



TECHNICAL BULLETIN

Audco

























Iron Taper Plug Valve

FCD AUEETB0002-01 06/13



Range and Index

Regular Pattern  Short Pattern 

	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	600	Pg	
	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16	18	24		
Standard Type Screwed ends/ Flanged																				9	
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MW14	MRW144GG	9	BG 13	BRG133GG	10
MW 11	MRW1DDGG	9	LW 11	MSW1DDGG	11
MW 11F	MRW1FFGG	9	LW 13	MSW133GG	11
MW 13	MRW133GG	9	LG 11	MSG1DDGG	11
BG 11	BRG1DDGN	10	LG 13	MSG133GG	11

Principles and Maintenance

Principles of Operation

The Audco Taper Plug Valve, manufactured in sizes from ½” to 12”, is used on a wide variety of liquid, gaseous and slurry services.

The tapered plug is held firmly into its tapered seat but can be so adjusted that complete leaktightness is achieved together with smooth valve operation. The tapered seating surfaces of the plug and body are not exposed to the line fluid when the valve is in the open position, so that the effects of corrosion and erosion are confined to the less important parts of the valve. Also since there is a straight flowpath through the valve, there is very little resistance to flow and pressure loss is minimised.

Super LoMu Treatment

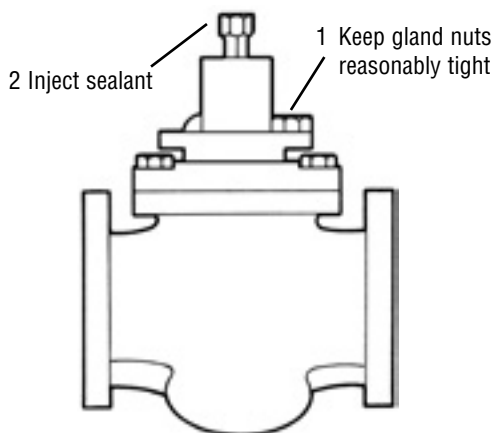
All Cast Iron taper plug valves, sizes 1½” and above, have plugs with Audco Super LoMu treatment. In this unique process, low friction PTFE is incorporated in the surface structure of the valve plug metal. This gives easier operation and enhanced resistance to taper lock over thousands of operations or many years of service.

Sealant Type

Valves in this catalogue are normally filled with 733 sealant during assembly.

If you require a sealant different from normal, please state this at the ordering stage so that the valve can be assembled with the correct sealant.

In those cases where no previous experience exists regarding the suitability of the normal sealant for the line fluid on which the valve is to be used, please provide full service details so that we may ensure that the correct type of sealant is used in the assembly of the valve.



Consult SAV full Overhaul & Repair Manual, available on request, before attempting any maintenance operations other than those described here.

Maintenance

Lubrication of the seating surfaces is by means of a specially compounded valve sealant which is fed into the operating shank of the valve, either in the form of mastic sticks or by sealant gun. The sealant then passes through a non-return valve into a system of grooves and ducts on the plug and body.

As the valve is operated, a film of sealant is spread evenly between the seating surfaces and, if a valve should become difficult to turn, sealant pressure may be built up in the small end chamber underneath the plug, so that the plug is eased slightly in its seat and operability is restored.

The design of the sealant system ensures that any sealant groove which is exposed to the line fluid during operation, is isolated from the sealant supply. Thus loss of sealant into the pipeline is avoided.

As well as facilitating valve operation, the special sealant also perfects the seal between the accurately matched seating surfaces and so assures positive leaktightness.

Audco sealants are specially formulated for use in Audco valves. It is extremely important that only Audco sealant be used as they retain their properties over a wide temperature range, resist corrosive attack and have many other characteristics necessary for the efficient operation of Audco Valves. Similarly, Audco sealant should not be used for any purpose other than injecting into Audco taper plug valves in the way described in our operating instructions, except with our express recommendation.

Sealant Injection

The frequency of the sealant injection and the quantity of sealant needed will depend on many factors specific to the particular duty. The operating regime of the valve, the temperature and pressure of the fluid, the age and condition of the valve are all important factors. Most important of all is the composition and nature of the line fluid and especially its effect on the recommended sealant. All of these variables make it difficult to make positive recommendations which would apply to all circumstances, but the following table provides a useful starting point in determining the maintenance requirement of a particular requirement:-

Frequency of Valve Operation	On average valve should be lubricated	
	Not more than	Not less than
Over 100 times per shift.....	Each shift	Weekly
10 to 100 times per day.....	Daily	Weekly
1 to 10 times daily.....	Weekly	Monthly
1 to 30 times monthly.....	Monthly	Quarterly
Less frequently.....	Quarterly	Twice Annually

Sealants

Audco sealants are formulated specially for use in Audco valves and no other types of sealant should be used, nor should Audco valve sealants be used for any purpose other than injecting into Audco plug valves without our express recommendation.

