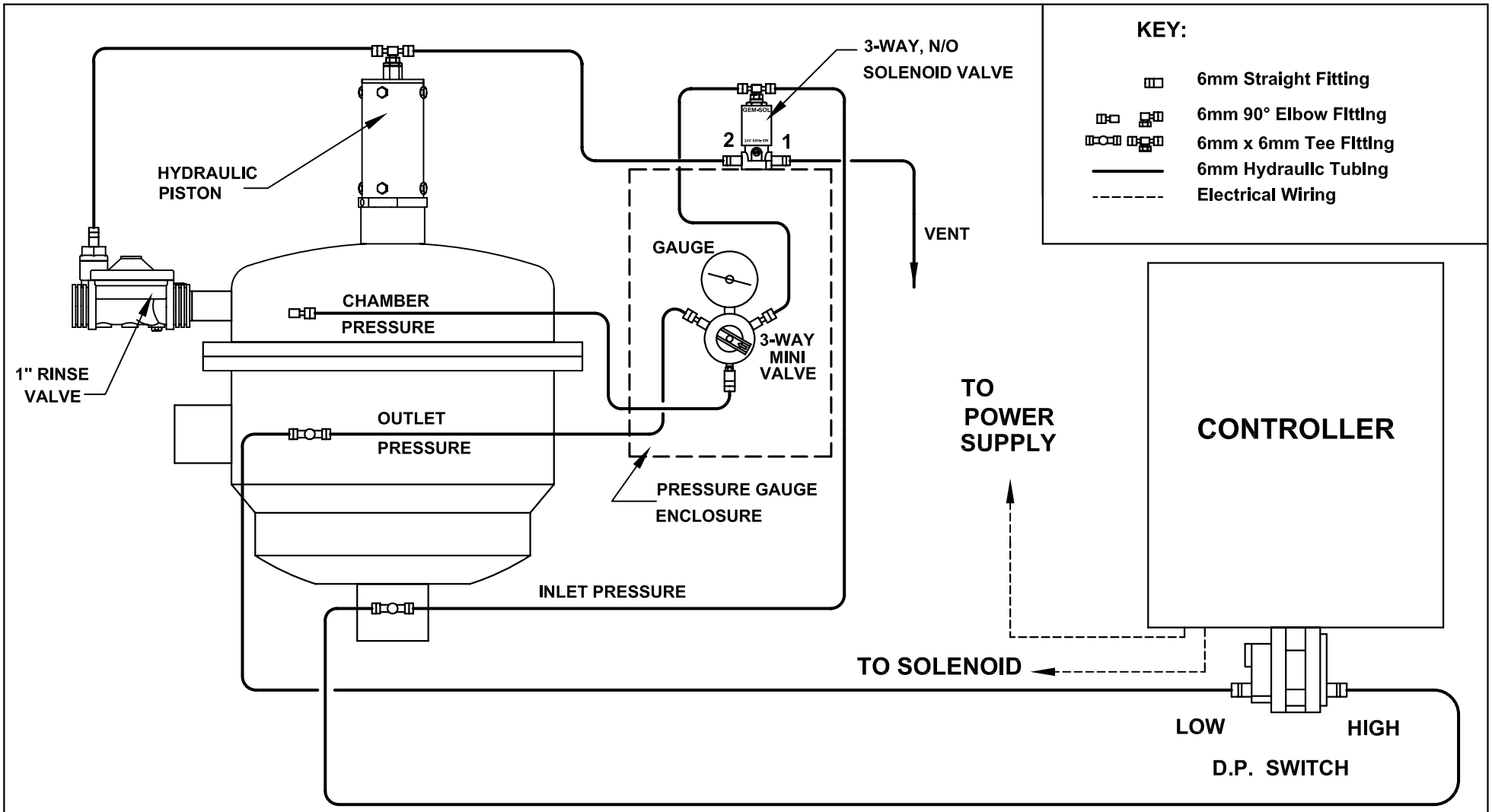


Figure 2

No.	Description	Notes
8	Hydraulic Piston	Connect to the Solenoid
7	1-1/2" Rinse Valve	Pipe to 1-1/2"or Larger Drain
6	Controller	Mounted on Filter Housing Can be Remote Mounted
5	Solenoid Valve	24 V, 60 Hz, 3 way N.O.
4	Differential Pressure Switch	Preset to 7 psi
3	Outlet Valve	Customer Supplied
2	System Bypass Valve	Customer Supplied
1	Inlet Valve	Customer Supplied

NOTE: Drain Line from the Rinse Valve Should have a Coupling to Allow Easy Removal of the Top Section of the Body During Maintenance.

DWG. NO.	SCALE: NONE	**RAIN BIRD CORPORATION** 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	G 4", 6", 8" & 10" FILTER TYPICAL INSTALLATION LAYOUT

