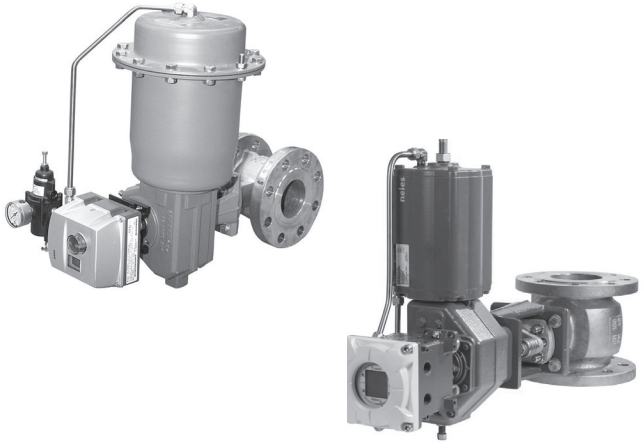
Neles™ Finetrol™ eccentric rotary plug control valve
Series FC and FG

Finetrol eccentric rotary plug valves are economical high-performance control valves designed to provide the best possible control accuracy and wide rangeability with all the inherent benefits of rotary control valves.

Standard units are equipped with spring-diaphragm actuators and ND9000™ intelligent valve controllers for precise flow control, extended operational life and performance monitoring on-line.



Features

Versatility: wide application range

- Finetrol valves are suitable for liquid, gas, steam and slurry applications.
- All actuator mounting directions can be used
- Temperature limits -80 °C ... +425° / -112 °F…+797 °F with the standard construction.
- Cryogenic version -200 °C / -328 °F.
- Full conformity to both ASME and EN standard requirements.
- Fulfils NACE MR0103-2003 requirements.

Accurate control

- The plug shape of the Finetrol valve is engineered to offer a constant gain expanded to a full 90° rotation.
- Optimum flow characteristic through plug shape, instead of positioner cams, provides control valve dynamic performance and control loop stability.
- Plug shape provides balanced dynamic torque.
- High rangeability minimizes need for reduced C_v-trim and trim changes.

Safety

- SIL 3 certified
- Fire-tested and certified.
- Anti-blowout feature is achieved by enlarged stem diameter.
- Valve turns clockwise to close.
- Rugged one-piece-body construction minimizes potential leak paths and makes the valve insensitive to pipe stress.

Environmental design

- Live loaded standard packing and rotary operation reduces emissions dramatically compared to sliding stem valves
- ISO 15848-1 Class BH certified with endurance class CC-3 (100 000 mechanical cycles). Standard packing construction meets the Clean Air Act, TA-Luft and SPE 77/312 requirements.

Low cost of ownership

- Large diameter shafts and heavy duty bearings.
- Heavy duty reliable actuators.
- Predictive maintenance and asset management features.

Noise/cavitation abatement

- Patented Q-Trim™: rotating attenuator design provides up to 18 dB (A) noise attenuation, self-flushing for impure fluids, high Cv and wide rangeability.
- Q-Trim + valve outlet attenuator plate construction extends Q-Trim performance for high pressure drop ratios and provides extra noise attenuation, up to 23 dB (A).

Easy maintenance

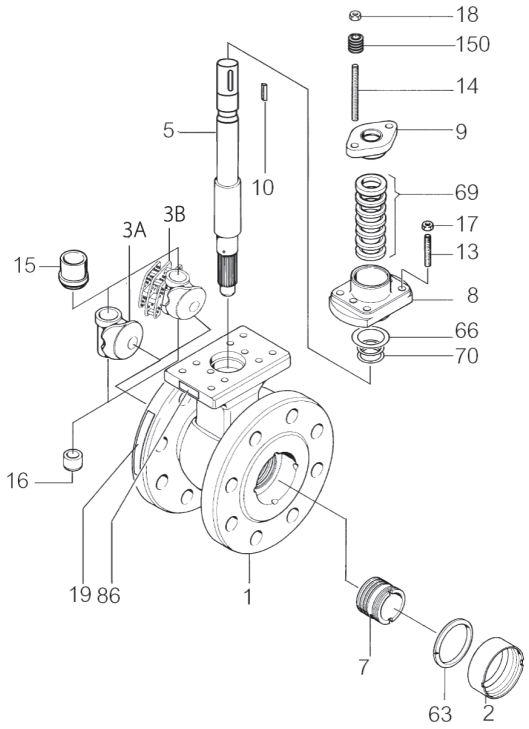
- Seat can be removed without valve disassembly.
- Spiral groove joint between seat and the valve body guarantees perfect alignment of seat without feeler gauges or lapping.
- Heavy square threads between valve body and seat ensures easy seat removal (rusting and jamming prevented).
- No pins, retaining bolts or shims.
- Valve assembly is simple and self-aligning.

Parts list*

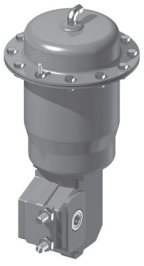
Part	Description	Material
1	Body	Carbon steel (WCC) / stainless steel (CF8M)
2	Insert	Stainless steel
3A	Plug	Stainless steel + cobalt based hard facing
3B	Plug with Q2 plate	Stainless steel + cobalt based hard facing
5	Stem	Stainless steel 17-4 PH Nitrated
7	Seat	Metal seat: Stainless steel XM-19/stainless steel+cobalt based hard facing Soft seat: Stainless steel + Xtreme
8	Bonnet	Carbon steel (WCC) / stainless steel (CF8M)
9	Gland	Stainless steel (CF8M)
10	Key	SS 142324
13	Stud	Carbon steel / stainless steel
14	Stud	Carbon steel / stainless steel
15	Upper bearing	Stainless steel 17-4 PH Nitrated
16	Lower bearing	Stainless steel 17-4 PH Nitrated
17	Hexagon nut	Carbon steel / stainless steel
18	Hexagon nut	Carbon steel / stainless steel
19	Identification plate	Stainless steel
63	Back seal	Graphite
66	Bonnet seal	Graphite
69	Gland packing	PTFE / graphite+PTFE
70	Thrust bearing	Cobalt based alloy
86	Flow direction arrow	Aluminium
150	Disc spring set	SIS 2324 & CrMO steel + ENP

