

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.



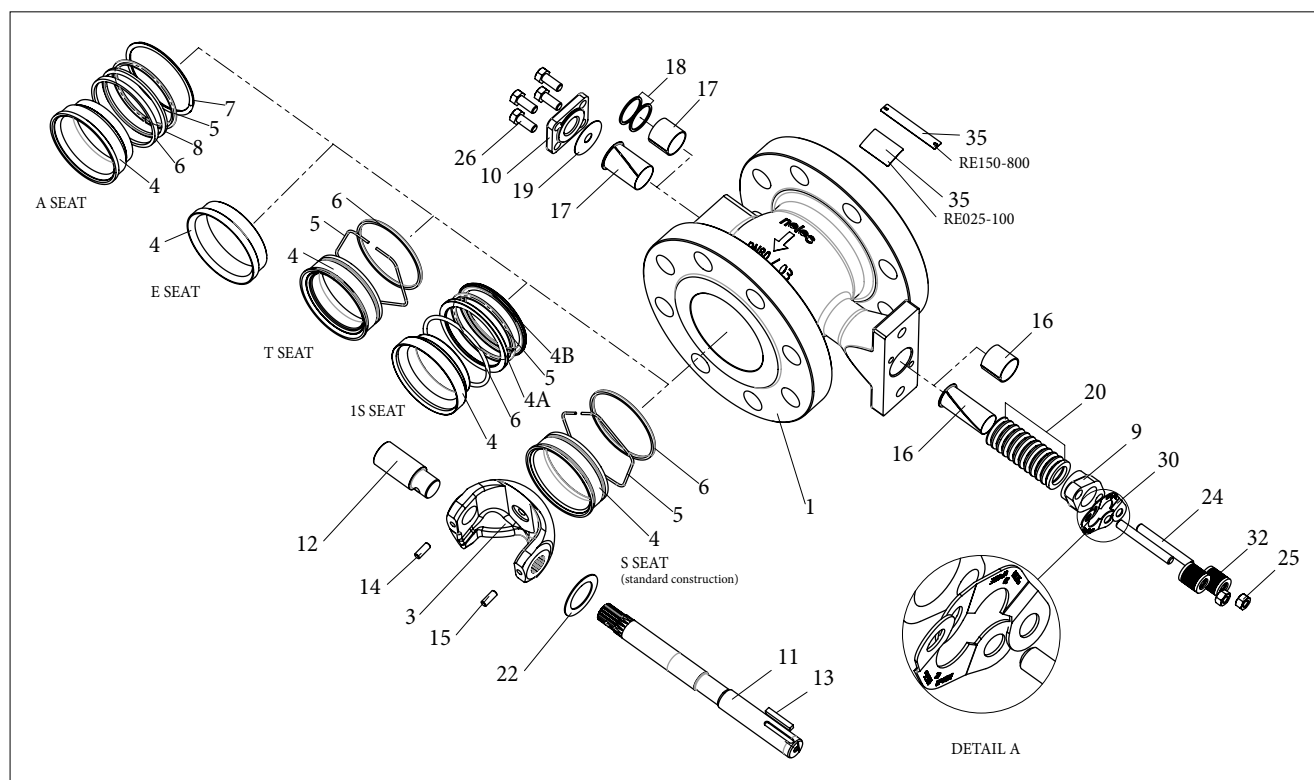
Economical

- 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.

Oxygen construction

Only for gaseous oxygen service.

Shut-off classification

Metal seat:

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

10 x ISO 5208 Rate D.

Soft seat:

IEC 60534-4/ANSI/FCI 70.2 Class V, Class VI optionally

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.

