



# ITT

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*Engineered for life*

## INSTRUCTION AND MAINTENANCE MANUAL

### **GH04 Series Cushion Loading Regulator**

**WARNING:** These instructions must be read carefully prior to installation and system startup.

#### INTRODUCTION

The model GH04 Cushion Loading Regulator is a compact unit designed for industrial and commercial services requiring a constant, regulated air pressure. Primarily used as a cushion loading device for Piston Actuators, this unit's design and high exhaust capabilities lend itself to many other application requirements. Constructed of all aluminum, this lightweight unit offers versatility in line mounting and gauge mounting with dual input and output 1/4" NPT connections. It is available with a 0-60 PSI (0-414 kPa) regulated pressure range and Buna "N" elastomers. The valve is Viton.

#### PRINCIPLE OF OPERATION

Turning the adjusting screw changes the set pressure, by changing the force exerted by the range spring on the diaphragm assembly. In equilibrium, the force exerted by the range spring is balanced by the force from the output pressure acting underneath the diaphragm assembly.

An unbalance between the output pressure and the set pressure causes a corresponding reaction in the diaphragm and internal valves. If the output pressure rises above the set pressure, the diaphragm set is lifted from the Viton valve ball, venting the excess pressure to atmosphere until equilibrium is reached. If the output pressure drops below the set pressure, the unbalanced force from the range spring acts through the diaphragm assembly unseating the Viton ball. This allows supply pressure to flow to the downstream port increasing the output pressure. The output pressure increases until it

#### WARNING

Conoflow's products are designed and manufactured using materials and workmanship required to meet applicable standards. The use of these products should be confined to services specified and/or recommended in the Conoflow catalogs, instructions, or by Conoflow application engineers.

To avoid personal injury or equipment damage resulting from misuse or misapplication of a product, it is necessary to select the proper materials of construction and pressure-temperature ratings which are consistent with performance requirements.

balances the force on the diaphragm assembly by the range spring. At equilibrium, the ball assumes a position which supplies the required flow while maintaining the output pressure at the set pressure.

A no bleed / no relief diaphragm assembly is used to prevent the process media from exhausting at atmosphere. This option is typically used with hazardous or flammable gases (natural gas, etc). The principle of operation is the same as above except that excess output pressure is not vented at atmosphere. Instead, as the diaphragm seat lifts off the ball and the ball is forced against its seat by the nozzle spring, the excess pressure must be relieved downstream.

#### INSTALLATION:

**WARNING:** The Maximum Inlet (supply) Pressure is 300 psi (2068 kPa).

The regulator has four (4) ¼ NPT connections. They are marked "IN", "OUT", "G1", and "G2". "IN" and "G2" are the inlet ports; "OUT" and "G1" are the regulated outlet ports.

***It is recommended that a filtered air supply is used.***

All connections should be checked for leakage after installation. Adjusting knob threads should be kept well lubricated with grease.

#### SPECIFICATIONS:

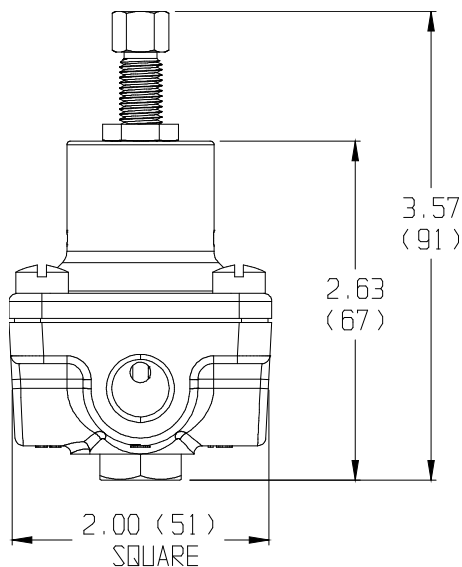
Maximum Inlet: 300 psi (2068 kPa)  
Maximum Output: 60 psi (414 kPa)  
Connections: 1/4" NPT (Inlet / Outlet / "G1" / "G2")  
Flow Capacity: 2 scfm (0.06 m3/min) w/100 psig (690 kPa) air supply pressure  
Exhaust: 6 scfm (0.17 m3/min)  
Supply Effect: 1.6 psi (11 kPa) for 25 psi (172 kPa) change in supply pressure  
Temp. Range: -20 °F to 150 °F (-29 to 66 °C)  
Weight: Approx. 1 lb (0.45 kg)

**Catalog Part Number Breakdown (Control Engineering Data for the GH04 Cushion Load Regulator)**

| Character Position        | Feature by Code Character   |
|---------------------------|---|
| 1-4 Model                 | GH04 = Regulator  |
| 5 - Operational Feature   | X = Standard  |
| 6 - Bonnet Options        | S = Plain bonnet (Standard)   |
| 7 - Adjustment Selections | K = Knob (Wrench Style) (Standard)                                      |
| 8 - Diaphragm Selections  | E = Buna "N" (w/Relief, No Bleed)<br>M = Buna "N" (No Bleed, No Relief) |
| 9 - Seat Selections       | X = Standard  |
| 10 - Material Options     | X = Standard  |
| 11 - Cleaning Options     | X = Standard  |
| 12 - Range Selections     | F = 0-60 PSI (0-414 kPa)  |

**Materials of Construction**

|                   |                    |
|-------------------|--------------------|
| Body:             | Aluminum           |
| Bonnet:           | Aluminum           |
| Diaphragm:        | Buna-N             |
| Ball Valve:       | Viton              |
| Range Spring:     | Steel, Zinc Plated |
| Adjustment, FIHMS | Steel, Zinc Plated |



**MAINTENANCE**

**CAUTION: Remove air supply pressure and thoroughly vent the inlet and outlet pressure prior to performing maintenance.**

Periodic replacement of the diaphragm assembly and ball valve is recommended for services where the unit is on stream continuously. The frequency of replacements will depend on the nature of the service, cleanliness of air, humidity of the air, etc.

