

Argonite®

System Description

FEATURES

- *Inert Gas Clean Agent Fire Suppression*
- *Safe for Personnel and Equipment*
- *Leaves No Residue*
- *Environmentally Friendly*
- *Actuation by Solenoid or Manual Actuator*
- *Three Available High-pressure (2900 PSI [200 bar]) Cylinder Sizes*
- *FM Approved/ULC Listed*

DESCRIPTION

Kidde Argonite® Fire Protection Systems are clean agent, automatic extinguishing systems that use Argonite (IG-55) and consist of four basic components and their associated accessories:

- Argonite Cylinders and Components,
- Completer Kits,
- Control Panels,
- Detection and Alarm Devices.

Argonite is an inert gas mixture, in equal parts, of Nitrogen and Argon. Both substances are naturally occurring and present in the atmosphere. Argonite is safe for use in occupied spaces and poses no threat to the environment.

1. Argonite Components consist of the agent cylinders, cylinder racking and the agent discharge nozzles.
2. The Completer Kits provide all the basic components necessary to operate the Argonite cylinders. The kits consist of hoses, connection fittings, pressure gauges, actuation devices required to operate the cylinder valve and warning signs to be displayed in the area(s) protected by an Argonite fire extinguishing system.
3. The Control Panels vary in features and complexity but in all cases are used to monitor the detection, actuate the alarms, initiate the agent discharge and control auxiliary functions such as shut down of vital equipment and ventilation dampers.
4. The Detection and Alarm devices provide fire detection by means of thermal or smoke detectors, audible and visual pre-alarm warnings and annunciation of the Argonite discharge.



AGENT DESCRIPTION

Argonite is a mixture of 50% pure Nitrogen and 50% pure Argon. Argonite contains only naturally occurring substances, and as such, has no ozone depletion potential and no direct global warming potential.

Argonite extinguishes by means of reducing the oxygen content within a room to the point at which fire can no longer burn, but without compromising the safety of individuals present. There are no toxicological factors associated with the use of Argonite. Argonite will not decompose or produce any by-products when exposed to a flame from a fire condition.

Most Argonite systems are designed to extinguish fires with a minimum agent concentration of 37.9% achieved within one minute. This results in extinguishment of the fire and an oxygen concentration of 13%.

Argonite is stored as a gas within the cylinder assembly. It is available at a storage pressure of 2900 PSI (200 bar).

USABLE CYLINDER CAPACITY

Three cylinder sizes are available (see Table 1).

Table 1. Cylinder Capacity

Size		Fill	
English	Metric	at 2900 PSI	at 200 Bar
972 cu. in.	15.9 L *	9.57 lb.	4.34 kg
4079 cu. in.	66.7 L *	40.15 lb.	18.21 kg
4893 cu. in.	80.0 L	48.13 lb.	21.83 kb



Figure 1. Argonite Cylinder

Table 2. Argonite cylinder Area Coverage

Cylinder	Area Coverage @ 38% Concentration/70°F (21°C)
15.9 L *	228.8 ft. ³ (6.47 m ³)
66.7 L *	959.8 ft. ³ (27.17 m ³)
80.0 L	1150.6 ft. ³ (32.58 m ³)

EQUIPMENT DESCRIPTION

The Kidde Fire Systems Argonite Fire Protection System can be released electrically, manually or pneumatically. The following is a description of the various components associated with the systems.

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CYLINDER AND VALVE ASSEMBLY

Argonite cylinders are available in three different sizes. The 2900 PSI (200 bar) cylinders are uniquely color coded to allow for quick and easy identification. The cylinders are red with yellow-green at the cylinder shoulder.

Because Argonite is stored as a gas, the cylinders have no dip tube and can be mounted in either the vertical or horizontal position.

The cylinder valve, required for all system cylinders, allows for connection of the cylinders into the system. The valve provides connections for electric, pneumatic and manual release of the cylinder contents, as well as a discharge outlet, connected by a discharge hose, to the distribution piping.

