



# B56 R, N, & M

## Field Service Regulator

The B56 is a pounds-to-pounds reducing regulator with internal relief, designed for applications requiring accurate regulation over a wide range of inlet and delivery pressures. A malleable iron valve body enables the B56 to handle inlet pressures of up to 1000 PSIG. The large diaphragm area (9 sq. in.) and lever ratio (3.5 to 1) ensure accurate regulation over an outlet pressure range of 5-60 PSIG. This combination of capabilities makes the B56R the ideal regulator for a wide range of applications.

### APPLICATIONS

- » Accurate second stage regulator which can sustain 1000 psig on inlet side in the event of a first stage failure
- » Farm/Suburban tap set at 60 psig or less
- » Lower inlet applications (below 250 psi) where more accurate regulation is required than can be achieved by high pressure field service regulators
- » Lower outlet applications (below 10 psi) where more accurate regulation is required than can be achieved by high pressure field service regulators

### BENEFITS

- » Economical
- » Light weight and compact design
- » Corrosion Resistant
- » Inlet pressure capabilities up to 1000 PSIG
- » No special start up procedures
- » Polyurethane seat ensures reliable "lockup"

- » Outlet pressure capabilities of 5 to 60 PSIG
- » Light weight die cast aluminum diaphragm case
- » Maximum flow capacities up to 20,000 SCFH

Controlled breather orifice size eliminates pulsation and provides normal actuation at low flows

### FEATURES

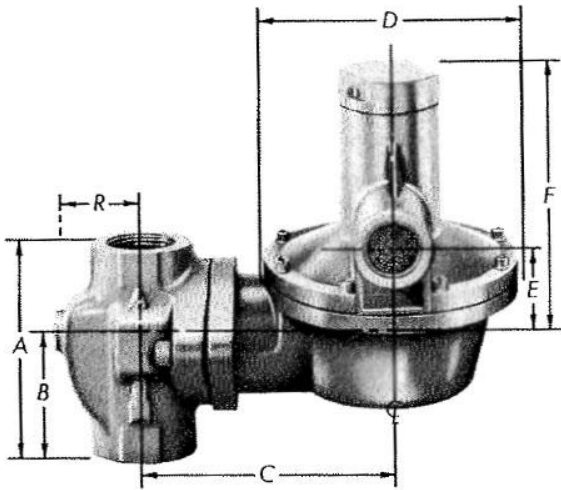
- » Easy field servicing
- » Interchangeable brass orifice
- » Spring-loaded internal relief valve assembly
- » Field interchangeable adjustment spring
- » ¾" NPT, 1" NPT, and 1-¼" NPT valve bodies available
- » 90 degree valve body also available
- » 16 different assembly positions
- » Controlled boost
- » Ideal for suburban tap and industrial applications

## SHIPPING WEIGHT

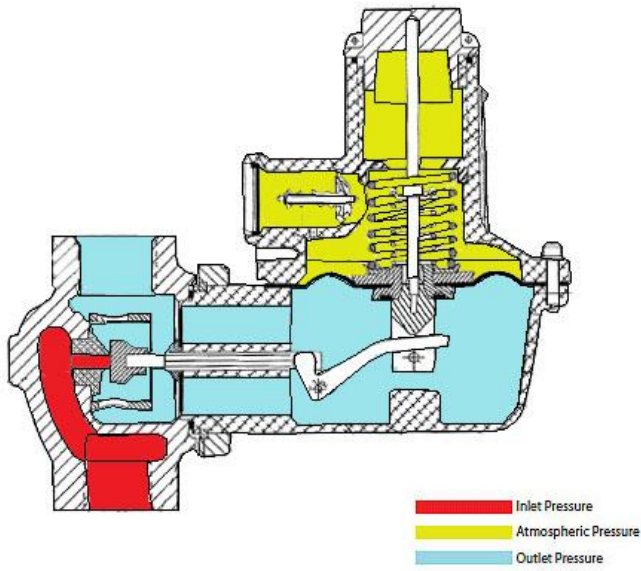
12 regulators per box    Box weight: 48 lbs.

