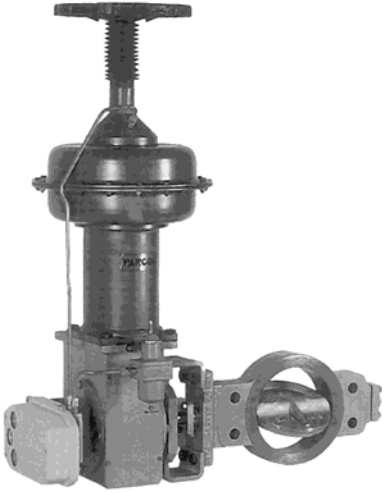


**1-2512 SERIES
BUTTERFLY
CONTROL VALVES**

1-2512 SERIES BUTTERFLY VALVES



1-2512 series control valves feature a "swing through" type disc plug suitably profiled to reduce the dynamic torque transmitted by the fluid and reduce the cavitation risk on liquids, yet allowing to operate even with high pressure drops.

Body sizes from DN 80 through DN 600 compatible with UNI and ANSI flanges are available.

Special sizes up to DN 1600 are available on request.

MAIN FEATURES

BODY

- type: flangeless.
- sizes: 3" through 24" compatible with UNI, DIN, ANSI flanges.
- face-to-face dimensions: according to ISO 5752, medium series.
- rating: UNI PN 10, 16, 25, 40, 64, 100; ANSI 150, 300, 600
See table on fig. 1 for the complete availability. Take into account that the max pressure and/or temperature can be affected by bearings and seal ring materials.
- construction materials: see relevant tables - Steel bodies can be cast, wrought or forged. Other special materials are available on request (Hastelloy, AISI 316L, Monel, Alloy 20).

PLUG

- type: profiled disc.
- construction materials: same as the body, cast construction.
- rangeability: depending on DN (in any case over 100) see Cv coefficients table.
- rotation: standard 90°
- flow direction: from either sides, for disc rotation see fig. 3.
- action: air-to-open and air-to-close with simple-acting or piston actuators. To change action only assembling operations are required.

- shutoff classification: according to Class II IEC 60534-4 (ANSI B16.104)

SHAFT

- construction: made in one piece and pinned to the disc.
- materials: 17-4-PH, A479 XM 19, AISI 316, AISI 316L.

BEARINGS

- construction: PTFE-lined or all-metal bushing for high temperature service.
- temperature capabilities: PTFE-lined bearings may be used up to 250 °C;
All-metal bearings may be used up to 375 °C.

PACKING

- seal materials: reinforced PTFE split rings and pure graphite rings.
- design: adjustable by follower and two screws.
- temperature capabilities: graphited PTFE rings: 200 °C;
pure graphite: no practical limits.

ACTUATORS

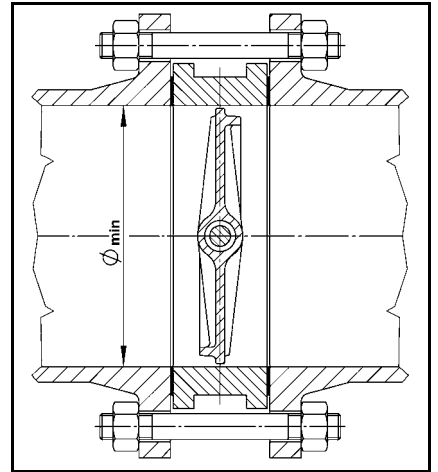
The valve is normally supplied with 1-X-271 series PARCOL pneumatic actuator.
For control service positioner is recommended.

Fig.1: RATING AVAILABILITY

DN in.	ANSI			PN UNI DIN					
	150	300	600	10	16	25	40	64	100
3	X	X	X	X	X	X	X	X	X
4	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	spec
8	X	X	X	X	X	X	X	X	X
10	X	(*)		X	X	X	X		
12	X	spec		X	X	spec	spec		
14	X	(*)		X	X	spec	spec		
16	X	(*)		X	X	X	spec		
18	X			(*)	(*)				
20	(*)			(*)	(*)				
24	(*)			(*)	(*)				

Fig.2: MINIMUM INSIDE DIAMETER OF PIPING FLANGES

DN in.	Ø min. mm
3	67
4	89
6	139
8	200
10	251
12	301
14	339
16	389
18	437
20	486
24	590

