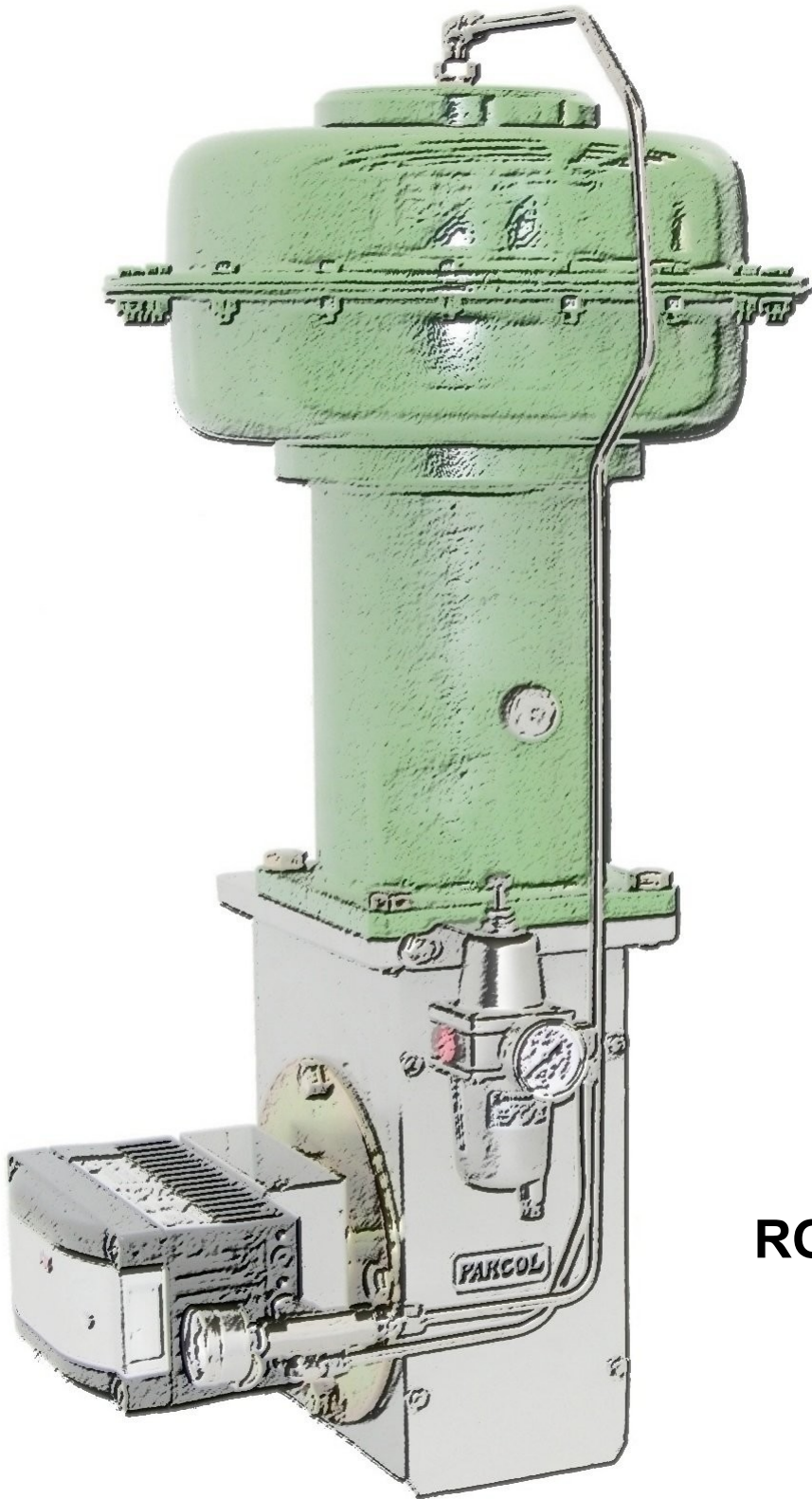


KOSO **PARCOL**



**1-X-271 SERIES
ROTARY PNEUMATIC
DIAPHRAGM
ACTUATORS**

1-X-271 SERIES ROTRAY PNEUMATIC DIAPHRAGM ACTUATORS



1-X-271 series rotary pneumatic diaphragm actuator is normally installed on PARCOL rotary valves ($0^{\circ} \div 90^{\circ}$). Floating stem construction minimizes frictions and backlashes and significantly reduces mass and dimensions. The design allows replacing the actuator without disassembling the valve or part of it.

MAIN FEATURES

DIAPHRAGM CASE

Two formed steel cases (upper and lower) clamp external edge of the diaphragm to get an air-proof sealing.

YOKE

Actuator yokes are from castings or fabricated forged steel, depending on stroke. Standard material is A216WCB carbon steel.

On request A350LF2 or A352LCB for low temperature service is available.

DIAPHRAGM

Diaphragm is molded neoprene with a cloth fabric insert. It has an excellent resistance to aging, chemicals and to continuous deformations under load.

The particular design provides a remarkably constant efficiency throughout the travel (see table of net stem thrust).

PRESSURE / TEMPERATURE LIMITS

Max operating pressure = 3.5 bar (50 psig). Should this pressure limit be exceeded, internal parts of actuator can be permanently deformed.

The case and the relevant joints can withstand a pressure of 10 bar at least without significant permanent deformations (PED certification: PS = 6 bar).

Bursting pressure = over 40 bar.