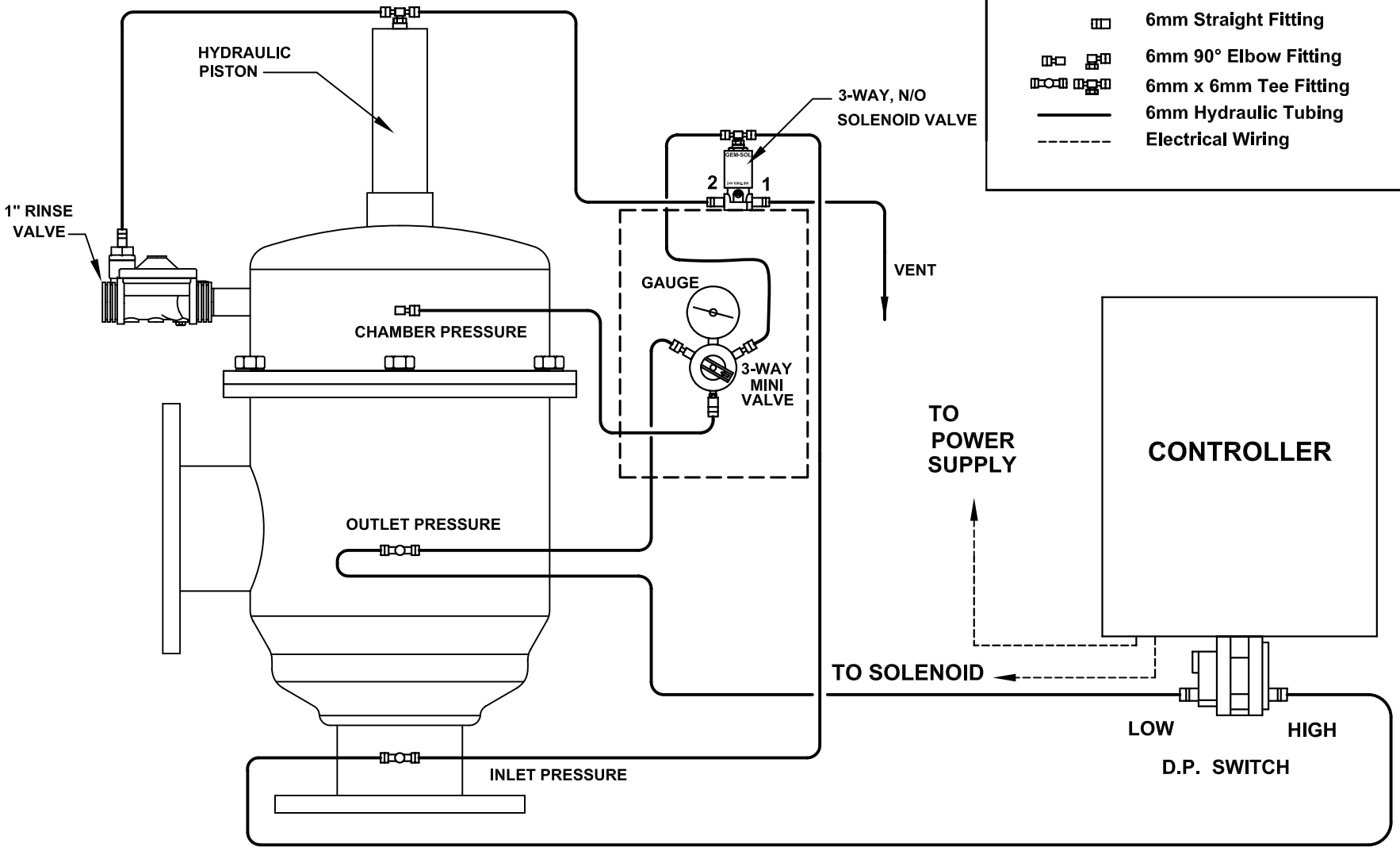


TYPICAL INSTALLATION SHOWN. THE PRESSURE GAUGE ENCLOSURE IS ATTACHED TO FILTER. DIFFERENT CONTROLLERS MIGHT BE SUPPLIED, BASED ON THE APPLICATION, AND MIGHT BE MOUNTED ON THIS ENCLOSURE OR SUPPLIED SEPARATELY FOR REMOTE MOUNTING.

NOTES:

1. COMPONENTS MAY BE ENLARGED OR ROTATED TO SHOW DETAIL
2. ALL TUBING & FITTINGS ARE 6 mm

DRAWING NO.:	SCALE: NONE	RAIN BIRD CORPORATION 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	HYDRAULIC TUBING & ELECTRICAL CONNECTIONS FOR G/A-015-LE & G/A-020-LE FILTERS

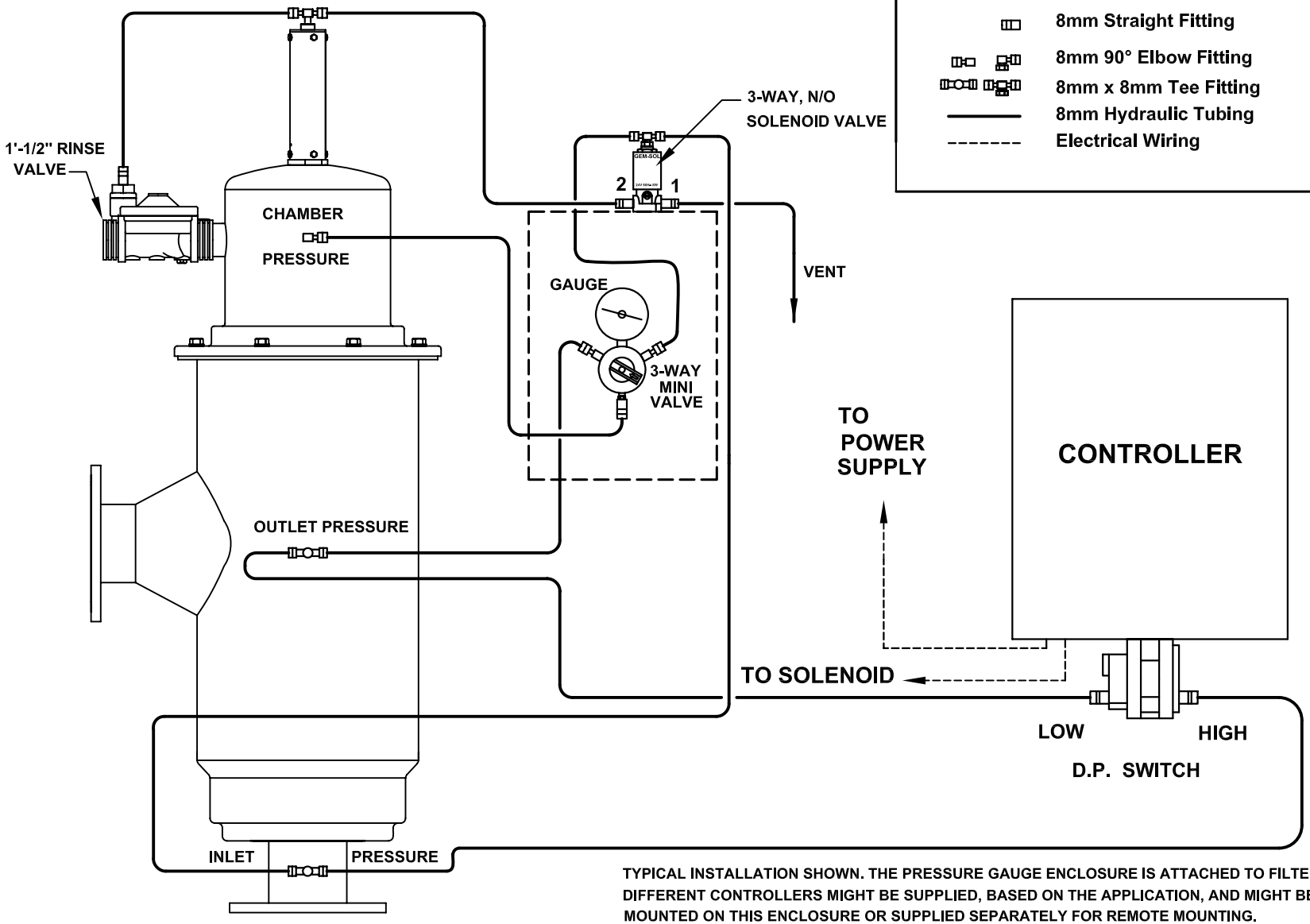


TYPICAL INSTALLATION SHOWN. THE PRESSURE GAUGE ENCLOSURE IS ATTACHED TO FILTER. DIFFERENT CONTROLLERS MIGHT BE SUPPLIED, BASED ON THE APPLICATION, AND MIGHT BE MOUNTED ON THIS ENCLOSURE OR SUPPLIED SEPARATELY FOR REMOTE MOUNTING.

NOTES:

1. COMPONENTS MAY BE ENLARGED OR ROTATED TO SHOW DETAIL
2. ALL TUBING AND FITTINGS ARE 6 mm

DRAWING NO.:	SCALE: NONE	RAIN BIRD CORPORATION 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	HYDRAULIC TUBING & ELECTRICAL CONNECTIONS FOR G-030-LE, G/A-03-LE, G-040-LS & G/A-040-LS FILTERS



TYPICAL INSTALLATION SHOWN. THE PRESSURE GAUGE ENCLOSURE IS ATTACHED TO FILTER. DIFFERENT CONTROLLERS MIGHT BE SUPPLIED, BASED ON THE APPLICATION, AND MIGHT BE MOUNTED ON THIS ENCLOSURE OR SUPPLIED SEPARATELY FOR REMOTE MOUNTING.