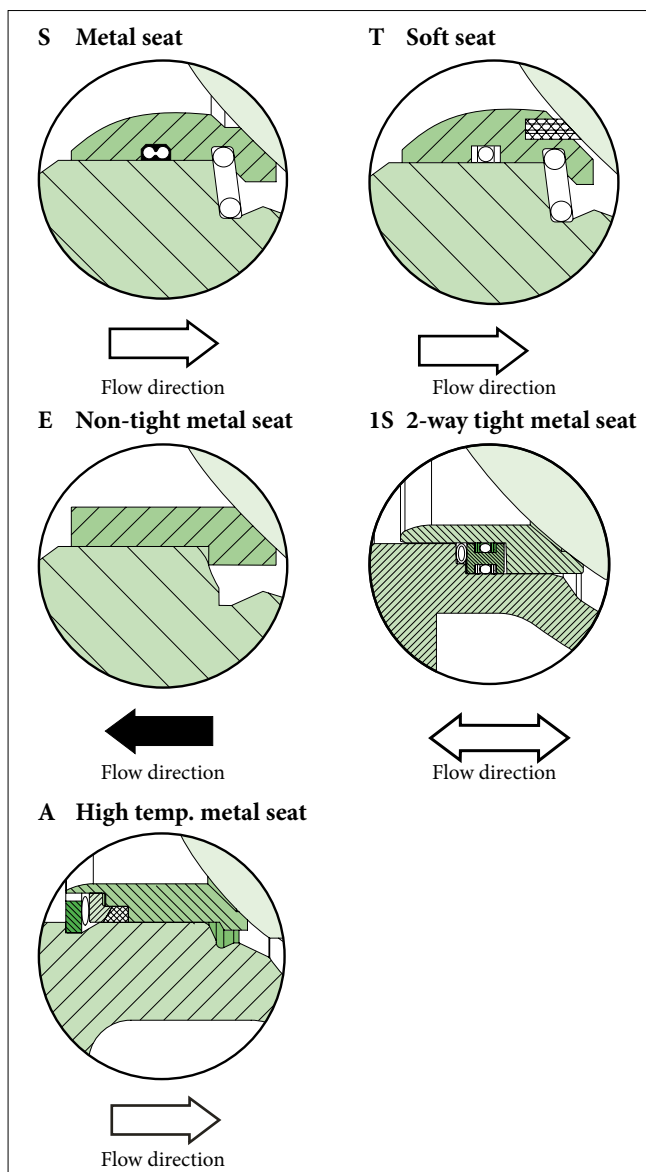
Seat design options shown on the next page.

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



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 in sizes 2", 3", and larger (not available in 2.5" size)

Construction options



Low C_v trims

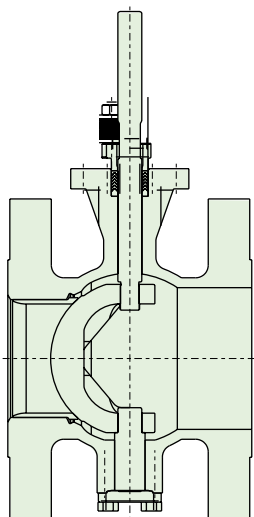
Reduced C_v trims are available on the DN25/1" valve to control very low flows with high accuracy. The narrow orifice is a selfflushing design because the trim orifice is continually increasing.



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

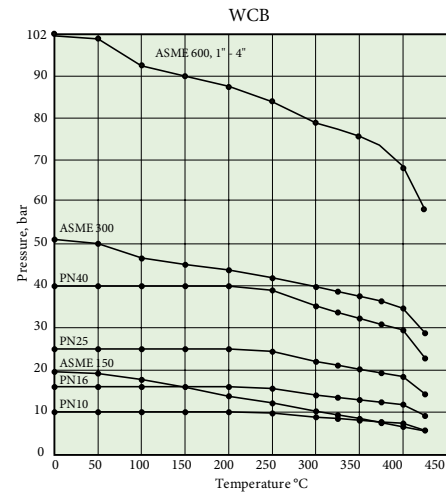
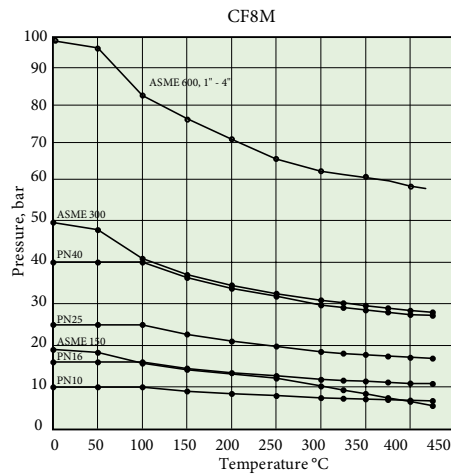
principles combined with the rotation of the attenuator elements provides a combination of cavitation/noise abatement with high rangeability, high capacity and capability to handle impure fluids.



