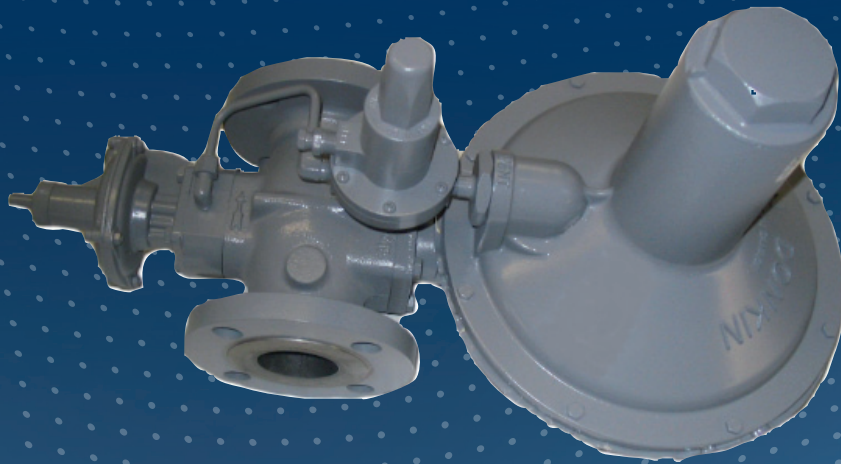


Gas Pressure Regulator Series 273PL



PRODUCT INFORMATION

**Serving the Gas Industry
Worldwide**



MODEL 273PL REGULATOR

Introduction, Characteristics, Constructions, Technical Data

Introduction

- The Model 273 Regulator is a pilot operated regulator for superior accuracy and control.
- Use with confidence on natural and manufactured gases of non-aggressive nature, including nitrogen, carbon dioxide, propane, butane, etc.
- Versions available for special applications like indoor applications with no requirement for vent-line
- Fixed factor billing model available (PFM) for applications that require accuracy to +/- 1% absolute pressure

Characteristics

- Wide inlet pressure range 1-275 psi (0.07-19.0 bar) depending on orifice diameter
- Maximum inlet pressure 275 psi (19.0 bar) without incorporated safety slam-shut valve
- Maximum inlet pressure 150 psig (10.3 bar) with incorporated safety slam-shut valve
- Maximum allowable operating pressure 275 psi (19.0 bar) depending on orifice diameter
- Pilot-operated to accommodate changes in inlet pressure, increase accuracy and widen outlet pressure ranges
- Various interchangeable orifices for ease of maintenance, customability and increased turndown ratio to accommodate a wide range of flow and pressure requirements
- Outlet pressure range from 1.0 psi - 60.0 psi (0.14-6.1 bar) over 3 pilot spring ranges
- 2" flanged connections (180°) in ANSI 150 RF/FF or PN16 RF/FF. Flanged body material available in ductile iron
- Available with internal (I.C.L.) or external (E.C.L.) impulse
- Ease of maintenance due to interchangeable diaphragm casing cartridge
- Various integral safety slam-shut (SSV) models available for pressure/flow shut off protection.
- Custom designed and pre-fabricated regulator meter set assemblies available
- Pilot-loaded version available for higher outlet pressure set points and higher flow capacities

Available Constructions

- 273PL - standard version
 - 273PL-309LP UPCO/OPCO - with integral under and over-pressure slam-shut device (over pressure up to 8 psi or 560 mbar)
 - 273PL-309LP2 UPCO/OPCO - with integral under and over-pressure slam-shut device (over pressure up to 22 psi or 1.5 bar)
 - 273PL-309LP4 UPCO/OPCO - with integral under and over-pressure slam-shut device (over pressure up to 66 psi or 4.5 bar)
 - 273SD-309 UPCO/OPCO - safety diaphragm version with integral over and under-pressure slam-shut device and internal vent limiting devices (indoor installations only)
 - PFM Version - fixed factor billing or pressure factor metering version for outlet pressure accuracy of +/- 1% absolute pressure
-

PRESSURE RATINGS		
Maximum Inlet Pressure	all orifices	275 psi (19.0 bar)
Maximum Allowable Operating Pressure	20.0mm	275 psi (19.0 bar)
	30.0mm	150 psi (10.3 bar)