Multi-purpose Plug Sealants

Sealant	Form	Colour	Temp Range °C (°F)		Recommended for	Do not use on
			Min	Max		
733	K Sticks Cartridges Bulk	Cream	-20 (-5)	250 (480)	Most Hydrocarbon services, Butane, propane, gasoline, kerosene, oils, fuel oils, most hydrocarbon solvents. Sweet and sour natural and manufactured gas with water organic condensates, LPG systems, glycols	Strong alkali and high aromatic and chlorinated solvents
735	K Sticks Hard grade Bulk only	Black	-40 (-40)	325 (620)	Premium Multipurpose Sealant suitable for a range of fluids including hydrocarbon, water, amines and methanol Suitable for high / low temperature applications	Neat petroleum products Strong mineral acids Chlorinated and aromatic acids
731	K Sticks Cartridges Bulk	Cream	-15 (0) -20 (-5) -25 (-13)	230 (450) 230 (450) 230 (450)	Most chemical plant services, compressed air, water, aqueous solutions, dilute acids, all alkaline solutions tars and bitumens	Strong acid solutions, hydrocarbons, chlorinated and aromatic solvents

* Temperature range is dependent upon nature of service.

Specialised Plug Sealants

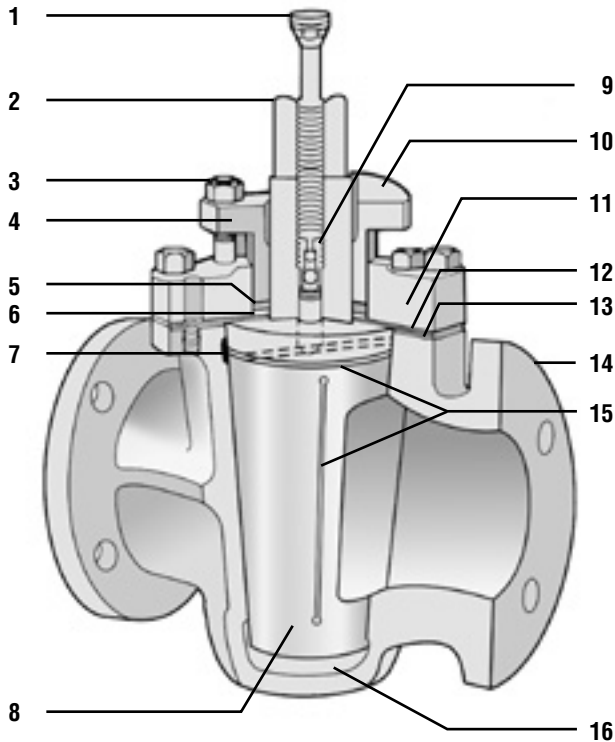
Sealant	Form	Colour	Temp Range °C (°F)		Recommended for	Do not use on
			Min	Max		
985	K Sticks Cartridges Soft grade Bulk only	Light Brown	-10 (12)	150 (300)	Sweet and sour natural and manufactured gas with water/organic condensates Preferred at elevated temperatures	As 733
201	K Sticks Cartridges Bulk	White	-7 (-20)	200 (390)	Domestic water services, foodstuffs and pharmaceuticals	As 731
147	K Sticks Cartridges Bulk	White	-10 (14)	70 (160)	Nitrating acids, sulphuric acid and other oxidising elements	Hydrocarbon chlorinated and aromatic solvents
563	K Sticks Cartridges Bulk	Yellow	-10 (14)	150 (300)	Chlorinated and aromatic hydrocarbon solvents	Strong acids, nitrating acids, water and water based services and alcohols
734	K Sticks Cartridges Bulk	Cream	0 (32)	170 (340)	Water, high pressure, hot water and steam	As 731
591	K Sticks Cartridges Bulk	Cream	0 (32)	300 (570)	Petroleum based heat transfer oils. Hot fuel oil to 120°C	As 733
608	K Sticks Cartridges Bulk	Off White	0 (32)	340 (650)	Hot hydrocarbon gases and vapours including high temperature cracking and reforming Strong acids and alkalis to 150°C	Aromatic and chlorinated solvents Liquid hydrocarbons and nitrating acids
733LT	K Sticks Cartridges Bulk	Brown	-30 (-20) -46 (-50)	150 (300) 100 (200)	As for 733, but particularly useful at lower temperatures and winter conditions	As for 733