Ambient temperature = $-55^{\circ}\text{C} \div +60^{\circ}\text{C}$.

SPRING

The spring is made of a high strength, nickel - chromium - silicium steel and is protected by a corrosion resistant coating.

A suitable spring can be delivered for each listed combination of actuator type and spring range.

Spring is top and bottom guided by slots in the spring housing and diaphragm plate.

Up to D46 size the spring is preloaded in a suitable case, to make diaphragm replacement safer and simpler.

STEM

Stem is made of AISI 316 stainless steel. Guiding (direct acting type) surfaces are ground and rolled. Stem is screwed into a bushing fastened to the diaphragm plate. A screw prevents loosening of the two parts.

CONNECTIONS

Air connections are default provided for fast open/closed service

TYPE	AIR CONNECTION		
	1/4" NPT	1/2" NPT	3/4" NPT
D25	x	x	
D33	x	x	
D39		x	x
D46		x	x
D63			x

Air is exhausted through a special plug which prevents liquid infiltration.

Standard materials for main components are listed in table MATERIALS OF CONSTRUCTION.

TOP-DRIVEN HANDWHEEL

It is installed on the upper case of the actuators. The handwheel has a one-way-only action: makes stem to come out. The opposite movement is due solely to the spring thrust; so top handwheel can act as a simple stop device limiting valve stem travel in the spring load direction. To fully disengage the top-driven handwheel, it is necessary to take the handwheel at the maximum upward position till the diaphragm plate (214) subassembly comes in contact with the bottom part of the handwheel body. The screwed shaft of the manual operator must be always locked with suitable nut. Top-driven handwheel has a very simple design, needs no maintenance and leaves actuator sides free.

SPRING RANGES

Standard diaphragm settings are 6÷30 psi (0.4÷2 bar) and 20÷44 psi (1.4÷3 bar) with 40÷50 psi (2.8÷3.5 bar) supply. Other spring ranges are available on request.

Note: The action only depends on mounting of the actuator on the valve (internal configuration is only foreseen for direct acting); see figure 3 for available installations.

Size	Spring range (psi)		Maximum net torque (Nm) ⁽¹⁾
	A	B	
D25	6÷30	20÷44	210
D33	6÷30	20÷44	500
D39	6÷30	20÷44	880
D46	6÷30	20÷44	1510
D63	6÷30	20÷44	4520

NOTES

⁽¹⁾ 100% of torque diagram
 spring range A: typical for Air-To-Close applications, B: typical for Air-To-Open
 For detailed torque values and actuator sizing please contact PARCOL technical department

