

## 299H Series Pressure Reducing Regulators

- Inlet Pressure up to 175 psig / 12.1 bar
- Compact
- Integral Pilot
- $\pm 1\%$  Accuracy for Fixed Factor Billing (PFM)
- Rugged Construction
- Easy to Maintain

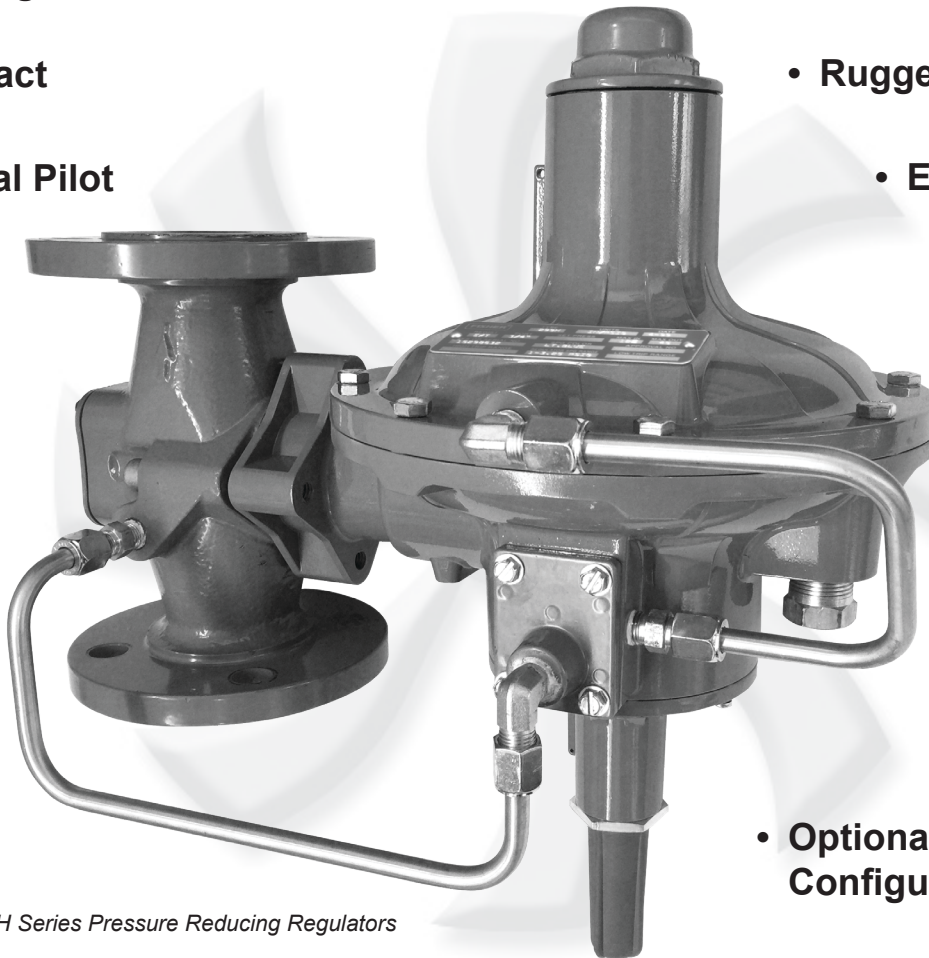


Figure 1. 299H Series Pressure Reducing Regulators

- High Capacity
- Robust
- Outlet Pressures up to 60 psig / 4.1 bar
- Optional Slam-Shut Configuration
- No Bleed Monitor
- External, Internal or Dual Registration
- Optional Token Relief

# 299H Series

## Specifications

Specifications for 299H Series constructions are given below. Some specifications for a given regulator as it originally comes from the factory are stamped on a nameplate located on the actuator upper casing.

### Available Constructions

**Type 299H:** Pilot-operated pressure reducing regulator with a pilot integrally mounted to the actuator casing.

**Type 299HR:** A Type 299H with a token internal relief valve to relieve minor overpressure caused by thermal expansion.

**Type 299HV:** Same as the Type 299H with a Type VSX8 slam-shut valve which provides overpressure or overpressure and underpressure protection.

**Type 299HVR:** Same as the Type 299HV with an internal token relief valve.

### Body Size and End Connection Styles

See Table 1

### Maximum Operating Inlet Pressure by Orifice Size<sup>(1)</sup>

|                                   |                     |
|-----------------------------------|---------------------|
| 1/4 x 3/8 in. / 6.4 x 9.5 mm      | 175 psig / 12.1 bar |
| 3/8 in. / 9.5 mm                  | 175 psig / 12.1 bar |
| 1/2 in. / 13 mm                   | 175 psig / 12.1 bar |
| 3/4 in. / 19 mm                   | 150 psig / 10.3 bar |
| 7/8 in. / 22 mm <sup>(5)</sup>    | 125 psig / 8.6 bar  |
| 1 in. / 25 mm <sup>(5)</sup>      | 100 psig / 6.9 bar  |
| 1-3/16 in. / 30 mm <sup>(5)</sup> | 80 psig / 5.5 bar   |

### Maximum Casing and Emergency Outlet Pressure<sup>(1)</sup>

66 psig / 4.5 bar

### Outlet (Control) Pressure Ranges<sup>(1)(2)</sup>

See Table 2

### Maximum Set Pressure for Type 299HV<sup>(1)</sup>

16 psig / 1.1 bar

### Maximum Set Pressure for Slam-Shut Device<sup>(1)</sup>

See Table 2

### Minimum and Maximum Slam-Shut Trip Pressure Ranges

**Types 299HV and 299HVR:** 21 psig / 1.45 bar

### Type VSX8 Sensing Line Connection

1/4 NPT

### Flow Coefficients

See Table 3

### Flow Capacities

See Tables 5 through 10

### Pressure Control Accuracy (Fixed Factor) (PFM)

±1%<sup>(3)</sup> of absolute control pressure

### Minimum Differential Pressure For Full Stroke

1.5 psid / 0.10 bar d

### Control Line Connections

3/4 NPT; See Figures 8 and 9

### Temperature Capabilities<sup>(1)(6)</sup>

-20 to 150°F / -29 to 66°C

### Approximate Weight

21 lbs / 10 kg

### Pressure Registration

Internal, External or Dual Registration

See Figure 3

### Fixed Restriction Sizes

0.044 in. / 1.1 mm, Red (**standard** gain)

0.071 in. / 1.8 mm, Green (low gain)

0.082 in. / 2.1 mm, Blue (lower gain)

### Options

- **Filter<sup>(3)</sup>:** A P590 Series filter installed in the pilot supply tubing between main body and pilot
- **Filtered pilot supply regulator<sup>(3)(4)</sup>:** A Type 67CF supply regulator with integral 5 micron Polyethylene filter
- **Reed switch:** An optional remote notification switch can be installed offering the capability to remotely notify the operator should VSX8 Series shut off occur. (Types 299HV and 299HVR only)

### Construction Materials

**Actuator Upper Casings:** Aluminum

**Actuator Lower Casing:** Aluminum

**Pilot Spring Case:** Aluminum

**Actuator Diaphragm:** Nitrile (NBR)

**Pilot Diaphragm:** Nitrile (NBR)

**Pilot Inlet Screen:** Stainless steel

**Valve Body:** Cast iron, Ductile iron or Steel

**Orifice and Valve Stem:** Aluminum

**Disk Holder:** Aluminum holder with Nitrile (NBR) disk

**Main Disk Construction:** Nitrile (NBR)

**Metal Trim Parts For Pilot:** Aluminum

**Pilot Disk Construction:** Nitrile (NBR)

**O-rings:** Nitrile (NBR)

**Fittings:** Steel (**standard**) or Stainless steel

**Tubing:** Stainless steel

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.

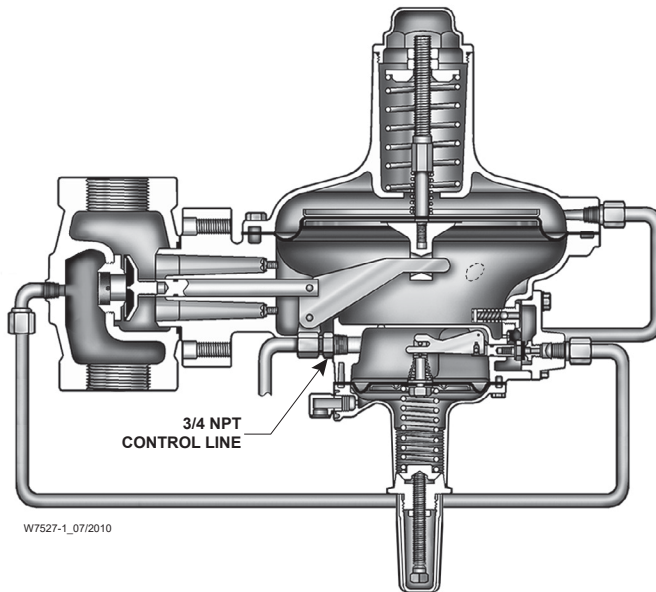
2. For optimum performance, a pilot supply regulator may be installed in the pilot supply tubing between the main valve and pilot.

3. A pilot supply regulator or a P590 Series filter (only one may be used, not both) may be ordered with the Type 299H, but not both.

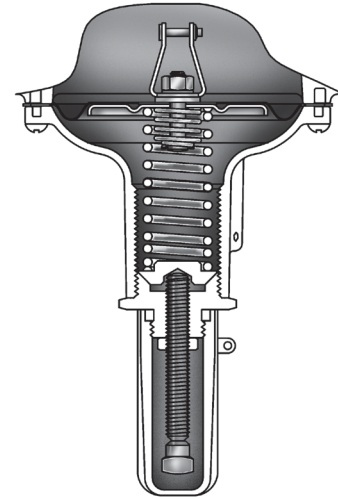
4. For in. w.c., use a pilot supply regulator if actual inlet pressure varies more than ±20 psi / ±1.4 bar and published accuracy is required.

5. This orifice size is not available for Types 299HV and 299HVR.

6. Product has passed Emerson Process Management Regulator Technologies, Inc. testing for lockup, relief start-to-discharge and reseal down to -40°.



TYPE 299H WITH EXTERNAL REGISTRATION



TYPE 299HR PILOT WITH OPTIONAL TOKEN RELIEF

Figure 2. 299H Series Sectional Views

## Features

- **Compact in Size**—Small envelope because of the built-in pilot and internal registration.
- **Unique No Bleed Monitor System**—Flexible worker/monitor system setup that allows for bleed to be piped to the intermediate piping thus eliminating downstream bleed which reduces lost and unaccounted for gas. Another advantage of this configuration is that the system lockup pressure is that of the worker instead of the monitor.
- **Not an Adaptation of Existing Regulators**—New design of integrated cases and internal registration ports.
- **Wide Variety of Applications**—Natural gas distribution systems, gas supply to industrial boilers, furnaces, ovens, mixers, plant air service.
- **Highest Quality**—Designed and manufactured to ISO 9001 standards.
- **Accuracy**—Keeps constant inlet pressures to downstream equipment by accurately controlling distribution system pressures at widely varying flow rates and supply pressures for maximum efficiency and best operation or by eliminating the need for pressure-compensating meters by holding a steady pressure to the meter inlet.
- **Optional Token Relief**—The Types 299HR and 299HVR with an integral token relief in the pilot is designed to relieve minor overpressure caused by thermal expansion.
- **High-Capacity Pressure Control**—Actuator diaphragm responds quickly to downstream pressure change, causing immediate correction in main valve position. Pilot responds simultaneously and controls final positioning of main valve. This action permits full main valve travel, resulting in higher capacity than could be obtained without an external pilot regulator.
- **Easy Registration Conversion**—Two screws and O-rings change internal registration to external or dual registration.
- **Easy Startup**—No special procedure required.
- **Easy to Maintain**—Main valve disk and orifice can be inspected without removing body from pipeline. Easy access two bolt flange permits quick removal of actuator and pilot from body.
- **Economical, Labor-Saving Installation**—Supply pressure to pilot is factory-piped directly from inlet side of main regulator body, thus requiring no upstream pilot supply line on standard installations.
- **Rugged Construction**—With a two bolt connection of the regulator to the body and no union ring, the 299H Series regulators are designed for longer service life with minimal maintenance requirements.
- **No gaskets**—Reusable O-rings at all serviceable joints.

# 299H Series

**Table 1. Body Sizes and End Connection Styles**

| BODY SIZE,<br>NPS / DN | BODY MATERIAL AND END CONNECTION STYLES      |                                                         |                                          |
|------------------------|----------------------------------------------|---------------------------------------------------------|------------------------------------------|
|                        | Cast Iron<br>(For Types 299H and 299HR only) | Ductile Iron                                            | Steel<br>(For Types 299H and 299HR only) |
| 1-1/4<br>1-1/2         | NPT<br>NPT                                   | ----<br>NPT                                             | ----<br>NPT                              |
| 2 / 50                 | NPT, CL125 FF Flanged <sup>(1)</sup>         | NPT, CL125 FF and CL250 RF Flanged,<br>PN 10/16 Flanged | NPT, CL150 RF Flanged                    |

1. This flange is available with a face-to-face dimension of 7.5 or 10 in. / 191 or 254 mm.

**Table 2. Outlet Pressure Ranges**

| OUTLET (CONTROL)<br>PRESSURE RANGE |                         | TYPE |                               | PILOT CONTROL SPRING |            |             |      |               |      |
|------------------------------------|-------------------------|------|-------------------------------|----------------------|------------|-------------|------|---------------|------|
|                                    |                         | 299H | 299HR,<br>299HV and<br>299HVR | Part Number          | Color      | Free Length |      | Wire Diameter |      |
| In. w.c.                           | mbar                    |      |                               |                      |            | In.         | mm   | In.           | mm   |
| 3.5 to 6 <sup>(1)</sup>            | 9 to 15 <sup>(1)</sup>  | X    | X                             | T13707T0012          | Black      | 1.86        | 47.2 | 0.055         | 1.40 |
| 5 to 9 <sup>(1)</sup>              | 12 to 22 <sup>(1)</sup> | X    | X                             | T13589T0012          | Yellow     | 2.05        | 52.1 | 0.051         | 1.30 |
| 7 to 20 <sup>(1)</sup>             | 17 to 50 <sup>(1)</sup> | X    | X                             | 1N3112X0012          | Unpainted  | 2.18        | 55.4 | 0.075         | 1.90 |
| 16 to 40 <sup>(1)</sup>            | 40 to 99 <sup>(1)</sup> | X    | X                             | 1B413727222          | Purple     | 2.12        | 53.8 | 0.092         | 2.34 |
| 1 to 3.25 psig                     | 69 mbar to 0.22 bar     | X    | X                             | T13593T0012          | Light blue | 2.12        | 53.8 | 0.105         | 2.67 |
| 2.75 to 6 psig                     | 0.19 to 0.41 bar        | X    | X                             | T13671T0012          | Orange     | 2.40        | 61.0 | 0.120         | 3.05 |
| 5 to 16 psig                       | 0.34 to 1.1 bar         | X    | X                             | T13600T0012          | Red        | 2.10        | 53.3 | 0.142         | 3.61 |
| 14 to 35 psig                      | 0.97 to 2.4 bar         | X    | ----                          | 19B0432X012          | Zinc       | 2.15        | 54.6 | 0.207         | 5.26 |
| 30 to 60 psig                      | 2.1 to 4.1 bar          | X    | ----                          | 19B0432X022          | Green      | 2.75        | 69.8 | 0.225         | 5.71 |

1. Use a pilot supply regulator if actual inlet pressure varies more than  $\pm 20$  psi /  $\pm 1.4$  bar and the published accuracy is required.

- **Startup Protection**—The main valve and the pilot are designed with reverse pressure mechanisms to prevent damage during startup or sudden increase in downstream pressure.
- **Fewer Parts**—Fewer recommended parts needed for spare parts inventory.

## Introduction

## Description



### WARNING

Since a pilot-operated regulator is constructed of both a pilot and a main valve, do not exceed the maximum inlet pressure shown on the nameplate.

The 299H Series pressure reducing regulators provide a broad capacity of controlled pressure ranges and capacities in a wide variety of distribution, industrial and commercial applications. A 299H Series regulator has a pilot integrally mounted to the actuator casing. The 299H Series regulators can handle inlet pressures up to 175 psig / 12.1 bar depending on orifice size.

**The integral token relief on the Types 299HR and 299HVR regulators is located in the pilot and alerts you to an increase in downstream pressure beyond the regulator setpoint.**

The Type 299HV provides overpressure or overpressure and underpressure protection by completely shutting off the flow of gas to the downstream system. It comes with a Type VSX8 (299HV) slam-shut device which can be configured for Overpressure Shutoff (OPSO) or Overpressure and Underpressure Shutoff (OPSO/UPS0). The slam-shut device's actions are independent of the main valve and of variations to the inlet pressure. The Type VSX8 (299HV) slam-shut device has internal or external registration. External registration requires a downstream sensing line.

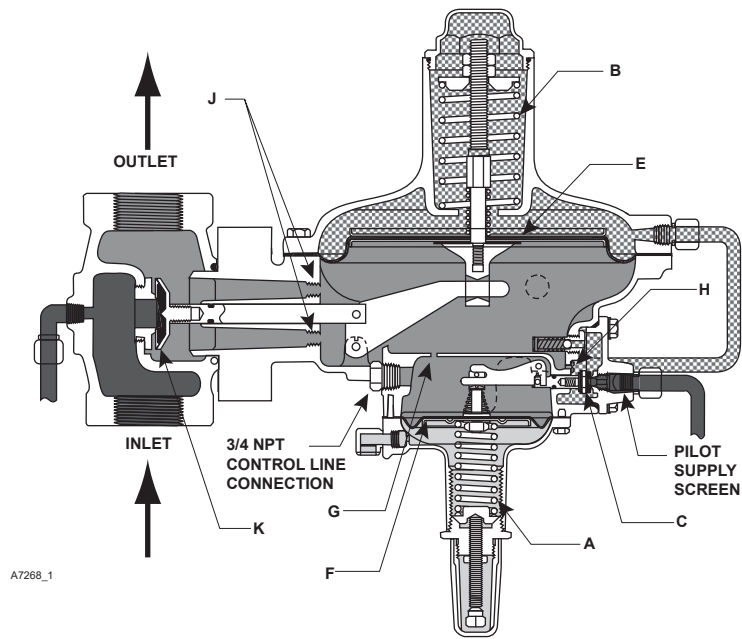
## Options

### P590 Series Pilot Supply Filter

The optional P590 Series pilot supply filter prevents pipeline debris from entering the pilot; a primary cause of pilot clogging. When the upstream system is free of debris, the 299H Series regulators may be installed without a pilot supply filter.

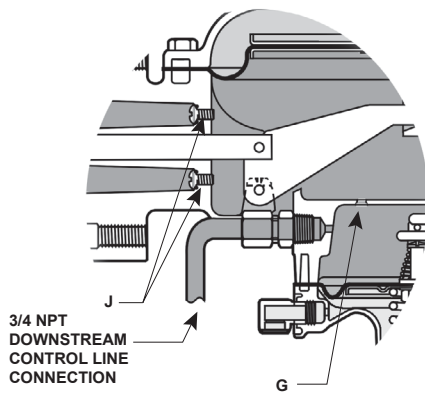
### Type 67CF Filtered Pilot Supply Regulator

When it is necessary to install a pilot supply regulator, an optional Type 67CF filtered pilot supply regulator may be installed. For example, on applications with in. of water column setpoints and inlet pressure variations of more than  $\pm 20$  psig /  $\pm 1.4$  bar it may be necessary to install a Type 67CF to maintain published accuracy.



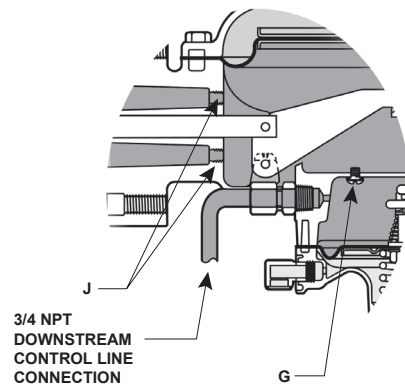
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TYPE 299H WITH INTERNAL REGISTRATION



A7269

EXTERNAL REGISTRATION



A7270

DUAL REGISTRATION

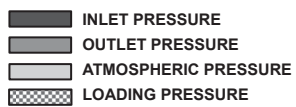


Figure 3. Type 299H Operational Schematic

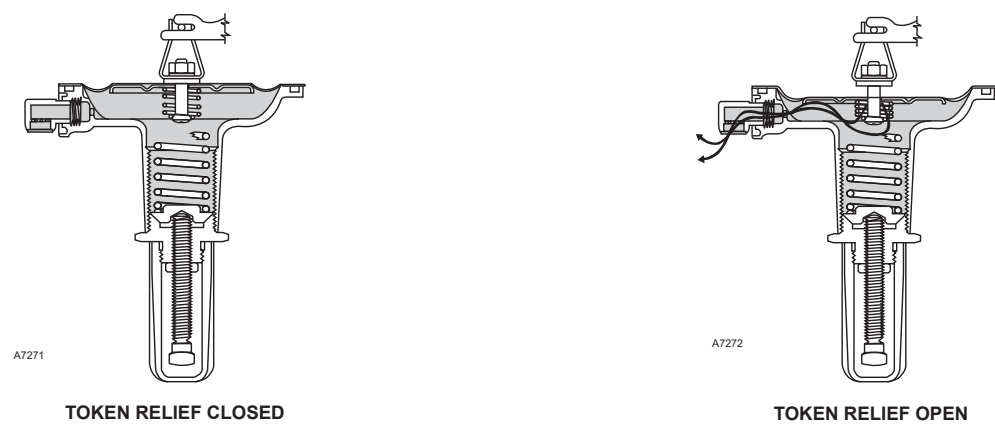


Figure 4. Type 299HR Operational Schematic

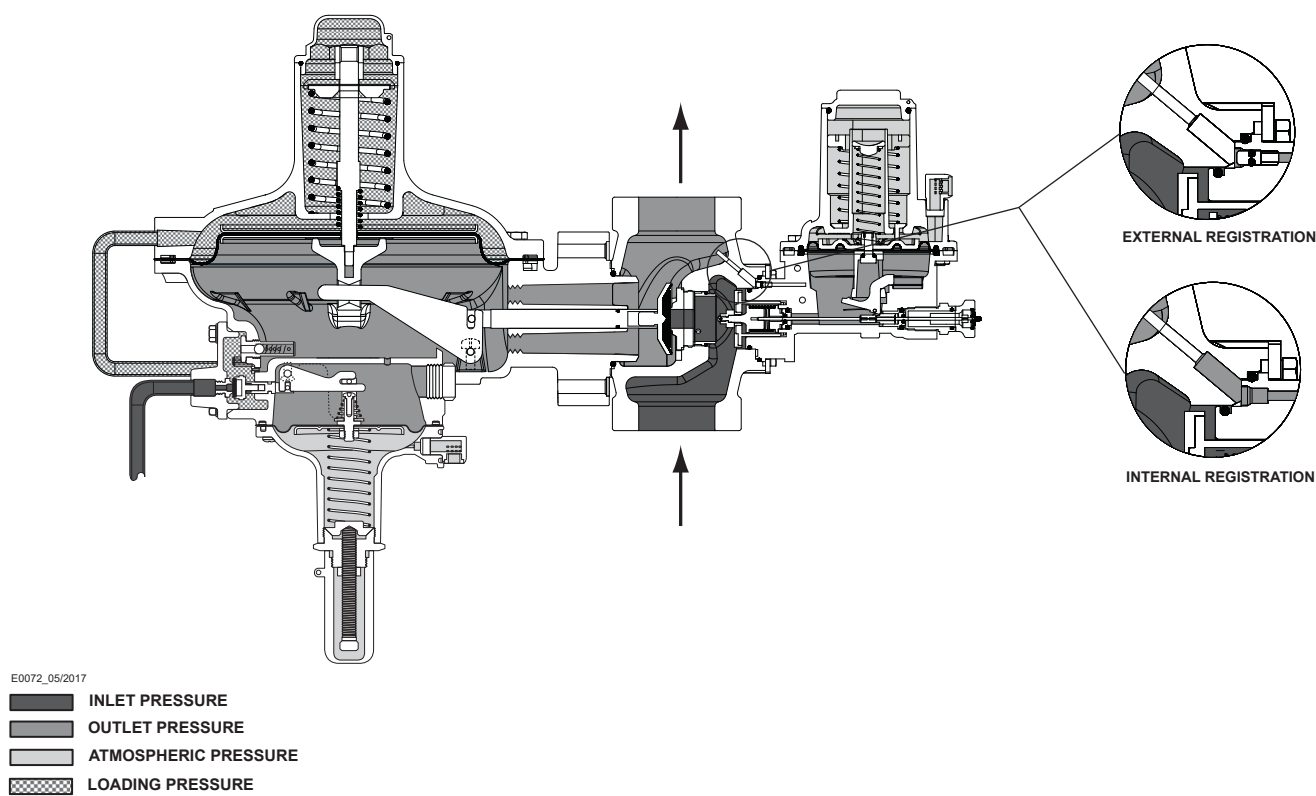


Figure 5. Type 299HV Operational Schematic

## Reed Switch

An optional remote notification switch can be installed offering the capability to remotely notify the operator should VSX8 Series shut off occur. Reed switch is available on our regulators 299HV and 299HVR Series only. Reference D103127X012 for instruction manual.

## Principle of Operation

Letter keys in this section refer to Figure 3 unless otherwise noted. Fast response and accuracy are made possible by the amplifying effect of the pilot and by the two-path control system. The function of the pilot is to sense change in the controlled outlet pressure and amplify it into a larger change in the loading pressure. Any changes in outlet pressure act quickly on both the actuator diaphragm and the loading pilot, thus providing the precise pressure control and fast speed of response that is characteristic of a two-path system.

Upstream or inlet pressure is utilized as the operating medium, which is reduced through pilot operation to load the main diaphragm chamber. Tubing connects the inlet pressure to the pilot. Downstream or outlet pressure registers underneath main diaphragm (E) and on top of pilot diaphragm (F). There are three different versions of pressure registration for the Type 299H.

**Internal registration (screws and O-rings (J) removed)**—Outlet pressure is registered through the throat to the main diaphragm chamber and through a small port (G) to the top of the pilot diaphragm. Internal registration is used for ease of installation. Capacity is somewhat limited because of droop and/or boost associated with sensing pressure within the body.

**External registration**—Screws and O-rings (J) block the throat and a downstream control line is connected to the pilot diaphragm chamber which is connected to the lower main diaphragm chamber by a small port (G). The other end of the control line connects to the downstream pipeline. External registration is used for higher capacity and/or the upstream regulator in a monitor set. It also allows monitoring for inlet pressures over 66 psig / 4.5 bar. Capacity is increased because of better registration of pipeline pressure when a control line is used. The alternate 3/4 NPT control line connection (on the side of the pilot) can be used for piping convenience, see Figures 8 and 9.

## Dual registration (screws and O-rings (J) removed)—

The lower main diaphragm chamber registers outlet pressure through the throat and the pilot diaphragm chamber registers downstream pressure by use of a downstream control line. The port (G) between the chambers is blocked by inserting a screw and O-ring (J) that was removed from the throat and the control line runs from the pilot to the downstream pipeline. Dual registration, with its larger orifice (control line must be piped to the primary 3/4 NPT connection on the side of the pilot), provides an improved performance as compared to internal pressure registration when used in low flow rate and high pressure drop applications. It is also used for no downstream bleed monitoring systems with inlet pressures up to 66 psig / 45 bar.

## Type 299H

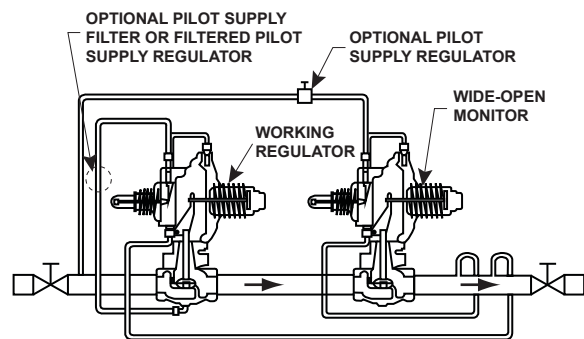
In operation, assume the outlet pressure is less than the setting of pilot control spring (A). The top side of pilot diaphragm assembly (F) will have a lower pressure than the setting of spring (A). Spring (A) forces the diaphragm assembly upward, opening the pilot orifice (C). Additional loading pressure is supplied to the top side of the main diaphragm (E).

This creates a higher pressure on the top side of main diaphragm (E) than on the bottom side, forcing the diaphragm downward. This motion is transmitted through a lever, which pulls the valve disk (K) open, allowing more gas to flow through the valve.

When the gas demand in the downstream system has been satisfied, the outlet pressure increases. The increased pressure is transmitted through the downstream control line (for external or dual registration) or through the port (G) (for internal registration) and acts on top of the pilot diaphragm (F). This pressure exceeds the pilot spring setting and forces the diaphragm down, closing the orifice (C). The loading pressure acting on main diaphragm (E) bleeds to the downstream system through a bleed restriction (H).

With a decrease in loading pressure on top of main diaphragm (E), main spring (B) exerts an upward force on the diaphragm post connected to main diaphragm (E), pulling it upward. This moves the main valve disk (K) toward its seat, decreasing flow to the downstream system.

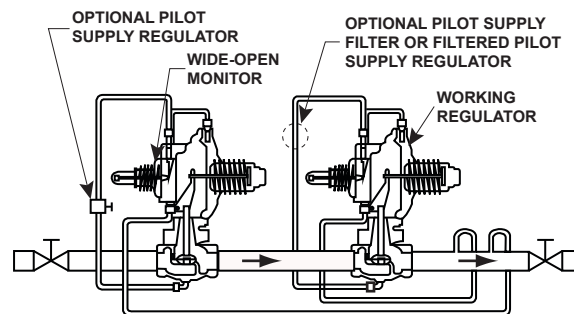
# 299H Series



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NOTE: IF USED, THE PILOT SUPPLY REGULATOR SHOULD BE SET TO 3 psig / 0.21 bar ABOVE THE MONITOR OUTLET PRESSURE SETTING.

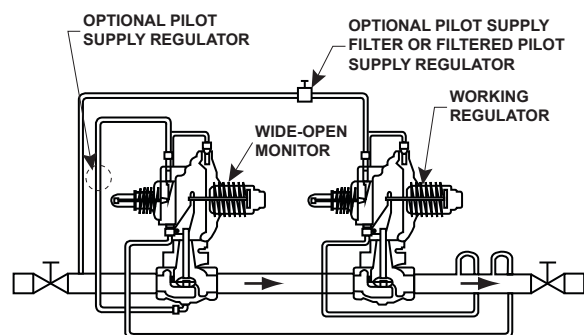
WIDE-OPEN DOWNSTREAM MONITOR



A7136B

NOTE: IF USED, THE PILOT SUPPLY REGULATOR SHOULD BE SET TO 3 psig / 0.21 bar ABOVE THE MONITOR OUTLET PRESSURE SETTING.

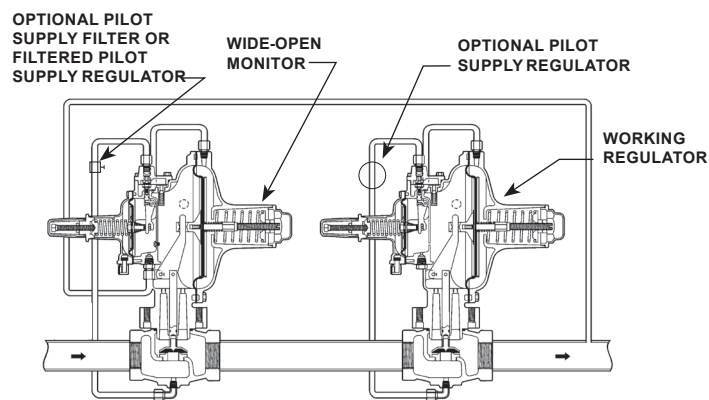
WIDE-OPEN UPSTREAM MONITOR



A7136C

NOTE: THE PILOT SUPPLY REGULATOR SHOULD BE SET TO 3 psig / 0.21 bar ABOVE THE MONITOR OUTLET PRESSURE SETTING.

WIDE-OPEN UPSTREAM MONITOR



A7273

NOTE: THE PILOT SUPPLY REGULATOR SHOULD BE SET TO 3 psig / 0.21 bar ABOVE THE MONITOR OUTLET PRESSURE SETTING.

