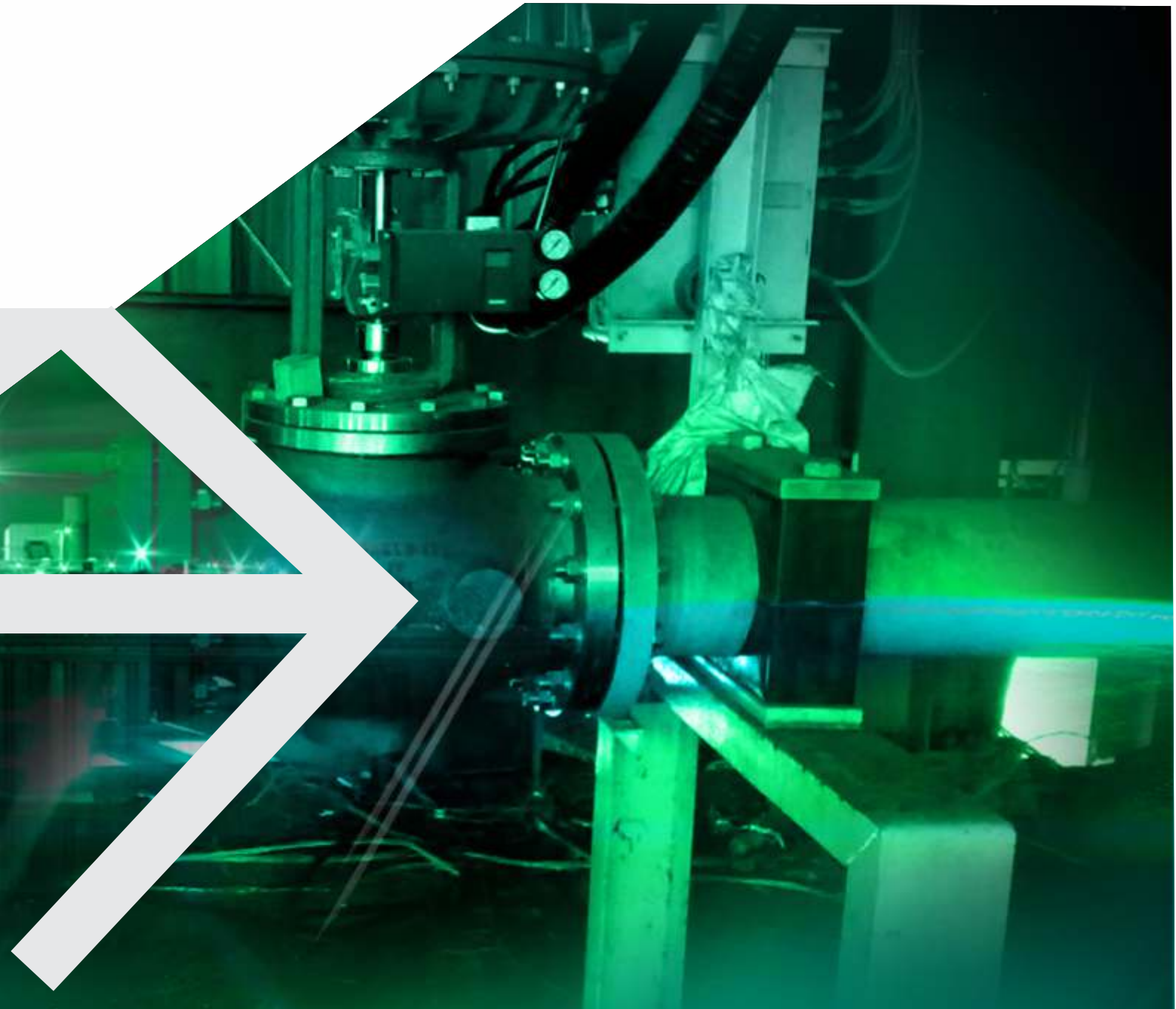
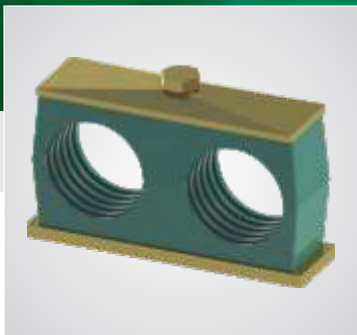




DIN PIPE CLAMPS & FLANGES



Flanges

by HYD-AIR Engineering Works, Goa

INTRODUCTION

The use of weld nipple and ferrule type fittings is widespread in Hydraulics, Pneumatics and Lubrication System for tube sizes upto 38mm OD and various thickness depending upon the pressure involved. For bigger sizes, ferrule and weld nipple type fittings are impracticable because of their heavy hexagonal sections which increase the pitch between pipes spreading the pipe installation over a large area. Also such fittings require very high torques for tightening which lead to loose joints.

In such a cases the use of flanges with Butt Weld or Socket Weld ends has been found to be more practical leading to compact piping installations.

CETOP PR 63H, AFNOR 48-0-54 and ISO 6164 specify flanges with Butt Weld ends and square clamping flanges for 250 bar and 400 bar static working pressure respectively. These correspond to 160 bar and 315 bar dynamic working pressures. The flange system consist of a sleeve to be butt or socket welded to the pipe and clamped together between two square flanges by a set of four hex bolts, nuts and spring washers. One of the sleeves carries an "O" ring groove fitted with an "O" ring for sealing the interface.

The use of these ISO 6164 flanges has one disadvantage. The size of the square flange require a higher pitch between pipes due to the flange sizes. In order to reduce the distance between pipes, SAE introduced their own standards which are now incorporated into ISO 6162 for the 3000 psi and 6000 psi static pressure ranges respectively. SAE System depends on the same set of Butt Welding sleeves held together by a set of split flange and solid flange secured by hex bolts and nut.

The design for the SAE system calls for forged flanges to ASTM A 105 with sleeves made from weldable material. In order to reduce costs, various manufacturers have introduced a two piece system shown on pages 24 & 26 where the sleeve and the flange were combined into one piece. Such a system is easily adaptable to both Butt Weld and Socket Weld systems. However, in practice, the two piece system is used mainly for Socket Weld flanges for cost considerations.

With the introduction of more corrosive fluids in piping systems, the total joint is not required to be of non-corrosive material, eg. SS. Only the sleeves which are wetted by the fluid are required to be of SS. This makes for an economical joint.

Further, the orientation of these flange joints can be so done to minimize the distance between pipes and provide for a compact installation.

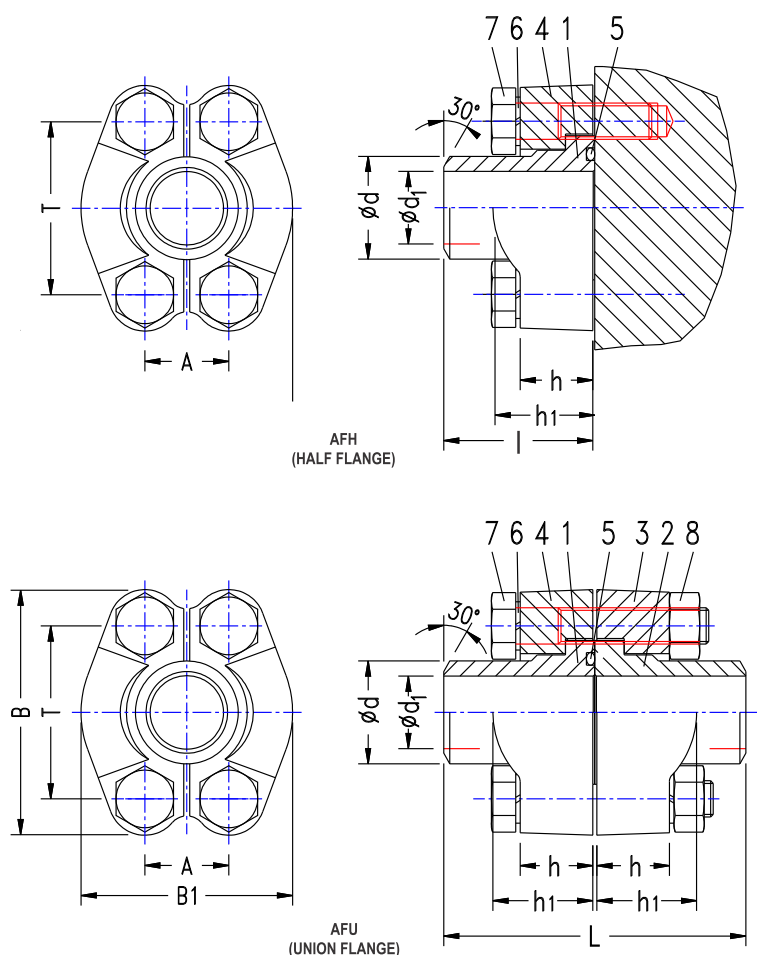
		AFU	AFH
PART	MATERIAL	QTY	
1) SLEEVE WITH GROOVE	IS. 2062	1	1
2) SLEEVE WITHOUT GROOVE	IS. 2062	1	-
3) FLANGE	A 105	1	-
4) SPLIT FLANGE (SET OF 2)	A 105	1	1
5) 'O' RING	NITRILE RUBBER	1	1
6) SPRING WASHER	IS. 3063	4	4
7) HEX. BOLT	IS. 1364 1983	4	4
8) HEX. NUT	IS. 1364 1983	4	-

NOTE : Unless otherwise ordered,
standard supply will have metric threads

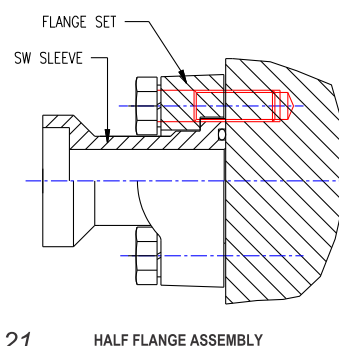
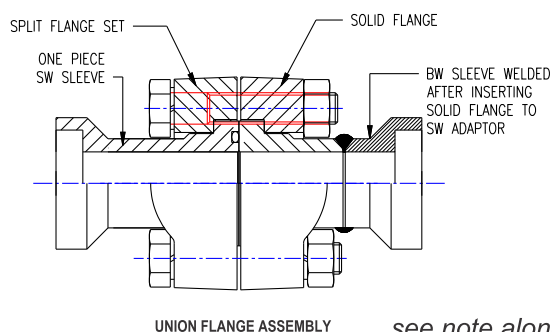
FINISH : Welding Sleeves and fasteners have Phosphatized finish, Flanges are zinc plated.