## B56 DIMENSIONS (INCHES)

Valve Body	A	B	C	D	E	F	R
3/4 and 1	3-3/4	2-1/8	4-7/8	4-7/8	2-5/8	5-1/2	2-1/4
3/4 and 1, 90°		1-5/8	4-7/8	4-7/8	2-5/8	5-1/2	2-1/4



## OPERATIONAL SCHEMATIC



## BASIC SPRING RANGES

Spring Color	Basic Range (PSIG)*
Green	5-12
Orange	12-16
Green/white	16-20.5
Blue/white	20.5-35
Silver	35-60

\*See spring data for actual spring performances.

## MAXIMUM INLET PRESSURE

Orifice (inches)	Maximum Allowable Operating Pressure (PSIG)
1/16-3/16	1000
1/4	600
3/8	200
1/2	200

## OPERATING TEMPERATURE RANGE

- -20°F to 150°F

## ADDITIONAL SPECIFICATIONS

<b>Available Vent Sizes</b>	3/4"
<b>Loading Ring Position</b>	0°
<b>Other Available Options</b>	Seal wire to indicate unapproved tampering
	1/8" pipe plug tap on upstream side of valve body
	BSP connections available
	BSPT connections available (1x1 valve body only)

\*Note The B56R is not recommended for buried service under any circumstances.

## CONSTRUCTION

Itron takes pride in delivering products with the utmost concern for safety, quality, and customer satisfaction.

### Construction material

Valve body	Ductile iron or steel
Orifice	Brass (standard) stainless steel (optional)
Valve seat	Urethane
Valve stem	Aluminum
Lever pin	Stainless steel
Lever	Zinc plated steel
Upper diaphragm plate	Zinc and dichromate plated steel
Lower diaphragm plate	Zinc and dichromate plated steel
Diaphragm	Buna-N and nylon reinforcing fabric
Vent valve/seat	Zinc plated steel
Vent screen	Stainless steel
Adjustment ferrule	Zinc plated steel
Seal cap	Cast iron
Diaphragm case	Aluminum

## VALVE BODY SIZES (INCHES)

Inlet	Outlet
3/4	3/4
1	1

## CORRECTION FACTORS FOR NON-NATURAL GAS APPLICATIONS

The B56 may be used to control gases other than natural gas. To determine the capacity for gases other than natural gas, multiply the values within the capacity tables by a correction factor. The table below lists the correction factors for some of the more common gases:

Gas Type	Specific Gravity	Correction Factor (CF)
Air	1.00	0.77
Butane	2.01	0.55
Carbon Dioxide (Dry)	1.52	0.63
Carbon Monoxide (Dry)	0.97	0.79
Natural Gas	0.60	1.00
Nitrogen	0.97	0.79
Propane	1.53	0.63
Propane-Air-Mix	1.20	0.71

To calculate the correction factor for gases not listed in the table above, use the gases' specific gravity and insert it in the formula listed below:

$$\text{Correction Factor (CF)} = \sqrt{\frac{SG_1}{SG_2}}$$

Where:

$SG_1$  = Specific gravity of the gas in which the capacity is published.

$SG_2$  = Specific gravity of the gas to be controlled.

## Wide Open Flow Calculations

For wide-open orifice flow calculations use the following equations:

$$\text{For } \frac{P_1}{P_2} < 1.89 \text{ use: } Q = K\sqrt{P_2(P_1 - P_2)}$$

$$\text{For } \frac{P_1}{P_2} > 1.89 \text{ use: } Q = \frac{KP_1}{2}$$

Where:  $P_1$  = Absolute Inlet Pressure (PSIA)

$P_2$  = Absolute Outlet Pressure (PSIA)

$Q$  = Flow Rate (SCFH)

$K$  = Orifice Coefficient (SCFH/PSI)

## B56 SERIES HIGH PRESSURE SERVICE REGULATOR

### Capacity Data 1x1 Valve Body (10% Droop)\*Set point varies @ 100 SCFH

Capacities in SCFH of 0.6 S.G. gas; base conditions of 14.7 PSIA and 60° F.