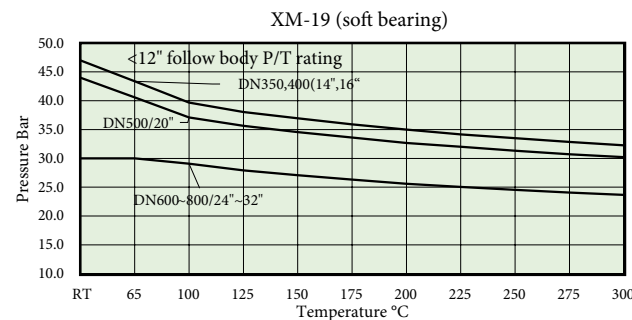
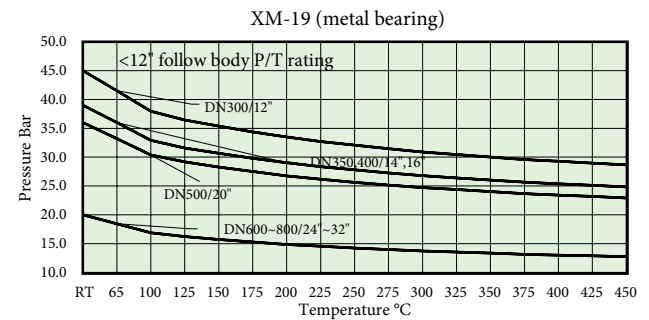
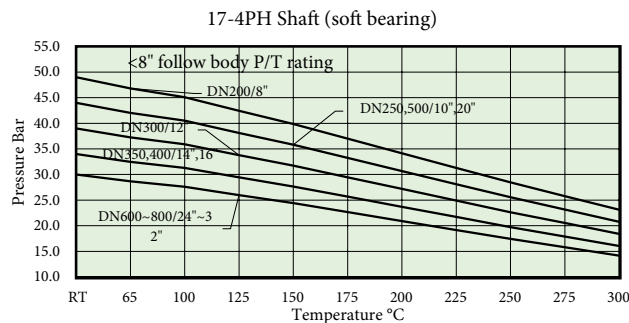
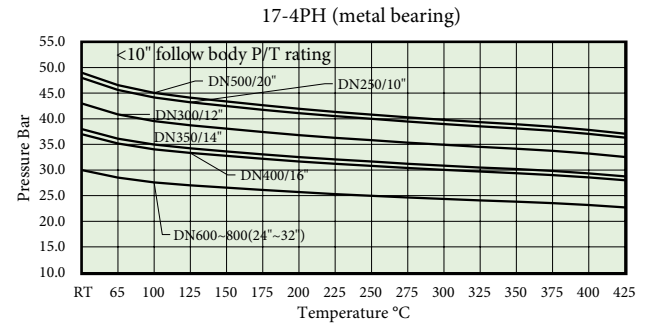
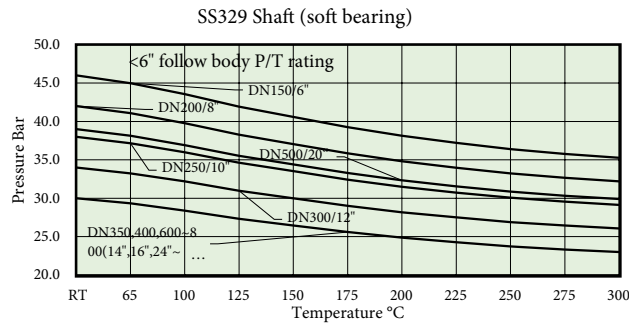
Erosion resistant version

