MODEL 274 GAS PRESSURE REGULATOR

General Description

Applications
- Primarily utilized for commercial and industrial applications
- For natural gas and all non-corrosive gaseous media
- Various options for specialty applications
- Fixed Factor Billing model available for PFM applications, that ensure outlet pressure accuracy to +/- 1% absolute pressure

Characteristics
- Specifically designed for safe, accurate, pressure reduction of gaseous media
- Wide inlet pressure range 1–125 psig (0.07-8.5 bar) depending on orifice diameter
- Maximum inlet pressure 150 psig (10 bar)
- Maximum operating pressure 125 psig (8.5 bar)
- Spring-loaded, lever-operated to accommodate changes in inlet pressure
- Various interchangeable orifices for ease of maintenance and increased turndown ratio to accommodate a wide range of flows and pressure conditions (inlet & outlet pressures)
- Outlet pressure settings from 6” w.c. to 6 psig (15-420 mbar) over 5 spring ranges
- Balanced valve version available for increased accuracy and control
- 3 different inlet/outlet thread diameters (National or British Pipe Standards – NPT, BSPT, BSPP)
- 2” flanged version available in ANSI150 or PN16 with flat or raised face profiles
- Flanged body available in cast iron, ductile iron or cast steel
- Various relief valve assemblies available (full, limited and zero capacity relief discharge)
- 1” threaded vent connection
- Available with Internal Impulse or Control Line (I.C.L.) or External Impulse or Control Line Connections (E.C.L.)
- Ease of maintenance due to interchangeable diaphragm casing cartridge
- Various safety slam-shut valve (SSV) models available for pressure/flow cut-off protection
- Custom designed and pre-fabricated regulator assemblies available
MODEL 274 GAS PRESSURE REGULATOR

General Description

◊ Fixed Factor Billing for PFM applications—to maintain outlet pressure accuracy for applications that require downstream pressure to be held within +/- 1% absolute pressure

◊ Outlet pressures from 6" w.c. to 6 psig over 5 spring ranges. Set point can be adjusted easily with standard socket. Regulator top cap has the capability of including the provision for a wire seal.

◊ 1" threaded vent connection protected by screen that is easily removed to attach vent extender or vent-line.

◊ Reinforced diaphragm for increased speed of response and durability.

◊ Under & Over Pressure Safety Slam-Shut Valve (UPCO/OPCO) options available

◊ Over Pressure Safety Slam-Shut Valve (OPCO) options available

◊ Integral slam-shut valves available to protect against under (UPCO) and over pressure (OPCO) conditions in the downstream pipe-work. Slam-shut valves also available with low differential pressure cut-off and thermal trip (T-type) protection feature to shut gas off if regulator is engulfed in a fire.

◊ Pressure test points available at inlet & outlet chambers of the body, as an option.

◊ Several available orifice diameters to accommodate a wide range of pressure conditions and flow require-

◊ 3 different pipe thread diameters available on an inline (180°) body designs. 1¼", 1½" or 2" or 1" NPT, BSPT or BSPP

◊ 2" flanged connections available in ANSI150 or PN16 with flat

◊ Available with integrated union fitting with o-ring seal for 100% bubble-tight seal on both inlet or outlet body connections to ease and reduce installation labor. Union available in standard or insulated versions.

◊ Available with Cartridge style regulator diaphragm casing design so retrofitting new regulator casings is very easy without removing regulator body from the pipe-work.

◊ Available with Internal Impulse or Control Line (I.C.L.) or External Impulse or Control Line Connections (E.C.L.)

Atmospheric Pressure
Inlet Pressure
Outlet Pressure
MODEL 274 GAS PRESSURE REGULATOR

General Description

Available Constructions
274 R: full internal relief capacity
274 P: no internal relief capacity
274LR-290 OPCO: limited internal relief capacity with integral Over Pressure Cut-Off safety slam-shut valve
274P-290 OPCO: no internal relief capacity with integral Over Pressure Cut-Off safety slam-shut valve
274SD-290 OPCO SD: no internal relief capacity with safety diaphragms and Over Pressure Cut-Off safety slam-shut valve
274LR-309 UPCO/OPCO: limited internal relief capacity with integral Under and Over Pressure Cut-Off safety slam-shut valve
274P-309 UPCO/OPCO: no internal relief capacity with integral Under and Over Pressure Cut-Off safety slam-shut valve
274SD-309 UPCO/OPCO: no internal relief capacity with safety diaphragms and Under and Over Pressure Cut-Off safety slam-shut valve.