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

Exploded view

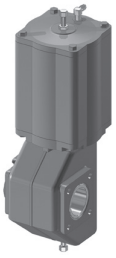


Actuators



Series Quadra-Powr™ X

Type	Pneumatic rotary spring-diaphragm actuator
Temperature range	-29 to +66 °C -20 to + 150 °F
Bulletin reference	A110-4



Series B1

Type	Pneumatic rotary cylinder actuator
Temperature range	-55 to +120 °C / -67 to +248 °F
Bulletin reference	6B20

Positioners



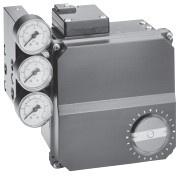
Intelligent valve controller Neles™ NDX™

Supply power	4 - 20 mA taken from control signal
Temperature range	-40 to + 85 °C / -40 to +185 °F
Communication	HART
Bulletin reference	7NDX21



Intelligent valve controller Neles™ ND9000™

Input	4 - 20 mA or 0 - 100 %
Split range	4 - 12 mA, 12 - 20 mA
Temperature range	-53 to + 85 °C / -64 to +185 °F
Communication	HART, Profibus PA, Foundation fieldbus
Bulletin reference	7ND9121



Electropneumatic positioner, NE 700

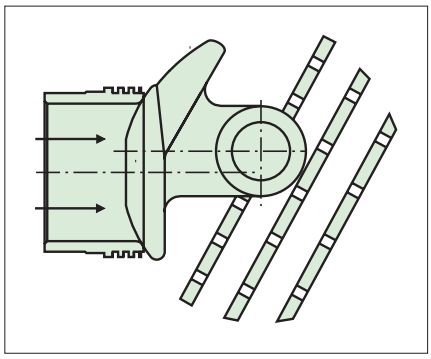
Input	4 - 20 mA, 0 - 20 mA
Split range	4 - 12 mA, 12 - 20 mA
Temperature range	-25 to +85 °C / -13 to +185 °F
Bulletin reference	7NENP20



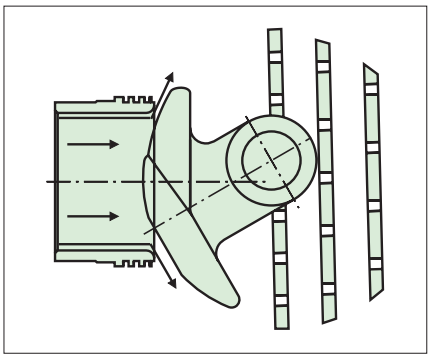
Pneumatic positioner, NP 700

Input	0.2 - 1 bar, 20 - 200 kPa, 3 - 15 psi
Split range	0.2 - 0.6 bar, 0.6 bar - 1 bar 3 - 9 psi, 9 - 15 psi
Temperature range	-40 to +90 °C / -40 to +194 °F
Bulletin reference	7NENP20

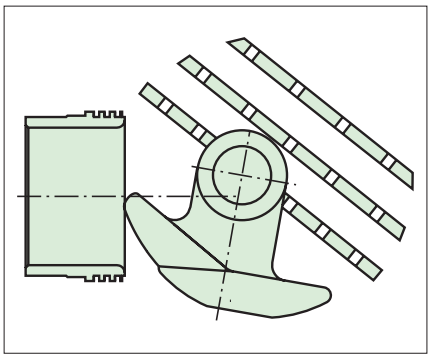
Operating principle of the Finetrol with Q-Trim



0 degree rotation / Closed position



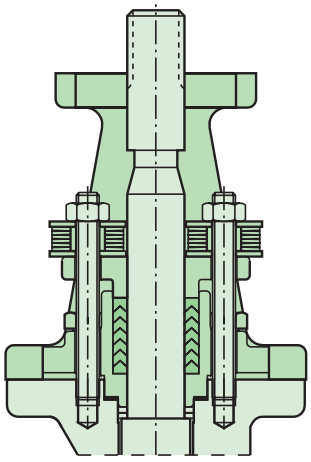
30 degree rotation showing effect of patented balanced eccentric rotary plug design



Open position / 80 degree rotation

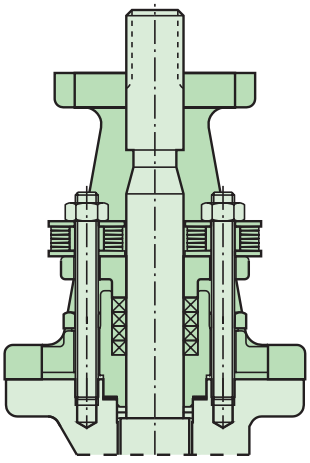
Standard bonnet constructions

TA/TB



Live-loaded PTFE / V-ring construction.
TA-Luft certified. Standard construction.

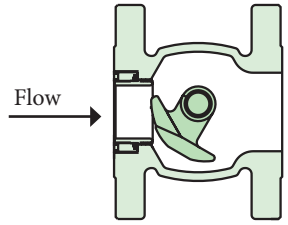
TA/TB



Live-loaded graphite (PTFE lubricated) construction. TA-Luft & ISO 15848-1certified. Standard construction for high temperature applications (+250 °C to +425 °C / +482 °F to +797 °F).

