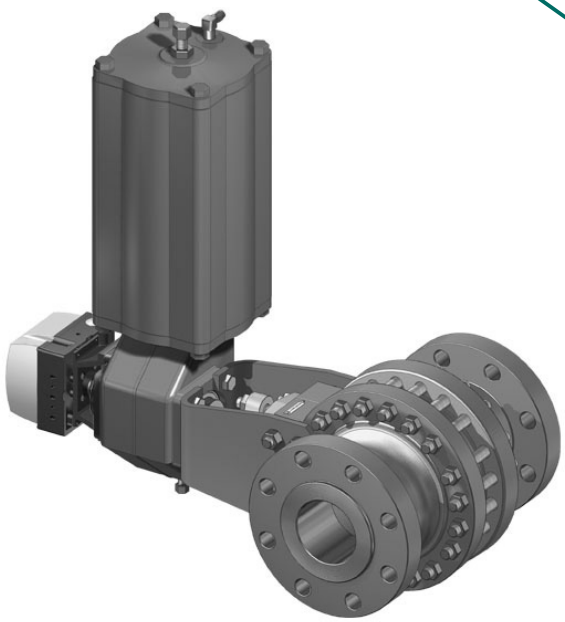
TRUNNION MOUNTED REDUCED AND FULL BORE NELES BALL VALVE, SERIES D

The D series ball valve is of Neles famous quarter turn design in which the closure element is a ball which rotates in concentric motion. This keeps the ball and seats in continuous contact with each other. The ball is trunnion mounted Stemball® on two bearings and the seat is spring-loaded against the ball.
Main benefits are very high rangeability, suitability for fibrous and impure fluids, excellent and durable tightness. The D series valves can be used for shut-off and throttling service with high pressure differentials.
The D series ball valves are flanged, reduced and fullbore valves with symmetrical split body construction. The strong stem is integrally cast with the ball and large low-friction bearings assure long lifetime, reliable and positive operation in all service conditions.
Due to very high MTBF (Mean Time Between Failure) D series is an exellent choise to to be used in ESD/ESV service.



APPLICATIONS

- Natural gas.
- Crude oil.
- Hydrocarbons.
- Liquids.
- Water.
- Oil and gas production.
- Chemical and petrochemical plants.
- Power plants.
- Marine applications.
- Steam.
- ESD/ESV
- Modulating control

DESIGN FEATURES

Sizes

- DN 50 … 900/2" … 36".

Pressure classes

- ASME CLASS 150, 300 and 600.

Stemball®

- Ball and stem of one piece.
- No dead-band, no hysteresis in throttling service.
- Reliable operation and excellent response even with high pressure differentials.

Trunnion mounted

- Good controllability.
- Low friction and operating torque.

Metal seats

- Spring-loaded.
- Durable tightness.
- Two way tight.
- Double block and bleed.

Full bore

- High C_V per nominal size.
- Straight ball opening means low flow resistance.
- High rangeability.

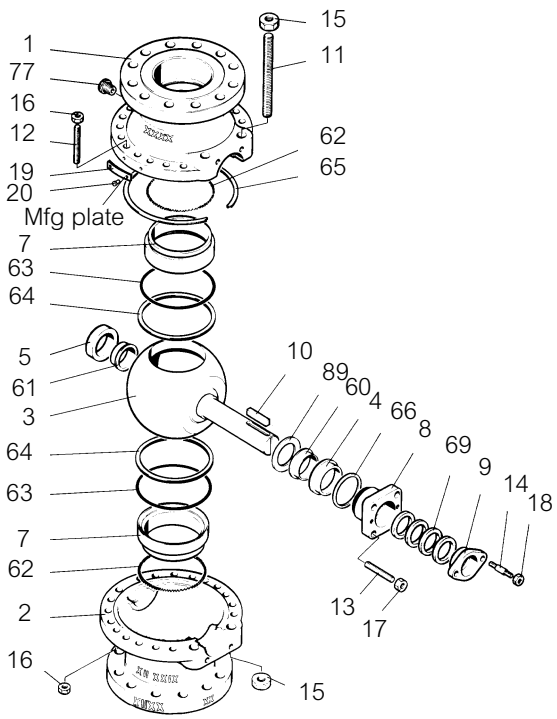
Excellent control characteristics

- Equal percentage inherent characteristic.
- Full ball with two throttling stages reduces cavitation & noise.
- Self flushing, low noise anti-cavitation Q-Trim.

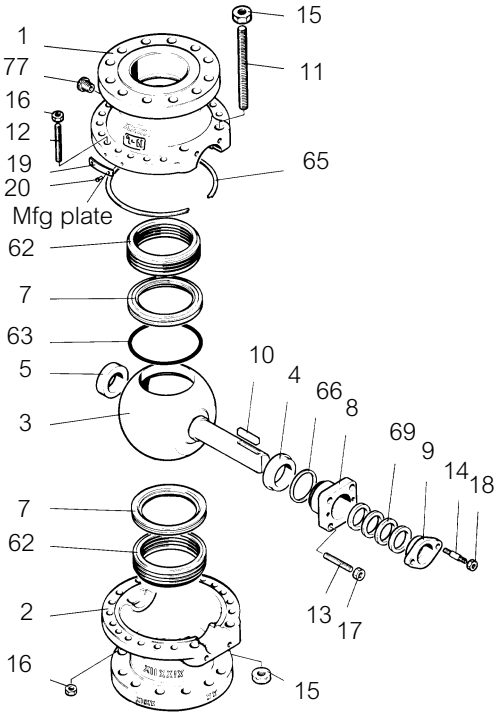
neles

metso
Expect results

EXPLODED VIEW



Standard construction



High temperature construction

PARTS LIST

Item	Part description	Material	
1	Body half (female)	Stainless steel, ASTM A 351 gr. CF8M	Carbon steel, ASTM A 216 gr. WCB
2	Body half (male)	Stainless steel, ASTM A 351 gr. CF8M	Carbon steel, ASTM A 216 gr. WCB
3	Ball	Stainless steel, ASTM A 351 gr. CF8M + Hard chrome	
4	Thrust bearing	Stainless steel, AISI 316 (Cobalt based alloy bushing in high temperature construction)	
5	Trunnion bearing	Stainless steel, AISI 316 (Cobalt based alloy bushing in high temperature construction)	
7	Seat	Stainless steel, AISI 316 + Cobalt based alloy	
8	Bonnet	Stainless steel, ASTM A 351 gr. CF8M	Carbon steel, ASTM A 216 gr. WCB
9	Gland	Stainless steel, ASTM A 351 gr. CF8M	Carbon steel, ASTM A 216 gr. WCB
10	Key	Stainless steel, AISI 329	
11	Stud	ASTM A 193 gr. B8M	ASTM A 320 gr. L7M
12	Hexagon screw or stud	ASTM A 193 gr. B8M	ASTM A 320 gr. L7M
13	Stud	ASTM A 193 gr. B8M	ASTM A 320 gr. L7M
14	Stud	ASTM A 193 gr. B8M	ASTM A 320 gr. L7M
15	Hexagon nut	ASTM A 193 gr. B8M	ASTM A 194 gr. 2H
16	Hexagon nut	ASTM A 193 gr. B8M	ASTM A 194 gr. 2H
17	Hexagon nut	ASTM A 193 gr. B8M	ASTM A 194 gr. 2H
18	Hexagon nut	ASTM A 193 gr. B8M	ASTM A 194 gr. 2H
19	Identification plate	Stainless steel, AISI 304	
20	Rivet	Stainless steel, AISI 316	
60	Bearing	PTFE on stainless steel net, standard construction	
61	Bearing	PTFE on stainless steel net, standard construction	
62	Spring/ bellow	Special alloy UNS N07750, in standard construction / EN 10088-1.4418 in high temperature construction	
63	Back seal	Fluorocarbon rubber Viton GF	
64	Back-up ring	Polytetrafluoroethylene (PTFE)	
65	Gasket	Graphite	
66	Gasket	Graphite	
69	Gland packing	Graphite + PTFE	
77	Plug	Stainless steel, AISI 316	
89	Thrust bearing	PTFE on stainless steel net	

