

Neles™ V-port segment valve RE-series

Neles RE series V-port segment valves are economical high performance valves in a quarter-turn design. They are offered with a variety of trim options from standard and low Cv trims for general applications, to noise/cavitation Q-Trim™ for reducing aerodynamic noise and preventing cavitation. Standard units are equipped with either diaphragm or cylinder actuators and ND9000™ intelligent valve controllers for precise control, reliability and performance monitoring on-line.

FEATURES

Integral body construction

- Integrally flanged R-Series valves feature one piece body construction with no flange rings, inserts or end caps to create potential leak paths, even if the valve is subjected to pipe bending forces. Seating capabilities are totally unaffected by pipeline forces, which assures reliable valve operation.

Accurate control

- Carefully designed V-ported segment, low torque requirements and clearance-free movement result in good control performance. The design provides steady and gentle contact between the seat and segment at all times to minimize friction while providing tightness. Bearings are located inside the valve body providing larger bearing areas, lower bearing loads and longer bearing life.

Safety and environment

- Rotary operation reduces fugitive emissions dramatically compared to a sliding stem design.

Durable metal seat

- The seat of the R-series V-port segment valve is firm and uniquely durable. The seat is designed in such a way that its sealing surface is not located directly in the flow stream. This gives the seat an extended service life. The working principle is a pressure-aided seat which enables good sealing properties at a low pressure difference. The seat is located inside the valve, which prevents forces from the pipe system influencing the sealing effect. Two-way tight seat is available as an option.



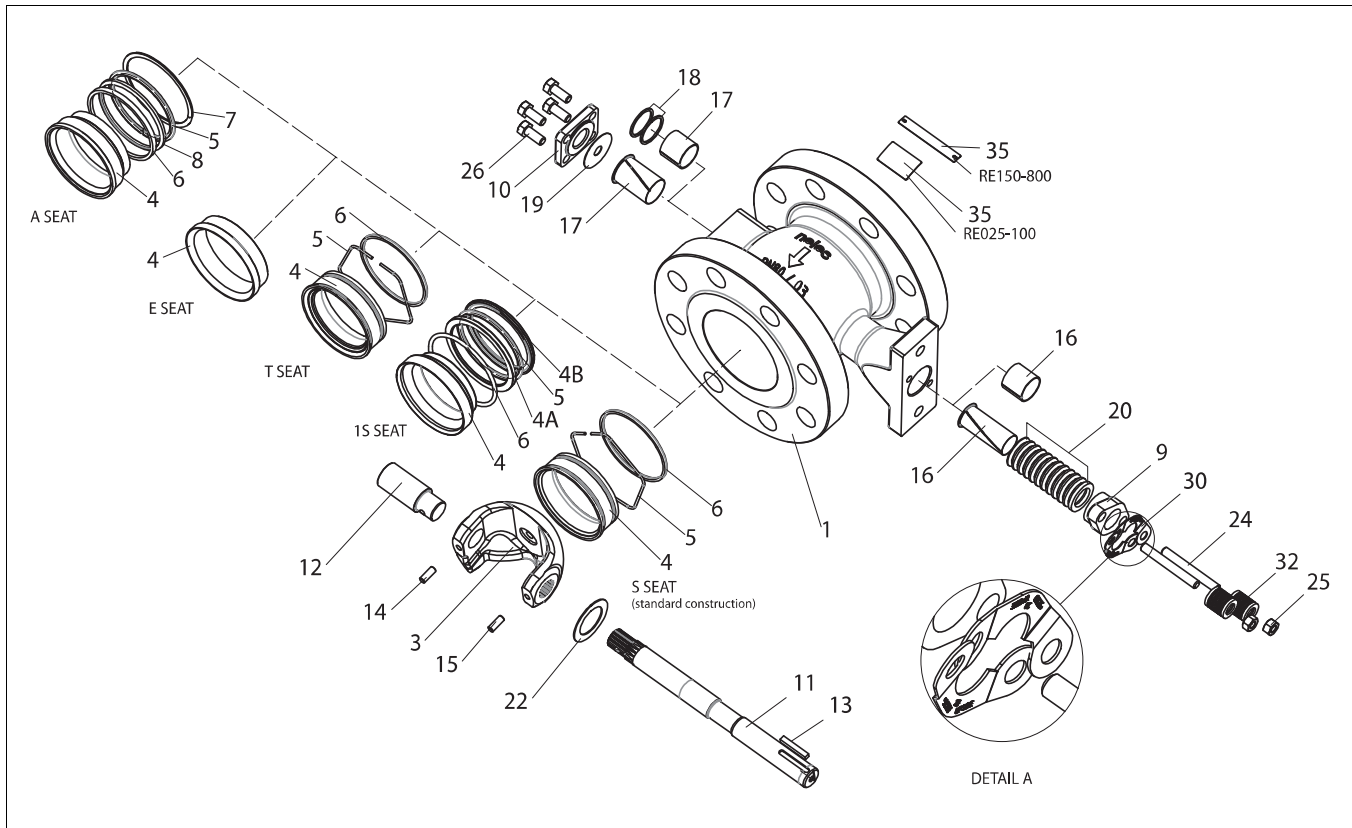
Economical

- Low torque requirements reduce wear, resulting in better reliability. In addition, standard designs carry hard chromium facing on the segment and cobalt based alloy seat, which has been designed to avoid the flow impingement. Together with low load bearing design and live-loaded packing, operational life is improved and maintenance needs are minimized. Low torque combined with the well integrated actuator design provides a lower cost valve unit.

Small flow and low noise/cavitation Q-Trim options

- DN25/1" valves feature five different segments. They extend the valves' application range to very low-flow high accuracy services, such as additive and coloring lines, pilot plants etc. Cavitation and aerodynamic noise are reduced with the patented Q-Trim option. This self-cleaning design handles contaminated flows (impure steam, river water, etc.) without plugging.

Exploded view



Parts list (standard construction)*

Part	Name	Body material	
		Stainless steel	Carbon steel
1	Body	ASTM A351 gr. CF8M	ASTM A216 gr. WCB
3	V-port segment	AISI 329 + chromium / CG8M + chromium ¹⁾	AISI 329 + chromium / CG8M + chromium ¹⁾
4	Seat	AISI 316 + Cobalt based alloy / PTFE ¹⁾	AISI 316 + Cobalt based alloy / PTFE ¹⁾
4A	Back ring	AISI 316	AISI 316
4B	Support ring	AISI 316	AISI 316
5	Lock spring	INCONEL 625	INCONEL 625
6	Back seal	Stainless steel + PTFE / Viton GF / Graphite	Stainless steel + PTFE / Viton GF / Graphite
7	Retaining ring	EN 10028-1.4571	EN 10028-1.4571
8	Support ring	AISI 316	AISI 316
9	Gland follower	ASTM A351 gr. CF8M	ASTM A351 gr. CF8M
10	Blind flange	ASTM A351 gr. CF8M	ASTM A351 gr. CF8M
11	Drive shaft	AISI 329 / 17-4PH ¹⁾	AISI 329 / 17-4PH ¹⁾
12	Shaft	AISI 329 / 17-4PH ¹⁾	AISI 329 / 17-4PH ¹⁾
13	Key	AISI 329	AISI 329
14	Cylindrical pin	AISI 329 / 17-4PH ¹⁾	AISI 329 / 17-4PH ¹⁾
15	Cylindrical pin	AISI 329 / 17-4PH ¹⁾	AISI 329 / 17-4PH ¹⁾
16	Bearing	PTFE + SS net / cobalt based alloy ¹⁾	PTFE + SS net / cobalt based alloy ¹⁾
17	Bearing	PTFE + SS net / cobalt based alloy ¹⁾	PTFE + SS net / cobalt based alloy ¹⁾
18	Thrust bearing	Cobalt based alloy ¹⁾	Cobalt based alloy ¹⁾
19	Sealing plate	Graphite / PTFE	Graphite / PTFE
20	Packing	Graphite / PTFE	Graphite / PTFE
22	Filling ring (only low Cv 1"/DN 25)	Stainless Steel AISI 316	Stainless Steel AISI 316
24	Stud	ISO 3506 A4-80/B8M	ISO 3506 A4-80/B8M
25	Hexagon nut	ISO 3506 A4-80/B8M	ISO 3506 A4-80/B8M
26	Hexagon bolt	ISO 3506 A4-80/B8M	ISO 3506 A4-80/B8M
30	Retainer plate	AISI 316	AISI 316
32	Spring stack	SIS 2324 & CrMo Steel + ENP	SIS 2324 & CrMo Steel + ENP
35	Identification plate	AISI 316	AISI 316

¹⁾ Alternative materials

* The parts are not in number order since certain part has dedicated part number.

Technical specifications

Type

Integrally flanged V-port segment, quarter-turn valve

Pressure ratings are as follows:

Body: ASME 150-300 (1"-32")
ASME 600 (1"-4")
PN 10-40 (1"-32")
PN63, PN100(1")

Body pressure ratings on page 5.

Trim: Valve differential pressure ratings on page 6.

Sizes

Inch 1", 1 1/2", 2", 2 1/2", 3", 4", 6", 8", 10", 12", 14", 16", 20", 24", 28", 32"

DN 25, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 500, 600, 700, 800

End-connections

Flanged

Face-to-face dimensions

ASME/ISA 75.08.02, IEC 60534-3-2.

Temperature range

-52...+260 °C / -60...+500 °F with soft bearings

-52...+315 °C / -60...+599 °F with metal bearings

-52...+425 °C / -60...+797 °F with metal bearing and high temperature seats.

Inherent flow characteristic

Equal percentage.

Fire safety

Fire safe design to meet ISO 10497:2010 - API 607, seventh edition.

Maximum C_v-coefficients for RE-series valves

Size		Metal seat, S	Q-trim, S-seat	Metal seat, 1S	Q-trim, 1S-seat	Soft seat, T	Q-trim, T-seat	Metal seat, A	Q-trim, A-seat
DN	INCH	Cv 100 % ¹⁾	Cv 100 % ²⁾	Cv 100 %	Cv 100 %	Cv 100 %	Cv 100 %	Cv 100 %	Cv 100 %
25	1	45	-	24	-	21	-	-	-
40	1.5	110	-	58	-	61	-	-	-
50	2	163	47	115	30	110	29	130	39
65	2.5	280	96	210	72	215	74	-	-
80	3	420	160	342	130	340	130	350	150
100	4	620	250	510	210	520	210	540	220
150	6	1260	540	1160	500	1070	459	1100	500
200	8	2030	880	1910	830	1760	763	1800	835
250	10	3210	1510	3050	1440	2830	1331	3000	1420
300	12	4490	2140	4340	2070	4080	1945	-	-
350	14	6440	3160	6220	3050	5750	2821	-	-
400	16	8510	4180	8330	4090	7630	3748	-	-
500	20	13020	6600	12560	6370	11670	5916	-	-
600	24	19700	9230	19700	9230	-	-	-	-
700	28	25300	13700	25300	13700	-	-	-	-
800	32	32000	16181	32000	16181	-	-	-	-

1) 100 % corresponds to 95° turning angle

2) For Q-R-valves, 100 % corresponds to 90° turning angle

Oxygen construction

Only for gaseous oxygen service.

Shut-off classification

IEC 60534-4/ANSI/FCI 70.2 Class IV, optionally Class V with high Δp testing pressure.

10 x ISO 5208 Rate D.

See also table on this page.

Flow capacity

See table on this page.

Valve trim rotation

Clockwise to close.

Options

Q-trim:

Inch 2", 2 1/2", 3", 4", 6", 8", 10", 12", 14", 16", 20", 24", 28", 32"

DN 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 500, 600, 700, 800

Reduced Cv trim: For DN 25 / 1" valve only.