Standard Construction

Audco Standard Type Valve

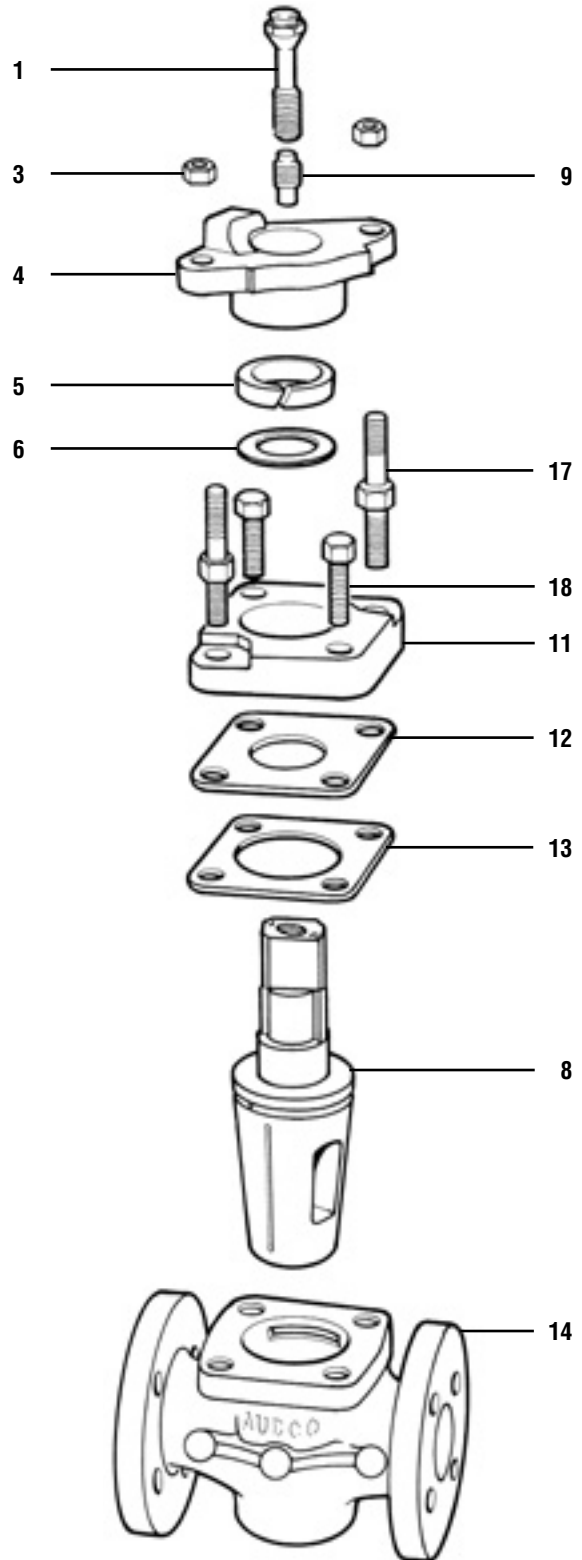
The Audco Standard type valve has its integral operating shank at the large end of the taper plug. The plug is seated by means of forces applied through the gland packing housed in the cover which also seals the shank against leakage.

To prevent damage to the packing where it would otherwise rub on the top of the plug, it bears on a metal shim which is clamped between the body and the cover. This reduces friction between the plug and the packing and also acts as a separate and very effective seal against leakage of the line fluid into the packing space.



- | | |
|----------------------|--------------------|
| 1 Sealant Injector * | 10 Stop |
| 2 Indicator | 11 Cover |
| 3 Gland Nuts | 12 Shim |
| 4 Gland | 13 Gasket |
| 5 Gland Packing | 14 Body |
| 6 Packing Ring | 15 Sealant Grooves |
| 7 Sealant Duct | 16 Sealant Chamber |
| 8 Plug | 17 Gland Studs |
| 9 Check Valve | 18 Cover Bolts |

* Sealant Screw (up to 40mm)