TECHNICAL SPECIFICATION

Product type

Full or reduced bore, trunnion mounted ball valve.
Ball and stem are integrally cast.
Split body design.
Flanged.

Pressure ratings

ASME Class 150, 300 and 600.

Size range fullbore

DN 300 … 900 / 12" - 36" in ASME Class 150.
DN 100 … 900 / 4" - 36" in ASME Class 300.
DN 50 … 600 / 2" - 24" in ASME Class 600.

Size range reduced bore

DN 250 ... 600 / 10" - 24" in ASME Class 150.
DN 200 ... 600 / 8" - 24" in ASME Class 300.
DN 80 ... 600 / 3" - 24" in ASME Class 600.
Larger sizes on request.

Temperature range

-200 °C … +450 °C (+600 °C)
-330 °F … +840 °F (+1100 °F).

Design standards

Valve body	ASME B16.34.
Valve body joint	ASME VIII. DIV. 1 APPX 2.
Valve flanges	ASME B16.5.
Face-to-face	ASME B16.10.

Standard materials

Body	ASTM A351 gr. CF8M. ASTM A216 gr. WCB.
Ball	ASTM A351 gr. CF8M + hard chrome or other special coating with metal seats.
Bearings	SS 316 + PTFE net or Cobalt based alloy
Seats	AISI 316 + Cobalt based alloy. AISI 316 + PTFE insert.
Seals/gaskets	PTFE, graphite.

Standard bearing construction

Large, low friction bearings.
SS 316 + PTFE net or Cobalt based alloy.

Bolting

B8M/8M with stainless steel body.
L7M/2H or 2MH with carbon steel body.

Standard options

Cryogenic design.
Bonnet extension.
Degreasing.
High temperature design.
Cobalt based hard facing or NiBo ball coating.
Noise/cavitation reduction ball insert; Q-trim design.
Fire safety BS 6755/API 607 (on selected seat designs).
NACE MR-01-03 or MR-01-75 on request.

Material and test certification

EN/DIN 10204-3.1 material certificates for body halves, ball and bonnet. Tightness test certificate.

Valve testing

Each valve is tested for body integrity and seat tightness. The body test pressure is 1.5 x PN. The seat test pressure for metal seated valves in 1.1 x PN. The seat test pressure for soft seats is 6 bar. The test medium is inhibited water.

Valve tightness

FCI 70-2 class V	for metal seats.
FCI 70-2 class VI	for soft seats
ISO 5208 rate C or D	for metal seats.
API-598 (1970)	for soft seats.

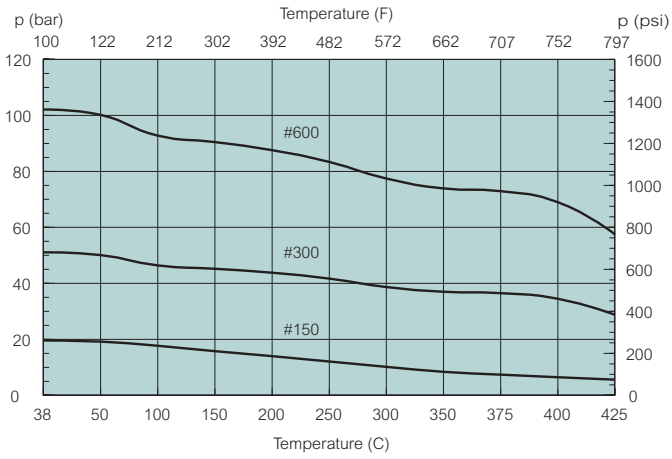
Other tigthness rates upon request.

Maximum flow coefficient C_v and flow resistance coefficient

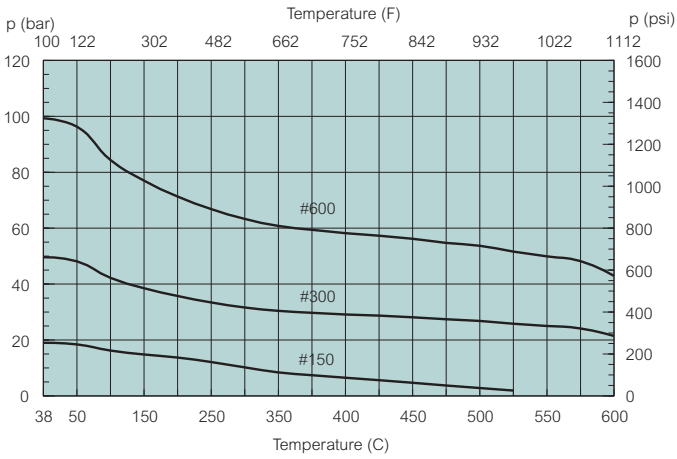
DN / Inch	C_v 90°	ζ 90°	DN / Inch	C_v 90°	ζ 90°
50 / 2	480	0.06	400 / 16	37700	0.04
80 / 3	1200	0.05	450 / 18	48000	0.03
100 / 4	2120	0.05	500 / 20	59500	0.03
150 / 6	5100	0.05	600 / 24	86300	0.03
200 / 8	9300	0.04	700 / 28	118000	0.03
250 / 10	15200	0.04	750 / 30	136000	0.03
300 / 12	22400	0.04	800 / 32	151000	0.03
350 / 14	28300	0.04	900 / 36	192000	0.03

C_V-values measured according to ISA S39.
C_V-values for reduced bore available on request.

