APPROVED CE APPROVED

CONVALVE

SPECIALIST IN VALVE AUTOMATION

SCOTCH YOKE PNEUMATIC ACTUATORS

OUR STANDARD YOUR GUARANTEE

ISO 9001 Quality

ISO 14001 Environment

OHSAS 18001 Health & Safety

PNEUMATIC ACTUATOR
PAC-S SERIES SCOTCH YOKE PNEUMATIC ACTUATORS

SCAN ME

DESCRIPTION

PAC-S Series Pneumatic Actuator is designed suitable for general purpose of valves and damper automation and offer a wide range of torques enable to operate ball, butterfly, plug valves, dampers or any device that requires a quarter turn operation for on-off or modulating service. Scotch Yoke actuators are available with symmetric yokes. Asymmetric yoke provide more constant torque throughout - at both the break points and end positions.

SPECIFICATION

- Comply to UNI EN 15714-3:2009 standard
- ISO Connection Standard ： UNI EN ISO 5211
- Auxiliary Connectioin ： NAMUR
- Control Angle ： 90°
- Torque ： Relative to control pressure. Please refer to torque selection table.
- Coating Protection ： Hard anodized surface, epoxy powder coated end cap. Surface coating can be customized.

WORKING CONDITIONS

Working Temperature	Standard ： -20℃~+80℃ High Temperature ： -20℃~+150℃ Low Temperature ： -50℃~+60℃
Supply Pressure	Min. 2 bar, Max. 8 bar
Working Medium	Filtered and dry compressed air or inert gas, without needing lubricant

