HANDBOOK ON

DUCTILE IRON VALVES

We are committed to produce
quality Products
(C.I., D.I., C.S. Valves, Pipes, Fittings,
Manhole Covers, Surface box etc.)
consistently on schedule to the best
satisfaction of all our customers.

We shall also strive for improvement in
Quality Management System
by establishing and achieving
Quality Objectives
aimed at overall improvement
in our activities for enhanced
customer satisfaction.

Kejriwal CASTINGS LIMITED

Manufacturers of
Ductile Iron & Cast Iron Pipes, Fittings, Valves Etc

Eleventh Edition
2025-26

Late Bhagawati Prasad Kejriwal

Founder

In 1956, just nine years after India gained independence, the nation was grappling with the aftermath of partition. Amidst this challenging backdrop, a young enthusiast from Rajasthan, driven by a zeal to make a difference and an eye for opportunities, took a bold step. He ventured into setting up a cast iron foundry in Howrah, West Bengal. This marked the beginning of the remarkable journey of our founder, a visionary, the late **Shri Bhagwati Prasad Kejriwal.**

Hailing from the small town of Ramgarh in Rajasthan, Shri Kejriwal had limited formal education. However, he more than compensated for this with his hard work, sincerity, dedication, and acute business sense. His passion and integrity were the cornerstones of his success. As Shri Kejriwal wisely said, "In the realms of business and industry, it is vision and perseverance that pave the way to success."

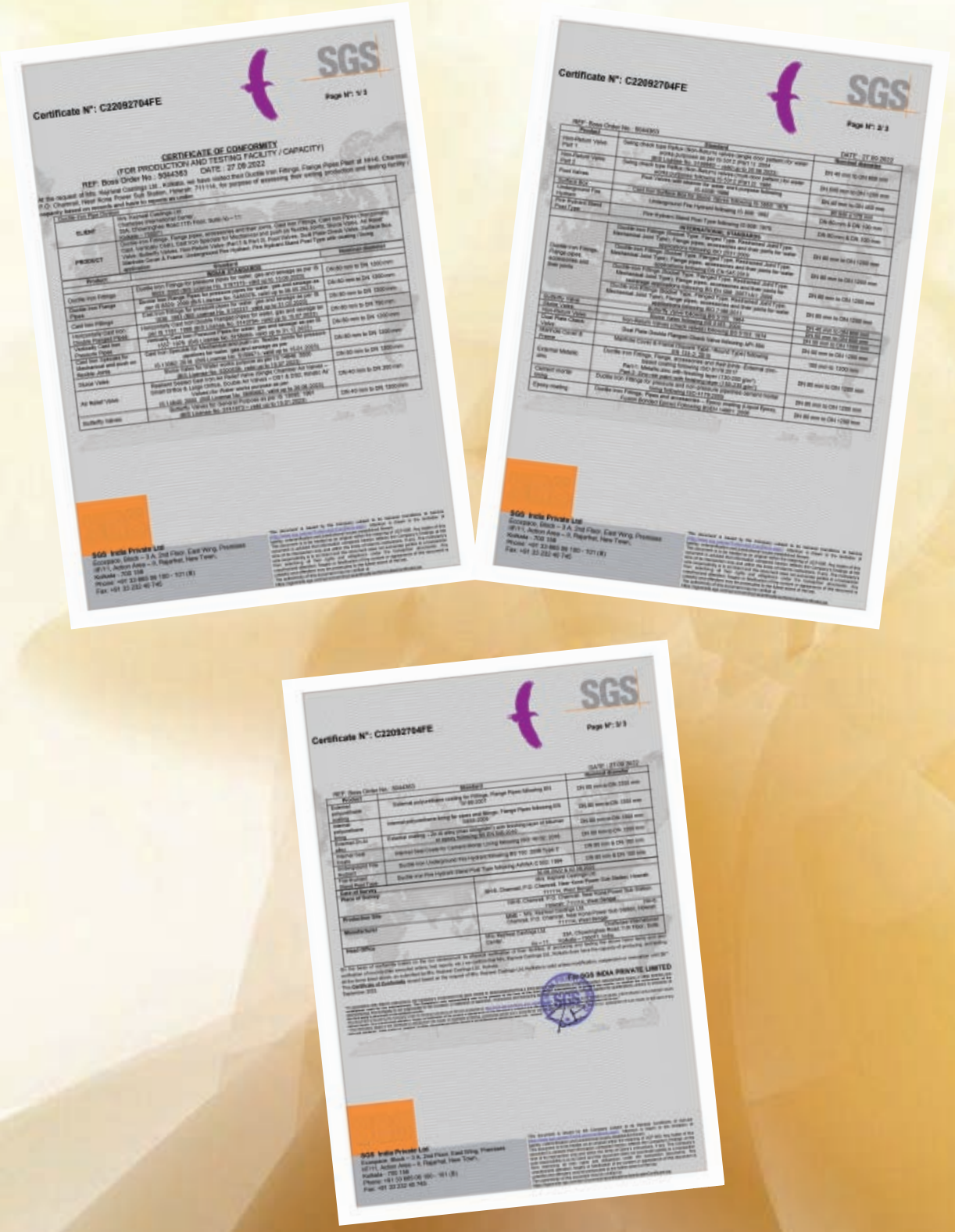
The journey that began with a modest foundry in 1956 has undergone numerous transformations over nearly seven decades. Today, Kejriwal Castings Ltd stands as a testament to sheer willpower and endurance. Under the visionary leadership of Shri Bhagwati Prasad Kejriwal, the company thrived on a foundation of quality, ethical practices, and forward-thinking approaches.

A true pioneer, Shri Kejriwal's passion for pushing boundaries and embracing new challenges was the hallmark of our growth. From the early days, he recognized the importance of staying ahead of technological advancements and integrating them into our processes. His relentless pursuit of excellence and deep understanding of market dynamics enabled the company to evolve and flourish in an ever-changing landscape, achieving numerous firsts in the field.

As the Rig Veda wisely notes, **"When there is harmony between the mind, heart, and resolution, then nothing is impossible."**

Kejriwal
CASTINGS LIMITED

SGS CAPABILITY CERTIFICATE FOR FITTINGS



KEJRIWAL CASTINGS LIMITED

Bureau Veritas Certification

ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018

KEJRIWAL CASTINGS LIMITED

Bureau Veritas Certification

ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018

ISO 9001, 14001, 45001 Certificates

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

KEJRIWAL CASTINGS LIMITED (TESTING LAB. DGP)

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

TESTING

NABL

Contents

Conversion

Table : i
Approximate Weight of Water Content in Cast Iron Pipes in Kg/metre.

Nominal Bore	Kg./mtr.	Nominal Bore	Kg./mtr.
80	5.0	450	161
100	8.2	500	199
125	12.7	600	285
150	18.2	700	388
200	32.2	750	445
250	50.6	800	505
300	72.7	900	645
350	98.7	1000	790
400	128.1	1200	1140

Table : ii
Conversion Factors

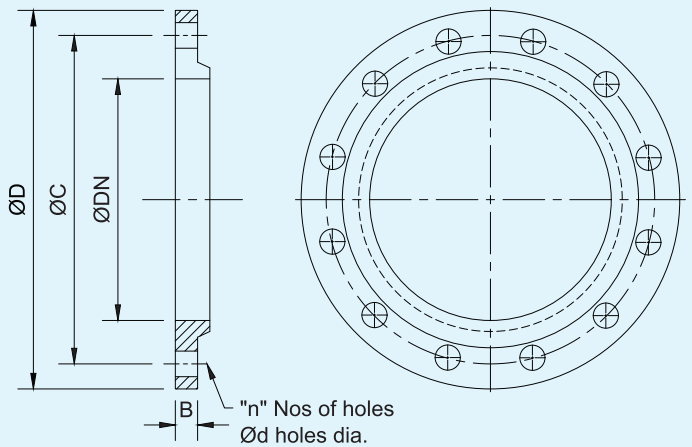
Length			
1 Inch	=	25.400	Milimetres (mm)
1 Foot	=	304.800	Milimetres (mm)
1 Yard	=	914.400	Milimetres (mm)
1 Mile	=	1.609	Kilometres (Km)
Weight			
1 Kilogram	=	2.2046	Pound
1 Pound	=	0.4536	Kilogram
Capacity			
1 Gallon (UK)	=	4.546	litres
1 Litre	=	0.219976	gallon (UK)
1 Gallon (US)	=	3.7853	litres
1 Litre	=	0.26418	gallon (US)
Others			
Pipe OD x π (3.14159)	=	Circumference	
1 liter	=	1000 cm^2 (approx.)	

Table : iii
Pressure Conversion Table

Kg/cm^2	lbs/ sq.inch	Meter Head	Approx. Feet Head	Kg/cm^2	lbs/ sq.inch	Meter Head	Approx. Feet Head	Kg/cm^2	lbs/ sq.inch	Meter Head	Approx. Feet Head
1	14.22	10	32.81	13	184.90	130	426.62	25	355.58	250	820.62
2	28.45	20	65.62	14	199.13	140	459.45	26	369.80	260	853.24
3	42.67	30	98.43	15	213.35	150	492.24	27	384.02	270	886.05
4	56.87	40	131.24	16	227.57	160	525.07	28	398.24	280	918.86
5	71.12	50	164.05	17	241.80	170	557.90	29	412.47	290	951.69
6	85.34	60	196.86	18	256.02	180	590.71	30	426.69	300	984.28
7	99.56	70	229.67	19	270.24	190	623.52	31	440.91	310	1017.31
8	113.79	80	262.47	20	284.47	200	656.38	32	455.14	320	1050.15
9	128.01	90	295.38	21	298.69	210	689.17	33	469.36	330	1082.96
10	142.23	100	328.19	22	312.91	220	721.98	34	483.58	340	1115.77
11	156.46	110	361.00	23	327.14	230	754.81	35	497.80	350	1148.33
12	170.68	120	393.81	24	341.36	240	787.62				

* All dimensions are in millimetres.

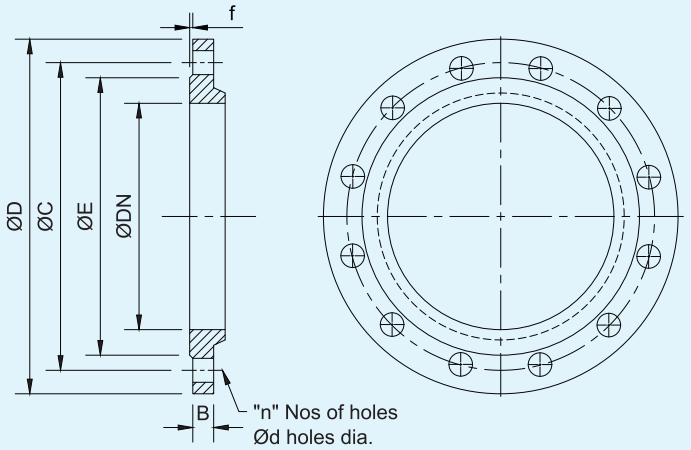
Flange Dimension



AS PER IS 1538, TABLE IV & VI

Nominal Diameter DN	Outside Diameter OD	Pitch Circle Diameter PCD	Flange Thickness B	Holes	
				No. n	Dia d
80	200	160	21	4	19
100	220	180	22	8	19
125	250	210	22.5	8	19
150	285	240	23	8	23
200	340	295	24.5	8	23
250	395	350	26	12	23
300	445	400	27.5	12	23
350	505	460	29	16	23
400	565	515	30	16	28
450	615	565	31.5	20	28
500	670	620	33	20	28
600	780	725	36	20	31
700	895	840	38.5	24	31
750	960	900	40	24	31
800	1015	950	41.5	24	34
900	1115	1050	44	28	34
1000	1230	1160	47	28	37
1050	1258	1194	48	28	37
1100	1340	1270	50	32	37
1200	1455	1380	53	32	40
1500	1800	1710	61	40	43

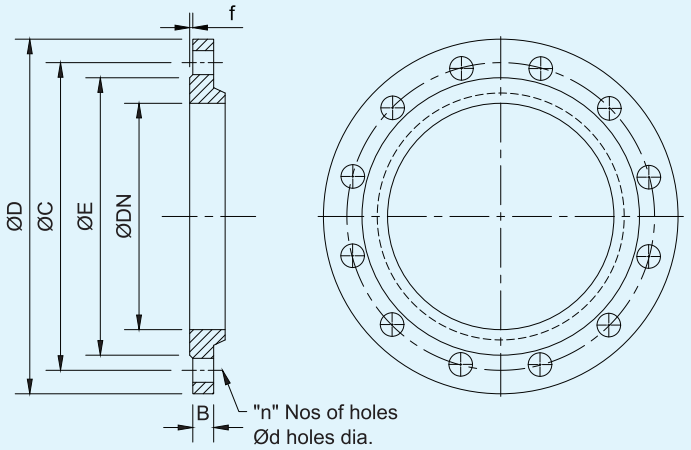
* All dimensions are in millimetres.



AS PER IS 9523, PN 10

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
80	200	160	16	3	4	19	132
100	220	180	16	3	8	19	156
125	250	210	16	3	8	19	184
150	285	240	16	3	8	23	211
200	340	295	17	3	8	23	266
250	395	350	19	3	12	23	319
300	445	400	20.5	4	12	23	370
350	505	460	20.5	4	16	23	429
400	565	515	20.5	4	16	28	480
450	615	565	21	4	20	28	530
500	670	620	22.5	4	20	28	582
600	780	725	25	5	20	31	682
700	895	840	27.5	5	24	31	794
750	960	900	29	5	24	31	857
800	1015	950	30	5	24	34	901
900	1115	1050	32.5	5	28	34	1001
1000	1230	1160	35	5	28	37	1112
1100	1340	1270	38	5	32	37	1231
1200	1455	1380	40	5	32	40	1328
1400	1675	1590	41	5	36	43	1530
1600	1915	1820	44	5	40	49	1750
1800	2115	2020	47	5	44	49	1950
2000	2325	2230	50	5	48	49	2150

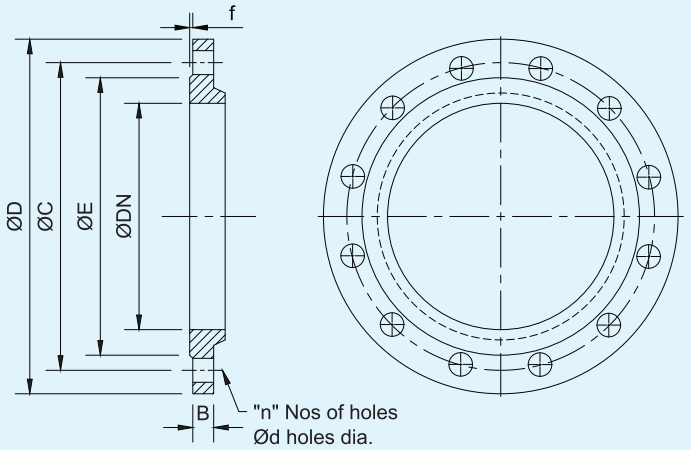
* All dimensions are in millimetres.



AS PER IS 9523, PN 16

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
80	200	160	16	3	8	19	132
100	220	180	16	3	8	19	156
125	250	210	16	3	8	19	184
150	285	240	16	3	8	23	211
200	340	295	17	3	12	23	266
250	400	355	19	3	12	28	319
300	455	410	20.5	4	12	28	370
350	520	470	22.5	4	16	28	429
400	580	525	24	4	16	31	480
450	640	585	26	4	20	31	548
500	715	650	27.5	4	20	34	609
600	840	770	31	5	20	37	720
700	910	840	34.5	5	24	37	794
750	970	900	36	5	24	37	857
800	1025	950	38	5	24	40	901
900	1125	1050	41	5	28	40	1001
1000	1255	1170	45	5	28	43	1112
1100	1355	1270	48.5	5	32	43	1218
1200	1485	1390	52	5	32	49	1328
1400	1685	1590	55	5	36	49	1530
1600	1930	1820	60	5	40	56	1750
1800	2130	2020	65	5	44	56	1950
2000	2345	2230	70	5	48	62	2150

* All dimensions are in millimetres.

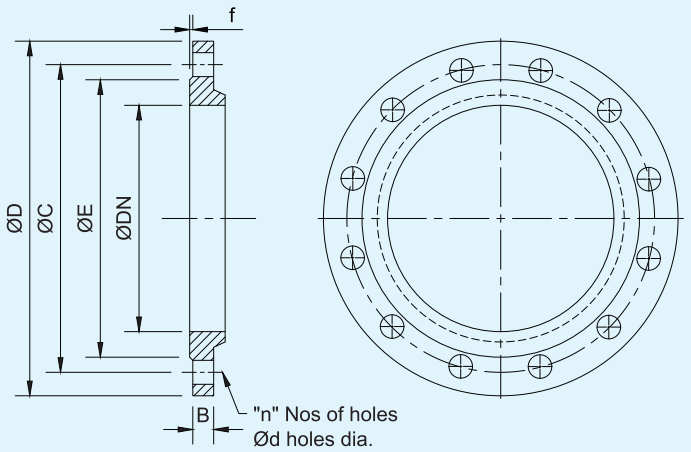


AS PER IS 9523, PN 25

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
80	200	160	16.0	3	8	19	132
100	235	190	16.0	3	8	23	156
125	270	220	16.0	3	8	28	184
150	300	250	17.0	3	8	28	211
200	360	310	19.0	3	12	28	274
250	425	370	21.5	3	12	31	330
300	485	430	23.5	4	16	31	389
350	555	490	26.0	4	16	34	448
400	620	550	28.0	4	16	37	503
450	670	600	30.5	4	20	37	548
500	730	660	32.5	4	20	37	609
600	845	770	37.0	5	20	40	720
700	960	875	41.5	5	24	43	820
750	1020	940	45.0	5	24	43	883
800	1085	990	46.0	5	24	49	928
900	1185	1090	50.5	5	28	49	1028
1000	1320	1210	55.0	5	28	56	1140
1100	1420	1310	60.5	5	32	56	1240
1200	1530	1420	64.0	5	32	56	1350
1400	1755	1640	69.0	5	36	62	1560
1600	1975	1860	76.0	5	40	62	1780
1800	2195	2070	83.0	5	44	70	1980
2000	2425	2300	90.0	5	48	70	2210

* All dimensions are in millimetres.

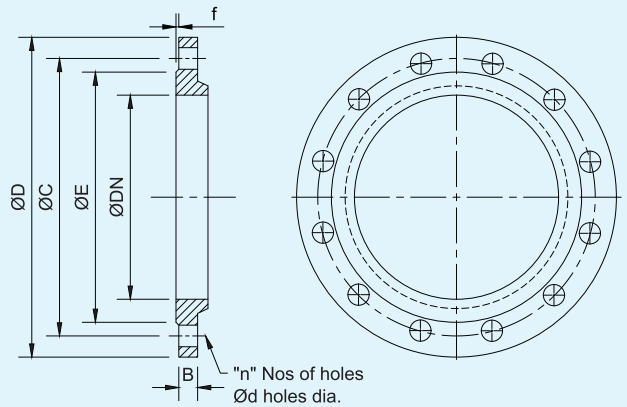
FLANGE DIMENSIONS



AS PER IS 9523, PN 40

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
80	200	160	16	3	8	19	132
100	235	190	16	3	8	23	166
125	270	220	20.5	3	8	28	184
150	300	250	23	3	8	28	211
200	375	320	27	3	12	31	284
250	450	385	31.5	3	12	34	345
300	515	450	35.5	4	16	34	409
350	580	510	40	4	16	37	465
400	660	585	44	4	16	40	535
450	685	610	46	4	20	40	560
500	755	670	48	4	20	43	615
600	890	795	53	5	20	49	735

* All dimensions are in millimetres.

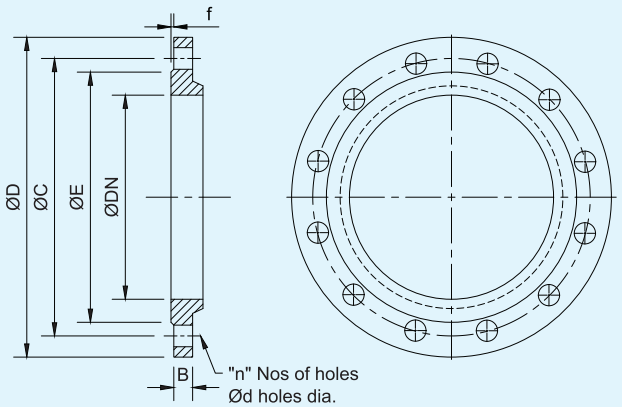


AS PER ISO 7005-2, PN 10

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
10	90	60	12.0	2	4	14	41
15	95	65	12.0	2	4	14	46
20	105	75	14.0	2	4	14	56
25	115	85	13.0	3	4	14	65
32	140	100	15.0	3	4	19	76
40	150	110	16.0	3	4	19	84
50	165	125	16.0	3	4	19	99
65	185	145	16.0	3	4	19	118
80	200	160	16.0	3	8	19	132
100	220	180	16.0	3	8	19	156
125	250	210	16.0	3	8	19	184
150	285	240	16.0	3	8	23	211
200	340	295	17.0	3	8	23	266
250	400	350	19.0	3	12	23	319
300	455	400	20.5	4	12	23	370
350	505	460	20.5	4	16	23	429
400	565	515	20.5	4	16	28	480
450	615	565	21.5	4	20	28	530
500	670	620	22.5	4	20	28	582
600	780	725	25.0	5	20	31	682
700	895	840	27.5	5	24	31	794
800	1015	950	30.0	5	24	34	901
900	1115	1050	32.5	5	28	34	1001
1000	1230	1160	35.0	5	28	37	1112
1200	1455	1380	40.0	5	32	40	1328
1400	1675	1590	41.0	5	36	43	1530
1600	1915	1820	44.0	5	40	49	1750
1800	2115	2020	47.0	5	44	49	1950
2000	2325	2230	50.0	5	48	49	2150

* All dimensions are in millimetres.

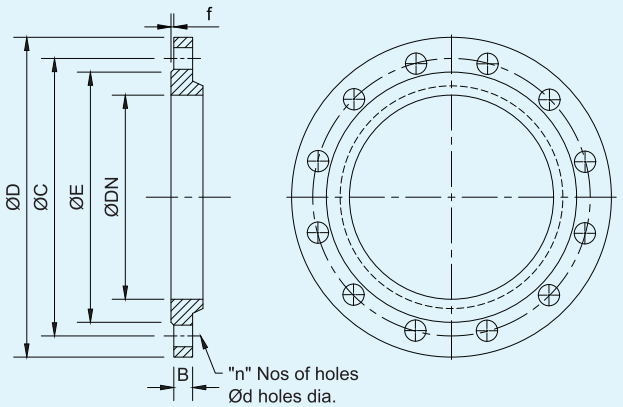
FLANGE DIMENSIONS



AS PER ISO 7005-2, PN 16

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
10	90	60	12.0	2	4	14	41
15	95	65	12.0	2	4	14	46
20	105	75	14.0	2	4	14	56
25	115	85	13.0	3	4	14	65
32	140	100	15.0	3	4	19	76
40	150	110	16.0	3	4	19	84
50	165	125	16.0	3	4	19	99
65	185	145	16.0	3	4	19	118
80	200	160	16.0	3	8	19	132
100	220	180	16.0	3	8	19	156
125	250	210	16.0	3	8	19	184
150	285	240	16.0	3	8	23	211
200	340	295	17.0	3	12	23	266
250	400	355	19.0	3	12	28	319
300	455	410	20.5	4	12	28	370
350	520	470	22.5	4	16	28	429
400	580	525	24.0	4	16	31	480
450	640	585	26.0	4	20	31	548
500	715	650	27.5	4	20	34	609
600	840	770	31.0	5	20	37	720
700	910	840	34.5	5	24	37	794
800	1025	950	38.0	5	24	40	901
900	1125	1050	41.5	5	28	40	1001
1000	1255	1170	45.0	5	28	43	1112
1200	1485	1390	52.0	5	32	49	1328
1400	1685	1590	55.0	5	36	49	1530
1600	1930	1820	60.0	5	40	56	1750
1800	2130	2020	65.0	5	44	56	1950
2000	2345	2230	70.0	5	48	62	2150

* All dimensions are in millimetres.