Maximum pressure/Temperature limitations on valve body according to ASME B16.34

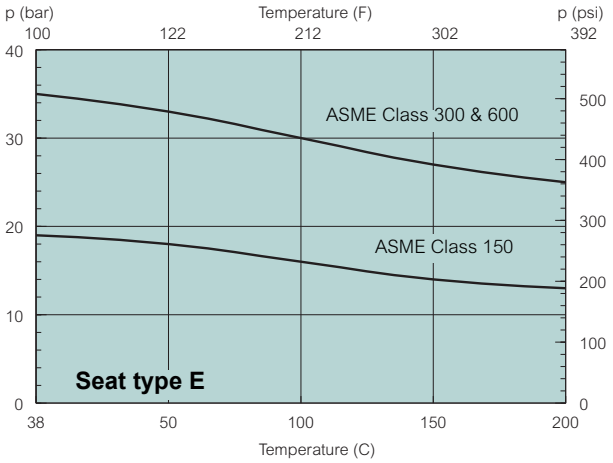


Material ASTM A216 gr. WCB.

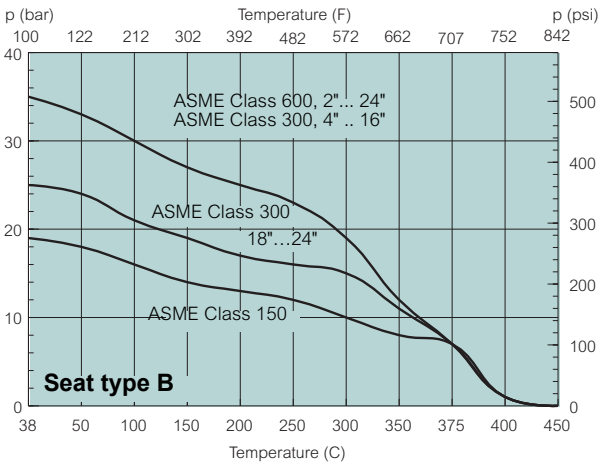


Material ASTM A351 gr. CF8M.

MAXIMUM ALLOWABLE Δp IN CONTROL SERVICE

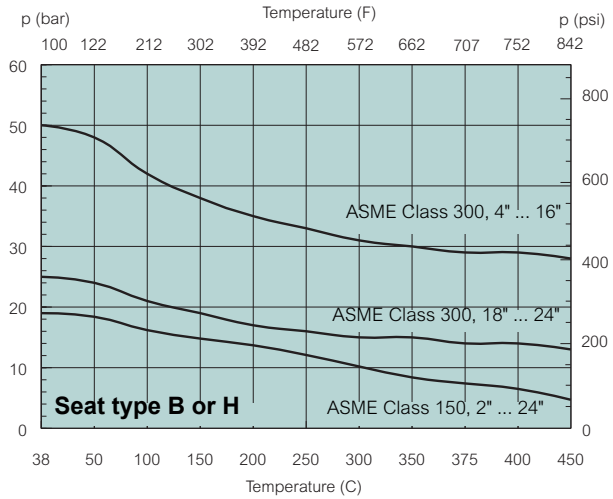


□ PTFE bearings □ Chrome plated ball



□ Metal bearings □ Chrome plated ball

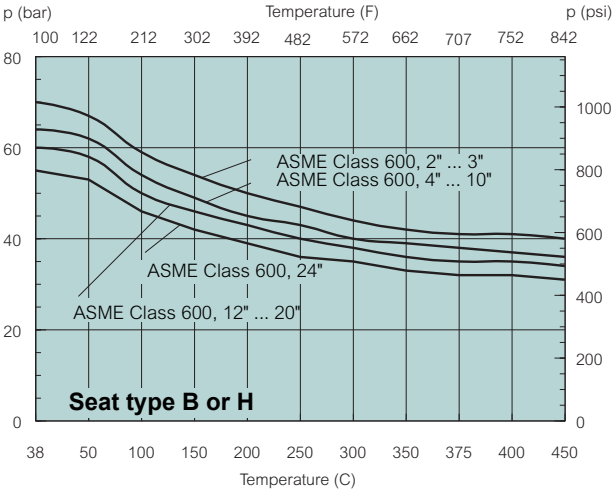
MAXIMUM ALLOWABLE Δp IN SHUT-OFF SERVICE



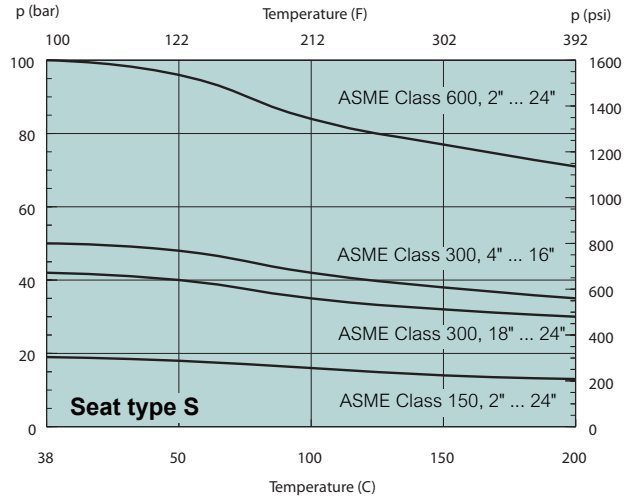
□ Metal bearings □ Chrome plated ball

Note: When Carbide or Nickel Boron coatings are used according qiven techical limitations max body material P/T values can be used. Always consider shaft strength.

Note: For reduced bore valves maximum allowable Δp is based on ball size (= one size smaller than valve size given in tables).



□ Metal bearings □ Chrome plated ball



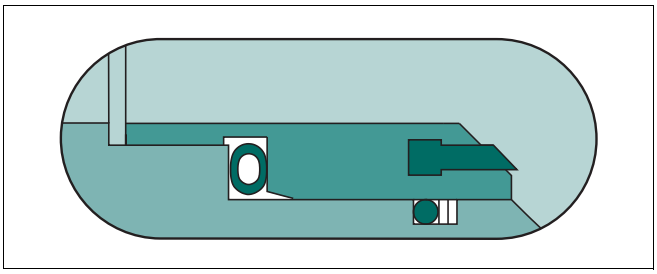
□ NPTFE bearings □ Chrome plated ball

Maximum operating pressure differentials for valves in shut-off or control service depend on valve size, seat design, bearing design and flow media. Only the most commonly used material and construction combinations are shown above.

Valves for applications exceeding +450 °C / +840 °F temperature limit shall be quoted separately.
Contact your local Metso representative.

STANDARD SEAT SELECTION FOR D SERIES VALVES

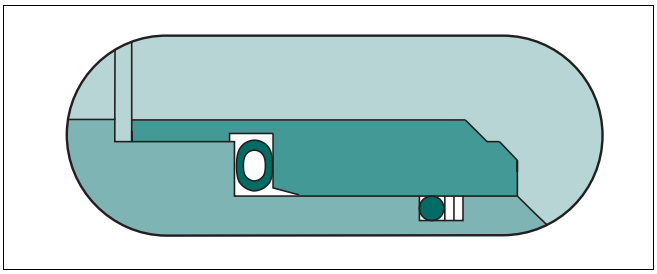
Soft seat design, seat code T



Size range: DN 50 … 900 / 2" … 36"
Seat material: AISI 316 + PTFE + C25 % insert
O-ring: Viton GF
Spring: UNS N07750
Temperature range: -30 °C … +200 °C / -22 °F … +390 °F.