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

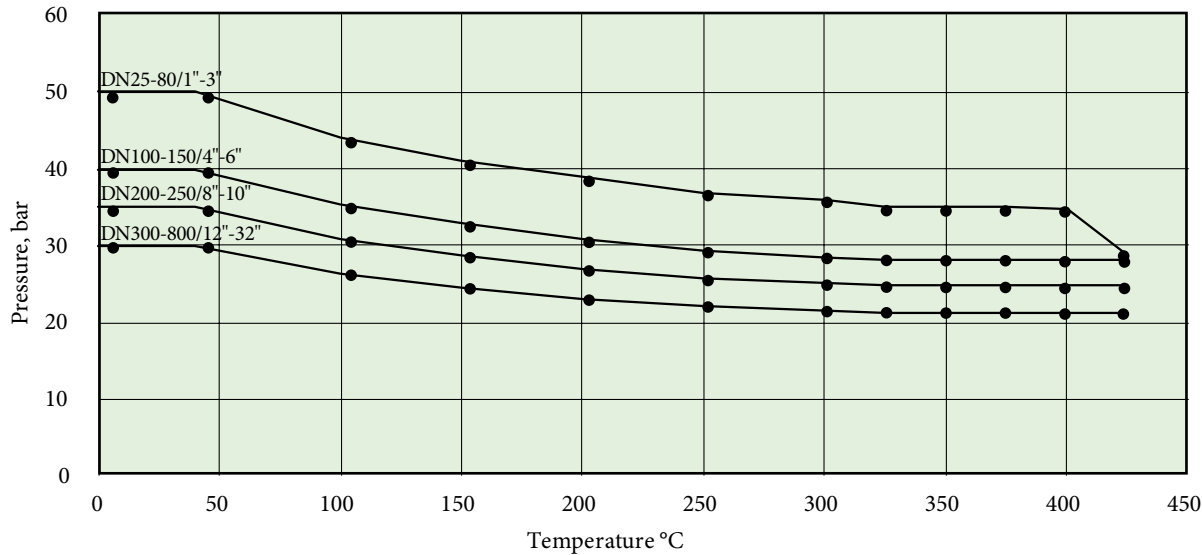


Maximum operating pressure differential in shut-off service

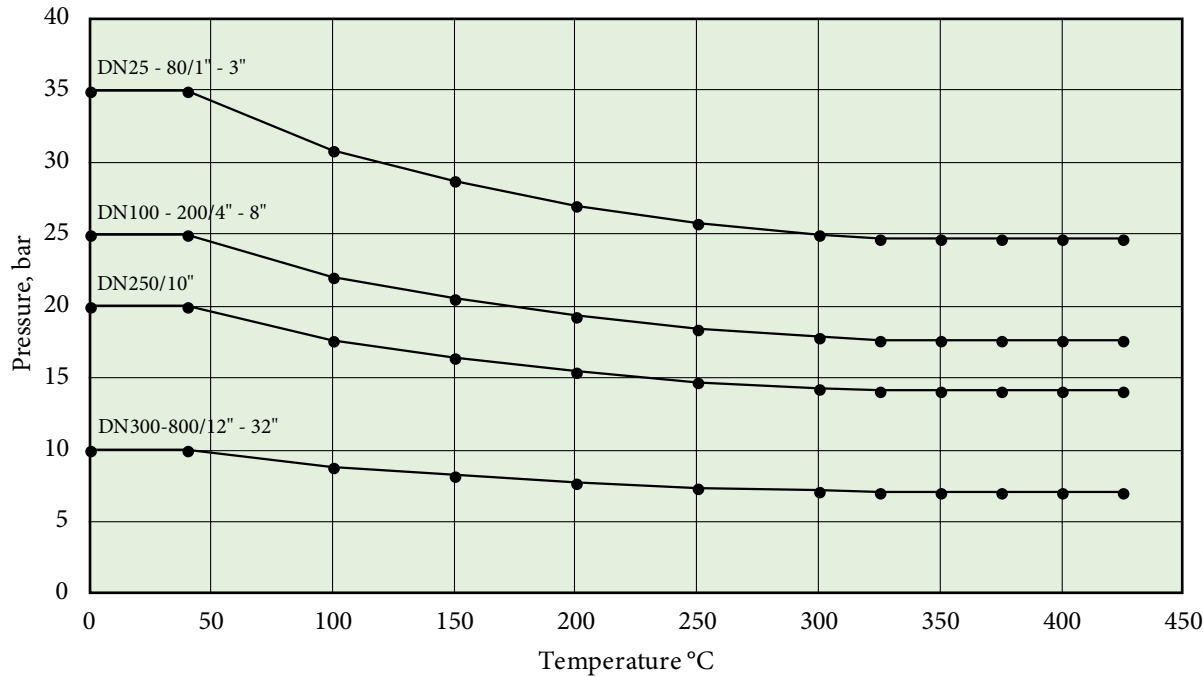


Note: Class 600 1", Max shut-off dp: 100bar
 Class 600 2"-3", Max shut-off dp: 80bar
 Class 600 4", Max shut-off dp: 60bar

