Neles™ soft seated ball valves

Trunnion supported, full bore, series 6D

Neles™ series 6D is an API 6D certified (cert. no. 6D-2173) full bore trunnion ball valve. The valve incorporates industry proven technology for body, ball, stem, stuffing box and seat designs. Packed with features, these piggable valves deliver long-lasting performance in isolation service. Valve modularity widens the options in material and operator selections to meet application specific requirements. Application based trim selection ensures the valve can serve for various conditions. Valve series meets the latest industry requirements concerning safety and emissions.

Applications

- Hydrocarbons
- Oil and gas (up-stream and mid-stream)
- Pipelines
- Refinery and petrochemical plants
- Emergency valves ESD/ESV/HIPPS
- Other general process industries

Size range

- NPS 2 – 24 / DN 50 – 600, full bore

Pressure classes

- ASME Class 150, 300, 600, 900, 1500

Seat tightness

- Bubble tight with no visible leakage under full differential pressure as per API 6D, API 598, ISO 5208 Rate-A
- Suitable for vacuum service

Features

- 3 mm added wall thickness as standard for longevity and enhanced corrosion protection
- Robust body and bolting complying to ASME Section VIII pressure vessel code and ASME B16.34 for maximum structural integrity
- Dowel pins provided to avoid bolts being subjected to combined torsional/bending loads in body, stem housing, trunnion, and stuffing box
- Fully machined valve internal surfaces for reduced flow induced frictional losses (fully piggable valve)
- Cavity vent port and bottom drain port in body as standard feature
- Dual body seal with primary O-ring and secondary graphite gasket for excellent performance when subjected to thermal shocks (in-service temperature & pressure excursions, event of fire, etc.). Robust spiral wound graphite gaskets for high pressure integrity.
- One-piece solid mirror finished ball
- Spring loaded single piston effect seat (SPE) with double block and bleed (DBB) design that absorbs pressure and thermal shocks, wear, and provides a long service life
- DBB seats allows venting of the body cavity in closed position
- Self-relieving Primary Soft Secondary Metal seat (PSSM) design with double barrier O-ring/Lip seals and graphite seal for excellent Fire-Tite™ performance
- Nickel alloy (Inconel X-750) helical springs behind seat ensures uniform & consistent seat leak tightness even in low pressure
- Corrosion resistant rugged trunnion secured with dowel pins & low friction bearings ensure precise guiding of ball during valve operation
- Emergency seat and stem sealant injection options
- Anti-static arrangement between ball-stem and stem-body
- Single piece, internal entry stem, blow-out proof, and precision guided with polymer and graphite thrust washer (for Fire-Tite™ performance) & internal bushings which handle side loading
- Engineered mounting hardware with high strength coupler & guide bearing for near perfect torque transmission for various types of actuations (including optional compliance to API 6DX)
- Lifting hook and mounting stand for safe lifting and easy handling

Options

- Optional weld overlay in seat sealing contact surfaces of Carbon & Alloy steel valves to resist corrosion

Full bore

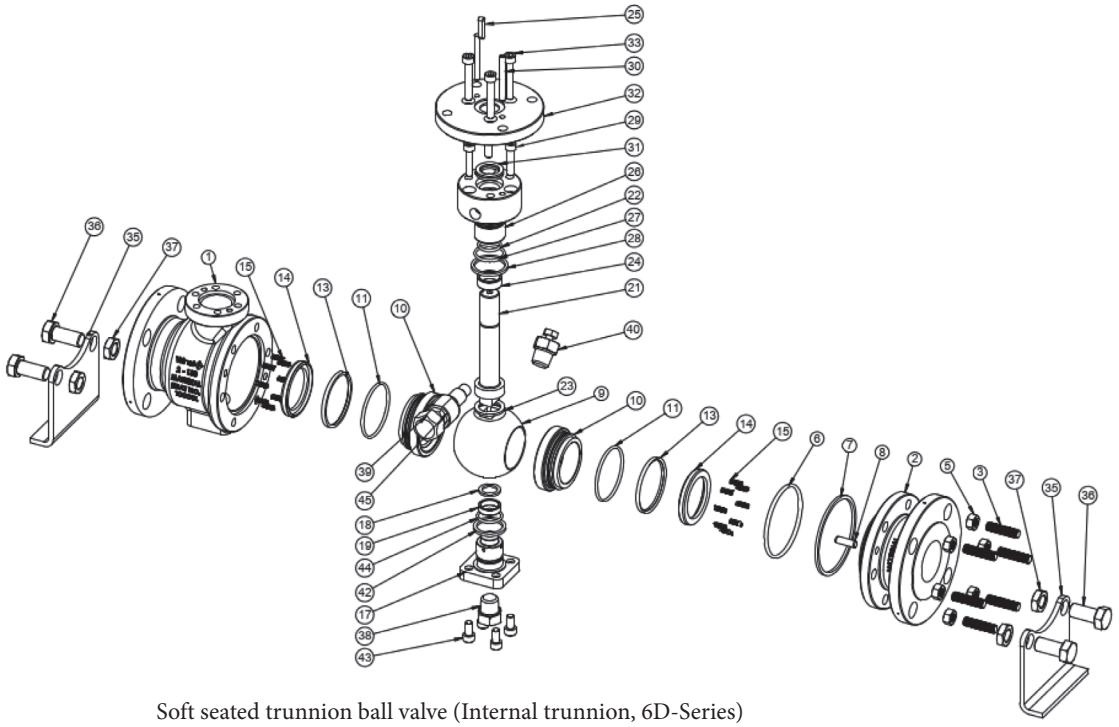
- Maximum flow capacity per nominal size / Full bore design for API 6D requirements
- Cylindrical flow path with low flow resistance
- Piggable

Reduced emissions

- Off-center body joint provides:
  - Uninterrupted circular O-ring and graphite gasket
  - No bending forces from pipeline to gland packing for lowest emissions
- Multi-layer stem seal assures long operating life, industry leading low emission levels, and online gland packing replacement
  - Internal pressure energized sandwich stem thrust washer (Fluoropolymer + Graphite)
  - O-rings
  - Graphite packing

Exploded view and parts list

NPS 2 & 3 ASME Class 150 & 300

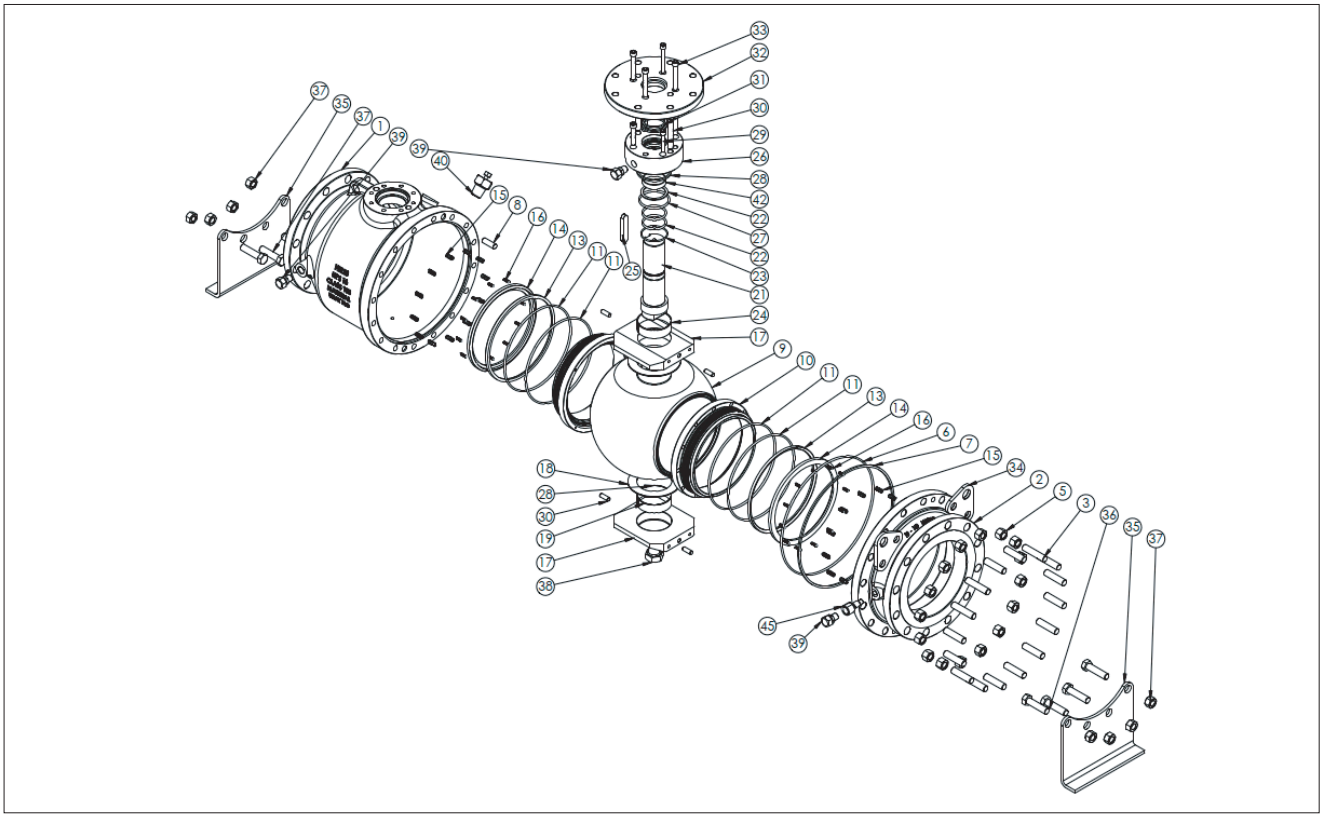


Soft seated trunnion ball valve (Internal trunnion, 6D-Series)