The standard PTFE-seated design is most suitable for shut-off service, for temperatures up to +200 °C/+390 °F and when pressure drop is relatively low and medium does not contain wearing particles.

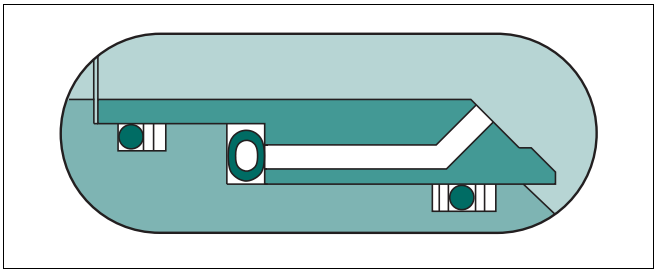
On-off metal seated design, seat code S



Size range: DN 50 … 900 / 2" … 36"
Seat material: AISI 316 + Cobalt based alloy.
O-ring: Viton GF
Spring: UNS N07750
Temperature range: -30 °C … +200 °C / -22 °F … +390 °F.

The on-off metal seat is most suitable for high pressure drop applications and for fluids containing impurities.

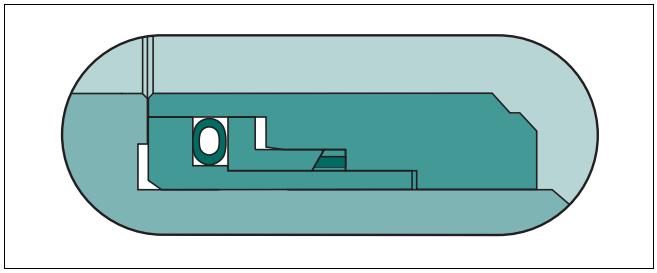
Control metal seat design, seat code E



Size range: DN 50 … 900 / 2" … 36"
Seat material: AISI 316 + Cobalt based alloy.
O-ring: Viton GF
Spring: UNS N07750
Temperature range: -30 °C … +200 °C / -22 °F … +390 °F.

The control metal seat features the ejector seat principle. This seat design is intended for demanding control applications.

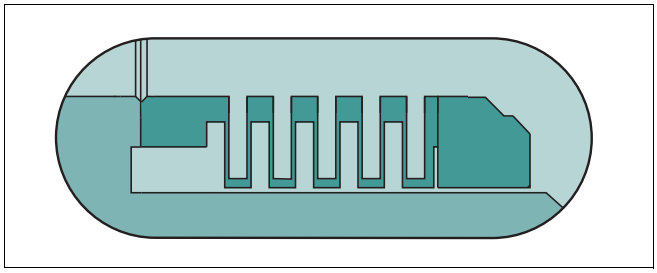
High temperature control metal seat design, seat code B



Size range: DN 50 … 600 / 2" … 24"
Seat material: AISI 316 + Cobalt based alloy.
Seat seal: Graphite
Spring: UNS N07750
Temperature range: -40 °C … +450 °C (+600 °C) / -40 °F … +840 °F (+1110 °F).

The high temperature metal seat is designed for both on-off and control applications and is suitable to be used with a wide range of flow media. The graphite seat seal makes this design a fire safe construction. Tested to BS 6755 and API 607.

Low and high temperature on-off metal seat, seat code H



Size range: DN 50 … 600 / 2" … 24"
Seat material: AISI 316 + Cobalt based alloy.
Bellows material: EN 10088-1.4418
Temperature range: -200 °C … +400 °C (+600 °C) / -330 °F … +750 °F (+1110 °F).

The Cobalt based alloy seat is preloaded with a bellows ring made of special stainless steel. The bellows acts as a spring and seal, and also increases the seat pressure at higher pressure differentials. Designed for demanding on-off applications containing impurities. Alternative bellows spring materials are available for temperatures up to +600 °C/ +1110 °F. The bellows seat design is choice for cryogenic service.

THE FAMOUS METSO Q-BALL® PRINCIPLE

With the introduction of Metso Q-Trim control valves, a new generation of low recovery rotary valves was born. The design was introduced in 1979 and has since been utilized in thousands of applications throughout the world and has been patented in all major control valve markets.
The Q-Ball technology effectively solves the problems associated with throttling large flow rates; cavitation and noise. It is based on the versatile Stem-Ball design - offering excellent control stability, rangeability and tightness.

Q-Trim operational principle

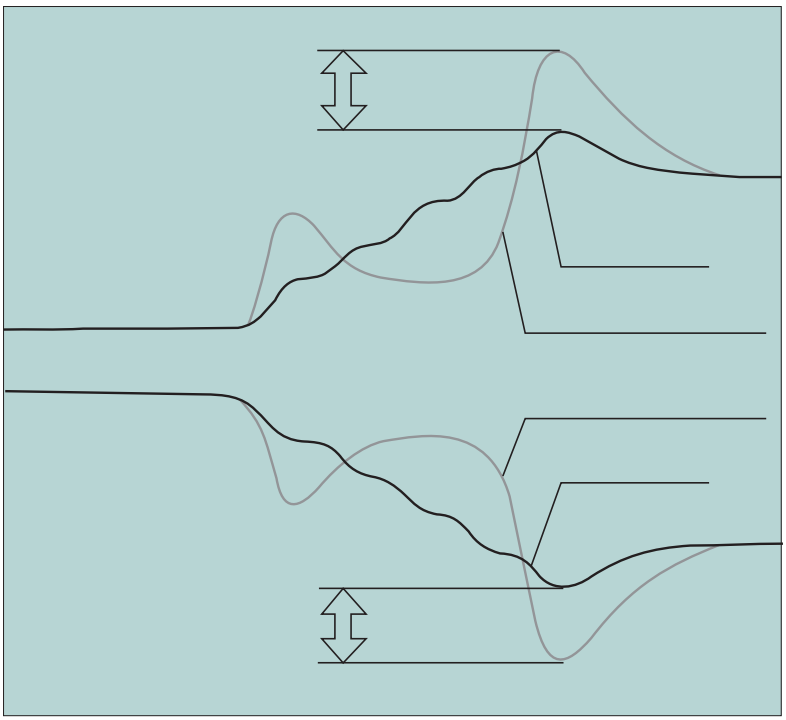
The aerodynamic noise reduction and abatement of liquid cavitation are done with a Q-Trim valve by two well-known principles:
Staging the pressure drop across the valve into a series of smaller drops. The lowest trim pressure is raised above the liquid vapor pressure and cavitation is avoided (pressure dropping below vapor pressure and successive recovery above vapor pressure). In gas/steam applications, the highest trim velocity (proportional to noise level produced) is reduced dramatically, resulting in noise reduction.
The division of flow into a number of small jet streams with less power to produce audible noise than a single large flow stream.
Up to 20 dB(A) noise reduction can be achieved with the Q-Trim design, depending on the application. Noise reduction in very high pressure drop applications can be further enhanced by utilizing diffusors and plate attenuators after the valve or at the valve outlet.

