



ISO Registered Company

# MODEL P3

## TWO STAGE CYLINDER GAS PRESSURE REDUCING REGULATOR



MODEL P3

### OVERVIEW

The Model P3 is designed for gases with inlet pressures up to 3600 psig (248 Barg). Standard adjustable outlet ranges from 1-10 (.07-.69 Barg) thru 5-500 psig (.34-34.5 Barg). Flow coefficients of 0.02, 0.06, and 0.08 available. This versatile cylinder gas regulator can be ordered with a variety of options to meet your system demands. Standard construction includes 40 micron integral filter and diffusion resistant stainless steel diaphragm. Gauges and CGA fittings are optional.

### TYPICAL APPLICATIONS

- Cylinder Gas
- Carrier Gas
- Calibration Gas
- Laser Gas
- Medical Gas

### FUNCTIONAL PERFORMANCE

Supply Pressure Effect: 0.01/100psig(0.0007/6.9Barg)

Temperature Coefficient: 0.16 psig/ °F (0.01Barg/ °C)

Internal Volume: 13.8 cc



**LINE SIZES AVAILABLE**  
1/4" (DN8), 3/8" (DN10), 1/2" (DN15)



**END CONNECTIONS**  
FNPT, CGA



**COMMON APPLICATIONS**  
CYLINDER GAS, CARRIER GAS, CALIBRATION GAS, LASER GAS, MEDICAL GAS



**DESIGN PRESSURE**  
INLET: UP TO 3600 psig (248 Barg)  
OUTLET: 1-500 psig (0.07-34.5 Barg)

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Петрозаводск (8142)55-98-37  
Псков (8112)59-10-37  
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Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Сургут (3462)77-98-35  
Сыктывкар (8212)25-95-17  
Тамбов (4752)50-40-97  
Тверь (4822)63-31-35

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## GENERAL SPECIFICATIONS

|                                   |  |                               |  |
|-----------------------------------|--|-------------------------------|--|
| Inlet / Outlet Size:              | 1/4", 3/8" & 1/2"<br>(DN8, DN10 & DN15)  | Trim Temperature Limits:      | See Table 2  |
| Cv Capability:                    | 0.02, 0.06, and 0.08   | Operating Temp. Range:        | See Table 1 and 2  |
| Maximum Inlet Pressure:           | See Table 1  | Range Spring Material:        | Steel or Stainless Steel   |
| Outlet Pressure:                  | See Table 1  | Composite Knob:<br>(Standard) | -50 to 200°F<br>(-45.6 to 93°C)<br>For temperatures outside (Std.) knob range see Options for Colored Knobs. |
| Body End Connections:             | FNPT<br>CGA End Connection   |                               |  |
| Body and Spring Chamber Material: | 316L SST/316L SST<br>Brass/316L SST<br>Brass/6061 AL<br>*Aluminum spring chambers are anodized black |                               |  |

