

# Model 046 Field Regulators

Installation, Maintenance Instructions and Parts List

Simple design, rugged construction and top performance make these regulators a dependable, economical answer for the wide variety of pounds to pounds applications. They are also available with an internal relief valve (IRV) and with a stem seal and control line tap for use as the upstream regulator in a monitor set.

The 046 Regulators typically are used for farm taps, field regulator applications, propane tanks and high pressure industrial air or gas uses.

## Maximum Inlet Pressure 046, 046-M and 046-C Models

| Orifice | Springs |                                  |          |
|---------|---------|----------------------------------|----------|
|         | Yellow  | Aluminum, White, Tan, Dark Green | Gray     |
| 1/8"    | 500 psi | 1000 psi                         | 1000 psi |
| 3/16"   | 500 psi | 1000 psi                         | 1000 psi |
| 1/4"    | 500 psi | 500 psi                          | 500 psi  |
| 5/16"   | 300 psi | 400 psi                          | 400 psi  |
| 3/8"    | 300 psi | 300 psi                          | 400 psi  |
| 1/2"    | 100 psi | 100 psi                          | 100 psi  |

Inlet Pressures ..... to 1000 psi  
 Outlet Pressures ..... 3 to 200 psi  
 Pipe Sizes ..... 3/4", 1", and 1 1/4"

## Maximum Inlet Pressure 046-2 and 046-2M Models

| Orifice | Springs |                                  |
|---------|---------|----------------------------------|
|         | Yellow  | Aluminum, White, Tan, Dark Green |
| 1/8"    | 500 psi | 925 psi                          |
| 3/16"   | 500 psi | 925 psi                          |
| 1/4"    | 500 psi | 500 psi                          |
| 5/16"   | 300 psi | 400 psi                          |
| 3/8"    | 300 psi | 300 psi                          |
| 1/2"    | 100 psi | 100 psi                          |

Inlet Pressures ..... to 925 psi  
 Outlet Pressures ..... 3 to 125 psi  
 Pipe Sizes ..... 3/4", 1", and 1 1/4"

## Maximum Inlet Pressure 046-PL and 046-CPL Models

| Orifice      | Springs |          |
|--------------|---------|----------|
|              | Yellow  | Aluminum |
| 1/8" to 1/2" | 250 psi | 250 psi  |

Inlet Pressures ..... to 250 psi  
 Outlet Pressures ..... 5 to 100 psi  
 Pipe Sizes ..... 3/4", 1", and 1 1/4"

| Valve Material       | Max Inlet Pressure | Max Diff. Pressure |
|----------------------|--------------------|--------------------|
| Poly-U Tan (90 Duro) | 1000 psig          | 800 psig           |
| Buna-N (80 Duro)     | 525 psig           | 400 psig           |
| Vitron (70 Duro)     | 300 psig           | 250 psig           |

## Installation and Start-Up

1. Remove the shipping plugs from both the regulator inlet and outlet connections.
2. Make certain that the inside of the piping and the regulator inlet and outlet connections are clean. They must be free of dirt, pipe dope and other debris.
3. Use pipe joint material only on the male threads of the pipe being connected to the regulator. Do not use pipe joint material on the female threads of the regulator.
4. Install the regulator in the line. Make certain that the gas flow through the regulator is in the direction indicated by the arrow on the regulator body.

The regulator may be installed in any position: right side up, upside down, vertical piping, diagonal piping, etc. If required, the diaphragm case may be rotated 360° in any number of increments. To rotate the diaphragm case assembly to another position in relation to the body, loosen coupling nut **33**. Make certain it is retightened to 35 to 50 ft.-lb. to hold the diaphragm case assembly in the new position and to reseal.

**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 to minimize the chances of foreign material collecting in the vent side of the regulator diaphragm.**



### CAUTION

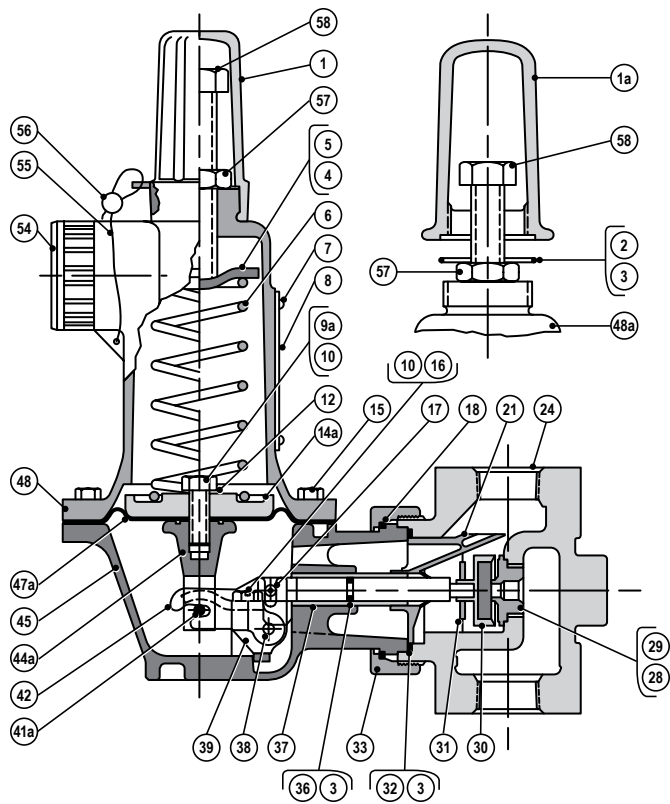
Turn gas on very slowly. If an outlet stop valve is used, it should be opened first. Do not overload the diaphragm with a sudden surge of inlet pressure. Monitor the outlet pressure during start-up to prevent an outlet pressure overload.

