

Figure 1 : Typical DB Series Regulator

The DB/- Series, Pressure Reducing Regulators are balanced trim regulators. These pressure regulators are widely used for supplying fuel gas (L.P.G., Natural Gas, etc.) for commercial applications to burners, furnaces and other applications. In general, these valves can be used where required outlet pressure is low with relatively high flow requirement. Different soft sealing discs are available for various gases and liquids for wide pressure and temperature range up to 190<sup>0</sup> C. Because of balanced trim design, these regulators can handle very high variations in inlet pressure without affecting the accuracy of outlet pressure control.

## FEATURES

- |                           |   |   |
|---------------------------|---|---|
| Easy to Maintain          | : | Compact design with minimum number of moving parts. Actuator internals, Valve Disc & trim parts can be replaced, without removing the regulator from the pipe line. |
| Tight Shut Off Capability | : | Special trim design eliminates wear & erosion of seating, providing excellent tight shut off capability over long working life.                                     |
| Tamper Resistant          | : | An adjusting screw lock nut and protective cap is standard to discourage tampering with pressure setting.   |
| Balanced Trim             | : | Because of balanced trim design, these regulators can handle very high variations in inlet pressure without affecting the accuracy of outlet pressure control.      |

## SPECIFICATIONS

Body Size & Connections :  
 Flanged : 1", 1 1/2", 2", 3", & 4", ANSI B16.5  
 Class 150 & 300 ratings.  
 (Higher rating on request)  
 Available Configurations :  
 As per different pressure and flow requirements,  
 different models are available, (Refer Table 2A to 2E)  
 Maximum Inlet Pressure :  
 Refer Table 2A to 2E.  
 Maximum Spring & Diaphragm Casing Pressure :  
 See Table 1.  
 Flow Coefficients & Port Diameters : See Table 3.  
 Material of Construction :  
 Body\* : ASTM - A - 216 Gr. WCB (Standard), CF8,  
 CF8M.  
 Bottom Diaphragm Casing : Steel (Std.), S.S.-304,  
 S.S.-316 or same as body material  
 Spring Casing : Steel or Aluminium.  
 Internal Trim Parts\* : S.S.316 (Standard), Monel,  
 Copper, Brass  
 \* NACE & other special materials available on request.  
 Disc & Diaphragm : Nitrile (Standard), Neoprene,  
 EPDM, Silicon, PTFE, Fluoropolymer.  
 Temperature Capabilities :  
 -25°C to 80°C with nitrile elastomeric parts.  
 -15°C to 180°C with fluoropolymer elastomeric parts.  
 Pressure Setting Adjustment : May be adjusted  
 throughout a spring range by turning the adjusting  
 screw.  
 Pressure Registration : External impulse connection from  
 downstream control line.  
 External Dimensions : Refer Fig. 3.

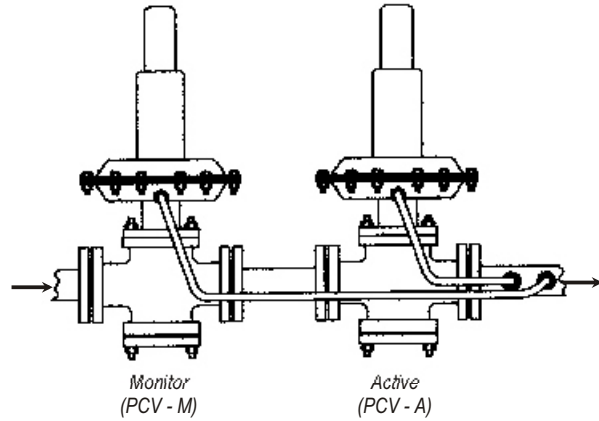


Figure 2

### ACTIVE - MONITOR CONFIGURATION :

DB/- Series Valves, can be used in Active-Monitor configuration (Ref. Fig.2).

Two Pressure Regulating Valves are connected in series with impulse connections as shown in Fig.2. PCV-M, is the monitor regulator, whose set pressure is slightly higher than the active regulator PCV-A. Normally, PCV-M remains wide open and PCV-A, the active pressure regulator regulates the controlled outlet pressure at the set value. If, in case of contingency, controlled outlet pressure tends to rise, PCV-M, the monitor pressure regulator takes over and regulates the controlled pressure at its set value, which is marginally higher than that of PCV-A.

