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
Design Leakage	
Outboard:	$1x10^{-9}$ scc/sec He
Inboard	$1x10^{-9}$ scc/sec He
Cv Capability:	0.02, 0.06 and 0.08

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)

GENERAL SPECIFICATIONS

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

TABLE 1 -
MODEL P3 DESIGN PRESSURE VS. TEMPERATURE RATINGS
FNPT END CONNECTION RATINGS IN ACCORDANCE WITH ASME B31.3
CGA END CONNECTION RATINGS IN ACCORDANCE WITH CGA V-1

BODY/SP. CHAMBER MATERIAL[4]	LINE SIZE	END CONNECTION	INLET PRESSURE		OUTLET PRESSURE		TEMPERATURE	
			Psig	(Barg)	Psig	(Barg)	°F	(°C)
BRASS/6061 AL[3]	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)
BRASS/316L SST[1]	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)
316L SST/316L SST[2]	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)

[1] Ratings for brass body materials shall not exceed 3000 Psig (206 Barg) and 400°F (200°C) in oxygen service. (CGA G-4.4)
[2] 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)
[3] 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 [1]	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			
[1] 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.

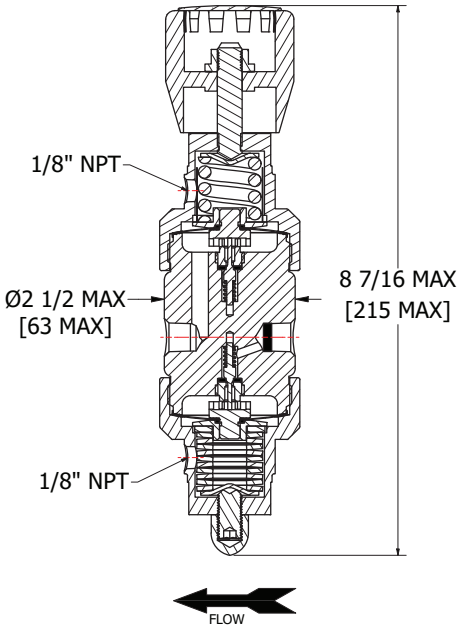
Gauge Ports - Available in 1/4" FNPT. See Porting Configuration Guide. Gauge port configurations are required when specifying pressure gauges and relief valves.

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.

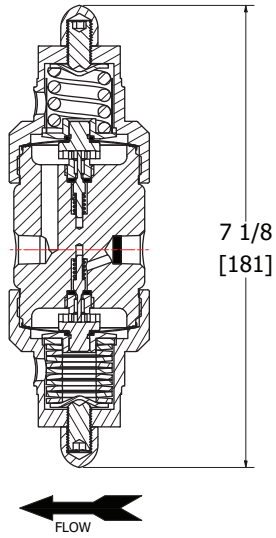
About Two Stage Regulators

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.