Valve body and seat test

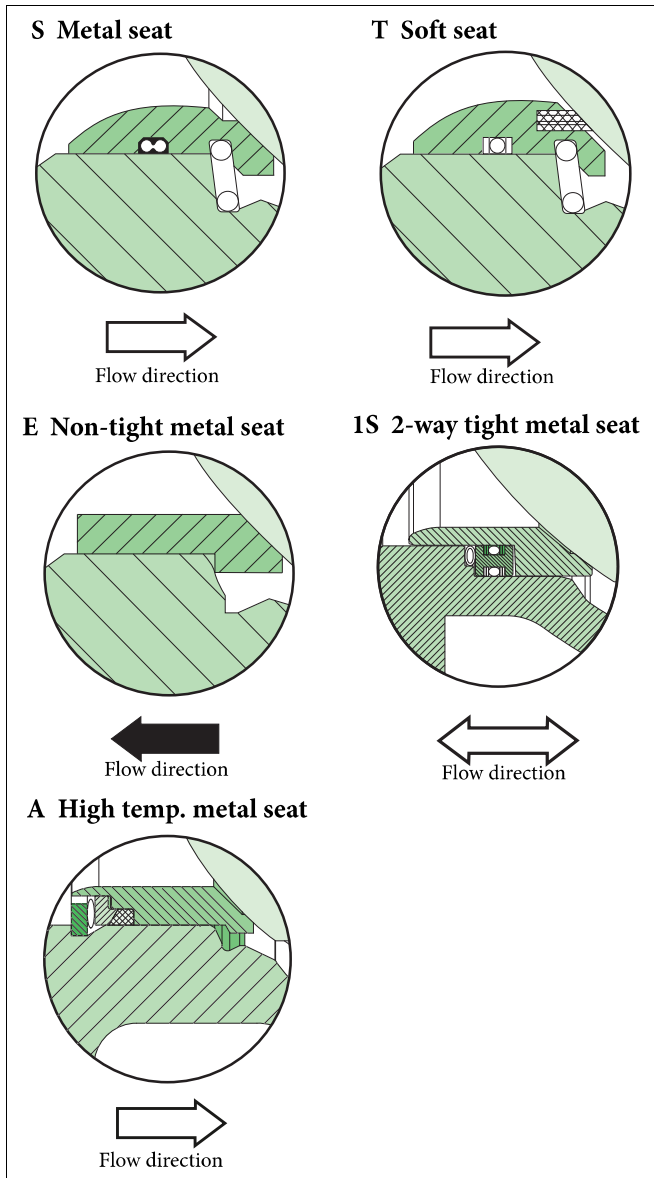
All valves manufactured by Valmet undergo pressure testing.

The test pressure of R-series valve body is 1.5 x the pressure rating and the standard test pressure of seat is 3,5 barG

according to IEC 60534 / ANSI/FCI 702 Class IV. The test medium is water containing a corrosion inhibitor.

Seat design options shown on the next page.

Seat design options shown on the next page.



Seat designs

S Metal seat

Seat:	316 SS + Cobalt based hard facing, sizes 1" - 20" / DN 32 - 800
Spring:	Inconel 625
Seat seal:	Filled PTFE lipseal / SS Elgiloy spring
Temp. range:	-52...+315 °C / -60 ...+599 °F
Service:	General

T Soft seat

Seat:	316 SS with PTFE + X-treme™, sizes 1" - 6" 316 SS with PTFE + C25 % insert, sizes 8" - 32"
Spring:	Inconel 625
Seat seal:	Filled PTFE lipseal
Back seal:	PTFE
Temp. range:	-52...+260 °C / -60 ...+500 °F
Service:	General service with tight shut-off.

E Non-tight metal seat

Seat:	Cobalt based alloy
Temp. range:	-80...+425 °C / -112 ...+797 °F
Service:	Extremely erosive applications, non-tight.
NOTE !	Flow direction is reversed.

IS 2-way tight metal seat

Seat:	316 SS + Cobalt based hard facing, sizes 1" - 32" / DN 25 - 800
Spring:	Inconel 625
Seat seal:	Viton GF
Temp. range:	-30...+200 °C / -22 ...+392 °F
Service:	General

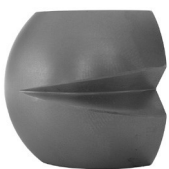
A High temp. metal seat

Seat:	A: SS 316 + Cobalt based hard facing A1: SS 316 + CrC facing (with K segment)
Spring:	Inconel 625
Seat seal:	Graphite
Temp. range:	-52...+425 °C, -60...+797 °F
Service:	General service

Note: Available with model code A only (11. sign)

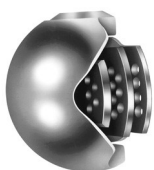
Construction options

Low C_v trims



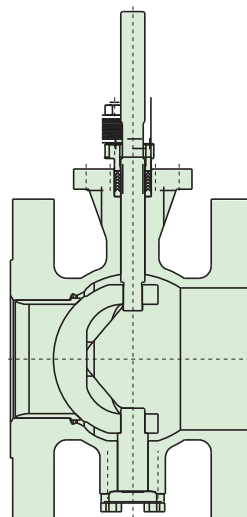
Reduced C_v trims are available on the DN25/1" valve to control very low flows with high accuracy. The narrow orifice is a self-flushing design because the trim orifice is continually increasing.

Q-trim™ valve trim for cavitation/noise abatement



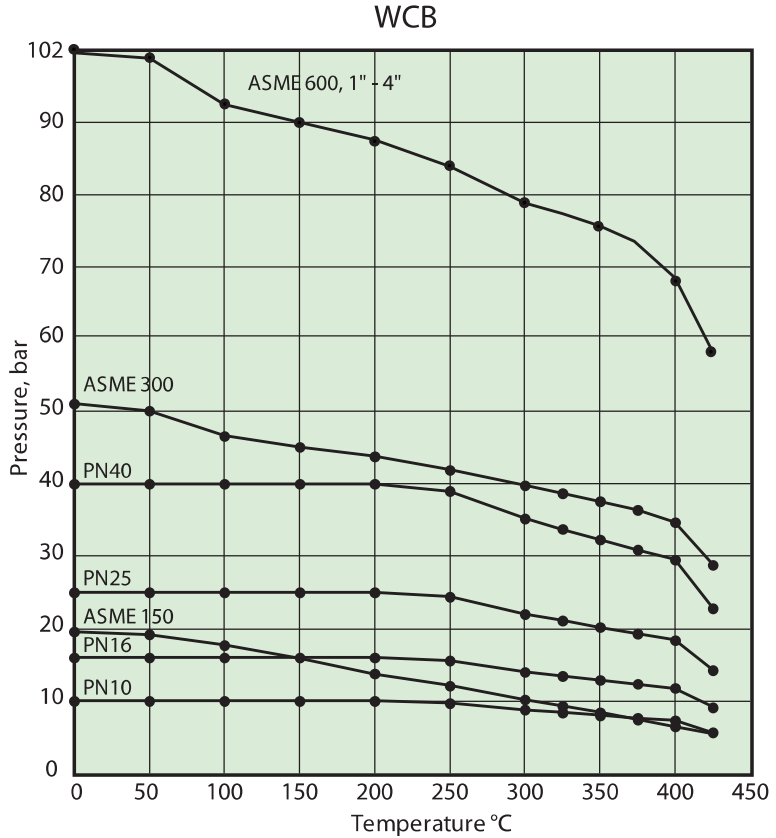
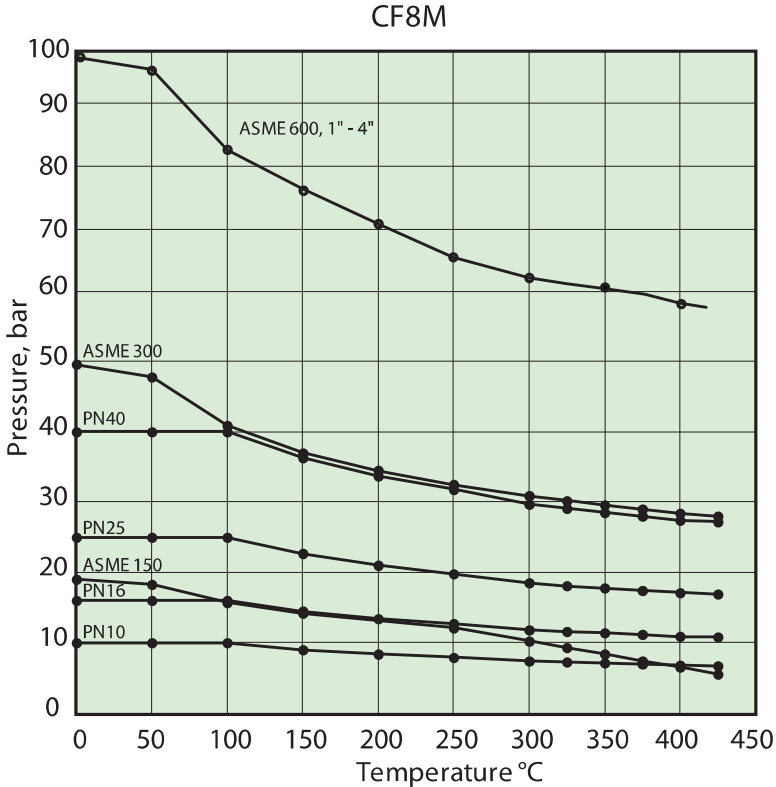
Liquid cavitation and aerodynamic noise problems can be solved with the patented Q-Trim™ valve trim. This design employs the two well-known principles of dividing the pressure drop into a series of small pressure drops and of separating the flow stream into many small jet streams. The use of these two principles combined with the rotation of the attenuator elements provides a combination of cavitation/noise abatement with high rangeability, high capacity and capability to handle impure fluids.

Erosion resistant version

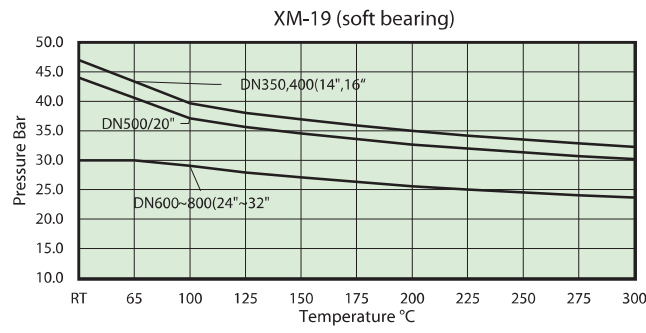
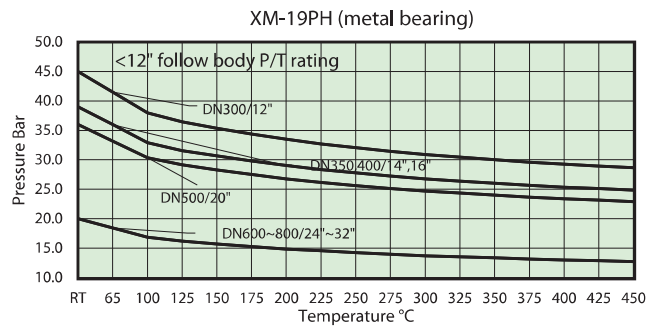
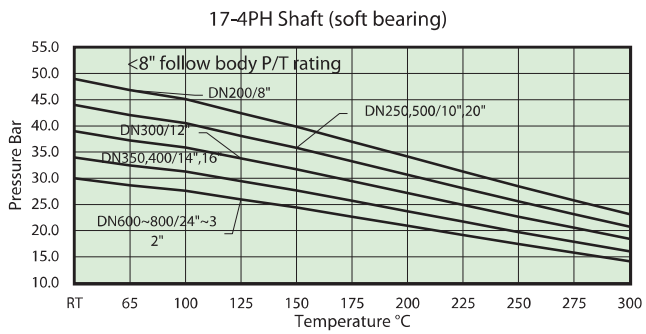
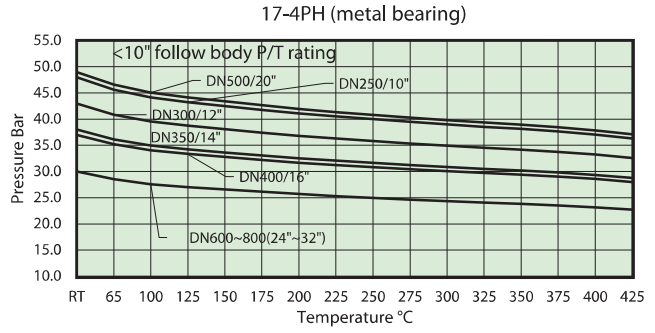
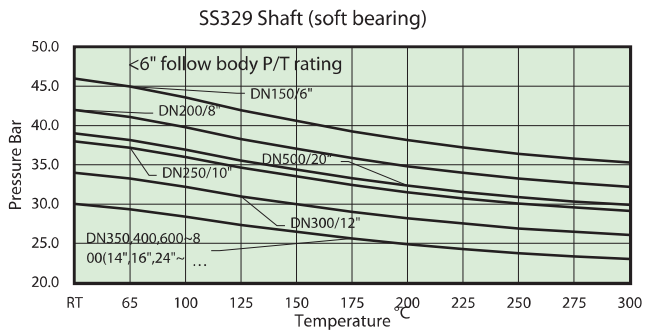


This heavy duty erosion resistant design handles contaminated flows and abrasive media at a favorable cost/useable life ratio. The seat is machined from cobalt chromium alloy and the seat design is changed from normal to reverse flow for maximum abrasion resistance. This version should not be used for isolation service since the seat is not in contact with the segment.