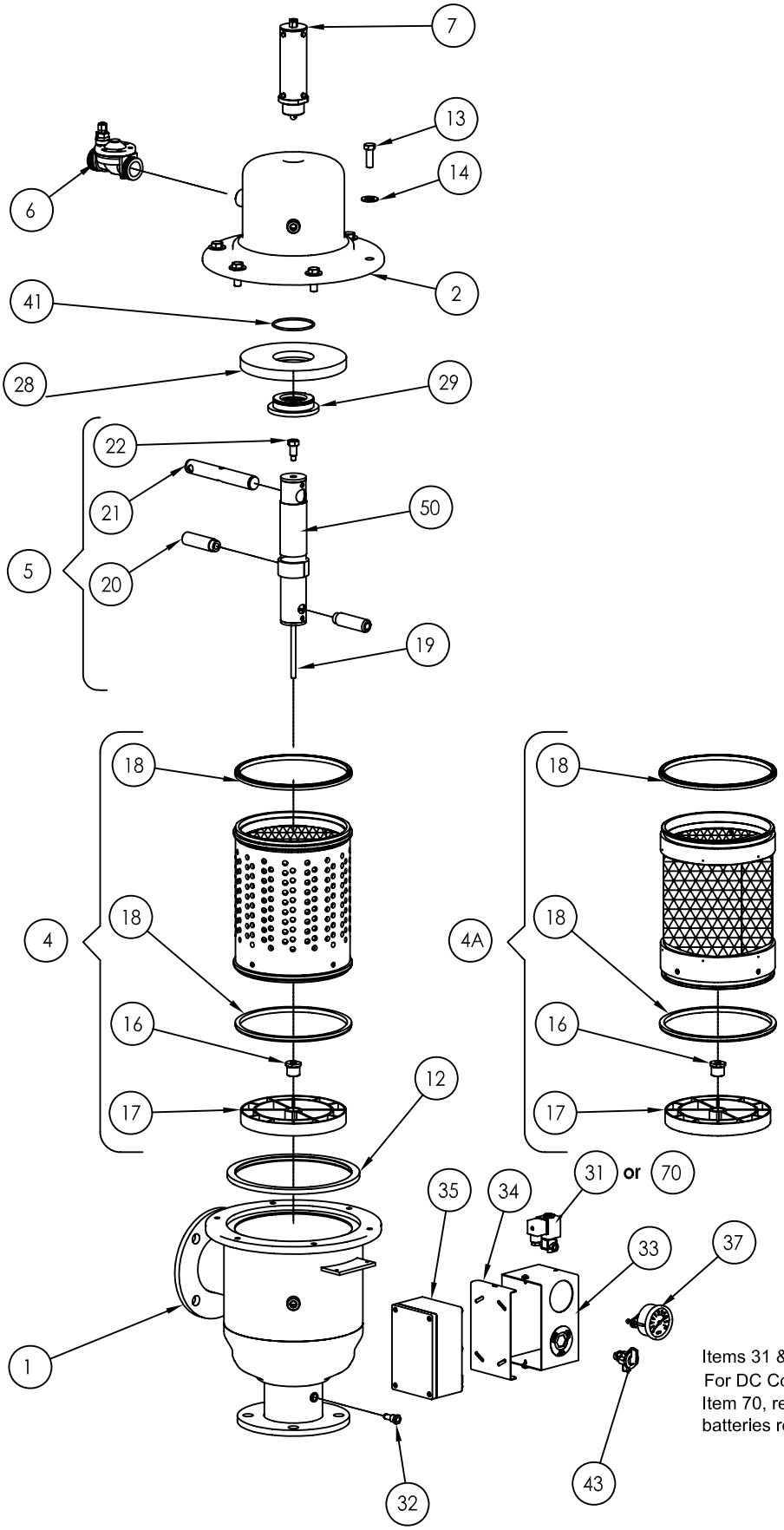
NOTES:

1. COMPONENTS MAY BE ENLARGED OR ROTATED TO SHOW DETAIL
2. ALL TUBING & FITTINGS ARE 8 mm

DRAWING NO.:	SCALE: NONE	RAIN BIRD CORPORATION 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	HYDRAULIC TUBING & ELECTRICAL CONNECTIONS FOR G-040-LE, G-060-LS, G-060-LE, G-080-LS & G-100-LS FILTERS

