

Gas Pressure Regulator SERIES 241



Technical Data



R.241.00.0103

Technical Data

Introduction

The Series 241 is a direct acting, single diaphragm, spring loaded open, lever operated regulator for use on gas pressure reduction systems.

Control of varying inlet pressure and capacity applications is ensured by utilising a range of interchangeable orifices of varying size.

Use with confidence on natural and manufactured gases of non-aggressive nature, including Nitrogen, Carbon Dioxide, Propane and Butane.

Application

Designed for use on gas pressure reduction services to domestic, business premises and small industrial feeds to burners, heater units, boilers and other items of equipment where an accurate, safe and dependable pressure controlled supply is required.

Size Range

1/2", 3/4" & 1" Screwed BS.21 Rc, Rp, & NPT

Installation

The regulator may be mounted in any orientation to suit site conditions, moisture or debris must not ingress the vent hole. For optimum performance the recommended operating position is with diaphragm casing horizontal and spring housing pointing vertically upwards.

It is important when installing equipment that pipeline stresses are kept to a minimum and no undue external forces are placed on the connections.

Service Conditions

Maximum Inlet Pressure (dependent upon orifice size fitted)	Up to 10.3 bar g (150psig)
Outlet Pressure Range:	10 to 82 mbar (4 to 33" wg)
Internal Relief Valve Setting	Nominally 20 mbar g (8" wg) (above regulator outlet pressure set point)
Temperature Range	-20°C to +60°C

Features

- ❑ Completely independent operation of regulator and safety cut-off valve.
- ❑ Diaphragm casing can be rotated through 360° at intervals of 45° to assist servicing and installation in confined spaces.
- ❑ Both regulator casing/valve head and safety cut-off valve can be removed from the body as cartridges, ensuring straightforward maintenance without removing the body from the pipeline.
- ❑ Wide operational pressure range.
- ❑ Regulator can be fitted with Over pressure (OPCO) or Under/Over pressure safety cut-off valve. These devices protect the downstream system in the event that a dangerous gas pressure condition develops.

Regulator Range

Option	Description	241P	241LR	241R
P	No Internal Relief	■		
LR	With Limited Internal Relief		■	
R	With Internal Relief			■
OPCO - MK2	MK2 - Standard Over Pressure Cut-Off Valve	■	■	■
S.309LP - OPCO	Series 309LP Over Pressure Cut-Off Valve	■	■	■
S.309LP UPCO/OPCO	Series 309LP combined Under/Over pressure safety cut-off valve	■	■	■
SD	Safety Diaphragm to comply with DVGW	■		
SD-OPCO	Safety Diaphragm + over pressure cut-off	■		

Example: 241-P-OPCO: Series 241 Regulator, no internal relief, with over pressure cut-off valve

Spring Selection

Regulator Spring Ranges

Spring		Outlet Pressure Range	
Number	Colour	mbar g	ins wg
121	Red	10 - 14	4 - 6
491	Self	13 - 25	5 - 10
307	Green	23 - 45	9 - 18
380	Orange	43 - 67	17 - 27
768	Blue	55 - 82	22 - 33

For details on SD regulator spring ranges, please contact BD-RMG

OPCO MK2: Over Pressure Cut-Off Valve

Spring		Outlet Pressure Range	
Number	Colour	mbar g	ins wg
861	Brown	35 - 70	14 - 28
868	Green	60 - 175	24 - 70

For details on SD OPCO spring ranges, please contact BD-RMG

S.309LP-OPCO Safety Cut-Off Valve

Spring		Cut-Off Range	
Number	Colour	mbar g	ins wg
861	Brown	35 - 90	14 - 36
1103	Gold	80 - 130	32 - 52
1104	Purple	120 - 250*	48 - 100*

* Maximum Over pressure set point: 175mbar (70" wg) on S.241 regulator

S.309LP UPCO/OPCO Safety Cut-Off Valve

Type	Spring		Cut-Off Range	
	Number	Colour	mbar	ins wg
OPCO	1109	Grey	40 - 55	16 - 22
	1110	Green	50 - 110	20 - 44
	1111	Silver	110 - 200*	44 - 80*
UPCO	1138	Blue/Green	10 - 30	4 - 12

* Maximum Over pressure set point: 175mbar (70" wg) on S.241 regulator

Minimum differential between regulator outlet and safety cut-off pressure:

- P - Type: 35 mbar (14" wg) or 10% above regulator set point, whichever is the higher
- R/LR - Type: 55 mbar (22" wg) when internal relief fitted
- When UPCO/OPCO is fitted then minimum differential for P-Type is 45 mbar (18" wg) and 65 mbar (26" wg) for R/LR-Type (with internal relief)