To replace the diaphragm assembly, loosen adjusting screw until spring tension is relieved. Remove four screws, and lift off bonnet, spring plate, spring and diaphragm assembly. Inspect the diaphragm for wear and check the condition of the ball seating surface on the lower tube. Reassemble by placing diaphragm assembly, re-install bonnet and tighten four screws.

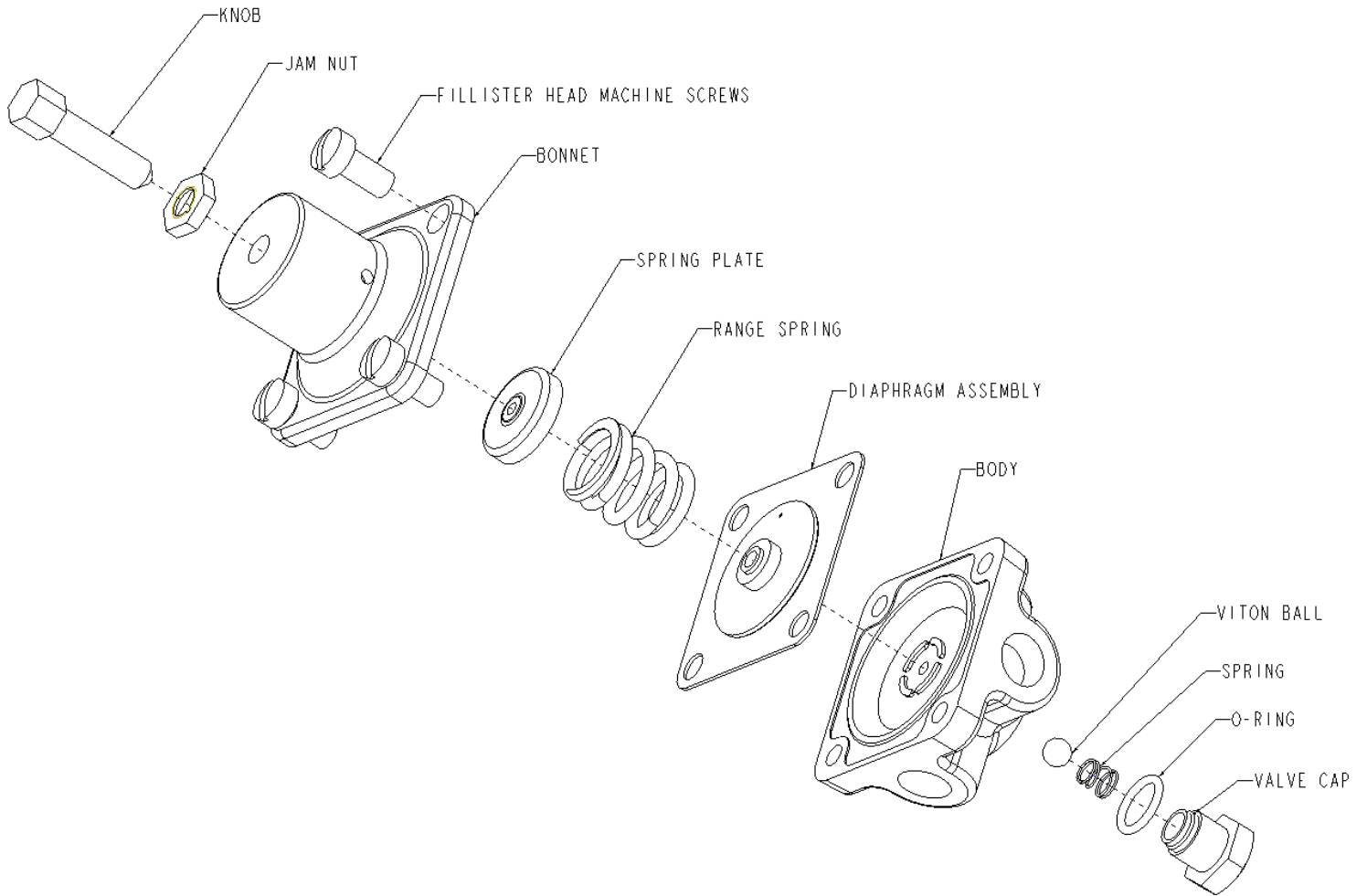
To replace ball, removed cap. Care should be exercised not to drop ball or nozzle spring. Inspect ball for wear and accumulation of foreign matter in recess. Reassemble by placing nozzle spring and ball into cap. Tighten cap until secure

**Parts List**

| Item Description                  | Quantity | Part No. |
|-----------------------------------|----------|----------|
| Knob, Adjustment (Wrench)         | 1        | G6017750 |
| Spring Plate                      | 1        | G6018857 |
| Bonnet                            | 1        | G6019632 |
| Range Spring 0-60 psi (0-414 kPa) | 1        | G6019657 |
| Nozzle Spring                     | 1        | G6019681 |
| Cap                               | 1        | G6019699 |
| Diaphragm Assembly (Relieving)    | 1        | G6019749 |
| Diaphragm Assembly (No Relief)    |          | G6019855 |
| Body (Relieving)                  | 1        | G6019665 |
| Body (No Relief)                  |          | G6019863 |
| Jam Nut (Palnut)                  | 1        | G6075949 |
| O-ring                            | 1        | G6076640 |
| Ball                              | 1        | G6077291 |
| FIHMS 1/4-20 X 1/2"               | 4        | G6900089 |

**When replacement parts are required, please contact the factory with the full model number and serial number of the regulator.**

**EXPLODED VIEW**



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