Bailey

CLASS TLP Pressure Reducing Valve

CLASS TLP Direct Acting Pressure Reducing Valve

The Class TLP balanced direct acting pressure regulator is designed for use on installations that have varying inlet pressures and capacities, and require positive shut-off under 'no flow' conditions.
The standard valve is best suited for controlling water.
A seawater compatible version is available for marine duty.

OPERATION

The Class TLP pressure regulator is operated by a spring loaded piston and has a balanced main valve which ensures that the outlet dead-end pressure is unaffected by changes of inlet pressure.
The valve is opened by the load on the adjusting spring and closed by reduced pressure on the underside of the diaphragm. Under normal working conditions, the balance of these two forces gives the degree of valve opening for the required reduced pressure.

FEATURES AND BENEFITS

- Fully balanced piston - allows a constant outlet pressure to be maintained, irrespective of varying inlet pressure.
- Soft disc - for positive shut-off.
- Self actuation/regulation - requires no external power source.
- Simple design - enables the valve to be easily maintained and serviced without removal from the line.
- Minimum variation between 'flow' and 'no-flow' pressure.
- Seawater version available.

CLASS TLP

TECHNICAL SPECIFICATION

Size	65, 80, 100, 125, 150 mm (2-1/2, 3, 4, 5, 6 inch)
Connection	Flanged BS4504 PN16. BS 10 table 'F'. Others available on request.
Material	Cast Iron
Temperature Range	-20 to 93°C
Maximum Inlet Pressure	20.7 Barg
Maximum Outlet Pressure*	5.5 Barg

Minimum Outlet Pressure*

MIN. OUTLET INLET PRESSURE RANGE	
0.35 Barg	up to 6.9 Barg
5% of inlet	6.9 to 20.7 Barg

* Setting including rise at dead end.

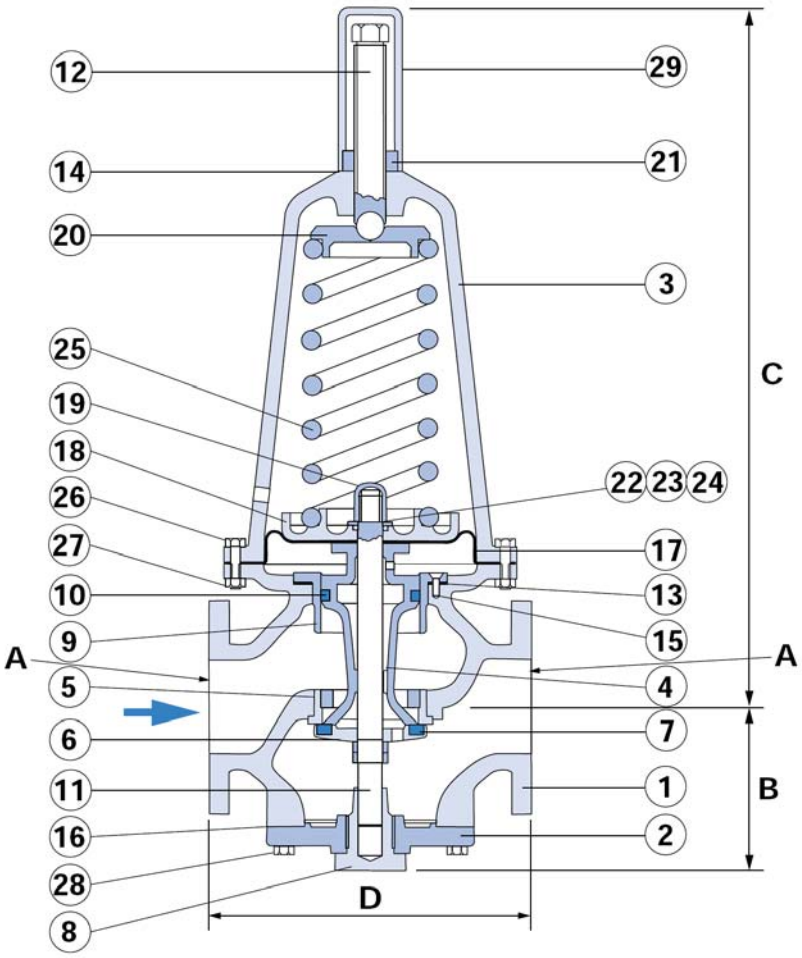
CE MARKING

The Class TLP has been certified to the requirements of the PED (Category II). For group 1 liquids, valve sizes below 100mm (4 inch), do not require, and hence, cannot be CE marked.