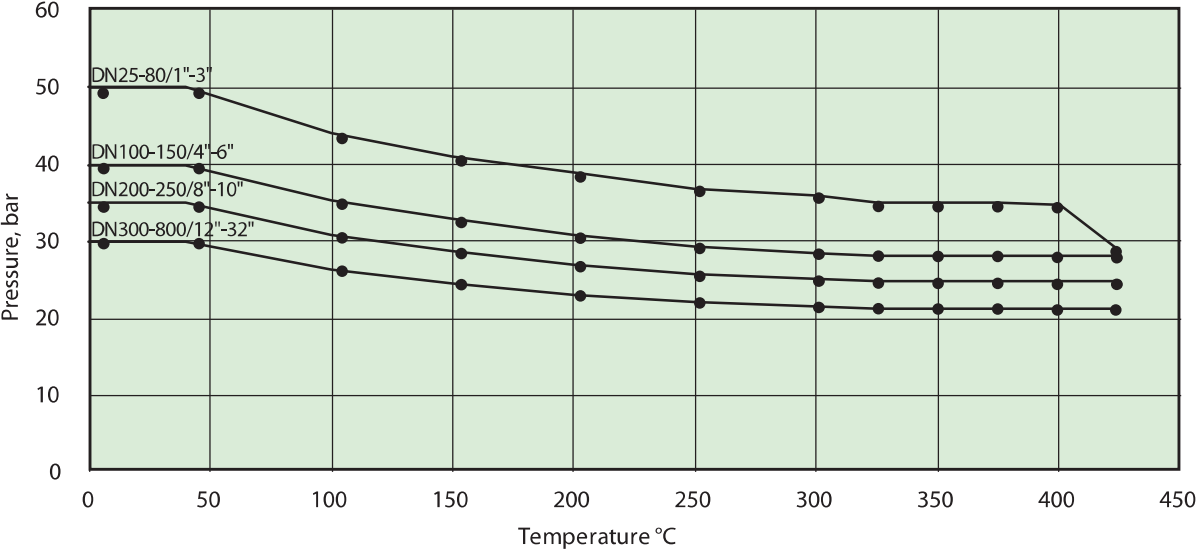
Body pressure ratings



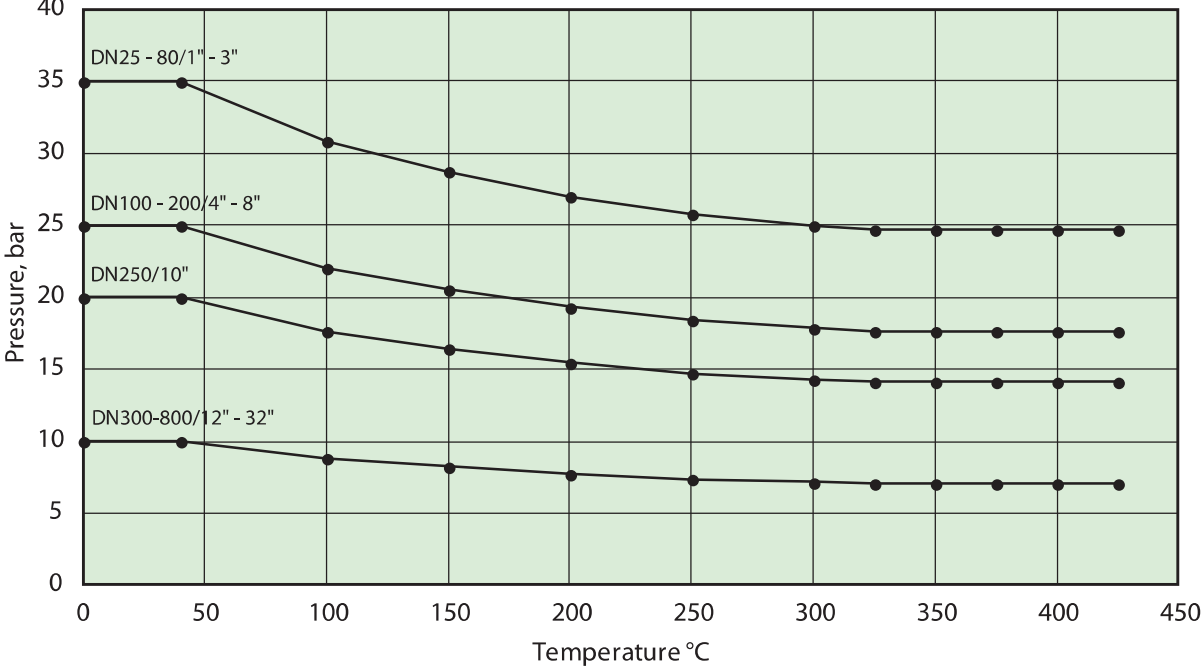
Maximum operating pressure differential in shut-off service



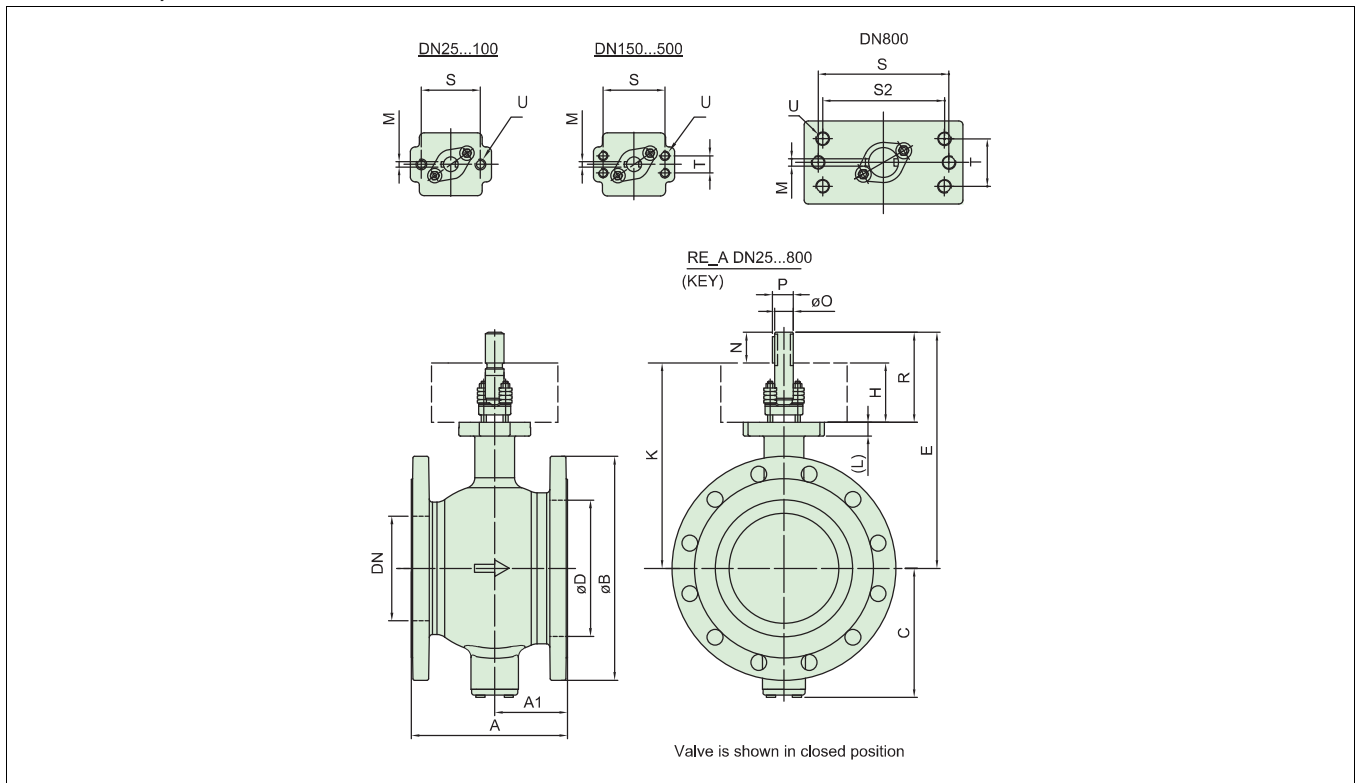
Max operating pressure differential in control service, RE
opening range 0 %-70 %



Max operating pressure differential in control service,
RE opening range 70 %-100 %



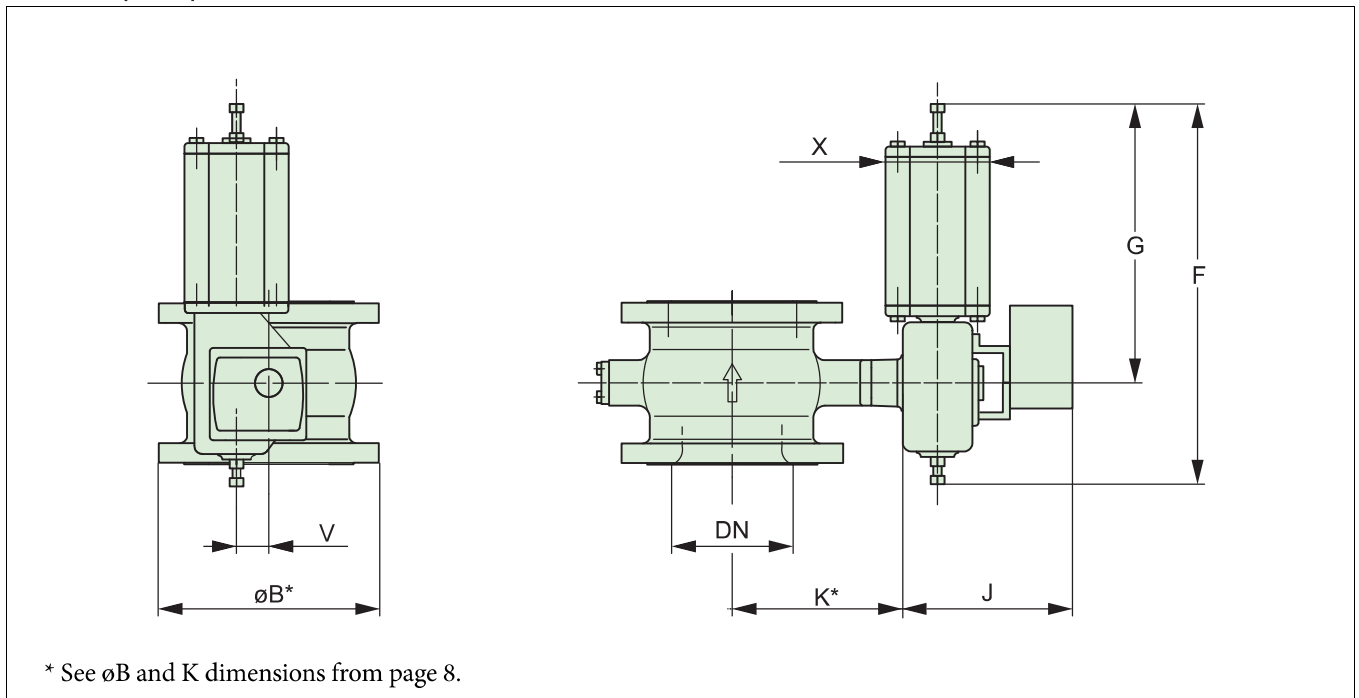
Dimensions, Series RE



DN/inch	Dimensions, mm										Shaft dimensions, mm					
	A1	A	C	øD	K	S/S2	T	U	L	H	RE_A (Key)					
											E	R	øO	M	P	N
25/1"	51	102	56	33	182	70	-	M10	15.5	80	207	105	15	4.76	17	25
40/1 1/2"	57	114	65	49	188.5	70	-	M10	15.5	80	213.5	105	15	4.76	17	25
50/2"	62	124	91	60	199.5	70	-	M10	15.5	80	224.5	105	15	4.76	17	25
65/2 1/2"	72.5	145	97	75	205	70	-	M10	15.5	80	231	105	15	4.76	17	25
80/3"	82.5	165	108	89	232	90	-	M12	16	90	267	125	20	4.76	22.2	35
100/4"	97	194	120	113	241	90	-	M12	16	90	276	125	20	4.76	22.2	35
150/6"	114.5	229	174	164	290	110	32	M12	22	90	335	135	25	6.35	27.8	46
200/8"	111.5	243	201	205	345	130	32	M12	22	110	395	160	30	6.35	32.9	51
250/10"	138.5	297	251	259	387	130	32	M12	26	110	445	168	35	9.53	39.1	58
300/12"	154	338	269	300	445	160	40	M16	26	120	485	188	40	9.53	44.2	68
350/14"	175	400	311	350	486	160	40	M16	29	120	513	200	45	12.70	50.4	80
400/16"	160	400	353	400	553	160	55	M20	29	140	584	230	50	12.70	55.5	90
500/20"	233	508	420	500	618	230	90	M24	40	180	727	292	70	19.05	78.2	119
600/24"	355	610	490	600	704	330/304.7	120	M30	40	220	838	354	75	19.05	81.9	134
700/28"	295	710	539	700	768	330/304.7	120	M30	55	220	914	366	85	22.23	95.3	146
800/32"	380	840	635	800	871.5	330/304.7	120	M30	55	220	1052	402	105	25.4	114.5	180

