

SERIES F16/F40 & F20/F50

FULL PORT TWO-PIECE FLANGED BALL VALVE

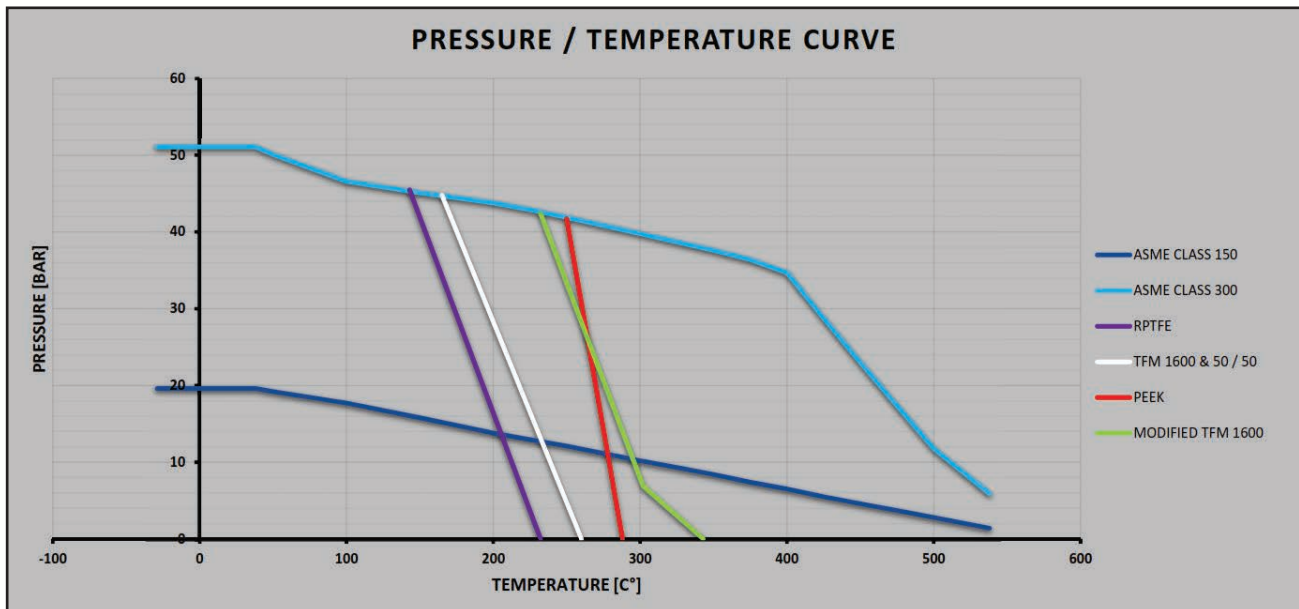


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FULL PORT TWO-PIECE FLANGED BALL VALVE

