

G4 Series

PILOT OPERATED PRESSURE REDUCING VALVES

...Extremely sensitive and accurate

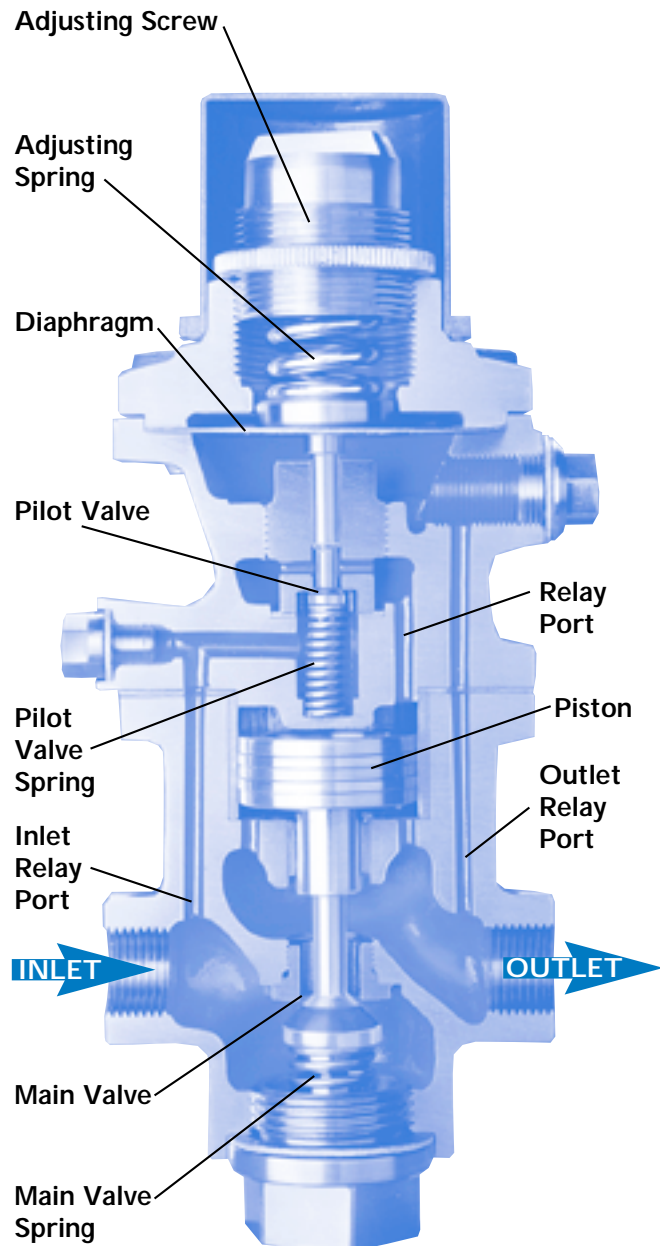
The 'G4' pressure reducing valve is designed for use on steam, air and gases. It will maintain a constant outlet pressure irrespective of variations in the inlet pressure or demand from the system.

Initially with no compression on the adjusting screw, both the pilot and main valve seats are closed due to the action of the springs in the pilot and main valve. Fluid at the inlet pressure passes up the inlet relay port to the pilot valve seat which is opened by clockwise (viewed from above) rotation of the adjusting screw. This compresses the adjusting spring and applies load to the topside of the diaphragm, pushing open the pilot valve. Fluid now passes through the pilot valve seat, through the relay port to the top of the large diameter piston, which in turn pushes the main valve open.

The pressure of the fluid is reduced as it passes through the open main valve from the inlet to the valve outlet. At the same time fluid passes up the outlet relay port to the underside of the diaphragm, from where the outlet pressure is controlled.

The outlet pressure is a result of the balancing of the forces acting on the diaphragm, from the adjusting spring above and the reduced pressure from below.

The 'G4' is extremely sensitive and accurate, due to the large diaphragm. Inlet variations, or demand from the system, will attempt to affect the outlet pressure. Such attempts will result in movement of the pilot valve, which in turn minutely moves the piston and main valve. Thus the outlet pressure is maintained and the controlling cycle starts again.