DN/inch	Flange dimensions (B) and weights											
	ASME 150		ASME 300/ASME 600		PN 10		PN 16		PN 25		PN 40/63/100	
	øB	Kg	øB	Kg	øB	Kg	øB	Kg	øB	Kg	øB	Kg
25/1"	108	3.6	124	4.3/5.2	115	4.6	115	4.6	115	4.6	115/125/125	4.3/5.2/5.2
40/1 1/2"	127	4.6	155	7.5/8.5	150	6.2	150	6.2	150	6.2	150	6.2
50/2"	152	7.4	165	9.5/11.4	165	8.8	165	8.8	165	8.8	165	8.8
65/2 1/2"	180	13	190	13/-	185	13	185	13	185	13	185	13
80/3"	191	14	210	19/22.6	200	16	200	16	200	16	200	16
100/4"	229	21	254/275	29/41.4	220	18	220	18	235	21	235	21
150/6"	279	39	318	54	285	37	285	37	300	42	300	42
200/8"	343	62	381	83	340	56	340	60	360	64	375	71
250/10"	406	91	450	139	405	85	405	84	425	101	450	125
300/12"	483	142	520	199	460	124	460	123	485	148	520	182
350/14"	534	203	584	284	505	178	520	183	555	223	580	266
400/16"	597	264	648	355	565	234	580	239	620	290	660	346
500/20"	699	550	775	600	670	415	715	435	730	530	755	700
600/24"	815	967	915	1165	780	900	840	973	845	1033	890	1039
700/28"	925	1249	1035	1512	897	1088	910	1129	960	1209	-	-
800/32"	1060	1850	1150	-	1105	1550	1025	1570	1085	1790	-	-

RE - B1C, B1J, B1JA



B1C Actuator

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

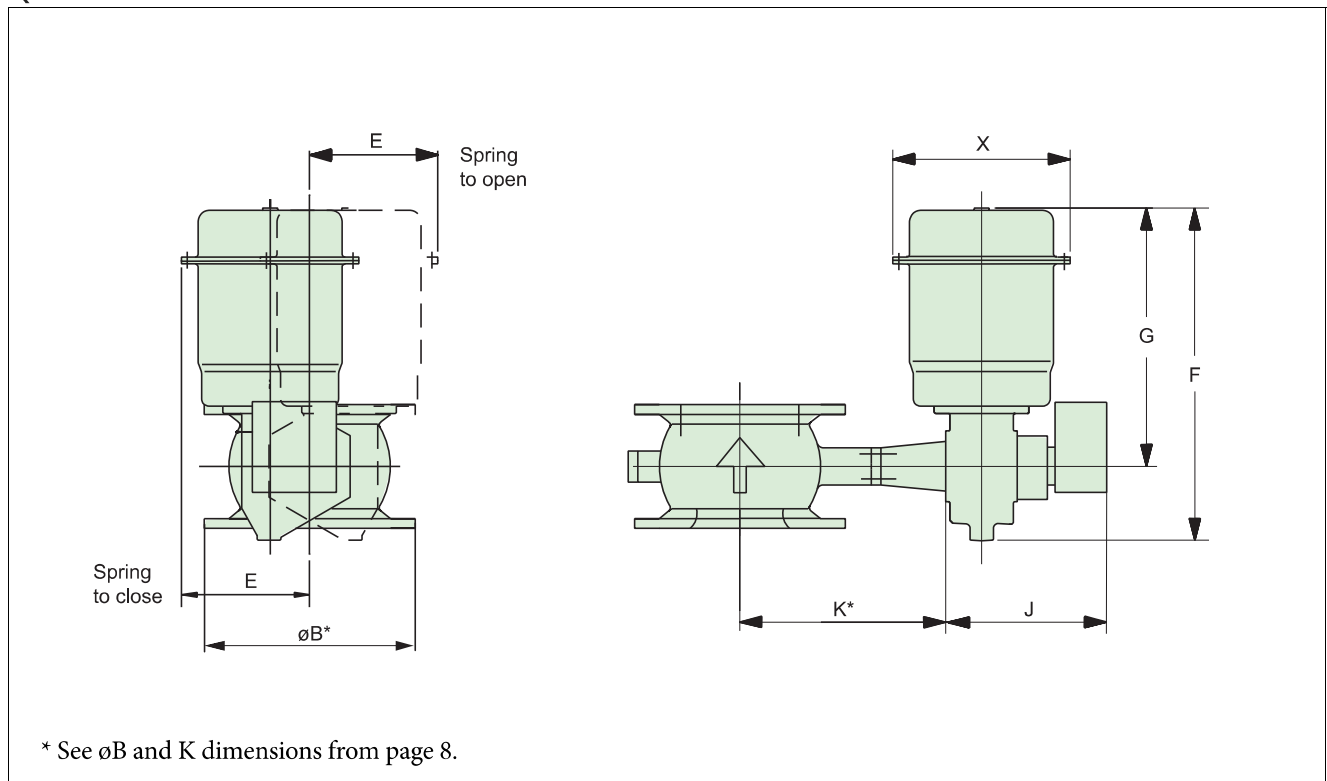
B1J/B1JA Actuator

Actuator	DIMENSIONS, mm					NPT	kg
	F	G	J	V	X		
B1J/B1JA6	485	368	273	36	110	3/8	8
B1J/B1JA8	560	420	279	43	135	3/8	17
B1J/B1JA10	650	490	290	51	175	3/8	30
B1J/B1JA12	800	620	316	65	215	1/2	57
B1J/B1JA16	990	760	351	78	265	1/2	100
B1J/B1JA20	1200	935	358	97	395	3/4	175
B1J/B1JA25	1530	1200	448	121	505	3/4	350
B1J/B1JA32	1830	1410	525	153	540	1	671
B1J/B1JA40	2095	1578	580	194	724	1	1100

Actuator	DIMENSIONS, inch					NPT	kg
	F	G	J	V	X		
B1C6	15.75	10.24	11.14	1.42	3.54	1/4	9
B1C9	17.91	12.40	10.98	1.69	4.33	1/4	21
B1C11	21.26	14.76	11.42	2.01	5.31	3/8	35
B1C13	25.00	17.52	12.44	2.56	6.89	3/8	68
B1C17	30.31	21.46	13.82	3.07	8.46	1/2	119
B1C20	33.07	22.64	15.16	3.82	8.46	1/2	161
B1C25	40.94	27.95	17.64	4.76	10.43	1/2	289
B1C32	52.36	35.83	20.67	6.02	15.55	3/4	564
B1C40	65.35	45.28	23.43	7.64	19.88	3/4	983
B1C50	77.56	53.15	27.17	9.53	24.02	1	1829

Actuator	DIMENSIONS, inch					NPT	kg
	F	G	J	V	X		
B1J/B1JA6	19.09	14.49	10.75	1.42	4.33	3/8	20
B1J/B1JA8	22.05	16.54	10.98	1.69	5.31	3/8	37
B1J/B1JA10	25.59	19.29	11.42	2.01	6.89	3/8	66
B1J/B1JA12	31.50	24.41	12.44	2.56	8.46	1/2	126
B1J/B1JA16	38.98	29.92	13.82	3.07	10.43	1/2	220
B1J/B1JA20	47.24	36.81	14.09	3.82	15.55	3/4	386
B1J/B1JA25	60.24	47.24	17.64	4.76	19.88	3/4	771
B1J/B1JA32	72.05	55.51	20.67	6.02	21.26	1	1479
B1J/B1JA40	82.48	62.13	22.8	7.64	28.5	1	2424

QPX-RE



Actuator size	E	F	G	J	X	Weight, kg
1	142	382	330	225	213	12
2	142	382	330	284	213	18
3	190	565	446	346	274	30
4	228	635	495	407	320	48
5	276	768	608	522	382	94

How to order

Example: The following example is for an RE flanged valve, with an ASME Class 300 body (D), standard construction (A), 3" size with WCB carbon steel body (D), duplex stainless steel V-port segment with HCr chromium coating (J), duplex

stainless steel shaft and pins, PTFE bearings on SS316 net (J), metal seats (S), live loaded PTFE V-ring packing (T), flange facing roughness Ra 3.2 - 6.3, smooth finish (/ -).

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	
Q-	RE	D	A	03	D	J	J	S	T	/	A

1. Sign	Trim codes
-	Standard V-port (no sign)
Q-	Low noise and anti-cavitation trim (for DN 50 / 2" and bigger)
C005-	Maximum Cv = 0.5 (for DN 25 / 1" only)
C015-	Maximum Cv = 1.5 (for DN 25 / 1" only)
C05-	Maximum Cv = 5.0 (for DN 25 / 1" only)
C15-	Maximum Cv = 15.0 (for DN 25 / 1" only)

2. Sign	Product series
RE	Flanged one piece body, V-port segment, face-to-face acc. to ISA 75.08.02 and IEC 60534-3-2.

3. Sign	Pressure rating and flange drilling
C	ASME 150 (1" - 32")
D	ASME 300 (1" - 32")
F	ASME 600 (1" - 4")
J	PN 10 (DN 200 - DN 800)
K	PN 16 (DN 100 - DN 800)
L	PN 25 (DN 200 - DN 800)
M	PN 40 (DN 25 - DN 600)
R	JIS 10K flanges, based on body casting of ASME 300 (1" - 28")
S	JIS 16K flanges, based on body casting of ASME 300 (1" - 28")
T	JIS 20K flanges, based on body casting of ASME 300 (1" - 28")
Y	Special, to be specified

4. Sign	Construction
A	Standard, drive shaft with ANSI keyway to actuator.
Z	Oxygen construction -BAM listed non-metallic materials (only for Gaseous Oxygen Service) -Temperature: -50...+200 °C -Max pressure 20 bar or as per body rating, whichever is lower -Applicable body materials (6th sign): A, C -Applicable shaft/bearing (8th sign): J, N, S, C -Applicable seats (9th sign): S, S2 -Applicable packing (10th sign): G -Cleaning acc. to internal procedure Recommended type code: RE_Z__AJJSG

5. Sign	Size
	Inch 1", 1 1/2", 2", 2 1/2", 3", 4", 6", 8", 10", 12", 14", 16", 20", 24", 28", 32" DN 25, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 500, 600, 700, 800

6. Sign	Body & screw materials
D	ASTM A216 gr. WCB / 1-0619 (blind flange & gland bolting SS A4-80/B8M)
A	ASTM A351 gr. CF8M / 1.4408 (blind flange & gland bolting SS A4-80/B8M)
T	Titanium (blind flange & gland bolting of titanium)

Note: Bodies have double material marking.

