
British Standard Specification for
**Face-to-face, centre-to-face, end-to-end and
centre-to-end dimensions of valves**

Dimensions face-à-face, face à axe, entre extrémités et axe à extrémité des appareils de robinetterie –
Spécifications

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Foreword

This revision of this British Standard has been prepared under the direction of the Piping Systems Components Standards Policy Committee and supersedes BS 2080 : 1974 which is withdrawn.

The main differences between this British Standard and BS 2080 : 1974 are as follows.

- (a) Dimensions of steel valves used for general purposes are included for the first time in addition to dimensions for steel valves for use in the petroleum, petrochemical and allied industries.
- (b) Dimensions of cast iron and copper alloy valves for general purposes are included for the first time.
- (c) The general format is based on that given in ISO 5752 published by the International Organization for Standardization (ISO). Table 1 indicates where each series of valve dimensions is equivalent to an ISO 5752 basic series and also gives the origin of the series.

Although not included in ISO 5752, this British Standard has retained face-to-face and centre-to-face dimensions of valves with ring-joint flanges in accordance with BS 1560 : Section 3.1. It has also retained end-to-end and centre-to-end dimensions for butt-weld end valves and the rules for establishing face-to-face and centre-to-face dimensions of valves with flanges in accordance with BS 1560 : Section 3.1 but with facings other than 1.6 mm or 6.4 mm raised face or ring joint.

Basic series numbers 51 to 65 in table 1 are the additional series needed to cover butt-weld end valves and those flanged valves detailed in British Standard valve product standards but which are not included in ISO 5752.

Series 15 and 17 detailed in ISO 5752 are not included in this British Standard because they are not in common use in the UK or included in any British valve product standard.

Dimensions given in table 1 but which are not in agreement with ISO 5752 or are not included in ISO 5752 are shown in bold type.

(d) Dimensions for Class 400 valves have been omitted as this rating is no longer in common use.

This British Standard applies when specified by any one of the following valve product standards:

BS 1414	BS 5153	BS 5159
BS 1868	BS 5154	BS 5160
BS 1873	BS 5155	BS 5163
BS 5150	BS 5156	BS 5351
BS 5151	BS 5157	BS 5352
BS 5152	BS 5158	BS 5353

In certain valve product standards 'short' and 'long' series of valves are listed but reference to these terms has been omitted in this British Standard. When the valve product standards are revised the terms 'short' and 'long' will be omitted and instead reference will be made to the 'basic series' given in this standard.

Although this British Standard is intended for use in conjunction with the appropriate valve product standard, it may be used for specifying face-to-face, centre-to-face, end-to-end and centre-to-end dimensions of valves not covered by product standards.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Amendment No. 1
published and effective from 15 May 1995
to BS 2080 : 1989

**Specification for face-to-face, centre-to-face, end-to-end and
centre-to-end dimensions of valves**

Obsolescence

Foreword

Delete the first paragraph and insert the following.

‘This British Standard has been reviewed under the direction of the Engineering Sector Board and should be regarded as obsolescent. Its use for new flanged valve designs is not therefore recommended, as it has been partly superseded by BS EN 558 : Part 1 : 1994 (PN designated) and BS EN 558 : Part 2 : 1994 (Class designated).

This standard will be withdrawn in due course on the publication of a European Standard for end-to-end dimensions for weld end valves.’

In paragraph 2, delete lines 1 and 2 and insert the following.

‘The main differences between this British Standard and BS 2080 : 1974, which has been withdrawn, are as follows.’

AMD 8434/May 1995

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Specification

1 Scope

This British Standard specifies the basic series of face-to-face, centre-to-face, end-to-end and centre-to-end dimensions for flanged and butt-weld end valves in steel, cast iron and copper alloy. The ranges of nominal size covered are ½ in to 42 in for Class designated valves in the range Class 125 to Class 2500 and DN 10 to DN 2000 in the range of nominal pressures PN 6 to PN 40.

NOTE 1. The full ranges of size and pressure are not applicable to all types of valve (see tables 2 to 24).

NOTE 2. PN 40 is a 'non preferred' nominal pressure and should be avoided for 'new design' valves.

NOTE 3. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply.

2.1 nominal size (DN). A numerical designation of size which is common to all components in a piping system other than components designated by outside diameters or by thread size.

It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions.

NOTE 1. Nominal size is designated by the letters DN followed by the appropriate reference number.

NOTE 2. This definition is identical to that given in ISO 6708.

2.2 nominal pressure (PN). A numerical designation which is a convenient round number for reference purposes.