Technical specification

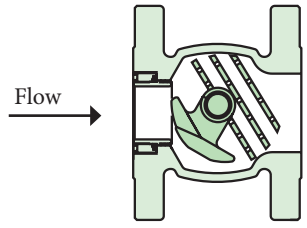
Product type		**Eccentric rotary plug valve, flanged**
Sizes	**DN**	25, 40, 50, 80, 100, 150, 200, 250, 300
	Inch	1, 1 1/2, 2, 3, 4, 6, 8, 10, 12
Pressure ratings		ASME Class 150-600 / PN10-100.
End connections		See table 1. on page 5.
Face-to-face		ASME/ISA 75.08.02 = IEC/EN 60534-3-2
Shut-off classification		Class VI with soft seat Class IV (Class V optionally) with metal seat per ANSI FCI 70-2. (0.01 % of valve rated capacity).
Materials		See page 5.
Temperature range		Metal seat: -200...+425 °C See table 3. on page 3. Soft seat: -50...+260 °C
Trim style		Quarter turn eccentric rotary plug.



Finetrol, flow to open.

Noise attenuation

Q-Trim attenuator plates rotate with the plug.



Finetrol with Q-trim and attenuation plate: Increased noise attenuation up to 23dB(A) at high pressure ratios. Flow to open.

Flow characteristic		Inherent linear characteristics. Please use the valve selection and sizing tool to verify the installed gain and flow characteristics according to the process data.
Flow direction		FTO = FLOW TO OPEN. Flow through seat ring and past the plug. Standard flow direction. FTC = FLOW TO CLOSE. Flow past the plug and through the seat ring. Recommended for erosive and flashing services.
Flow capacity		See table below.
Valve plug rotation		Clockwise to close.
OPTIONS		
Q-trim		
Sizes	**DN**	50, 80, 100, 150, 200, 250
	Inch	2, 3, 4, 6, 8, 10
Plates on valve outlet		
Attenuator plate	=	standard plate used in gas applications.
Q2 plate	=	advanced noise attenuation plate for gas application including 3 capacity options.
Baffle plate	=	customized plate used in liquid applications.
Reduced Cv trim		One reduction (50 %)/size is available on standard metal seated valve.

Flow direction recommendation

Flow to open direction produces typically 2-4 dB (A) lower noise level.

Application/Construction	Flow to open	Flow to close
General	x	(x)
Erosive	–	x
Vacuum after valve	–	x
Noise attenuating trims	x	–
High temperature	x	(x)
Flashing	–	x

Flow direction is marked on each Finetrol valve by a flow direction arrow.
X = recommended.
(X) = optional

Maximum C_v-values

Valve size DN Size/red"	Valve size inch Size/red	90° ROTATION								
		Standard metal seat				Soft seat		Q trim with metal seat		Q trim with soft seat
		FTO		FTC		FTO	FTC	FTO		FTO
		Cv100 %	CvR100 %	Cv100 %	CvR100 %	Cv100 %	Cv100 %	Cv100 %	CvR100 %	Cv100 %
25	1	14.5	7.97	16.8	11.9	12.5	15	–	–	–
40	1 1/2	31	15.5	39	15.7	27	35	–	–	–
50	2	53.5	27	64.8	26	45	56	31	22	25
80	3	137	70	155	70.9	107	105	84	56	75
100	4	230	120	265	110	199	190	144	95	130
150	6	535	230	636	230	406	359	310	210	290
200	8	760	440	1003	450	734	653	540	350	496
250	10	1300	575	1500	626	1113	950	840	550	767
300	12	2806	-	3139	–	–	–	–	–	–

Cv R = 50 % reduced Cv seat. FTO = Flow to open FTC = Flow to close

Pressure ratings and flange compatibility

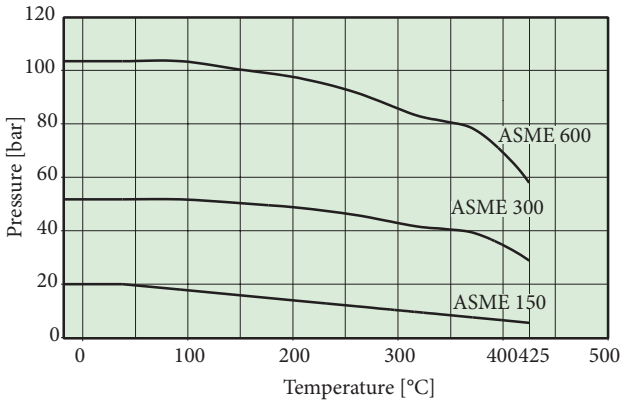
Size inch	ASME Flanged			Size DN	EN Flanged					
	Class 150[1]	Class 300	Class 600		PN 10[2]	PN 16[2]	PN 25[2]	PN 40[2]	PN 63[3]	PN100[3]
1	x	x	x[5]	25	x	x	x	x	x	x
1 1/2	x	x	x	40	x	x	x	x	x	x
2	x	x	x[4]	50	x	x	x	x	x	x
3	x	x	x[4]	80	x	x	x	x	x[4]	x[4]
4	x	x	x[4]	100	x	x	x	x	x[5]	x[5]
6	x	x	x[4]	150	x	x	x	x	x[4]	x[4]
8	x	x	x[4]	200	x	x	x	x	x[4]	x[4]
10	x	x	x[4]	250	x	x	x	x	x[4]	x[4]
12	x	x	–	300	x	x	x	x	–	–