Temperature Rating

-40° to 60° Celsius
 -40° to 140° Fahrenheit

Weights

- with cast iron screwed body - 22 lb. (10.0 kg)
- with cast iron flanged body - 30 lb. (13.6 kg)
- with ductile iron flanged body - 32 lb. (14.5 kg)
- with cast steel flanged body - 38 lb. (17.3 kg)
- with 309LP UPCO/OPCO - add 2.2 lb. (0.9 kg)
- with 309LP2 UPCO/OPCO - add 2.5 lb. (1.1 kg)
- with 309LP4 UPCO/OPCO - add 8.0 lb. (3.2 kg)
- with 309 T-type UPCO/OPCO - add 4.75 lb. (2.2 kg)

MATERIALS OF CONSTRUCTION	
Screwed Body Casting	Cast Iron
Flanged Body Casting	Cast Iron, Ductile Iron, Cast Steel
Diaphragm Casings	Die Cast Aluminum
Main Diaphragm	Molded Nitrile Rubber with Nylon Reinforcing
Valve Head (Seat)	Polyurethane
Diaphragm Plates	Steel
Orifice	Brass or Stainless Steel (t-type)
Pilot Supply Line (standard)	Copper
Pilot Supply Line (optional)	Stainless Steel
Top Cap	Aluminum
Springs	Steel
Lever	Steel
Pilot Regulator Body and Diaphragm Casing	Aluminum
Pilot Regulator Diaphragm	Molded Nitrile Rubber with Nylon Reinforcing
O-Rings	Nitrile Rubber

MODEL 273PL REGULATOR

Spring Ranges, Relief Valve Ranges, Correction Factors

OUTLET PRESSURE RANGES		
Range (imperial)	Range (metric)	Spring Number (Colour)
1.0 - 5.0 psi	0.07 - 0.35 bar	1047 (purple)
3.0 - 30.0 psi	0.21 - 2.1 bar	TX/002 (silver)
30.0 - 60.0 psig	2.1 - 4.1 bar	TX/003 (blue)

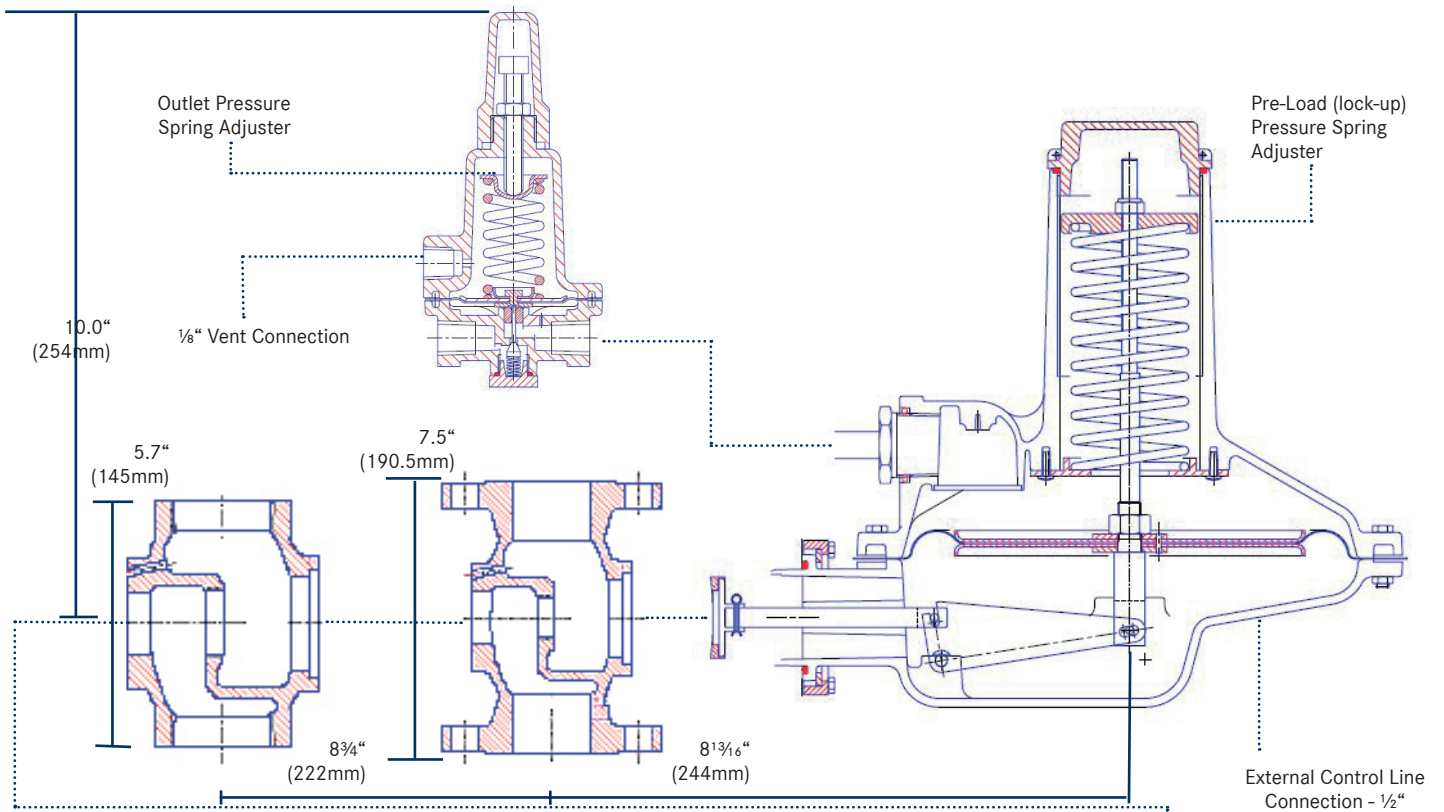
CORRECTION FACTORS FOR OTHER GASES		
Gas Type	Specific Gravity	Correction Factor (CF)
Air	1.00	0.77
Butane	2.01	0.55
Carbon Dioxide (Dry)	1.52	0.63
Carbon Monoxide (Dry)	0.97	0.79
Natural Gas	0.60	1.00
Nitrogen	0.97	0.79
Propane	1.53	0.63
Propane-Air Mix	1.20	0.71