Materials of Construction

REGULATOR	
Body & body cover	Cast Iron: BS.1452
Lower/Upper diaphragm casing & spring housing	Aluminium Alloy: BS.1490
Diaphragm carrier and vent plate	Nylon 11
Vent pin, spring and gauze ring	Stainless Steel: BS.970
Orifice	Brass: BS.249
Valve seat & 'O' rings	Nitrile
Diaphragm	Nitrile
Valve head, stem, spring adjuster and cap	Aluminium: BS.1476
Lever, pins, diaphragm plate and spindle	Carbon Steel: BS.4360 (Anti-corrosion plated)

SAFETY CUT-OFF VALVE (MK2)	
Lower/Upper diaphragm casing & spring housing	Aluminium Alloy: BS.1490
Diaphragm, spindle and reset spindle	Stainless Steel: BS.970 (nylon bearing surface)
Diaphragm plate, pins, loading & valve spring	Carbon Steel: BS.4360 (Anti-corrosion plated)
Diaphragm and 'O' rings	Nitrile and Viton
Valve seat	Polyurethane

S.309LP UPCO/OPCO SAFETY CUT-OFF VALVE	
Body	Aluminium: BS.1490 LM6
Spindle	Stainless Steel: BS.970 Grade 316 S31
Valve	Aluminium: BS.1474 Grade 6082TF
Valve seating	Polyurethane: BS.1449 CS4
Diaphragm & 'O' rings	Nitrile
Spring Adjuster	Brass: BS.249 Grade CZ 121
Spring	Spring Carbon Steel: BS.5216 Grade HS3

Orifice Selection

Orifice Size		Maximum Inlet Pressure	
mm	ins	bar	psi
2.5	1/8	10.3	150
3.5	-	7	100
5	3/16"	4	58
7	1/4"	2	29

** Use only metric size orifice when fitting safety cut-off valve

Capacities

IN scmh (15°C: 1013.25 mbar) OF NATURAL GAS (SG = 0.6)
 IN scfh (60°F: 1015.92 mbar) OF NATURAL GAS (SG = 0.6)