SPRING SELECTION

DEAD END PRESSURE SETTING RANGE (Barg)	DEAD END PRESSURE SETTING RANGE (Psig)	COLOUR CODE
0.35 to 2.1	5 to 30	Cream/Red
2.1 to 5.5	30 to 80	Cream/Blue

PARTS



ITEM	PART	MATERIAL
1	Body	Cast Iron
2	Bottom Cover	Cast Iron
3	Spring Chamber	Cast Iron
4	Piston	Bronze
5	Valve Seat	Bronze
6	Disc Holder	Bronze
7	Valve Disc	Nitrile
8	Bottom Cover Bush	Bronze
9	Piston Liner	Bronze
10	Piston Seal	Nitrile
11	Spindle	Bronze
12	Adjusting Screw	Brass
13	Piston Liner Joint	NAF
14	Adjusting Screw Cap Joint	NAF
15	Piston Liner Screw	Brass
16	Bottom Cover Joint	NAF
17	Diaphragm	Nitrile
18	Bottom Spring Plate	Cast Iron
19	Spindle Nut	Brass
20	Top Spring Plate	Cast Iron
21	Adjusting Screw Locknut	Brass
22	Spindle Nut Washer	Rubber/Metal
23	'O' Ring	Nitrile
24	'O' Ring Plate	Brass
25	Spring	Plt. Steel
26	Spring Chamber Bolt	Plt. Steel
27	Spring Chamber Nut	Plt. Steel
28	Bottom Cover Bolt	Plt. Steel
29	Adjusting Screw Cap	Cast Iron

DIMENSIONS

SIZE	DN65	DN80	DN100	DN125	DN150
A	2-1/2"	3"	4"	5"	6"
B	137	155	178	229	251
C	562	638	740	870	883
D	254	286	343	406	419
Kg	55	79	111	177	202

All dimensions in mm.

Class TLP Air Capacity - l/s @ 15ºC					
Rise to Dead End	**65 mm**	**80 mm**	**100 mm**	**125 mm**	**150 mm**
0.35 Bar	142	163	314	398	551
0.35 Bar	147	165	315	407	564
0.35 Bar	158	182	347	448	621
0.35 Bar	179	206	394	508	704
0.35 Bar	259	315	561	800	1119
0.70 Bar	371	451	802	1143	1600
1.00 Bar	530	645	1146	1634	2286
1.00 Bar	724	880	1565	2230	3120
1.00 Bar	724	880	1565	2230	3120
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
0.35 Bar	911	1130	1958	2892	4059
1.00 Bar	1183	1467	2543	3756	5271
1.00 Bar	1183	1467	2543	3756	5271
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
0.35 Bar	1372	1723	3054	4444	6317
1.00 Bar	1782	2238	3967	5772	8204
1.00 Bar	1782	2238	3967	5772	8204
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA

WATER CAPACITIES

TLP Water Capacity - l/s						
Pressure Differential (Barg)	**Rise to Dead End**	**65 mm**	**80 mm**	**100 mm**	**125 mm**	**150 mm**
1.00	**1 Bar**	6.80	8.08	11.90	14.80	20.00
2.00	**1 Bar**	9.18	10.90	16.06	19.98	27.00
3.00	**1 Bar**	10.54	12.52	18.44	22.94	31.00
4.00	**1 Bar**	11.22	13.33	19.63	24.42	33.00
5.00	**1 Bar**	11.90	14.14	20.82	25.90	35.00
6.00	**1 Bar**	12.37	14.70	21.65	26.93	36.40
7.00	**1 Bar**	12.85	15.27	22.49	27.97	37.80
8.00	**1 Bar**	13.32	15.83	23.32	29.00	39.20
9.00	**1 Bar**	13.80	16.40	24.15	30.04	40.59
10.00	**1 Bar**	14.28	16.96	24.99	31.08	42.00
15.00	**1 Bar**	14.75	17.53	25.82	32.11	43.40
20.00	NA	NA	NA	NA	NA	NA
25.00	NA	NA	NA	NA	NA	NA
30.00	NA	NA	NA	NA	NA	NA
35.00	NA	NA	NA	NA	NA	NA

VALVE TYPE RISE AT DEAD END

Class T/TLP	0.35 Bar	0.7 Bar	1 Bar	*Note: Only the capacity shown*
	0.54	0.77	1.0	*at 1 Bar rise can be adjusted*

SIZING GUIDELINES FOR AIR AND GAS DUTIES

The capacity sizing charts are for:

1) Critical pressure drop sizing.
2) Air.
3) Temperature of 15°C.
4) Units l/s.
5) Standard rise at dead end setting.

The following instructions will assist when the actual service conditions differ from the above criteria.

1) **Critical Pressure Drop**

The air capacity charts are based on critical pressure drop sizing. To achieve these flows, it is critical that the correct pipe sizes are used.

