





SOUTHWEST GAS CORPORATION
® ENGINEERING STAFF
MATERIAL SPECIFICATION

Section No:	MS F-5
Page No.:	1 of 8
Issue Date:	03/01/16
Superseded Date:	02/24/15

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

REGULATORS

Commercial & Industrial Direct Operated Regulators

1. SCOPE

This specification covers spring loaded regulators typically used on Commercial and Industrial Meter Set Assemblies (MSAs) requiring Over Pressure Protection (OPP). These regulators provide stable delivery pressures from 1% to 5% absolute pressure deviation (droop) over their entire capacity range. All regulators 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) B-109.4, "Self-Operated Diaphragm Type Natural Gas Service Regulator."
- 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 editions of the above documents incorporated by DOT 49 CFR 192 are 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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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 The diaphragm case shall have a vent connection with Female National Pipe Taper (NPT) pipe threads and be equipped with a removable vent screen. The vent opening shall be sized for the intended function of the port using sound engineering practices.
- 4.2 The diaphragm when assembled in the regulator shall be capable of withstanding a differential pressure at least equal to the maximum outlet pressure for which the regulator was designed plus a safety margin of at least 150% of the maximum rated pressure.
- 4.3 All materials used in the manufacture of regulators supplied to this specification will be compatible with natural gas. No copper components will be accepted.
- 4.4 The regulator shall be capable of withstanding temperatures ranging from -20° F to 150 ° F (-28.9° C to 65.5° C).
- 4.5 Products should meet customary and workman-like standards of fit and finish.
- 4.6 All replacement parts for use in regulators 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 regulator is subject to the provisions of 4.1 (above).
- 4.7 Replacement parts commonly used to repair specific areas of the regulator (i.e., valve seat and/or orifice replacement, diaphragm 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. Parts kits will be packaged in a box or sealed in a plastic bag. Each parts kit will be provided with a unique part number to identify the particular kit and its contents.





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4. MATERIALS AND MANUFACTURING (Cont'd)

- 4.8 Threaded pipe connections must conform to the requirements of ANSI B-1.20.1.
- 4.9 Flanges must conform to the Requirements of ANSI B-16.5.
- 4.10 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 ± 0.0625 ".
- 4.11 A recess of at least $\frac{1}{4}$ " shall be provided beyond all threaded connections to minimize the possibility of butting pipe against any component part within the regulator body.
- 4.12 The external components of the regulator shall be made of, or protected by, materials resistant to attack by atmosphere, weather, or sunlight, and of agents used in regulator 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.

5. PERFORMANCE REQUIREMENTS

- 5.1 The regulator must maintain delivery pressure at flowrates and pressures specified in the manufacturer's documentation for any approved configuration.
- 5.2 All regulator performance attributes published by the manufacturer must be reproducible and repeatable.
- 5.3 When under normal operating conditions, excluding failure from foreign material or component damage that prohibits proper valve operation, the regulator will exhibit positive shutoff under long term "no load" conditions.





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5. PERFORMANCE REQUIREMENTS (Cont'd)

5.4 Maximum regulator lockup pressures are listed in Table F-5.1.

Maximum Lockup Pressure	
Nominal Outlet Pressure	Maximum Lockup Pressure
0 - 12 psig	25% over setpoint
12 - 60 psig	3 psig over setpoint
Over 60 psig	5% over setpoint

TABLE F-5.1

5.5 Each regulator 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.

5.6 If the regulator adjustment device can cause a particular spring to become completely compressed before the limits of adjustment travel are reached, the regulator 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 regulator from operation in that spring/pressure range.

6. INSPECTION

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 any and all materials, products or systems referenced in this specification that are 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.





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6. INSPECTION (Cont'd)

- 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.**

7. CERTIFICATION

The manufacturer's or 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 all 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.

The applicable operational criterion of Title 49 CFR Part 192 Section D has been met and the 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) Southwest Gas Engineering Staff
- 3) Southwest Gas Corporation
Corporate Safety
Mail Station LVA-120
P.O. Box 98510
Las Vegas, NV 89193-8510



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8. DOCUMENTATION (Cont'd)

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.

9. PRODUCT MARKING

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

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

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

10. PACKAGING AND PACKAGE MARKING

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

10.2 Each regulator 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.





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10. PACKAGING AND PACKAGE MARKING (Cont'd)

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

10.5 Parts kits will be packaged in a box or sealed in a durable plastic bag.

11. REGULATOR SETTINGS

Unless otherwise specified, all regulators 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 regulator:

REGULATOR, MFG NAME & MODEL, REGULATOR 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.