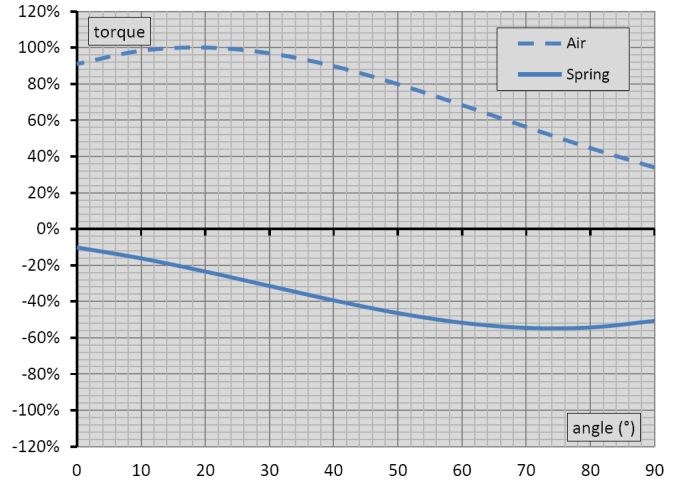


Figure 1 - Torque diagram for Spring range A

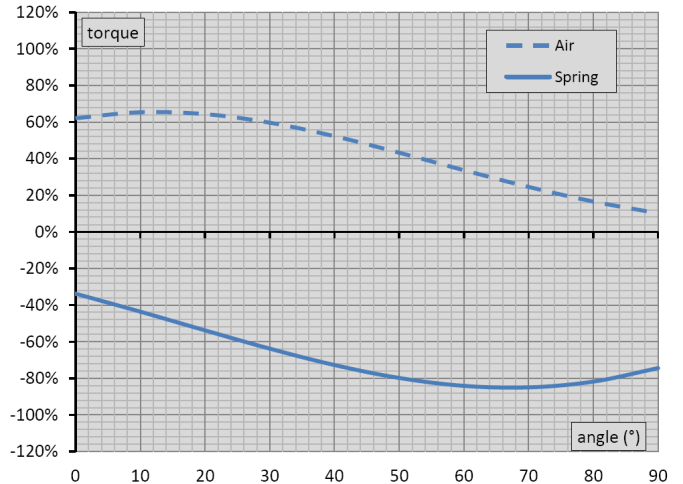


Figure 2 - Torque diagram for Spring range B

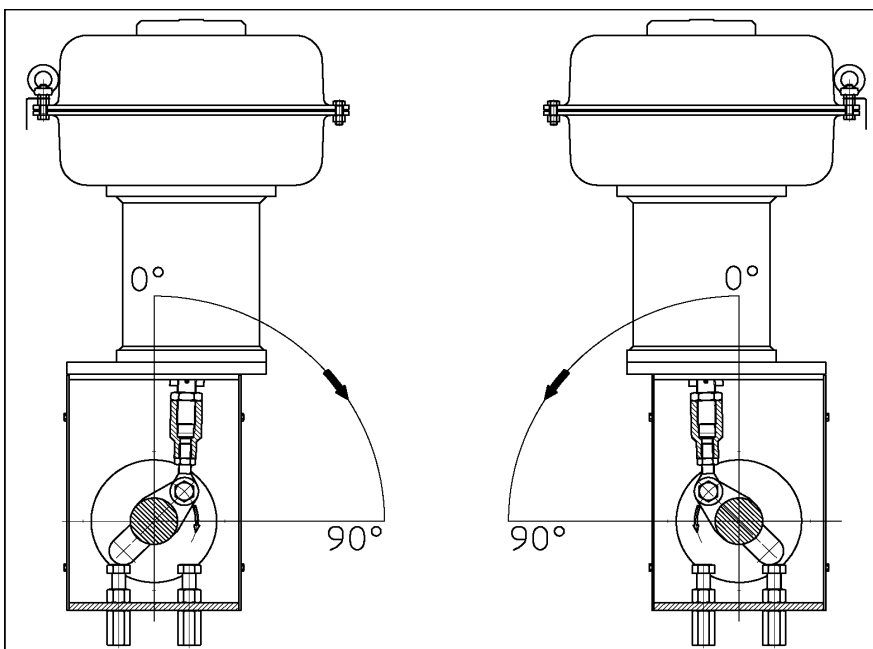
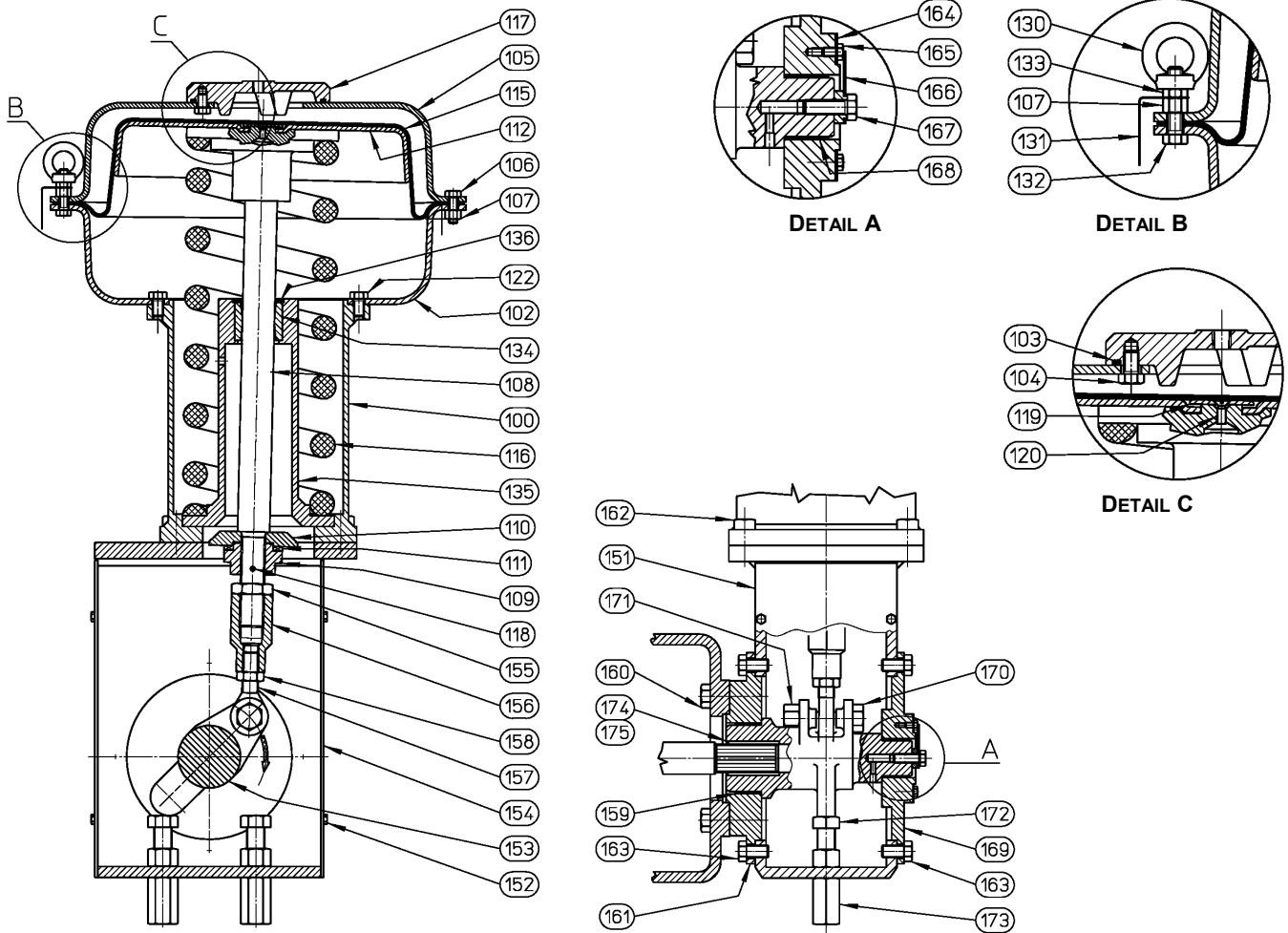