TYPICAL G/A SERIES FILTER ASSEMBLY

Exploded View For Models G/A-015-LE thru G/A-040-LS

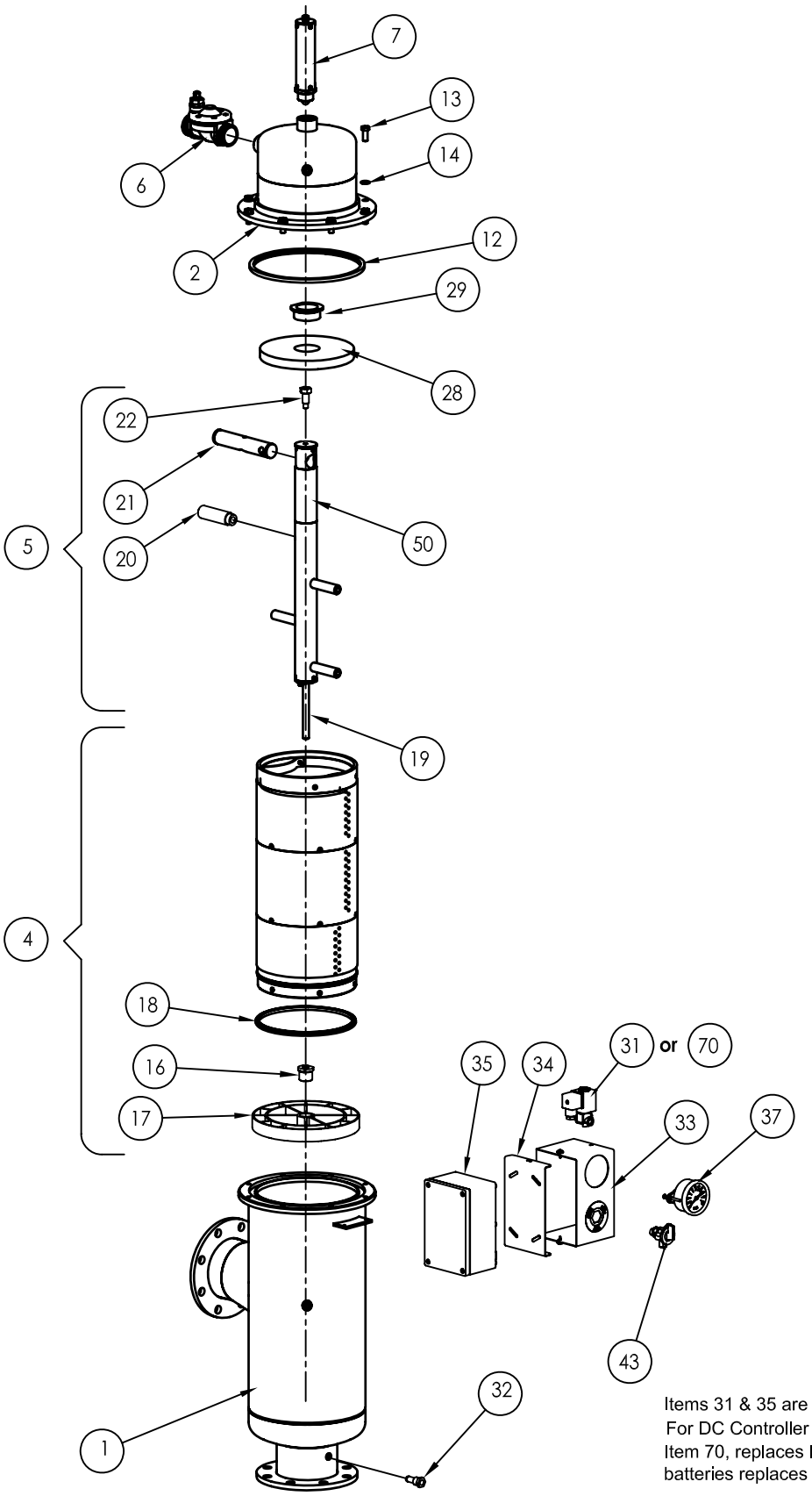


Item	Description
1	Housing, Bottom
2	Housing, Cover
4	Fine Screen Assembly - PVC Supplied with Items 16, 17 & two 18
4A	Fine Screen Assembly - Sintered Supplied with Items 16, 17 & two 18
5	Dirt Collector Assembly Supplied with Items 19, 20, 21, 22 & 50
6	1" Rinse Valve Assembly
7	Hydraulic Piston Assembly
12	Housing/Cover Seal
13	1/2" Housing Bolt - St/St
14	1/2" Housing/Cover Washer - St/St
16	Shaft Bearing/Upper Bearing - Brass
17	Fine Screen Handle
18	Fine Screen Seal
19	Dirt Collector Shaft
20	Dirt Collector Nozzle - PVC
21	Hydraulic Motor - PVC
22	Dirt Collector Locking Plug - St/St
28	Separator Plate & Bearing Assembly
29	Dirt Collector Bearing - Delrin
31	Solenoid Valve, 24 Vac, 3-Way, N.O.
32	1/4" Mini Filter with 1/8" Port
33	Pressure Gauge Enclosure
34	Pressure Gauge Enclosure Cover
35	Controller
37	Pressure Gauge
41	O-Ring Seal & Retainer
43	Three Way Mini Valve
50	Dirt Collector Bearing Sleeve
70	2-Wire Latch Solenoid Valve

Items 31 & 35 are shown for AC powered 400 Controller. For DC Controller operation, a Two-Wire Latch Solenoid, Item 70, replaces Item 31, & a 150 Controller powered by batteries replaces Item 35.

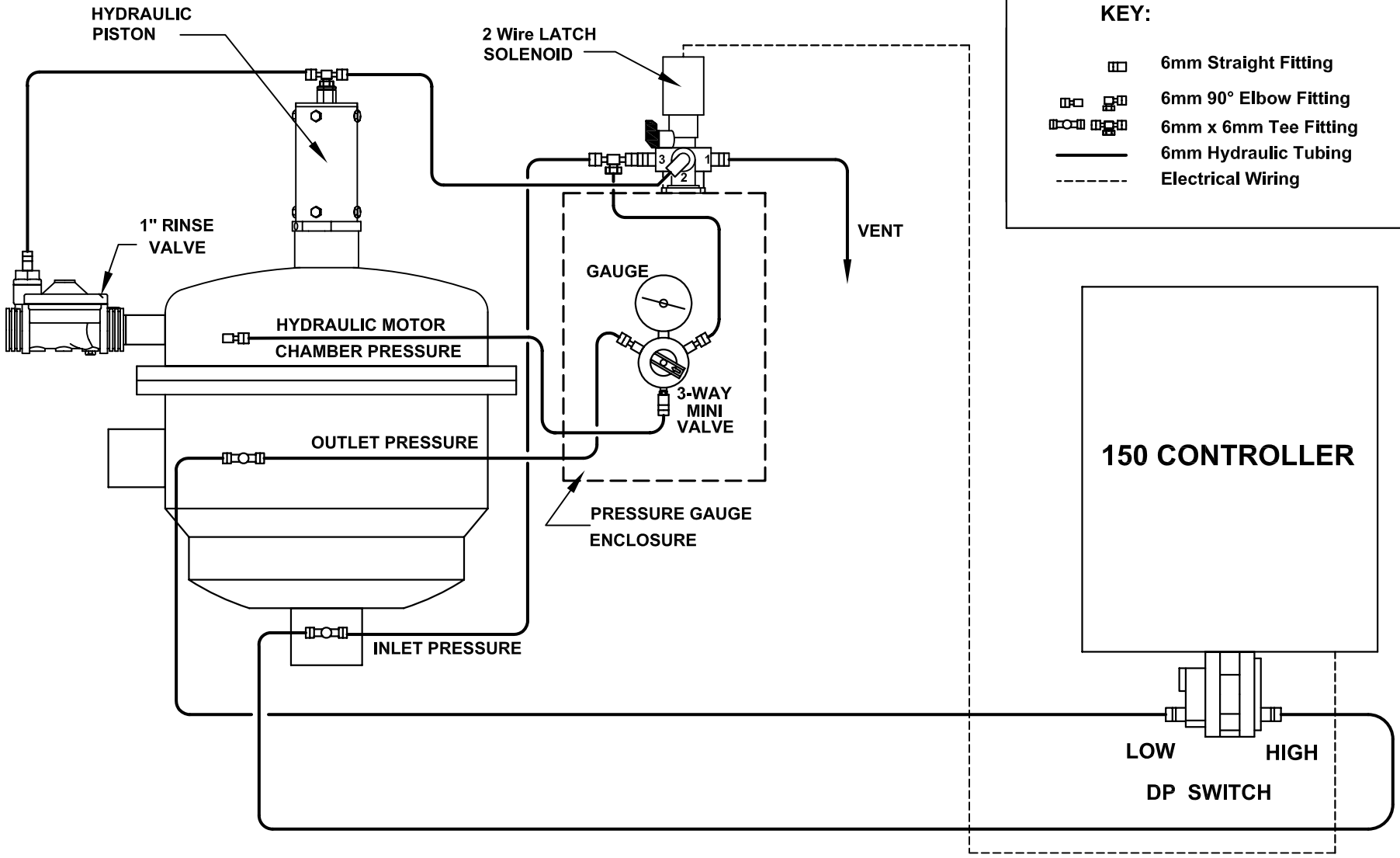
TYPICAL G SERIES FILTER ASSEMBLY

Exploded View For Models G-040-LE thru G-100-LS



Item	Description
1	Housing, Bottom
2	Housing, Cover
4	Fine Screen Assembly - PVC Supplied with Items 16, 17 & two 18
5	Dirt Collector Assembly Supplied with Items 19, 20, 21,22 & 50
6	1-1/2" Rinse Valve Assembly
7	Hydraulic Piston Assembly
12	Housing/Cover Seal
13	1/2" Housing Bolt - St/St
14	1/2" Housing/Cover Washer - St/St
16	Shaft Bearing/Upper Bearing - St/St
17	Fine Screen Handle
18	Fine Screen Seal
19	Dirt Collector Shaft - Brass
20	Dirt Collector Nozzle - PVC
21	Hydraulic Motor - PVC
22	Dirt Collector Locking Plug - St/St
28	Separator Plate And Bearing Assembly
29	Dirt Collector Bearing - Brass
31	Solenoid Valve, 24 Vac, 3-Way, N.O.
32	1/4" Mini Filter with 1/8" Port
33	Pressure Gauge Enclosure
34	Pressure Gauge Enclosure Cover
35	Controller
37	Pressure Gauge
43	Three Way Mini Valve
50	Dirt Collector Bearing Sleeve - St/St
70	2-Wire Latch Solenoid Valve

Items 31 & 35 are shown for AC powered 400 Controller. For DC Controller operation, a Two-Wire Latch Solenoid, Item 70, replaces Item 31, & a 150 Controller powered by batteries replaces Item 35.