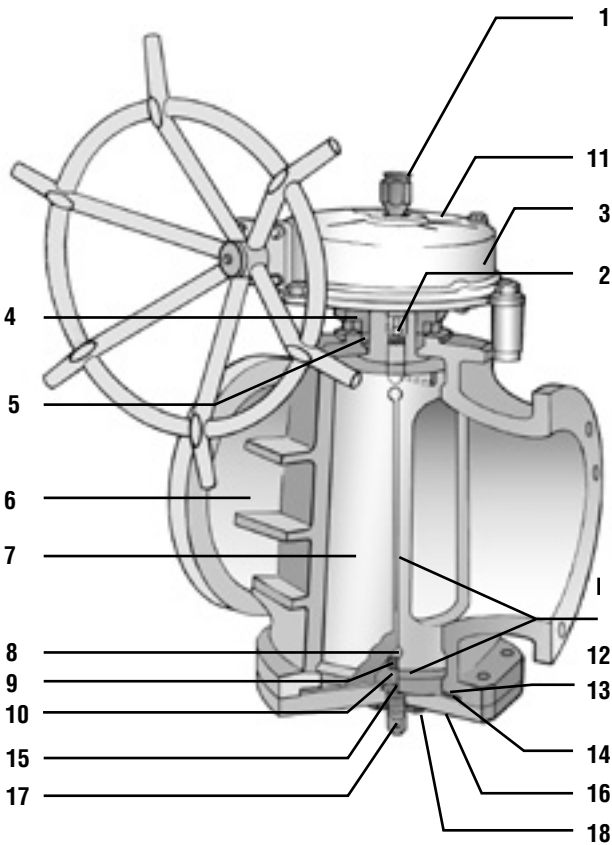


Standard Construction

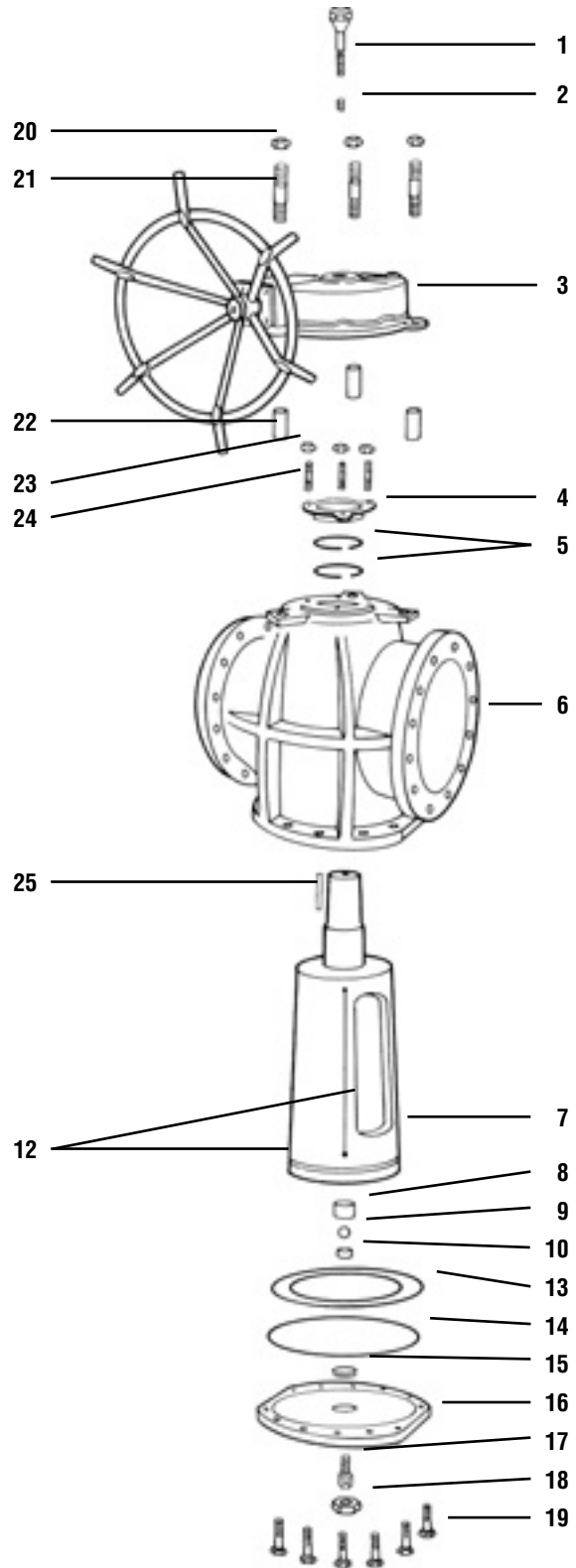
Audco Inverted Type Valve

The larger sizes of Audco Regular Pattern valves are of the INVERTED TYPE. In this design, the plug tapers towards its upper end and is firmly seated by means of a loading screw passing through the cover which seals the valve base.

The sealant chamber is at the upper end of the plug, and the plug seating is independent of the gland, which serves only to seal the plug shank against leakage to atmosphere. These large valves are normally operated by a worm gear unit and handwheel.



