

Model AC/Circuit Sentry Automatic Flow Limiting Valve

Description: The Automatic Flow-Limiting Valves (AFLV) are designed to automatically control the flow in piping systems to selected preset limit. As pressure differential increases, a cartridge inside the valve body reduces the flow area to accurately maintain the preselected flow rate.



NOTICE: This product is not intended for use in open systems. An open system is one that is exposed to atmospheric pressure at any point, such as a cooling tower system.

Installation Instructions for NPT Connections:

1. Install the AFLV in the piping system/circuit where it is desired to maintain the flow at a preselected value. Apply pipe joint compound sparingly to the male pipe threads only.
2. Install the unit so that the flow arrow on the body housing points in the direction of flow.

Operating Instructions: Operation of the Automatic Flow-Limiting Valves is fully automatic and does not require any adjustment. It automatically maintains the selected flow over the designed differential pressure range.



CAUTION: Hot insulated surfaces can cause burns to the skin. Do not touch hot surfaces. Failure to follow these instructions could result in moderate personal injury.

Before the system start up, remove cartridge from the valve. Flush the hydronic system and then reassemble cartridge into the valve and make sure cap is tightened properly. Start the system and check for the AFLV leak.

How to use Automatic Flow-Limiting Valve Pressure Taps to Determine Proper Function of Valve:

1. Using Bell & Gosset Model RP-250B readout probes, attach a Bell & Gosset differential pressure readout kit to the readout valves on the Automatic Flow-Limiting Valve.
2. Read the differential pressure across the Automatic Flow-Limiting Valve. This can be compared to system pump head to determine valve function and system flow blockage.



CAUTION: Hot water leakage can occur from read-out valve during probe insertion and during hookup of readout kit. Follow the instruction manual supplied with readout probe and kit for safe use. Failure to follow this instruction could result in serious personal injury and/or property damage.



Service Instructions: Should the Automatic Flow-Limiting Valve require cleaning or changing the orifice, follow the following instructions.

WARNING: System fluid under pressure and/or at high temperature can be very hazardous. Before servicing reduce system pressure to zero or isolate the pressure reducing from the system. Leave drain valve open. Allow system to cool below 100°F (38°C). Failure to follow these instructions could result in serious personal injury or death and property damage.



1. Loosen and remove the cap from the valve body.
2. Pull the cartridge assembly from the valve body for cleaning or replacing with the new flow cartridge. Check the cartridge by pushing the orifice washer into the cartridge housing for several times to make sure spring is functional.
3. To change the orifice washer (for more or less flow rate); with a screwdriver, remove the clip ring from inside the cartridge housing. Pull the orifice washer out and replace with the new orifice size preferred.
4. Reinstall or replace the clip ring in the cartridge housing groove and slide cartridge into the body. Reassemble the cap with the o-ring body with appropriate torque..

WARNING: Corrosion or leakage is indication that the Automatic Flow-Limiting Valve must be replaced. Failure to follow these instructions could result in serious personal injury or death and property damage.



Maximum Operating Temperature: 250°F (121°C)
Maximum Operating Pressure: 300 psig (2069 kPa)
Differential Pressure Flow Control: 2 to 60 psig (14 to 414 kPa) nominal



VALVE INSTALLATION, OPERATION AND SERVICE INSTRUCTIONS

INSTALLER: PLEASE LEAVE THIS MANUAL FOR THE OWNER'S USE

GENERAL SAFETY NOTES:



WARNING: It is possible, depending on the age or condition of the product, for some liquid to escape when operating blow-down ball valves. Safety goggles should be worn while servicing the product. In this case, arrangements should be made to replace leaking valves. Failure to follow these instructions could result in serious personal injury.



WARNING: Check for proper sealing when using as an isolation valve. If the seat is not sealing properly, liquid will continue to flow from the drain valves. In this case, arrangements should be made to replace leaking valves. Failure to follow these instructions could result in serious personal injury or death and property damage.

OPERATIONAL LIMITS

| Coil Hookup Accessory | Temp °F (°C) | Pressure psi (kPa) |
|-----------------------------------|----------------------|-----------------------|
| Y-Strainer Valve (NPT) | 250 (121) | 400 (2758) |
| Y-Strainer Valve (sweat) | Based on solder type | ASTM Std. B16.18 |
| Union Ended Ball Valve (NPT) | 250 (121) | 400 (2758) |
| Union Ended Ball Valve (sweat) | Based on solder type | ASTM Std. B16.18 |
| Accessory (NPT) | 250 (121) | 400 (2758) |
| Accessory (sweat) | Based on solder type | ASTM Std. B16.18 |
| Hose 1/2" | 212 (100) | 375 (2585) |
| Hose 1" to 2" | 212 (100) | 350 (2413) |
| Venturi/Ball Valve (NPT) | 250 (121) | 400 (2758) |
| Venturi/Ball Valve (sweat) | Based on solder type | ASTM Std. B16.18 |