SUMMARY

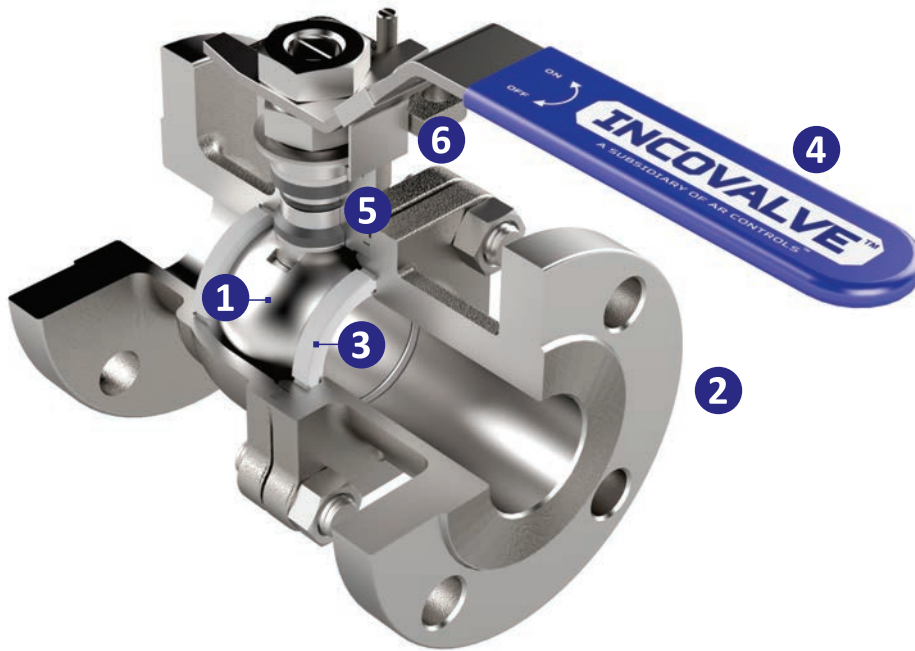
- **PRESSURE RATING** | F16: PN10 / PN16 ; F40: PN25 / PN40
- **SIZE RANGE** | DN15 - DN200 (1/2" - 8")
- **BODY MATERIALS** | STAINLESS STEEL & CARBON STEEL & SPECIAL ALLOY
- **FIRE SAFE** | API 607 7TH EDITION
- **STANDARD SEAT MATERIAL** | TFM 1600 (MODIFIED PTFE)
- **OPTIONAL SEAT MATERIALS TO SUIT VARIOUS APPLICATIONS:**
PTFE | RPTFE (15% GLASS FIBRE REINFORCED) | PFA | PEEK | UHMWPE | 50/50 (316 SS + RPTFE) | METAL | 15% CARBON REINFORCED PTFE | 25% CARBON REINFORCED PTFE | MODIFIED TFM1600 |
- **BLOW-OUT PROOF STEM**
- **ANTI-STATIC DEVICE**
- **FULL PORT**
- **V-PORT OPTIONS** | 15°; 30°; 45°; 60°; 90°
- **INTERCHANGEABLE SEATS WITH PRESSURE RELIEF GROOVES**
- **MOUNTING PAD** | ISO 5211
- **STANDARD LOCKABLE HAND LEVER**
- **TEMPERATURE RANGE** | -20 TO 180°C
- **DESIGN** | EN 12516-1
- **FLANGE DIMENSIONS** | EN 1092-1 TYPE 21 PN16/40 (RF SS)
- **FACE TO FACE** | EN 558-1 F4/F5 (DIN 3202 F4)
- **PRESSURE TEST** | EN 12266-1



* ASME CL 150 / 300 CURVE VARIES SLIGHTLY DEPENDING ON BODY MATERIALS

FEATURES

IncoValve's F16/F40 is a flanged, fire safe, floating ball valve featuring a split body and full port design. The F16/F40 is designed to be robust and is manufactured to the highest quality standards in IncoValve's world class manufacturing facility, offering superior service life, even in challenging industrial applications.



1 BALL

Cast with the highest integrity and precision machined to a perfect sphere with a superior surface finish to ensure an optimal sealing surface. A bi-directional bubble tight seal is achieved while maintaining a low operating torque. Full port ball ensures a high Cv and allows pigging of the line.

2 FLANGES

Exterior flange sealing surface is serrated to ensure a tight seal. The valve has a DIN 3202 F4 face-to-face and is available in various flange drillings to suit the customer requirement.

3 SEATS

F16/F40 resilient seats are designed to relieve entrapped cavity pressure through integral relief grooves. Seats are available in various specialised engineered materials to suit any application and ensure the lowest friction and operating torque, reducing the need to compromise on sufficient preloading for low pressure and vacuum service.

4 LEVER

Stainless Steel levers are supplied as standard on all manually operated valves. The lever features a self-engaging locking device to prevent unwanted movement of the ball.

5 STEM PACKING

The standard F16/F40 packing provides an API 607 7TH edition fire safe stem seal design. Belleville washers ensure that constant pressure is maintained on the adjustable packing when changes in temperature occur, and these forces are evenly distributed to the packing through the packing gland. Premium materials are offered as standard.