The actuator operates on a 1 to 10 ratio requiring only 300 PSI (21 bar) for the 2900 PSI (200 bar) system to operate the valve. The following are the connections provided on the valve.

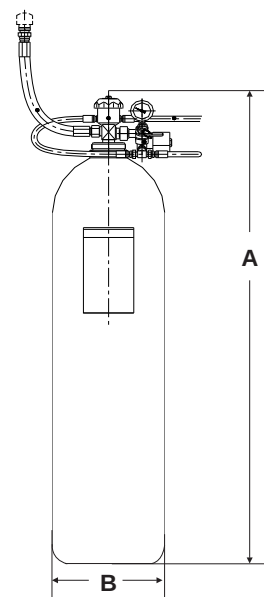


Figure 2. Cylinder Dimensions

Table 3. Cylinder Dimensions

Cylinder Size	Dimension	
	A	B (Diameter)
15.9 L *	39.07 in. (992.38 mm)	7.00 in. (177.80 mm)
66.7 L *	64.41 in. (1636.10 mm)	10.49 in. (266.45 mm)
80.0 L	68.81 in. (1747.77 mm)	11.25 in. (285.75 mm)

1. Manual/Pneumatic Actuator Connection:

Each cylinder valve must be fitted with either a Pilot or Slave type actuator.

The Pilot actuator provides a manual (pull pin turn handle) actuator and connections from an electrical solenoid and pressure switch assembly. The pilot actuator also has connections to adjacent slave cylinder actuators to discharge entire groups of cylinders virtually simultaneously.

The Slave actuator is purely pneumatic; it receives pressure from the pilot actuator and opens its associated cylinder valve.

2. Solenoid Valve, Pressure Gauge and Supervisory Pressure Switch Connection:

This is a threaded port that serves for the connection of one of the following:

- Solenoid Valve, Pressure Gauge and Supervisory Pressure Switch for pilot actuator connections.
- Pressure Gauge and Supervisory Pressure Switch for slave actuator connections.

3. Discharge Outlet:

The cylinder valve outlet is connected to the distribution piping by a flexible hose with 1/2-inch steel fittings.

Additional features of the valve include a Burst Disc, designed to rupture upon excessive internal pressure, and an external Bleeder Valve with indicator that acts as a pressure relief valve.