7. Sign	Segment materials
J	Type AISI 329+HCr
C	CG8M + HCr
S	Type AISI 329
K	CG8M + CrC
T	Titanium + ceramic coating
V	Titanium without coating

8. Sign	Shaft, pin & bearing materials
J	Type AISI 329 & PTFE on SS316 net
S	17-4 PH / Cobalt based alloy (NPS 2" - 10" / DN 50 - 250) (max +425 °C)
T	Titanium / PVDF

9. Sign	Seat
A	316 SS + cobalt based hard facing High temp. metal seat
S	S 316 SS + Cobalt based hard facing, back seal PTFE lip seal.
S2	SS 316 + CrC hardfacing (with K segment)
T2	X-treme, metal body, back seal PTFE lip seal, sizes 1"-6" PTFE+CrC25 %, metal body, back seal PTFE lip seal, size 8" - 32"
P	On-off metal seat
E	Cobalt based alloy, erosion-resistant version non-tight
1S	1S 316 SS + Cobalt based hard facing, 2-way tight metal seat
A1	SS 316 + CrC hardfacing (with K segment)
U	Titanium metal seat
T5	Titanium soft seat

10. Sign	Stem packing & blind flange seal
T	PTFE V-rings, live loaded
G	Graphite rings, live loaded (fire-safe)

11. Sign	Model code
-	Version - is used only with NPS1, NPS1H, NPS2H and NPS12 and above / DN25, DN40, DN65 and DN300 and above
A	Version A is used only with NPS02, NPS03-10 / DN50, DN80-DN250

12. Sign	Flange facing
/ -	ASME B16.5 (Ra 3.2 - 6.3 / RMS 125-250) Cover EN1092-1 Type B1

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Neles™ V-port segment valve RA-series

Neles V-port valve in the R-series is primarily intended as a control valve, but it can also be used for shut-off service. The R-series V-port segment valve is a good general control valve for most pulp and paper process applications. The valve can be fitted with an aerodynamic noise- and liquid cavitation-reducing (for example, steam and gas applications) Q-Trim™ segment. A low capacity segment is available for the DN25 valve.



Features

Single-piece valve body

- R-series valves have single-piece bodies, which prevents leaks caused by separate flanges or locking rings.

Durable metal seat

- The seat of the R-series V-port segment valve is firm and uniquely durable. The seat is designed in such a way that its sealing surface is not located directly in the flow stream. This gives the seat an extended service life. The working principle is a pressure-aided seat which enables good sealing properties at a low pressure difference. The seat is located inside the valve, which prevents forces from the pipe system influencing the sealing effect.

PTFE seat

- The R-series V-port segment valve is also available with a soft seat. This is primarily intended for applications where a hard chromium plated segment is unsuitable, e.g. for acids and acidic liquids. This structure contains an Xtreme™ seat, fitted in a body made of stainless steel.

Bearings

- The bearings are located in the valve body, away from the flow stream, with a large bearing surface, offering a low bearing pressure and a long service life.

Smooth action

- Because of the double bearing, the pre-tightened spring-loaded gland packing, and the low seat friction, the torque requirement of the R-series V-port segment valve is low. For this reason the size of actuator required is small. As a consequence, the control valve package combines low overall costs with good control performance.

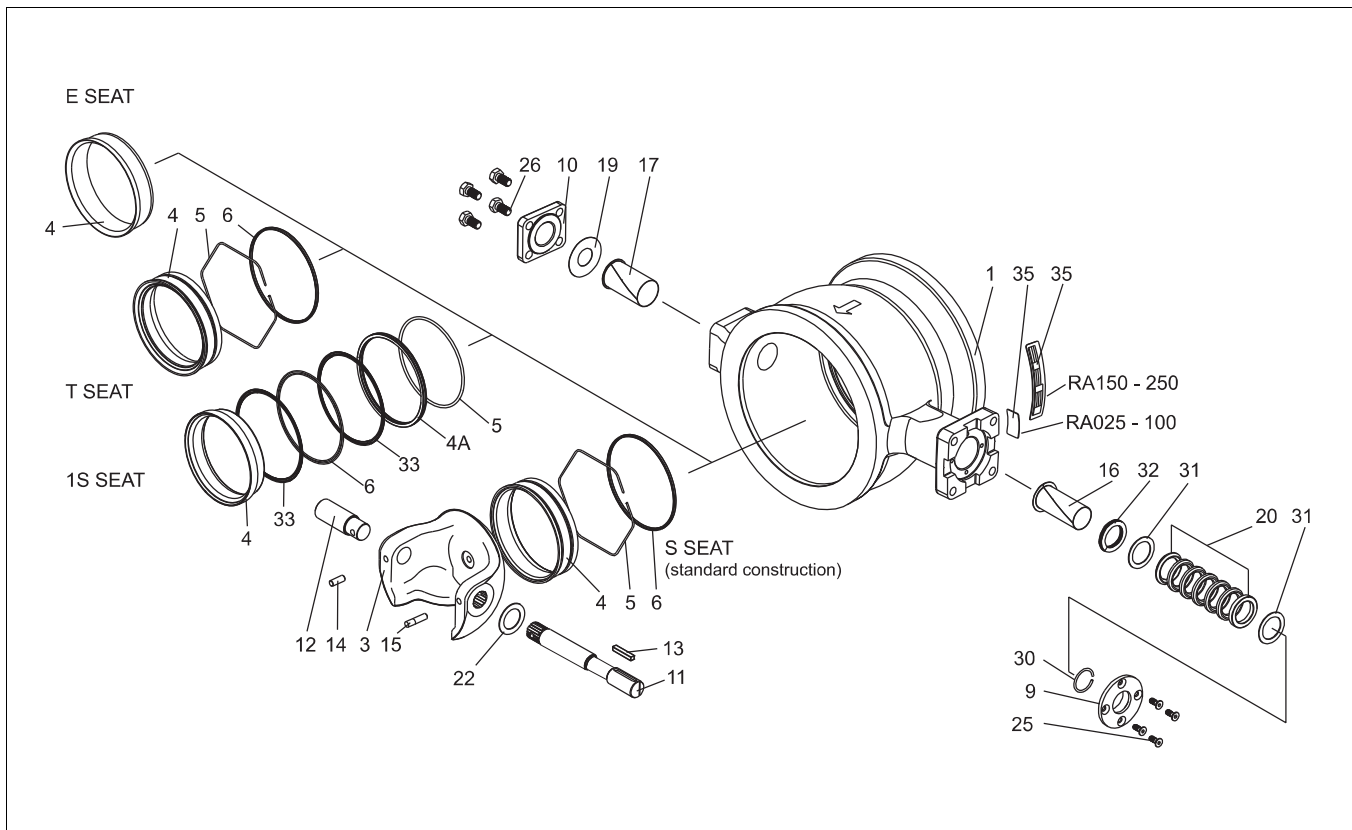
Q-Trim™

- Most pulp and paper mills have maximum noise levels for control valves. These limits are easily exceeded, especially for gas and steam applications, when using standard valves. High pressure drops, which occur during control of water and liquid flows, generate cavitation which may cause damage to the pipe system. The solution to these applications is the Q-Trim design. Impurities will not block the valve because of the self-cleaning design. The design can be used for media such as impure steam, black liquor, and even 3.5 % pulp.

Low capacity

- Four different low capacity C_v trims are available for the DN25 valve. These enable high accuracy control of small flows. Typical applications are, for example, dyes and other additives on a paper machine.

Exploded view



Parts list (standard construction)*

Part	Name	Body material
1	Body	ASTM A351 gr. CF8M
3	V-port segment	SIS 2324 + chromium / SIS 2324 / AISI 329
4	Seat	Cobalt based alloy / PTFE 1)
4A	Back ring	AISI 316
5	Lock spring	INCONEL 625
6	Back seal	Stainless steel + PTFE
9	Gland follower	ASTM A351 gr. CF8M
10	Blind flange	ASTM A351 gr. CF8M
11	Drive shaft	SIS 2324/AISI 329 duplex SS
12	Shaft	SIS 2324/AISI 329 duplex SS
13	Key	SIS 2324/AISI 329
14	Cylindrical pin	SIS 2324/AISI 329
15	Cylindrical pin	SIS 2324/AISI 329
16	Bearing	PTFE + SS net
17	Bearing	PTFE + SS net
19	Sealing plate	Graphite
20	Packing	PTFE
22	Filling ring (only low Cv 1"/DN 25)	Stainless Steel AISI 316
25	Countersunk screw	ISO 3506 A2-70
26	Hexagon bolt	ISO 3506 A2-70
30	Retainer ring	AISI 316
31	Sheet ring	AISI 316
32	Wave spring	AISI 316
35	Identification plate	AISI 304

* The parts are not in number order since certain part has dedicated part number.

TECHNICAL SPECIFICATIONS

Type

Reduced-bore quarter-turn valve
– RA mounted between flanges

Pressure ratings

Body

RA: ASME 300 / PN 40

Trim: See table below

Valve size DN / inch	Max. shut-off dp, (bar)
025 / 1"	50
040 / 1 1/2"	50
050 / 2"	50
065 / 2 1/2"	50
080 / 3"	50
100 / 4"	40
150 / 6"	40
200 / 8"	35
250 / 10"	35

Size

RA: DN25, 40, 50, 65, 80, 100, 150, 200, 250

Face-to-face dimensions

RA According to internal standard

Temperature range

-40... +260 °C.

Inherent flow characteristic

Equal percentage.

Tightness

Tightness testing is done in the flow direction. The standard tightness of the metal-seated V-port segment valve is ANSI/FCI 70.2 Class IV.

Pressure and tightness testing of the valve

Every valve manufactured by Valmet is subjected to a body pressure test and a trim tightness test. The test pressure of a R-series body is 1.5 x the maximum operating pressure. The pressure of the tightness test is 3,5 barG according to IEC 60534 / ANSI/FCI 702 Class IV. The testing medium is water.

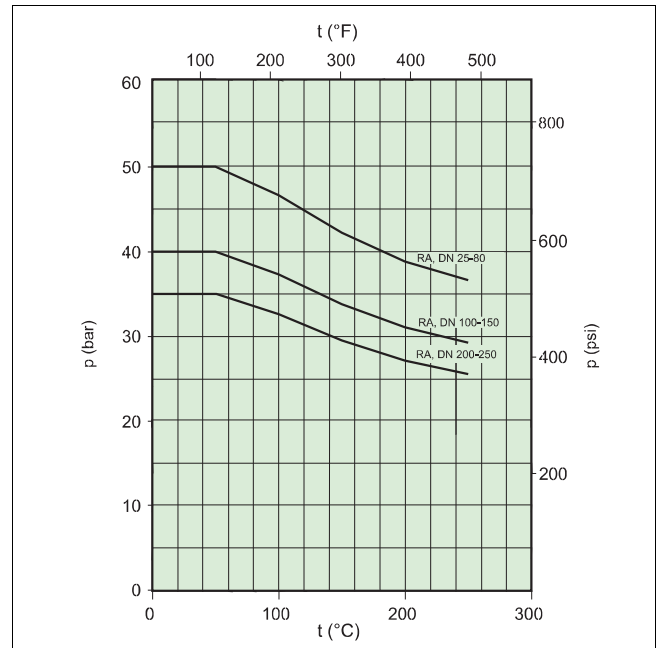
Maximum C_v-values for RA series valves

Size		Metal seat, S	Q-Trim	Metal seat, 1S	Q-Trim with 1S	Soft seat, T2
DN	Inch	C _v 100 % ¹⁾	C _v 100 % ²⁾	C _v 100 % ¹⁾	C _v 100 % ²⁾	C _v 100 % ¹⁾
25	1	45	-	24	-	21
40	1 1/2	110	-	58	-	61
50	2	163	47	115	30	110
65	2 1/2	280	96	210	72	215
80	3	420	160	342	130	340
100	4	620	250	510	210	520
150	6	1260	540	1160	500	1070
200	8	2030	880	1910	830	1760
250	10	3210	1510	3050	1440	2830

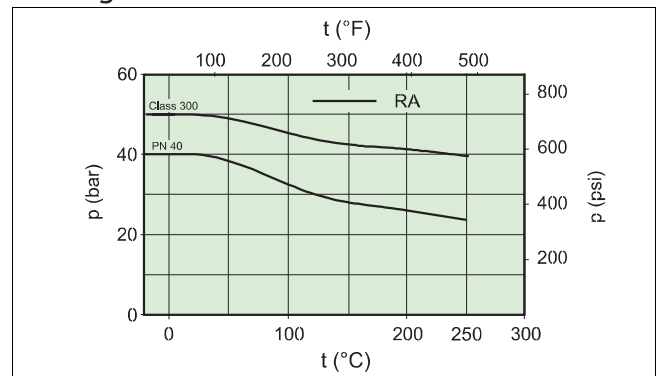
1) 100 % corresponds to 95° turning angle