### Overpressure Protection :

Like most regulators, DB/- series regulators have outlet pressure rating that are lower than their inlet pressure rating. A pressure relieving or a pressure limiting device must be provided by the user for DB/- series regulators if inlet pressure exceeds maximum spring and diaphragm casing pressure rating specified in Table - 1.

Table 1  
Maximum Spring & Diaphragm Casing Pressures

DIAPHRAGM CASING TYPE	MODEL NO.	MAXIMUM DIAPHRAGM CASING PRESSURE
'C' Type	DB/06-A, DB/06-B, DB/06-C	6 Kg/Cm <sup>2</sup> g
'P' Type	DB/06-D, DB/06-E	19 Kg/Cm <sup>2</sup> g
'C' Type	DB/08-A, DB/08-B, DB/08-C	4 Kg/Cm <sup>2</sup> g
'P' Type	DB/08-D, DB/08-E	13 Kg/Cm <sup>2</sup> g
'C' Type	DB/11-A, DB/11-B, DB/11-C	2.5 Kg/Cm <sup>2</sup> g
'P' Type	DB/11-D, DB/11-E	7 Kg/Cm <sup>2</sup> g
'C' Type	DB/14-A, DB/14-B, DB/14-C, DB/14-D	2.25 Kg/Cm <sup>2</sup> g
'P' Type	DB/14-E	5 Kg/Cm <sup>2</sup> g
'C' Type	DB/18-A to DB/18-E	2.25 Kg/Cm <sup>2</sup> g



# DB/- SERIES SELF ACTUATED BALANCE TRIM DOWNSTREAM PRESSURE CONTROL VALVES



## Capacity Information

To determine the flow capacity required of relief valve connected downstream of regulator to limit the over - pressure use equation (a) For Gases and Vapours & equation (c) For Liquids.

To find our regulating flow capacity at 10% droop, use equation (b) For Gases & Vapours & equation (d) For Liquids.

$$(a) Q = \frac{256 \times Cv - r \times P_1 \times \sin \left( 100 \times \sqrt{\frac{P_1 - Pr}{P_1}} \right)}{\sqrt{GT}} \text{ DEG}$$

$$(b) Q = \frac{256 \times Cv - o \times P_1 \times \sin \left( 100 \times \sqrt{\frac{P_1 - Ps}{P_1}} \right)}{\sqrt{GT}} \text{ DEG}$$

In equations (a) & (b)

Q is flow in Normal Cubic Meters per hour;  
G is Specific Gravity of Gas with respect to Air and  
T is absolute Temperature in °K.

$$(c) Q = \frac{0.855 \times Cv - r \times \sqrt{P_1 - Pr}}{\sqrt{G}}$$

$$(d) Q = \frac{0.855 \times Cv - o \times \sqrt{P_1 - Ps}}{\sqrt{G}}$$

In equations (c) & (d)

Q is flow in Cubic Meters per hour;  
G is Specific Gravity of Liquid with respect to Water.

In all the equations (a), (b), (c) & (d)

Cv - r is wide open Cv of regulator for relief valve sizing available in Table 3

Cv - o is operating Cv of regulator at specific droop (10 % unless specified otherwise) See Table 3

P<sub>1</sub> is inlet Pressure in Bar abs.

Pr is Relief Valves set Pressure in Bar abs.

Ps is Regulator set Pressure in Bar abs.

Table 3

Valve Size	1"	1 1/2"	2"	3"	4"
Port Diameter (mm)	25	35	45	70	90
Cv - o	5	10	18	40	62
Cv - r	10	20	34	70	135

Table 2 B DB/08 REGULATOR MAX. INLET PRESSURE (Bar.g.)

Set pressure range Bar.g.	Valve Size	1"	1 1/2"	2"
	Cv - o	5	10	18
	Set Pr., Bar.g.			
0.2 to 0.9 (DB/08-A)	0.25	1.03	0.78	0.65
	0.4	1.64	1.25	1.01
	0.6	2.46	1.88	1.52
0.45 to 1.75 (DB/08-B)	0.8	3.29	2.50	2.02
	1	4.11	3.13	2.53
0.7 to 2.5 (DB/08-C)	1.2	4.93	3.75	3.03
	1.5	6.16	4.69	3.79
	1.75	7.19	5.48	4.42
1.4 to 5.4 (DB/08-D)	2	8.21	6.26	5.05
	2.5	10.27	7.82	6.32
	3	12.32	9.39	7.58
2.5 to 8.2 (DB/08-E)	3.5	14.37	10.95	8.84
	4	16.43	12.51	10.11
	5	20.53	15.64	12.64
	6	24.64	18.77	15.16
	7	28.75	21.90	17.69
	8	32.85	25.03	20.22

Table 2A DB/06 REGULATOR MAX. INLET PRESSURE (Bar.g.)