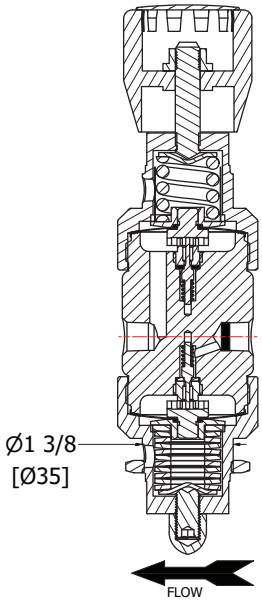
DIMENSIONS



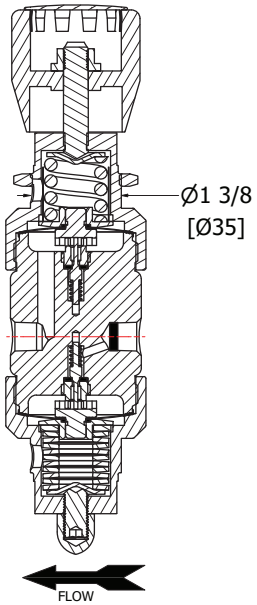
STANDARD



TAMPER PROOF

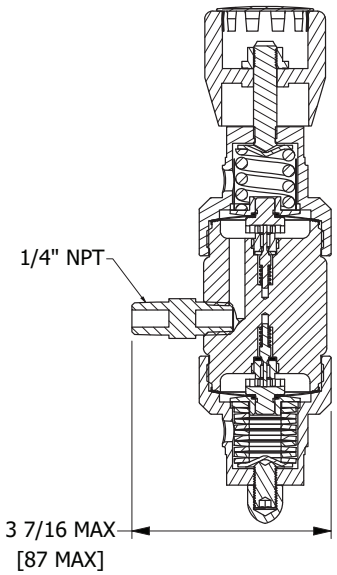


FIRST STAGE
PANEL MOUNT

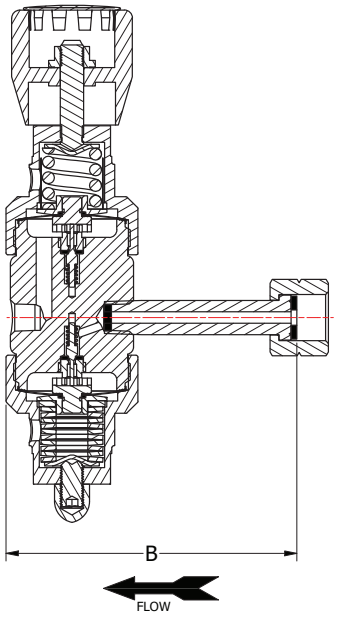


SECOND STAGE
PANEL MOUNT

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

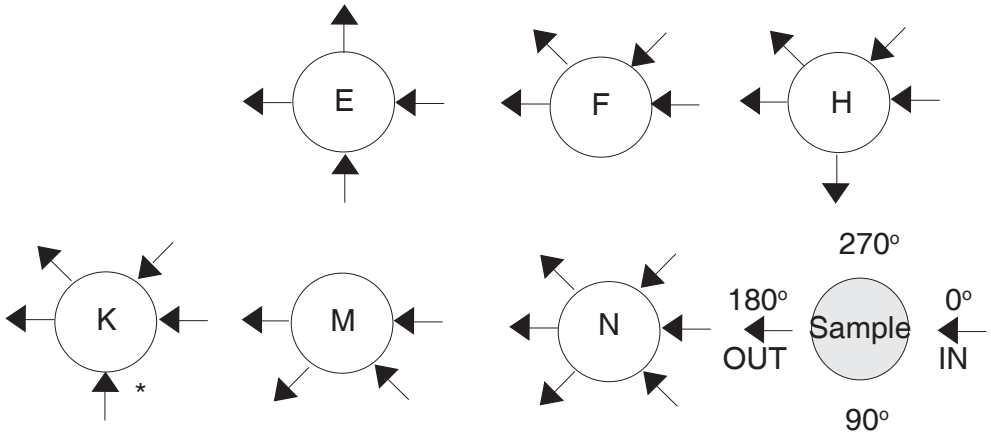


CGA ADAPTERS

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.

MODEL P3 PRODUCT CODER 10/11/22

P3	POS 3	—	POS 5	POS 6	POS 7	7	—	POS 10	POS 11	POS 12	POS 13	POS 14	POS 15	POS 16	POS 17	A

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

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 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

*** For information on ATEX see pages 8 & 9 on the IOM.**

Cashco, Inc.
P.O. Box 6
Ellsworth, KS 67439-0006
PH (785) 472-4461
Fax. # (785) 472-3539
www.cashco.com
email: sales@cashco.com
Printed in U.S.A. P3-TB

Cashco GmbH
Handwerkerstrasse 15
15366 Hoppegarten, Germany
PH +49 3342 30968 0
Fax. No. +49 3342 30968 29
www.cashco.com
email: germany@cashco.com

Cashco do Brasil, Ltda.
Al.Venus, 340
Indaiatuba - Sao Paulo, Brazil
PH +55 11 99677 7177
Fax. No.
www.cashco.com
email: brazil@cashco.com