NO DOWNSTREAM BLEED MONITOR SYSTEM

Figure 6. Typical Monitor Installations

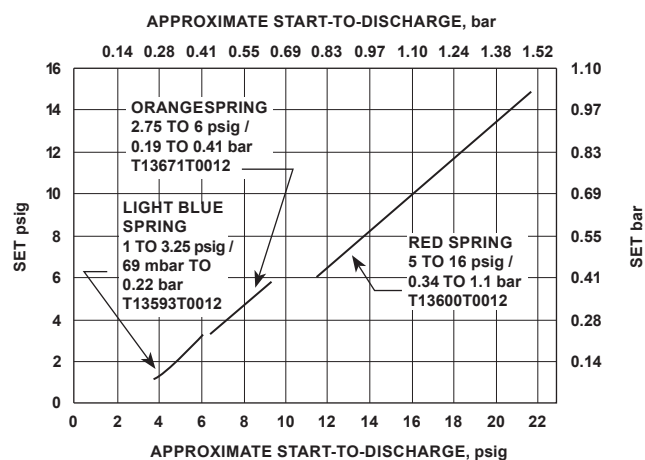
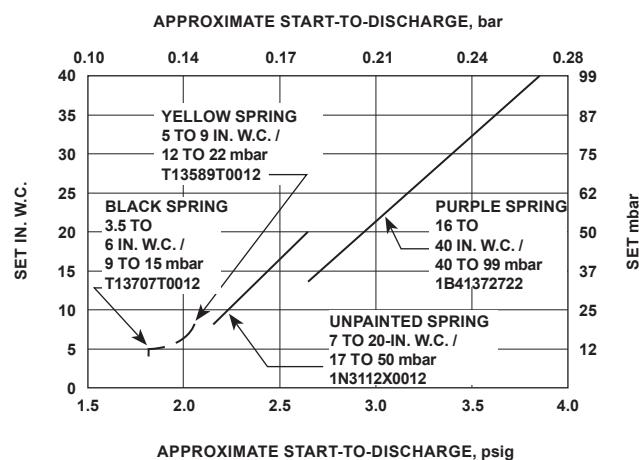


Figure 7. Type 299HR Approximate Start-to-Discharge

## Type 299HR

Refer to Figure 4. The Type 299HR provides an integral token relief valve. During an overpressure condition the spring on the pilot post will allow the diaphragm head to travel to the spring case. As the diaphragm head moves a small amount of gas is relieved.

### Note

**The Type 299HR is not a full capacity relief device. Approximate start-to-discharge pressure is dependent on set pressure, see Figure 7.**

During normal operation the Type 299HR performance is identical to the Type 299H. If an overpressure condition occurs, the pilot diaphragm head will separate from the pilot diaphragm post and travel until it contacts the pilot spring case. The movement of the diaphragm head creates a path and a token or noticeable amount of gas will be released.

When the overpressure condition ceases, the pilot diaphragm head will return to the diaphragm post and the regulator will return to normal operation.

## Type 299HV

Refer to Figure 5. The Type VSX8 (299HV) slam-shut devices on the Type 299HV regulator is a fast acting slam-shut valve which provides overpressure or overpressure and underpressure protection by completely shutting off the flow of gas to the downstream system. The slam-shut modules' actions are independent of the Type 299HV main regulator and of variations to the inlet pressure. The Type VSX8 (299HV) has internal or external registration. External registration requires a downstream sensing line.

The slam-shut disk is held in the open position (reset position) by an internal latching mechanism that holds the valve stem and disk assembly. If the pressure below the diaphragm increases (or decreases) reaching the Type VSX8 (299HV) setpoint, the diaphragm will travel upwards (or downwards) operating a lever which in turn releases the valve stem assembly.

Once released, the spring force on the stem will push the stem and disk to the closed position against the seat shutting off all gas flow. The pilot supply pressure is also shut off when the Type VSX8 (299HV) is closed. The manual reset has an internal bypass to equalize the reset pressure on either side on the slam-shut disk.

In order for the Underpressure Shutoff (UPSO) of any slam shut to be triggered, the downstream pipe pressure must drop below the UPSO setpoint. In the case of a downstream line break, numerous factors can prevent the downstream pipe pressure from decreasing below the slam-shut UPSO setpoint. These factors include the distance of pipe to the break, the diameter of the pipe, size of the break and the number of restrictions, such as valves, elbows and bends, downstream of the regulator and/or slam-shut device. Due to these factors additional protections should be installed to stop flow in the event of a line break.

## Overpressure Protection

Like most regulators, the Type 299H has outlet pressure ratings lower than the inlet pressure ratings. Complete downstream overpressure protection is needed if the actual inlet pressure exceeds the outlet pressure rating.

Overpressure protection for internal parts is built into the main and pilot diaphragms by means of a small spring on each post. The springs will allow the diaphragm heads to move farther on the posts avoiding damage to or bending of the valve trim.

Overpressuring any portion of a regulator or associated equipment may cause leakage, parts damage or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas. Regulator operation within ratings specified in the Specifications section and on the regulator nameplate does not preclude the possibility of damage from external sources or from debris in the pipeline. A regulator should be inspected for damage periodically and after any overpressure condition. The pilot vent is provided with a 1/4 NPT tapped connection in the spring case.

# 299H Series

**Table 3. Flow Coefficients**

| TYPE                | ORIFICE DIAMETER |           | WIDE-OPEN      |                | REGULATING <sup>(1)</sup> |                | C <sub>v</sub> WHEN<br>ΔP < 10 psi / 0.69 bar | C <sub>v</sub> WHEN<br>ΔP > 10 psi / 0.69 bar |
|---------------------|------------------|-----------|----------------|----------------|---------------------------|----------------|-----------------------------------------------|-----------------------------------------------|
|                     | In.              | mm        | C <sub>g</sub> | C <sub>v</sub> | C <sub>g</sub>            | C <sub>v</sub> |                                               |                                               |
| 299H/299HR          | 1/4 x 3/8        | 6.4 x 9.5 | 53             | 2.0            | 50                        | 1.9            | 26                                            | 26                                            |
|                     | 3/8              | 9.5       | 117            | 4.2            | 115                       | 4.0            | 30                                            | 28                                            |
|                     | 1/2              | 13        | 203            | 7.0            | 200                       | 6.9            | 30                                            | 28                                            |
|                     | 3/4              | 19        | 437            | 14.1           | 430                       | 13.9           | 32                                            | 30                                            |
|                     | 7/8              | 22        | 544            | 16.5           | 534                       | 16.2           | 34                                            | 32                                            |
|                     | 1                | 25        | 725            | 20.7           | 710                       | 20.3           | 36                                            | 34                                            |
|                     | 1-3/16           | 30        | 910            | 25.3           | 885                       | 24.6           | 37                                            | 35                                            |
| 299HV and<br>299HVR | 1/4 x 3/8        | 6.4 x 9.5 | 53             | 2.0            | 50                        | 1.9            | 26                                            | 26                                            |
|                     | 3/8              | 9.5       | 117            | 4.1            | 115                       | 4.0            | 30                                            | 28                                            |
|                     | 1/2              | 13        | 184            | 5.0            | 180                       | 4.9            | 38                                            | 36                                            |
|                     | 3/4              | 19        | 421            | 11.9           | 415                       | 11.7           | 36                                            | 35                                            |

1. For external/dual registration only.

**Table 4a. Type VSX8 High and Low Trip Pressure Ranges (North American Overpressure Shut-off OPSO Ranges Only)**

| REGULATOR                                                                                                                                                                                                                                                                                                     |                  |                           | SLAM SHUT DEVICE |                                 |                                 |                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------|------------------|---------------------------------|---------------------------------|------------------------------------|
| Type Number                                                                                                                                                                                                                                                                                                   | Typical Setpoint | Spring Range              | Type Number      | OPSO                            |                                 | OPSO <sup>(1)</sup><br>Typical Set |
|                                                                                                                                                                                                                                                                                                               |                  |                           |                  | Set Range Over<br>UPSO Setpoint | Spring Part Number<br>and Color |                                    |
|                                                                                                                                                                                                                                                                                                               | In. w.c.         | In. w.c.                  |                  | In. w.c.                        |                                 | In. w.c.                           |
| 299HV<br>299HVR                                                                                                                                                                                                                                                                                               | 4.0              | 3.5 to 6.0                | VSX8L            | 12.0 to 24.0                    | GF02168X012<br>Brown            | 19.0                               |
|                                                                                                                                                                                                                                                                                                               | 7.0              | 5.0 to 9.0                |                  |                                 |                                 | 22.0                               |
|                                                                                                                                                                                                                                                                                                               | 11.0             | 7.0 to 20.0               |                  | 16.0 in. w.c.<br>to 1.6 psig    | GF02169X012<br>Red              | 25.0                               |
|                                                                                                                                                                                                                                                                                                               | 14.0             |                           |                  | 24.0 in. w.c.<br>to 2.8 psig    | GF02170X012<br>Orange           | 1.1 psig                           |
|                                                                                                                                                                                                                                                                                                               | 1 psig           | 16.0 in. w.c. to 1.4 psig |                  |                                 |                                 | 2.0 psig                           |
|                                                                                                                                                                                                                                                                                                               | 2.0 psig         | 1.0 to 3.3 psig           |                  | 2.0 to 7.3 psig                 | GF02172X012<br>Green            | 3.5 psig                           |
|                                                                                                                                                                                                                                                                                                               | 3.0 psig         | 2.8 to 6.0 psig           |                  |                                 |                                 | 5.0 psig                           |
|                                                                                                                                                                                                                                                                                                               | 5.0 psig         |                           |                  | 3.2 to 11.0 psig                | GF02173X012<br>Silver           | 7.0 psig                           |
|                                                                                                                                                                                                                                                                                                               | 10.0 psig        | 5.0 to 16.0 psig          |                  | 5.8 to 21.0 psig                | GF04353X012<br>Yellow           | 12.0 psig                          |
|                                                                                                                                                                                                                                                                                                               | 15.0 psig        |                           |                  |                                 |                                 | 19.0 psig                          |
| 1. For units equipped with Token Relief, if Non-Factory Slam-shut OPSO setpoints are specified, they must be higher than the Token Relief Start-to-Discharge values provided in Table 5.<br>Note: Other spring combinations are available. Please contact your local Sales Office for additional information. |                  |                           |                  |                                 |                                 |                                    |

1. For units equipped with Token Relief, if Non-Factory Slam-shut OPSO setpoints are specified, they must be higher than the Token Relief Start-to-Discharge values provided in Table 5.  
Note: Other spring combinations are available. Please contact your local Sales Office for additional information.

**Table 4b. Type VSX8 High and Low Trip Pressure Ranges (European Overpressure Shut-off OPSO Ranges Only)**

| REGULATOR                                                                                                                                                                                                                                                                                                     |                  |              | SLAM SHUT DEVICE |                                 |                                 |                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------|------------------|---------------------------------|---------------------------------|------------------------------------|
| Type Number                                                                                                                                                                                                                                                                                                   | Typical Setpoint | Spring Range | Type Number      | OPSO                            |                                 | OPSO <sup>(1)</sup><br>Typical Set |
|                                                                                                                                                                                                                                                                                                               |                  |              |                  | Set Range Over<br>UPSO Setpoint | Spring Part Number<br>and Color |                                    |
|                                                                                                                                                                                                                                                                                                               | mbar             | mbar         |                  | mbar                            |                                 | mbar                               |
| 299HV<br>299HVR                                                                                                                                                                                                                                                                                               | 21               | 12 to 22     | VSX8L            | 30 to 60                        | GF02168X012<br>Brown            | 45                                 |
|                                                                                                                                                                                                                                                                                                               | 35               | 17 to 50     |                  | 40 to 110                       | GF02169X012<br>Red              | 67                                 |
|                                                                                                                                                                                                                                                                                                               | 50               | 40 to 100    |                  | 60 to 190                       | GF02170X012<br>Orange           | 90                                 |
|                                                                                                                                                                                                                                                                                                               | 60               |              |                  |                                 |                                 | 104                                |
|                                                                                                                                                                                                                                                                                                               | 75               |              |                  |                                 |                                 | 128                                |
|                                                                                                                                                                                                                                                                                                               | 100              | 170          |                  |                                 |                                 |                                    |
|                                                                                                                                                                                                                                                                                                               | 150              | 70 to 224    |                  | 140 to 500                      | GF02172X012<br>Green            | 248                                |
|                                                                                                                                                                                                                                                                                                               | 300              | 190 to 414   |                  | 220 to 760                      | GF02173X012<br>Silver           | 450                                |
|                                                                                                                                                                                                                                                                                                               | 500              | 345 to 1103  |                  | 400 to 1450                     | GF04353X012<br>Yellow           | 700                                |
| 1. For units equipped with Token Relief, if Non-Factory Slam-shut OPSO setpoints are specified, they must be higher than the Token Relief Start-to-Discharge values provided in Table 5.<br>Note: Other spring combinations are available. Please contact your local Sales Office for additional information. |                  |              |                  |                                 |                                 |                                    |

1. For units equipped with Token Relief, if Non-Factory Slam-shut OPSO setpoints are specified, they must be higher than the Token Relief Start-to-Discharge values provided in Table 5.  
Note: Other spring combinations are available. Please contact your local Sales Office for additional information.

**Table 4c. Type VSX8 High and Low Trip Pressure Ranges (North American Overpressure and Underpressure Shut-off UPSO/OPSO Ranges)**

| REGULATOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                          |                              | SLAM SHUT DEVICE |                              |                              |                              |                              |                         |                            |                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------|------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------|----------------------------|-------------------------|
| Type Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Typical Setpoint         | Spring Range                 | Type Number      | UPSO                         |                              | OPSO                         |                              | Typical Set             |                            |                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | In. w.c.                 | In. w.c.                     |                  | Set Range <sup>(1)</sup>     | Spring Part Number and Color | Set Range Over UPSO Setpoint | Spring Part Number and Color | UPSO                    | Adjusted OPSO Range        | OPSO <sup>(2)</sup>     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                          |                              |                  | In. w.c.                     |                              | In. w.c.                     |                              | In. w.c.                |                            | In. w.c.                |
| 299HV<br>299HVR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 7.0 <sup>(3)</sup>       | 5.0 to 9.0                   | VSX8L            | 3.0 to 12.0                  | ERAA05835A0<br>White         | 18 in. w.c.<br>to 1.1 psig   | GF02168X012<br>Brown         | 3 <sup>(3)</sup>        | 21 in. w.c.<br>to 1.2 psig | 22.0                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 11.0 <sup>(3)</sup>      | 7.0 to 20.0                  |                  |                              |                              |                              |                              | 6 <sup>(3)</sup>        | 24 in. w.c.<br>to 1.3 psig | 25.0                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 14.0 <sup>(3)</sup>      |                              |                  | 4.0 in. w.c.<br>to 1.1 psig  | T14169T0012<br>Blue          | 25 in. w.c.<br>to 1.9 psig   | GF02169X012<br>Red           | 9 <sup>(3)</sup>        | 27 in. w.c.<br>to 1.3 psig | 1.1 psig                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.0 psig <sup>(3)</sup>  | 16.0 in. w.c. to<br>1.4 psig |                  |                              |                              |                              | 14 <sup>(3)</sup>            | 1.4 to<br>2.4 psig      | 2.0 psig                   |                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2.0 psig <sup>(4)</sup>  | 1.0 psig to<br>3.3 psig      |                  | 10.0 in. w.c. to<br>2.3 psig | T14170T0012<br>Silver        | 1.2 to<br>3.2 psig           | GF02170X012<br>Orange        | 1.0 psig <sup>(4)</sup> | 2.2 to<br>4.2 psig         | 3.5 psig                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3.0 psig <sup>(4)</sup>  | 2.8 to<br>6.0 psig           |                  | 1.5 to<br>7.3 psig           | FA142869X12<br>Orange Stripe | 2.6 to<br>5.6 psig           | GF02171X012<br>Pink          | 2.0 psig <sup>(4)</sup> | 4.4 to<br>7.4 psig         | 5.0 psig                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5.0 psig <sup>(4)</sup>  |                              |                  |                              |                              | 3.5 to<br>8.2 psig           | GF02172X012<br>Green         | 3.0 psig <sup>(4)</sup> | 6.5 to<br>11.2 psig        | 7.0 psig                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 10.0 psig <sup>(5)</sup> | 5.0 to<br>16.0 psig          |                  |                              |                              |                              |                              |                         |                            | 5.0 psig <sup>(5)</sup> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 15.0 psig <sup>(5)</sup> |                              |                  |                              | 1.5 to<br>10.9 psig          | T14171T0012<br>Olive         | 6.7 to<br>13.5 psig          | GF02173X012<br>Silver   | 7.0 psig <sup>(5)</sup>    | 13.7 to<br>20.5 psig    |
| <div>1. If Non-Factory UPSO setpoints are specified, a minimum differential of 4 in. w.c. between UPSO setpoint and regulator setpoint must be maintained in order to ensure a secure latch of the Slam-Shut.</div> <div>2. For units equipped with Token Relief, if Non-Factory Slam-shut OPSO setpoints are specified, they must be higher than the Token Relief Start-to-Discharge values provided in Table 5.</div> <div>3. For an internally registered Type VSX8, UPSO cannot be used with this main valve spring range to provide underpressure shutoff under flowing conditions. If protection against loss of inlet pressure is the only required function for the Type VSX8 then an internally registered Type VSX8 may be used with the same minimum trip pressures as an externally registered Type VSX8.</div> <div>4. For an internally registered Type VSX8, 70% of regulator setpoint is the minimum allowable UPSO setting used with this main valve spring range. If protection against loss of inlet pressure is the only required function for the Type VSX8 then an internally registered Type VSX8 may be used with the same minimum trip pressures as an externally registered Type VSX8.</div> <div>5. For an internally registered Type VSX8, 75% of regulator setpoint is the minimum allowable UPSO setting used with this main valve spring range. If protection against loss of inlet pressure is the only required function for the Type VSX8 then an internally registered Type VSX8 may be used with the same minimum trip pressures as an externally registered Type VSX8.</div> <div>Note: Other spring combinations are available. Please contact your local Sales Office for additional information.</div> |                          |                              |                  |                              |                              |                              |                              |                         |                            |                         |

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**Table 4d. Type VSX8 High and Low Trip Pressure Ranges (European Overpressure and Underpressure Shut-off UPSO/OPSO Ranges)**

| REGULATOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                        |                    | SLAM SHUT DEVICE |                          |                              |                              |                              |                    |                     |                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------|------------------|--------------------------|------------------------------|------------------------------|------------------------------|--------------------|---------------------|---------------------|
| Type Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Typical Setpoint, mbar | Spring Range, mbar | Type Number      | UPSO                     |                              | OPSO                         |                              | Typical Set        |                     |                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |                    |                  | Set Range <sup>(1)</sup> | Spring Part Number and Color | Set Range Over UPSO Setpoint | Spring Part Number and Color | UPSO               | Adjusted OPSO Range | OPSO <sup>(2)</sup> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |                    |                  | mbar                     |                              | mbar                         |                              | mbar               |                     | mbar                |
| 299HV<br>299HVR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 21 <sup>(3)</sup>      | 12 to 22           | VSX8L            | 7 to 30                  | ERAA05835A0<br>White         | 40 to 55                     | GF02167X012<br>Black         | 10 <sup>(3)</sup>  | 50 to 65            | 55                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 35 <sup>(3)</sup>      | 17 to 50           |                  |                          |                              | 45 to 76                     | GF02168X012<br>Brown         | 18 <sup>(3)</sup>  | 63 to 94            | 67                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 50 <sup>(3)</sup>      | 40 to 100          |                  | 10 to 75                 | T14169T0012<br>Blue          | 50 to 80                     |                              | 25 <sup>(3)</sup>  | 75 to 105           | 90                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 60 <sup>(3)</sup>      |                    |                  |                          |                              | 62 to 132                    | GF02169X012<br>Red           | 30 <sup>(3)</sup>  | 80 to 110           | 104                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 75 <sup>(3)</sup>      | 70 to 224          |                  | 25 to 160                | T14170T0012<br>Silver        | 83 to 221                    | GF02170X012<br>Orange        | 38 <sup>(3)</sup>  | 100 to 170          | 128                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 100 <sup>(4)</sup>     |                    |                  |                          |                              | 75 <sup>(4)</sup>            | 133 to 271                   | 170                |                     |                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 150 <sup>(4)</sup>     | 158 to 296         |                  | 248                      |                              |                              |                              |                    |                     |                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 300 <sup>(4)</sup>     | 190 to 414         |                  | 100 to 500               | FA142869X12<br>Orange Stripe | 179 to 386                   | GF02171X012<br>Pink          | 150 <sup>(4)</sup> | 329 to 536          | 450                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 500 <sup>(5)</sup>     | 345 to 1103        |                  | 100 to 750               | T14171T0012<br>Olive         | 460 to 932                   | GF02173X012<br>Silver        | 250 <sup>(5)</sup> | 710 to 1182         | 710                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1000 <sup>(5)</sup>    |                    |                  |                          |                              |                              |                              | 500 <sup>(5)</sup> | 960 to 1432         | 1320                |
| <p>1. If Non-Factory UPSO setpoints are specified, a minimum differential of 10 mbar between UPSO setpoint and regulator setpoint must be maintained in order to ensure a secure latch of the Slam-Shut.</p> <p>2. For units equipped with Token Relief, if Non-Factory Slam-shut OPSO setpoints are specified, they must be higher than the Token Relief Start-to-Discharge values provided in Table 5.</p> <p>3. For an internally registered Type VSX8, UPSO cannot be used with this main valve spring range to provide underpressure shutoff under flowing conditions. If protection against loss of inlet pressure is the only required function for the Type VSX8 then an internally registered Type VSX8 may be used with the same minimum trip pressures as an externally registered Type VSX8.</p> <p>4. For an internally registered Type VSX8, 70% of regulator setpoint is the minimum allowable UPSO setting used with this main valve spring range. If protection against loss of inlet pressure is the only required function for the Type VSX8 then an internally registered Type VSX8 may be used with the same minimum trip pressures as an externally registered Type VSX8.</p> <p>5. For an internally registered Type VSX8, 75% of regulator setpoint is the minimum allowable UPSO setting used with this main valve spring range. If protection against loss of inlet pressure is the only required function for the Type VSX8 then an internally registered Type VSX8 may be used with the same minimum trip pressures as an externally registered Type VSX8.</p> <p>Note: Other spring combinations are available. Please contact your local Sales Office for additional information.</p> |                        |                    |                  |                          |                              |                              |                              |                    |                     |                     |

## Monitoring Systems

Monitoring regulators serve as overpressure protection devices to limit system pressure in the event of open failure of a working regulator feeding the system.

### Wide-Open Monitor

The control line of the upstream regulator is connected downstream of the second regulator (Figure 6), so that during normal operation the monitoring regulator is standing wide open with the reduction to distribution pressure being taken across the working regulator. Only in case of open failure of the working regulator does the wide-open monitoring regulator take control at its slightly higher setting. A pressure build-up above the monitor set pressure is required for the monitor to take control in the event of an overpressure situation. Installing a pilot supply regulator on the monitor will minimize the pressure build-up. The pilot supply regulator should be set to 3 psig / 0.21 bar above the monitor setpoint.

The minimum set pressure difference between the worker and monitor should be greater than the proportional band. Small set pressure differences may cause the worker and monitor to function independently.

The upstream regulator can easily be field converted or ordered with screws and O-rings in the throat (Figure 6). This seals off the path that otherwise would let line pressure ahead of the working regulator inlet and try to close the wide-open monitoring regulator.

### No Downstream Bleed Monitor

The no bleed monitor is a wide-open upstream monitor which works like a conventional wide-open upstream monitor except for registration. The no bleed monitor utilizes a dual registration construction as opposed to the external registration construction of the conventional monitor. This ensures that the lockup of the monitor system is the lockup of the downstream working monitor at zero flow during normal operation.

## Installation

Although the actuator and pilot can be mounted in 90° increments relative to the body, the normal installation is with the body in a horizontal run of pipe and the pilot hanging vertically from the bottom of the actuator.

Control and vent lines necessary for installation are not supplied with a Type 299H regulator. Control and vent connection locations are shown in Figures 8 and 9. In many instances good piping practice will require that outlet piping be swaged up above the body size to prevent excessive pressure drop along the outlet line. The piping should be expanded as close to the regulator outlet as possible.

## Capacity Information

Tables 5 through 10 give the 299H Series natural gas regulating capacities at selected inlet pressures and outlet pressure settings. Flows are in SCFH (60°F and 14.7 psig) and Nm³/h (0°C and 1.01325 bar) of 0.6 specific gravity natural gas. To determine equivalent capacities for air, propane, butane or nitrogen, multiply the capacity number in the Tables by the following appropriate conversion factor: 0.775 for air, 0.628 for propane, 0.548 for butane or 0.789 for nitrogen. For gases of other specific gravities, multiply the given capacity by 0.775 and divide by the square root of the appropriate specific gravity.

### For critical flow:

To determine wide-open flow capacities for relief sizing of 0.6 specific gravity natural gas at 60°F at critical pressure drops (absolute outlet pressure equal to approximately one-half or less than one-half of the absolute inlet pressure), use the following formula:

$$Q = P_{1(\text{abs})}(C_g)(1.29)$$

### For subcritical flow:

If pressure drops are lower than critical (absolute outlet pressure greater than approximately one-half the absolute inlet pressure), use the following formula and convert according to the factors in the preceding paragraph if necessary:

$$Q = \sqrt{\frac{520}{GT}} C_g P_1 \sin \left( \frac{3417}{C_1} \sqrt{\frac{\Delta P}{P_1}} \right) \text{DEG}$$

where:

- $C_1$  =  $C_g/C_v$  (see Table 3)
- $C_g$  = Gas sizing coefficient (see Table 3)
- $G$  = Gas specific gravity (air = 1.0)
- $P_1$  = Regulator inlet pressure, psia
- $\Delta P$  = Pressure drop across regulator, psi
- $Q$  = Gas flow rate, SCFH
- $T$  = Absolute temperature of gas at inlet, °Rankine

### Note

**Due to boost, the above formulas cannot be used to obtain correct regulating capacities for regulators with internal registration.**

The published capacities were obtained using inlet and outlet piping the same size as the regulator body size.

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**Table 5. Types 299H and 299HR Flow Capacities<sup>(1)</sup> for 1-1/2 NPT and NPS 2 / DN 50 External/Dual Registration**