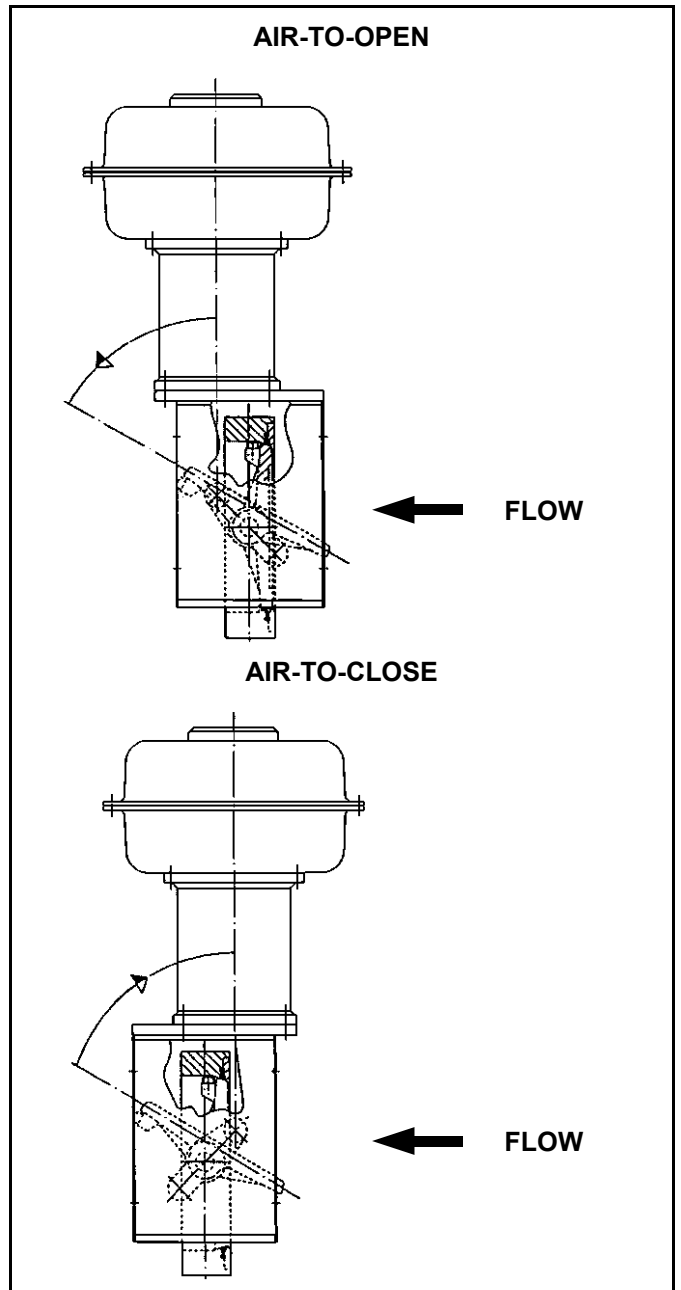


COMPATIBILITY WITH PIPING FLANGES

- The four holes around the shaft normally pass through the body
- Where (*) is indicated the holes are ISO coarse threaded with the following correspondance:
1" 8UN = M27, 1.1/8" 8UN = M30, 1.1/4" 8UN = M33
- On request, ANSI B1.1 threads are available
- The UNI, DIN raised faces are available only on forged bodies
- Cast UNI, DIN bodies are faced in according to the ANSI standard.

To prevent interference with disc rotation the connected piping shall have an inside diameter greater than the one shown on fig. 2

Fig.3: DISC ROTATION



FLOW COEFFICIENT $C_v^{(1)}$

DN in.	DN mm	Cv max 90°	Valve opening ⁽²⁾⁽³⁾									
			5°	10°	20°	30°	40°	50°	60°	70°	80°	
3	80	275	2.0	4	13	25	42	69	108	169	241	
4	100	460	3.3	6	22	41	71	115	181	282	404	
5	125	700	5.0	10	33	63	108	176	276	429	615	
6	150	1120	8.0	15	53	101	172	281	441	687	983	
7	175	1460	10.4	20	69	131	225	366	575	895	1282	
8	200	2120	15	29	88	168	271	421	663	1022	1565	
10	250	3570	26	49	148	283	456	709	116	1721	2635	
12	300	5110	37	70	211	405	652	1015	1597	2464	3771	
14	350	6490	46	89	268	514	829	1289	2029	3129	4790	
16	400	8990	64	124	372	712	1148	1786	2810	4334	6635	
18	450	11120	80	153	460	880	1420	2209	3476	5361	8207	
20	500	13500	97	186	558	1069	1724	2682	4220	6509	9963	
24	600	20300	145	280	840	1607	2592	4033	6345	9787	14981	

RECOVERY FACTOR F_L

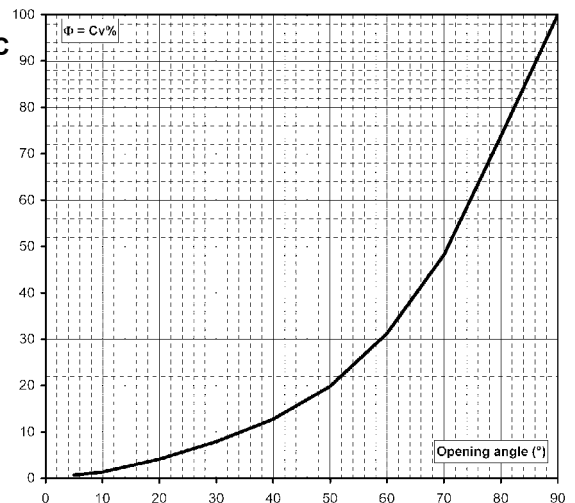
DN in.	DN mm	F _L 90°	Valve opening									
			5°	10°	20°	30°	40°	50°	60°	70°	80°	
3	80	0.61	0.95	0.95	0.93	0.90	0.87	0.82	0.76	0.70	0.63	
4	100	0.61	0.95	0.95	0.93	0.90	0.86	0.82	0.76	0.69	0.63	
5	125	0.61	0.95	0.95	0.93	0.90	0.87	0.82	0.76	0.70	0.63	
6	150	0.59	0.95	0.95	0.92	0.90	0.86	0.81	0.75	0.68	0.61	
7	175	0.60	0.95	0.95	0.93	0.90	0.86	0.81	0.75	0.68	0.62	
8	200	0.58	0.95	0.95	0.93	0.90	0.87	0.83	0.77	0.71	0.64	
10	250	0.57	0.95	0.95	0.92	0.90	0.86	0.82	0.76	0.70	0.62	
12	300	0.57	0.95	0.95	0.92	0.90	0.86	0.82	0.76	0.70	0.62	
14	350	0.57	0.95	0.95	0.92	0.90	0.86	0.82	0.76	0.70	0.62	
16	400	0.56	0.95	0.95	0.92	0.89	0.86	0.81	0.76	0.69	0.61	
18	450	0.56	0.95	0.95	0.92	0.89	0.86	0.82	0.76	0.69	0.62	
20	500	0.57	0.95	0.95	0.92	0.90	0.86	0.82	0.76	0.70	0.62	
24	600	0.56	0.95	0.95	0.92	0.89	0.86	0.82	0.76	0.69	0.62	