| <b>TABLE 1 -<br/>MODEL P3 DESIGN PRESSURE VS. TEMPERATURE RATINGS</b> |             |                |                |        |                 |        |             |               |
|---|-------------|----------------|----------------|--------|-----------------|--------|-------------|---------------|
| FNPT END CONNECTION RATINGS IN ACCORDANCE WITH ASME B31.3             |             |                |                |        |                 |        |             |               |
| CGA END CONNECTION RATINGS IN ACCORDANCE WITH CGA V-1                 |             |                |                |        |                 |        |             |               |
| BODY/SP. CHAMBER MATERIAL <sup>4</sup>                                | LINE SIZE   | END CONNECTION | INLET PRESSURE |        | OUTLET PRESSURE |        | TEMPERATURE |               |
|   |             |                | Psig           | (Barg) | Psig            | (Barg) | °F          | (°C)          |
| <b>BRASS/6061 AL<sup>3</sup></b>                                      | 1/4" (DN8)  | FNPT           | 3600           | (248)  | 500             | (34.5) | -325 to 400 | (-198 to 204) |
|   | 3/8" (DN10) | FNPT           | 3600           | (248)  | 500             | (34.5) | -325 to 400 | (-198 to 204) |
|   | 1/2" (DN15) | FNPT           | 3600           | (248)  | 500             | (34.5) | -325 to 400 | (-198 to 204) |
|   | 1/4" (DN8)  | CGA            | 3000           | (207)  | 500             | (34.5) | -325 to 70  | (-198 to 21)  |
| <b>BRASS/316L SST<sup>1</sup></b>                                     | 1/4" (DN8)  | FNPT           | 3600           | (248)  | 750             | (51.7) | -325 to 400 | (-198 to 204) |
|   | 3/8" (DN10) | FNPT           | 3600           | (248)  | 750             | (51.7) | -325 to 400 | (-198 to 204) |
|   | 1/2" (DN15) | FNPT           | 3600           | (248)  | 750             | (51.7) | -325 to 400 | (-198 to 204) |
|   | 1/4" (DN8)  | CGA            | 3000           | (207)  | 750             | (51.7) | -325 to 70  | (-198 to 21)  |
| <b>316L SST/316L SST<sup>2</sup></b>                                  | 1/4" (DN8)  | FNPT           | 3600           | (248)  | 750             | (51.7) | -425 to 500 | (-254 to 260) |
|   |             |                | 3415           | (235)  | 710             | (48.9) | 600         | (315)         |
|   |             | CGA            | 3000           | (207)  | 750             | (51.7) | -425 to 70  | (-254 to 21)  |
|   |             |                |                |        |                 |        |             |               |
|   | 3/8" (DN10) | FNPT           | 3600           | (248)  | 750             | (51.7) | -425 to 500 | (-254 to 260) |
|   |             |                | 3415           | (235)  | 710             | (48.9) | 600         | (315)         |
|   | 1/2" (DN15) | FNPT           | 3600           | (248)  | 750             | (51.7) | -425 to 500 | (-254 to 260) |
|   |             |                | 3415           | (235)  | 710             | (48.9) | 600         | (315)         |

<sup>1</sup> Ratings for brass body materials shall not exceed 3000 Psig (206 Barg) and 400°F (200°C) in oxygen service. (CGA G-4.4)  
<sup>2</sup> Ratings for 316L SST body materials shall not exceed 375 Psig (26 Barg) and 400°F (200°C) in oxygen service. (CGA G-4.4)  
<sup>3</sup> 6061 AL is prohibited for use in oxygen service. (CGA G-4.4)

**TABLE 2 -  
MODEL P3 TRIM MATERIALS**

| TRIM COMPONENT                          | TRIM CODE (POSITION 6 ON CODER SHEET) |                |              |                |                |              |              |              |
|---|---------------------------------------|----------------|--------------|----------------|----------------|--------------|--------------|--------------|
|   | 1                                     | 2              | 3            | 4              | 5              | 6            | P            | R            |
| ACTUATOR DIAPHRAGM                      | 302 SST                               | 302 SST        | 302 SST      | INCONEL 718    | INCONEL 718    | INCONEL 718  | INCONEL 718  | INCONEL 718  |
| ACTUATOR                                | 316L SST                              | 316L SST       | 316L SST     | MONEL R405     | MONEL R405     | MONEL R405   | 316L SST     | 316L SST     |
| ACTUATOR HEX NUT                        | ALUMINUM                              | ALUMINUM       | ALUMINUM     | 316L SST       | 316L SST       | 316L SST     | ALUMINUM     | ALUMINUM     |
| GASKETS OR DIAPHRAGM LINER <sup>1</sup> | PTFE                                  | PTFE           | PTFE         | PTFE           | PTFE           | PTFE         | PTFE         | PTFE         |
| O-RING                                  | PTFE                                  | PTFE           | PTFE         | PTFE           | PTFE           | PTFE         | PTFE         | PTFE         |
| POPPET                                  | 316L SST                              | 316L SST       | 316L SST     | MONEL R405     | MONEL R405     | MONEL R405   | 316L SST     | 316L SST     |
| POPPET SPRING                           | INCONEL X750                          | INCONEL X750   | INCONEL X750 | INCONEL X750   | INCONEL X750   | INCONEL X750 | INCONEL X750 | INCONEL X750 |
| SEAT (MAIN)                             | PCTFE                                 | POLYAMIDE      | PTFE         | PCTFE          | POLYAMIDE      | PTFE         | PCTFE        | PTFE         |
| SEAT RETAINER                           | 316L SST                              | 316L SST       | 316L SST     | MONEL R405     | MONEL R405     | MONEL R405   | 316L SST     | 316L SST     |
| SCREEN FILTER                           | 316L SST                              | 316L SST       | 316L SST     | 316L SST       | 316L SST       | 316L SST     | 316L SST     | 316L SST     |
| TEMPERATURE RANGE                       | -325 to +380°F                        | -325 to +400°F |              | -325 to +380°F | -325 to +400°F |              |              |              |
|   | -198 to +193°C                        | -198 to +204°C |              | -198 to +193°C | -198 to +204°C |              |              |              |

