




# **SOUTHWEST GAS CORPORATION**

® ENGINEERING STAFF

## **MATERIAL SPECIFICATION**

*Prepared By:* Engineering Staff 

*Approved By:* Jerome T. Schmitz 

<b>Section No:</b>	MS F-8
<b>Page No.:</b>	1 of 8
<b>Issue Date:</b>	03/01/16
<b>Superseded Date:</b>	02/24/15

### **REGULATORS**

Spring Loaded Relief Valves

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#### **1. SCOPE**

These specifications cover spring loaded relief valves intended to provide overpressure protection to systems by releasing excess gas pressure to the atmosphere. All relief valves covered by this specification, when installed as a single component, may be installed without an installation pressure test.

#### **2. APPLICABLE DOCUMENTS**

- 2.1 American National Standards Institute (ANSI) B-1.20.1, "Pipe Threads, General Purpose (INCH)."
- 2.2 American National Standards Institute (ANSI) B-16.5, "Steel Pipe Flanges and Flanged Fittings – Class 150 through 2500."
- 2.3 American National Standards Institute (ANSI) B109.4, "Self Operated Diaphragm Type Natural Gas Service Regulators."
- 2.4 American National Standards Institute (ANSI) Z-55.1, "Specification for Gray Finishes for Industrial Apparatus and Equipment."
- 2.5 United States Department of Transportation (DOT), Code of Federal Regulations, Title 49, Part 192, "Transportation of Natural and Other Gas by Pipeline; Minimum Safety Standards."

**NOTE:** Unless otherwise specified, the edition of the above documents incorporated by DOT 49 CFR 192 is applicable. Documents not incorporated by DOT 49 CFR 192 will be the most recent edition.

#### **3. TERMINOLOGY**

##### **3.1 General**


- 3.1.1 "Southwest Gas," "Southwest" or "SWG" wherever used in this specification and other related documents will refer exclusively to Southwest Gas Corporation.
- 3.1.2 The terms "approved," "as approved," "satisfactory," "as directed," "or equal" or other similar terms wherever used in this specification and other related documents will mean "as determined by Southwest Gas," unless specifically stated otherwise.




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<b>Section No:</b>	MS F-8
<b>Page No.:</b>	2 of 8
<b>Issue Date:</b>	03/01/16
<b>Superseded Date:</b>	02/24/15

### **REGULATORS**

Spring Loaded Relief Valves

---

### **3. TERMINOLOGY** (Cont'd)

- 3.1.3 “Product Information Package” or “PIP” wherever used in this specification and other related documents will mean the required technical product information that a manufacturer must submit to SWG to determine if the product is suitable for use by SWG, unless specifically stated otherwise.

### **4. MATERIALS AND MANUFACTURING**

- 4.1 For diaphragm actuated relief valves, the diaphragm shall be capable of withstanding a differential pressure at least equal to the maximum outlet pressure for which the relief valve was designed plus a safety margin of at least 150% of the maximum rated pressure.
- 4.2 All materials used in the manufacture of relief valves supplied to this specification will be compatible with natural gas. No copper components will be accepted.
- 4.3 The relief valve shall be capable of withstanding temperatures ranging from -20° to 150° F (-28.9° to 65.5° C).
- 4.4 Products should meet customary and workman-like standards of fit and finish.
- 4.5 All replacement parts for use in relief valves supplied to this specification will perform to the original or subsequently pre-approved design criterion. Any design or materials changes to any part supplied for a particular relief valve is subject to the provisions of 4.1 above.
- 4.6 Replacement parts commonly used to repair specific areas of the relief valve (i.e., valve seat and/or orifice replacement, or complete overhaul), will be made available in packaged kit form that will include all normally replaced parts, including all soft parts (o-rings, gaskets, etc.) by either the manufacturer or the manufacturer's representative. Each parts kit will be provided with a unique part number to identify the particular kit and its contents.
- 4.7 Threaded pipe connections must conform to the requirements of ANSI B-1.20.1.