Typical Capacity Info.	
Manufacturer	Itron
Type and model	B56R
Loading ring	0°

Inlet Pressure (PSIG)	Outlet Pressure (PSIG)	Orifice Size						
		1/16" x 3/32"	3/32"	1/8"	3/16"	1/4 "	3/8"	1/2"
15	1 or less	110	180	230	360	440	610	780
	10	80	140	170	270	330	460	580
20	5 or less	130	210	270	420	520	710	910
	10	120	190	240	380	470	640	820
	15	90	150	190	290	360	500	640
30	11 or less	170	270	350	540	670	920	1170
	15	160	260	330	510	630	860	1110
	20	140	230	290	450	550	760	980
50	22 or less	240	390	500	780	960	1300	1700
	25	230	380	490	760	940	1290	1650
	40	170	280	360	560	700	960	1230
75	37 or less	330	550	690	1080	1330	1800	2400
	50	300	490	620	970	1200	1650	2100
	60	250	410	520	800	1000	1370	1750
100	50 or less	430	700	890	1400	1710	2300	3000
	60	410	670	840	1310	1630	2200	2900
150	60 or less	610	1000	1270	2000	2500	3400	4300
200	60 or less	800	1310	1700	2600	3200	4400	5600
300	60 or less	1170	1920	2400	3800	4700		
400	60 or less	1540	2500	3200	5000	6200		
500	60 or less	1910	3100	4000	6200	7700		
600	60 or less	2280	3700	4700	7400	9100		
700	60 or less	2700	4400	5500	8600			
800	60 or less	3050	5000	6300	9800			
1000	60 or less	3800	6200	7800	12200			

\*Individual regulator performance may vary from data shown.

## B56 SERIES HIGH PRESSURE SERVICE REGULATOR

### Capacity Data 1x1 Valve Body (20% Droop)\* Set point varies @ 100 SCFH

Capacities in SCFH of 0.6 S.G. gas; base conditions of 14.7 PSIA and 60° F.

Typical Capacity Info.		Inlet Pressure (PSIG)	Outlet Pressure (PSIG)	Orifice Size						
				1/16" x 3/32"	3/32"	1/8"	3/16"	1/4 "	3/8"	1/2"
<b>Manufacturer</b>	Itron	15	1 or less	125	240	400	670	810	1140	1400
<b>Type and model</b>	B56R	20	5 or less	150	280	465	780	950	1330	1630
		30	11 or less	190	365	600	1010	1230	1710	2100
		50	24 or less	275	530	870	1460	1700	2500	3050
		75	41 or less	380	730	1200	2020	2450	3400	4200
		100	58 or less	485	935	1540	2600	3150	4400	5400
		150	60 or less	700	1340	2210	3700	4500	6300	7800
		200	60 or less	910	1750	2900	4800	5900	8200	10100
		300	60 or less	1330	2550	4200	7100	8600		
		400	60 or less	1750	3400	5600	9300	11400		
		500	60 or less	2180	4200	6900	11600	14100		
		600	60 or less	2600	5000	8300	13800	16900		
		700	60 or less	3000	5800	9600	16100			
		800	60 or less	3450	6650	10900	18400			
		1000	60 or less	4300	8250	13600	22900			