Figure 3 - Typical actuator installations

1-X-271 SERIES PNEUMATIC DIAPHRAGM ACTUATORS

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

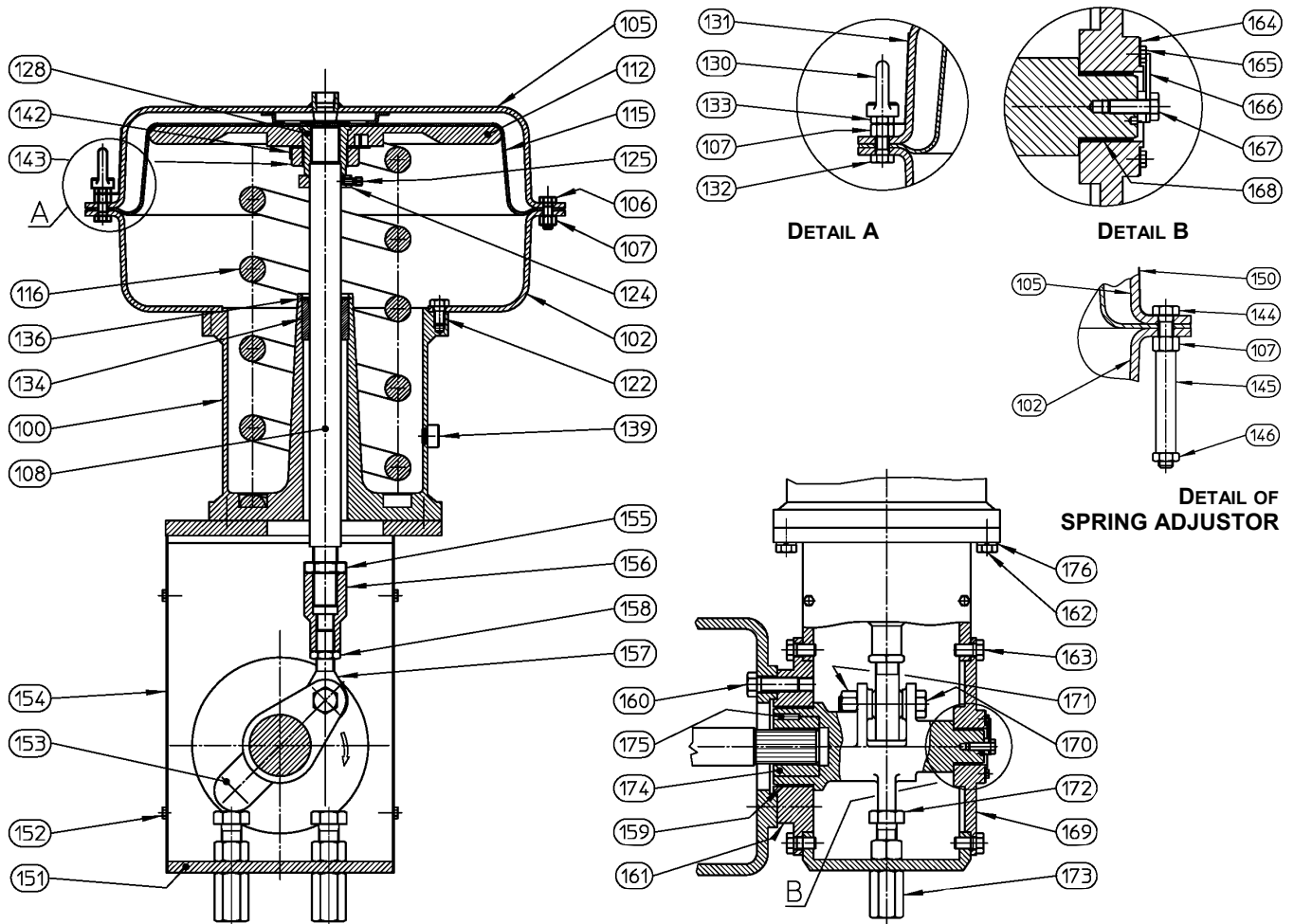


ITEM	PART NAME
100	SPRING CASE
102	LOWER DIAPHRAGM CASE
103	"O" RING
104	SCREW
105	TOP DIAPHRAGM CASE
106	SCREW
107	NUT
108	STEM AND SPRING GUIDE
109	CLAMPING NUT
110	SPACER
111	BEARING
112	DIAPHRAGM PLATE
115	DIAPHRAGM
116	SPRING
117	CAP
118	PIN
119	WASHER
120	SCREW
122	SCREW
130	EYEBOLT
131	EYEBOLT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