TEST PRESSURE :
 SERIES 3000 PSI (Code 61) = 210 bar : 3000 PSI
 HYDROSTATIC @ ROOM TEMPERATURE.

SERIES 6000 PSI (Code 62) = 410 bar : 6000 PSI
HYDROSTATIC @ ROOM TEMPERATURE.



FLANGE ASSEMBLY WITH SOCKET WELD END CONNECTIONS



DIMENSIONS : SAE 3000 PSI (Code 61) = 210 bar

DN		PIPE SIZE	φd	φd1	φd2	l	L	h	h1	B	B1	T	A	'O' RING SIZE	HEX.HD.CAP SCREW SIZE
INCH	MM	OD x WT													AFH
1/2"	13	20.0 x 3.0	20	14.0	30.2	30	60	13	19	54	46	38.1	17.5	18.64 x 3.53	M8 x 25/ 5/16" _18UNC x 1 1/4"
		22.0 x 2.0	22	18.0											M8 x 40/ 5/16" _18UNC x 1 1/2"
		21.3 x 2.6	22	16.0											
3/4"	19	22 x 2.0	22	18.0	38.1	35	70	14	22	65	52	47.6	22.3	24.99 x 3.53	M10 x 30/ 3/8" _16UNC x 1 1/4"
		25.0 x 3.0	25	19.0											M10 x 40/ 3/8" _16UNC x 1 1/2"
		26.9 x 3.6	27	19.5											
1"	25	30.0 x 4.0	30	22.0	44.45	40	80	16	24	70	59	52.4	26.2	32.92 x 3.53	M10 x 30/ 3/8" _16UNC x 1 1/4"
		35.0 x 4.0	35	27.0											M10 x 45/ 3/8" _16UNC x 2"
		33.7 x 3.2	34	27.0											
		38.0 x 2.5	38	33.0											
		38.0 x 4.0	38	30.0											
1 1/4"	32	38.0 x 4.0	38	30.0	50.8	45	90	16	22	80	73	58.7	30.2	37.69 x 3.53	M10 x 30/ 7/16" _14UNC x 1 1/2"
		42.0 x 3.0	42	36.0											M10 x 50/ 7/16" _14UNC x 2"
		42.3 x 3.2	43	36.0											
		42.4 x 5.6	43	31.2											
1 1/2"	38	38.0 x 4.0	38	30.0	60.3	50	100	16	25	94	83	69.9	35.7	47.22 x 3.53	M12 x 35/ 1/2" _13UNC x 1 1/2"
		42.0 x 3.0	42	36.0											M12 x 50/ 1/2" _13UNC x 2"
		48.3 x 4.5	49	39.0											
		48.3 x 6.3	49	35.5											
2"	51	42.0 x 3.0	42	36.0	71.4	60	120	16	26	102	97	77.8	42.9	56.74 x 3.53	M12 x 35/ 1/2" _13UNC x 1 1/2"
		42.3 x 3.2	43	36.0											M12 x 50/ 1/2" _13UNC x 2"
		48.3 x 3.2	49	42.0											
		60.3 x 5.6	61	49.0											
		60.3 x 8.0	61	44.0											

NOTE: ISO : 6162 does not have a separate series for flange assembly with socket weld end connections. The entire assembly remains the same as butt weld end connections shown above. However, the sleeves are welded with adaptors to convert the butt weld to socket weld end connections and dimensions can be given on request.

The use of the ISO : 6162 system increases the overall length of the flange assembly which may not be acceptable in the piping design. For socket weld end connections, designers usually prefer the two-piece system based on ISO : 6162 dimensions shown on pages 25-27 of the catalog.

DIMENSIONS : SAE 3000 PSI (Code 61) = 210 bar

DN		PIPE SIZE	ϕd	ϕd1	ϕd2	I	L	h	h1	B	B1	T	A	'O' RING SIZE	HEX.HD.CAP SCREW SIZE
INCH	MM	OD x WT													AFH
															AFU
2 1/2"	65	76.1 x 7.1	77	62.0	84.1	70	140	19	38	115	109	88.9	50.8	69.44 x 3.53	M12 x 40/ ½" _13UNC x 1¾"
		76.1 x 3.6	77	69.0											M12 x 60 ½" _13UNC x 2¾"
		82.5 x 7.1	86	68.0											
		80.0 x 2.0	80	76.0											
3"	76	60.3 x 3.6	61	53.0	101.6	80	160	22	41	136	131	106.4	61.9	85.32 x 3.53	M16 x 50/ 5/8" _11UNC x 1¾"
		76.1 x 3.6	77	69.0											M16 x 70/ 5/8" _11UNC x 2¾"
		76.1 x 7.1	77	62.0											
		88.9 x 3.6	90	81.5											
3 1/2"	89	76.1 x 3.6	77	69.0	114.3	95	190	22	28	153	140	120.7	69.9	98.02 x 3.53	M16 x 50/ 5/8" _11UNC x 2"
		88.9 x 3.6	90	81.5											M16 x 70/ 5/8" _11UNC x 2¾"
		114.3 x 3.6	115	107.0											
4"	102	76.1 x 3.6	77	69.0	127.0	110	220	25	35	163	152	130.2	77.8	110.72 x 3.53	M16 x 50/ 5/8" _11UNC x 2"
		88.9 x 3.6	90	81.5											M16 x 80/ 5/8" _11UNC x 3 ¼"
		114.3 x 3.6	115	107.0											
5"	127	139.7 x 4.0	140	131.5	152.4	120	220	28	41	183	181	152.4	92.1	136.12 x 3.53	M16 x 55/ 5/8" _11UNC x 2 ¼"
		127.0 x 4.0	127	119.0											M16 x 80/ 5/8" _11UNC x 3 ¼"

NOTES : * PN 170 bar
 ** PN 140 bar
 *** PN 35 bar

DIMENSIONS : SAE 6000 PSI (Code 61) = 410 bar

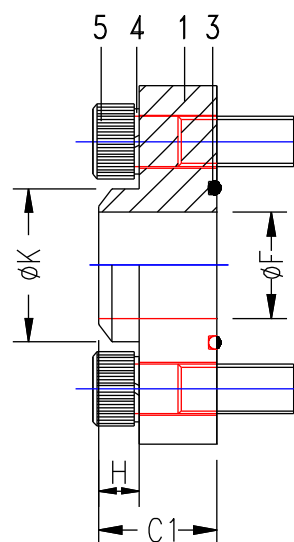
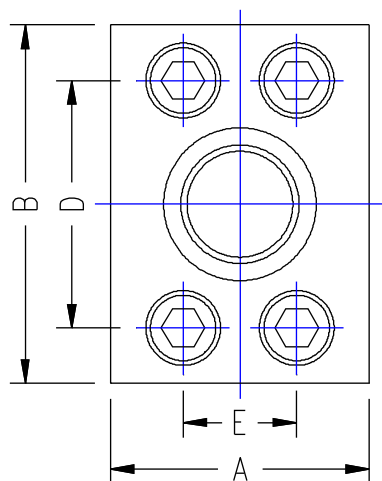
DN		PIPE SIZE	φd	φd1	φd2	l	L	h	h1	B	B1	T	A	'O' RING SIZE	HEX.HD.CAP SCREW SIZE
INCH	MM														AFH
1/2"	13	16.0 x 2.5	16	11.0	31.8	40	80	16	22	56	48	40.5	18.2	18.64 x 3.53	M8 x 30/ 5/16" _18UNC x 1 1/4"
		20.0 x 3.0	20	14.0											M8 x 45/ 5/16" _18UNC x 1 3/4"
		21.3 x 4.5	21	12.0											
3/4"	19	20.0 x 3.0	20	14.0	41.3	45	90	19	28	71	60	50.8	23.8	24.99 x 3.53	M10 x 35/ 3/8" _16UNC x 1 1/2"
		25.0 x 4.0	25	17.0											M10 x 50/ 3/8" _16UNC x 2"
		26.9 x 5.6	27	15.5											
1"	25	25.0 x 4.0	25	17.0	47.6	50	100	24	33	81	70	57.2	27.8	32.92 x 3.53	M12 x 45/ 7/16" _14UNC x 1 3/4"
		30.0 x 4.0	30	22.0											M12 x 65/ 7/16" _14UNC x 2 1/2"
		33.7 x 7.1	34	19.5											
		38.0 x 4.0	38	30.0											
1 1/4"	32	30.0 x 4.0	30	22.0	54.0	55	110	27	38	95	78	66.6	31.8	37.69 x 3.53	M12 x 45/ 1/2" _13UNC x 1 3/4"
		38.0 x 5.0	38	28.0											M12 x 70/ 1/2" _13UNC x 2 3/4"
		42.4 x 8.8	43	24.5											
1 1/2"	38	38.0 x 5.0	38	28.0	63.5	60	120	30	43	113	95	79.3	36.5	47.22 x 3.53	M16 x 55/ 5/8" _11UNC x 2 1/4"
		48.3 x 6.3	49	35.5											M16 x 80/ 5/8" _11UNC x 3 1/4"
		48.3 x 8.0	49	32.0											
		48.3 x 8.8	49	30.5											
		60.3 x 10.0	61	40.0											
2"	51	60.3 x 10.0	61	40.0	79.4	70	140	37	52	133	114	96.8	44.5	56.74 x 3.53	M20 x 70/ 3/4" _10UNC x 2 3/4"
		60.3 x 12.5	61	35.0											M20 x 100/ 3/4" _10UNC x 4"
		76.1 x 12.5	77	51.0											
		60.3 x 8.0	61	44.0											
2 1/2"	64	76.1 x 7.1	77	62.0	105.0	75	150	39	56	175	149	123.8	58.7	69.44 x 3.53	M24 x 3 1/4"
		76.1 x 10.0	77	56.0											M24 x 5"
		76.1 x 12.0	77	52.0											
3"	76	88.9 x 7.6	90	73.5	130.0	80	160	42	61	217	178	152.4	71.4	85.32 x 3.53	M30 x 4"
		88.9 x 11.0	90	67.0											M30 x 5 1/2"
		88.9 x 14.2	90	60.5											