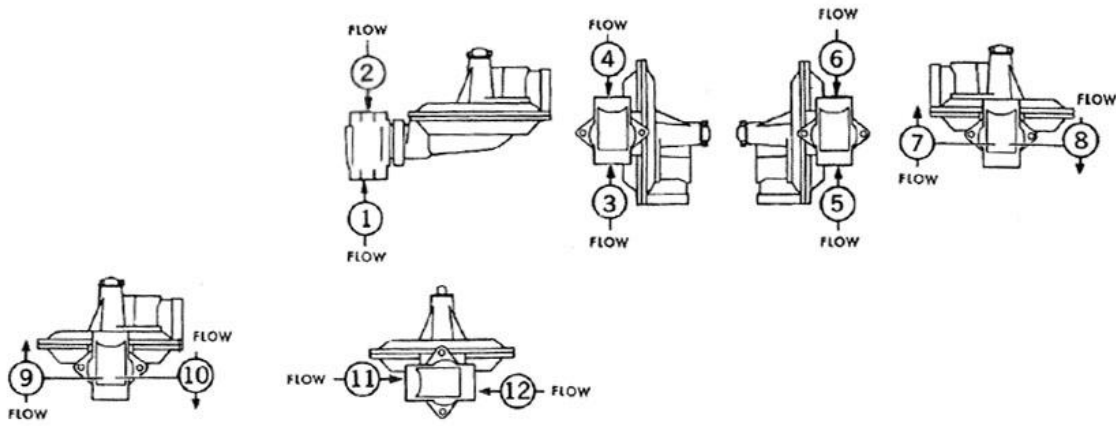
\*Individual regulator performance may vary from data shown.

**B56R FIELD SERVICE REGULATOR ADJUSTMENT SPRING DATA**

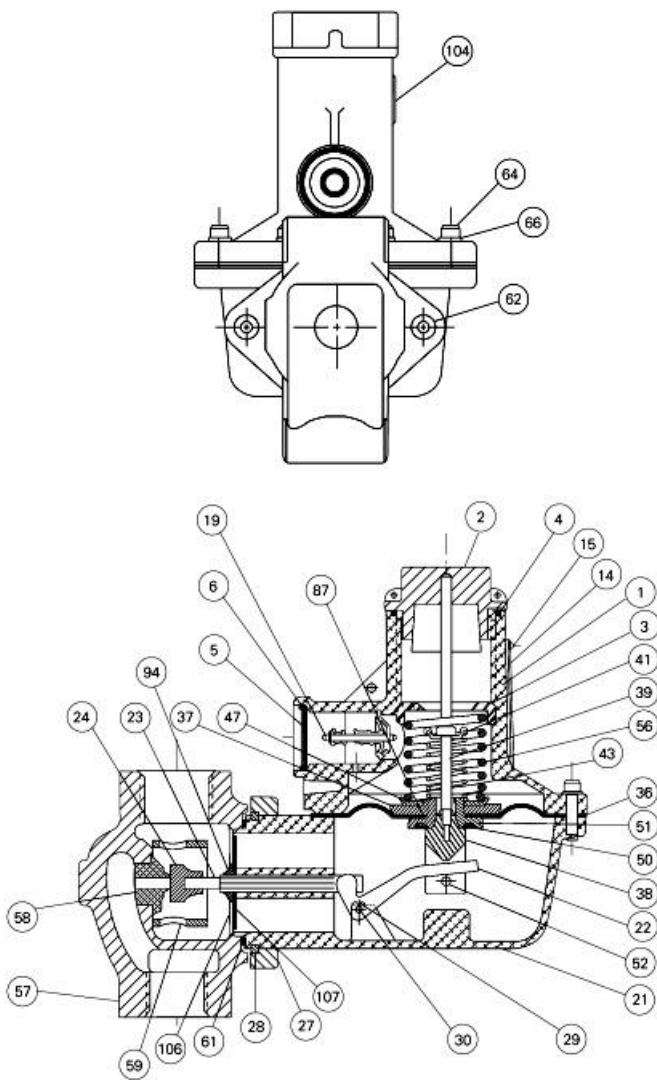
Spring Color	Orifice Size	Adjustment Screw Position	Outlet Pressure (PSIG)									
			Inlet Pressure (PSIG)									
			100	200	300	400	500	600	700	800	900	1000
Green	3/32	Maximum	12	12.5	13	13	13	13	13.5	14	14	14
	1/8	Maximum	12.5	12.5	13	13	13	13.5	14	14	14.5	15
	3/16	Maximum	12.5	13	13	14	14	15	15	15.5	16	17
	1/4	Maximum	12	13	13	13.5	14	15	16	16	18.5	---
Orange	3/32	Minimum	6	6	6	6	6	6	6.5	6.5	7	7
		Maximum	16	16	16	16.5	17	17	17	17	17	17.5
	1/8	Minimum	5.5	6	6	6	6.5	6.5	7	7	7.5	8
		Maximum	15.5	16	16	16.5	17	17	17.5	18	18	18.5
3/16	Minimum	6	6.5	7	7	7.5	8	8.5	9	9.5	10	
	Maximum	16	16.5	17	17	17.5	18	18	19	19	20	
1/4	Minimum	6	6	6.5	7	7.5	8	8.5	9	10	---	
	Maximum	16	16.5	17	18	18.5	19	20	21	22	---	
Green/white	3/32	Minimum	9.5	10	10	10	10.5	10	10.5	11	11	11
		Maximum	20.5	20.5	21	21	21.5	21.5	21.5	22	22	22.5
	1/8	Minimum	9	9.5	10	10	10.5	11	11	11	11.5	12
		Maximum	20.5	21	21	21.5	22	22	22.5	23	23	23.5
3/16	Minimum	10	10.5	10.5	11	11	11.5	12	12.5	13	14	
	Maximum	21	21.5	21.5	22.5	23	23	23.5	24	25	26	
1/4	Minimum	10	11	12	12	13	13.5	14	15	15	---	
	Maximum	21	22	23	23.5	24	25	26	27	28	---	
Blue/white	3/32	Minimum	14	14.5	15	15	15	15.5	16	16	16	16
		Maximum	36	36.5	37	37	37.5	38	38	38	38	38
	1/8	Minimum	14	14.5	15	15	15	15.5	16	16	16.5	17
		Maximum	35	35.5	36	38	37	38	37.5	38	38	38.5
3/16	Minimum	15	15	16	16	16.5	17	17.5	18	18.5	20	
	Maximum	36.5	37	37.5	38	38.5	39	39.5	40	40.5	41	
1/4	Minimum	14	15	16	16.5	17	18	19	19.5	21	---	
	Maximum	36	37	37.5	38	39	40	40.5	41.5	42.5	---	
Silver	3/32	Maximum	60	58.5	60	60.1	61	61.5	62	62.5	63	64
	1/8	Maximum	58	59	59.5	60	61	61.5	62	63	63.5	64
	3/16	Maximum	60	61	62	63	63.5	64	65	66	67.5	68.5
	1/4	Maximum	58	59	60.5	62	63	64.5	65.5	67	69	71