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<b>Section No:</b>	MS F-8
<b>Page No.:</b>	3 of 8
<b>Issue Date:</b>	03/01/16
<b>Superseded Date:</b>	02/24/15

### **REGULATORS**

Spring Loaded Relief Valves

---

#### **4. MATERIALS AND MANUFACTURING (Cont'd)**

- 4.8 Flanges must conform to the Requirements of ANSI B-16.5.
- 4.9 The valve inlet and outlet piping connections will not exceed an axial alignment tolerance of  $\pm 2^\circ$  and will be within radial offset tolerance of  $\pm 0.0625"$  (1.587 mm), except for a  $90^\circ$  inlet/outlet port configuration in which case the axial alignment will include the  $90^\circ$  angle.
- 4.10 A recess of at least  $\frac{1}{4}"$  (6.35mm) shall be provided beyond all threaded connections to minimize the possibility of butting pipe against any component part within the relief valve body.
- 4.11 The external components of the relief valve shall be made of, or protected by, materials resistant to attack by atmosphere, weather, or sunlight, and of agents used in relief valve repair and cleaning. The exteriors shall be capable of meeting or exceeding exterior performance requirements in ANSI B109.4. Unless otherwise specified, all regulators shall be coated with an Industrial Gray Coating No. 49 per ANSI Z-55.1. The paint application procedures and a description of the specific painting products to be used shall be submitted for approval. Relief valves using brass, stainless steel or plastic components on all exposed surfaces are exempt from this requirement.

#### **5. PERFORMANCE REQUIREMENTS**

- 5.1 Diaphragm actuated relief valves shall operate in a smooth throttling action and shut-off completely after excess pressure has been relieved.
- 5.2 Throttling action in poppet type relief valves is not required, but the valve must shut off completely after excess pressure has been relieved.
- 5.3 The relief valve must be able to relieve at the flow rates, set pressure and maximum build up pressures specified in the manufacturers documentation.
- 5.4 All relief valve performance attributes published by the manufacturer must be reproducible and repeatable.
- 5.5 Each diaphragm actuated relief valve shall pass a cantilever load test similar to that specified in ANSI B109.4 at a minimum load of 300 pounds (136 kg) without leakage or operational impairment.




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<b>Section No:</b>	MS F-8
<b>Page No.:</b>	4 of 8
<b>Issue Date:</b>	03/01/16
<b>Superseded Date:</b>	02/24/15

### **REGULATORS**

Spring Loaded Relief Valves

---

#### **5. PERFORMANCE REQUIREMENTS (Cont'd)**

5.6 If the relief valve adjustment device can cause a particular spring to become completely compressed before the limits of adjustment travel are reached, the relief valve must be equipped with an adjuster travel limiting device or some other means of preventing spring over compression. If the limiting device is in the form of an added on device, all springs that can be over compressed will be supplied with the device as the sole option to obtain those springs. Failure to meet this specification will disqualify the relief valve from operation in that spring/pressure range.

#### **6. INSPECTIONS**

- 6.1 Successful review of the Product Information Package (PIP) as well as any future reference by SWG to the seller's part number or internal code number in any future contract or purchase, will mean only that no conflict with the specification was found and will not relieve the Seller from meeting all the requirements of this specification.
- 6.2 SWG retains the option to inspect the manufacture and testing of relief valves sold to SWG.
- 6.3 SWG will make appropriate inspections and tests of any and all materials, products or systems supplied to this specification. SWG will have the right, at their option, to reject any material which fails to conform to this specification. Any such rejection may take place at the manufacturer's facility; the supplier's warehouse or any subsequent delivery location, before or after SWG assumes possession. Notice of the rejection will be made promptly to the supplier by SWG. The defective product will be replaced or returned for credit at the manufacturer's expense.
- 6.4 Any changes in the manufacturing of previously approved materials, products or systems described in this material specification for sale to SWG, must be approved by SWG's Engineering Staff. **Failure to obtain SWG's approval may be cause for rejection and disqualification as an approved supplier.**



