

# HSRL Series LP-Gas Regulators



Figure 1. Type HSRL Series Regulators



## WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Fisher® equipment must be installed, operated, and maintained in accordance with federal, state, and local codes and Fisher instructions. The installation in most states must also comply with NFPA No. 54 and 58 standards.

Only personnel trained in the proper procedures, codes, standards, and regulations of the LP-Gas industry should install and service this equipment.

## Things to tell the gas customer:

1. Show the customer the vent or vent assembly or vent tube. Stress that this opening must remain unobstructed at all times. Tell the customer to check the vent opening after a freezing rain, sleet storm, or snow to make sure ice has not formed in the vent.
2. Show the customer the shutoff valve on the container. The customer should close this valve immediately if gas is smelled, appliance pilot lights fail to stay on or appear higher than usual or any other abnormal situation occurs.
3. Tell the customer to call your company to service the regulator if the regulator vents gas or a leak develops in the system. Only a qualified gas service person should install or service the regulator.



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## Specifications

Tables 1 to 3 list the specifications for these regulators. Contact the factory if the regulator is to be used on any service other than LP-Gas, natural gas, or air. The following information is located on the spring case: Type number, orifice size, spring range, and date of manufacture.

<p><b>Body Size and End Connection Styles</b> 3/4, 1, and 1-1/4 NPT</p> <p><b>Allowable Inlet Pressure<sup>(1)</sup></b> <b>Emergency:</b> 150 psig / 10.3 bar <b>Maximum Operating Pressure:</b> See Table 1</p> <p><b>Allowable Outlet Pressure<sup>(1)</sup></b> <b>Emergency (Casing):</b> 25 psig / 1.7 bar <b>Maximum Operating Pressure to Avoid Internal Parts Damage:</b> 3 psi / 0.21 bar differential above outlet pressure setting</p>	<p><b>Outlet Pressure Range</b> 9 to 13 inches w.c. / 22 to 32 mbar</p> <p><b>Temperature Capabilities</b> -20 to 160°F / -29 to 71°C</p> <p><b>Pressure Registration</b> Internal</p> <p><b>Approximate Weight</b> 5.5 pounds / 2.5 kg</p>
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1. The pressure/temperature limits in this Instruction Manual or any applicable standard limitation should not be exceeded.

**Table 1. Maximum Operating Inlet Pressure**

ORIFICE SIZE		WIDE-OPEN C <sub>g</sub> FOR RELIEF SIZING	MAXIMUM OPERATING INLET PRESSURE TO OBTAIN GOOD REGULATING PERFORMANCE	
Inch	mm		psig	bar
3/8	9.5	105	30	2.1
1/2	13	185	20	1.4

**Table 2. Relief Performance**

ORIFICE SIZE		MAXIMUM ALLOWABLE INLET PRESSURE IF OUTLET PRESSURE IS HELD AT OR BELOW 2 psig / 140 mbar WITH DISC REMOVED	
Inch	mm	psig	bar
3/8	9.5	15	1.0
1/2	13	9	0.6

**Table 3. Capacity, Connection Sizes, and Vent Orientation**

END CONNECTION	TYPE NUMBER	CAPACITY BTU/HR PROPANE <sup>(1)</sup>	INLET PRESSURE SETTING	OUTLET PRESSURE SETTING	3/4-INCH NPT SCREENED VENT STANDARD LOCATION
3/4-inch FNPT	HSRL-BFC	2,100,000	10 psig / 0.69 bar	11 inches w.c. / 27 mbar	Over Inlet
1-inch FNPT	HSRL-CFC				
1-1/4-inch FNPT	HSRL-EHC	4,110,000	14.5 psig / 1.0 bar	12 inches w.c. / 30 mbar	