PFM version: fixed factor billing or pressure factor metering version for outlet pressure accuracy within ±1% absolute pressure. Outlet pressure range from 2 to 5.5 psig (140 to 385 mbar)

Thermal Protection (T-Type): no internal relief capacity with safety diaphragms and integral safety slam-shut valve (OPCO or UPCO/OPCO) that has shut-off protection if assembly is engulfed in a fire. Assembly has many steel component parts.

I.C.L. Type: Internally sensing or internal control line to measure outlet pressure

E.C.L. Type: Externally sensing or external control line required to measure outlet pressure in downstream pipe-work. Diaphragm casings drilled and tapped ½” NPT or BSPT to connect downstream sensing line.

F version: complete with inlet mess filter

Body Sizes and Connection Types

Screwed Type Body
• 1¼”, 1½” & 2” screwed
• NPT, BSPT or BSPP threaded types
• U-type: with modified inlet union fitting on either inlet and/or outlet connections

Flanged Type Body
• 2” flanged inlet/outlet
MODEL 274 GAS PRESSURE REGULATOR

General Description

Pressure Ratings
- **Maximum Recommended Inlet Pressure**
  - 150 psig (10 bar)
- **Maximum Recommended Operating Pressure**
  - 125 psig (8.6 bar) with 5.0, 7.5mm & 10.0mm orifices
  - 75 psig (5 bar) with 15.0mm orifice
  - 60 psig (4 bar) with 20.0mm orifice
  - 15 psig (1 bar) with 25.0mm & 30.0mm orifices
  - 125 psig (8.6 bar) with 30.0mm orifice and balanced valve

Materials of Construction
- **Screwed Body**
  - Cast Iron
- **Flanged Body**
  - Cast Iron, Ductile Iron, Cast Steel
- **Diaphragm Casings**
  - Die Cast Aluminum
- **Diaphragm**
  - Molded Nitrile Rubber with Nylon Reinforcing
- **Valve Head (Seat)**
  - Buna-N Rubber & Polyurethane
- **Diaphragm Plates**
  - Steel
- **Orifice**
  - Brass or Stainless Steel (T-type)
- **Vent Screen**
  - Stainless Steel
- **Fasteners**
  - Steel
- **Top Cap (standard)**
  - Aluminum

Weights
- w/ screwed body — 18 lb. (8.2 kg)
- w/ cast iron flanged body - 28 lb. (12.75 kg)
- w/ ductile iron flanged body – 30 lb. (13.6 kg)
- w/ cast steel flanged body – 36 lb. (16.4 kg)
- w/ 290 OPCO - add 1.1 lb. (0.5 kg)
- w/ 309 UPCO/OPCO – 2.2 lb. (1.0 kg)
- w/ 309 T-Type UPCO/OPCO – 4.75 lb. (2.2 kg)

Temperature Rating
- -40° to 60° Celsius
- -40° to 140° Fahrenheit
# MODEL 274 GAS PRESSURE REGULATOR

## General Description

### Outlet Pressure Range

<table>
<thead>
<tr>
<th>Range (imperial)</th>
<th>Range (metric)</th>
<th>Spring Number/Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>6” — 14” w.c.</td>
<td>15 —35 mbar</td>
<td>960 (grey)</td>
</tr>
<tr>
<td>12” - 22” w.c.</td>
<td>30 — 56 mbar</td>
<td>961 (yellow)</td>
</tr>
<tr>
<td>20” - 40” w.c.</td>
<td>50 — 100 mbar</td>
<td>962 (brown)</td>
</tr>
<tr>
<td>1 — 3 psig</td>
<td>70 — 210 mbar</td>
<td>963 (orange)</td>
</tr>
<tr>
<td>2 — 6 psig</td>
<td>140 — 420 mbar</td>
<td>964 (blue)</td>
</tr>
</tbody>
</table>