| Type Solder | Maximum Limitations 1/2" - 1" | | Maximum Limitations 1 1/4" - 2" | |
|--------------------------|-------------------------------------|-----------------|---------------------------------------|-----------------|
| | Pressure psi (kPa) | Temp °F (°C) | Pressure psi (kPa) | Temp °F (°C) |
| 95-5 TIN- ANTIMONY | 300 (2069) | 200 (93) | 300 (2069) | 175 (79) |
| | 250 (1724) | 225 (107) | 250 (1724) | 200 (93) |
| | 200 (1379) | 250 (121) | 175 (1207) | 250 (121) |

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Ball Valve

Installation Instructions:

1. Ensure the pipeline is free of dirt or debris. Flush system if necessary. Foreign matter can damage valve or degrade performance.
2. Thoroughly clean pipe threads and apply thread dope to the male thread only. PTFE thread sealant is recommended for most applications. (Installer is responsible for selecting a sealant compatible with fluid).
3. Apply torque to the valve at wrenching flats nearest the end being assembled. Do not apply torque through the full length of the valve body as this may compromise the integrity of the body to end piece seal. Care should be taken not to over tighten as this can cause distortion of the valve body and effect valve performance. Pipe wrenches should not be used on the valve as they can crush the body distorting the NPT thread.
4. A tight leak free joint can be obtained on valves 2" and under by rotating the valve 2 to 3 turns relative to the pipe, larger valves should be turned 1 1/2 to 2 turns. (Basic Dimensions, American National Standards Taper Pipe Threads, NPT ANSI B1.20.1-1983.)
5. After installation operate the valve through several full open to close cycles. Check tightness of stem packing.
6. For valves with NPT side taps assembly is the same as end connections. Tighten the mating part 2 to 3 turns past hand tight while holding the valve securely. The valve should be secured at the wrenching flats only. Applying a radical load on the main part of the body can distort it.

Operation Instructions:

The valve is opened by turning counterclockwise one quarter turn and close by turning clockwise. Valve state is indicated by the lever. A closed valve's lever is at 90° to the valve axis. When the valve is open the lever lies along axis.



Y-Strainer Combination Valve

Description: Y-strainer valves are of brass construction with an integrated ball valve, strainer, blow-down valve and union with tailpiece.

Installation Instructions:

1. The valves must be installed on the supply side of the coil with fixed end on the upstream side and other end on the downstream side.
2. When installing the Y-strainer valves space around the units must be provided to move the valve handle to the shutoff position and to move the strainer from the strainer body for cleaning.
3. The Y-strainer must be installed with the strainer chamber down to prevent air binding and also to allow accumulated dirt to be blown down from the strainer.

Operation Instructions:

Y-strainer can be used to isolate hydronic equipment for repairs and/or drain the system. To close the Y-strainer ball valve move the handle a quarter of a turn until the handle is perpendicular to the valve and piping.

If Y-strainer pressure drop becomes excessive, accumulated dirt should be blown down through the blow-down line (if installed) to a drain. If a blow-down line is not installed see the service instructions for removing and cleaning the strainer. The Y-strainers have construction with an integrated ball valve which will function as a service valve.

Service Instructions:

If excessive pressure drop is measured across the Y-strainer the internal strainer has collected dirt/debris and needs to be cleaned. Install blow-down line (hose), then open blow-down valve. If blowing down the strainer has not solved the pressure drop problem, the Y-strainer must be disassembled and strainer cleaned.



WARNING: Failure to use proper hose connection to the blow-down valve may result in serious personal injury and property damage.

To clean the strainer, isolate the Y-strainer by shutting off the ball valve on upstream and downstream of the Y-strainer. Allow the system to cool down to 100°F (38°C) or less.



WARNING: Hot fluid and/or fluids under pressure are a safety hazard. Do not service the strainer while it is hot or under pressure. Failure to follow these instructions could result in serious personal injury or death and property damage.

Using the appropriate size wrench remove the brass cap on the Y portion of the strainer. Grab and remove the strainer. Clean the strainer in water to remove collected debris. Reinstall the strainer and the strainer cap. Pressurize the system and check for strainer cap leaks. If noted, slightly tighten nut until leakage stops.



Periodically inspect the Y-strainer for signs of corrosion or leakage. If corrosion or leakage is noted the Y-strainer must be replaced.

WARNING: Corrosion or leakage is indication that the Y-strainer Combination Valve must be replaced. Failure to follow these instructions could result in serious personal injury or death and property damage.