| OUTLET PRESSURE<br>RANGE SETTING,<br>ACCURACY,<br>SPRING PART NUMBER<br>AND COLOR                                                     | INLET<br>PRESSURE                                                                                                                    |      | CAPACITIES IN SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |       |           |       |          |       |          |        |          |        |         |        |             |        |      |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------|-------|-----------|-------|----------|-------|----------|--------|----------|--------|---------|--------|-------------|--------|------|
|                                                                                                                                       |                                                                                                                                      |      | Orifice Size, In. / mm                                         |       |           |       |          |       |          |        |          |        |         |        |             |        |      |
|                                                                                                                                       |                                                                                                                                      |      | 1/4 x 3/8 / 6.4 x 9.5                                          |       | 3/8 / 9.5 |       | 1/2 / 13 |       | 3/4 / 19 |        | 7/8 / 22 |        | 1 / 25  |        | 1-3/16 / 30 |        |      |
|                                                                                                                                       | psig                                                                                                                                 | bar  | SCFH                                                           | Nm³/h | SCFH      | Nm³/h | SCFH     | Nm³/h | SCFH     | Nm³/h  | SCFH     | Nm³/h  | SCFH    | Nm³/h  | SCFH        | Nm³/h  |      |
| 3.5 to 6 in. w.c. /<br>9 to 15 mbar<br><br>3.5 in. w.c. /<br>9 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13707T0012<br>Black | 2                                                                                                                                    | 0.14 | 760                                                            | 20.4  | 1560      | 41.8  | 2700     | 72.4  | 5490     | 147    | 6460     | 173    | 8170    | 219    | 9940        | 266    |      |
|                                                                                                                                       | 5                                                                                                                                    | 0.34 | 1160                                                           | 31.1  | 2460      | 65.9  | 4270     | 114   | 8790     | 236    | 10,350   | 277    | 13,310  | 357    | 16,250      | 436    |      |
|                                                                                                                                       | 10                                                                                                                                   | 0.69 | 1590                                                           | 42.6  | 3580      | 95.9  | 6230     | 167   | 13,060   | 350    | 15,270   | 409    | 20,300  | 544    | 24,900      | 667    |      |
|                                                                                                                                       | 15                                                                                                                                   | 1.0  | 1920                                                           | 51.4  | 4410      | 118   | 7670     | 206   | 16,480   | 442    | 19,450   | 521    | 25,780  | 691    | 31,730      | 850    |      |
|                                                                                                                                       | 20                                                                                                                                   | 1.4  | 2240                                                           | 60.0  | 5150      | 138   | 8960     | 240   | 19,250   | 516    | 24,110   | 646    | 31,790  | 852    | 39,620      | 1062   |      |
|                                                                                                                                       | 25                                                                                                                                   | 1.7  | 2570                                                           | 68.9  | 5890      | 158   | 10,250   | 275   | 22,030   | 590    | 27,110   | 727    | 36,370  | 975    | 45,330      | 1215   |      |
|                                                                                                                                       | 30                                                                                                                                   | 2.1  | 2890                                                           | 77.4  | 6640      | 178   | 11,540   | 309   | 24,800   | 665    | 31,110   | 834    | 40,950  | 1097   | 51,040      | 1368   |      |
|                                                                                                                                       | 40                                                                                                                                   | 2.8  | 3530                                                           | 94.6  | 8120      | 218   | 14,120   | 378   | 30,350   | 813    | 38,100   | 1021   | 50,100  | 1343   | 62,450      | 1674   |      |
|                                                                                                                                       | 50                                                                                                                                   | 3.4  | 4180                                                           | 112   | 9600      | 257   | 16,700   | 448   | 35,890   | 962    | 44,100   | 1182   | 59,260  | 1588   | 73,870      | 1980   |      |
|                                                                                                                                       | 60                                                                                                                                   | 4.1  | 4820                                                           | 129   | 11,090    | 297   | 19,280   | 517   | 41,440   | 1111   | 51,090   | 1369   | 68,420  | 1834   | 85,290      | 2286   |      |
|                                                                                                                                       | 80                                                                                                                                   | 5.5  | 6110                                                           | 164   | 14,050    | 377   | 24,440   | 655   | 52,540   | 1408   | 65,080   | 1744   | 86,740  | 2325   | 108,120     | 2898   |      |
|                                                                                                                                       | 100                                                                                                                                  | 6.9  | 7400                                                           | 198   | 17,020    | 456   | 29,600   | 793   | 63,630   | 1705   | 79,060   | 2119   | 105,060 | 2816   |             |        |      |
|                                                                                                                                       | 125                                                                                                                                  | 8.6  | 9020                                                           | 242   | 20,730    | 556   | 36,050   | 966   | 77,500   | 2077   | 96,050   | 2574   |         |        |             |        |      |
|                                                                                                                                       | 150                                                                                                                                  | 10.3 | 10,630                                                         | 285   | 24,440    | 655   | 42,500   | 1139  | 91,360   | 2448   |          |        |         |        |             |        |      |
|                                                                                                                                       | 175                                                                                                                                  | 12.1 | 12,240                                                         | 328   | 28,150    | 754   | 48,950   | 1312  |          |        |          |        |         |        |             |        |      |
|                                                                                                                                       | 5 to 9 in. w.c. /<br>12 to 22 mbar<br><br>7 in. w.c. /<br>17 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13589T0012<br>Yellow | 2    | 0.14                                                           | 750   | 20.1      | 1520  | 40.7     | 2650  | 71.0     | 5380   | 144      | 6270   | 168     | 8000   | 214         | 9730   | 261  |
|                                                                                                                                       |                                                                                                                                      | 5    | 0.34                                                           | 1160  | 31.1      | 2440  | 65.4     | 4240  | 114      | 8730   | 234      | 10,250 | 275     | 13,220 | 354         | 16,130 | 432  |
|                                                                                                                                       |                                                                                                                                      | 10   | 0.69                                                           | 1590  | 42.6      | 3580  | 95.9     | 6220  | 167      | 13,040 | 349      | 15,220 | 408     | 20,250 | 543         | 24,830 | 665  |
|                                                                                                                                       |                                                                                                                                      | 15   | 1.0                                                            | 1920  | 51.4      | 4410  | 118      | 7670  | 206      | 16,480 | 442      | 19,420 | 520     | 25,750 | 690         | 31,690 | 849  |
| 20                                                                                                                                    |                                                                                                                                      | 1.4  | 2240                                                           | 60.0  | 5150      | 138   | 8960     | 240   | 19,250   | 516    | 24,110   | 646    | 31,790  | 852    | 39,620      | 1062   |      |
| 25                                                                                                                                    |                                                                                                                                      | 1.7  | 2570                                                           | 68.9  | 5890      | 158   | 10,250   | 275   | 22,030   | 590    | 27,110   | 727    | 36,370  | 975    | 45,330      | 1215   |      |
| 30                                                                                                                                    |                                                                                                                                      | 2.1  | 2890                                                           | 77.4  | 6640      | 178   | 11,540   | 309   | 24,800   | 665    | 31,110   | 834    | 40,950  | 1097   | 51,040      | 1368   |      |
| 40                                                                                                                                    |                                                                                                                                      | 2.8  | 3530                                                           | 94.6  | 8120      | 218   | 14,120   | 378   | 30,350   | 813    | 38,100   | 1021   | 50,100  | 1343   | 62,450      | 1674   |      |
| 50                                                                                                                                    |                                                                                                                                      | 3.4  | 4180                                                           | 112   | 9600      | 257   | 16,700   | 448   | 35,890   | 962    | 44,100   | 1182   | 59,260  | 1588   | 73,870      | 1980   |      |
| 60                                                                                                                                    |                                                                                                                                      | 4.1  | 4820                                                           | 129   | 11,090    | 297   | 19,280   | 517   | 41,440   | 1111   | 51,090   | 1369   | 68,420  | 1834   | 85,290      | 2286   |      |
| 80                                                                                                                                    |                                                                                                                                      | 5.5  | 6110                                                           | 164   | 14,050    | 377   | 24,440   | 655   | 52,540   | 1408   | 65,080   | 1744   | 86,740  | 2325   | 108,120     | 2898   |      |
| 100                                                                                                                                   |                                                                                                                                      | 6.9  | 7400                                                           | 198   | 17,020    | 456   | 29,600   | 793   | 63,630   | 1705   | 79,060   | 2119   | 105,060 | 2816   |             |        |      |
| 125                                                                                                                                   |                                                                                                                                      | 8.6  | 9020                                                           | 242   | 20,730    | 556   | 36,050   | 966   | 77,500   | 2077   | 96,050   | 2574   |         |        |             |        |      |
| 150                                                                                                                                   |                                                                                                                                      | 10.3 | 10,630                                                         | 285   | 24,440    | 655   | 42,500   | 1139  | 91,360   | 2448   |          |        |         |        |             |        |      |
| 175                                                                                                                                   |                                                                                                                                      | 12.1 | 12,240                                                         | 328   | 28,150    | 754   | 48,950   | 1312  |          |        |          |        |         |        |             |        |      |
| 7 to 20 in. w.c. /<br>17 to 50 mbar<br><br>14 in. w.c. /<br>35 mbar<br>±2 in. w.c./<br>±5 mbar<br><br>1N3112X0012<br>Unpainted        |                                                                                                                                      | 2    | 0.14                                                           | 700   | 18.8      | 1430  | 38.3     | 2480  | 66.5     | 5040   | 135      | 5850   | 157     | 7480   | 200         | 9090   | 244  |
|                                                                                                                                       |                                                                                                                                      | 5    | 0.34                                                           | 1140  | 30.5      | 2400  | 64.3     | 4170  | 112      | 8570   | 230      | 10,040 | 269     | 12,950 | 347         | 15,800 | 423  |
|                                                                                                                                       |                                                                                                                                      | 10   | 0.69                                                           | 1580  | 42.3      | 3560  | 95.4     | 6190  | 166      | 12,970 | 348      | 15,110 | 405     | 20,110 | 539         | 24,640 | 660  |
|                                                                                                                                       |                                                                                                                                      | 15   | 1.0                                                            | 1920  | 51.4      | 4410  | 118      | 7670  | 206      | 16,480 | 442      | 19,350 | 519     | 25,660 | 688         | 31,560 | 846  |
|                                                                                                                                       | 20                                                                                                                                   | 1.4  | 2240                                                           | 60.0  | 5150      | 138   | 8960     | 240   | 19,250   | 516    | 24,110   | 646    | 31,790  | 852    | 39,620      | 1062   |      |
|                                                                                                                                       | 25                                                                                                                                   | 1.7  | 2570                                                           | 68.9  | 5890      | 158   | 10,250   | 275   | 22,030   | 590    | 27,110   | 727    | 36,370  | 975    | 45,330      | 1215   |      |
|                                                                                                                                       | 30                                                                                                                                   | 2.1  | 2890                                                           | 77.4  | 6640      | 178   | 11,540   | 309   | 24,800   | 665    | 31,110   | 834    | 40,950  | 1097   | 51,040      | 1368   |      |
|                                                                                                                                       | 40                                                                                                                                   | 2.8  | 3530                                                           | 94.6  | 8120      | 218   | 14,120   | 378   | 30,350   | 813    | 38,100   | 1021   | 50,100  | 1343   | 62,450      | 1674   |      |
|                                                                                                                                       | 50                                                                                                                                   | 3.4  | 4180                                                           | 112   | 9600      | 257   | 16,700   | 448   | 35,890   | 962    | 44,100   | 1182   | 59,260  | 1588   | 73,870      | 1980   |      |
|                                                                                                                                       | 60                                                                                                                                   | 4.1  | 4820                                                           | 129   | 11,090    | 297   | 19,280   | 517   | 41,440   | 1111   | 51,090   | 1369   | 68,420  | 1834   | 85,290      | 2286   |      |
|                                                                                                                                       | 80                                                                                                                                   | 5.5  | 6110                                                           | 164   | 14,050    | 377   | 24,440   | 655   | 52,540   | 1408   | 65,080   | 1744   | 86,740  | 2325   | 108,120     | 2898   |      |
|                                                                                                                                       | 100                                                                                                                                  | 6.9  | 7400                                                           | 198   | 17,020    | 456   | 29,600   | 793   | 63,630   | 1705   | 79,060   | 2119   | 105,060 | 2816   |             |        |      |
|                                                                                                                                       | 125                                                                                                                                  | 8.6  | 9020                                                           | 242   | 20,730    | 556   | 36,050   | 966   | 77,500   | 2077   | 96,050   | 2574   |         |        |             |        |      |
|                                                                                                                                       | 150                                                                                                                                  | 10.3 | 10,630                                                         | 285   | 24,440    | 655   | 42,500   | 1139  | 91,360   | 2448   |          |        |         |        |             |        |      |
|                                                                                                                                       | 175                                                                                                                                  | 12.1 | 12,240                                                         | 328   | 28,150    | 754   | 48,950   | 1312  |          |        |          |        |         |        |             |        |      |
|                                                                                                                                       | 16 to 40 in. w.c. /<br>40 to 99 mbar<br><br>28 in. w.c. /<br>70 mbar<br>±4 in. w.c. /<br>±10 mbar<br><br>1B413727222<br>Purple       | 5    | 0.34                                                           | 1110  | 29.7      | 2320  | 62.2     | 4020  | 108      | 8250   | 221      | 9580   | 257     | 12,430 | 333         | 15,150 | 406  |
|                                                                                                                                       |                                                                                                                                      | 10   | 0.69                                                           | 1570  | 42.1      | 3530  | 94.6     | 6140  | 165      | 12,830 | 344      | 14,870 | 399     | 19,830 | 531         | 24,290 | 651  |
|                                                                                                                                       |                                                                                                                                      | 15   | 1.0                                                            | 1920  | 51.4      | 4410  | 118      | 7670  | 206      | 16,170 | 433      | 19,220 | 515     | 25,480 | 683         | 31,320 | 839  |
|                                                                                                                                       |                                                                                                                                      | 20   | 1.4                                                            | 2240  | 60.0      | 5150  | 138      | 8960  | 240      | 19,250 | 516      | 24,110 | 646     | 30,670 | 822         | 37,820 | 1014 |
| 25                                                                                                                                    |                                                                                                                                      | 1.7  | 2570                                                           | 68.9  | 5890      | 158   | 10,250   | 275   | 22,030   | 590    | 27,110   | 727    | 36,370  | 975    | 45,330      | 1215   |      |
| 30                                                                                                                                    |                                                                                                                                      | 2.1  | 2890                                                           | 77.4  | 6640      | 178   | 11,540   | 309   | 24,800   | 665    | 31,110   | 834    | 40,950  | 1097   | 51,040      | 1368   |      |
| 40                                                                                                                                    |                                                                                                                                      | 2.8  | 3530                                                           | 94.6  | 8120      | 218   | 14,120   | 378   | 30,350   | 813    | 38,100   | 1021   | 50,100  | 1343   | 62,450      | 1674   |      |
| 50                                                                                                                                    |                                                                                                                                      | 3.4  | 4180                                                           | 112   | 9600      | 257   | 16,700   | 448   | 35,890   | 962    | 44,100   | 1182   | 59,260  | 1588   | 73,870      | 1980   |      |
| 60                                                                                                                                    |                                                                                                                                      | 4.1  | 4820                                                           | 129   | 11,090    | 297   | 19,280   | 517   | 41,440   | 1111   | 51,090   | 1369   | 68,420  | 1834   | 85,290      | 2286   |      |
| 80                                                                                                                                    |                                                                                                                                      | 5.5  | 6110                                                           | 164   | 14,050    | 377   | 24,440   | 655   | 52,540   | 1408   | 65,080   | 1744   | 86,740  | 2325   | 108,120     | 2898   |      |
| 100                                                                                                                                   |                                                                                                                                      | 6.9  | 7400                                                           | 198   | 17,020    | 456   | 29,600   | 793   | 63,630   | 1705   | 79,060   | 2119   | 105,060 | 2816   |             |        |      |
| 125                                                                                                                                   |                                                                                                                                      | 8.6  | 9020                                                           | 242   | 20,730    | 556   | 36,050   | 966   | 77,500   | 2077   | 96,050   | 2574   |         |        |             |        |      |
| 150                                                                                                                                   |                                                                                                                                      | 10.3 | 10,630                                                         | 285   | 24,440    | 655   | 42,500   | 1139  | 91,360   | 2448   |          |        |         |        |             |        |      |
| 175                                                                                                                                   |                                                                                                                                      | 12.1 | 12,240                                                         | 328   | 28,150    | 754   | 48,950   | 1312  |          |        |          |        |         |        |             |        |      |

- Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Downstream piping may affect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

**Table 5. Types 299H and 299HR Flow Capacities<sup>(1)</sup> for 1-1/2 NPT and NPS 2 / DN 50 External/Dual Registration (continued)**

| OUTLET PRESSURE RANGE SETTING, ACCURACY, SPRING PART NUMBER AND COLOR                                      | INLET PRESSURE                                                                                  |      | CAPACITIES IN SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |       |           |       |          |        |          |        |          |        |         |        |             |        |     |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------|-------|-----------|-------|----------|--------|----------|--------|----------|--------|---------|--------|-------------|--------|-----|
|                                                                                                            |                                                                                                 |      | Orifice Size, In. / mm                                         |       |           |       |          |        |          |        |          |        |         |        |             |        |     |
|                                                                                                            |                                                                                                 |      | 1/4 x 3/8 / 6.4 x 9.5                                          |       | 3/8 / 9.5 |       | 1/2 / 13 |        | 3/4 / 19 |        | 7/8 / 22 |        | 1 / 25  |        | 1-3/16 / 30 |        |     |
|                                                                                                            | psig                                                                                            | bar  | SCFH                                                           | Nm³/h | SCFH      | Nm³/h | SCFH     | Nm³/h  | SCFH     | Nm³/h  | SCFH     | Nm³/h  | SCFH    | Nm³/h  | SCFH        | Nm³/h  |     |
| 1 to 3.25 psig / 69 mbar to 0.22 bar<br><br>2 psig / 0.14 bar ±1% psia / bar<br><br>T13593T0012 Light Blue | 5                                                                                               | 0.34 | 1020                                                           | 27.3  | 2100      | 56.4  | 3640     | 97.5   | 7440     | 199    | 8650     | 232    | 11,140  | 299    | 13,560      | 363    |     |
|                                                                                                            | 10                                                                                              | 0.69 | 1550                                                           | 41.5  | 3340      | 89.5  | 5810     | 156    | 12,040   | 323    | 14,410   | 386    | 18,460  | 495    | 22,570      | 605    |     |
|                                                                                                            | 15                                                                                              | 1.0  | 1920                                                           | 51.4  | 4360      | 117   | 7580     | 203    | 15,990   | 429    | 18,950   | 508    | 25,050  | 671    | 30,760      | 824    |     |
|                                                                                                            | 20                                                                                              | 1.4  | 2240                                                           | 60.0  | 5150      | 138   | 8960     | 240    | 19,250   | 516    | 24,110   | 646    | 30,380  | 814    | 37,410      | 1003   |     |
|                                                                                                            | 25                                                                                              | 1.7  | 2570                                                           | 68.9  | 5890      | 158   | 10,250   | 275    | 22,030   | 590    | 27,110   | 727    | 36,370  | 975    | 45,330      | 1215   |     |
|                                                                                                            | 30                                                                                              | 2.1  | 2890                                                           | 77.4  | 6640      | 178   | 11,540   | 309    | 24,800   | 665    | 31,110   | 834    | 40,950  | 1097   | 51,040      | 1368   |     |
|                                                                                                            | 40                                                                                              | 2.8  | 3530                                                           | 94.6  | 8120      | 218   | 14,120   | 378    | 30,350   | 813    | 38,100   | 1021   | 50,100  | 1343   | 62,450      | 1674   |     |
|                                                                                                            | 50                                                                                              | 3.4  | 4180                                                           | 112   | 9600      | 257   | 16,700   | 448    | 35,890   | 962    | 44,100   | 1182   | 59,260  | 1588   | 73,870      | 1980   |     |
|                                                                                                            | 60                                                                                              | 4.1  | 4820                                                           | 129   | 11,090    | 297   | 19,280   | 517    | 41,440   | 1111   | 51,090   | 1369   | 68,420  | 1834   | 85,290      | 2286   |     |
|                                                                                                            | 80                                                                                              | 5.5  | 6110                                                           | 164   | 14,050    | 377   | 24,440   | 655    | 52,540   | 1408   | 65,080   | 1744   | 86,740  | 2325   | 108,120     | 2898   |     |
|                                                                                                            | 100                                                                                             | 6.9  | 7400                                                           | 198   | 17,020    | 456   | 29,600   | 793    | 63,630   | 1705   | 79,060   | 2119   | 105,060 | 2816   |             |        |     |
|                                                                                                            | 125                                                                                             | 8.6  | 9020                                                           | 242   | 20,730    | 556   | 36,050   | 966    | 77,500   | 2077   | 96,050   | 2574   |         |        |             |        |     |
|                                                                                                            | 150                                                                                             | 10.3 | 10,630                                                         | 285   | 24,440    | 655   | 42,500   | 1139   | 91,360   | 2448   |          |        |         |        |             |        |     |
|                                                                                                            | 175                                                                                             | 12.1 | 12,240                                                         | 328   | 28,150    | 754   | 48,950   | 1312   |          |        |          |        |         |        |             |        |     |
| 2.75 to 6 psig / 0.19 to 0.41 bar<br><br>5 psig / 0.34 bar ±1% psia / bar<br><br>T13671T0012 Orange        | 10                                                                                              | 0.69 | 1390                                                           | 37.2  | 2910      | 78.0  | 5050     | 135    | 10,350   | 277    | 12,700   | 340    | 15,600  | 418    | 19,030      | 510    |     |
|                                                                                                            | 15                                                                                              | 1.0  | 1870                                                           | 50.1  | 4190      | 112   | 7280     | 195    | 15,150   | 406    | 17,950   | 481    | 23,310  | 625    | 28,530      | 765    |     |
|                                                                                                            | 20                                                                                              | 1.4  | 2240                                                           | 60.0  | 5090      | 136   | 8850     | 237    | 18,640   | 500    | 22,970   | 616    | 29,180  | 782    | 35,820      | 960    |     |
|                                                                                                            | 25                                                                                              | 1.7  | 2570                                                           | 68.9  | 5890      | 158   | 10,250   | 275    | 22,030   | 590    | 27,110   | 727    | 34,550  | 926    | 42,530      | 1140   |     |
|                                                                                                            | 30                                                                                              | 2.1  | 2890                                                           | 77.4  | 6640      | 178   | 11,540   | 309    | 24,800   | 665    | 31,110   | 834    | 40,950  | 1097   | 51,040      | 1368   |     |
|                                                                                                            | 40                                                                                              | 2.8  | 3530                                                           | 94.6  | 8120      | 218   | 14,120   | 378    | 30,350   | 813    | 38,100   | 1021   | 50,100  | 1343   | 62,450      | 1674   |     |
|                                                                                                            | 50                                                                                              | 3.4  | 4180                                                           | 112   | 9600      | 257   | 16,700   | 448    | 35,890   | 962    | 44,100   | 1182   | 59,260  | 1588   | 73,870      | 1980   |     |
|                                                                                                            | 60                                                                                              | 4.1  | 4820                                                           | 129   | 11,090    | 297   | 19,280   | 517    | 41,440   | 1111   | 51,090   | 1369   | 68,420  | 1834   | 85,290      | 2286   |     |
|                                                                                                            | 80                                                                                              | 5.5  | 6110                                                           | 164   | 14,050    | 377   | 24,440   | 655    | 52,540   | 1408   | 65,080   | 1744   | 86,740  | 2325   | 108,120     | 2898   |     |
|                                                                                                            | 100                                                                                             | 6.9  | 7400                                                           | 198   | 17,020    | 456   | 29,600   | 793    | 63,630   | 1705   | 79,060   | 2119   | 105,060 | 2816   |             |        |     |
|                                                                                                            | 125                                                                                             | 8.6  | 9020                                                           | 242   | 20,730    | 556   | 36,050   | 966    | 77,500   | 2077   | 96,050   | 2574   |         |        |             |        |     |
|                                                                                                            | 150                                                                                             | 10.3 | 10,630                                                         | 285   | 24,440    | 655   | 42,500   | 1139   | 91,360   | 2448   |          |        |         |        |             |        |     |
|                                                                                                            | 175                                                                                             | 12.1 | 12,240                                                         | 328   | 28,150    | 754   | 48,950   | 1312   |          |        |          |        |         |        |             |        |     |
|                                                                                                            | 5 to 16 psig / 0.34 to 1.1 bar<br><br>10 psig / 0.69 bar ±1% psia / bar<br><br>T13600T0012 Red  | 15   | 1.0                                                            | 1580  | 42.3      | 3280  | 87.9     | 5690   | 152      | 11,640 | 312      | 12,640 | 339     | 17,470 | 468         | 21,280 | 570 |
| 20                                                                                                         |                                                                                                 | 1.4  | 2130                                                           | 57.1  | 4720      | 126   | 8210     | 220    | 17,000   | 456    | 20,380   | 546    | 25,940  | 695    | 31,690      | 849    |     |
| 25                                                                                                         |                                                                                                 | 1.7  | 2540                                                           | 68.1  | 5710      | 153   | 9930     | 266    | 20,790   | 557    | 24,570   | 658    | 32,220  | 863    | 39,480      | 1058   |     |
| 30                                                                                                         |                                                                                                 | 2.1  | 2890                                                           | 77.4  | 6640      | 178   | 11,540   | 309    | 24,150   | 647    | 29,540   | 792    | 37,900  | 1016   | 46,550      | 1248   |     |
| 40                                                                                                         |                                                                                                 | 2.8  | 3530                                                           | 94.6  | 8120      | 218   | 14,120   | 378    | 30,350   | 813    | 38,100   | 1021   | 50,100  | 1343   | 62,450      | 1674   |     |
| 50                                                                                                         |                                                                                                 | 3.4  | 4180                                                           | 112   | 9600      | 257   | 16,700   | 448    | 35,890   | 962    | 44,100   | 1182   | 59,260  | 1588   | 73,870      | 1980   |     |
| 60                                                                                                         |                                                                                                 | 4.1  | 4820                                                           | 129   | 11,090    | 297   | 19,280   | 517    | 41,440   | 1111   | 51,090   | 1369   | 68,420  | 1834   | 85,290      | 2286   |     |
| 80                                                                                                         |                                                                                                 | 5.5  | 6110                                                           | 164   | 14,050    | 377   | 24,440   | 655    | 52,540   | 1408   | 65,080   | 1744   | 86,740  | 2325   | 108,120     | 2898   |     |
| 100                                                                                                        |                                                                                                 | 6.9  | 7400                                                           | 198   | 17,020    | 456   | 29,600   | 793    | 63,630   | 1705   | 79,060   | 2119   | 105,060 | 2816   |             |        |     |
| 125                                                                                                        |                                                                                                 | 8.6  | 9020                                                           | 242   | 20,730    | 556   | 36,050   | 966    | 77,500   | 2077   | 96,050   | 2574   |         |        |             |        |     |
| 150                                                                                                        |                                                                                                 | 10.3 | 10,630                                                         | 285   | 24,440    | 655   | 42,500   | 1139   | 91,360   | 2448   |          |        |         |        |             |        |     |
| 175                                                                                                        |                                                                                                 | 12.1 | 12,240                                                         | 328   | 28,150    | 754   | 48,950   | 1312   |          |        |          |        |         |        |             |        |     |
| 5 to 16 psig / 0.34 to 1.1 bar<br><br>15 psig / 1.0 ba ±1% psia / bar<br><br>T13600T0012 Red               |                                                                                                 | 20   | 1.4                                                            | 1750  | 46.9      | 3620  | 97.0     | 6290   | 169      | 12,830 | 344      | 15,830 | 424     | 19,190 | 514         | 23,360 | 626 |
|                                                                                                            |                                                                                                 | 25   | 1.7                                                            | 2360  | 63.2      | 5220  | 140      | 9070   | 243      | 18,700 | 501      | 22,040 | 591     | 28,360 | 760         | 34,610 | 928 |
|                                                                                                            | 30                                                                                              | 2.1  | 2820                                                           | 75.6  | 6290      | 169   | 10,940   | 293    | 22,790   | 611    | 27,870   | 747    | 35,050  | 939    | 42,890      | 1149   |     |
|                                                                                                            | 40                                                                                              | 2.8  | 3530                                                           | 94.6  | 8120      | 218   | 14,120   | 378    | 29,650   | 795    | 36,530   | 979    | 46,610  | 1249   | 57,270      | 1535   |     |
|                                                                                                            | 50                                                                                              | 3.4  | 4180                                                           | 112   | 9600      | 257   | 16,700   | 448    | 35,890   | 962    | 44,100   | 1182   | 57,080  | 1530   | 70,350      | 1885   |     |
|                                                                                                            | 60                                                                                              | 4.1  | 4820                                                           | 129   | 11,090    | 297   | 19,280   | 517    | 41,440   | 1111   | 51,090   | 1369   | 68,420  | 1834   | 85,290      | 2286   |     |
|                                                                                                            | 80                                                                                              | 5.5  | 6110                                                           | 164   | 14,050    | 377   | 24,440   | 655    | 52,540   | 1408   | 65,080   | 1744   | 86,740  | 2325   | 108,120     | 2898   |     |
|                                                                                                            | 100                                                                                             | 6.9  | 7400                                                           | 198   | 17,020    | 456   | 29,600   | 793    | 63,630   | 1705   | 79,060   | 2119   | 105,060 | 2816   |             |        |     |
|                                                                                                            | 125                                                                                             | 8.6  | 9020                                                           | 242   | 20,730    | 556   | 36,050   | 966    | 77,500   | 2077   | 96,050   | 2574   |         |        |             |        |     |
|                                                                                                            | 150                                                                                             | 10.3 | 10,630                                                         | 285   | 24,440    | 655   | 42,500   | 1139   | 91,360   | 2448   |          |        |         |        |             |        |     |
|                                                                                                            | 175                                                                                             | 12.1 | 12,240                                                         | 328   | 28,150    | 754   | 48,950   | 1312   |          |        |          |        |         |        |             |        |     |
|                                                                                                            | 14 to 35 psig / 0.97 to 2.4 bar<br><br>20 psig / 1.4 bar ±1% psia / bar<br><br>19B0432X012 Zinc | 25   | 1.7                                                            | 1920  | 51.4      | 3930  | 105      | 6840   | 183      | 13,930 | 373      | 14,960 | 401     | 20,800 | 557         | 25,310 |     |
|                                                                                                            |                                                                                                 | 30   | 2.1                                                            | 2580  | 69.1      | 5680  | 152      | 9870   | 265      | 20,280 | 544      | 24,090 | 646     | 30,630 | 821         | 37,340 |     |
|                                                                                                            |                                                                                                 | 40   | 2.8                                                            | 3480  | 93.3      | 7830  | 210      | 13,610 | 365      | 28,440 | 762      | 34,480 | 924     | 43,980 | 1179        | 53,880 |     |
| 50                                                                                                         |                                                                                                 | 3.4  | 4180                                                           | 112   | 9600      | 257   | 16,700   | 448    | 35,140   | 942    | 41,940   | 1124   | 55,310  | 1482   | 67,980      |        |     |
| 60                                                                                                         |                                                                                                 | 4.1  | 4820                                                           | 129   | 11,090    | 297   | 19,280   | 517    | 41,440   | 1111   | 51,090   | 1369   | 65,780  | 1763   | 81,060      |        |     |
| 80                                                                                                         |                                                                                                 | 5.5  | 6110                                                           | 164   | 14,050    | 377   | 24,440   | 655    | 52,540   | 1408   | 65,080   | 1744   | 86,740  | 2325   | 108,120     |        |     |
| 100                                                                                                        |                                                                                                 | 6.9  | 7400                                                           | 198   | 17,020    | 456   | 29,600   | 793    | 63,630   | 1705   | 79,060   | 2119   | 105,060 | 2816   |             |        |     |
| 125                                                                                                        |                                                                                                 | 8.6  | 9020                                                           | 242   | 20,730    | 556   | 36,050   | 966    | 77,500   | 2077   | 96,050   | 2574   |         |        |             |        |     |
| 150                                                                                                        |                                                                                                 | 10.3 | 10,630                                                         | 285   | 24,440    | 655   | 42,500   | 1139   | 91,360   | 2448   |          |        |         |        |             |        |     |
| 175                                                                                                        |                                                                                                 | 12.1 | 12,240                                                         | 328   | 28,150    | 754   | 48,950   | 1312   |          |        |          |        |         |        |             |        |     |

- Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Downstream piping may affect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

# 299H Series

**Table 5. Types 299H and 299HR Flow Capacities<sup>(1)</sup> for 1-1/2 NPT and NPS 2 / DN 50 External/Dual Registration (continued)**

| OUTLET PRESSURE RANGE SETTING, ACCURACY, SPRING PART NUMBER AND COLOR                                 | INLET PRESSURE |      | CAPACITIES IN SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|-------------------------------------------------------------------------------------------------------|----------------|------|-----------------------------------------------------------------------------|--------------------|-----------|--------------------|----------|--------------------|----------|--------------------|----------|--------------------|---------|--------------------|-------------|--------------------|
|                                                                                                       |                |      | Orifice Size, In. / mm                                                      |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      | 1/4 x 3/8 / 6.4 x 9.5                                                       |                    | 3/8 / 9.5 |                    | 1/2 / 13 |                    | 3/4 / 19 |                    | 7/8 / 22 |                    | 1 / 25  |                    | 1-3/16 / 30 |                    |
|                                                                                                       | psig           | bar  | SCFH                                                                        | Nm <sup>3</sup> /h | SCFH      | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH    | Nm <sup>3</sup> /h | SCFH        | Nm <sup>3</sup> /h |
| 14 to 35 psig / 0.97 to 2.4 bar<br><br>25 psig / 1.7 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc | 30             | 2.1  | 2070                                                                        | 55.5               | 4230      | 113                | 7360     | 197                | 14,980   | 401                | 18,330   | 491                | 22,310  | 598                | 27,140      | 727                |
|                                                                                                       | 40             | 2.8  | 3320                                                                        | 89.0               | 7350      | 197                | 12,780   | 343                | 26,420   | 708                | 32,120   | 861                | 40,220  | 1078               | 49,120      | 1316               |
|                                                                                                       | 50             | 3.4  | 4140                                                                        | 111                | 9340      | 250                | 16,250   | 436                | 34,040   | 912                | 40,400   | 1083               | 52,830  | 1416               | 64,770      | 1736               |
|                                                                                                       | 60             | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 19,280   | 517                | 40,630   | 1089               | 48,920   | 1311               | 64,010  | 1715               | 78,690      | 2109               |
|                                                                                                       | 80             | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 52,540   | 1408               | 65,080   | 1744               | 86,740  | 2325               | 108,120     | 2898               |
|                                                                                                       | 100            | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 63,630   | 1705               | 79,060   | 2119               | 105,060 | 2816               |             |                    |
|                                                                                                       | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 77,500   | 2077               | 96,050   | 2574               |         |                    |             |                    |
|                                                                                                       | 150            | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 91,360   | 2448               |          |                    |         |                    |             |                    |
|                                                                                                       | 175            | 12.1 | 12,240                                                                      | 328                | 28,150    | 754                | 48,950   | 1312               |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
| 14 to 35 psig / 0.97 to 2.4 bar<br><br>30 psig / 2.1 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc | 40             | 2.8  | 2980                                                                        | 79.9               | 6520      | 175                | 11,330   | 304                | 23,190   | 621                | 27,330   | 732                | 34,790  | 932                | 42,370      | 1136               |
|                                                                                                       | 50             | 3.4  | 4020                                                                        | 108                | 8950      | 240                | 15,560   | 417                | 32,300   | 866                | 37,410   | 1003               | 49,460  | 1326               | 60,480      | 1621               |
|                                                                                                       | 60             | 4.1  | 4800                                                                        | 129                | 10,850    | 291                | 18,870   | 506                | 39,600   | 1061               | 46,980   | 1259               | 61,630  | 1652               | 75,590      | 2026               |
|                                                                                                       | 80             | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 52,540   | 1408               | 65,080   | 1744               | 83,170  | 2229               | 102,470     | 2746               |
|                                                                                                       | 100            | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 63,630   | 1705               | 79,060   | 2119               | 105,060 | 2816               |             |                    |
|                                                                                                       | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 77,500   | 2077               | 96,050   | 2574               |         |                    |             |                    |
|                                                                                                       | 150            | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 91,360   | 2448               |          |                    |         |                    |             |                    |
|                                                                                                       | 175            | 12.1 | 12,240                                                                      | 328                | 28,150    | 754                | 48,950   | 1312               |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
| 14 to 35 psig / 0.97 to 2.4 bar<br><br>35 psig / 2.4 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc | 40             | 2.8  | 2350                                                                        | 63.0               | 4790      | 128                | 8330     | 223                | 16,920   | 453                | 20,530   | 550                | 25,150  | 674                | 30,580      | 820                |
|                                                                                                       | 50             | 3.4  | 3770                                                                        | 101                | 8300      | 222                | 14,430   | 387                | 29,690   | 796                | 34,220   | 917                | 44,890  | 1203               | 54,750      | 1467               |
|                                                                                                       | 60             | 4.1  | 4700                                                                        | 126                | 10,510    | 282                | 18,270   | 490                | 38,050   | 1020               | 44,960   | 1205               | 58,520  | 1568               | 71,620      | 1919               |
|                                                                                                       | 80             | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 51,600   | 1383               | 62,470   | 1674               | 81,400  | 2182               | 100,090     | 2682               |
|                                                                                                       | 100            | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 63,630   | 1705               | 79,060   | 2119               | 105,060 | 2816               |             |                    |
|                                                                                                       | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 77,500   | 2077               | 96,050   | 2574               |         |                    |             |                    |
|                                                                                                       | 150            | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 91,360   | 2448               |          |                    |         |                    |             |                    |
|                                                                                                       | 175            | 12.1 | 12,240                                                                      | 328                | 28,150    | 754                | 48,950   | 1312               |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
| 30 to 60 psig / 2.1 to 4.1 bar<br><br>40 psig / 2.8 bar<br>±1% psia / bar<br><br>19B0432X022<br>Green | 50             | 3.4  | 3340                                                                        | 89.5               | 7290      | 195                | 12,670   | 340                | 25,840   | 693                | 30,500   | 817                | 38,590  | 1034               | 46,950      | 1258               |
|                                                                                                       | 60             | 4.1  | 4500                                                                        | 121                | 9970      | 267                | 17,340   | 465                | 35,820   | 960                | 42,700   | 1144               | 54,480  | 1460               | 66,530      | 1783               |
|                                                                                                       | 80             | 5.5  | 6100                                                                        | 163                | 13,840    | 371                | 24,070   | 645                | 50,670   | 1358               | 61,300   | 1643               | 79,160  | 2121               | 97,160      | 2604               |
|                                                                                                       | 100            | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 63,630   | 1705               | 77,250   | 2070               | 100,560 | 2695               |             |                    |
|                                                                                                       | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 77,500   | 2077               | 95,700   | 2565               |         |                    |             |                    |
|                                                                                                       | 150            | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 91,360   | 2448               |          |                    |         |                    |             |                    |
|                                                                                                       | 175            | 12.1 | 12,240                                                                      | 328                | 28,150    | 754                | 48,950   | 1312               |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
| 30 to 60 psig / 2.1 to 4.1 bar<br><br>50 psig / 3.4 bar<br>±1% psia / bar<br><br>19B0432X022<br>Green | 60             | 4.1  | 3680                                                                        | 98.6               | 7990      | 214                | 13,900   | 373                | 28,290   | 758                | 33,300   | 892                | 42,110  | 1129               | 51,210      | 1372               |
|                                                                                                       | 80             | 5.5  | 5900                                                                        | 158                | 13,170    | 353                | 22,900   | 614                | 47,570   | 1275               | 57,000   | 1528               | 72,950  | 1955               | 89,220      | 2391               |
|                                                                                                       | 100            | 6.9  | 7400                                                                        | 198                | 16,830    | 451                | 29,260   | 784                | 61,700   | 1654               | 74,800   | 2005               | 96,630  | 2590               |             |                    |
|                                                                                                       | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 77,500   | 2077               | 94,400   | 2530               |         |                    |             |                    |
|                                                                                                       | 150            | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 91,360   | 2448               |          |                    |         |                    |             |                    |
|                                                                                                       | 175            | 12.1 | 12,240                                                                      | 328                | 28,150    | 754                | 48,950   | 1312               |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |
| 30 to 60 psig / 2.1 to 4.1 bar<br><br>60 psig / 4.1 bar<br>±1% psia / bar<br><br>19B0432X022<br>Green | 80             | 5.5  | 5380                                                                        | 144                | 11,810    | 317                | 20,540   | 550                | 42,160   | 1130               | 50,000   | 1340               | 63,540  | 1703               | 77,440      | 2075               |
|                                                                                                       | 100            | 6.9  | 7260                                                                        | 195                | 16,270    | 436                | 28,290   | 758                | 59,000   | 1581               | 70,900   | 1900               | 90,970  | 2438               |             |                    |
|                                                                                                       | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 35,860   | 961                | 75,900   | 2034               |          |                    |         |                    |             |                    |
|                                                                                                       | 150            | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 91,360   | 2448               |          |                    |         |                    |             |                    |
|                                                                                                       | 175            | 12.1 | 12,240                                                                      | 328                | 28,150    | 754                | 48,950   | 1312               |          |                    |          |                    |         |                    |             |                    |
|                                                                                                       |                |      |                                                                             |                    |           |                    |          |                    |          |                    |          |                    |         |                    |             |                    |