x = available

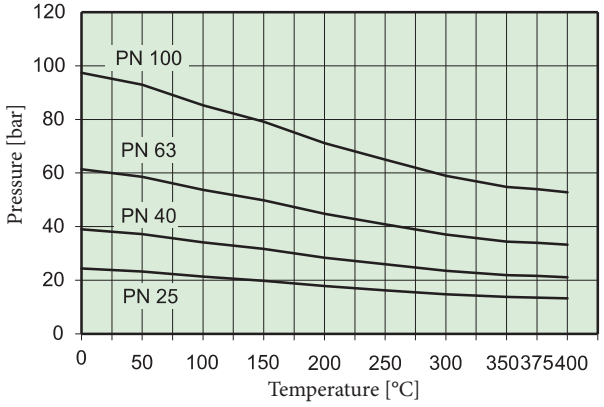
[1] In Asme 150 valve, the flange drilling is according to class 150, while flange thickness according to ASME 300
[2] ASME class 300 flange thickness.
[3] ASME class 600 flange thickness.
[4] 2 threaded flange drillings in the valve neck area.
[5] All flange wholes are threaded drillings

Maximum pressure/temperature ratings

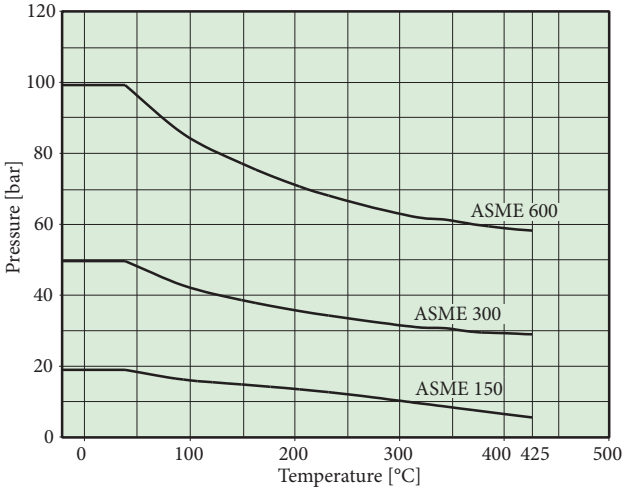
A 216 Gr. WCC



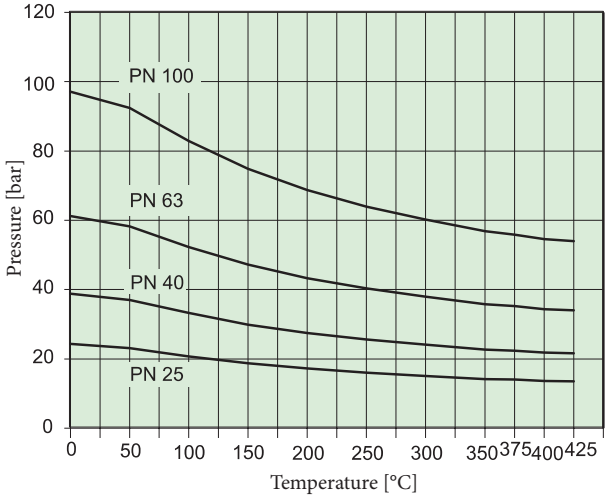
W.No. 1.0619



A 351 Gr. CF8M



W.No. 1.4581



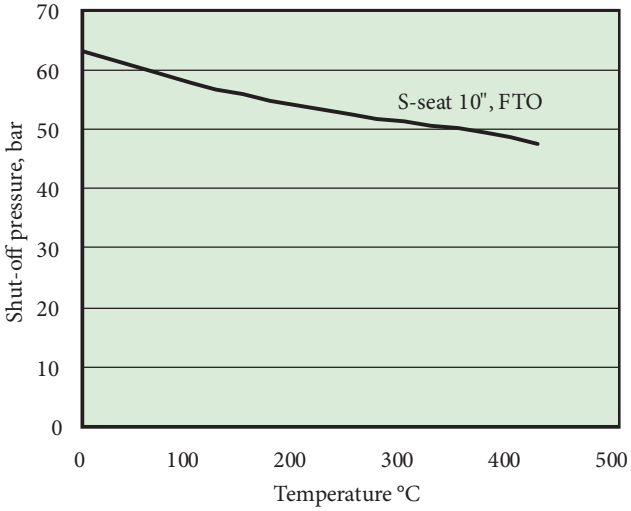
Note: For applications involving cavitation, impurities or excessive noise, contact Valmet for max Δp.

Temperature ranges

	Metal seat valve		Soft seat valve	
WCC/1.0619 body	-29 … +425 °C*	-20 … +797 °F*	-29 … +260 °C*	-20 … +500 °F*
CF8M/1.4408 body	-80 … +425 °C*	-112 … +797 °F*	-50 … +260 °C*	-58 … +500 °F*
CF8M Low temperature/cryo	-200 °C (min)**	-328 °F**	N/A	N/A

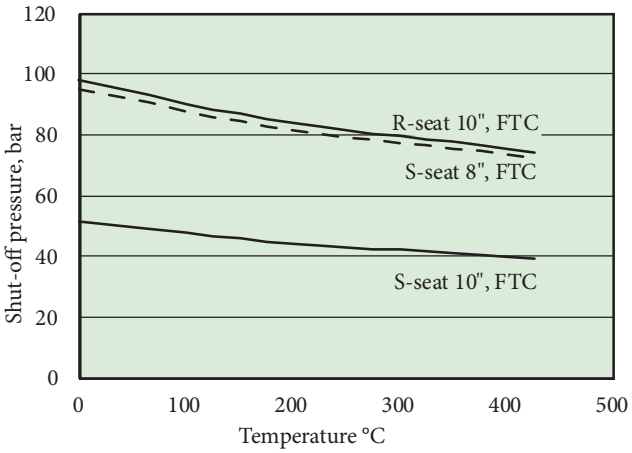
Graphite (PTFE lubricated) packing is recommended above 250 °C / 482 °F and for firesafe applications.
* Standard construction, no extension pipe needed.
** Cryogenic construction.