PRESSURE EQUIPMENT DIRECTIVE (PED)

The G4 pressure reducing valve is fully compliant/certified to the PED as follows:

Sizes DN15 to DN25 in accordance with article 3, paragraph 3 (sound engineering practice) hence do not require the CE mark.

Sizes DN32 to DN100 to Category II, group 1 gases (CE marked)

Sizes DN32 to DN150 to Category II, group 2 gases (CE marked)

REMOTE PRESSURE SENSING

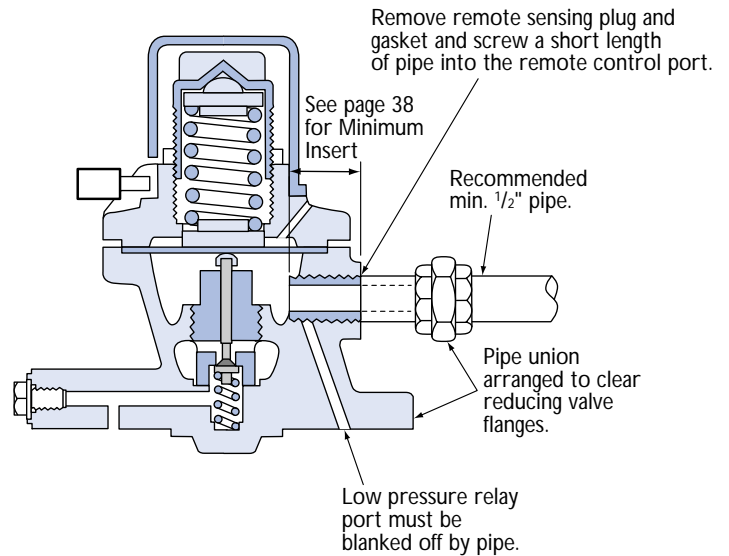
For Steam Applications

The 'G4' is a self-actuated, pilot operated pressure reducing valve and it relies upon a stable pressure signal from the outlet pipe work in order to maintain stable control of the outlet pressure.

However, under certain conditions the signal pressure may be unstable in the immediate vicinity of the valve outlet and as a result may cause erratic control.

This can easily be overcome by installing a balance pipe from the remote sensing port to a straight section of the outlet pipe where stable flow has been resumed (see diagram below).

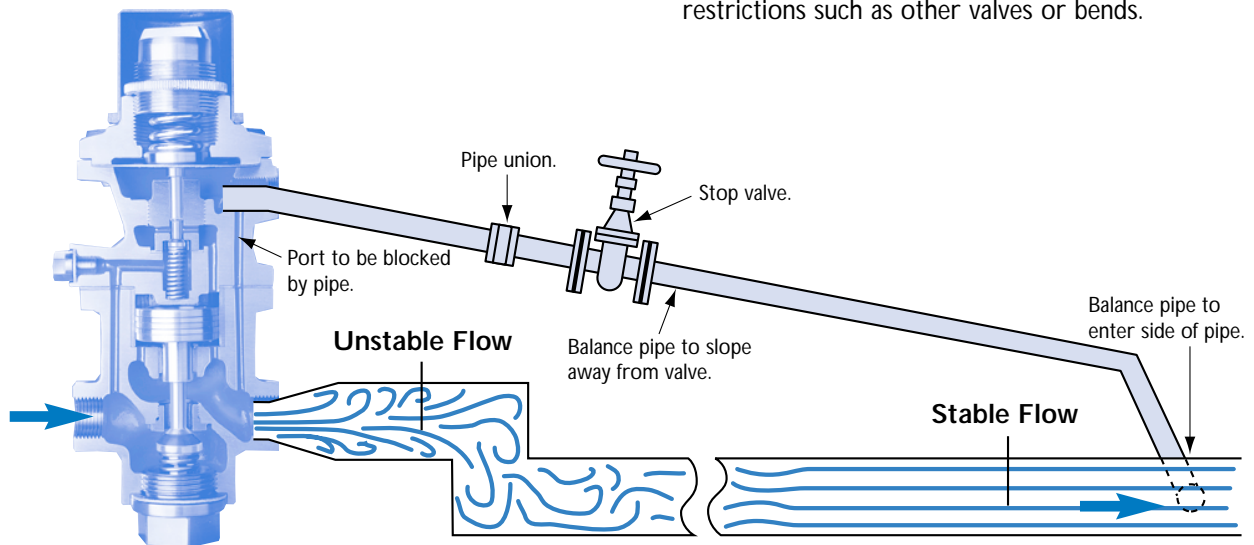
Ideally the balance pipe should be a minimum of 2 metres (6 feet) long and must be screwed into the remote sensing port to the required depth, see page 38. It should also include a pipe union and stop valve to allow dismantling and isolation. It should be installed with a steady fall away from the reducing valve, to facilitate self drainage of condensate.