ITEM	PART NAME
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 PNEUMATIC DIAPHRAGM ACTUATORS

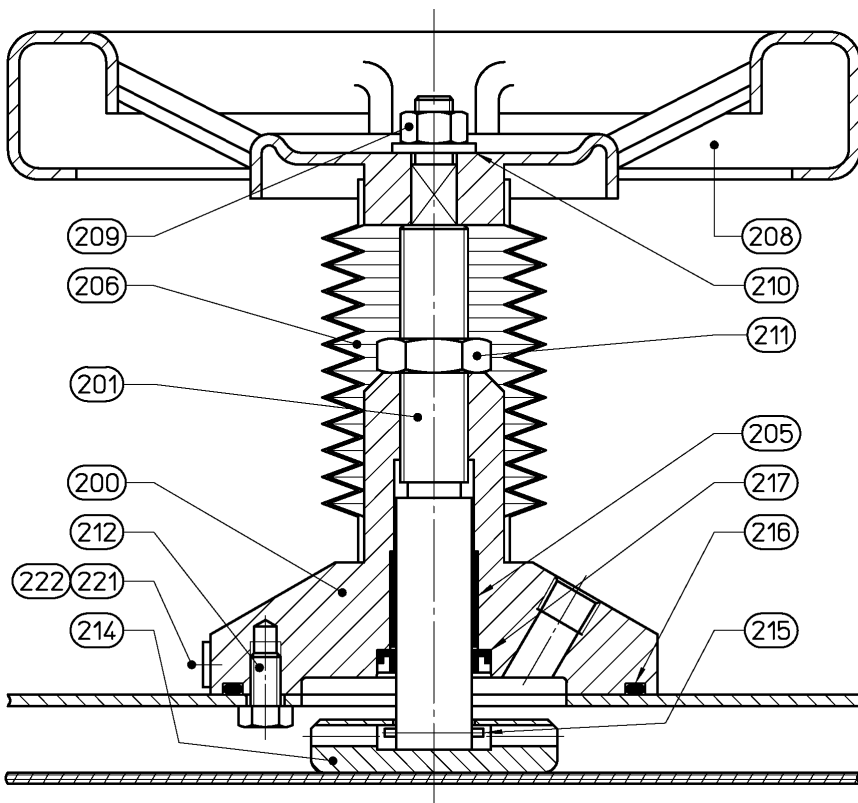
1-X-271 SERIES D63 TYPE DIAPHRAGM ACTUATOR



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

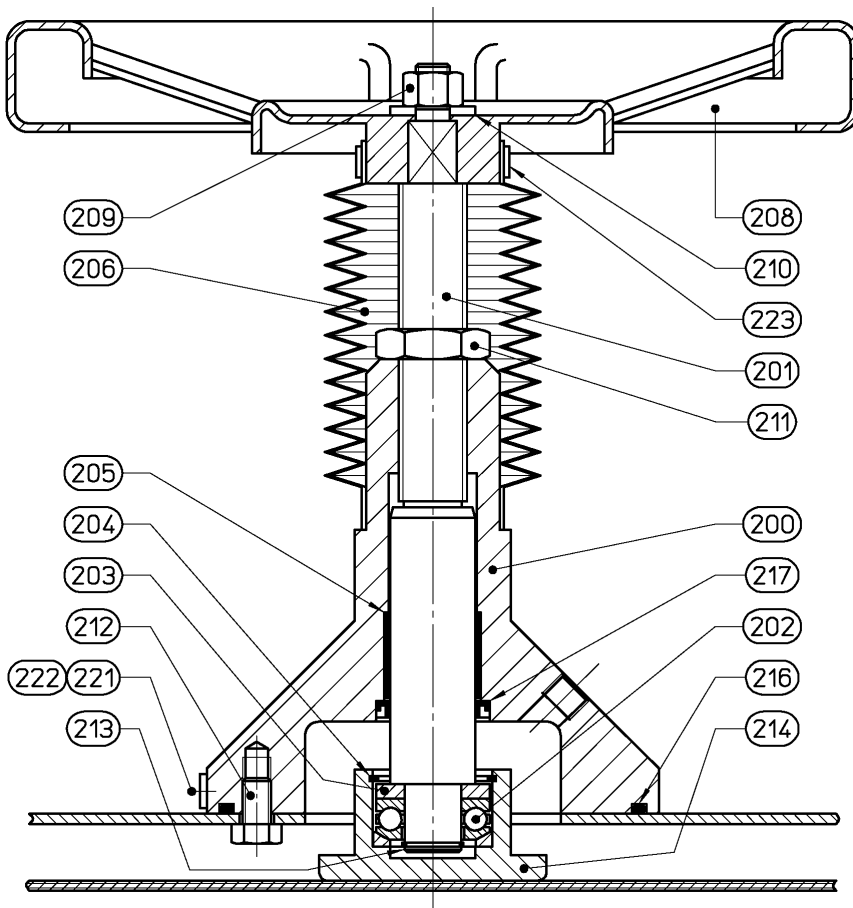
ITEM	PART NAME
151	ACTUATOR SUPPORT
152	SCREW
153	LEVER
154	SIDE COVER
155	NUT
156	JOINT
157	BALL JOINT
158	NUT
159	BEARING
160	SCREW
161	COVER
162	SCREW
163	SCREW
164	PLATE
165	SCREW
166	TRAVEL INDICATOR
167	SCREW
168	BEARING
169	COVER
170	SCREW
171	NUT
172	SCREW
173	NUT
174	BUSHING
175	PIN
176	WASHER

TOP HANDWHEEL FOR D25 AND D33 TYPE ACTUATORS



ITEM	PART NAME
200	BODY
201	SCREWED SHAFT
205	GUIDE BUSHING
206	BELLOWS
208	HANDWHEEL
209	NUT
210	WASHER
211	NUT
212	SCREW
214	DIAPHRAGM PLATE
215	ELASTIC PIN
216	O-Ring
217	"CORTECO" ring
221	PLATE
222	SCREW