<sup>1</sup> DIAPHRAGM LINER REPLACES BOTH GASKET AND ACTUATOR GASKET WHEN SELECTED.

## **STANDARD CONSTRUCTION**

### **Captured Vent**

The captured vent is designed to pipe away flammable or toxic vapors to a safe location in the event of diaphragm leakage or failure. It features a 1/8" FNPT port located on the spring housing. Captured vent port is not usable with the panel mount option.

## **OPTIONS**

**NACE Construction** - Internal wetted portions meet NACE standard MR0175, when exterior of the regulator is not directly exposed to a sour gas environment, buried, insulated or otherwise denied direct atmospheric exposure. Available with 316L/316 SST body and spring chamber only.

**Panel Mount** - Includes a panel nut that allows the spring chamber and control knob to be secured through a panel wall. Requires 1/8" minimum panel thickness and 1-3/8" diameter hole. The panel mount option is available for either 1st stage or 2nd stage spring chambers. Use of the panel mount option will prevent access to the captured vent port.

**Tamper Proof** - In this feature the control knob is removed and replaced with an acorn nut. The user can set the outlet pressure and securely tighten the nut, preventing any unwanted adjustments on the regulator.

**Colored Knobs** - In this feature the control knob is anodized aluminum either in black, blue or red, compared to the standard red composite knob. This allows for color coding of processes. Temperature range: -55 to 300°F (-45.6 to 149 °C).

**Relief Valve** - This option installs an adjustable spring loaded relief valve into an outlet gauge port and prevents excess downstream pressures due to system malfunctions. Both ends of the relief valve are 1/4" MNPT and can be piped away to a safe location. Requires an outlet gauge port configuration or an additional outlet gauge port when an outlet pressure gauge is specified. Relief valve pressure setting must be specified at time of order.

**Cleaned for Oxygen Service #S-1134** - Cashco cleaning specification that is required for gaseous oxygen service. This specification is compliant with CGA G-4.4 and includes sealed enclosure bag and notification tag stating suitability for gaseous oxygen service. For use with trim codes 4, 5, and 6 in position 6 of product coder sheet only. See Notes 1 - 3 on Table 1 for material and ratings restrictions.

**Cleaned for Non-Oxygen Service #S-1542** - Cashco cleaning specification similar to S-1134 that includes sealed enclosure bag and notification tag stating suitability for non-oxygen service.

**CGA End Connections** - Installs 1/4" MNPT x CGA adapter nipple, gasket, and nut into inlet port only. Nipple and nut material will match body material. Available for 1/4" (DN8) line sizes only. See Table 1 for pressure and temperature rating restrictions.

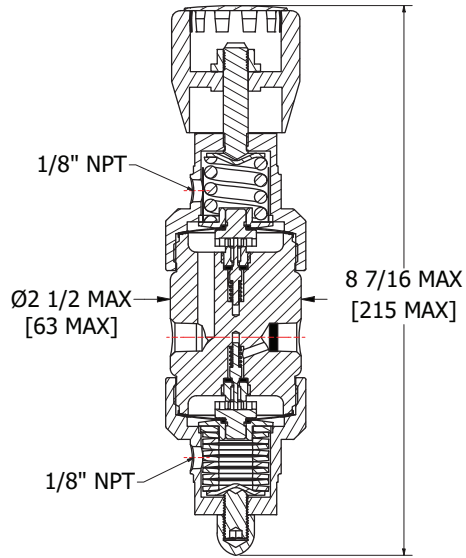
**Gauge Ports** - Available in 1/4" FNPT. See Porting Configuration Guide. Gauge port configurations are required when specifying pressure gauges and relief valves.