* PN315 bar

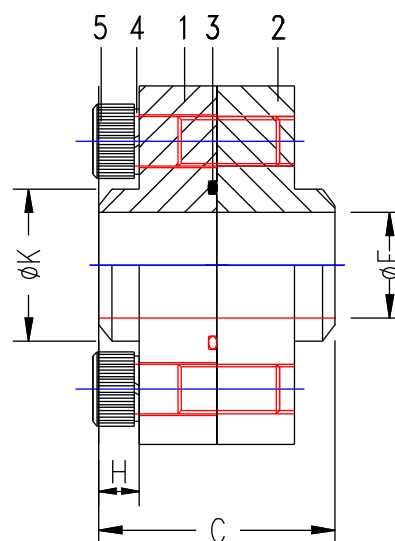
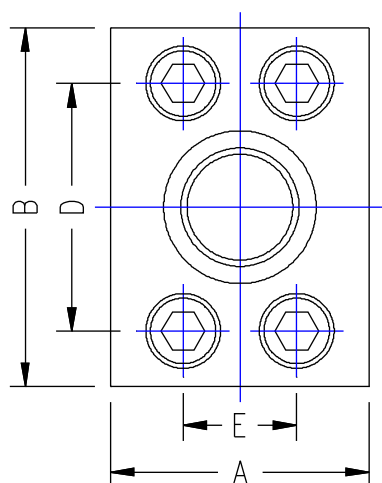
PART	MATERIAL	ABU	ABH
1) FLANGE WITH GROOVE	IS. 2062	1	1
2) FLANGE WITHOUT GROOVE	IS. 2062	1	-
3) "O" RING	NITRILE RUBBER	1	1
4) SPRING WASHER	IS. 3063	4	4
5) SOC. HD. CAP SCREW	IS. 1367 - CLASS 12-9	4	4

FINISH : ALL CS PARTS ARE PHOSPHATIZED

TEST PRESSURE : SERIES 3000 PSI = 210 bar : 3000 PSI HYDROSTATIC @ ROOM TEMPERATURE.
 SERIES 3000 PSI = 410 bar : 6000 PSI HYDROSTATIC @ ROOM TEMPERATURE.



ABH
HALF FLANGE ASSEMBLY



ABU
UNION FLANGE ASSEMBLY

DIMENSIONS : SAE 3000 # SERIES

PIPE SIZE INCHES	SCHEDULE	A	B	C	C1	D	E	Φ F	H	Φ K	'O' RING SIZE	SOC . HD. CAP SCREW SIZE
1/2	80	38	54	64	32	38.1	17.5	13.5	10	22.4	18.64 x 3.53	4 / M 8 x 40
	160							12.0				
3/4	80	45	67	64	32	47.6	22.2	19.0	10	28.5	24.99 x 3.53	4 / M 10 x 40
	160							15.5				
1	80	51	72	64	32	52.4	26.2	23.9	10	35.0	32.92 x 3.53	4 / M 10 x 40
	160							20.5				
1 ¼	80	64	81	64	32	58.7	30.2	31.8	10	44.5	37.69 x 3.53	4 / M 10 x 40
	160							29.5				
1 ½	80	70	95	76	38	69.8	35.7	38.0	13	50.8	47.22 x 3.53	4 / M 12x 45
	160							34.0				
2	80	83	102	76	38	77.8	42.9	49.3	13	63.5	56.74 x 3.53	4 / M 12 x 45
	160							43.0				
* 2 ½	80	102	114	90	45	88.9	50.8	59.0	13	76.2	69.44 x 3.53	4 / M 12 x 50
	160							53.9				
** 3	80	114	135	102	51	106.4	61.9	73.7	13	88.9	85.32 x 3.53	4 / M 16 x 60
	160							66.5				
*** 3 ½	80	127	152	76	38	120.6	69.9	85.4	13	101.6	98.02 x 3.53	4 / M 16 x 50
	160							76.0				
*** 4	80	140	162	76	38	130.2	77.8	97.3	13	114.3	110.72 x 3.53	4 / M 16 x 50
	160							87.4				
*** 5	80	178	184	102	51	152.4	92.1	122.2	13	142.8	136.12 x 3.53	4 / M 16 x 60
	160							109.5				

NOTES : * PN 170 bar

** PN 140 bar

*** PN 35 bar

DIMENSIONS : SAE 6000 # SERIES

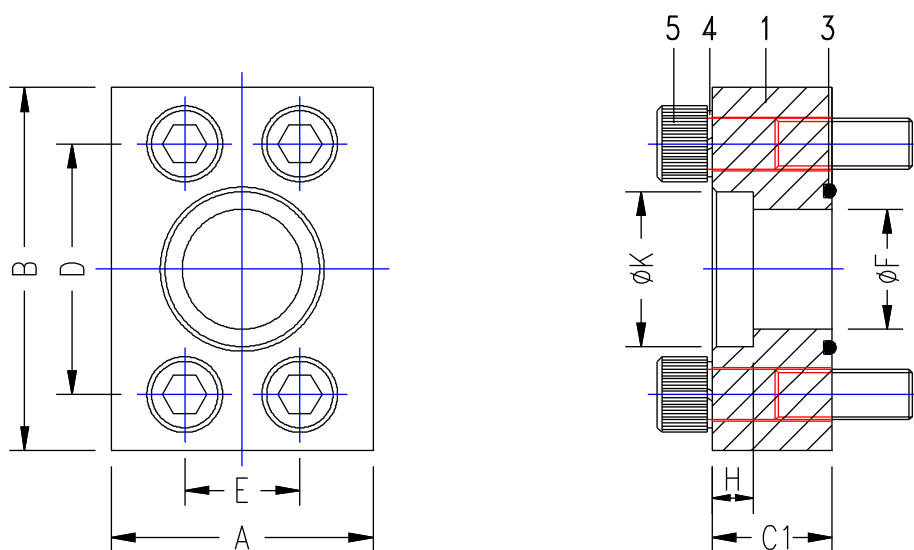
1/2	80	45	56	64	32	40.5	18.2	13.5	10	22.4	18.64 x 3.53	4 / M 8 x 40
	160							12.0				
3/4	80	51	71	64	32	50.8	23.8	19.0	10	28.5	24.99 x 3.53	4 / M 10 x 40
	160							15.5				
1	80	57	81	64	32	57.2	27.8	23.9	10	35.0	32.92 x 3.53	4 / M 12 x 45
	160							20.5				
1 ¼	80	70	95	64	32	66.7	31.8	31.8	10	44.5	37.69 x 3.53	4 / M 12 x 50
	160							29.5				
1 ½	80	83	114	76	38	79.4	36.5	38.0	13	50.8	47.22 x 3.53	4 / M 16 x 50
	160							34.0				
2	80	102	134	90	45	96.8	44.5	49.3	13	63.5	56.74 x 3.53	4 / M 20 x 60
	160							43.0				
* 2 ½	80	127	175	102	51	123.8	58.7	59.0	13	76.2	69.44 x 3.53	4 / M 22 x 70
	160							53.8				
* 3	80	152	216	127	63.5	152.4	71.4	73.7	13	88.9	85.32 x 3.53	4 / M 27 x100
	160							66.5				

NOTES : * PN 315 BAR

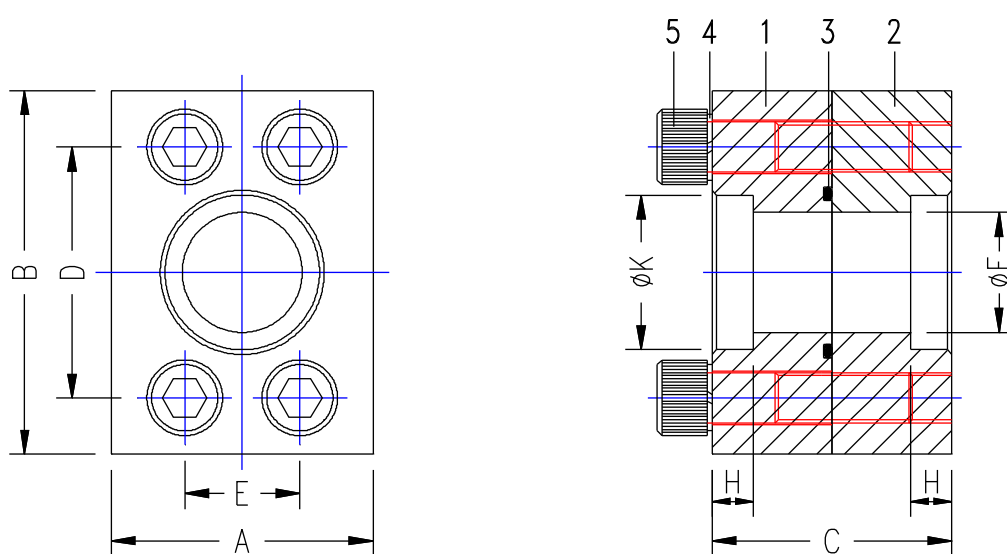
PART	MATERIAL	ASU	ASH
		QTY	
1) FLANGE WITH GROOVE	IS. 2062	1	1
2) FLANGE WITHOUT GROOVE	IS. 2062	1	-
3) "O" RING	NITRILE RUBBER	1	1
4) SPRING WASHER	IS. 3063	4	4
5) SOC. HD. CAP SCREW	IS. 1367 - CLASS 12-9	4	4

FINISH : ALL CS PARTS ARE PHOSPHATIZED

TEST PRESSURE : SERIES 3000 PSI = 210 bar : 3000 PSI HYDROSTATIC @ ROOM TEMPERATURE.
 SERIES 3000 PSI = 410 bar : 6000 PSI HYDROSTATIC @ ROOM TEMPERATURE.