COEFFICIENT OF INCIPIENT CAVITATION $X_{FZ}^{(4)}$

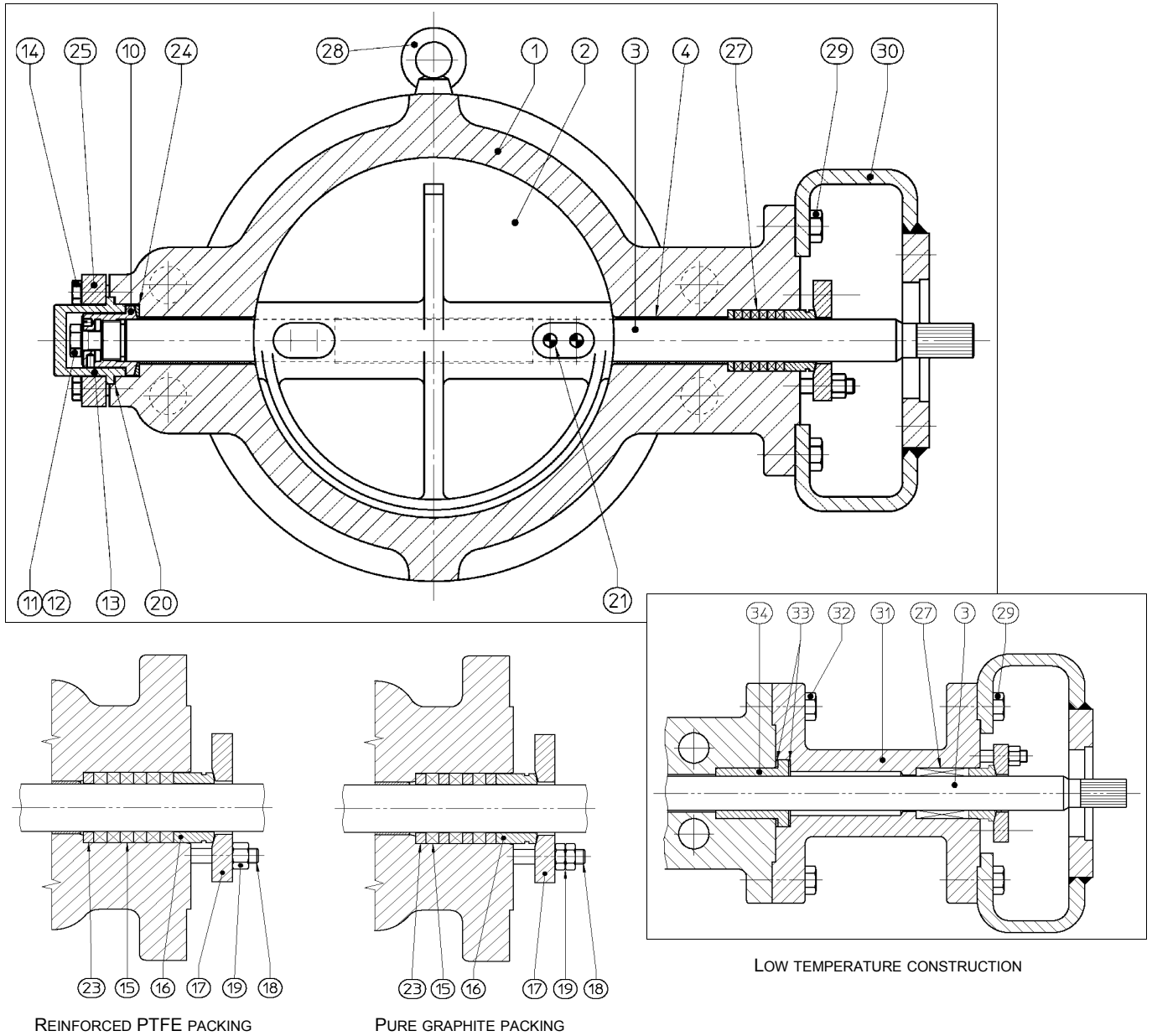
DN in.	DN mm	X _{FZ} 90°	Valve opening									
			5°	10°	20°	30°	40°	50°	60°	70°	80°	
3	80	0.22	0.86	0.84	0.79	0.72	0.64	0.54	0.44	0.33	0.25	
4	100	0.22	0.85	0.84	0.78	0.71	0.63	0.53	0.43	0.32	0.24	
5	125	0.22	0.85	0.84	0.78	0.72	0.64	0.54	0.44	0.33	0.25	
6	150	0.20	0.84	0.83	0.77	0.70	0.61	0.51	0.41	0.30	0.23	
7	175	0.21	0.84	0.83	0.77	0.70	0.62	0.52	0.41	0.31	0.23	
8	200	0.19	0.84	0.83	0.77	0.71	0.64	0.55	0.45	0.35	0.25	
10	250	0.18	0.84	0.82	0.76	0.69	0.62	0.53	0.43	0.33	0.23	
12	300	0.17	0.83	0.82	0.76	0.69	0.62	0.53	0.43	0.32	0.23	
14	350	0.17	0.83	0.82	0.76	0.69	0.62	0.53	0.43	0.32	0.23	
16	400	0.17	0.83	0.81	0.75	0.68	0.61	0.52	0.41	0.31	0.22	
18	450	0.17	0.83	0.81	0.75	0.68	0.61	0.52	0.42	0.32	0.23	
20	500	0.17	0.83	0.81	0.75	0.69	0.61	0.52	0.42	0.32	0.23	
24	600	0.17	0.82	0.81	0.75	0.68	0.60	0.52	0.41	0.31	0.22	

