

# Model 461-57S Regulator

## Installation and Maintenance Instructions

### Introduction

The heart of the Model 461-57S is the “Roll-Out” Diaphragm. The 461-57S is a spring regulator with performance which approximates that of a pilot operated regulator. The “Roll-Out” Diaphragm makes this exceptional performance possible because its unique action reduces “droop” to a minimum (“droop” being fall-off in outlet pressure as a spring regulator opens to increase flow).

### Installation and Start-Up

**Note:** Do not install sideways. The diaphragm should be horizontal.

1. Thoroughly purge inlet piping to remove dirt and debris which could damage the regulator or impair its operation. If this cannot be done, a filter or strainer should be installed ahead of the regulator (see Sensus Bulletin RDS-1498, Regulator Pressure Ratings). Make certain that regulator is free of any dirt or foreign matter that might have collected.
2. Place regulator in the line with high pressure connected to the inlet side (be sure that shipping screens or covers, if used, are removed from the inlet and outlet).

On flanges, tighten bolts evenly.

Where required, the regulator may be inverted. It may also be installed in a vertical line. However, if installed in a vertical line, there could be excessive wear in anti-friction bushing.

3. From the ¼" union **20** extend pipe or tubing to the control connection into the outlet piping. (See Figure 1 on page 2.) This control piping should not be less than ¼" in size and should be adequately protected against breakage (Regulators will go wide open if the control line is broken).



#### CAUTION

It is the user's responsibility to ensure that all regulator vents and/or vent lines exhaust to a non-hazardous location away from ANY POTENTIAL sources of ignition. Where vent lines are used, it is the user's responsibility to ensure that each regulator is individually vented and that common vent lines ARE NOT used.

The regulator will work to deliver the pressure, for which it is adjusted, at that point in the outlet piping where the control connection is located.

In general the control connection should be at least eight pipe diameters from the regulator and should be in as straight a run of pipe as possible.

The control connection should be clean and smooth, free of rough edges, welding “icicles”, etc.

Where outlet piping increases in size near the regulator, it's generally preferable to locate the control connection in the larger size. The ¼" union **20** contains a small orifice, approximately ⅛" diameter. This orifice should not be removed. Also, make certain this orifice is open and free of foreign material.



#### CAUTION

The diaphragm case vent must be positioned to protect against flooding, drain water, ice formation, traffic, tampering, etc. The vent must be protected against nest building animals, bees, insects, etc., to prevent vent blockage and minimize chances for foreign material from collecting in the vent side of the regulator diaphragm.

4. Check all connections for leaks.
5. Put the regulator into operation as follows: (See Figure 1)
  - a. Slowly open the downstream control line valve **A**.
  - b. Slowly open the downstream block valve **B**.
  - c. Very slowly open the upstream block valve **C**.
  - d. Set the adjusting screw **2** for the required outlet pressure. Turn it clockwise to increase the pressure and counter-clockwise to decrease it. Only make this adjustment when gas is actually flowing through the regulator.



#### CAUTION

Turn gas on very slowly. If an outlet stop valve is used, it should be opened first. Do not overload diaphragm with a sudden surge of inlet pressure. Monitor the outlet pressure during start-up to prevent an outlet pressure overload.

- e. After adjustment is complete, the lock nut **3** should be tightened firmly and the seal cap **1** replaced.
6. To shut down, carefully close valves **C**, **B**, and **A** in that order.