**ASH
HALF FLANGE ASSEMBLY**



**ASU
UNION FLANGE ASSEMBLY**

DIMENSIONS : SAE 3000 # SERIES

	PIPE SIZE INCHES	A	B	C	C1	D	E	Φ F	H	Φ K	'O' RING SIZE	SOC . HD. CAP SCREW SIZE
	1/2	38	54	38	19	38.1	17.5	13	10	22	18.64 x 3.53	4 / M 8 x 35
	3/4	45	67	51	25.5	47.6	22.2	19	13	27	24.99 x 3.53	4 / M 10 x 45
	1	51	72	51	25.5	52.4	26.2	25	13	35	32.92 x 3.53	4 / M 10 x 40
	1¼	64	81	51	25.5	58.7	30.2	32	13	43	37.69 x 3.53	4 / M 12 x 45
	1½	70	95	76	32	69.8	35.7	38	13	49	47.22 x 3.53	4 / M 12 x 50
	2	83	102	76	38	77.8	42.9	49	16	61	56.74 x 3.53	4 / M 12 x 60
*	2½	102	114	90	45	88.9	50.8	61	19	74	69.44 x 3.53	4 / M 12 x 65
**	3	114	135	102	51	106.4	61.9	75	19	90	85.32 x 3.53	4 / M 16 x 75
***	3½	127	152	76	38	120.6	69.9	86	19	102	98.02 x 3.53	4 / M 16 x 65
***	4	140	162	76	38	130.2	77.8	98	19	115	110.72 x 3.53	4 / M 16 x 65
***	5	178	184	102	51	152.4	92.1	122	19	142	136.12 x 3.53	4 / M 16 x 75

NOTES : * PN 170 bar
 ** PN 140 bar
 *** PN 35 bar

DIMENSIONS: SAE 6000 # SERIES

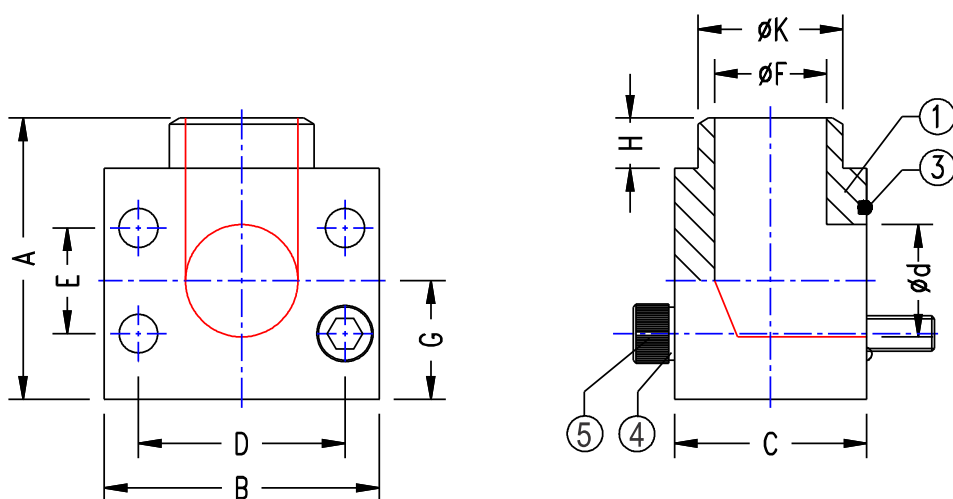
	1/2	45	56	51	25.5	40.5	18.2	13	13	22	18.64 x 3.53	4 / M 8 x 40
	3/4	51	71	51	25.5	50.8	23.8	19	13	27	24.99 x 3.53	4 / M 10 x 45
	1	57	81	51	25.5	57.2	27.8	25	13	34	32.92 x 3.53	4 / M 12 x 45
	1¼	70	95	64	32	66.7	31.8	32	13	43	37.69 x 3.53	4 / M 14 x 55
	1½	83	114	76	38	79.4	36.7	38	13	49	47.22 x 3.53	4 / M 16 x 65
	2	102	134	90	45	96.8	44.5	49	16	61	56.74 x 3.53	4 / M 20 x 75
*	2½	127	175	102	51	123.8	58.7	61	16	74	69.44 x 3.53	4 / M 24 x 90
*	3	152	216	127	63.5	152.4	71.4	75	16	90	85.32 x 3.53	4 / M 30 x 110

NOTES : * PN 315 bar

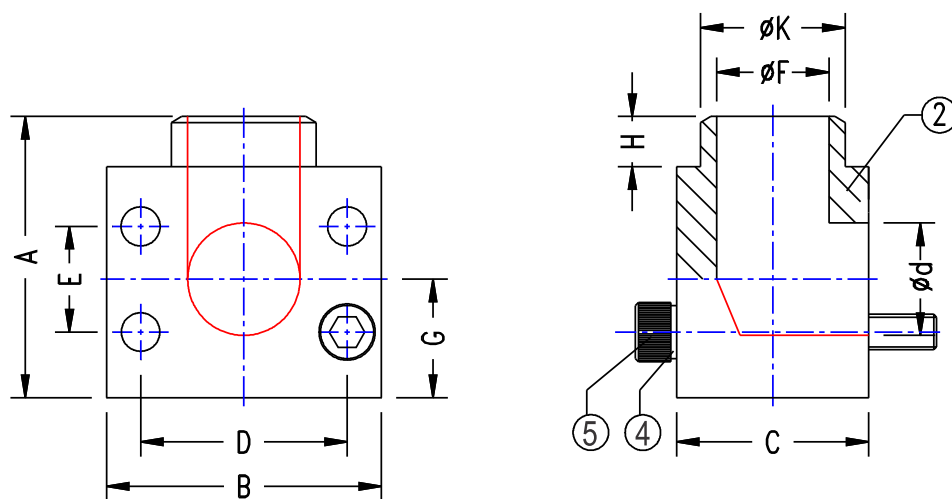
PART	MATERIAL	AEBO	AEB
		QTY	
1) ELBOW FLANGE WITH "O" RING	IS. 2062	1	-
2) ELBOW FLANGE WITHOUT "O" RING	IS. 2062	-	1
3) "O" RING	NITRILE RUBBER	1	1
4) SPRING WASHER	IS. 3063	4	4
5) SOC. HD. CAP SCREW	IS. 1367 - CLASS 12-9	4	4

FINISH : ALL CS PARTS ARE PHOSPHATIZED

TEST PRESSURE : SERIES 3000 PSI = 210 bar : 3000 PSI HYDROSTATIC @ ROOM TEMPERATURE.
 SERIES 3000 PSI = 410 bar : 6000 PSI HYDROSTATIC @ ROOM TEMPERATURE.



AEBO
ELBOW FLANGE WITH "O" RING



AEB
ELBOW FLANGE WITHOUT "O" RING

DIMENSIONS : SAE 3000 # SERIES

PIPE SIZE INCHES	SCHEDULE	A	B	C	D	E	Φ F	G	H	Φ K	'O' RING SIZE	SOC . HD. CAP SCREW SIZE	T
1/2	80	51	54	38	38.1	17.5	13.5	19	10	22.4	18.64 x 3.53	4 / M 8 x 50	M8
	160						11.7						
3/4	80	57	67	45	47.6	22.2	19.0	22	10	28.5	24.99 x 3.53	4 / M 10 x 65	M10
	160						15.5						
1	80	64	72	51	52.4	26.2	24.3	25	10	35.0	32.92 x 3.53	4 / M 10 x 70	M10
	160						20.5						
1 ¼	80	76	81	57	58.7	30.2	32.5	32	10	44.5	37.69 x 3.53	4 / M 12 x 75	M12
	160						29.5						
1 ½	80	83	95	76	69.8	35.7	38.0	35	13	50.8	47.22 x 3.53	4 / M 14 x 100	M14
	160						34.0						
2	80	95	102	89	77.8	42.9	49.3	41	13	63.5	56.74 x 3.53	4 / M 14 x 115	M14
	160						43.0						
* 2 ½	80	114	114	102	88.9	50.8	59.0	51	13	76.2	69.44 x 3.53	4 / M 14 x 125	M14
	160						53.9						
** 3	80	127	135	127	106.4	61.9	73.7	57	13	88.9	85.32 x 3.53	4 / M 16 x 150	M16
	160						66.5						
*** 3 ½	80	140	152	140	120.6	69.9	85.4	63	13	101.6	98.02 x 3.53	4 / M 16 x 165	M16
	160						76.0						
*** 4	80	152	162	152	130.2	77.8	97.3	70	13	114.3	110.72 x 3.53	4 / M 16 x 180	M16
	160						87.4						