**Pressure Gauges** - Available with 1/4" MNPT bottom mount connections. Gauge connection material matches the body material. Pressure gauges are oxygen cleaned when specified and requires use of the appropriate gauge port configuration code.

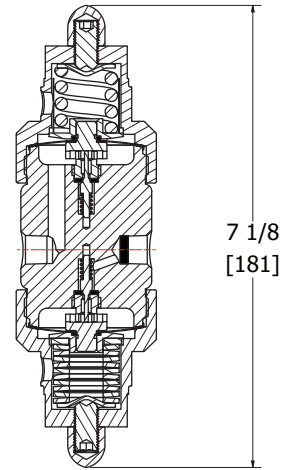
## **About Two Stage Regulators**

Two stage regulators provide precise outlet pressure control of gases with variation in supply pressure. The P3 features low operating torque, accurate adjustment and is capable of high flows with minimal pressure drop.

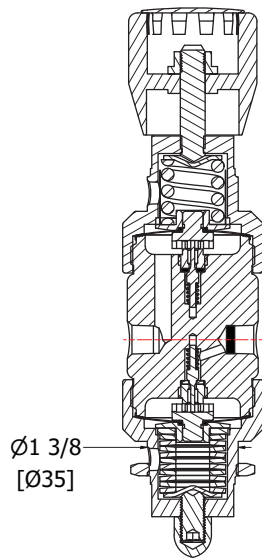
## DIMENSIONS



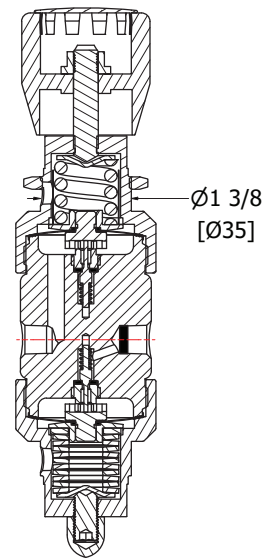
**STANDARD**



**TAMPER PROOF**



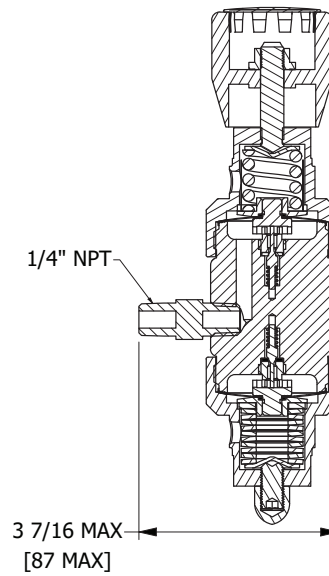
**FIRST STAGE  
 PANEL MOUNT**



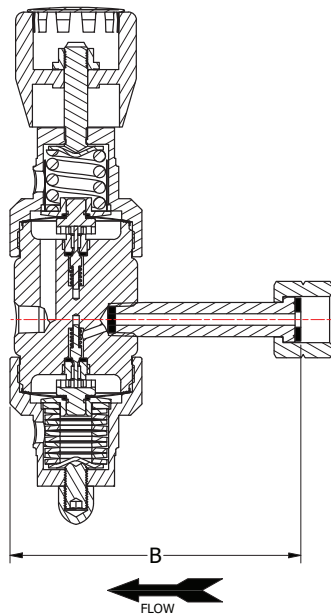
**SECOND STAGE  
 PANEL MOUNT**

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| SIZE      | A in  | A (mm) | Wt |
|-----------|-------|--------|----|
| 1/4"/DN8  | 2     | (50)   | 3  |
| 3/8"/DN10 | 2     | (50)   | 3  |
| 1/2"/DN15 | 2 1/2 | (63)   | 3  |