6 MOUNTING PAD

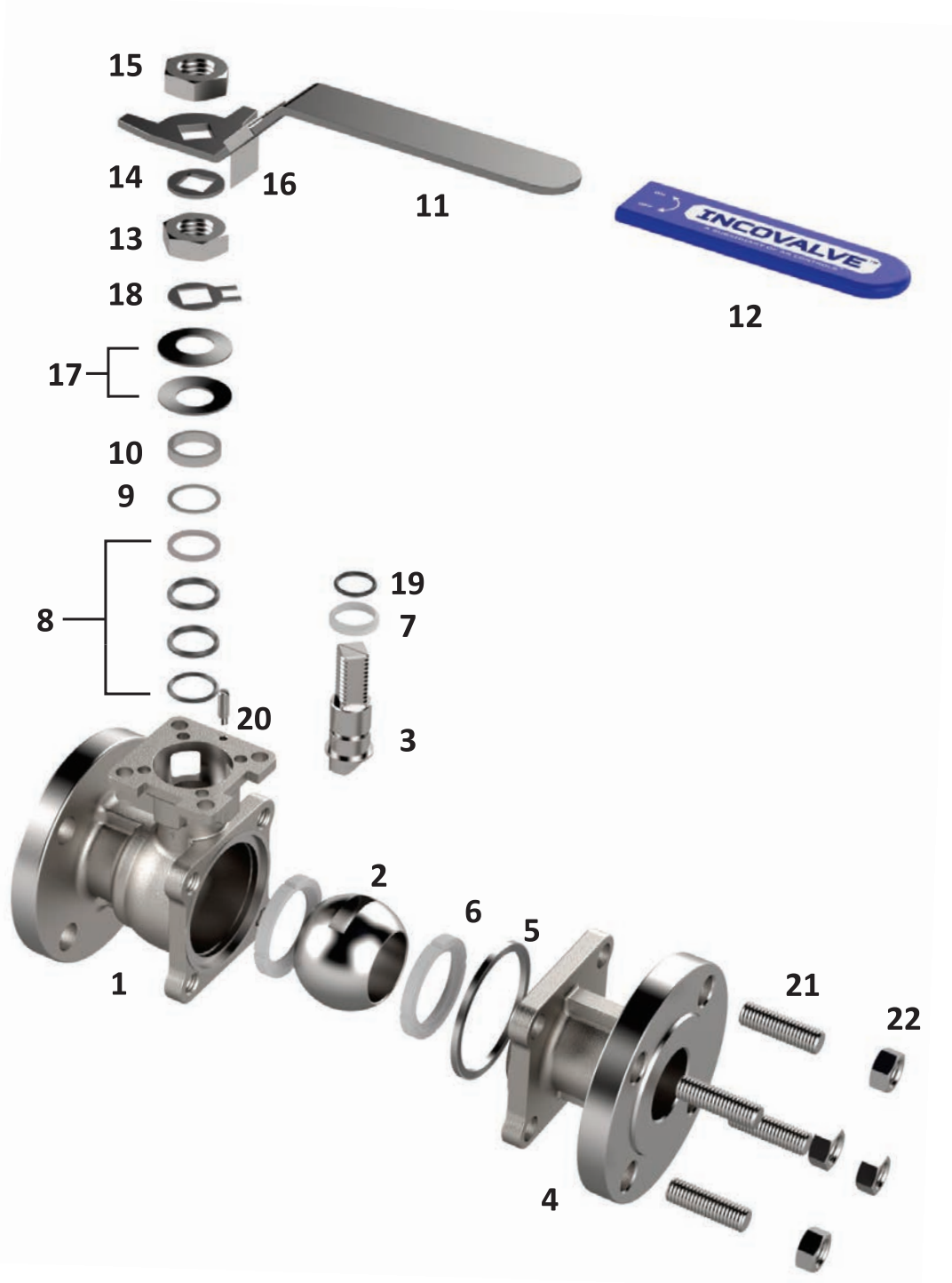
The mounting pad is precision machined to provide a perfectly level mounting surface for actuators, eliminating the possibility of shaft misalignment. The mounting pad is raised for full flange clearance, allowing any size or style actuator to be fitted in the desired orientation without the use of brackets and couplings.



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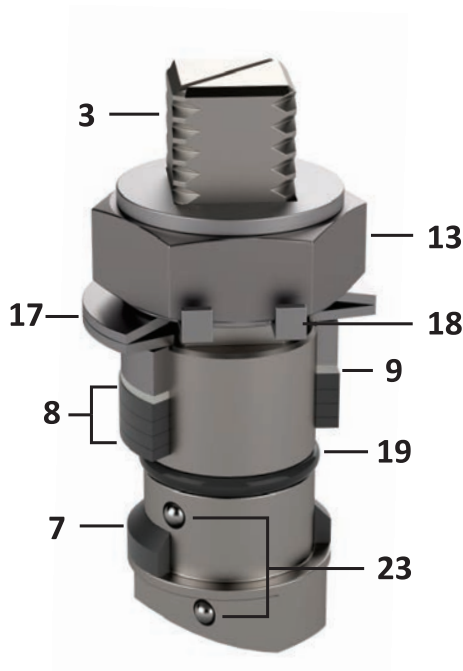
MATERIALS OF CONSTRUCTION