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Downstream piping may affect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

**Table 6. Types 299H and 299HR Flow Capacities<sup>(1)</sup> for 1-1/2 NPT Internal Registration**

| OUTLET PRESSURE<br>RANGE SETTING,<br>ACCURACY,<br>SPRING PART NUMBER<br>AND COLOR                                                     | INLET<br>PRESSURE |      | CAPACITIES IN SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-----------------------------------------------------------------------------|--------------------|-----------|--------------------|----------|--------------------|----------|--------------------|--------|--------------------|-------------|--------------------|
|                                                                                                                                       |                   |      | Orifice Size, In. / mm                                                      |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                                                       | psig              | bar  | 1/4 x 3/8 / 6.4 x 9.5                                                       |                    | 3/8 / 9.5 |                    | 1/2 / 13 |                    | 3/4 / 19 |                    | 1 / 25 |                    | 1-3/16 / 30 |                    |
|                                                                                                                                       |                   |      | SCFH                                                                        | Nm <sup>3</sup> /h | SCFH      | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH   | Nm <sup>3</sup> /h | SCFH        | Nm <sup>3</sup> /h |
| 3.5 to 6 in. w.c. /<br>9 to 15 mbar<br><br>3.5 in. w.c. /<br>9 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13707T0012<br>Black | 2                 | 0.14 | 760                                                                         | 20.4               | 1560      | 41.8               | 2700     | 72.4               | 4050     | 109                | 4340   | 116                | 4540        | 122                |
|                                                                                                                                       | 5                 | 0.34 | 1200                                                                        | 32.2               | 2600      | 69.7               | 4500     | 121                | 8490     | 228                | 10,690 | 286                | 7290        | 195                |
|                                                                                                                                       | 10                | 0.69 | 1700                                                                        | 45.6               | 3800      | 102                | 6500     | 174                | 7140     | 191                | 8570   | 230                | 10,570      | 283                |
|                                                                                                                                       | 15                | 1.0  | 2000                                                                        | 53.6               | 4600      | 123                | 8000     | 214                | 7120     | 191                | 10,860 | 291                | 9020        | 242                |
|                                                                                                                                       | 20                | 1.4  | 2350                                                                        | 63.0               | 5300      | 142                | 9250     | 248                | 7060     | 189                | 11,250 | 302                | 9810        | 263                |
|                                                                                                                                       | 25                | 1.7  | 2700                                                                        | 72.4               | 6000      | 161                | 10,010   | 268                | 7100     | 190                | 11,170 | 299                | 9760        | 262                |
|                                                                                                                                       | 30                | 2.1  | 3040                                                                        | 81.5               | 6740      | 181                | 10,330   | 277                | 8030     | 215                | 11,660 | 312                | 9700        | 260                |
|                                                                                                                                       | 40                | 2.8  | 3700                                                                        | 99.2               | 8200      | 220                | 11,640   | 312                | 9610     | 258                | 10,790 | 289                | 11,150      | 299                |
|                                                                                                                                       | 50                | 3.4  | 4400                                                                        | 118                | 9700      | 260                | 11,650   | 312                | 10,530   | 282                | 9460   | 254                | 10,100      | 271                |
|                                                                                                                                       | 60                | 4.1  | 5100                                                                        | 137                | 11,200    | 300                | 11,380   | 305                | 11,590   | 311                | 9010   | 241                | 10,200      | 273                |
|                                                                                                                                       | 80                | 5.5  | 4700                                                                        | 126                | 4680      | 125                | 4510     | 121                | 15,210   | 408                | 6250   | 168                | 8900        | 239                |
|                                                                                                                                       | 100               | 6.9  | 4300                                                                        | 115                | 3040      | 81.5               | 3990     | 107                | 14,510   | 389                | 7700   | 206                |             |                    |
|                                                                                                                                       | 125               | 8.6  | 4300                                                                        | 115                | 3200      | 85.8               | 4390     | 118                | 8640     | 232                |        |                    |             |                    |
|                                                                                                                                       | 150               | 10.3 | 4320                                                                        | 116                | 3200      | 85.8               | 4810     | 129                | 2650     | 71.0               |        |                    |             |                    |
|                                                                                                                                       | 175               | 12.1 | 5600                                                                        | 150                | 5050      | 135                | 7300     | 196                |          |                    |        |                    |             |                    |
| 5 to 9 in. w.c. /<br>12 to 22 mbar<br><br>7 in. w.c. /<br>17 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13589T0012<br>Yellow  | 2                 | 0.14 | 750                                                                         | 20.1               | 1520      | 40.7               | 2650     | 71.0               | 5380     | 144                | 5610   | 150                | 5790        | 155                |
|                                                                                                                                       | 5                 | 0.34 | 1300                                                                        | 34.8               | 2600      | 69.7               | 4250     | 114                | 7110     | 191                | 7600   | 204                | 6620        | 177                |
|                                                                                                                                       | 10                | 0.69 | 1600                                                                        | 42.9               | 3800      | 102                | 6500     | 174                | 8150     | 218                | 8210   | 220                | 10,320      | 277                |
|                                                                                                                                       | 15                | 1.0  | 2000                                                                        | 53.6               | 4400      | 118                | 8000     | 214                | 6180     | 166                | 10,770 | 289                | 9040        | 242                |
|                                                                                                                                       | 20                | 1.4  | 2300                                                                        | 61.6               | 5100      | 137                | 9500     | 255                | 6520     | 175                | 11,510 | 308                | 9510        | 255                |
|                                                                                                                                       | 25                | 1.7  | 2600                                                                        | 69.7               | 5800      | 155                | 10,660   | 286                | 6190     | 166                | 10,920 | 293                | 9850        | 264                |
|                                                                                                                                       | 30                | 2.1  | 2970                                                                        | 79.6               | 6600      | 177                | 10,410   | 279                | 7420     | 199                | 10,850 | 291                | 10,080      | 270                |
|                                                                                                                                       | 40                | 2.8  | 3700                                                                        | 99.2               | 8200      | 220                | 10,170   | 273                | 12,030   | 322                | 10,310 | 276                | 10,170      | 273                |
|                                                                                                                                       | 50                | 3.4  | 4400                                                                        | 118                | 9700      | 260                | 11,170   | 299                | 12,160   | 326                | 10,430 | 280                | 10,000      | 268                |
|                                                                                                                                       | 60                | 4.1  | 5100                                                                        | 137                | 11,200    | 300                | 11,710   | 314                | 10,620   | 285                | 8230   | 221                | 10,200      | 273                |
|                                                                                                                                       | 80                | 5.5  | 4850                                                                        | 130                | 4700      | 126                | 4670     | 122                | 3610     | 96.7               | 8000   | 214                | 8500        | 228                |
|                                                                                                                                       | 100               | 6.9  | 4600                                                                        | 123                | 2800      | 75.0               | 3790     | 102                | 3380     | 90.6               | 6400   | 172                |             |                    |
|                                                                                                                                       | 125               | 8.6  | 4600                                                                        | 123                | 3200      | 85.8               | 4190     | 112                | 3440     | 92.2               |        |                    |             |                    |
|                                                                                                                                       | 150               | 10.3 | 4600                                                                        | 123                | 3640      | 97.5               | 4590     | 123                | 2400     | 64.3               |        |                    |             |                    |
|                                                                                                                                       | 175               | 12.1 | 5400                                                                        | 145                | 5050      | 135                | 7300     | 196                |          |                    |        |                    |             |                    |
| 7 to 20 in. w.c. /<br>17 to 50 mbar<br><br>14 in. w.c. /<br>35 mbar<br>±2 in. w.c. /<br>±5 mbar<br><br>1N3112X0012<br>Unpainted       | 2                 | 0.14 | 700                                                                         | 18.8               | 1430      | 38.3               | 2480     | 66.5               | 5040     | 135                | 6900   | 185                | 7050        | 189                |
|                                                                                                                                       | 5                 | 0.34 | 1100                                                                        | 29.5               | 2200      | 59.0               | 4000     | 107                | 7180     | 192                | 7280   | 195                | 8860        | 237                |
|                                                                                                                                       | 10                | 0.69 | 1700                                                                        | 45.6               | 3600      | 96.5               | 6500     | 174                | 8310     | 223                | 9330   | 250                | 10,320      | 277                |
|                                                                                                                                       | 15                | 1.0  | 1900                                                                        | 50.9               | 4600      | 123                | 8000     | 214                | 7000     | 188                | 11,940 | 320                | 9530        | 255                |
|                                                                                                                                       | 20                | 1.4  | 2150                                                                        | 57.6               | 5300      | 142                | 8500     | 228                | 7410     | 199                | 11,850 | 318                | 11,060      | 296                |
|                                                                                                                                       | 25                | 1.7  | 2400                                                                        | 64.3               | 6000      | 161                | 9000     | 241                | 6900     | 185                | 11,330 | 304                | 11,080      | 297                |
|                                                                                                                                       | 30                | 2.1  | 2740                                                                        | 73.4               | 6740      | 181                | 10,000   | 268                | 6500     | 174                | 11,270 | 302                | 10,780      | 289                |
|                                                                                                                                       | 40                | 2.8  | 3400                                                                        | 91.1               | 8200      | 220                | 10,900   | 292                | 9220     | 247                | 10,820 | 290                | 11,220      | 301                |
|                                                                                                                                       | 50                | 3.4  | 4250                                                                        | 114                | 9700      | 260                | 10,210   | 274                | 12,580   | 337                | 10,820 | 290                | 10,450      | 280                |
|                                                                                                                                       | 60                | 4.1  | 5100                                                                        | 137                | 11,000    | 295                | 9650     | 259                | 11,750   | 315                | 8840   | 237                | 11,100      | 297                |
|                                                                                                                                       | 80                | 5.5  | 5250                                                                        | 141                | 5210      | 140                | 4060     | 109                | 4970     | 133                | 8550   | 229                | 9400        | 252                |
|                                                                                                                                       | 100               | 6.9  | 5400                                                                        | 145                | 4580      | 123                | 4410     | 118                | 4970     | 133                | 6780   | 182                |             |                    |
|                                                                                                                                       | 125               | 8.6  | 5400                                                                        | 145                | 4400      | 118                | 5290     | 142                | 4330     | 116                |        |                    |             |                    |
|                                                                                                                                       | 150               | 10.3 | 5900                                                                        | 158                | 5020      | 135                | 6170     | 165                | 3130     | 83.9               |        |                    |             |                    |
|                                                                                                                                       | 175               | 12.1 | 555                                                                         | 149                | 5200      | 139                | 6500     | 174                |          |                    |        |                    |             |                    |
| 16 to 40 in. w.c. /<br>40 to 99 mbar<br><br>28 in. w.c. /<br>70 mbar<br>±4 in. w.c. /<br>±10 mbar<br><br>1B413727222<br>Purple        | 5                 | 0.34 | 1200                                                                        | 32.2               | 2400      | 64.3               | 4000     | 107                | 6010     | 161                | 9210   | 247                | 9070        | 243                |
|                                                                                                                                       | 10                | 0.69 | 1600                                                                        | 42.9               | 3700      | 99.2               | 6500     | 174                | 8130     | 218                | 10,300 | 276                | 10,650      | 285                |
|                                                                                                                                       | 15                | 1.0  | 2000                                                                        | 53.6               | 4400      | 118                | 8000     | 214                | 10,340   | 277                | 13,020 | 349                | 12,890      | 345                |
|                                                                                                                                       | 20                | 1.4  | 2300                                                                        | 61.6               | 5100      | 137                | 9250     | 248                | 11,980   | 321                | 14,790 | 396                | 13,170      | 353                |
|                                                                                                                                       | 25                | 1.7  | 2600                                                                        | 69.7               | 5800      | 155                | 10,500   | 281                | 12,390   | 332                | 14,570 | 390                | 14,180      | 380                |
|                                                                                                                                       | 30                | 2.1  | 2800                                                                        | 75.0               | 6600      | 177                | 11,840   | 317                | 12,500   | 335                | 14,050 | 377                | 13,770      | 369                |
|                                                                                                                                       | 40                | 2.8  | 3200                                                                        | 85.8               | 8200      | 220                | 14,060   | 377                | 13,350   | 358                | 13,290 | 356                | 14,110      | 378                |
|                                                                                                                                       | 50                | 3.4  | 4100                                                                        | 110                | 9750      | 261                | 14,010   | 375                | 14,530   | 389                | 12,860 | 345                | 12,050      | 323                |
|                                                                                                                                       | 60                | 4.1  | 5000                                                                        | 134                | 11,100    | 297                | 14,040   | 376                | 13,440   | 360                | 13,020 | 349                | 10,950      | 293                |
|                                                                                                                                       | 80                | 5.5  | 6300                                                                        | 169                | 5910      | 158                | 6140     | 165                | 9950     | 267                | 8500   | 228                | 10,200      | 273                |
|                                                                                                                                       | 100               | 6.9  | 7600                                                                        | 204                | 5220      | 140                | 5420     | 145                | 7780     | 209                | 6500   | 174                |             |                    |
|                                                                                                                                       | 125               | 8.6  | 9200                                                                        | 247                | 5690      | 152                | 6010     | 161                | 8220     | 220                |        |                    |             |                    |
|                                                                                                                                       | 150               | 10.3 | 10,700                                                                      | 287                | 7380      | 198                | 5970     | 160                | 4900     | 131                |        |                    |             |                    |
|                                                                                                                                       | 175               | 12.1 | 5510                                                                        | 148                | 5100      | 137                | 7250     | 194                |          |                    |        |                    |             |                    |

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Downstream piping may affect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

- continued -

# 299H Series

**Table 6. Types 299H and 299HR Flow Capacities<sup>(1)</sup> for 1-1/2 NPT Internal Registration (continued)**

| OUTLET PRESSURE<br>RANGE SETTING,<br>ACCURACY,<br>SPRING PART NUMBER<br>AND COLOR                                   | INLET<br>PRESSURE |      | CAPACITIES IN SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |                    |           |                    |          |                    |          |                    |         |                    |             |                    |
|---------------------------------------------------------------------------------------------------------------------|-------------------|------|-----------------------------------------------------------------------------|--------------------|-----------|--------------------|----------|--------------------|----------|--------------------|---------|--------------------|-------------|--------------------|
|                                                                                                                     |                   |      | Orifice Size, In. / mm                                                      |                    |           |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                                     | psig              | bar  | 1/4 x 3/8 / 6.4 x 9.5                                                       |                    | 3/8 / 9.5 |                    | 1/2 / 13 |                    | 3/4 / 19 |                    | 1 / 25  |                    | 1-3/16 / 30 |                    |
|                                                                                                                     |                   |      | SCFH                                                                        | Nm <sup>3</sup> /h | SCFH      | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH    | Nm <sup>3</sup> /h | SCFH        | Nm <sup>3</sup> /h |
| 1 to 3.25 psig /<br>69 mbar to 0.22 bar<br><br>2 psig / 0.14 bar<br>±1% psia / bar<br><br>T13593T0012<br>Light Blue | 5                 | 0.34 | 1020                                                                        | 27.3               | 2100      | 56.4               | 3640     | 97.5               | 7020     | 188                | 10,790  | 289                | 10,820      | 290                |
|                                                                                                                     | 10                | 0.69 | 1550                                                                        | 41.5               | 3340      | 89.5               | 5840     | 157                | 8990     | 241                | 12,180  | 326                | 11,180      | 300                |
|                                                                                                                     | 15                | 1.0  | 1920                                                                        | 51.4               | 4360      | 117                | 7580     | 203                | 11,260   | 302                | 13,580  | 364                | 11,960      | 321                |
|                                                                                                                     | 20                | 1.4  | 2240                                                                        | 60.0               | 5150      | 138                | 8960     | 240                | 12,950   | 347                | 13,630  | 365                | 12,750      | 342                |
|                                                                                                                     | 25                | 1.7  | 2570                                                                        | 68.9               | 5890      | 158                | 10,250   | 275                | 13,090   | 351                | 13,890  | 372                | 13,370      | 358                |
|                                                                                                                     | 30                | 2.1  | 2890                                                                        | 77.4               | 6640      | 178                | 11,540   | 309                | 14,830   | 397                | 13,740  | 368                | 14,000      | 375                |
|                                                                                                                     | 40                | 2.8  | 3530                                                                        | 94.6               | 8120      | 218                | 14,120   | 378                | 13,500   | 362                | 13,470  | 361                | 15,250      | 409                |
|                                                                                                                     | 50                | 3.4  | 4180                                                                        | 112                | 9600      | 257                | 15,010   | 402                | 13,780   | 369                | 13,970  | 374                | 12,500      | 335                |
|                                                                                                                     | 60                | 4.1  | 4820                                                                        | 129                | 10,890    | 292                | 15,740   | 422                | 14,050   | 377                | 14,080  | 377                | 12,300      | 330                |
|                                                                                                                     | 80                | 5.5  | 6110                                                                        | 164                | 9000      | 241                | 12,230   | 328                | 11,100   | 297                | 12,750  | 342                | 10,500      | 281                |
|                                                                                                                     | 100               | 6.9  | 7400                                                                        | 198                | 5200      | 139                | 5200     | 139                | 5200     | 139                | 6400    | 172                |             |                    |
|                                                                                                                     | 125               | 8.6  | 8170                                                                        | 219                | 5040      | 135                | 5200     | 139                | 5200     | 139                |         |                    |             |                    |
|                                                                                                                     | 150               | 10.3 | 8450                                                                        | 226                | 5870      | 157                | 5200     | 139                | 5600     | 150                |         |                    |             |                    |
|                                                                                                                     | 175               | 12.1 | 7750                                                                        | 208                | 5250      | 141                | 5730     | 154                |          |                    |         |                    |             |                    |
|                                                                                                                     | 10                | 0.69 | 1390                                                                        | 37.2               | 2910      | 78.0               | 5050     | 135                | 8470     | 227                | 12,010  | 322                | 12,190      | 327                |
|                                                                                                                     | 15                | 1.0  | 1870                                                                        | 50.1               | 4190      | 112                | 7280     | 195                | 11,290   | 303                | 14,300  | 383                | 12,400      | 332                |
| 2.75 to 6 psig /<br>0.19 to 0.41 bar<br><br>5 psig / 0.34 bar<br>±1% psia / bar<br><br>T13671T0012<br>Orange        | 20                | 1.4  | 2240                                                                        | 60.0               | 5090      | 136                | 8850     | 237                | 12,590   | 337                | 13,820  | 370                | 13,260      | 355                |
|                                                                                                                     | 25                | 1.7  | 2570                                                                        | 68.9               | 5890      | 158                | 10,250   | 275                | 13,210   | 354                | 14,500  | 389                | 14,310      | 384                |
|                                                                                                                     | 30                | 2.1  | 2890                                                                        | 77.4               | 6640      | 178                | 11,540   | 309                | 13,820   | 370                | 15,290  | 410                | 15,370      | 412                |
|                                                                                                                     | 40                | 2.8  | 3530                                                                        | 94.6               | 8120      | 218                | 14,120   | 378                | 15,060   | 404                | 15,650  | 419                | 16,630      | 446                |
|                                                                                                                     | 50                | 3.4  | 4180                                                                        | 112                | 9600      | 257                | 16,700   | 448                | 15,400   | 413                | 16,010  | 429                | 14,000      | 375                |
|                                                                                                                     | 60                | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 16,290   | 437                | 15,750   | 422                | 16,370  | 439                | 13,250      | 355                |
|                                                                                                                     | 80                | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 14,000   | 375                | 13,620   | 365                | 14,000  | 375                | 14,000      | 375                |
|                                                                                                                     | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 9020     | 242                | 9610     | 258                | 14,000  | 375                |             |                    |
|                                                                                                                     | 125               | 8.6  | 9020                                                                        | 242                | 7690      | 206                | 7690     | 206                | 7890     | 211                |         |                    |             |                    |
|                                                                                                                     | 150               | 10.3 | 10,630                                                                      | 285                | 6330      | 170                | 6360     | 170                | 5500     | 147                |         |                    |             |                    |
|                                                                                                                     | 175               | 12.1 | 6800                                                                        | 182                | 6050      | 162                | 8200     | 220                |          |                    |         |                    |             |                    |
|                                                                                                                     | 15                | 1.0  | 1580                                                                        | 42.3               | 3280      | 87.9               | 5690     | 152                | 9930     | 266                | 13,230  | 355                | 13,570      | 364                |
|                                                                                                                     | 20                | 1.4  | 2130                                                                        | 57.1               | 4720      | 126                | 8210     | 220                | 11,990   | 321                | 14,130  | 379                | 14,100      | 378                |
|                                                                                                                     | 25                | 1.7  | 2540                                                                        | 68.1               | 5740      | 154                | 9940     | 266                | 13,400   | 359                | 15,990  | 429                | 15,870      | 425                |
|                                                                                                                     | 30                | 2.1  | 2890                                                                        | 77.4               | 6580      | 176                | 11,440   | 307                | 14,810   | 397                | 17,850  | 478                | 17,640      | 473                |
| 5 to 16 psig /<br>0.34 to 1.1 bar<br><br>10 psig / 0.69 bar<br>±1% psia / bar<br><br>T13600T0012<br>Red             | 40                | 2.8  | 3530                                                                        | 94.6               | 8120      | 218                | 14,120   | 378                | 17,640   | 473                | 18,630  | 499                | 18,920      | 507                |
|                                                                                                                     | 50                | 3.4  | 4180                                                                        | 112                | 9600      | 257                | 16,700   | 448                | 18,110   | 485                | 19,400  | 520                | 16,400      | 440                |
|                                                                                                                     | 60                | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 17,200   | 461                | 18,580   | 498                | 20,170  | 541                | 16,600      | 445                |
|                                                                                                                     | 80                | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 16,950   | 454                | 17,810   | 477                | 15,750  | 422                | 17,600      | 472                |
|                                                                                                                     | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 15,350   | 411                | 15,900   | 426                | 15,950  | 427                |             |                    |
|                                                                                                                     | 125               | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 16,740   | 449                | 16,270   | 436                |         |                    |             |                    |
|                                                                                                                     | 150               | 10.3 | 6790                                                                        | 182                | 6790      | 182                | 6830     | 183                | 5800     | 155                |         |                    |             |                    |
|                                                                                                                     | 175               | 12.1 | 6200                                                                        | 166                | 5600      | 150                | 5700     | 153                |          |                    |         |                    |             |                    |
|                                                                                                                     | 20                | 1.4  | 1750                                                                        | 46.9               | 3620      | 97.0               | 6290     | 169                | 11,380   | 305                | 114,450 | 3067               | 14,980      | 401                |
|                                                                                                                     | 25                | 1.7  | 2360                                                                        | 63.2               | 5220      | 140                | 9070     | 243                | 13,590   | 364                | 17,440  | 467                | 17,430      | 467                |
|                                                                                                                     | 30                | 2.1  | 2820                                                                        | 75.6               | 6290      | 169                | 10,940   | 293                | 15,810   | 424                | 20,430  | 548                | 19,910      | 534                |
|                                                                                                                     | 40                | 2.8  | 3540                                                                        | 94.9               | 8070      | 216                | 14,020   | 376                | 20,230   | 542                | 21,610  | 579                | 21,220      | 569                |
|                                                                                                                     | 50                | 3.4  | 4180                                                                        | 112                | 9600      | 257                | 16,700   | 448                | 20,820   | 558                | 22,800  | 611                | 20,500      | 549                |
|                                                                                                                     | 60                | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 18,110   | 485                | 21,410   | 574                | 23,890  | 640                | 21,600      | 579                |
|                                                                                                                     | 80                | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 19,910   | 534                | 22,000   | 590                | 19,500  | 523                | 19,900      | 533                |
|                                                                                                                     | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 21,710   | 582                | 22,600   | 606                | 22,200  | 595                |             |                    |
| 14 to 35 psig /<br>0.97 to 2.4 bar<br><br>20 psig / 1.4 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc            | 125               | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 23,960   | 642                | 23,190   | 621                |         |                    |             |                    |
|                                                                                                                     | 150               | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 26,210   | 702                | 21,200   | 568                |         |                    |             |                    |
|                                                                                                                     | 175               | 12.1 | 7400                                                                        | 198                | 6750      | 181                | 7100     | 190                |          |                    |         |                    |             |                    |
|                                                                                                                     | 25                | 1.7  | 1920                                                                        | 51.4               | 3930      | 105                | 6840     | 183                | 12,840   | 344                | 15,670  | 420                | 16,320      | 437                |
|                                                                                                                     | 30                | 2.1  | 2580                                                                        | 69.1               | 5690      | 152                | 9870     | 265                | 15,200   | 407                | 20,740  | 556                | 20,760      | 556                |
|                                                                                                                     | 40                | 2.8  | 3480                                                                        | 93.3               | 7830      | 210                | 13,610   | 365                | 22,820   | 612                | 24,600  | 659                | 23,510      | 630                |
|                                                                                                                     | 50                | 3.4  | 4180                                                                        | 112                | 9550      | 256                | 16,610   | 445                | 20,950   | 561                | 23,620  | 633                | 22,200      | 595                |
|                                                                                                                     | 60                | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 18,080   | 485                | 23,330   | 625                | 26,120  | 700                | 25,000      | 670                |
|                                                                                                                     | 80                | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 20,980   | 562                | 25,120   | 673                | 24,500  | 657                | 24,900      | 667                |
|                                                                                                                     | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 23,680   | 635                | 26,930   | 722                | 26,200  | 702                |             |                    |
|                                                                                                                     | 125               | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 26,980   | 723                | 28,020   | 751                |         |                    |             |                    |
|                                                                                                                     | 150               | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 30,280   | 812                | 21,600   | 579                |         |                    |             |                    |
|                                                                                                                     | 175               | 12.1 | 7500                                                                        | 201                | 8200      | 220                | 8600     | 230                |          |                    |         |                    |             |                    |
|                                                                                                                     |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |         |                    |             |                    |
|                                                                                                                     |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |         |                    |             |                    |

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Downstream piping may affect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

- continued -

**Table 6. Types 299H and 299HR Flow Capacities<sup>(1)</sup> for 1-1/2 NPT Internal Registration (continued)**

| OUTLET PRESSURE<br>RANGE SETTING,<br>ACCURACY,<br>SPRING PART NUMBER<br>AND COLOR                        | INLET<br>PRESSURE |      | CAPACITIES IN SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|----------------------------------------------------------------------------------------------------------|-------------------|------|-----------------------------------------------------------------------------|--------------------|-----------|--------------------|----------|--------------------|----------|--------------------|--------|--------------------|-------------|--------------------|
|                                                                                                          |                   |      | Orifice Size, In. / mm                                                      |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          | psig              | bar  | 1/4 x 3/8 / 6.4 x 9.5                                                       |                    | 3/8 / 9.5 |                    | 1/2 / 13 |                    | 3/4 / 19 |                    | 1 / 25 |                    | 1-3/16 / 30 |                    |
|                                                                                                          |                   |      | SCFH                                                                        | Nm <sup>3</sup> /h | SCFH      | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH   | Nm <sup>3</sup> /h | SCFH        | Nm <sup>3</sup> /h |
| 14 to 35 psig /<br>0.97 to 2.4 bar<br><br>25 psig / 1.7 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc | 30                | 2.1  | 2070                                                                        | 55.5               | 4230      | 113                | 7360     | 197                | 14,300   | 383                | 16,880 | 452                | 17,700      | 474                |
|                                                                                                          | 40                | 2.8  | 3320                                                                        | 89.0               | 7350      | 197                | 12,780   | 343                | 16,810   | 451                | 24,040 | 644                | 24,090      | 646                |
|                                                                                                          | 50                | 3.4  | 4140                                                                        | 111                | 9340      | 250                | 16,250   | 436                | 21,090   | 565                | 24,430 | 655                | 23,500      | 630                |
|                                                                                                          | 60                | 4.1  | 4830                                                                        | 129                | 11,030    | 296                | 18,050   | 484                | 25,240   | 676                | 28,260 | 757                | 27,400      | 734                |
|                                                                                                          | 80                | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 22,050   | 591                | 28,250   | 757                | 30,200 | 809                | 28,500      | 764                |
|                                                                                                          | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 25,650   | 687                | 31,260   | 838                | 27,000 | 724                |             |                    |
|                                                                                                          | 125               | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 30,000   | 804                | 32,840   | 880                |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 34,360   | 921                | 27,000   | 724                |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 10,200                                                                      | 273                | 25,200    | 675                | 7900     | 212                |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 14 to 35 psig /<br>0.97 to 2.4 bar<br><br>30 psig / 2.1 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc | 40                | 2.8  | 2980                                                                        | 79.9               | 6520      | 175                | 11,330   | 304                | 15,750   | 422                | 18,100 | 485                | 19,080      | 511                |
|                                                                                                          | 50                | 3.4  | 4020                                                                        | 108                | 8950      | 240                | 15,560   | 417                | 21,220   | 569                | 25,240 | 676                | 22,500      | 603                |
|                                                                                                          | 60                | 4.1  | 4800                                                                        | 129                | 10,850    | 291                | 18,020   | 483                | 27,150   | 728                | 30,390 | 814                | 28,000      | 750                |
|                                                                                                          | 80                | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 23,130   | 620                | 31,370   | 841                | 30,500 | 817                | 32,300      | 866                |
|                                                                                                          | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 27,630   | 740                | 35,690   | 956                | 32,500 | 871                |             |                    |
|                                                                                                          | 125               | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 33,030   | 885                | 37,670   | 1010               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 38,430   | 1030               | 32,000   | 858                |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 10,600                                                                      | 284                | 24,500    | 657                | 31,500   | 844                |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 14 to 35 psig /<br>0.97 to 2.4 bar<br><br>35 psig / 2.4 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc | 40                | 2.8  | 2350                                                                        | 63.0               | 4790      | 128                | 8330     | 223                | 13,640   | 366                | 19,570 | 524                | 20,850      | 559                |
|                                                                                                          | 50                | 3.4  | 3770                                                                        | 101                | 8300      | 222                | 14,430   | 387                | 21,350   | 572                | 26,060 | 698                | 22,000      | 590                |
|                                                                                                          | 60                | 4.1  | 4700                                                                        | 126                | 10,510    | 282                | 18,270   | 490                | 29,060   | 779                | 32,530 | 872                | 29,000      | 777                |
|                                                                                                          | 80                | 5.5  | 6120                                                                        | 164                | 14,000    | 375                | 24,350   | 653                | 34,490   | 924                | 34,500 | 925                | 33,600      | 900                |
|                                                                                                          | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 39,920   | 1070               | 38,200 | 1024               |             |                    |
|                                                                                                          | 125               | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 42,500   | 1139               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 32,100   | 860                |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 10,900                                                                      | 292                | 24,800    | 665                | 37,000   | 992                |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 30 to 60 psig /<br>2.1 to 4.1 bar<br><br>40 psig / 2.8 bar<br>±1% psia / bar<br><br>19B0432X022<br>Green | 50                | 3.4  | 2400                                                                        | 64.3               | 6000      | 161                | 10,000   | 268                | 14,000   | 375                | 20,000 | 536                | 20,000      | 536                |
|                                                                                                          | 60                | 4.1  | 3470                                                                        | 93.0               | 8000      | 214                | 13,670   | 366                | 22,000   | 590                | 26,000 | 697                | 22,667      | 607                |
|                                                                                                          | 80                | 5.5  | 5600                                                                        | 150                | 12,000    | 322                | 21,000   | 563                | 38,000   | 1018               | 30,000 | 804                | 28,000      | 750                |
|                                                                                                          | 100               | 6.9  | 6400                                                                        | 172                | 14,500    | 389                | 27,000   | 724                | 38,000   | 1018               | 34,000 | 911                |             |                    |
|                                                                                                          | 125               | 8.6  | 7600                                                                        | 204                | 19,500    | 523                | 33,000   | 884                | 38,000   | 1018               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 9500                                                                        | 255                | 22,750    | 610                | 37,000   | 992                | 42,000   | 1126               |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 11,400                                                                      | 306                | 26,000    | 697                | 41,000   | 1099               |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 30 to 60 psig /<br>2.1 to 4.1 bar<br><br>50 psig / 3.4 bar<br>±1% psia / bar<br><br>19B0432X022<br>Green | 60                | 4.1  | 3000                                                                        | 80.4               | 6500      | 174                | 9500     | 255                | 16,250   | 436                | 22,500 | 603                | 25,000      | 670                |
|                                                                                                          | 80                | 5.5  | 5250                                                                        | 141                | 10,750    | 288                | 17,750   | 476                | 28,750   | 771                | 31,250 | 838                | 32,500      | 871                |
|                                                                                                          | 100               | 6.9  | 6750                                                                        | 181                | 15,000    | 402                | 26,000   | 697                | 41,250   | 1106               | 40,000 | 1072               |             |                    |
|                                                                                                          | 125               | 8.6  | 8250                                                                        | 221                | 17,500    | 469                | 32,500   | 871                | 43,750   | 1173               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 9500                                                                        | 255                | 21,750    | 583                | 37,750   | 1012               | 46,250   | 1240               |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 10,750                                                                      | 288                | 26,000    | 697                | 43,000   | 1152               |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 30 to 60 psig /<br>2.1 to 4.1 bar<br><br>60 psig / 4.1 bar<br>±1% psia / bar<br><br>19B0432X022<br>Green | 80                | 5.5  | 2750                                                                        | 73.7               | 7200      | 193                | 13,000   | 348                | 18,750   | 503                | 27,500 | 737                | 32,500      | 871                |
|                                                                                                          | 100               | 6.9  | 2750                                                                        | 73.7               | 10,600    | 284                | 15,500   | 415                | 25,000   | 670                | 40,000 | 1072               |             |                    |
|                                                                                                          | 125               | 8.6  | 3250                                                                        | 87.1               | 3000      | 80.4               | 22,000   | 590                | 46,250   | 1240               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 3130                                                                        | 83.9               | 2900      | 77.7               | 18,000   | 482                | 11,250   | 302                |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 3000                                                                        | 80.4               | 2800      | 75.0               | 14,000   | 375                |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Downstream piping may affect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