5. Turn gas on very slowly.
6. Make certain that there are no leaks and that all connections are tight.

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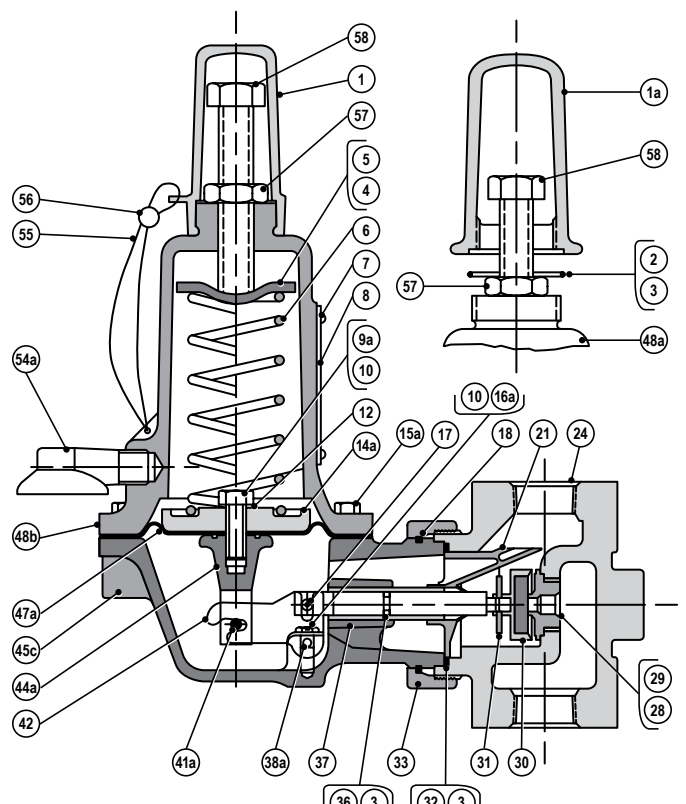
| Model                              | Body                                 | Diaphragm Case | Internal Relief Valve | Maximum Inlet Pressure | Outlet Pressure Range |
|------------------------------------|--------------------------------------|----------------|-----------------------|------------------------|-----------------------|
| 046<br>046-M <sup>1</sup><br>046-C | Ductile Iron<br>ASTM 395 GR 60-90-18 | Aluminum       | No                    | See Tables<br>Above    | 3 to 200 psi          |
|                                    |                                      | Aluminum       | No                    |                        |                       |
|                                    |                                      | Cast Iron      | No                    |                        |                       |
| 046-2<br>046-2M <sup>1</sup>       |                                      | Aluminum       | Yes                   | See Tables<br>Above    | 3 to 125 psi          |
|                                    |                                      | Aluminum       | Yes                   |                        |                       |
| 046-PL<br>046-CPL                  |                                      | Aluminum       | No                    | See Tables<br>Above    | 5 to 100 psi          |
|                                    |                                      | Cast Iron      | No                    |                        |                       |

1. Regulator requires a control line.



GIM1312-005

MODEL NO. 046



GIM1312-010

MODEL NO. 046-C

- Adjust set-point (outlet pressure) by turning adjustment screw **58**. Turn clockwise to increase and counterclockwise to decrease. Be sure to tighten nut **57** after adjustment is completed. Do not adjust when regulator is closed (no flow). Only adjust when gas is flowing through regulator (approximately 250 SCFH).

Except for lock-up (regulator closed), the outlet pressure during normal operation must not go higher than the maximum limit of the spring range. Whenever it goes higher, the spring could be overstressed. Also, the higher pressure springs could compress solid and thereby keep the regulator from closing.

Therefore, whenever the set-point is within the upper third of the spring range, set-point adjustment should be made at low flow (approximately 250 SCFH). If set-point, adjustment must be made when flow is greater, use the next higher range spring.

**CAUTION**

It is the user's responsibility to assure 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 assure that each regulator is individually vented and that common vent lines ARE NOT used.

- The vent assembly **54** or **54A** is an escape path for flammable gas and it must be located and/or piped so that potential discharge occurs in a safe area away from buildings, open flames, collection areas, arcing devices, etc.

**Regulators that are installed indoors or in a non-vented area must be vented to the outside. Simply run vent piping from the regulator vent connection to a non-hazardous location on the outside away from ANY**

**potential sources of ignition. The vent piping must be a minimum 1/4" NPT connection size or larger and piped to a safe area. The vent discharge must be protected against the potentials outlined in instructions 4, 8, 9 and 10.**