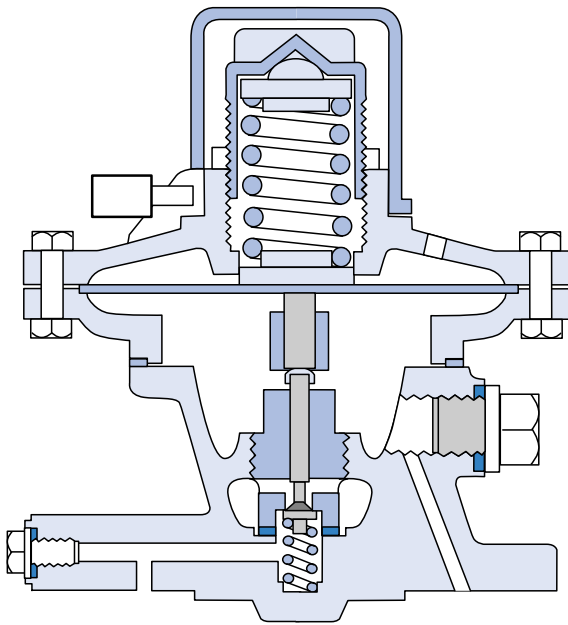


We recommend fitting a balance pipe:

1. When the reduced pressure is below 55% of the inlet pressure.
2. When a low pressure top is fitted.
3. When difficult outlet pipe work conditions occur.

We do not recommend fitting a balance pipe on air/gas applications. To ensure correct operation the G4 should be mounted at least 10 pipe diameters from restrictions such as other valves or bends.





The standard 'G4' pilot top can reduce pressures down to 0.35 Barg (5 Psig). For pressures below this, a bronze low pressure pilot top can be fitted in place of the standard top. It is suitable for outlet pressures from 0.07 to 0.35 Barg (1 to 5 Psig) using the yellow spring. The low pressure top is available for fitting on to valve sizes 15 to 100mm ($\frac{1}{2}$ to 4 inch), and a balance line should always be fitted to a low pressure top, on steam duty and never on air/gas duty.

Note: A low pressure top is only suitable for inlet pressure up to a maximum of 7 Barg (100 Psig).

Higher inlet pressures can be accommodated by use of two G4 valves 'in-series', refer to page 37.

The low pressure top can also be supplied as a **conversion kit**, allowing existing valves and stock to be modified quickly should the need suddenly arise.

The 'G4' has successfully been used for many years with metal seats on demanding steam applications. However soft seated versions are available for industrial fine gas applications, involving such gases as carbon dioxide, nitrogen and oxygen. Typical application areas would include pharmaceuticals, food processing and brewing.