BILL OF MATERIALS

NO	PART NAME	PN16 / PN40		CLASS 150 / CLASS 300	
		CF8M	WCB	CF8M	WCB
1	BODY*	CF8M	WCB	CF8M	WCB
2	BALL *	CF8M		CF8M	
3	STEM*	SS316		SS316	
4	END CAP*	CF8M	WCB	CF8M	WCB
5	BODY SEAL	SPIRAL WOUND Ss316 / GRAPHITE			
6	SEAT*	TFM 1600			
7	THRUST WASHER	MODIFIED TFM 1600			
8	STEM PACKING*	GRAPHITE			
9	PACKING PROTECTOR	MODIFIED TFM 1600			
10	GLAND BUSH	1.4301		SS304	
11	HANDLE	1.4301		SS304	
12	HANDLE COVER	PLASTIC			
13	STEM NUT	1.4301		SS304	
14	THRUST WASHER	1.4301		SS304	
15	HANDLE NUT	1.4301		SS304	
16	LOCKING PAD	1.4301		SS304	
17	BELLEVILLE WASHER	1.4310		SS301	
18	STOP WASHER	1.4301		SS304	
19	STEM O-RING	FKM			
20	MECHANICAL STOP	1.4301		SS304	
21	BODY STUD	Gr. B8		Gr. B8	
22	BODY NUT	Gr. 8		Gr. 8	
23	ANTI-STATIC DEVICE	1.4301		SS304	

* VARIOUS MATERIALS AVAILABLE



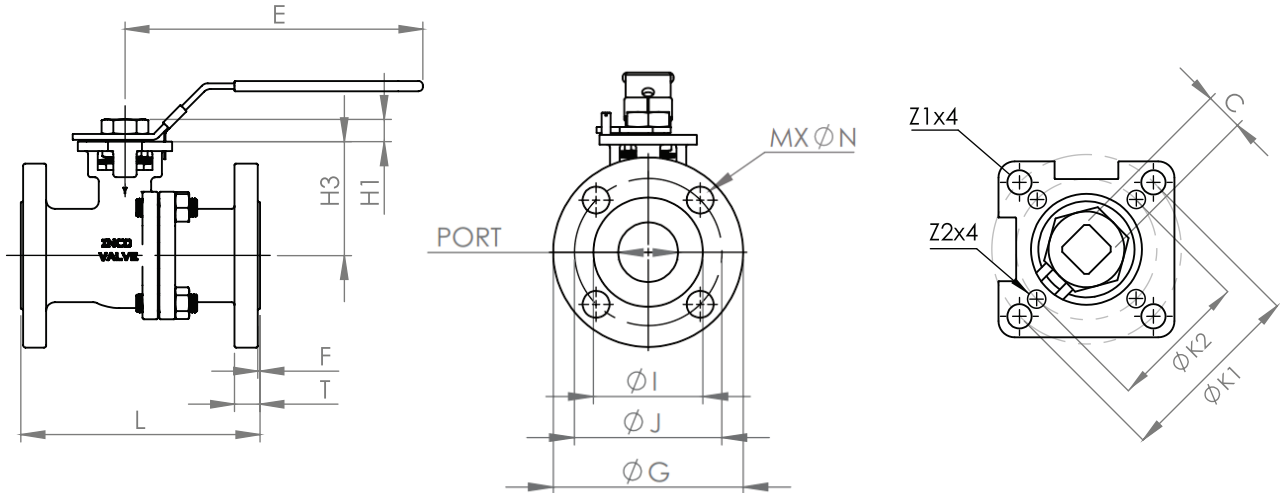
INCOVALVE® F16 AND F40 STEM ASSEMBLY



SERIES F16/F40

FULL PORT TWO-PIECE FLANGED BALL VALVE

DIMENSIONS



Valve Size		SERIES F16 & F40 [DN15 - DN50]															WEIGHT		
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØK2	ØZ1	ØZ2	KG
½"	15	15	115	112	8.5	48	9	95	65	45	16	2	4	14	50	36	7	6	1.57
¾"	20	20	120	112	8.5	59	9	105	75	58	18	2	4	14	50	36	7	6	3.08
1"	25	25	125	136	9.5	64	9	115	85	68	18	2	4	14	50	36	7	6	3.86
1¼"	32	32	130	185	9.5	71	9	140	100	78	18	2	4	18	50	36	7	6	5.73
1½"	40	38	140	198	14	78.5	14	150	110	88	18	3	4	18	70	50	9	7	6.86
2"	50	50	150	198	13.7	87	14	165	125	102	20	3	4	18	70	50	9	7	9.43

