

August 2016

H100 Series External Relief Valves

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.

A person should **NEVER** stand directly over or in front of or look directly into a relief valve when the tank is pressurized. The relief valve could suddenly “pop” open blowing gas, dirt and other debris into the person’s face and eyes.

Fisher™ equipment must be installed, operated and maintained in accordance with federal, state and local codes and Fisher instructions. In addition, in most states the installation must also comply with NFPA No. 58, NFPA 501C, DOT and ANSI K61.1 standards.

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

Introduction

Scope of the Manual

This manual covers instructions for the H100 Series direct-operated relief valves which can be used in various vapor and liquid applications. Most H100 Series relief valves must be used on vapor service only. Use only advertised hydrostatic relief valves for liquid applications. The valves are typically installed in ASME tanks, DOT cylinders and piping applications.

Things To Tell The Gas Customer:

1. The purpose of a relief valve is to keep the tank from rupturing from excessive tank pressure by venting gas to the atmosphere until the tank pressure



Figure 1. H100 Series

drops. Excessive tank pressure can be caused by the following:

- a. Exposure to fire or radiant heat including hot summer days.
 - b. New or refilled tanks not fully purged of air.
 - c. Tank colors (other than white) increase the heat absorption of the tank raising the pressure in the tank.
 - d. Propane with “vapor pressures” out of specification, i.e., “Hot Gas.”
 - e. Overfilling the tank.
2. Do not beat, pound, or hit the relief valve with hammers or other tools or attempt to force the valve closed as this will not stop gas discharge and could damage relief valve parts or rupture the tank.
 3. Call your gas dealer if the relief valve discharges gas.

H100 Series

Specifications

The Specifications section on this page provides the ratings and other specifications for H100 Series external relief valves. Factory specifications are engraved on the body of the relief valve at the factory.

<p>Body Size, Tank Connection: Types H110, H120, H123, H124: 1/4 in. NPT Types H125, H135, H144, H148: 1/2 in. NPT Types H150, H160, H173, H174, H185: 3/4 in. NPT</p> <p>Maximum Allowable Relief (Inlet) Pressure⁽¹⁾: 420 psig / 29 bar</p> <p>Fixed Relief Pressures: 35 to 350 psig / 2.4 to 21.1 bar, see Table 1</p>	<p>Temperature Capabilities⁽¹⁾: -20 to 160°F / -29 to 71°C</p> <p>Materials: Body, poppet and spring retainer: Brass and Stainless steel Disk: Nitrile (NBR) Spring and retainer pin: Stainless steel</p> <p>Approximate Weights: H110 and H120 Series: 0.2 lb / 0.09 kg All Others: 0.4 lb / 0.18 kg</p>
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1. The pressure/temperature limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.

Table 1. H100 Series External Relief Valves

TYPE	CONTAINER TYPE	CONTAINER CONNECTION, in.	START-TO-DISCHARGE PRESSURE, psig / bar	PRESSURE PLUS BUILDUP, psig / bar	FLOW CAPACITY, SCFM / SCMH air	ACCESSORY		
						Pipeway Adaptor	Protective Cap	
H110-250 ⁽¹⁾	ASME	1/4 MNPT	250 / 17.2	----	310 / 527	----	P206	
H125-250		1/2 MNPT	250 / 17.2	----	610 / 1036	----	----	
H135-250 ⁽¹⁾				----	594 / 1009	P174 ⁽³⁾	----	
H150-250		3/4 MNPT	250 / 17.2	----	580 / 985	----	----	
H160-250 ⁽¹⁾				----	605 / 1028	----	----	
H185-250 ⁽¹⁾				----	2223 / 3777	----	P145	
H185-275 ⁽¹⁾				275 / 19.0	----	2456 / 4173	----	----
H110-312 ⁽¹⁾		1/4 MNPT	312 / 21.5	----	390 / 663	----	P206	
H135-312 ⁽¹⁾		1/2 MNPT		----	765 / 1300	P174 ⁽³⁾	----	
H160-312		3/4 MNPT		----	765 / 1300	----	----	
H123 ⁽¹⁾	DOT or Hydrostatic Relief	1/4 MNPT	375 / 25.9	----	----	----	P206	
H148 ⁽¹⁾		1/2 MNPT		----	903 / 1534 ⁽²⁾	P174 ⁽³⁾	P206	
H173 ⁽¹⁾		3/4 MNPT		----		----	P206	
H120-35	Hydrostatic	1/4 MNPT	35 / 2.4	60 / 4.1	77 / 131	----	P206	
H120-60			60 / 4.1	85 / 5.9	105 / 178	----	P206	
H120-120			120 / 8.3	145 / 10	165 / 281	----	P206	
H120-150			150 / 10.3	180 / 12	191 / 325	----	P206	
H120-175			175 / 12.1	210 / 14	224 / 380	----	P206	
H120-200			200 / 13.8	240 / 17	262 / 445	----	P206	
H120-225			225 / 15.5	270 / 19	280 / 476	----	P206	
H120-275			275 / 19.0	330 / 23	303 / 515	----	P206	
H120-350			350 / 24.1	420 / 29	445 / 756	----	P206	
H124 ⁽¹⁾			450 / 31.0	----	----	----	P206	
H144 ⁽¹⁾			1/2 MNPT	450 / 31.0	----	----	----	P206
H174 ⁽¹⁾			3/4 MNPT	450/31.0	----	----	----	P206