For Other Conversion Factors

$$C_f = \sqrt{\frac{0.6}{\text{SG of Gas}}}$$

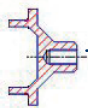
MODEL 273PL REGULATOR

Dimensional Data, Sectional View, SSV Reset, ECL Connection, Spring Adjustment



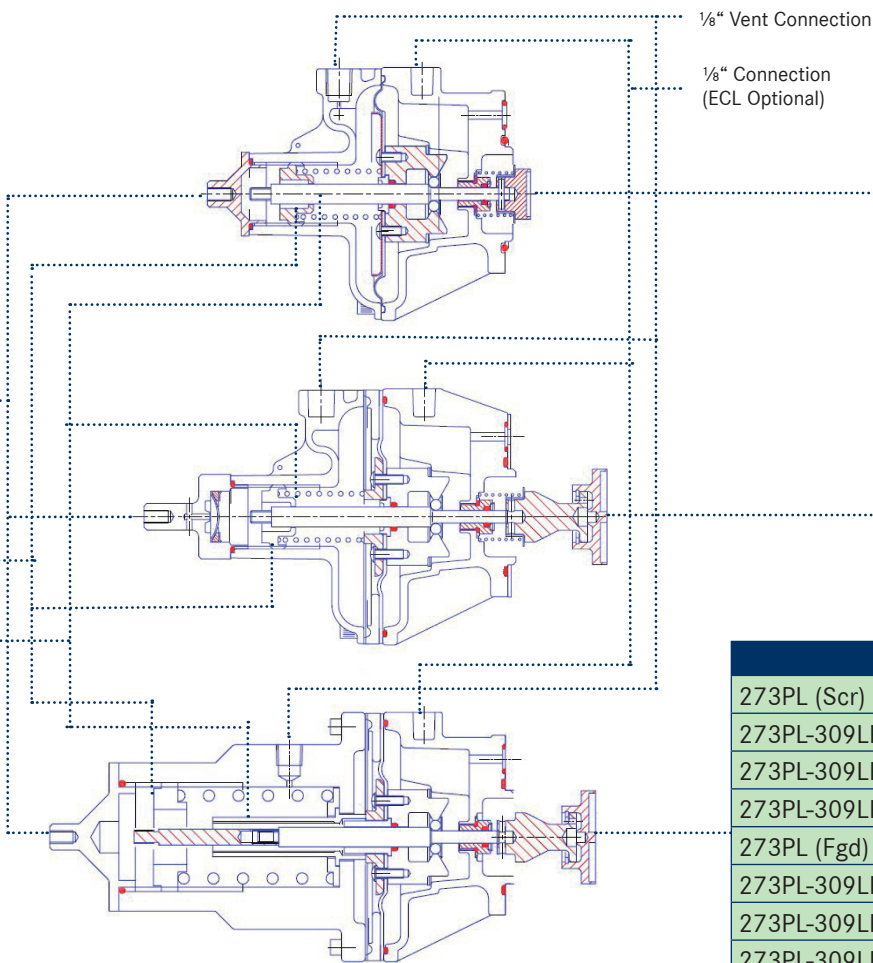
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TO RESET VALVE
 - remove fitting
 - reverse & thread on spindle
 - pull back to reset