- | | |
|--------------------|-----------------------|
| 1 Sealant Injector | 14 Diaphragm |
| 2 Check Valve | 15 Pressure Plate |
| 3 Gear Unit | 16 Cover |
| 4 Gland | 17 Plug Loading Screw |
| 5 Gland Packing | 18 Locknut |
| 6 Body | 19 Cover Bolts |
| 7 Plug | 20 Gear Unit Nuts |
| 8 Plug Ball Seat | 21 Gear Unit Studs |
| 9 Ball | 22 Distance Pieces |
| 10 Ball Seat | 23 Gland Stud Nuts |
| 11 Indicator | 24 Gland Studs |
| 12 Sealant Grooves | 25 Key |
| 13 Joint Ring | |



Materials and Figure Numbers

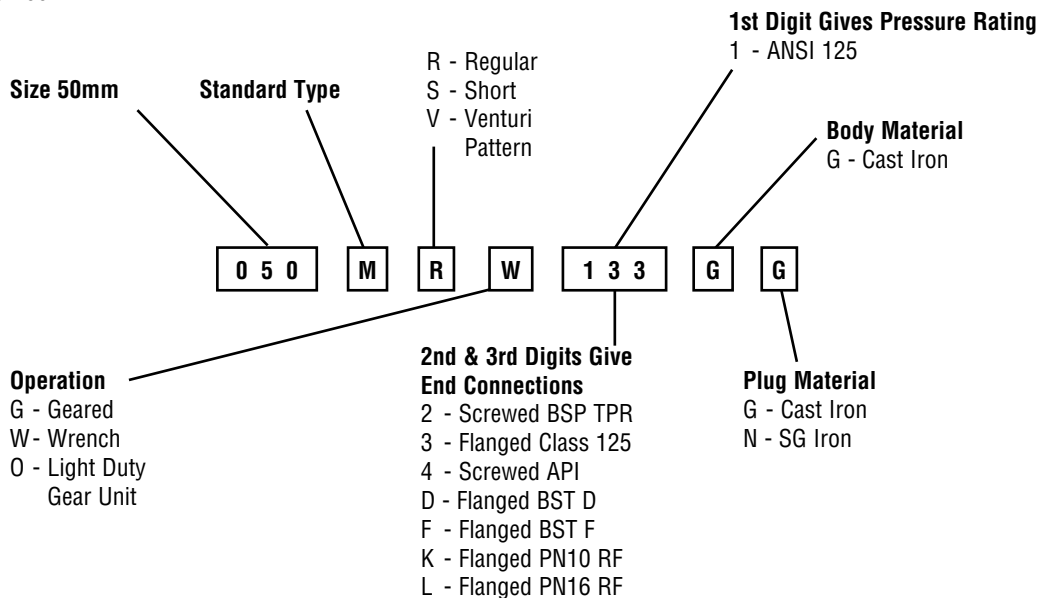
Body and Plug Materials

	SAV Specification	Used for	Comparable Specifications
GREY IRON	ASTM A278 NO.30 / NO.40	Body, Plug, Cover & Gland	BS EN 1561 EN-JL1030 / EN-JL1040

Figure Numbering

A familiarity with our figure number system is not necessary when specifying or ordering our valves. Providing a full description of the valve is given, our Sales Office will translate this into a figure number. A full description of the valve would begin with "Audco Iron Plug Valve", and would then go on to give size, pressure rating, flanging details etc.

We give an example below in order to illustrate figure number, but if a fuller explanation is required please request Standards Sheet 0028-4001.



Standards and Patterns

Cast iron plug valves with threaded ends or with flanges, for general purposes, are covered in BS5158. Flanges conform to BS EN 1092-2 or ANSI B16.1

The valves in this catalogue are shown as Regular, Short or Venturi Pattern. The different patterns vary as regards end-to-end dimensions and port area for a given size of valve and conform to BS5158 definitions.

Regular pattern valves have end-to-end dimensions in accordance with BS5158 Long and ANSI B16.10. The plug ports of these valves are rectangular in shape but are substantially full area giving the minimum flow restriction for a given size of valve.

Short pattern valves have end-to-end dimensions in accordance with BS5158 Short and ANSI B16.10. which make them interchangeable with Class 125 and Class 150 gate valves. As a consequence of this short end-to-end dimension, port area is reduced compared with regular pattern valves and the change in shape from circular pipe bore to rectangular plug port is more abrupt.

Venturi pattern valves have end-to-end dimensions in accordance with BS5158 Long and ANSI B16.10. The plug port area is reduced but the change in shape of the flow passage is sufficiently gradual to produce a venturi shape which allows significant pressure recovery. These valves are ideally suited for all normal pipeline applications, particularly in the larger sizes where there is a considerable saving in weight and cost.

