ISO Registered Company

TECHNICAL BULLETIN **P1-TB**
02-16

Model P1

Single Stage Pressure Reducing Regulator 1/4"-1/2" (DN8-DN15)

The Model P1 is designed for gases and liquids with inlet pressures up to 3600 psig (248 Barg). Standard adjustable outlet ranges from 1-10 psig (.07-.69 Barg) thru 10-750 psig (.69-51.7 Barg). Flow coefficient of 0.02, 0.06, and 0.20 available. This versatile point of use 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.

TYPICAL APPLICATIONS

- Instrumentation
- Analyzer Systems
- Gas Cabinets
- Inline Point of Use
- Suitable for Corrosive
- Suitable for High Purity Gas

FEATURES

- Accurate Adjustment
- Low Internal Volume
- Low Operating Torque
- Suitable for corrosive applications

FUNCTIONAL PERFORMANCE

Supply Pressure Effect:	0.5/100 psig (.03/6.89 Barg)
Temperature Coefficient:	0.16 psig/°F (.01Barg/ °C)
Design Proof Pressure:	150% of Max Operating Pressure 5,400 psig (372.3 Barg)
Internal Volume:	6.9 cc
Design Leakage:	
Outboard -	$1x10^{-9}$ scc/sec He
Inboard -	$1x10^{-9}$ scc/sec He

GENERAL SPECIFICATIONS

Inlet & Outlet Size:	1/4", 3/8" & 1/2" (DN8, DN10 & DN15)
Cv Capability:	0.02, 0.06 and 0.20
Maximum Inlet Pressure:	FNPT/Tube Ends - 3,600 psig (248.2 Barg). Tri-Clamp - 300 psig (20.7 Barg) Min Pressure Drop - 100 psid.
Outlet Pressure:	1-750 psig (.07-51.7 Barg)
Body End Connections:	FNPT, Tube Ends, Tri-Clamp - 1/2" (DN15) Only
Body / Spring Chamber Material:	316L SST/316L SST, Brass/6061 AL Sanitary Construction: Interior of body surface Electro Polished to 16 micro-inch Ra finish with Electro Polished exterior.
Wetted Material Temp. Limits:	See Coder Position 6.
PCTFE -	-45 to 185°F (-42.7 to 85° C)
Polyimide -	-45 to 575°F (-42.7 to 301° C)
TFE -	-45 to 275°F (-42.7 to 135°C)
Operating Temp Range:	
Brass -	-20 to 400°F (-28.9 to 204°C)
SST -	-20 to 500°F (-28.9 to 260°C)
Range Spring Material:	Std: Steel, Sanitary Service: SST 1 -250 psig
Composite Knob: (Standard)	-50 to 200°F (-45.6 to 93°C) For temperatures outside (Std.) knob range see Options for Colored Knobs.

STANDARD CONSTRUCTION

Captured Vent

The captured vent is designed to safely vent process fluid when handling toxic or hazardous media. The user can easily pipe this vent to a safe location. It features a 1/8" FNPT port located on the spring housing. This feature can be incorporated into a self-relieving regulator that provides an additional port to permit the piping away of the expelled media.

OPTIONS

NACE Construction - (P or R) in Position 6. - Internal wetted portions meet NACE standard MR0175, when the exterior of the regulator is not directly exposed to a sour gas environment, buried, insulated or otherwise denied direct atmospheric exposure. SST/SST body/spring chamber materials only. Inconel w/TFE liner, Inconel X-750 spring.

Dome Loaded - (0) in Position 11. - The dome loaded option allows for regulators to be loaded from remote location to change pressure settings. **NOTES:** Diaphragm failure will result in loading fluid to mix with the process being controlled. Maximum Loading Pressure is 125 psig (8.6 Barg).

Mounting Bracket - (5) in Position 14. - The mounting bracket is a base, or step type. The material is 303 stainless steel. The bracket mounts to the back of the single stage, and back pressure regulators, via 10/32 screws.

Panel Mount - (C) in Position 14. - The panel mount feature requires a panel cut out of 1–3/8", complete with a threaded spring housing, and a panel mount ring to secure the regulator.

Tamper Proof - (1) in Position 15. **-** 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 - (2, 8 and W) in Position 15. - 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 - (H, J, K, or L) in Position 16. - The relief valve main function is to relieve excess downstream pressure due to system malfunctions. This feature prevents over pressurization by automatically venting of gas or liquid. The valve is fully adjustable, is 1/4" male x 1/4" male.