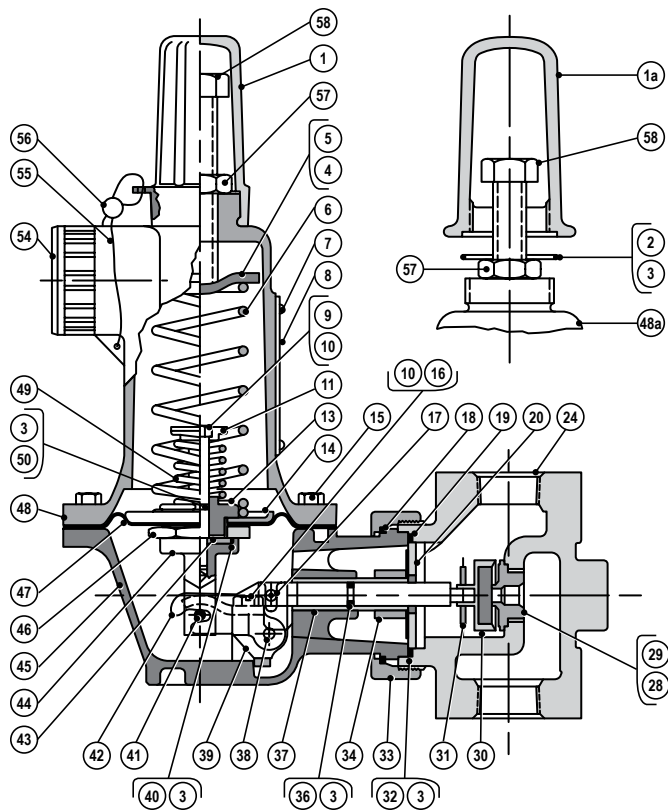
For regulators equipped with internal relief valves (IRV), models 046-2 and 046-2M, vent piping must be vent connection size (1" NPT) or larger. This will assure that the vent piping will be large enough to vent all of the IRV discharge to atmosphere without excessive back pressure that would result in excessive pressure increase in the regulator.

**The outlet of the vent piping must allow for the free and unobstructed passage of air and gas and must be protected against the potentials listed in instructions 4, 8, 9 and 10.**

- For outdoor installations, it is recommended that the regulator be installed so that the regulator vent faces down to avoid the potential for water or other foreign matter entering the regulator and interfering with the proper operation of the regulator.
- For application on combustible gas with a specific gravity greater than 1.0 (such as propane), it is recommended that the gas be vented outdoors where the gas will not collect in low areas and away from all open flames, arcing devices, etc.

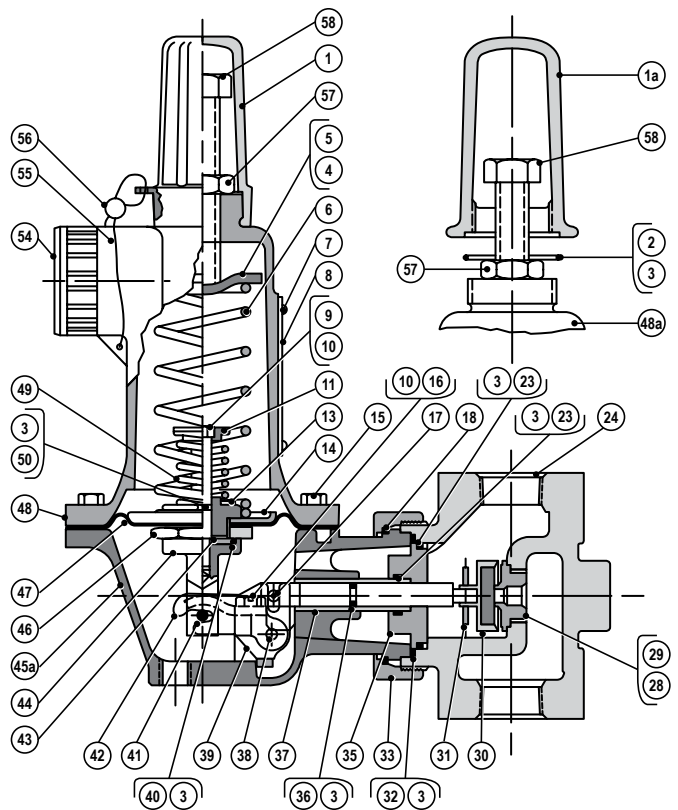
**CAUTION**

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



GIM1312-015

MODEL NO. 046-2



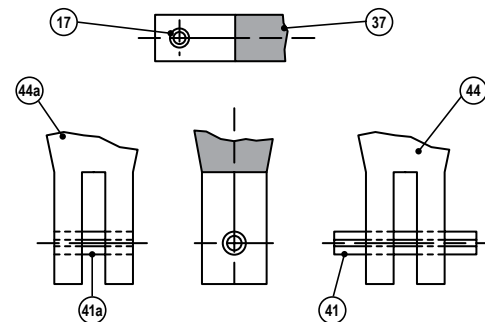
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MODEL NO. 046-2M