2) **Other Gases**

If you wish to use the valve on other compatible gases, the chart opposite can be used, however the capacity will change depending on the specific gravity of the flowing gas. Divide the valve air capacity by $\sqrt{SG}$ to give the gas capacity (SG = specific gravity, relative to air = 1)

3) **Other Temperatures**

If the flowing temperature is not 15°C the chart capacity will need to be divided by $\sqrt{(T/288)}$
where: T= flowing temperature °C + 273°K

4) **Useful Conversions**

m^3/h = l/s x 3.6
CFM = l/s x 2.12

5) **Non-Standard Rise at Dead End**

For a definition of rise at dead-end. To calculate capacities at a different rise at dead end multiply chart capacity by the below figures.

Example:

Chart air capacity = 100 l/s
SG of gas = 0.8
Gas capacity of valve will be
$100 \div \sqrt{0.8}$ = 111.8 l/s (gas)

Example:

Chart air capacity = 100 l/s
Air temperature = 50°C (T = 323°K)
Actual Air capacity at temperature will be:
$100 \div \sqrt{323/288}$ = 94.4 l/s (@ 50°C)

Example:

Chart air capacity = l/s
Valve type Class T
Required rise at dead end 0.35 Barg
Actual air capacity will become
1000 x 0.54 = 540 l/s

SIZING GUIDELINES FOR WATER AND OTHER LIQUIDS

The capacity sizing charts are for:

1) Water.
2) Units l/s.
3) Standard rise at dead end setting.

The following instructions will assist when the actual service conditions differ from the above criteria.

1) **Other Liquids**

If you wish to use the valve on other compatible liquids, the sizing chart opposite can be used.
However, the valve capacity will change depending on the specific gravity of the flowing liquid. Divide the valve water capacity by $\sqrt{SG}$ to give the liquid capacity.
(SG = specific gravity, relative to water =1.)

2) **Useful Conversions**

lgpm = l/s x 13.33
m^3/min = l/s x 0.06

3) **Non-Standard Rise at Dead End**

For a definition of rise at dead end.

Standard rise at dead end is 1 barg.
To determine the capacity at a different rise at dead end, multiply the water capacity by the following factors.
Note. The capacity is unaffected by changes in temperature.

Example:
Chart water capacity = 2 l/s
SG of liquid = 0.8
Liquid capacity of valve will be
$2 \div \sqrt{0.8}$ = 2.24 l/s (liquid).

Example:
Chart water capacity = 2 l/s
Valve Type C10
Size 1”
Required rise at dead end 1.4 barg
actual water capacity will become
2 x 1.190 = 2.38 l/s

TYPE & SIZE	RISE AT DEAD END		
	0.35 Bar	0.7 Bar	1.4 Bar
T/TLP			
1/2" to 4"	0.625	0.813	—
5" to 6"	—	0.770	1.230

Note. The capacity is unaffected by changes in temperature.

INSTALLATION OF PRESSURE REGULATING VALVES

Installation

1) Mount the valve with the spring centre line vertical and with the adjusting screw uppermost.
2) Ensure the valve and pipework is adequately supported and that the pipe does not impose strain onto the valve.
3) Provide adequate headroom or adjustment and space underneath to remove the bottom cover or plug, to give access for dismantling.
4) It is recommended to fit pressure gauges downstream of the valve.
5) Isolating valves and line strainers are advisable.
6) The downstream (outlet) system should be protected by a correctly sized safety relief valve, set at a pressure not less than 1 barg or 15% (whichever is the greater) above the dead end setting of the regulator.
7) Flush the pipework to ensure that it is clear of dirt and debris.
8) For valves on air, gas and steam. The outlet piping should be expanded to accommodate the increased volume.
9) Ensure correct orientation of the valve, with respect to the direction of flow. Each valve is marked with a flow direction arrow.
10) Ensure that the correct spring is fitted for the required downstream (outlet) pressure, including the 'rise at dead end'

Setting

All direct acting regulating valves should be set against a 'Dead end', allowing for a 'rise at dead end'. For definitions of these terms please refer to Page 90.
1) Remove all the load from the spring by unscrewing the adjusting screw (see item 12 on individual valve drawings).
2) Provide a downstream (outlet) 'Dead end' complete with pressure gauge, by closing a suitable isolating valve.
3) Admit upstream (inlet) pressure.
4) Commence adding load to the spring by screwing the adjusting screw (item 12). Stop when the required downstream (outlet) dead end setting pressure has been achieved.
5) Open the downstream isolating valve slowly to allow flow through the valve. On steam applications
it is important that the down stream system is allowed to clear any condensate and to warm through gradually.
6) If necessary, reset the pressure by turning the adjusting screw and then checking the new dead end setting.