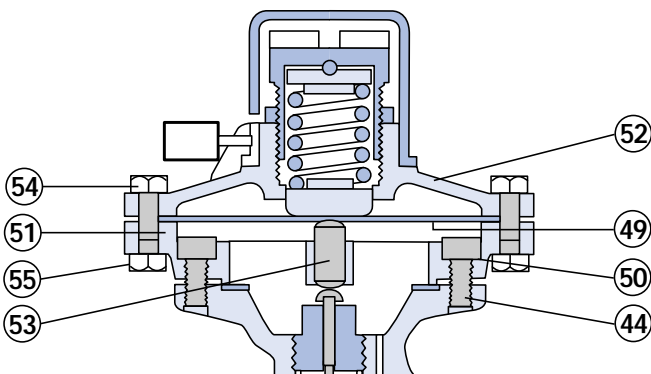
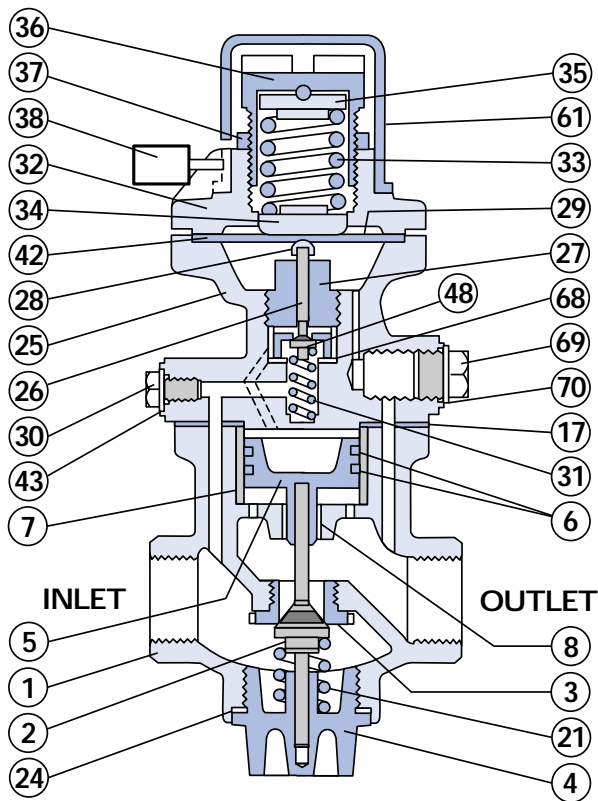
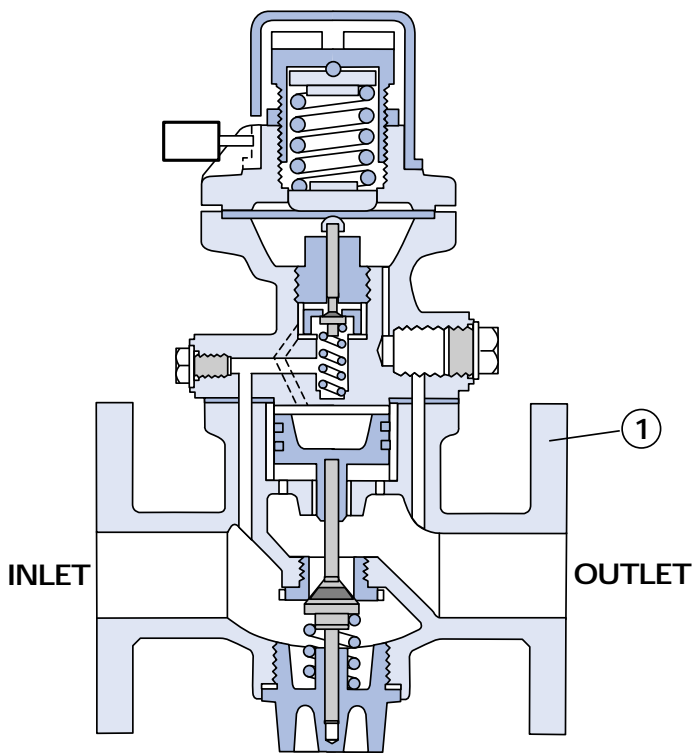
The 'G4' utilises a range of soft elastomer seat materials to meet the ever growing demand for these specialist applications.

In addition, valves for active gases, such as oxygen and methane, can be supplied fully assembled and tested to "oxygen service" standard in Bailey's state of the art clean room facility. This facility complies fully with the "Industrial Gas Committee" guidelines.