Rangeability

The attenuators rotate with the rotation of the valve closure element, thereby producing a variable resistance flow path depending on the opening of the valve. Very small flows can therefore be handled accurately at small openings. Also, particularly with rotation valves there is no unstable zone in the small openings.
At large openings, rotating attenuators create less resistance (corresponding with the lower pressure drop available for the control valve at large flows), enabling very large flows to pass through the same valve.

Handling impurities

There are always two types of flow across an attenuator plate in the Q-Trim design: one that goes through the holes and one that goes along the plates. The flow along the plates flushes away any impurities that might stick to the holes. The larger the valve opening, the more effective the flushing.

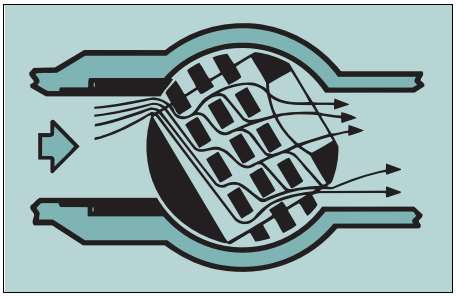


Less velocity means

- Nless kinetic energy
- Nless noise
- Nless erosion

Improved pressure recovery means

- Nless cavitation
- Nless noise
- Nless vibration



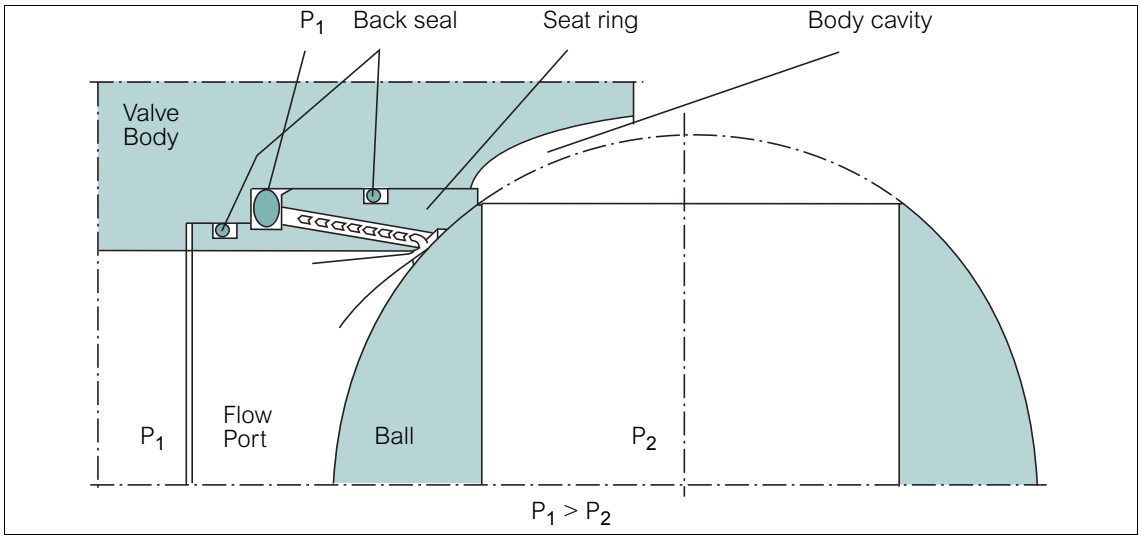
D SERIES VALVES FOR CONTROL SERVICE

In the last 30 years the Metso has become known for developing innovative, high quality rotary valves for control service.

One example is the patented special control seat design available in D series construction. This seat design is general purpose metal seat with following features:

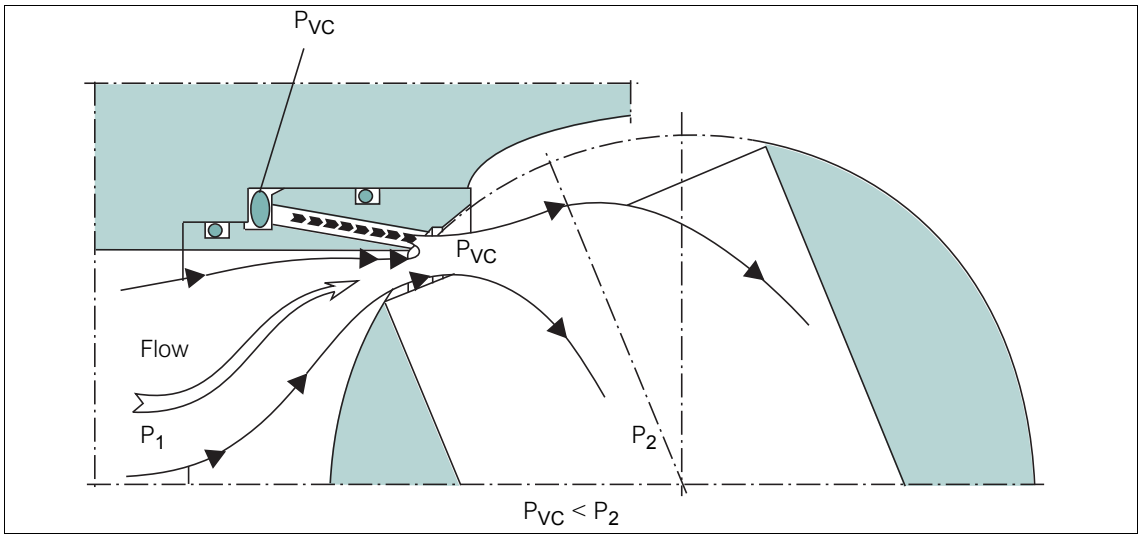
- With this seat construction, the seat friction decreases considerably. Thereby better dynamic behavior and smooth and accurate control are achieved.
- There is less wear on the seat and ball surfaces, while tightness remains excellent. The service life of the valves is considerably increased, also in on-off service.