2) For Q-R-valves, 100 % corresponds to 90° turning angle

Maximum operating pressure differential in shut-off service



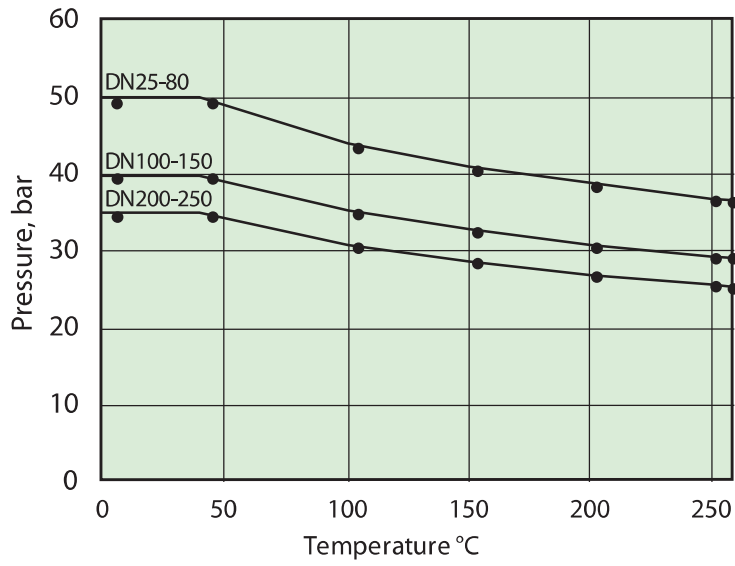
Maximum body pressure for standard A 351 gr. CF8M material



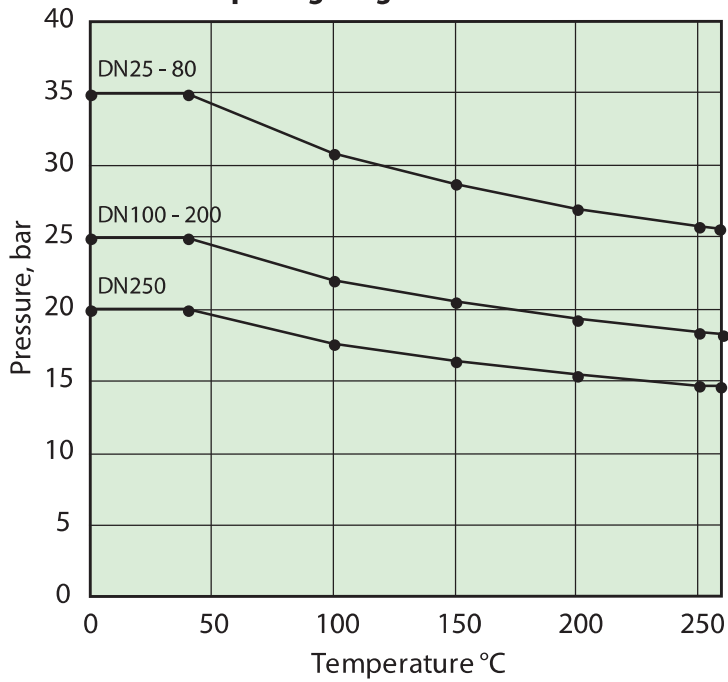
Note that max. throttling pressures are mechanical maximum differential pressures at ambient temperature.

In practice you must always check temperature, actuator, load factor, noise, cavitation intensity, velocity, etc. from Nelprof™ sizing and selection software.

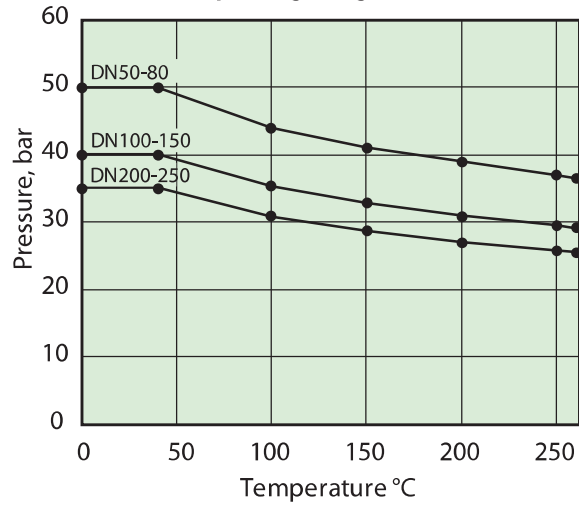
**Max operating pressure differential in control service,
RA opening range 0 %-70 %**



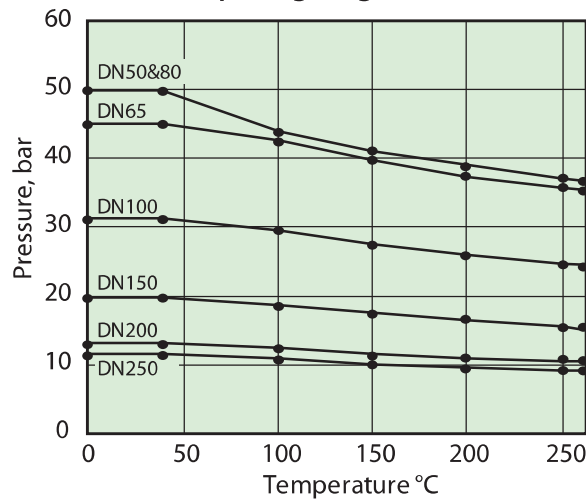
**Max operating pressure differential in control service,
RA opening range 70 %-100 %**



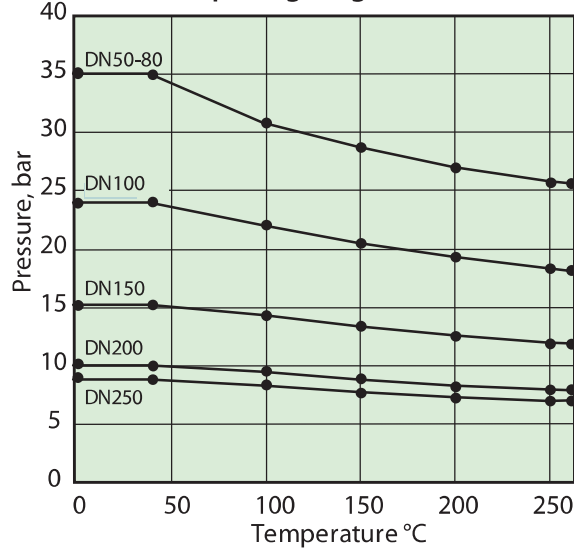
**Max operating pressure differential in control service,
Q-RA opening range 0 %- 30 %**



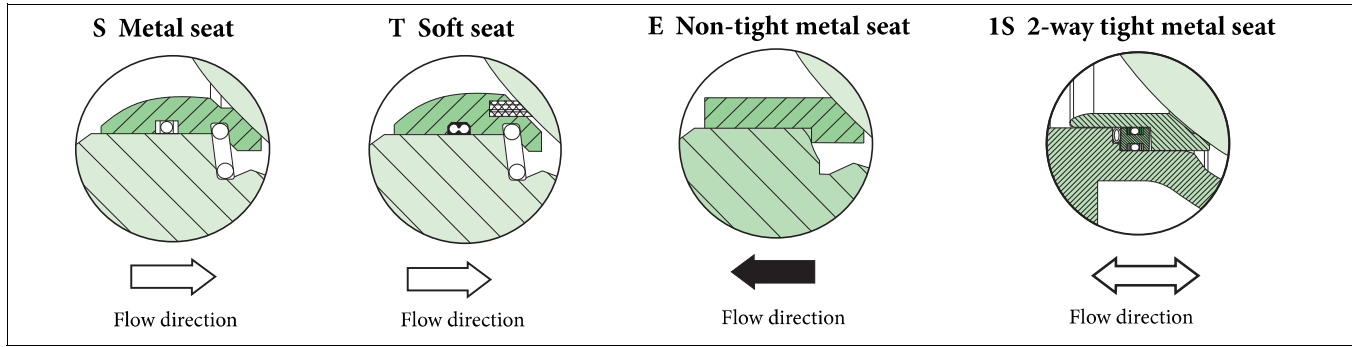
**Max operating pressure differential in control service,
Q-RA opening range 30 %- 60 %**



**Max operating pressure differential in control service,
Q-RA opening range 60 %-100 %**



Seats design



Actuator selection, R-series valve

Valve/actuator sizes have been pre-selected. You will find them on pages 7 - 11. The valve/actuator size must be checked with the Nelprof program for each control valve.

Maximum allowed stem torque

Valve size		Torque	
DN	Inches	Nm	ft-lb
25	1	30	22
40	1.5	30	22
50	2	65	48
65	2.5	65	48
80	3	160	118
100	4	160	118
150	6	490	362
200	8	675	498
250	10	1350	996

S seat

Seat	Stainless steel + cobalt based hard facing
Spring	Inconel 625
Seat seal	Filled PTFE lip seal/Elgiloy spring
Temperature range	-40 °C... +260 °C / - 40 °F ...+500 °F
Service	General service

T Soft seat (PTFE + C25 %)

Code	Seat body	Spring	Seat seal	Back seal
T2	316 SS	Inconel 625	DN 25 - 150 X-treme DN 200 - 250 filled PTFE	PTFE
Temperature range T2, -40 °C... +260 °C / -40 °F ...+500 °F				

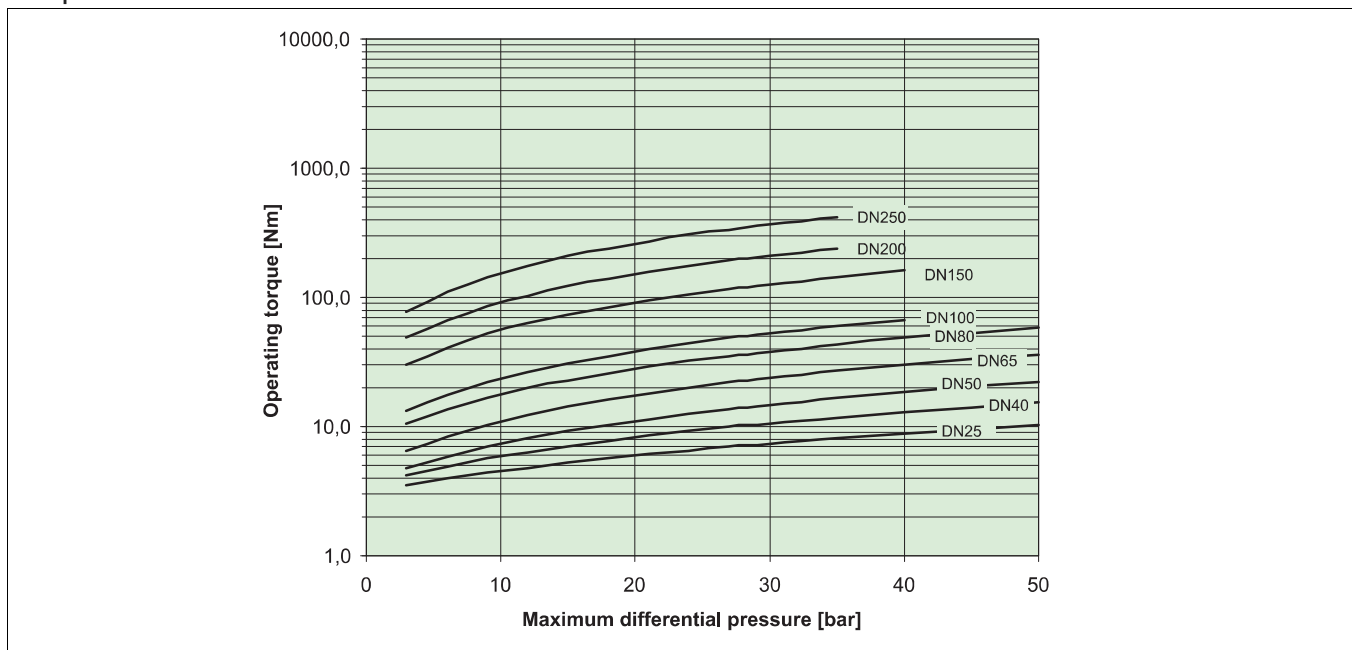
E Non-tight metal seat

Seat	Cobalt based alloy
Temperature range	-40 °C... +260 °C / - 40 °F ...+500 °F
Service	Erosive applications, non-tight design.
Note!	Flow direction arrow is reversed.

