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Product Information Letter

Date: 1-19-15

PIL #: GP15-002

Product Line: All Regulators

Distribution:

Itron Internal
 Distributors

Customers
 Sales & Itron Representatives

Subject: *Standards requirement classifications*

Overview:

The following document clarifies ANSI and DOT standards requirements as they pertain to Itron regulators.

- **ANSI B109.4** – Self-operated Diaphragm-type Natural Gas Service Regulators.
- **DOT 49 192.197** – Control of the pressure of gas delivered from high-pressure distribution systems.
- **ANSI Z21.80/CSA 6.22** – Line Pressure Regulators
- **CSA 6.18** – Canadian Standards Association – Service Regulators For Natural Gas
- **G-0108** – Measurement Canada Approval

ANSI B109.4 – Self-operated Diaphragm-type Natural Gas Service Regulators

The ANSI standard that is most commonly adhered to by all service regulator manufactures in the industry. This standard applies to the minimum design, material, performance and testing requirements for service type regulators.

This standard only applies to:

- Regulators with valve bodies 1-1/4” or smaller.
- Regulators operating at inlet pressures up to 125 psig.
- Regulators with maximum outlet pressure of 14 IWC.

The Main scope of this Standard:

“The relief valve shall be designed to relieve pressure at a rate that limits the downstream pressure to a maximum of 2 PSIG for the maximum inlet pressure recommended by the manufacturer for the orifice installed.” “Cause the regulator to fail by disconnecting the linkage between the diaphragm and valve mechanism.”

All Itron service regulators (B42, B57, B58, B31, B531 and B34SR) will meet this requirement with certain inlet pressures and orifice sizes. Relief charts are provided in the literature which contains the particular pressures and orifice sizes that will meet the required 2 PSIG or less build-up pressure. All relief type regulators with an inlet pressure of 2 psig or less will automatically comply with ANSI B109.4.

CSA 6.18 is the Canadian equivalent to ANSI B109.4. Canada requires that regulators be approved and listed by Measurement Canada. G-0108 is the Itron approval number for CSA 6.18. The US allows manufactures to self-approve/list their products by simply stating they comply with the ANSI B109.4 standard.



PIL

Product Information Letter

DOT 49 192.197 – Control of the pressure of gas delivered from high-pressure distribution systems.

Department of Transportation – Code Of Federal Regulations – Title 49 Subtitle B Chapter 1 Subchapter D Part 192 Subpart D 197

(a) If the maximum actual operating pressure of the distribution system is 60 p.s.i. (414 kPa) gage, or less and a service regulator having the following characteristics is used, no other pressure limiting device is required:

(1) A regulator capable of reducing distribution line pressure to pressures recommended for household appliances.

(2) A single port valve with proper orifice for the maximum gas pressure at the regulator inlet.

(3) A valve seat made of resilient material designed to withstand abrasion of the gas, impurities in gas, cutting by the valve, and to resist permanent deformation when it is pressed against the valve port.

(4) Pipe connections to the regulator not exceeding 2 inches (51 millimeters) in diameter.

(5) A regulator that, under normal operating conditions, is able to regulate the downstream pressure within the necessary limits of accuracy and to limit the build-up of pressure under no-flow conditions to prevent a pressure that would cause the unsafe operation of any connected and properly adjusted gas utilization equipment.

(6) A self-contained service regulator with no external static or control lines.

(b) If the maximum actual operating pressure of the distribution system is 60 p.s.i. (414 kPa) gage, or less, and a service regulator that does not have all of the characteristics listed in paragraph (a) of this section is used, or if the gas contains materials that seriously interfere with the operation of service regulators, there must be suitable protective devices to prevent unsafe overpressuring of the customer's appliances if the service regulator fails.

(c) If the maximum actual operating pressure of the distribution system exceeds 60 p.s.i. (414 kPa) gage, one of the following methods must be used to regulate and limit, to the maximum safe value, the pressure of gas delivered to the customer:

(1) A service regulator having the characteristics listed in paragraph (a) of this section, and another regulator located upstream from the service regulator. The upstream regulator may not be set to maintain a pressure higher than 60 p.s.i. (414 kPa) gage. A device must be installed between the upstream regulator and the service regulator to limit the pressure on the inlet of the service regulator to 60 p.s.i. (414 kPa) gage or less in case the upstream regulator fails to function properly. This device may be either a relief valve or an automatic shutoff that shuts, if the pressure on the inlet of the service regulator exceeds the set pressure (60 p.s.i. (414 kPa) gage or less), and remains closed until manually reset.

(2) A service regulator and a monitoring regulator set to limit, to a maximum safe value, the pressure of the gas delivered to the customer.