### Spring Ranges

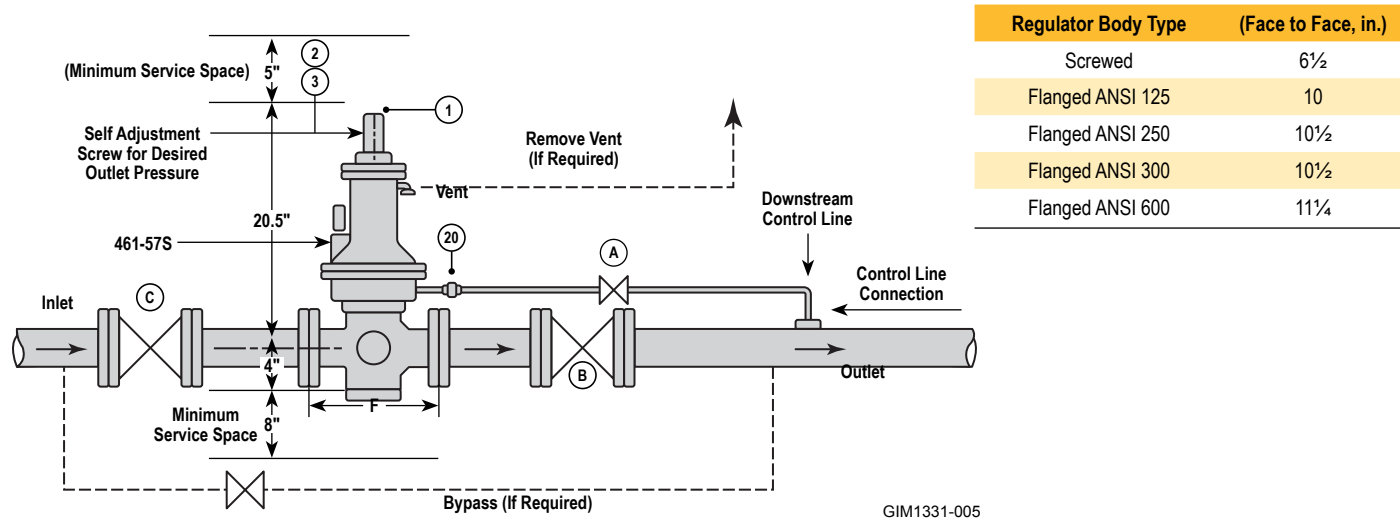
Outlet Pressure Range	Color of Spring	Nominal Diaphragm Size (I.D.)
3 to 6 psi	Yellow	5" all ranges
5 to 9 psi	Gray	
7½ to 15 psi	Blue	
12½ to 30 psi	Red	
25 to 55 psi	Brown	
50 to 75 psi	Black	
70 to 100 psi	Brown plus White*	

\*White colored spring is nested within brown.

#### Maximum Inlet Pressures for all Regular Body Types

Regulator Body type	461 Body Materials	Maximum Working Pressure of Body	Maximum Inlet Pressure
Screwed End	Cast Iron (ASTM A126-71 Class B)	250 psi	250 psi
Flanged ANSI 125 lb. FF	Cast Iron (ASTM A126-71 Class B)	175 psi	175 psi
Flanged ANSI 250 lb. RF	Ductile Iron (ASTM A395-71 gr 60-4-18)	575 psi	575 psi
Flanged ANSI 300 lb. RF	Cast Steel (ASTM A216-70a gr WCB)	720 psi	720 psi
Flanged ANSI 600 lb. RF	Cast Steel (ASTM A216-70a gr WCB)	1200 psi	1000 psi

**Figure 1. Typical Arrangement and Dimensions (indoor and outdoor installation)**



Regulator Body Type	(Face to Face, in.)
Screwed	6½
Flanged ANSI 125	10
Flanged ANSI 250	10½
Flanged ANSI 300	10½
Flanged ANSI 600	11¼

## Servicing and Adjustment

### General Notes (see Illustrations on pages 5 and 6)

1. Make sure the regulator is entirely depressurized before servicing.
2. A quick visual inspection of the valve can be made by removing inspection plates 33 from the sides of the body. These also provide greatly improved access to the valve when servicing or adjusting.
3. The diaphragm 11d, the springs 9, and all other parts from the diaphragm up (except the 11h stud) are interchangeable with the Model 441-57S Regulator. Valve and body parts are interchangeable with other 461 Regulators (461-S, 461-X57, 1100, 1200).

4. Use lubricants sparingly and with care to avoid exposing tacky surfaces to the gas stream. Such surfaces could cause dirt accumulation on close clearance parts.

Use moly or silicone type lubricants. Avoid the use of petroleum base types.

Lubricate the stem 12b, guide 12j and stem O-rings 12a and 12n with dry silicon lubricant to help assure free movement and a tight seal.

An application of lubricant to other O-rings and the tetraseals in the regulator will also help ensure their tightness.

5. When using double-seat balanced valve assembly, bushing 13 must be screwed firmly into place. When using single-seat balanced valve assembly, bushing 13 must be removed.

### To Service Double-Seat Balanced Valve Assembly

1. Remove seal cap 1, back off adjusting screw 2, remove housing cover 6, and remove spring 9.
2. Remove bottom inspection plate 14, and unscrew valve assembly intact from diaphragm assembly (12b unscrews from 11h).