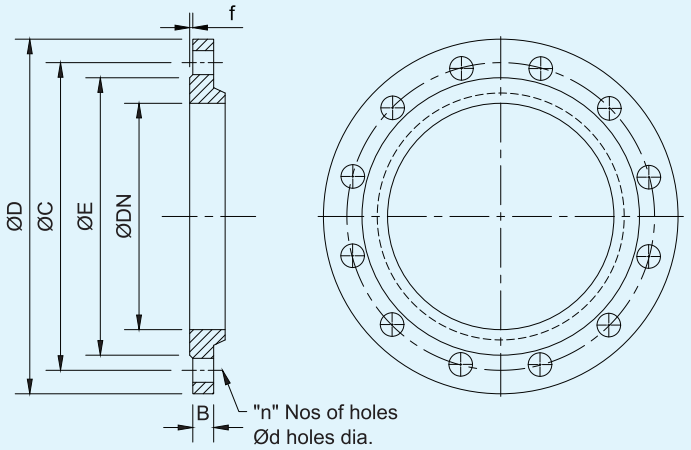


AS PER ISO 7005-2, PN 25

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
10	90	60	12.0	2	4	14	41
15	95	65	12.0	2	4	14	46
20	105	75	14.0	2	4	14	56
25	115	85	13.0	3	4	14	65
32	140	100	15.0	3	4	19	76
40	150	110	16.0	3	4	19	84
50	165	125	16.0	3	4	19	99
65	185	145	16.0	3	8	19	118
80	200	160	16.0	3	8	19	132
100	235	190	16.0	3	8	23	156
125	270	220	16.0	3	8	28	184
150	300	250	17.0	3	8	28	211
200	360	310	19.0	3	12	28	274
250	425	370	21.5	3	12	31	330
300	485	430	23.5	4	16	31	389
350	555	490	26.0	4	16	34	448
400	620	550	28.0	4	16	37	503
450	670	600	30.5	4	20	37	548
500	730	660	32.5	4	20	37	609
600	845	770	37.0	5	20	40	720
700	960	875	41.5	5	24	43	820
800	1085	990	46.0	5	24	49	928
900	1185	1090	50.5	5	28	49	1028
1000	1320	1210	55.0	5	28	56	1140
1200	1530	1420	64.0	5	32	56	1350
1400	1755	1640	69.0	5	36	62	1560
1600	1975	1860	76.0	5	40	62	1780
1800	2195	2070	83.0	5	44	70	1985
2000	2425	2300	90.0	5	48	70	2210

* All dimensions are in millimetres.

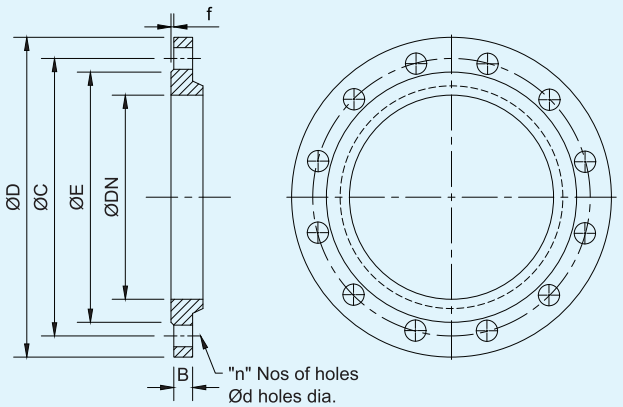
FLANGE DIMENSIONS



AS PER ISO 7005-2, PN 40

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
10	90	60	12	2	4	14	41
15	95	65	12	2	4	14	46
20	105	75	14	2	4	14	56
25	115	85	13	3	4	14	65
32	140	100	15	3	4	19	76
40	150	110	16	3	4	19	84
50	165	125	16	3	4	19	99
65	185	145	16	3	8	19	118
80	200	160	16	3	8	19	132
100	235	190	16	3	8	23	156
125	270	220	20.5	3	8	28	184
150	300	250	23	3	8	28	211
200	375	320	27	3	12	31	284
250	450	385	31.5	3	12	34	345
300	515	450	35.5	4	16	34	409
350	580	510	40	4	16	37	465
400	660	585	44	4	16	40	535
450	685	610	45	4	20	40	560
500	755	670	48	4	20	43	615
600	890	795	53	5	20	49	735

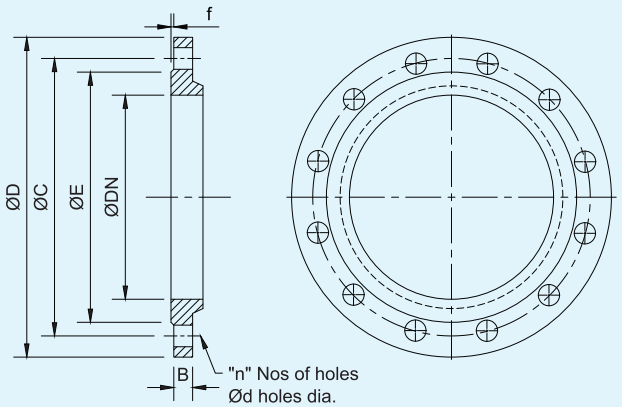
* All dimensions are in millimetres.



AS PER EN 1092-2, PN 10

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
10	90	60	12.0	2	4	14	41
15	95	65	12.0	2	4	14	46
20	105	75	14.0	2	4	14	56
25	115	85	13.0	3	4	14	65
32	140	100	15.0	3	4	19	76
40	150	110	16.0	3	4	19	84
50	165	125	16.0	3	4	19	99
60	175	135	16.0	3	4	19	108
65	185	145	16.0	3	4	19	118
80	200	160	16.0	3	8	19	132
100	220	180	16.0	3	8	19	156
125	250	210	16.0	3	8	19	184
150	285	240	16.0	3	8	23	211
200	340	295	17.0	3	8	23	266
250	400	350	19.0	3	12	23	319
300	455	400	20.5	4	12	23	370
350	505	460	20.5	4	16	23	429
400	565	515	20.5	4	16	28	480
450	615	565	21.5	4	20	28	530
500	670	620	22.5	4	20	28	582
600	780	725	25.0	5	20	31	682
700	895	840	27.5	5	24	31	794
800	1015	950	30.0	5	24	34	901
900	1115	1050	32.5	5	28	34	1001
1000	1230	1160	35.0	5	28	37	1112
1100	1340	1270	37.5	5	32	37	1218
1200	1455	1380	40.0	5	32	41	1328
1400	1675	1590	41.0	5	36	44	1530
1500	1785	1700	42.5	5	36	44	1640
1600	1915	1820	44.0	5	40	50	1750
1800	2115	2020	47.0	5	44	50	1950
2000	2325	2230	50.0	5	48	50	2150

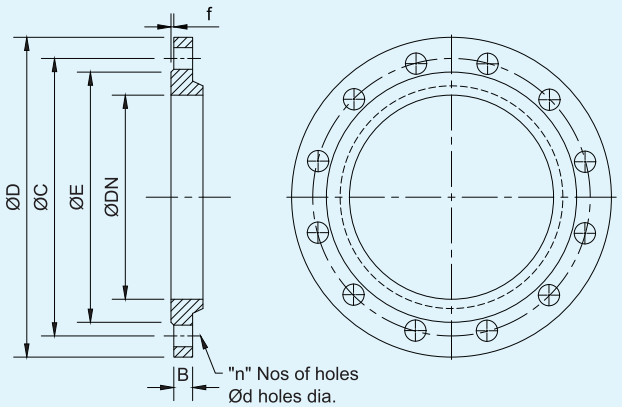
* All dimensions are in millimetres.



AS PER EN 1092-2, PN 16

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
10	90	60	12.0	2	4	14	41
15	95	65	12.0	2	4	14	46
20	105	75	14.0	2	4	14	56
25	115	85	13.0	3	4	14	65
32	140	100	15.0	3	4	19	76
40	150	110	16.0	3	4	19	84
50	165	125	16.0	3	4	19	99
60	175	135	16.0	3	4	19	108
65	185	145	16.0	3	4	19	118
80	200	160	16.0	3	8	19	132
100	220	180	16.0	3	8	19	156
125	250	210	16.0	3	8	19	184
150	285	240	16.0	3	8	23	211
200	340	295	17.0	3	12	23	266
250	400	355	19.0	3	12	28	319
300	455	410	20.5	4	12	28	370
350	520	470	22.5	4	16	28	429
400	580	525	24.0	4	16	31	480
450	640	585	26.0	4	20	31	548
500	715	650	27.5	4	20	34	609
600	840	770	31.0	5	20	37	720
700	910	840	34.5	5	24	37	794
800	1025	950	38.0	5	24	41	901
900	1125	1050	41.5	5	28	41	1001
1000	1255	1170	45.0	5	28	44	1112
1100	1355	1270	48.5	5	32	44	1218
1200	1485	1390	52.0	5	32	50	1328
1400	1685	1590	55.0	5	36	50	1530
1500	1820	1710	57.5	5	36	57	1640
1600	1930	1820	60.0	5	40	57	1750
1800	2130	2020	65.0	5	44	57	1950
2000	2345	2230	70.0	5	48	62	2150

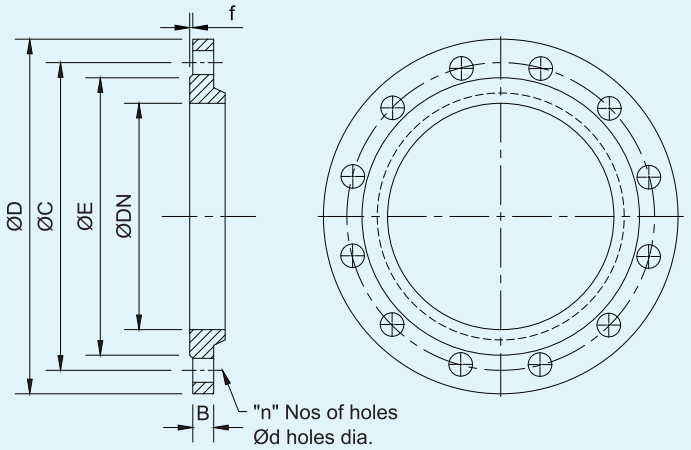
* All dimensions are in millimetres.



AS PER EN 1092-2, PN 25

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
10	90	60	12.0	2	4	14	41
15	95	65	12.0	2	4	14	46
20	105	75	14.0	2	4	14	56
25	115	85	13.0	3	4	14	65
32	140	100	15.0	3	4	19	76
40	150	110	16.0	3	4	19	84
50	165	125	16.0	3	4	19	99
60	175	135	16.0	3	8	19	108
65	185	145	16.0	3	8	19	118
80	200	160	16.0	3	8	19	132
100	235	190	16.0	3	8	23	156
125	270	220	16.0	3	8	28	184
150	300	250	17.0	3	8	28	211
200	360	310	19.0	3	12	28	274
250	425	370	21.5	3	12	31	330
300	485	430	23.5	4	16	31	389
350	555	470	26.0	4	16	34	448
400	620	550	28.0	4	16	37	503
450	670	600	30.5	4	20	37	548
500	730	660	32.5	4	20	37	609
600	845	770	37.0	5	20	41	720
700	960	875	41.5	5	24	44	820
800	1085	990	46.0	5	24	50	928
900	1185	1090	50.5	5	28	50	1028
1000	1320	1210	55.0	5	28	57	1140
1100	1420	1310	59.5	5	32	57	1240
1200	1530	1420	64.0	5	32	57	1350
1400	1755	1640	69.0	5	36	62	1560
1500	1865	1750	72.5	5	36	62	1678
1600	1975	1860	76.0	5	40	62	1780
1800	2195	2070	83.0	5	44	70	1985
2000	2425	2300	90.0	5	48	70	2210

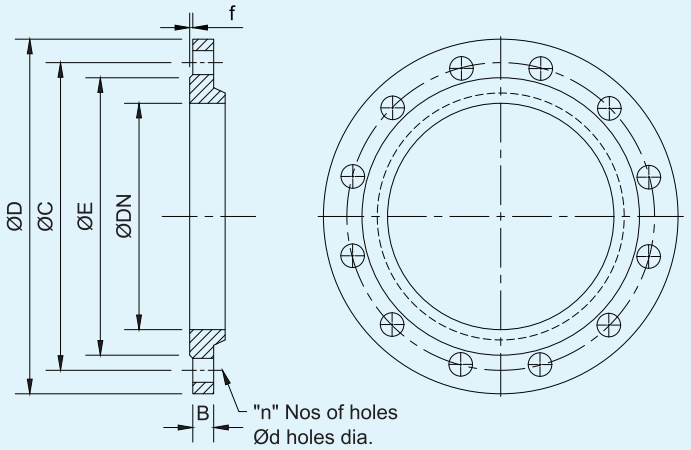
* All dimensions are in millimetres.



AS PER EN 1092-2, PN 40

Nominal Diameter	Outside Diameter	Pitch Circle Diameter	Flange Thickness		Holes		Raised Face Diameter
					No.	Dia	
DN	D	C	B	f	n	d	E
10	90	60	12.0	2	4	14	41
15	95	65	12.0	2	4	14	46
20	105	75	14.0	2	4	14	56
25	115	85	13.0	3	4	14	65
32	140	100	15.0	3	4	19	76
40	150	110	16.0	3	4	19	84
50	165	125	16.0	3	4	19	99
60	175	135	16.0	3	4	19	108
65	185	145	16.0	3	4	19	118
80	200	160	16.0	3	8	19	132
100	235	190	16.0	3	8	23	156
125	270	220	20.5	3	8	28	184
150	300	250	23.0	3	8	28	211
200	375	320	27.0	3	12	31	284
250	450	385	31.5	3	12	34	345
300	515	450	35.5	4	16	34	409
350	580	510	40.0	4	16	37	465
400	660	585	44.0	4	16	41	535
450	685	610	45.0	4	20	41	560
500	755	670	48.0	4	20	44	615
600	890	795	53.0	5	20	50	735

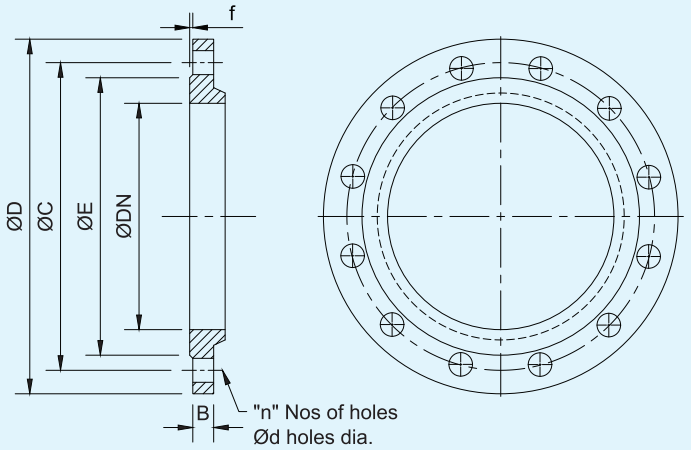
* All dimensions are in millimetres.



ANSI B 16.5 CLASS 150#

Nominal Bore		OD	PCD	THK		No. of Hole	Hole Dia	RF Dia
mm	inch			B	f			
15	1/2	88.9	60.5	11.2	1.6	4	15.9	35
20	3/4	98.6	69.9	11.2	1.6	4	15.9	43
25	1	108	79.3	11.2	1.6	4	15.9	50.8
32	1 ¼	117.3	88.9	12.7	1.6	4	15.9	63.5
40	1 ½	127	98.6	14.2	1.6	4	15.9	73.2
50	2	152.4	120.7	15.8	1.6	4	19	92
65	2 ½	177.8	139.7	17.5	1.6	4	19	104.6
80	3	190.5	152.4	19.0	1.6	4	19	127
90	3 ½	215.9	177.8	20.6	1.6	8	19	139.7
100	4	228.6	190.5	20.6	1.6	8	19	157.2
125	5	254	215.9	23.9	1.6	8	22.2	185.7
150	6	279.4	241.3	25.4	1.6	8	22.2	215.9
200	8	342.9	298.5	28.4	1.6	8	22.2	269.7
250	10	406.4	362	30.2	1.6	12	25.4	323.9
300	12	482.6	431.8	31.8	1.6	12	25.4	381
350	14	533.4	476.3	35.0	1.6	12	28.6	412.8
400	16	596.9	539.8	36.6	1.6	16	28.6	469.9
450	18	635	577.9	39.6	1.6	16	31.8	533.4
500	20	698.5	635	43.0	1.6	20	31.8	584.2
600	24	812.8	749.3	47.8	1.6	20	35	692.2
750	30	984.3	914.4	--	1.6	28	35	857.3
900	36	1168.4	1085.9	--	1.6	32	41.3	1022.4
1050	42	1346.2	1257.3	--	1.6	36	41.3	1193.8
1200	48	1511.3	1422.4	--	1.6	44	41.3	1358.9

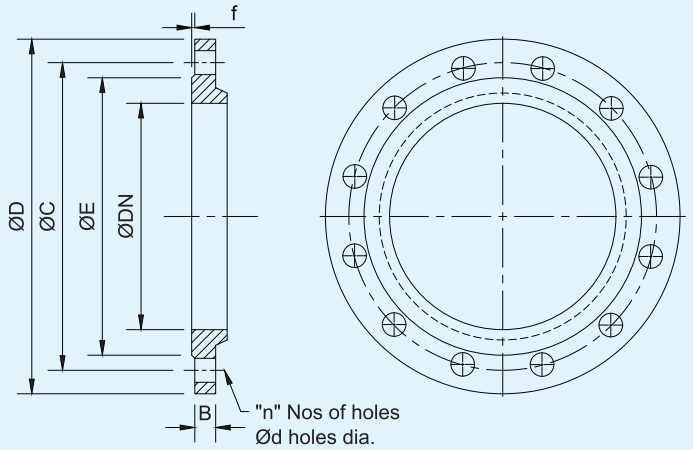
* All dimensions are in millimetres.



ANSI B 16.5 CLASS 300#

Nominal Bore		OD	PCD	THK		No. of Hole	Hole Dia	RF Dia
mm	inch			B	f			
15	1/2	95.3	66.5	14.2	1.6	4	15.9	35
20	3/4	117.3	82.6	15.7	1.6	4	19	43
25	1	124	88.9	17.5	1.6	4	19	50.8
32	1¼	133.4	98.6	19	1.6	4	19	63.5
40	1½	155.4	114.3	20.6	1.6	4	22.2	73.2
50	2	165.1	127	22.4	1.6	8	19	92
65	2 ½	190.5	149.4	25.4	1.6	8	22.2	104.6
80	3	209.6	168.1	28.5	1.6	8	22.2	127
90	3½	228.6	184.1	30.2	1.6	8	22.2	139.7
100	4	254	200.2	31.8	1.6	8	22.2	157.2
125	5	279.4	235	35	1.6	8	22.2	185.7
150	6	317.5	269.7	36.6	1.6	12	22.2	215.9
200	8	381	330.2	41.1	1.6	12	25.4	269.7
250	10	444.5	387.4	47.8	1.6	16	28.6	323.9
300	12	520.7	450.9	50.8	1.6	16	31.8	381
350	14	584.2	514.4	53.8	1.6	20	31.8	412.8
400	16	647.7	571.5	57.2	1.6	20	35	469.9
450	18	711.2	628.7	60.5	1.6	24	35	533.4
500	20	774.7	685.8	63.5	1.6	24	35	584.2
600	24	914.4	812.8	69.9	1.6	24	41.3	692.2
750	30	1092.2	997	91.9	1.6	28	47.6	857.3
900	36	1270	1168.4	104.6	1.6	32	54	1022.4

* All dimensions are in millimetres.



ANSI B 16.5 CLASS 600#

Nominal Bore		OD	PCD	THK		No. of Hole	Hole Dia	RF Dia
mm	inch			B	f			
15	1/2	95.3	66.5	20.6	6.35	4	15.9	35
20	3/4	117.3	82.6	22.2	6.35	4	19	43
25	1	124	88.9	23.9	6.35	4	19	50.8
32	1 ¼	133.4	98.6	26.9	6.35	4	19	63.5
40	1½	155.4	114.3	28.7	6.35	4	22.2	73.2
50	2	165.1	127	31.8	6.35	8	19	92
65	2½	190.5	149.4	35	6.35	8	22.2	104.6
80	3	209.6	168.1	38.1	6.35	8	22.2	127
90	3 ½	228.6	184.1	41.4	6.35	8	25.4	139.7
100	4	273	215.9	44.5	6.35	8	25.4	157.2
125	5	330.2	266.7	50.8	6.35	8	28.6	185.7
150	6	355.6	292.1	54.1	6.35	12	28.6	215.9
200	8	419.1	349.3	62	6.35	12	31.8	269.7
250	10	508	431.8	69.9	6.35	16	35	323.9
300	12	558.8	489	73	6.35	20	35	381
350	14	603.3	527	76.2	6.35	20	38.1	412.8
400	16	685.8	603.3	82.6	6.35	20	41.3	469.9
450	18	743	654	88.9	6.35	20	44.5	533.4
500	20	812.8	723.9	95.3	6.35	24	44.5	584.2
600	24	939.8	838.2	108	6.35	24	50.8	692.2
750	30	1130.3	1022	120	6.35	28	54	857.3

* All dimensions are in millimetres.

Sluice Valves

A **Sluice valve**, also known as a Gate Valve, is a type of valve used to control the flow of liquid through a pipe. It works by lifting a gate or wedge out of the path of the fluid.

Types of Sluice Valves

Rising Stem Valve

- The stem rises as the valve opens, providing a visual indication of valve position.
- More space needed above the valve.

Non-Rising Stem Valve

- The stem remains in place; only the gate moves.
- Compact, used where space is limited.

This Valves can further be categorized based on MOC of Wedge

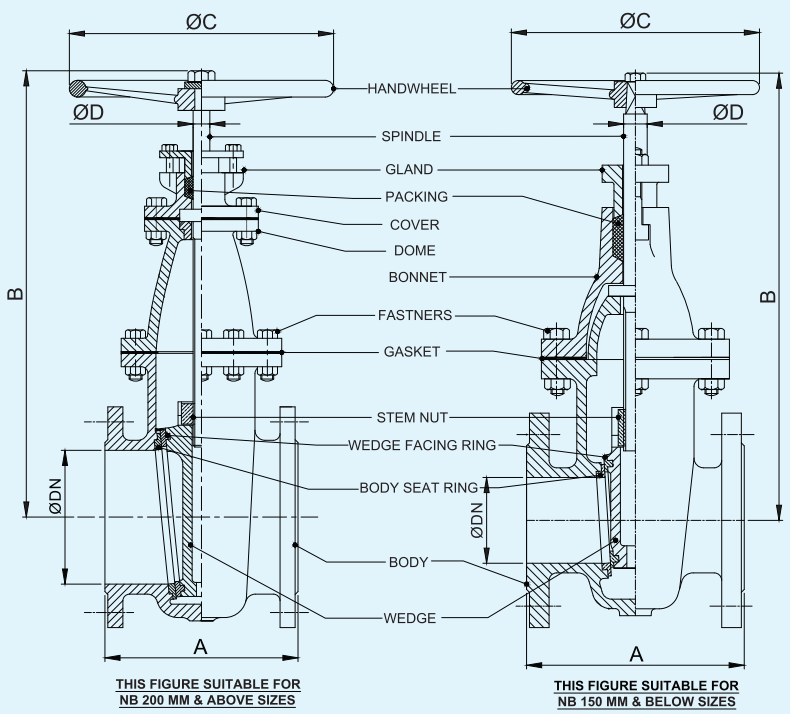
Resilient Seated Gate Valve

- Uses a rubber-coated gate for better sealing.
- Suitable for potable water and corrosion-prone systems.

Metal Seated Gate Valve

- Uses metal-to-metal contact for sealing.
- Durable, suitable for High temp./abrasive fluids.