## ASSEMBLY POSITIONS



## PARTS LIST SCHEMATIC



**PARTS LIST**

Item Number	Part Number	Quantity per Regulator	Description
1A	753044	1	Upper diaphragm case pilot as machined
1B	710044	1	Upper case assembly B36/56/CL2 pilot
2	730003	1	Seal cap assembly
3	760201	1	Adjustment screw B35/36/56
4	765603	1	Seal cap gasket
5	75572701	1	Vent screen retaining ring 3/4 vent
6	762905	1	Vent screen, spiral B36/56-CL2 pilot
14	769241	1	Badge B34-35-38 spring
15	755071	2	Drive screw U #2 x 1/8 plated
19	730101	1	Vent valve assembly, B36/56/CL2
21A	752311	1	Lover diaphragm case B36/56/CL2
21B	715071	1	Lower case assembly B56
22	761201	1	Lever B36/56/CL1 pilot
23	754021	1	Valve stem B31/56 aluminum
24	765030	1	Valve seat B56 urethane
27	751957	1	Retainer plate malleable iron B34/56
28	755725	1	RTNR Ring-retainer plate B31/34/56/531 snap ring
29	755141	2	8-32x5/16 Phillips head lever pin screw
30	754832	1	Pin-lever B56
47	761421	1	Diaphragm plate spring guide, R B35/36/56/CL2 pilot
56			Adjustment spring, please specify
	762403	1	Green
	762409	1	Silver
	762415	1	Orange
	762417	1	Green/white
	762419	1	Blue/white
57			Valve body, please specify:
	750504	1	3/4 x 3/4
	750510	1	1 x 1
	750513	1	3/4 x 3/4 BSP
	750519	1	1 x 1 BSP
	750520	1	1 x 1 BSPT
	750521	1	3/4 x 3/4 1/8 Tap
	750525	1	1 x 1 1/8 Tap
58			Orifice, specify
	757081	1	1/16 x 3/32 Stainless steel
	757082	1	3/32 Stainless steel
	758531	1	1/8 brass
	758532	1	3/16 brass
	758533	1	1/4 brass
	758534	1	5/16 brass
	758535	1	3/8 brass
	758536	1	1/2 brass
	758541	1	1/8 Stainless steel
	758542	1	3/16 Stainless steel
59	761753	1	Loading ring white 2-hole
61	765605	1	Valve body gasket B35/34S/42/56
62	755171	2	5/16-18x1 Soc Hd valve body