Set pressure range Bar.g.	Valve Size	1"	1 1/2"
	Cv - o	5	10
	Set Pr., Bar.g.		
0.45 to 1.75 (DB/06-A)	0.45	0.97	0.74
	0.75	1.62	1.23
	1	2.15	1.64
	1.25	2.69	2.05
0.85 to 3.35 (DB/06-B)	1.5	3.23	2.46
	2	4.31	3.28
	2.5	5.38	4.10
1.25 to 4.85 (DB/06-C)	3	6.46	4.92
	3.5	7.54	5.74
	4	8.61	6.56
	5	10.77	8.20
2.75 to 10.45 (DB/06-D)	6	12.92	9.84
	7	15.07	11.49
	8	17.23	13.13
	10	21.54	16.41
4.0 to 15.7 (DB/06-E)	12	25.84	19.69
	14	30.15	22.97
	15.7	33.81	25.76

Table 2C DB/11 REGULATOR MAX. INLET PRESSURE (Bar.g.)

Set pressure range Bar.g.	Valve Size	1"	1 1/2"	2"	3"
	Cv - o	5	10	18	40
	Set Pr., Bar.g.				
0.15 to 0.5 (DB/11-A)	0.15	1.06	0.81	0.65	0.34
	0.25	1.76	1.34	1.08	0.56
	0.4	2.82	2.15	1.74	0.90
0.3 to 1.0 (DB/11-B)	0.5	3.53	2.69	2.17	1.13
	0.6	4.23	3.22	2.60	1.35
0.4 to 1.4 (DB/11-C)	0.7	4.94	3.76	3.04	1.58
	0.8	5.64	4.30	3.47	1.81
	1	7.05	5.37	4.34	2.26
0.8 to 3.0 (DB/11-D)	1.2	8.46	6.45	5.21	2.71
	1.5	10.58	8.06	6.51	3.38
	1.75	12.34	9.40	7.59	3.95
	2	14.10	10.74	8.68	4.51
1.3 to 4.5 (DB/11-E)	2.5	17.63	13.43	10.85	5.64
	3	21.15	16.12	13.02	6.77
	3.5	24.68	18.80	15.19	7.90
	4	28.20	21.49	17.36	9.03
	4.5	31.73	24.18	19.53	10.15

NOTE:1) For ANSI 150# class rating max. inlet pressure is 20 Bar. & For ANSI 300# rating max. inlet pressure is 50 Bar.g.  
2) Cv-o is operating Cv at 10% droop. Droop 20% for set pressures less than 0.4 Bar.g. & 15% for set pressures between 0.4 to 0.6



# DB/- SERIES SELF ACTUATED BALANCE TRIM DOWNSTREAM PRESSURE CONTROL VALVES



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Table 2D DB/14 REGULATOR MAX. INLET PRESSURE (Bar.g.)

Set pressure range Bar.g.	Valve Size	1"	1 1/2"	2"	3"	4"
	Cv - o	5	10	18	40	62
	Set Pr., Bar.g.					
0.10 to 0.25 (DB/14-A)	0.1	1.22	0.93	0.75	0.39	0.28
	0.15	1.83	1.40	1.13	0.59	0.41
	0.2	2.44	1.86	1.50	0.78	0.55
0.15 to 0.6 (DB/14-B)	0.25	3.05	2.33	1.88	0.98	0.69
	0.3	3.66	2.79	2.25	1.77	0.83
	0.4	4.88	3.72	3.00	1.56	1.10
0.25 to 0.85 (DB/14-C)	0.5	6.10	4.65	3.76	1.95	1.38
	0.6	7.32	5.58	4.51	2.34	1.66
	0.7	8.54	6.51	5.26	2.73	1.93
0.5 to 1.8 (DB/14-D)	0.8	9.77	7.44	6.0	3.13	2.21
	1	12.21	9.30	7.51	3.91	2.76
	1.25	15.26	11.63	9.39	4.88	3.45
0.8 to 2.6 (DB/14-E)	1.5	18.31	13.95	11.27	5.86	4.14
	1.75	21.36	16.28	13.15	6.84	4.83
	2	24.41	18.60	15.02	7.81	5.52
	2.25	27.47	20.93	16.90	8.79	6.21
	2.6	31.74	24.18	19.53	10.16	7.17

Table 2E DB/18 REGULATOR MAX. INLET PRESSURE (Bar.g.)