# 299H Series

**Table 7. Types 299H and 299HR Flow Capacities<sup>(1)</sup> for NPS 2 / DN 50 Internal Registration**

| OUTLET PRESSURE<br>RANGE SETTING,<br>ACCURACY,<br>SPRING PART NUMBER<br>AND COLOR                                                  | INLET<br>PRESSURE |      | CAPACITIES IN SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-----------------------------------------------------------------------------|--------------------|-----------|--------------------|----------|--------------------|----------|--------------------|--------|--------------------|-------------|--------------------|
|                                                                                                                                    |                   |      | Orifice Size, In. / mm                                                      |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                                                    | psig              | bar  | 1/4 x 3/8 / 6.4 x 9.5                                                       |                    | 3/8 / 9.5 |                    | 1/2 / 13 |                    | 3/4 / 19 |                    | 1 / 25 |                    | 1-3/16 / 30 |                    |
|                                                                                                                                    |                   |      | SCFH                                                                        | Nm <sup>3</sup> /h | SCFH      | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH   | Nm <sup>3</sup> /h | SCFH        | Nm <sup>3</sup> /h |
| 3.5 to 6-in. w.c. /<br>9 to 15 mbar<br><br>3.5-in. w.c. / 9 mbar<br>-1 to 2-in. w.c. /<br>-2 to 5 mbar<br><br>T13707T0012<br>Black | 2                 | 0.14 | 760                                                                         | 20.4               | 1560      | 41.8               | 2700     | 72.4               | 4050     | 109                | 5740   | 154                | 6350        | 170                |
|                                                                                                                                    | 5                 | 0.34 | 1200                                                                        | 32.2               | 2600      | 69.7               | 4500     | 121                | 8600     | 230                | 11,500 | 308                | 12,000      | 322                |
|                                                                                                                                    | 10                | 0.69 | 1700                                                                        | 45.6               | 3800      | 102                | 6500     | 174                | 9500     | 255                | 14,750 | 395                | 17,000      | 456                |
|                                                                                                                                    | 15                | 1.0  | 2000                                                                        | 53.6               | 4600      | 123                | 8000     | 214                | 10,600   | 284                | 18,000 | 482                | 15,500      | 415                |
|                                                                                                                                    | 20                | 1.4  | 2350                                                                        | 63.0               | 5300      | 142                | 9250     | 248                | 11,400   | 306                | 19,700 | 528                | 16,000      | 429                |
|                                                                                                                                    | 25                | 1.7  | 2700                                                                        | 72.4               | 6000      | 161                | 10,500   | 281                | 12,200   | 327                | 20,400 | 547                | 17,300      | 464                |
|                                                                                                                                    | 30                | 2.1  | 3030                                                                        | 81.2               | 6730      | 180                | 11,500   | 308                | 14,630   | 392                | 21,100 | 565                | 18,600      | 498                |
|                                                                                                                                    | 40                | 2.8  | 3700                                                                        | 99.2               | 8200      | 220                | 13,500   | 362                | 19,500   | 523                | 20,400 | 547                | 21,800      | 584                |
|                                                                                                                                    | 50                | 3.4  | 4400                                                                        | 118                | 9700      | 260                | 17,000   | 456                | 20,000   | 536                | 19,700 | 528                | 25,000      | 670                |
|                                                                                                                                    | 60                | 4.1  | 5100                                                                        | 137                | 11,200    | 300                | 20,500   | 549                | 20,500   | 549                | 14,833 | 398                | 12,500      | 335                |
|                                                                                                                                    | 80                | 5.5  | 4700                                                                        | 126                | 7500      | 201                | 12,750   | 342                | 19,600   | 525                | 5100   | 137                | 12,000      | 322                |
|                                                                                                                                    | 100               | 6.9  | 4300                                                                        | 115                | 3800      | 102                | 5000     | 134                | 18,700   | 501                | 3500   | 93.8               |             |                    |
|                                                                                                                                    | 125               | 8.6  | 4300                                                                        | 115                | 4000      | 107                | 5500     | 147                | 11,150   | 299                |        |                    |             |                    |
|                                                                                                                                    | 150               | 10.3 | 4300                                                                        | 115                | 4000      | 107                | 6000     | 161                | 3600     | 96.5               |        |                    |             |                    |
|                                                                                                                                    | 175               | 12.1 | 4300                                                                        | 115                | 4000      | 107                | 6500     | 174                |          |                    |        |                    |             |                    |
| 5 to 9-in. w.c. /<br>12 to 22 mbar<br><br>7-in. w.c. / 17 mbar<br>-1 to 2-in. w.c. /<br>-2 to 5 mbar<br><br>T13589T0012<br>Yellow  | 2                 | 0.14 | 750                                                                         | 20.1               | 1520      | 40.7               | 2650     | 71.0               | 5380     | 144                | 6260   | 168                | 6680        | 179                |
|                                                                                                                                    | 5                 | 0.34 | 1300                                                                        | 34.8               | 2600      | 69.7               | 4250     | 114                | 8500     | 228                | 10,500 | 281                | 10,000      | 268                |
|                                                                                                                                    | 10                | 0.69 | 1600                                                                        | 42.9               | 3800      | 102                | 6500     | 174                | 12,500   | 335                | 14,350 | 385                | 17,000      | 456                |
|                                                                                                                                    | 15                | 1.0  | 2000                                                                        | 53.6               | 4400      | 118                | 8000     | 214                | 10,500   | 281                | 18,200 | 488                | 16,000      | 429                |
|                                                                                                                                    | 20                | 1.4  | 2300                                                                        | 61.6               | 5100      | 137                | 9500     | 255                | 11,500   | 308                | 20,600 | 552                | 16,000      | 429                |
|                                                                                                                                    | 25                | 1.7  | 2600                                                                        | 69.7               | 5800      | 155                | 11,000   | 295                | 12,500   | 335                | 20,500 | 549                | 17,750      | 476                |
|                                                                                                                                    | 30                | 2.1  | 2970                                                                        | 79.6               | 6600      | 177                | 11,170   | 299                | 16,830   | 451                | 20,400 | 547                | 19,500      | 523                |
|                                                                                                                                    | 40                | 2.8  | 3700                                                                        | 99.2               | 8200      | 220                | 11,500   | 308                | 25,500   | 683                | 20,200 | 541                | 20,200      | 541                |
|                                                                                                                                    | 50                | 3.4  | 4400                                                                        | 118                | 9700      | 260                | 15,750   | 422                | 22,500   | 603                | 20,000 | 536                | 20,900      | 560                |
|                                                                                                                                    | 60                | 4.1  | 5100                                                                        | 137                | 11,200    | 300                | 20,000   | 536                | 19,500   | 523                | 14,800 | 397                | 12,500      | 335                |
|                                                                                                                                    | 80                | 5.5  | 4850                                                                        | 130                | 7350      | 197                | 12,380   | 332                | 4500     | 121                | 4400   | 118                | 12,500      | 335                |
|                                                                                                                                    | 100               | 6.9  | 4600                                                                        | 123                | 3500      | 93.8               | 4750     | 127                | 4500     | 121                | 2800   | 75.0               |             |                    |
|                                                                                                                                    | 125               | 8.6  | 4600                                                                        | 123                | 4000      | 107                | 5250     | 141                | 4500     | 121                |        |                    |             |                    |
|                                                                                                                                    | 150               | 10.3 | 4600                                                                        | 123                | 4560      | 122                | 5750     | 154                | 4500     | 121                |        |                    |             |                    |
|                                                                                                                                    | 175               | 12.1 | 4600                                                                        | 123                | 5120      | 137                | 6500     | 174                |          |                    |        |                    |             |                    |
| 7 to 20-in. w.c. /<br>17 to 50 mbar<br><br>14-in. w.c. / 35 mbar<br>±2-in. w.c. / ±5 mbar<br><br>1N3112X0012<br>Unpainted          | 2                 | 0.14 | 700                                                                         | 18.8               | 1430      | 38.3               | 2480     | 66.5               | 5040     | 135                | 7440   | 199                | 8460        | 227                |
|                                                                                                                                    | 5                 | 0.34 | 1100                                                                        | 29.5               | 2200      | 59.0               | 4000     | 107                | 8500     | 228                | 11,800 | 316                | 12,400      | 332                |
|                                                                                                                                    | 10                | 0.69 | 1700                                                                        | 45.6               | 3600      | 96.5               | 6500     | 174                | 12,500   | 335                | 15,850 | 425                | 17,000      | 456                |
|                                                                                                                                    | 15                | 1.0  | 1900                                                                        | 50.9               | 4600      | 123                | 8000     | 214                | 11,500   | 308                | 19,900 | 533                | 17,000      | 456                |
|                                                                                                                                    | 20                | 1.4  | 2150                                                                        | 57.6               | 5300      | 142                | 8500     | 228                | 12,500   | 335                | 21,000 | 563                | 19,100      | 512                |
|                                                                                                                                    | 25                | 1.7  | 2400                                                                        | 64.3               | 6000      | 161                | 9000     | 241                | 13,250   | 355                | 21,150 | 567                | 19,750      | 529                |
|                                                                                                                                    | 30                | 2.1  | 2740                                                                        | 73.4               | 6740      | 181                | 10,000   | 268                | 14,000   | 375                | 21,300 | 571                | 20,400      | 547                |
|                                                                                                                                    | 40                | 2.8  | 3400                                                                        | 91.1               | 8200      | 220                | 12,000   | 322                | 19,500   | 523                | 21,150 | 567                | 21,650      | 580                |
|                                                                                                                                    | 50                | 3.4  | 4250                                                                        | 114                | 9700      | 260                | 13,500   | 362                | 25,000   | 670                | 21,000 | 563                | 22,900      | 614                |
|                                                                                                                                    | 60                | 4.1  | 5100                                                                        | 137                | 11,200    | 300                | 15,000   | 402                | 22,050   | 591                | 16,330 | 438                | 14,100      | 378                |
|                                                                                                                                    | 80                | 5.5  | 5250                                                                        | 141                | 8200      | 220                | 10,000   | 268                | 5620     | 151                | 7000   | 188                | 12,400      | 332                |
|                                                                                                                                    | 100               | 6.9  | 5400                                                                        | 145                | 5200      | 139                | 5000     | 134                | 6000     | 161                | 8300   | 222                |             |                    |
|                                                                                                                                    | 125               | 8.6  | 5400                                                                        | 145                | 5000      | 134                | 6000     | 161                | 6000     | 161                |        |                    |             |                    |
|                                                                                                                                    | 150               | 10.3 | 5900                                                                        | 158                | 5700      | 153                | 7000     | 188                | 6000     | 161                |        |                    |             |                    |
|                                                                                                                                    | 175               | 12.1 | 6400                                                                        | 172                | 6400      | 172                | 7000     | 188                |          |                    |        |                    |             |                    |
| 16 to 40-in. w.c. /<br>40 to 99 mbar<br><br>28-in. w.c. / 70 mbar<br>±4-in. w.c. / ±10 mbar<br><br>1B413727222<br>Purple           | 5                 | 0.34 | 1200                                                                        | 32.2               | 2400      | 64.3               | 4000     | 107                | 7500     | 201                | 9500   | 255                | 11,400      | 306                |
|                                                                                                                                    | 10                | 0.69 | 1600                                                                        | 42.9               | 3700      | 99.2               | 6500     | 174                | 11,750   | 315                | 14,850 | 398                | 16,850      | 452                |
|                                                                                                                                    | 15                | 1.0  | 2000                                                                        | 53.6               | 4400      | 118                | 8000     | 214                | 16,000   | 429                | 20,200 | 541                | 22,300      | 598                |
|                                                                                                                                    | 20                | 1.4  | 2300                                                                        | 61.6               | 5100      | 137                | 9250     | 248                | 19,000   | 509                | 24,500 | 657                | 21,800      | 584                |
|                                                                                                                                    | 25                | 1.7  | 2600                                                                        | 69.7               | 5800      | 155                | 10,500   | 281                | 21,750   | 583                | 25,600 | 686                | 23,900      | 641                |
|                                                                                                                                    | 30                | 2.1  | 2800                                                                        | 75.0               | 6600      | 177                | 11,830   | 317                | 24,500   | 657                | 25,230 | 676                | 24,130      | 647                |
|                                                                                                                                    | 40                | 2.8  | 3200                                                                        | 85.8               | 8200      | 220                | 14,500   | 389                | 26,750   | 717                | 24,500 | 657                | 24,600      | 659                |
|                                                                                                                                    | 50                | 3.4  | 4100                                                                        | 110                | 9750      | 261                | 16,500   | 442                | 29,000   | 777                | 24,000 | 643                | 26,000      | 697                |
|                                                                                                                                    | 60                | 4.1  | 5000                                                                        | 134                | 11,300    | 303                | 18,500   | 496                | 24,170   | 648                | 23,500 | 630                | 27,200      | 729                |
|                                                                                                                                    | 80                | 5.5  | 6300                                                                        | 169                | 9150      | 245                | 12,880   | 345                | 14,500   | 389                | 24,500 | 657                | 30,000      | 804                |
|                                                                                                                                    | 100               | 6.9  | 7600                                                                        | 204                | 7000      | 188                | 7250     | 194                | 14,500   | 389                | 22,400 | 600                |             |                    |
|                                                                                                                                    | 125               | 8.6  | 9200                                                                        | 247                | 7000      | 188                | 7380     | 198                | 14,500   | 389                |        |                    |             |                    |
|                                                                                                                                    | 150               | 10.3 | 10,700                                                                      | 287                | 9300      | 249                | 7500     | 201                | 15,500   | 415                |        |                    |             |                    |
|                                                                                                                                    | 175               | 12.1 | 12,200                                                                      | 327                | 11,600    | 311                | 15,250   | 409                |          |                    |        |                    |             |                    |
|                                                                                                                                    |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Downstream piping may affect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

- continued -

**Table 7. Types 299H and 299HR Flow Capacities<sup>(1)</sup> for NPS 2 / DN 50 Internal Registration (continued)**

| OUTLET PRESSURE RANGE SETTING, ACCURACY, SPRING PART NUMBER AND COLOR                                         | INLET PRESSURE |      | CAPACITIES IN SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|---------------------------------------------------------------------------------------------------------------|----------------|------|-----------------------------------------------------------------------------|--------------------|-----------|--------------------|----------|--------------------|----------|--------------------|--------|--------------------|-------------|--------------------|
|                                                                                                               |                |      | Orifice Size, In. / mm                                                      |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               | psig           | bar  | 1/4 x 3/8 / 6.4 x 9.5                                                       |                    | 3/8 / 9.5 |                    | 1/2 / 13 |                    | 3/4 / 19 |                    | 1 / 25 |                    | 1-3/16 / 30 |                    |
|                                                                                                               |                |      | SCFH                                                                        | Nm <sup>3</sup> /h | SCFH      | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH   | Nm <sup>3</sup> /h | SCFH        | Nm <sup>3</sup> /h |
| 1 to 3.25 psig / 69 bar to 0.22 bar<br><br>2 psig / 0.14 bar ± 1% psia / bar<br><br>T13593T0012<br>Light Blue | 5              | 0.34 | 1020                                                                        | 27.3               | 2100      | 56.4               | 3640     | 97.5               | 7440     | 199                | 10,980 | 294                | 13,800      | 370                |
|                                                                                                               | 10             | 0.69 | 1550                                                                        | 41.5               | 3340      | 89.5               | 5840     | 157                | 12,040   | 323                | 15,460 | 414                | 17,710      | 475                |
|                                                                                                               | 15             | 1.0  | 1920                                                                        | 51.4               | 4360      | 117                | 7580     | 203                | 15,990   | 429                | 20,900 | 560                | 20,670      | 554                |
|                                                                                                               | 20             | 1.4  | 2240                                                                        | 60.0               | 5150      | 138                | 8960     | 240                | 19,250   | 516                | 22,470 | 602                | 21,620      | 579                |
|                                                                                                               | 25             | 1.7  | 2670                                                                        | 71.5               | 5890      | 158                | 10,250   | 275                | 22,030   | 590                | 24,000 | 643                | 22,410      | 601                |
|                                                                                                               | 30             | 2.1  | 2890                                                                        | 77.4               | 6640      | 178                | 11,540   | 309                | 27,800   | 745                | 24,860 | 666                | 24,170      | 648                |
|                                                                                                               | 40             | 2.8  | 3530                                                                        | 94.6               | 8120      | 218                | 14,120   | 378                | 27,070   | 725                | 25,640 | 687                | 26,160      | 701                |
|                                                                                                               | 50             | 3.4  | 4180                                                                        | 112                | 9600      | 257                | 16,700   | 448                | 28,970   | 776                | 26,390 | 707                | 26,900      | 721                |
|                                                                                                               | 60             | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 19,280   | 517                | 25,770   | 691                | 26,000 | 697                | 29,000      | 777                |
|                                                                                                               | 80             | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 25,500   | 683                | 12,800 | 343                | 30,000      | 804                |
|                                                                                                               | 100            | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,840   | 800                | 14,260   | 382                | 28,300 | 758                |             |                    |
|                                                                                                               | 125            | 8.6  | 8170                                                                        | 219                | 12,360    | 331                | 17,520   | 470                | 13,260   | 355                |        |                    |             |                    |
|                                                                                                               | 150            | 10.3 | 8450                                                                        | 226                | 13,750    | 369                | 18,580   | 498                | 17,000   | 456                |        |                    |             |                    |
|                                                                                                               | 175            | 12.1 | 12,400                                                                      | 332                | 7100      | 190                | 20,000   | 536                |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 2.75 to 6 psig / 0.19 to 0.41 bar<br><br>5 psig / 0.34 bar ± 1% psig / bar<br><br>T13671T0012<br>Orange       | 10             | 0.69 | 1390                                                                        | 37.2               | 2910      | 78.0               | 5050     | 135                | 10,350   | 277                | 13,200 | 354                | 16,070      | 431                |
|                                                                                                               | 15             | 1.0  | 1870                                                                        | 50.1               | 4190      | 112                | 7280     | 195                | 15,150   | 406                | 21,850 | 586                | 21,370      | 573                |
|                                                                                                               | 20             | 1.4  | 2240                                                                        | 60.0               | 5090      | 136                | 8850     | 237                | 18,640   | 500                | 21,350 | 572                | 21,390      | 573                |
|                                                                                                               | 25             | 1.7  | 2570                                                                        | 68.9               | 5890      | 158                | 10,250   | 275                | 21,260   | 570                | 24,540 | 658                | 22,740      | 609                |
|                                                                                                               | 30             | 2.1  | 2890                                                                        | 77.4               | 6640      | 178                | 11,540   | 309                | 24,340   | 652                | 26,500 | 710                | 25,870      | 693                |
|                                                                                                               | 40             | 2.8  | 3530                                                                        | 94.6               | 8120      | 218                | 14,120   | 378                | 27,670   | 742                | 28,300 | 758                | 28,930      | 775                |
|                                                                                                               | 50             | 3.4  | 4180                                                                        | 112                | 9600      | 257                | 16,700   | 448                | 30,570   | 819                | 29,870 | 801                | 30,000      | 804                |
|                                                                                                               | 60             | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 19,280   | 517                | 29,390   | 788                | 30,390 | 814                | 31,000      | 831                |
|                                                                                                               | 80             | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 31,410   | 842                | 28,000 | 750                | 34,000      | 911                |
|                                                                                                               | 100            | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 22,150   | 594                | 32,000 | 858                |             |                    |
|                                                                                                               | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 21,590   | 579                |        |                    |             |                    |
|                                                                                                               | 150            | 10.3 | 10,630                                                                      | 285                | 17,170    | 460                | 26,560   | 712                | 17,000   | 456                |        |                    |             |                    |
|                                                                                                               | 175            | 12.1 | 11,800                                                                      | 316                | 15,400    | 413                | 21,500   | 576                |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 5 to 16 psig / 0.34 to 1.1 bar<br><br>10 psig / 0.69 bar ± 1% psia / bar<br><br>T13600T0012<br>Red            | 15             | 1.0  | 1580                                                                        | 42.3               | 3280      | 87.9               | 5690     | 152                | 11,640   | 312                | 15,420 | 413                | 18,340      | 492                |
|                                                                                                               | 20             | 1.4  | 2130                                                                        | 57.1               | 4720      | 126                | 8210     | 220                | 17,000   | 456                | 19,500 | 523                | 21,000      | 563                |
|                                                                                                               | 25             | 1.7  | 2540                                                                        | 68.1               | 5740      | 154                | 9940     | 266                | 20,790   | 557                | 25,440 | 682                | 23,290      | 624                |
|                                                                                                               | 30             | 2.1  | 2890                                                                        | 77.4               | 6580      | 176                | 11,440   | 307                | 24,150   | 647                | 29,250 | 784                | 28,700      | 769                |
|                                                                                                               | 40             | 2.8  | 3530                                                                        | 94.6               | 8120      | 218                | 14,120   | 378                | 28,660   | 768                | 32,780 | 879                | 33,540      | 899                |
|                                                                                                               | 50             | 3.4  | 4180                                                                        | 112                | 9600      | 257                | 16,700   | 448                | 33,230   | 891                | 35,680 | 956                | 33,100      | 887                |
|                                                                                                               | 60             | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 19,280   | 517                | 35,410   | 949                | 37,700 | 1010               | 33,100      | 887                |
|                                                                                                               | 80             | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 41,270   | 1106               | 38,000 | 1018               | 37,000      | 992                |
|                                                                                                               | 100            | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 35,310   | 946                | 35,000 | 938                |             |                    |
|                                                                                                               | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 35,740   | 958                |        |                    |             |                    |
|                                                                                                               | 150            | 10.3 | 10,630                                                                      | 285                | 20,590    | 552                | 34,530   | 925                | 22,000   | 590                |        |                    |             |                    |
|                                                                                                               | 175            | 12.1 | 11,200                                                                      | 300                | 18,100    | 485                | 25,000   | 670                |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 5 to 16 psig / 0.34 to 1.1 bar<br><br>15 psig / 10 bar ± 1% psia / bar<br><br>T13600T0012<br>Red              | 20             | 1.4  | 1750                                                                        | 46.9               | 3620      | 97.0               | 6290     | 169                | 12,830   | 344                | 17,640 | 473                | 20,640      | 553                |
|                                                                                                               | 25             | 1.7  | 2360                                                                        | 63.2               | 5220      | 140                | 9070     | 243                | 18,700   | 501                | 26,350 | 706                | 23,850      | 639                |
|                                                                                                               | 30             | 2.1  | 2820                                                                        | 75.6               | 6290      | 169                | 10,940   | 293                | 22,790   | 611                | 31,990 | 857                | 31,540      | 845                |
|                                                                                                               | 40             | 2.8  | 3540                                                                        | 94.9               | 8070      | 216                | 14,020   | 376                | 29,650   | 795                | 37,270 | 999                | 38,150      | 1022               |
|                                                                                                               | 50             | 3.4  | 4180                                                                        | 112                | 9600      | 257                | 16,700   | 448                | 35,890   | 962                | 41,490 | 1112               | 43,000      | 1152               |
|                                                                                                               | 60             | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 19,280   | 517                | 41,440   | 1111               | 45,020 | 1207               | 39,000      | 1045               |
|                                                                                                               | 80             | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 51,120   | 1370               | 49,000 | 1313               | 43,000      | 1152               |
|                                                                                                               | 100            | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 48,470   | 1299               | 46,000 | 1233               |             |                    |
|                                                                                                               | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 49,780   | 1334               |        |                    |             |                    |
|                                                                                                               | 150            | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 60,000   | 1608               |        |                    |             |                    |
|                                                                                                               | 175            | 12.1 | 11,800                                                                      | 316                | 27,400    | 734                | 48,000   | 1286               |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 14 to 35 psig / 0.97 to 2.4 bar<br><br>20 psig / 14 bar ± 1% psia / bar<br><br>19B0432X012<br>Zinc            | 25             | 1.7  | 1920                                                                        | 51.4               | 3930      | 105                | 6840     | 183                | 13,930   | 373                | 20,800 | 557                | 21,940      | 588                |
|                                                                                                               | 30             | 2.1  | 2580                                                                        | 69.1               | 5680      | 152                | 9870     | 265                | 20,280   | 544                | 30,630 | 821                | 32,630      | 874                |
|                                                                                                               | 40             | 2.8  | 3480                                                                        | 93.3               | 7830      | 210                | 13,610   | 365                | 28,440   | 762                | 33,040 | 885                | 35,700      | 957                |
|                                                                                                               | 50             | 3.4  | 4180                                                                        | 112                | 9550      | 256                | 16,610   | 445                | 35,140   | 942                | 41,800 | 1120               | 40,520      | 1086               |
|                                                                                                               | 60             | 4.1  | 4820                                                                        | 129                | 11,090    | 297                | 19,280   | 517                | 41,440   | 1111               | 47,530 | 1274               | 40,520      | 1086               |
|                                                                                                               | 80             | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 51,240   | 1373               | 41,800 | 1120               | 41,000      | 1099               |
|                                                                                                               | 100            | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 52,260   | 1401               | 41,800 | 1120               |             |                    |
|                                                                                                               | 125            | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 56,710   | 1520               |        |                    |             |                    |
|                                                                                                               | 150            | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 65,000   | 1742               |        |                    |             |                    |
|                                                                                                               | 175            | 12.1 | 11,600                                                                      | 311                | 26,300    | 705                | 47,000   | 1260               |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                               |                |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Downstream piping may affect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