1S 2-way tight metal seat

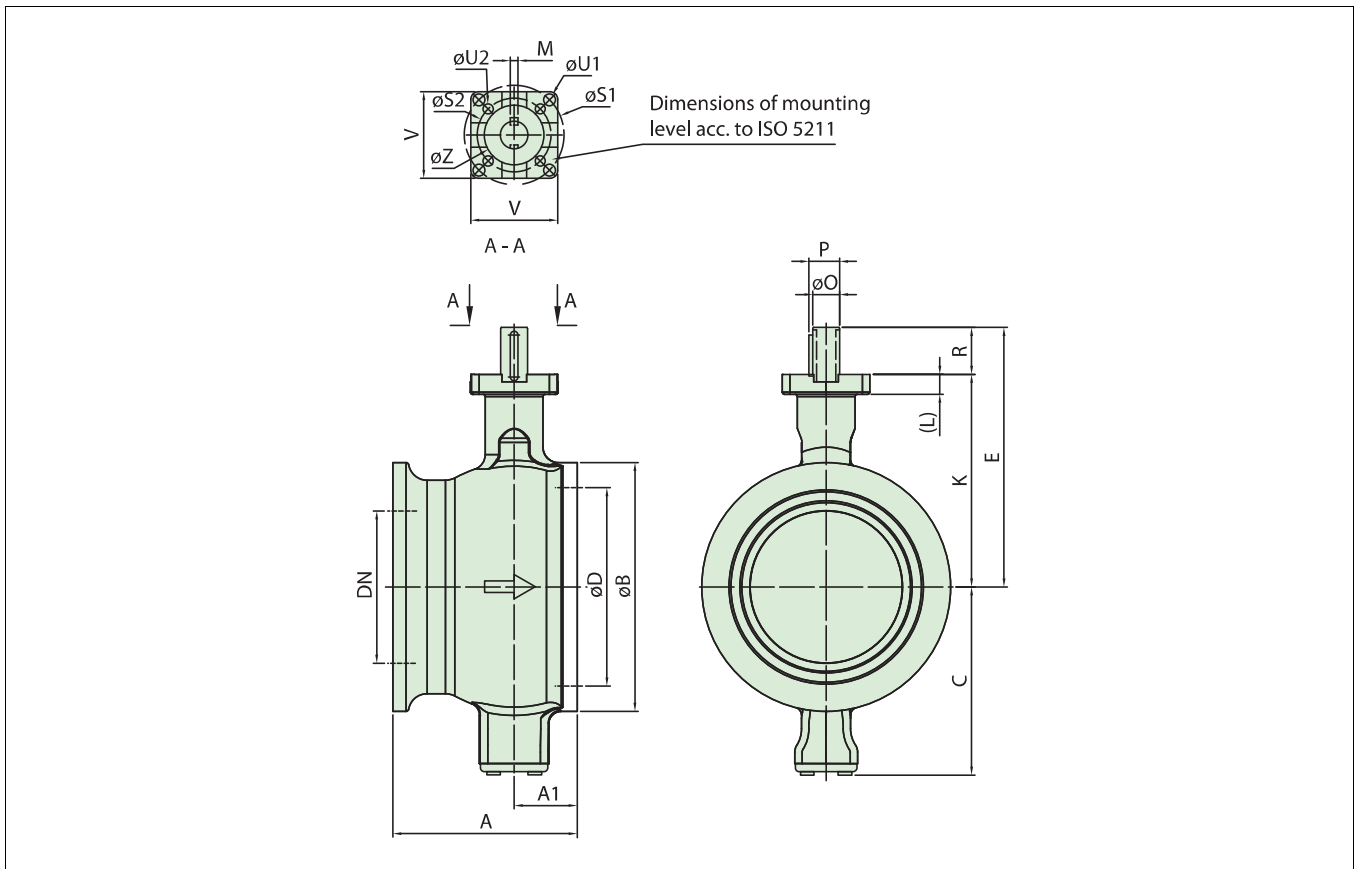
Seat:	316 SS + Cobalt based hard facing
Spring:	Inconel 625
Seat seal:	Viton GF
Temp. range:	-30 °C... +200 °C / -22 °F ...+186 °F
Service:	General

Torque chart



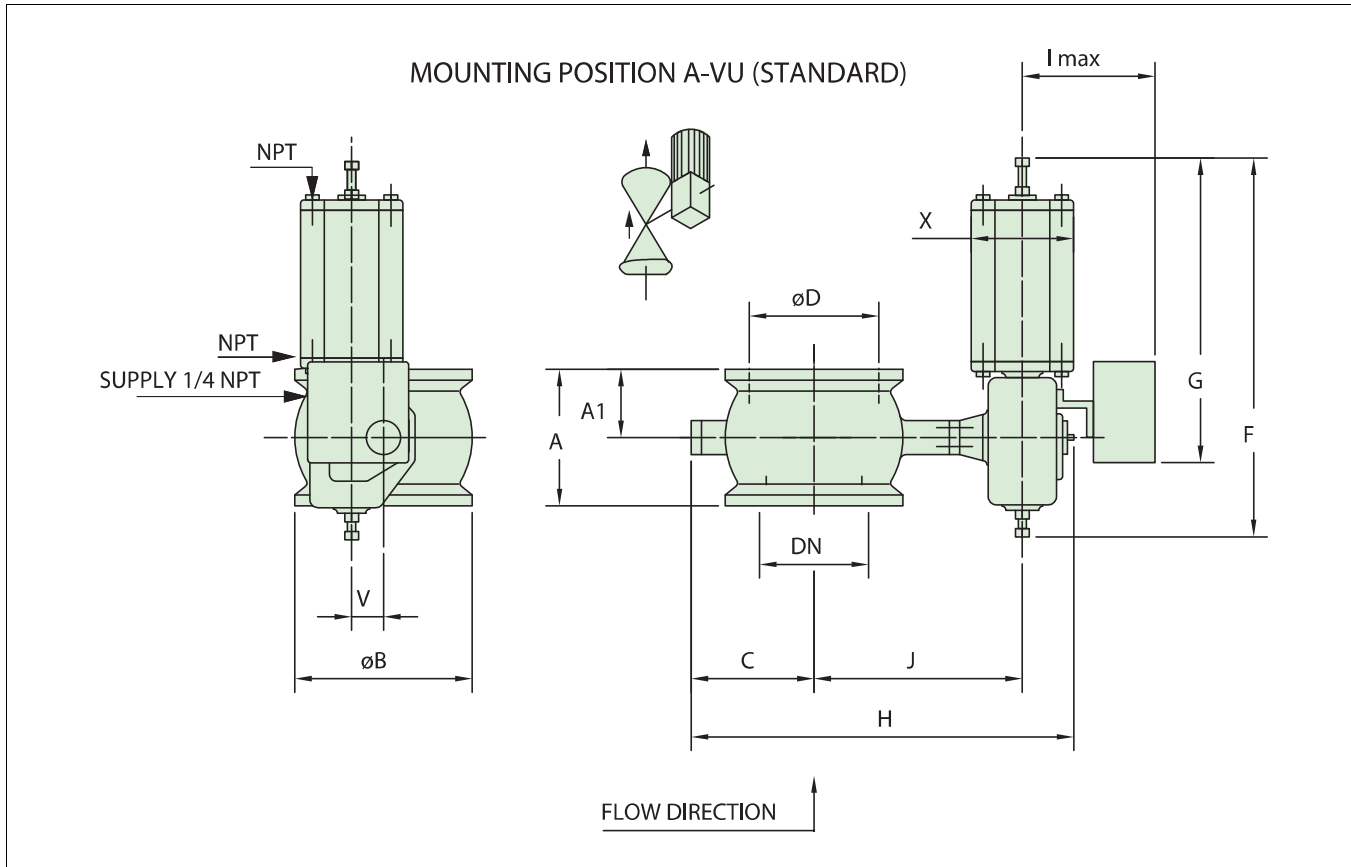
DIMENSIONS

RA



Type	DN	ISO 5211	Dimensions, mm																	Kg	
			A1	A	ϕB	C	ϕD	E	R	K	ϕO	M	P	$\phi S1$	$\phi S2$	$\phi U1$	$\phi U2$	ϕZ	L		V
RA	25	F05	21	50	64	56	33	127	27	102	15	4.76	17	-	50	-	6.6	35	15.5	52	1.3
	40	F05	21	60	82	65	49	133.5	25	108.5	15	4.76	17	-	50	-	6.6	35	15.5	52	2.4
	50	F05, F07	27	75	100	91	60	144.5	25	119.5	15	4.76	17	70	50	9	6.6	55	15.5	67	3.7
	65	F05, F07	40	100	118	97	75	151	25	126	15	4.76	17	70	50	9	6.6	55	15.5	67	5.3
	80	F07, F10	38	100	130	108	89	177	35	142	20	4.76	22.2	102	70	11	9	70	16	94	6.2
	100	F07, F10	41	115	158	120	115	186	35	151	20	4.76	22.2	102	70	11	9	70	16	94	9.6
	150	F10, F12	55	160	216	174	164	244	44	200	25	6.35	27.8	125	102	14	11	85	22	114	24
	200	F10, F12	70	200	268	201	205	289	54	235	30	6.35	32.9	125	102	14	11	85	22	114	42
	250	F12, F14	82	240	324	251	259	338	61	277	35	9.53	39.1	140	125	18	14	100	26	136	68