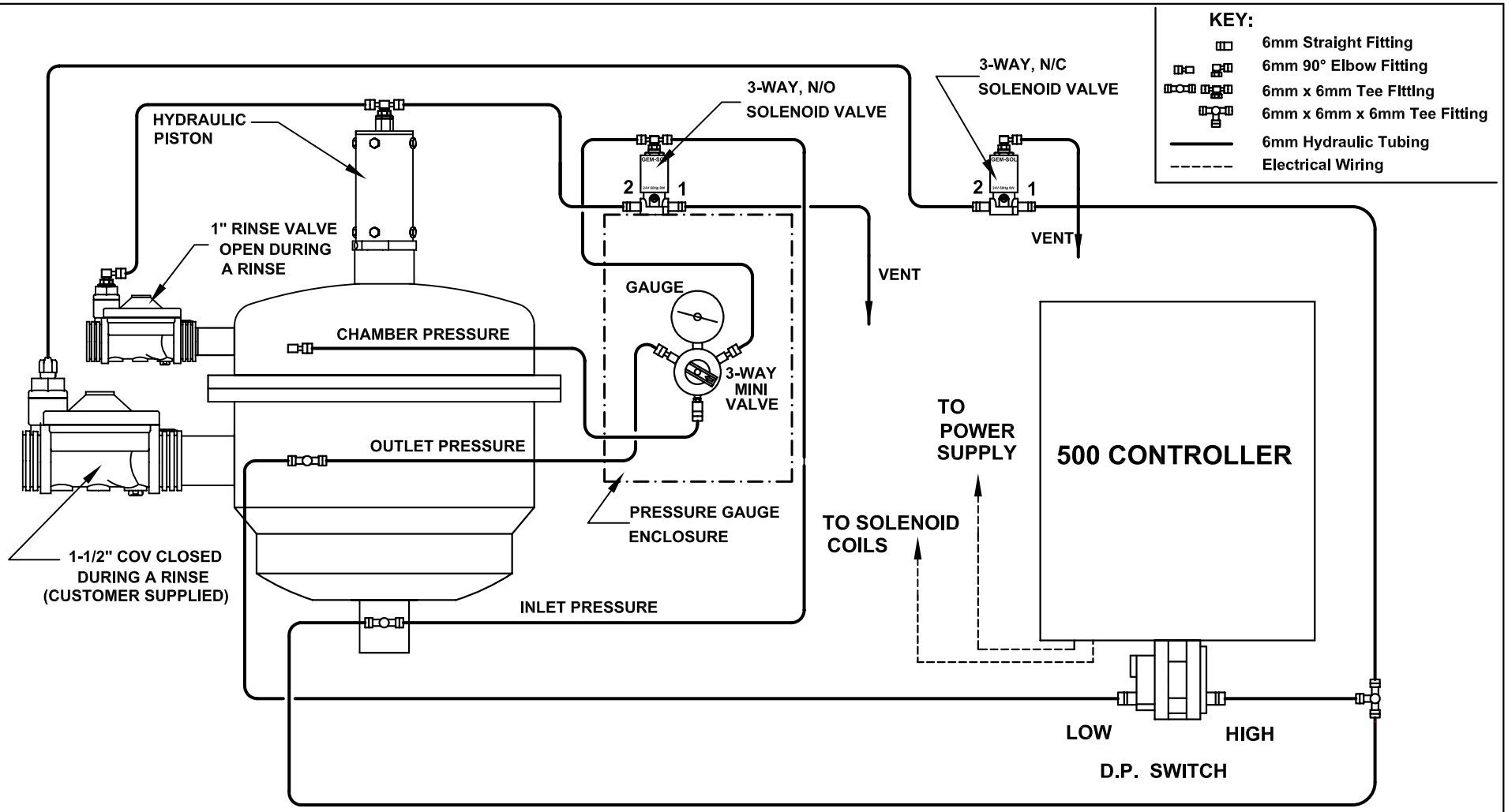


TYPICAL INSTALLATION SHOWN. THE PRESSURE GAUGE ENCLOSURE IS ATTACHED TO FILTER. DIFFERENT CONTROLLERS MIGHT BE SUPPLIED, BASED ON THE APPLICATION, AND MIGHT BE MOUNTED ON THIS ENCLOSURE OR SUPPLIED SEPARATELY FOR REMOTE MOUNTING.

NOTES:

1. COMPONENTS MAY BE ENLARGED OR ROTATED TO SHOW DETAIL.

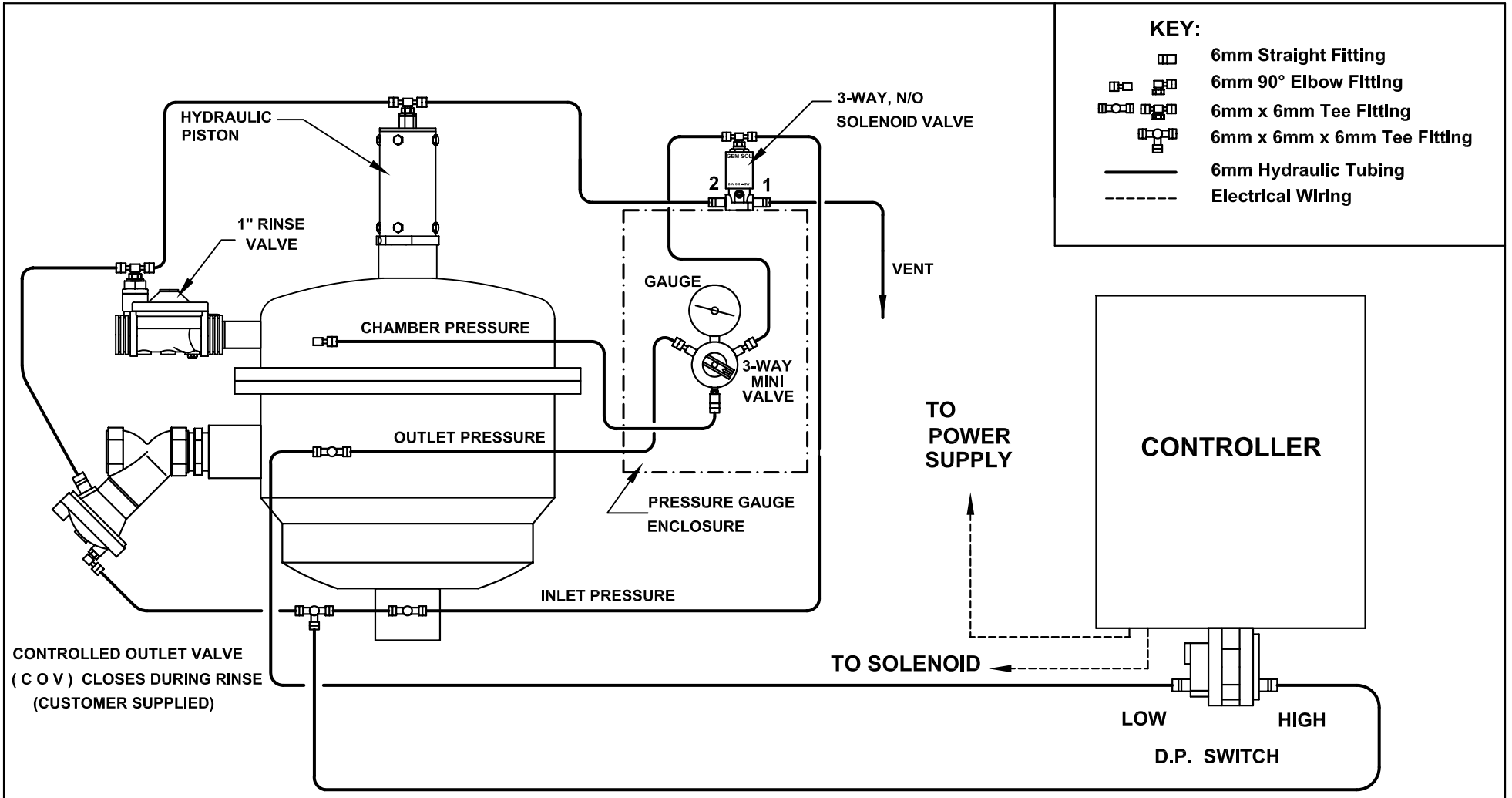
DRAWING NO.:	SCALE: NONE	RAIN BIRD CORPORATION 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	TYPICAL HYDRAULIC TUBING & ELECTRICAL CONNECTIONS FOR G & G/A SERIES FILTERS with DC CONTROLLER and LATCH SOLENOID