PARENT / BASIC MATERIAL	DUCTILE IRON, CAST IRON, CAST STEEL, WCB
TYPE OF CONSTRUCTION	RISING SPINDLE, NON RISING SPINDLE
MANUFACTURING STANDARD	IS 14846, BS 5163, BS 5150, EN 1074-1, AWWA C 500, DIN 3352
END FLANGE STANDARD	IS 1538, IS 9523, ISO 7005-2, EN 1092-2, BS 4504, ANSI 16.1, ANSI 16.5 OR ANY OTHER STANDARD
MANUFACTURING RANGE OF SIZE	DN 40MM TO DN 2400 MM
RATING	PN 10, PN 16, PN 25, PN 40
COATING	BLACK BITUMEN, LIQUID EPOXY, FUSION BONDED EPOXY, POLYURETHENE, CERAMIC EPOXY

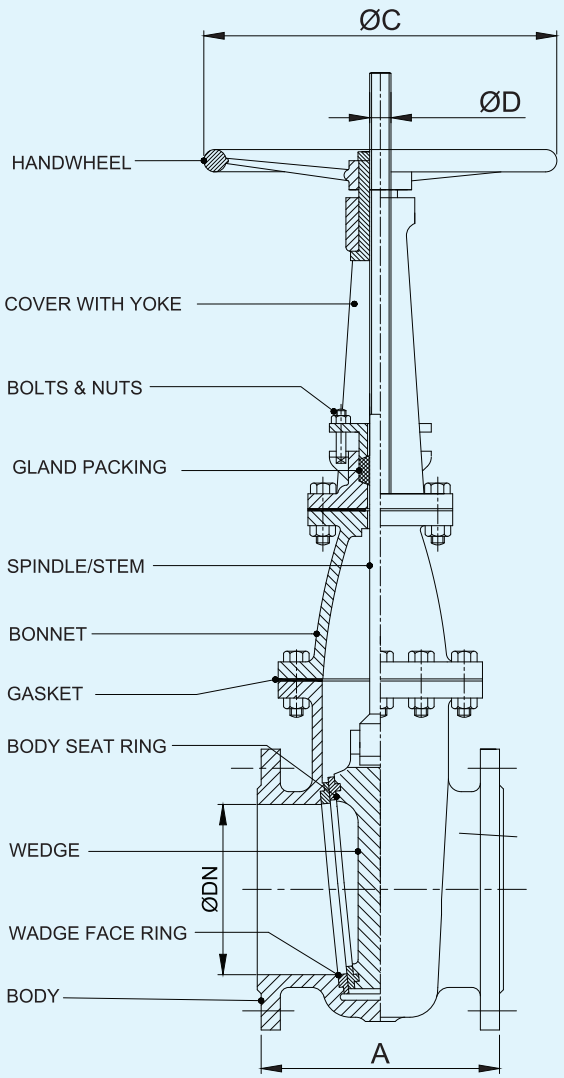


NON RISING SPINDLE SLUICE VALVE

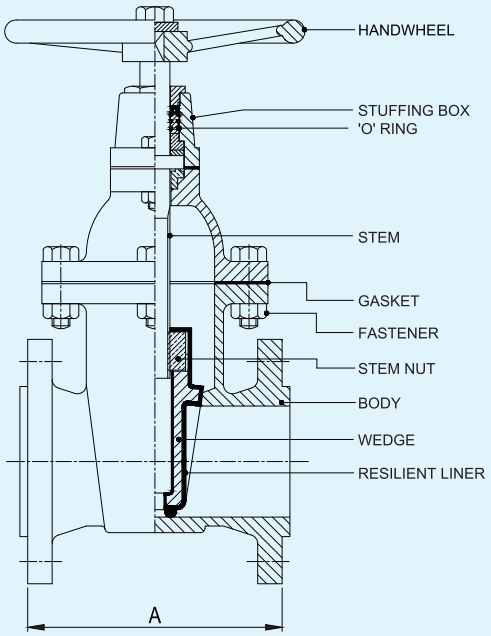
OPTIONAL ARRANGEMENT

- ENCLOSED GEAR
- OPEN GEAR
- ELECTRIC ACTUATOR
- BACK SEAT BUSH
- BY PASS ARRANGEMENT
- DRAIN PLUG/SCOUR
- SHOE & CHANNEL
- LIFTING LUGS
- THRUST BALL BEARING
- EXTENSION SPINDLE
- HEAD STOCK
- TEE KEY OPERATION
- SCREWED IN SEAT

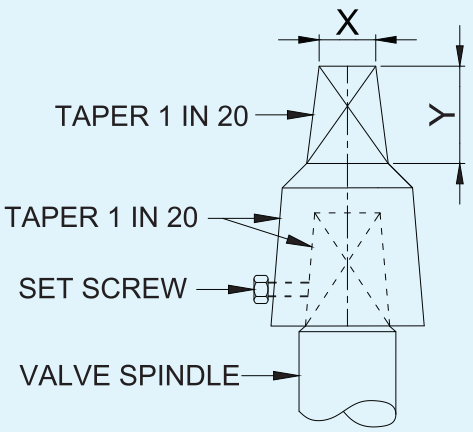
* All dimensions are in millimetres.



RISING SPINDLE SLUICE VALVE



RESILIENT SEATED SLUICE VALVE



VALVE CAP

Nominal Size of Sluice Valve (mm)	Size of By Pass Arrangement (mm)
250	25
300	25
350	40
400	40
450	50
500	50
600	65
700	80
750	80
800	80
900	100
1000	100
1100	125
1200	125

HYDRSTATIC TEST PRESSURE				
PN RATING	TEST TYPE	TEST PRESSURE		TEST DUARATION
		Mpa	BAR	Minute
PN-1.0/10	Body	1.5	15	5
	Seat	1.0	10	2
PN-1.6/16	Body	2.4	24	5
	Seat	1.6	16	2
PN-2.5/25	Body	3.7	37	5
	Seat	2.5	25	2
PN-4.0/40	Body	6.0	60	5
	Seat	4.0	40	2

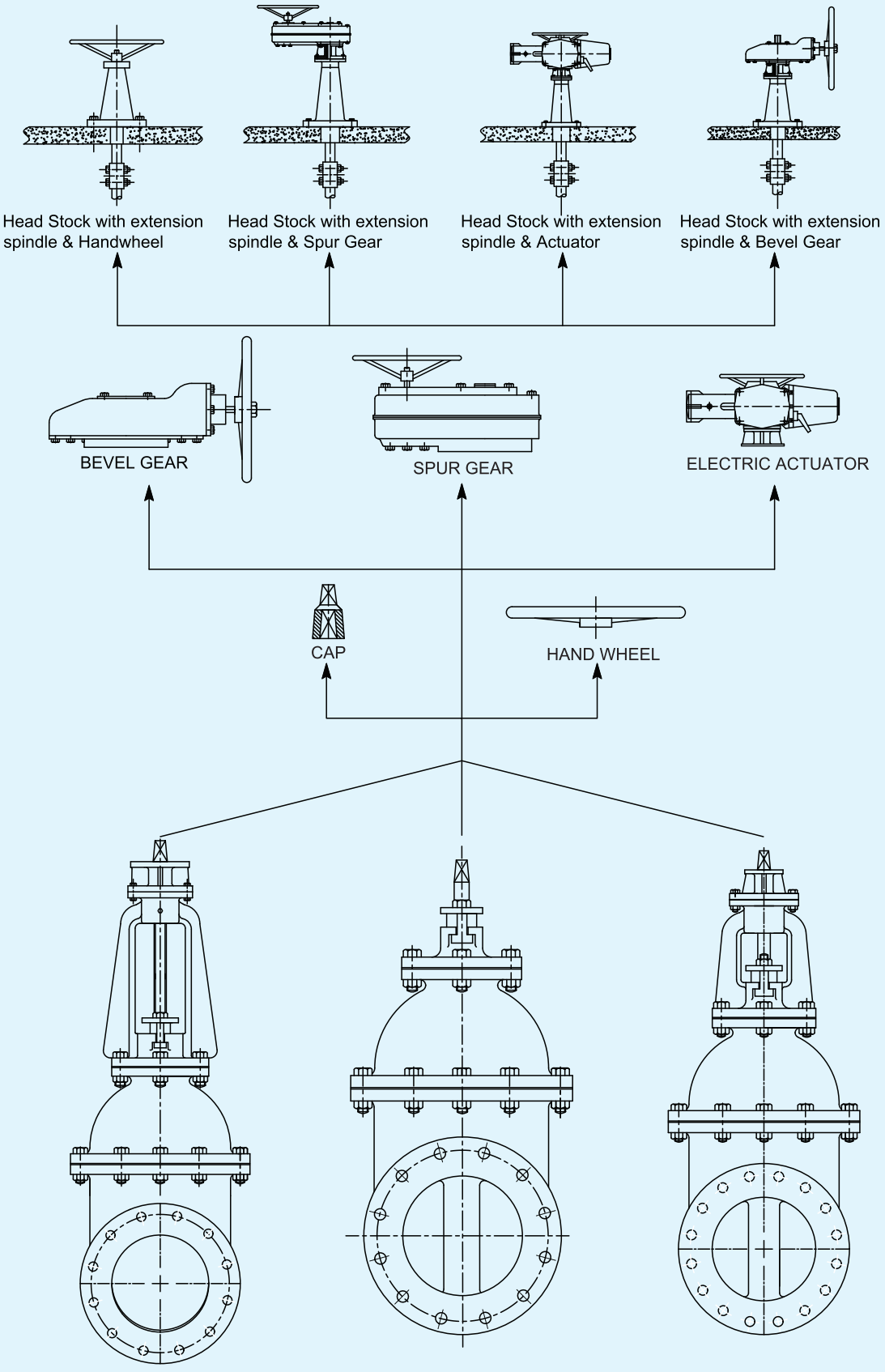
* All dimensions are in millimetres.

DIMENSION TABLE FOR SLUICE VALVE

SIZE	BODY					SPINDLE		HANDWHEEL		CAP	
	FACE TO FACE (A)			WIDTH	CENTRE TO TOP	STEM DIA (D)		WHEEL DIA (MM)		SIZE OF BOTTOM SQUARE	LENGTH OF SQUARE
DN	PD	ALT-I	ALT-II	B (MAX)	H (MAX)	PN-1.0/10	PN-1.6/16	PN-1.0/10	PN-1.6/16	X	Y
40	165	--	--	--	340	18	20	180	225	--	–
50	178	250	215	160	365	22	22	225	280	35	60
65	190	270	230	215	380	22	22	225	280	35	60
80	203	280	230	220	425	22	22	225	280	35	60
100	229	300	255	250	470	27	27	320	360	35	60
125	254	325	266	310	485	27	27	320	360	35	60
150	267	350	280	330	595	27	27	320	360	35	60
200	292	400	318	460	725	32	32	360	450	35	60
250	330	450	355	500	835	36	36	400	640	35	60
300	356	500	380	550	910	36	36	400	640	35	60
350	381	550	--	600	1020	37	42	500	640	48	75
400	406	600	--	650	1110	42	47	640	730	48	75
450	432	650	--	700	1200	47	52	720	800	48	75
500	457	700	--	800	1300	47	52	720	800	48	75
600	508	800	--	900	1500	47	57	720	800	48	75
700	610	900	1130	950	1670	62	--	800	--	65	100
750	610	950	1200	1000	1780	67	--	900	--	65	100
800	660	1000	1250	1100	1930	67	--	900	--	65	100
900	711	1100	1380	1200	2080	77	--	900	--	65	100
1000	811	1200	1500		2200	77	--	900	--	65	100
1100	811	--	--	--	2450	87	--	1000	--	65	100
1200	811	--	--	--	2580	87	--	1000	--	65	100
1300	700	--	--	--	2800	85	90	1000	1000	--	–
1400	710	--	--	--	2975	85	90	1000	1000	--	–
1500	760	--	--	--	3150	92	97	1000	1000	--	–
1600	790	--	--	--	3325	92	97	1000	1000	--	–
1700	820	--	--	--	3500	100	107	1000	1000	--	–
1800	870	--	--	--	3680	100	107	1000	1000	--	–
1900	970	--	--	--	3880	113	120	1000	1000	--	–
2000	1100	--	--	--	4100	120	127	1000	1000	--	–
2100	1230	--	--	--	4300	125	132	1000	1000	--	–
2200	1350	--	--	--	4500	135	138	1000	1000	--	–
2300	1500	--	--	--	4725	138	143	1000	1000	--	–
2400	1650	--	--	--	4950	143	150	1000	1000	--	–
2500	1800	--	--	--	5200	150	160	1000	1000	–	–

Note :
1. PD - Preferred Dimensions
2. ALT 1 - Alternate I Dimensions (long body)
3. ALT II - Alternate II Dimensions

* All dimensions are in millimetres.



VARIOUS WAYS TO OPERATE GATE VALVE / SLUICE VALVE

MATERIALS OF COMPONENT PARTS OF SLUICE VALVE			
Sl. No.	**COMPONENT**	**MATERIAL**	**GRADE**
1	BODY, BONNET, COVER, WEDGE, GLAND, THURST PLATE, CAP	DUCTILE IRON	SG 500-7 / GGG 50
		CAST IRON	SG 400-12/GGG 40
			FG 200
		CAST STEEL	FG 260
2	STEM \ SPINDLE	STAINLESS STEEL	12Cr13\04 Cr18 Ni10
			04 Cr 17 Ni 12 Mo2
			20 Cr 13
			AISI 410
			AISI 304
			AISI 316
		HIGH TENSILE BRASS	HTB 2
			FHTB 2
3	WEDGE NUT / STEM NUT	LEADED TIN BRASS	LTB 2
		HIGH TENSILE BRASS	JTN 2
4	BODY SEAT RING, WEDGE FACE RING & BUSHES	LEADED TIN BRASS	LTB 2
		STAINLESS STEEL	04 CR 18 NI 10
			AISI 304
5	BOLTS & NUTS	CARBON STEEL	GRADE 4.0,4.6
		STAINLESS STEEL	SS 316
6	GASKET	RUBBER	TYPE B
			NE3OPHRENE
7	GLAND PACKING	JUTE & HEMP	

Tolerance on L	
Up to and including 300 mm	± 2 mm
Above 300 and including 600 mm	± 3 mm
Above 600 and including 800 mm	± 4 mm
Above 800 and including 1000 mm	± 5 mm
Above 1000 mm	± 6 mm

Other Tolerances	
Tolerances on Square, a and X	± 0.5 mm
Tolerances on Size of Hand Wheel, D	± 0.5 mm

* All dimensions are in millimetres.

Non Return Valve/Check Valve/Reflux Valve

A **Non-Return Valve (NRV)**, also known as a **Check Valve**. NRV is a type of valve that allows fluid to flow in only one direction, preventing backflow in a piping system. It doesn't require manual operation or external control. It works purely based on pressure differences in the system.

Types of Non-Return Valves

1. **Swing Check Valve**
   - Has a disc that swings open with flow and closes with backflow.
   - Common in water and wastewater systems.

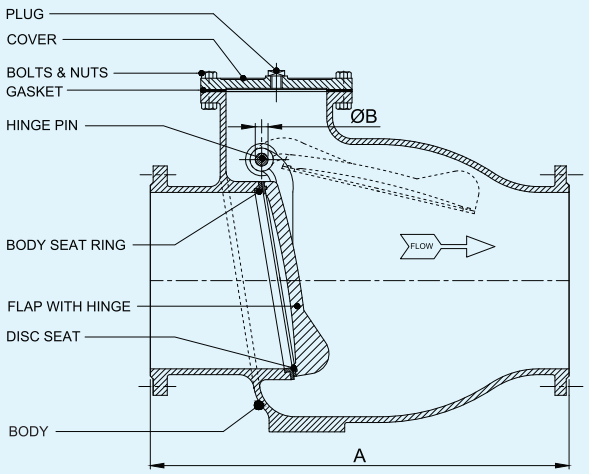
   Based on number of Door/Disc swing type check valve can be two types
   a. Single Door swing check type non return valve
   b. Multi Door swing check type non return valve

2. **Dual Plate Check Valve (Wafer Type)**
   - Has two half discs that fold open during flow and spring back shut.
   - Compact, lightweight, suitable for large pipelines.

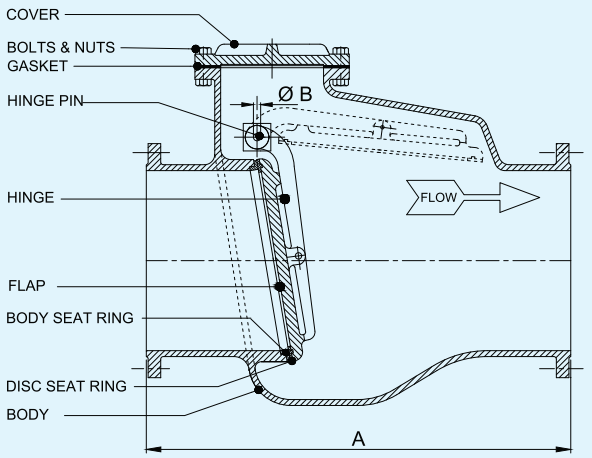
SINGLE DOOR NON RETURN / CHECK / REFLUX VALVE	
PARENT / BASIC MATERIAL	DUCTILE IRON, CAST IRON, CAST STEEL, WCB
TYPE OF CONSTRUCTION	SWING CHECK, TILTING DISC
MANUFACTURING STANDARD	IS 5312-1, BS 5153
END FLANGE STANDARD	IS 1538, IS 9523, ISO 7005-2, EN 1092-2, BS 4504, ANSI 16.1, ANSI 16.5 OR ANY OTHER STANDARD
MANUFACTURING RANGE OF SIZE	DN 40MM TO DN 600 MM
RATING	PN 10, PN 16, PN 25, PN 40
COATING	BLACK BITUMEN, LIQUID EPOXY, FUSION BONDED EPOXY, POLYURETHENE, CERAMIC EPOXY

MULTI DOOR NON RETURN / CHECK / REFLUX VALVE	
PARENT / BASIC MATERIAL	DUCTILE IRON, CAST IRON, CAST STEEL, WCB
TYPE OF CONSTRUCTION	4 DOOR SWING CHECK WITH INBUILT DUCKFOOT
MANUFACTURING STANDARD	IS 5312-2, BS 5153
END FLANGE STANDARD	IS 1538, IS 9523, ISO 7005-2, EN 1092-2, BS 4504, ANSI 16.1, ANSI 16.5 OR ANY OTHER STANDARD
MANUFACTURING RANGE OF SIZE	DN 500MM TO DN 1800 MM
RATING	PN 10, PN 16, PN 25, PN 40
COATING	BLACK BITUMEN, LIQUID EPOXY, FUSION BONDED EPOXY, POLYURETHENE, CERAMIC EPOXY

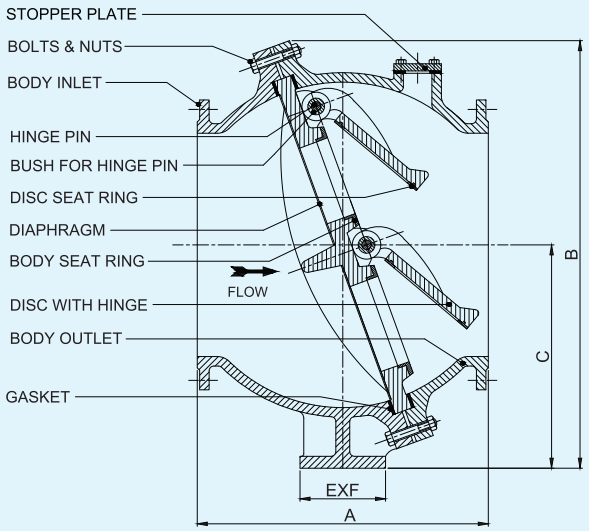
DUAL PLATE CHECK VALVE	
PARENT / BASIC MATERIAL	DUCTILE IRON, CAST IRON, CAST STEEL, FABRICATED STEEL
TYPE OF DISC	DOUBLE DOOR SOLID FLAT FLIP WITH INTEGRAL HINGE
MANUFACTURING STANDARD	API 594, API 6D & API 598 (Testing)
END FLANGE STANDARD	IS 1538, IS 9523, ISO 7005-2, EN 1092-2, BS 4504, ANSI 16.1, ANSI 16.5 OR ANY OTHER STANDARD
MANUFACTURING RANGE OF SIZE	DN 500MM TO DN 1800 MM
RATING	PN 10, PN 16, CL-150, 300, 600, 900
COATING	BLACK BITUMEN, LIQUID EPOXY, FUSION BONDED EPOXY, POLYURETHENE



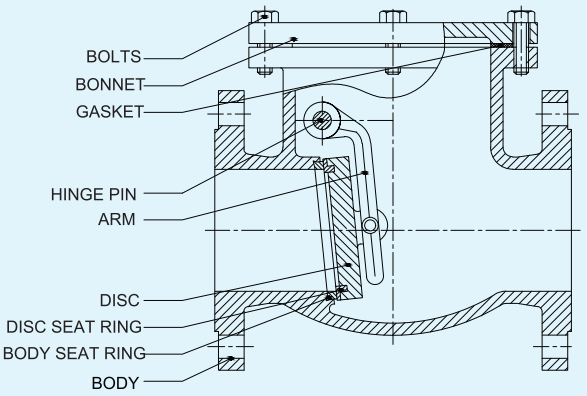
NON SLAM DESIGN SINGLE DOOR SWING CHECK NON RETURN VALVE



CONVENTIONAL DESIGN SINGLE DOOR SWING CHECK NON RETURN VALVE



MULTI DOOR SWING CHECK NON RETURN VALVE



Dimension Table for Single Door NRV

SINGLE DOOR NON RETURN VALVE			
DN (MM)	FACE TO FACE (L)	HINGE PIN DIA (B)	BY PASS SIZE
50	203	60	10
65	216	75	10
80	241	130	10
100	292	140	10
125	330	150	15
150	356	200	15
200	495	220	25
250	622	250	25
300	698	320	40
350	787	340	40
400	914	350	40
450	978	430	50
500	978	510	50
600	1295	600	65

TOLERANCE ON LENGTH (SINGLE DOOR NRV)	
0 TO 250mm	±2
250mm TO 500mm	±3
500mm TO 800mm	±4
800mm TO 1000mm	±5
1000mm TO 1300mm	±6

* All dimensions are in millimetres.