Self-Relieving - (S) in Position 16. - The self-relieving option features an integral mechanism allowing downstream pressure to be vented to the atmosphere as the outlet pressure setting is decreased. This allows the user to easily and rapidly decrease the pressure in a closed, or low volume system without an auxiliary bleed valve. In addition, this option also functions as a sensitive relief valve. The pressure at which it relieves is automatically determined by the outlet pressure setting of the regulator.

Self-Relieving & Mechanical Stop - (T) in Position 16. - Same as self-relieving except construction includes mechanical stop to limit maximum outlet setting.

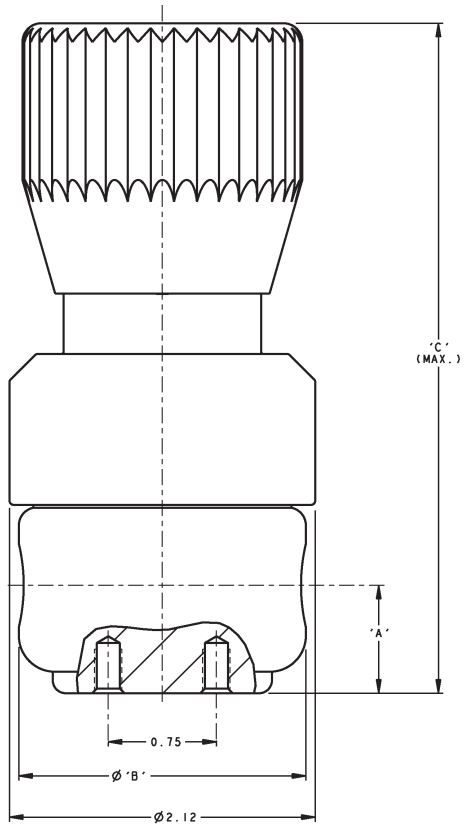
Vacuum Assist Spring - (V) in Position 16. **-** In this feature a vacuum assist spring is placed under the diaphragm. This spring prevents the diaphragm from collapsing during a vacuum purge.

Cleaned for Oxygen Service #S-1134 - (M) in Position 17. - This is a requirement for gaseous oxygen environments. All regulators requiring advanced cleaning shall be processed according to strict guidelines. **NOTE:** Design Pressure Rating shall not exceed 375 psig (25.8 Barg) when body material is SST and process medium is oxygen.

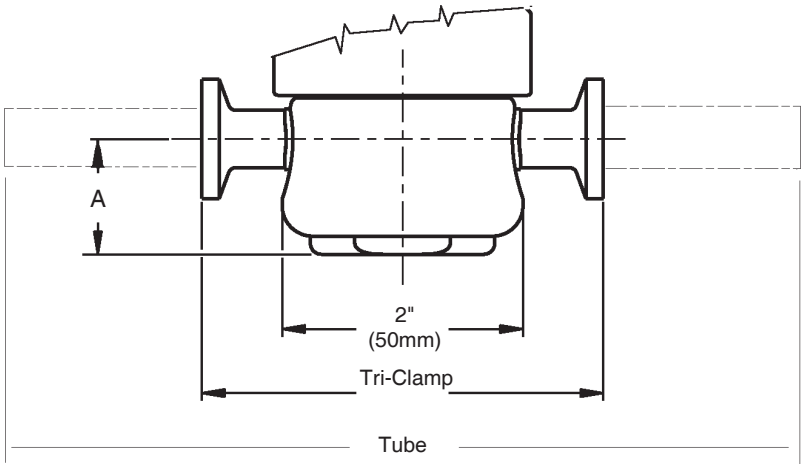
Cleaned per Spec. #S-1542 - (N) in Position 17. - Cleaning identical to that of #S-1134, but not labeled for application in oxygen service. NOT suitable for Oxygen Service.

Sanitary Construction - (P) in Position 17. - SST Construction with Smooth SST Knob - Interior of body surface Electro Polished to 16 micro-inch Ra finish with Electro Polished exterior. NPT Connections. Tri-Clamp Ends 1/2" Size only. Unit is cleaned to Cashco Spec. #S-1576. Comply with FDA 21 CRF 177 2600 & USP Class VI material classification.