**Service**

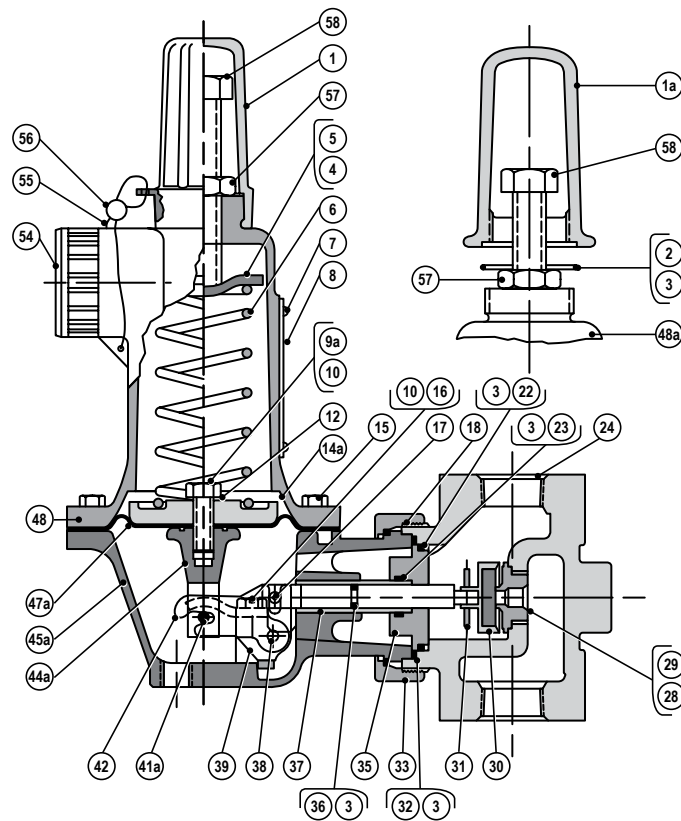
1. Make sure the regulator is entirely depressurized before disassembling.
2. In general, it is not necessary to disconnect the body **24** or **24A** from the piping. Leave in place in the line when servicing the regulator.
3. Carefully note the location and position of each part during disassembly to make certain reassembly is correct. Replace all worn, damaged or otherwise unsatisfactory parts.
4. To service the valve or orifice, first loosen coupling nut **33** and separate the diaphragm case assembly from the body. Remove and inspect the body to lower case seal **32**. Replace if damaged. To remove the valve assembly **30**, first remove hair pin **31**. Orifice **29** unscrews from body using 1" hex socket wrench "thin wall" type. Use a moderate amount of pipe dope on the sealing surface (male threads) when replacing the orifice.
5. During reassembly, make sure tetriseal **32** is correctly positioned. Tighten coupling nut **33** with a torque of 35 to 50 ft.-lbs.
6. To change spring **6**, remove cover cap **1** or **1a**, and turn adjusted screw **58** counterclockwise to remove spring load. Remove screws **15** or **15a**, remove upper diaphragm case **48**, **48a** or **48b** and spring ferrule **5**. Make sure the new spring is correctly nested on diaphragm pan **14** or **14a** and install spring ferrule **5**. Also, make sure diaphragm **47** or **47a** is not pinched.
7. To replace the diaphragm, follow step 6 during disassembly and reassembly. Remove screw **9a** to disassemble the diaphragm assembly and remove diaphragm **47** or **47a**. On

- regulators with internal relief valves (all -2 models), remove IRV bolt **9** and IRV spring **49** slowly, as force is required to keep the spring from expanding rapidly. Remove clamping nut **46** and replace diaphragm **47**. Assemble diaphragm **47** in reverse order. Inspect IRV "O" rings **50** and **40** and replace if necessary. Align roll pin **41** parallel and square to the diaphragm centerline. Make sure roll pin **41** or **41a** is correctly positioned as shown below. On reassembly, tighten screws **15** or **15a** evenly to a torque of 125 in.-lbs. The screws must be tight enough to prevent leakage, but not so tight as to crush or damage the diaphragm. The diaphragm coupling roll pin **41** or **41a** must be assembled parallel and square to the diaphragm centerline to prevent binding of coupling **44** or **44a** and lever **42**. Also, diaphragm **47** or **47a** must not be twisted or pinched.
8. Upon completing servicing, make sure the regulator is free of leaks.



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**SPIROL/ROLL PIN POSITIONING**



GIM1312-030

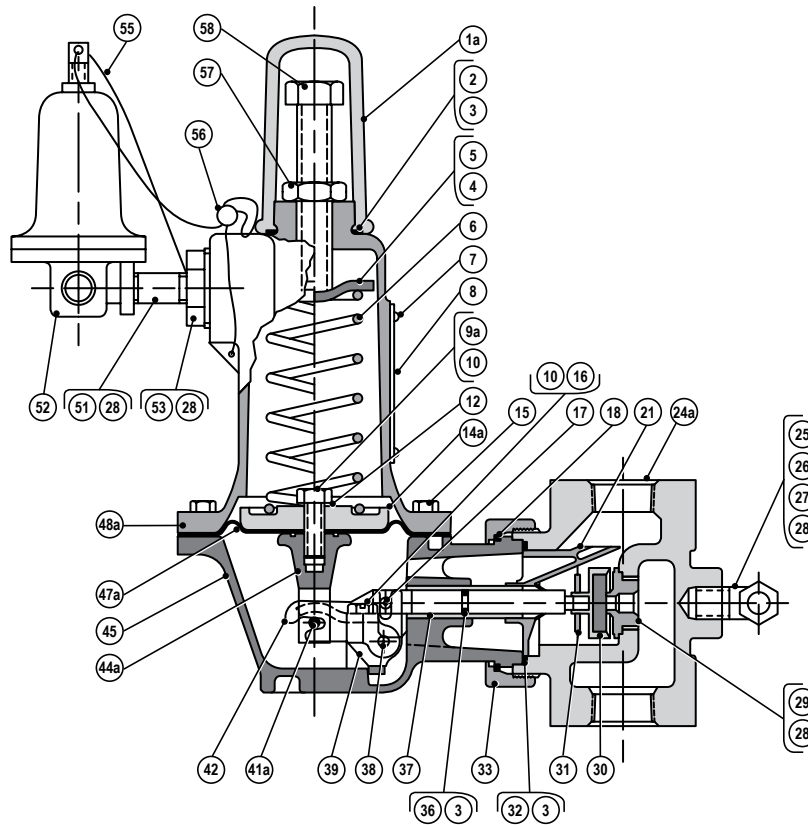
MODEL NO. 046-M

### 046 Parts List

The following are the parts for the 046 regulators. Those parts generally required in maintenance and servicing are in bold type.