Over Pressure Shut-off Spring Adjustment

Under Pressure Shut-off Spring Adjustment

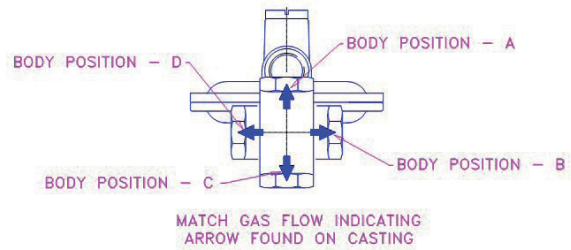
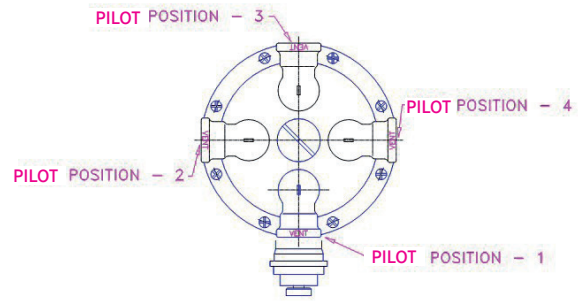


OVERALL LENGTH	
273PL (Scr)	18.0" (457mm)
273PL-309LP (Scr)	23.5" (597mm)
273PL-309LP2 (Scr)	24.0" (610mm)
273PL-309LP4 (Scr)	27.0" (686mm)
273PL (Fgd)	19.0" (483mm)
273PL-309LP (Fgd)	24.0" (610mm)
273PL-309LP2 (Fgd)	25.0" (635mm)
273PL-309LP4 (Fgd)	28.0" (711mm)
Scr = Screwed	Fgd = Flanged