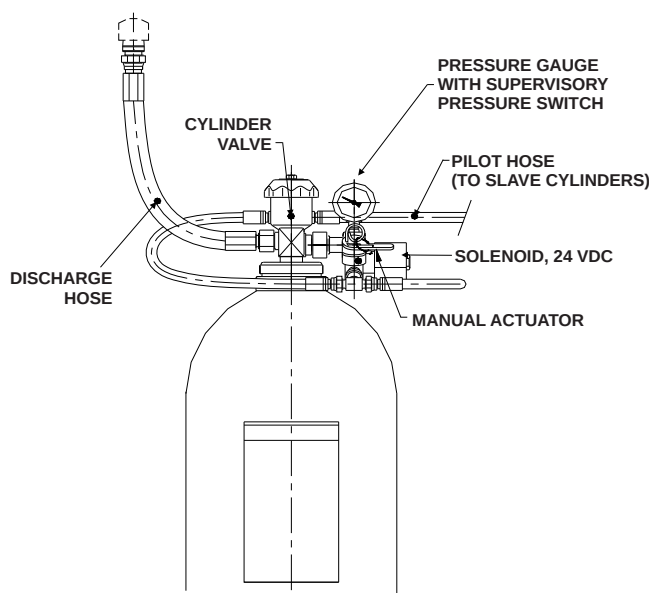


Figure 3. Argonite Cylinder and Valve Assembly

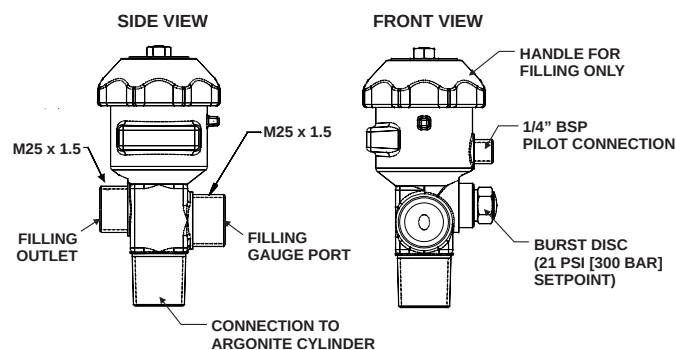


Figure 4. Argonite Cylinder Valve

Table 4. Argonite Cylinder and Valve Assembly Data

Part Number	Cylinder Assembly (Filled Cylinder/Valve)	Description
38-100159-001	15.9 L *	200 bar; DOT and TC versions
38-100667-001	66.7 L *	200 bar; DOT and TC versions
38-100800-001	80.0 L	200 bar; DOT and TC versions
Note: DOT=Department of Transportation (US) TC=Transport Canada		

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COMPLETER KIT COMPONENTS

Either a pilot or a slave completer kit is required to complete the installation of each Argonite cylinder.

Table 5. Completer Kit Data

Description	Completer Kits	
	Primary (Qty.) P/N 38-109802-001	Slave (Qty.) P/N 38-109803-001
Solenoid Valve	1	0
Pressure Gauge with Supervisory Pressure Switch	1	1
Manual Release	1	0
Pilot Hose #1	1	0
Pilot Hose #2	1	0
Pilot Hose #3	0	1
Bleeder Valve	1	0
Tee piece for hose connection	2	1
Discharge Hose	1	1
Inlet Stem Assembly	1	1
Note: If cylinders are used in a Main/Reserve system, use decal P/N 31033 (Main Decal) and P/N 31034 (Reserve Decal).		

SOLENOID AND PRESSURE GAUGE ASSEMBLY WITH SUPERVISORY PRESSURE SWITCH

The solenoid/pressure gauge assembly provides an electrical means (24 Vdc) of actuating the system as well as a visual means to determine the pressure within the pilot cylinder.

This unit includes an integral supervisory pressure switch and is supplied with a pilot flex hose #1. The supervisory pressure switch consists of one normally open (N.O.) contact that changes state upon loss of cylinder pressure.

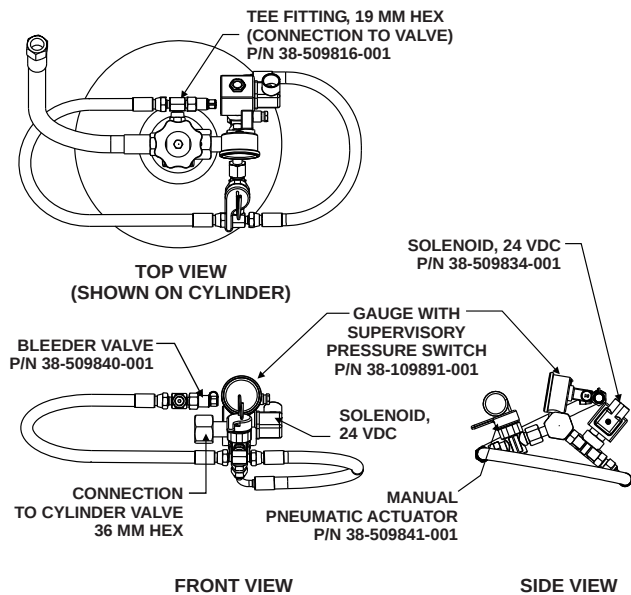


Figure 5. Solenoid and Pressure Switch Gauge Assembly with Supervisory Pressure Switch

PRESSURE GAUGE ASSEMBLY WITH SUPERVISORY PRESSURE SWITCH, P/N 38-109891-001

This unit is required for the slave cylinders to provide a local visual means to determine the pressure within the slave cylinder.

The pressure gauge assembly includes an integral supervisory pressure switch, consisting of one N.O. contact that changes state upon loss of cylinder pressure.