The seating principle in shut-off



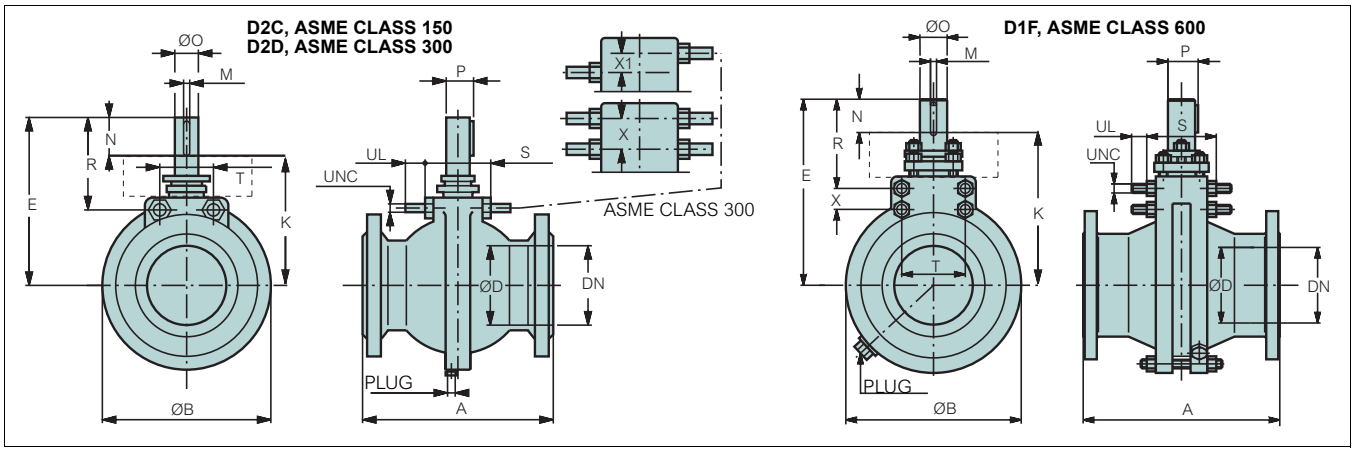
The seat works like a normal pressure assisted seat in trunnion mounted ball valves. The upstream pressure is led through the hole behind the seat, pushing it against the ball. To ensure pressure tightness, the seat is spring energized.

The working principle in control



In control, the high velocity flow passes through the restriction point of the partly open valve. The high velocity creates low pressure, which is led behind the ball seat through the hole located in the vena contracta. The seat will thus be unloaded.

DIMENSIONS



D2C, ASME CLASS 150

TYPE	DIMENSIONS, mm														UNC	PLUG NPTF	kg
	DN	A	ØB	ØD	E	K	M	N	ØO	P	R	S	T	UL			
D2C 12	300	610	596	304	586	430	22.22	156	95	104.8	320	236	196	48	1 1/4	1	420
D2C 14	350	686	668	337	650	494	22.22	156	95/105	104.8	354	248	212	52	1 1/4	1	550
D2C 16	400	762	744	387	715	559	22.22	156	95/120	104.8	380	286	240	58	1 1/2	1	720
D2C 18	450	864	814	440	890	737	22.22	156	95/120	104.8	504	242	210	63	1 1/2	1	1300
D2C 20	500	914	904	490	950	770	25.40	180	95/105	116.1	520	242	210	63	1 1/2	1	1500
D2C 24	600	1067	1084	590	1125	920	31.75	205	95/120	133.8	615	318	270	78	2	1	2300
D2C 28	700	1244	1245	692	1266	1041	31.75	225	105/135	149	661	336	275	92	1 3/4	1	3800
D2C 30	750	1295	1318	740	1325	1075	38.10	250	150	166.6	665	410	310	119	2 1/2	1	4400
D2C 36	900	1524	1560	880	1580	1300	38.10	280	165	181.8	799	514	380	148	3	1	6500

TYPE	DIMENSIONS, inch														UNC	PLUG NPTF	lbs
	SIZE	A	ØB	ØD	E	K	M	N	ØO	P	R	S	T	UL			
D2C 12	12	24.02	23.46	11.97	23.07	16.93	0.87	6.14	3.74	4.13	12.60	9.29	7.72	1.89	1 1/4	1	924
D2C 14	14	27.01	26.30	13.27	25.59	19.45	0.87	6.14	3.74/4.13	4.13	13.94	9.76	8.35	2.05	1 1/4	1	1210
D2C 16	16	30.00	29.29	15.24	28.15	22.01	0.87	6.14	3.74/4.72	4.13	14.96	11.26	9.45	2.28	1 1/2	1	1584
D2C 18	18	34.02	32.05	17.32	35.04	29.02	0.87	6.14	3.74/4.72	4.13	19.84	9.53	8.27	2.48	1 1/2	1	2860
D2C 20	20	35.98	35.59	19.29	37.40	30.31	1.00	7.09	3.74/4.13	4.57	20.47	9.53	8.27	2.48	1 1/2	1	3300
D2C 24	24	42.01	42.68	23.23	44.29	36.22	1.25	8.07	3.74/4.72	5.27	24.21	12.52	10.63	3.07	2	1	5060
D2C 28	28	48.98	49.02	27.24	49.84	40.98	1.25	8.86	4.13/5.31	5.87	26.02	13.23	10.83	3.62	1 3/4	1	8360
D2C 30	30	50.98	51.89	29.13	52.17	42.32	1.50	9.84	5.91	6.56	26.18	16.14	12.20	4.69	2 1/2	1	9680
D2C 36	36	60.00	61.42	34.65	62.20	51.18	1.50	11.02	6.50	7.16	31.46	20.24	14.96	5.83	3	1	14300

D2D, ASME CLASS 300

TYPE	DIMENSIONS, mm															UNC	PLUG NPTF	kg
	DN	A	ØB	ØD	E	K	M	N	ØO	P	R	S	T	X	X1	UL		
D2D 4	100	305	262	100	264	196	9.52	68	40	44.2	157	120	102	–	–	29	3/4	1/2	60
D2D 6	150	403	368	152	345	255	12.70	90	55	60.6	186	164	128	–	–	37	1	3/4	140
D2D 8	200	502	454	202	424	305	19.05	119	70	78.2	226	198	150	–	–	48	1 1/4-8	3/4	240
D2D 10	250	568	558	254	514	368	22.22	146	85	94.6	270	236	176	–	–	58	1 1/2-8	1	380
D2D 12	300	648	630	304	586	430	22.22	156	95	104.8	310	262	196	–	–	58	1 1/2-8	1	590
D2D 14	350	762	706	337	650	470	25.40	180	105	116.2	338	288	212	–	–	65	1 3/4-8	1	770
D2D 16	400	838	792	387	715	510	31.75	205	120	133.8	360	330	240	–	–	71	2-8	1	1050
D2D 18	450	914	884	440	890	734	22.22	156	95	104.8	378	292	230	104	–	82	2-8	1	1250
D2D 20	500	991	966	490	950	770	25.40	180	105	116.2	396	292	240	104	–	82	2-8	1	1950
D2D 24	600	1143	1172	590	1125	920	31.75	205	120	133.8	519	396	280	–	74	94	2 1/2-8	1	3100
D2D 28	700	1346	1340	690	1266	1041	31.75	225	135	149	568	400	310	–	74	125	3-8	1	5250
D2D 30	750	1397	1414	740	1325	1075	38.10	250	150	166.6	591	400	310	–	74	125	3-8	1	5500
D2D 36	900	1727	1684	880	1580	1300	38.10	280	165	181.8	705	512	380	–	94	135	3-8	1	8700