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HOW TO USE PRESSURE TAPS TO MEASURE SYSTEM OPERATING CONDITIONS

1. Using Bell & Gossett's Model RP-250B readout probes, attach a Bell & Gossett differential pressure readout kit to the readout valves on the Accessory valve.



WARNING: Hot water leakage can occur from readout valve during probe insertion and during hookup of readout kit. Follow the instruction manuals supplied with the readout probes and readout kit for safe use. Failure to follow this instruction could result in serious personal injury and/or property damage.

2. Read the differential pressure across the coil. This can be compared to system pump head to determine system flow blockage.
3. Differential pressure can also be taken at Circuit Setter, AFLV and Y-strainer.

GENERAL INFORMATION:

For Installing Sweat Connections:

1. Clean tube ends and valve connections thoroughly per good piping practices with a fine grade emery cloth or fine grit sandpaper.
2. For soldering, use 95-5 (Tin-Antimony) solder and a good grade of flux.
3. Use a torch with a sharp point flame.
4. When sweating the joints, first adjusting the valve in the full open position, then wrap the valve with a cool wet rag and then direct the flame with care to avoid subjecting the valve to excessive heat. Allow the valve to cool before torching or operating.
5. Check the soldering connection for leaks.



WARNING: Use of improper procedures to sweat valve model with union connection into system can damage valve. Before installing sweat union connection to valve, remove the union nut and O-ring from the valve body, then union tailpiece with nut must be sweated (soldered) into place. Make sure the O-ring is reinstalled. Failure to follow this instruction could result in property damage and/or moderate personal injury.



CAUTION: Heat associated with the use of silver solder may damage valve components and void the product warranty. Do Not use silver solder. Failure to follow these instructions could result in property damage and/or moderate personal injury.



CAUTION: Excessive use of solder or flux may result in damage to the shutoff valve seat and ball. Do not use excessive solder or flux. Failure to follow these instructions can result in moderate personal injury and/or property damage.

For Installing NPT Connections:

Apply pipe compound conservatively to male connecting fittings only. After installation check all joints for leakage and retighten where necessary.



CAUTION: The use of PTFE impregnated pipe compound and PTFE tape on pipe threads provides lubricity. Care should be taken to prevent over-tightening which may damage the valve body. Failure to follow these instructions can result in moderate personal injury and/or property damage.



ChamFlex® “Class A” Fire Rated Hose Assemblies Installation Instructions

A) All applications should be checked to ensure that the proper hose assembly lengths are being installed:

- Hose assemblies should not be installed in a “stretched” (taut) fashion. Some expansion and contraction of the hose assembly can occur due to temperature variation, system pressures, and system cycling (see Figure #1).
- All hose assemblies should be routed properly to avoid contact with other surfaces that could possibly cause “chafing” (abrasion of the wire braided reinforcement).
- The use of elbows and adapters should be considered to relieve hose “strain” (Figure #2). Do not use plastic fittings or adapters.
- Hose assemblies should not be “bent” past the minimum bend radius requirements listed in the chart below. Hose assemblies showing evidence of “kinking” (being bent beyond the recommended bend radius) should not be installed (see Figure #3).

| Specs | ChamFlex 1/2" | ChamFlex 3/4" | ChamFlex 1" | ChamFlex 1-1/4" |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Working Pressure | 400 PSI | 400 PSI | 500 PSI | 400 PSI |
| Burst Pressure at Ambient Temp. | 1600 PSI | 1600 PSI | 2000 PSI | 1600 PSI |
| Minimum Bend Radius | 2.5" | 4" | 5.5" | 7" |
| Hose OD | 0.700" | 0.975" | 1.245" | 1.58" |
| Temperature Range | -40°F to 212°F | -40°F to 212°F | -40°F to 212°F | -40°F to 212°F |

B) All hose assemblies should be installed in the following fashion so that no “twisting” occurs:

- Solid male pipe thread (NPT) ends should be installed first unless they are being connected to a “swivel” female (NPT). The entire hose assembly must rotate during the tightening of this connection in order to avoid hose tube damage.
- The flared adapter on the “union” (female swivel) end should be removed with the male pipe (NPT) end of the adapter connected to the appropriate port first. Thread sealant or thread tape should not be used on “flared” connections. A watertight seal between male and female JIC connections is achieved by a metal-to-metal seal. Additional thread sealant or thread tape should not be applied to male pipe thread (NPT) ends where factory installed thread sealant is already present.
- The last step is to reconnect the flared swivel female coupling to the flared end of the adapter in a manner that ensures that the hose assembly is not twisted (see Figure #4).

C) The use of dielectric unions is at the sole discretion of the end user.