All soft seat options can also be supplied as **conversion kits**, allowing existing valves and stock to be modified quickly should the need suddenly arise.

We do not recommend fitting a balance pipe on gas applications. To ensure correct operation the G4 should be mounted at least 10 pipe diameters from restrictions such as other valves or bends.

PARTS



ITEM PART

1	Body
2†	Main Valve
3†	Main Valve Seat
4	Bottom Plug
5	Piston
6*†	Piston Rings
7	Piston Liner
8	Piston Guide
17*†	Valve Body Top Joint
21†	Main Valve Spring
24*†	Bottom Plug Joint
25	Pilot Valve Top
26†	Pilot Valve
27†	Pilot Valve Plug
28*†	Pilot Valve Cap
29*†	Diaphragm
30	H.P. Port Plug
31†	Pilot Valve Spring
32	Pilot Valve Top Cover
33	Adjusting Spring
34	Adjusting Spring Bottom Plate
35	Adjusting Spring Top Plate
36	Adjusting Screw
37	Locking Ring
38	Padlock
42*†	Diaphragm Joint
43*†	H.P. Port Plug Joint
44	Cap Headed Screws
48†	Pilot Valve Head
49	L.P. Diaphragm
50	L.P. Screw Joint
51	L.P. Adaptor Flange
52	L.P. Top Cover
53	L.P. Push Rod
54	L.P. Top Cover Bolts
55	L.P. Top Cover Nuts
61	Top Cap
68*†	Pilot Valve Plug Joint
69	Remote Control Plug
70*†	Remote Control Plug Joint

Note: A variety of elastomeric or PTFE seats and gaskets are available to suit various applications.

*Routine service pack; available from Safety Systems UK Ltd.

†Complete repair pack; available from Safety Systems UK Ltd.

Recommended inspection every 12 months.

MATERIALS

ITEM	2042 & 2043 Bronze	2044 Carbon Steel	2045 Carbon Steel	2046 Carbon Steel
1	Bronze	Carbon Steel	Carbon Steel	Carbon Steel
2	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
3	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
4	Bronze	Bronze	Stainless Steel	Stainless Steel
5	Bronze	Bronze	Bronze	Stainless Steel
6	Bronze	Bronze	Bronze	Chrome Iron
7	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
8	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
17	NAF	NAF	NAF	NAF
21	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
24	NAF	NAF	NAF	NAF
25	Bronze	Bronze	Bronze	Steel
26	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
27	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
28	Brass	Brass	Brass	Brass
29	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
30	Bronze	Bronze	Bronze	Carbon Steel
31	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
32	Bronze	Bronze	Bronze	Carbon Steel
33	Steel	Steel	Steel	Steel
34	Brass	Brass	Brass	Brass
35	Brass	Brass	Brass	Brass
36	Bronze	Bronze	Bronze	Bronze
37	Bronze	Bronze	Bronze	Bronze
38	Brass	Brass	Brass	Brass
42	NAF	NAF	NAF	NAF
43	NAF	NAF	NAF	NAF
44	Steel	Stainless Steel	Stainless Steel	Stainless Steel
48	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
49	Bronze	Bronze	Bronze	N/A
50	Copper	Copper	Copper	N/A
51	Bronze	Bronze	Bronze	N/A
52	Bronze	N/A	N/A	N/A
53	Monel	Monel	Monel	N/A
54	Steel	Steel	Steel	N/A
55	Steel	Steel	Steel	N/A
61	Nylon	Nylon	Nylon	Nylon
68	Copper	Copper	Copper	Copper
69	Brass	Bronze	Bronze	Carbon Steel
70	NAF	NAF	NAF	NAF