1. Capacities based on 2 inches w.c. / 5 mbar droop.

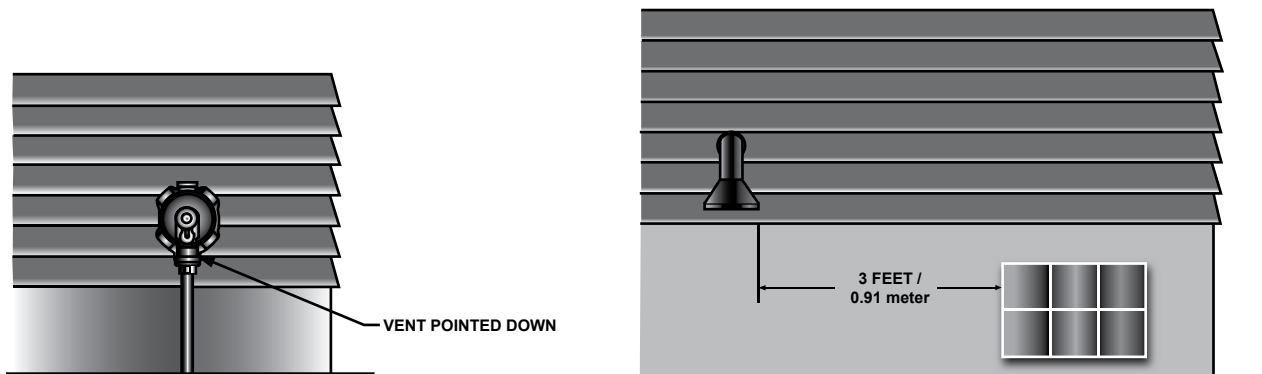


Figure 2. Regulator with Vent Pointed Down

## Introduction

### Scope of the Manual

This Instruction Manual covers Installation and Maintenance for the HSRL Series regulators, which are second stage regulators used on LP-Gas vapor service applications. They are not to be used on liquid service.

### Description

The HSRL Series regulators are second stage low pressure regulators, provide low pressure, inches of water column, delivery pressures. They are normally set at 11-inches w.c. / 27 mbar pressure. They have high capacity internal relief valve construction.

## Installation



### WARNING

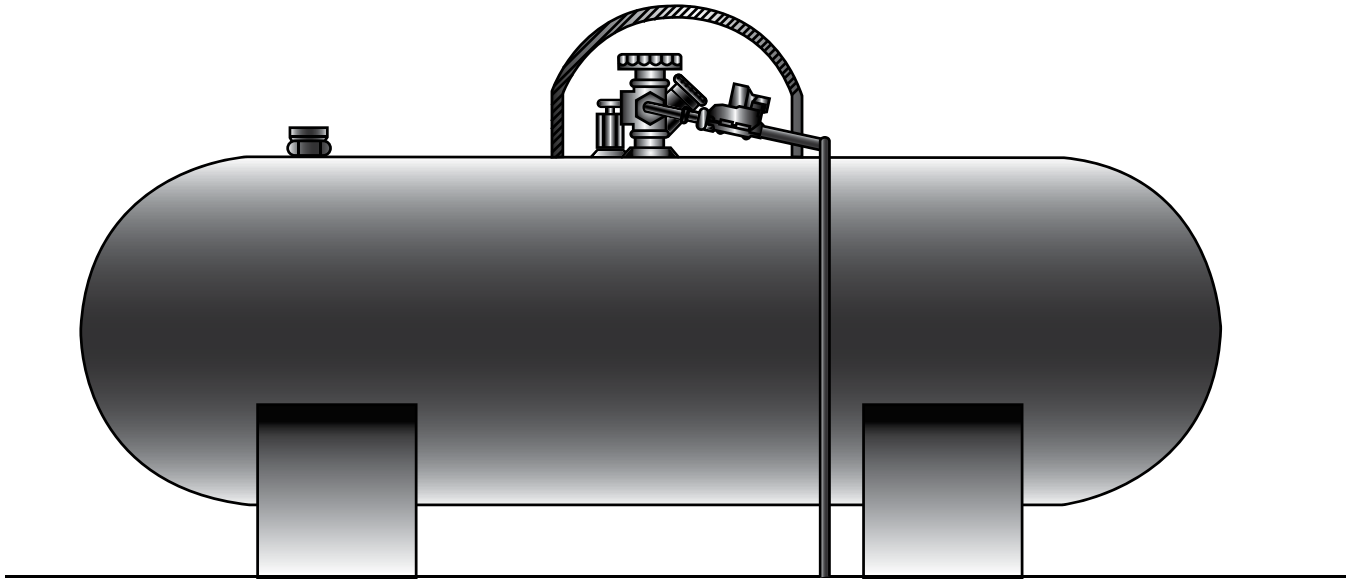
**All vents should be kept open to permit free flow of air in and out of the regulator. Protect vent openings against the entrance of rain, snow, ice formation, paint, mud, insects, or any other foreign material that could plug the vent or vent line.**