(3) A service regulator with a relief valve vented to the outside atmosphere, with the relief valve set to open so that the pressure of gas going to the customer does not exceed a maximum safe value. The relief valve may either be built into the service regulator or it may be a separate unit installed downstream from the service regulator. This combination may be used alone only in those cases where the inlet pressure on the service

PIL

Product Information Letter

regulator does not exceed the manufacturer's safe working pressure rating of the service regulator, and may not be used where the inlet pressure on the service regulator exceeds 125 p.s.i. (862 kPa) gage. For higher inlet pressures, the methods in paragraph (c) (1) or (2) of this section must be used.

(4) A service regulator and an automatic shutoff device that closes upon a rise in pressure downstream from the regulator and remains closed until manually reset.

This DOT code normally covers the service regulators and commercial type regulators or any regulator supplying a service type regulator. This code is very vague and does not specify specific build-up or outlet pressures to be maintained. Refers to pressures being within a safe range for the customer being supplied.

This standard only applies to:

- Regulators with valve bodies 2" or smaller.

The Main scope of this Standard:

- With inlet pressure of 60 psig or less – regulator must be able to limit the failed build-up pressure to a safe pressure for the appliances being supplied or have a suitable over-pressure protection device. (This code does not specify specific pressures)
- With inlet pressure of 60 PSIG or more – regulator must have some type of over pressure protection that limits the inlet pressure to the service regulator to 60 psig or less.
- Over pressure protection – A regulator supplying 60 psig or less to the service regulator, operator/monitor, IM regulator, relief valve, or OPSO.

ANSI Z21.80/CSA 6.22 – Line Pressure Regulators

The ANSI requirement that applies to line pressure regulators rated for inlet pressures in excess of 2 PSI which include an integral overpressure device. Also applies to separate overpressure devices installed in conjunction with a line pressure regulator.

Line Pressure Regulator – A gas pressure regulator intended for installation in a natural gas distribution system between the service regulator and gas utilization equipment.

This standard only applies to:

- **Regulators installed between the service regulator and appliances.**
- **Inlet pressures of 10 PSIG or less but more than 2 PSIG.**
- **Outlet pressures of ½ psig(14 IWC) or less.**



PIL

Product Information Letter

The Main scope of this Standard:

Line pressure regulators rated for inlet pressures in excess of 2 psi and capable of being adjusted to deliver an outlet pressure of ½ psi(14iwc) or less shall be provided with an independent means to limit the downstream pressure to 2 psi maximum in the event of failure of the regulating mechanism.

CSA 6.22 is the Canadian equivalent to ANSI Z21.80. Canada requires that regulators be approved or listed by Measurement Canada. The US allows manufactures to self-list their products by simply stating they comply with the ANSI Z21.80 standard. Itron is not currently approved for CSA 6.22. We do publish in our literature that we are listed and comply with Z21.80. The B31R, B42R, B34SR, and B34R will meet the ANSI Z21.80 requirements under specific conditions. Following is a list for those conditions;

B31 (internal relief model) compliance with ANSI Z21.80, Line Pressure Regulators

Model B31R used with a 1" vent connection is listed and compliant with ANSI Z21.80 in the configurations noted and shown in the following tables.

With inlet pressures up to 2 PSIG, the B31R is compliant in any configuration.

With inlet pressures up to 5 PSIG

| Orifice Size | Set Point | Maximum Vent Line Length (ft.) | *Number of Elbows** |
|--------------|---------------|--------------------------------|---------------------|
| 1/8" | Up to 1 PSIG | 50 | 4 or less |
| 3/16" | Up to 1 PSIG | 40 | 4 or less |
| 1/4" | Up to 7" w.c. | 40 | 4 or less |
| 5/16" | Up to 7" w.c. | 15 | 4 or less |
| 3/8" | Up to 7" w.c. | 10 | 2 or less |

*Clean 1" black steel pipe

** For each elbow greater than 4 elbows, subtract 2.6 ft. from the maximum vent line length.

With inlet pressures up to 10 PSIG

| Orifice Size | Set Point | Maximum Vent Line Length (ft.) | *Number of Elbows** |
|--------------|----------------|--------------------------------|---------------------|
| 1/8" | Up to 14" w.c. | 50 | 4 or less |
| 3/16" | Up to 14" w.c. | 50 | 4 or less |
| 1/4" | Up to 7" w.c. | 20 | 4 or less |
| 5/16" | Up to 7" w.c. | No Vent Pipe | No Elbows |

*Clean 1" black steel pipe

** For each elbow greater than 4 elbows, subtract 2.6 ft. from the maximum vent line length.

B42 (internal relief model) compliance with ANSI Z21.80, Line Pressure Regulators

Model B42R used with a 1" vent connection is listed and compliant with ANSI Z21.80 in the configurations noted and shown in the following tables.

With inlet pressures up to 2 PSIG, the B42R is compliant in any configuration.