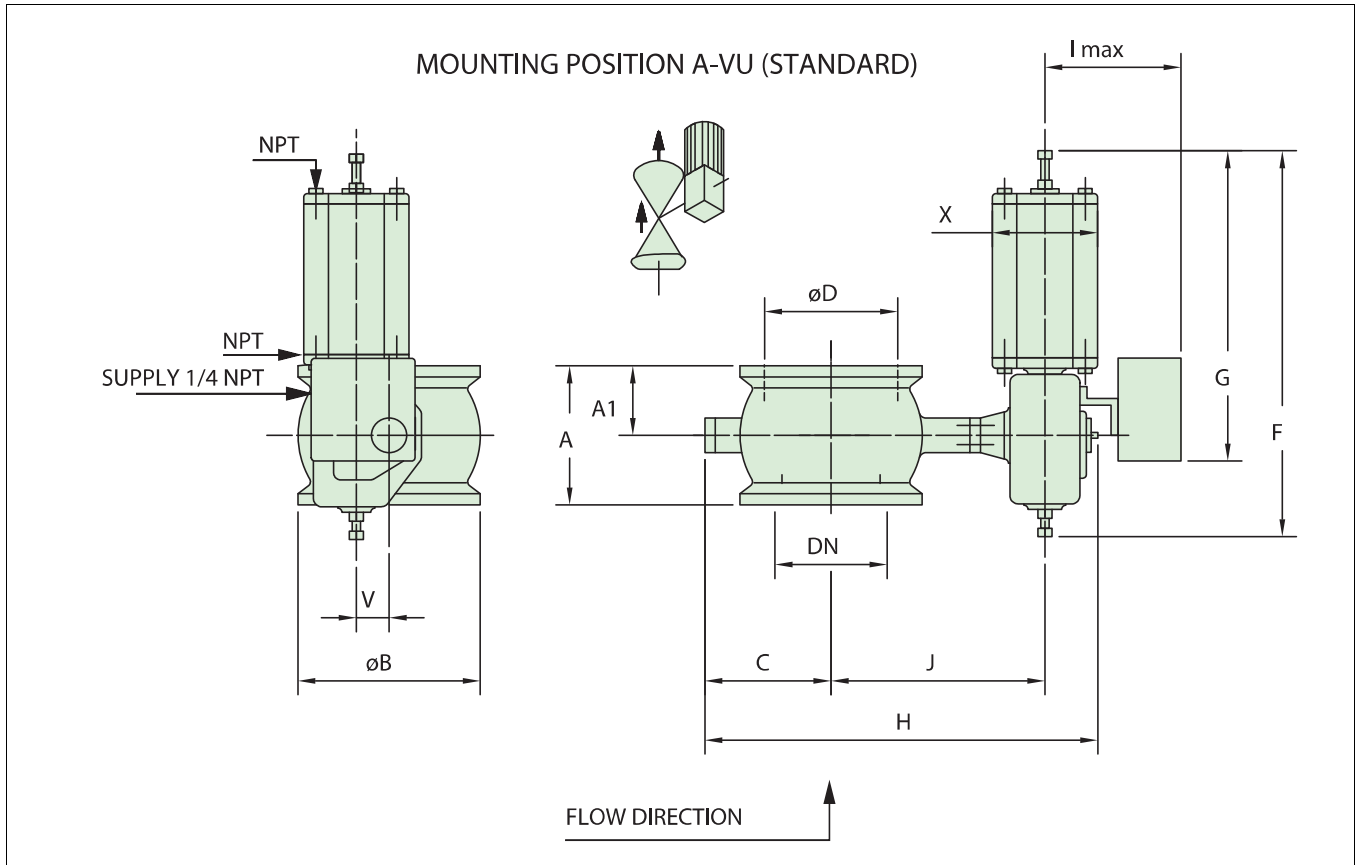
RA-B1C



Type	Max. Δp 1)	Dimensions [mm]												NPT	Kg	
		DN	A	A1	B	C	D	F	G	X	V	J	H			I max
RA_025-B1C6	50	25	50	21	64	56	33	400	260	90	36	168	305	310	1/4	5,5
RA_040-B1C6	50	40	60	21	82	65	49	400	260	90	36	175	320	310	1/4	6,6
RA_050-B1C6	50	50	75	27	100	91	60	400	260	90	36	185	355	310	1/4	8
RA_050-B1C9	50	50	75	27	100	91	60	455	315	110	43	185	365	305	1/4	13,5
RA_065-B1C6	50	65	100	40	118	97	75	400	260	90	36	192	367	310	1/4	9,5
RA_065-B1C9	50	65	100	40	118	97	75	455	315	110	43	192	380	305	1/4	15
RA_080-B1C6	50	80	100	38	130	108	89	400	260	90	36	200	390	310	1/4	11
RA_080-B1C9	50	80	100	38	130	108	89	455	315	110	43	200	400	305	1/4	16
RA_100-B1C6	40	100	115	41	158	120	115	400	260	90	36	210	410	310	1/4	15
RA_100-B1C9	40	100	115	41	158	120	115	455	315	110	43	210	420	305	1/4	19
RA_150-B1C9	25	150	160	55	216	174	164	455	315	110	43	260	515	305	1/4	34
RA_150-B1C11	40	150	160	55	216	174	164	540	375	135	51	265	530	310	3/8	40
RA_150-B1C13	40	150	160	55	216	174	164	635	445	175	65	280	550	325	3/8	55
RA_200-B1C9	15	200	200	70	268	201	205	455	315	110	43	294	575	305	1/4	52
RA_200-B1C11	32	200	200	70	268	201	205	540	375	135	51	310	590	310	3/8	59
RA_200-B1C13	35	200	200	70	268	201	205	635	445	175	65	325	610	325	3/8	73
RA_250-B1C13	30	250	240	82	324	251	259	635	445	175	65	366	730	325	3/8	100
RA_250-B1C17	35	250	240	82	324	251	259	770	545	215	78	373	750	340	3/8	125

1) Max Δp in on-off service with actuator load factor 0.6 and supply pressure 5 bar

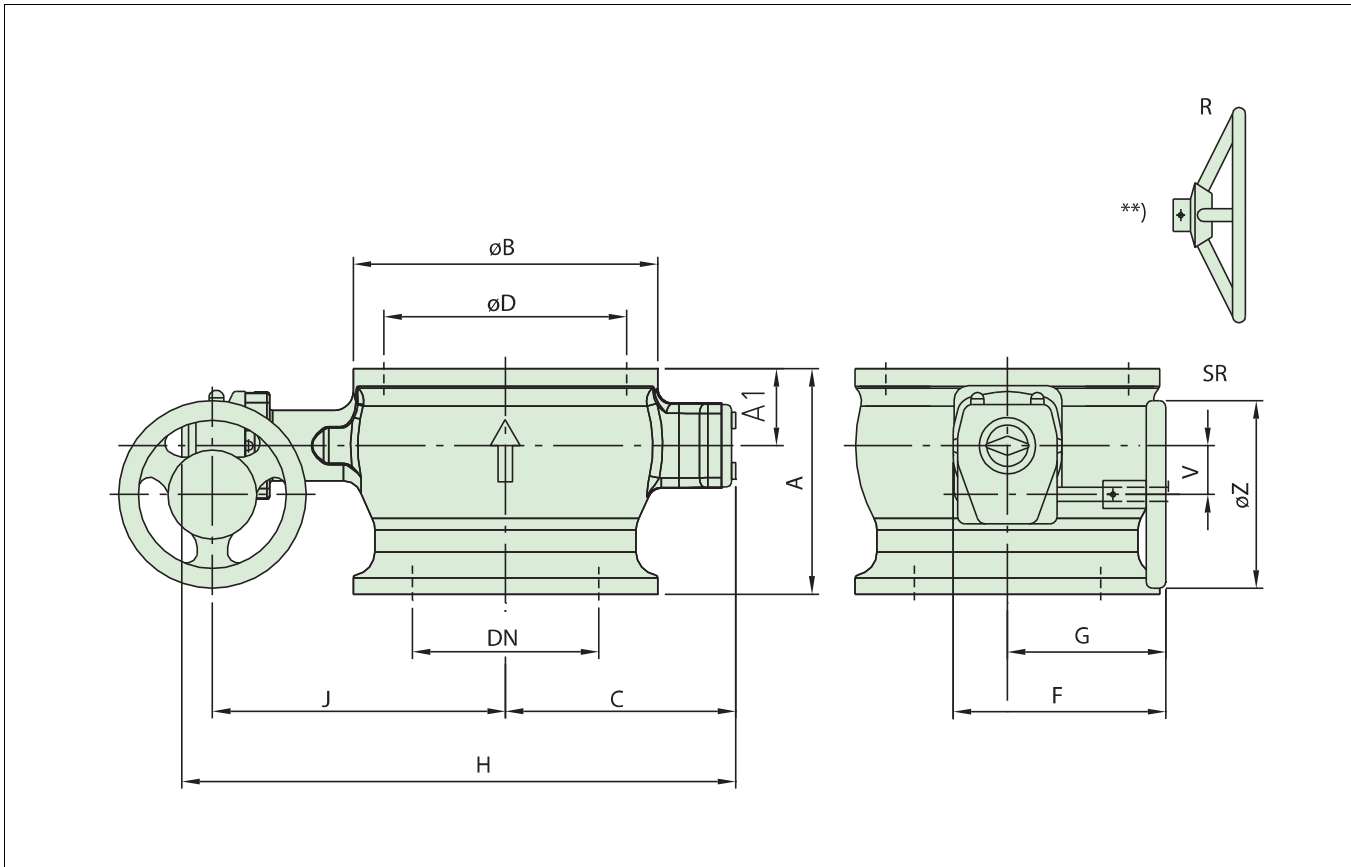
RA - B1J, B1JA



Type	Max. Δp 1)	Dimensions, mm														
		DN	A	A1	ØB	C	ØD	F	G	X	V	J	H	I max	NPT	kg
RA_025-B1J6/B1JA6	50/50	25	50	21	64	56	33	485	368	110	36	167	291	305	3/8	17
RA_040-B1J6/B1JA6	50/50	40	60	21	82	65	49	485	368	110	36	174	306	305	3/8	16
RA_050-B1J6/B1JA6	50/50	50	75	27	100	91	60	485	368	110	36	184	343	305	3/8	17
RA_065-B1J6/B1JA6	50/50	65	100	40	118	97	75	485	368	110	36	194	358	305	3/8	19
RA_080-B1J6/B1JA6	25/50	80	100	38	130	108	89	485	368	110	36	199	374	305	3/8	20
RA_100-B1J6/B1JA6	12/50	100	115	41	158	120	113	485	368	110	36	209	398	305	3/8	23
RA_150-B1J6/B1JA6	-/25	150	160	55	216	174	164	485	368	110	36	257	498	305	3/8	37
RA_025-B1J8/B1JA8	50/50	25	50	21	64	56	33	560	420	135	43	168	293	305	3/8	19
RA_040-B1J8/B1JA8	50/50	40	60	21	82	65	49	560	420	135	43	175	308	305	3/8	20
RA_050-B1J8/B1JA8	50/50	50	75	27	100	91	60	560	420	135	43	185	345	305	3/8	21
RA_065-B1J8/B1JA8	50/50	65	100	40	118	97	75	560	420	135	43	195	360	305	3/8	23
RA_080-B1J8/B1JA8	50/50	80	100	38	130	108	89	560	420	135	43	200	376	305	3/8	24
RA_100-B1J8/B1JA8	50/50	100	115	41	158	120	113	560	420	135	43	210	400	305	3/8	27
RA_150-B1J8/B1JA8	10/25	150	160	55	216	174	164	560	420	135	43	258	500	305	3/8	41
RA_150-B1J10/B1JA10	40/40							650	490	175	51	275	530	225	3/8	55
RA_200-B1J10/B1JA10	15/25	200	200	70	268	201	205	650	490	175	51	310	590	310	3/8	75
RA_200-B1J12/B1JA12	32/35							800	620	215	65	324	635	235	1/2	100
RA_250-B1J16/B1JA16	35/35	250	240	85	324	251	259	990	760	265	78	373	760	340	1/2	170

1) Supply pressure BJ 4 bar / BJA 5 bar

RA - M



Type	Actuator/ mounting ISO 5211	Dimensions, mm												kg
		DN	ØD	A	A1	ØB	C	F	G	H	J	V	ØZ	
RA	M07/15F05	25	33/38x	50	21	64	56	235	184	223	131	52	160	5.1
	M07/15F05	40	49	60	21	82	65	235	184	238	137	52	160	6.2
	M07/15F05	50	60	75	27	100	91	235	184	275	148	52	160	7.5
	M07/15F05	65	75	100	40	118	97	235	184	288	155	52	160	9.5
	M07/20F07	80	89	100	38	130	108	235	184	315	171	52	160	10
	M07/20F07	100	115	115	41	158	120	235	184	336	180	52	160	14
	M10/25F10	150	164	160	55	216	174	238	187	439	235	52	200	29
	M12/30F12	200	205	200	70	268	201	307	238	524	276	71	315	52
	M12/35F12	250	259	240	82	324	251	307	238	616	318	71	315	78
	M14/35F12	250	259	240	82	324	251	385	285	621	320	86	400	87

***) ACTUATORS M07...M12 ARE EQUIPPED WITH HANDWHEEL TYPE SR,
ACTUATORS M14...M25 ARE EQUIPPED WITH HANDWHEEL TYPE R.

How to order

Example: The following example is for a RA valve, with a standard capacity trim (-), flangeless body design ASME Class 300 (RA), standard keyway (A), size (080), body CF8M,

segment type 329+Hard chromium, screws A2-70, shafts, pins, & bearings AISI 329/PTFE (A) and seat cobalt based alloy, back seal PTFE lip seal (S).

	RA	A	080	A	S
1.	2.	3.	4.	5.	6.

1.	Q-Trim or low-capacity C_v
-	Standard capacity C_v or without a Q-trim.
Q	Q-trim to reduce noise and cavitation.
C005	Max. $C_v = 0.5$, DN25 valve.
C015	Max. $C_v = 1.5$, DN25 valve.
C05	Max. $C_v = 5$, DN25 valve.
C15	Max. $C_v = 15$, DN25 valve.
2.	Product series / Design
RA	Flangeless, reduced bore, manufacturer face to face length, Body Class 300/PN 40
3.	Construction
A	Standard drive shaft with keyway
4.	Size
	Size in millimeters: 025, 040, 050, 065, 080, 100, 150, 200, 250.

5.	Body	Segment	Screws	Shafts, pins bearings
A	CF8M	Type 329+ Hard chromium	A2-70	AISI 329/ PTFE
S	CF8M	Type 329	A2-70	AISI 329/PTFE
H (with T6 seat)	CW-6M (Hastelloy C)	CW-6M	A2-70	Hastelloy C/ PVDF
U (with U seat)	CK3MCuN (SMO)	ASTM A351 gr. CK3MCuN + ceramic coating (TiO)	A2-70	UNS31254/Filled PTFE on SMO 254 net

6.	Seat
S	Cobalt based alloy, back seal PTFE lip seal.
T	X-treme sizes DN 25 - 150, metal body, back seal PTFE lip seal. PTFE+C25 % sizes DN 200 - 250, metal body, back seal PTFE lip seal.
E	Cobalt based alloy, erosion-resistant version non-tight.
U	Titanium, back seal virgin PTFE lip seal/titanium spring
1S	316 SS + Cobalt based hard facing, 2-way tight metal seat

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www.valmet.com/flowcontrol

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