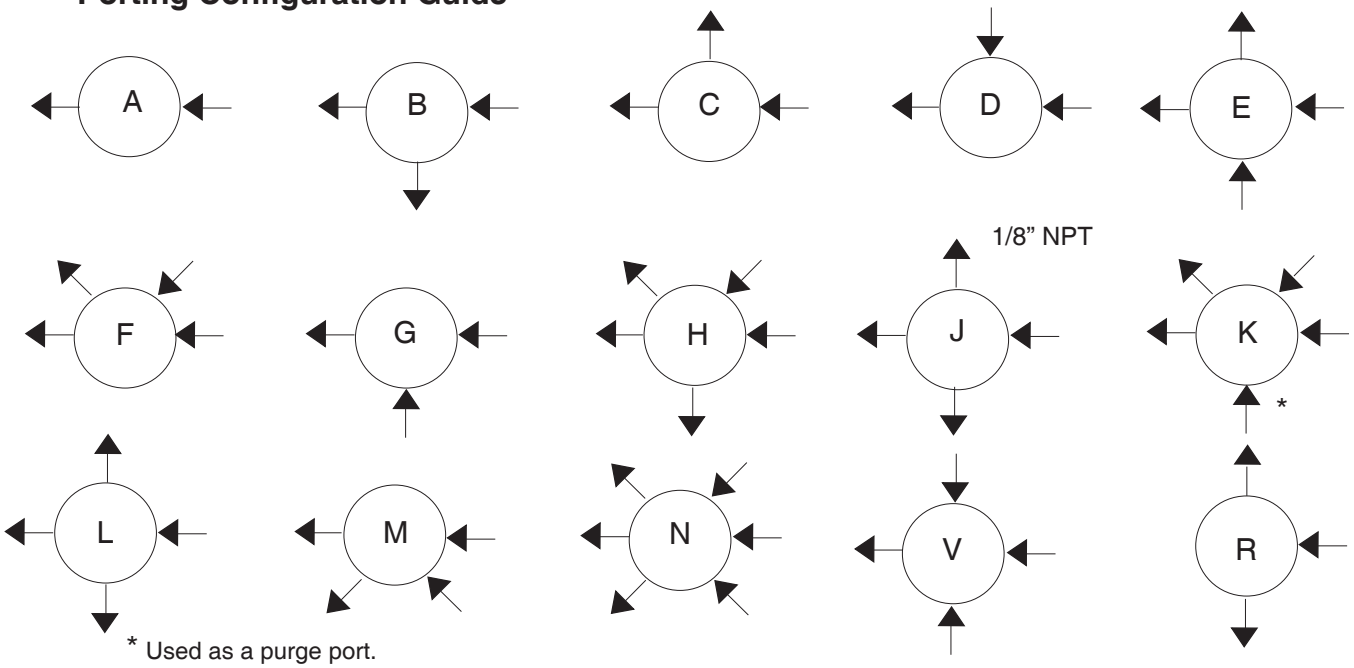
DIMENSIONS



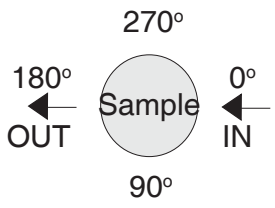
English Units In. & lbs.					
Size	A	B	C	C Dome Load	Wt
1/4", 3/8" NPT	.75	2.00	5.13	3.05	2.2
1/2" NPT	.88	2.48	5.38	3.30	2.2
1/4 - 1/2" Tube	.95	6.94	5.38	-	2.4
1/2" Tri-Clamp	.95	3.31	5.13	-	2.4
Metric Units mm & kg					
DN8, DN10 NPT	19	50	130	78	1.0
DN15 NPT	22	63	137	84	1.0
DN8-15 Tube	24	177	137	-	1.1
DN15 Tri-Clamp	24	84	130	-	1.1



Porting Configuration Guide



* Used as a purge port.



MODEL P1 PRODUCT CODER 02/10/16
(COMPOSITE RED KNOB STANDARD)

An "X" in POS 12 followed by a 5-digit control number overrides remaining selections.