PILOT FLEX HOSE #1, P/N 38-509818-001

This 1/4-inch ID reinforced rubber flex hose has threaded connections to allow interface between the pilot cylinder solenoid/pressure gauge assembly and pilot manual/pneumatic actuator. It is supplied with the pilot solenoid assembly.

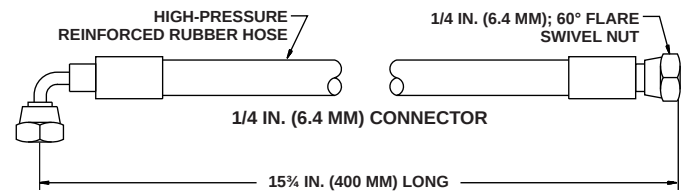


Figure 6. Pilot Flex Hose #1

MANUAL/PNEUMATIC ACTUATOR, P/N 38-509841-001

The manual/pneumatic actuator supplied with the pilot completer kit is required on the pilot cylinder to manually actuate the cylinder valve as well as to supply pressure to actuate any slave cylinders. Interconnection between cylinders is by means of high-pressure flex hoses.

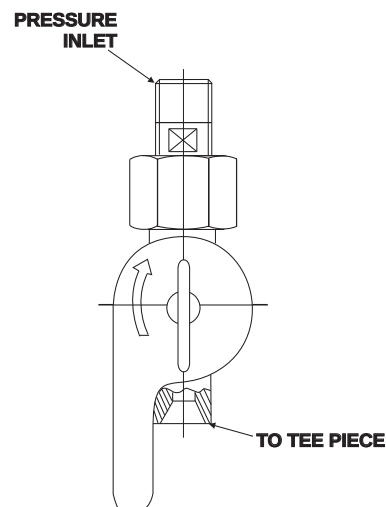


Figure 7. Manual/Pneumatic Actuator

TEE PIECE FOR HOSE CONNECTIONS, P/N 38-509816-001

The tee piece is supplied with each of the completer kits. It provides the interface with the pilot assembly (through a high pressure flex hose) to simultaneously operate the slave cylinder pneumatically.

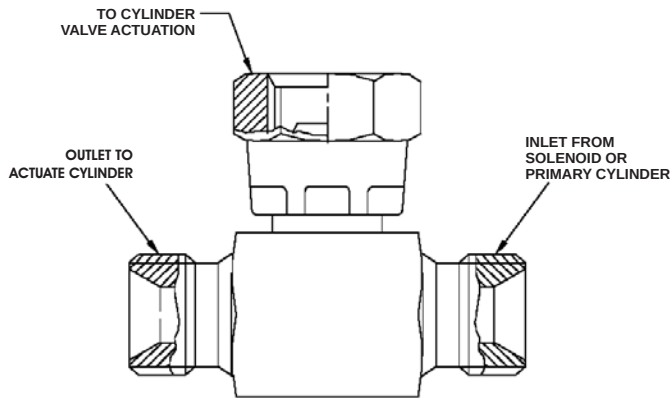


Figure 8. Tee Piece

BLEEDER VALVE FOR ACTUATOR, P/N 38-509840-001

A bleeder valve is included with the Pilot Completer Kit to prevent an accidental accumulation of pressure within the pilot lines, which, if not bled to atmosphere, could cause a false discharge. Connection requires a copper gasket between the bleeder valve and pneumatic actuator.

PILOT FLEX HOSES

This 1/4-inch ID reinforced rubber flex hose has threaded connections to allow interface between components.

