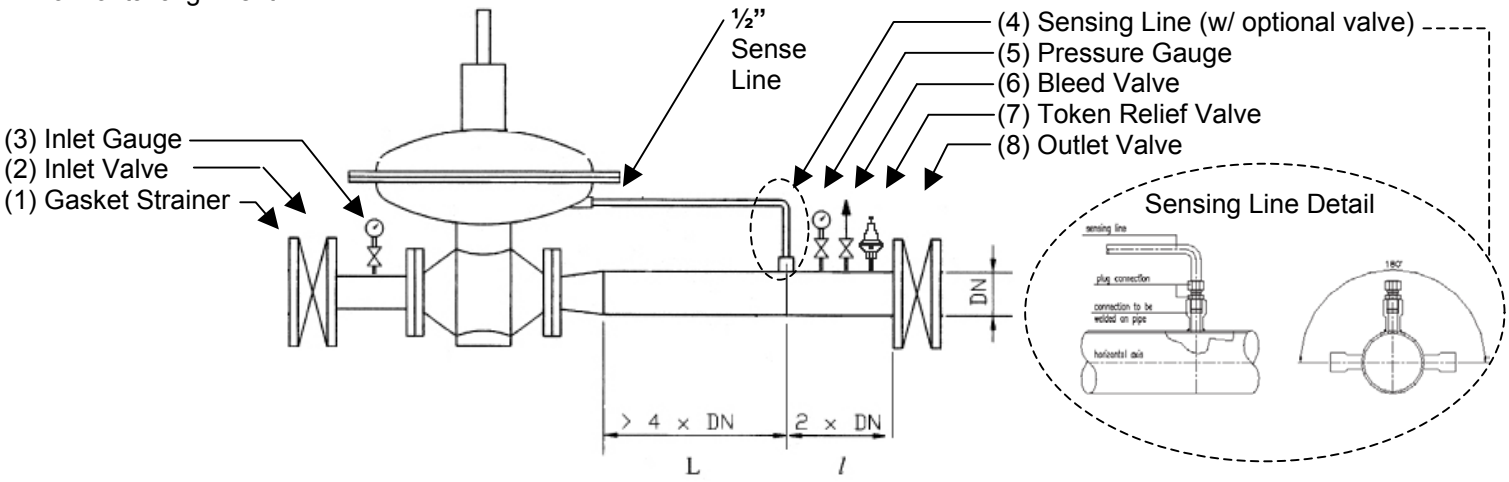
Installation Guidelines

1.5” to 4” Direct Acting Regulators with External Sensing Lines

Before installing the pressure regulator in the piping, the following must be checked:

- The upstream and downstream flanges must be parallel and the pressure regulating unit must be capable of being fitted without undue stress.
- The upstream piping must be cleaned from all impurities (sand, welding slag, etc.). Blow out the lines!
- The pressure regulator must not be visibly damaged.
- The inlet and outlet chambers of the pressure regulator must be perfectly clean.

After these checks have been made, the unit can be installed in the piping, making sure that the direction of gas flow corresponds to the arrow on the pressure regulator’s body. We recommend performing installation with the valve body in horizontal alignment.



The following are also recommended:

- An electrically insulating joint upstream and downstream, if the incoming and outgoing piping is made with ferrous material.
- A strainer or filter (1) to catch debris (rust, pvc shavings, weld slag) that can damage the valve
- An ON/OFF valve upstream (2) and downstream (8) of the pressure regulator
- A pressure gauge upstream (3) and downstream (5) from the pressure regulator
- A bleed valve (6) downstream for start-up and changes in pressure setting
- A token relief valve (7) for accidental over-pressure (example: the exposure of the downstream piping to direct sunlight at zero flow).
- Free passage for maintenance operations
- In the case of an ON/OFF gas load, the downstream volume must be greater than 1ft3 per 1000 ft3/hr. of flowrate.

All variations in diameter downstream must be performed progressively in order to prevent negative turbulence.

Avoid locating the control line piping:

- Near sources of heat
- Direct sun light.