Item	Part Description	Material	
		Carbon steel	Stainless steel
1	Body	ASTM A216 Gr. WCB	ASTM A351 Gr. CF8M
2	Body cap	ASTM A216 Gr. WCB	ASTM A351 Gr. CF8M
3	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
5	Heavy Hex Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 8M
6	O-ring	Fluoroelastomer (FKM)	
7	Gasket	Graphite	
8	Dowel Pin	UNS S32750	
9	Ball	ASTM A105 + ENP coating	316 SS
10	Seat	Reinforced PTFE with metal backing (ASTM A105 + ENP coating)	Reinforced PTFE with metal backing (316 SS)
11	O-Ring	Fluoroelastomer (FKM)	
13	Seat Gasket	Graphite	
14	Seat Retainer	ASTM A105 + ENP coating	316 SS
15	Spring	Inconel X-750	
17	Trunnion	ASTM A105	316 SS
18	Thrust Washer	AISI 316 + Fluoropolymer	
19	Bearing	AISI 316 + Fluoropolymer	
21	Stem	13% Chrome steel	17-4 PH steel
22	O-Ring	Fluoroelastomer (FKM)	
23	Thrust Washer (Stem seal)	Fluoropolymer + Graphite	
24	Bearing	AISI 316 + Fluoropolymer	
25	Key	AISI 329	
26	Stem Housing (Bonnet)	ASTM A105	ASTM A182 Gr. F316
27	O-Ring	Fluoroelastomer (FKM)	
28	Gasket	Graphite	
29	Cap Screw	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
30	Dowel Pin	UNS S32750	
31	Gland Packing	Graphite	
32	Mounting Flange (Gland)	ASTM A105	ASTM A182 Gr. F316
33	Cap Screw	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
35	Mounting Stand	Coated steel	
36	Bolt	Coated steel	
37	Nut	Coated steel	
38	Drainage Connection	316 SS	
39	Grease Fitting	316 SS	
40	Bleeder Valve	316 SS	
42	Gasket	Graphite	
43	Cap Screw	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
44	O-ring	Fluoroelastomer (FKM)	
45	Connector	316 SS	

Note: NACE compliant Carbon steel valve will have ASTM A193 Gr. L7M & ASTM A194 Gr. 7M bolting. Other valve materials available on request.

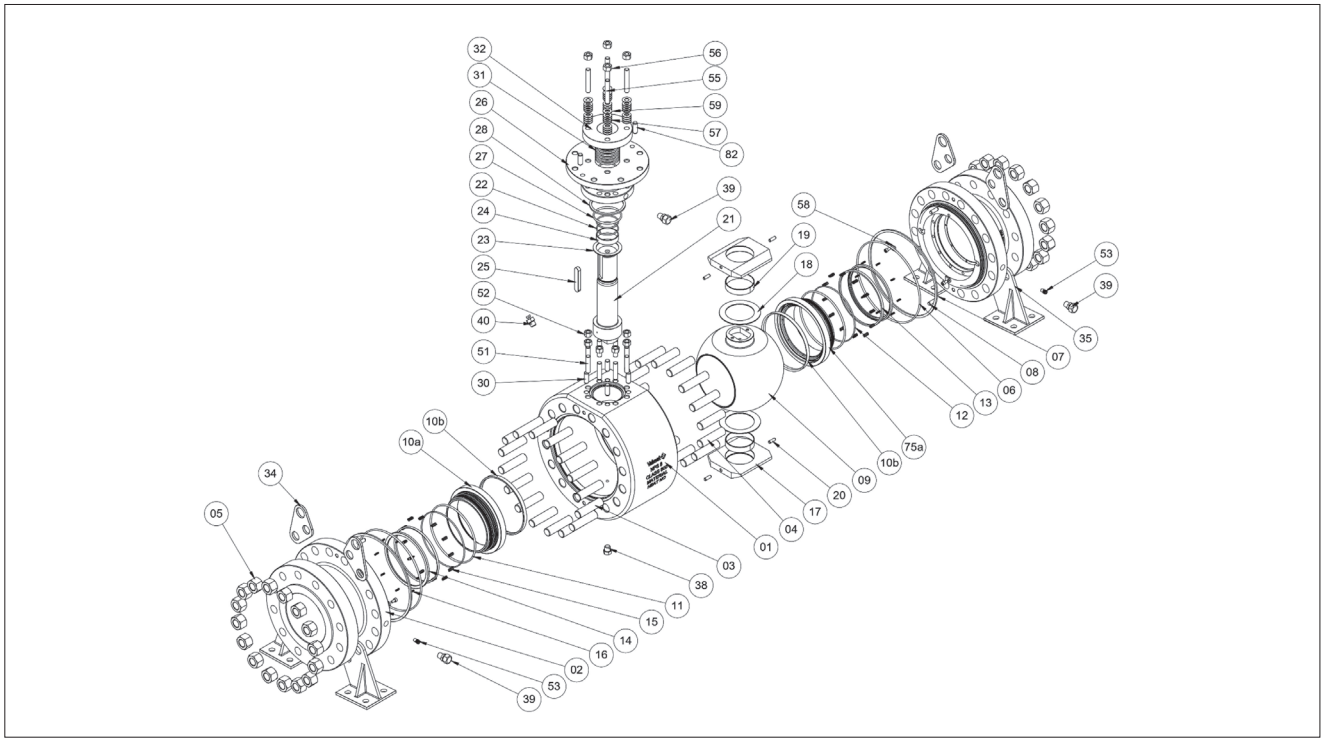
NPS 4 to 24 ASME Class 150 & 300



Item	Part Description	Material	
		Carbon steel	Stainless steel
1	Body	ASTM A216 Gr. WCB	ASTM A351 Gr. CF8M
2	Body cap	ASTM A216 Gr. WCB	ASTM A351 Gr. CF8M
3	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
5	Heavy Hex Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 8M
6	O-ring	Fluoroelastomer (FKM)	
7	Gasket	Graphite	
8	Dowel Pin	UNS S32750	
9	Ball	ASTM A105 + ENP coating	316 SS
10	Seat	Reinforced PTFE with metal backing (ASTM A105 + ENP coating)	Reinforced PTFE with metal backing (316 SS)
11	O-Ring	Fluoroelastomer (FKM)	
13	Seat Gasket	Graphite	
14	Seat Retainer	ASTM A105 + ENP coating	316 SS
15	Spring	Inconel X-750	
16	Spring	Inconel X-750	
17	Trunnion (Trunnion plate)	ASTM A105	316 SS
18	Thrust Washer	AISI 316 + Fluoropolymer	
19	Bearing	AISI 316 + Fluoropolymer	
20	Dowel Pin	UNS S32750	
21	Stem	13% Chrome steel	17-4 PH steel
22	O-Ring	Fluoroelastomer (FKM)	
23	Thrust Washer (Stem seal)	Fluoropolymer + Graphite	
24	Bearing	AISI 316 + Fluoropolymer	
25	Key	AISI 329	
26	Stem Housing (Bonnet)	ASTM A105	ASTM A182 Gr. F316
27	O-Ring	Fluoroelastomer (FKM)	
28	Gasket	Graphite	
29	Cap Screw	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
30	Dowel Pin	UNS S32750	
31	Gland Packing	Graphite	
32	Mounting Flange (Gland)	ASTM A105	ASTM A182 Gr. F316
33	Cap Screw	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
34	Lifting Hook	Coated steel	
35	Mounting Stand	Coated steel	
36	Bolt	Coated steel	
37	Nut	Coated steel	
38	Drainage Connection	316 SS	
39	Grease Fitting	316 SS	
40	Bleeder Valve	316 SS	
45	Connector	316 SS	
53	Internal Check Valve	316 SS	

Note: NACE compliant Carbon steel valve will have ASTM A193 Gr. L7M & ASTM A194 Gr. 7M bolting. Other valve materials available on request.