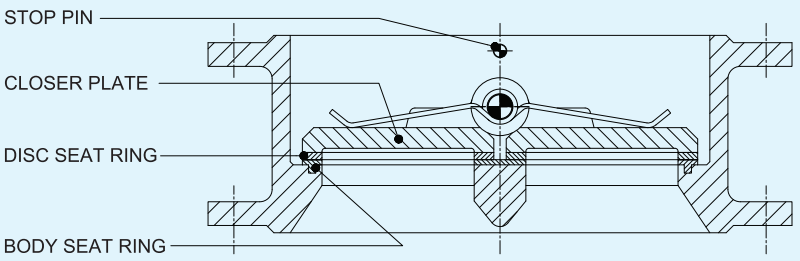
MATERIALS FOR DIFFERENT COMPONENT PARTS OF CHECK VALVE			
Sl. No.	COMPONENT	MATERIAL	GRADE
1.	BODY, COVER , DOOR	DUCTILE IRON	SG 500-7 / GGG 50
		CAST IRON	SG 400-12/ GGG40
			FG 200
		CAST STEEL	FG 260
2.	HINGE PIN, DOOR PIN	STAINLESS STEEL	12 Cr 12
			04Cr19Ni9
			04Cr17Ni12M02
		HIGH TENSILE BRASS	HT 2
3.	BODY SEAT RING	LEADED TIN BRONZE	LTB-2
		STAINLESS STEEL	Gr 1/Gr 4/Gr 10
			AISI 304
4.	DOOR FACE RING	LEADED TIN BRONZE	LTB-2
		STAINLESS STEEL	Gr 1/Gr 4/Gr 10
			AISI 304
		NATURAL/SYNTHETIC RUBBER	
5.	BEARING BUSH	LEADED TIN BRONZE	LTB-2
		P.T.F.E	
6.	BOLTS & NUTS	CARBON STEEL	GRADE 4.0
			GRADE 4.6
7.	GASKET	RUBBER	

MULTIDOOR NON RETURN VALVE					
DN (MM)	FACE TO FACE (L)	OVERALL HEIGHT (B)	HEIGHT OF CENTRE (C)	SIZE OF DUCK FOOT (EXF)	BY PASS SIZE
500	815	1150	600	200 X 250	80
600	914	1333	685	254 X 254	80
700	1000	1446	750	300 X 375	100
750	1045	1446	750	300 X 375	100
800	1118	1570	850	300 X 375	100
900	1250	1634	815	300 X 375	100
1000	1250	1730	915	300 X 375	100
1100	1396	2069	1080	400 X 450	100
1200	1500	2250	1175	400 X 450	100

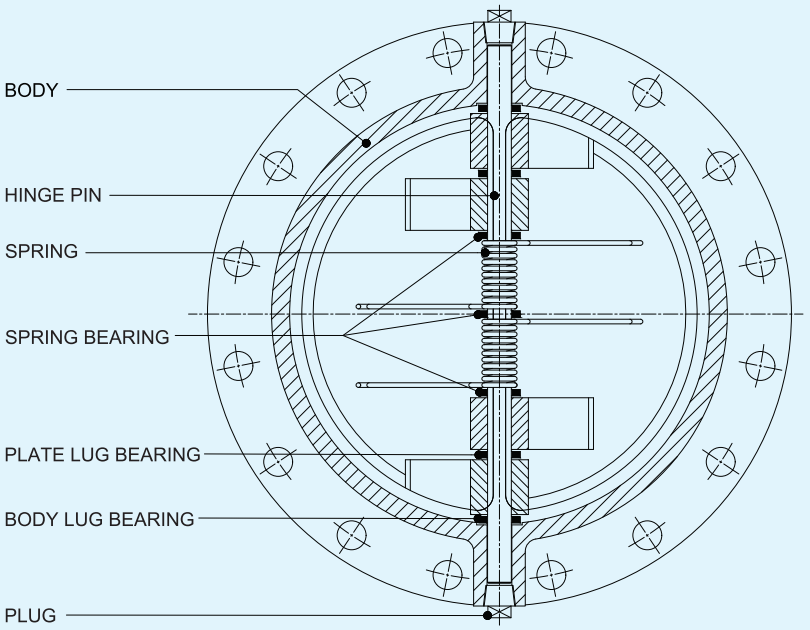
TOLERANCE ON LENGTH (MULTIDOOR NRV)	
400mm	±2
Above 400mm up to and including 600mm	±3
Above 600mm up to and including 800mm	±4
Above 800mm up to and including 1000mm	±5

* All dimensions are in millimetres.

DUAL PLATE CHECK VALVE



DIMENSION TABLE FOR DPCV		
DN (MM)	FACE TO FACE (A)	HINGE PIN DIA
50	54	7
65	54	7
80	57	8
100	64	8
125	70	10
150	98	12
200	127	14
250	146	16
300	181	18
350	184	20
400	191	23
450	203	23
500	213	30
600	222	30
700	264	34
750	305	34
800	330	38
900	368	38
1000	432	44
1100	457	44
1200	524	50
1300	530	55
1400	540	60
1500	660	65
1600	770	70
1700	800	75
1800	915	80
1900	990	85
2000	1070	90



HYDRSTATIC TEST PRESSURE				
PN RATING	TEST TYPE	TEST PRESSURE		TEST DUARATION
		Mpa	BAR	Min
PN-1.0/10	Body	1.5	15	5
	Seat	1.0	10	2
PN-1.6/16	Body	2.4	24	5
	Seat	1.6	16	2
PN-2.5/25	Body	3.7	37	5
	Seat	2.5	25	2
PN-4.0/40	Body	6.0	60	5
	Seat	4.0	40	2

* All dimensions are in millimetres.
* As per Indian Standard PN-16 rating Valves can also be supplied with PN-10 Flanges.

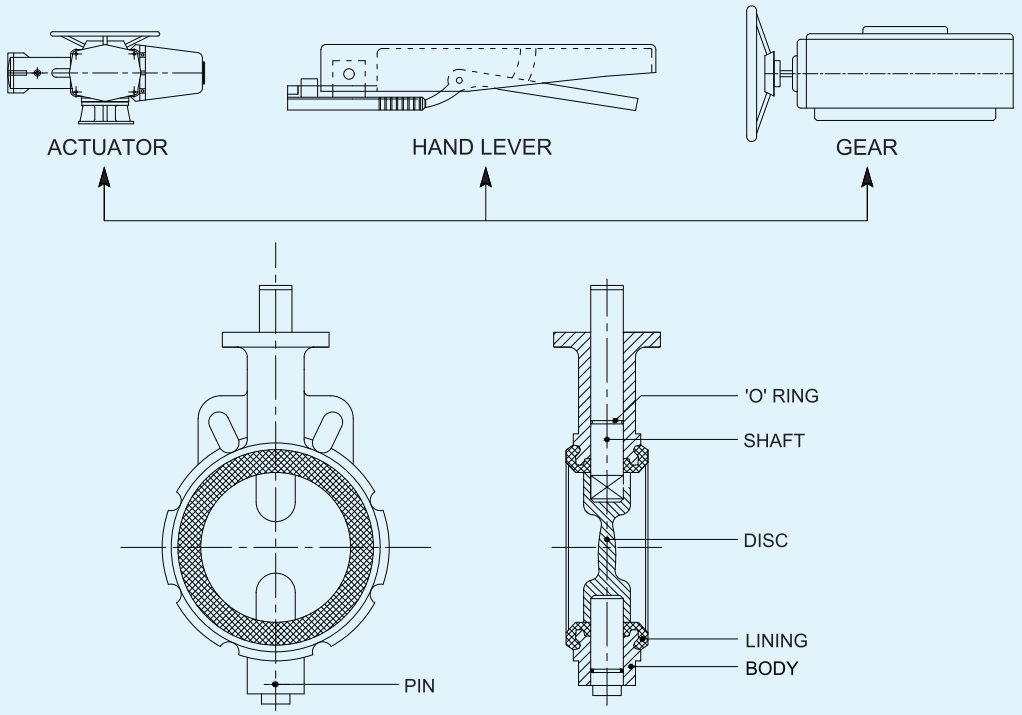
Butterfly Valve

A **Butterfly Valve** is a quarter-turn valve used to regulate or isolate flow in a pipeline. It has a rotating disc mounted on a central shaft, which opens or closes the valve when the handle or actuator is turned. The name "butterfly" comes from the disc's wing-like motion inside the valve body.

Types of Butterfly Valves based on Connection Type

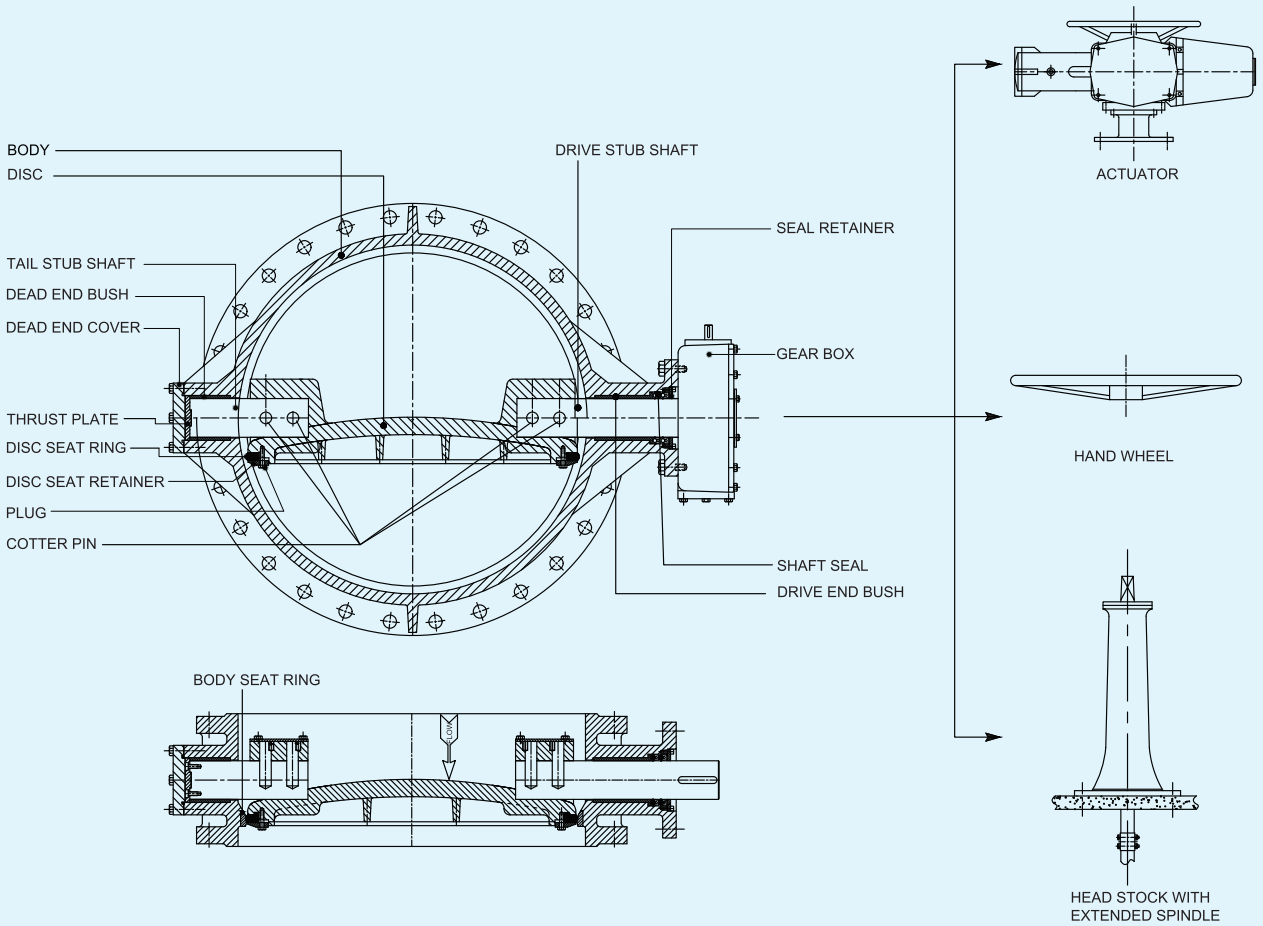
- **Wafer Type:** Sandwiched between two flanges; most common.
- **Lug Type:** Has threaded lugs for bolting to flanges on both sides.
- **Flanged Type:** Has integral flanges; easier to remove and maintain.

PARENT / BASIC MATERIAL	DUCTILE IRON, CAST IRON, CAST STEEL, WCB
TYPE OF CONSTRUCTION OF SHAFT	DOUBLE ECCENTRIC, CONCENTRIC, TRIPLE ECCENTRIC
TYPE OF CONSTRUCTION OF BODY	DOUBLE FLANGE SHORT, DOUBLE FLANGED LONG, WAFER SHORT, WAFER MEDIUM, WAFER LONG
MANUFACTURING STANDARD	IS 13095, BS 5155, BS EN 593, API 609, AWWA C 504
END FLANGE STANDARD	IS 1538, IS 9523, ISO 7005-2, EN 1092-2, BS 4504, ANSI 16.1, ANSI 16.5 OR ANY OTHER STANDARD
MANUFACTURING RANGE OF SIZE	DN 50MM TO DN 2400 MM
COATING	BLACK BITUMEN, LIQUID EPOXY, FUSION BONDED EPOXY, POLYURETHENE, CERAMIC EPOXY



WAFER TYPE BUTTERFLY FLANGE

DOUBLE FLANGE BUTTERFLY VALVE



NOMINAL PRESSURES

Valves shall be designated by nominal pressure (PN) defined as the maximum permissible working pressure (MPa/Bar) at 20° C temperature as follows:

PN 0·25(2.5), PN 0·6(6), PN 1·0(10), PN 1.6(16), PN 2·5(25) & PN 4·0(40)

The class designations for valves specified by nominal pipe sizes shall be class 125, class 150 and class 300 and shall have working pressure (MPa) at -29 to 38°C temperature as follows:

HYDROSTATIC WORK PRESSURE

Material	Nominal Pipe sizes	Working Pressure (Mpa)		
		Class 125	Class 150	Class 300
Cast Iron	NPS < 12	1.38	-	-
	NPS 14 to 24	1.03	-	-
	NPS > 30	1.03	-	-
Ductile Iron	All	-	1.72	4.4
Steels	All		1.96	5.11

TOLERANCE ON FACE TO FACE DIMENSIONS

Face to Face Dimension (mm)		Tolerance (mm)
Over	Upto and including	
0	250	±2
250	500	±3
500	800	±4
800	1000	±5
1000	2400	±6

* All dimensions are in millimetres.

DIMENSION TABLE OF BUTTERFLY VALVE						
Nominal Diameter	Double Flanged Short	Double Flanged Long	Wafer Short	Wafer Medium	Wafer Long	Wafer Long
	Face to Face dimensions for nominal pressure		Face to face dimensions for nominal pressure			
DN	PN 1.0 (10) / PN 1.6 (16) / PN 2.5 (25)	PN 4.0(40)	PN 1.0 (10) / PN 1.6 (16) / PN 2.5 (25)	PN 1.0 (10) / PN 1.6 (16) / PN 2.5 (25)	PN 1.0 (10) / PN 1.6 (16) / PN 2.5 (25)	PN 4.0(40)
	Class 125/150	Class 300	Class 125/150	Class 125/150	Class 125/150	Class 300
40	106	140	33	--	--	–
50	108	150	43	--	--	–
65	112	170	46	--	--	–
80	114	180	46	--	64	49
100	127	190	52	--	64	56
125	140	200	56	--	70	64
150	140	210	56	--	78	70
200	152	230	60	--	89	71
250	165	250	68	--	114	76
300	178	270	78	--	114	83
350	190	290	--	92	127	127
400	216	310	--	102	140	140
450	222	330	--	114	152	160
500	229	350	--	127	152	170
600	267	390	--	154	178	200
700	292	430	--	--	229	
800	318	470	--	--	241	
900	330	510	--	--	241	
1000	410	550	--	--	300	
1200	470	630	--	--	350	
1400	530	710	--	--	390	
1600	600	790	--	--	440	
1800	670	870	--	--	490	
2000	760	950	--	--	540	

DIMENSION TABLE OF BUTTERFLY VALVE			
Sl. No.	**COMPONENT**	**MATERIAL**	**GRADE**
1.	**BODY**	DUCTILE IRON	SG 500-7 / GGG 50
			SG 400-12/ GGG40
		CAST IRON	FG 200
		CAST STEEL	FG 260
2.	**DISC**	DUCTILE IRON	SG 500-7 / GGG 50
			SG 400-12/ GGG40
		CAST IRON	FG 200
			FG 260
		CAST STEEL	
		STAINLESS STEEL	GR 6 OR 7
3.	**SHAFT**	STAINLESS STEEL	GR 6 OR 7
			12 Cr 12
			15 Cr 16 Ni 2
			04 Cr 19 Ni 9
			04 Cr 17 Ni 12 Mo 2
			20 Cr 13
		Carbon Steel	40 C 8
		Aluminium Bronze	Ab2
4.	**SEAT**	ELASTOMERS	Nitrile, Neoprene,
			E.P.D.M.
		ELASTOMERS	04 Cr 19 Ni9 04 Cr 17 Ni 12 Mo 2 AISI 304
5.	**INTERNAL FASTERNERS**	STAINLESS STEEL	SS 316
6.	**EXTERNAL BOLTS**	CARBON STEEL	GRADE 4.0, 4.6

HYDROSTATIC TEST PRESSURE						
PN RATING	**TEST TYPE**	**TEST PRESSURE**		**TEST DURATION (Minute)**		
		Mpa	**BAR**		**BODY TEST**	**SEAT TEST**
PN-1.0/ 10	Body	1.5	15	Nominal Diameter		
	Seat	1.0	10	DN (mm)		
PN-1.6/ 16	Body	2.4	24	Up to and including 50	0.25	0.25
	Seat	1.6	16			
PN-2.5/ 25	Body	3.7	37	65 to 150	1	1
	Seat	2.5	25	200 to 300	2	2
PN-4.0/ 40	Body	6.0	60	350 to 1 000	5	2
	Seat	4.0	40	1 200 to 2 000	5	3

* As per Indian Standard PN-16 rating Valves can also be supplied with PN-10 Flanges.

Air Relief Valve

An **Air Relief Valve** (also called an **Air Release Valve**) is a type of valve used in piping systems to automatically release trapped air from the pipeline.

Application:

Single Air Valve (Small Orifice)
For automatically releasing air which may accumulate under pressure in a section of pipe line during normal working condition.

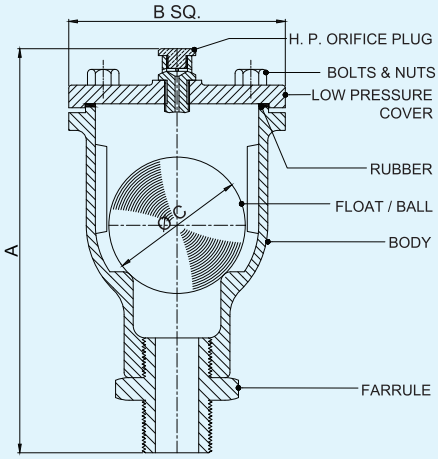
Single Air Valve (Large Orifice)
For automatically releasing/admitting air that may accumulate under pressure in a section of pipe line at the time of initial charging or draining of mains.

Double Air Valves
These valves are simply a combination of small and large orifice air valves with common connection to the main, small orifice function being similar to that of a single air valve. Large orifice serves for automatically exhausting air when a pipe is being filled with water, or automatically ventilating a pipe when it is being emptied of water.

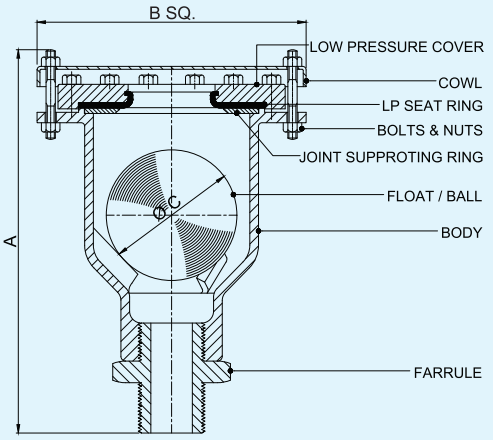
Kinetic Air Valves
These valves are essentially the same as the conventional double air valves but with certain refinements and are suitable for high head pipe lines where high rates of air discharge and ventilation is required.

VALVE	TYPE	NOMINAL PRESSURE	NOMINAL SIZE (mm)	END CONNECTION
Single Air Valve	Small Orifice Type (S1)	PN-1.0 / PN 10 PN-1.6 / PN 16	15, 25, 40	Screwed / Flanged
	Large Orifice Type (S2)		25, 40, 50	
Double Air Valve	With in Built Isolating Valve (DS 1)		40, 50, 80, 100, 150, 200	Flanged
	Without Isolating Valve (DS 2)			
Kinetic Air Valve	Kinetic Air Valve (DK)			
Tamper Proof	Tamper Proof Air Valve		50, 65, 80, 100, 150, 200	
	Duojet Air Valve			

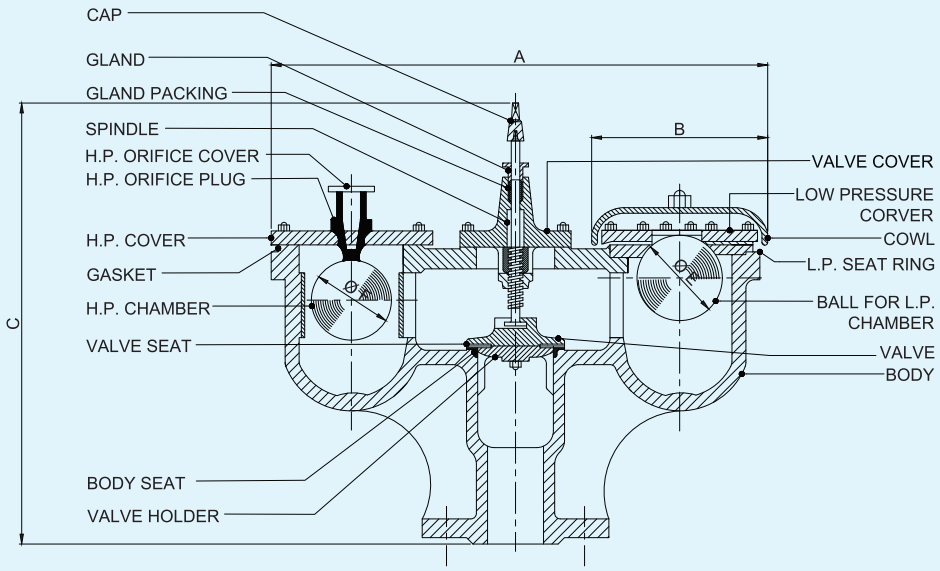
PARENT / BASIC MATERIAL	DUCTILE IRON, CAST IRON
TYPE OF CONSTRUCTION	SINGLE SMALL ORIFICE, SINGLE LARGE ORIFICE, DOUBLE LARGE & SMALL ORIFICE, DOUBLE LARGE & SMALL ORIFICE WITH INBUILT ISOLATING VALVE, KINETIC DOUBLE LARGE SMALL ORIFICE WITH SEPARATE ISOLATING SLUICE VALVE, TAMPER PROOF AIR VALVE, SINGLE CHAMBER DOUBLE ORIFICE TRIPLE ACTING AIR VALVE
MANUFACTURING STANDARD	IS 14845, EN 1074-4, AWWA C 512
END FLANGE STANDARD	IS 1538, IS 9523, ISO 7005-2, EN 1092-2, BS 4504, ANSI 16.1, ANSI 16.5 OR ANY OTHER STANDARD
SCREWED END STANDARD	BSPT, NPT OR ANY OTHER STANDARD
MANUFACTURING RANGE OF SIZE	DN 25MM TO DN 200 MM
RATING	PN 10, PN 16, PN 25, PN 40
COATING	BLACK BITUMEN, LIQUID EPOXY, FUSION BONDED EPOXY, POLYURETHENE, CERAMIC EPOXY



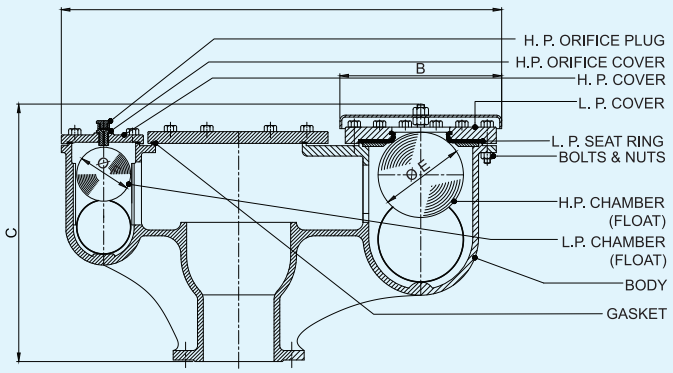
DIMENSION TABLE FOR S1 AIR VALVE			
DN	A (min)	B (min)	C (Approx.)
15	196	118	75
25	255	158	100
40	290	158	100



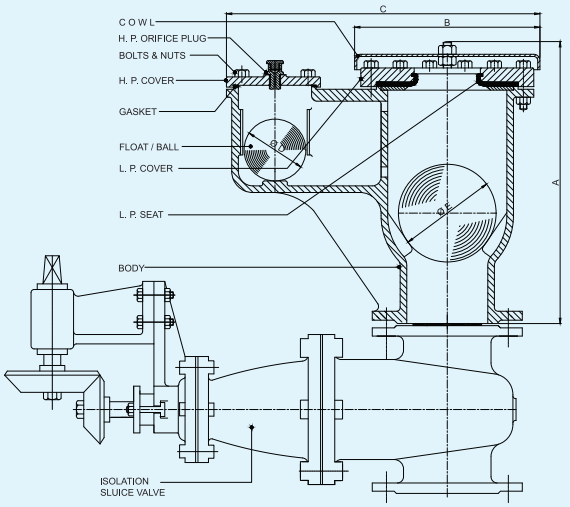
DIMENSION TABLE FOR S2 AIR VALVE			
DN	A (min)	B (min)	C (Approx.)
25	202	164	75
40	237	180	75
50	287	180	75