### RELIEF VALVE

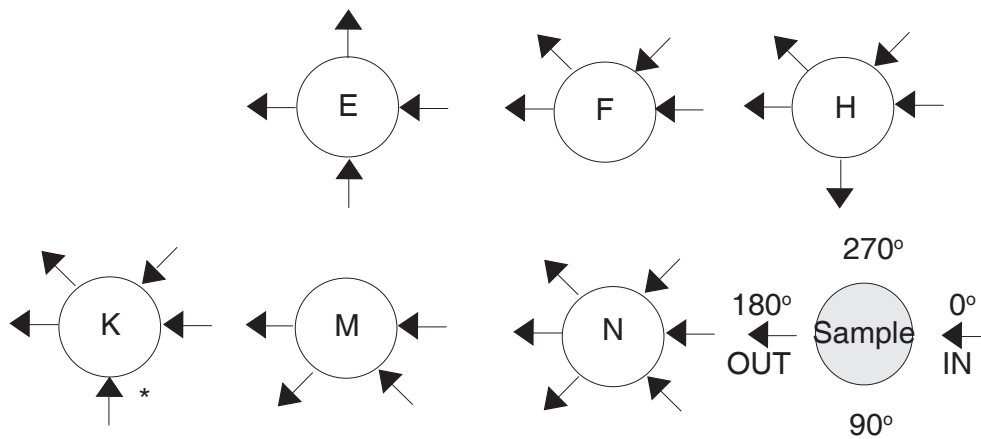


### CGA ADAPTERS

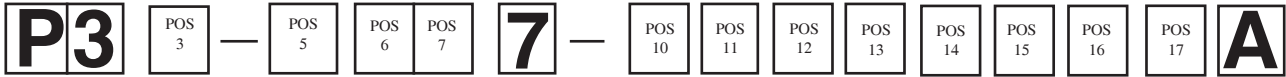
| CGA CONN. | B in    | B (mm) |
|-----------|---------|--------|
| 320       | 4 11/16 | (119)  |
| 330       | 4 11/16 | (119)  |
| 346       | 4 9/16  | (116)  |
| 350       | 5 1/16  | (129)  |
| 540       | 4 9/16  | (116)  |
| 580       | 5 1/16  | (129)  |
| 590       | 5 1/16  | (129)  |
| 660       | 5 1/16  | (129)  |

1. CGA CONNECTIONS ARE FOR 1/4" BODIES ONLY.
2. CGA CONNECTION APPLIES TO INLET PORT ONLY.
3. DIMENSION B INCLUDES GASKET WHERE APPLICABLE.

### Porting Configuration Guide



\* Used as a purge port.



| POSITION 3 - BODY SIZE / Cv |      |      |
|-----------------------------|------|------|
| Size                        | Cv   | CODE |
| 1/4" (DN8)                  | 0.02 | 1    |
|                             | 0.06 | 2    |
|                             | 0.08 | 3    |
| 3/8" (DN10)                 | 0.02 | 4    |
|                             | 0.06 | 5    |
|                             | 0.08 | 6    |
| 1/2" (DN15)                 | 0.02 | 7    |
|                             | 0.06 | 8    |
|                             | 0.08 | 9    |

| POSITION 5 - BODY & SPRING CHAMBER MATERIAL |      |
|---|------|
| Body / Spring Chamber                       | CODE |
| 316L SST / 316L SST                         | S    |
| Brass / 6061 AL                             | B    |
| Brass / 316L SST                            | T    |

| POSITION 6 - TRIM MATERIALS                                       |               |      |
|---|---------------|------|
| Diaphragm , Seat Retainer, Poppet & Poppet Spring                 | Seat Material | CODE |
| 302 SST with PTFE Gasket, 316L SST, 316L SST, Inconel X-750       | PCTFE         | 1    |
|   | Polyimide     | 2    |
|   | TFE           | 3    |
| Inconel with PTFE liner, Monel R-405, Monel R-405 Inconel X-750   | PCTFE         | 4    |
|   | Polyimide     | 5    |
|   | TFE           | 6    |
| NACE - Inconel with PTFE liner, 316L SST, 316L SST, Inconel X-750 | PCTFE         | P    |
|   | TFE           | R    |