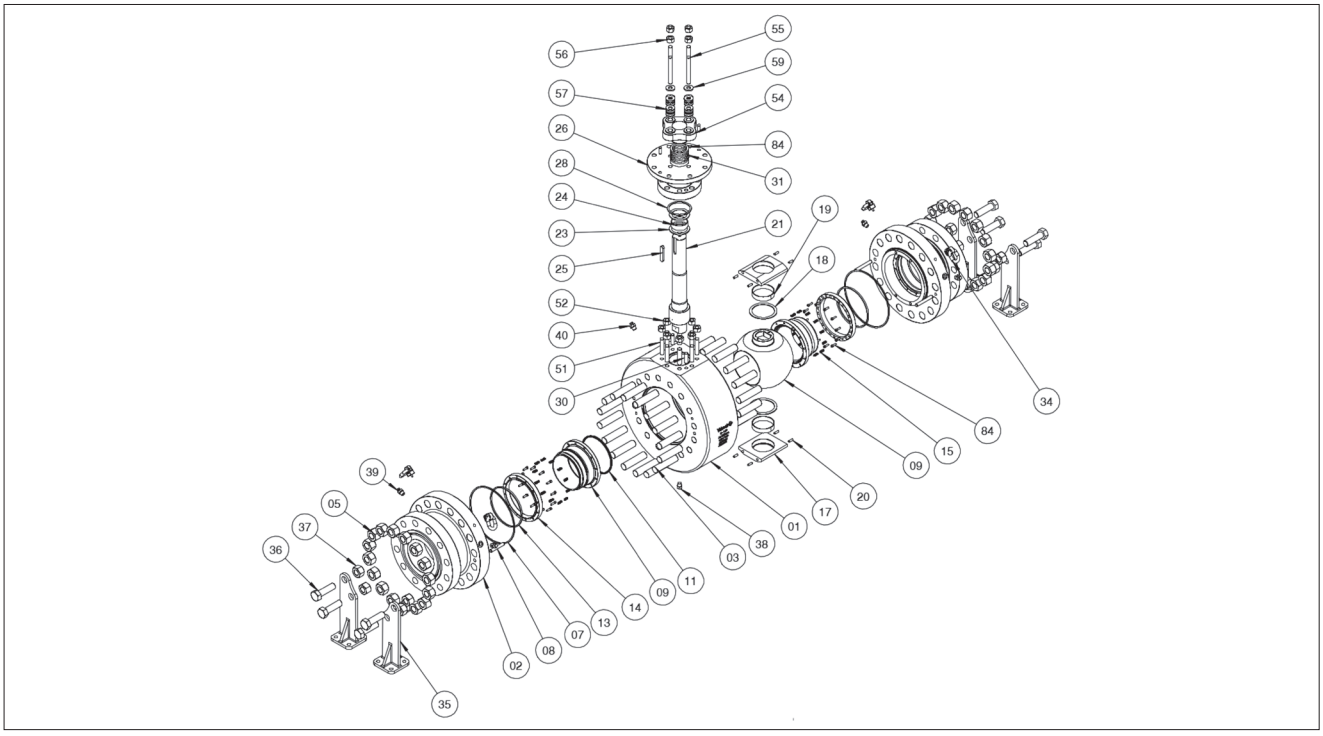
NPS 2 to 24 ASME Class 600



Item	Part Description	Material	
		Carbon steel	Stainless steel
1	Body	ASTM A105	ASTM A182 Gr. F316
2	Body cap	ASTM A105	ASTM A182 Gr. F316
3, 4	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
5	Heavy Hex Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 8M
6	O-ring	Fluoroelastomer (FKM) AED	
7	Gasket	Spirally wound SS316 + Graphite	
8	Dowel Pin	AISI 329	
9	Ball	ASTM A105 + ENP coating	316 SS
10	Seat Assembly	Devlon® with metal backing (ASTM A105 + ENP coating)	Devlon® with metal backing (316 SS)
11, 12	O-Ring	Fluoroelastomer (FKM) AED	
13	Seat Gasket	Graphite	
14	Seat Retainer	ASTM A105 + ENP coating	316 SS
15, 16	Spring	Inconel X-750	
17	Trunnion (Trunnion plate)	ASTM A105	316 SS
18	Thrust Washer	AISI 316 + Fluoropolymer	
19	Bearing	AISI 316 + Fluoropolymer	
20	Dowel Pin	AISI 329	
21	Stem	17-4 PH steel	
22	O-Ring	Fluoroelastomer (FKM) AED	
23	Thrust Washer (Stem seal)	PEEK	
24	Bearing	AISI 316 + Fluoropolymer	
25	Key	AISI 329	
26	Stem Housing (Bonnet)	ASTM A105	ASTM A182 Gr. F316
27	O-Ring	Fluoroelastomer (FKM) AED	
28	Gasket	Spirally wound SS316 + Graphite	
30	Dowel Pin	AISI 329	
31	Gland Packing	Graphite	
32	Gland	316 SS	
34	Lifting Hook	Coated steel	
35	Mounting Stand	Coated steel	
38	Drainage Connection	316 SS	
39	Grease Fitting	316 SS	
40	Bleeder Valve	316 SS	
42	Connector	316 SS	
51	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
52	Hex Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 8M
53	Internal Check Valve	316 SS	
55	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
56	Heavy Hex Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 8M
57	Disc spring (live loading)	17-7PH	
58	Socket head cap screw	ASTM A193 Gr. B8M	
59	Flat washer	Stainless steel	
82	Dowel Pin	AISI 329	

Note: NACE compliant Carbon steel valve will have ASTM A193 Gr. L7M & ASTM A194 Gr. 7M bolting. Other valve materials available on request.

NPS 2 to 12 ASME Class 900 & 1500



Item	Part Description	Material	
		Carbon steel	Stainless steel
1	Body	ASTM A105	ASTM A182 Gr. F316
2	*Body cap	*ASTM A105	ASTM A182 Gr. F316
3	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
5	Heavy Hex Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 8M
7	Body Gasket	Spirally wound SS316 + Graphite	
8	Dowel Pin	UNS 32750	
9	Ball	ASTM A105 + ENP coating	316 SS
10	Seat Assembly	PEEK with metal backing (ASTM A105 + ENP coating)	PEEK with metal backing (316 SS)
11	*Lip Seal	Fluoropolymer with Elgiloy spring	
13	Seat Gasket	Graphite	
14	Seat Retainer	ASTM A105 + ENP coating	316 SS
15	Spring	Inconel X-750	
17	Trunnion (Trunnion plate)	ASTM A105	316 SS
18	Thrust Washer	AISI 316 + Fluoropolymer	
19	Bearing	AISI 316 + Fluoropolymer	
20	Dowel Pin	UNS 32750	
21	Stem	17-4 PH steel	
23	Thrust Washer (Stem seal)	AISI 316 + Fluoropolymer	
24	Bearing	AISI 316 + Fluoropolymer	
25	Key	AISI 329	
26	Stem Housing (Bonnet)	ASTM A105	ASTM A182 Gr. F316
28	Gasket	Spirally wound SS316 + Graphite	
30	Dowel Pin	UNS 32750	
31	Gland Packing	Graphite	
34	Lifting Hook	AISI 316	
35	Mounting Stand	Coated steel	
36	Bolt	Coated steel	
37	Nut	Coated steel	
38	Drainage Connection	316 SS	
39	#Grease Fitting	316 SS	
40	Bleeder Valve	316 SS	
51	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
52	Hex Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 8M
53	#Internal check valve	316 SS	
54	Gland	316 SS	
55	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B8M
56	Heavy Hex Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 8M
57	Disc spring (live loading)	17-7PH	
59	Flat washer	Stainless steel	
84	Socket head cap screw	High alloy steel	
89	Anti Extrusion Ring	316 SS	

* Lip seal contact surfaces in Carbon & Alloy steel valves are with corrosion resistant SS316L overlay as standard
# Optional feature, to be selected if required
Note: NACE compliant Carbon steel valve will have ASTM A193 Gr. L7M & ASTM A194 Gr. 7M bolting. Other valve materials available on request.

Technical specification

Product type

Full bore valve
Trunnion supported ball design
Off-center split body design
Class 150 & 300 with 2-piece casting construction
Class 600, 900, 1500 with 3-piece forging construction

Pressure ratings

ASME Class 150, 300, 600, 900, 1500

Size range

NPS 2 – 24 / DN 50 – 600

Temperature range

-46 °C...+230 °C / -51 °F...+446 °F

Design standards

Valve body	ASME B16.34, API 6D, IOGP S-562, ISO 17292
Valve flanges	ASME B16.5
Face-to-face	API 6D, ASME B16.10 long pattern
Actuator mounting	ISO 5211
Fire safe	API 607 & ISO 10497
Fugitive emissions	ISO 15848 Class AH tightness
Safety level	SIL-3 capable

Standard materials

	Class 150 & 300	Class 600	Class 900 & 1500
Body:	WCB or CF8M	A105 or F316	
Ball:	A105 + ENP coating or 316 SS		
Bearings:	AISI 316 + Fluoropolymer		
Seats:	RPTFE	Devlon®	PEEK
Seals/ gaskets:	O-ring/Graphite		Spring energized lip seal/Graphite
Body gasket:	O-ring + Graphite	O-ring + Spirally wound graphite gasket	Spirally wound graphite gasket
Gland packing:	O-ring + Graphite		Graphite
Bolting:	B7/2H or B8M/8M		

Devlon® is a registered trademark of Jameswalker Inc.

Material and test certification

EN 10204-3.1 material certificates for pressure containing parts
Valve pressure test and seat leak tightness report

Standards & options

CE marked for PED as standard
Anti-static as standard
CRN approval as standard
NACE MR 0175 (Optional)
API 6D monogram (Optional)
API 6DX mounting hardware & actuators (Optional)
ATEX (Optional)

Valve testing

Each valve is tested for body integrity and seat tightness as per API 6D, ISO 5208.
The body hydro test pressure is 1.5 x rated pressure at ambient temperature.
The seat hydro test (on both sides) pressure is 1.1 x rated pressure at ambient temperature.
The test medium is corrosion inhibited water.
Air seat leak test as standard.