All equipment of the same nominal size (DN) designated by the same PN number shall have compatible mating dimensions.

NOTE 1. The maximum allowable working pressure depends on materials, design and working temperatures, and should be selected from the tables of pressure/temperature ratings given in the appropriate standards.

NOTE 2. Nominal pressure is designated by the letters PN followed by the appropriate reference number.

NOTE 3. This definition is identical to that given in ISO 7268.

2.3 face-to-face dimension (for straight pattern flanged end valves). The distance, expressed in millimetres, between the two planes perpendicular to the valve axis located at the extremities of the body end ports or as may be specified in the relevant valve product standard.

For butterfly valves, the distance between the extremities of the valve in the installed condition.

2.4 centre-to-face dimension (for angle pattern flanged end valves). The distance, expressed in millimetres, between the plane located at the extremity of either body end port and perpendicular to its axis and the axis of the other body end port.

2.5 end-to-end dimension (for straight pattern butt-weld end valves). The distance, expressed in millimetres, between the extremities of the body end ports.

2.6 centre-to-end dimension (for angle pattern butt-weld end valves). The distance, expressed in millimetres, between the intersection of the axes of the two branches and the extremities of the body end ports.

3 Dimensions

The basic series of face-to-face, centre-to-face, end-to-end and centre-to-end dimensions, expressed in millimetres, shall be as given in table 1.

NOTE 1. Each series of dimensions in table 1 lists the full range of sizes covered in the original national standard for that series. Individual valve product standards may not call up every size from the original series and this is reflected in tables 2 to 24. Any dimensions listed in tables 2 to 24 which are not in accordance with table 1 are indicated by notes in the relevant table.

NOTE 2. Dimensions of valves having flanges in accordance with BS 1560 : Section 3.1 with ring-joint facings have been derived from the basic series given in table 1. To assist in the identification of those derived series they are designated in tables 3, 6, 9, 12, 15, 20 and 23 by the basic series number and the suffix letter R.

NOTE 3. To avoid the proliferation of new series of dimensions it is recommended that the dimensions for a range of valves are selected where possible from one series only and not from more than one series. Due consideration should also be given to the original national standard of the series in respect to the intended usage of the dimensions selected.

Valves shall have face-to-face, centre-to-face, end-to-end and centre-to-end dimensions given in tables 2 to 24, as appropriate, for the following types of body end connections.

(a) Flanged, flat face or raised face

NOTE 1. These are designated by face-to-face or centre-to-face dimensions and have the reference letters *A* or *E* respectively in tables 2, 5, 8, 11, 14, 17, 18, 19 and 22 and figure 1.

NOTE 2. Raised face is the regular flange facing for valves having flanges in accordance with the following:

BS 1560 : Section 3.1, Classes 150 to 2500 in steel

BS 1560 : Section 3.2, Class 250 in grey and ductile cast iron and Classes 150 and 300 in ductile cast iron

BS 4504 : Section 3.1, PN 6 to PN 40 in steel

BS 4504 : Section 3.2, PN 6 to PN 40 in grey cast iron and ductile cast iron.

Reference should be made to the relevant flange standard for the actual height of the raised face.

NOTE 3. Flat face is the regular flange facing for valves having flanges in accordance with the following:

BS 1560 : Section 3.2, Class 125 in grey and malleable cast iron

BS 1560 : Section 3.3, Classes 150 and 300 in copper alloy

BS 4504 : Section 3.2, PN 6 to PN 40 in malleable cast iron

BS 4504 : Section 3.3, PN 6 to PN 40 in copper alloy.

(b) Flanged, ring-joint facing

NOTE 1. Valves having steel flanges in accordance with BS 1560 : Section 3.1 with ring-joint facings are designated by face-to-face or centre-to-face dimensions and have the reference letters *B* and *F* respectively in tables 3, 6, 9, 12, 15, 20 and 23 and figure 2.

NOTE 2. The face-to-face dimension of valves with ring-joint facings, not included in tables 3, 6, 9, 12, 15, 20 and 23, is established by adding to the face-to-face dimension (dimension *A*) for the valves with raised face flanges the distance *X* given in table 25 (see appendix A). For angle

pattern valves the centre-to-face dimension is established by adding $X/2$ to the respective centre-to-face dimension (dimension B). Dimensions established by this method may be rounded to the nearest whole millimetre.