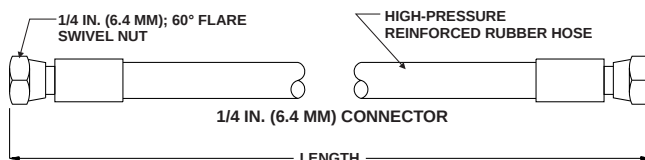


Figure 9. Pilot Flex Hose

Table 6. Pilot Flex Hose Data

Part Number	Description	Length
38-509817-001	Pilot Hose #3 between cylinder actuation pieces	10-5/8 in. (270 mm)
38-509820-001	Pilot Hose #2 between actuator and cylinder valve	17-3/4 in. (450 mm)

DISCHARGE FLEX HOSE, P/N 38-509819-001

This flex hose has 1/2-inch threaded connections to allow interface between the cylinder valves and the discharge manifold (if applicable). Where more than one cylinder is connected to a common manifold, check valves are required at the end of each discharge flex hose.

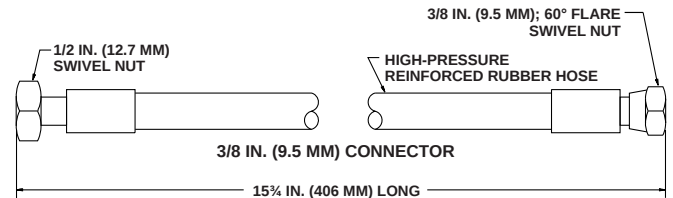


Figure 10. Discharge Flex Hose

CHECK VALVE ASSEMBLY, P/N 38-509833-001

To prevent accidental discharge of the Argonite into unintended areas, a check valve is required for each discharge hose in all multi-cylinder systems. All Kidde Fire Systems manifolds are constructed of threaded pipe with welded check valve connections and include pre-installed check valves. All customer connections are via threaded pipe.

Note: For single cylinder systems, a 1/2-inch BSP x 1/2-inch FNPT adapter is required to connect the discharge hose (BSP) to the Schedule 160 pipe (NPT).

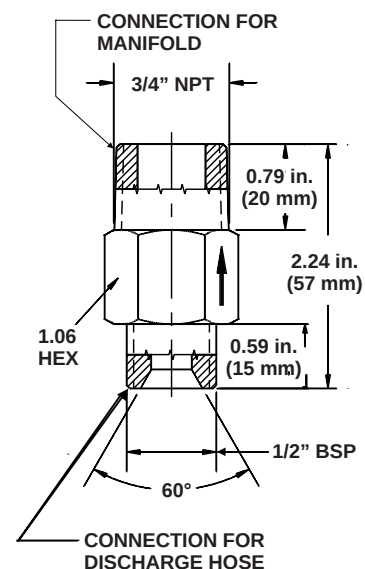


Figure 11. Check Valve Assembly

FLOW RESTRICTOR

The restrictor assembly reduces the initial Argonite pressure from the discharge manifold to between 174 and 870 PSI (12 and 60 bar) before entering the discharge piping. The size of the orifice within the restrictor is determined through calculations based upon the required flow and discharge time.

Larger diameter restrictors, up to 4 in. (102 mm) connection, are available for very large system requirements. An orifice plate is custom drilled to the specific requirements of the project as determined by computerized flow calculations.

Note: Flanged restrictor for large system requirements. Only the orifice plate is provided.

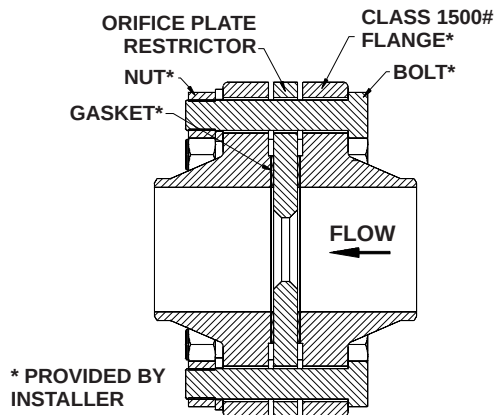


Figure 12. Flow Restrictor

Table 7. Flow Restrictor Sizes

Part Number	Description
38-250001-xxx	2-1/2 in. Flow Restrictor
38-300001-xxx	3 in. Flow Restrictor
38-400001-xxx	4 in. Flow Restrictor