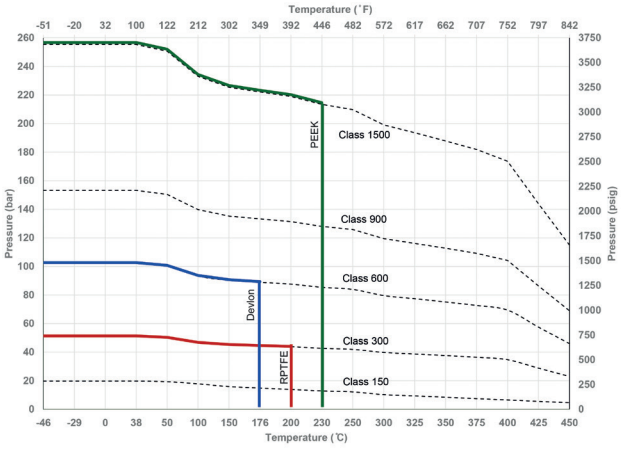
Valve tightness

All valves are with no visible leakage as per API 6D, ISO 5208 Rate-A.

Optional tests

Cavity over pressure test, Double block & bleed test, Low pressure air seat leak test, Anti-static test, etc. as per API 6D

Maximum allowable ΔP in isolation service



For typical Carbon steel valve.

Seal temperature range:
-29°C to +200°C for FKM & FKM AED O-rings: #150, 300, 600
-46°C to +230°C for Lip seals: #900, 1500

Actuator selection

6D series valve can be equipped with the following Neles™ actuator types:

1. B1 & N1 series pneumatic double acting or spring return actuator
2. Manual gear operator
3. Optional API 6DX mounting hardware & actuator

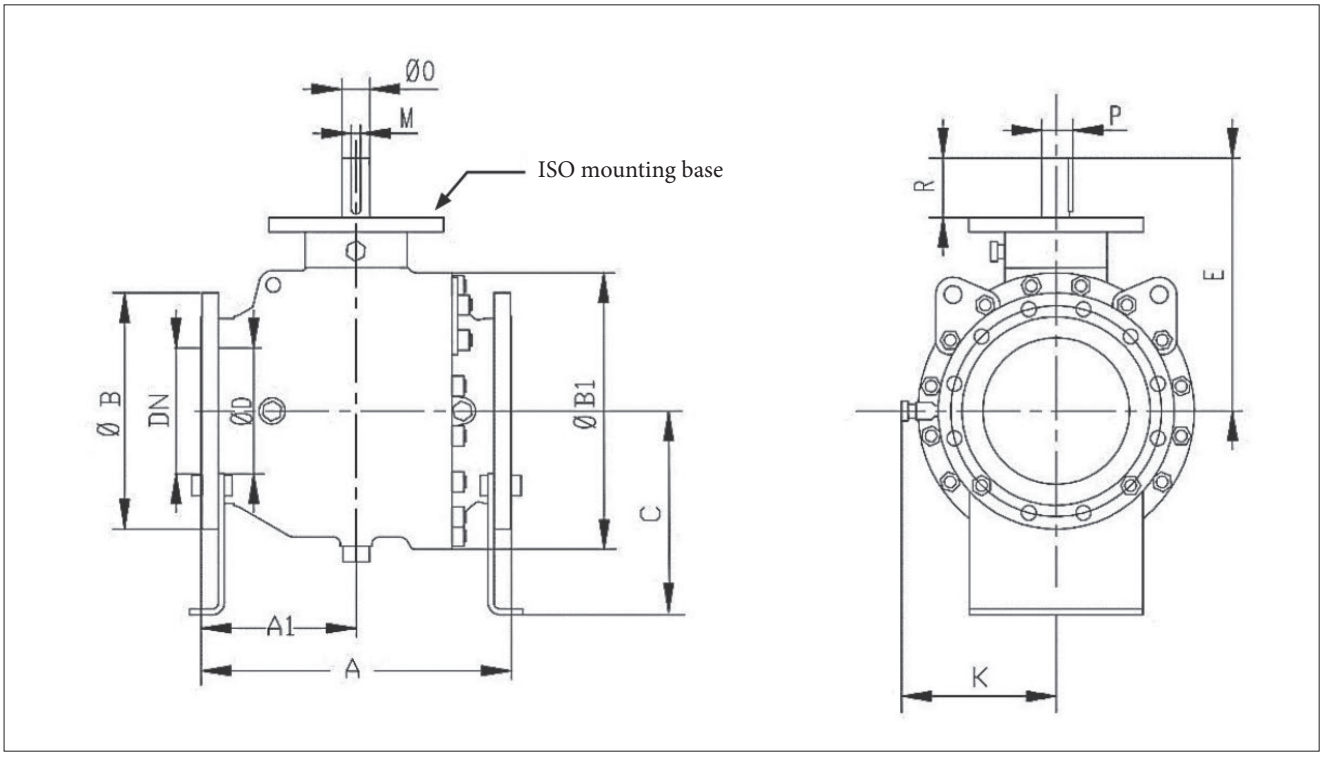
When selecting other actuators, please contact your local Valmet representative.
For the correct actuator selection in isolation service, the following process data are mandatory:

- valve size, pressure class, seat type
- gland packing type
- maximum shut-off pressure across the valve
- supply pressure for the actuator

Note:
Each valve can be application specific, many factors should be considered when selecting a valve for a given application. Therefore, some of the applications in which the valves are used are outside the scope of this document. If you have any questions concerning the use, application or compatibility of the valve with the intended service, contact nearest Valmet sales office for more information.
Refer Nelprof for valve torque information and actuator sizing / selection.

Dimensions & weight

Bare valve



Note: Valve face-to-face dimension acc. to Table C-2 of API 6D

SI units

ASME Class 150

NPS	DIMENSIONS, mm												WEIGHT kg	ISO 5211
	A	A1	ØB	ØB1	C	ØD	E	K	M	ØO	P	R		
2	178	84	152	136.5	131	49	172	125	6	22	24.5	34	21	F10
3	203	94.5	190	180	164	74	206.5	170	12	30	33	43.5	37	F12
4	229	114.5	229	230	181	100	243	170	10	38	41	55	53	F12
6	394	197	279	324	210	150	292.5	170	14	45	48.5	62.5	153	F16
8	457	228.5	343	403	313	201	381	250	18	60	64	80	257	F25
10	533	266.5	406	475	350	252	437.5	275	18	64	68	105	380	F25
12	610	305	483	566	410	303	489	345	20	73	77.5	114	575	F25
14	686	343	533	631	400	334	525.5	350	25	87	90	130.5	795	F25
16	762	381	597	726	500	385	615	415	25	92	97	153.5	1195	F30
18	864	432	635	800	500	436	689.5	435	28	100	106	158	1410	F30
20	914	457	698	900	570	487	715	485	32	110	117	172.5	1850	F30
24	1067	533.5	813	1040	620	589	860	550	32	122	129	220	2800	F35

ASME Class 300

NPS	DIMENSIONS, mm												WEIGHT kg	ISO 5211
	A	A1	ØB	ØB1	C	ØD	E	K	M	ØO	P	R		
2	216	103	165	136.5	116	49	172	125	6	22	24.5	34	25	F10
3	283	137.5	210	190	182	74	206.5	170	12	30	33	43.5	52	F12
4	305	142.5	254	236	156	100	243	170	10	38	41	55	76	F12
6	403	201.5	318	338	228.5	150	292.5	170	14	45	48.5	62.5	182	F16
8	502	251	381	420	315	201	381	280	18	60	64	80	340	F25
10	568	284	444	490	360	252	437.5	310	18	64	68	105	460	F25
12	648	324	521	587	410	303	489	350	20	73	77.5	114	690	F25
14	762	381	584	631	400	334	525.5	350	25	87	90	130.5	850	F25
16	838	435.8	648	740	500	385	615	420	25	92	97	153.5	1205	F30
18	914	457	711	822	500	436	689.5	445	28	100	106	158	1645	F30
20	991	495.5	775	920	570	487	715	495	32	110	117	172.5	2255	F30
24	1143	571.5	914	1070	620	589	860	550	32	122	130	220	3430	F35