FIGURE 1 — HOSE AND MACHINE TOLERANCES

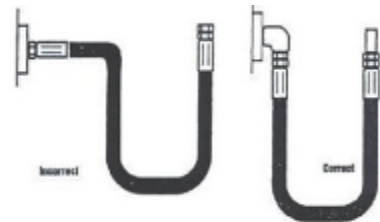


FIGURE 2 — ELBOWS AND ADAPTERS

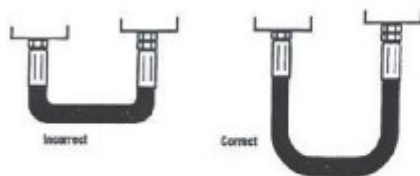


FIGURE 3 — MINIMUM BEND RADIUS



FIGURE 4 — TWIST ANGLE AND ORIENTATION

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CAUTION:

- Hoses are not rated for potable water or open-loop systems.
- Disconnect sweat adapters from hose prior to soldering onto piping; allow all sweat fittings/adapters/tubing to cool prior to hose installation
- Chamberlin recommends maintaining appropriate water treatment & chemistry, system straining, and routine maintenance/inspection
- Avoid exposure to excessive heat or cold, salt water, chemicals, flux and solder drips, or other contaminants. Shield hoses when necessary



NO PIPE DOPE — NO THREAD TAPE

DO NOT PUT ANYTHING ON THE
JIC FITTINGS



DO NOT EXCEED BEND RADIUS

ChamFlex® hose assemblies have superior flexibility due to their unique construction but everything has its limits. Please refer to the installation instructions for the minimum bend radius of your hose assembly.



PROTECT YOUR HOSE FROM **FLUX & SOLDER**

ChamFlex® hose assemblies will be damaged if flux & solder is allowed to drip onto them during installation. Be sure to protect your hose assemblies to prevent future problems.

To insure proper installation, hose assemblies must be installed according to instructions. Chamberlin Rubber Company, Inc. will not be responsible for failed hose assemblies and/or subsequent damage that occurred by failing to follow the provided Installation Instructions as well as the Safety Guide. Because Chamberlin cannot control conditions and methods of application, the purchaser/end user must make the final determination of product compatibility, fit, application, and design requirements as well as conformance to local, state, and federal regulations.



All Metal Stainless Steel Braided Single Hose Assembly Installation Instructions

A) All applications should be checked to ensure that the proper hose assembly lengths are being installed:

- Hose assemblies should not be installed in a “stretched” (taut) fashion. Some expansion and contraction of the hose assembly can occur due to temperature variation, system pressures, and system cycling (See Figure #1).
- All hose assemblies should be routed properly to avoid contact with other surfaces that could possibly cause “chafing” (abrasion of the wire braided reinforcement).
- The use of elbows and adapters should be considered to relieve hose “strain” (Figure #2). Do not use plastic fittings or adapters.
- Hose assemblies should not be “bent” past the minimum bend radius requirements listed in the chart below. Hose assemblies showing evidence of “kinking” (being bent beyond the recommended bend radius) should not be installed (see Figure #3).

| Hose Size | Working Pressure | Minimum Burst (@ 72° F) | Temperature Range | Minimum Bend Radius |
|-----------|------------------|-------------------------|-------------------|---------------------|
| 1 1/2" | 300 PSI | 1200 PSI | -20° F– 800° F | 11.75" |
| 2" | 300 PSI | 1200 PSI | -20° F– 800° F | 12.55" |

B) All hose assemblies should be installed in the following fashion so that no “twisting” occurs:

- Solid male pipe thread (NPT) ends should be installed first unless they are being connected to a “swivel” female (NPT). The entire hose assembly must rotate during the tightening of this connection in order to avoid hose tube damage.
- The flared adapter on the “union” (female swivel) end should be removed with the male pipe (NPT) end of the adapter connected to the appropriate port first. Thread sealant or thread tape should not be used on “flared” connections. A watertight seal between male and female JIC connections is achieved by a metal-to-metal seal. Additional thread sealant or thread tape should not be applied to male pipe thread (NPT) ends where factory installed thread sealant is already present.
- The last step is to reconnect the flared swivel female coupling to the flared end of the adapter in a manner that ensures that the hose assembly is not twisted (see Figure #4).

C) The use of dielectric unions is at the sole discretion of the end user.



FIGURE 1 — HOSE AND MACHINE TOLERANCES

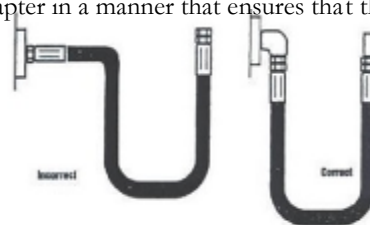


FIGURE 2 — ELBOWS AND ADAPTERS



FIGURE 3 — MINIMUM BEND RADIUS

FIGURE 4 — TWIST ANGLE AND ORIENTATION

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