### Relief Pressure Range

<table>
<thead>
<tr>
<th>Outlet Pressure Spring</th>
<th>Relief Range (imperial)</th>
<th>Relief Range (metric)</th>
</tr>
</thead>
<tbody>
<tr>
<td>960</td>
<td>12” - 34” w.c.</td>
<td>30 — 85 mbar</td>
</tr>
<tr>
<td>961</td>
<td>22” - 50” w.c.</td>
<td>55 — 125 mbar</td>
</tr>
<tr>
<td>962</td>
<td>34” - 68” w.c.</td>
<td>85 — 170 mbar</td>
</tr>
<tr>
<td>963</td>
<td>2 - 5 psig</td>
<td>140 — 350 mbar</td>
</tr>
<tr>
<td>964</td>
<td>3 - 9 psig</td>
<td>210 - 630 mbar</td>
</tr>
</tbody>
</table>

### Relief Valve Options

- **SD-Type**
- **Safety Diaphragm**

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### General Description

**MODEL 274 GAS PRESSURE REGULATOR**

#### Inlet Pressure

<table>
<thead>
<tr>
<th>Outlet Pressure</th>
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<th>Orifice Size (millimeters/inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>psig</td>
<td>bar</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>(0.070)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>(0.140)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>(0.350)</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>(0.700)</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>(1)</td>
</tr>
<tr>
<td>30</td>
<td>(2)</td>
<td>2200</td>
</tr>
<tr>
<td>45</td>
<td>(3)</td>
<td>2700</td>
</tr>
<tr>
<td>60</td>
<td>(4)</td>
<td>3400</td>
</tr>
<tr>
<td>75</td>
<td>(5)</td>
<td>4200</td>
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<tr>
<td>100</td>
<td>(7)</td>
<td>7000</td>
</tr>
<tr>
<td>125</td>
<td>(8.6)</td>
<td>9500</td>
</tr>
</tbody>
</table>

### HIGHLIGHTED AREAS MUST BE SERVICED BY AN EXTERNAL CONTROL LINE (E.C.L.)

Scfh (ft³/hr) - natural gas, 0.6 sg
Scmh (m³/hr) - natural gas, 0.6 sg
### MODEL 274 GAS PRESSURE REGULATOR

#### General Description

**Outlet Pressure**

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>Orifice Size (millimeters/inches)</th>
</tr>
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<tbody>
<tr>
<td>psig</td>
<td>bar</td>
</tr>
<tr>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>1</td>
<td>(0.070)</td>
</tr>
<tr>
<td>2</td>
<td>(0.140)</td>
</tr>
<tr>
<td>3</td>
<td>(0.350)</td>
</tr>
<tr>
<td>4</td>
<td>(0.700)</td>
</tr>
<tr>
<td>5</td>
<td>(1.140)</td>
</tr>
<tr>
<td>6</td>
<td>(2.200)</td>
</tr>
<tr>
<td>7</td>
<td>(4.000)</td>
</tr>
<tr>
<td>8</td>
<td>(6.500)</td>
</tr>
<tr>
<td>9</td>
<td>(12.500)</td>
</tr>
<tr>
<td>10</td>
<td>(22.500)</td>
</tr>
<tr>
<td>11</td>
<td>(37.000)</td>
</tr>
<tr>
<td>12</td>
<td>(63.000)</td>
</tr>
</tbody>
</table>

**HIGHLIGHTED AREAS MUST BE SERVICED BY AN EXTERNAL CONTROL LINE (E.C.L.)**

Scfh (ft³/hr) - natural gas, 0.6 sg
Scmh (m³/hr) - natural gas, 0.6 sg
# MODEL 274 GAS PRESSURE REGULATOR