Set pressure range Bar.g.	Valve Size	1"	1 1/2"	2"	3"	4"
	Cv - o	5	10	18	40	62
	Set Pr., Bar.g.					
0.1 to 0.2 (DB/18-A)	0.1	1.76	1.34	1.08	0.56	0.40
	0.15	2.64	2.01	1.62	0.84	0.60
0.1 to 0.4 (DB/18-B)	0.2	3.52	2.68	2.16	1.13	0.79
	0.3	5.27	4.02	3.25	1.69	1.19
0.15 to 0.6 (DB/18-C)	0.4	7.03	5.36	4.33	2.25	1.59
	0.5	8.79	6.70	5.41	2.81	1.99
	0.6	10.55	8.04	6.49	3.38	2.38
0.35 to 1.2 (DB/18-D)	0.7	12.30	9.38	7.57	3.94	2.78
	0.8	14.06	10.71	8.65	4.50	3.18
	1	17.58	13.39	10.82	5.63	3.97
0.5 to 1.9 (DB/18-E)	1.25	21.97	16.74	13.52	7.03	4.97
	1.5	26.37	20.09	16.23	8.44	5.96
	1.7	29.88	22.77	18.39	9.56	6.75
	1.9	33.40	25.45	20.55	10.69	7.55

NOTE: 1) For ANSI 150# class rating max. inlet pressure is 20 Bar. & For ANSI 300# rating max. inlet pressure is 50 Bar.g.  
2) Cv-o is operating Cv at 10% droop. Droop 20% for set pressures less than 0.4 Bar.g. & 15% for set pressures between 0.4 to 0.6

SIZE	DB06		DB08		DB11		DB14		DB18		ANSI 150#					ANSI 300#				
	Ø W	H(MAX)	Ø W	H(MAX)	Ø W	H(MAX)	Ø W	H(MAX)	Ø W	H(MAX)	Ø D	L	p	d	n	Ø D	L	p	d	n
1" (25NB)	160	600	210	610	280	650	356	650	457	680	108	184	79.4	16	4	123.6	197	88.9	19	4
1 1/2" (40NB)	160	650	210	660	280	700	356	700	457	720	127	222	98.4	16	4	155.4	235	114.3	22.2	4
2" (50NB)	---	---	210	670	280	710	356	710	457	740	152.2	254	120.6	19	4	165	267	127	19	8
3" (75NB)	---	---	---	---	280	750	356	750	457	780	190.4	298	152.4	19	4	209.5	318	168.3	22.2	8
4" (100NB)	---	---	---	---	---	---	356	820	457	850	228.6	352	190.5	19	8	254	368	200.1	22.2	8

Consult Nirmal for exact height of particular spring range.

n - Number of Holes ,  
All dimensions are in mm.

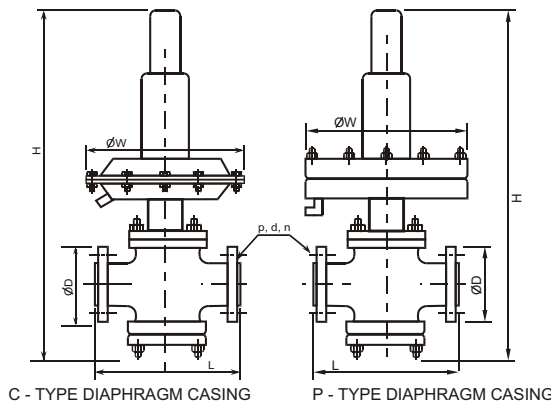
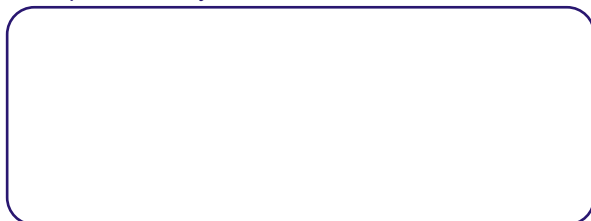


Figure 3 : External Dimensions

### ENQUIRY SPECIFICATIONS

INLET PRESSURE      SERVICE FLUID  
OUTLET PRESSURE    FLOW MIN./MAX.  
LINE/SIZE            PERMISSIBLE DROOP  
SPECIFIC GRAVITY    MAX. TEMP.

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