TECHNICAL SPECIFICATION - G4 reducing valves

Figure Number	Size Range mm	Connections	MATERIALS			PRESSURE Barg		TEMP.
			Body	Pilot Top	Main Valve Trim	Inlet Min-Max	Outlet Min-Max	Deg.C Min-Max
2042	15-50	Screwed	Bronze	Bronze	St Steel	0.7-35§	0.07-21	-20 to +260
†2042GN	15-50	Screwed	Bronze	Bronze	Nitrile	0.7-31	0.07-21	-20 to +100
†2042GV	15-50	Screwed	Bronze	Bronze	Viton	0.7-31	0.07-21	-18 to +150
†2042GP	15-50	Screwed	Bronze	Bronze	PTFE	0.7-35	0.07-21	-20 to +170
2043	15-50	Flanged	Bronze	Bronze	St Steel	0.7-35§	0.07-21	-20 to +260
†2043GN	15-50	Flanged	Bronze	Bronze	Nitrile	0.7-31	0.07-21	-20 to +100
†2043GV	15-50	Flanged	Bronze	Bronze	Viton	0.7-31	0.07-21	-18 to +150
†2043GP	15-50	Flanged	Bronze	Bronze	PTFE	0.7-35	0.07-21	-20 to +170
2044	65-150*	Flanged	Carbon St.	Bronze	St Steel	0.7-16π§	0.07-15π§	-20 to +220
2044GP	65-150*	Flanged	Carbon St.	Bronze	PTFE	1.0-16	0.07-15π	-20 to +170
2045	65-150*	Flanged	Carbon St.	Bronze	St Steel	0.7-35π§	0.35-21π§	-20 to +260
2045GP	65-150*	Flanged	Carbon St.	Bronze	PTFE	1.0-35	0.07-21§	-20 to +170
2046	15-100	Flanged	Carbon St.	Carbon St.	St Steel	0.7-42π§	0.35-21π§	-20 to +400
#2046GN	15-50	Flanged	Carbon St.	Carbon St.	Nitrile	0.7-31	0.35-21	-20 to +100
#2046GV	15-50	Flanged	Carbon St.	Carbon St.	Viton	0.7-31	0.35-21	-18 to +150
#2046GP	15-100	Flanged	Carbon St.	Carbon St.	PTFE	1.0-42	0.35-21π	-20 to +170

The pressures and temperatures in this table are the maximum for the model shown, restrictions apply as shown below.

Note: When outlet pressure is less than 0.35 Barg a low pressure top will be fitted.

† 'G' for gas duty can be replaced by 'O' for oxygen duty.

‡ When a stainless steel spring is fitted the maximum outlet pressure is 10.5 Barg.

15/20/25mm are all fitted into the 25mm body (1" flanges).

32/40/50mm are all fitted into the 50mm body (2" flanges).

π Air service restrictions see below.

§ Steam service restrictions see below.

* A 150mm body can be offered with a restricted main valve to give a 125mm size flow rate.

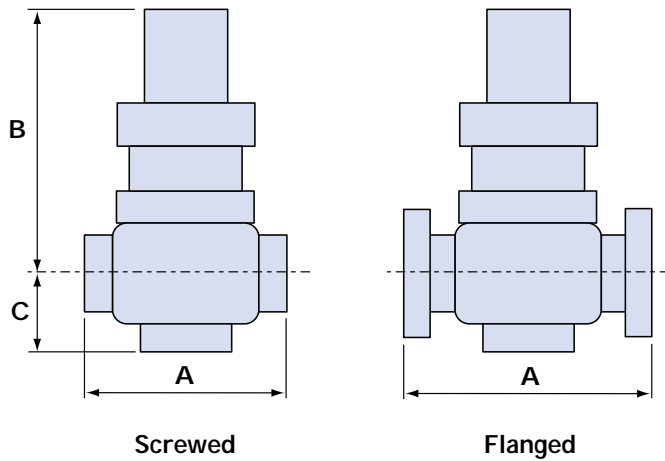
§ - Steam Service Restrictions

Figure Number	Restriction on:	Restriction
2042	Inlet	25 Barg to 225°C/17 Barg to 260°C
2043	Inlet	25 Barg to 225°C/17 Barg to 260°C
2044	Inlet	13 Barg Max
2044	Outlet	12 Barg Max
2045	Inlet	65-150mm 25 Barg to 225°C/17 Barg to 260°C
2045	Outlet	65-100mm 21 Barg to 225°C/16 Barg to 260°C
2045	Outlet	125-150mm 12 Barg Max
2046	Inlet	42 Barg to 280°C/32 Barg to 400°C
2046	Outlet	125-100mm 12 Barg Max