MODEL 273PL REGULATOR

Orientation, Approvals, Vent-Less Indoor Regulator

Body/Vent Orientation

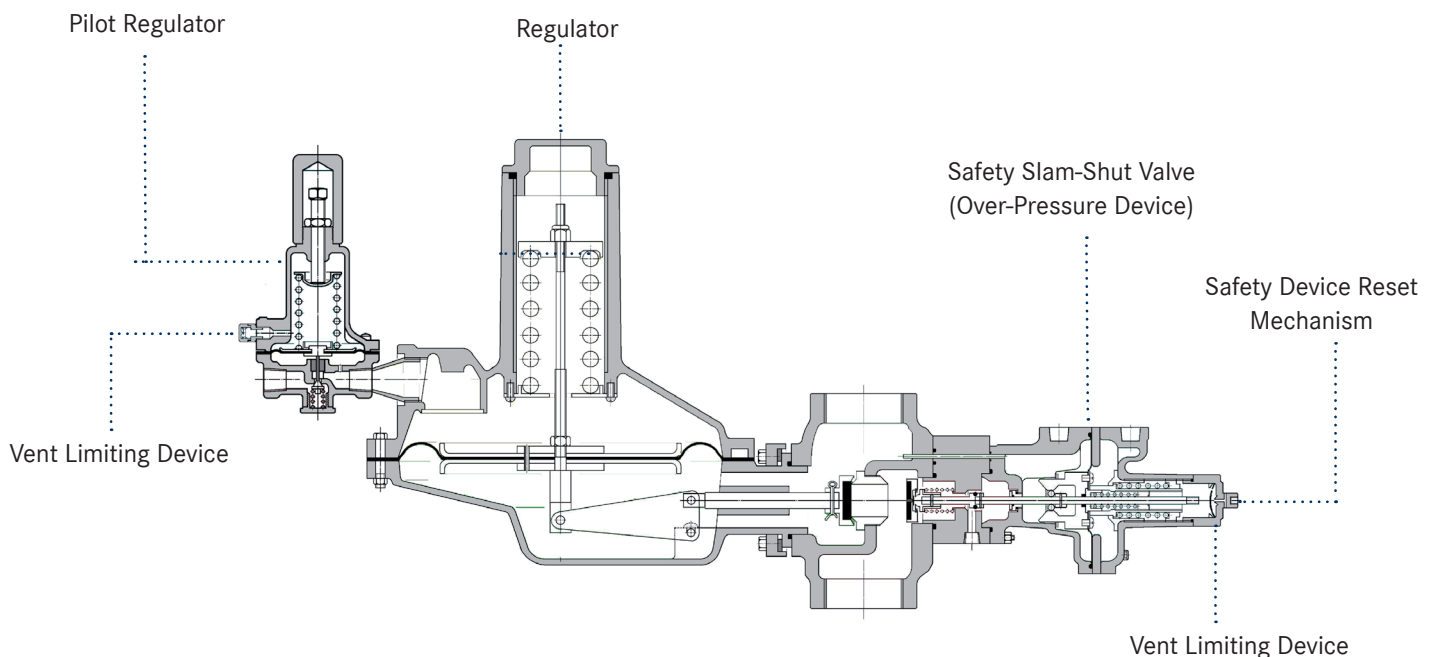


Agency Approvals

- Measurement Canada Approved (P.F.M. applications)

Indoor „Vent-Less“ Regulator

- Regulator assembly incorporates a regulator with integral over-pressure safety slam-shut device (OPCO)
- Regulator does not incorporate an internal relief valve (IRV)
- Both regulator and integral slam-shut device have internal vent-limiting devices to limit the gas expelled from the valve upon diaphragm failure to below 1 ft³/hr (0.0283 m³/hr)
- If there is an over-pressure condition above a pre-determined level downstream of the regulator assembly, the slam-shut device (OPCO) will completely shut-off the gas flow.
- The valve must be manually reset after an over-pressure shut-off condition
- The regulator and slam-shut device have vent connections. These are for atmospheric reference and do not require a vent line connection to the outside
- Vent lines will actually restrict the performance of the regulator
- REFER TO TECHNICAL BOOKLET - CERTIFIED LINE PRESSURE REGULATORS FOR MORE INFORMATION



MODEL 273PL REGULATOR

Performance Capacities

Spring TX/002 Outlet Pressure Set Point 0.14 bar (2 psi)	
1	
2	
3	
4	
5	
6	
9	
10	

Orifice Diameter											
20.0 mm						30.0mm					
ACCURACY						ACCURACY					
5%		10%		20%		5%		10%		20%	
SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH
210	7416	265	9358	320	11301	295	10418	350	12360	420	14832
300	10594	350	12360	425	15009	135	4767	630	22248	720	25427
140	4944	635	22425	725	25603	90	3178	160	5650	940	33196
120	4238	220	7769	785	27722	80	2825	130	4591	270	9535
100	3531	185	6533	760	26839	70	2472	130	4591	240	8476
80	2825	160	5650	940	33196	65	2295	120	4238	220	7769

Spring TX/002 Outlet Pressure Set Point 0.35 bar (5 psi)	
1	
2	
3	
4	
5	
6	
7	
9	
10	

Orifice Diameter											
20.0 mm						30.0mm					
ACCURACY						ACCURACY					
5%		10%		20%		5%		10%		20%	
SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH
210	7416	250	8829	265	9358	300	10594	380	13420	420	14832
420	14832	430	15185	445	15715	630	22248	680	24014	720	25427
230	8122	610	21542	610	21542	300	10594	870	30724	1050	37080
220	7769	730	25780	735	25956	180	6357	400	14126	1200	42378
210	7416	860	30371	865	30547	145	5121	290	10241	660	23308
200	7063	580	20483	980	34608	115	4061	240	8476	550	19423
240	8476	320	11301	460	16245	105	3708	215	7593	500	17657
220	7769	230	8122	410	14479	100	3531	210	7416	480	16951
220	7769	240	8476	400	14126						

MODEL 273PL REGULATOR

Performance Capacities

Spring TX/002 Outlet Pressure Set Point 1 bar (15 psi)		Orifice Diameter											
		20.0 mm						30.0mm					
		ACCURACY						ACCURACY					
		5%		10%		20%		5%		10%		20%	
		SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH
2		360	12713	400	14126	410	14479	620	21895	840	29664	860	30371
3		550	19423	560	19776	570	20129	1120	39552	1250	44143	1280	45203
4		700	24720	710	25073	720	25427	1300	45909	1420	50147	1600	56503
5		840	29664	850	30017	860	30371	550	19423	1850	65332	2000	70629
6		580	20483	1010	35668	1010	35668	380	13420	2250	79458	2300	81224
7		340	12007	1100	38846	1140	40259	420	14832	2300	81224	2550	90052
9		320	11301	1400	49441	1400	49441	450	15892	880	31077	3000	105944
10		300	10594	1520	53678	1530	54031						
15,5	Note 1	Note 1		Note 1									
20,6													