- continued -

# 299H Series

**Table 7. Types 299H and 299HR Flow Capacities<sup>(1)</sup> for NPS 2 / DN 50 Internal Registration (continued)**

| OUTLET PRESSURE<br>RANGE SETTING,<br>ACCURACY,<br>SPRING PART NUMBER<br>AND COLOR                        | INLET<br>PRESSURE |      | CAPACITIES IN SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|----------------------------------------------------------------------------------------------------------|-------------------|------|-----------------------------------------------------------------------------|--------------------|-----------|--------------------|----------|--------------------|----------|--------------------|--------|--------------------|-------------|--------------------|
|                                                                                                          |                   |      | Orifice Size, In. / mm                                                      |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          | psig              | bar  | 1/4 x 3/8 / 6.4 x 9.5                                                       |                    | 3/8 / 9.5 |                    | 1/2 / 13 |                    | 3/4 / 19 |                    | 1 / 25 |                    | 1-3/16 / 30 |                    |
|                                                                                                          |                   |      | SCFH                                                                        | Nm <sup>3</sup> /h | SCFH      | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH     | Nm <sup>3</sup> /h | SCFH   | Nm <sup>3</sup> /h | SCFH        | Nm <sup>3</sup> /h |
| 14 to 35 psig /<br>0.97 to 2.4 bar<br><br>25 psig / 1.7 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc | 30                | 2.1  | 2070                                                                        | 55.5               | 4230      | 113                | 7360     | 197                | 14,980   | 401                | 22,310 | 598                | 23,270      | 624                |
|                                                                                                          | 40                | 2.8  | 3320                                                                        | 89.0               | 7350      | 197                | 12,780   | 343                | 23,420   | 628                | 40,220 | 1078               | 33,260      | 891                |
|                                                                                                          | 50                | 3.4  | 4140                                                                        | 111                | 9340      | 250                | 16,250   | 436                | 34,040   | 912                | 42,110 | 1129               | 50,000      | 1340               |
|                                                                                                          | 60                | 4.1  | 4830                                                                        | 129                | 11,030    | 296                | 19,190   | 514                | 40,630   | 1089               | 50,050 | 1341               | 54,000      | 1447               |
|                                                                                                          | 80                | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 51,360   | 1376               | 62,000 | 1662               | 60,000      | 1608               |
|                                                                                                          | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 56,050   | 1502               | 60,000 | 1608               |             |                    |
|                                                                                                          | 125               | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 63,640   | 1706               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 77,000   | 2064               |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 11,000                                                                      | 295                | 26,500    | 710                | 46,000   | 1233               |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 14 to 35 psig /<br>0.97 to 2.4 bar<br><br>30 psig / 2.1 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc | 40                | 2.8  | 2980                                                                        | 79.9               | 6520      | 175                | 11,330   | 304                | 23,190   | 621                | 24,580 | 659                | 30,810      | 826                |
|                                                                                                          | 50                | 3.4  | 4020                                                                        | 108                | 8950      | 240                | 15,560   | 417                | 32,300   | 866                | 42,430 | 1137               | 50,000      | 1340               |
|                                                                                                          | 60                | 4.1  | 4800                                                                        | 129                | 10,850    | 291                | 18,870   | 506                | 39,600   | 1061               | 52,560 | 1409               | 54,000      | 1447               |
|                                                                                                          | 80                | 5.5  | 6110                                                                        | 164                | 14,050    | 377                | 24,440   | 655                | 51,480   | 1380               | 72,000 | 1930               | 72,000      | 1930               |
|                                                                                                          | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 59,840   | 1604               | 76,000 | 2037               |             |                    |
|                                                                                                          | 125               | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 70,570   | 1891               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 84,000   | 2251               |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 10,200                                                                      | 273                | 25,000    | 670                | 48,000   | 1286               |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 14 to 35 psig /<br>0.97 to 2.4 bar<br><br>35 psig / 2.4 bar<br>±1% psia / bar<br><br>19B0432X012<br>Zinc | 40                | 2.8  | 2350                                                                        | 63.0               | 4790      | 128                | 8330     | 223                | 16,920   | 453                | 20,350 | 545                | 28,360      | 760                |
|                                                                                                          | 50                | 3.4  | 3770                                                                        | 101                | 8300      | 222                | 14,430   | 387                | 29,690   | 796                | 42,740 | 1145               | 48,000      | 1286               |
|                                                                                                          | 60                | 4.1  | 4700                                                                        | 126                | 10,510    | 282                | 18,270   | 490                | 38,050   | 1020               | 55,080 | 1476               | 60,000      | 1608               |
|                                                                                                          | 80                | 5.5  | 6120                                                                        | 164                | 14,000    | 375                | 24,350   | 653                | 51,600   | 1383               | 70,000 | 1876               | 74,000      | 1983               |
|                                                                                                          | 100               | 6.9  | 7400                                                                        | 198                | 17,020    | 456                | 29,600   | 793                | 63,630   | 1705               | 76,000 | 2037               |             |                    |
|                                                                                                          | 125               | 8.6  | 9020                                                                        | 242                | 20,730    | 556                | 36,050   | 966                | 77,500   | 2077               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 10,630                                                                      | 285                | 24,440    | 655                | 42,500   | 1139               | 87,000   | 2332               |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 11,200                                                                      | 300                | 25,500    | 683                | 49,000   | 1313               |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 30 to 60 psig /<br>2.1 to 4.1 bar<br><br>40 psig / 2.8 bar<br>±1% psia / bar<br><br>19B0432X022<br>Green | 50                | 3.4  | 1600                                                                        | 42.9               | 6500      | 174                | 9000     | 241                | 20,000   | 536                | 28,000 | 750                | 34,000      | 911                |
|                                                                                                          | 60                | 4.1  | 2800                                                                        | 75.0               | 8170      | 219                | 17,000   | 456                | 33,000   | 884                | 48,000 | 1286               | 52,000      | 1394               |
|                                                                                                          | 80                | 5.5  | 5200                                                                        | 139                | 11,500    | 308                | 23,000   | 616                | 48,000   | 1286               | 66,000 | 1769               | 68,000      | 1822               |
|                                                                                                          | 100               | 6.9  | 7600                                                                        | 204                | 13,500    | 362                | 29,000   | 777                | 31,000   | 831                | 76,000 | 2037               |             |                    |
|                                                                                                          | 125               | 8.6  | 8200                                                                        | 220                | 19,000    | 509                | 35,000   | 938                | 76,000   | 2037               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 9800                                                                        | 263                | 22,750    | 610                | 42,000   | 1126               | 91,000   | 2439               |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 11,400                                                                      | 306                | 26,500    | 710                | 47,000   | 1260               |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 30 to 60 psig /<br>2.1 to 4.1 bar<br><br>50 psig / 3.4 bar<br>±1% psia / bar<br><br>19B0432X022<br>Green | 60                | 4.1  | 3400                                                                        | 91.1               | 7000      | 188                | 10,000   | 268                | 21,000   | 563                | 32,000 | 858                | 45,000      | 1206               |
|                                                                                                          | 80                | 5.5  | 5800                                                                        | 155                | 11,000    | 295                | 21,000   | 563                | 45,000   | 1206               | 69,000 | 1849               | 74,000      | 1983               |
|                                                                                                          | 100               | 6.9  | 6200                                                                        | 166                | 15,000    | 402                | 26,000   | 697                | 59,000   | 1581               | 88,000 | 2358               |             |                    |
|                                                                                                          | 125               | 8.6  | 8400                                                                        | 225                | 19,500    | 523                | 35,000   | 938                | 77,000   | 2064               |        |                    |             |                    |
|                                                                                                          | 150               | 10.3 | 9600                                                                        | 257                | 23,000    | 616                | 42,000   | 1126               | 89,000   | 2385               |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 10,800                                                                      | 289                | 26,500    | 710                | 49,000   | 1313               |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |
| 30 to 60 psig /<br>2.1 to 4.1 bar<br><br>60 psig / 4.1 bar<br>±1% psia / bar<br><br>19B0432X022<br>Green | 80                | 5.5  | 2800                                                                        | 75.0               | 3500      | 93.8               | 17,000   | 456                | 36,000   | 965                | 52,000 | 1394               | 53,000      | 1420               |
|                                                                                                          | 100               | 6.9  | 3600                                                                        | 96.5               | 9500      | 255                | 23,000   | 616                | 50,000   | 1340               | 64,000 | 1715               |             |                    |
|                                                                                                          | 125               | 8.6  | 2800                                                                        | 75.0               | 15,000    | 402                | 22,000   | 590                | 69,000   | 1849               | 90,000 | 2412               |             |                    |
|                                                                                                          | 150               | 10.3 | 4600                                                                        | 123                | 11,000    | 295                | 18,000   | 482                | 89,000   | 2385               |        |                    |             |                    |
|                                                                                                          | 175               | 12.1 | 6400                                                                        | 172                | 7000      | 188                | 18,000   | 482                |          |                    |        |                    |             |                    |
|                                                                                                          |                   |      |                                                                             |                    |           |                    |          |                    |          |                    |        |                    |             |                    |

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Downstream piping may affect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

**Table 8. Types 299HV and 299HVR Flow Capacities<sup>(1)(2)</sup> for 1-1/2 NPT and NPS 2 / DN 50 External/Dual Registration**

| OUTLET PRESSURE<br>RANGE SETTING,<br>CONTROL, SPRING<br>PART NUMBER AND<br>COLOR                                                   | INLET<br>PRESSURE |      | CAPACITIES IN SCFH/ Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |       |           |       |          |       |          |       |          |       |        |       |             |       |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|---------------------------------------------------------------|-------|-----------|-------|----------|-------|----------|-------|----------|-------|--------|-------|-------------|-------|
|                                                                                                                                    |                   |      | Orifice Size, In. / mm                                        |       |           |       |          |       |          |       |          |       |        |       |             |       |
|                                                                                                                                    | psig              | bar  | 1/4 x 3/8 / 6.4 x 9.5                                         |       | 3/8 / 9.5 |       | 1/2 / 13 |       | 3/4 / 19 |       | 7/8 / 22 |       | 1 / 25 |       | 1-3/16 / 30 |       |
|                                                                                                                                    |                   |      | SCFH                                                          | Nm³/h | SCFH      | Nm³/h | SCFH     | Nm³/h | SCFH     | Nm³/h | SCFH     | Nm³/h | SCFH   | Nm³/h | SCFH        | Nm³/h |
| 3.5 to 6 in. w.c. /<br>9 to 15 mbar<br><br>3.5 in. w.c. / 9 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13707T0012<br>Black | 2                 | 0.14 | 750                                                           | 20.1  | 1540      | 41.3  | 1960     | 52.5  | 4750     | 127   |          |       |        |       |             |       |
|                                                                                                                                    | 5                 | 0.34 | 1150                                                          | 30.8  | 2440      | 65.4  | 3230     | 86.6  | 7760     | 208   | 10,540   | 282   | 11,394 | 305   | 11,663      | 313   |
|                                                                                                                                    | 10                | 0.69 | 1580                                                          | 42.3  | 3570      | 95.7  | 4970     | 133   | 11,660   | 312   | 15,614   | 418   | 18,162 | 487   | 18,972      | 508   |
|                                                                                                                                    | 15                | 1.0  | 1910                                                          | 51.2  | 4400      | 118   | 6890     | 185   | 15,890   | 426   | 20,165   | 540   | 23,540 | 631   | 24,661      | 661   |
|                                                                                                                                    | 20                | 1.4  | 2230                                                          | 59.8  | 5140      | 138   | 8050     | 216   | 18,570   | 498   | 23,993   | 643   | 28,127 | 754   | 31,438      | 843   |
|                                                                                                                                    | 25                | 1.7  | 2560                                                          | 68.6  | 5880      | 158   | 9210     | 247   | 21,250   | 570   | 27,706   | 743   | 32,707 | 877   | 35,350      | 947   |
|                                                                                                                                    | 30                | 2.1  | 2880                                                          | 77.2  | 6630      | 178   | 10,370   | 278   | 23,930   | 641   | 31,108   | 834   | 38,218 | 1024  | 37,940      | 1017  |
|                                                                                                                                    | 40                | 2.8  | 3520                                                          | 94.3  | 8110      | 217   | 12,700   | 340   | 29,280   | 785   | 39,427   | 1057  | 46,259 | 1240  | 45,493      | 1219  |
|                                                                                                                                    | 50                | 3.4  | 4170                                                          | 112   | 9590      | 257   | 15,020   | 403   | 34,630   | 928   | 45,661   | 1224  | 48,253 | 1293  | 50,019      | 1341  |
|                                                                                                                                    | 60                | 4.1  | 4810                                                          | 129   | 11,080    | 297   | 17,340   | 465   | 39,990   | 1072  | 53,494   | 1434  | 53,859 | 1443  | 54,666      | 1465  |
|                                                                                                                                    | 80                | 5.5  | 6100                                                          | 163   | 14,040    | 376   | 21,980   | 589   | 50,690   | 1358  | 67,139   | 1799  |        |       |             |       |
|                                                                                                                                    | 100               | 6.9  | 7390                                                          | 198   | 17,010    | 456   | 26,630   | 714   | 61,400   | 1646  |          |       |        |       |             |       |
|                                                                                                                                    | 125               | 8.6  | 9010                                                          | 241   | 20,720    | 555   | 32,430   | 869   | 74,780   | 2004  |          |       |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 10,620                                                        | 285   | 24,430    | 655   | 38,240   | 1025  | 88,170   | 2363  |          |       |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 12,230                                                        | 328   | 28,140    | 754   | 44,040   | 1180  |          |       |          |       |        |       |             |       |
| 5 to 9 in. w.c. /<br>12 to 22 mbar<br><br>7 in. w.c. / 17 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13589T0012<br>Yellow  | 2                 | 0.14 | 730                                                           | 19.6  | 1490      | 39.9  | 1900     | 50.9  | 4610     | 124   |          |       |        |       |             |       |
|                                                                                                                                    | 5                 | 0.34 | 1150                                                          | 30.8  | 2420      | 64.9  | 3190     | 85.5  | 7690     | 206   | 10,393   | 279   | 11,742 | 315   | 11,620      | 311   |
|                                                                                                                                    | 10                | 0.69 | 1580                                                          | 42.3  | 3570      | 95.7  | 4950     | 133   | 11,620   | 311   | 15,259   | 409   | 17,369 | 465   | 18,967      | 508   |
|                                                                                                                                    | 15                | 1.0  | 1910                                                          | 51.2  | 4400      | 118   | 6890     | 185   | 15,890   | 426   | 20,561   | 551   | 23,554 | 631   | 25,175      | 675   |
|                                                                                                                                    | 20                | 1.4  | 2230                                                          | 59.8  | 5140      | 138   | 8050     | 216   | 18,570   | 498   | 23,562   | 631   | 28,285 | 758   | 31,321      | 839   |
|                                                                                                                                    | 25                | 1.7  | 2560                                                          | 68.6  | 5880      | 158   | 9210     | 247   | 21,250   | 570   | 27,267   | 731   | 31,977 | 857   | 37,818      | 1014  |
|                                                                                                                                    | 30                | 2.1  | 2880                                                          | 77.2  | 6630      | 178   | 10,370   | 278   | 23,930   | 641   | 30,848   | 827   | 37,113 | 995   | 38,935      | 1043  |
|                                                                                                                                    | 40                | 2.8  | 3520                                                          | 94.3  | 8110      | 217   | 12,700   | 340   | 29,280   | 785   | 38,318   | 1027  | 44,341 | 1188  | 47,918      | 1284  |
|                                                                                                                                    | 50                | 3.4  | 4170                                                          | 112   | 9590      | 257   | 15,020   | 403   | 34,630   | 928   | 47,466   | 1272  | 53,890 | 1444  | 56,081      | 1503  |
|                                                                                                                                    | 60                | 4.1  | 4810                                                          | 129   | 11,080    | 297   | 17,340   | 465   | 39,990   | 1072  | 53,039   | 1421  | 60,622 | 1625  |             |       |
|                                                                                                                                    | 80                | 5.5  | 6100                                                          | 163   | 14,040    | 376   | 21,980   | 589   | 50,690   | 1358  | 66,483   | 1782  |        |       |             |       |
|                                                                                                                                    | 100               | 6.9  | 7390                                                          | 198   | 17,010    | 456   | 26,630   | 714   | 61,400   | 1646  |          |       |        |       |             |       |
|                                                                                                                                    | 125               | 8.6  | 9010                                                          | 241   | 20,720    | 555   | 32,430   | 869   | 74,780   | 2004  |          |       |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 10,620                                                        | 285   | 24,430    | 655   | 38,240   | 1025  | 88,170   | 2363  |          |       |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 12,230                                                        | 328   | 28,140    | 754   | 44,040   | 1180  |          |       |          |       |        |       |             |       |
| 7 to 20 in. w.c. /<br>17 to 50 mbar<br><br>14 in. w.c. /<br>35 mbar<br>±2 in. w.c. / ±5 mbar<br><br>1N3112X0012<br>Unpainted       | 2                 | 0.14 | 690                                                           | 18.5  | 1410      | 37.8  | 1790     | 48    | 4340     | 116   |          |       |        |       |             |       |
|                                                                                                                                    | 5                 | 0.34 | 1130                                                          | 30.3  | 2390      | 64.1  | 3130     | 83.9  | 7550     | 202   | 9764     | 262   | 11,452 | 307   | 12,284      | 329   |
|                                                                                                                                    | 10                | 0.69 | 1570                                                          | 42.1  | 3550      | 95.1  | 4920     | 132   | 11,540   | 309   | 15,138   | 406   | 18,218 | 488   | 20,569      | 551   |
|                                                                                                                                    | 15                | 1.0  | 1910                                                          | 51.2  | 4400      | 118   | 6890     | 185   | 15,890   | 426   | 19,519   | 523   | 23,109 | 619   | 27,205      | 729   |
|                                                                                                                                    | 20                | 1.4  | 2230                                                          | 59.8  | 5140      | 138   | 8050     | 216   | 18,570   | 498   | 23,646   | 634   | 27,901 | 748   | 33,170      | 889   |
|                                                                                                                                    | 25                | 1.7  | 2560                                                          | 68.6  | 5880      | 158   | 9210     | 244   | 21,250   | 570   | 27,241   | 730   | 33,164 | 889   | 40,850      | 1095  |
|                                                                                                                                    | 30                | 2.1  | 2880                                                          | 77.2  | 6630      | 178   | 10,370   | 278   | 23,930   | 641   | 30,997   | 831   | 36,623 | 981   | 44,658      | 1197  |
|                                                                                                                                    | 40                | 2.8  | 3520                                                          | 94.3  | 8110      | 217   | 12,700   | 340   | 29,280   | 785   | 39,939   | 1070  | 45,847 | 1229  | 56,561      | 1516  |
|                                                                                                                                    | 50                | 3.4  | 4170                                                          | 112   | 9590      | 257   | 15,020   | 403   | 34,630   | 928   | 47,469   | 1272  | 54,827 | 1459  | 66,341      | 1778  |
|                                                                                                                                    | 60                | 4.1  | 4810                                                          | 129   | 11,080    | 297   | 17,340   | 465   | 39,990   | 1072  | 52,312   | 1402  | 62,894 | 1686  |             |       |
|                                                                                                                                    | 80                | 5.5  | 6100                                                          | 163   | 14,040    | 376   | 21,980   | 589   | 50,690   | 1358  | 68,196   | 1828  | 80,319 | 2153  |             |       |
|                                                                                                                                    | 100               | 6.9  | 7390                                                          | 198   | 17,010    | 456   | 26,630   | 714   | 61,400   | 1646  | 81,232   | 2177  |        |       |             |       |
|                                                                                                                                    | 125               | 8.6  | 9010                                                          | 241   | 20,720    | 555   | 32,430   | 869   | 74,780   | 2004  |          |       |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 10,620                                                        | 285   | 24,430    | 655   | 38,240   | 1025  | 88,170   | 2363  |          |       |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 12,230                                                        | 328   | 28,140    | 754   | 44,040   | 1180  |          |       |          |       |        |       |             |       |
| 16 to 40 in. w.c. /<br>40 to 99 mbar<br><br>28 in. w.c. /<br>70 mbar<br>±4 in. w.c. / ±10 mbar<br><br>1B413727222<br>Purple        | 5                 | 0.34 | 1100                                                          | 29.5  | 2310      | 61.9  | 3010     | 80.7  | 7260     | 195   |          |       |        |       |             |       |
|                                                                                                                                    | 10                | 0.69 | 1560                                                          | 41.8  | 3420      | 91.7  | 4680     | 125   | 11,180   | 300   | 15,468   | 415   | 8194   | 220   | 17,680      | 474   |
|                                                                                                                                    | 15                | 1.0  | 1910                                                          | 51.2  | 4400      | 118   | 6890     | 185   | 14,680   | 393   | 20,472   | 549   | 17,151 | 460   | 24,885      | 667   |
|                                                                                                                                    | 20                | 1.4  | 2230                                                          | 59.8  | 5140      | 138   | 8050     | 216   | 18,570   | 498   | 23,136   | 620   | 24,103 | 646   | 32,028      | 858   |
|                                                                                                                                    | 25                | 1.7  | 2560                                                          | 68.6  | 5880      | 158   | 9210     | 247   | 21,250   | 570   | 27,228   | 730   | 27,654 | 741   | 36,731      | 984   |
|                                                                                                                                    | 30                | 2.1  | 2880                                                          | 77.2  | 6630      | 178   | 10,370   | 278   | 23,930   | 641   | 31,435   | 842   | 32,859 | 881   | 43,473      | 1165  |
|                                                                                                                                    | 40                | 2.8  | 3520                                                          | 94.3  | 8110      | 217   | 12,700   | 340   | 29,280   | 785   | 39,248   | 1052  | 38,539 | 1033  | 53,601      | 1437  |
|                                                                                                                                    | 50                | 3.4  | 4170                                                          | 112   | 9590      | 257   | 15,020   | 403   | 34,630   | 928   | 47,246   | 1266  | 46,734 | 1252  | 62,712      | 1681  |
|                                                                                                                                    | 60                | 4.1  | 4810                                                          | 129   | 11,080    | 297   | 17,340   | 465   | 39,990   | 1072  | 53,504   | 1434  | 56,788 | 1522  |             |       |
|                                                                                                                                    | 80                | 5.5  | 6100                                                          | 163   | 14,040    | 376   | 21,980   | 589   | 50,690   | 1358  | 68,415   | 1834  | 64,452 | 1727  |             |       |
|                                                                                                                                    | 100               | 6.9  | 7390                                                          | 198   | 17,010    | 456   | 26,630   | 714   | 61,400   | 1646  | 84,001   | 2251  |        |       |             |       |
|                                                                                                                                    | 125               | 8.6  | 9010                                                          | 241   | 20,720    | 555   | 32,430   | 869   | 74,780   | 2004  |          |       |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 10,620                                                        | 285   | 24,430    | 655   | 38,240   | 1025  | 88,170   | 2363  |          |       |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 12,230                                                        | 328   | 28,140    | 754   | 44,040   | 1180  |          |       |          |       |        |       |             |       |

■ - Black areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Capacities are limited to 15,000 SCFH / 402 Nm³/h when the Type VSX8 is used without a control line.

2. Due to slam-shut properties, capacities cannot be calculated with critical flow equation.

- continued -

# 299H Series

**Table 8. Types 299HV and 299HVR Flow Capacities<sup>(1)(2)</sup> for 1-1/2 NPT and NPS 2 / DN 50 External/Dual Registration (continued)**

| OUTLET PRESSURE<br>RANGE SETTING,<br>CONTROL, SPRING<br>PART NUMBER AND<br>COLOR                                    | INLET<br>PRESSURE |      | CAPACITIES IN SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |       |           |       |          |       |          |       |          |       |        |       |             |       |
|---------------------------------------------------------------------------------------------------------------------|-------------------|------|----------------------------------------------------------------|-------|-----------|-------|----------|-------|----------|-------|----------|-------|--------|-------|-------------|-------|
|                                                                                                                     |                   |      | Orifice Size, In. / mm                                         |       |           |       |          |       |          |       |          |       |        |       |             |       |
|                                                                                                                     | psig              | bar  | 1/4 x 3/8 / 6.4 x 9.5                                          |       | 3/8 / 9.5 |       | 1/2 / 13 |       | 3/4 / 19 |       | 7/8 / 22 |       | 1 / 25 |       | 1-3/16 / 30 |       |
|                                                                                                                     |                   |      | SCFH                                                           | Nm³/h | SCFH      | Nm³/h | SCFH     | Nm³/h | SCFH     | Nm³/h | SCFH     | Nm³/h | SCFH   | Nm³/h | SCFH        | Nm³/h |
| 1 to 3.25 psig /<br>69 mbar to 0.22 bar<br><br>2 psig / 0.14 bar<br>±1% psia / bar<br><br>T13593T0012<br>Light blue | 5                 | 0.34 | 1010                                                           | 27.1  | 2090      | 56.0  | 2690     | 72.1  | 6500     | 174   |          |       |        |       |             |       |
|                                                                                                                     | 10                | 0.69 | 1540                                                           | 41.3  | 3330      | 89.2  | 4500     | 121   | 10,780   | 289   | 14,222   | 381   | 15,686 | 420   | 15,919      | 427   |
|                                                                                                                     | 15                | 1.00 | 1910                                                           | 51.2  | 4350      | 117   | 6160     | 165   | 14,420   | 386   | 19,116   | 512   | 23,603 | 633   | 24,528      | 657   |
|                                                                                                                     | 20                | 1.4  | 2230                                                           | 59.8  | 5140      | 138   | 8050     | 216   | 18,570   | 498   | 23,217   | 622   | 27,076 | 726   | 30,146      | 808   |
|                                                                                                                     | 25                | 1.7  | 2560                                                           | 68.6  | 5880      | 158   | 9210     | 247   | 21,250   | 570   | 27,178   | 728   | 32,736 | 877   | 34,548      | 926   |
|                                                                                                                     | 30                | 2.1  | 2880                                                           | 77.2  | 6630      | 178   | 10,370   | 278   | 23,930   | 641   | 30,349   | 813   | 37,957 | 1017  | 40,482      | 1085  |
|                                                                                                                     | 40                | 2.8  | 3520                                                           | 94.3  | 8110      | 217   | 12,700   | 340   | 29,280   | 785   | 38,690   | 1037  | 46,362 | 1243  | 51,296      | 1375  |
|                                                                                                                     | 50                | 3.4  | 4170                                                           | 112   | 9590      | 257   | 15,020   | 403   | 34,630   | 928   | 46,334   | 1242  | 54,656 | 1465  | 60,987      | 1634  |
|                                                                                                                     | 60                | 4.1  | 4810                                                           | 129   | 11,080    | 297   | 17,340   | 465   | 39,990   | 1072  | 53,323   | 1429  | 63,150 | 1692  | 70,797      | 1897  |
|                                                                                                                     | 80                | 5.5  | 6100                                                           | 163   | 14,040    | 376   | 21,980   | 589   | 50,690   | 1358  | 67,640   | 1813  | 79,896 | 2141  |             |       |
|                                                                                                                     | 100               | 6.9  | 7390                                                           | 198   | 17,010    | 456   | 26,630   | 714   | 61,400   | 1646  | 80,643   | 2161  |        |       |             |       |
|                                                                                                                     | 125               | 8.6  | 9010                                                           | 241   | 20,720    | 555   | 32,430   | 869   | 74,780   | 2004  |          |       |        |       |             |       |
|                                                                                                                     | 150               | 10.3 | 10,620                                                         | 285   | 24,430    | 655   | 38,240   | 1024  | 88,170   | 2363  |          |       |        |       |             |       |
|                                                                                                                     | 175               | 12.1 | 12,230                                                         | 328   | 28,140    | 754   | 44,040   | 1180  |          |       |          |       |        |       |             |       |
|                                                                                                                     | 10                | 0.69 | 1380                                                           | 37.0  | 2890      | 77.5  | 3780     | 101   | 9110     | 244   |          |       |        |       |             |       |
|                                                                                                                     | 15                | 1.0  | 1860                                                           | 49.8  | 4180      | 112   | 5690     | 152   | 13,370   | 358   | 16,755   | 449   | 20,355 | 546   | 20,759      | 556   |
|                                                                                                                     | 20                | 1.4  | 2230                                                           | 59.8  | 5080      | 136   | 7170     | 192   | 16,790   | 450   | 21,483   | 576   | 25,610 | 686   | 28,316      | 759   |
|                                                                                                                     | 25                | 1.7  | 2560                                                           | 68.6  | 5880      | 158   | 9210     | 247   | 21,250   | 570   | 25,963   | 696   | 31,443 | 843   | 33,560      | 899   |
| 2.75 to 6 psig /<br>0.19 to 0.41 bar<br><br>5 psig / 0.34 bar<br>±1% psia / bar<br><br>T13671T0012<br>Orange        | 30                | 2.1  | 2880                                                           | 77.2  | 6630      | 178   | 10,370   | 278   | 23,930   | 641   | 29,934   | 802   | 35,739 | 958   | 39,000      | 1045  |
|                                                                                                                     | 40                | 2.8  | 3520                                                           | 94.3  | 8110      | 217   | 12,700   | 340   | 29,280   | 785   | 38,424   | 1030  | 43,927 | 1177  | 50,866      | 1363  |
|                                                                                                                     | 50                | 3.4  | 4170                                                           | 112   | 9590      | 257   | 15,020   | 403   | 34,630   | 928   | 44,529   | 1193  | 53,511 | 1434  | 58,608      | 1571  |
|                                                                                                                     | 60                | 4.1  | 4810                                                           | 129   | 11,080    | 297   | 17,340   | 465   | 39,990   | 1072  | 52,347   | 1403  | 63,935 | 1713  |             |       |
|                                                                                                                     | 80                | 5.5  | 6100                                                           | 163   | 14,040    | 376   | 21,980   | 589   | 50,690   | 1358  | 66,795   | 1790  | 79,794 | 2138  |             |       |
|                                                                                                                     | 100               | 6.9  | 7390                                                           | 198   | 17,010    | 456   | 26,630   | 714   | 61,400   | 1646  | 79,208   | 2123  |        |       |             |       |
|                                                                                                                     | 125               | 8.6  | 9010                                                           | 241   | 20,720    | 555   | 32,430   | 869   | 74,780   | 2004  |          |       |        |       |             |       |
|                                                                                                                     | 150               | 10.3 | 10,620                                                         | 285   | 24,430    | 655   | 38,240   | 1024  | 88,170   | 2363  |          |       |        |       |             |       |
|                                                                                                                     | 175               | 12.1 | 12,230                                                         | 328   | 28,140    | 754   | 44,040   | 1180  |          |       |          |       |        |       |             |       |
|                                                                                                                     | 15                | 1.0  | 1570                                                           | 42.1  | 3270      | 87.6  | 4220     | 113   | 10,200   | 273   |          |       |        |       |             |       |
|                                                                                                                     | 20                | 1.4  | 2120                                                           | 56.8  | 4710      | 126   | 6310     | 169   | 14,850   | 398   | 16,629   | 446   | 22,183 | 595   | 22,421      | 601   |
|                                                                                                                     | 25                | 1.7  | 2530                                                           | 67.8  | 5700      | 153   | 7890     | 211   | 18,510   | 496   | 27,996   | 750   | 27,255 | 730   | 28,275      | 758   |
|                                                                                                                     | 30                | 2.1  | 2880                                                           | 77.2  | 6630      | 178   | 10,370   | 278   | 21,820   | 585   | 36,384   | 975   | 33,489 | 898   | 34,464      | 924   |
|                                                                                                                     | 40                | 2.8  | 3520                                                           | 94.3  | 8110      | 217   | 12,700   | 340   | 29,280   | 785   | 44,427   | 1191  | 41,736 | 1119  | 44,446      | 1191  |
|                                                                                                                     | 50                | 3.4  | 4170                                                           | 112   | 9590      | 257   | 15,020   | 403   | 34,630   | 928   | 51,078   | 1369  | 50,865 | 1363  | 58,369      | 1564  |
|                                                                                                                     | 60                | 4.1  | 4810                                                           | 129   | 11,080    | 297   | 17,340   | 465   | 39,990   | 1072  | 66,891   | 1793  | 61,962 | 1661  | 68,137      | 1826  |
|                                                                                                                     | 80                | 5.5  | 6100                                                           | 163   | 14,040    | 376   | 21,980   | 589   | 50,690   | 1358  | 81,404   | 2182  | 79,036 | 2118  |             |       |
|                                                                                                                     | 100               | 6.9  | 7390                                                           | 198   | 17,010    | 456   | 26,630   | 714   | 61,400   | 1646  | 99,821   | 2675  |        |       |             |       |
|                                                                                                                     | 125               | 8.6  | 9010                                                           | 241   | 20,720    | 555   | 32,430   | 869   | 74,780   | 2004  |          |       |        |       |             |       |
|                                                                                                                     | 150               | 10.3 | 10,620                                                         | 285   | 24,430    | 655   | 38,240   | 1025  | 88,170   | 2363  |          |       |        |       |             |       |
|                                                                                                                     | 175               | 12.1 | 12,230                                                         | 328   | 28,140    | 754   | 44,040   | 1180  |          |       |          |       |        |       |             |       |
| 5 to 16 psig /<br>0.34 to 1.1 bar<br><br>10 psig / 0.69 bar<br>±1% psia / bar<br><br>T13600T0012<br>Red             | 20                | 1.4  | 1740                                                           | 46.6  | 3610      | 96.7  | 4640     | 124   | 11,210   | 300   | 11,950   | 320   | 12,660 | 339   | 11,555      | 310   |
|                                                                                                                     | 25                | 1.7  | 2350                                                           | 63.0  | 5210      | 139   | 6890     | 185   | 16,220   | 435   | 17,299   | 464   | 13,716 | 368   | 22,563      | 605   |
|                                                                                                                     | 30                | 2.1  | 2810                                                           | 75.3  | 6280      | 168   | 8560     | 229   | 20,110   | 539   | 26,131   | 700   | 23,285 | 624   | 29,827      | 799   |
|                                                                                                                     | 40                | 2.8  | 3520                                                           | 94.3  | 8110      | 217   | 12,700   | 340   | 26,850   | 720   | 34,479   | 924   | 29,875 | 801   | 45,150      | 1210  |
|                                                                                                                     | 50                | 3.4  | 4170                                                           | 112   | 9590      | 257   | 15,020   | 403   | 34,630   | 928   | 43,353   | 1162  | 39,753 | 1065  | 56,272      | 1508  |
|                                                                                                                     | 60                | 4.1  | 4810                                                           | 129   | 11,080    | 297   | 17,340   | 464   | 39,990   | 1072  | 51,751   | 1387  | 51,758 | 1387  | 65,725      | 1761  |
|                                                                                                                     | 80                | 5.5  | 6100                                                           | 163   | 14,040    | 376   | 21,980   | 589   | 50,690   | 1358  | 65,973   | 1768  | 61,159 | 1639  |             |       |
|                                                                                                                     | 100               | 6.9  | 7390                                                           | 198   | 17,010    | 456   | 26,630   | 714   | 61,400   | 1646  | 78,904   | 2115  |        |       |             |       |
|                                                                                                                     | 125               | 8.6  | 9010                                                           | 241   | 20,720    | 555   | 32,430   | 869   | 74,780   | 2004  |          |       |        |       |             |       |
|                                                                                                                     | 150               | 10.3 | 10,620                                                         | 285   | 24,430    | 655   | 38,240   | 1025  | 88,170   | 2363  |          |       |        |       |             |       |
|                                                                                                                     | 175               | 12.1 | 12,230                                                         | 328   | 28,140    | 754   | 44,040   | 1180  |          |       |          |       |        |       |             |       |
|                                                                                                                     | 20                | 1.4  | 1740                                                           | 46.6  | 3610      | 96.7  | 4640     | 124   | 11,210   | 300   | 11,950   | 320   | 12,660 | 339   | 11,555      | 310   |
|                                                                                                                     | 25                | 1.7  | 2350                                                           | 63.0  | 5210      | 139   | 6890     | 185   | 16,220   | 435   | 17,299   | 464   | 13,716 | 368   | 22,563      | 605   |
|                                                                                                                     | 30                | 2.1  | 2810                                                           | 75.3  | 6280      | 168   | 8560     | 229   | 20,110   | 539   | 26,131   | 700   | 23,285 | 624   | 29,827      | 799   |
|                                                                                                                     | 40                | 2.8  | 3520                                                           | 94.3  | 8110      | 217   | 12,700   | 340   | 26,850   | 720   | 34,479   | 924   | 29,875 | 801   | 45,150      | 1210  |
|                                                                                                                     | 50                | 3.4  | 4170                                                           | 112   | 9590      | 257   | 15,020   | 403   | 34,630   | 928   | 43,353   | 1162  | 39,753 | 1065  | 56,272      | 1508  |
|                                                                                                                     | 60                | 4.1  | 4810                                                           | 129   | 11,080    | 297   | 17,340   | 464   | 39,990   | 1072  | 51,751   | 1387  | 51,758 | 1387  | 65,725      | 1761  |
|                                                                                                                     | 80                | 5.5  | 6100                                                           | 163   | 14,040    | 376   | 21,980   | 589   | 50,690   | 1358  | 65,973   | 1768  | 61,159 | 1639  |             |       |
|                                                                                                                     | 100               | 6.9  | 7390                                                           | 198   | 17,010    | 456   | 26,630   | 714   | 61,400   | 1646  | 78,904   | 2115  |        |       |             |       |
|                                                                                                                     | 125               | 8.6  | 9010                                                           | 241   | 20,720    | 555   | 32,430   | 869   | 74,780   | 2004  |          |       |        |       |             |       |
|                                                                                                                     | 150               | 10.3 | 10,620                                                         | 285   | 24,430    | 655   | 38,240   | 1025  | 88,170   | 2363  |          |       |        |       |             |       |
|                                                                                                                     | 175               | 12.1 | 12,230                                                         | 328   | 28,140    | 754   | 44,040   | 1180  |          |       |          |       |        |       |             |       |

■ - Black areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Capacities are limited to 15,000 SCFH / 402 Nm³/h when the Type VSX8 is used without a control line.