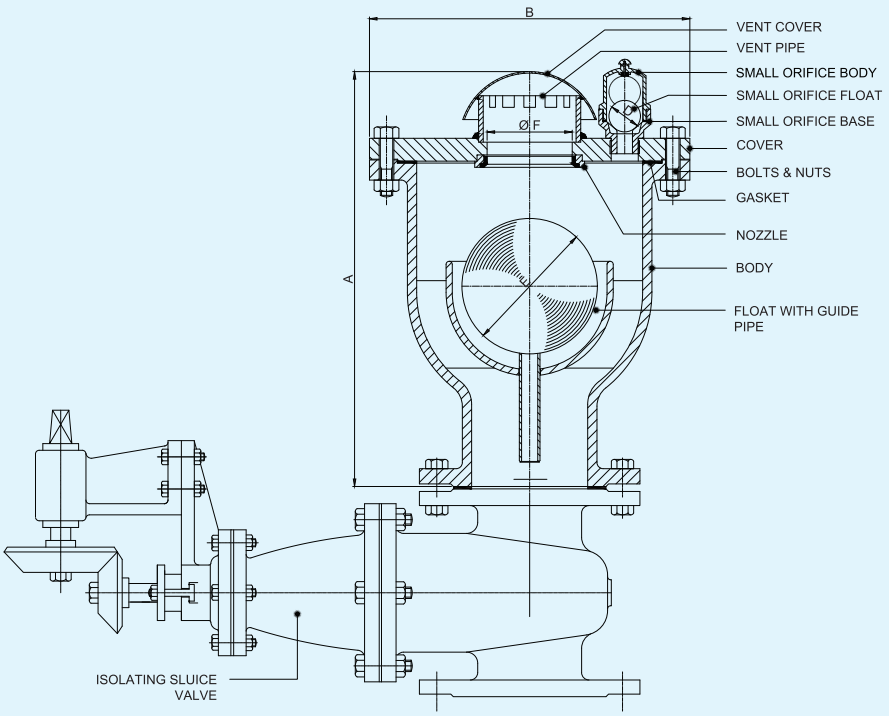
DOUBLE ORIFICE AIR VALVE WITH IN-BUILT ISOLATING VALVE (DS-1/H 40)						
Dimension				Float Dia		Suitable for main size
DN	A (min)	B (min)	C (min)	E (Approx.)	F (Approx.)	
40	442	210	371	100	75	Up to 100
50	442	210	407	100	75	125 to 200
80	504	236	431	100	100	225 to 350
100	634	280	501	125	125	400 to 500
150	862	430	620	125	200	600 to 900
200	988	506	735	140	250	1000 to 1200



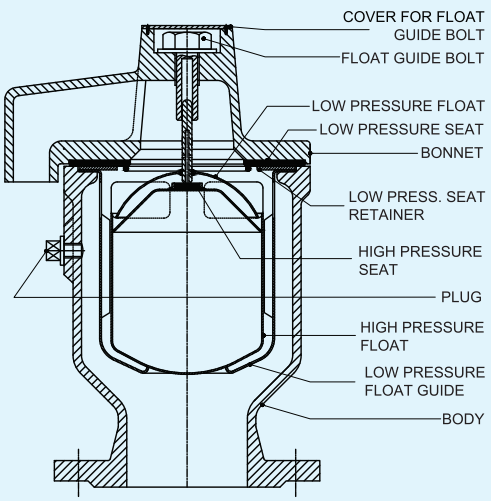
DOUBLE ORIFICE AIR VALVE WITHOUT IN-BUILT ISOLATING VALVE (DS-2/H-7)						
Dimension				Float Dia		Suitable for main size
DN	A (min)	B (min)	C (min)	E (Approx.)	F (Approx.)	
40	442	210	224	100	75	Up to 100
50	442	210	264	100	75	125 to 200
80	504	236	287	100	100	225 to 350
100	634	280	356	125	125	400 to 500
150	862	430	476	125	200	600 to 900
200	988	506	580	140	250	1000 to 1200



DOUBLE ORIFICE AIR VALVE WITH ISOLATING SLUICE VALVE (DK)						
Dimension				Float Dia		Suitable for main size
DN	A (min)	B (min)	C (min)	E (Approx.)	F (Approx.)	
40	260	196	324	90	55	Up to 100
50	280	211	352	100	75	125 to 200
80	305	236	373	115	100	225 to 350
100	360	280	424	125	125	400 to 500
150	487	450	674	150	200	600 to 900
200	700	506	739	150	250	1000 to 1200



TAMPER PROOF AIR VALVE WITH ISOLATING SLUICE VALVE					
Dimension Table for Tamper Proof Air Valve			Float Dia		Large Orifice Dia
DN	A (min)	B (min)	E (Approx.)	F (Approx.)	
50	345	180	--	--	–
65	345	180	--	--	–
80	380	240	--	--	–
100	400	360	40	90	55
150	450	460	50	150	90
200	460	480	50	200	110



Single Chamber Double Orifice Triple Acting Air Release Valve / Duo Jet Air Valve / Double Jet Air Release Valve

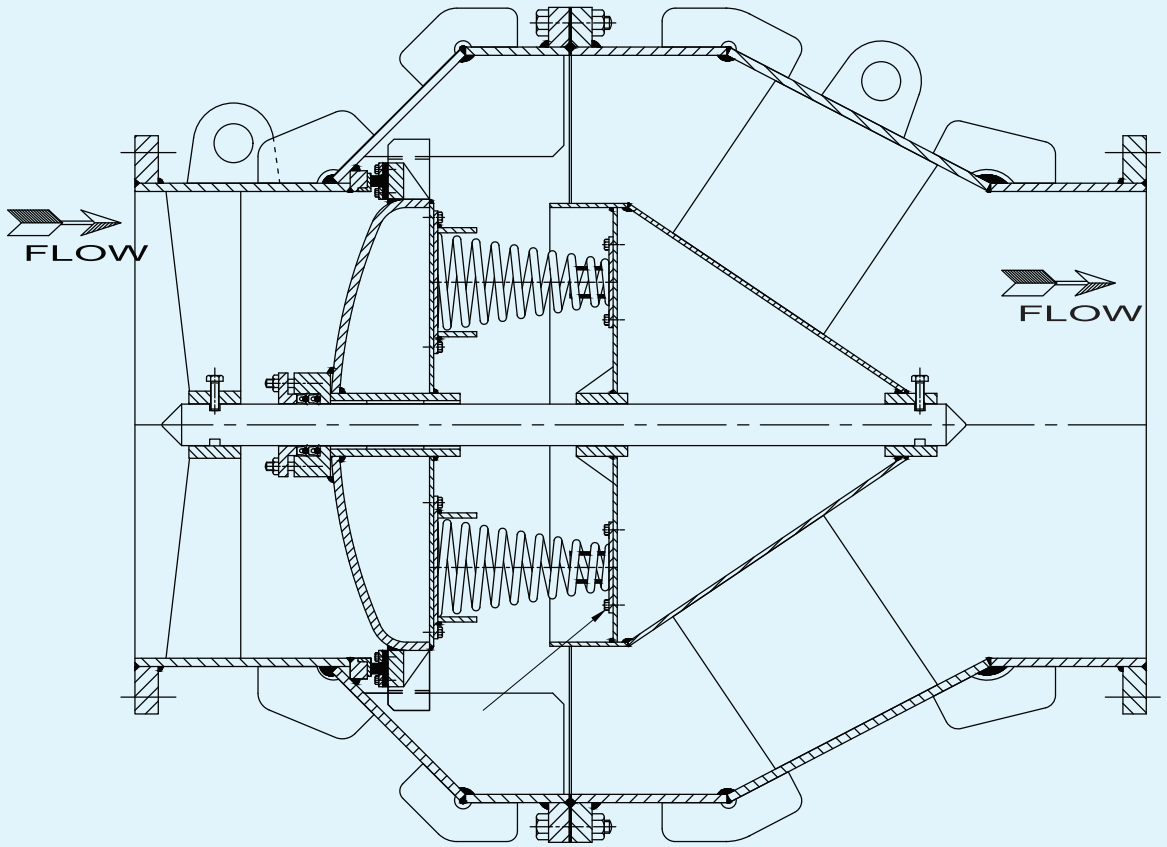
* All dimensions are in millimetres.

MATERIALS OF COMPONENT PARTS OF SLUICE VALVE			
Sl. No.	**COMPONENT**	**MATERIAL**	**GRADE**
1.	**BODY, COVER, COWL CAP, JOINT SUPPORT RING**	DUCTILE IRON	SG 500-7 / GGG 50
			SG 400-12/ GGG40
		CAST IRON	FG 200
		CAST STEEL	FG 260
2.	**STEM \ SPINDLE**	STAINLESS STEEL	12Cr13\04 Cr18 Ni10
			04 Cr 17 Ni 12 Mo2
			20 Cr 13
			AISI 410
			AISI 304
		HIGH TENSILE BRASS	HTB 2
3.	**LOW PRESSURE SEAT RING & FACE RING**	RUBBER	NATURAL RUBBER
			NITRILE RUBBER
			EPDM
4.	**BODY SEAT RING**	LEADED TIN BRONZE	LTB 2
		STAINLESS STEEL	04 CR 18 NI 10
			AISI 304
5.	**BOLTS & NUTS**	CARBON STEEL	–
		STAINLESS STEEL	–
6.	**GASKET**	RUBBER	TYPE B
			NEOPHRENE
7.	**FLOAT (LOW PRESSURE ORIFICE)**	TIMBER CORE WITH VALCANITE COATING	04 Cr 18 Ni
			10AISI 304
		STAINLESS STEEL	
8.	**FLOAT (HIGH PRESSURE ORIFICE)**	TIMBER CORE WITH RUBBER COATING	04 Cr 18 Ni
			10AISI 304
		STAINLESS STEEL	

* As per Indian Standard PN-16 rating Valves can also be supplied with PN-10 Flanges.

Zero Velocity Valve

A **Zero Velocity Valve (ZVV)** is a specialized safety or isolation valve used in fuelling systems, particularly in aviation fuel hydrant systems or liquid flow pipelines, to shut off fuel flow when the flow velocity drops to zero (or near-zero).

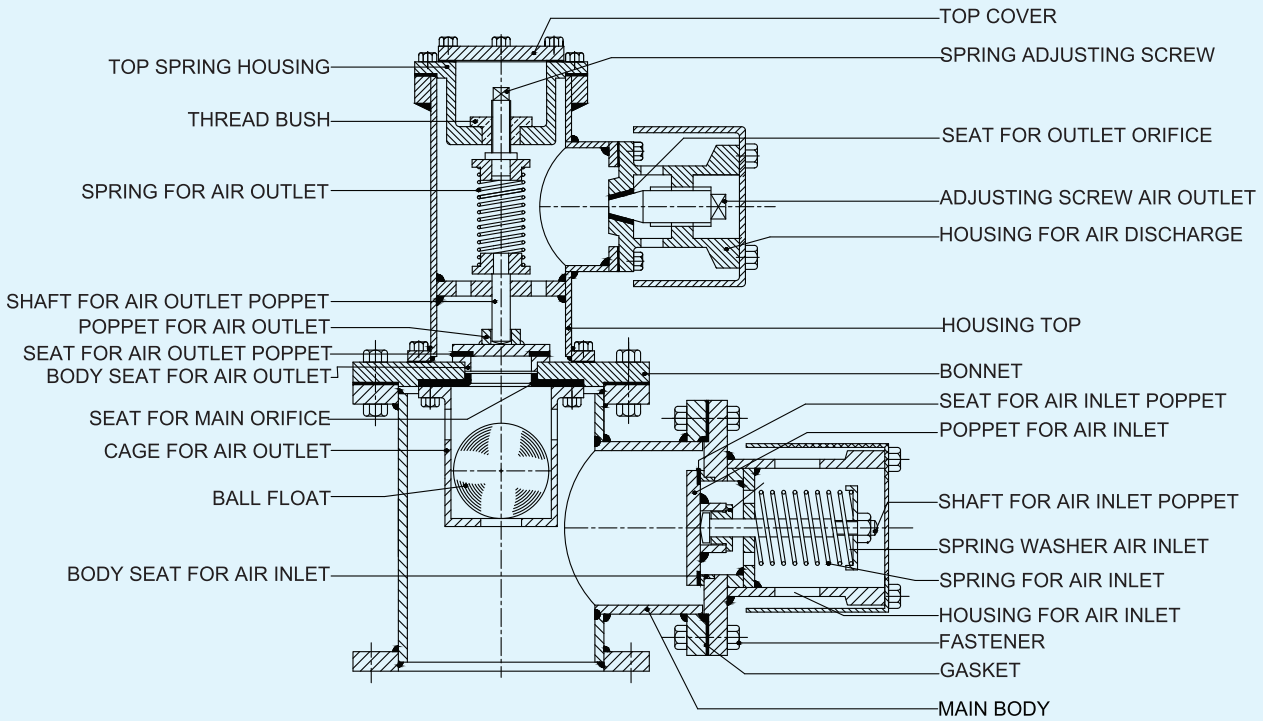


PARENT / BASIC MATERIAL	FABRICATED STEEL, CAST STEEL, DUCTILE IRON, CAST IRON
END CONNECTION	BARREL/PLAIN END, FLANGE END
END FLANGE STANDARD	IS 1538, IS 9523, ISO 7005-2 EN 1092-2, BS 4504 , ANSI 16.1, ANSI 16.5 OR ANY OTHER STANDARD
MANUFACTURING RANGE OF SIZE	DN 40MM TO DN 2400 MM
RATING	PN 10, PN 16, PN 25, PN 40
COATING	BLACK BITUMEN, LIQUID EPOXY, FUSION BONDED EPOXY, POLYURETHENE

* As per Indian Standard PN-16 rating Valves can also be supplied with PN-10 Flanges.

Air Cushion Valve

An **Air Cushion Valve** is a type of hydraulic control valve designed to control the closing speed of another valve, especially in systems where water hammer or pressure surges are a concern. It uses an air chamber (air cushion) to absorb the shock and slow down the movement of the main valve piston or disc.



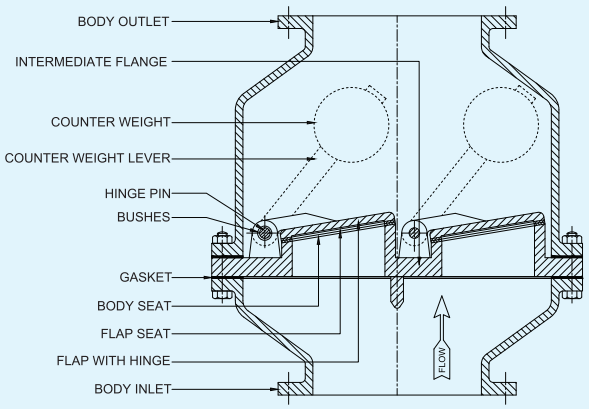
PARENT / BASIC MATERIAL	FABRICATED STEEL, CAST STEEL, DUCTILE IRON, CAST IRON
END FLANGE STANDARD	IS 1538, IS 9523, ISO 7005-2 EN 1092-2, BS 4504 , ANSI 16.1, ANSI 16.5 OR ANY OTHER STANDARD
MANUFACTURING RANGE OF SIZE	DN 80 MM TO DN 300 MM
RATING	PN 10, PN 16, PN 25, PN 40
COATING	BLACK BITUMEN, LIQUID EPOXY, FUSION BONDED EPOXY, POLYURETHENE

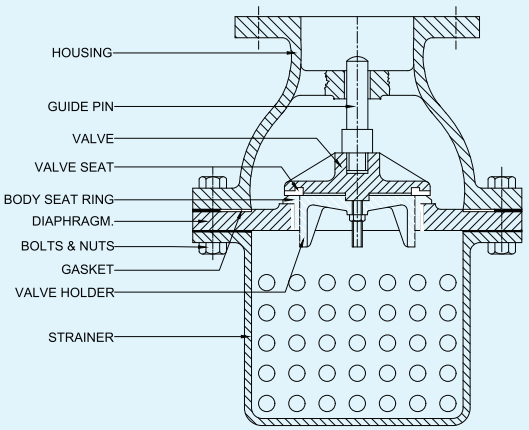
* As per Indian Standard PN-16 rating Valves can also be supplied with PN-10 Flanges.

Foot Valve

A **Foot Valve** is a type of check valve installed at the bottom (foot) of a suction line, typically in a well, tank, or pond, to prevent the backflow of liquid and maintain the priming of a pump. The strainer in a foot valve is used to filter out debris and protect the pump and piping system from

PARENT / BASIC MATERIAL	FABRICATED STEEL, CAST STEEL, DUCTILE IRON, CAST IRON
END CONNECTION	FLANGE END, SCREWED END, LIFT/SWING TYPE, DISC TYPE
END FLANGE STANDARD	IS 1538, IS 9523, ISO 7005-2 EN 1092-2, BS 4504 , ANSI 16.1, ANSI 16.5 OR ANY OTHER STANDARD
MANUFACTURING STANDARD	IS 4038, IS 10805
MANUFACTURING RANGE OF SIZE	DN 25MM TO DN 450 MM
RATING	PN 2, PN 4, PN 6, PN 10
COATING	BLACK BITUMEN, LIQUID EPOXY, FUSION BONDED EPOXY, POLYURETHENE





DIMENSION OF STRAINER HOLES		
Nominal Size of Valve	Maximum Dia of Hole	Maximum Dia of Hole
DN (mm)	(When circular)	(When on circular)
25, 32	10	10
40, 50, 65, 80	12	12
100, 125, 150	20	16
200, 250	22	20
300, 350	25	22
400, 450	28	22

HYDROSTATIC TEST			Duration
	Mpa	Bar	Minute
Seat Test	0.2	2	2
Housing Test	0.6	6	2

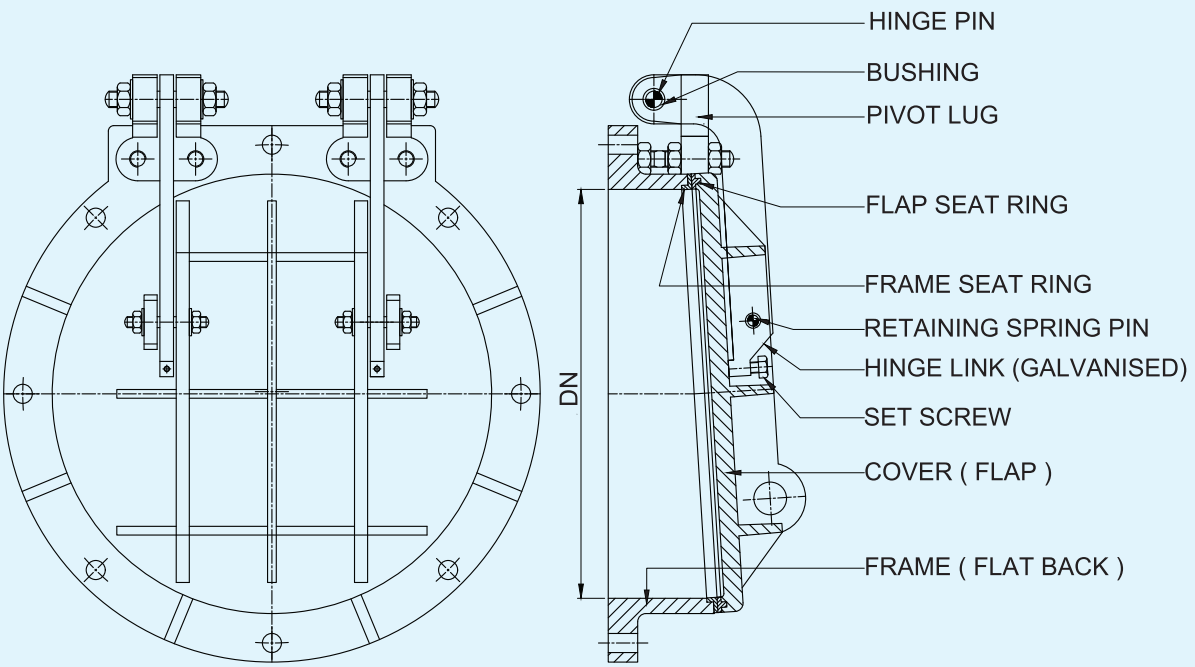
* All dimensions are in millimetres.
* As per Indian Standard PN-16 rating Valves can also be supplied with PN-10 Flanges.

Flap Valve

A **Flap Valve** is a type of check valve that allows fluid to flow in one direction only.

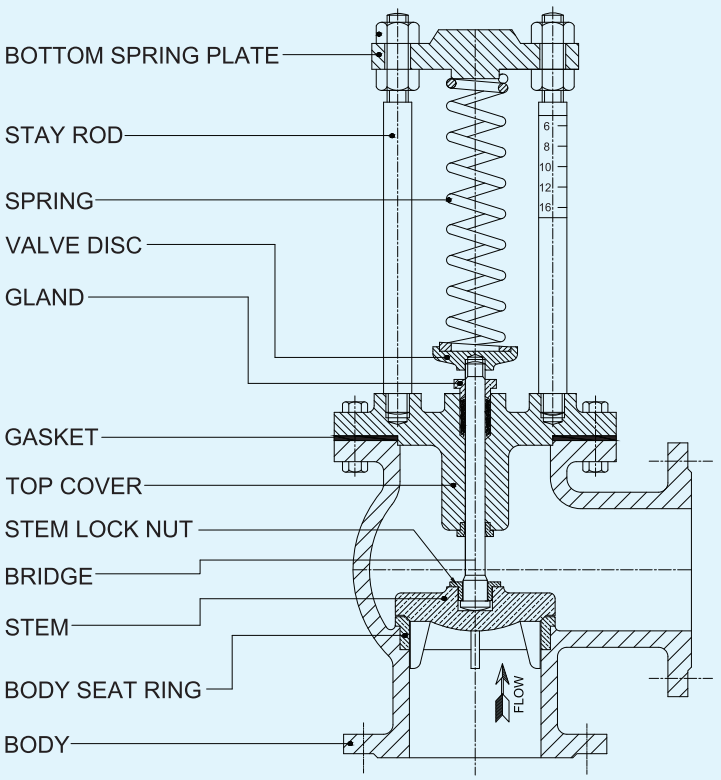
Uses:-

1. Allowing gravity flow of Sewage water/Treated / Un-Treated water from internal pipes to river/ Canal/ Water body/ Sea.
2. It prevents back flow of water from the river/ Canal/ Water Body/ Sea into the pipeline or internal channels

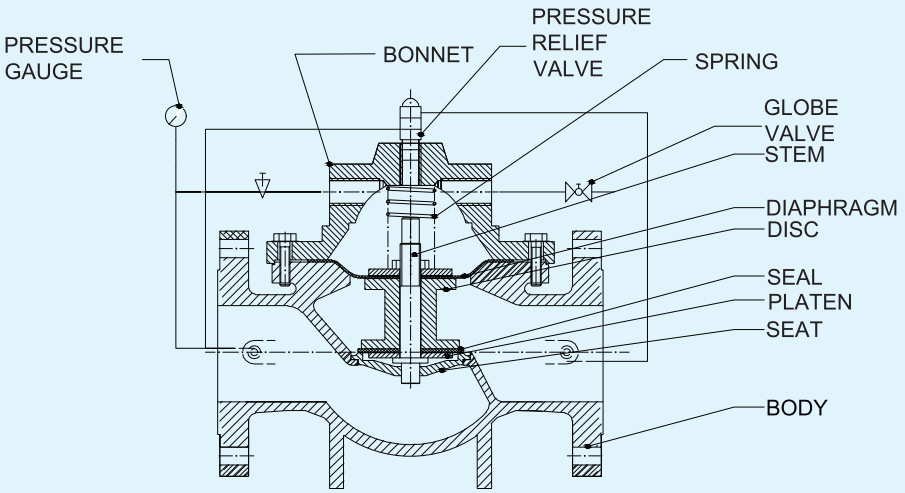


Pressure Relief Valve

A **Pressure Relief Valve (PRV)** is a safety device designed to protect equipment or systems from excessive pressure. It automatically opens at a predetermined pressure to release fluid (liquid or gas) and then closes once normal conditions are restored.