## General Description

<table>
<thead>
<tr>
<th>Outlet Pressure</th>
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<th>Orifice Size (millimeters/inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>psig</td>
<td>bar 5.0mm</td>
</tr>
<tr>
<td>SET POINT 5 psig (350 mbar)</td>
<td>10</td>
<td>(0.700)</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>(2)</td>
</tr>
<tr>
<td>DROOP/BOOST 1 psig 70 mbar</td>
<td>45</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>(5)</td>
</tr>
<tr>
<td>Accuracy Class 20%</td>
<td>100 (7)</td>
<td>4000</td>
</tr>
<tr>
<td></td>
<td>125 (8.6)</td>
<td>4500</td>
</tr>
</tbody>
</table>

Pressure Factor Metering (±1% Absolute Pressure)

Measurement Canada Approval – AG-0539

<table>
<thead>
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<tbody>
<tr>
<td></td>
<td>psig</td>
<td>bar 5.0mm</td>
</tr>
<tr>
<td>SET POINT 2.0 psig (140 mbar)</td>
<td>10</td>
<td>(0.700)</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>(1.4)</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>(2)</td>
</tr>
<tr>
<td>DROOP/BOOST 0.16 psig 11 mbar</td>
<td>40</td>
<td>(2.7)</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>(3.4)</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>(4.1)</td>
</tr>
<tr>
<td>Accuracy Class ±1% ABS P.F.M.</td>
<td>70</td>
<td>(4.8)</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>(5.4)</td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>(6.1)</td>
</tr>
</tbody>
</table>

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<tr>
<th>Outlet Pressure</th>
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<th>Orifice Size (millimeters/inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>psig</td>
<td>bar 5.0mm</td>
</tr>
<tr>
<td>SET POINT 5.0 psig (350 mbar)</td>
<td>10</td>
<td>(0.700)</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>(1.4)</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>(2)</td>
</tr>
<tr>
<td>DROOP/BOOST 0.2 psig 14 mbar</td>
<td>40</td>
<td>(2.7)</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>(3.4)</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>(4.1)</td>
</tr>
<tr>
<td>Accuracy Class ±1% ABS P.F.M.</td>
<td>70</td>
<td>(4.8)</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>(5.4)</td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>(6.1)</td>
</tr>
</tbody>
</table>

Scfh (ft³/hr) - natural gas, 0.6 sg
Scmh (m³/hr) - natural gas, 0.6 sg
MODEL 274 GAS PRESSURE REGULATOR

General Description

Capacity Calculation or Correction Factors for Other Gases

<table>
<thead>
<tr>
<th>Gas Type</th>
<th>Specific Gravity</th>
<th>Correction Factor (CF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>1.00</td>
<td>0.77</td>
</tr>
<tr>
<td>Butane</td>
<td>2.01</td>
<td>0.55</td>
</tr>
<tr>
<td>Carbon Dioxide (Dry)</td>
<td>1.52</td>
<td>0.63</td>
</tr>
<tr>
<td>Carbon Monoxide (Dry)</td>
<td>0.97</td>
<td>0.79</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>0.60</td>
<td>1.00</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>0.97</td>
<td>0.79</td>
</tr>
<tr>
<td>Propane</td>
<td>1.53</td>
<td>0.63</td>
</tr>
<tr>
<td>Propane-Air-Mix</td>
<td>1.20</td>
<td>0.71</td>
</tr>
</tbody>
</table>

Vent and Body Orientations

Orientation — Body Position Letter followed by Vent Position Number

For Other Correction Factors

$$C_F = \sqrt{\frac{0.6}{\text{Sg of Gas}}}$$
MODEL 274 GAS PRESSURE REGULATOR

General Description

Sectional Diagrams

274  R (screwed body)

274 — 290 OPCO

274 — 309 “T” OPCO
MODEL 274 GAS PRESSURE REGULATOR

General Description

Dimensional Drawings

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>11&quot;</td>
<td>3½&quot;</td>
<td>5¾&quot;</td>
<td>8½&quot;</td>
<td>10&quot;</td>
<td>3½&quot;</td>
<td>4&quot;</td>
<td>6½&quot;</td>
<td>7½&quot;</td>
<td>4¼&quot;</td>
<td>8½&quot;</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

274 (screwed body)
Overall Length — 18"

274 (flanged body)
Overall Length — 20"

274—290 (screwed body)
Overall Length — 25"

274—290 (flanged body)
Overall Length — 25"

274—309 (screwed body)
Overall Length — 27"

274—309 (flanged body)
Overall Length — 27"
MODEL 274 GAS PRESSURE REGULATOR

General Description

External Control Line Versions (E.C.L.)