Imperial units

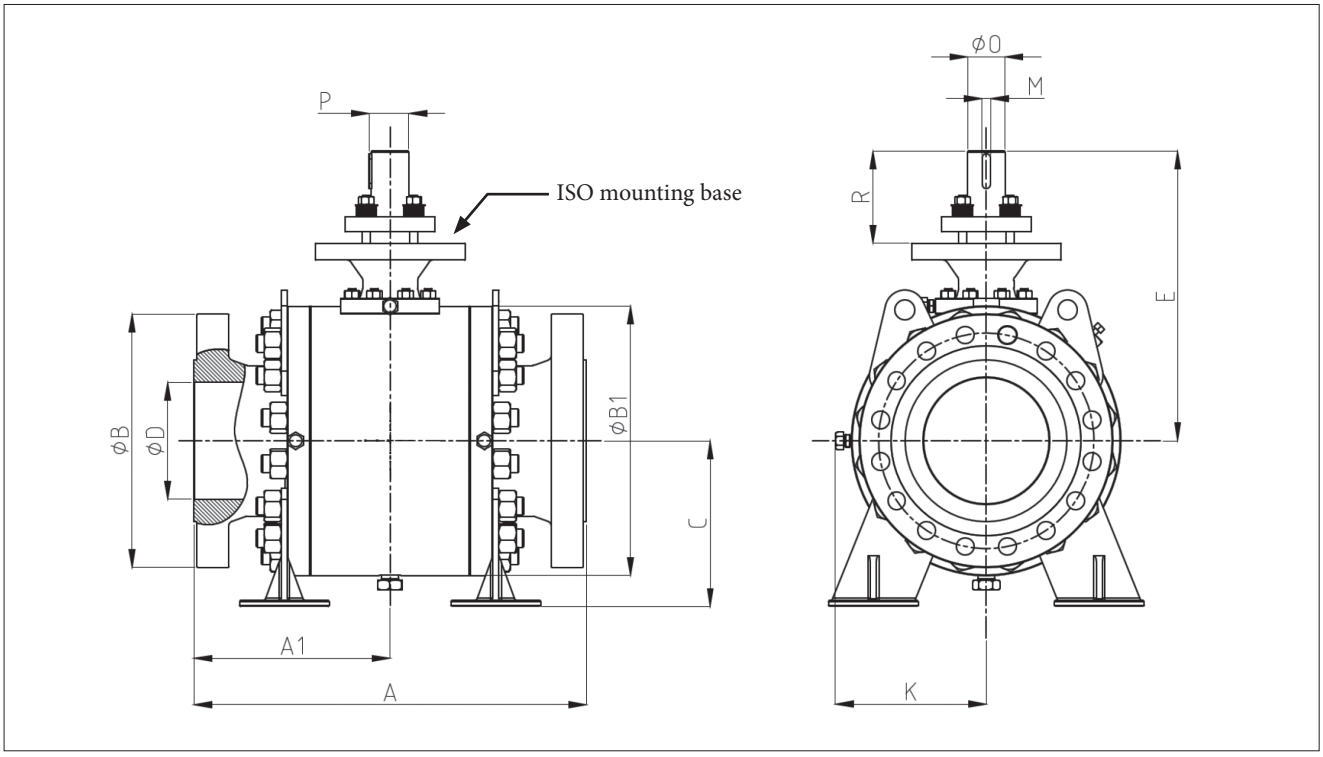
ASME Class 150

NPS	DIMENSIONS, inch												WEIGHT lbs	ISO 5211
	A	A1	ØB	ØB1	C	ØD	E	K	M	ØO	P	R		
2	7.01	3.31	5.98	5.37	5.16	1.93	6.77	4.92	0.24	0.87	0.96	1.34	46	F10
3	7.99	3.72	7.48	7.09	6.46	2.91	8.13	6.69	0.47	1.18	1.30	1.71	82	F12
4	9.02	4.51	9.02	9.06	7.13	3.94	9.57	6.69	0.39	1.50	1.61	2.17	117	F12
6	15.51	7.76	10.98	12.76	8.27	5.91	11.52	6.69	0.55	1.77	1.91	2.46	337	F16
8	17.99	9.00	13.50	15.87	12.32	7.91	15.00	9.84	0.71	2.36	2.52	3.15	567	F25
10	20.98	10.49	15.98	18.70	13.78	9.92	17.22	10.83	0.71	2.52	2.68	4.13	838	F25
12	24.02	12.01	19.02	22.28	16.14	11.93	19.25	13.58	0.79	2.87	3.05	4.49	1268	F25
14	27.01	13.50	20.98	24.84	15.75	13.15	20.69	13.78	0.98	3.43	3.54	5.14	1753	F25
16	30.00	15.00	23.50	28.58	19.69	15.16	24.21	16.34	0.98	3.62	3.82	6.04	2635	F30
18	34.02	17.01	25.00	31.50	19.69	17.17	27.15	17.13	1.10	3.94	4.17	6.22	3109	F30
20	35.98	17.99	27.48	35.43	22.44	19.17	28.15	19.09	1.26	4.33	4.61	6.79	4079	F30
24	42.01	21.00	32.01	40.94	24.41	23.19	33.86	21.65	1.26	4.80	5.08	8.66	6173	F35

ASME Class 300

NPS	DIMENSIONS, inch												WEIGHT lbs	ISO 5211
	A	A1	ØB	ØB1	C	ØD	E	K	M	ØO	P	R		
2	8.50	4.06	6.50	5.37	4.57	1.93	6.77	4.92	0.24	0.87	0.96	1.34	55	F10
3	11.14	5.41	8.27	7.48	7.17	2.91	8.13	6.69	0.47	1.18	1.30	1.71	115	F12
4	12.01	5.61	10.00	9.29	6.14	3.94	9.57	6.69	0.39	1.50	1.61	2.17	168	F12
6	15.87	7.93	12.52	13.31	9.00	5.91	11.52	6.69	0.55	1.77	1.91	2.46	401	F16
8	19.76	9.88	15.00	16.54	12.40	7.91	15.00	11.02	0.71	2.36	2.52	3.15	750	F25
10	22.36	11.18	17.48	19.29	14.17	9.92	17.22	12.20	0.71	2.52	2.68	4.13	1014	F25
12	25.51	12.76	20.51	23.11	16.14	11.93	19.25	13.78	0.79	2.87	3.05	4.49	1521	F25
14	30.00	15.00	22.99	24.84	15.75	13.15	20.69	13.78	0.98	3.43	3.54	5.14	1874	F25
16	32.99	17.16	25.51	29.13	19.69	15.16	24.21	16.54	0.98	3.62	3.82	6.04	2657	F30
18	35.98	17.99	27.99	32.36	19.69	17.17	27.15	17.52	1.10	3.94	4.17	6.22	3627	F30
20	39.02	19.51	30.51	36.22	22.44	19.17	28.15	19.49	1.26	4.33	4.61	6.79	4971	F30
24	45.00	22.50	35.98	42.13	24.41	23.19	33.86	21.65	1.26	4.80	5.12	8.66	7562	F35

Bare valve



Note: Valve face-to-face dimension acc. to Table C-2 of API 6D

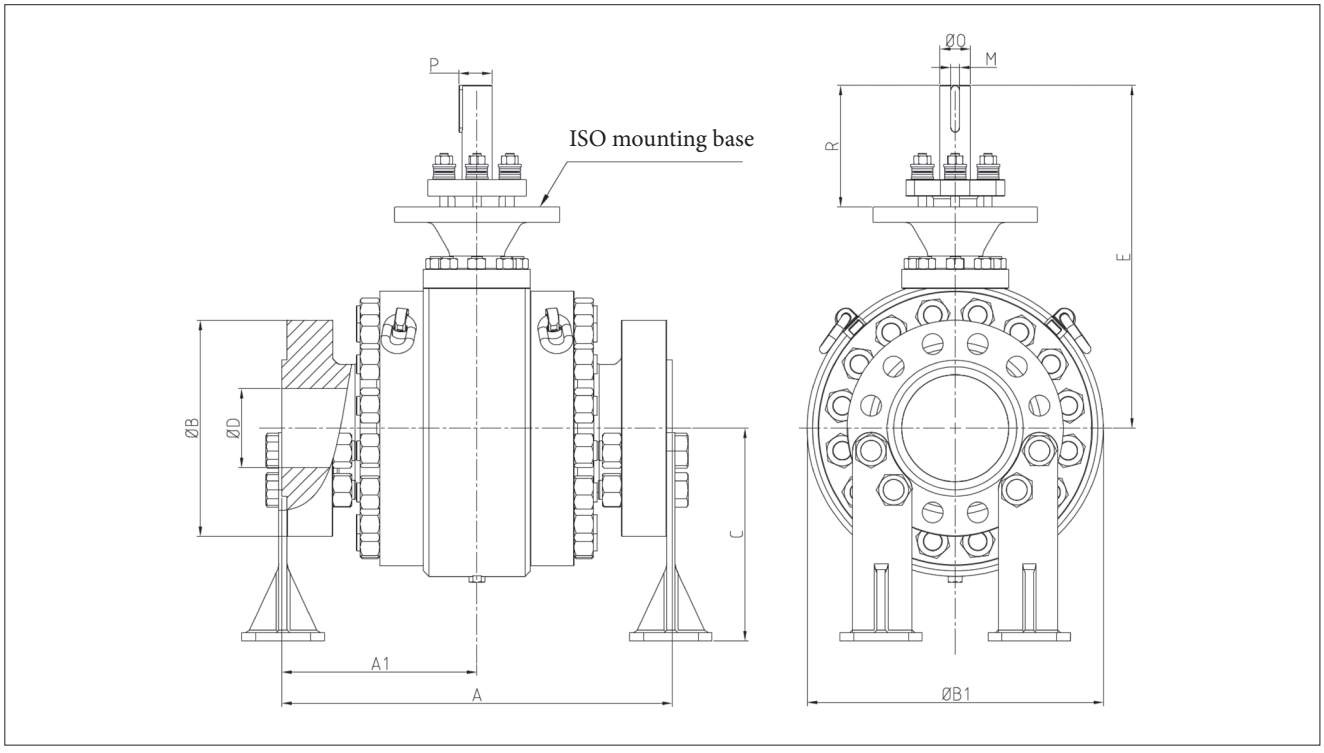
SI units
ASME Class 600

NPS	DIMENSIONS, mm												WEIGHT kg	ISO 5211
	A	A1	B	B1	C	D	E	K	M	ØO	P	R		
2	292	146	165	180	125	49	235.5	-	6	22	24.5	83.5	40	F10
3	356	178	210	225	155	74	299.5	142	8	26	29	107	74	F12
4	432	216	273	314	205	100	356	172	12	40	43	105.5	160	F16
6	559	279.5	356	370	240	150	451.5	220	14	45	48.5	158.5	290	F16
8	660	330	419	500	308	201	557.5	261	20	70	74.5	200.5	545	F25
10	787	393.5	508	540	332	252	580.5	304	20	75	79.5	184.5	800	F25
12	838	419	559	635	442	303	658	345	22	80	85	206	1130	F25
14	889	444.5	603	705	412	334	717	385	22	85	90	234.5	1490	F30
16	991	495.5	686	780	495	385	749.5	425	22	85	90	234.5	1980	F30
18	1092	546	743	870	555	436	847	468	25	90	95	252	2640	F35
20	1194	597	813	960	565	487	884	514	28	100	106	238.5	3345	F35
24	1397	698.5	940	1120	715	589	1009	593	32	120	127	259	5100	F40