2. Due to slam-shut properties, capacities cannot be calculated with critical flow equation.

**Table 9. Types 299HV and 299HVR Flow Capacities<sup>(1)(2)</sup> for 1-1/2 NPT and NPS 2 / DN 50 Internal Registration**

| OUTLET PRESSURE<br>RANGE SETTING,<br>CONTROL, SPRING<br>PART NUMBER AND<br>COLOR                                                   | INLET<br>PRESSURE |      | CAPACITIES IN SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |       |           |       |          |       |          |       |        |       |             |       |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|----------------------------------------------------------------|-------|-----------|-------|----------|-------|----------|-------|--------|-------|-------------|-------|
|                                                                                                                                    |                   |      | Orifice Size, In. / mm                                         |       |           |       |          |       |          |       |        |       |             |       |
|                                                                                                                                    |                   |      | 1/4 x 3/8 / 6.4 x 9.5                                          |       | 3/8 / 9.5 |       | 1/2 / 13 |       | 3/4 / 19 |       | 1 / 25 |       | 1-3/16 / 30 |       |
|                                                                                                                                    | psig              | bar  | SCFH                                                           | Nm³/h | SCFH      | Nm³/h | SCFH     | Nm³/h | SCFH     | Nm³/h | SCFH   | Nm³/h | SCFH        | Nm³/h |
| 3.5 to 6 in. w.c. /<br>9 to 15 mbar<br><br>3.5 in. w.c. / 9 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13707T0012<br>Black | 2                 | 0.14 | 760                                                            | 20.4  | 1780      | 47.7  | 2800     | 75    | 6460     | 173   | 6560   | 176   | 5783        | 155   |
|                                                                                                                                    | 5                 | 0.34 | 1160                                                           | 31.1  | 2450      | 65.7  | 4000     | 107   | 7140     | 191   | 8126   | 218   | 11,983      | 321   |
|                                                                                                                                    | 10                | 0.69 | 1590                                                           | 42.6  | 3560      | 95.4  | 6000     | 161   | 7140     | 191   | 6448   | 173   | 16,515      | 443   |
|                                                                                                                                    | 15                | 1.0  | 1920                                                           | 51.5  | 4400      | 118   | 7500     | 201   | 8320     | 223   | 15,728 | 422   | 21,277      | 570   |
|                                                                                                                                    | 20                | 1.4  | 2240                                                           | 60.0  | 5100      | 137   | 9000     | 241   | 10,830   | 290   | 20,783 | 557   | 17,610      | 472   |
|                                                                                                                                    | 25                | 1.7  | 2570                                                           | 68.9  | 5450      | 146   | 7620     | 204   | 9870     | 265   | 30,763 | 824   | 16,968      | 455   |
|                                                                                                                                    | 30                | 2.1  | 2890                                                           | 77.5  | 5800      | 155   | 9880     | 265   | 9870     | 265   | 30,366 | 814   | 17,571      | 471   |
|                                                                                                                                    | 40                | 2.8  | 3530                                                           | 94.6  | 7550      | 202   | 12,070   | 323   | 6400     | 172   | 17,055 | 457   | 28,457      | 763   |
|                                                                                                                                    | 50                | 3.4  | 3880                                                           | 104   | 9300      | 249   | 11,300   | 303   | 6840     | 183   | 9825   | 263   | 12,505      | 335   |
|                                                                                                                                    | 60                | 4.1  | 4090                                                           | 110   | 7700      | 206   | 6660     | 178   | 7010     | 188   | 4041   | 108   | 10,672      | 286   |
|                                                                                                                                    | 80                | 5.5  | 3110                                                           | 83.3  | 2800      | 75    | 1230     | 33    | 9000     | 241   | 5199   | 139   |             |       |
|                                                                                                                                    | 100               | 6.9  | 4790                                                           | 128   | 3600      | 97.0  | 2990     | 80    | 4650     | 125   | 4374   | 117   |             |       |
|                                                                                                                                    | 125               | 8.6  | 5210                                                           | 140   | 3600      | 97.0  | 4090     | 110   | 3230     | 87    |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 5640                                                           | 151   | 3600      | 97.0  | 5210     | 140   | 3230     | 87    |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 7310                                                           | 196   | 5680      | 152   | 7300     | 196   |          |       |        |       |             |       |
| 5 to 9 in. w.c. /<br>12 to 22 mbar<br><br>7 in. w.c. / 17 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13589T0012<br>Yellow  | 2                 | 0.14 | 750                                                            | 20.1  | 1890      | 50.7  | 2800     | 75    | 5520     | 148   |        |       |             |       |
|                                                                                                                                    | 5                 | 0.34 | 1120                                                           | 30.0  | 2460      | 65.9  | 4000     | 107   | 6020     | 161   | 8254   | 221   | 11,576      | 310   |
|                                                                                                                                    | 10                | 0.69 | 1590                                                           | 42.6  | 3400      | 91.1  | 6000     | 161   | 6520     | 175   | 11,345 | 304   | 13,793      | 370   |
|                                                                                                                                    | 15                | 1.0  | 1920                                                           | 51.5  | 4320      | 116   | 7000     | 188   | 8000     | 214   | 15,571 | 417   | 19,851      | 532   |
|                                                                                                                                    | 20                | 1.4  | 2240                                                           | 60.0  | 5060      | 136   | 9000     | 241   | 7930     | 213   | 20,425 | 547   | 16,104      | 432   |
|                                                                                                                                    | 25                | 1.7  | 2570                                                           | 68.9  | 5800      | 155   | 9690     | 260   | 7420     | 199   | 24,997 | 670   | 16,019      | 429   |
|                                                                                                                                    | 30                | 2.1  | 2890                                                           | 77.5  | 6500      | 174   | 10,480   | 281   | 7050     | 189   | 27,772 | 744   | 16,648      | 446   |
|                                                                                                                                    | 40                | 2.8  | 3530                                                           | 94.6  | 7900      | 212   | 11,490   | 308   | 4900     | 131   | 100    | 3     | 27,833      | 746   |
|                                                                                                                                    | 50                | 3.4  | 4180                                                           | 112   | 7800      | 209   | 10,280   | 276   | 5940     | 159   | 17,431 | 467   | 12,059      | 323   |
|                                                                                                                                    | 60                | 4.1  | 4820                                                           | 129   | 6560      | 176   | 7170     | 192   | 6310     | 169   | 10,160 | 272   | 10,193      | 273   |
|                                                                                                                                    | 80                | 5.5  | 4020                                                           | 108   | 2620      | 70.0  | 1200     | 32    | 8340     | 224   | 5,330  | 143   |             |       |
|                                                                                                                                    | 100               | 6.9  | 4670                                                           | 125   | 3420      | 92.0  | 2990     | 80    | 3900     | 105   | 4535   | 122   |             |       |
|                                                                                                                                    | 125               | 8.6  | 5070                                                           | 136   | 3600      | 97.0  | 5180     | 139   | 3360     | 90    |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 5480                                                           | 147   | 3870      | 104   | 5180     | 139   | 2340     | 63    |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 6430                                                           | 172   | 5120      | 137   | 7300     | 196   |          |       |        |       |             |       |
| 7 to 20 in. w.c. /<br>17 to 50 mbar<br><br>14 in. w.c. / 35 mbar<br>±2 in. w.c. / ±5 mbar<br><br>1N3112X0012<br>Unpainted          | 2                 | 0.14 | 700                                                            | 18.8  | 1420      | 38.1  | 3440     | 92.2  | 4790     | 128   |        |       | 4762        | 128   |
|                                                                                                                                    | 5                 | 0.34 | 1110                                                           | 29.7  | 2200      | 59.0  | 4000     | 107   | 6080     | 163   | 10,790 | 289   | 11,429      | 306   |
|                                                                                                                                    | 10                | 0.69 | 1580                                                           | 42.3  | 3500      | 93.8  | 6000     | 161   | 7440     | 199   | 11,629 | 312   | 13,361      | 358   |
|                                                                                                                                    | 15                | 1.0  | 1920                                                           | 51.5  | 4300      | 115   | 7600     | 204   | 9250     | 248   | 15,212 | 408   | 19,037      | 510   |
|                                                                                                                                    | 20                | 1.4  | 2240                                                           | 60.0  | 5000      | 134   | 9000     | 241   | 10,670   | 286   | 20,121 | 539   | 19,644      | 526   |
|                                                                                                                                    | 25                | 1.7  | 2570                                                           | 68.9  | 5700      | 153   | 10,000   | 268   | 8950     | 240   | 23,600 | 632   | 18,515      | 496   |
|                                                                                                                                    | 30                | 2.1  | 2890                                                           | 77.5  | 6500      | 174   | 11,200   | 300   | 8450     | 226   | 26,579 | 712   | 19,121      | 512   |
|                                                                                                                                    | 40                | 2.8  | 3530                                                           | 94.6  | 7900      | 212   | 11,620   | 311   | 6800     | 182   | 23,140 | 620   | 29,888      | 801   |
|                                                                                                                                    | 50                | 3.4  | 4180                                                           | 112   | 9300      | 249   | 12,400   | 332   | 7240     | 194   | 19,015 | 510   | 12,707      | 341   |
|                                                                                                                                    | 60                | 4.1  | 4820                                                           | 129   | 7490      | 201   | 12,090   | 324   | 7400     | 198   | 15,119 | 405   | 11,074      | 297   |
|                                                                                                                                    | 80                | 5.5  | 4600                                                           | 123   | 2730      | 73.0  | 2030     | 54    | 7420     | 199   |        |       |             |       |
|                                                                                                                                    | 100               | 6.9  | 4970                                                           | 133   | 3900      | 105   | 4410     | 118   | 4970     | 133   |        |       |             |       |
|                                                                                                                                    | 125               | 8.6  | 5200                                                           | 139   | 3900      | 105   | 5990     | 161   | 4330     | 116   |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 5430                                                           | 146   | 3900      | 105   | 5990     | 161   | 3120     | 84    |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 4700                                                           | 126   | 3900      | 105   | 6310     | 169   |          |       |        |       |             |       |
| 16 to 40 in. w.c. /<br>40 to 99 mbar<br><br>28 in. w.c. / 70 mbar<br>±4 in. w.c. / ±10 mbar<br><br>1B413727222<br>Purple           | 5                 | 0.34 | 1110                                                           | 29.7  | 2600      | 69.7  | 3600     | 96.5  | 5200     | 139   | 9528   | 255   | 9677        | 259   |
|                                                                                                                                    | 10                | 0.69 | 1570                                                           | 42.1  | 3500      | 93.8  | 6000     | 161   | 6910     | 185   | 17,268 | 463   | 18,587      | 498   |
|                                                                                                                                    | 15                | 1.0  | 1920                                                           | 51.5  | 4400      | 118   | 7200     | 193   | 9370     | 251   | 18,027 | 483   | 24,955      | 669   |
|                                                                                                                                    | 20                | 1.4  | 2240                                                           | 60.0  | 5100      | 137   | 8800     | 236   | 11,030   | 296   | 21,638 | 580   | 28,078      | 752   |
|                                                                                                                                    | 25                | 1.7  | 2570                                                           | 68.9  | 5800      | 155   | 10,000   | 268   | 11,390   | 305   | 24,673 | 661   | 23,468      | 629   |
|                                                                                                                                    | 30                | 2.1  | 2890                                                           | 77.5  | 6500      | 174   | 11,600   | 311   | 11,980   | 321   | 27,545 | 738   | 23,110      | 619   |
|                                                                                                                                    | 40                | 2.8  | 3530                                                           | 94.6  | 7900      | 212   | 13,570   | 364   | 11,220   | 301   | 26,603 | 713   | 32,005      | 858   |
|                                                                                                                                    | 50                | 3.4  | 4180                                                           | 112   | 9300      | 249   | 13,920   | 373   | 10,020   | 269   | 21,460 | 575   | 34,089      | 914   |
|                                                                                                                                    | 60                | 4.1  | 4820                                                           | 129   | 8250      | 221   | 14,410   | 386   | 9170     | 246   | 18,221 | 488   | 13,112      | 351   |
|                                                                                                                                    | 80                | 5.5  | 6110                                                           | 164   | 4260      | 114   | 3090     | 83    | 11,320   | 303   | 13,875 | 372   |             |       |
|                                                                                                                                    | 100               | 6.9  | 6360                                                           | 170   | 5150      | 138   | 4850     | 130   | 3750     | 101   | 12,844 | 344   |             |       |
|                                                                                                                                    | 125               | 8.6  | 6450                                                           | 173   | 5930      | 159   | 5290     | 142   | 3960     | 106   |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 6540                                                           | 175   | 6110      | 164   | 5570     | 149   | 2520     | 68    |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 2950                                                           | 79    | 3560      | 95.0  | 3320     | 89.0  |          |       |        |       |             |       |

■ - Black areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.  
 1. Capacities are limited to 15,000 SCFH / 402 Nm³/h when the Type VSX8 is used without a control line.  
 2. Due to slam-shut properties, capacities cannot be calculated with critical flow equation.

- continued -

# 299H Series

**Table 9. Types 299HV and 299HVR Flow Capacities<sup>(1)(2)</sup> for 1-1/2 NPT and NPS 2 / DN 50 Internal Registration (continued)**

| OUTLET PRESSURE<br>RANGE SETTING,<br>CONTROL, SPRING<br>PART NUMBER AND<br>COLOR                                    | INLET<br>PRESSURE                                                                                       |      | CAPACITIES IN SCFH/ Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |       |           |       |          |       |          |        |        |        |             |        |     |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------|-------|-----------|-------|----------|-------|----------|--------|--------|--------|-------------|--------|-----|
|                                                                                                                     |                                                                                                         |      | Orifice Size, In. / mm                                        |       |           |       |          |       |          |        |        |        |             |        |     |
|                                                                                                                     | psig                                                                                                    | bar  | 1/4 x 3/8 / 6.4 x 9.5                                         |       | 3/8 / 9.5 |       | 1/2 / 13 |       | 3/4 / 19 |        | 1 / 25 |        | 1-3/16 / 30 |        |     |
|                                                                                                                     |                                                                                                         |      | SCFH                                                          | Nm³/h | SCFH      | Nm³/h | SCFH     | Nm³/h | SCFH     | Nm³/h  | SCFH   | Nm³/h  | SCFH        | Nm³/h  |     |
| 1 to 3.25 psig /<br>69 mbar to 0.22 bar<br><br>2 psig / 0.14 bar<br>±1% psia / bar<br><br>T13593T0012<br>Light blue | 5                                                                                                       | 0.34 | 1020                                                          | 27.3  | 2900      | 77.7  | 4000     | 107   | 5660     | 152    | 10,146 | 272    | 3           | 0      |     |
|                                                                                                                     | 10                                                                                                      | 0.69 | 1550                                                          | 41.5  | 3600      | 96.5  | 5500     | 147   | 7,840    | 210    | 16,652 | 446    | 18,337      | 491    |     |
|                                                                                                                     | 15                                                                                                      | 1.0  | 1920                                                          | 51.5  | 4300      | 115   | 7500     | 201   | 10,210   | 273    | 16,884 | 452    | 23,809      | 638    |     |
|                                                                                                                     | 20                                                                                                      | 1.4  | 2240                                                          | 60.0  | 5000      | 134   | 8500     | 228   | 12,100   | 324    | 20,709 | 555    | 28,791      | 772    |     |
|                                                                                                                     | 25                                                                                                      | 1.7  | 2570                                                          | 68.9  | 5550      | 149   | 10,000   | 268   | 11,880   | 318    | 24,308 | 651    | 31,522      | 845    |     |
|                                                                                                                     | 30                                                                                                      | 2.1  | 2890                                                          | 77.5  | 6100      | 163   | 11,000   | 295   | 12,800   | 343    | 27,520 | 738    | 24,784      | 664    |     |
|                                                                                                                     | 40                                                                                                      | 2.8  | 3530                                                          | 94.6  | 7750      | 208   | 14,000   | 375   | 13,960   | 374    | 33,891 | 908    | 26,046      | 698    |     |
|                                                                                                                     | 50                                                                                                      | 3.4  | 4180                                                          | 112   | 9400      | 252   | 14,380   | 385   | 10,940   | 293    | 19,543 | 524    | 36,155      | 969    |     |
|                                                                                                                     | 60                                                                                                      | 4.1  | 4820                                                          | 129   | 10,530    | 282   | 15,510   | 416   | 9810     | 263    | 21,023 | 563    | 20,026      | 537    |     |
|                                                                                                                     | 80                                                                                                      | 5.5  | 6110                                                          | 164   | 8580      | 230   | 12,000   | 322   | 3700     | 99     | 14,926 | 400    |             |        |     |
|                                                                                                                     | 100                                                                                                     | 6.9  | 6850                                                          | 184   | 3290      | 88    | 1130     | 30    | 2910     | 78     |        |        |             |        |     |
|                                                                                                                     | 125                                                                                                     | 8.6  | 7070                                                          | 189   | 3050      | 82    | 2220     | 60    | 2910     | 78     |        |        |             |        |     |
|                                                                                                                     | 150                                                                                                     | 10.3 | 7300                                                          | 196   | 3200      | 86    | 2090     | 56    | 2910     | 78     |        |        |             |        |     |
|                                                                                                                     | 175                                                                                                     | 12.1 | 4560                                                          | 122   | 5540      | 148   | 2090     | 56    |          |        |        |        |             |        |     |
| 2.75 to 6 psig /<br>0.19 to 0.41 bar<br><br>5 psig / 0.34 bar<br>±1% psia / bar<br><br>T13671T0012<br>Orange        | 10                                                                                                      | 0.69 | 1390                                                          | 37.3  | 2800      | 75    | 5000     | 134   | 6540     | 175    | 13,850 | 371    | 11,743      | 315    |     |
|                                                                                                                     | 15                                                                                                      | 1.0  | 1870                                                          | 50.1  | 3750      | 101   | 7000     | 188   | 9680     | 259    | 20,557 | 551    | 21,885      | 587    |     |
|                                                                                                                     | 20                                                                                                      | 1.4  | 2240                                                          | 60.0  | 4700      | 126   | 8500     | 228   | 11,480   | 308    | 25,547 | 685    | 28,040      | 751    |     |
|                                                                                                                     | 25                                                                                                      | 1.7  | 2570                                                          | 68.9  | 5700      | 153   | 9500     | 255   | 12,420   | 333    | 22,097 | 592    | 32,687      | 876    |     |
|                                                                                                                     | 30                                                                                                      | 2.1  | 2890                                                          | 77.5  | 6430      | 172   | 11,000   | 295   | 13,050   | 350    | 27,576 | 739    | 37,211      | 997    |     |
|                                                                                                                     | 40                                                                                                      | 2.8  | 3530                                                          | 94.6  | 7900      | 212   | 13,000   | 348   | 15,780   | 423    | 33,919 | 909    | 29,920      | 802    |     |
|                                                                                                                     | 50                                                                                                      | 3.4  | 4180                                                          | 112   | 9300      | 249   | 16,000   | 429   | 15,110   | 405    | 35,931 | 963    | 30,031      | 805    |     |
|                                                                                                                     | 60                                                                                                      | 4.1  | 4790                                                          | 128   | 10,700    | 287   | 15,200   | 407   | 10,710   | 287    | 31,207 | 836    | 41,617      | 1115   |     |
|                                                                                                                     | 80                                                                                                      | 5.5  | 5740                                                          | 154   | 13,350    | 358   | 13,170   | 353   | 8670     | 232    | 21,999 | 590    |             |        |     |
|                                                                                                                     | 100                                                                                                     | 6.9  | 6680                                                          | 179   | 16,000    | 429   | 2,430    | 65    | 8670     | 232    | 15,606 | 418    |             |        |     |
|                                                                                                                     | 125                                                                                                     | 8.6  | 7170                                                          | 192   | 4740      | 127   | 1700     | 46    | 7300     | 196    |        |        |             |        |     |
|                                                                                                                     | 150                                                                                                     | 10.3 | 7650                                                          | 205   | 3530      | 95    | 1910     | 51    | 6470     | 173    |        |        |             |        |     |
|                                                                                                                     | 175                                                                                                     | 12.1 | 4400                                                          | 118   | 3530      | 95    | 3050     | 82    |          |        |        |        |             |        |     |
|                                                                                                                     | 5 to 16 psig /<br>0.34 to 1.1 bar<br><br>10 psig / 0.69 bar<br>±1% psia / bar<br><br>T13600T0012<br>Red | 15   | 1.0                                                           | 1800  | 48.2      | 3200  | 85.8     | 4000  | 107      | 7250   | 194    | 11,639 | 312         | 14,732 | 395 |
| 20                                                                                                                  |                                                                                                         | 1.4  | 2200                                                          | 59    | 4300      | 115   | 12,000   | 322   | 9870     | 265    | 22,403 | 600    | 23,228      | 623    |     |
| 25                                                                                                                  |                                                                                                         | 1.7  | 2600                                                          | 69.7  | 5400      | 145   | 9000     | 241   | 12,240   | 328    | 26,281 | 704    | 27,637      | 741    |     |
| 30                                                                                                                  |                                                                                                         | 2.1  | 3000                                                          | 80.4  | 6600      | 177   | 10,000   | 268   | 13,490   | 362    | 28,080 | 753    | 35,678      | 956    |     |
| 40                                                                                                                  |                                                                                                         | 2.8  | 3650                                                          | 97.8  | 7800      | 209   | 13,000   | 348   | 17,230   | 462    | 36,123 | 968    | 44,046      | 1180   |     |
| 50                                                                                                                  |                                                                                                         | 3.4  | 4300                                                          | 115   | 9000      | 241   | 16,000   | 429   | 18,520   | 496    | 41,283 | 1106   | 49,610      | 1330   |     |
| 60                                                                                                                  |                                                                                                         | 4.1  | 4950                                                          | 133   | 10,460    | 280   | 16,050   | 430   | 20,460   | 548    | 44,057 | 1181   | 35,915      | 963    |     |
| 80                                                                                                                  |                                                                                                         | 5.5  | 6250                                                          | 168   | 13,400    | 359   | 15,950   | 427   | 10,780   | 289    | 37,078 | 994    | 54,401      | 1458   |     |
| 100                                                                                                                 |                                                                                                         | 6.9  | 7600                                                          | 204   | 16,110    | 432   | 15,030   | 403   | 11,250   | 302    | 30,874 | 827    |             |        |     |
| 125                                                                                                                 |                                                                                                         | 8.6  | 9300                                                          | 249   | 19,500    | 553   | 16,250   | 436   | 11,250   | 302    |        |        |             |        |     |
| 150                                                                                                                 |                                                                                                         | 10.3 | 6320                                                          | 169   | 4960      | 133   | 1970     | 53    | 6590     | 177    |        |        |             |        |     |
| 175                                                                                                                 |                                                                                                         | 12.1 | 5810                                                          | 156   | 3270      | 88    | 1970     | 53    |          |        |        |        |             |        |     |
| 5 to 16 psig /<br>0.34 to 1.1 bar<br><br>15 psig / 1.0 bar<br>±1% psia / bar<br><br>T13600T0012<br>Red              |                                                                                                         | 20   | 1.4                                                           | 1900  | 50.9      | 3400  | 91.1     | 6000  | 161      | 8,860  | 237    | 15,265 | 409         | 15,327 | 411 |
|                                                                                                                     |                                                                                                         | 25   | 1.7                                                           | 2450  | 65.7      | 4550  | 122      | 8000  | 214      | 10,900 | 292    | 24,397 | 654         | 24,228 | 649 |
|                                                                                                                     | 30                                                                                                      | 2.1  | 3000                                                          | 80.4  | 5700      | 153   | 10,000   | 268   | 13,870   | 372    | 30,686 | 822    | 31,796      | 852    |     |
|                                                                                                                     | 40                                                                                                      | 2.8  | 3700                                                          | 99.2  | 7600      | 204   | 13,000   | 348   | 19,100   | 512    | 31,184 | 836    | 44,116      | 1182   |     |
|                                                                                                                     | 50                                                                                                      | 3.4  | 4320                                                          | 116   | 8900      | 239   | 15,000   | 402   | 20,300   | 544    | 39,146 | 1049   | 53,217      | 1426   |     |
|                                                                                                                     | 60                                                                                                      | 4.1  | 4950                                                          | 133   | 10,330    | 277   | 16,900   | 453   | 20,660   | 554    | 44,294 | 1187   | 58,091      | 1557   |     |
|                                                                                                                     | 80                                                                                                      | 5.5  | 6200                                                          | 166   | 13,200    | 354   | 18,730   | 502   | 21,940   | 588    | 50,086 | 1342   | 46,125      | 1236   |     |
|                                                                                                                     | 100                                                                                                     | 6.9  | 7350                                                          | 197   | 16,000    | 429   | 21,260   | 570   | 16,310   | 437    | 42,814 | 1147   |             |        |     |
|                                                                                                                     | 125                                                                                                     | 8.6  | 8800                                                          | 236   | 19,500    | 523   | 23,920   | 641   | 13,970   | 374    |        |        |             |        |     |
|                                                                                                                     | 150                                                                                                     | 10.3 | 10,220                                                        | 274   | 22,950    | 615   | 25,900   | 694   | 10,600   | 284    |        |        |             |        |     |
|                                                                                                                     | 175                                                                                                     | 12.1 | 7300                                                          | 196   | 6500      | 174   | 5910     | 158   |          |        |        |        |             |        |     |
|                                                                                                                     | ■ - Black areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.   |      |                                                               |       |           |       |          |       |          |        |        |        |             |        |     |
|                                                                                                                     | 1. Capacities are limited to 15,000 SCFH / 402 Nm³/h when the Type VSX8 is used without a control line. |      |                                                               |       |           |       |          |       |          |        |        |        |             |        |     |
|                                                                                                                     | 2. Due to slam-shut properties, capacities cannot be calculated with critical flow equation.            |      |                                                               |       |           |       |          |       |          |        |        |        |             |        |     |