NOTES : * PN 170 bar

** PN 140 bar

*** PN 35 bar

DIMENSIONS : SAE 6000 # SERIES

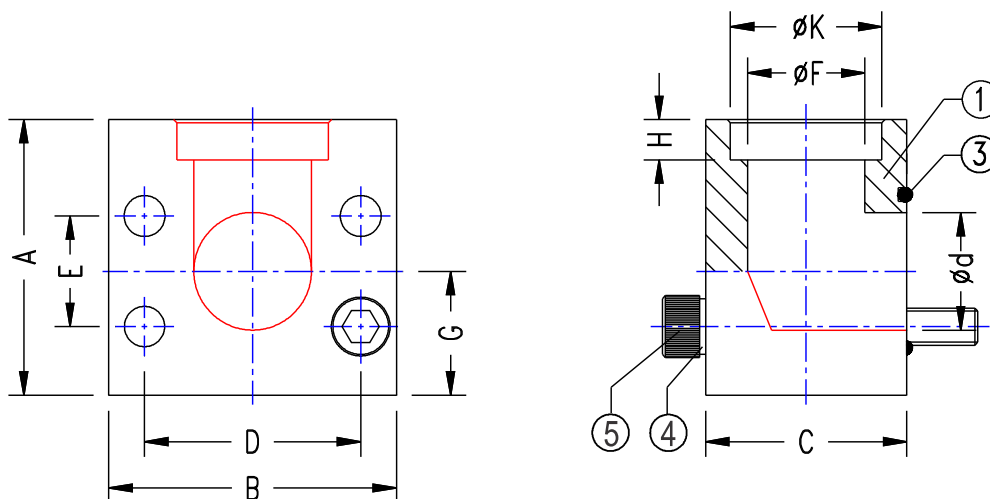
1/2	80	57	56	38	40.5	18.2	13.5	22	10	22.4	18.64 x 3.53	4 / M 8 x 50	M8
	160						11.7						
3/4	80	64	72	45	50.8	23.8	19.0	25	10	28.5	24.99 x 3.53	4 / M 10 x 65	M10
	160						15.5						
1	80	70	81	51	57.2	27.8	24.3	28	10	35.0	32.92 x 3.53	4 / M 12 x 70	M12
	160						20.5						
1 ¼	80	83	95	57	66.7	31.8	32.5	35	10	44.5	37.69 x 3.53	4 / M 14 x 80	M14
	160						29.5						
1 ½	80	95	114	76	79.4	36.5	38.0	41	13	50.8	47.22 x 3.53	4 / M 16 x 100	M16
	160						34.0						
2	80	115	133	89	96.8	44.5	49.3	51	13	63.5	56.74 x 3.53	4 / M 20 x 115	M20
	160						43.0						
* 2 ½	80	140	174	102	123.8	58.7	59.0	64	13	76.2	69.44 x 3.53	4 / M 24 x 140	M24
	160						53.9						
* 3	80	127	216	127	152.4	71.4	73.7	76	13	88.9	85.32 x 3.53	4 / M 30 x 175	M30
	160						66.5						

NOTES : * PN 315 bar

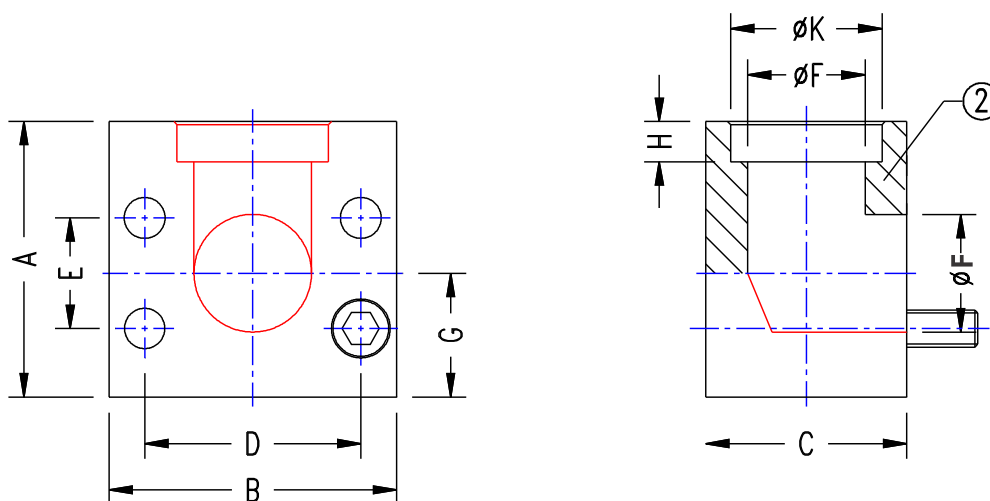
PART	MATERIAL	AESO	AES
		QTY	
1) ELBOW FLANGE WITH "O" RING	IS. 2062	1	-
2) ELBOW FLANGE WITHOUT "O" RING	IS. 2062	-	1
3) "O" RING	NITRILE RUBBER	1	1
4) SPRING WASHER	IS. 3063	4	4
5) SOC. HD. CAP SCREW	IS. 1367 - CLASS 12-9	4	4

FINISH : ALL CS PARTS ARE PHOSPHATIZED

TEST PRESSURE : SERIES 3000 PSI = 210 bar : 3000 PSI HYDROSTATIC @ ROOM TEMPERATURE.
 SERIES 3000 PSI = 410 bar : 6000 PSI HYDROSTATIC @ ROOM TEMPERATURE.



AESO
ELBOW FLANGE WITH "O" RING



AES
ELBOW FLANGE WITHOUT "O" RING

DIMENSIONS : SAE 3000 # SERIES

	PIPE SIZE INCHES	A	B	C	D	E	Φ F	G	H	Φ K	'O' RING SIZE	SOC . HD. CAP SCREW SIZE	T
	1/2	45	54	38	38.1	17.5	13	19	10	22	18.64 x 3.53	4 / M 8 x 50	M8
	3/4	51	67	45	47.6	22.2	19	23	13	27	24.99 x 3.53	4 / M 10 x 65	M10
	1	57	72	51	52.4	26.2	25	25	13	34	32.92 x 3.53	4 / M 10 x 70	M10
	1¼	70	81	57	58.7	30.2	32	32	13	43	37.69 x 3.53	4 / M 12 x 75	M12
	1½	76	95	76	69.8	35.7	38	35	13	49	47.22 x 3.53	4 / M 14 x 100	M14
	2	89	102	89	77.8	42.9	49	41	16	61	56.74 x 3.53	4 / M 14 x 115	M14
*	2½	102	114	102	88.9	50.8	61	51	19	74	69.44 x 3.53	4 / M 14 x 125	M14
**	3	127	135	127	106.4	61.9	75	57	19	90	85.32 x 3.53	4 / M 16 x 150	M16
***	3½	140	152	140	120.6	69.9	86	64	19	103	98.02 x 3.53	4 / M 16 x 165	M16
***	4	152	162	152	130.2	77.8	98	70	19	115	110.72 x 3.53	4 / M 16 x 180	M16

NOTES : * PN 170 bar

** PN 140 bar

*** PN 35 bar

DIMENSIONS: SAE 6000 # SERIES

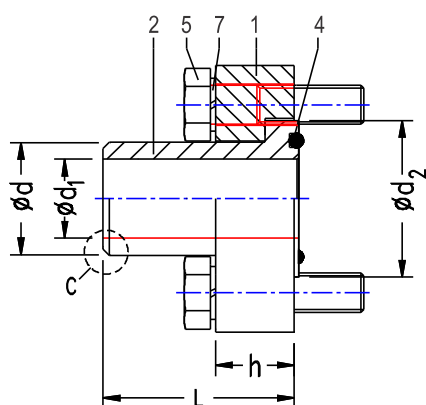
													T
	1/2	51	56	38	40.5	18.2	13	23	13	22	18.64 x 3.53	4 / M 8 x 50	M8
	3/4	57	71	45	50.8	23.8	19	25	13	27	24.99 x 3.53	4 / M 10 x 65	M10
	1	64	81	51	57.2	27.8	25	28	13	34	32.92 x 3.53	4 / M 12 x 70	M12
	1¼	76	95	57	66.7	31.7	32	35	13	43	37.69 x 3.53	4 / M 14 x 80	M14
	1½	89	115	76	79.4	36.5	38	41	13	49	47.22 x 3.53	4 / M 16 x 100	M16
	2	102	133	89	96.8	44.5	49	51	16	61	56.74 x 3.53	4 / M 20 x 115	M20
*	2½	140	175	102	123.8	58.7	61	64	16	74	69.44 x 3.53	4 / M 24 x 140	M24
*	3	152	216	127	152.4	71.4	75	76	16	90	85.32 x 3.53	4 / M 30 x 175	M30

*PN 315 bar

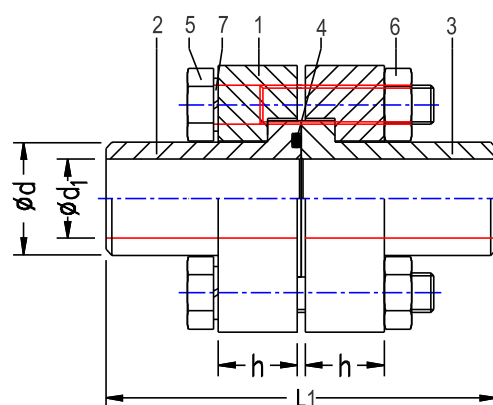
PART	MATERIAL	FH	FU
1) FLANGE	C. S. IS. 2062	1	2
2) SLEEVE WITH GROOVE	C. S. IS. 2062	1	1
3) SLEEVE WITHOUT GROOVE	C. S. IS. 2062	-	1
4) 'O'RING	NITRILE	1	1
5) HEX BOLT	IS. 1363	4 or 8	4 or 8
6) HEX NUT	IS. 1363	-	4 or 8
7) SPRING WASHER	IS. 3063	4 or 8	4 or 8

FINISH : ALL CS PARTS ARE PHOSPHATIZED.