| POSITION 10 - END CONNECTIONS |      |
|-------------------------------|------|
| End Connection(s)             | CODE |
| FNPT                          | 1    |
| CGA End Connection #320       | 4    |
| CGA End Connection #330       | 5    |
| CGA End Connection #346       | 2    |
| CGA End Connection #350       | 3    |
| CGA End Connection #540       | A    |
| CGA End Connection #580       | H    |
| CGA End Connection #590       | L    |
| CGA End Connection #660       | R    |

| POSITION 11 - RANGE SPRING/OUTLET PRESSURE |      |
|--|------|
| Psig (Barg)                                | CODE |
| 1 - 10 (.07 - .69)                         | 1    |
| 2 - 25 (.14 - 1.7)                         | 2    |
| 2 - 50 (.14 - 3.4)                         | 3    |
| 2 - 100 (.14 - 6.9)                        | 4    |
| 3 - 250 (.21 - 17.2)                       | 5    |
| 5 - 500 (.34 - 34.5)                       | 6    |

| POSITION 12 - OUTLET GAUGE |      |
|----------------------------|------|
| Psig (Barg)                | CODE |
| 0 - 15 (0 - 1.0)           | A    |
| 0 - 30 (0 - 2.1)           | B    |
| 0 - 60 (0 - 4.1)           | C    |
| 0 - 100 (0 - 6.9)          | D    |
| 0 - 160 (0 - 11.0)         | E    |
| 0 - 300 (0 - 20.7)         | F    |
| 0 - 600 (0 - 41.4)         | G    |
| No Outlet Gauge            | 0    |

| POSITION 7 - PORTING CONFIGURATION |      |
|------------------------------------|------|
| Description                        | CODE |
| See Porting Guide                  | E    |
|                                    | F    |
|                                    | H    |
|                                    | K    |
|                                    | M    |
|                                    | N    |

| POSITION 13 - INLET GAUGE |      |
|---------------------------|------|
| Psig (Barg)               | CODE |
| 0 - 15 (0 - 1.0)          | A    |
| 0 - 30 (0 - 2.1)          | B    |
| 0 - 60 (0 - 4.1)          | C    |
| 0 - 100 (0 - 6.9)         | D    |
| 0 - 160 (0 - 11.0)        | E    |
| 0 - 300 (0 - 20.7)        | F    |
| 0 - 600 (0 - 41.4)        | G    |
| 0 - 1000 (0 - 69.0)       | H    |
| 0 - 2000 (0 - 137.9)      | I    |
| 0 - 3000 (0 - 206.9)      | J    |
| 0 - 5000 (0 - 344.9)      | K    |
| No Inlet Gauge            | 0    |

| POSITION 14 - MOUNTING |      |                       |      |
|------------------------|------|-----------------------|------|
| OPTIONS                | CODE | OPTIONS               | CODE |
| No Option              | 0    | Panel Mount 2nd Stage | B    |
| Panel Mount 1st Stage  | A    |                       |      |

| POSITION 15 - KNOB      |      |                        |      |
|-------------------------|------|------------------------|------|
| OPTIONS                 | CODE | OPTIONS                | CODE |
| Red Composite (STD)     | 0    | Blue Anodized Aluminum | 8    |
| Tamper Proof            | 1    | Red Anodized Aluminum  | W    |
| Black Anodized Aluminum | 2    |                        |      |

| POSITION 16 - OPTIONS      |      |
|----------------------------|------|
| OPTIONS                    | CODE |
| No Option                  | 0    |
| Relief Valve: 3-50 psig    | H    |
| Relief Valve: 50-150 psig  | J    |
| Relief Valve: 150-350 psig | K    |
| Relief Valve: 350-600 psig | L    |

| POSITION 17 - CLEANING   |      |
|--|------|
| OPTIONS  | CODE |
| No Option  | 0    |
| Cleaned For Oxygen Service Per Cashco Specification S-1134     | M    |
| Cleaned For Non-Oxygen Service Per Cashco Specification S-1542 | N    |

Алматы (7273)495-231  
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