3. Unscrew orifice 18 with socket wrench (1½" hex, deep socket). Remove orifice 18 and valve assembly intact through bottom opening.
4. If valve assembly and orifice do not warrant replacement, screw orifice 18 firmly into place. Replace without disturbing set screw 12g. Top end of 12b screws into 11h until it bottoms and should then be **backed off one-half to one full turn**.
5. If new parts are needed, disassemble valve assembly by loosening set screw 12g and unscrewing 12h from 12b, and then unscrewing nut 12e and part 12j.
6. Replace parts as required, then reassemble upper half valve assembly (parts 12a, 12b, 12c, 12d, 12e) and lower half (parts 12f, 12g, 12h, 12c, 12d, 12j).
7. Insert through bottom opening:
  - a. Upper half valve assembly – screw 12b onto 11h until it bottoms then **back off one-half to one full turn**.
  - b. Orifice 18 – screw firmly into place.
  - c. Lower half valve assembly – screw onto upper half by three or four turns (12h screws onto 12b).
8. Make the valve lock-up adjustment. Seat the upper valve against orifice 19 while screwing up the lower half valve assembly (12h screws onto 12b until the lower valve is seated against 18). Then, firmly tighten set screw 12g.
  - a. To seat the upper valve against orifice 19, either reach it through the body side opening or remove diaphragm assembly and pull top end of stem 12b upwards.
  - b. Tighten 12g with screwdriver through body side opening. If necessary, carefully turn the entire valve assembly. (Do not disturb adjustment to face 12g toward side opening.)
  - c. 12g must tighten against flat area at top of 12h to correctly lock the adjustment.
9. Screw entire valve assembly up (top of 12b screws onto lower end of 11h until it bottoms), then **back off one-half to one full turn – this is important**.
10. Complete assembly as per steps 6 thru 10 under "To Assemble 461-57S".

### To Service Single Seat Balanced Valve Assembly

1. Remove seal cap **1**, back off adjusting screw **2**, remove housing cover **6**, and remove spring **9**.
2. Remove bottom inspection plate **14**.
3. Remove lock nut **12e**, then slip off valve **12d** and retainer **12c**. Orifice **18** can be removed with socket wrench (1½" hex, deep socket). Reassemble in reverse order.
4. If it should be necessary to remove stem **12b** or valve guide **30**, do so by first removing lower diaphragm case **21** (steps 2 thru 4 under "To Take 461-57S Apart"). Use socket wrench (1½" hex, deep socket) for **30**.

**Note:** Single-seat balanced valve does not require any lock-up adjustment.

**Note:** Orifice **18** must be same size as stem guide **30**. (1" **18** with 1" **30**, and 1¼" **18** with 1¼" **30**). Do not use 1¼" size of one with 1" size of the other.

5. Reassemble as per applicable steps under "To Assemble 461-57S".

### To Change Spring

1. Remove seal cap **1**, back off adjusting screw **2**, remove housing cover **6**, and remove spring **9**.
2. Insert the new spring. Be sure it nests correctly into part **11c** and that travel indicator bracket **36k** is in place. Inspect the diaphragm before inserting the spring to be sure the roll-out is uniform and in place. (Use a flashlight, if necessary.)
3. Complete as per steps 8, 9, and 10 under "To Assemble 461-57S".

### To Service Diaphragm

1. Remove seal cap **1**, back off adjusting screw **2**, remove housing cover **6**, and remove spring **9**.
2. Remove bolts **23** and then carefully remove upper diaphragm case **10**.
3. Turn diaphragm assembly counterclockwise until **11h** unscrews from **12b**, then remove assembly and inspect diaphragm.
4. If a new diaphragm **11d** is required, remove nut **11a** and disassemble.
5. When reassembling, **be sure fabric side and gasket of diaphragm is toward the vent side of the regulator and the rubber side of diaphragm toward the pressure side. The gasket is always placed on the spring side of diaphragm.**
6. To minimize rolling friction and prevent sticking, coat the fabric side of the diaphragm with Molycote, or equivalent graphite based lubricant, before installation. Screw diaphragm assembly back into place. (**11h** screws into **12b** until it bottoms), then **back off one-half to one full turn – this is important.**
7. Form roll into roll-out diaphragm **11d**, then carefully reinstall upper diaphragm case **10**. Diaphragm must not be pinched between upper and lower cases, **10** and **21**. Also, roll-out loop must be uniformly full and even. It should be in place as shown of the cross-section drawing. Tighten bolts **23** and nuts **22** evenly.
8. Replace spring, etc., per steps 7 thru 10 under "To Assemble 461-57S".