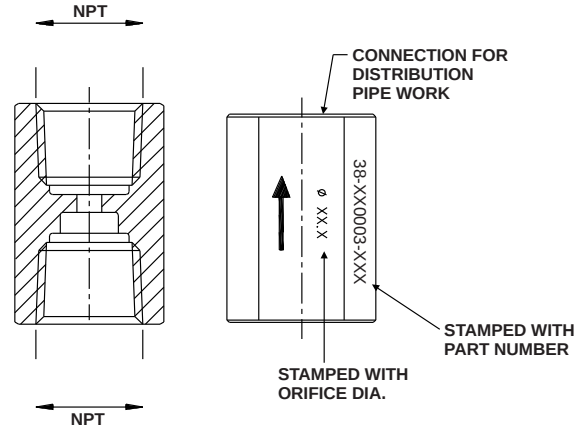


Figure 13. Restrictor Female NPT/Female NPT, Sizes 1/2-inch to 2 inches

Table 8. Flow Restrictor Data

Part Number	Flow Restrictor FNPT x FNPT Pipe Diameter (NPT)
38-050003-xxx	1/2 in. (13 mm) Brass, Code 035 to 075
38-100003-xxx	1 in. (25 mm) Brass, Code 050 to 130
38-150003-xxx	1-1/2 in. (38 mm) Brass, Code 085 to 220
38-200003-xxx	2 in. (51 mm) Stainless Steel, Code 115 to 270

SELECTOR VALVES

Argonite systems are particularly suited to the use of selector valves, where one central storage of agent is used to provide protection to two or more hazard areas.

Selector valves are available in six sizes, and are pneumatically operated. One common pressure regulator and vented elbow are also required to reduce the actuation pressure to each set of selector valves.

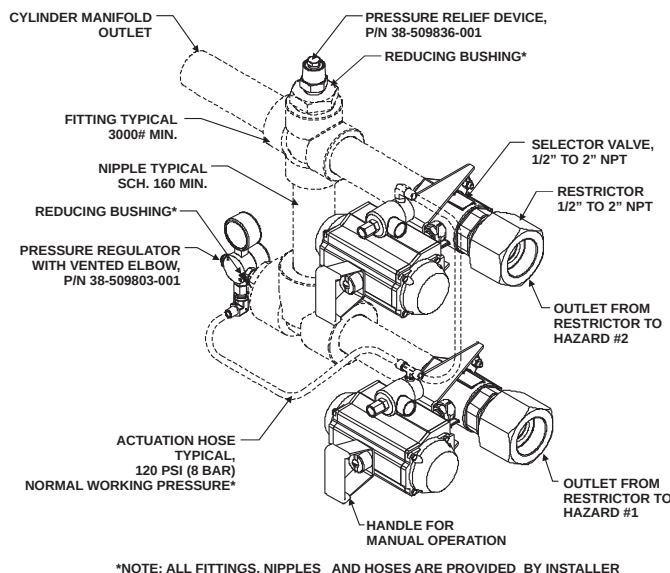


Figure 14. Selector Valve System

Table 9. Selector Valves and Components

Part Number	Description
38-609800-001	1/2 in. (13 mm) Pipe Diameter
38-609800-002	3/4 in. (19 mm) Pipe Diameter
38-609800-003	1 in. (25 mm) Pipe Diameter
38-609800-004	1-1/4 in. (32 mm) Pipe Diameter
38-609800-005	1-1/2 in. (38 mm) Pipe Diameter
38-609800-006	2 in. (52 mm) Pipe Diameter
38-509803-001	Pressure regulator kit with relief 120 PSI (8.3 bar) preset for selector valves

NOZZLES

The brass discharge nozzles are available in four basic sizes 1/2-inch, 3/4-inch, 1-inch and 1-1/2-inch. Each is fitted with a drilled orifice to assure proper flow rates, agent quality and proper discharge timing as determined by flow calculations. Maximum nozzle spacing for room mounted nozzles should not exceed 18.8 feet (5.7 m) square. Nozzle height should not exceed 16 feet (4.9 m) from a single layer of nozzles.