**LP-Gas may discharge to the atmosphere through the vent. An obstructed vent which limits air or gas flow can cause abnormally high pressure that could result in personal injury or property damage. Failure to use a vent line on Indoor Installations can cause a hazardous accumulation of gas which could result in personal injury or property damage.**

## General Installation Instructions

Before installing the regulator:

- Check for damage, which might have occurred in shipment.
- Check for and remove any dirt or foreign material, which may have accumulated in the regulator body.
- Replace old pigtails. Blow out any debris, dirt or copper sulfate in the copper tubing and the pipeline.
- Apply pipe compound to the male threads of the pipe before installing the regulator.
- Make sure gas flow through the regulator is in the same direction as the arrow on the body. "Inlet" and "Outlet" connections are clearly marked.



*Figure 3. Tank Installation*

## Installation Location

- The installed regulator should be adequately protected from vehicular traffic and damage from other external sources.
- Install the regulator with the vent pointed vertically down, see Figure 2. If the vent cannot be installed in a vertically down position, the regulator must be installed under a separate protective cover. Installing the regulator with the vent down allows condensation to drain, minimizes the entry of water or other debris from entering the vent, and minimizes vent blockage from freezing precipitation.
- Do not install the regulator in a location where there can be excessive water accumulation or ice formation, such as directly beneath a down spout, gutter, or roof line of building. Even a protective hood may not provide adequate protection in these instances.
- Install the regulator so that any gas discharge through the vent or vent assembly is over 3 feet / 0.91 meter horizontally from any building opening below the level of discharge.
- Install the regulator high enough above ground level at least 18 inches / 45 cm—so that rain splatter cannot freeze in the vent.

## Regulators Subjected to Heavy Snow Conditions

Some installations, such as in areas with heavy snowfall, may require a hood or enclosure to protect the regulator from snow load and vent freeze over.

## Horizontally Installed Regulators

Horizontally mounted regulators, such as found in single cylinder installations and ASME tanks, must be installed beneath a protective cover or under the ASME tank dome, refer to Figure 3. If possible, slope or turn the vent down sufficiently to allow any condensation to drain out of the spring case. Be careful that the slot in the tank dome or protective cover for the regulator's outlet piping does not expose the vent to the elements.

## Indoor Installations

By code, regulators installed indoors have limited inlet pressure, and they require a vent line to the outside of the building, see Figure 4. A vent assembly, such as Fisher®. Y602 Series, should be used on the end of the vent line. The same installation precautions, previously discussed throughout this manual for the regulator vent, apply to the end of the vent tube assembly. Vent lines must not restrict the gas flow