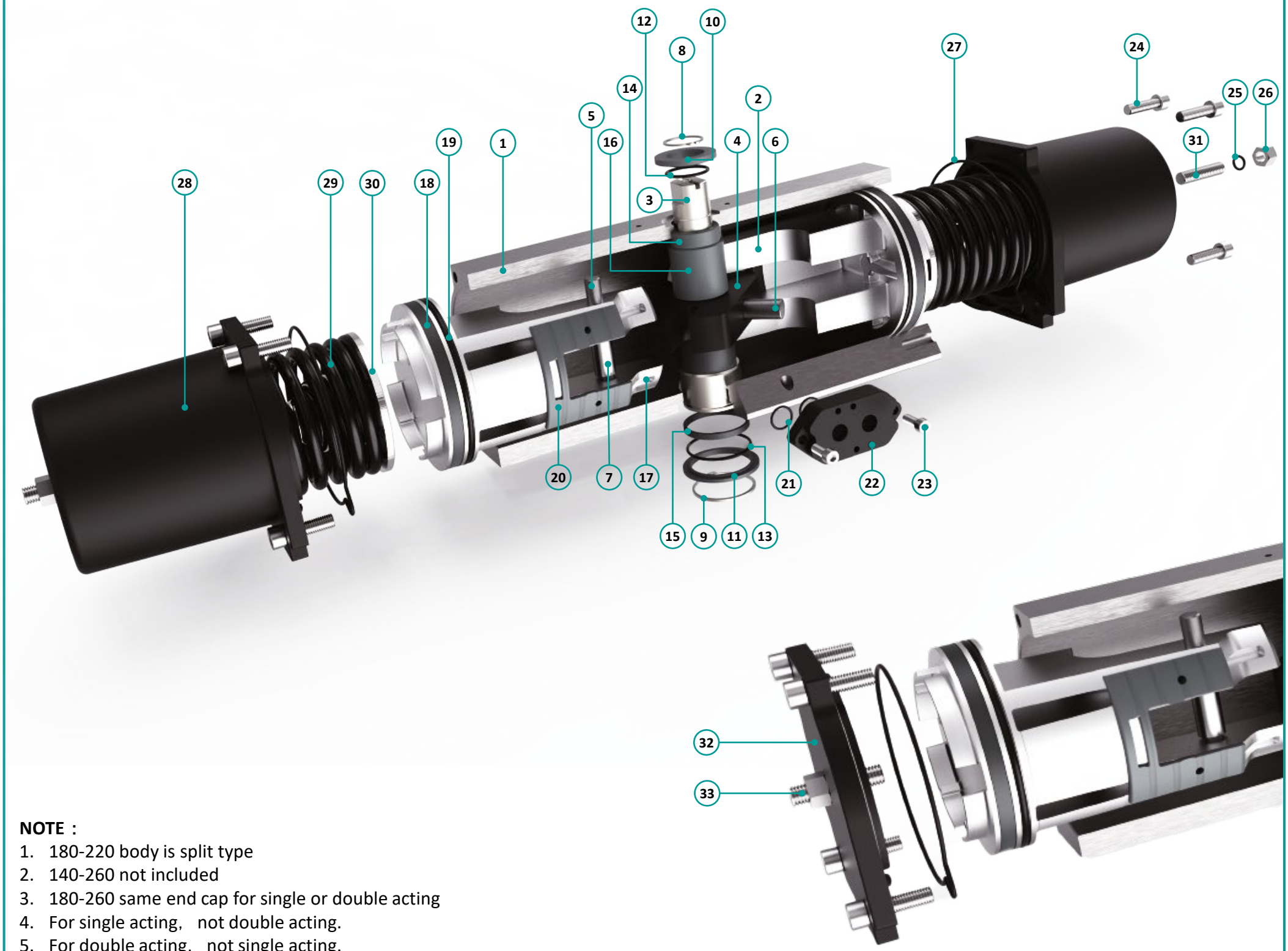
FEATURES AND BENEFITS

1. **Provide with the self-lubricated bearing and guide ring between the sliding parts**.
   - Less friction between piston and cylinder
2. **Both pin, yoke and bearings are made of Alloy Steel , the hardness is higher than 50HRC** .
   - Effective resistance to the actuator internal dynamic wear;
3. **Rolling friction between yoke and bearing**
   - Reduced the friction between the piston and shaft;
4. **Scotch yoke with rolling friction (transforming rotary motion into linear motion using piston and shaft without teeths/gears)**
   - Reduced friction between piston and shaft with consequently less wear on the relevant parts
   - High opening and closing torques provided by scotch-yoke concept;
   - Compared with rack and pinion actuator, reduced actuator volume (30%) and installation space;
   - Compared with rack and pinion actuator, reduced actuator weight (30%) and construction of equipment's.