17-4PH shaft in Flow-to-Open direction



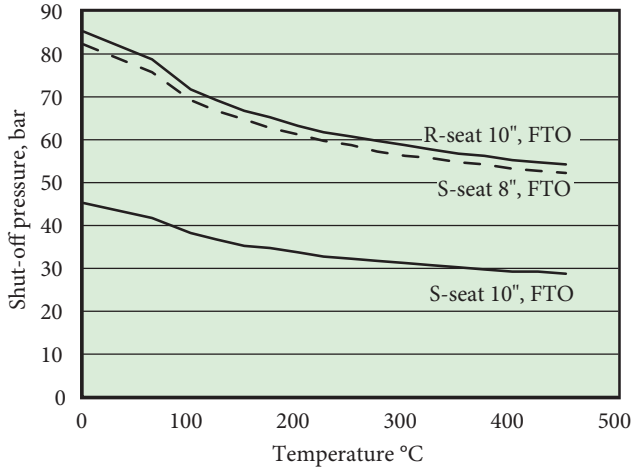
Other sizes as per valve body pressure rating
FTO = Flow to open

17-4PH shaft in Flow-to-Close direction



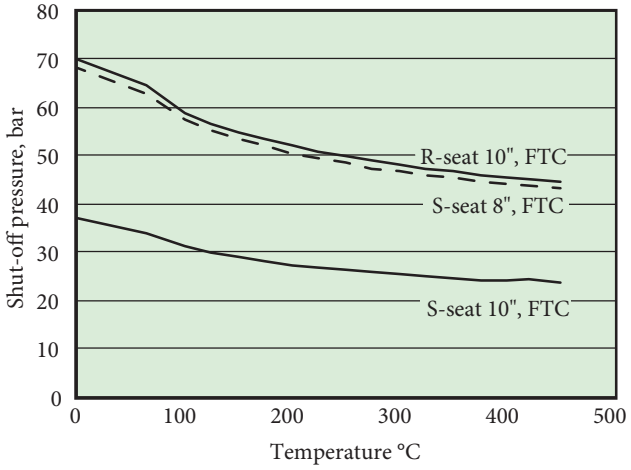
Other sizes as per valve body pressure rating
FTC = Flow to close