Imperial units
ASME Class 600

NPS	DIMENSIONS, inch												WEIGHT lbs	ISO 5211
	A	A1	B	B1	C	D	E	K	M	ØO	P	R		
2	11.5	5.75	6.50	7.09	4.92	1.93	9.27	-	0.24	0.87	0.96	3.29	88	F10
3	14.0	7.0	8.25	8.86	6.10	2.91	11.79	5.59	0.31	1.02	1.14	4.21	163	F12
4	17.0	8.5	10.75	12.36	8.07	3.94	14.02	6.77	0.47	1.57	1.69	4.15	353	F16
6	22.0	11	14.00	14.57	9.45	5.91	17.78	8.66	0.55	1.77	1.91	6.24	639	F16
8	26.0	13	16.50	19.69	12.13	7.91	21.95	10.28	0.79	2.76	2.93	7.89	1202	F25
10	31.0	15.5	20.00	21.26	13.07	9.92	22.85	11.97	0.79	2.95	3.13	7.26	1764	F25
12	33.0	16.5	22.00	25.00	17.40	11.93	25.91	13.58	0.87	3.15	3.35	8.11	2492	F25
14	35.0	17.5	23.75	27.76	16.22	13.15	28.23	15.16	0.87	3.35	3.54	9.23	3285	F30
16	39.0	19.5	27.00	30.71	19.49	15.16	29.51	16.73	0.87	3.35	3.54	9.23	4366	F30
18	43.0	21.5	29.25	34.25	21.85	17.16	33.35	18.43	0.98	3.54	3.74	9.92	5821	F35
20	47.0	23.5	32.00	37.80	22.24	19.17	34.80	20.24	1.10	3.94	4.17	9.39	7376	F35
24	51.0	25.5	37.00	44.09	28.15	23.19	39.72	23.35	1.26	4.72	5.00	10.20	11246	F40

Bare valve



Note: Valve face-to-face dimension acc. to Table C-2 of API 6D

SI units

ASME Class 900

NPS	DIMENSIONS, mm											WEIGHT kg	ISO 5211
	A	A1	ØB	C	ØD	E	ØB	M	ØO	P	R		
2	368	184	216	177	49	368	250	8	28	31	143	89	F12
3	381	190.5	241	205	74	436.5	350	10	35	38	147	178	F16
4	457	228.5	292	260	100	486	400	12	43	46	174.5	279	F16
6	610	305	381	380	150	591	540	16	55	57.5	188	654	F25
8	737	368.5	470	436.1	201	743	680	20	75	79.5	248	1155	F30
10	838	419	546	525.9	252	879.5	850	22	80	83	267.5	2302	F30
12	965	482.5	610	625	303	1039.5	920	25	86	91	367.5	3144	F35

ASME Class 1500

NPS	DIMENSIONS, mm											WEIGHT kg	ISO 5211
	A	A1	ØB	C	ØD	E	ØB	M	ØO	P	R		
2	368	184	216	177	49	368	250	8	28	31	143	89	F12
3	470	235	267	260	74	436.5	350	10	35	38	147	227	F16
4	546	273	311	260	100	486	400	12	43	46	174.5	320	F16
6	705	352.5	394	387.34	144	591	540	16	55	57.5	188	787	F25
8	832	416	483	436.1	192	743	680	20	75	79.5	248	1446	F30
10	991	495.5	584	538.7	239	879.5	850	22	80	83	267.5	2606	F30
12	1130	565	673	624.75	287	1039.5	920	25	86	91	367.5	3640	F35

Imperial units

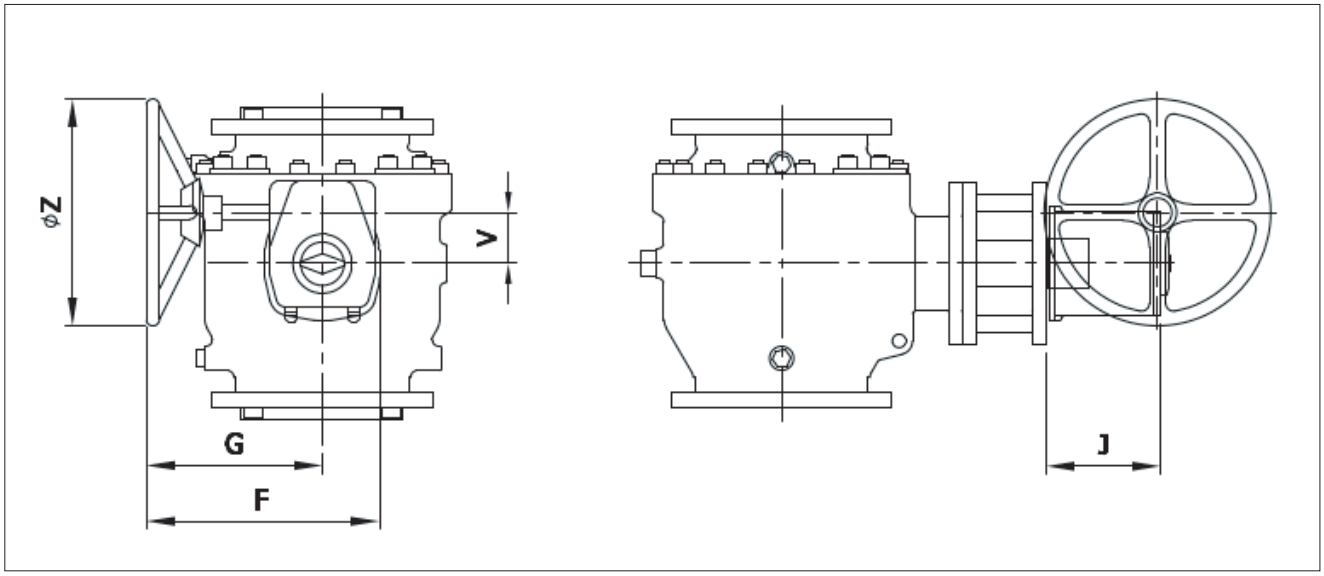
ASME Class 900

NPS	DIMENSIONS, inch											WEIGHT lbs	ISO 5211
	A	A1	ØB	C	ØD	E	ØB	M	ØO	P	R		
2	14.50	7.25	8.50	6.97	1.93	14.49	9.84	0.31	1.10	1.22	5.63	196	F12
3	15.00	7.50	9.50	8.07	2.91	17.19	13.78	0.39	1.38	1.50	5.79	392	F16
4	18.00	9.00	11.50	10.24	3.94	19.13	15.74	0.47	1.69	1.81	6.87	615	F16
6	24.00	12.00	15.00	14.96	5.91	23.27	21.26	0.63	2.17	2.26	7.40	1442	F25
8	29.00	14.50	18.50	17.17	7.91	29.25	26.78	0.79	2.95	3.13	9.76	2546	F30
10	33.00	16.50	21.50	20.70	9.92	34.63	33.46	0.87	3.15	3.27	10.53	5075	F30
12	38.00	19.00	24.00	24.61	11.93	40.93	36.22	0.98	3.39	3.58	14.47	6931	F35

ASME Class 1500

NPS	DIMENSIONS, inch											WEIGHT lbs	ISO 5211
	A	A1	ØB	C	ØD	E	ØB	M	ØO	P	R		
2	14.50	7.25	8.50	6.97	1.93	14.49	9.84	0.31	1.10	1.22	5.63	196	F12
3	18.50	9.25	10.50	10.24	2.91	17.19	13.78	0.39	1.38	1.50	5.79	500	F16
4	21.50	10.75	12.25	10.24	3.94	19.13	15.74	0.47	1.69	1.81	6.87	705	F16
6	27.75	13.88	15.50	15.25	5.67	23.27	21.26	0.63	2.17	2.26	7.40	1735	F25
8	32.75	16.38	19.00	17.17	7.55	29.25	26.78	0.79	2.95	3.13	9.76	3187	F30
10	39.00	19.50	23.00	21.21	9.41	34.63	33.46	0.87	3.15	3.27	10.53	5745	F30
12	44.50	22.25	26.50	24.60	11.30	40.93	36.22	0.98	3.39	3.58	14.47	8025	F35

