Function

Pressure reducing valves are devices which, when installed on water systems, reduce and stabilize the pressure of the water entering from the water supply main. This pressure, in general, is too high and variable for domestic systems to operate correctly.

The 535H series pressure reducing valves, ideal for residential and commercial applications, feature a dial indicator with direct readout allowing easy pressure pre-adjustment. After installation, the valve will control at the pre-adjusted pressure setting.

The valve is constructed of DZR low-lead forged brass and incorporates a unique noise reducing and high flow seat design, is easily serviced with a replaceable cartridge and has an integral stainless steel filter (35 mesh), suitable for water systems that may contain sediment and debris.

The valve is ICC-ES certified to ASSE 1003, CSA B356, NSF 61, NSF 372, low lead laws and listed by ICC-ES. It meets codes IPC, IRC and UPC for use in accordance with the US and Canadian plumbing codes.

Product range

5353H Series  Pre-adjustable pressure reducing valve with or without pressure gauge and NPT female threaded union connections, sizes ½", ¾", 1", 1¼", 1½" and 2".

5356H Series  Pre-adjustable pressure reducing valve with or without pressure gauge and union press connections, sizes ¾" and 1".

5356H Series  Pre-adjustable pressure reducing valve with or without pressure gauge and union PEX crimp connections, sizes ¾" and 1".

5359H Series  Pre-adjustable pressure reducing valve with or without pressure gauge and union sweat connections, sizes ½", ¾", 1", 1¼", 1½" and 2".
CAUTION: If the 535H series pressure reducing valve is not installed, commissioned and maintained properly, according to the instructions contained in this manual, it may not operate correctly and may endanger the user.

CAUTION: All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.

CAUTION: Make sure that all the connecting pipework is water tight.

CAUTION: When making the water connections, make sure that the connecting pipework is not mechanically over-stressed. Over time this could cause breakages, with consequent water losses which, in turn, could cause harm to property and/or people.

CAUTION: Water temperatures higher than 100°F (38°C) can be dangerous. During the installation, commissioning and maintenance of the 535H PRV, take the necessary precautions to ensure that such temperatures do not endanger people.

Leave this manual for the user
Technical specifications

- **Body**: DZR low-lead brass
- **Cover**: glass reinforced nylon PA66M40/1
- **Control stem**: stainless steel
- **Moving parts**: DZR low-lead brass
- **Diaphragm & seals**: peroxide-cured EPDM
- **Compensation piston rings**: PTFE
- **Filter**: stainless steel
- **Seat**: stainless steel
- **Shuttle**: PPSG40

**Max working pressure**: 300 psi (20 bar)
**Downstream pressure setting range**: 15 - 90 psi (1 - 6 bar)
**Factory setting**: 45 psi (3 bar)
**Max. working temperature**: 180°F (80°C)
**Pressure gauge scale**: 0 - 100 psi (0 - 7 bar)
**Filter mesh size**: 0.51 mm (35 mesh)

**Suitable fluids**: water

**Main connections**:
- NPT female and sweat union
- Press and PEX crimp union

**Lay length** (¾" press connection): size ¾": 4¼"; size 1": 5 ⅜"

**Pressure gauge connection**: ⅛" NPT female
APPROVALS

1. ICC-ES certified to ASSE 1003, CSA B356, NSF 61 and NSF 372.


Hydraulic characteristics

Graph 1 (Circulation speed)
Graph 2 (Pressure drop)

Reference values: Upstream pressure = 116 psi (800 kPa)
Downstream pressure = 43 psi (300 kPa)

Sizing procedure

Flow velocity is recommended to be kept within 3 to 6 feet per second when calculating the correct pressure reducing valve size. This will prevent noise in the pipes and rapid wear of appliances.

The correct diameter of the pressure reducing valve is taken from graph 1 on the basis of the design flow rate taking into account an ideal flow velocity of between 3 and 6 f/s (blue band).

Example:
For 8 gpm, select the ¾" size valve (see arrow on graph 1).

The pressure drop is taken from graph 2 also on the basis of where the design flow rate intersects the curve for the valve size already selected (the downstream pressure falls by an amount equal to the pressure drop, with respect to the set pressure at no flow condition).