TYPICAL INSTALLATION SHOWN. THE PRESSURE GAUGE ENCLOSURE IS ATTACHED TO FILTER. DIFFERENT CONTROLLERS MIGHT BE SUPPLIED, BASED ON THE APPLICATION, AND MIGHT BE MOUNTED ON THIS ENCLOSURE OR SUPPLIED SEPARATELY FOR REMOTE MOUNTING.

NOTES:
1. COMPONENTS MAY BE ENLARGED OR ROTATED TO SHOW DETAIL.

DRAWING NO.:	SCALE: NONE	RAIN BIRD CORPORATION 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	TYPICAL HYDRAULIC TUBING & ELECTRICAL CONNECTIONS FOR 1-1/2" G & G/A FILTERS WITH A 1-1/2" COV



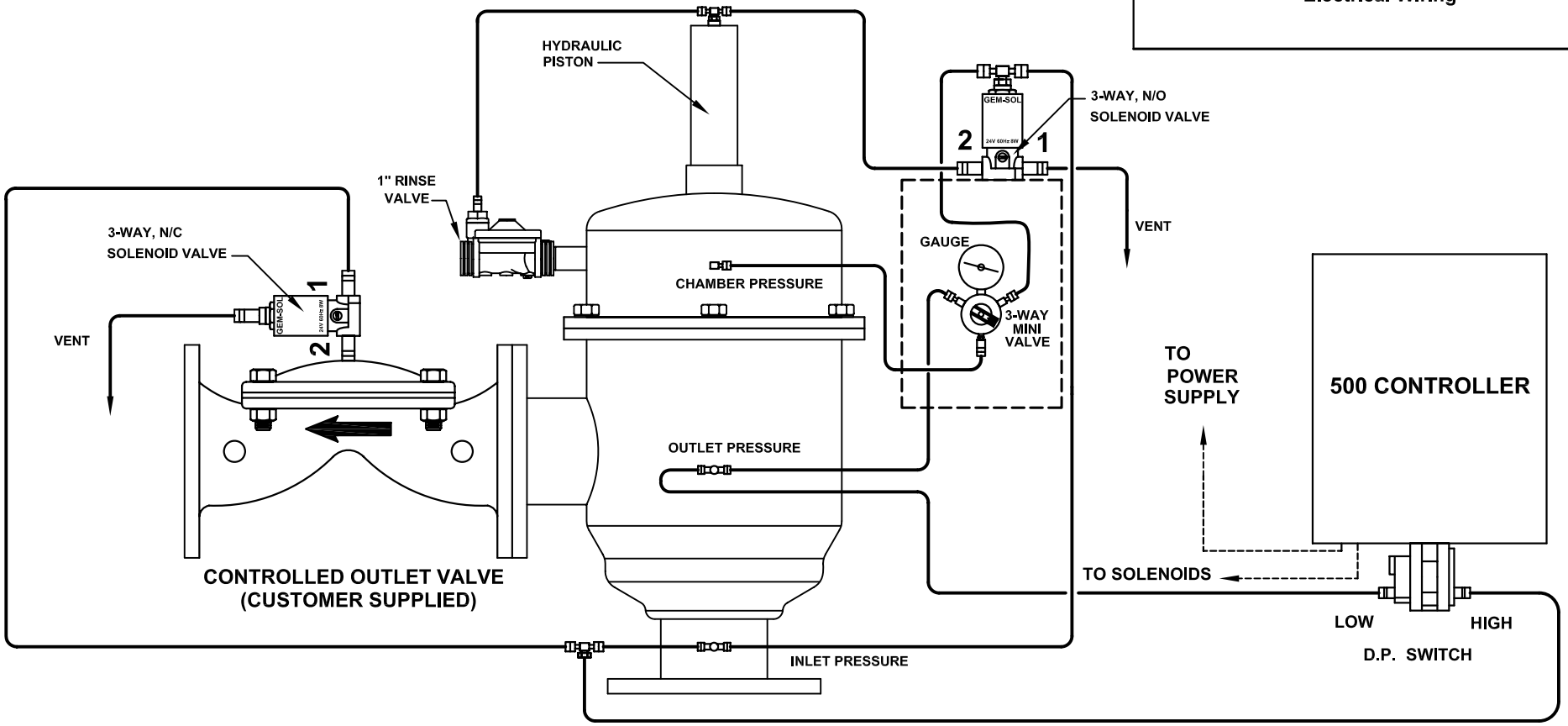
TYPICAL INSTALLATION SHOWN. THE PRESSURE GAUGE ENCLOSURE IS ATTACHED TO FILTER. DIFFERENT CONTROLLERS MIGHT BE SUPPLIED, BASED ON THE APPLICATION, AND MIGHT BE MOUNTED ON THIS ENCLOSURE OR SUPPLIED SEPARATELY FOR REMOTE MOUNTING.

NOTES:
1. COMPONENTS MAY BE ENLARGED OR ROTATED TO SHOW DETAIL.