1. Listed under UL® Section 132.
 2. DOT cylinder water capacity 500 lbs / 227 kg, approved by Bureau of Explosives and CGA.
 3. 1/2 in. FNPT

CAUTION

If the valve is to be for service other than LP-Gas, anhydrous ammonia, or air; contact the factory to determine if the valve materials are suitable for the particular service.

Valves with brass materials must not be used on anhydrous ammonia service.

H100 Series relief valves range in size from 1/4 to 3/4 in. threaded MNPT inlet connections. Set pressures and flow capacities vary by size and application. Materials of construction are typically brass, steel and stainless steel with nitrile discs. Consult your Fisher™ Catalog for size, set pressure and flow capacity combinations.

UL® listed valves are required by most states, although some states require ASME capacity rated valves. Be sure the valve is rated and stamped to meet the requirements of the state where it will be used. The valve should also have sufficient capacity for the container size where it is used.

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Required relief valve capacity is a function of the container surface area. Consult NFPA #58 or other appropriate product standards.

The start-to-discharge pressure stamped on the valve must be correct for the design pressure of the container. Do not use a valve with a start-to-discharge pressure higher than the design pressure of the container.

Principle of Operation

The relief valve (See Figure 1) is held close by the spring force seating the rubber valve disc against the orifice.

When the tank pressure exceeds the spring force, the valve disc lifts off the orifice allowing gas to discharge through the valve to the air.

Gas discharge initially may be small producing only seepage and a light “hissing” sound. As pressure increases and gas volume discharge continues, a “popping” condition occurs with large volumes of gas discharge and a loud “hissing or roaring” sound.

When the tank pressure decreases enough, the spring force closes the valve disc back against the orifice stopping further discharge.

Installation

WARNING

Vapor relief valves must be installed only in the vapor space to provide relief capacity for the tank.

Installed vapor relief valves must have direct contact with the vapor space of the containers.

Hydrostatic relief valves are required on liquid lines to provide relief protection for the liquid line between two shutoff valves. Hydrostatic relief valves must be installed in the liquid space.

Install the valve so that flow is unobstructed. Be certain that any discharge from the valve will not impinge on the container, adjacent containers or any source of ignition.

Each application will dictate whether discharge stacks or deflectors are required. Deflectors and adaptors are separate devices mounted to the outlet of the valve to control discharge direction. Consult the applicable standard to determine if these additional devices are required.

Coat the male threads of the valve with an UL® listed sealing compound. Do not allow excess compound to drip into the container or flow around the bottom edge of the pipe threads.

Pull the valve into the coupling hand tight, and then wrench tighten it for approximately two additional turns. Do not install the valve with such extreme torque that the coupling can cut threads into the valve. This could cause valve distortion

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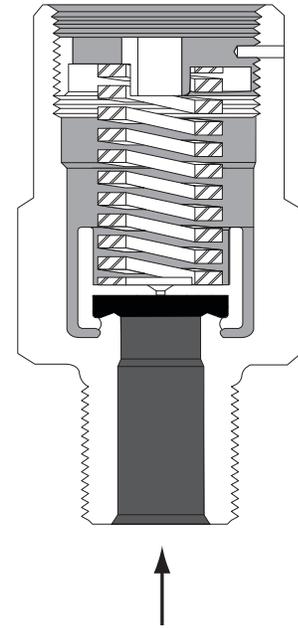


Figure 2. H100 Series Operational Schematic

and affect the internal working parts. Larger size valves (especially if of steel construction) may require an additional amount of torque to obtain a leak free connection.