METRIC (MM)

Valve Size		SERIES F16 [DN65 - DN100]															WEIGHT		
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØK2	ØZ1	ØZ2	KG
2½"	65	64	170	450	18	106.8	17	185	145	122	18	3	4	18	102	70	12	10	13.53
3"	80	76	180	450	18	116	17	200	160	138	20	3	8	18	102	70	12	10	16.68
4"	100	100	190	450	18	154.5	17	220	180	158	20	3	8	18	102	70	12	10	23.86

METRIC (MM)

Valve Size		SERIES F40 [DN65 - DN100]															WEIGHT		
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØK2	ØZ1	ØZ2	KG
2½"	65	64	170	450	18	106.8	17	185	145	122	22	3	8	18	102	70	12	10	14.38
3"	80	76	180	450	18	116	17	200	160	138	24	3	8	18	102	70	12	10	18.93
4"	100	100	190	450	18	154.5	17	235	190	158	24	3	8	22	102	70	12	10	28.50

METRIC (MM)

Valve Size		SERIES F16 [DN125 - DN200]															WEIGHT
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØZ1	KG
5"	125	125	325	600	30	194	27	250	210	188	22	3	8	18	125	14	48.25
6"	150	150	350	800	30	213	27	285	240	212	22	3	8	22	125	14	62.33
8"	200	200	400	800	30	246.4	27	340	295	268	24	3	12	22	125	14	106.25

METRIC (MM)

Valve Size		SERIES F40 [DN125 - DN150]															WEIGHT
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØZ1	KG
5"	125	125	325	600	30	194	27	270	220	188	26	3	8	26	125	14	64.20
6"	150	150	350	800	30	213	27	300	250	218	28	3	8	26	125	14	72.38

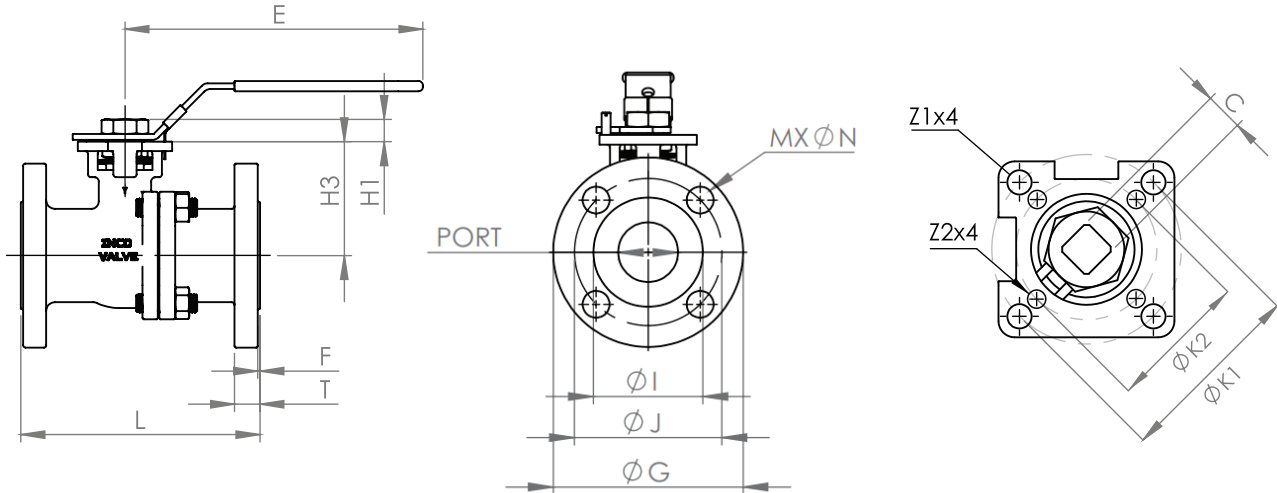
METRIC (MM)

PLEASE CONTACT AR CONTROLS FOR SIZE 10" [DN250] AND LARGER.