DRAWING NO.:	SCALE: NONE	RAIN BIRD CORPORATION 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	TYPICAL HYDRAULIC TUBING & ELECTRICAL CONNECTIONS FOR 2" G & G/A FILTERS WITH A 2" COV

KEY:

- 6mm Straight Fitting
- 6mm 90° Elbow Fitting
- 6mm x 6mm Tee Fitting
- 6mm Hydraulic Tubing
- Electrical Wiring

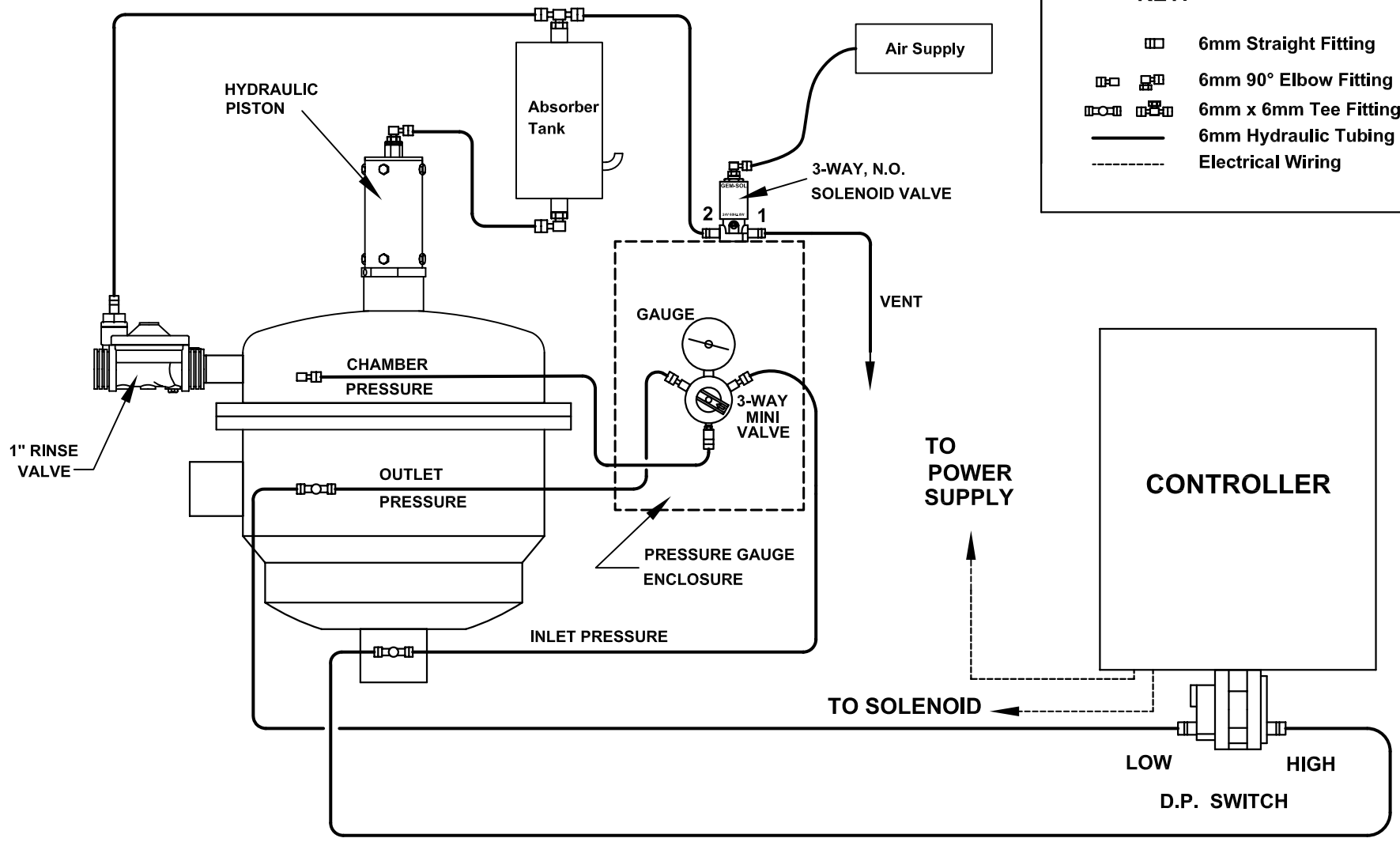


TYPICAL INSTALLATION SHOWN. THE PRESSURE GAUGE ENCLOSURE IS ATTACHED TO FILTER. DIFFERENT CONTROLLERS MIGHT BE SUPPLIED, BASED ON THE APPLICATION, AND MIGHT BE MOUNTED ON THIS ENCLOSURE OR SUPPLIED SEPARATELY FOR REMOTE MOUNTING.

NOTES:

1. COMPONENTS MAY BE ENLARGED OR ROTATED TO SHOW DETAIL
2. ALL TUBING AND FITTINGS ARE 6 mm

DRAWING NO.:	SCALE: NONE	RAIN BIRD CORPORATION 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	TYPICAL HYDRAULIC TUBING & ELECTRICAL CONNECTIONS for an G-030-LE & Larger - with a C O V VALVE