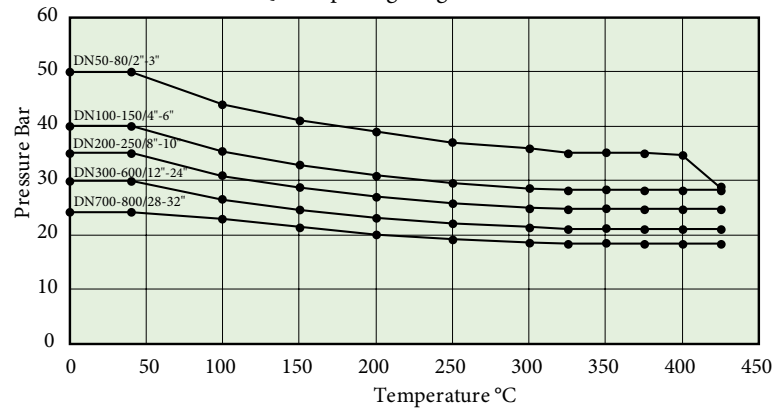
Max operating pressure differential in control service, RE
opening range 0 %-70 %



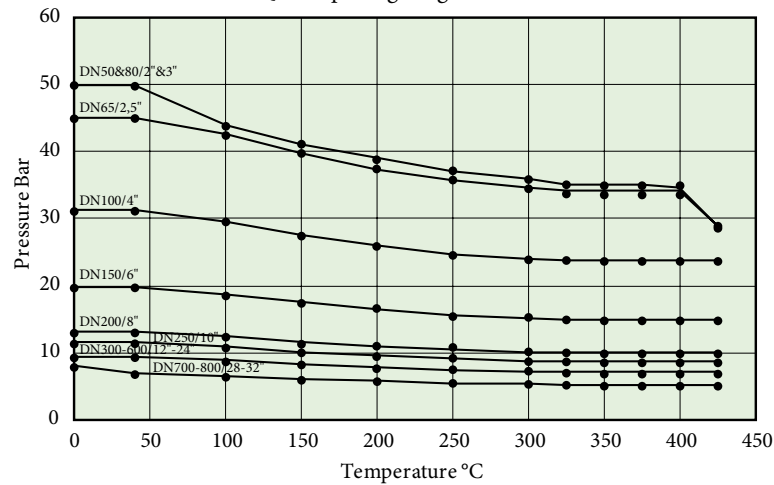
Max operating pressure differential in control service,
RE opening range 70 %-100 %



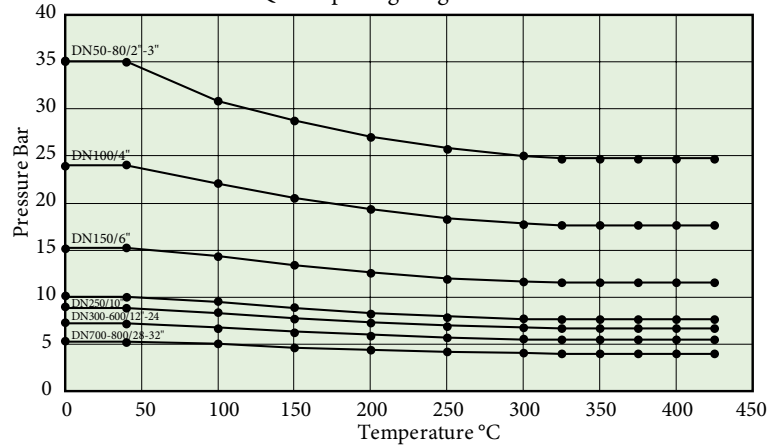
Max operating pressure differential in control service,
Q-RE opening range 0 %- 30 %