(c) *Flanged, other facings*

For valves having Classes 150 to 2500 flanges in accordance with BS 1560 : Section 3.1 with large or small male and female faces and large or small tongue and groove faces, the face-to-face or centre-to-face dimensions relative to dimensions A and E respectively shall be as indicated in figure 2.

NOTE. The face-to-face and centre-to-face dimensions of valves having flanges in accordance with BS 4504 : Section 3.1 but with other than raised or flat faces have not been established in this standard. It is recommended that the manufacturer is consulted for this information.

(d) *Butt-weld ends*

NOTE. These are designated by end-to-end or centre-to-end dimensions and have the reference letters D or G respectively in tables 4, 7, 10, 13, 16, 21 and 24 and figure 1.

(e) *Lined valves*

For valves other than butterfly type provided with resilient lining which extends over the pipe end flanges, the face-to-face dimension given in tables 2, 5, 11, 18, 19 and 22 shall be increased by the total thickness of the linings on the two flanges in the installed conditions.

For angle pattern valves, the thickness of the lining on one flange only shall be added to the centre-to-face dimension given in tables 8 and 14.

4 Tolerances

Unless specified otherwise in the individual valve product standard, the allowable tolerances for face-to-face, centre-to-face, end-to-end and centre-to-end dimensions given in tables 2 to 24 inclusive shall be as follows.

(a) **Face-to-face (dimension A) and end-to-end (dimension D)**

Valves sizes	Tolerance
10 in or DN 250 and smaller	± 2.0 mm
12 in or DN 300 and larger	± 3.5 mm

(b) **Centre-to-face (dimension B) and centre-to-end (dimension E)**

Valve sizes	Tolerance
10 in or DN 250 and smaller	± 1.0 mm
12 in or DN 300 and larger	± 2.0 mm

5 Flange, flange facing and butt-weld end dimensions

NOTE. For the dimensions of flanges and flange facings, reference should be made to BS 1560 : Sections 3.1, 3.2 or 3.3, BS 4504 : Sections 3.1, 3.2 or 3.3, BS 3293 or API Standard 605 as appropriate to the material, nominal size and rating. For the dimensions of butt-weld ends, reference should be made to the individual valve product standard.

Table 1. Face-to-face, centre-to-face, end-to-end and centre-to-end dimensions* (basic series)

Nominal size		ISO 5752 basic series																			
		1	2	3	4	5	7	8	9	10	11	12	13	14	16	18	19	20	21	24	25
		ISO 5752 basic series																			
		DIN 3202 : Part 1 : F1	DIN 3202 : Part 1 : F2	ANSI B16.10	ANSI B16.10	ANSI B16.10	BS 5156	DIN 3202 : Part 1 : F32	DIN 3202 : Part 1 : F33	ANSI B16.10	ANSI B16.10	ANSI B16.10 BS 5353	BS 5155	DIN 3202 : Part 1 : F4	API 609 BS 5155	BS 5154	ANSI B16.10	API 609 BS 5155	ANSI B16.10	ANSI B16.10	MSS SP 67
DN	in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
10		130	210	102				108	85	105											
15	½	130	210	108	140	165	108	90	105	108	57	130							152	83	
20	¾	150	230	117	152	190	117	95	115	117	64	130							178	95	
25	1	160	230	127	165	216	127	100	115	127	70	140				100	165		203/216†	108	
32	1¼	180	260	140	178	229	146	105	130	140	76	165				110	178		216/229†	114	
40	1½	200	260	165	190	241	159	115	130	165	83	165	106	140	33	120	190	33	229/241†	121	
50	2	230	300	178	216	292	190	125	150	203	102	203	108	150	43	135	216	43	267	146	
65	2½	290	340	190	241	330	216	145	170	216	108	222	112	170	46	165	241	46	292	165	
80	3	310	380	203	283	356	254	155	190	241	121	241	114	180	64	185	283	46	318	178	49
100	4	350	430	229	305	432	305	175	215	292	146	305	127	190	64	229	305	52	356	216	56
125	5	400	500	254	381	508	356	200	250	330†/356	165/178	356	140	200	70		381	56	400	254	64
150	6	480	550	267	403	559	406	225	275	356†/406	178/203	394	140	210	76		403	56	444	279	70
200	8	600	650	292	419/502‡	660	521	275	325	495	248	457	152	230	89		419	60	533†/559	330	71
250	10	730	775	330	457/568‡	787	635	325		622	311	533	165	250	114		457	68	622	394	76
300	12	850	900	356	502/648‡	838	749	375		698	349	610	178	270	114		502	78	711	419	83
350	14	980	1025	381	762	889		425		787	394	686	190	290	127		572	78	838	92	
400	16	1100	1150	406	838	991		475		864†/914	457	762	216	310	140		610	102	864		102
450	18	1200	1275	432	914	1092		500		978†/965	483	864	222	330	152		660	114	978		114
500	20	1250	1400	457	991	1194				978†/1067		914	229	350	152		711	127	1016		127
	22			483	1092	1295				1067		1016			170		749	154	1118		
600	24	1450	1650	508	1143	1397				1295†/1219		1067	267	390	178		787	154	1346		154
	26			559	1245	1448				1295					210			165	1346		
700	28	1650		610	1346					1448			292	430	229			165	1499		
750	30	1750		610	1397	1651				1524					230			190	1594		
800	32	1850		660		1778							318	470	241			190			
900	36	2050		711	1727	2083				1956			330	510	241			203	2083		
1000	42	2250		813	1981								410	550	300			216			
1200													470	630	350			254			
1400													530	710	390						
1600													600	790	440						
1800													670	870	490						
2000													760	950	540						
*Dimensions not given in ISO 5752 or which are different from those given in ISO 5752 are shown in bold type.																					
†Swing check valves only.																					
‡Full bore ball valves only.																					
Used for	Face-to-face	Flanged end valves	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓		✓
	Centre-to-face							✓	✓		✓									✓	
	End-to-end	Butt-weld end valves			✓	✓				✓									✓		
	Centre-to-end										✓									✓	