DN in.	DN mm	X _T 90°	X _T 10°
3	80	0.26	0.84
4	100	0.26	0.84
5	125	0.26	0.84
6	150	0.24	0.84
7	175	0.25	0.84
8	200	0.24	0.84
10	250	0.22	0.84
12	300	0.22	0.84
14	350	0.22	0.84
16	400	0.22	0.84
18	450	0.22	0.84
20	500	0.22	0.84
24	600	0.22	0.84

FIG.4 FLOW CHARACTERISTIC FOR DN > 6"



- (1) C_v are expressed in U.S. gallons/min. of water with Δp=1 psi
- (2) Rangeability can be calculated as C_v max/C_v 5°
- (3) Tolerance accorgind to IEC 60534-2-4
- (4) IEC 60534-8 -4



ITEM	PART NAME
1	BODY
2	DISC
3	SHAFT
4	BEARING
10	ADJUSTING RING
11	SCREW
12	LOCK WASHER
13	COVER
14	SCREW
15	PACKING RING
16	PACKING FOLLOWER
17	PACKING FLANGE
18	STUD
19	NUT

ITEM	PART NAME
20	GASKET
21	PIN
23	BUSHING
24	ANTIFRICTION RING
25	FLANGE
27	PACKING
28	EYE BOLT
29	SCREW
30	SUPPORT
31	EXTENSION
32	SCREW
33	GASKET
34	BUSHING

MATERIALS OF CONSTRUCTION

ITEM	PART NAME	BASIC CLASS					NACE (MR0175 - MR0103)	
		A	B	G	H	K	(A)	(G)
1	BODY	A 216 WCB / A 105		AISI 316	AISI 316L	ASTM A890/A890M 4A	A 216 WCB / A 105 22HRC max	AISI 316 22HRC max
2	DISC	A 216 WCB / A 105		AISI 316	AISI 316L	ASTM A890/A890M 4A	A 216 WCB / A 105 22HRC max	AISI 316 22HRC max
3	SHAFT	SEE SUB-CLASS TABLE						
4	BEARING	SEE SUB-CLASS TABLE						
10	ADJUSTING RING	S 21800						
11	SCREW	AISI 304		AISI 316	MONEL 400		AISI 304	
12	LOCK WASHER	AISI 304			AISI 316L		AISI 304	
13	COVER	A 105	AISI 316	AISI 316L		A 105 22HRC max	AISI 316 22HRC max	
14	SCREW	AISI 304			AISI 316L		AISI 304	
20	GASKET	INORGANIC COMPOUND T ≤ 300 °C - ARMoured GRAPHITE T > 300 °C						
21	PIN	MONEL K500						
24	ANTIFRICTION RING	AISI 316		AISI 316L	BSZN 5-BRONZE		AISI 316 22HRC max	
25	FLANGE	A 105			AISI 316		A 105	
27	PACKING	SEE PACKING TABLE						
28	EYEBOLT	CARBON STEEL						
29	SCREW	8.8 UNI 3740		AISI 304		8.8 UNI 3740		AISI 304
30	SUPPORT	CARBON STEEL						

ITEM	PART NAME	SUB-CLASS							
		01	02	04	06	07	08	09	
3	SHAFT	ASTM A 564-630 H900 (ASTM A 564-630 H1150M) ⁽²⁾			AISI 316 (22HRC max) ⁽²⁾	XM 19 (35HRC max) ⁽²⁾	AISI 316L (22HRC max) ⁽²⁾	UNS S31803 (SAF 2205) (25HRC max) ⁽²⁾	
4	BEARING	CARBON STEEL + BRONZE + PTFE	ASTM B 148-955 (grade D)	AISI 316L + PTFE FIBRES ⁽¹⁾			INCONEL 625 + PTFE FIBRES ⁽¹⁾		

ITEM	PART NAME	PACKING TYPE	SUB-CLASS		
			A-B	G	H-K
15	PACKING RING	TFK	Reinforced PTFE		
		GRF	GRAPHITE		
16	PACKING FOLLOWER	TFK - GRF	AISI 316		AISI 316L
17	PACKING FLANGE		CARBON STEEL	AISI 316	
18	STUD		AISI 304		
19	NUT		AISI 304		
23	SPACER RING	TFK	25% Glass loaded PTFE		
		GRF	AISI 316	AISI 316L	

SELECTION GUIDE				
BASIC CLASS	SUB-CLASS	TEMPERATURE	SERVICE	
A	01	-29 °C ÷ 200 °C	NOT CORROSIVE	
	02	-29 °C ÷ 375 °C	NOT CORROSIVE T > 200 °C	
B	01	-29 °C ÷ 200 °C	NOT CORROSIVE	
	02	-29 °C ÷ 250 °C	NOT CORROSIVE T > 200 °C	
G	02	-29 °C ÷ 375 °C	CORROSIVE T > 200 °C	
	04	-29 °C ÷ 200 °C	CORROSIVE	
	06	-50 °C ⁽³⁾ ÷ 200 °C	CORROSIVE (NACE)	
	07	-50 °C ⁽³⁾ ÷ 200 °C	CORROSIVE FOR HIGH Δp (NACE)	
H	08	-29 °C ÷ 200 °C	CORROSIVE (NACE)	
K	09	-29 °C ÷ 200 °C	SEAWATER (BRINE)	NOT SUITABLE FOR COPPER FREE SERVICE

(1) Not suitable for hydrochloric acid. For strong solvents the compatibility must be checked with bushing manufacturer