Item Number	Part Number	Quantity per Regulator	Description
64	755175	8	10-24x7/8 Soc Hd
66	755855	8	Washer, lock .190 split
94	755785	1	RTNR Ring deflector ring B31/56/531/CL31 IM
106	765197	1	Throat valve plate
107	761605	1	Throat valve disc
T-1	799017	1	Orifice wrench machined

## VENT LINES FOR REGULATORS

When constructing vent lines to be attached to regulators installed indoors, follow a few basic rules:

- a. Never use pipe sizes smaller than the vent size; smaller pipe sizes restrict the gas flow. If a long gas run must be used, Itron advises increasing the pipe one nominal size every ten feet to keep the flow restriction as low as possible.
- b. Keep the vent line length as short as possible to minimize the restriction and reduce the vent's tendency to cause regulator pulsation.
- c. Support the vent pipe to eliminate strain on the regulator diaphragm case.
- d. Always point outdoor vent pipes in the downward position to reduce the possibility of rain, snow, sleet, and other moisture entering the pipe. Install a bug screen in the end of the pipe.
- e. Do not locate the vent line terminus near windows, fans, or other ventilation equipment. See the installation instructions furnished with the regulator.
- f. Adhere to all applicable codes and regulations.
- g. If your vent pipe causes regulator pulsation, consult your sales representative or manufacturer.
- h. Itron strongly recommends running a separate vent line for each regulator. Headers with various installed devices can cause regulator malfunction.

**Caution** Ensure the end of the vent line is away from ANY potential ignition sources. It is the installer's responsibility to ensure the vent line is exhausting to a safe environment.

## INSTALLATION

**Warning** Itron does not endorse or warrant the completeness or accuracy of any third party regulator installation procedures or practices, unless otherwise provided in writing by Itron. Follow your company's standard operating procedures regarding the use of personal protection equipment (PPE). Adhere to guidelines issued by your company in addition to those given in this document when installing regulators.

- a. Remove all shipping plugs from the regulator inlet, outlet, and vent before installation.
- b. Verify the piping interior and regulator inlet and outlet are clean and free of dirt, pipe dope, and other debris. Dirt and other foreign materials entering the regulator can cause a loss of pressure control.
- c. Apply pipe joint sealant to the male pipe threads. Do not use pipe joint material on the regulator's female threads. Joint sealant could become lodged in the regulator and cause a loss of pressure control.
- d. Gas must flow through the regulator's valve body in the direction cast on the regulator body. Gas flowing in the wrong direction can overpressure and cause damage to the regulator.
- e. The diaphragm casing can be mounted in any position relative to the body through a full 360° angle.
- f. When the regulator is installed OUTDOORS, the vent must always be positioned so that rain, snow, moisture or foreign particles cannot enter the vent opening. Itron recommends positioning the pilot vent downward to avoid entry of water or other matter which could interfere with the proper operation of the regulator. The vent should be located away from building eaves, window openings, building air intakes and above the expected snow level at the site. The vent opening should be inspected periodically to insure it does not become blocked by foreign material as outlined in DOT PHMSA-RSPA-2004-19856.
- g. When the regulator is installed INDOORS, the vent must be piped to the outside atmosphere using the shortest length of pipe, the fewest possible pipe elbows, and a pipe diameter as large as the vent size or larger. USING VENT PIPE SMALLER THAN THE VENT CONNECTION LIMITS THE REGULATOR'S INTERNAL RELIEF VALVE CAPACITY. The outlet end of the pipe must be protected from moisture and the entrance of foreign particles. The regulator should be specified by the user with the size vent and pipe threads desired to make the vent pipe connection.