| Illustration Number | Description  | Part Number                    |
|---------------------|--|--------------------------------|
| 1                   | Plastic Cover Cap  | 046-00-005-00                  |
| 1a                  | Cast Iron Cover Cap  | 046-00-005-01                  |
| 2                   | <b>Tetraseal, Buna-N<br/>Tetraseal, (or O-ring), Viton</b> | <b>950805<br/>950806</b>       |
| 3                   | O-ring Lube  | 1191074                        |
| 4                   | Aero-Lubriplate  | 1191073                        |
| 5                   | Spring Ferrule   | 141-62-009-00                  |
| 6                   | <b>Spring</b>  | <b>See Chart</b>               |
| 7                   | #0 x 1/8" Ig. Drive Screw                                  | 914760                         |
| 8                   | Nameplate<br>Nameplate (Taipei City)                       | 046-00-086-00<br>046-00-086-01 |
| 9                   | <b>IRV Guide Bolt</b>                                      | <b>046-00-153-00</b>           |
| 9a                  | <b>5/16" - 18 x 7/8" Ig. Hex Head Screw</b>                | <b>910029</b>                  |
| 10                  | Loctite 242  | 906114                         |
| 11                  | <b>Spring Holder</b>                                       | <b>046-00-009-00</b>           |
| 12                  | <b>Stat-O-Seal (High Temp Only)</b>                        | <b>904983</b>                  |
| 13                  | <b>Guide Bushing</b>                                       | <b>046-00-074-00</b>           |
| 14                  | <b>Diaphragm Pan (IRV)</b>                                 | <b>046-00-022-01</b>           |

| Illustration Number | Description  | Part Number                                     |
|---------------------|--|---|
| 14a                 | <b>Diaphragm Pan</b>                                     | <b>046-00-022-00</b>                            |
| 15                  | <b>5/16" - 18 x 3/4" Hex Head Cap Screw</b>              | <b>951136</b>                                   |
| 15a                 | <b>1/4" - 20 x 5/8" Ig. Hex Head Cap Screw</b>           | <b>907558</b>                                   |
| 16                  | <b>1/4" - 20 x 3/4" Ig. Hex Head Thd Forming Screw</b>   | <b>903164</b>                                   |
| 16a                 | <b>#10 - 24 x 1/2" Ig. Bind Head Mach Screw</b>          | <b>903314</b>                                   |
| 17                  | <b>Spirol Pin 5/32" x 5/16" Ig.</b>                      | <b>950381</b>                                   |
| 18                  | <b>Retaining Ring</b>                                    | <b>141-62-130-00</b>                            |
| 19                  | <b>Stabilizer Disc</b>                                   | <b>141-62-035-00</b>                            |
| 20                  | <b>Stabilizer</b>  | <b>141-62-034-00</b>                            |
| 21                  | <b>Boost Tube</b>  | <b>141-62-045-00</b>                            |
| 22                  | <b>O-ring, Buna-N<br/>O-ring, Viton</b>                  | <b>934010<br/>902987</b>                        |
| 23                  | <b>O-ring, Buna-N<br/>O-ring, Viton</b>                  | <b>908771<br/>950746</b>                        |
| 24                  | Body, 3/4" Conn.<br>Body, 1" Conn.<br>Body, 1 1/4" Conn. | 046-00-001-06<br>046-00-001-04<br>046-00-001-05 |



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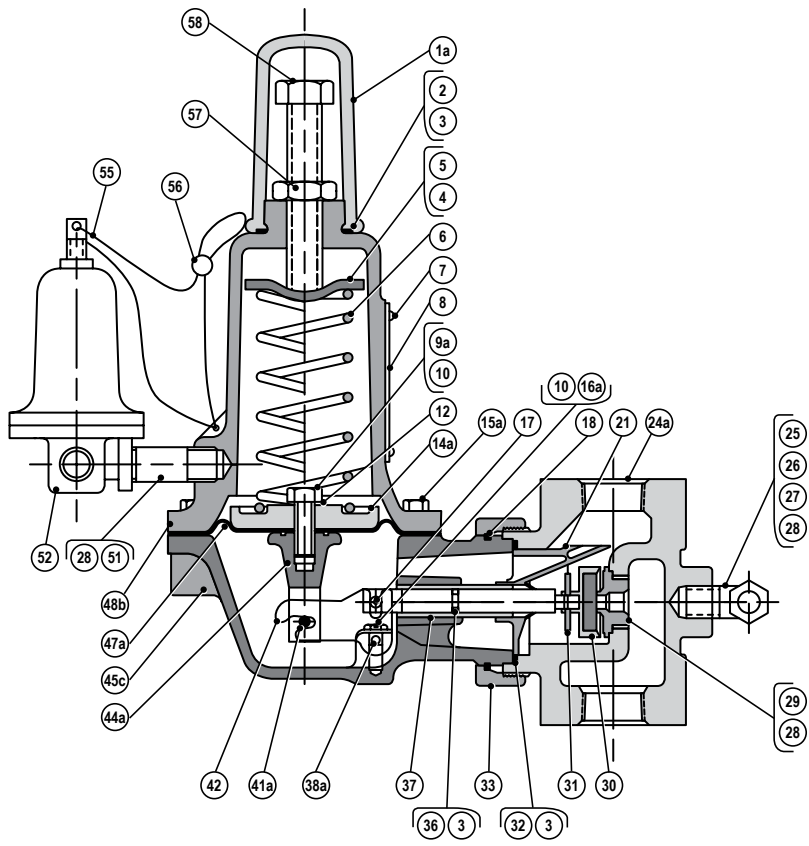
MODEL NO. 046-PL

**046 Parts List** (Continued)

The following are the parts for the 046 regulators. Those parts generally required in maintenance and servicing are in bold.