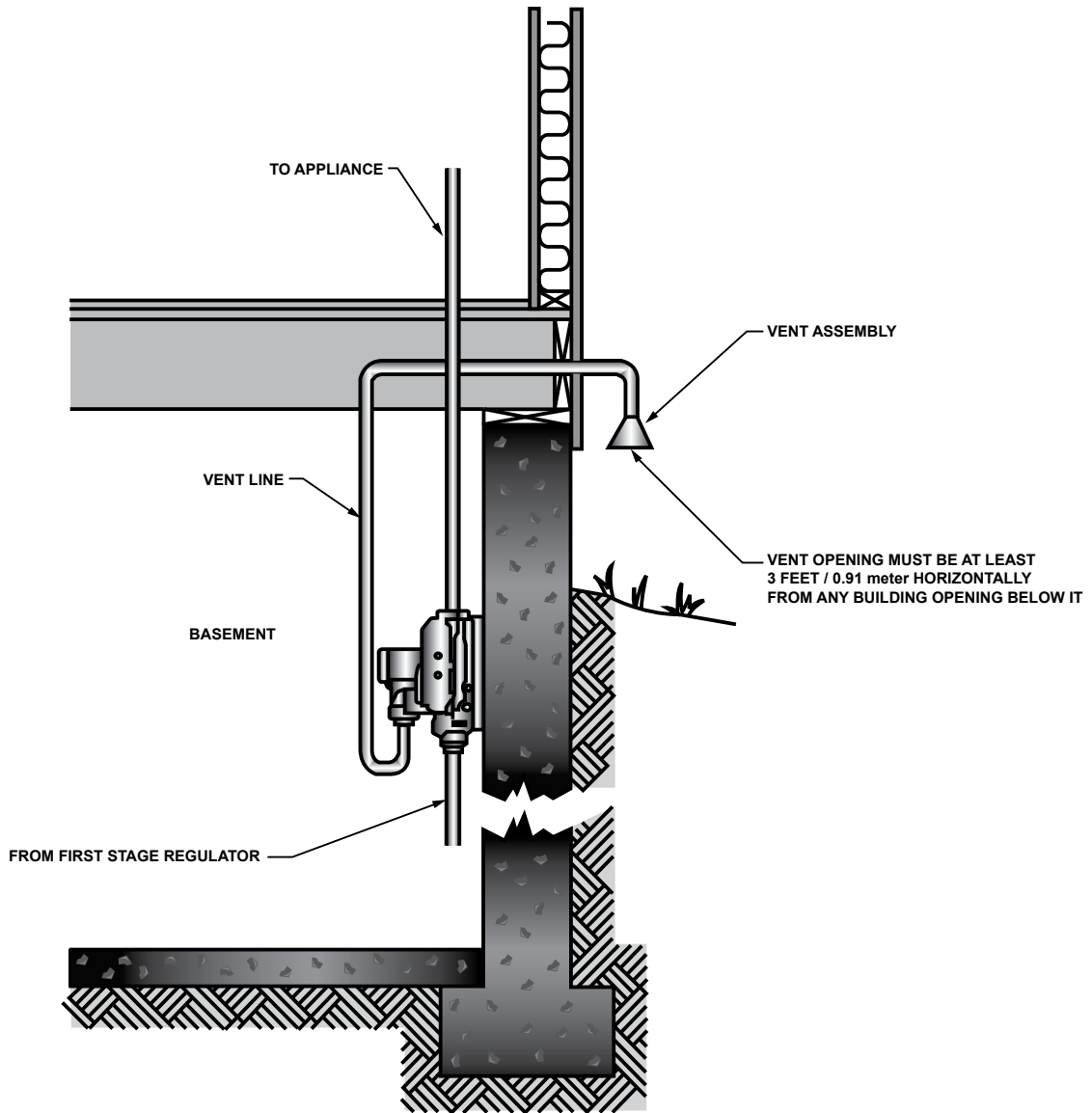


Figure 4. Basement Installation

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from the regulator's internal relief valve. Vent lines should be at least 3/4-inch NPT pipe or 3/4-inch NPT size, Gray PVC Schedule 40 Rigid Non-metallic Electrical Conduit for above Ground Service, per Underwriters Laboratories (UL®) 651. To install the vent line, remove the vent screen and apply a good grade of pipe dope to the male threads of the line. Vent lines should be as straight as possible with a minimum number of bends.

## Adjustment

To increase the outlet pressure setting of the regulator, the adjusting screw must be turned clockwise. This requires removal of the closing cap. To reduce the outlet pressure setting, turn the adjusting screw counterclockwise. A pressure gauge should always be used to monitor downstream pressure while adjustments are being made. Do not adjust the spring to produce an outlet pressure setting above the limit identified on the information label. After the spring adjustment has been completed, replace the closing cap.