SPRING No. AND OUTLET PRESSURE	INLET PRESSURE		ORIFICE SIZE – MILLIMETRES/INCHES											
	mbar	P.S.I.G.	2.5		1/8"		3.5		3/16" (5)		1/4"		7	
SPRING No. 121 10-14 mbar (4-6" W.G.) SET TO 12.5 mbar (5" W.G.) DROOP 2.5 mbar (1" W.G.)	20	8" W.G.												
	25	10							2.1	76	3.3	116	4.1	144
	45	18							3.1	110	4.7	165	5.8	204
	69	1 p.s.i.g.	1.9	67	2.5	88	2.7	96	3.7	130	6.7	237	9.1	322
	210	3	3.6	127	5.0	175	5.5	194	11.1	393	15.6	550	18.5	655
	345	5	4.7	165	6.5	228	8.1	286	15.9	562	21.6	763	25.3	892
	690	10	6.9	242	9.4	333	13.7	484	20.4	722	26.7	943	30.4	1075
	1 bar	14.5	8.1	287	11.2	396	16.4	580	23.4	826	30.0	1060	33.8	1193
	1.5	22	10.3	365	14.3	504	21.0	742	28.9	1022	35.3	1245	38.2	1350
	2.0	29.5	12.7	450	17.6	621	25.2	892	33.1	1170	39.6	1400	42.5	1500
	2.5	37	15.6	550	21.5	759	28.3	1000	35.7	1260				
	3.0	44	17.6	620	24.2	855	30.6	1080	38.2	1350				
	4.0	59	18.4	650	25.4	897	34.7	1225	42.4	1500				
	6.0	88	29.7	1050	41.1	1450	49.3	1742						
	7.0	103	32.7	1155	45.0	1590	58.1	2050						
8.0	117.5	36.0	1270	49.6	1750									
8.6	125	36.8	1300	55.2	1950									
10	150	36.8	1300											
SPRING No. 491 13-25 mbar (5-10" W.G.) SET TO 20 mbar (8" W.G.) DROOP 3 mbar (1.2" W.G.)	25	10" W.G.							1.3	46	1.6	58	1.8	65
	45	18							2.3	81	3.0	107	3.5	123
	69	1 p.s.i.g.	1.3	48	1.8	63	2.1	75	3.0	106	4.2	147	4.9	174
	210	3	2.4	85	3.2	113	3.7	130	5.6	200	9.4	334	12.3	436
	345	5	3.6	129	4.7	166	5.3	187	9.3	329	17.0	599	23.0	812
	690	10	5.6	197	7.5	264	8.7	306	18.9	670	25.1	888	28.9	1022
	1 bar	14.5	7.4	262	10.7	380	13.1	462	24.6	870	30.7	1083	33.8	1193
	1.5	22	9.9	350	15.6	550	19.8	699	29.5	1042	34.1	1204	38.7	1365
	2.0	29.5	12.4	438	19.7	698	25.2	892	31.3	1106	38.5	1360	42.1	1485
	2.5	37	14.5	513	23.0	811	29.2	1032	35.0	1236				
	3.0	44	16.4	580	25.3	894	31.8	1122	38.1	1345				
	4.0	59	20.1	710	30.0	1060	37.1	1310	39.6	1400				
	6.0	88	26.2	924	37.7	1330	45.6	1610						
	7.0	103	28.8	1016	40.3	1422	54.7	1930						
	8.0	117.5	32.6	1150	45.6	1610								
8.6	125	36.8	1300	55.2	1950									
10	150	36.8	1300											
SPRING No. 307 23-45 mbar (9-18" W.G.) SET TO 37.5 mbar (15" W.G.) DROOP 5.6 mbar (2.25" W.G.)	45	18" W.G.							2.1	75	2.6	92	2.8	100
	69	1 p.s.i.g.	1.4	50	1.8	65	2.1	75	4.2	147	5.2	184	5.8	204
	210	3	2.8	99	3.9	137	4.6	162	6.8	240	10.0	354	12.3	436
	345	5	4.4	155	5.7	203	6.5	231	11.2	396	17.3	610	21.7	767
	690	10	6.3	223	9.4	333	11.7	412	21.3	752	28.7	1015	33.4	1181
	1 bar	14.5	7.7	273	12.1	428	15.3	542	25.8	910	34.0	1200	38.9	1375
	1.5	22	10.4	369	17.3	612	22.6	797	31.3	1106	38.5	1360	42.0	1484
	2.0	29.5	12.4	439	20.0	705	25.6	903	35.0	1235	41.6	1471	44.4	1568
	2.5	37	14.8	524	23.3	822	29.5	1042	39.2	1386				
	3.0	44	16.5	585	25.4	898	31.9	1126	41.7	1473				
	4.0	59	21.8	770	30.3	1071	36.0	1270	42.9	1515				
	6.0	88	29.4	1040	35.5	1254	38.2	1350						
	7.0	103	32.4	1144	38.9	1372	45.9	1620						
	8.0	117.5	35.6	1258	46.3	1635								
	8.6	125	36.8	1300	55.2	1950								
10	150	36.8	1300											
SPRING No. 380 43-67 mbar (17-27" W.G.) SET TO 60 mbar (24" W.G.) DROOP 9 mbar (3.6" W.G.)	69	1 p.s.i.g.	1.0	36	1.3	48	1.6	56	2.5	88	3.2	112	3.6	126
	210	3	2.9	103	3.7	130	4.1	144	6.7	238	9.8	345	11.9	419
	345	5	4.0	141	5.5	194	6.5	228	11.0	390	15.3	542	19.7	694
	690	10	6.4	227	8.9	316	10.6	376	21.0	743	29.7	1050	35.7	1259
	1 bar	14.5	7.8	277	12.1	428	15.3	539	27.4	968	34.4	1215	41.4	1461
	1.5	22	10.3	363	16.1	570	20.4	722	35.3	1246	39.8	1405	42.6	1504
	2.0	29.5	12.4	438	20.0	704	25.5	903	37.1	1310	42.7	1508	46.9	1655
	2.5	37	14.7	520	23.3	824	29.7	1050	40.7	1439				
	3.0	44	17.0	600	25.7	908	32.0	1130	42.8	1513				
	4.0	59	21.2	750	31.2	1103	38.2	1350	45.3	1600				
	6.0	88	28.3	1000	37.5	1326	43.2	1525						
	7.0	103	31.3	1105	43.6	1540	51.8	1830						
	8.0	117.5	34.5	1220										
	8.6	125	36.8	1300										
	10	150	36.8	1300										