Spring TX/002 Outlet Pressure Set Point 2 bar (30 psi)		Orifice Diameter											
		20.0 mm						30.0mm					
		ACCURACY						ACCURACY					
		5%		10%		20%		5%		10%		20%	
		SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH	SCMH	SCFH
3		480	16951	490	17304	530	18717	1000	35315	1050	37080	1060	37434
4		600	21189	640	22601	650	22955	1120	39552	1280	45203	1300	45909
5		760	26839	820	28958	840	29664	1500	52972	1780	62860	1820	64273
6		890	31430	910	32136	920	32489	2100	74161	2200	77692	2220	78399
7		1040	36727	1080	38140	1090	38493	2350	82989	2500	88287	2600	91818
9		1300	45909	1360	48028	1400	49441	950	33549	3200	113007	3250	114773
15,5	Note 1	Note 1		Note 1		Note 1		Note 1		Note 1		Note 1	
20,6	Note 1	Note 1		Note 1		Note 1		Note 1		Note 1		Note 1	

Notes:

Note 1

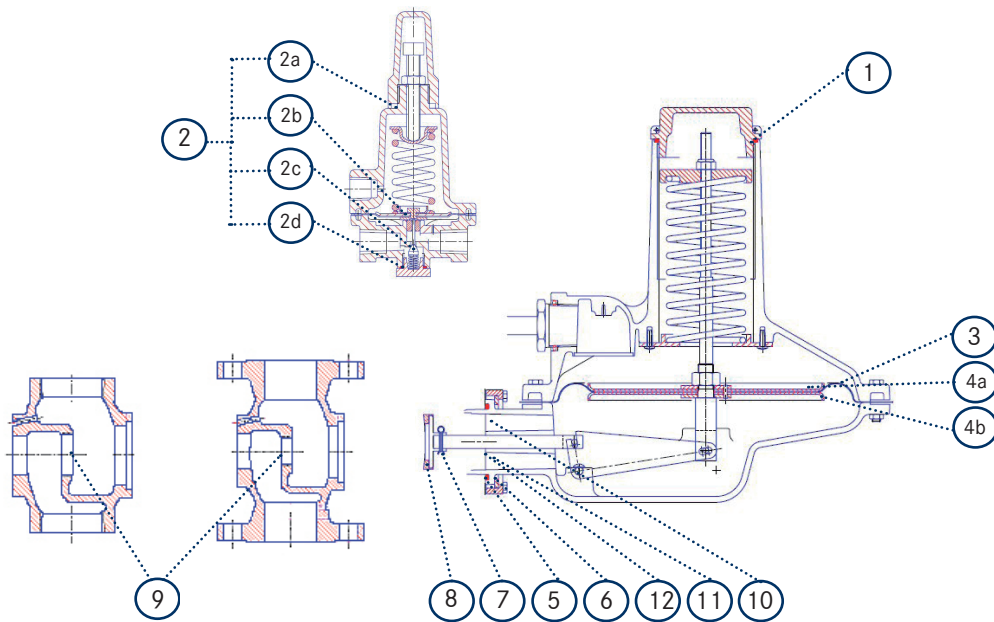
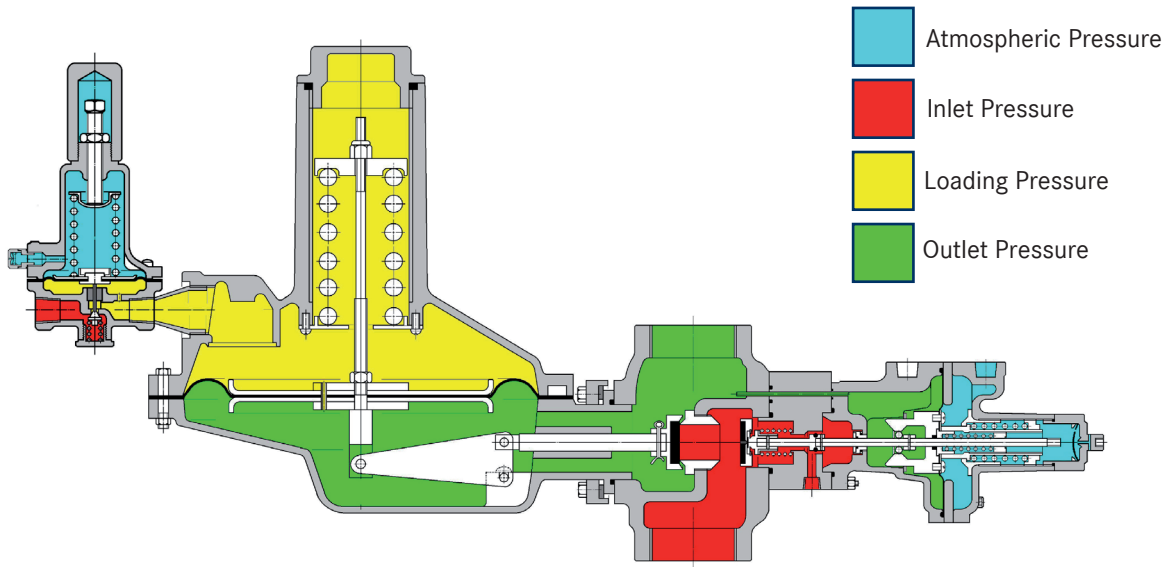
For Inlet pressures higher than 10 bar (150 psi), Please contact your local representative to validate product suitability