Example:
For 8 gpm the $\Delta p = 7.3$ psi (see arrow on graph 2).

<table>
<thead>
<tr>
<th>Design Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
</tr>
<tr>
<td>gpm</td>
</tr>
</tbody>
</table>
Installation

1) Turn all the faucets on before installing the pressure reducing valve, to flush the system and expel any air remaining in the pipes.
2) Install shut-off valves upstream and downstream to facilitate maintenance operations.
3) The pressure reducing valve may be installed on either vertical or horizontal pipe. However, it must not be installed upside down.
4) Close the downstream shut-off valve.
5) This mechanical pre-adjustment system, with the operating knob and pressure indicator visible from both sides, allows the pressure reducing valve to be set to the required value in the system prior to installation. The pressure indicator features incremental step movement, so that the pressure can be adjusted continuously and the value displayed at 15 psi increments.
6) Set using the operating knob on the upper part of the valve. The pressure reducing valves are factory set to a pressure of 45 psi.
7) Because the pre-adjustment dial displays in 15 psi increments, the optional downstream outlet pressure gauge can be used to show the exact outlet pressure, which is especially useful for applications requiring this precision.
8) After installation, the internal mechanism will automatically control the pressure, until the set value has been reached.
9) Slowly reopen the downstream shut-off valve.

Installation recommendations

1. Installation below ground
   Installation below the ground is not advisable.

2. Outdoor installation
   Pressure reducing valves should not be installed outside the building unless properly protected from freezing and the weather.

3. Water hammer
   Water hammer is a common reason for pressure reducing valve failures. Specific devices should be installed to absorb water hammer for systems with this risk.

PVC jumper nipple with male union thread. The length of the jumper nipple matches the 535H valve face-to-face dimension, allowing the piping to be completed prior to the installation of valve and permitting quick change out from the jumper to the valve.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Face-to-Face Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA11304</td>
<td>Jumper nipple for 535H ½&quot; series</td>
<td>3&quot;</td>
</tr>
<tr>
<td>NA11305</td>
<td>Jumper nipple for 535H ¾&quot; series</td>
<td>3 9/16&quot;</td>
</tr>
<tr>
<td>NA11306</td>
<td>Jumper nipple for 535H 1&quot; series</td>
<td>3 ¾&quot;</td>
</tr>
<tr>
<td>NA11307</td>
<td>Jumper nipple for 535H 1¼&quot; series</td>
<td>4 5/16&quot;</td>
</tr>
<tr>
<td>NA11308</td>
<td>Jumper nipple for 535H 1½&quot; series</td>
<td>4 ¾&quot;</td>
</tr>
<tr>
<td>NA11309</td>
<td>Jumper nipple for 535H 2&quot; series</td>
<td>5 ¼&quot;</td>
</tr>
</tbody>
</table>
**Maintenance**

The cartridge, containing the diaphragm, strainer, seat, valve plug and compensating piston, is pre-assembled as a self-contained unit with a cover and can be removed for inspection and maintenance. When checking, cleaning or replacing the cartridge:

1) Shut off the inlet and outlet isolation valves.

2) The downstream pressure setting can be left at the set value.

3) Remove the upper cover, using a spanner. This cover is integral with the cartridge.

4) Check and clean the filter.

5) If needed, the self-contained cartridge can be completely replaced. When the cartridge is screwed back into the body, the pressure indicating window will return the value to the original position.

6) Reopen the shut off valves and the pressure will return to the original set value.

![Diagram of maintenance process](image)
Troubleshooting

System failures are not always caused by the pressure reducing valve. Most frequently:

1. Increased downstream pressure in the presence of a water heater
   If the downstream pressure increases beyond the desired setting due to an inline water heater, install an expansion tank between the pressure reducing valve and the water heater to absorb the increased pressure, caused by water expansion from heating.

2. The pressure reducing valve does not maintain downstream setting value
   If the pressure reducing valve does not maintain the downstream setting, it most likely is due to impurities accumulating on the valve seat, causing unnecessary flow to pass-through, increasing the downstream pressure. Proper maintenance and cleaning of the removable cartridge is recommended.