TYPE	DIMENSIONS, inch																UNC	PLUG NPTF	lbs
	SIZE	A	ØB	ØD	E	K	M	N	ØO	P	R	S	T	X	X1	UL			
D2D 4	4	12.01	10.31	3.94	10.39	7.72	0.37	2.68	1.57	1.74	6.18	4.72	4.02	–	–	1.14	3/4	1/2	132
D2D 6	6	15.87	14.49	5.98	13.58	10.04	0.50	3.54	2.17	2.39	7.32	6.46	5.04	–	–	1.46	1	3/4	308
D2D 8	8	19.76	17.87	7.95	16.69	12.01	0.75	4.69	2.76	3.08	8.90	7.80	5.91	–	–	1.89	1 1/4-8	3/4	528
D2D 10	10	22.36	21.97	10.00	20.24	14.49	0.87	5.75	3.35	3.72	10.63	9.29	6.93	–	–	2.28	1 1/2-8	1	836
D2D 12	12	25.51	24.80	11.97	23.07	16.93	0.87	6.14	3.74	4.13	12.20	10.31	7.72	–	–	2.28	1 1/2-8	1	1298
D2D 14	14	30.00	27.80	13.27	25.59	18.50	1.00	7.09	4.13	4.57	13.31	11.34	8.35	–	–	2.56	1 3/4-8	1	1694
D2D 16	16	32.99	31.18	15.24	28.15	20.08	1.25	8.07	4.72	5.27	14.17	12.99	9.45	–	–	2.80	2-8	1	2310
D2D 18	18	35.98	34.80	17.32	35.04	28.90	0.87	6.14	3.74	4.13	14.88	11.50	9.06	4.09	–	3.23	2-8	1	2750
D2D 20	20	39.02	38.03	19.29	37.40	30.31	1.00	7.09	4.13	4.57	15.59	11.50	9.45	4.09	–	3.23	2-8	1	4290
D2D 24	24	45.00	46.14	23.23	44.29	36.22	1.25	8.07	4.72	5.27	20.43	15.59	11.02	–	2.91	3.70	2 1/2-8	1	6820
D2D 28	28	52.99	52.76	27.17	49.84	40.98	1.25	8.86	5.31	5.87	22.36	15.75	12.20	–	2.91	4.92	3-8	1	11550
D2D 30	30	55.00	55.67	29.13	52.17	42.32	1.50	9.84	5.91	6.56	23.27	15.75	12.20	–	2.91	4.92	3-8	1	12100
D2D 36	36	69.13	66.30	34.65	62.20	51.18	1.50	11.02	6.50	7.16	27.76	20.16	14.96	–	3.70	5.31	3-8	1	19140

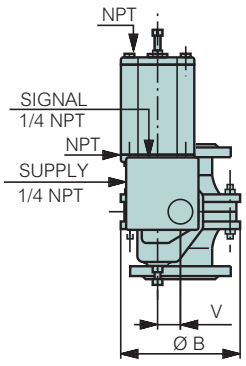
D1F, ASME CLASS 600

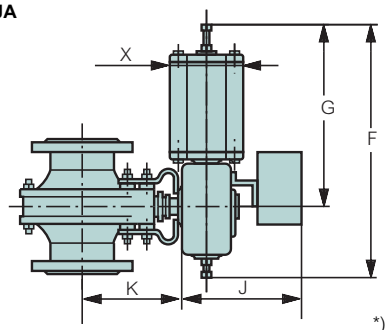
TYPE	DIMENSIONS, mm															UNC	PLUG NPTF	kg
	DN	A	ØB	ØD	E	K	M	N	ØO	P	R	S	T	X	UL			
D1F 2	50	292	206	50	280	234	6.35	46	25	27.8	172	128	80	36	25	5/8-11	1/2	35
D1F 3	80	356	262	77	350	292	9.52	58	35	39.1	212	154	100	42	34	3/4-10	1/2	60
D1F 4	100	432	314	100	392	324	9.52	68	40	44.2	225	158	110	43.7	38	3/4-10	1/2	120
D1F 6	150	559	404	152	495	405	12.70	90	55	60.6	280	200	130	55	46	1-8	3/4	280
D1F 8	200	660	498	202	595	476	19.05	119	70	78.2	325	244	160	68	50	11/4-8	3/4	380
D1F 10	250	787	610	254	730	584	22.22	146	85	94.6	415	244	180	65	62	11/4-8	1	690
D1F 12	300	838	748	302	837	681	22.22	156	95	104.8	437	358	220	92	88	13/4-8	1	1134
D1F 14	350	889	824	340	890	710	25.40	180	105	116.1	454	398	240	91	81	13/4-8	1	1500
D1F 16	400	991	954	390	988	783	31.75	205	120	133.8	482	432	270	104.1	76	2-8	1	2500
D1F 18	450	1092	1090	440	1140	915	31.75	225	135	149	557	506	310	128.7	103	21/2-8	1	3300
D1F 20	500	1194	1176	490	1220	970	38.10	250	150	166.6	596	526	340	129.4	93	21/2-8	1	3880
D1F 24	600	1397	1224	591	1265	985	38.10	280	165	181.8	615	550	368	129.6	106	21/2-8	1	6500

TYPE	DIMENSIONS, inch															UNC	PLUG NPTF	lbs
	SIZE	A	ØB	ØD	E	K	M	N	ØO	P	R	S	T	X	UL			
D1F 2	2	11.50	8.11	1.97	11.02	9.21	0.25	1.81	0.98	1.09	6.77	5.04	3.15	1.42	0.98	5/8-11	1/2	77
D1F 3	3	14.02	10.31	3.03	13.78	11.50	0.37	2.28	1.38	1.54	8.35	6.06	3.94	1.65	1.34	3/4-10	1/2	132
D1F 4	4	17.01	12.36	3.94	15.43	12.76	0.37	2.68	1.57	1.74	8.86	6.22	4.33	1.72	1.50	3/4-10	1/2	264
D1F 6	6	22.01	15.91	5.98	19.49	15.94	0.50	3.54	2.17	2.39	11.02	7.87	5.12	2.17	1.81	1-8	3/4	616
D1F 8	8	25.98	19.61	7.95	23.43	18.74	0.75	4.69	2.76	3.08	12.80	9.61	6.30	2.68	1.97	11/4-8	3/4	836
D1F 10	10	30.98	24.02	10.00	28.74	22.99	0.87	5.75	3.35	3.72	16.34	9.61	7.09	2.56	2.44	11/4-8	1	1518
D1F 12	12	32.99	29.45	11.89	32.95	26.81	0.87	6.14	3.74	4.13	17.20	14.09	8.66	3.62	3.46	13/4-8	1	2495
D1F 14	14	35.00	32.44	13.39	35.04	27.95	1.00	7.09	4.13	4.57	17.87	15.67	9.45	3.58	3.19	13/4-8	1	3300
D1F 16	16	39.02	37.56	15.35	38.90	30.83	1.25	8.07	4.72	5.27	18.98	17.01	10.63	4.10	2.99	2-8	1	5500
D1F 18	18	42.99	42.91	17.32	44.88	36.02	1.25	8.86	5.31	5.87	21.93	19.92	12.20	5.07	4.06	21/2-8	1	7260
D1F 20	20	47.01	46.30	19.29	48.03	38.19	1.50	9.84	5.91	6.56	23.46	20.71	13.39	5.09	3.66	21/2-8	1	8536
D1F 24	24	55.00	48.19	23.27	49.80	38.78	1.50	11.02	6.50	7.16	24.21	21.65	14.49	5.10	4.17	21/2-8	1	14300

VALVE + ACTUATOR DIMENSIONS

D2C + B1C / B1J, B1JA
D2D + B1C / B1J, B1JA





MOUNTING POSITION A (STANDARD)

*) See K dimension from Valve dimension tables.