(2) For NACE

(3) With packing chamber extension: -100 °C

MAX DIFFERENTIAL PRESSURE ACROSS THE VALVE Δp - bar

DN in.	60° OPEN VALVE CLASS									
	A01	A02	B01	B02	G02	G04	G06	G07	H08	K09
3	33.8	33.8	33.8	33.8	33.8	33.8	13.4	33.8	10.8	10.8
4	26.5	31.3	26.5	31.3	31.3	26.5	14.6	26.5	11.8	11.8
6	14.9	14.9	14.9	14.9	14.9	14.9	4.3	14.9	3.5	3.5
8	18.3	21.5	18.3	21.5	21.5	18.3	9.0	18.3	7.3	7.3
10	11.8	12.4	11.8	12.4	12.4	11.8	3.6	11.8	2.9	2.9
12	10.0	10.7	10.0	10.7	10.7	10	3.1	10.0	2.5	2.5
14	7.5	7.5	7.5	7.5	7.5	7.5	2.2	7.5	1.7	1.7
16	4.9	4.9	4.9	4.9	4.9	4.9	1.4	4.9	1.1	1.1
18	8.7	10.2	8.7	10.2	10.2	8.7	3.1	8.7	2.5	2.5
20	7.6	7.6	7.6	7.6	7.6	7.6	2.2	7.6	1.8	1.8
24	4.3	4.3	4.3	4.3	4.3	4.3	1.3	4.3	1.0	1.0

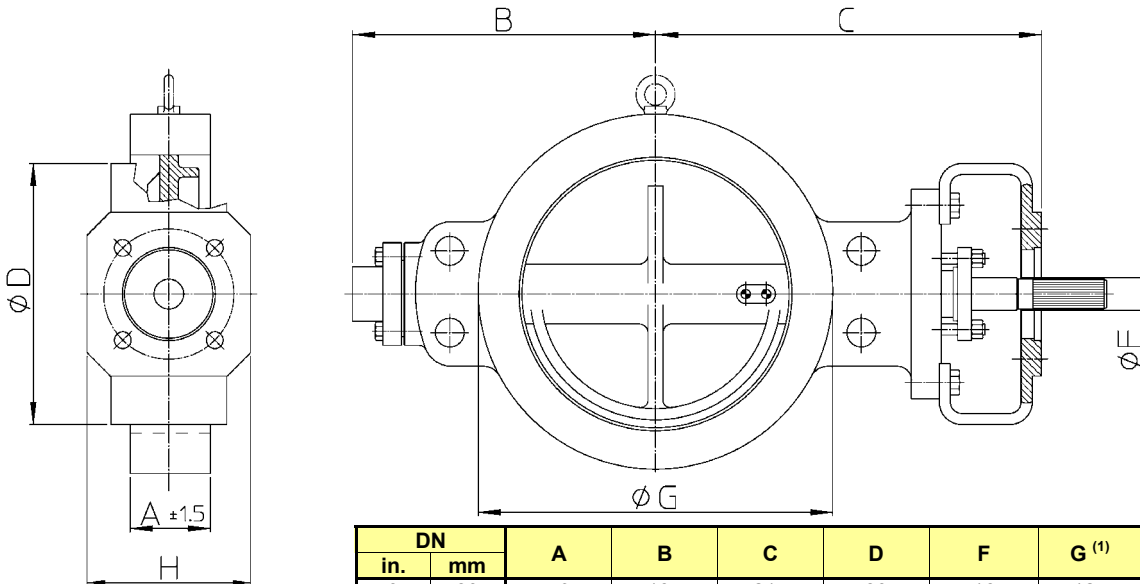
DN in. / ACTUATOR	60° OPEN VALVE - with actuator CLASS									
	A01	A02	B01	B02	G02	G04	G06	G07	H08	K09
3 / D25	28.7	28.7	28.7	28.7	28.7	28.7	13.4	28.7	10.8	10.8
4 / D33	26.5	31.3	26.5	31.3	31.3	26.5	14.6	26.5	11.8	11.8
6 / D33	9.8	9.8	9.8	9.8	9.8	9.8	4.3	9.8	3.5	3.5
8 / D39	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
10 / D39	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
12 / D46	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.5	2.5
14 / D46	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.7	1.7
16 / D46	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.1	1.1
18 / D63	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
20 / D63	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
24 / D63	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

DN in.	CLOSED VALVE CLASS									
	A01	A02	B01	B02	G02	G04	G06	G07	H08	K09
3	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8
4	26.5	31.3	26.5	31.3	31.3	26.5	26.5	26.5	31.3	31.3
6	26.2	30.9	26.2	30.9	30.9	26.2	22.0	26.2	17.7	17.7
8	18.3	21.5	18.3	21.5	21.5	18.3	18.3	18.3	21.5	21.5
10	11.8	13.9	11.8	13.9	13.9	11.8	11.8	11.8	13.9	13.9
12	10.0	11.8	10.0	11.8	11.8	10.0	10.0	10.0	11.8	11.8
14	10.1	11.9	10.1	11.9	11.9	10.1	10.1	10.1	11.9	11.9
16	7.6	9.0	7.6	9.0	9.0	7.6	7.6	7.6	9.0	9.0
18	8.7	10.2	8.7	10.2	10.2	8.7	8.7	8.7	10.2	10.2
20	9.3	10.9	9.3	10.9	10.9	9.3	9.3	9.3	10.9	10.9
24	8.9	10.5	8.9	10.5	10.5	8.9	8.9	8.9	9.5	9.5