## STARTUP PROCEDURE

- a. Mount a pressure gauge downstream of the regulator to monitor the downstream pressure.
- b. With the downstream pressure valve closed, slowly open the inlet valve. The outlet pressure should rise to slightly more than the set point. Verify there are no leaks and all connections are tight.
- c. The regulator was pre-set at the factory to match order specifications. If necessary, adjust the outlet pressure by removing the seal cap on the top of the spring housing using a large flat-head screwdriver. With a small amount of gas flowing through the regulator, rotate the pilot ferrule clockwise to raise the outlet pressure or counter-clockwise to lower the outlet pressure.
- d. Replace the seal cap and check for leaks after the desired outlet pressure is achieved.

The regulator is ready for operation.

## SAFETY WARNING

This product, as of the date of manufacture, is designed and tested to conform to all governmental and industry safety standards as they may apply to the manufacturer. The purchaser/user of this product must comply with all fire control, building codes, and other safety regulations governing the application, installation, operation, and general use of this regulator to avoid leaking gas hazards resulting from improper installation, startup or use of this product.

Itron strongly recommends installation by a qualified professional and periodic inspection of pressure regulators (inspections may be required by local applicable codes or regulations).

Inspections should include checking for gas quality, cycle numbers, external environmental changes, and operating conditions that impact wear on the regulator's moving parts. To ensure safe and efficient operation of this product, replace worn or damaged parts found during inspection.

The maximum inlet pressure for this regulator is dependent upon the size of the orifice and model designation. The non-relief models are limited to 60 PSIG maximum inlet pressure unless additional safety devices are used as outlined in DOT code, OPS, Part 192, section 192.197.

When B56 models are used on liquid petroleum gases, they should be restricted to second-stage pressure reduction in the gaseous phase.

## LIMITED WARRANTY

Itron, Inc. 2111 North Molter Road Liberty Lake, WA 99019, warrants this gas product against defects in materials and workmanship for the earlier of one (1) year from the date the product is shipped by Itron or a period of one year from the date the product is installed by Itron at the original purchaser's site. During such one-year period, provided that the original purchaser continues to own the product, Itron will, at its sole option, repair any defects, replace the product or repay the purchase price.

» This warranty will be void if the purchaser fails to observe the procedures for installation, operation or service of the product as set forth in the Operating Manual and Specifications for the product or if the defect is caused by tampering, physical abuse or misuse of the product.

- » ITRON SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THOSE OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. UNDER NO CIRCUMSTANCES WILL ITRON BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER.
- » Itron's liability for any claim of any kind, including negligence and breach of warranty for the sale and use of any product covered by or furnished, shall in no case exceed the price allocable to the product or part thereof which gives rise to the claim.
- » In the event of a malfunction of the product, consult your Itron Service Representative or Itron Inc., 2111 North Molter Road Liberty Lake, WA 99019. See Itron Terms and Conditions of Sale for the full and complete terms of the Limited Warranty.

## ORDERING INFORMATION

Specify:

1. Inlet and Outlet Connection Size and Type
2. Model Number
3. Outlet pressure desired
4. Pilot needed
5. Inlet pressure range
6. Type of gas and maximum capacity required
7. Assembly position number (see chart below)
8. Special requirements such as tagging, 1/8" pipe plug tap, seal wire, etc.



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### CORPORATE HQ

2111 North Molter Road  
Liberty Lake, WA 99019 USA

**Phone:** 1.800.635.5461

**Fax:** 1.509.891.3355