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



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

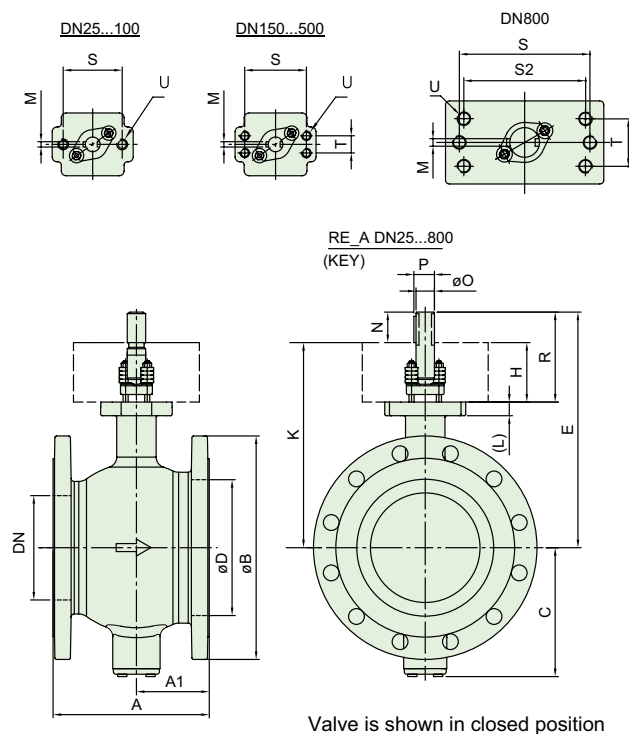


Note:

- 1) RE-valves are not recommended for applications with high on-off cycling rate. X- or L-series valves should be used in these cases.
- 2) Please observe body rating for material in question when determining maximum allowable shut-off pressure differential.

Given maximum allowable throttling differential pressures are based on mechanical strength of the parts only. Nelprof analysis determines actual throttling dp capability, taking into account trim velocity, exit velocity, noise and cavitation.