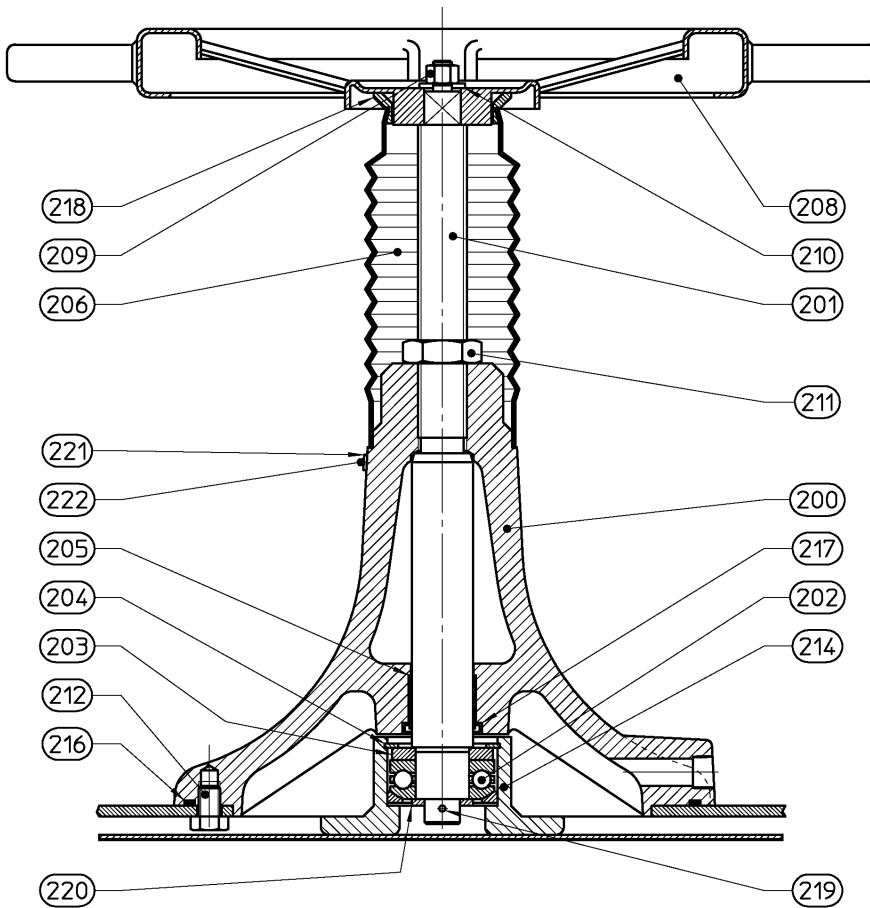
TOP HANDWHEEL FOR D39 AND D46 TYPE ACTUATORS



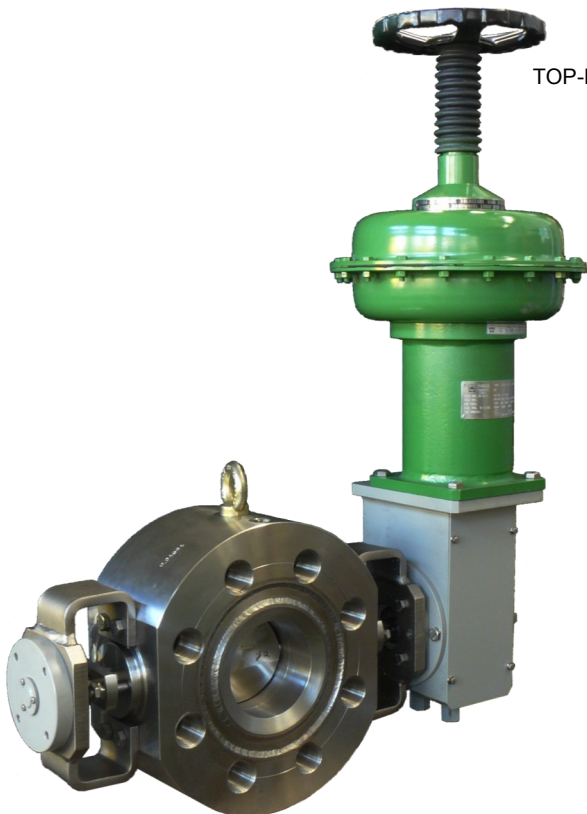
ITEM	PART NAME
200	BODY
201	SCREWED SHAFT
202	BALL BEARING
203	SPACER RING
204	STOP RING
205	GUIDE BUSHING
206	BELLOWS
208	HANDWHEEL
209	NUT
210	WASHER
211	NUT
212	SCREW
213	STOP RING
214	DIAPHRAGM PLATE
216	O-Ring
217	"CORTECO" ring
221	PLATE
222	SCREW
223	CLAMP

1-X-271 SERIES PNEUMATIC DIAPHRAGM ACTUATORS

TOP HANDWHEEL FOR D63 TYPE ACTUATORS



ITEM	PART NAME
200	BODY
201	SCREWED SHAFT
202	BALL BEARING
203	SPACER RING
204	STOP RING
205	GUIDE BUSHING
206	BELLOWS
208	HANDWHEEL
209	NUT
210	WASHER
211	NUT
212	SCREW
214	DIAPHRAGM PLATE
216	O-Ring
217	"CORTECO" ring
218	BELLOWS COLLAR
219	SPLIT PIN
220	WASHER
221	PLATE
222	SCREW



1-X-271 SERIES PNEUMATIC ROTARY DIAPHRAGM ACTUATOR D33 SIZE WITH TOP-DRIVEN HANDWHEEL MOUNTED ON 1-2312 SERIES VALVE DN 6" LUG FLANGED