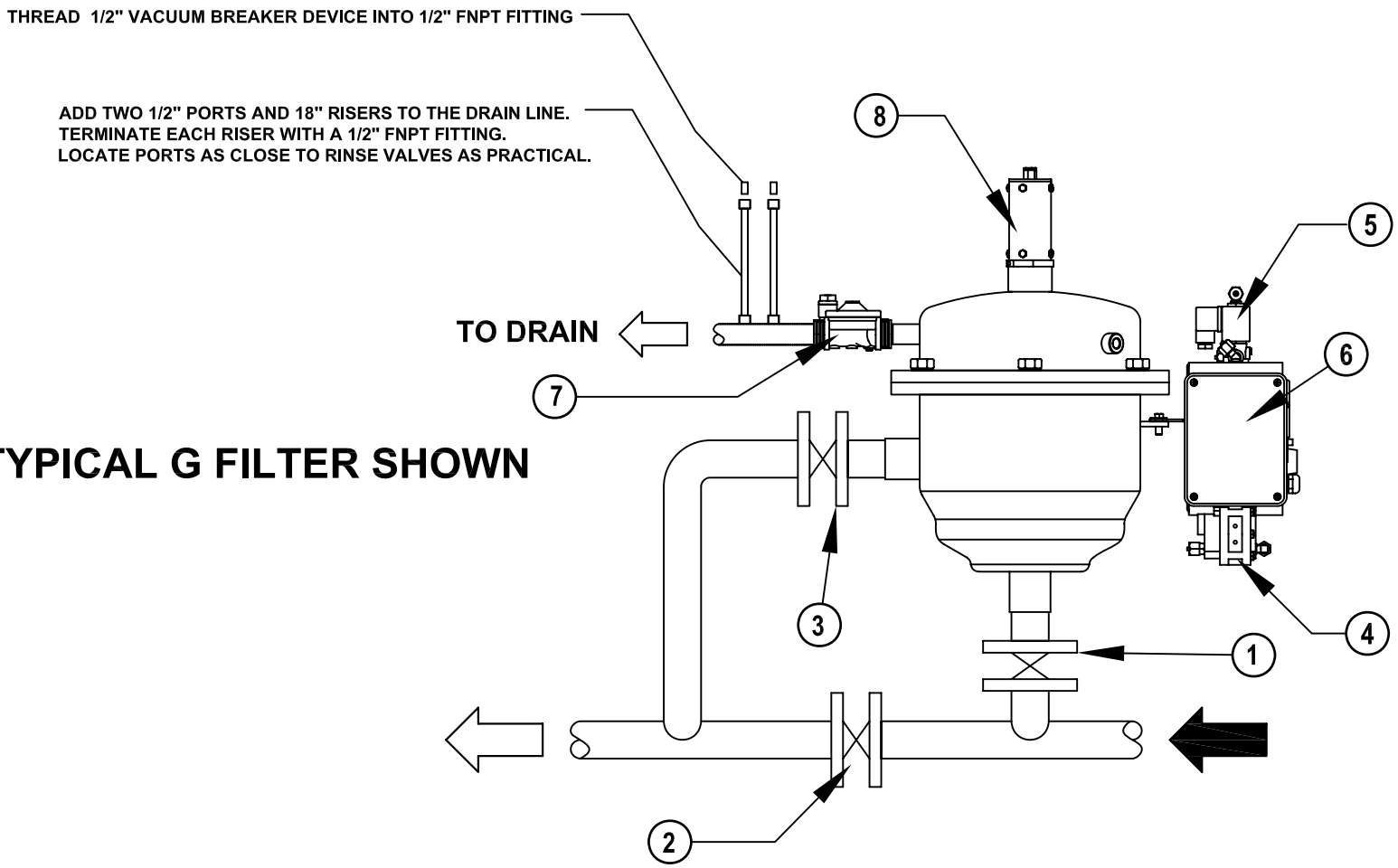


TYPICAL INSTALLATION SHOWN. THE PRESSURE GAUGE ENCLOSURE IS ATTACHED TO FILTER. DIFFERENT CONTROLLERS MIGHT BE SUPPLIED, BASED ON THE APPLICATION, AND MIGHT BE MOUNTED ON THIS ENCLOSURE OR SUPPLIED SEPARATELY FOR REMOTE MOUNTING.

NOTES:

1. COMPONENTS MAY BE ENLARGED OR ROTATED TO SHOW DETAIL
2. ALLTUBING & FITTINGS ARE 6 mm

DRAWING NO.:	SCALE: NONE	RAIN BIRD CORPORATION 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	TYPICAL PNEUMATIC TUBING & ELECTRICAL CONNECTIONS FOR G & G/A FILTERS

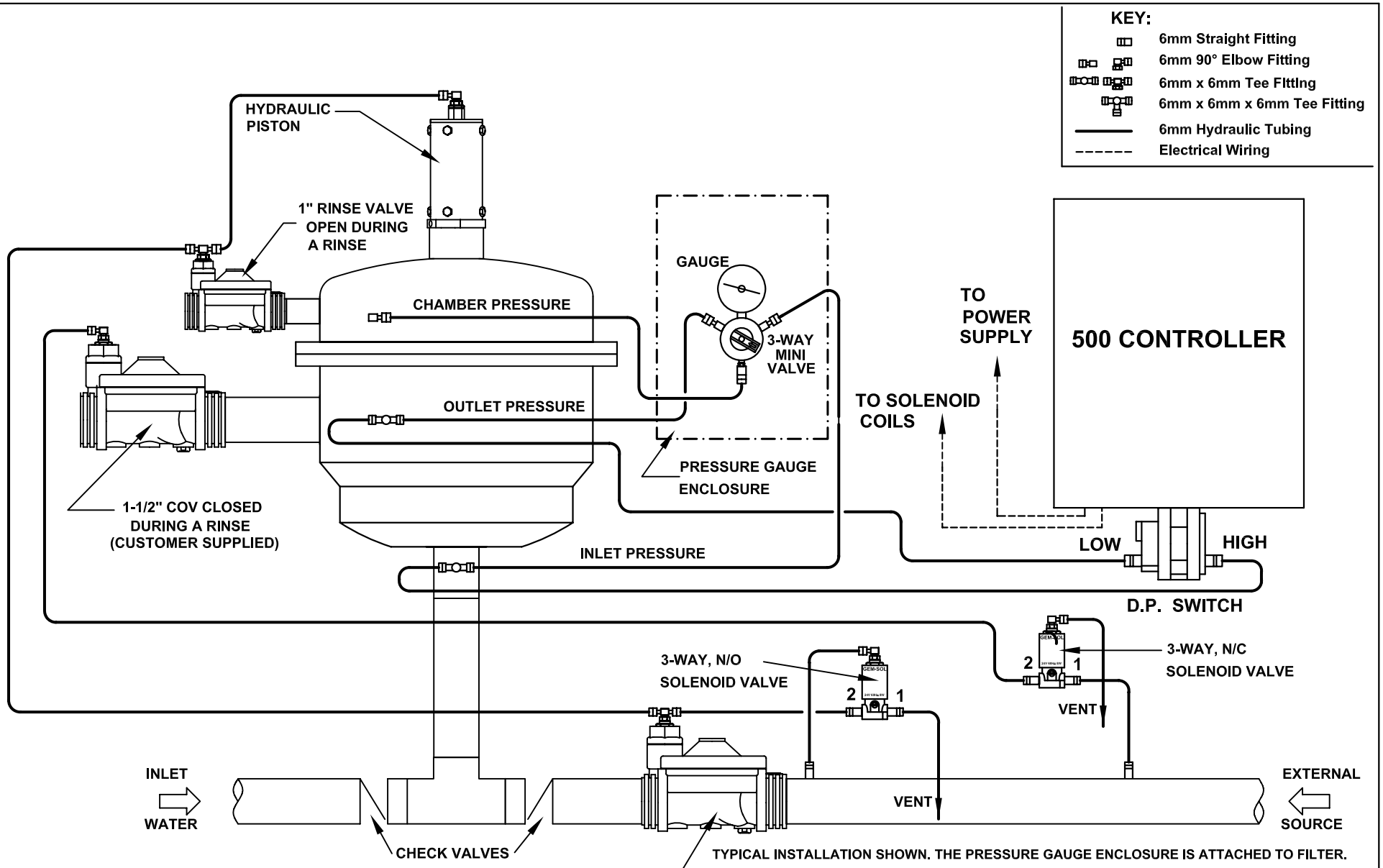


TYPICAL G FILTER SHOWN

No.	Description	Notes
8	Hydraulic Piston	Connected to Solenoid
7	Rinse Valve	Pipe to Drain
6	Controller	Mounted on Filter Housing Can be Remote Mounted
5	Solenoid Valve	24 V, 60 Hz, 3 way N.O.
4	Differential Pressure Switch	Preset to 7 psi
3	Outlet Valve	Customer Supplied
2	System Bypass Valve	Customer Supplied
1	Inlet Valve	Customer Supplied

NOTE: Drain Line from the Rinse Valve Should have a Coupling to Allow Easy Removal of the Top Section of the Body During Maintenance.

DWG. NO.	SCALE: NONE	**RAIN BIRD CORPORATION** 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	TYPICAL G & G/A SERIES FILTERS WATER HAMMER FIX INSTALLATION



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NOTES:
1. COMPONENTS MAY BE ENLARGED OR ROTATED TO SHOW DETAIL.

DRAWING NO.:	SCALE: NONE	RAIN BIRD CORPORATION 6991 EAST SOUTHPOINT ROAD TUCSON, AZ 85756
DRAWN BY:	DATE:	TYPICAL HYDRAULIC TUBING & ELECTRICAL CONNECTIONS FOR 1-1/2" G & G/A FILTERS WITH A 1-1/2" COV AND 1-1/2" EXTERNAL SOURCE VALVE