   - Compared with rack and pinion actuator, reduced the air consumption (40%)
   - Faster switching speed than rack and pinion actuator(40% for double acting,20% for single acting)
5. **Cylindrical cylinder**
   - Reduced wear of the sliding piston parts with low roughness of the surface.
6. **SIL3**
   - Meet the requirements of SIL and guarantee the highly reliable and safe operation
7. **ATEX Certificate**
   - Allow products to be installed in the potential explosive environments.

OPTIONS

- Direct mount solenoid valves
- Monitor/Position confirmation limit switches
- Electro-Pneumatic positioner 4-20m input
- Pneumatic positioners 3-15 PSI input

PART LIST AND MATERIAL SPECIFICATION



NOTE :

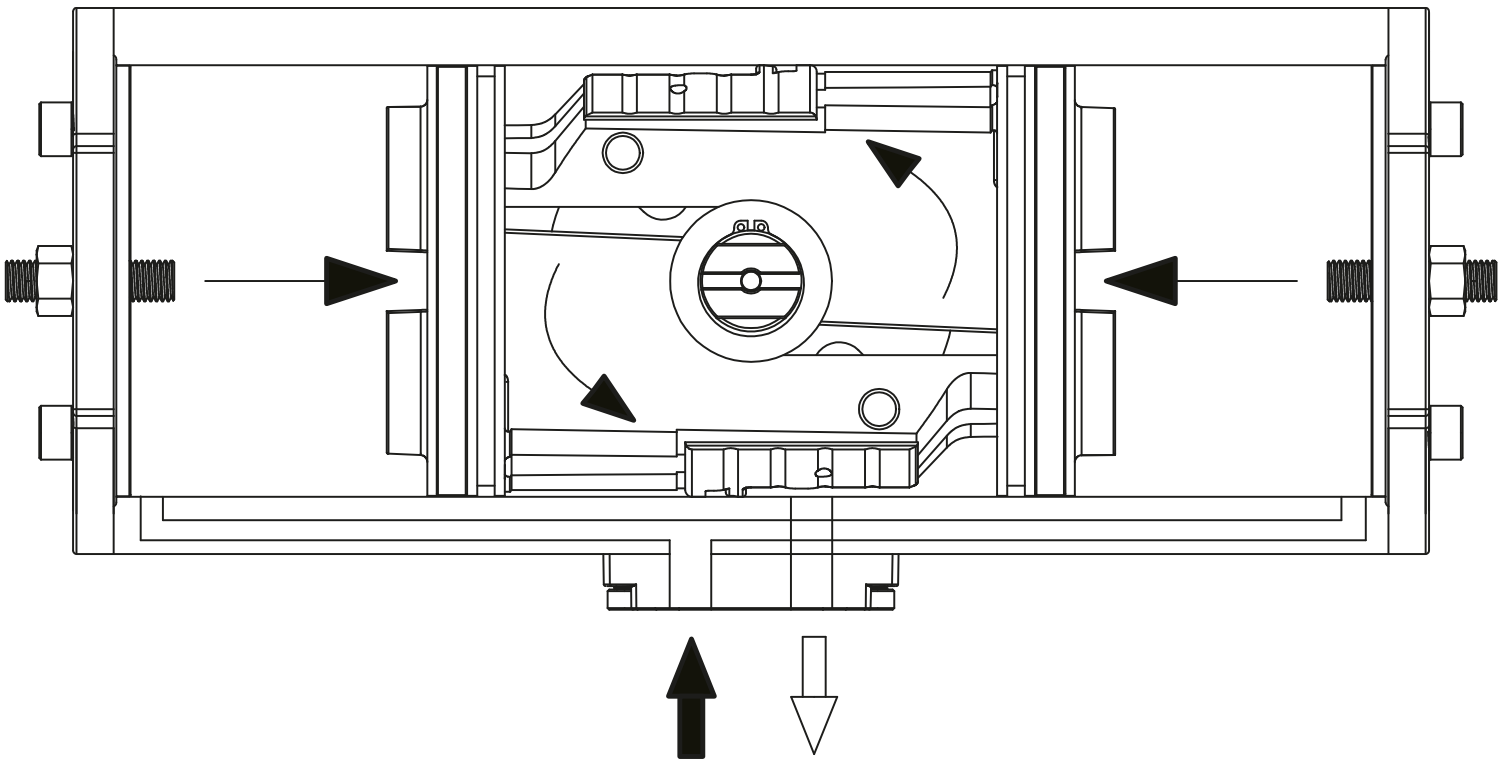
1. 180-220 body is split type
2. 140-260 not included
3. 180-260 same end cap for single or double acting
4. For single acting, not double acting.
5. For double acting, not single acting.