DN in. / ACTUATOR	CLOSED VALVE - with actuator CLASS									
	A01	A02	B01	B02	G02	G04	G06	G07	H08	K09
3 / D25	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8
4 / D33	26.5	31.3	26.5	31.3	31.3	26.5	26.5	26.5	31.3	31.3
6 / D33	26.2	30.9	26.2	30.9	30.9	26.2	22.0	26.2	17.7	17.7
8 / D39	18.3	21.5	18.3	21.5	21.5	18.3	18.3	18.3	21.5	21.5
10 / D39	11.8	13.9	11.8	13.9	13.9	11.8	11.8	11.8	13.9	13.9
12 / D46	10.0	11.8	10.0	11.8	11.8	10.0	10.0	10.0	11.8	11.8
14 / D46	10.1	11.9	10.1	11.9	11.9	10.1	10.1	10.1	11.9	11.9
16 / D46	7.6	9.0	7.6	9.0	9.0	7.6	7.6	7.6	9.0	9.0
18 / D63	8.7	10.2	8.7	10.2	10.2	8.7	8.7	8.7	10.2	10.2
20 / D63	9.3	10.9	9.3	10.9	10.9	9.3	9.3	9.3	10.9	10.9
24 / D63	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1

Listed values are applicable up to 100 °C. Over this temperature limit Δp values must be reduced according to materials of construction limitations.

OVERALL DIMENSIONS (mm) AND MASSES (kg)



DN		A	B	C	D	F	G ⁽¹⁾	H	MASS ⁽²⁾
in.	mm								
3	80	49	137	215	80	16	127	90	26
4	100	56	152	246	102	19,05	126	126	38
6	150	70	217	300	150	25,4	216	126	52
8	200	70	245	357	206	31,75	270	176	63
10	250	76	270	382	256	31,75	324	176	73
12	300	83	315	415	306	34,92	381	176	100
14	350	92	332	432	345	41,27	413	176	124
16	400	102	357	457	396	41,27	470	176	144
18	450	114	410	539	445	50,8	533	212	200
20	500	127	435	579	496	60	584	212	140
24	600	154	523	656	599	70	692	212	296

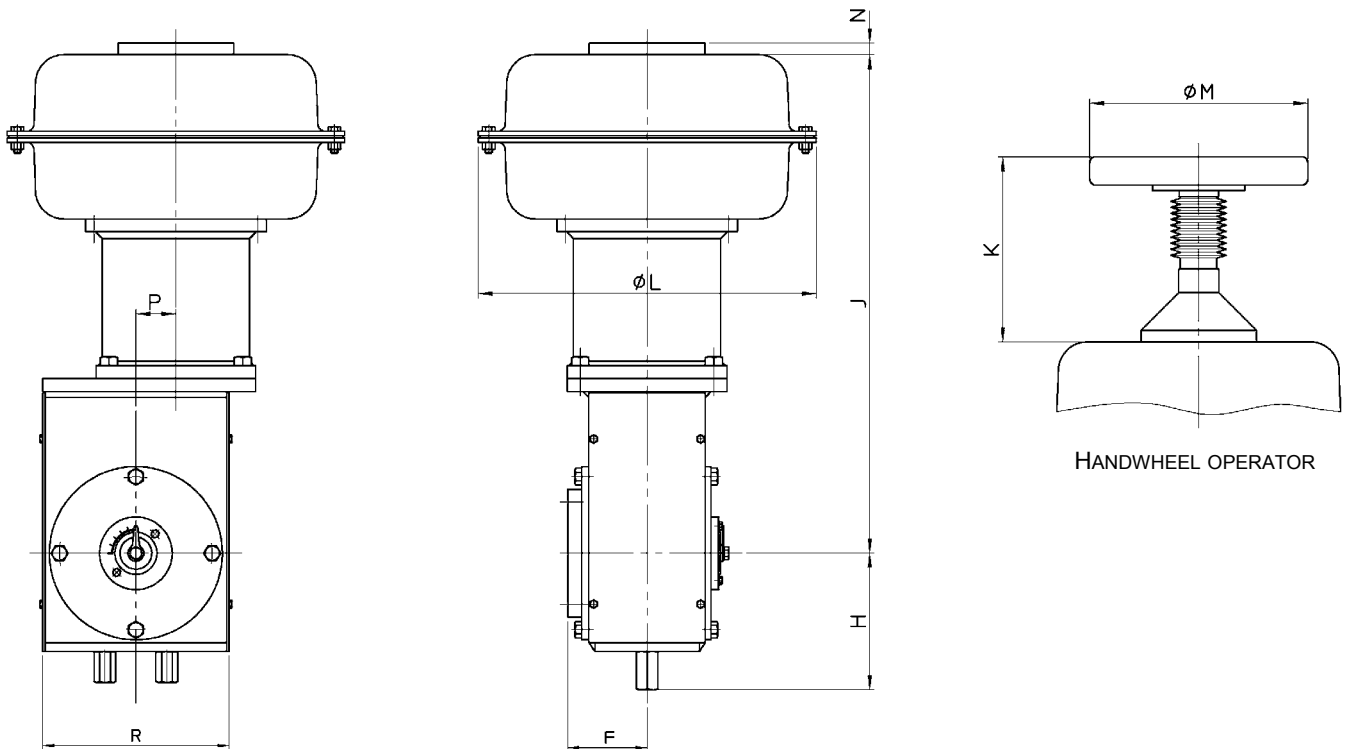
(1) If requested, forged bodies are available with UNI, DIN raised faces
 (2) Without actuator

1-X-271 SERIES PNEUMATIC DIAPHRAGM ACTUATORS

1-X-271 series rotary pneumatic diaphragm actuator is normally installed on PARCOL rotary valves (0° to 90°). D25, D33, D39, D46 and D63 sizes are available. Floating stem construction minimizes frictions and backlash and significantly reduces mass and dimension. The spring is preloaded in a suitable case, to make diaphragm replacement safer and simpler. The design allows to replace the actuator without disassembling the valve or part of it.