RIGHT ANGLE TYPE PRESSURE RELIEF VALVE



STRAIGHT THROUGH TYPE PRESSURE RELIEF VALVE

Wall Thimble Mounted Sluice Gates

Single faced **Sluice Gate** are extensively used in water supply, waste water applications, water treatment, intake wells, pumping stations, drainage works, irrigation canals, effluent treatment, sewage treatment system, flood control, thermal power station and water cooling systems for controlling the flow or shut off. These are of three types, one where the gate with spigot back frame is directly mounted on the wall, type two where mounting on the wall is through wall thimble and type three where mounting on RC C channel through channel type frame.

CONSTRUCTION UNDER SPECIFICATION IS : 3042

This specification is suitable for seating head pressure only. The gates are single machined metal faces **Sluice Gate** (200 mm to 1200 mm). Gates are in three types in shape square, circular / round and rectangular, spindle of the gate are also two types one rising type other non-rising type. Mounting of the gate are spigot back wall mounted. Rating of the gate are Class I (6 meter water column) and Class Ii (15 mm meter water column).

CONSTRUCTION UNDER SPECIFICATIONS IS : 13349 - 1992 & AWWA C 5-1-1992

This specification is suitable for both **seating & unseating head pressure**. The gates are single machined metal faces and machined adjustable wedging devices. Sluice Gate (300 mm to 2500 mm). Gates are in three types in opening shape square, circular / round & rectangular. They may be of the conventional - closure or flush-bottom-closure type. Spindle of the gate are two types one rising spindle other non-rising type. Rating of the gate are Class I (5 meter water column) and Class II (5 meter to 10 meter water column) & Class III (10 meter to 15 meter water column). The gates mounting on the wall is through thimble an accessory which is first embedded in the wall and its front flange being flush with the face of wall. The gate frame having machined back flange in mounded on thimble flange, with a gasket in between the flanges, and fastened to it with the help of studs.

GUIDELINE FOR SELECTION OF SLUICE GATES & FLAP GATES

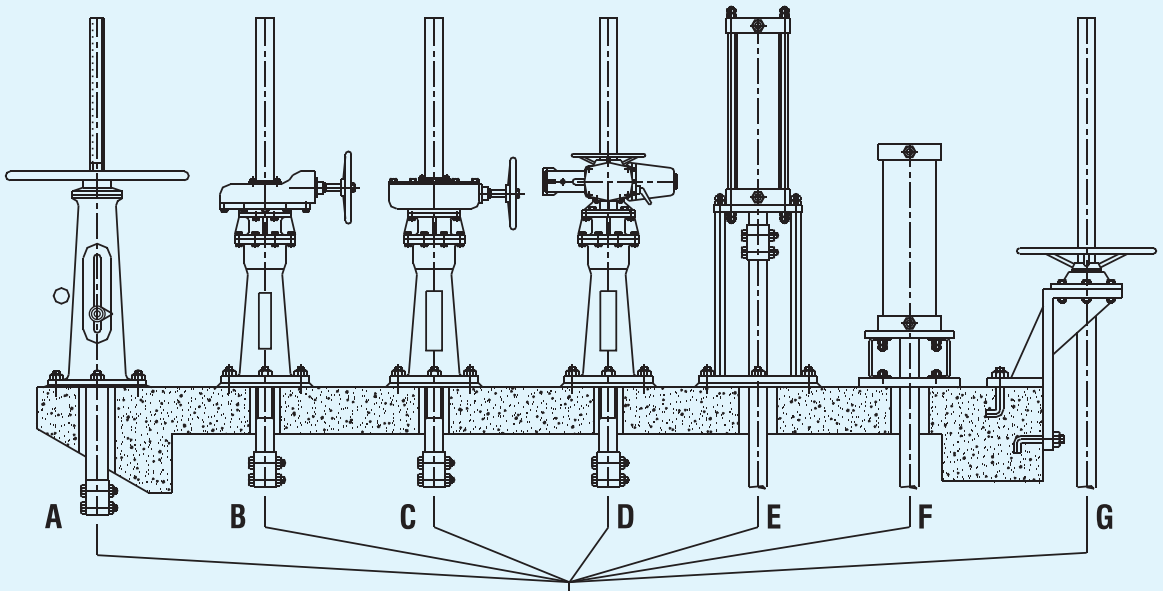
Sl. No.	Application	Suitable Water Head	Mounting	Specification
1	For isolation of flow in and out of a closed conduit	Seating/On-seating head	Spigot back wall mounted	IS:3042
2	For isolation of flow in and out of a closed	Seating/On-seating & Unseating/off-seating water head	Flange back face wall thimble mounted	IS:13349, AWWA C 501/AWWA C 560 BS ; 7775
3	For isolation of flow in and out of an open channel	Seating/on-seating water head	Channel side wall mounted	AWWA C 513
4	For modulation of flow in and out of a closed conduit	Seating/on-seating Unseating/off-seating water head	Flange back face wall thimble mounted	IS:13349, AWWA C 501/AWWA C 560 BS:7775
5	For drainage outfall out of a closed conduit	Unseating/off-seating water head	Flange back face wall thimble mounted.	

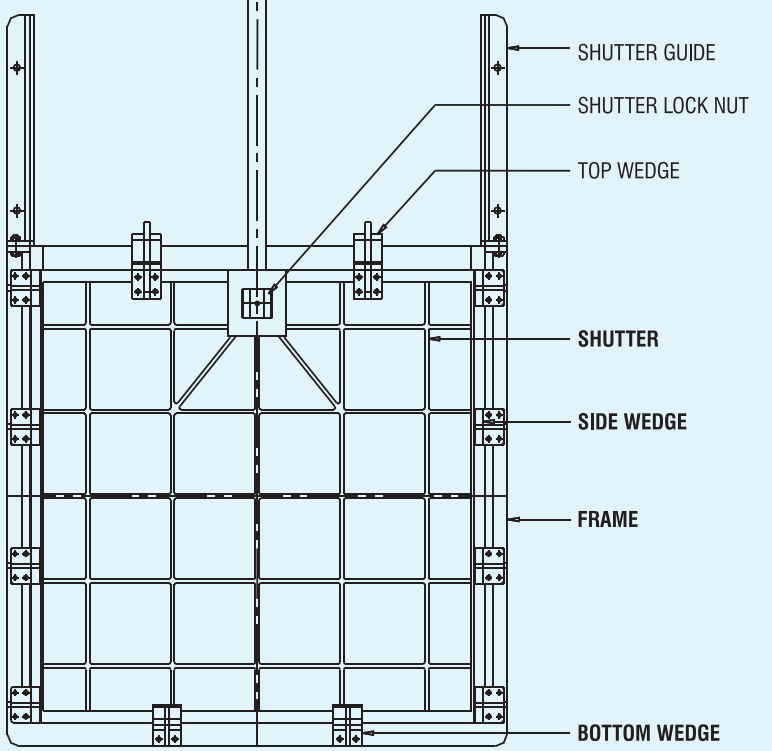
Above3 applications cover most general uses. For any other application & installation requirement needs a different type of gate as mentioned above.

OPTIONAL FEATURES

POSITION INDICATOR	To observe the actual opening position of the shutter inside the frame.
STEM MUFF COUPLING	To couple / connect with two nos one end stem / extension stem for rising spindle sluice gates.
STEM ADAPTOR	To couple / connect with two nos. one end non-rising stem / extension stem for sluice gates.
ADJUSTABLE STEM GUIDE BRACKET	To avoid buckling under compression or from lateral thrust by debris or solids. It is acting as intermediate support.
FOOT PLATE WALL BRACKET	To support headstock in case civil platform is not available for mounting of headstock. The bracket is grouted on the vertical face of the civil wall.
OFFSET CENTRE PILLAR	The bracket is provided to install stem nut and handwheel or headstock where the civil platform is not available. Bracket is grouted on the horizontal face of platform.
UNIVERSAL COUPLING	For joining two straight length of stem in different planes or center-line and for transmission of torsion loads only.
STOP NUT	Stop nut with set screw on rising stem of manually operated sluice gates to prevent over travel and chances of damage to wedges block.
THRUST BALL BEARING	It is placed at the both end of stem collar or stem nut collar to reduce the rotating torque.
STEM PROTECTOR	The stem protector / pipe hood is provided on top of the floor stand, gear operator or electric actuator to protect the threaded portion of rising spindle sluice gate.
HANDWHEEL LOCKING	Handwheel / Handlever locking arrangement is provided to prevent unauthorised operation.
EXTENSION STEM	Extension stem is used where the distance between centre line of waterway to top of the operating platform is greater than gate size. One or more nos extension spindle may be provided. Generally length of single piece extension spindle are not more than 4 meter.
FLOOR STAND / HEADSTOCK	To operate the gate from floor
ANCHOR BOLT	L or Y shape anchor bolts are used to fixing the gate frame, stem guide bracket or headstock.
POSITION LIMIT SWITCH	To receive signal on control panel.
FIXED CENTRE STEM GUIDE	It is provided where the distance between center line of stem and the face of the wall is less than 175 mm. These are directly erected on the face of the wall through anchor bolt.

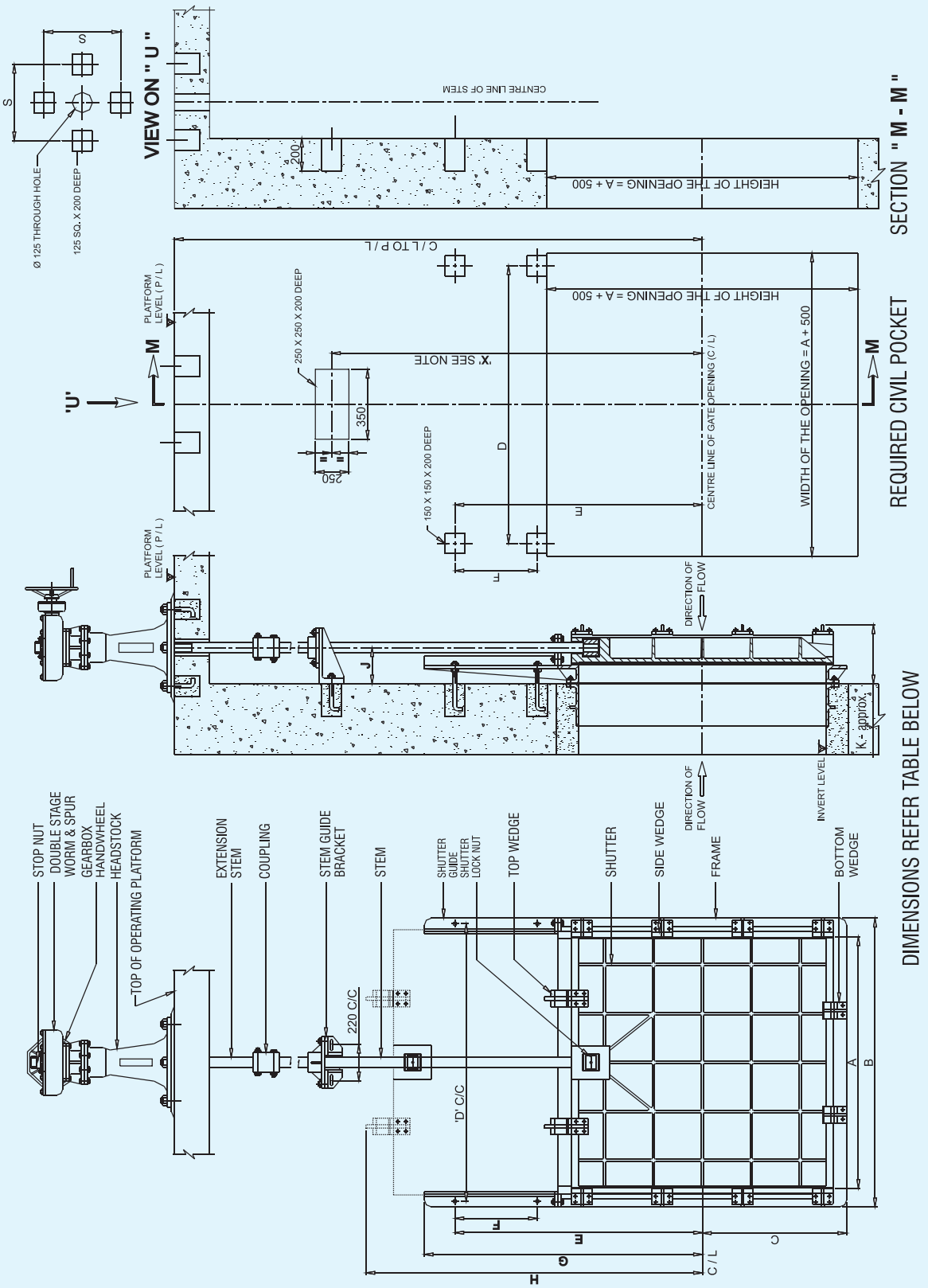
TYPE OF REMOTE OPERATION FOR SLUICE GATE





- A FLOORSTAND WITH HANDWHEEL INDICATOR AND EXTENDED SPINDLE ARRANGEMENT.
- B FLOORSTAND WITH BEVEL GEARBOX. HANDWHEEL AND EXTENDED SPINDLE.
- C FLOORSTAND WITH WORM GEARBOX. HANDWHEEL AND EXTENDED SPINDLE.
- D FLOORSTAND WITH ELECTRIC ACTUATOR. HANDWHEEL AND EXTENDED SPINDLE.
- E FLOORSTAND WITH PNEUMATIC ACTUATOR AND EXTENDED SPINDLE.
- F FLOORSTAND WITH HYDRAULIC ACTUATOR AND EXTENDED SPINDLE.
- G OFFSET CENTRE PILLAR WITH HANDWHEEL AND EXTENDED SPINDLE.

ERECTION DETAILS OF THIMBLE MOUNTED FLANGE BACK FRAME RISING STEM SLUICE GATE FITTED WITH ADJUSTABLE CENTRE STEM GUIDE BRACKET

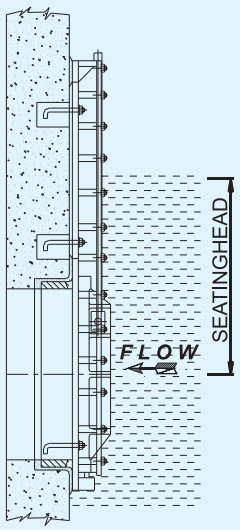


DIMENSION TABLE & SIZES FOR THIMBLE MOUNTED FLANGE BACK FRAME RISING STEM "MODERN" BRAND CAST IRON SLUICE GATES

A SIZE	B	C	D	E	F	G	H	J	K	ANCHOR BOLT	
										NO.	DIA.
200	415	200	–	–	–	450	470	100	160	–	–
250	465	225	–	–	–	500	550	100	160	–	–
300	515	250	–	–	–	550	630	100	160	–	–
350	565	275	–	–	–	600	710	100	180	–	–
400	615	300	–	–	–	675	785	170	180	–	–
450	665	350	–	–	–	725	985	170	300	–	–
500	715	375	–	–	–	775	1075	170	300	–	–
600	815	425	–	–	–	825	1225	170	300	–	–
650	865	450	–	–	–	875	1300	200	330	–	–
700	915	475	–	–	–	925	1380	200	330	–	–
750	965	500	–	–	–	1000	1450	200	330	–	–
800	1015	525	–	–	–	1050	1540	200	330	–	–
900	1115	575	–	–	–	1150	1700	200	330	–	–
1000	1280	625	–	–	–	1250	1850	200	330	–	–
1050	1330	650	–	–	–	1300	1925	230	330	–	–
1100	1380	675	–	--	–	1350	2000	230	330	–	–
1200	1480	725	1390	1350	–	1450	2150	230	330	2	24
1300	1590	780	1510	1450	–	1550	2335	250	400	2	24
1400	1700	830	1610	1550	–	1650	2485	250	420	2	24
1500	1800	880	1710	1650	--	1750	2640	250	420	2	24
1600	1900	930	1810	1750	600	1900	2800	260	450	4	24
1700	2000	980	1910	1850	600	2000	2950	260	460	4	24
1800	2100	1030	2010	1950	600	2100	3100	265	480	4	24
1900	2200	1080	2110	2050	600	2200	3250	265	520	4	24
2000	2300	1130	2210	2150	600	2300	3400	265	530	4	24
2100	2500	1250	2400	2300	750	2400	3570	300	530	4	30
2200	2600	1300	2500	2400	750	2500	3750	300	530	4	30
2300	2700	1350	2600	2550	750	2600	3930	320	550	4	30
2400	2800	1400	2700	2650	800	2700	4100	320	550	4	30
2500	2900	1450	2800	2750	800	2800	4270	320	560	4	30
3000	3400	1700	3300	3250	850	3300	5150	320	560	4	30

NOTES :

1. All dimensions are in millimeter.
2. A = Shape of gate opening is square or circular. In the sketch opening of gate also shown in dotted line refer alternative circular opening.
3. Distance between centre line of gate to centre line of stem guide bracket X depends on requirement of no. of stem guide bracket which may be nil or one or more depending on C/L to P/L distance.
4. Distance S depends on Gate size. Water head and operating torque, which is acting on headstock. Dimension S = 200/250/300/450 depending upon type of headstock
5. Larger size gate and also rectangular size of gate (Rising spindle as well as Non-rising spindle) can be supplied on request.
6. The figures and dimensions are for general guidance purpose only. For more details, G.A. drawings along with material specifications can be furnished on request
7. This type of gate is used in seating water head as well as unseating water head.
8. The figure shows conventional bottom closure gate. In case of flush bottom closure gate dimension 'K' are more 50 mm
9. In case of circular opening gate with circular flange to be mounted on circular pipe flange, recommended installation clearance is 200 mm along each side and beneath the bottom of gate.



SEATING WATER HEAD / ON - SEATING WATER HEAD

When the water flow create the pressure on the shutter/door & door seat face create the pressure on frame seat face then the type of water is called seating/on-seating water head.

These gates are generally as per IS : 13349 / AWWA C 501 / AWWA C 560 / BS : 7775 / IS : 3042. And suitable for seating water head / on seating water head application.

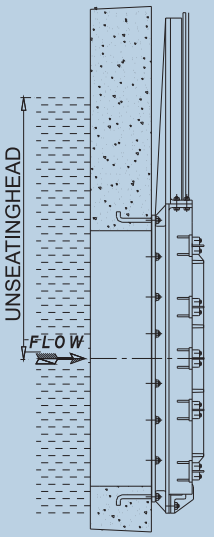
To achieve seating water head/on-seating water head application gates must be provided side wedge arrangement (suitable for 1200 mm x 1200 mm size)

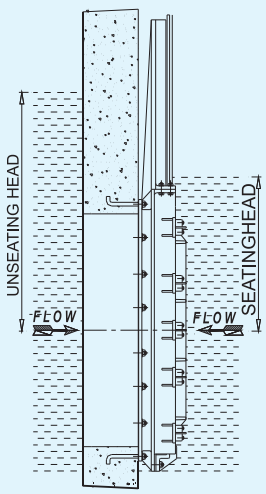
SEATING WATER HEAD / ON - SEATING WATER HEAD

When the water flow create the pressure on the shutter / door at seat face side and create the pressure to unseat from frame seat face then the type of water is called unseating / off-seating water head.

These gates are generally as per IS:13349 / AWWA C 501 / AWWA C 560 / BS : 7775. And suitable for unseating water head / off-seating water head application. Spigot mounted sluice gate to IS : 3042 are not suitable for unseating water head.

To achieve unseating water head application gates must be provided side wedge, bottom wedge, flush bottom, top wedge arrangement (for require-ment of bottom wedge, flush bottom, top wedge arrangement is depends upon size). The purpose of these bottom wedge & top wedge is to resist the backward thrust and to minimise the rate of leakage.;

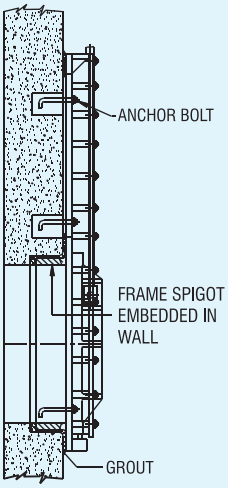




SEATING AS WELL AS UNSEATING WATER HEAD

When the water flow create the pressure on the shutter / door at both sides either seating / unseating at different points of time. The water level may rise up either seating side or unseating side. These type of gates are only suitable for this application / condition.

Only these gates as per IS : 13349 / AWWA C 501 / AWWA C 560 / BS : 7775. And suitable for seating water head / on-seating water head as well as unseating water head / off-seating water head application. Spigot mounted sluice gate to IS : 3042 are not suitable for unseating water head.



SPIGOT BACK FRAME SLUICE GATE

This type of gate have an integral raised spigot on frame, which is embedded in the wall. The frame back face is flush with the wall and anchored rigidly through anchor bolt. After holding the gate check alignment property and grout the clearance by pressure cement concrete.

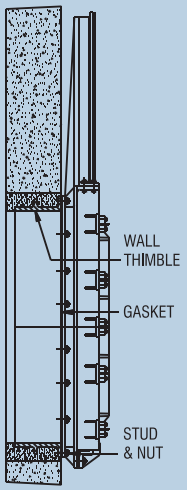
Once erected this type of gate can never be removed it for maintenance without substantially breaking the concrete.

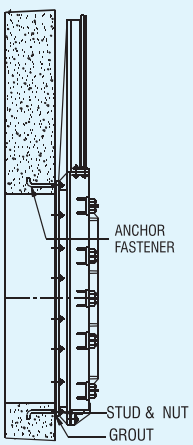
These gates are generally manufactured as per IS : 3042. And suitable for seating water head / on-seating water head application.

FLANGE BACK FRAME SLUICE GATE THROUGH WALL THIMBLE

This type of gate have an integral flange on the back side of the frame. A separate flange end wall thimble is first embedded in the wall. The flange face of the thimble flush with the face of the wall. The flange of the gate is housed with thimble flange through the studs and nuts. A gasket is placed in between two flanges to avoid the leakage. Since it is a flange connection and no portion of the gate frame is embedded in the wall the gate can easily removed from the thimble & wall for repairs without breaking concrete.

These gates are generally manufactured as per IS:13349, AWWA C 560, BS:7775. And suitable for seating water head / on seating water head / on seating water head as well as unseating / off seating water head application. The thimble of gate can be supplied at the time of main wall construction of concrete. The gate can be mounted on thimble later.



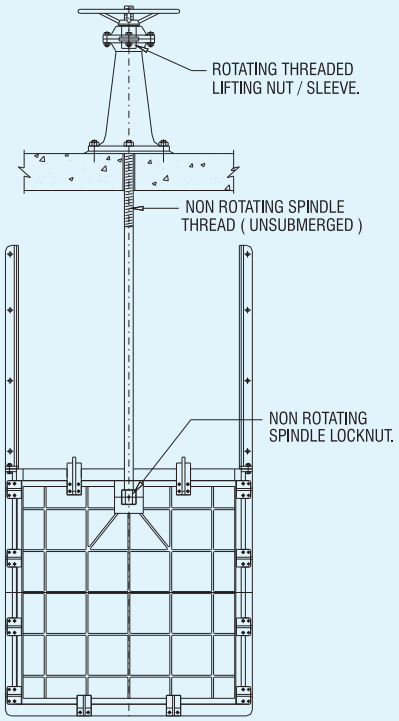


FLAT BACK FRAME SLUICE GATE

This type of gate have a integral flat faced flange on frame, which is directly anchored with the face of wall. The frame back ace is anchored rigidly through anchor bolt. After holding the gate check alignment properly and grout the clearance by pressure cement concrete.

Once installed these type of gates can be removed it for maintenance. But may be required grouting after reinstallation of gate.