- Regulators with an external control line have the throat of the regulator blocked with a seal and the outlet pressure measuring chamber (lower diaphragm casing) drilled and tapped for an outlet pressure sensing line. It is recommended that the sensing point is a minimum of 5 times the outlet pipe diameter downstream of the regulator.
- Sensing outlet pressure via an external control line enables the regulator to respond more accurately to the downstream system.

Diagram of Regulator Station and Recommended Location of External Control Line (E.C.L.) Connections
MODEL 274 GAS PRESSURE REGULATOR

General Description

Internal Relief Valve and Safety Slam Shut Valve Options

Regulators for Reduced Clearances or Venting Limitations
- Please contact one of our representatives for more detailed information

Regulators for Indoor Installations without Requirement for Vent-Line
- Please contact one of our representatives for more detailed information

Internal Safety Relief Valve (SRV) Description

- The SRV is designed to monitor the pressure in the outlet chamber or downstream of the regulator and to relieve by either venting gas leakages or full flow capacity (depending on the device design) into the atmosphere in the event of an over-pressure condition.
- If the pressure in the measuring chamber exceeds the force of the set point spring of the relief valve, the diaphragm rises and opens the relief valve. The gas then flows from the outlet pressure line to atmosphere or another desired location.
- The relief gas pressure and flow is discharged until the pressure is returned to the predetermined safe level.
- The safety relief pressure of the internal relief valve occurs slightly above the set pressure of the main spring or outlet pressure

Safety Slam Shut Valve (SSV) Description

- The SSV is designed to monitor the outlet pressure and to interrupt the gas flow, if preset limits are exceeded.
- This preset pressure is adjustable in the field.
- If the measured pressure reaches the set point of the SSV, a release mechanism is triggered and the SSV closes the valve on the inlet pressure side of the regulator. This closing function completely blocks the forward movement of gas past the SSV.
- Safety slam shut valves are available in over pressure cut off (OPCO) protection or under and over pressure cut off (UPCO/OPCO) protection.
- After the SSV is tripped, the condition that triggered the closing of the valve must be addressed and then the SSV can be manually reset.
- Thermal trip protection is also available as an option to shut the gas flow off, if the safety slam shut valve is exposed to high temperatures or engulfed in a fire (T-Type).
- Please contact one of our representatives for the technical brochure on all of our safety slam shut valves.
MODEL 274 GAS PRESSURE REGULATOR

General Description

Commissioning and Installation Instructions

Please contact one of our representatives for the installation and commissioning instructions. Additionally, the commissioning and installation instructions are found in each box that the equipment is shipped in and can be downloaded from the website.

Ordering Information

1. Inlet pressure (minimum and maximum)
2. Outlet pressure requirement
3. Flow requirement (minimum and maximum)
4. Type of gas
5. Temperature
6. Pipe connections (inlet and outlet)
7. Internal or external impulse (sensing)
8. Safety options or requirements (SRV and/or SSV)
9. Vent and body orientation
10. Other critical information (system design or description)

Product Portfolio

- Pressure regulators for every application from domestic, commercial, industrial to transmission line, city gate stations and other gas utility applications.
- Safety relief valves
- Safety slam shut valves
- Metering equipment (rotary displacement, turbine, vortex shedding, ultrasonic)
- Volume correctors (temperature and pressure)
- Filters
- Underground pressure regulator and metering modules
- Ball valves
- Station design and assembly (prefabricated stations, skid-mounted assemblies, small regulator/meter-set assemblies)
- Flame arrestors
- Data logging and software
- Check and non-return valves
- Training and after-sales service
MODEL 274 GAS PRESSURE REGULATOR

General Description

Contact Information

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Fax: +49-561-5007-107
Website: www.rmg.de

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Fax: +44-1246-501-500
Website: www.bdrmg.co.uk

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Fax: +1-203-272-9860
Website: www.bryandonkinusa.com

Distributor Information