| Illustration Number      | Description                                  | Part Number   |
|--------------------------|--|---------------|
| 24a                      | Body, 3/4" Conn. With Inlet Tap (1/4" NPT)   | 046-00-001-09 |
|                          | Body, 1" Conn. With Inlet Tap (1/4" NPT)     | 046-00-001-10 |
|                          | Body, 1 1/4" Conn. With Inlet Tap (1/4" NPT) | 046-00-001-11 |
| 25                       | Elbow 3/8" x 1/4" NPT                        | 903989        |
| 26                       | Conn. 3/8" Tube x 1/4" NPT                   | 903973        |
| 27                       | Tube 3/8" O.D. x .035 Wall                   | 51125         |
| 28                       | Loctite 222 Mild                             | 905115        |
| 29                       | 1/8" Stainless Steel Valve Orifice           | 046-00-023-02 |
|                          | 3/16" Stainless Steel Valve Orifice          | 046-00-023-03 |
|                          | 1/4" Stainless Steel Valve Orifice           | 046-00-023-04 |
|                          | 5/16" Stainless Steel Valve Orifice          | 046-00-023-05 |
|                          | 3/8" Stainless Steel Valve Orifice           | 046-00-023-06 |
|                          | 1/2" Stainless Steel Valve Orifice           | 046-00-023-07 |
|                          | 1/8" Brass Valve Orifice                     | 046-00-023-22 |
|                          | 3/16" Brass Valve Orifice                    | 046-00-023-23 |
|                          | 1/4" Brass Valve Orifice                     | 046-00-023-24 |
|                          | 5/16" Brass Valve Orifice                    | 046-00-023-25 |
|                          | 3/8" Brass Valve Orifice                     | 046-00-023-26 |
| 1/2" Brass Valve Orifice | 046-00-023-27                                |               |
| 30                       | Valve Assembly, Buna-N                       | 141-62-511-03 |
|                          | Valve Assembly, Poly-U Tan                   | 141-62-511-01 |
|                          | Valve Assembly, Viton                        | 141-62-511-04 |
| 31                       | Hair Pin Cotter                              | 141-62-118-00 |
| 32                       | Tetraseal, Buna-N                            | 902497        |
|                          | Tetraseal (or O-ring), Viton                 | 907718        |

| Illustration Number | Description                                   | Part Number   |
|---------------------|---|---------------|
| 33                  | Coupling Nut                                  | 143-62-102-00 |
| 34                  | Stabilizer Hub                                | 141-62-036-00 |
| 35                  | Monitor Throat Block                          | 046-00-038-00 |
| 36                  | O-ring, Buna-N                                | 934005        |
|                     | O-ring, Viton                                 | 904839        |
| 37                  | Valve Stem, Brass                             | 046-00-016-00 |
|                     | Valve Stem, Stainless Steel (s.s.)            | 046-00-016-01 |
| 38                  | Fulcrum Dowel Pin 3/16" x 3/4" lg. (s.s.)     | 950728        |
| 38a                 | Fulcrum Pin                                   | 141-62-033-00 |
| 39                  | Pivot Bracket                                 | 046-00-029-00 |
| 40                  | O-ring, Buna-N                                | 904824        |
| 41                  | Roll Pin, 3/16" x 1 1/4" lg.                  | 901695        |
| 41a                 | Roll Pin, 3/16" x 3/8" lg.                    | 901697        |
| 42                  | Lever   | 046-00-030-00 |
| 43                  | IRV Coupling Disc                             | 046-00-154-00 |
| 44                  | Diaphragm Coupling (IRV)                      | 046-00-028-01 |
| 44a                 | Diaphragm Coupling                            | 046-00-028-00 |
| 45                  | Lower Case (Stainless Steel Bushing Assembly) | 046-00-602-09 |
|                     | Lower Case (Brass Bushing Assembly)           | 046-00-602-08 |



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MODEL NO. 046-CPL

**046 Parts List (Continued)**

The following are the parts for the 046 regulators. Those parts generally required in maintenance and servicing are in bold.

| Illustration Number | Description  | Part Number                    | Illustration Number       | Description                                | Part Number          |
|---------------------|--|--------------------------------|---------------------------|--|----------------------|
| 45a                 | Monitor Lower Case<br>(Stainless Steel Bushing Assembly) | 046-00-602-11                  | 52                        | Pilot 67R 3-20 psi                         | 1191495              |
|                     | Monitor Lower Case (Bushing Assembly)                    | 046-00-602-10                  |                           | Pilot 67R 5-35 psi                         | 1191496              |
| 45c                 | CI Lower Case<br>(Stainless Steel Bushing Assembly)      | 046-00-602-07                  |                           | Pilot 67R 30-60 psi                        | 1191497              |
|                     | CI Lower Case (Brass Bushing Assembly)                   | 046-00-602-06                  |                           | Pilot 67R 35-100 psi                       | 1191498              |
| 46                  | <b>Clamping Nut</b>                                      | <b>046-00-155-00</b>           |                           | Pilot 67RS 3-20 psi IRV                    | 1191509              |
| 47                  | <b>IRV Diaphragm, Buna-N</b>                             | <b>046-00-150-01</b>           |                           | Pilot 67RS 5-35 psi IRV                    | 1191510              |
| 47a                 | Diaphragm, Buna-N<br>Diaphragm, Viton                    | 046-00-150-00<br>046-00-150-02 |                           | Pilot 67RS 30-60 psi IRV                   | 1191511              |
| 48                  | Upper Case (Aluminum) Cover                              | 046-00-003-03                  | Pilot 67RS 35-100 psi IRV | 1191512                                    |                      |
| 48a                 | Upper Case (Aluminum With Thd's) Cover                   | 046-00-003-04                  | 53                        | Hex bushing 1" NPT to 1/4" NPT             | 904397               |
| 48b                 | Upper Case (Cast Iron With Thd's) Cover                  | 046-00-003-01                  | 54                        | <b>Vent Assembly 1" NPT</b>                | <b>046-00-527-00</b> |
| 49                  | <b>Spring Dark Blue (IRV)</b>                            | <b>080-02-021-01</b>           | 54a                       | <b>Vent Cap Assembly</b>                   | <b>137-02-505-03</b> |
| 50                  | <b>O-ring, Buna-N</b>                                    | <b>934003</b>                  | 55                        | Seal Wire 12" lg.                          | 001-63-057-50        |
| 51                  | Nipple 1/4" x 2"   | 924059                         | 56                        | Seal                                       | 001-60-157-00        |
|                     |  |                                | 57                        | 1/16" - 12 unc Hex Steel Jam Nut           | 921006               |
|                     |  |                                | 58                        | 1/16" - 12 unc x 3" lg. Hex hd stl Cap scr | 950655               |
|                     |  |                                | Not Shown                 | Customer Badge                             | 141-62-086-04        |