TEST PRESSURE : FH SERIES & FU SERIES : PN 160 bar : 2400 PSI HYDROSTATIC @ ROOM TEMPERATURE
 PN 250 bar : 3750 PSI HYDROSTATIC @ ROOM TEMPERATURE
 PN 315 bar : 4500 PSI HYDROSTATIC @ ROOM TEMPERATURE

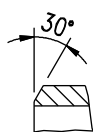


FH
HALF FLANGE ASSEMBLY

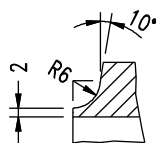


FU
UNION FLANGE ASSEMBLY

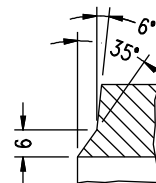
VERSION OF THE FORM OF WELDING SEAM
 ACCORDING TO DIN 2559 (DETAILS 'C')



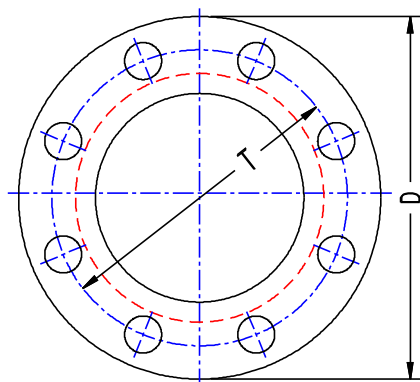
WALL THICKENSS UPTO 12 mm



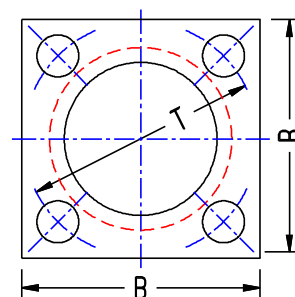
FROM 12 mm UPTO 16 mm



ABOVE 16 mm



ROUND FLANGE FOR SIZES ABOVE DN 150



SQUARE FLANGE FOR SIZES UPTO DN 150

DIMENSIONS : FH SERIES & FU SERIES - PN 160

DN		PIPE SIZE	ϕ d	ϕ d 1	ϕ d 2	L	L 1	B/D	h	T	'O' RING SIZE	HEX. BOLT
INCH	MM	OD x WT										FH SERIES
1/2	15	16 x 12	16	12	28	43	80	50	19	44	17.12 x 2.62	4/ M10 x 35
		17.1 x 3.2 (3/8" SCH 80)	17	10.5								4/ M10 x 55
3/4	20	20 x 2.5	20	15	38	50	94	60	19	54	25.07 x 2.62	4/ M10 x 35
		21.3 x 3.73 (1/2" SCH 80)	22	13.5								4/ M10 x 55
		25 x 3	25	19								
		26.9 x 3.91 (3/4" SCH 80)	27	19								
1	25	30 x 4	30	22	46	56	106	70	19	64	29.82 x 2.62	4/ M12 x 35
		33.4 x 4.55 (1" SCH 80)	35	24								4/ M12 x 60
1 1/4	32	48.3 x 5.0 (1 1/2" SCH 80)	49	38.5	55	64	122	80	24	72	34.59 x 2.62	4/ M12 x 40
												4/ M12 x 70
1 1/2	40	48.3 x 5.08 (1 1/2" SCH 80)	49	38.5	60	68	130	90	29	80	47.22 x 3.53	4/ M16 x 50
		38x5	38	28								4/ M16 x 80
		42.2 x 4.85	43	32.5								
2	50	60.3 x 5.54 (2" SCH 80)	62	49	76	80	153	100	38	98	53.57 x 5.33	4/ M16 x 60
		60.3 x 6.3	62	47.5								4/ M16 x 100
2 1/2	65	73.0 x 7.01 (2 1/2" SCH 80)	73	59	92	98	190	120	47	118	69.44 x 5.33	4/ M20 x 70
		76.1 x 7.1	76	62								4/ M20 x 120
3	80	88.9 x 7.62 (3" SCH 80)	90	73.5	135	135	262	180	59	175	100.3 x 5.33	4/ M30 x 90
		101.6 x 10	102	81.5								4/ M30 x 150
4	100	114.3 x 11.13 (4" SCH 120)	115	92	135	135	262	180	59	175	107.54 x 5.33	4/ M30 x 90
												4/ M30 x 150
5	125	141.3 x 12.7 (5" SCH 120)	142	116	168	150	292	245	69	200	132.71 x 6.99	8/M24 x 100
		152.4 x 16	153	120.5								8/M24 x 170
6	150	168.3 x 14.27 (6" SCH 120)	169	139.5	205	150	372	300	79	245	158.11 x 6.99	8xM30 x 110
		177.8 x 17.5	179	143								8xM30 x 200

DIMENSIONS : FH SERIES & FU SERIES - PN 250

DN		PIPE SIZE	ϕ d	ϕ d 1	ϕ d 2	L	L 1	B/D	h	T	'O' RING SIZE	HEX. BOLT
		OD x WT										FH SERIES
INCH	MM											FU SERIES
3/8	10	16 x 2.6	16	12	28	43	80	50	19	44	17.12 x 2.62	4/ M10 x 35
		17.1 x 3.2 (3/8" SCH 80)	17	10.5								4/ M10 x 55
1/2	15	20 x 2.9	20	14	38	50	94	60	19	54	25.07 x 2.62	4/ M10 x 35
		21.3 x 2.6	22	16								4/ M10 x 55
		21.3 x 3.73 (1/2" SCH 80)	22	13.5								
3/4	20	26.9 x 3.6	27	19.5	46	56	106	70	19	64	29.82 x 2.62	4/ M12 x 35
		26.9 x 3.91 (3/4" SCH 80)	27	19								4/ M12 x 60
1	25	33.4 x 4.5 (1" SCH 80)	34	25	55	64	122	80	24	72	34.59 x 2.62	4/ M12 x 40
												4/ M12 x 70
1 1/4	32	42.2 x 5.6	43	31	60	68	130	90	29	80	44.04 x 3.53	4/ M16 x 50
		42.2 x 6.35 (1 1/4" SCH 160)	43	29.5								4/ M16 x 80
1 1/2	40	48.3 x 7.14 (1 1/2" SCH 160)	49	34	76	80	153	100	38	98	53.34 x 5.33	4/ M16 x 60
		60.3 x 8.74 (2" SCH 160)	61	42.5								4/ M16 x 100
2	50	73.0 x 9.53 (2 1/2" SCH 160)	73	54	92	98	190	120	47	118	59.69 x 5.33	4/ M20 x 70
		76.1 x 10	76	56								4/ M20 x 120
2 1/2	65	88.9 x 11.13 (3" SCH 160)	90	67	110	109	210	150	48	145	75.56 x 5.33	4/ M24 x 75
												4/ M24 x 130
3	80	101.6 x 14.1	102	73	135	135	262	180	59	175	88.26 x 5.33	4/ M30 x 90
		114.3 x 13.49 (4" SCH 160)	115	87.5								4/ M30 x 150
4	100	141.3 x 15.88 (5" SCH 120)	142	109.5	168	150	292	245	69	200	113.66 x 5.33	8/ M24 x 100
		139.7 x 20	140	99.5								8/ M24 x 170
5	125	168.3 x 21.95 (6" SCH XXS)	169	124	205	190	372	300	79	245	148.59 x 6.99	8/ M30 x 110
												8/ M30 x 200
6	150				245	200	391	355	89	290	183.51 x 6.99	8/ M36 x 130
		193.7 x 25	193	143.5								8/ M36 x 220

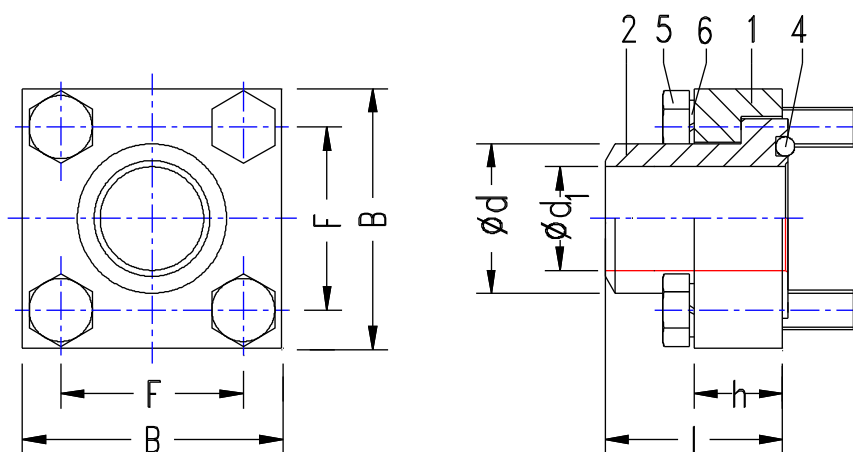
DIMENSIONS : FH SERIES & FU SERIES - PN 315