Table 1 (concluded)

Nominal size	BS 2080 basic series															
	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	
	Origin of basic series															
	ANSI B16.10	ANSI B16.10	ANSI B16.10	ANSI B16.10	ANSI B16.10	ANSI B16.10	ANSI B16.10	ANSI B16.10	ANSI B16.10 ISO 7121	ANSI B16.10	ANSI B16.10	ANSI B16.10	ANSI B16.10	BS 5154	BS 5154	BS 5155
DN in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
10																
15 ½	108		216 ⁺⁺	264 ¶	140				76		108	132	65	70		
20 ¾	117	229 ^{**}	229 ⁺⁺	273 ¶	152				89	114	114	137	70	75		
25 1	127	254 ¶	254 ¶	308 ¶	165				102	127	127	154	80	85		
32 1½	140	279 ¶	279 ¶	349 ¶	184				108	140	140	175	90	95		
40 1½	165	305 ¶	305 ¶	384 ¶	203	152		190	114	152	152	192	95	100		
50 2	216	368	368	451	229	178	267	216	133	184	184	225	105	115		
65 2½	241	419	419	508	279	216	305	273	146	210	210	254	115	125		
80 3	283	381	470	578	318	254	330	310	159	190	235	289	125	135	49	
100 4	305	457	546	673	368	305	356	350	178	229	273	337			56	
125 5	381	559	673	794		381			200	279	337	397			64	
150 6	403	610	705	914	470	457	457	457	222	305	352	457			70	
200 8	419	737	832	1022	597	584	521	521	279	368	416	511			71	
250 10	457	838	991	1270	673	711	559	559	311	419	495	635			76	
300 12	502	965	1130	1422	775	813	635	635	356	483	565	711			83	
350 14	572	1029	1257 §		889	762	762			514	629				127	
400 16	610	1130¶	1384¶			991	838	838		660					140	
450 18	660	1219¶	1537¶			1092	914			737					160	
500 20	711	1321¶	1664¶			1194	991			825					170	
22	762															
600 24	813	1549¶	1943¶			1397	1143			991					200	
26	902 §															
700 28	991 §															
750 30	991 §															
800																
900 36	1219 §															
1000 42	1397 §															
1200																
§ Dimensions are not in ANSI B16.10. ¶ Gate and swing check valves only. ¶ Not used for double disk and conduit gate valves. **Globe and check valves only. ++Globe, check and plug valves only.																
Flanged end valves		✓	✓	✓	✓	✓										✓
									✓	✓	✓	✓	✓	✓		
Butt-weld end valves	✓	✓	✓	✓	✓	✓	✓	✓								
									✓	✓	✓	✓				