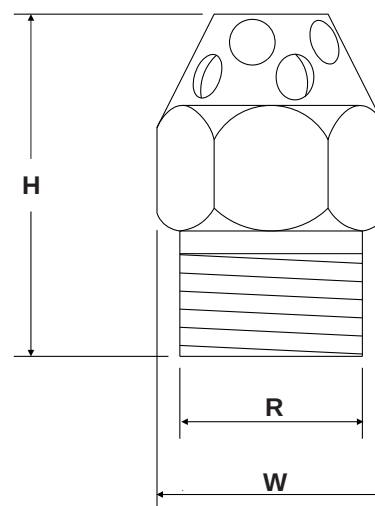


Figure 15. Nozzles (37 mm)

Table 10. Argonite Discharge Nozzle Data

Argonite Discharge Nozzle				
Part Number	Size (R) NPT	Orifice Dia. ¹	Height (H)	Width (W)
38-300502-xxx	1/2 in. (13 mm)	3 to 10 mm	1-9/16 in. (40 mm)	7/8 in. (22 mm)
38-300752-xxx	3/4 in. (19 mm)	7 to 14 mm	1-7/8 in. (48 mm)	1-1/8 in. (29 mm)
38-301002-xxx	1 in. (25 mm)	10 to 18 mm	2-3/8 in. (60 mm)	1-7/16 in. (37 mm)
38-301502-xxx	1-1/2 in. (38 mm)	15 to 26 mm	3-3/16 in. (81 mm)	2 in. (51 mm)

¹ An orifice plate within the nozzle is custom drilled to the specific requirements of the project as determined by computerized flow calculations.

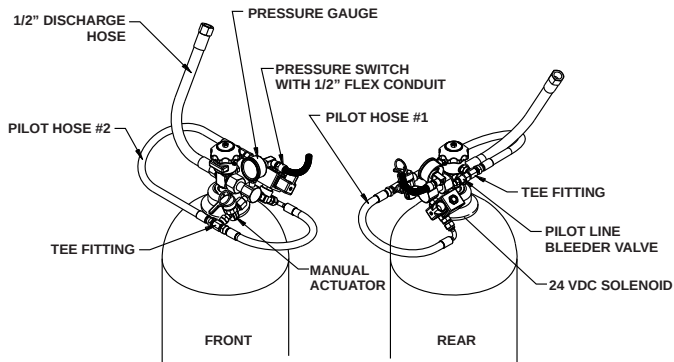


Figure 16. Typical Argonite Pilot Completer Kit

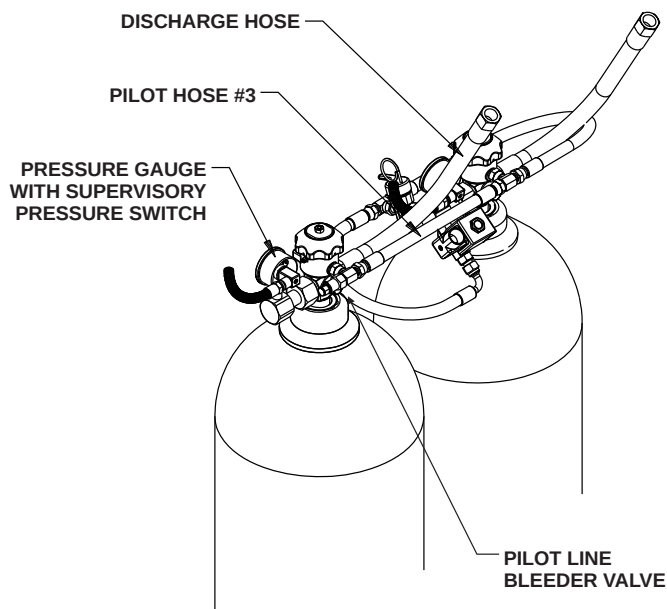


Figure 17. Typical Argonite Pilot and Slave Completer Kit

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