## Overpressure Protection



### WARNING

**Some type of overpressure protection is needed if actual inlet pressure can exceed the outlet pressure rating. Overpressuring any portion of this equipment above the limits shown in the Specifications section may cause damage to regulator parts, leaks in the regulator, or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas.**

**If any portion of the regulator is exposed to an overpressure condition that exceeds the limits in the Specifications section, it must be inspected for damage that may have occurred.**

**Large volumes of gas may discharge through the regulator vent during internal relief valve operation, which can, if not controlled, result in fire or explosion from accumulated gas.**

The HSRL Series regulators contain internal relief valves. The internal relief valve in all units will give overpressure protection against excessive build-up resulting from seat leakage due to worn parts or chips or foreign material on the orifice. The amount of internal relief protection provided varies with the regulator type and the cause for the overpressure relief valve operation. When the internal relief valve opens, gas escapes to the atmosphere through the regulator's vent.

Some type of additional external overpressure protection must be provided if the outlet pressure in an overpressure condition exceeds the inlet pressure rating of the gas system or downstream equipment. Common methods of external overpressure protection include relief valves, monitoring regulators, shutoff devices, and series regulation.

## Maintenance



### WARNING

**To avoid personal injury or equipment damage, do not attempt any maintenance or disassembly without first isolating the regulator from system pressure and relieving all internal pressure.**

**Regulators that have been disassembled for repair must be tested for proper operation before being returned to service. Only parts manufactured by Fisher® should be used for repairing Fisher regulators. Relight pilot lights according to normal startup procedures.**

**Due to normal wear or damage that may occur from external sources, these regulators must be inspected and maintained periodically. The frequency of inspection and replacement of the**

**regulators depends upon the severity of service conditions or the requirements of local, state, and federal regulations. Even under ideal conditions, these regulators should be replaced after 20 years from date of manufacture or sooner should inspection reveal the need.**

Visually inspect the regulator each time a gas delivery is made for:

- Improper installation, vent not pointed vertically down or under a cover; no vent tube on underground systems
- Plugged or frozen vent
- Wrong regulator or no regulator in the system
- Internal or external corrosion
- Flooded Regulator; water in spring case; regulator submersed on underground tanks
- Regulator age
- Any other condition that could cause the uncontrolled escape of gas

Failure to properly inspect the regulator could result in personal injury or property damage.

## Vent Opening

Make sure the regulator vent, vent assembly, or vent tube does not become plugged by mud, insects, ice, snow, paint, etc. The vent screen aids in keeping the vent from becoming plugged, and the screen should be clean and properly installed.

## Regulator Replacement

Older regulators are more likely to catastrophically fail because of worn or corroded parts. Replace HSRL Series regulators over 20 years of age. Other

service or environmental conditions may dictate replacement of the regulator before it becomes 20 years old. Regulators that are installed on underground systems and in areas that are subject to sea salt (coastal) atmospheres should be inspected annually for external and internal corrosion and may require replacement sooner. Refer to Fisher® Bulletin LP-32 for additional information.

## Water inside Regulators from Floods or Weather

Replace any regulator that has been flooded, has had water in the spring case or shows evidence of external or internal corrosion. Checking for internal corrosion can be done by removing the closing cap and with the aid of a flashlight observing the condition of the relief valve spring, main spring, and internal spring barrel area. A more detailed examination will require shutting down the gas system and complete removal of the adjusting screw. Closely examine regulators installed with their vent horizontal for signs of corrosion. Correct any improper installations.

## Regulator Repair

Regulators that have been disassembled for repair must be tested for proper operation before being returned to service. Only parts manufactured by Fisher should be used to repair Fisher regulators. Be sure to give the complete type number of the regulator when corresponding with the factory.

The type number, orifice size, and spring range are on a label attached to the spring barrel. The date of manufacture is stamped on the regulator. Always provide this information in any correspondence with your Fisher Distributor regarding replacement parts or technical assistance. If construction changes are made in the field, be sure that the regulator marking is also changed to reflect the most recent construction.

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## LP-Gas Equipment

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