### Over-Pressurization Protection

Protection must be provided for the downstream piping system and the regulator’s low pressure chambers to assure against the potential over-pressurization due to a regulator malfunction or a failure of the regulator to lock up. The allowable over-pressurization is the lowest of the maximum pressures permitted by federal codes, state codes, Sensus Bulletin RDS-1498 or other applicable standards. The method of providing over-pressure protection could be a relief valve, a monitor regulator, a shutoff device or any similar device.

### Internal Relief Valve (IRV) Capacity

Internal relief valves, like all relief valves, must be carefully checked for adequate capacity. IRVs only have full capacity relief capability when the inlet pressure to the regulator is low enough and the regulator orifice is small enough. If either or both are too large, the IRV will not have full capacity relief capability and will not be able to prevent the outlet pressure from exceeding the maximum allowable limit.

Capacity for the full open 046 IRV can be calculated with the following formula.

$$Q = \frac{K P_o}{2} \text{ for 0.6 specific gravity gas}$$

where

- K = 600 (IRV constant)
- P<sub>o</sub> = absolute outlet pressure (psia)

Field regulators with internal relief valves can be obtained by specifying Models 046-2 or 046-2M. The 046-2M is a limited capacity IRV unit due to flow through the control line.

### Spring Ranges

046, 046-M, 046-C and 046-CM Models

| Outlet Pressures | Spring Color            | Part Number   |
|------------------|-------------------------|---------------|
| 3 to 10 psig     | Yellow                  | 046-00-021-00 |
| 8 to 20 psig     | Aluminum                | 046-00-021-01 |
| 15 to 52 psig    | White                   | 046-00-021-02 |
| 50 to 125 psig   | Tan                     | 046-00-021-03 |
| 100 to 200 psig  | Gray                    | 046-00-021-04 |
| 10 to 95 psig    | Dark Green <sup>1</sup> | 046-00-021-05 |

046-2 and 046-2M Models

| Outlet Pressures | Spring Color            | Part Number   |
|------------------|-------------------------|---------------|
| 3 to 10 psig     | Yellow                  | 046-00-021-00 |
| 8 to 20 psig     | Aluminum                | 046-00-021-01 |
| 15 to 52 psig    | White                   | 046-00-021-02 |
| 50 to 125 psig   | Tan                     | 046-00-021-03 |
| 10 to 95 psig    | Dark Green <sup>1</sup> | 046-00-021-05 |

1. General Purpose Spring

### Spring Ranges and Combinations

046-PL and 046-CPL

| For this Outlet Pressure Range | Use These Springs |         |                   |
|--------------------------------|-------------------|---------|-------------------|
|                                | 046 Regulator     |         | Loading Regulator |
| 5 to 15 psi                    | Yellow            | 3 psig  | 2 to 20 psig      |
| 15 to 25 psi                   | Yellow            | 10 psig | 2 to 20 psig      |
| 20 to 40 psi                   | Yellow            | 10 psig | 5 to 35 psig      |
| 30 to 50 psi                   | Aluminum          | 20 psig | 5 to 35 psig      |
| 50 to 75 psi                   | Aluminum          | 20 psig | 30 to 60 psig     |
| 60 to 100 psi                  | Aluminum          | 20 psig | 35 to 100 psig    |

### Full Open Capacity

Use the following formulas for calculating the full open capacity of 046 regulators. Do not use full open capacity when sizing one of these regulators for an application. Instead, use the capacity tables in Bulletin R-1312.

- $Q = K \sqrt{P_o(P_i - P_o)}$

- $Q = \frac{K P_i}{2}$

Q = maximum capacity of the regulator (in SCFH of 0.6 specific gravity natural gas)

K = the “K” factor, the regulator constant (from the table)

P<sub>i</sub> = absolute inlet pressure (psia)

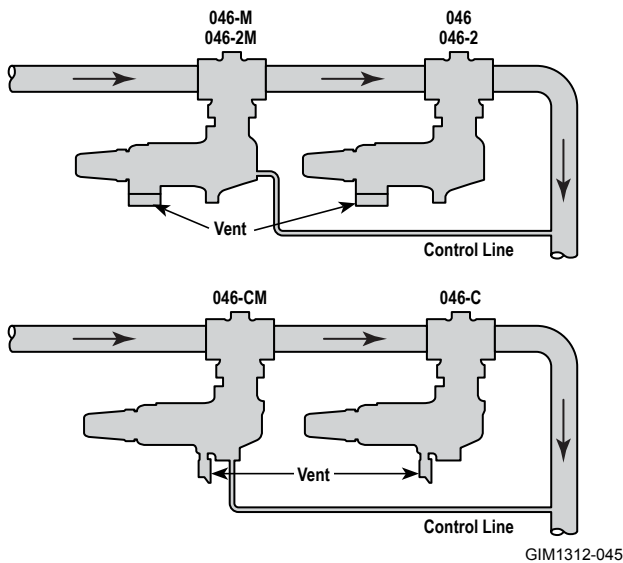
P<sub>o</sub> = absolute outlet pressure (psia)

Use formula 1, when  $\frac{P_i}{P_o}$  is less than 1.894.