XM-19 shaft in Flow-to-Open direction



Other sizes as per valve body pressure rating
FTO = Flow to open

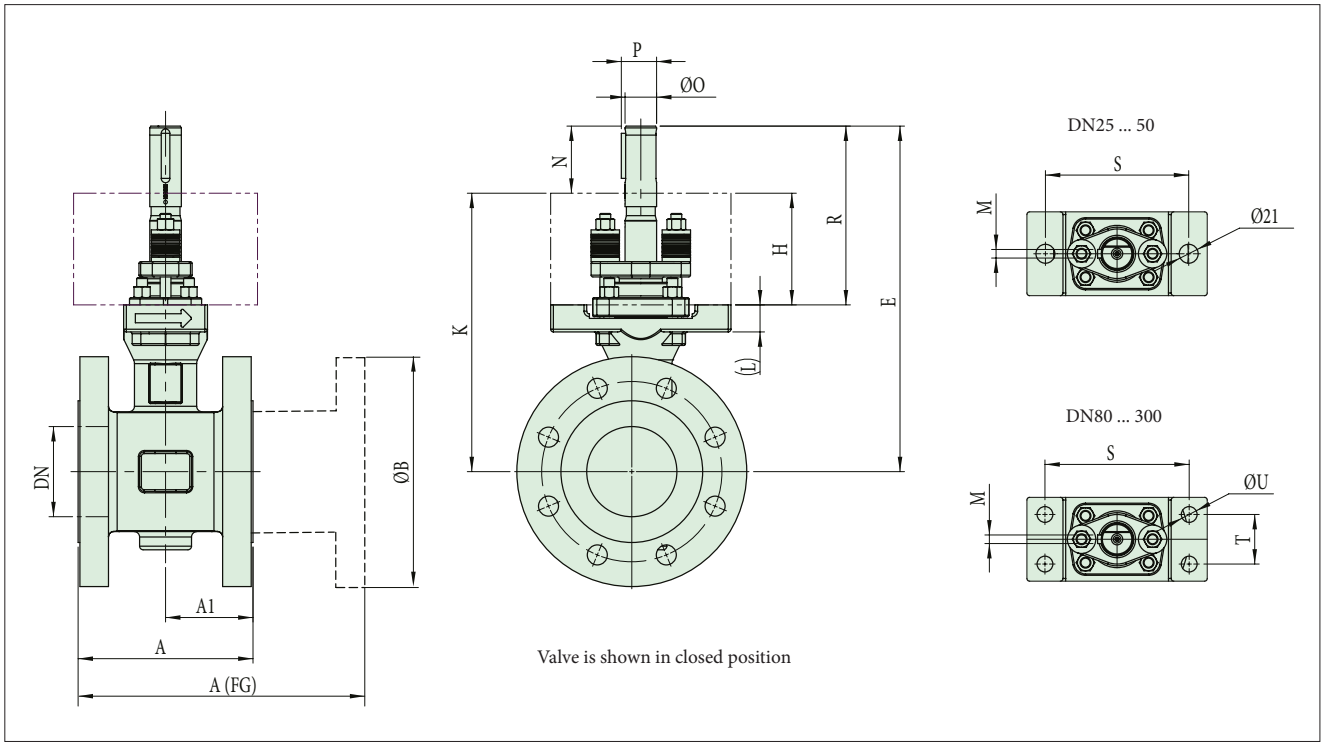
XM-19 shaft in Flow-to-Close direction



Other sizes as per valve body pressure rating
FTC = Flow to close

Dimensions

Series FC

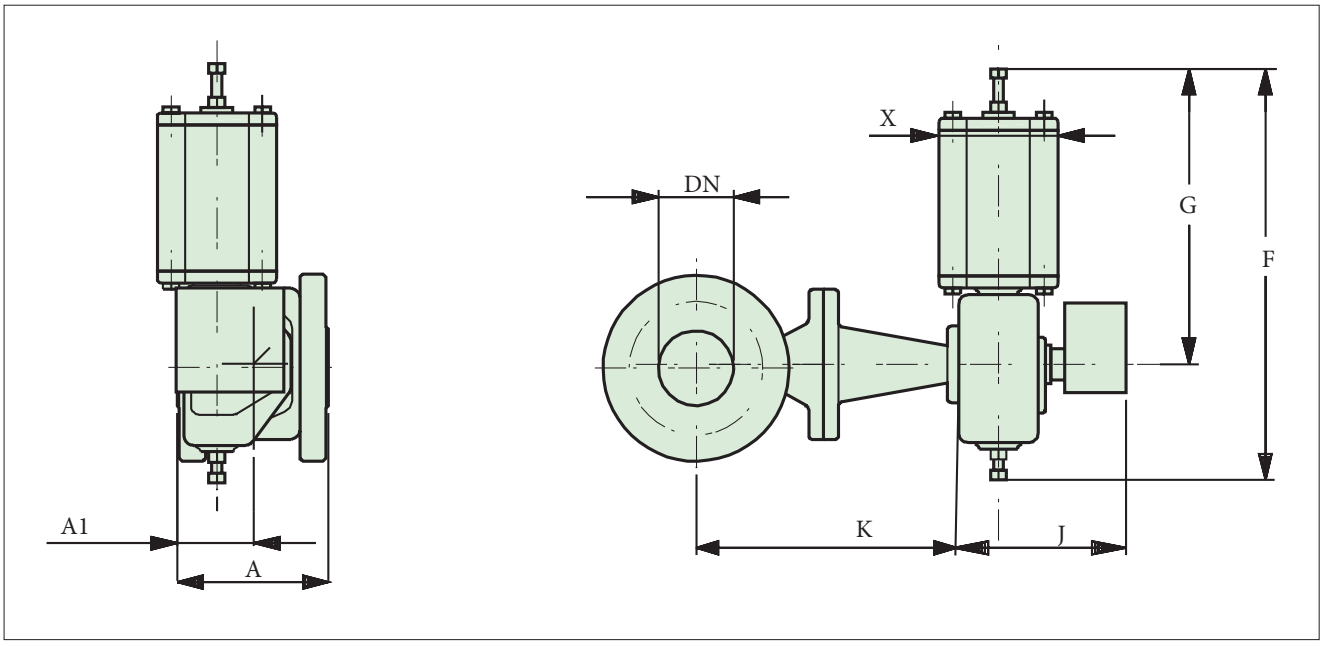


DN/Inch	Dimensions, mm																
	Series FC	Series FG, globe face to face A			A1	K	S	T	U	L	H	E	R	øO	M	P	N
	A	#150	#300	#600													
25/1”	102	184	197	210	51	192	90	-	2 x M12	18	90	217	115	15	4,76	17	25
40/1 1/2”	114	222	235	251	57	207	90	-	2 x M12	18	90	232	115	15	4,76	17	25
50/2”	124	254	267	286	62	217	90	-	2 x M12	18	90	252	125	20	4,76	22,2	35
80/3”	165	298	318	337	82,5	253	130	32	4 x M12	16	110	299	156	25	6,35	27,8	46
100/4”	194	352	368	394	97	325	160	55	4 x M20	30	140	383	198	35	9,53	39,1	58
150/6”	229	-	-	-	114,5	365	160	55	4 x M20	30	140	423	198	35	9,53	39,1	58
200/8”	243	-	-	-	121,5	473	230	90	4 x M24	36	180	553	260	45	12,7	50,4	80
250/10”	297	-	-	-	148,5	510	230	90	4 x M24	36	180	590	260	45	12,7	50,4	80
300/12”	338	-	-	-	169	530	230	90	4 x M24	35	215	630	315	70	19	75	100

DN/Inch	Flange dimensions (B) and weights														
	ASME 150			ASME 300			ASME 600			PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
	ØB	Kg(FC)	Kg(FG)	ØB	Kg(FC)	Kg(FG)	ØB	Kg(FC)	Kg(FG)	ØB					
25/1”	110	8	9	125	8	9	125	9	10	115	115	115	115	140	140
40/1 1/2”	125	11	12	155	11	13	155	12	13	150	150	150	150	170	170
50/2”	150	18	20	165	18	21	165	19	21	165	165	165	165	180	195
80/3”	190	24	26	210	24	28	210	26	30	200	200	200	200	215	230
100/4”	230	41	44	255	41	45	275	46	53	220	220	235	235	250	265
150/6”	280	58	-	320	58	-	355	73	-	285	285	300	300	345	355
200/8”	345	140	-	380	140	-	420	165	-	340	340	360	375	415	430
250/10”	405	190	-	445	190	-	510	230	-	395	405	425	450	470	505
300/12”	-	-	-	520	220	-	-	-	-	-	-	-	520	-	-

Dimension for low CV version (Class 300)																
DN	A	A1	K	S	T	U	L	H	E	R	øO	M	P	N	ØB	Kg
25	102	51	180	70	-	2 x M10	15,5	78	205	103	15	4,76	17	25	125	5

Dimensional drawings, optional actuator B1C/B1J, dimensions in mm (inch)