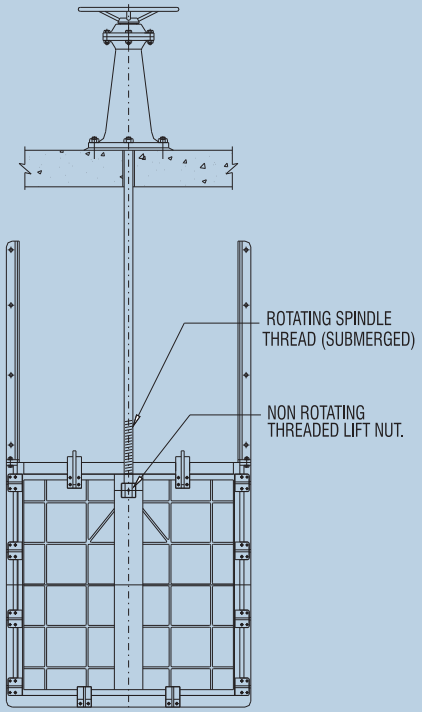
These gates are made similar to AWWA C 501, AWA C 560, BS : 7775. And suitable for seating water head / on-seating water head as well as unseating / off-seating water head application.



RISING SPINDLE SLUICE GATES

At the time of handwheel rotating the spindle of the sluice gate causes upward and downward movement of shutter, while opening and closing of the sluice gate, is called rising spindle gate.

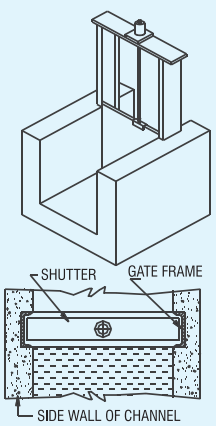
This type of sluice gate have rotating lifting nut & non-rotating spindle. The lifting nut generally housed in lifting mechanism which is generally placed above the water level. The handwheel is directly engaged with lifting nut and the spindle thread is also engaging with lifting nut. A door lock nut and dead end of spindle is coupled through thread and coter pin. The shutter generally moves in between frame channel, as a result of this system shutter moves upwards and downwards (principally rotary movement is converted to Linear movement).



NON RISING SPINDLE SLUICE GATES

At the time of handwheel rotation the spindle of the sluice gate remain same position during upward and downward movement of shutter while opening and closing of sluice gate is called non-rising spindle sluice gate.

This type of sluice gate have non-rotating lifting nut & rotating spindle. The lifting nut generally housed in a shutter pocket which remain submerged and below the water level. Because of submerge, the threaded portion of stem they remain exposed to damage and corrosion. Regularly cleaning and greasing of such submerged stem is not possible. These type of gates are generally used in low height rooms where rising stem gates are not accommodated and clear water application.



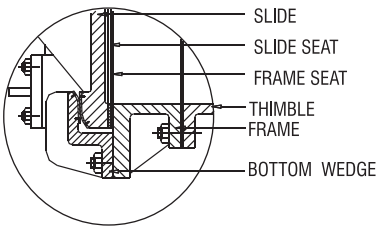
CHANNEL MOUNTED SLUICE GATE

This type of gate is embedded in the side wall of the channel. The frame of the gate is placed in the pocket of side wall of main channel. After errection made grouting to fill up the clearance.

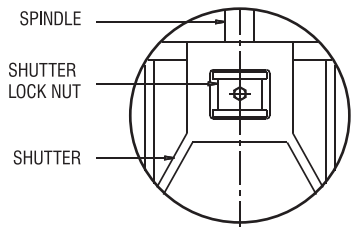
Once foundation is completed this type of gate can never be removed for maintenance without substantially breaking the concrete.

These gates are suitable for seating water head / on-seating water head as well as unseating / off-seating water head application.

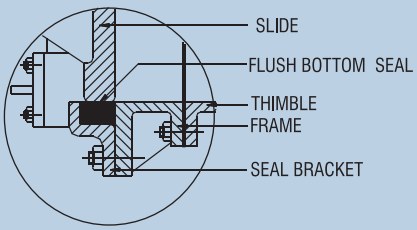
TYPE OF SEALING & SPINDLE - SHUTTER LOCKING ARRANGEMENT



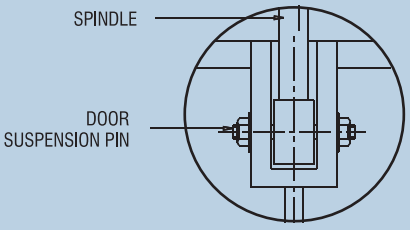
ENLARGED VIEW OF BOTTOM WEDGE



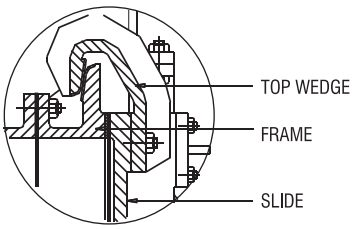
ENLARGED TOP VIEW OF SHUTTER LOCK NUT



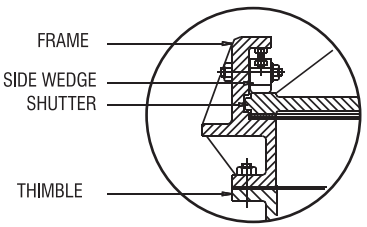
ENLARGED VIEW OF FLUSH BOTTOM SEAL



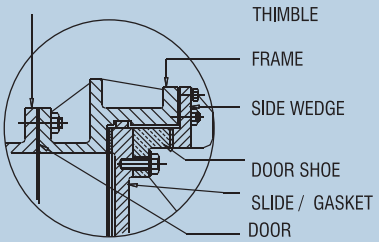
ENLARGED TOP VIEW OF DOOR SUSPENSION PIN



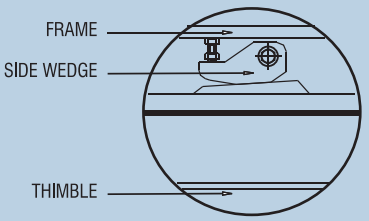
ENLARGED VIEW OF TOP WEDGE



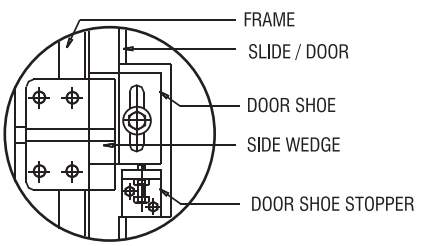
SPECIAL ARRT. OF SIDE WEDGE



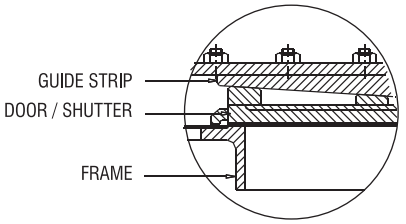
ENLARGED VIEW OF SIDE WEDGE



SIDE VIEW OF SPECIAL ARRT. OF SIDE WEDGE

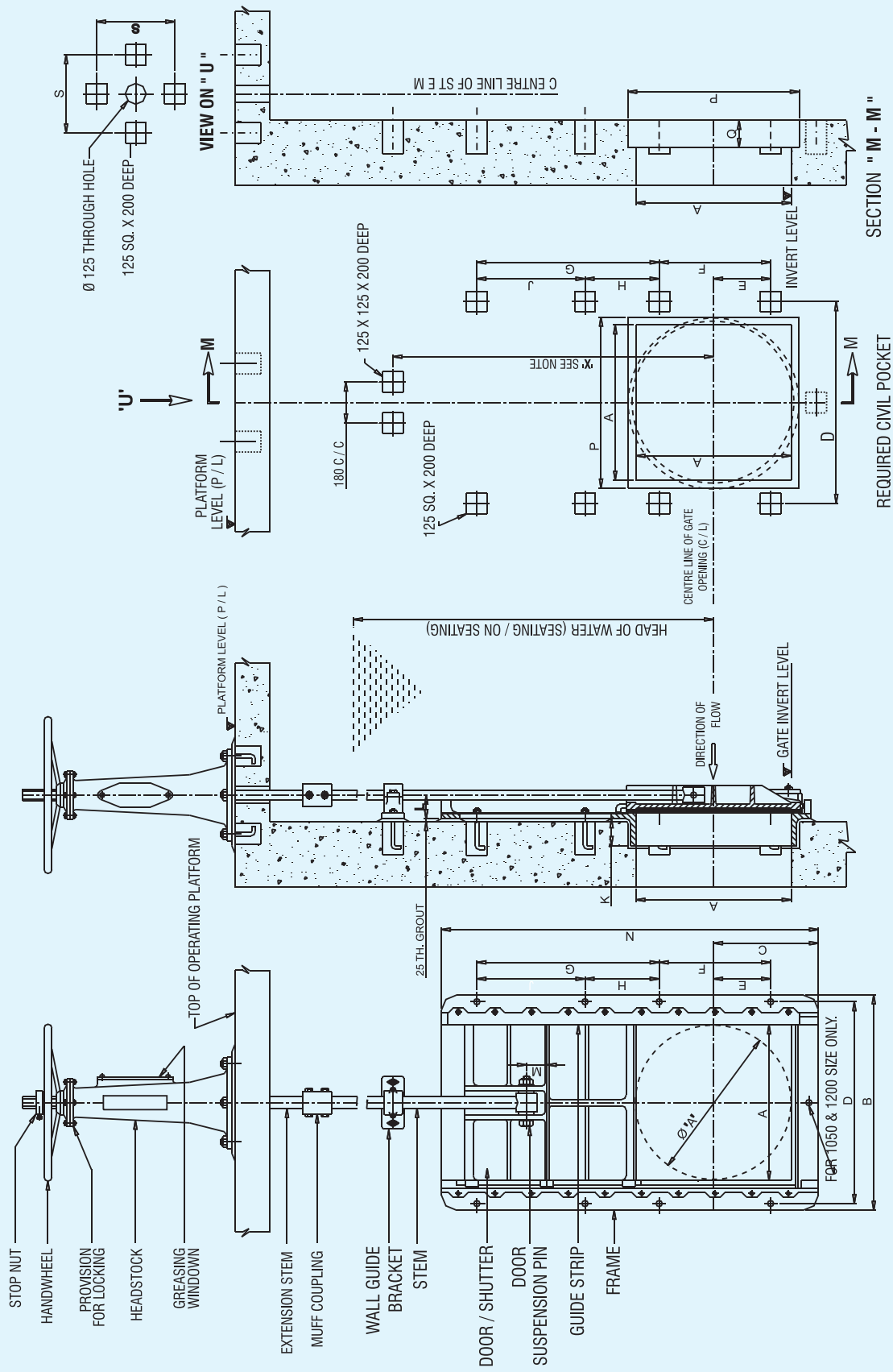


ENLARGED TOP VIEW OF SIDE WEDGE



VIEW OF SEALING ARRT. OF GATE IS : 3042

ERECTION DETAILS AND SKETCH SPIGOT BACK FRAME RISING STEM SLUICE GATE AS PER IS:3042-1965 FITTED WITH FIXED CENTRE STEM GUIDE BRACKET



DIMENSIONS REFER TABLE BELOW

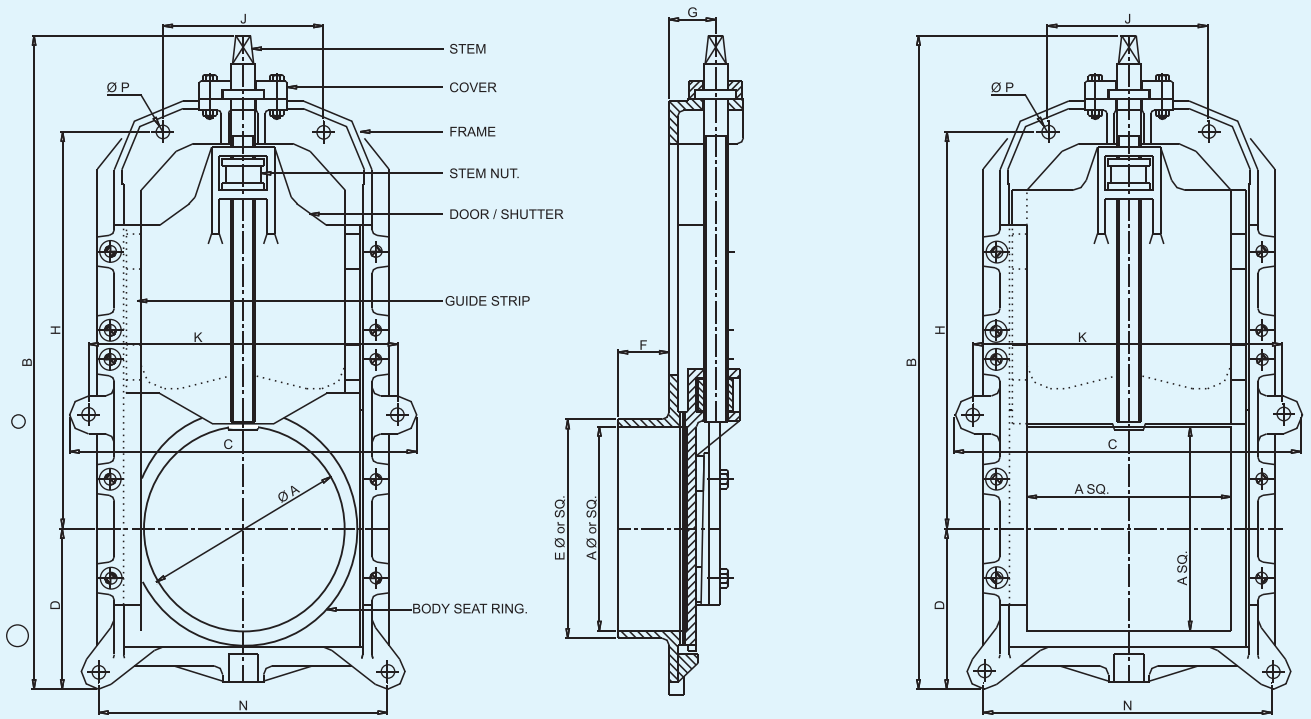
DIMENSIONS TABLE & SIZES FOR SPIGOT BACK FRAME RISING STEM CAST IRON SLUICE GATES AS EPR IS : 3042-1965

A SIZE	B	C	D	E	F	G	H	J	K	L	M	N	ANCHOR BOLT		P	Q	R
													NO.	DIA.			
200	465	215	415	70	420	–	–	–	85	95	–	700	4	20	280	85	120
250	465	215	415	70	420	–	–	–	85	95	–	700	4	20	330	85	120
300	515	240	465	85	475	–	–	–	85	95	–	800	4	20	380	85	120
350	600	265	555	165	700	–	–	–	85	95	–	900	4	20	430	85	120
400	660	290	610	120	330	330	–	–	85	95	–	1020	6	20	480	85	120
450	710	325	660	145	380	380	–	–	85	95	–	1130	6	22	530	85	120
500	770	350	714	200	470	470	–	–	85	95	–	1240	6	22	580	85	120
550	840	375	785	235	495	495	–	–	85	95	–	1340	6	22	630	85	120
600	890	405	825	240	535	535	–	–	85	95	–	1445	6	24	680	85	120
650	940	430	875	250	600	600	–	–	90	95	–	1560	6	24	750	90	120
700	990	466	925	300	680	680	–	–	115	100	–	1670	6	24	800	115	125
750	1065	490	990	305	710	710	–	–	115	100	95	1765	6	24	850	115	125
800	1120	515	1040	350	770	770	–	–	115	105	105	1870	6	24	900	115	130
825	1145	530	1065	345	710	890	–	–	115	105	115	1920	6	24	925	115	130
900	1220	565	1150	375	760	950	–	–	140	105	115	2070	6	24	1000	140	130
1000	1320	640	1246	430	690	1280	520	760	150	115	130	2320	8	30	1100	150	140
1050	1370	675	1295	475	760	1330	570	760	150	115	130	2425	10	30	1150	150	140
1200	1525	735	1445	535	915	1425	585	840	175	120	150	2715	10	30	1300	175	145

NOTES : -

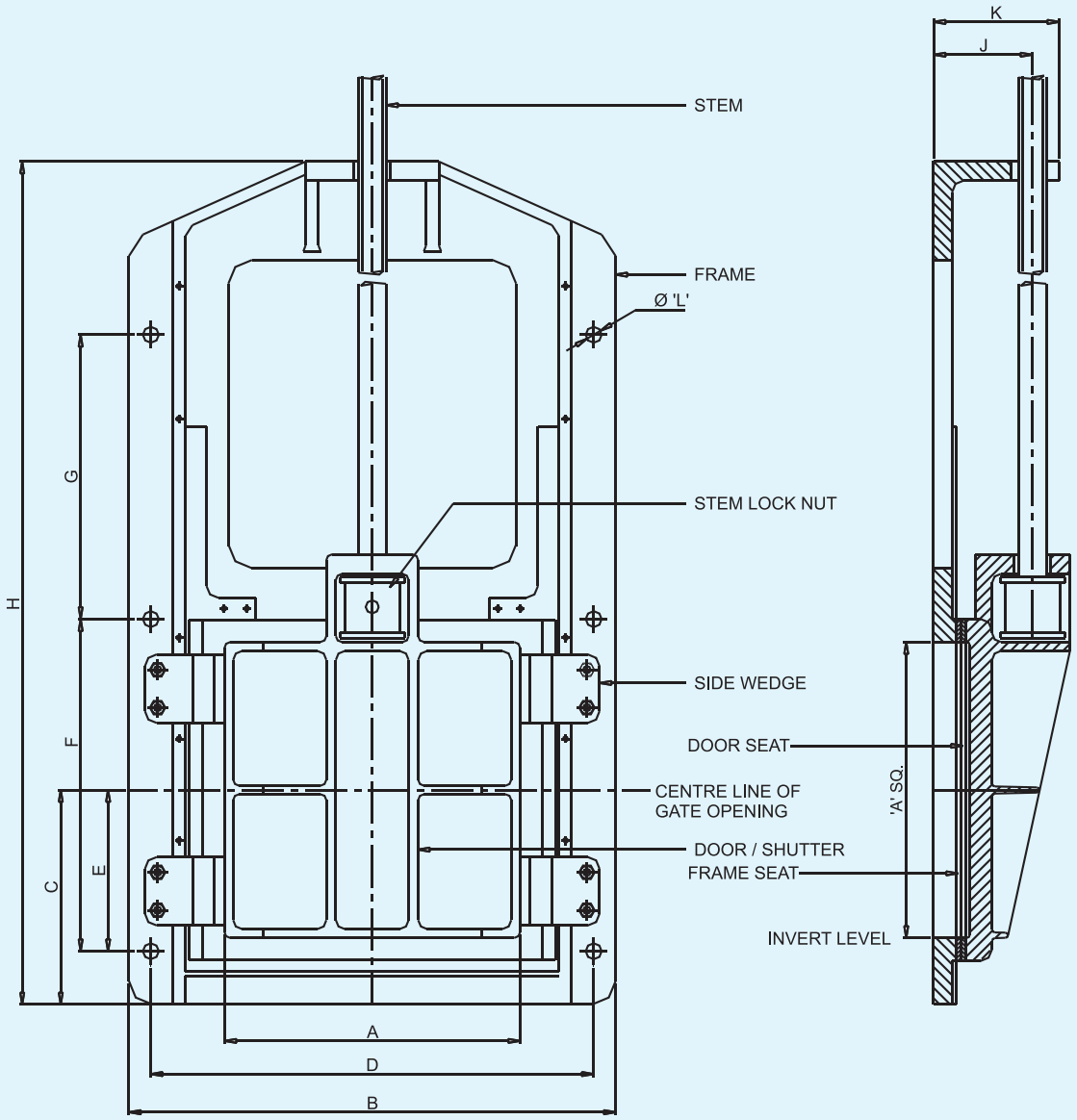
1. All dimensions are in millimeters.
2. A = Size of gate opening square / circular. In the sketch opening of gate also shown in dotted line refer alternative circular opening.
3. Distance between centre line of gate to centre line of stem guide bracket **'X'** depends on requirements of no of stem guide bracket, which may be nil or one or more, depending on C / L to P / L distance
4. Distance **'S'** depends on Gate size, Water head & operating torque, which is acting on headstock. Dimension 'S' = 200 / 250 / 300 / 450 depending upon type of headstock.
5. Larger size gate and also rectangular size of gate (Rising spindle as well as Non-rising spindle)can be supplied on request.
6. Above sketch and dimensions are in general guidance purpose only. For more details, G. A. drawings along with materials specifications can be furnished on request.
7. These type of gates are used in seating water head only.

SKETCH OF NON-RISING STEM SPIGOT BACK FRAME SLUICE GATE SUITABLE FOR 6 MM WATER HEAD



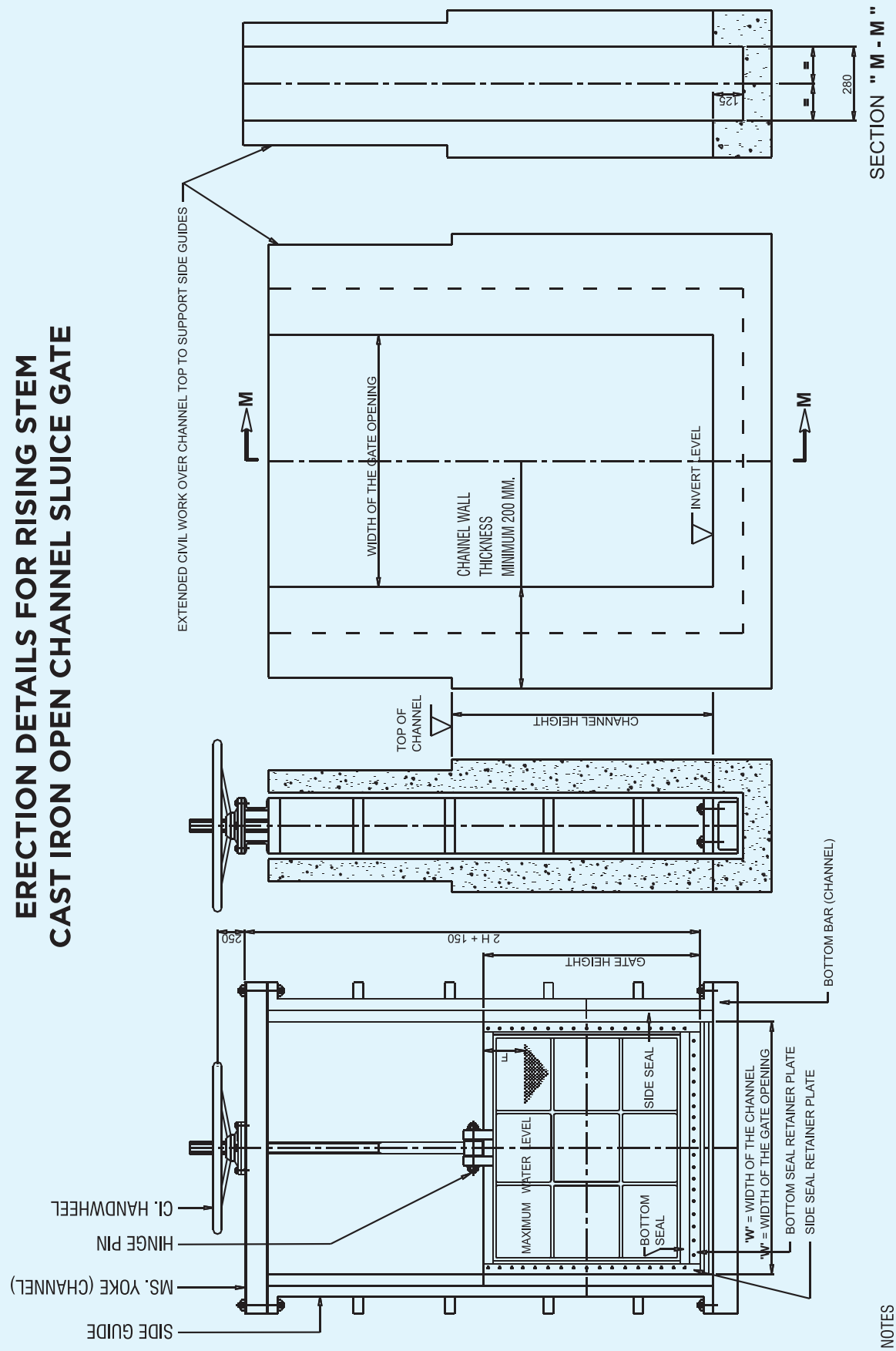
A	B	C	D	E	F	G	H	J	K	L	M	N	P
200	730	360	160	225	50	65	400	205	320	120	140	320	15
250	835	410	185	275	50	65	480	215	370	140	165	375	15
300	900	480	230	325	50	65	555	240	430	165	195	395	15
350	1120	595	285	385	65	80	680	275	530	195	245	495	20
450	1315	685	315	495	65	80	800	330	620	250	280	565	20
500	1475	755	35-	535	65	100	895	380	685	280	310	630	20
550	1575	805	385	585	65	100	975	405	735	305	335	680	20
600	1675	875	400	640	65	105	1050	465	795	330	360	735	22

SKETCH OF RISING STEM SQUARE OPENING FLAT BACK FRAME WALL MOUNTED SLUICE GATE UPTO 600 MM SIZE



A	B	C	D	E	F	G	H	J	K	Ø L	ANCHOR BOLT	
											NO.	DIA.
200	390	195	340	125	400	_	670	95	125	15	4	12
250	440	220	390	125	450	_	770	95	125	15	4	12
300	490	245	440	125	475	_	870	95	125	15	4	12
350	540	270	490	175	650	_	970	95	125	19	4	16
400	590	295	540	200	700	450	1070	95	125	19	4	16
450	640	320	590	225	450	500	1170	95	125	19	6	16
500	690	345	640	250	500	550	1270	95	125	19	6	16
600	790	395	740	300	600		1470	95	125	19	6	16

ERECTION DETAILS FOR RISING STEM CAST IRON OPEN CHANNEL SLUICE GATE



NOTES
1. All dimensions are in millimeters.
2. 'F' = Free length between maximum water level to top of the gate
3. We can supply manually operated pillar type headstock (geared or ungeared) in place of bench headstock which as shown in the sketch
4. We can also supply MS fabricated type open channel Sluice Gate on request.
5. Above sketch and dimensions are in general guidance purpose only. For more details, G.A. drawings along with material specifications can be furnished on request.