Use formula 2, when  $\frac{P_i}{P_o}$  is greater than 1.894.

| Orifice    | 1/8" | 3/16" | 1/4" | 5/16" | 3/8" | 1/2" |
|------------|------|-------|------|-------|------|------|
| “K” Factor | 33   | 74    | 132  | 206   | 292  | 520  |

When sizing relief valves for use with 046 regulators, use full open capacity as calculated with the above formulas. Do not use values from the capacity tables in Bulletin R-1312.



GIM1312-045

**MONITOR SET**

**Monitoring**

The 046 regulator makes an excellent monitor, which is a standby regulator installed in series that assumes control if a failure in the operating regulator permits the outlet pressure to exceed the set-point. It can be in either the upstream or the downstream position.

When an 046 is used to monitor a regulator with an identical inner valve (another 046), the total maximum capacity through both regulators can be figured at 70% of the capacity of one of them alone. This applies with the monitor located either up or downstream.

**Maximum Emergency Pressure**

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

- 046, 046-2, 046-M, 046-2M, 046-PL and 046-CPL ..... Max. Inlet Pressure + 100 psi

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

- For set-points of 3 to 200 psi ..... set-point+100 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 replaced or repaired.

The maximum pressure that can be safely contained by the diaphragm case is:

- 046, 046-2, 046-C, 046-M, 046-2M ..... 400 psi
- 046-PL and 046-CPL ..... 250 psi

Safely contained means no leakage as well as no bursting.

**Temperature Limits**

The 046 regulators can be used for flowing temperatures from -20°F to 150°F.

**Other Gases**

The 046 regulators are mainly used for natural gas service; however, these regulators will perform equally as well on other gases. When using the 046 regulators on 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:

$$\text{Correction Factor} = \sqrt{\frac{60}{\text{Specific gravity of the gas}}}$$

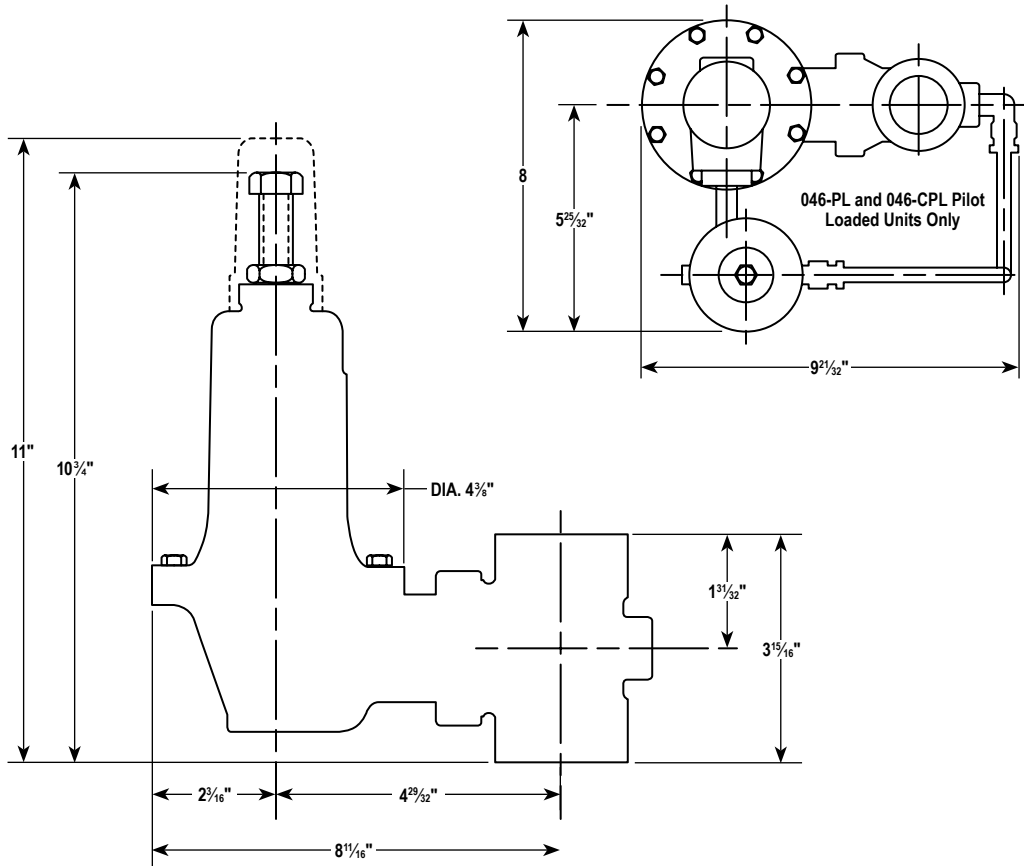
For use with gases not listed above, please contact your Sensus Representative or Industrial Distributor for recommendations.

**Buried Service**

The 046 regulators **are not** recommended for buried service.



### Dimensions



# Model 046 Field Regulators

Installation, Maintenance Instructions and Parts List



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