Type	DIMENSIONS, mm					NPT	kg
	X	G	F	V	J		
B1C6	90	260	400	36	283	1/4	4.2
B1C9	110	315	455	43	279	1/4	9.6
B1C11	135	375	540	51	290	3/8	16
B1C13	175	445	635	65	316	3/8	31
B1C17	215	545	770	78	351	1/2	54
B1C20	215	575	840	97	385	1/2	73
B1C25	265	710	1040	121	448	1/2	131
B1C32	395	910	1330	153	525	3/4	256
B1C40	505	1150	1660	194	595	3/4	446
B1C50	610	1350	1970	242	690	1	830

Type	DIMENSIONS, inch					NPT	lbs
	X	G	F	V	J		
B1C6	3.54	10.24	15.75	1.42	11.14	1/4	9
B1C9	4.33	12.4	17.91	1.69	10.98	1/4	21
B1C11	5.31	14.76	21.26	2.01	11.42	3/8	35
B1C13	6.89	17.52	25	2.56	12.44	3/8	68
B1C17	8.46	21.46	30.31	3.07	13.82	1/2	119
B1C20	8.46	22.64	33.07	3.82	15.16	1/2	161
B1C25	10.43	27.95	40.94	4.76	17.64	1/2	289
B1C32	15.55	35.83	52.36	6.02	20.67	3/4	564
B1C40	19.88	45.28	65.35	7.64	23.43	3/4	983
B1C50	24.02	53.15	77.56	9.53	27.17	1	1829

Type	DIMENSIONS, mm					NPT	kg
	X	G	F	V	J		
B1J, B1JA8	135	420	560	43	279	3/8	17
B1J, B1JA10	175	490	650	51	290	3/8	30
B1J, B1JA12	215	620	800	65	316	1/2	57
B1J, B1JA16	265	760	990	78	351	1/2	100
B1J, B1JA20	395	935	1200	97	358	3/4	175
B1J, B1JA25	505	1200	1530	121	448	3/4	350
B1J, B1JA32	540	1410	1830	153	525	1	671

Type	DIMENSIONS, inch					NPT	lbs
	X	G	F	V	J		
B1J, B1JA8	5.31	16.54	22.05	1.69	10.98	3/8	37
B1J, B1JA10	6.89	19.29	25.59	2.01	11.42	3/8	66
B1J, B1JA12	8.46	24.41	31.5	2.56	12.44	1/2	126
B1J, B1JA16	10.43	29.92	38.98	3.07	13.82	1/2	220
B1J, B1JA20	15.55	36.81	47.24	3.82	14.09	3/4	386
B1J, B1JA25	19.88	47.24	60.24	4.76	17.64	3/4	771
B1J, B1JA32	21.26	55.51	72.05	6.02	20.67	1	1479

For reduced bore valves dimensional drawings available on request. Generally the body internals are one size smaller as well as actuator size. This offers remarkably lighter valve/actuator package.

HOW TO ORDER

To specify a control valve, make a selection from each designation below. These codes create a complete valve model code. The valve model number expresses the standard product construction.
An extensive number of unlisted options and variations are available. For options not shown, or to enter an order, contact your local Metso sales representative.

	1	2	3	4	5	6	7	8
Q	D2	D	A	06	A	A	E	02

Q-code	Product options
Q	Low noice trim

1, 2	Valve type & pressure rating
D2C	Trunnion mounted, flanged, ASME Class 150.
D2D	Trunnion mounted, flanged, ASME Class 300.
D1F	Trunnion mounted, flanged, ASME Class 600.
D5C	Trunnion mounted, flanged reduced bore, ASME Class 150.
D5D	Trunnion mounted, flanged reduced bore, ASME Class 300.
D5F	Trunnion mounted, flanged reduced bore, ASME Class 600.

3	Construction type
A	Double seated, two way tight, PTFE bearings. -50 °C ... +230 °C.
B	Single seated, one way tight, high temperature, metal bearings. -50 °C ... +600 °C.
E	Single seated, one way tight, PTFE bearings. -50 °C ... +230 °C.
H	Double seated, two way tight, high temperature, metal bearings. -50 °C ... +600 °C.
C	Cryogenic, PTFE bearings, two way tight. Below -50 °C.
Y	Special, to be specified.

4	Size (inches)

5, 6	Standard materials
	Body (5)
A	ASTM A 351 gr. CF8M.
D	ASTM A 216 gr. WCB.
	Ball (6)
A	ASTM A 351 gr. CF8M.
D	CF8M + NiBo.
R3	CF8M + carbide

7	Seat type	
E	Control metal seat.	-30…+200°C / -22…+390°F
B	High temp. metal seat.	-40…+450°C (+600°C)/ -40…+840°F (+1110°F)
T	Soft seat.	-30…+200°C / -22…+390°F
S	Shut-off metal seat.	-30…+200°C / -22…+390°F
H	Low/high temp. metal seat.	-200 …+400°C (+600°C)/ -330…+750°F (+1110°F)
H3	Low/high temp. metal seat (carbide coating)	-200...+600°C -330...+1110°F

8	Soft seals
02	Body seals graphite and O-rings Viton GF.
03	All seals graphite.

Subject to change without prior notice.

Metso Automation Inc.
Europe, Levytie 6, P.O. Box 310, 00811 Helsinki, Finland.
Tel. +358 20 483 150. Fax +358 20 483 151
North America, 44 Bowditch Drive, P.O. Box 8044, Shrewsbury, MA 01545, USA.
Tel. +1 508 852 0200. Fax +1 508 852 8172
South America, Av. Independência, 2500- Iporanga, 18087-101, Sorocaba-São Paulo, Brazil.
Tel. +55 15 2102 9700. Fax +55 15 2102 9748/49
Asia Pacific, 238A Thomson Road, #25-09 Novena Square Tower A, 307684 Singapore.
Tel. +65 6511 1011. Fax +65 6250 0830
China, 19/F, the Exchange Beijing, No. 118, Jianguo Lu Yi, Chaoyang Dist, 100022 Beijing, China.
Tel. +86-10-6566-6600. Fax +86-10-6566-2575
Middle East, Roundabout 8, Unit AB-07, P.O. Box 17175, Jebel Ali Freezone, Dubai,
United Arab Emirates. Tel. +971 4 883 6974. Fax +971 4 883 6836
www.metso.com/automation

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