DN		PIPE SIZE	ϕ d	ϕ d 1	ϕ d 2	L	L 1	B/D	h	T	'O' RING SIZE	HEX. BOLT
INCH	MM	OD x WT										FH SERIES
												FU SERIES
3/8	10	16 x 2.6	16	11	28	43	80	50	19	44	17.12 x 2.62	4/ M10 x 35
		17.1 x 3.2 (3/8" SCH 80)	17	10.5								4/ M10 x 55
1/2	15	20 x 2.9	20	14	38	50	94	60	19	54	25.07 x 2.62	4/ M10 x 35
		21.3 x 2.6	22	16								4/ M10 x 55
		21.3 x 3.73 (1/2" SCH 80)	22	13.5								
3/4	20	26.9 x 3.6	27	19.5	46	56	106	70	19	64	29.82 x 2.62	4/ M12 x 35
		26.9 x 3.91 (3/4 SCH 80)	27	19								4/ M12 x 60
1	25	33.4 x 4.5 (1" SCH 80)	34	25	55	64	122	80	24	72	34.59 x 2.62	4/ M12 x 40
												4/ M12 x 70
1 1/4	32	42.2 x 5.6	43	31	60	68	130	90	29	80	44.04 x 3.53	4/ M16 x 50
		42.2 x 6.35 (1 1/4" SCH 160)	43	29.5								4/ M16 x 80
1 1/2	40	48.3 x 7.14 (1 1/2" SCH 160)	49	34	76	80	153	100	38	98	53.34 x 5.33	4/ M16 x 60
												4/ M16 x 100
		60.3 x 8.74 (2" SCH "160)	61	42.5								
2	50	73.0 x 9.53 (2 1/2" SCH 160)	73	54	92	98	190	120	47	118	59.69 x 5.33	4/ M20 x 70
												4/ M20 x 120
		76.1 x 10	76	56								
2 1/2	65	88.9 x 11.13 (3" SCH 160)	90	67	110	109	210	150	48	145	75.56 x 5.33	4/ M24 x 75
												4/ M24 x 130
3	80	101.6 x 14.1	102	73	135	135	262	180	59	175	88.26 x 5.33	4/ M30 x 90
												4/ M30 x 150
		114.3 x 13.49 (4" SCH 160)	115	87.5								
4	100	141.3 x 15.88 (5" SCH 120)	142	109.5	168	150	292	245	69	200	113.66 X 5.33	8/ M24 x 100
												8/ M24 x 170
		139.7 x 20	140	99.5								
5	125	168.3 x 21.95 (6" SCH XXS)	169	124	205	190	372	300	79	245	148.59 X 6.99	8/ M30 x 110
												8/ M30 x 200
6	150				245	200	391	355	89	290	183.51 X 6.99	8/ M36 x 130
												8/ M36 x 200
		193.7 x 25	194	143.5								

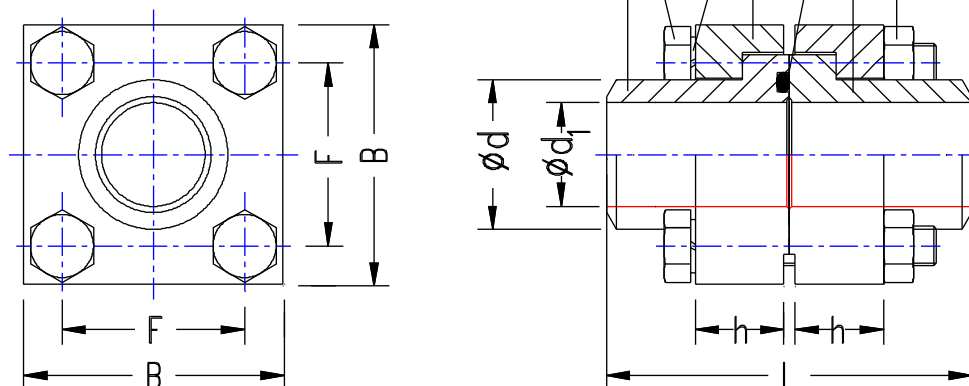
PART	MATERIAL	CBH	QTY	CBU
1) FLANGE	IS. 2062	1		1
2) SLEEVE WITH GROOVE	IS. 2062	1		-1
3) SLEEVE WITHOUT GROOVE	IS. 2062	-		1
4) "O" RING	NITRILE RUBBER	1		1
5) HEX. HD. CAP SCREW	IS. 1363	4		4
6) SPRING WASHER	IS. 3063	4		4
7) HEX NUT	IS. 1363	-		4

FINISH : ALL CS PARTS ARE PHOSPHATIZED

TEST PRESSURE : PN 250 STATIC & PN 160 DYNAMIC = 3750 PSI HYDROSTATIC @ ROOM TEMPERATURE.
PN 400 STATIC & PN 315 DYNAMIC = 6000 PSI HYDROSTATIC @ ROOM TEMPERATURE.



CBH
HALF FLANGE ASSEMBLY



CBU
UNION FLANGE ASSEMBLY

DIMENSIONS : PN_250 STATIC & PN-160 DYNAMIC

PIPE SIZE		PIPE OD	ϕD_1	ϕD	B	h	F	I	L	'O' RING SIZE	BOLT SIZE	
INCH	MM										HALF FLANGE	UNION FLANGE
3/8	10	17.1	12.5	18	40	18	24.7	30	60	17.12 x 2.62	4/M6 X 30	4/M6x45
1/2	15	21.3	15	24	45	20	29.7	30	60	18.64 x 3.53	4/M8 X 35	4/M8 x 50
3/4	20	26.7	20	32	50	22	35.4	35	70	24.99 x 3.53	4/M8 X 35	4/M8 x 55
1	25	33.4	25	38	65	25	43.8	40	80	32.92 x 3.53	4/M10 X 40	4/M10 x 65
1.1/4	32	42.3	32	43	75	30	51.6	45	90	37.69 x 3.53	4/M12 x 50	4/M12 x 75
1.1/2	40	48.3	38	50	90	36	60.1	50	100	47.22 x 3.53	4/M16 x 60	4/M16 x 90
2	50	60.3	47	62	100	40	69.3	60	120	56.74 x 3.53	4/M16 x 65	4/M16 x100
2.1/2	65	73.0	58	76	120	45	83.4	70	140	69.44 x 3.53	4/M20 x 80	4/M20 x 110
3	80	88.9	70	90	140	52	102.5	80	160	85.32 x 3.53	4/M20 x 90	4/M20 x 120

DIMENSIONS : PN_400 STATIC & PN-315 DYNAMIC

PIPE SIZE		PIPE OD	ϕD_1	ϕD	B	h	F	I	L	'O' RING SIZE	BOLT SIZE	
INCH	MM										HALF FLANGE	UNION FLANGE
3/8"	10	17.1	11	18	40	18	24.7	35	70	17.12 x 2.62	4/M6 x 30	4/M6 x 45
1/2"	15	21.3	14	24	45	20	29.7	40	80	18.64 x 3.53	4/M8 x 35	4/M8 x 50
3/4"	20	26.7	18	32	50	22	35.4	45	90	24.99 x 3.53	4/M8 x 35	4/M8 x 55
1"	25	33.4	22	38	65	25	43.8	50	100	32.92 x 3.53	4/M10 x 40	4/M10 x65
1.1/4"	32	42.3	29	44	75	30	51.6	55	110	37.69 x 3.53	4/M12 x 50	4/M12 x 75
1.1/2"	40	48.3	35	51	90	36	60.1	60	120	47.22 x 3.53	4/M16x60	4/M16x90
2"	50	60.3	43	67	100	40	69.3	70	140	56.74 x 3.53	4/M16 x 65	4/M16x100
2.1/2"	65	73.0	53	80	120	50	83.4	80	160	69.44 x 3.53	4/M20 x 80	4/M20 x 130
3"	80	88.9	58	90	150	52	102.5	90	180	85.32 x 3.53	4/M24 x 90	4/M24 x 130
3.1/2"	89	101.6	63	102	160	60	113.1	90	180	98.02 x 3.53	4/M24 x 100	4/M24 x 150
4"	100	114.3	74	114	180	70	123.7	105	210	110.72 x 3.53	4/M30 x 120	4/M30 x 170

PART	MATERIAL	CSH	CSU
1) FLANGE	IS. 2062	1	1
2) SLEEVE WITH GROOVE	IS. 2062	1	1
3) SLEEVE WITHOUT GROOVE	IS. 2062	-	1
4) "O" RING	NITRILE RUBBER	1	1
5) HEX. HD. CAP SCREW	IS. 1363	4	4
6) SPRING WASHER	IS. 3063	4	4
7) HEX NUT	IS. 1363	-	4

FINISH : ALL CS PARTS ARE PHOSPHATIZED

TEST PRESSURE : PN 250 STATIC & PN 160 DYNAMIC = 3750 PSI HYDROSTATIC @ ROOM TEMPERATURE.
PN 400 STATIC & PN 315 DYNAMIC = 6000 PSI HYDROSTATIC @ ROOM TEMPERATURE.