Valve with manual operator
MGR Series



SI units
ASME Class 150

NPS	Gear	ISO Mounting	Dimensions, mm					WEIGHT kg
			F	G	J	V	øZ	
2	MGR 5/QA	F05	255	226	56	42	102	23
3	MGR 5/QA	F05	255	226	56	42	102	39
4	MGR7/QA	F07	268	217	61	52	200	57
6	MGR10/QA	F10	303	252	61	52	305	157
8	MGR12/QA	F14	369	304	87	71	508	266
10	MGR14/QA	F16	381	306	92	86	813	394
12	MGR14/QA	F16	381	306	92	86	813	589
14	MGR16/QA	F25	422	348	119	53	813	819
16	MGR16/QA	F25	422	348	119	53	813	1219
18	MGR20/K85A	F25	539	430	131	140	610	1459
20	MGR20/K85A	F25	539	430	131	140	610	1899
24	MGR30/K105A	F30	620	470	131	182	711	2864

ASME Class 300

NPS	Gear	ISO Mounting	Dimensions, mm					WEIGHT kg
			F	G	J	V	øZ	
2	MGR5/QA	F05	255	226	56	42	102	27
3	MGR7/QA	F07	268	217	61	52	200	56
4	MGR10/QA	F10	303	252	61	52	305	80
6	MGR14/QA	F16	381	306	92	86	813	196
8	MGR14/QA	F16	381	306	92	86	813	354
10	MGR15/QA	F16	437	346	103	104	813	482
12	MGR16/QA	F25	422	348	119	53	813	714
14	MGR20/K85A	F25	539	430	131	140	610	899
16	MGR30/K105A	F30	620	470	131	182	711	1269
18	MGR30/K105A	F30	620	470	131	182	711	1709
20	MGR30/K105A	F30	620	470	131	182	711	2319
24	MGR40/K135A	F35	662	490	169	209	711	3564

Imperial units

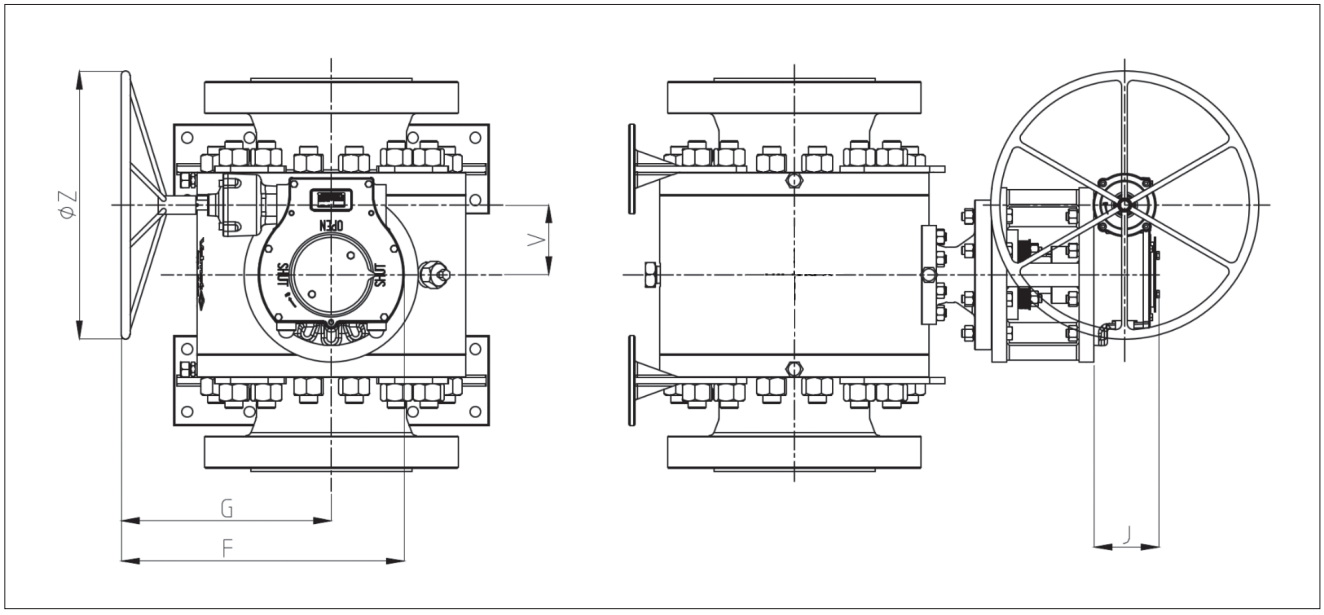
ASME Class 150

NPS	Gear	Dimensions, inch						WEIGHT lbs
		ISO Mounting	F	G	J	V	øZ	
2	MGR 5/QA	F05	10.04	8.90	2.20	1.65	4.02	51
3	MGR 5/QA	F05	10.04	8.90	2.20	1.65	4.02	86
4	MGR7/QA	F07	10.55	8.54	2.40	2.05	7.87	126
6	MGR10/QA	F10	11.93	9.92	2.40	2.05	12.01	346
8	MGR12/QA	F14	14.53	11.97	3.43	2.80	20.00	587
10	MGR14/QA	F16	15.00	12.05	3.62	3.39	32.01	869
12	MGR14/QA	F16	15.00	12.05	3.62	3.39	32.01	1299
14	MGR16/QA	F25	16.61	13.70	4.69	2.09	32.01	1806
16	MGR16/QA	F25	16.61	13.70	4.69	2.09	32.01	2688
18	MGR20/K85A	F25	21.22	16.93	5.16	5.51	24.02	3217
20	MGR20/K85A	F25	21.22	16.93	5.16	5.51	24.02	4187
24	MGR30/K105A	F30	24.41	18.50	5.16	7.17	27.99	6315

ASME Class 300

NPS	Gear	Dimensions, inch						WEIGHT lbs
		ISO Mounting	F	G	J	V	øZ	
2	MGR5/QA	F05	10.04	8.90	2.20	1.65	4.02	60
3	MGR7/QA	F07	10.55	8.54	2.40	2.05	7.87	123
4	MGR10/QA	F10	11.93	9.92	2.40	2.05	12.01	176
6	MGR14/QA	F16	15.00	12.05	3.62	3.39	32.01	432
8	MGR14/QA	F16	15.00	12.05	3.62	3.39	32.01	781
10	MGR15/QA	F16	17.20	13.62	4.06	4.09	32.01	1063
12	MGR16/QA	F25	16.61	13.70	4.69	2.09	32.01	1574
14	MGR20/K85A	F25	21.22	16.93	5.16	5.51	24.02	1982
16	MGR30/K105A	F30	24.41	18.50	5.16	7.17	27.99	2798
18	MGR30/K105A	F30	24.41	18.50	5.16	7.17	27.99	3768
20	MGR30/K105A	F30	24.41	18.50	5.16	7.17	27.99	5113
24	MGR40/K135A	F35	26.06	19.29	6.65	8.23	27.99	7859

MGR Series



SI units

ASME Class 600

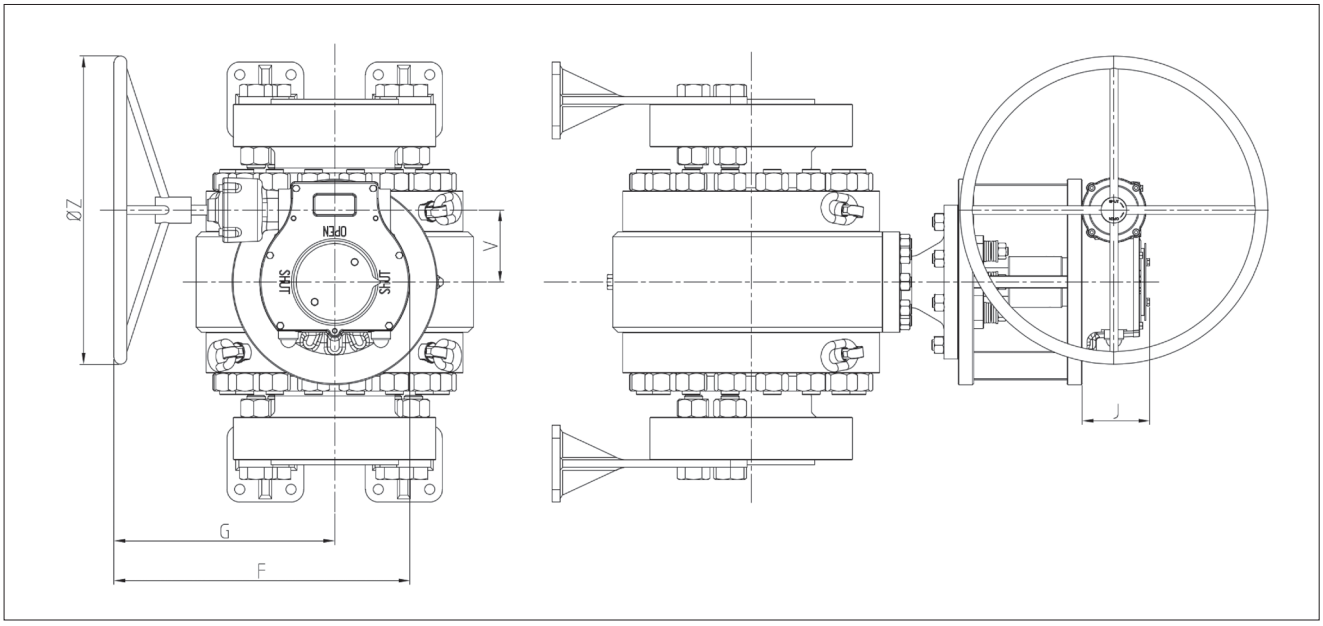
NPS	Gear	ISO Mounting	Dimensions, mm					WEIGHT kg
			ØZ	G	F	V	J	
2	MGR7/QA	F10	200	217	268	52	61	48
3	MGR10/QA	F12	300	252	303	52	61	92
4	MGR12/QA	F14	500	304	369	71	87	185
6	MGR14/QA	F16	700	306	381	86	92	354
8	MGR16/QA	F25	800	348	422	53	119	645
10	MGR20/K85A	F25	600	430	539	140	131	950
12	MGR20/K85A	F25	600	430	539	140	131	1240
14	MGR30/K105A	F30	700	470	620	182	172	1715
16	MGR30/K105A	F30	700	470	620	182	172	2225
18	MGR40/K135A	F35	700	490	662	209	215	3040
20	MGR40/K135A	F35	700	490	662	209	215	3770