Note 2

For Outlet pressure above 2 bar (30 psi), please contact your local representative to validate product suitability

MODEL 273PL REGULATOR

Sectional Drawing and Spares Kit



SPARES KIT FOR MODEL 272PL REGULATOR - CSK 1856 (INCLUDES MODEL 600 PILOT REGULATOR SPARES KIT)

Bullet	Description	Part Number
1	O-Ring	BS/USA 232
2	Spares Kit for Model 600 Pilot	CSK 1921
2a	O-Ring	BS/USA 113
2b	O-Ring	BS/USA 013
2c	Valve	TN-003
2d	Diaphragm Assembly	TJ-005
3	Diaphragm	MJ/005
4a	Diaphragm Plate	206/XH/028
4b	Diaphragm Plate	206/XH/028

SPARES KIT FOR MODEL 272PL REGULATOR - CSK 1856 (INCLUDES MODEL 600 PILOT REGULATOR SPARES KIT)

Bullet	Description	Part Number
5	O-Ring	BS/USA 226
6	O-Ring	BS/USA 141
7	Cotter Pin	2mm x 25mm
8	Valve Assembly	MM/001
9a	O-Ring (M30 thread orifice - hex)	BS/USA 120
9b	O-Ring (M39 thread orifice - round)	BS/USA 128
10	O-Ring	BS/USA 128
11	O-Ring	BS/USA 110
12	Retaining Clip	5005-0175

MODEL 273PL REGULATOR

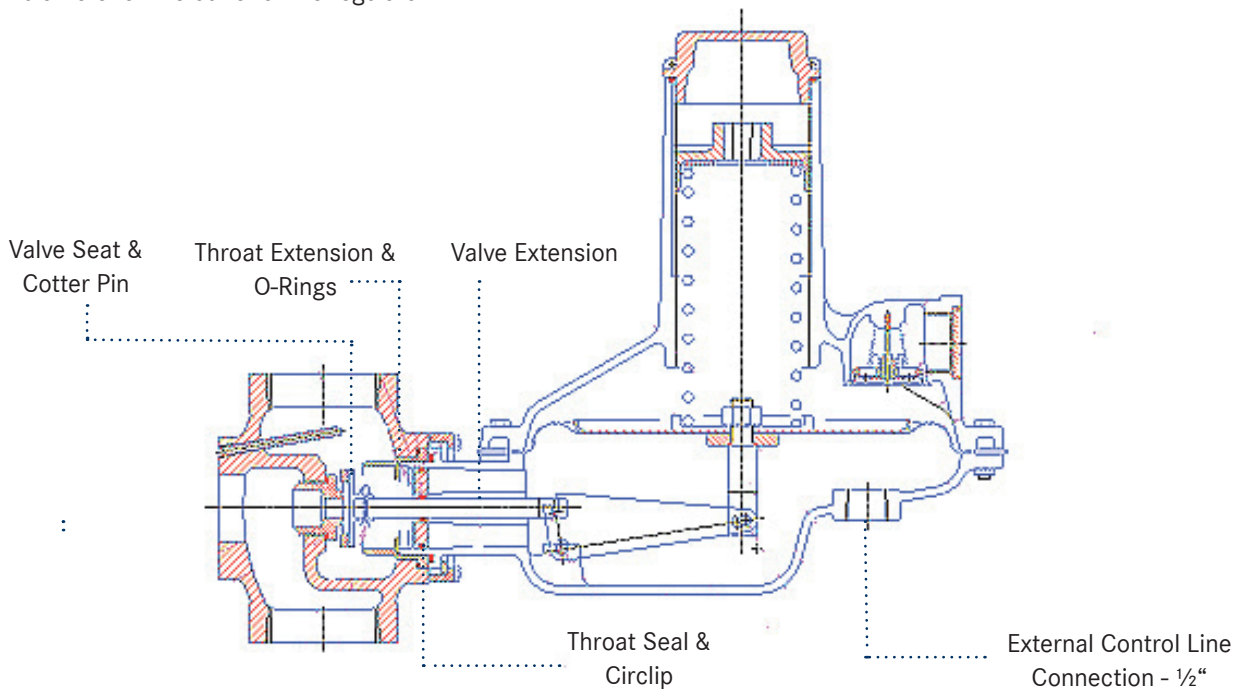
Internal to External Impulse Conversion (E.C.L.)