### To Take 461-57S Apart

1. Remove seal cap **1**, loosen nut **3**, back off adjusting screw **2**, remove cover cap screws **16**, remove housing cover **6**, remove gasket **28**, and remove spring **9**.
2. Remove bolts **23** and nuts **22** and upper diaphragm case **10**.
3. Unscrew diaphragm assembly **11** from stem **12b**.
4. Remove lower case to body cap screws **16** and remove lower diaphragm case **21**.
5. Remove valve assembly and orifice **18** per previous sections on servicing valve assembly.
6. Remove inlet orifice **19** (or guide **30**) through top opening using 1½" socket wrench.

### To Assemble 461-57S

1. Install valve parts as required through top opening (guide **30** with stem **12b** plus pin **12m** or orifice **19**).
2. Install lower diaphragm case **21**.
3. Install valve assembly and orifice **18** per previous instructions on servicing valve assemblies. Make lock-up adjustment on double-seat valve.
4. Screw diaphragm assembly back into place. **11h** screws into **12b** until it bottoms, then **back off one-half to one full turn – this is important.**
5. Install upper diaphragm case per step 7 under "To Service Diaphragm".
6. Replace bottom inspection plate **14** (with double-seat valve, engage pin in **13** with slot in lower end of **12j**, then rotate **14** until holes line up to install cap screws **16**).
7. Insert the spring. Be sure it nests correctly into part **11c** and that travel indicator bracket is in place. Inspect the diaphragm before inserting the spring to be sure the roll-out is uniform and in place. (Use a flashlight, if necessary.)
8. Insert top spring button **7a** and ball bearing **7b**. Be sure it is nested correctly on the spring.
9. Install housing cover gasket **28** and housing cover **6**. Be sure the lower end of adjusting screw **2** goes into the hole in button **7a**. Install housing cover screws **16**.
10. Set adjusting screw **2** for desired outlet pressure, firmly tighten nut **3** and replace seal **4** and cap **1**.



### CAUTION

Regulators are pressure control devices with numerous moving parts subject to wear that is dependent upon particular operating conditions. To ensure continuous satisfactory operation, adhere to a periodic inspection schedule with the frequency of inspection determined by the severity of service and applicable laws and regulations.

### Maximum Emergency Pressures

**NOTE:** Make sure this entire section is clearly understood before using any of the following data.

The maximum pressure the regulator inlet may be subjected to under abnormal conditions without causing damage to the regulator is:

Cast Iron Body, Screwed End	275 psi
Cast Iron, Flanged ANSI 125 lb	200 psi
Ductile Iron, Flanged ANSI 250 lb	630 psi
Cast Steel, Flanged ANSI 300 lb	800 psi
Cast Steel, Flanged ANSI 600 lb	1100 psi

The maximum pressure the outlet may be subjected to without causing damage to the internal parts of the regulator is:

All 461-57S ..... set-point + 25 psi

Set-point is defined as the outlet pressure a regulator is adjusted to deliver. If any of the above pressure limits are exceeded, the regulator must be taken out of service and inspected. Damaged or otherwise unsatisfactory parts must be repaired or replaced. The maximum pressure than can be safely contained by the diaphragm case is:

All 461-57S ..... 175 psi

Safely contained means no leakage as well as no bursting.

### Other Gases

Model 461-57S Regulators are mainly used with natural gas. However, they perform equally well with LP gas, nitrogen, dry CO<sub>2</sub>, air and others.

Other Gases	Correction Factor
Air (Specific Gravity 1.0)	0.77
Propane (Specific Gravity 1.53)	0.63
1350 BTU Propane-Air Mix (1.20)	0.71
Nitrogen (Specific Gravity 0.97)	0.79
Dry Carbon Dioxide (Specific Gravity 1.52)	0.63

For other non-corrosive gases:  
 CORRECTION FACTOR =  $\sqrt{\frac{0.60}{\text{Specific gravity of the gas}}}$

For use with gases not listed above, please contact your Sensus representative or Industrial Distributor for recommendations.