With inlet pressures up to 5 PSIG

| Orifice Size | Set Point | Maximum Vent Line Length (ft.) | * Number of Elbows** |
|--------------|---------------|--------------------------------|----------------------|
| 1/8" | Up to 1 PSIG | 50 | 4 or less |
| 1/8" x 3/16" | Up to 1 PSIG | 50 | 4 or less |
| 3/16" | Up to 1 PSIG | 40 | 4 or less |
| 1/4" | Up to 7" w.c. | 40 | 4 or less |
| 5/16" | Up to 7" w.c. | 15 | 4 or less |

*Clean 1" black steel pipe

** For each elbow greater than 4 elbows, subtract 2.6 ft. from the maximum vent line length.



PIL

Product Information Letter

With inlet pressures up to 10 PSIG

| Orifice Size | Set Point | Maximum Vent Line Length (ft.)* | Number of Elbows** |
|--------------|----------------|---------------------------------|--------------------|
| 1/8" | Up to 14" w.c. | 50 | 4 or less |
| 1/8" x 3/16" | Up to 14" w.c. | 50 | 4 or less |
| 3/16" | Up to 14" w.c. | 50 | 4 or less |
| 1/4" | Up to 7" w.c. | 10 | 4 or less |

*Clean 1" black steel pipe

** For each elbow greater than 4 elbows, subtract 2.6 ft. from the maximum vent line length.

The B34SR (internal relief model) compliance with ANSI Z21.80, Line Pressure Regulators

Model B34SR used with a 1" vent connection is listed and compliant with ANSI Z21.80 in the configurations noted and shown in the following tables:

With inlet pressures up to 2 PSIG, the B34SR is compliant in any configuration.

With inlet pressures up to 5 PSIG

| Orifice Size | Set Point | Maximum Vent Line Length (ft.)* | Number of Elbows** |
|--------------|----------------|---------------------------------|--------------------|
| 1/4" x 3/8" | Up to 1 PSIG | 50 | 4 or less |
| 3/8" x 1/2" | Up to 14" w.c. | 50 | 4 or less |
| 1/2" x 5/8" | Up to 14" w.c. | 20 | 4 or less |
| 5/8" x 3/4" | Up to 14" w.c. | No vent line | No vent line |

• *Clean 1" black steel pipe

• **For each elbow greater than 4 elbows, subtract 2.6 ft. from the maximum vent line length.

With inlet pressures up to 10 PSIG

| Orifice Size | Set Point | Maximum Vent Line Length (ft.)* | Number of Elbows** |
|--------------|----------------|---------------------------------|--------------------|
| 1/4" x 3/8" | Up to 1 PSIG | 50 | 4 or less |
| 3/8" x 1/2" | Up to 14" w.c. | 25 | 4 or less |

*Clean 1" black steel pipe

**For each elbow greater than 4 elbows, subtract 2.6 ft. from the maximum vent line length.

The B34R (internal relief model) compliance with ANSI Z21.80, Line Pressure Regulators

Model B34R used with a 1" vent connection is listed and compliant with ANSI Z21.80 in the configurations noted and shown in the following tables:

With inlet pressures up to 2 PSIG, the B34R is compliant in any configuration.

With inlet pressures up to 5 PSIG

| Orifice Size | Set Point | Maximum Vent Line Length (ft.)* | Number of Elbows** |
|--------------|----------------|---------------------------------|--------------------|
| 1/4" | Up to 1 PSIG | 50 | 4 or less |
| 1/4" x 3/8" | Up to 1 PSIG | 50 | 4 or less |
| 3/8" | Up to 14" w.c. | 50 | 4 or less |
| 3/8" x 1/2" | Up to 14" w.c. | 50 | 4 or less |
| 1/2" | Up to 14" w.c. | 25 | 4 or less |
| 1/2" x 5/8" | Up to 14" w.c. | 10 | 4 or less |
| 5/8" | Up to 14" w.c. | 10 | 4 or less |
| 5/8" x 3/4" | Up to 14" w.c. | No vent line | No vent line |
| 3/4" | Up to 14" w.c. | No vent line | No vent line |

*Clean 1" black steel pipe

**For each elbow greater than 4 elbows, subtract 2.6 ft. from the maximum vent line length.



PIL

Product Information Letter

With inlet pressures up to 10 PSIG

| Orifice Size | Set Point | Maximum Vent Line Length (ft.)* | Number of Elbows** |
|--------------|-----------------|---------------------------------|--------------------|
| 1/4" | Up to 1 PSIG 50 | 4 or less | |
| 1/4" x 3/8" | Up to 1 PSIG 50 | 4 or less | |
| 3/8" | Up to 14" w.c. | 30 | 4 or less |
| 3/8" x 1/2" | Up to 14" w.c. | 25 | 4 or less |
| 1/2" | Up to 14" w.c. | No vent line | No vent line |

*Clean 1" black steel pipe

**For each elbow greater than 4 elbows, subtract 2.6 ft. from the maximum vent line length.

If you have questions regarding this PIL or would like more details, please contact your sales representative or me directly at 502-484-6258.

Sincerely,

Robbie Swigert
Itron Regulator Application Engineer