External Control Line (E.C.L.)

- The standard regulator is supplied as internally impusled or internal control line (I.C.L.) unless specified
- Sensing outlet pressure via an external control line enables the regulator to respond more accurately to the downstream system.
- Additionally, the standard regulator is supplied with both bosses drilled and tapped on the underside of the diaphragm casing. These bosses will be plugged with a removeable brass fitting.

- To modify to E.C.L., remove the 4 bolts that secure the diaphragm casing to the regulator body. Remove the throat extension and o-rings. Ensure that the o-rings and the throat extension are kept away from debris
- Remove the valve seat by taking out the cotter pin that secures it to the valve extension.
- Secure the throat seal down the valve extension, ensuring that it bottoms out against the diaphragm casing. Secure with the circlip.

- Replace the valve seat and new cotter pin. Replace throat extension and o-rings.
- Bolt body back to the diaphragm casing with the 4 original bolts.
- Remove one of the brass fittings from the bottom of the diaphragm casing.
- Connect 1/2" compression fitting and external control line to this boss.
- The sensing point at the termination of the control line should be a minimum of 5 times the nominal pipe diameter at the outlet of the regulator.



PARTS REQUIRED FOR I.C.L. TO E.C.L. CONVERSION

Bullet	Description	Part Number
1	Throat Seal Assembly	MN-005
	- Seal Disc	202/LG/004
	- O-ring	BS/USA 128
	- O-ring	BD/USA 110
2	Retaining Clip	5005-0175
3	Cotter Pin for Valve Seat	2mm x 25mm

MODEL 273PL REGULATOR

Part Numbering System

RMG 272 R 1 H N C I X 3 B X K F

INTERNAL RELIEF	
C	constant loaded

OPCO TYPE	
2	309LP OPCO
3	309LP UPCO/OPCO
4	309LP2 OPCO
5	309LP2 UPCO/OPCO
6	309LP4 OPCO
7	309LP4 UPCO/OPCO

CONNECTIONS SIZE	
H	1¼" x 1¼"
I	1¼" x 1½"
J	1¼" x 2"
K	1½" x 1½"
L	1½" x 2"
M	2" x 2"

CONNECTION TYPE	
N	NPT
B	BSPT
P	BSPP
1	ANSI150RF
2	ANSI150FF
6	PN16RF
7	PN16FF

MATERIAL	
C	Cast Iron
D	Ductile Iron
S	Cast Steel

IMPULSE	
I	Internal
E	External

OPTIONAL FEATURES	
T	Stainless Steel Pilot Feed Line
I	Test Point on Inlet
O	Test Point on Outlet
E	Casting Engraving
B	Test Point on both Inlet & Outlet
F	Inlet Filter Strainer
Z	Blanking Plate

BODY/VENT ORIENTATION	
B1	E
D1	M

ORIFICE DIAMETER	
20.0mm	G
30.0mm	I

UPCO SPRING	
1138	A
638	B
IA/006	D

OPCO SPRING	
861	A
1171	F
1172	G
1173	H
1174	I
1175	J
1254	C
1030	K
1031	L
1032	M
1033	N

PILOT SPRING	
1047	6
TX/002	2
TX/003	3

For More Information

To learn more about RMG's advanced gas solutions, contact your RMG account manager or visit www.rmg.com

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