Table 2. Gate valves, flanged ends, raised or flat facings

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
Nominal size		PN 6	PN 10/16 Class 125/150								PN 25/40 Class 250/300								Class 600			Class 900	Class 1500		Class 2500		
		Face-to-face dimension A (see figure 1)																									
		BS 5150 (see Note)	BS 1414	BS 5150	BS 5151	BS 5154		BS 5157	BS 5163	BS 5352	BS 1414	BS 5150	BS 5151	BS 5154		BS 5157		BS 5163	BS 5352	BS 1414	BS 5157		BS 5352	BS 1414	BS 1414	BS 5352	BS 1414
DN	in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
10				102		80	108							80	108												
15	½			108		80	108			108		140		80	108				140			165			216		
20	¾			117		90	117			117		152		90	117				152			190			229		
25	1		127	127		100	127			127	165	165		100	127				165	216		216		254	254	308	
32	1¼		140	140		110	146			140	178	178		110	146				178	229		229		279	279	349	
40	1½	140	165	165	165	120	159	165		165	190	190	190	120	159	190	190		190	241	152	241	241	305	305	384	
50	2	150	178	178	178	135	190	178	178	178	216	216	216	135	190	216	216	216	216	292	178	292	292	368	368	451	
65	2½	170	190	190	190	165	216	190	190		241	241	241	165	216	241	241	241		330	216	330		419		508	
80	3	180	203	203	203	185	254	203	203		283	283	283	185	254	283	283	283		356	254	356		381	470	578	
100	4	190	229	229	229	229	305	229	229		305	305	305	229	305	305	305	305		432	305	432		457	546	673	
125	5	200		254	254			254	254			381	381			381	381	381			381	508					
150	6	210	267	267	267			267	267		403	403	403			403	403	403		559	457	559		610	705	914	
200	8	230	292	292	292			292	292		419	419	419			419	419	419		660	584	660		737	832	1022	
250	10	250	330	330	330			330	330		457	457	457			457	457	457		787	711	787		838	991	1270	
300	12	270	356	356	356			356	356		502	502	502			502	502	502		838	813	838		965	1130	1422	
350	14	290	381	381	381			381	381		572	572	572			572	572	572		889	889	889		1029	1257		
400	16	310	406	406	406			406	406		610	610	610			610	610	610		991	991	991		1130	1384		
450	18	330	432	432	432			432	432		660	660	660			660	660	660		1092	1092	1092		1219	1537		
500	20	350	457	457	457			457	457		711	711	711			711	711	711		1194	1194	1194		1321	1664		
600	24		508	508	508			508	508		787	787	787			787	787	787		1397	1397	1397		1549	1943		
	26		559								1245																
700	28		610	610	620*						1346																
750	30		610								1397																
800				660	680*																						
900	36		711	711	740*						1727																
1000	42		813	811*	760*						1981																
Basic series		14	3	3	3	18	7	3	3	3	4	19	19	18	7	19	4	19	4	5	56	5	5	52	53	53	54

NOTE. Maximum cold working pressures/rating differs from ISO 5752.
Dimension differs from basic series in table 1.

Table 3. Gate valves, flanged ends, ring-joint facings

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Nominal size		Class 150			Class 300				Class 600				Class 900	Class 1500		Class 2500
		Face-to-face dimension <i>B</i> (see figure 2)														
		BS 1414	BS 5157	BS 5352	BS 1414	BS 5157		BS 5352	BS 1414	BS 5157		BS 5352	BS 1414	BS 1414	BS 5352	BS 1414
DN	in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
15	½			119				151				164			216	
20	¾			130				165				190			229	
25	1	140		140	178			178	216			216		254	254	308
32	1¼	152		152	190			190	229			229		279	279	352
40	1½	178	178	178	203	203	203	203	241	152	241	241		305	305	387
50	2	190	190	190	232	232	232	232	295	181	295	295		371	371	454
65	2½	203	203		257	257	257		333	219	333			422		514
80	3	216	216		298	298	298		359	257	359		384	473		584
100	4	241	241		321	321	321		435	308	435		460	549		683
125	5		267			397	397			384	511					
150	6	279	279		419	419	419		562	460	562		613	711		927
200	8	305	305		435	435	435		664	587	664		740	841		1038
250	10	343	343		473	473	473		791	714	791		841	1000		1292
300	12	368	368		518	518	518		841	816	841		968	1146		1445
350	14	394	394		778	587	778		892	892	892		1038	1276		
400	16	419	419		854	625	854		994	994	994		1140	1407		
450	18	444	444		930	676	930		1095	1095	1095		1232	1559		
500	20	470	470		1010	730	1010		1200	1200	1200		1334	1686		
600	24	521	521		1165	810	1165		1407	1407	1407		1568	1972		
Derived series		3R	3R	3R	4R	19R	4R	4R	5R	56R	5R	5R	52R	53R	53R	54R