π - Air Service Restrictions

Figure Number	Restriction on:	Restriction
2044	Inlet	16 Barg to 120°C/13 Barg to 220°C
2044	Outlet	65-100mm 15 Barg to 120°C/12 Barg to 220°C
2044	Outlet	125-150mm 12 Barg
2045	Inlet	65-150mm 35 Barg to 170°C/17 Barg to 260°C
2045	Outlet	65-100mm 21 Barg to 170°C/16 Barg to 260°C
2045	Outlet	125-150mm 12 Barg Max
2046	Inlet	42 Barg to 280°C/32 Barg to 400°C
2046	Outlet	125-100mm 12 Barg

DIMENSIONS



CONNECTION OPTIONS

Screwed BSP**	API/NPT
Flanged BS4504 PN**	ANSI, BS10

**Standard item.

Valve type	Size	Connection	A			B		C		Weight kg
			ins	mm	DIN flange mm	ins	mm	ins	mm	
Fig 2042 Screwed Bronze	15mm	½" BSP	4.125	105	–	8	203	2.375	60	6
	20mm	¾" BSP	4.125	105	–	8.25	210	2.5	64	6.8
	25mm	1" BSP	4.5	114	–	8.375	213	2.625	67	7
	32mm	1¼" BSP	4.875	124	–	9.625	244	3	76	10.8
	40mm	1½" BSP	5.25	133	–	9.875	251	3.125	79	12.7
	50mm	2" BSP	6.375	162	–	10.25	260	3.25	83	15.4
Fig 2043 Flanged Bronze	15mm	½"	5.5	140	130*	8	203	2.375	60	8
	20mm	¾"	5.625	143	150*	8.25	210	2.5	64	8.6
	25mm	1"	6.75	171	160*	8.375	213	2.625	67	9
	32mm	1¼"	7	178	180*	9.625	244	3	76	13.6
	40mm	1½"	7.5	191	200*	9.875	251	3.125	79	16.3
	50mm	2"	8.5	216	230*	10.25	260	3.25	83	20.8
Fig 2044 Flanged Carbon Steel (Brz. top)	65mm	2½"	10	254	254	11.25	286	5.125	130	38
	80mm	3"	11.25	286	286	11.25	286	5.75	146	56
	100mm	4"	13.5	343	343	12.75	324	7	178	80
	125mm	6"	16.5	419	419	16.5	419	9.75	248	174
	150mm	6"	16.5	419	419	16.5	419	9.75	248	174
Fig 2045 Flanged Carbon Steel (Brz. top)	65mm	2½"	10	254	254	11.25	286	5.125	130	38
	80mm	3"	11.25	286	286	11.25	286	5.75	146	56
	100mm	4"	13.5	343	343	12.75	324	7	178	80
	125mm	6"	16.5	419	419	16.5	419	9.75	248	174
	150mm	6"	16.5	419	419	16.5	419	9.75	248	174
	Fig 2046 Flanged Carbon Steel (C.S. top)	15mm	1"	6.75	171	230†	8.375	213	2.75	70
20mm		1"	6.75	171	230†	8.375	213	2.75	70	13.5
25mm		1"	6.75	171	230†	8.375	213	2.75	70	13.5
32mm		2"	9	229	229	10.5	267	3.5	89	26.3
40mm		2"	9	229	229	10.5	267	3.5	89	26.3
50mm		2"	9	229	229	10.5	267	3.5	89	26.3
65mm		2½"	10	254	254	11.25	286	5.125	130	42
80mm		3"	11.25	286	286	11.25	286	5.75	146	52
100mm		4"	13.5	343	343	12.75	324	7	178	87

Face to face dimensions are in accordance with

*Din 3300 (PN40)

†Din 3300 (PN64)