Test Pressures

VALVE	ENDS	C.W.P.		TEST PRESSURES (Hydrostatic)			
		lbf/in ²	bar	Shell		Seat	
				lbf/in ²	bar	lbf/in ²	bar
MRW/O	BST D	100	6.9	225	15.5	165	11.4
	BST F	150	10.3				
	BSP Tr	150	10.3				
	ANSI 125	200	13.8	300	20.7	220	15.2
	NPT	200	13.8				
	PN 10	145	10				
	PN 16	232	16				
BRG ≤ DN 300	BST D	100	6.9	300	20.7	220	15.2
	BST F	150	10.3				
	ANSI 125	200	13.8				
	PN 10	145	10	218	15	160	11
	PN 16	232	16	348	24	255	17.6
BRG ≤ DN 350	BST D	100	6.9	225	15.5	165	11.4
	BST F	150	10.3				
	ANSI 125	150	10.3				
	PN 10	145	10	218	15	160	11
MSW/G/O	BST D	100	6.9	300	20.7	220	15.2
	ANSI 125	200	13.8				
	PN 10	145	10	218	15	160	11
	PN 16	232	16	348	24	255	17.6

All of the above conform with BS 5158 and BS 6755 Part 1.

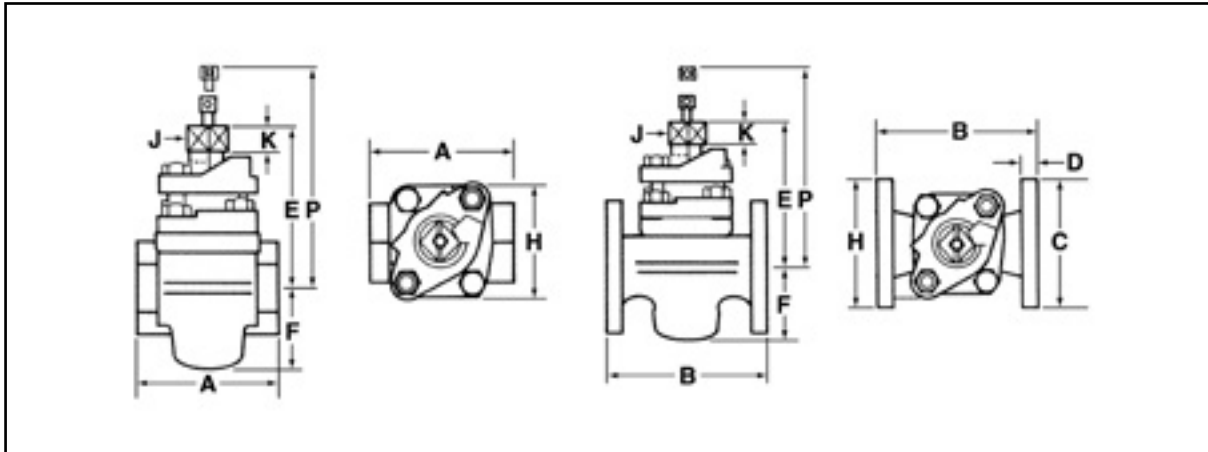
Test Duration

Each relevant standard defines the minimum length of time for which each test pressure is to be maintained and also the testing operations sequence.

These durations will be adhered to unless a different specification is required against a particular order. If, once fitted into the line, a valve is to be subjected to a greater test pressure or a longer duration of test, then this should be specified and this can be covered at the inspection stage of the finished valve before painting.

Regular Pattern, Standard Type

MRW122GG	Screwed BSP Tr	15-100mm	MRW1DDGG	Flanged BST D	15-200mm
MRW144GG	Screwed NPT	15-100mm	MRW1FFGG	Flanged BST F	15-200mm
			MRW133GG	Flanged ANSI 125	12-200mm