SERIES F20/F50

FULL PORT TWO-PIECE FLANGED BALL VALVE

DIMENSIONS



Valve Size		SERIES F20 [DN15 - DN50]																WEIGHT	
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØK2	ØZ1	ØZ2	KG
½"	15	15	108	112	8.5	48	9	89	60.5	35	11.2	1.6	4	16	50	36	7	6	1.79
¾"	20	20	117	112	8.5	59	9	98.6	70	43	12.7	1.6	4	16	50	36	7	6	2.30
1"	25	25	127	136	9.5	64	9	108	79.2	51	14.3	1.6	4	16	50	36	7	6	3.09
1¼"	32	32	140	185	9.5	71	9	117.5	88.9	63.5	15.9	1.6	4	16	50	36	7	6	5.27
1½"	40	38	165	198	14	78.5	14	127	98.6	73.2	17.5	1.6	4	16	70	50	9	7	5.80
2"	50	50	178	198	13.7	87	14	152.5	120.7	92	19.1	1.6	4	19.1	70	50	9	7	9.05

METRIC [MM]

Valve Size		SERIES F50 [DN15 - DN50]																WEIGHT	
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØK2	ØZ1	ØZ2	KG
½"	15	15	140	112	8.5	48	9	95.3	66.5	35	14.3	1.6	4	16	50	36	7	6	2.33
¾"	20	20	152	112	8.5	59	9	117.4	82.6	43	15.9	1.6	4	19.1	50	36	7	6	3.40
1"	25	25	165	136	9.5	64	9	124	88.9	51	17.5	1.6	4	19.1	50	36	7	6	4.10
1¼"	32	32	178	185	9.5	71	9	133.4	98.6	63.5	19.1	1.6	4	19.1	50	36	7	6	6.85
1½"	40	38	190	198	14	78.5	14	155.5	114.3	73.2	20.6	1.6	4	22.3	70	50	9	7	8.32
2"	50	50	216	198	13.7	87	14	165.1	127	92	22.4	1.6	8	19.1	70	50	9	7	10.57

METRIC [MM]

Valve Size		SERIES F20 [DN65 - DN100]																WEIGHT	
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØK2	ØZ1	ØZ2	KG
2½"	65	64	190	265	18	106.8	17	177.8	139.7	104.7	23.3	1.6	4	19.1	102	70	12	10	14.45
3"	80	76	203	265	18	116	17	190.5	152.4	127	23.9	1.6	4	19.1	102	70	12	10	17.91
4"	100	100	229	325	18	154.5	17	228.6	190.5	157.2	23.9	1.6	8	19.1	102	70	12	10	27.88

METRIC [MM]

Valve Size		SERIES F50 [DN65 - DN100]																WEIGHT	
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØK2	ØZ1	ØZ2	KG
2½"	65	64	241	265	18	106.8	17	190.5	149.4	104.7	25.4	1.6	8	22.3	102	70	12	10	16.72
3"	80	76	283	265	18	116	17	209.6	168.1	127	28.6	1.6	8	22.3	102	70	12	10	21.66
4"	100	100	305	325	18	154.5	17	254	200.2	157.2	31.8	1.6	8	22.3	102	70	12	10	38.15

METRIC [MM]

Valve Size		SERIES F20 [DN125 - DN200]														WEIGHT	
inch	mm	PORT	L	E	H1	H3	C	ØG	ØJ	ØI	T	F	M	ØN	ØK1	ØZ1	KG
5"	125	125	356	600	30	194	27	254	216	186	24	1.6	8	22.3	125	14	54
6"	150	150	394	800	30	213	27	279.4	241.3	216	25.4	1.6	8	22.3	125	14	66
8"	200	200	457	800	30	246.4	27	342.9	298.5	270	28.5	1.6	8	22.3	125	14	113.5

METRIC [MM]

PLEASE CONTACT AR CONTROLS FOR SIZE 10" [DN250] AND LARGER.