DIMENSIONS : PN 400 STATIC & PN 350 DYNAMIC

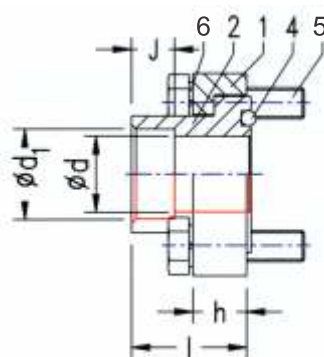
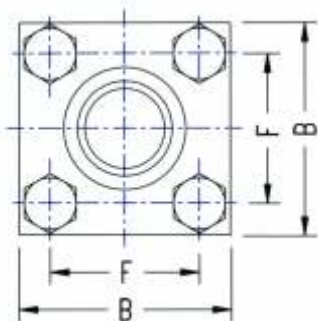
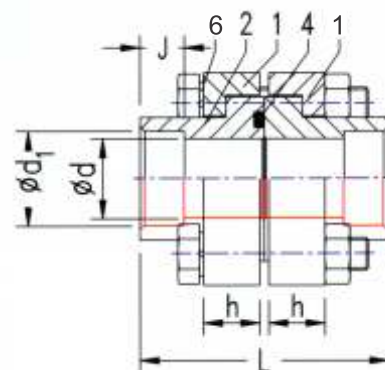
DN		PIPE SIZE	φd	φd 1	I	L	J	B	h	F	'O' RING SIZE	HEX, BOLT SIZE
INCH	MM	OD- WT										HALF
												UNION
3/8	10	16 x 2.0	11	16.5	30	60	12	45	13	29.7	18.64 x 3.53	M 8 x 30
		17.1 x 3.2	11	17.6								M 8 x 40
1/2	13	20 x 3.0	14	20.5	35	70	13	50	15	35.3	24.99 x 3.53	M 8 x 30
		21.3 x 4.75	12	21.7								M 8 x 45
3/4	19	25 x 4.0	17	25.5	40	80	14	65	17	43.8	32.92 x 3.53	M 10 x 35
		26.7 x 5.56	16	27.3								M 10 x 50
1	25	30 x 4.5	21	30.5	45	90	16	75	18	51.6	37.69 x 3.53	M 12 x 40
		32 x 5.0	22	32.5								M 12 x 60
		33.4 x 6.35	21	34.0								
1¼	32	38 x 6	26	38.5	50	100	18	85	22	60.0	47.22 x 3.53	M 14 x 45
		40 x 6	28	40.7								M 14 x 70
		42.2 x 6.35	30	43.0								
1½	38	48.3 x 7.14	35	49.0	60	120	20	100	27	69.4	56.74 x 3.53	M 16 x 55
		50 x 7.3	35	50.7								M 16 x 80
2	51	60.3 x 11.07	38.5	61.0	70	140	22	120	33	83.4	69.44 x 3.53	M 20 x 65
		63 x 10	43	64.0								M 20 x 100
2½	65	73 x 14.02	45	74.0	80	160	24	150	37	102.5	85.32 x 3.53	M 24 x 75
												M 24 x 110
		76.1 x 12	53	77.0								M 24 x 90
												M 24 x 120
3	80	88.9 x 15.24	58	90.0	100	200	28	160	50	113.2	110.72 x 3.53	M 24 x 100
		90 x 15	60	91.0								M 24 x 140



HYD-AIR

CETOP PR 63 H. AFNOR 48-0 54. ISO 6164 Socket Weld End Flanges**Flanges : PN - 250 STATIC & PN - 160 DYNAMIC****PN - 400 STATIC & PN - 315 DYNAMIC**

ISO 6164-1994

CSH
HALF FLANGE ASSEMBLYCSU
UNION FLANGE ASSEMBLY**DIMENSIONS : PN_250 STATIC & PN-160 DYNAMIC**

DN	PIPE SIZE		Ød	Ød 1	l	L	J	B	h	F	'O' RING SIZE	HEX, BOLT SIZE
												HALF
INCH	MM	OD										UNION
3/8	10	16 x 2	12.5	16.5	30	60	12	45	13	29.7	18.64 x 3.53	M 8 x 30
		17.1 x 3.20	10.7	17.6								M 8 x 40
1/2	13	20	15	20.5	35	70	13	50	15	35.3	24.99 x 3.53	M 8 x 30
		21.3 x 3.73	14	21.7								M 8 x 45
3/4	19	25 x 2.5	20	25.5	40	80	14	65	17	43.8	32.92 x 3.53	M 10 x 35
		26.7 x 3.91	19	27.3								M 10 x 50
1	25	30 x 2.5	25	30.5	45	90	16	75	18	51.6	37.69 x 3.53	M 12 x 40
		32 x 3.5	25	32.5								M 12 x 60
		33.4 x 4.55	25	34.0								
		35 x 5	25	35.5								
1 1/4	32	38 x 3	32	38.5	50	100	18	85	22	60.0	47.22 x 3.53	M 14 x 45
		40 x 4	32	40.7								M 14 x 70
		42.2 x 4.85	32	43.0								
1 1/2	38	48.3 x 5.08	38	49.0	60	120	20	100	27	69.4	56.74 x 3.53	M 16 x 55
		50 x 6.0	38	50.7								M 16 x 80
2	51	60.3 x 8.75	46	61.0	70	140	22	120	33	83.4	69.44 x 3.53	M 20 x 65
		63.5 x 8.0	47	64.0								M 20 x 100
2 1/2	65	73 x 9.53	54	74.0	80	160	24	150	37	102.5	85.32 x 3.53	M 24 x 75
												M 24 x 110
		76.1 x 9.00	58	77.0								M 24 x 90
3	80				100	200	24	150	45	102.5	98.05 x 3.53	M 24 x 120
		88.9 x 11.13	70	90.0								M 24 x 100
		90 x 10	70	91.0								M 24 x 140

DIMENSIONS : PN 100

DN		PIPE SIZE	PART NO. SN 712	ϕd	$\phi d 1$	t	b	a	c	BOLT SIZE	'O' RING SIZE
INCH	MM	OD									
1/2	15	21.3	A 15/22-100	22	15	13	39	50	35	4/M8 x 50	18.6 x 3.53
3/4	20	26.7	A 20/27-100	27	20	13	39	50	35	4/M8 x 50	25.0 x 3.53
1	25	33.4	A25/34-100	34	25	16	52	75	52	4/M10 x 70	32.9 x 3.53
1¼	32	42.2	A32/43-100	43	32	16	52	75	52	4/M12 x 70	37.7 x 3.53
1½	40	48.3	A40/49-100	49	40	20	80	100	70	4/M12 x 100	44.0 x 3.53
2	50	60.3	A50/61-100	61	50	20	90	110	75	4/M16 x 110	57.0 x 4.0
2½	65	73.0	A65/74-100	73.5	65	25	110	140	100	4/M16 x 130	70.0 x 4.0
3	80	88.9	A80/90-100	90	80	25	140	160	120	4/M20 x 160	90.0 x 5.0

DIMENSIONS : PN 160

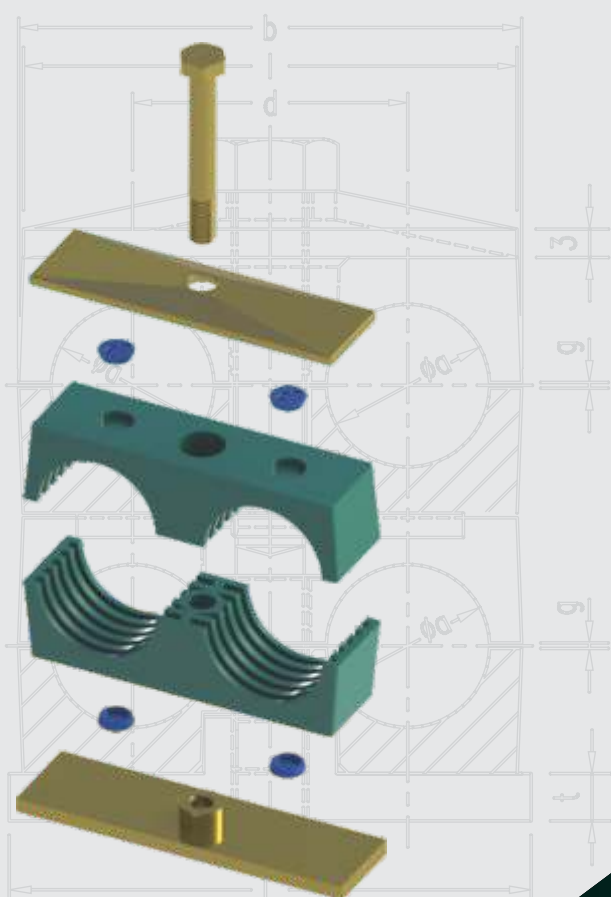
DN		PIPE SIZE	PART NO. SN 712	ϕd	$\phi d 1$	t	b	a	c	BOLT SIZE	'O' RING SIZE
INCH	MM	OD									
1/2	15	21.3	A 15/22-160	22	14	12	38	45	29.5	4/M8 x 50	18.6 x 3.53
3/4	20	26.7	A 20/27-160	27	19	13	40	50	35.5	4/M8 x 65	25.0 x 3.53
1	25	33.4	A25/34-160	34	24	14	44	65	44	4/M10 x 60	32.9 x 3.53
1¼	32	42.2	A32/43-160	43	32	16	52	75	51	4/M12 x 70	37.7 x 3.53
1½	40	48.3	A40/49-160	49	40	20	80	100	70	4/M12 x 100	44.0 x 3.53
2	50	60.3	A50/61-160	61	50	20	90	110	75	4/M16 x 110	57.0 x 4.0
2½	65	73.0	A65/74-160	74	60	25	110	140	100	4/M16 x 130	70.0 x 4.0
3	80	88.9	A80/90-160	90	73	25	140	160	120	4/M20 x 160	90.0 x 5.0

DIMENSIONS : PN 250

DN		PIPE SIZE	PART NO. SN 712	ϕd	$\phi d 1$	t	b	a	c	BOLT SIZE	'O' RING SIZE
INCH	MM	OD									
1/2	15	21.3	A 15/22-250	22	12	13	50	60	36.5	4/M10 x 65	18.6 x 3.53
3/4	20	26.7	A 20/27-250	27	15	13	50	65	44.5	4/M10 x 65	25.0 x 3.53
1	25	33.4	A25/34-250	34	21	13	50	75	51	4/M12 x 70	32.9 x 3.53
1¼	32	42.2	A32/43-250	43	29	16	64	100	70	4/M16 x 80	37.7 x 3.53
1½	40	48.3	A40/49-250	49	34	20	90	100	70	4/M16 x 110	44.0 x 3.53
2	50	60.3	A50/61-250	61	40	20	90	110	75	4/M16 x 110	44.0 x 3.53
2½	65	73.0	A65/74-250	74	50	20	110	140	100	4/M16 x 130	57.0 x 4.0
3	80	88.9	A80/90-250	90	65	25	140	160	120	4/M20 x 160	70.0 x 5.0

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