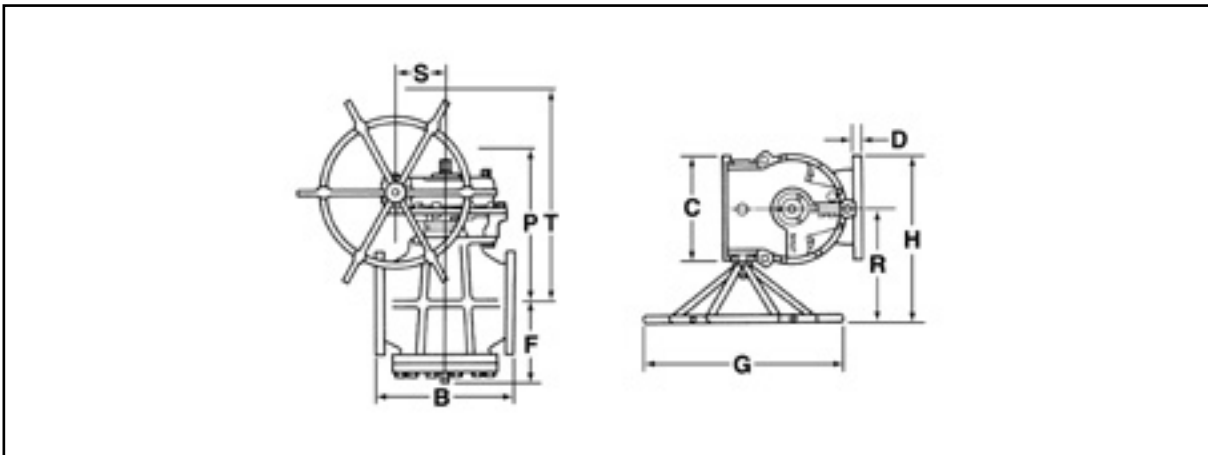


			15	20	25	40	50	65	80	100	125	150	200
A	End-to-end screwed	mm	89	95	111	133	152	-	-	-	-	-	-
B	Face-to-face flanged	mm	121	121	140	165	203	222	241	305	356	394	457
C	Flange diameter BST D	mm	95.3	102	114	133	152	165	184	216	254	279	337
C	Flange diameter BST F	mm	95.3	102	146	140	165	184	203	229	279	305	368
C	Flange diameter ANSI 125	mm	88.9	98.4	108	127	152	178	190	229	254	279	343
D	Flange thickness BST D	mm	12.7	12.7	12.7	15.9	19	19	19	22.2	23.8	25.4	25.4
D	Flange thickness BST F	mm	12.7	12.7	12.7	15.9	19	19	19	23.8	25.4	25.4	28.6
D	Flange thickness ANSI 125	mm	12.7	12.7	12.7	15.9	19	19	19	23.8	23.8	25.4	28.6
E	CL to top of stem	mm	100	114	121	157	173	197	227	248	243	327	402
F	CL to bottom of body	mm	35	46	50	65	76	92	108	137	164	186	232
H	Maximum width of body	mm	86	101	91	110	127	145	152	220	260	290	350
J	Size of plug square	mm	19	22.2	22.2	27	31.8	38.1	41.3	47.6	50.8	50.8	58.7
K	Depth of plug square	mm	20.6	20.6	20.6	25.4	28.6	30.2	49.2	50.8	54	54	66.7
P	Clearance to remove sealant screw	mm	154	162	175	213	250	273	318	338	416	450	524
U	CL to end of fitted wrench	mm	152	229	229	330	381	457	559	711	1016	1016	1016
	Weight (approx) screwed	kg	1.6	2.7	3.8	7.3	11	-	23	41	-	-	-
	Weight (approx) flanged	kg	3	4.5	5.4	10	14	21	27	51	81	100	182
	Wrench number		2	3H	3H	4H	5H	6H	7H	8H	10H	10H	11H
	Sealant stick size		A	A	A	B	C	C	D	D	E	E	E

Regular Pattern, Inverted Type

Regular Pattern

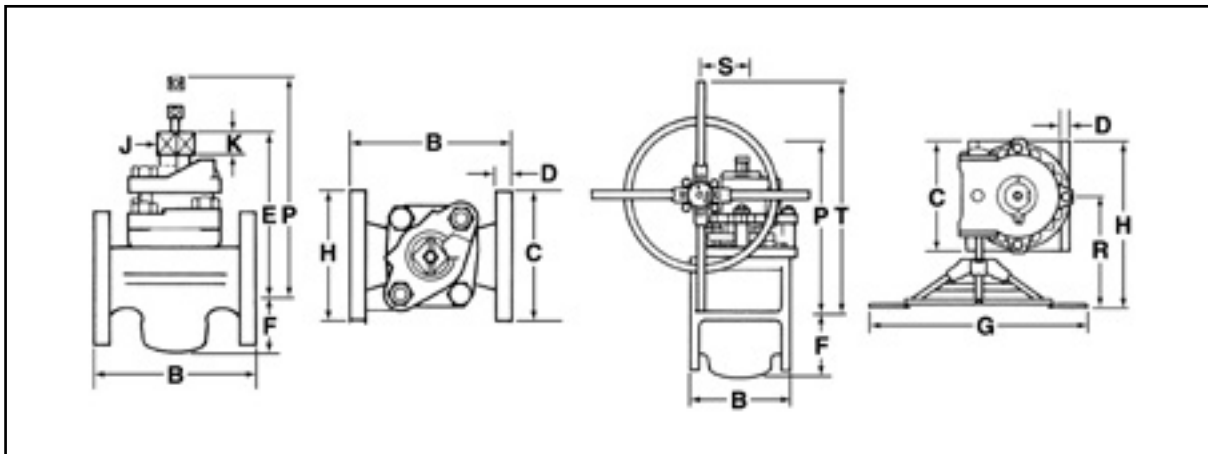
- BRG1DDGN** Flanged BST D
- BRG1FFGN** Flanged BST F
- BRG133GN** Flanged ANSI 125
- BRG1KKGN** Flanged PN10 RF
- BRG1LLGN** Flanged PN16 RF