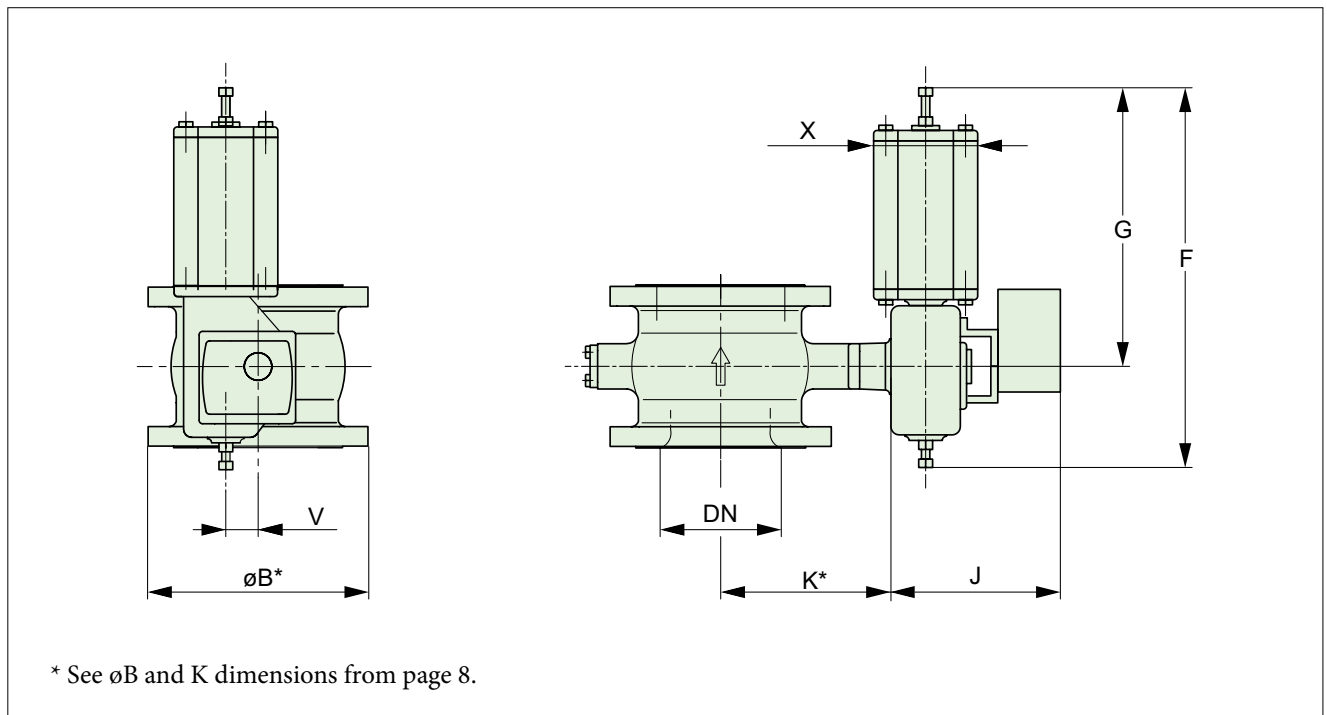
Dimensions, Series RE



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

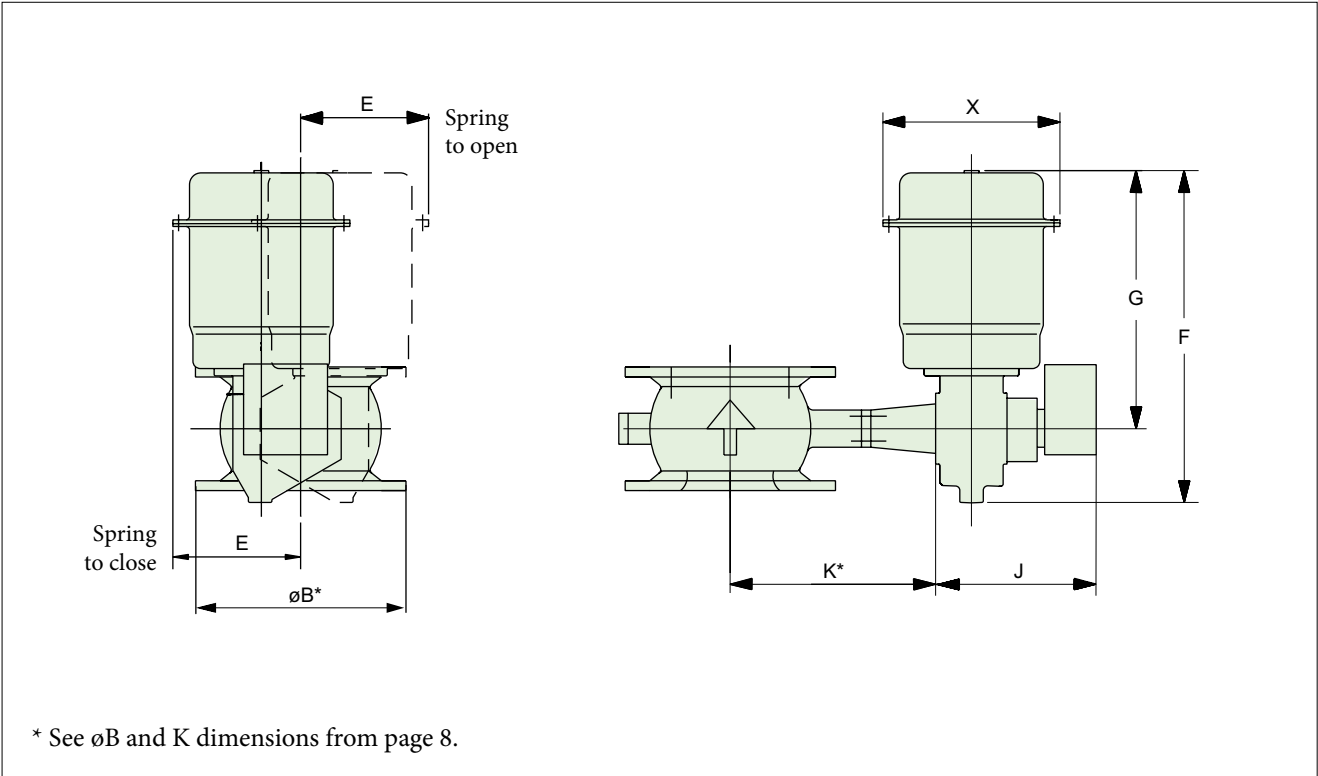
Actuator	DIMENSIONS, inch					NPT	kg
	F	G	J	V	X		
B1C6	15.75	10.24	11.14	1.42	3.54	1/4	9
B1C9	17.91	12.40	10.98	1.69	4.33	1/4	21
B1C11	21.26	14.76	11.42	2.01	5.31	3/8	35
B1C13	25.00	17.52	12.44	2.56	6.89	3/8	68
B1C17	30.31	21.46	13.82	3.07	8.46	1/2	119
B1C20	33.07	22.64	15.16	3.82	8.46	1/2	161
B1C25	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

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		
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_AJJSJG

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)
D1	ASTM A 216 gr WCB Nitrated (US market only). (blind flange & gland bolting SS A4-80/B8M)
A	ASTM A351 gr. CF8M / 1.4408 (blind flange & gland bolting SS A4-80/B8M)
C	ASTM A351 gr. CG8M (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 (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+C25 %, 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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