### Buried Service

The model 461-57S Regulator is **not** recommended for buried service.

### Temperature Limits

The model 461-57S Regulator can be used for flowing temperatures from -20°F to 150°F.

### Over-pressurization Protection

Protect the downstream piping system and the regulator’s low pressure chambers against over-pressurization due to possible regulator malfunction or failure to achieve complete lockup. The allowable outlet pressure is the lowest of the maximum pressures permitted by federal codes, state codes, Sensus Bulletin RDS-1498, or other applicable standards. The method of protection can be a relief valve, monitor regulator, shutoff device, or similar mechanism.

### Condensed Parts List

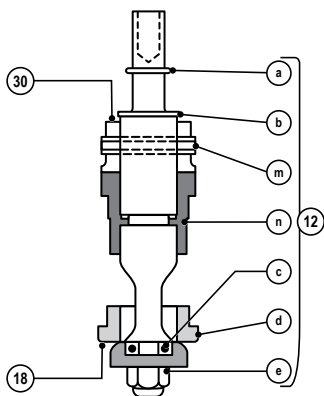
**NOTE:** Items in bold face type denote minimum recommended spare parts.

Illustration Number	Description	Part Number
3	Hex Steel Nut 5/8" – 11	921407
<b>4</b>	<b>Tetraseal (or O-Ring) 1 3/4" x 2"</b>	<b>904092</b>
7b	Thrust Bearing-Stainless ball 3/8" Dia.	930510
8	Anti-Friction Bushing Assy.	091-16-373-00
9	Spring – Yellow 3 to 6 psi	091-00-021-05
	Spring – Gray 5 to 9 psi	091-00-021-04
	Spring – Blue 7 1/2 to 15 psi	091-00-021-03
	Spring – Red 12 1/2 to 30 psi	091-00-021-02
	Spring – Brown 25 to 55 psi	091-00-021-01
9	Spring – Black 50 to 75 psi	091-00-021-00
	Spring – Brown plus White 70 to 100 psi	
	Brown outer spring	091-00-021-01
	White inner spring	091-00-021-08
11a	Hex, Steel Nut 5/8" – 18	905993
11c	Diaphragm Plate – upper	091-00-010-00
<b>11d</b>	<b>Diaphragm – 5" Roll-Out</b>	<b>091-00-350-00</b>
11e	Diaphragm Plate – lower	091-00-022-00
<b>11f</b>	<b>O-Ring, 5/8" x 3/4"</b>	<b>902922</b>
11g	Split Lockwasher 5/8"	932531
11h	Diaphragm Stem	091-00-058-00
12	1" Double-Seat Valve Assembly brass trim, Buna-N	091-16-515-01
	1" Double-Seat Valve Assembly stainless trim, Buna-N	091-16-515-03
	1" Double-Seat Valve Assembly brass trim, Red Polyurethane	091-16-515-11
	1" Double-Seat Valve Assembly stainless trim, Tan Polyurethane, V-port	091-16-515-13
	1" Double-Seat Valve Assembly brass trim, Tan Polyurethane, V-port	091-16-515-65
	1 1/16" Double-Seat Valve Assembly brass trim, Buna-N	091-16-515-00
	1 1/16" Double-Seat Valve Assembly stainless trim, Buna-N	091-16-515-02
	1 1/16" Double-Seat Valve Assembly brass trim, Red Polyurethane	091-16-515-10
	1 1/16" Double-Seat Valve Assembly stainless trim, Red Polyurethane	091-16-515-12
	1" Single-Seat Valve Assembly stainless trim, Red Polyurethane	091-16-515-51
	1 1/16" Single-Seat Valve Assembly stainless trim, Red Polyurethane	091-16-515-50
	<b>12a</b>	<b>O-Ring, 3/8" x 1/2"</b>
12b	Male Valve Stem, 5 1/16" Lg. brass for 1" & 1 1/16" Double-Seat assembly	091-16-116-02
	Male Valve Stem, 5 1/16" Lg. stainless for 1" & 1 1/16" Double-Seat assembly	091-16-116-00
12c	Valve Stem – stainless for 1" Single-Seat assembly	091-00-016-06
	Valve Retainer – brass for 1" Double-Seat (2 used)	091-16-018-03
	Valve Retainer – brass for 1 1/16" Double-Seat (2 used)	091-16-018-02
	Valve Retainer – stainless for 1" Single- or Double-Seat (1 or 2 used)	091-16-018-01
	Valve Retainer – Stainless for 1 1/16" Single- or Double-Seat (1 or 2 used)	091-16-018-00