TORQUE FIGURES

$$T_T = T_{WP} \times (S_F + M_F + C_F + F_F)$$

T_T = Total Torque Requirement

T_{WP} = Torque at Working Pressure

S_F = Seat Factor

M_F = Media Factor

C_F = Configuration Factor

F_F = Frequency Factor

Valve Size		Torque [Nm] @ Working Pressure			
inch	mm	10 bar	16 bar	25 bar	40 bar
1/2"	15	6	6	6	7
3/4"	20	6	6	6	8
1"	25	10	10	10	12
1 1/4"	32	14	14	14	19
1 1/2"	40	18	18	18	26
2"	50	14	16	24	32
2 1/2"	65	30	38	52	60
3"	80	30	44	70	86
4"	100	70	74	94	142
5"	125	150	187	300	435
6"	150	200	250	400	580

* NO SAFETY FACTOR INCLUDED

Media Factor		Configuration Factor	
MEDIA	FACTOR	CONFIGURATION	FACTOR
Clean lubricating fluid	0,0	Through Port	0,0
Clean non-lubricating fluid	0,0	V-Port	0,3
Chilled water	0,3	Modulating Service	0,3
Low temperature service (< 0°C)	0,3	Frequency Factor	
Raw water	0,4	FREQUENCY	FACTOR
Steam	0,4	Cycled Daily	0,0
Clean Gas	0,4	Cycled Weekly	0,1
Slurry	0,8	Cycled Monthly	0,2
Dry media	0,8	Cycled Bi-monthly	0,3
Seat Factor			
SEAT MATERIAL	FACTOR	SEAT MATERIAL	FACTOR
TFM 1600, MODIFIED TFM 1600, PTFE	0,90	UHMWPE	1,35
RPTFE	1,00	PEEK, 50/50	1,50