The pressure regulator’s ½” sensing control line must be connected to the downstream pipe. If a valve is installed in this line it must be locked *open* during operation. Connections must be inserted in a straight section of the downstream pipe. For this purpose, we recommend welding the control line connections on the upper part of the piping in order to prevent impurities and condensation from collecting and obstructing the passage of the gas. It is also important to make sure that the control line piping slopes slightly downwards to the pipe. For adequate operation, the gas velocity at the control line position in the pipe, must not exceed those given below:

Low pressure	Med/high pressure
< 2.9 PSIG: 50-65 ft/s	>2.9 PSIG: 65-130 ft/s

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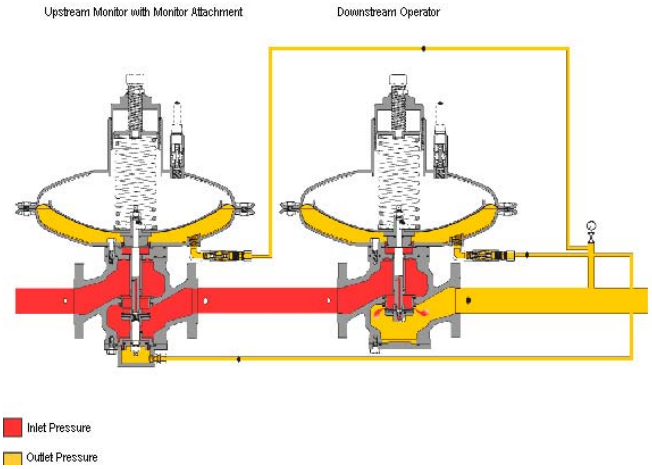
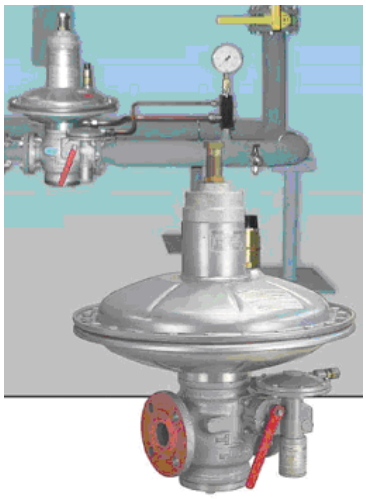
A token relief valve (7) can be installed as pictured. This valve will relieve gas to the atmosphere in the event that the downstream pressure rises significantly above set point. ***The relief valve does not provide full over pressure protection unless it has been sized for full wide open failure.*** If overpressure protection is required then a slam shut or monitor set should be considered.

Example of typical monitor set:



Example of typical slam shut set:



Picture above shows close-up a Norval with slam shut. The installation behind it shows that the sensing lines can be installed at the same point on the top portion of the pipe with 4D straight pipe between the regulator and the sensing line, and an additional 2D of straight pipe after the sensing line(s).

Consult code and local inspecting authorities for overpressure requirements.

Start Up

After the pressure regulator has been installed, make sure that:

- The on/off valve upstream (2) and downstream (8) are all closed
- The pressure of the inlet gas is not higher than the established design value.

After these checks have been made, proceed as follows:

- Partially open the upstream on/off valve (2), just enough to make sure that a very small amount of gas passes
- Check that the pressure rises slowly on the gauges; the downstream pressure must stabilize around the pre-set set value or a value slightly higher (if the pressure continues to rise, interrupt the starting procedure by closing the on/off valve and consult the trouble-shooting list to identify the cause of the malfunction);
- After the upstream pressure value has stabilized, open the on/off valve (2) completely; then slowly open the downstream on/off valve (8) until the piping is completely filled.

At this point, the pressure regulator is operative. The same procedure must be used when installing monitor-equipped pressure regulators connected on line with the active pressure regulator bearing in mind that the gauge installed in the section in between the two regulators must indicate the same pressure value as the upstream gauge. Refer to Operator/Monitor Guide

Pressure Regulator Adjustment & Setting

The pressure regulator is usually delivered already set to the specifications indicated in the order. Whenever the set pressure must be modified, this value must be set within the setting range of the spring installed. ***Pressure adjustments should always be made while the regulator is pressurized and flowing gas.*** If there is no downstream equipment running, then the bleed valve should be opened (venting to a safe area) to permit the regulator to stroke open.

To increase the value of the set pressure:
Rotate spring adjustment ferrule nut clockwise using the adjustment wrench until desired value is reached (which can be read on the gauge downstream).
To decrease the value of the set pressure:
Proceed as above, rotating spring adjustment ferrule counter-clockwise.

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