**Condensed Parts List (Continued)**

**NOTE:** Items in bold face type denote minimum recommended spare parts.

Illustration Number	Description	Part Number
12d	<b>Molded Valve Buna-N (Black, 45-55 Duro), for 1" Double-Seat all trim</b>	<b>091-16-315-01</b>
	Molded Valve, Buna-N (Black, 45-55 Duro), for 1/16" Double-Seat all trim	091-16-315-00
	Molded Valve, Polyurethane (Red, 65-75 Duro), for 1" Double-Seat all trim	091-16-315-11
	Molded Valve, Polyurethane (Red, 65-75 Duro), for 1/16" Double-Seat all trim	091-16-315-10
	Molded Valve, Polyurethane (Tan, 85-95 Duro), for 1" Double-Seat all trim	091-16-315-15
	Molded Valve, Polyurethane (Tan, 85-95 Duro), for 1/16" Double-Seat all trim	091-16-315-14
	Molded Valve, Viton (65-75 Duro, stamped V), for 1" Double-Seat all trim	091-16-315-13
	Molded Valve, Viton (65-75 Duro, stamped V), for 1/16" Double-Seat all trim	091-16-315-12
	Molded Valve, Polyurethane (Red, 65-75 Duro), for 1" Single-Seat	091-16-315-51
	Molded Valve, Polyurethane (Red, 65-75 Duro), for 1/16" Single-Seat	091-16-315-50
	Molded Valve, Polyurethane (Tan, 85-95 Duro), for 1" Single-Seat	091-16-315-60
	Molded Valve, Polyurethane (Tan, 85-95 Duro), for 1/16" Single-Seat	091-16-315-59
	Molded Valve, Viton (65-75 Duro, stamped V), for 1" Single-Seat	091-16-315-58
	Molded Valve, Viton (65-75 Duro, stamped V), for 1/16" Single-Seat	091-16-315-57
	Stainless Valve – Nylon disc, for 1" Double-Seat	091-16-315-04
	Stainless Valve – Nylon disc, for 1/16" Double-Seat	091-16-315-03
	Stainless Valve – Nylon disc, for 1" Single-Seat	091-16-315-52
	Stainless Valve – Nylon disc, for 1/16" Single-Seat	091-16-315-02