			250	300	350	400
B	Face-to-face flanged	mm	533	610	610	686
C	Flange diameter BST D	mm	406	457	527	578
C	Flange diameter BST F	mm	432	489	552	610
C	Flange diameter ANSI 125	mm	406	483	533	597
C	Flange diameter PN10	mm	395	445	505	565
C	Flange diameter PN16	mm	405	460	520	580
D	Flange thickness BST D	mm	30.2	31.8	34.9	36.5
D	Flange thickness BST F	mm	30.2	31.8	34.9	36.5
D	Flange thickness ANSI 125	mm	30.2	31.8	34.9	36.5
D	Flange thickness PN10	mm	28	28	30	32
D	Flange thickness PN16	mm	32	32	36	38
F	CL to bottom of body	mm	311	350	375	416
G	Handwheel diameter	mm	578	787	787	787
H	Maximum width	mm	511	680	680	713
P	Clearance to remove sealant injector	mm	607	654	649	702
R	CL to face of handwheel	mm	308	437	437	437
S	CL valve to CL operating spindle	mm	105	195	195	195
T	CL valve to top of handwheel	mm	726	862	851	900
	Weight (approx)	kg	406	546	564	682
	Sealant stick size		E	E	E	E

Short Pattern, Standard Type

MSW1DDGG	Flanged BST D	50-250mm	MSG1DDGG	Flanged BST D	250 & 300mm
MSW133GG	Flanged ANSI 125	50-250mm	MSG133GG	Flanged ANSI 125	250 & 300mm
MSW1KKG	Flanged PN10 RF	50-250mm	MSG1KKG	Flanged PN10 RF	250 & 300mm
MSW1LLGG	Flanged PN16 RF	50-250mm	MSG1LLGG	Flanged PN16 RF	250 & 300mm



			50	65	80	100	150	200	250	250	300
B	Face-to-face	mm	178	191	203	229	267	292	330	330	356
C	Flange diameter BST D	mm	152	178	191	229	279	343	406	406	457
C	Flange diameter ANSI 125	mm	152	165	184	216	279	343	406	406	483
C	Flange diameter PN10	mm	152	178	191	229	279	343	395	395	445
C	Flange diameter PN16	mm	152	178	191	229	279	*	405	405	460
D	Flange thickness (all Standards)	mm	19.1	19.1	19.1	23.8	25.4	28.6	30.2	30.2	31.8
E	CL to top of stem	mm	156	173	202	227	294	327	364	-	-
F	CL to bottom of body	mm	71	87	101	114	175	180	220	220	290
G	Handwheel diameter	mm	-	-	-	-	-	-	-	578	578
H	Maximum width	mm	105	125	145	152	280	343	381	524	554
J	Size of plug square	mm	27	31.8	38.1	41.3	50.8	50.8	50.8	-	-
K	Depth of plug square	mm	25.4	28.6	30.2	33.3	54	54	54	-	-
P	Clearance to remove sealant injector	mm	213	252	278	318	416	450	483	537	597
R	CL to face of handwheel	mm	-	-	-	-	-	-	-	308	308
S	CL valve to CL operating spindle	mm	-	-	-	-	-	-	-	105	105
T	CL valve to top of handwheel	mm	-	-	-	-	-	-	-	680	718
U	CL to end of fitted wrench	mm	330	381	457	559	1016	1016	-	-	-
	Weight (approx)	kg	13	18	25	34	82	112	168	186	270
	Wrench number		4H	5H	6H	7H	10H	10H	-	-	-
	Sealant stick size		B	C	C	D	E	E	E	E	E
	Number of tapped holes in each flange	BST D	0	0	0	0	2	4	2	2	8
	Number of tapped holes in each flange	ANSI 125	0	0	0	0	2	2	4	4	8
	Number of tapped holes in each flange	PN10	0	0	0	0	2	2	4	8	8
	Number of tapped holes in each flange	PN16	0	0	0	0	2	*	4	8	8

* Consult Audco Valves