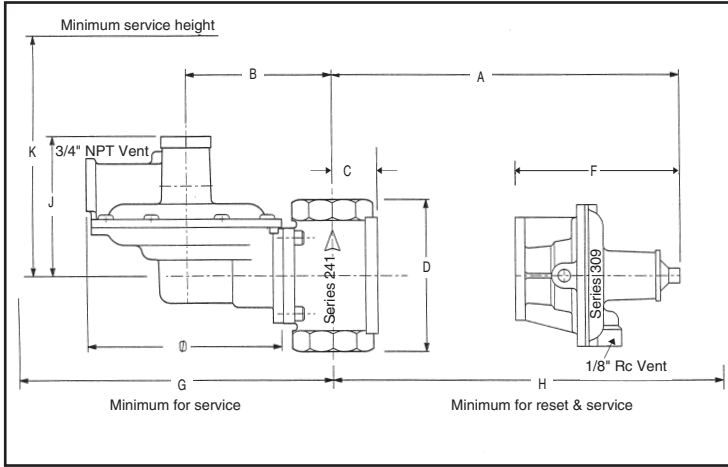
Types of Gases:

The capacities shown in the table are given in terms of natural gas SG 0.6. For all other gases multiply by the following correction factor:

$$\frac{0.6}{\sqrt{\text{SG of gas handled}}}$$

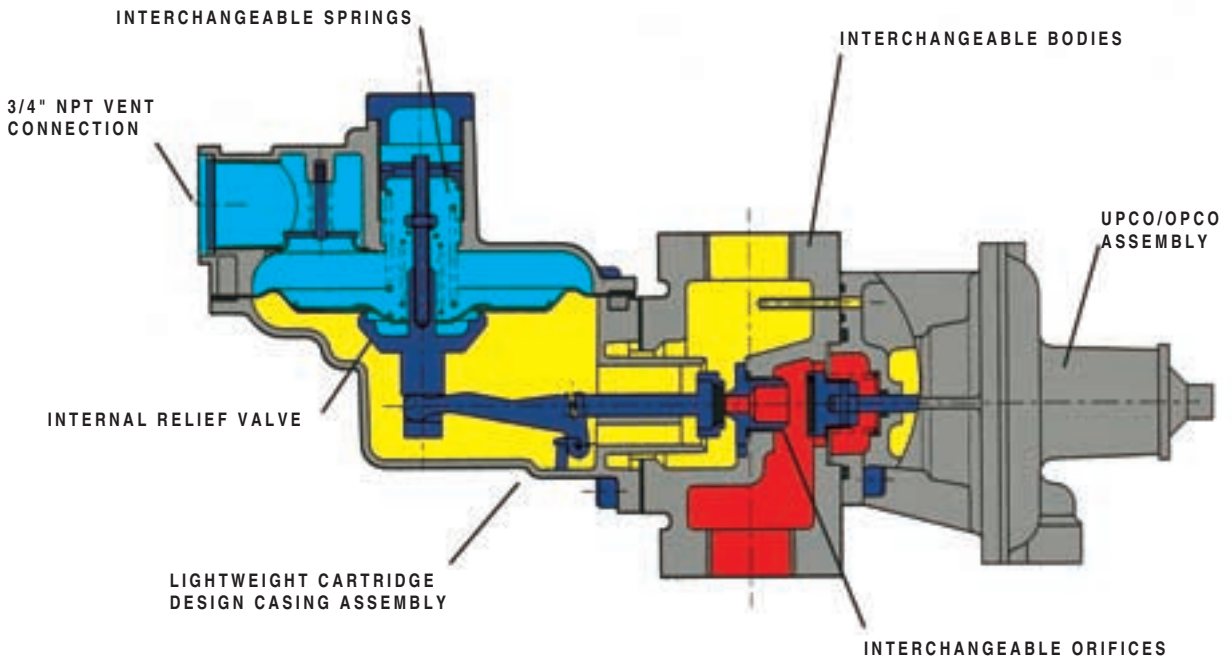
Dimensions & Sectional Arrangement

Dimensions & Weights



REF	1/2" - 1" No OPCO		1/2" - 1" With OPCO		1/2" - 1" With S.309 OPCO	
	mm	ins	mm	ins	mm	ins
A	100	4	100	4	100	4
B	-	-	76	3	76	3
C	40	1 1/2	-	-	-	-
D	102	4	102	4	102	4
E	127	5	127	5	127	5
F	-	-	108	4 1/4	113	4 1/2
G	200	8	200	8	200	8
H	-	-	165	6 1/4	275	10 7/8
J	94	3 3/4	94	3 3/4	94	3 3/4
K	160	6 5/16	160	6 5/16	160	6 5/16
Wt - Kg	1.9		2.2		2.5	
Wt - lb	4.2		4.9		5.5	

Sectional Arrangement



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