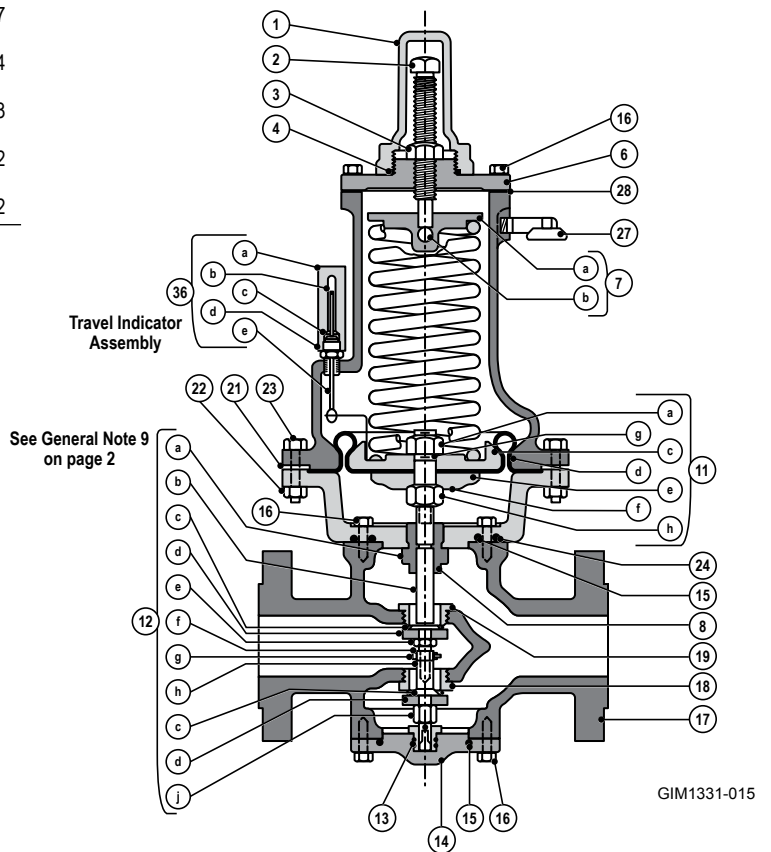
GIM1331-010

**SINGLE SEAT BALANCE VALVE ASSEMBLY**

**Condensed Parts List (Continued)**

**NOTE:** Items in bold face type denote minimum recommended spare parts.

Illustration Number	Description	Part Number
12e	Valve lock nut – brass for Double-Seat assembly	091-16-102-00
	Valve lock nut – stainless for Double-Seat assembly	091-16-102-01
12f	Valve lock nut – 3/8" – 24 Crown Nylok, for Single-Seat assembly	903936
	<b>Valve Stem Locking Ring – stainless for Double-Seat assembly</b>	<b>091-16-043-01</b>
12g	Set Screw – slotted headless or Hex. Soc. cup pt.	907694
12h	<b>Female Valve Stem – brass for Double-Seat assembly</b>	<b>091-16-016-00</b>
	Female Valve Stem – stainless for Double-Seat assembly	091-16-016-03
12j	Valve Guide – brass for Double-Seat assembly	091-16-012-00
	Valve Guide – stainless for Double-Seat assembly	091-16-012-02
12m	Roll Pin – 1/4" x 1 1/2" Lg. for Single-Seat assembly	901707



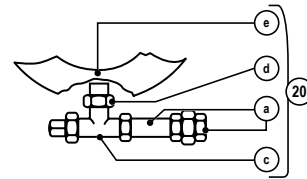
GIM1331-015

**DOUBLE SEAT BALANCE VALVE ASSEMBLY**

**Condensed Parts List** (Continued)

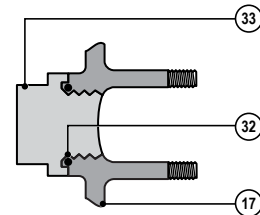
**NOTE:** Items in bold face type denote minimum recommended spare parts.

Illustration Number	Description	Part Number
12n	<b>O-Ring – 3/4" x 1", for Single-Seat assembly</b>	<b>934015</b>
	<b>O-Ring – 9/16" x 3/4", for 1/16" Single-Seat assembly</b>	<b>934011</b>
13	Guide Bushing – brass, with pin	091-16-385-02
	Guide Bushing – stainless, with pin	091-16-385-03
15	<b>Tetraseal (or O-Ring), 2 3/4" x 3"</b>	<b>904079</b>
16	Hex. Cap Screw – 120,000#	910030
	Tensile, 5/16" – 18 x 1" (24 used)	
18	<b>Outlet Orifice – 1" brass</b>	<b>091-16-029-01</b>
	Outlet Orifice – 1" stainless	091-16-029-05
	Outlet Orifice – 1 1/16" brass	091-16-029-00
	Outlet Orifice – 1 1/16" stainless	091-16-029-04
19	<b>Inlet Orifice – 1" brass</b>	<b>091-16-028-01</b>
	Inlet Orifice – 1" stainless	091-16-028-05
	Inlet Orifice – 1 1/16" brass	091-16-028-00
	Inlet Orifice – 1 1/16" stainless	091-16-028-04
20a	Nipple, Orifice Plug and Union Assembly	091-00-361-00
20c	Tee (14T)	946150
20e	Pipe Plug (1/4)	906055
22	Hex. Steel Bolt – 3/8" – 16 x 1 3/4" Lg. (8 used)	920853
23	Hex. Steel Bolt – 3/8" – 16 x 1 3/4" Lg. (8 used)	910058
24	<b>Tetraseal (or O-Ring), 4 3/8" x 4 5/8"</b>	<b>904085</b>
27	Vent Cap – 1/4"	137-02-505-02
28	<b>Housing Cover Gasket</b>	<b>091-00-066-30</b>
30	Valve Stem Guide – stainless, 1/16" Single-Seat assembly	091-16-012-52
	Valve Stem Guide – stainless, 1" Single-Seat assembly	091-16-012-53
32	<b>Tetraseal (or O-Ring), 1 1/2" x 1 3/4"</b>	<b>904086</b>
36	Travel Indicator Assembly (1/4" scale)	091-00-365-73
	Travel Indicator Assembly (5/8" scale)	091-00-365-75
	Travel Indicator Assembly (1" scale)	091-00-365-77
	Travel Indicator Assembly (1 1/4" scale)	091-00-365-79
36a	Window (opens down 1/4")	091-00-174-76
	Window (opens down 5/8")	091-00-174-80
	Window (opens down 1")	091-00-174-82
	Window (opens down 1 1/4")	091-00-174-84
36b	Tube Cap	950188
36c	O-Ring	950071
36d	Half Union (Imp.48F. 1/4NPT)	903984