P1	POS 3	—	POS 5	POS 6	POS 7	POS 8	—	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
	0.20	3
3/8" (DN10)	0.02	4
	0.06	5
	0.20	6
1/2" (DN15)	0.02	7
	0.06	8
	0.20	9

POSITION 5- BODY & SPRING CHAMBER MATERIAL

Body / Spring Chamber	CODE
Brass / 6061 AL	B
316L SST / 316L SST *	S

* Select for NACE or Sanitary Construction

POSITION 6 - TRIM MATERIALS

Diaphragm , Seat Retainer, Poppet & Poppet Spring	Seat Material	CODE
302 SST w/Tefzel ring, 316L SST, 316L SST, Inconel X-750	PCTFE	1
	Polyimide	2
	TFE	3
Inconel w/TFE liner, Monel R-405, Monel R-405 Inconel X-750	PCTFE	4
	Polyimide	5
	TFE	6
Hastelloy C-276 w/TFE liner, Hastelloy C-276, Hastelloy C-276, Hastelloy C-276	PCTFE	A
	Polyimide	B
	TFE	C
NACE Const. - Inconel w/TFE liner, 316L SST, 316L SST, Inconel X-750	PCTFE	P
	TFE	R
For Sanitary / Pharmaceutical Construction *		
302 SST w/TFE liner, 316L SST, 316L SST, Inconel X-750	TFE	Q **
	TFE	S

* 16 Micro-inch Ra Finish w/Electro-Polish. Range 1 - 250 psig Only available for Port "A".
** Comply with FDA 21 CRF 177.2600 & USP Class VI material classification

POSITION 8 - Product Classification Under European "Pressure Equipment Directive"

PRODUCT DESTINATION	HAZARD CATEGORY	CODE
Anywhere except Europe	N/A	7
European Countries *	Sound Engineering Practice (SEP)	S

* For products to be placed in service in Europe - Ref to Directive 97/23/EC.
Forward Completed "EU" Application Recorder prior to quotation. (Without Recorder- Processing of Purchase Order will be delayed). Contact Cashco for Assistance.

POSITION 7 - PORTING CONFIGURATION

Description	CODE	Description	CODE
See Porting Guide	**** A	See Porting Guide	*** N
	** B		** J
	** C		*** K
	* D		** L
	*** E		*** M
	*** F		** R
	* G		*** V
	*** H		–

NOTE: When selecting from Positions 12 & 13, review asterisks as follows::

*	Inlet gauge port only
**	Outlet gauge port only
***	Inlet & outlet gauge ports
****	No gauge ports available

POSITION 10 - END CONNECTIONS

End Connection(s)	CODE
FNPT	1
Tri-Clamp End * **	S
Tube End *	T

* Not available on Brass body material.
** (Tri-Clamp Available in 1/2" Size Only)

POSITION 11 - RANGE SPRING

Psig (Barg)	CODE
Pneumatic Dome Loaded 0 - 125 (0 - 8.6)	0
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
10 - 750 (.69 - 51.7) *	7

* Not Available Sanitary Construction

POSITION 12 - OUTLET GAUGE (See "NOTE" - Position 7)

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
No Outlet Gauge	0
For Special Construction Contact Cashco for Special Product Code	X

POSITION 13 - INLET GAUGE (See "NOTE" - Position 7)

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 - OPTIONS

OPTIONS	CODE	OPTIONS	CODE
No Option	0	Panel Mount.	C
Mounting Bracket.	5		

POSITION 15 - OPTIONS

OPTIONS	CODE	OPTIONS	CODE
No Option	0	Blue Knob.	8
Tamper Proof.	1	Red Knob.	W
Black Knob.	2		

POSITION 16 - OPTIONS

OPTIONS	CODE	OPTIONS	CODE
No Option	0	Relief Valve: 350-600 psig. *	L
Relief Valve: 3-50 psig. *	H	Self-Relieving.	S
Relief Valve: 50-150 psig. *	J	Self-Relieving & Mechanical Stop.	T
Relief Valve: 150-350 psig. *	K	Vacuum Assist Spring.	V

* When selecting Relief Valve indicate SET POINT PRESSURE in Special Instructions on order. If outlet gauge is also specified, Body Port Configuration must have two outlet ports. See Porting Guide page 3.

POSITION 17 - OPTIONS

OPTIONS	CODE	OPTIONS	CODE
No Option	0	Oxygen Cleaned Per Spec #S-1134.	M
		* Special Cleaning: Per Spec #S-1542.	N
		Sanitary Construction - Clean per #S-1576	P

* NOT suitable for Oxygen Service.

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. P1-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