Imperial units

ASME Class 600

NPS	Gear	ISO Mounting	Dimensions, inch					WEIGHT lbs
			ØZ	G	F	V	J	
2	MGR7/QA	F10	7.9	8.54	10.55	2.05	2.40	106
3	MGR10/QA	F12	11.8	9.92	11.93	2.05	2.40	203
4	MGR12/QA	F14	19.7	11.97	14.53	2.80	3.43	408
6	MGR14/QA	F16	27.6	12.05	14.98	3.39	3.62	781
8	MGR16/QA	F25	31.5	13.70	16.63	2.09	4.69	1423
10	MGR20/K85A	F25	23.6	16.93	21.21	5.51	5.16	2095
12	MGR20/K85A	F25	23.6	16.93	21.21	5.51	5.16	2735
14	MGR30/K105A	F30	27.6	18.52	24.41	7.17	6.77	3782
16	MGR30/K105A	F30	27.6	18.52	24.41	7.17	6.77	4907
18	MGR40/K135A	F35	27.6	19.31	26.10	8.23	8.46	6704
20	MGR40/K135A	F35	27.6	19.31	26.10	8.23	8.46	8313

MGR Series



SI units

ASME Class 900

NPS	Gear	ISO Mounting	Dimensions, mm					Weight kg
			ØZ	G	F	V	J	
2	MGR12/QA	F14	500	304	369	71	87	117
3	MGR12/QA	F14	500	304	369	71	87	210
4	MGR14/QA	F16	700	306	381	86	92	330
6	MGR15/QA	F16	800	346	437	104	103	790
8	MGR20/K85A	F25	600	430	539	140	131	1340
10	MGR30/K105A	F30	700	470	850	182	172	2510
12	MGR30/K105A	F30	700	470	850	182	172	3475

ASME Class 1500

NPS	Gear	ISO Mounting	Dimensions, mm					Weight kg
			ØZ	G	F	V	J	
2	MGR12/QA	F14	500	304	369	71	87	117
3	MGR12/QA	F14	500	304	369	71	87	260
4	MGR15/QA	F16	800	346	437	104	103	380
6	MGR16/QA	F25	800	348	422	53	119	925
8	MGR20/K85A	F25	600	430	539	140	131	1650
10	MGR30/K105A	F30	700	470	850	182	172	2816
12	MGR40/K135A	F35	700	490	662	209	215	4040

Imperial units

ASME Class 900

NPS	Gear	ISO Mounting	Dimensions, inch					Weight lbs
			ØZ	G	F	V	J	
2	MGR12/QA	F14	19.70	11.97	14.53	2.80	3.43	258
3	MGR12/QA	F14	19.70	11.97	14.53	2.80	3.43	463
4	MGR14/QA	F16	27.60	12.05	14.98	3.39	3.62	728
6	MGR15/QA	F16	31.50	13.62	17.20	4.11	4.04	1742
8	MGR20/K85A	F25	23.60	16.93	21.21	5.51	5.16	2954
10	MGR30/K105A	F30	27.60	18.52	24.41	7.17	6.77	5534
12	MGR30/K105A	F30	27.60	18.52	24.41	7.17	6.77	7661

ASME Class 1500

NPS	Gear	ISO Mounting	Dimensions, inch					Weight lbs
			ØZ	G	F	V	J	
2	MGR12/QA	F14	19.70	11.97	14.53	2.80	3.43	258
3	MGR12/QA	F14	19.70	11.97	14.53	2.80	3.43	573
4	MGR15/QA	F16	31.50	13.62	17.2	4.11	4.04	835
6	MGR16/QA	F25	31.50	13.70	16.63	2.09	4.69	2040
8	MGR20/K85A	F25	23.60	16.93	21.21	5.51	5.16	3638
10	MGR30/K105A	F30	27.60	18.52	24.41	7.17	6.77	6208
12	MGR40/K135A	F35	27.60	19.31	26.10	8.23	8.46	8907

How to order

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
6D	F	06	C	W	B1	G1	J2	AA	M4	AA	R	V1	A	A	-

1.	Valve series description
6D	Full bore, flanged, trunnions, long pattern

2.	Port type
F	Full bore (circular opening)

3.	Valve size	Class
02	NPS 2 or DN 50	150, 300, 600, 900, 1500
03	NPS 3 or DN 80	
04	NPS 4 or DN 100	
06	NPS 6 or DN 150	
08	NPS 8 or DN 200	
10	NPS 10 or DN 250	
12	NPS 12 or DN 300	
14	NPS 14 or DN 350	150, 300, 600
16	NPS 16 or DN 400	
18	NPS 18 or DN 450	
20	NPS 20 or DN 500	
24	NPS 24 or DN 600	

4.	Pressure class
C	ASME Class 150
D	ASME Class 300
F	ASME Class 600
G	ASME Class 900
H	ASME Class 1500

5.	End connection style
W	Raised face, ASME B16.5 (Ra 3.2~6.3)
Z	Ring joint, ASME B16.5 (for Class 900, 1500)

6.	Construction and application			
	Seat type	Emergency sealant injection		Cavity drain & vent
		Seat	Stem	
B1[a)]	DBB*		Included	Included
B2[b)]	DBB*	Included	Included	Included
B4[std)]	DBB*			Included
B5	DBB*	Included		Included

*Double block and bleed effect seat configuration
[a)] For valves sizes NPS 2 to 6 in Class 150 & 300 and NPS 2 in Class 600 -Select option B1
[b)] For valve sizes ≥ NPS 8 in Class 150 & 300 and ≥ NPS 3 in Class 600 -Select option B2
[std)] Standard option for all Class 900 & 1500 rated valves. Also available in Class 150, 300, 600

7.	Stem seal / Gland packing			
	Stem seal	Temperature range	Gland packing	Class
G1	O-ring	-29°C to +200°C	Graphite	150, 300
G2	O-ring	-29°C to +200°C	Graphite+Live loading	600
G5		-46°C to +400°C	Graphite+Live loading	900, 1500

8.	**Body material	Class
J2	ASTM A216 Gr. WCB (Carbon steel)	150 & 300
S6	ASTM A351 Gr. CF8M (Stainless steel)	150 & 300
AA	ASTM A105 (Carbon steel)	600, 900, 1500
SP	ASTM A182 Gr. F316 (Stainless steel)	600, 900, 1500

** Forging body options not offered in Class 150 & 300, and Casting body options not offered in Class 600, 900, 1500

9.	Ball material
AA	[c)]ASTM A105 + ENP
M4	410 SS (13% Cr)
SP	316 SS

[c)] Used only in Carbon steel body valves

10.	Stem material
M4	[c)]410 SS (13% Cr)
PH	17-4PH SS

[c)] Used only in Carbon steel body valves in Class 150 & 300

11.	Seat material
AA	[c)]ASTM A105 + ENP
M4	410 SS (13% Cr)
SP	316 SS

[c)] Used only in Carbon steel body valves

12.	Seat insert material	Temperature
R	Reinforced PTFE (RPTFE) for Class 150 & 300	-50°C to +220°C
D	Devlon® for Class 600	-50°C to +176°C
P	PEEK for Class 900 & 1500	-46°C to +230°C

13.	O-ring material	Temperature
V1	[d)]FKM (Fluoroelastomer) in Class 150 & 300 & FKM AED in Class 600	-29°C to +200°C
L1	Spring energized fluoropolymer lip seal in Class 900 & 1500	-46°C to +230°C

[d)] Selection covers all O-rings used inside the valve

14.	#Bolting material
A	B7/2H
D	[e)]B8M/8M
F	[f)] L7M/7M

Body & gland bolting material are same
[e)] Used on Stainless steel body valves
[f)] NACE bolting for Carbon steel body valves

15.	Model code
A	For all valves

16.	Option / Modifier code
	Blank, Standard option with Pressure equipment directive 2014/68/EU (PED)
A	Valve with API 6D monogram
I	IOGP S-562 design compliance

Note: Other sizes, class, end connections, materials, construction, seals, etc. are available on request. Please contact nearest Valmet sales office for support.
Valve working temperature range depends on the temperature limit of all soft parts used. Check limitations on Sign. 7, 12, and 13.
For chemical resistance chart of metallic valve parts refer Valmet publication T101-1EN, and for non-metallic valve parts refer T101-3EN.

Valmet Flow Control Oy
Vanha Porvoontie 229, 01380 Vantaa, Finland.
Tel. +358 10 417 5000.
www.valmet.com/flowcontrol