CV Table for V-Port Ball Valve at Selected Percentage of Port Opening

Size	Angle	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100% CV
	slotted	0	0%	0,1	0,1	0,1	0,1	0,2	0,2	0,2	0,3	0,3
1/4"	15	0	0,1	0,1	0,1	0,1	0,2	0,2	0,3	0,4	0,4	0,4
	30	0	0,1	0,1	0,1	0,1	0,2	0,3	0,4	0,5	0,5	0,6
	45	0	0,1	0,1	0,1	0,2	0,3	0,4	0,6	0,7	0,8	1,1
	60	0	0,1	0,1	0,2	0,2	0,3	0,4	0,5	0,9	1,2	1,4
	90	0	0,1	0,2	0,2	0,3	0,4	0,5	0,7	1	1,4	1,7
	slotted	0	0,1	0,1	0,1	0,1	0,2	0,3	0,3	0,4	0,5	0,6
1/2"	15	0	0,1	0,1	0,1	0,2	0,3	0,5	0,5	0,6	0,7	0,8
	30	0	0,1	0,1	0,2	0,3	0,5	0,8	1,1	1,6	2,2	2,6
	45	0	0,1	0,1	0,2	0,4	0,6	1,1	1,5	2,6	3,4	4,1
	60	0	0,1	0,1	0,3	0,5	0,9	1,4	2	3,3	4,4	6
	90	0	0,1	0,2	0,4	0,6	0,9	1,5	2,2	3,8	5,4	6,9
	slotted	0	0,1	0,3	0,5	0,8	1,2	1,6	2	2,4	2,7	3
3/4"	15	0	0,1	0,1	0,4	0,5	0,8	1,1	1,6	2	3,1	3,6
	30	0	0,1	0,2	0,5	0,7	1,1	1,8	2,4	3,3	4,5	5,4
	45	0	0,1	0,2	0,6	0,8	1,5	2,3	3,2	5	7,3	8
	60	0	0,1	0,2	0,7	1	1,7	2,8	4	6,5	9	12
	90	0	0,2	0,4	0,8	1,2	2	3,1	4,6	8	11,3	10
	slotted	0	0,2	0,4	0,7	1,2	1,8	2,5	3,2	4	4,8	5,6
1"	15	0	0,1	0,3	0,6	0,9	1,5	2,1	3	6,8	5,9	7
	30	0	0,1	0,3	0,8	1,3	2,3	3,5	5,1	9,8	8,5	10
	45	0	0,1	0,3	1	1,6	2,9	4,4	6,6	11	12,1	15
	60	0	0,2	0,4	1,1	1,8	3,4	5,3	7,9	12,3	15,3	21
	90	0	0,2	0,6	1,8	3,4	5,1	8,1	11,4	16	21	29
	slotted	0	0,3	0,9	1,6	2,3	3,1	3,9	4,8	5,6	6,4	7
1-1/4"	15	0	0,1	0,4	0,8	1,3	2,6	3,4	5,5	7	8,5	10
	30	0	0,2	0,4	1,1	2	3,7	5,5	8	10	13	15
	45	0	0,2	0,5	1,5	2,3	4,4	7,6	10,6	15	22	28
	60	0	0,2	0,6	1,8	3	5,5	9,5	12,8	19	26	39
	90	0	0,3	0,8	2	5	8	14	19	28	39	55
	slotted	0	0,3	1	2,1	3,1	4	4,9	5,8	6,7	7,8	8,8
1-1/2"	15	0	0,3	0,5	1,2	2	3,7	5,1	7	9	11,7	14
	30	0	0,3	0,6	1,6	3	5	7,5	11	14	17	20
	45	0	0,3	0,7	2,1	3,6	6,8	10	16	21	30	37
	60	0	0,4	0,8	2,5	4	8	13	19	27	40	52
	90	0	0,4	0,9	3,5	7	13	20	31	42	63	78
	slotted	0	0,4	2	4,5	7,5	10,5	14,5	18,2	22,4	26,1	30,2
2"	15	0	0,4	0,7	2,2	4	6	10	16	20	28	41
	30	0	0,4	1,2	3,8	6	10	15	23	31	43	60
	45	0	0,4	1,4	4,2	8	13,6	21	32	42	62	88
	60	0	0,5	1,5	4,6	9	16,5	27	39	55	83	110
	90	0	0,5	2	6	12	22	35	45	50	105	135
	slotted	0	0,9	4,8	9,8	15,6	20,9	25,6	29,8	34,1	39,2	43,2
2-1/2"	15	0	0,4	0,7	3,1	5,9	8	12	18	25	40	51
	30	0	0,4	1	4	8	12	18	28	37	62	75
	45	0	0,4	1,3	4,6	8,9	17	27	41	57	84	121
	60	0	0,4	1,5	5	10	21	34	53	75	103	150
	90	0	0,5	1,7	7	14	28	48	70	106	160	218
	slotted	0	1,2	6,2	10,6	17,5	22,3	27,2	33,4	39,1	44,5	50
3"	15	0	0,5	0,8	3,3	6,1	10	16	21	31	42	60
	30	0	0,5	1,2	4	8	14	23	33	46	65	82
	45	0	0,5	1,9	4,6	11,2	20	32	51	73	101	135
	60	0	0,5	2,5	6	14	25	40	65	91	128	165
	90	0	0,7	3,5	8	18	35	60	90	135	205	310
	slotted	0	3,2	11,6	19,6	28,9	38,2	47,6	57,1	66,5	75,3	82
4"	15	0	0,6	1,2	4,4	11	18	37	50	68	88	98
	30	0	0,6	2	6	15	29	48	71	100	130	159
	45	0	0,7	2,6	8,4	21	31	53	82	121	172	261
	60	0	0,7	3	11	25	40	59	90	141	212	356
	90	0	1	3,5	16	40	75	125	190	295	442	670
	slotted	0	4,5	28	49	72	95	117	139	161	183	205
6"	15	0	0,8	1,8	8,7	23	41	67	99	149	190	241
	30	0	0,9	3,2	14	33	60	103	155	220	280	350
	45	0	1,6	4,2	18	47	87	150	240	316	445	589
	60	0	2	5	22	60	110	190	285	416	586	800
	90	0	3	8	35	90	160	280	425	650	970	1480





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PRODUCT WARRANTY

AR Controls will at its discretion repair or replace without charge or refund the purchase price for products supplied, which prove to be defective in matter or workmanship provided that, in each case the product has been properly installed and is used in the service for which it was recommended, and that the written claim, specifying the alleged defect is presented to AR Controls within 18 months from the date of shipment or within 12 months from date of installation, whichever date occurs first. AR Controls shall in no event be liable for the following cost, which includes but is not limited to costs associated with; consequential damages, labour, equipment or engineering costs related to the repair or replacement of defective equipment.

The warranty stated in this paragraph is in lieu of all other warranties, either express or implied. With respect to warranties, this paragraph states the buyer's exclusive remedy and AR Controls' exclusive liability."

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