**Table 10. Types 299HV and 299HVR Flow Capacities<sup>(1)(2)</sup> for 2 NPT Internal Registration**

| OUTLET PRESSURE<br>RANGE SETTING,<br>CONTROL, SPRING<br>PART NUMBER AND<br>COLOR                                                   | INLET<br>PRESSURE |      | CAPACITIES IN SCFH/ Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |       |           |       |          |       |          |       |        |       |             |       |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|---------------------------------------------------------------|-------|-----------|-------|----------|-------|----------|-------|--------|-------|-------------|-------|
|                                                                                                                                    |                   |      | Orifice Size, In. / mm                                        |       |           |       |          |       |          |       |        |       |             |       |
|                                                                                                                                    |                   |      | 1/4 x 3/8 / 6.4 x 9.5                                         |       | 3/8 / 9.5 |       | 1/2 / 13 |       | 3/4 / 19 |       | 1 / 25 |       | 1-3/16 / 30 |       |
|                                                                                                                                    | psig              | bar  | SCFH                                                          | Nm³/h | SCFH      | Nm³/h | SCFH     | Nm³/h | SCFH     | Nm³/h | SCFH   | Nm³/h | SCFH        | Nm³/h |
| 3.5 to 6 in. w.c. /<br>9 to 15 mbar<br><br>3.5 in. w.c. / 9 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13707T0012<br>Black | 2                 | 0.14 | 760                                                           | 20.4  | 1780      | 47.7  | 2800     | 75    | 6460     | 173   | 5606   | 150   | 5922        | 159   |
|                                                                                                                                    | 5                 | 0.34 | 1160                                                          | 31.1  | 2450      | 65.7  | 4000     | 107   | 7600     | 204   | 10,320 | 277   | 11,844      | 317   |
|                                                                                                                                    | 10                | 0.69 | 1590                                                          | 42.6  | 3560      | 95.4  | 6000     | 161   | 9500     | 255   | 8869   | 238   | 9910        | 266   |
|                                                                                                                                    | 15                | 1.0  | 1920                                                          | 51.5  | 4400      | 118   | 7500     | 201   | 12,400   | 332   | 10,603 | 284   | 11,972      | 321   |
|                                                                                                                                    | 20                | 1.4  | 2240                                                          | 60.0  | 5100      | 137   | 9000     | 241   | 17,500   | 469   | 11,396 | 305   | 14,038      | 376   |
|                                                                                                                                    | 25                | 1.7  | 2570                                                          | 68.9  | 5450      | 146   | 8000     | 214   | 17,000   | 456   | 11,940 | 320   | 16,853      | 452   |
|                                                                                                                                    | 30                | 2.1  | 2890                                                          | 77.5  | 5800      | 155   | 11,000   | 295   | 17,000   | 456   | 11,676 | 313   | 18,544      | 497   |
|                                                                                                                                    | 40                | 2.8  | 3530                                                          | 94.6  | 7550      | 202   | 14,000   | 375   | 13,000   | 348   | 9852   | 264   | 13,471      | 361   |
|                                                                                                                                    | 50                | 3.4  | 3880                                                          | 104   | 9300      | 249   | 16,500   | 442   | 13,000   | 348   | 15,049 | 403   | 10,859      | 291   |
|                                                                                                                                    | 60                | 4.1  | 4090                                                          | 110   | 7700      | 206   | 12,000   | 322   | 12,400   | 332   | 9677   | 259   | 9901        | 265   |
|                                                                                                                                    | 80                | 5.5  | 3110                                                          | 83.3  | 4500      | 121   | 3500     | 94    | 11,600   | 311   | 6486   | 174   |             |       |
|                                                                                                                                    | 100               | 6.9  | 4790                                                          | 128   | 4500      | 121   | 3750     | 101   | 6000     | 161   | 4000   | 107   |             |       |
|                                                                                                                                    | 125               | 8.6  | 5210                                                          | 140   | 4500      | 121   | 5120     | 137   | 4400     | 118   |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 5620                                                          | 151   | 4500      | 121   | 6500     | 174   | 4400     | 118   |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 5620                                                          | 151   | 4500      | 121   | 6500     | 174   |          |       |        |       |             |       |
| 5 to 9 in. w.c. /<br>12 to 22 mbar<br><br>7 in. w.c. / 17 mbar<br>-1 to 2 in. w.c. /<br>-2 to 5 mbar<br><br>T13589T0012<br>Yellow  | 2                 | 0.14 | 750                                                           | 20.1  | 1890      | 50.7  | 2800     | 75    | 5520     | 148   |        |       | 4569        | 122   |
|                                                                                                                                    | 5                 | 0.34 | 1120                                                          | 30.0  | 2460      | 65.9  | 4000     | 107   | 7200     | 193   | 10,252 | 275   | 11,314      | 303   |
|                                                                                                                                    | 10                | 0.69 | 1590                                                          | 42.6  | 3400      | 91.1  | 6000     | 161   | 10,000   | 268   | 9,207  | 247   | 10,232      | 274   |
|                                                                                                                                    | 15                | 1.0  | 1920                                                          | 51.5  | 4320      | 116   | 7000     | 188   | 13,600   | 364   | 10,685 | 286   | 12,452      | 334   |
|                                                                                                                                    | 20                | 1.4  | 2240                                                          | 60.0  | 5060      | 136   | 9000     | 241   | 14,000   | 375   | 11,892 | 319   | 13,958      | 374   |
|                                                                                                                                    | 25                | 1.7  | 2570                                                          | 68.9  | 5800      | 155   | 10,000   | 268   | 15,000   | 402   | 11,949 | 320   | 16,366      | 439   |
|                                                                                                                                    | 30                | 2.1  | 2890                                                          | 77.5  | 6500      | 174   | 11,250   | 302   | 16,000   | 429   | 11,574 | 310   | 18,492      | 496   |
|                                                                                                                                    | 40                | 2.8  | 3530                                                          | 94.6  | 7900      | 212   | 13,000   | 348   | 10,400   | 279   | 11,780 | 316   | 13,165      | 353   |
|                                                                                                                                    | 50                | 3.4  | 4180                                                          | 112   | 7800      | 209   | 14,500   | 389   | 10,400   | 279   | 17,726 | 475   | 10,835      | 290   |
|                                                                                                                                    | 60                | 4.1  | 4180                                                          | 112   | 6560      | 176   | 12,250   | 328   | 10,400   | 279   | 9838   | 264   | 10,216      | 274   |
|                                                                                                                                    | 80                | 5.5  | 4020                                                          | 108   | 4100      | 110   | 3250     | 87    | 10,400   | 279   | 7808   | 209   |             |       |
|                                                                                                                                    | 100               | 6.9  | 4670                                                          | 125   | 4270      | 114   | 3750     | 101   | 5200     | 139   |        |       |             |       |
|                                                                                                                                    | 125               | 8.6  | 5070                                                          | 136   | 4500      | 121   | 6500     | 174   | 4400     | 118   |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 5480                                                          | 147   | 4850      | 130   | 6500     | 174   | 4400     | 118   |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 5480                                                          | 147   | 5200      | 139   | 6500     | 174   |          |       |        |       |             |       |
| 7 to 20 in. w.c. /<br>17 to 50 mbar<br><br>14 in. w.c. /<br>35 mbar<br>±2 in. w.c. /<br>±5 mbar<br><br>1N3112X0012<br>Unpainted    | 2                 | 0.14 | 700                                                           | 18.8  | 1420      | 38.1  | 3440     | 92.2  | 4800     | 129   |        |       | 4411        | 118   |
|                                                                                                                                    | 5                 | 0.34 | 1110                                                          | 29.7  | 2200      | 59    | 4000     | 107   | 7200     | 193   | 9773   | 262   | 11,480      | 308   |
|                                                                                                                                    | 10                | 0.69 | 1580                                                          | 42.3  | 3500      | 93.8  | 6000     | 161   | 11,200   | 300   | 9366   | 251   | 11,502      | 308   |
|                                                                                                                                    | 15                | 1.0  | 1920                                                          | 51.5  | 4300      | 115   | 7600     | 204   | 15,200   | 407   | 11,161 | 299   | 13,850      | 371   |
|                                                                                                                                    | 20                | 1.4  | 2240                                                          | 60.0  | 5000      | 134   | 9000     | 241   | 18,000   | 482   | 12,750 | 342   | 25,753      | 690   |
|                                                                                                                                    | 25                | 1.7  | 2570                                                          | 68.9  | 5700      | 153   | 10,000   | 268   | 17,200   | 461   | 13,890 | 372   | 26,576      | 712   |
|                                                                                                                                    | 30                | 2.1  | 2890                                                          | 77.5  | 6500      | 174   | 11,200   | 300   | 18,200   | 488   | 16,214 | 435   | 26,082      | 699   |
|                                                                                                                                    | 40                | 2.8  | 3530                                                          | 94.6  | 7900      | 212   | 12,800   | 343   | 14,400   | 386   | 22,043 | 591   | 24,392      | 654   |
|                                                                                                                                    | 50                | 3.4  | 4180                                                          | 112   | 9300      | 249   | 16,400   | 440   | 14,400   | 386   | 20,925 | 561   | 12,252      | 328   |
|                                                                                                                                    | 60                | 4.1  | 4820                                                          | 129   | 7630      | 204   | 18,800   | 504   | 14,000   | 375   | 17,782 | 477   | 10,689      | 286   |
|                                                                                                                                    | 80                | 5.5  | 4600                                                          | 123   | 4300      | 115   | 5000     | 134   | 8400     | 225   | 8924   | 239   |             |       |
|                                                                                                                                    | 100               | 6.9  | 4970                                                          | 133   | 4430      | 119   | 5000     | 134   | 6000     | 161   |        |       |             |       |
|                                                                                                                                    | 125               | 8.6  | 5200                                                          | 139   | 4600      | 123   | 6800     | 182   | 6000     | 161   |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 5430                                                          | 146   | 4850      | 130   | 6800     | 182   | 6000     | 161   |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 5430                                                          | 146   | 5100      | 137   | 6800     | 182   |          |       |        |       |             |       |
| 16 to 4 in. w.c. /<br>40 to 99 mbar<br><br>28 in. w.c. /<br>70 mbar<br>±4 in. w.c. /<br>±10 mbar<br><br>1B413727222<br>Purple      | 5                 | 0.34 | 1110                                                          | 29.7  | 2600      | 69.7  | 3600     | 96.5  | 6500     | 174   | 10,863 | 291   | 10,774      | 289   |
|                                                                                                                                    | 10                | 0.69 | 1570                                                          | 42.1  | 3500      | 93.8  | 6000     | 161   | 10,000   | 268   | 17,444 | 467   | 17,697      | 474   |
|                                                                                                                                    | 15                | 1.0  | 1920                                                          | 51.5  | 4400      | 118   | 7200     | 193   | 14,500   | 389   | 14,348 | 385   | 22,216      | 595   |
|                                                                                                                                    | 20                | 1.4  | 2240                                                          | 60.0  | 5100      | 137   | 8800     | 236   | 17,500   | 469   | 15,587 | 418   | 27,214      | 729   |
|                                                                                                                                    | 25                | 1.7  | 2570                                                          | 68.9  | 5800      | 155   | 10,000   | 268   | 20,000   | 536   | 18,194 | 488   | 29,193      | 782   |
|                                                                                                                                    | 30                | 2.1  | 2890                                                          | 77.5  | 6500      | 174   | 11,600   | 311   | 23,500   | 630   | 21,824 | 585   | 29,364      | 787   |
|                                                                                                                                    | 40                | 2.8  | 3530                                                          | 94.6  | 7900      | 212   | 14,000   | 375   | 22,500   | 603   | 33,884 | 908   | 27,850      | 746   |
|                                                                                                                                    | 50                | 3.4  | 4180                                                          | 112   | 9300      | 249   | 16,400   | 440   | 20,000   | 536   | 36,019 | 965   | 28,517      | 764   |
|                                                                                                                                    | 60                | 4.1  | 4820                                                          | 129   | 8400      | 225   | 19,000   | 509   | 16,500   | 442   | 36,145 | 969   | 29,267      | 784   |
|                                                                                                                                    | 80                | 5.5  | 6110                                                          | 164   | 6600      | 177   | 6500     | 174   | 16,500   | 442   | 12,286 | 329   |             |       |
|                                                                                                                                    | 100               | 6.9  | 6360                                                          | 170   | 6910      | 185   | 6500     | 174   | 7000     | 188   |        |       |             |       |
|                                                                                                                                    | 125               | 8.6  | 6450                                                          | 173   | 7300      | 196   | 6500     | 174   | 7000     | 188   |        |       |             |       |
|                                                                                                                                    | 150               | 10.3 | 6540                                                          | 175   | 7700      | 206   | 7000     | 188   | 7000     | 188   |        |       |             |       |
|                                                                                                                                    | 175               | 12.1 | 6540                                                          | 175   | 8100      | 217   | 7000     | 188   |          |       |        |       |             |       |

■ - Black areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Capacities are limited to 15,000 SCFH / 402 Nm³/h when the Type VSX8 is used without a control line.

2. Due to slam-shut properties, capacities cannot be calculated with critical flow equation.

- continued -

# 299H Series

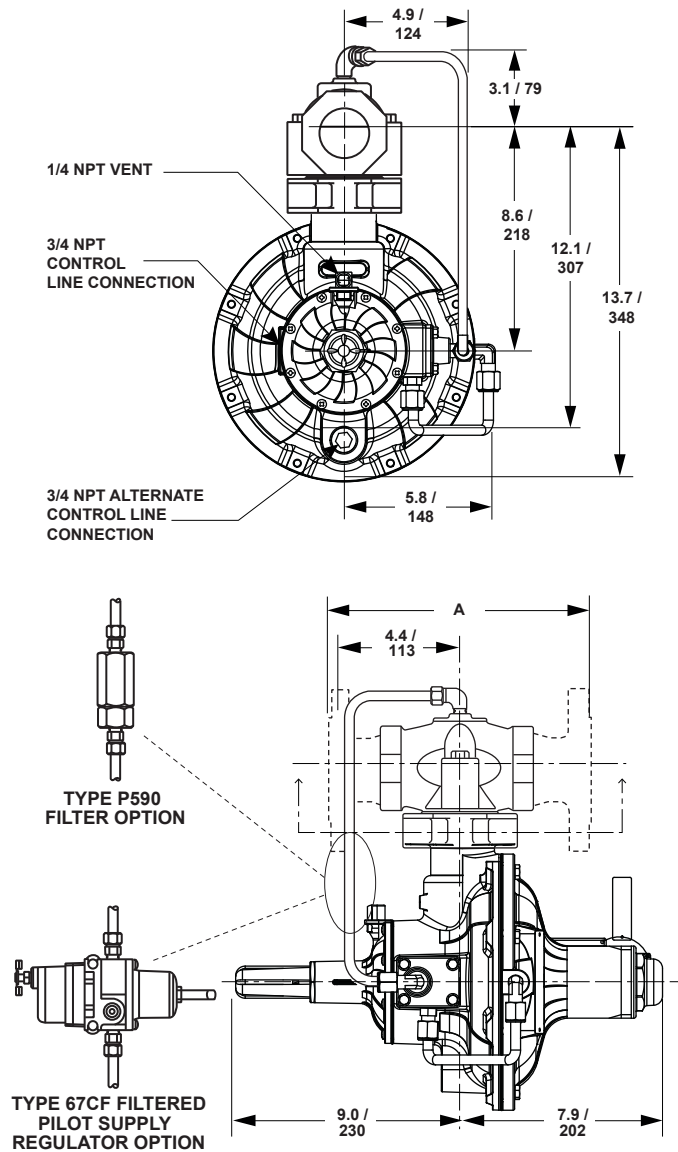
**Table 10. Types 299HV and 299HVR Flow Capacities<sup>(1)(2)</sup> for 2 NPT Internal Registration (continued)**

| OUTLET PRESSURE<br>RANGE SETTING,<br>CONTROL, SPRING<br>PART NUMBER AND<br>COLOR                                    | INLET<br>PRESSURE                                                                                       |      | CAPACITIES IN SCFH/ Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |       |           |       |          |       |          |        |        |       |             |       |     |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------|-------|-----------|-------|----------|-------|----------|--------|--------|-------|-------------|-------|-----|--|--|--|--|
|                                                                                                                     |                                                                                                         |      | Orifice Size, In. / mm                                        |       |           |       |          |       |          |        |        |       |             |       |     |  |  |  |  |
|                                                                                                                     |                                                                                                         |      | 1/4 x 3/8 / 6.4 x 9.5                                         |       | 3/8 / 9.5 |       | 1/2 / 13 |       | 3/4 / 19 |        | 1 / 25 |       | 1-3/16 / 30 |       |     |  |  |  |  |
|                                                                                                                     | psig                                                                                                    | bar  | SCFH                                                          | Nm³/h | SCFH      | Nm³/h | SCFH     | Nm³/h | SCFH     | Nm³/h  | SCFH   | Nm³/h | SCFH        | Nm³/h |     |  |  |  |  |
| 1 to 3.25 psig /<br>69 mbar to 0.22 bar<br><br>2 psig / 0.14 bar<br>±1% psia / bar<br><br>T13593T0012<br>Light blue | 5                                                                                                       | 0.34 | 1020                                                          | 27.3  | 2900      | 77.7  | 4000     | 107   | 6000     | 161    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 10                                                                                                      | 0.69 | 1550                                                          | 41.5  | 3600      | 96.5  | 5500     | 147   | 10,500   | 281    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 15                                                                                                      | 1.0  | 1920                                                          | 51.5  | 4300      | 115   | 7500     | 201   | 14,500   | 389    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 20                                                                                                      | 1.4  | 2240                                                          | 60.0  | 5000      | 134   | 8500     | 228   | 18,000   | 482    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 25                                                                                                      | 1.7  | 2670                                                          | 71.6  | 5550      | 149   | 10,000   | 268   | 20,000   | 536    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 30                                                                                                      | 2.1  | 2890                                                          | 77.5  | 6100      | 163   | 11,000   | 295   | 24,000   | 643    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 40                                                                                                      | 2.8  | 3530                                                          | 94.6  | 7750      | 208   | 14,000   | 375   | 28,000   | 750    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 50                                                                                                      | 3.4  | 4180                                                          | 112   | 9400      | 252   | 16,000   | 429   | 23,000   | 616    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 60                                                                                                      | 4.1  | 4820                                                          | 129   | 10,730    | 288   | 19,000   | 509   | 18,000   | 482    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 80                                                                                                      | 5.5  | 6110                                                          | 164   | 13,400    | 359   | 24,000   | 643   | 8000     | 214    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 100                                                                                                     | 6.9  | 6850                                                          | 184   | 10,770    | 289   | 6500     | 174   | 8000     | 214    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 125                                                                                                     | 8.6  | 7070                                                          | 189   | 7500      | 201   | 7500     | 201   | 8000     | 214    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 150                                                                                                     | 10.3 | 7300                                                          | 196   | 7500      | 201   | 7500     | 201   | 9500     | 255    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 175                                                                                                     | 12.1 | 7300                                                          | 196   | 7500      | 201   | 7500     | 201   |          |        |        |       |             |       |     |  |  |  |  |
| 2.75 to 6 psig /<br>0.19 to 0.41 bar<br><br>5 psig / 0.34 bar<br>±1% psia / bar<br><br>T13671T0012<br>Orange        | 10                                                                                                      | 0.69 | 1390                                                          | 37.3  | 2800      | 75    | 5000     | 134   | 8000     | 214    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 15                                                                                                      | 1.0  | 1870                                                          | 50.1  | 3750      | 101   | 7000     | 188   | 13,000   | 348    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 20                                                                                                      | 1.4  | 2240                                                          | 60.0  | 4700      | 126   | 8500     | 228   | 17,000   | 456    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 25                                                                                                      | 1.7  | 2570                                                          | 68.9  | 5700      | 153   | 9500     | 255   | 20,000   | 536    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 30                                                                                                      | 2.1  | 2890                                                          | 77.5  | 6430      | 172   | 11,000   | 295   | 23,000   | 616    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 40                                                                                                      | 2.8  | 3530                                                          | 94.6  | 7900      | 212   | 13,000   | 348   | 29,000   | 777    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 50                                                                                                      | 3.4  | 4180                                                          | 112   | 9300      | 249   | 16,000   | 429   | 30,000   | 804    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 60                                                                                                      | 4.1  | 4790                                                          | 128   | 10,700    | 287   | 18,000   | 482   | 20,000   | 536    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 80                                                                                                      | 5.5  | 5740                                                          | 154   | 13,350    | 358   | 23,000   | 616   | 20,000   | 536    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 100                                                                                                     | 6.9  | 6680                                                          | 179   | 16,000    | 429   | 8000     | 214   | 20,000   | 536    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 125                                                                                                     | 8.6  | 7170                                                          | 192   | 12,800    | 343   | 8000     | 214   | 20,000   | 536    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 150                                                                                                     | 10.3 | 7650                                                          | 205   | 9600      | 257   | 8000     | 214   | 20,000   | 536    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 175                                                                                                     | 12.1 | 7650                                                          | 205   | 9600      | 257   | 8000     | 214   |          |        |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 5 to 16 psig /<br>0.34 to 1.1 bar<br><br>10 psig / 0.69 bar<br>±1% psia / bar<br><br>T13600T0012<br>Red | 15   | 1.0                                                           | 1800  | 48.2      | 3200  | 85.8     | 4000  | 107      | 8500   |        |       |             |       | 228 |  |  |  |  |
| 20                                                                                                                  |                                                                                                         | 1.4  | 2200                                                          | 59    | 4300      | 115   | 12,000   | 322   | 14,000   | 375    |        |       |             |       |     |  |  |  |  |
| 25                                                                                                                  |                                                                                                         | 1.7  | 2600                                                          | 69.7  | 5400      | 145   | 9000     | 241   | 19,000   | 509    |        |       |             |       |     |  |  |  |  |
| 30                                                                                                                  |                                                                                                         | 2.1  | 3000                                                          | 80.4  | 6600      | 177   | 10,000   | 268   | 22,000   | 590    |        |       |             |       |     |  |  |  |  |
| 40                                                                                                                  |                                                                                                         | 2.8  | 3650                                                          | 97.8  | 7800      | 209   | 13,000   | 348   | 28,000   | 750    |        |       |             |       |     |  |  |  |  |
| 50                                                                                                                  |                                                                                                         | 3.4  | 4300                                                          | 115   | 9000      | 241   | 16,000   | 429   | 34,000   | 911    |        |       |             |       |     |  |  |  |  |
| 60                                                                                                                  |                                                                                                         | 4.1  | 4950                                                          | 133   | 10,460    | 280   | 18,000   | 482   | 39,000   | 1045   |        |       |             |       |     |  |  |  |  |
| 80                                                                                                                  |                                                                                                         | 5.5  | 6250                                                          | 168   | 13,400    | 359   | 23,000   | 616   | 25,000   | 670    |        |       |             |       |     |  |  |  |  |
| 100                                                                                                                 |                                                                                                         | 6.9  | 7600                                                          | 204   | 16,110    | 432   | 29,000   | 777   | 25,000   | 670    |        |       |             |       |     |  |  |  |  |
| 125                                                                                                                 |                                                                                                         | 8.6  | 9300                                                          | 249   | 19,500    | 523   | 35,000   | 938   | 25,000   | 670    |        |       |             |       |     |  |  |  |  |
| 150                                                                                                                 |                                                                                                         | 10.3 | 9,900                                                         | 265   | 15,050    | 403   | 10,000   | 268   | 25,000   | 670    |        |       |             |       |     |  |  |  |  |
| 175                                                                                                                 |                                                                                                         | 12.1 | 10,500                                                        | 281   | 10,600    | 284   | 10,000   | 268   |          |        |        |       |             |       |     |  |  |  |  |
| 5 to 16 psig /<br>0.34 to 1.1 bar<br><br>15 psig / 1.0 bar<br>±1% psia / bar<br><br>T13600T0012<br>Red              |                                                                                                         | 20   | 1.4                                                           | 1900  | 50.9      | 3400  | 91.1     | 6000  | 161      | 10,000 | 268    |       |             |       |     |  |  |  |  |
|                                                                                                                     |                                                                                                         | 25   | 1.7                                                           | 2450  | 65.7      | 4550  | 122      | 8000  | 214      | 15,000 | 402    |       |             |       |     |  |  |  |  |
|                                                                                                                     | 30                                                                                                      | 2.1  | 3000                                                          | 80.4  | 5700      | 153   | 10,000   | 268   | 20,000   | 536    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 40                                                                                                      | 2.8  | 3700                                                          | 99.2  | 7600      | 204   | 13,000   | 348   | 28,000   | 750    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 50                                                                                                      | 3.4  | 4320                                                          | 116   | 8900      | 239   | 15,000   | 402   | 35,000   | 938    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 60                                                                                                      | 4.1  | 4950                                                          | 133   | 10,330    | 277   | 18,000   | 482   | 40,000   | 1072   |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 80                                                                                                      | 5.5  | 6200                                                          | 166   | 13,200    | 354   | 23,000   | 616   | 51,000   | 1367   |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 100                                                                                                     | 6.9  | 7350                                                          | 197   | 16,000    | 429   | 29,000   | 777   | 35,000   | 938    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 125                                                                                                     | 8.6  | 8800                                                          | 236   | 19,500    | 523   | 36,000   | 965   | 30,000   | 804    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 150                                                                                                     | 10.3 | 10,220                                                        | 274   | 22,950    | 615   | 40,000   | 1072  | 30,000   | 804    |        |       |             |       |     |  |  |  |  |
|                                                                                                                     | 175                                                                                                     | 12.1 | 11,650                                                        | 312   | 26,400    | 708   | 40,000   | 1072  |          |        |        |       |             |       |     |  |  |  |  |

- Black areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

1. Capacities are limited to 15,000 SCFH / 402 Nm³/h when the Type VSX8 is used without a control line.

2. Due to slam-shut properties, capacities cannot be calculated with critical flow equation.



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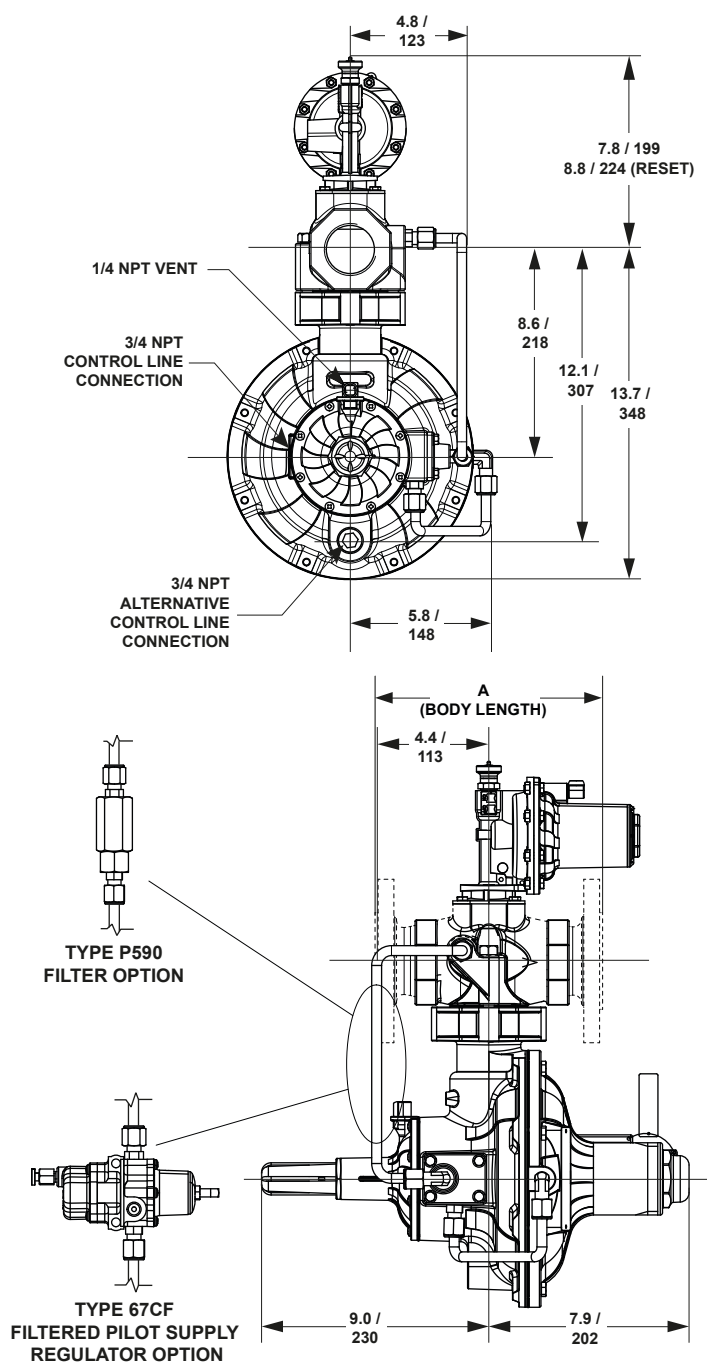
IN. / mm

**Figure 8.** Types 299H and 299HR Dimensions

**Table 12.** Types 299H and 299HR Dimensions

| DIMENSION                                                             | END CONNECTION STYLE AND FACE-TO-FACE DIMENSION |     |                         |     |          |     |          |     |                         |     |                            |     |
|-----------------------------------------------------------------------|-------------------------------------------------|-----|-------------------------|-----|----------|-----|----------|-----|-------------------------|-----|----------------------------|-----|
|                                                                       | NPT                                             |     | CL125 FF <sup>(1)</sup> |     | CL125 FF |     | CL150 RF |     | CL250 RF <sup>(2)</sup> |     | PN 10 or 16 <sup>(2)</sup> |     |
|                                                                       | In.                                             | mm  | In.                     | mm  | In.      | mm  | In.      | mm  | In.                     | mm  | In.                        | mm  |
| A                                                                     | 6.12                                            | 155 | 7.50                    | 199 | 10.00    | 254 | 10.00    | 254 | 10.50                   | 267 | 9.06                       | 230 |
| 1. Available in Cast iron only.<br>2. Available in Ductile iron only. |                                                 |     |                         |     |          |     |          |     |                         |     |                            |     |

# 299H Series



ERAA23274\_AB

IN. / mm

Figure 9. Types 299HV and 299HVR Dimensions

Table 13. Types 299HV and 299HVR Dimensions

| DIMENSION | BODY SIZE AND END CONNECTION |     |       |     |               |     |          |     |             |     |
|-----------|------------------------------|-----|-------|-----|---------------|-----|----------|-----|-------------|-----|
|           | 1-1/2 NPT                    |     | 2 NPT |     | NPS 2 / DN 50 |     |          |     |             |     |
|           |                              |     |       |     | CL125 RF      |     | CL250 RF |     | PN 10/16 RF |     |
|           | In.                          | mm  | In.   | mm  | In.           | mm  | In.      | mm  | In.         | mm  |
| A         | 6.12                         | 155 | 6.12  | 155 | 10.00         | 254 | 10.50    | 267 | 9.06        | 230 |

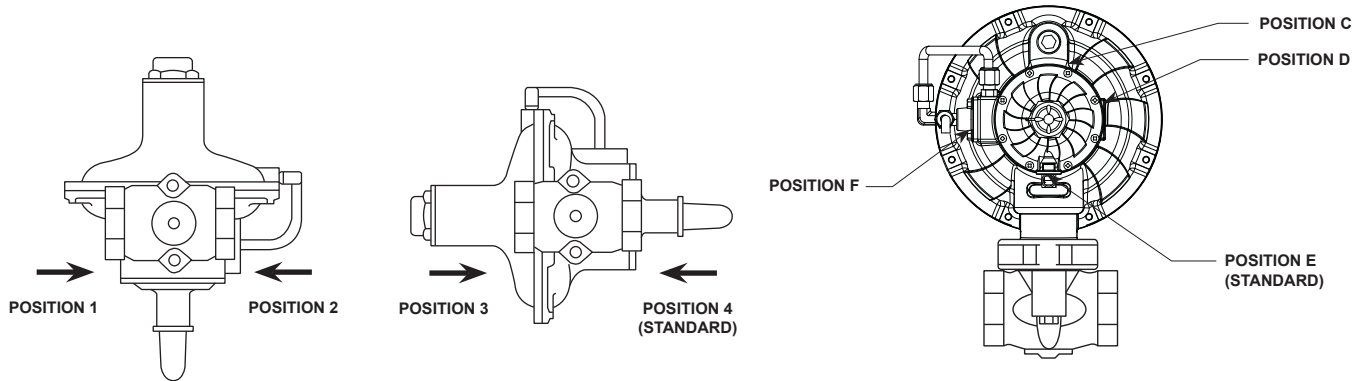


Figure 10. Body and Vent Positions

## Ordering Information

To order, complete the Ordering Guide on pages 31 and 32. Carefully review the Specifications section on page 2 and specify the desired selection whenever there is a choice to be made.

## Ordering Guide

### Type (Select One)

- ☐ 299H\*\*\*
- ☐ 299HR\*\*\*
- ☐ 299HV\*\*\*
- ☐ 299HVR\*\*\*

### Body Size, Material and End Connection Style (Select One)

#### 1-1/4 NPT

- ☐ Grey cast iron (For Types 299H and 299HR only)\*\*\*

#### 1-1/2 NPT

- ☐ Grey cast iron (For Types 299H and 299HR only)\*\*\*
- ☐ Ductile iron\*\*\*
- ☐ Steel (For Types 299H and 299HR only)\*\*\*

#### NPS 2 / DN 50

Grey cast iron (For Types 299H and 299HR only)

- ☐ NPT\*\*\*
- ☐ CL125 FF - 7.5 in. / 191 mm\*\*\*
- ☐ CL125 FF - 10 in. / 254 mm\*\*\*

Ductile iron

- ☐ NPT\*\*\*
- ☐ CL125 FF - 10 in. / 254 mm\*\*\*
- ☐ CL250 RF\*\*\*
- ☐ PN 10/16 Flanged\*

Steel (For Types 299H and 299HR only)

- ☐ NPT\*\*\*
- ☐ CL150 RF\*\*\*

### Orifice Size (Select One)

- ☐ 1/4 x 3/8 in. / 6.4 x 9.5 mm\*\*\*
- ☐ 3/8 in. / 9.5 mm\*\*\*
- ☐ 1/2 in. / 13 mm\*\*\*
- ☐ 3/4 in. / 19 mm\*\*\*
- ☐ 7/8 in. / 22 mm (For Types 299H and 299HR only)\*\*\*
- ☐ 1 in. / 25 mm (For Types 299H and 299HR only)\*\*\*
- ☐ 1-3/16 in. / 30 mm (For Types 299H and 299HR only)\*\*\*

### Outlet Pressure Range (Select One)

- ☐ 3.5 to 6 in. w.c. / 9 to 15 mbar, Black\*\*\*
- ☐ 5 to 9 in. w.c. / 12 to 22 mbar, Yellow\*\*\*
- ☐ 7 to 20 in. w.c. / 17 to 50 mbar, Unpainted\*\*\*
- ☐ 16 to 40 in. w.c. / 40 to 99 mbar, Purple\*\*\*
- ☐ 1 to 3.25 psig / 69 mbar to 0.22 bar, Light Blue\*\*\*
- ☐ 2.75 to 6 psig / 0.19 to 0.41 bar, Orange\*\*\*
- ☐ 5 to 16 psig / 0.34 to 1.1 bar, Red\*\*\*
- ☐ 14 to 35 psig / 0.97 to 2.4 bar (Type 299H), Zinc\*\*\*
- ☐ 30 to 60 psig / 2.1 to 4.1 bar (Type 299H), Green\*\*\*

### Pressure Registration (Select One)

- ☐ Internal\*\*\*
- ☐ External\*\*\*
- ☐ Dual\*\*\*

### Fixed Restriction (Select One)

- ☐ 0.044 in. / 1.1 mm, Red (**standard gain**)\*\*\*
- ☐ 0.071 in. / 1.8 mm, Green (low gain)\*\*\*
- ☐ 0.082 in. / 2.1 mm, Blue (lower gain)\*\*\*

### VSX Series Slam-Shut Trip Pressure Setting

(Select one if applicable and specify setpoint/s, see Tables 4a, 4b, 4c and 4d.)

### Overpressure Protection Only (OPSO)

- ☐ Supply setpoint required \_\_\_\_\_

- continued -

# 299H Series

## Ordering Guide (continued)

### Overpressure and Underpressure Protection (OPSO/UPSO)

☐ Supply overpressure setpoint required

☐ Supply underpressure setpoint required

### Type P590 Pilot Supply Filter (Optional)

☐ Type P593-1, Aluminum

☐ Type 594-1, Brass

### Type 67CF Filtered Pilot Supply Regulator (Optional)

☐ Yes, please add a Type 67CF regulator to this order.

### Main Valve Parts Kit (Optional)

☐ Yes, please send one parts kit to match this order.

### Pilot Parts Kit (Optional)

☐ Yes, please send one parts kit to match this order.

| Regulators Quick Order Guide                                                                                                            |                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| ***                                                                                                                                     | Standard - Readily Available for Shipment                                                            |
| **                                                                                                                                      | Non-Standard - Allow Additional Time for Shipment                                                    |
| *                                                                                                                                       | Special Order, Constructed from Non-Stocked Parts. Consult your local Sales Office for Availability. |
| Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction. |                                                                                                      |

### Specification Worksheet

#### Application (Please designate units):

Specific Use \_\_\_\_\_

Line Size \_\_\_\_\_

Gas Type and Specific Gravity \_\_\_\_\_

Gas Temperature \_\_\_\_\_

Does the Application Require Overpressure Protection?

☐ No ☐ Yes, if so, which is preferred:

☐ Relief Valve ☐ Monitor Regulator ☐ Shutoff Device

Is overpressure protection equipment selection assistance desired? \_\_\_\_\_

#### Pressure (Please designate units):

Maximum Inlet Pressure ( $P_{1max}$ ) \_\_\_\_\_

Minimum Inlet Pressure ( $P_{1min}$ ) \_\_\_\_\_

Downstream Pressure Setting(s) ( $P_2$ ) \_\_\_\_\_

Maximum Flow ( $Q_{max}$ ) \_\_\_\_\_

#### Performance Required:

Accuracy Requirements? \_\_\_\_\_

Need for Extremely Fast Response? \_\_\_\_\_

Other Requirements: \_\_\_\_\_

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