1-X-271 SERIES PNEUMATIC DIAPHRAGM ACTUATORS

1-X-271 ACTUATORS MATERIALS OF CONSTRUCTION

CLASS		C	B	U
ITEM	PART NAME	TEMPERATURE RANGE		
		-55°C ÷60°C	-29°C ÷60°C	-29°C ÷60°C
100	SPRING CASE ASSEMBLY	ASTM A350 LF2 / ASTM 333 Gr.60	Carbon steel	
102	LOWER DIAPHRAGM CASE	UNI EN 10025-95 S235J2G3		
103	O-ring	SI 80	NB 70	
104	SCREW	AISI 304	8.8 UNI 3740	AISI 304
105	TOP DIAPHRAGM CASE	see item 1050-1053		
1050	COVER	UNI EN 10025-95 S235J2G3		
1053	CLAMPING PLATE	ASTM A350 LF2	Carbon steel	
106	SCREW	AISI 304	8.8 UNI 3740	AISI 304
107	NUT	AISI 304	ASTM A 194-4 Gr. 2H	AISI 304
108	STEM	AISI 316		
109	CLAMPING NUT	F6NM nitrided		
110	SPACER	ASTM A350 LF2	Carbon steel	
111	BEARING	Standard material		
112	DIAPHRAGM PLATE	D25÷D46	UNI EN 10025-95 S235J2G3	
		D63	ASTM A350 LF2	Carbon steel
113	SPRING SEAT	ASTM A350 LF2	Carbon steel	
115	DIAPHRAGM	SIL 70	NEOPRENE	
116	SPRING	52 Si Cr Ni 5 UNI 3545		
117	CAP	ASTM A350 LF2	Carbon steel	
118	PIN	AISI 316		
119	WASHER	AISI 316	Carbon steel	
120	SCREW	AISI 304		
122	SCREW	AISI 304	8.8 UNI 3740	AISI 304
124	TRAVEL LIMIT DEVICE	ASTM A350 LF2	Carbon steel	
125	SCREW	ASTM A350 LF2	Carbon steel	
128	D63 HUB	ASTM A350 LF2	ASTM A105	
130	EYEBOLT	Stainless steel	Carbon steel	
131	EYEBOLT PLATE	AISI 304		
132	SCREW	AISI 304	8.8 UNI 3740	AISI 304
133	NUT	AISI 304	ASTM A 194-4 Gr. 2H	AISI 304
134	GUIDE BUSHING	GRAPHITED PTFE		
135	LOWER SPRING SEAT	ASTM A350 LF2	Carbon steel	
136	STOP RING	SPRING STEEL		
139	VENT PLUG	D25÷D33	AISI 304	
		D39÷D63	PLASTIC	
142	WASHER	AISI 304		
143	CLAMPING NUT	AISI 304		
144	SCREW	AISI 304	8.8 UNI 3740	AISI 304
145	THREADING PROTECTION	Carbon steel		

1-X-271 SERIES PNEUMATIC DIAPHRAGM ACTUATORS

1-X-271 ACTUATORS MATERIALS OF CONSTRUCTION

CLASS		C	B	U
ITEM	PART NAME	TEMPERATURE RANGE		
		-55°C ÷60°C	-29°C ÷60°C	-29°C ÷60°C
146	NUT	AISI 304	ASTM A 194-4 Gr. 2H	AISI 304
150	PLATE	AISI 304		
151	YOKE	ASTM A350 LF2	Carbon steel	
152	SCREW	AISI 304		
153	LEVER	AISI 316	GS 370-17 UNI 4544-74	
154	SIDE COVER	Carbon steel		
155	NUT	AISI 304	Carbon steel	AISI 304
156	SCREW COUPLING	AISI 304	Carbon steel	AISI 304
157	LEFT THREADED BALL JOINT	Carbon steel + PTFE		
158	NUT	AISI 304	Carbon steel	AISI 304
159	BEARING	Carbon steel + PTFE		
160	SCREW	AISI 304	8.8 UNI 3740	AISI 304
161	COVER	ASTM A350 LF2	Carbon steel	
162	SCREW	AISI 304	8.8 UNI 3740	AISI 304
163	SCREW	AISI 304	8.8 UNI 3740	AISI 304
164	PLATE	AISI 304		
165	SCREW	AISI 304		
166	TRAVEL INDICATOR	Carbon steel		
167	SCREW	AISI 304	8.8 UNI 3740	AISI 304
168	BEARING	Carbon steel + PTFE		
169	COVER	ASTM A350 LF2	Carbon steel	
170	SCREW	AISI 304	8.8 UNI 3740	AISI 304
171	NUT	AISI 304	ASTM A 194-4 Gr. 2H	AISI 304
172	SCREW	AISI 304	8.8 UNI 3740	AISI 304
173	NUT	AISI 304	Carbon steel	AISI 304
174	BUSHING	17-4 PH H1150	AISI 416 hardened 220 ÷240 HB	
175	PIN	AISI 316		
176	WASHER	AISI 304		