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<b>Section No:</b>	MS F-8
<b>Page No.:</b>	5 of 8
<b>Issue Date:</b>	03/01/16
<b>Superseded Date:</b>	02/24/15

**REGULATORS**

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---

**7. CERTIFICATION**

The manufacturers of supplier's certification shall be furnished to Southwest. This certification shall state that samples representing each lot have been manufactured, tested and inspected in accordance with this specification and that requirements have been met. When requested or specified in the purchase order or contract, a report of test results will be provided.

Upon the request of Southwest, the certification of an independent third party indicating conformance to the specification may be considered at Southwest's expense.

That the operational criterion and Maximum Allowable Operating Pressure (MAOP) was established as required by Title 49 CFR Part 192.619 and that the device may be installed without need of further qualification testing.

**8. DOCUMENTATION**

**8.1 Safety Data Sheets**

In accordance with law, the seller will supply Safety Data Sheets for all applicable items supplied under this specification to the following:

- 1) The Receiving Location
- 2) Engineering Staff
- 3) Southwest Gas Corporation  
Corporate Safety  
Mail Station LVA-120  
P.O. Box 98510  
Las Vegas, NV 89193-8510

**8.2 Product and Technical Literature**

Product and technical literature shall be maintained and updated to reflect the current state of product knowledge. The literature shall be provided in electronic format, preferably on portable media (CD or DVD). This information should be mirrored on a website. Interim updates can be posted to the website or updated to the portable media.




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<b>Page No.:</b>	6 of 8
<b>Issue Date:</b>	03/01/16
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**9. PRODUCT MARKING**

9.1 The following information shall be permanently marked on the relief valve diaphragm case or shall be stamped on a metal tag permanently affixed to the relief valve diaphragm case.

- Manufacturer
- Relief valve Model Number/ Type
- Orifice Diameter
- Spring Range
- Maximum Inlet Pressure
- Month and Year of Manufacture

9.2 The direction of the gas flow shall be clearly and permanently marked on the relief valve body.

**10. PACKAGING AND PACKAGE MARKING**

10.1 All relief valves will be packaged in a manner to prevent damage during shipping, transportation and storage.

10.2 Each relief valve will be packaged with an appropriate instruction manual.

10.3 Individual springs packaged with an adjuster travel limiting device (see section 5.7) will include a written warning tag affixed to the spring informing the installer of the necessity of installing the travel limiting device.

10.4 The package will be marked with the following information:


- Manufacturer's name or trademark
- Model designation
- Manufacturer's part number
- Connection size and type
- Orifice size
- Spring range




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<b>Section No:</b>	MS F-8
<b>Page No.:</b>	7 of 8
<b>Issue Date:</b>	03/01/16
<b>Superseded Date:</b>	02/24/15

**REGULATORS**

Spring Loaded Relief Valves

---

**11. RELIEF VALVE SETTINGS**

Unless otherwise specified, all relief valves supplied to this specification will be delivered with the adjustment screw adjusted to the midpoint of adjustment travel.

**12. STOCK CLASSIFICATION DESCRIPTIONS**

12.1 Complete Relief Valve:

RELIEF VALVE, MFG NAME & MODEL, VALVE SIZE (IF THREADED, NOMINAL SIZE NPT) (IF FLANGED NOMINAL SIZE ANSI FLANGE DESIGNATION & FLANGE FACE TYPE), FRACTIONAL INCH ORIFICE SIZE, SPRING RANGE (LOW TO HIGH), OTHER INFORMATION.

12.2 Miscellaneous Parts:

PART DESCRIPTION, MFG NAME & MODEL, PART SIZE, OTHER INFORMATION.