See A, A1 and K dimensions from page 7

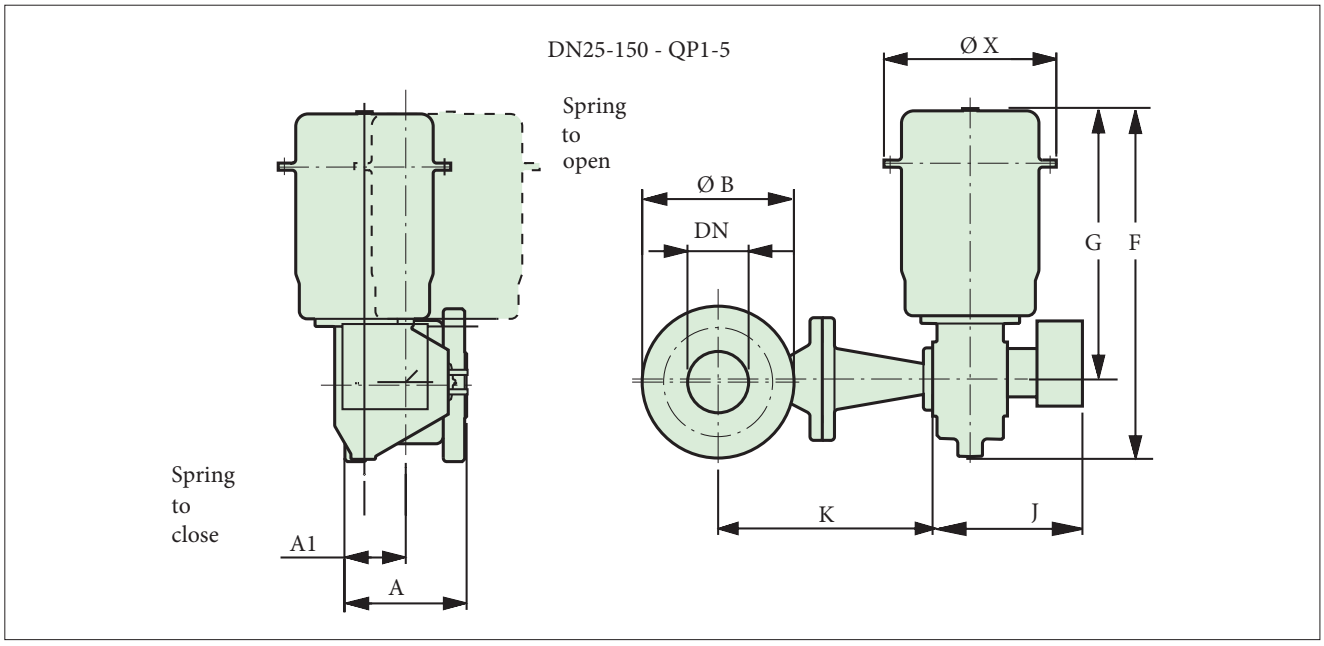
ACTUATOR	F	G	J	X	KG
B1C6	400	260	283	90	4.2
B1C9	455	315	279	110	9.6
B1C11	540	375	290	135	16
B1C13	635	445	316	175	31
B1C17	770	545	351	215	54
B1C20	840	575	385	215	72
B1C25	1040	710	448	265	131
B1C32	1330	910	525	395	256

ACTUATOR	F	G	J	X	KG
B1C6	15.75	10.24	11.14	3.54	9
B1C9	17.91	12.40	10.98	4.33	21
B1C11	21.26	14.76	11.42	5.31	35
B1C13	25.00	17.52	12.44	6.89	68
B1C17	30.31	21.46	13.82	8.46	119
B1C20	33.07	22.64	15.16	8.45	161
B1C25	40.94	27.95	17.64	10.43	289
B1C32	52.36	35.83	20.67	15.55	564

ACTUATOR	F	G	J	X	KG
B1J/B1JA6	485	368	273	110	8
B1J/B1JA8	560	420	297	185	17
B1J/B1JA10	650	490	290	175	30
B1J/B1JA12	800	620	316	215	57
B1J/B1JA16	990	760	351	265	100
B1J/B1JA20	1200	935	358	295	175
B1J/B1JA25	15309	1200	448	505	350
B1J/B1JA32	1830	1410	525	540	671

ACTUATOR	F	G	J	X	KG
B1J/B1JA6	19.09	14.49	10.75	4.33	20
B1J/B1JA8	22.05	16.54	10.98	5.31	37
B1J/B1JA10	25.59	19.29	11.42	6.89	66
B1J/B1JA12	31.5	24.41	12.44	8.46	126
B1J/B1JA16	38.98	29.92	13.82	10.43	220
B1J/B1JA20	47.24	36.81	14.09	15.55	386
B1J/B1JA25	60.24	47.24	17.64	19.88	771
B1J/B1JA32	72.05	55.51	20.26	21.26	

Dimensional drawings, actuator Quadra-Powr, dimensions in mm (inch)



See A, A1 and K dimensions from page 7.

ACTUATOR	F	G	J	X	KG
QPX1	382	330	225	213	12
QPX2	382	330	284	213	18
QPX3	565	445	346	274	30
QPX4	635	495	407	320	48
QPX5	768	608	522	382	94

ACTUATOR	F	G	J	X	lb
QPX1	15.04	12.99	8.86	8.39	26.46
QPX2	15.04	12.99	11.18	8.39	39.68
QPX3	22.24	17.52	13.62	10.79	66.14
QPX4	25.00	19.49	16.02	12.60	105.82
QPX5	30.94	23.94	20.55	15.04	207.23

How to order

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
FC	04	D	W	TA	S6	KB	SGT	D	A

Example: The following example is for a FC flanged valve, 4" size with ASME class 300 body (D), end connection style according to ASME B16.5 (W), general and fire safe construction with live loaded packing and flow-to-open flow direction (TA), CF8M body with 316SS insert, CF8M bonnet and 316SS gland (S6), CF8M plug with cobalt based hard facing and 17-4PH stem and bearing (KB), Cv-100% XM-19 seat with cobalt based hard facing and graphite back seal with PTFE V-ring and graphite bonnet seal (SGT), B8M studs and 8M nuts for stainless steel body (D), standard actuator mounting face (A).