1-X-271 SERIES PNEUMATIC DIAPHRAGM ACTUATORS

1-X-2003 MANUAL OPERATOR MATERIALS OF CONSTRUCTION

CLASS		A	C	U
ITEM	PART NAME	TEMPERATURE RANGE		
		-30°C ÷60°C	-55°C ÷60°C	-30°C ÷60°C
200	BODY	D25 ÷ D46	A 350 LF2	
		D63	GS 370-17 UNI 4544-74	A 352 LCB
201	SCREWED SHAFT	AISI 416	17-4 PH H1150 NITRIDED	AISI 416
202	GUIDE BUSHING	STANDARD MATERIAL		
203	SPACER RING	Carbon steel	AISI 304	
204	STOP RING	SPRING STEEL		
205	GUIDE BUSHING	DU ⁽¹⁾ + bronze B10		
206	BELLOWS	NEOPRENE		
208	HANDWHEEL	Carbon steel		
209	NUT	A 194-4	AISI 304	
210	WASHER	Carbon steel	AISI 304	
211	NUT	AISI 304		
212	SCREW	8.8 UNI 3740	AISI 304	
213	STOP RING	SPRING STEEL		
214	DIAPHRAGM PLATE	Carbon steel	AISI 304	Carbon steel
215	ELASTIC PIN	AISI 304		
216	O-Ring	NB-70		
217	"CORTECO" ring	NB-70		
218	BELLOWS COLLAR	Nylon		
219	SPLIT PIN	AISI 304		
220	WASHER	AISI 304		
221	PLATE	AISI 304		
222	SCREW	AISI 304		
223	CLAMP	AISI 304		

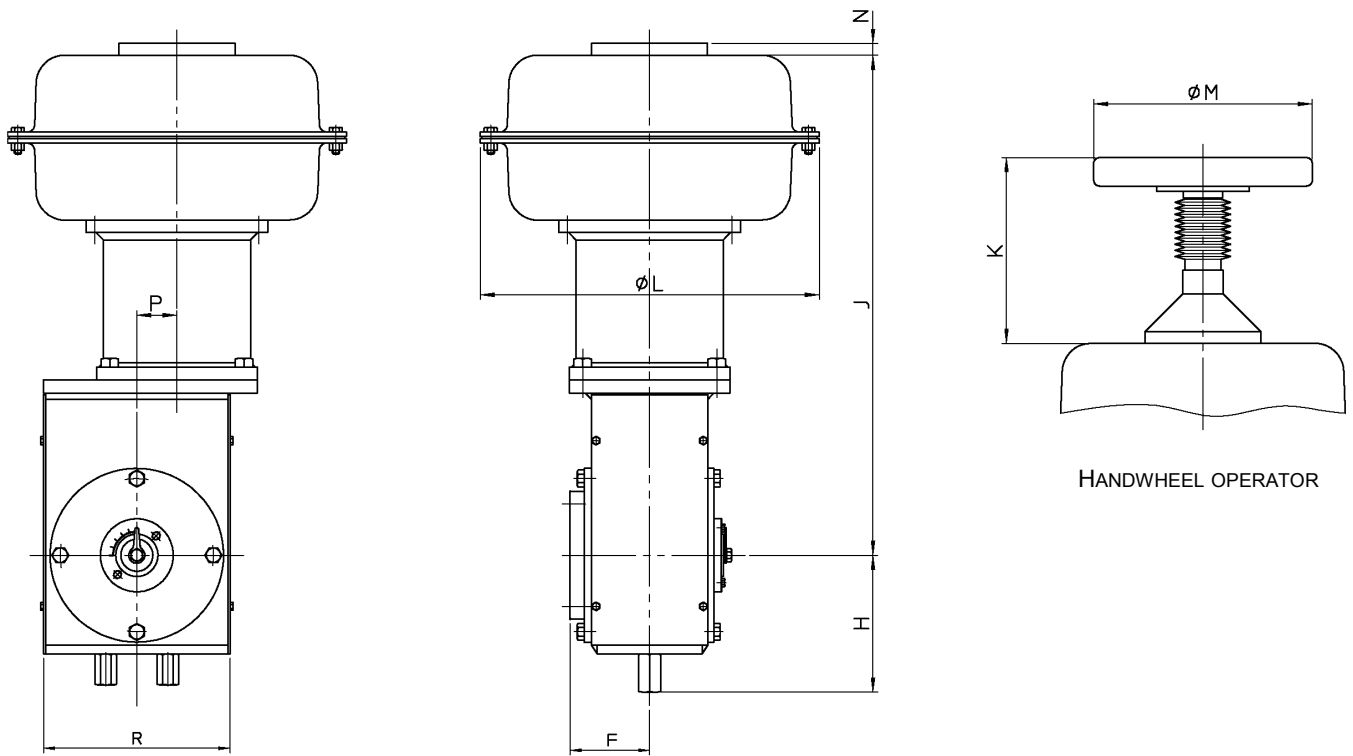
1-X-271 SERIES PNEUMATIC DIAPHRAGM ACTUATOR WITH TOP-DRIVEN HANDWHEEL MOUNTED ON 1-2471 SERIES VALVE DN 10" LUG FLANGED



⁽¹⁾ BRONZE + PTFE + Pb

1-X-271 SERIES PNEUMATIC DIAPHRAGM ACTUATORS

OVERALL DIMENSIONS (mm) AND WEIGHTS (kg)



Actuator Size	F	H	J	K	L	M	N	P	R	WEIGHT ⁽¹⁾
D25	65	112	432	220	262	175	21	29	140	28
D33	78	140	538	255	333	225	21	36	170	50
D39	96	170	639	343	395	300	24	46	224	85
D46	109	190	731	397	465	400	24	55	250	140
D63	155	275	836	520	640	570	21	72	300	180

⁽¹⁾ Without handwheel operator

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