MATERIAL OF CONSTRUCTION FOR SPIGOT END, THIMBLE MOUNTED, FLANGE BACK, FLAT BACK FRAME SLUICE GATE

SL NO.	COMPONENT	PREFERRED MATERIAL	ALTERNATIVE MATERIAL
1	Frame, Shutter / Door, Wall Thimble, Wedge bracket, Headstock, Guide bracket Wedgeing device, Flush bottom seal support bar	Grey Cast Iron, IS : 210 -1993, Grade - FG 200, 220, 260 Cast Iron, BS EN : 1561, Grade - EN - GJL 200 Cast Iron, ASTM A 126, Grade - Class B	Grey Cast Iron, IS : 210 -1993, Grade - Flake Graphite 150 or 300. Spheroidal Graphite Iron, IS : 1865 - 2000, Grade - 500/7 or 400/12. Cast Steel, IS : 1030, Gr. 230-450W or ASTM A 216, Grade - WCB Fabricated Mild Steel, IS : 2062, or Steel, IS : 2002
2	Wages, Wage facings, Sealing faces, Stem nut	Leaded Tin Bronze, IS : 318 -1981, Grade - LTB 1 or 2. Leaded Gunmetal, BS : 1400, Grade - LG 2. Naval Brass IS : 291, Grade - 1 or 2. Phosphor Bronze, IS:7814, Gr.- 1or 2 / IS:28, Gr.- 1or 2 Bronze, ASTM B 21, Gr.- CA-C46200, C48200 Stainless Steel, ASTM A 276 / 240, Gr. - 304, 316, 410	Alloy Steel, IS : 3444, Grade - 1 / Grade - 4 / Grade - 10 Stainless Steel, IS : 6603, Grade - 04 Cr18 Ni10 Stainless Steel, AISI : 304. or Stainless Steel, AISI : 316. Stainless Steel, BS : 970, Type 304, 410, 316
3	Resilient rubber seal, Flush bottom seal	Natural Rubber, IS : 11855 EPDM Rubber, ASTM D 2000 Neoprene Rubber, ASTM D 2000	Nitrile Rubber / Dexine
4	Rubber seal retainer strip	Mild Steel, IS : 2062, Stainless Steel, ASTM A 276 / 240, Gr. - 304, 316, 410	Spheroidal Graphite Iron, IS : 1865 - 2000, Grade - 500/7 or 400/12. Stainless Steel, BS : 970, Type 304, 410, 316
5	Stem / Spindle, Extension Stem Muff Coupling	Mild Steel, IS : 2062, Grade - A Stainless Steel, ASTM A 276 / 240, Gr. - 304, 316, 410 Stainless Steel, AISI : 410, AISI : 304, AISI : 316,	Stainless Steel, BS : 970, Part 1, Type 304, 410, 316
6	Fasteners & Studs Muff Coupling	Mild Steel, IS : 2062, Grade - A Carbon Steel, IS : 1363, (Part - 1 & 3) Class - 4.6 & 4, Stainless Steel, AISI : 410, AISI : 304, AISI : 316,	Stainless Steel, BS : 970, Part 1, Type 304, 410, 316
7	Anchor Bolts	Mild Steel, IS : 2062, Grade - A Carbon Steel, IS : 1363, (Part - 1 & 3) Class - 4.6 & 4, Stainless Steel, AISI : 410, AISI : 304, AISI : 316,	Stainless Steel, BS : 970, Part 1, Type 304, 410, 316
8	Yoke / Channel	Mild Steel, IS : 2062, Grade - A Grey Cast Iron, IS : 210 -1993, Grade - FG 200, 220, 260 Stainless Steel, ASTM A 276 / 240, Gr. - 304, 316, 410	Grey Cast Iron, IS : 210 -1993, Grade - Flake Graphite 150 or 300. Stainless Steel, BS : 970, Part 1, Type 304, 410, 316

FIRE HYDRANTS

Fire Hydrants

Fire Hydrant

Ductile Iron / Cast Iron Fire Hydrants are used for fire fighting purposes to derive water from the main under ground water pipe line. Here are the main two types of fire hydrant:-

1) Fire Hydrant, Stand post type
2) Underground fire hydrant sluice valve type

Stand post Type Fire Hydrant

PARENT / BASIC MATERIAL	DUCTILE IRON, CAST IRON
END CONNECTION	FLANGE END, SOCKET END
MANUFACTURING STANDARD	IS 908
HYDROSTATIC TEST	2 MPa / 20 Bar
COATING	FIRE RED COLOUR

For Single outlet Fire Hydrant consists of :

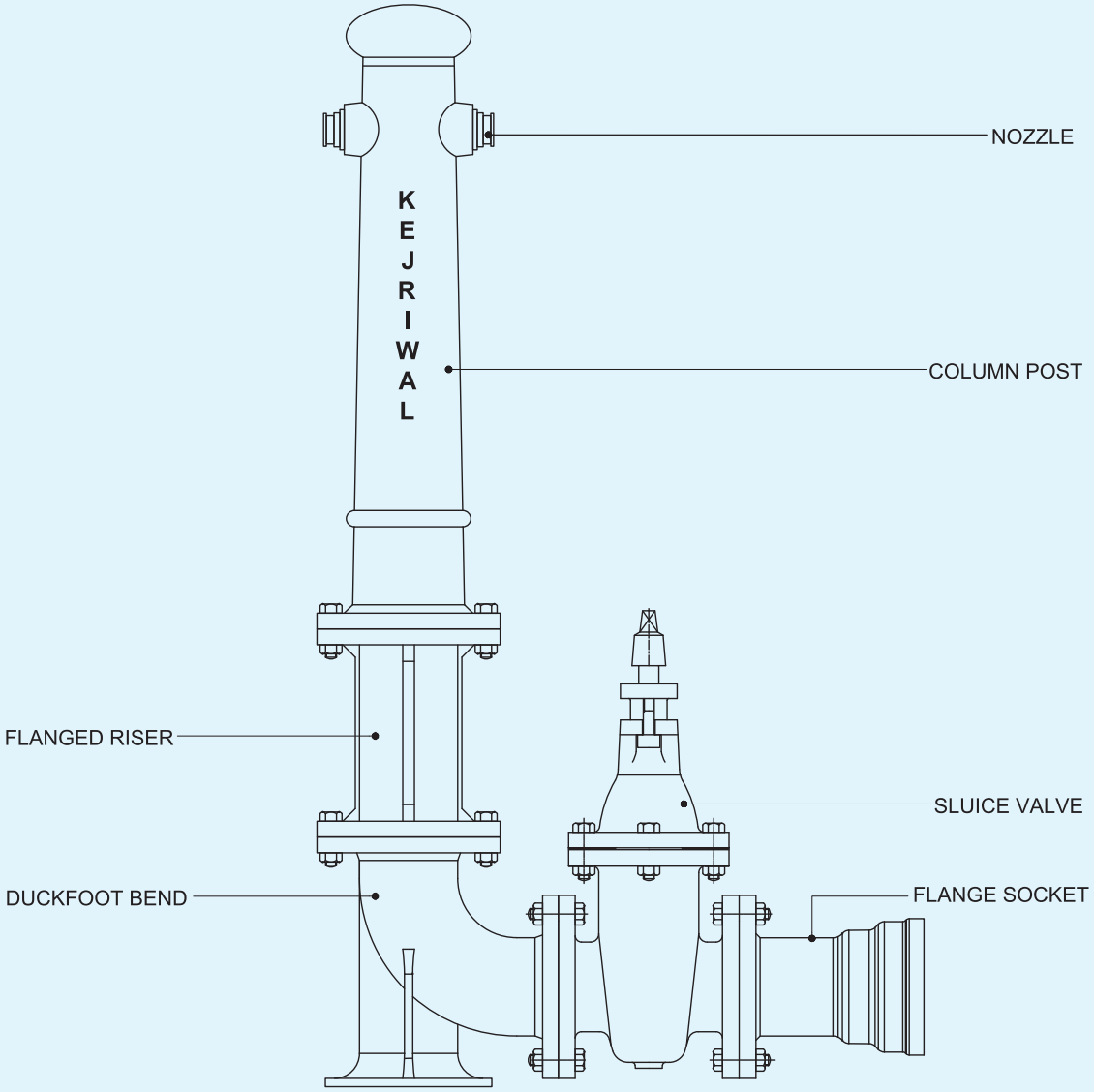
COMPONENT	MATERIAL	DIMENSION	STANDARD
Sluice Valve	Ductile Iron, Cast Iron	80mm Dia	IS 14846, BS 5163,EN 1074-2
Road Surface Box	Ductile Iron, Cast Iron		IS 3950, BS 750, BS 5834
Duckfoot Bend	Ductile Iron, Cast Iron	80mm Dia	IS 1538, IS 9523, BS 545, ISO 2531
Double Flange Riser	Ductile Iron, Cast Iron	80mm Dia X 250 mm Long*	IS 7181, IS 9523, BS 545, ISO 2531
Stand post Column with Single mouth	Ductile Iron, Cast Iron		
Coupling	Gun Metal	63mm	IS 903, BS 750

For Double Outlet Fire Hydrant consists of :

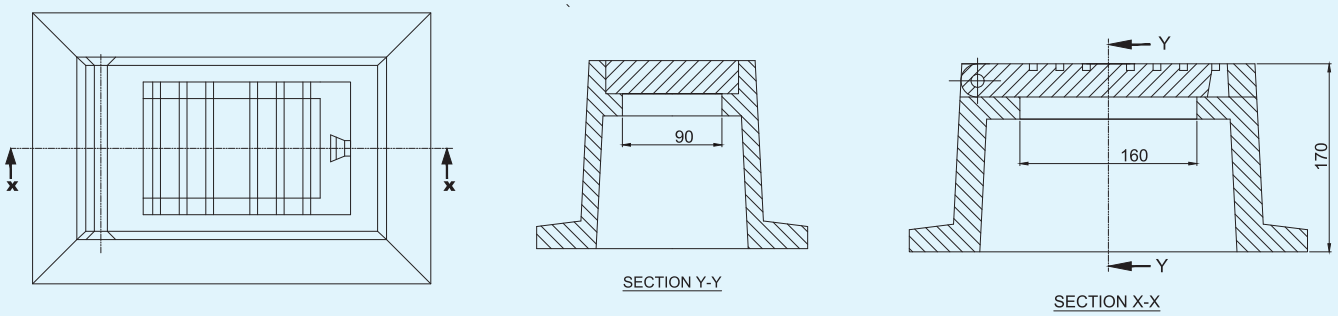
COMPONENT	MATERIAL	DIMENSION	STANDARD
Sluice Valve	Ductile Iron, Cast Iron	100mm Dia	IS 14846, BS 5163,EN 1074-2
Road Surface Box	Ductile Iron, Cast Iron		IS 3950, BS 750, BS 5834
Duckfoot Bend	Ductile Iron, Cast Iron	80mm Dia	IS 1538, IS 9523, BS 545, ISO 2531
Double Flange Riser	Ductile Iron, Cast Iron	80mm Dia X 250 mm Long*	IS 7181, IS 9523, BS 545, ISO 2531
Stand post Column with Double mouth	Ductile Iron, Cast Iron		
Coupling	Gun Metal	63mm	IS 903, BS 750

* The length may be alternated to suit specific requirements

** A Flange Socket tailpiece/ Flange adapter may also be supplied along with the above components to connect spigot end of main water pipeline.



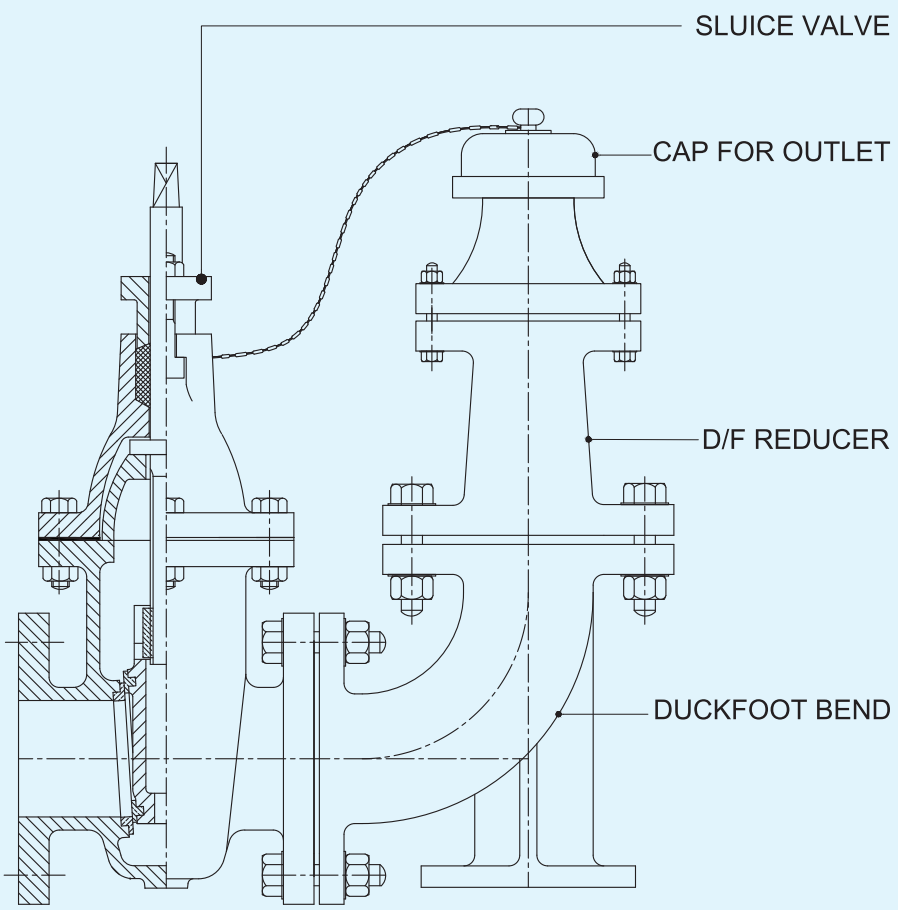
FIRE HYDRANT, STAND POST TYPE



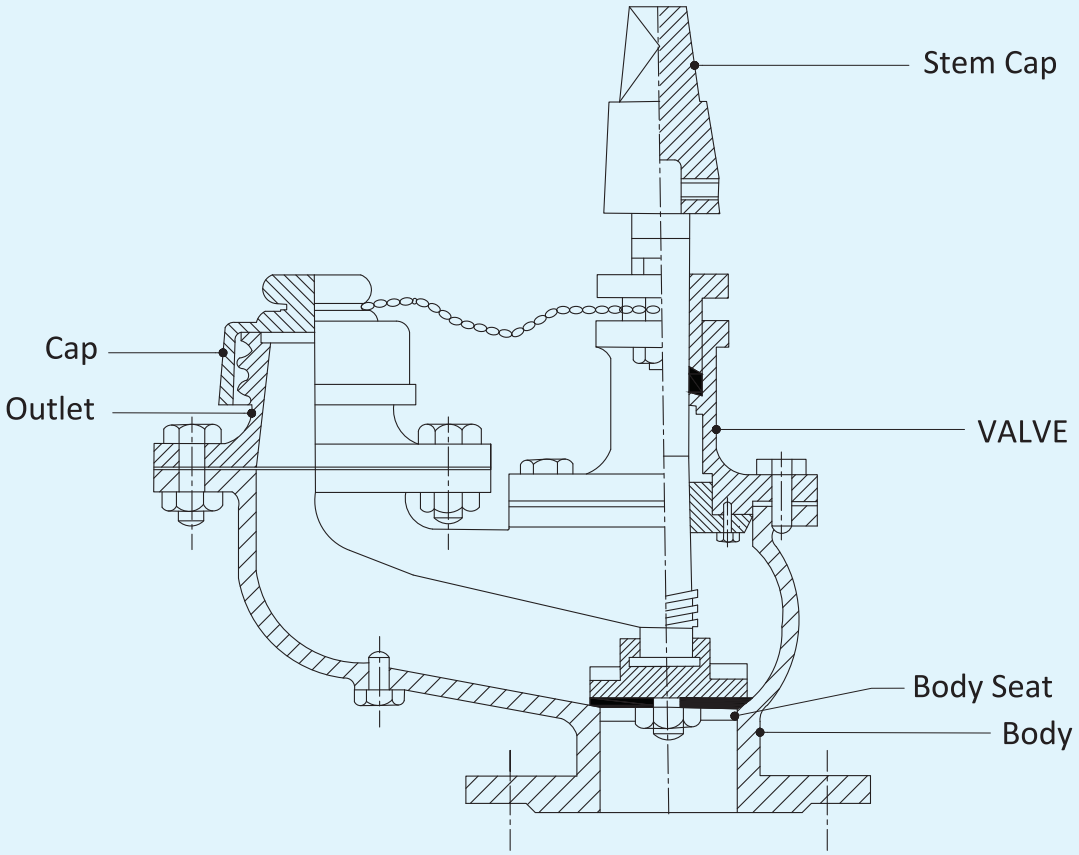
RECTANGULAR SURFACE BOX FOR SLUICE VALVE

Underground Fire Hydrant Sluice Valve Type :-

PARENT / BASIC MATERIAL	DUCTILE IRON, CAST IRON
END CONNECTION	FLANGE END
MANUFACTURING STANDARD	IS 909
TYPE OF CONSTRUCTION	FIG A / TYPE A & FIG B / TYPE B
HYDROSTATIC TEST	2 MPa / 20 Bar
COATING	FIRE RED COLOUR



COMPONENT	MATERIAL	DIMENSION	STANDARD
Sluice Valve	Ductile Iron, Cast Iron	80mm Dia	IS 14846, BS 5163,EN 1074-2
Road Surface Box	Ductile Iron, Cast Iron		IS 3950, BS 750, BS 5834
Duckfoot Bend	Ductile Iron, Cast Iron	80mm Dia	IS 1538, IS 9523, BS 545, ISO 2531
Double Flange Riser	Ductile Iron, Cast Iron	80mm Dia X 250 mm Long*	IS 7181, IS 9523, BS 545, ISO 2531
Stand post Column with Single mouth	Ductile Iron, Cast Iron		
Coupling	Gun Metal	63mm	IS 903, BS 750

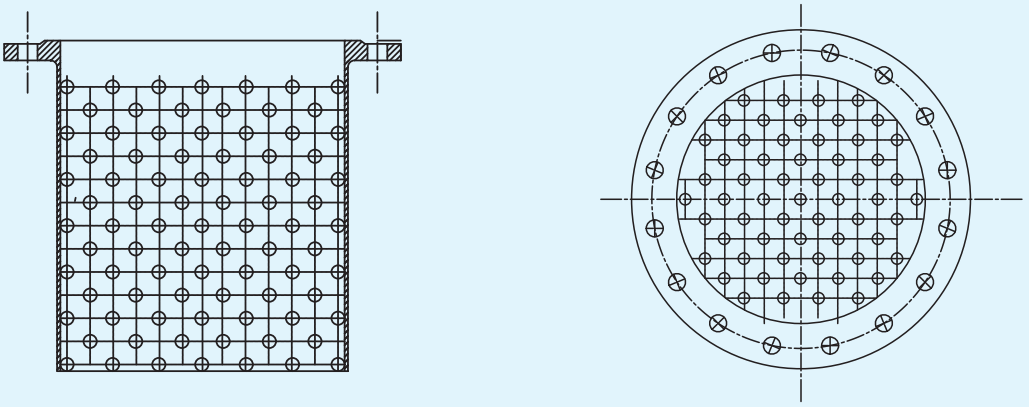


COMPONENT	MATERIAL SPECIFICATION
BODY	CAST IRON, DUCTILE IRON
VALVE SEAT	GUN METAL
VALVE	GUN METAL
SPINDLE NUT	GUN METAL
BONNET	CAST IRON, DUCTILE IRON
SPINDLE	BRASS
SPINDLE CAP	CAST IRON, DUCTILE IRON
DRAIN BOLT	MILD STEEL, STAINLESS STEEL
OUTLET	GUN METAL
CAP	CAST IRON, DUCTILE IRON
CHAIN	GALVANISED IRON
NUT & BOLT	MILD STEEL, STAINLESS STEEL

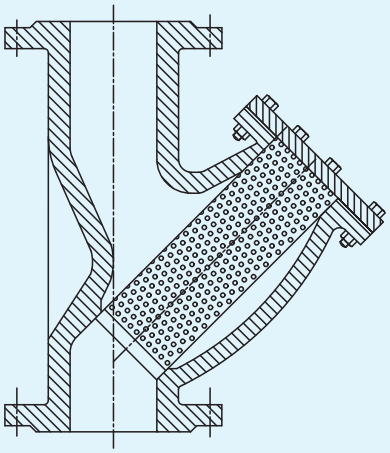
Strainers

A **Pipeline Strainer** is installed in the flow path of a pipeline to protect downstream equipment from damage or clogging. It has a perforated or mesh screen inside a casing that traps solid particles while allowing water to pass through.

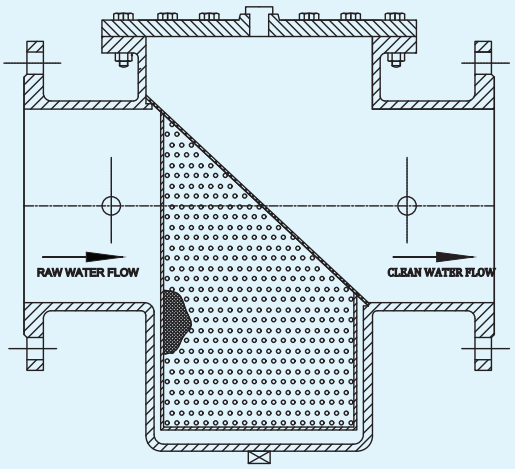
These are some various type of strainers



BUCKET TYPE SUCTION STRAINER



Y STRAINER



BASKET / T-POT STRAINER

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