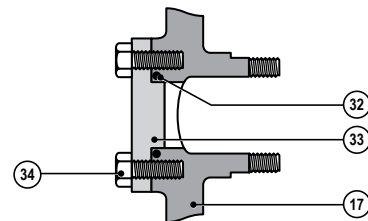
**OUTLET CONTROL PIPING**

GIM1331-020



**SCREWED SIDE INSPECTION PLATES**

GIM1331-025



**TWO BOLT SIDE INSPECTION PLATES**

GIM1331-030

### Maximum Emergency Pressure

**NOTE:** Make sure this entire section is clearly understood before using any of the following data.

The maximum emergency pressure the inlet side of the Model 461-57S Regulator may be subjected to under abnormal conditions without causing damage to the regulator is:

**Cast Iron Body** ..... Maximum Inlet Pressure + 25 psi

**Ductile Iron Body**.. Maximum Inlet Pressure + 60 psi

**Cast Steel Body** .. Maximum Inlet Pressure + 100 psi

If pressure exceeds the above values the regulator must be removed from service and inspected. Damaged or otherwise unsatisfactory parts must be repaired or replaced before returning the regulator to service.

The maximum pressure which the diaphragm may be subjected to under abnormal conditions without causing internal damage is the set-point + 25 psi. If the pressure on the diaphragm exceeds set-point by more than + 25 psi, the regulator must be removed from service and inspected. Damaged or otherwise unsatisfactory parts must be repaired or replaced before returning the regulator to service. The set-point is the outlet pressure the regulator is adjusted to deliver.

The maximum pressure that can be safely contained by the diaphragm case is 175 psi. Safely contained means no leakage as well as no bursting.

Before using any of the above data, make sure this entire section is clearly understood.

### Other Gases

The Model 461-57S Regulator is mainly used with natural gas services; however, this regulator will perform equally as well with other gases. When using the Model 461-57S Regulator with other gases, the regulator capacities must be adjusted using the following correction factors:

Type of Gas	Correction Factor
Air (Specific Gravity 1.0)	0.77
Propane (Specific Gravity 1.53)	0.63
1350 BTU Propane-Air Mix (Specific Gravity 1.20)	0.71
Nitrogen (Specific Gravity 0.97)	0.79
Dry Carbon Dioxide (Specific Gravity 1.52)	0.63

For other non-corrosive gases use the following formula:

$$\text{CORRECTION FACTOR} = \sqrt{\frac{0.60}{\text{Specific gravity of the gas}}}$$

For use with gases not listed above, please contact your Sensus representative or Industrial Distributor for recommendations.

### Monitoring

The Model 461-57S Regulator makes an excellent monitor. It can act as a standby regulator installed in series which assumes control if a failure in the operating regulator permits the outlet pressure to exceed the set-point. It can be located in either the upstream or the downstream position.

When a Model 461-57S Regulator is used to monitor a regulator with an identical inner valve (another 461-57S Regulator), the **total maximum capacity** through both regulators can be figured at 70% of the capacity of one regulator alone. This applies with the monitor located either upstream or downstream.

# Model 461-57S Regulator

Installation and Maintenance Instructions



## Authorized Distributor:

All products purchased and services performed are subject to Sensus terms of sale, available at either: <http://na.sensus.com/TC/TermsConditions.pdf> or 1-800-METER-IT. Sensus reserves the right to modify these terms and conditions in its own discretion without notice to the customer.

This document is for informational purposes only, and SENSUS MAKES NO EXPRESS WARRANTIES IN THIS DOCUMENT. FURTHERMORE, THERE ARE NO IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES AS TO FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. ANY USE OF THE PRODUCTS NOT SPECIFICALLY PERMITTED HEREIN IS PROHIBITED.