Standard diaphragm settings are 3÷15 psi (0.2÷1 bar), 6÷30 psi (0.4÷2 bar), 20÷44 psi (1.4÷3 bar) with 20÷50 psi (1.4÷3,5 bar) supply in air-to-open and air-to-close flow directions; other spring ranges are available on request.

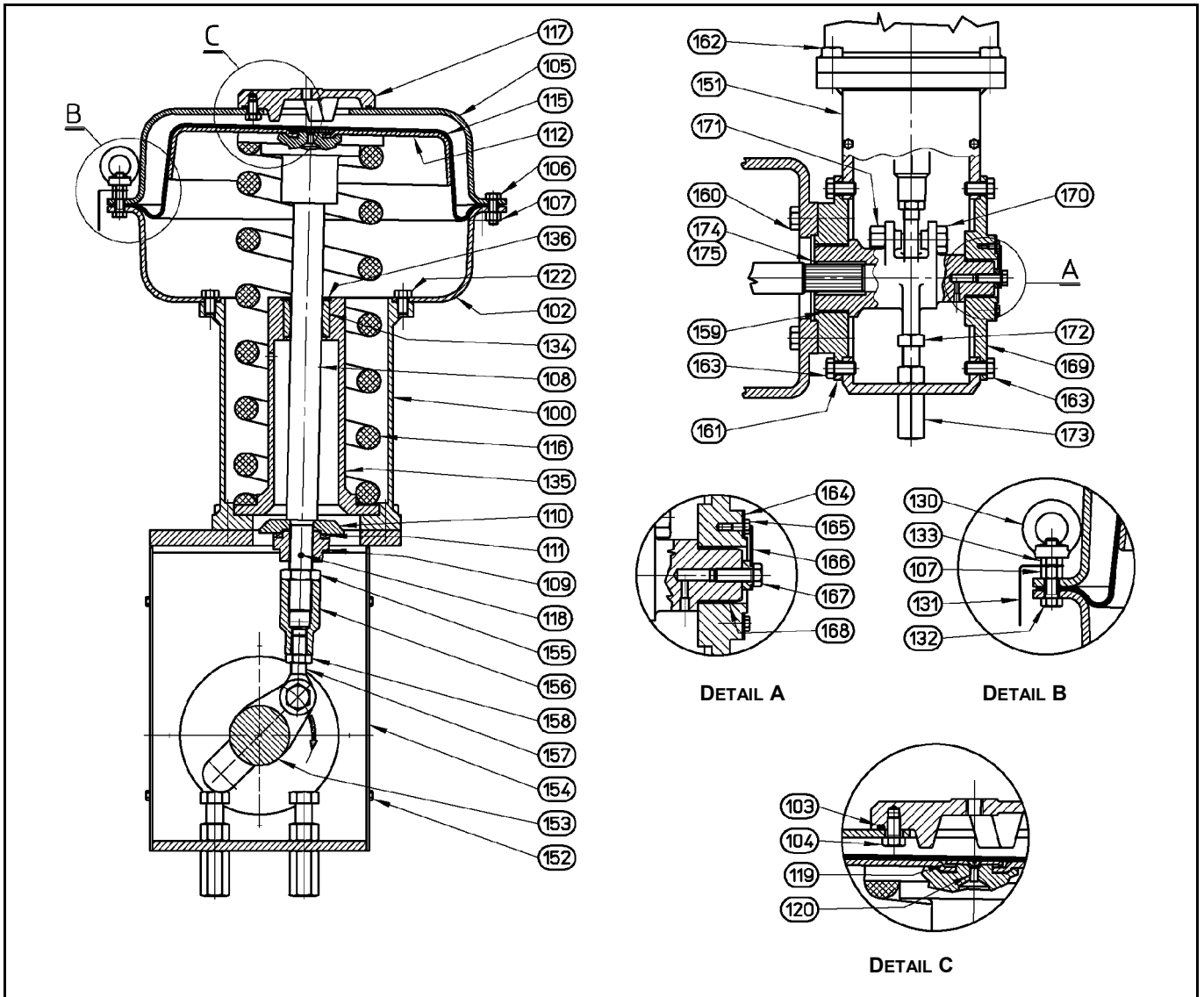
Maximum working pressure is 3.5 bar; the design pressure (maximum allowable pressure to case and flanged connection) is 10 bar.



OVERALL DIMENSIONS (mm) AND MASSES (kg)

DN		1-X-271 ACTUAT.	F	H	J	K	L	M	N	P	R	MASS ⁽¹⁾
in.	mm											
3	80	D25	65	112	432	220	262	175	21	29	140	28
4	100	D33	78	140	538	255	333	225	21	36	170	50
6	150											
8	200	D39	96	170	639	343	395	300	24	46	224	85
10	250											
12	300	D46	109	190	731	397	465	400	24	55	250	140
14	350											
16	400											
18	450	D63	155	275	836	520	640	570	21	72	300	180
20	500											
24	600											