ASME/ISA valves

1. sign	Valve series & style, face-to-face length
FC	Finetrol rotary control valve, flanged face-to-face acc. to ASME/ISA S75.08.02
FG	Finetrol rotary control valve, flanged, face-to-face acc. to ASME/ISA S75.03 (globe valve face-to-face)

2. sign	Connection size	
01	1"	Only series FC
1H	1 1/2"	
02	2"	
03	3"	
04	4"	
06	6"	
08	8"	
10	10"	
12	12" only OA/OB construction	

3. sign	Pressure ratings, flanges, flange drilling
C	ASME class 150*
D	ASME class 300
F	ASME class 600, not for size 12"

* Flange thickness' according to ASME 300

4. sign	End connection style
W	ASME B16.5, Raised face, (Ra 3.2-6.3 / AARH 125-250)

PN valves

1. sign	Valve series & style, face-to-face length
FC	Finetrol rotary control valve, flanged face-to-face acc. to IEC/EN 60534-3-2

2. sign	Size	
025	25 mm	Only series FC
040	40 mm	
050	50 mm	
080	80 mm	
100	100 mm	
150	150 mm	
200	200 mm	
250	250 mm	
300	300 mm, only OA/OB construction	

3. sign	Pressure ratings, flanges, flange drilling
J	PN 10*
K	PN 16*
L	PN 25*
M	PN 40*
N	PN 63**
P	PN100**

* Flange thickness according to class 300 for all sizes
** Flange thickness according to class 600 for all sizes; DN80, 150, 200, 250 have 2 threaded flange drillings in the valve neck area
DN100 has all threaded flange drilling

4. sign	End connection style
C	Raised face, standard Rz 40-160 (Ra 10-40)

All Finetrol valves

5. sign	Application and / or construction
TA	General and Fire Safe, Live loaded single packing, FTO, TA-Luft tested and certified by TÜV.
TB	General and Fire Safe, Live loaded single packing, FTC, TA-Luft tested and certified by TÜV.
QT	Q-trim FTO, Live loaded single packing
KA	Cryogenic construction, extended bonnet, FTO
KB	Cryogenic construction, extended bonnet, FTC
KQ	Cryogenic construction with Q-trim, extended bonnet, FTO
OA	Non-crossing shaft construction, FTO
OB	Non-crossing shaft construction, FTC

ASME/ISA valves

6. sign	Body	Insert	Bonnet	Gland
S6	CF8M /1.4408	316SS / 1.4436	CF8M / 1.4408	316SS / 1.4436
J1	WCC / 1.0619	316SS / 1.4436	WCC / 1.0619	316SS / 1.4436

All Finetrol valves

7. sign	PLUG, STEM AND BEARINGS MATERIAL AND STEM TYPE			
	Plug	Coating	Stem Material / Type	Bearing
KB	CF8M / 1.4581	Cobalt based hard facing	17-4PH, Nitrated Keyway	17-4PH, Nitrated

All Finetrol valves

8. sign	SEAT AND SEAT MATERIAL AND CONSTRUCTION				
	Seat type	Seat material	Back seal	Packings	Bonnet seal
NGT	S, Cv 100 %	6”-10”: 316 (no coating)	Graphite	V-ring PTFE	Graphite
NGG	S, Cv 100 %	6”-10”: 316 (no coating)	Graphite	Graphite	Graphite
MGT	R, Cv 50 %	6”-10”: 316 (no coating)	Graphite	V-ring PTFE	Graphite
MGG	R, Cv 50 %	6”-10”: 316 (no coating)	Graphite	Graphite	Graphite
SGT	S, Cv 100 %	1”-4” : XM-19, 6”-10”: 316 + cobalt based hard facing	Graphite	V-ring PTFE	Graphite
SGG	S, Cv 100 %	1”-4” : XM-19, 6”-10”: 316 + cobalt based hard facing	Graphite	Graphite	Graphite
RGT	R, Cv 50 %	1”-4”: XM-19, 6”-10”: 316 + cobalt based hard facing	Graphite	V-ring PTFE	Graphite
RGG	R, Cv 50 %	1”-4”: XM-19, 6”-10”: 316 + cobalt based hard facing	Graphite	Graphite	Graphite
TTT	T, Cv 100 %	316+Xtreme	PTFE	V-ring PTFE	Graphite
TTG	T, Cv 100 %	316+Xtreme	PTFE	Graphite	Graphite

ASME/ISA VALVES

9. sign	Studs	Nuts
D *	B8M	8M
F **	L7M	2HM

* Bolting material for stainless steel body.
** Bolting material for carbon steel body.

MODEL CODE

10. sign	Actuator mounting face
A	Standard
-	Special

Actuators, positioners

For Quadra-Powr™ actuators see bulletin 6 QPX 21
For B-series actuators see bulletin 6 B 20
For ND-positioners see bulletin 7 ND90 21
For NDX-positioners see bulletin 7 NDX 21
For NE/NP-positioners see bulletin 7 NE/NP 20.
Codes for Finetrol in Nelprof™ control valve selection software: FI - FTO, FI - FTC, FI-FTO-O, FI-FTC-O, Q - FI

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