Raincaps are required on all valves. The raincap should be kept in place; an out-of-place raincap indicates the valve may have opened to relieve overpressure. Most relief valves have a drain hole in the body which must remain open at all times.

Relief valves on bobtails, transports and motor fuel applications must be protected as specified by DOT, NFPA #58 and other applicable laws, codes and standards.

New containers must be purged to remove air from the container. Failure to properly purge may result in excessive pressure and the possibility of “popping” the relief valve when the container is filled. Follow NFPA #58 and NLPGA Pamphlet 133-80 guidelines for purging containers.

Maintenance and Replacement

Safety relief valves are non-repairable valves and cannot be adjusted in the field.

WARNING

Any valve that has fully opened “popped” should be tested to see if it is within the allowable start-to-discharge pressure setting. If it is not within the correct range, it must be replaced. Relief valve start-to-discharge and reseal pressures may be lower if the valve has fully opened (popped).

H100 Series

Some relief valve installations require periodic testing or replacement, such as those required by DOT, NFPA #58, NFPA Pamphlet 59 (LP-Gas Utility Gas Plants) and ANSI K61.1. It is recommended that all relief valves be regularly inspected for visible damage, dirt, corrosion, missing raincaps, paint inside outlet, tampering, etc. If any of the preceding is evident or questionable, the valve should be re-tested or replaced immediately.

The discharge side of the relief valve body must be kept free of dirt, water and other foreign matter which can damage the valve seat or “weld” some “wing style” poppets to the valve body. This can prevent the valve from opening. Replace valves when this occurs.

Relief valves are precisely set by the manufacturer for the correct start-to-discharge setting and field repair should never be attempted. Fisher™ recommends that a relief valve not be used for longer than 15 years from the date of manufacture. The service application of the relief valve and the environment in which it operates may shorten the safe service life of the relief valve. Replacement of the relief valve in less than 15 years may be required.

Parts List

Key	Description
1	Body
2	Spring Retainer
3	Groove Pin
4	Spring
5	Poppet Assembly

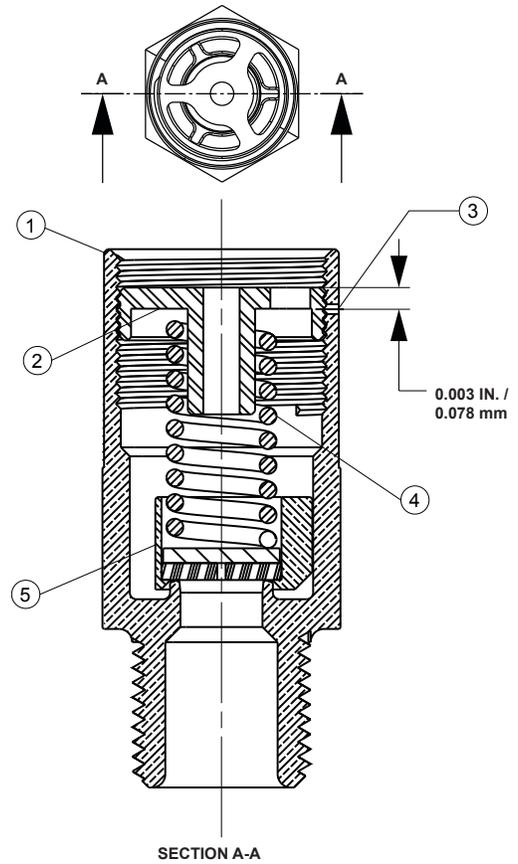


Figure 3. H100 Series Assembly Drawing

✉ Webadmin.Regulators@emerson.com

🔍 Fisher.com

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🌐 LinkedIn.com/company/emerson-process-management

🐦 Twitter.com/emersonprocess

Emerson Process Management Regulator Technologies

Americas

McKinney, Texas 75070 USA
T +1 800 558 5853
+1 972 548 3574

Europe

Bologna 40013, Italy
T +39 051 419 0611

Asia Pacific

Singapore 128461, Singapore
T +65 6770 8337

Middle East and Africa

Dubai, United Arab Emirates
T +971 4 811 8100

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