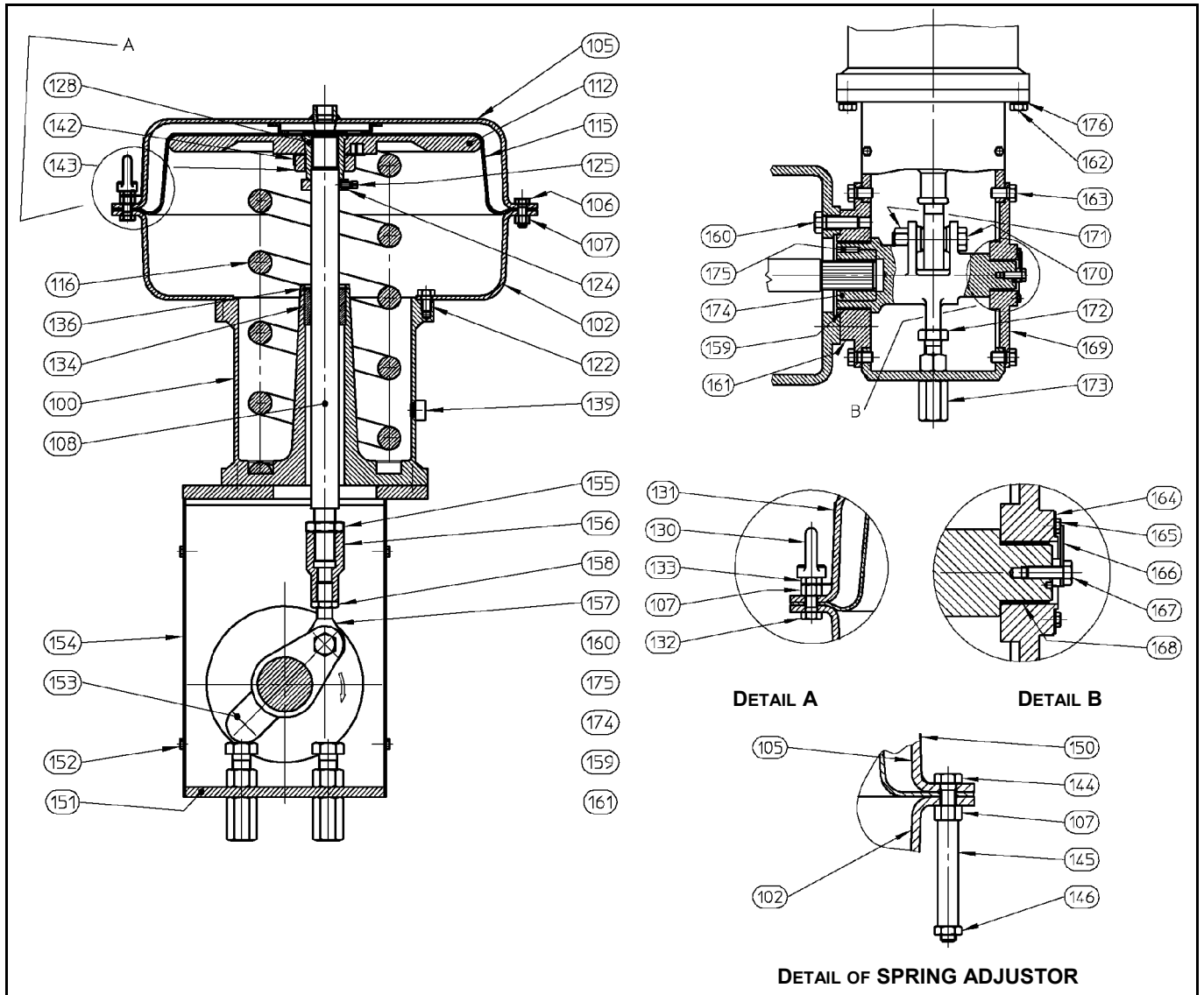
⁽¹⁾ Without handwheel operator



1-X-271 SERIES D25-D46 TYPE DIAPHRAGM ACTUATOR

ITEM	PART NAME
100	SPRING CASE
102	LOWER DIAPHRAGM CASE
103	"O" RING
104	SCREW
105	TOP DIAPHRAGM CASE
106	SCREW
107	NUT
108	STEM AND SPRING GUIDE
109	CLAMPING NUT
110	SPACER
111	BEARING
112	DIAPHRAGM PLATE
115	DIAPHRAGM
116	SPRING
117	CAP
118	SPRING
119	WASHER
120	SCREW
121	SPACER RING
122	SCREW
130	EYEBOLT
131	EYEBOLT PLATE
132	SCREW
133	NUT
134	GUIDE BUSHING
135	LOWER SPRING SEAT

ITEM	PART NAME
136	STOP RING
151	YOKE
152	SCREW
153	LEVER
154	SIDE COVER
155	NUT
156	SCREW COUPLING
157	LEFT THREADED BALL JOINT
158	NUT
159	BEARING
160	SCREW
161	COVER
162	SCREW
163	SCREW
164	PLATE
165	SCREW
166	TRAVEL INDICATOR
167	SCREW
168	BEARING
169	COVER
170	SCREW
171	NUT
172	SCREW
173	NUT
174	BUSHING
175	PIN



1-X-271 SERIES D63 TYPE DIAPHRAGM ACTUATOR

ITEM	PART NAME
100	YOKE
102	LOWER DIAPHRAGM CASE
105	UPPER DIAPHRAGM CASE
106	SCREW
107	NUT
108	STEM
112	DIAPHRAGM PLATE
115	DIAPHRAGM
116	SPRING
122	SCREW
124	STROKE LIMITER
125	SCREW
128	NUT
130	EYEBOLT
131	EYEBOLT PLATE
132	SCREW
133	NUT
134	GUIDE BUSHING
136	STOP RING
139	VENT PLUG
142	WASHER
143	CLAMPING NUT
144	SPRING ADJUSTOR
145	THREADING PROTECTION
146	NUT
150	PLATE

ITEM	PART NAME
151	ACTUATOR SUPPORT
152	SCREW
153	LEVER
154	SIDE COVER
155	NUT
156	JOINT
157	BALL JOINT
158	NUT
159	BEARING
160	SCREW
161	COVER
162	SCREW
163	SCREW
164	PLATE
165	SCREW
166	TRAVEL INDICATOR
167	SCREW
168	BEARING
169	COVER
170	SCREW
171	NUT
172	SCREW
173	NUT
174	BUSHING
175	PIN
176	WASHER



LOW-NOISE DESIGN 1-2513 IS ALSO SUITABLE FOR SERVICE ON CAVITATING LIQUIDS



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