ABOVE ILLUSTRATION FOR INTERNAL STRUCTURE DEMONSTRATION ONLY, NOT FOR ALL MODEL AND PARTS.

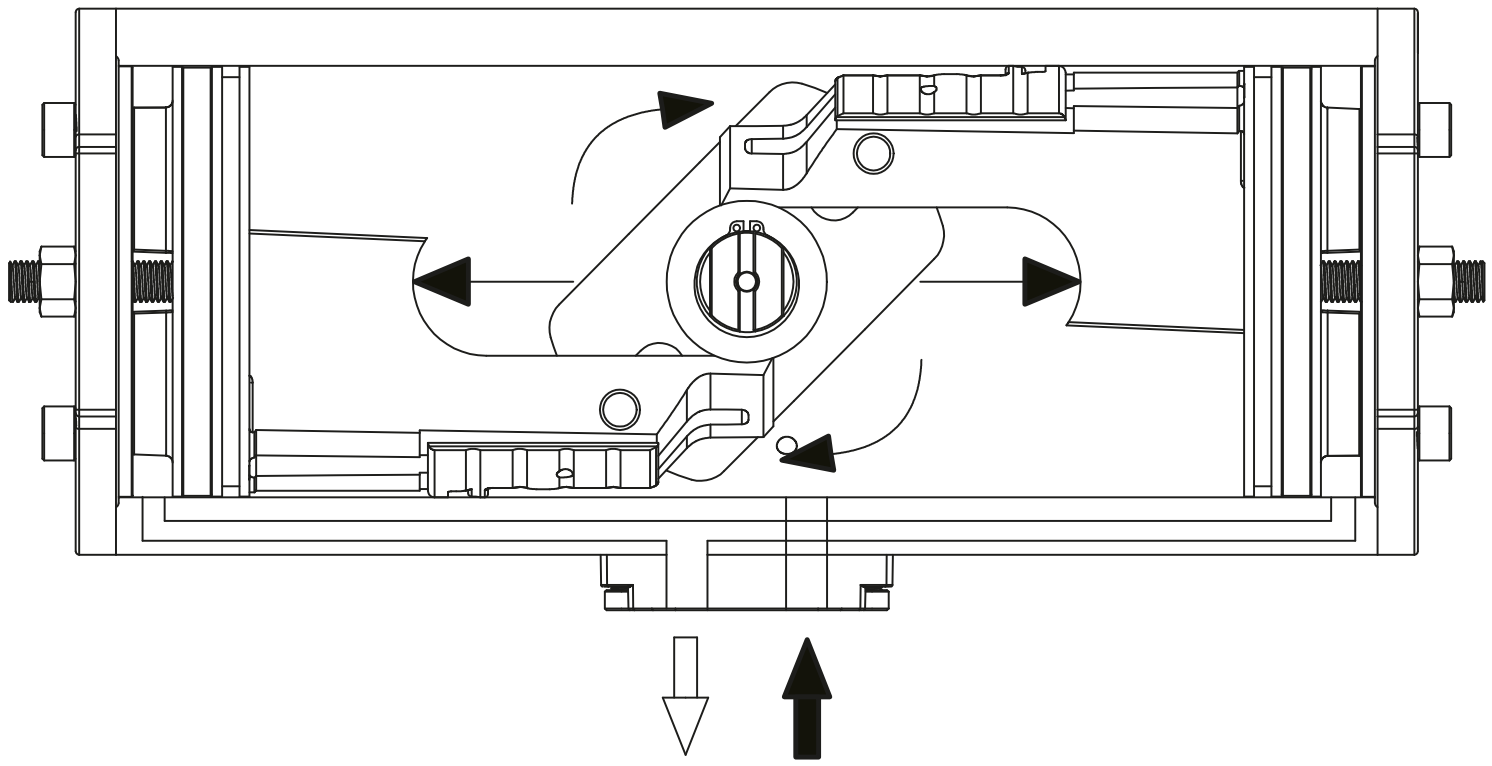
NO	PART NAME	MATERIAL	NO	PART NAME	MATERIAL
1	Cylinder [1]	Aluminium Alloy	18	Piston Ring	Crystalline Polymer
2	Piston	Aluminium Alloy	19	Piston O-ring	Nbr
3	Shaft	Alloy Steel	20	Piston Support Chip	Crystalline Polymer
4	Yoke	Alloy Steel	21	Connection Plate O-ring[2]	Nbr
5	Piston Pin	Alloy Steel	22	Connection Plate[2]	Aluminium Alloy
6	Yoke Pin	Alloy Steel	23	Plate Socket Screw[2]	Stainless Steel
7	Bearing	Alloy Steel	24	Cover Socket Screw	Stainless Steel
8	Upper Circlip	Stainless Steel	25	Nut O-ring	Nbr
9	Lower Circlip	Stainless Steel	26	Screws	Stainless Steel
10	Upper Washer	Crystalline Polymer	27	End Cover Seal Ring	Nbr
11	Lower Washer	Crystalline Polymer	28	Cover[3]	Aluminium Alloy
12	Upper Shaft O-ring	Nbr	29	Spring[4]	Spring Steels
13	Lower Shaft O-ring	Nbr	30	Lower Spring Washer[4]	Aluminium Alloy
14	Upper Shaft Bearing	Crystalline Polymer/Graphite Copper Bushing	31	Spring Shaft[4]	Stainless Steel
15	Lower Shaft Bearing	Crystalline Polymer/Graphite Copper Bushing	32	Double Acting End Cover	Aluminium Alloy
16	Upper Piston Bearing	Crystalline Polymer	33	Set Screw[5]	Stainless Steel
17	Lower Piston Bearing	Crystalline Polymer			

OPEN AND CLOSE DEMONSTRATION

DOUBLE ACTING OPEN



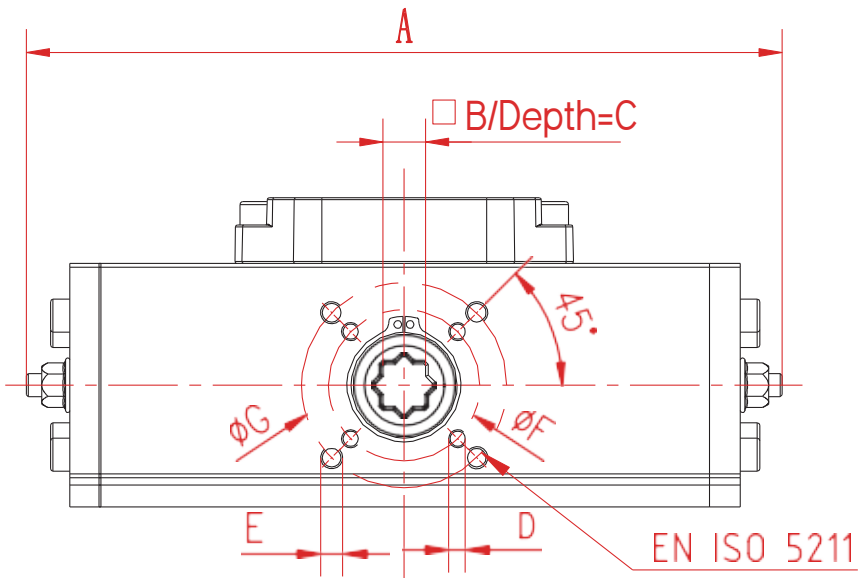
DOUBLE ACTING CLOSE

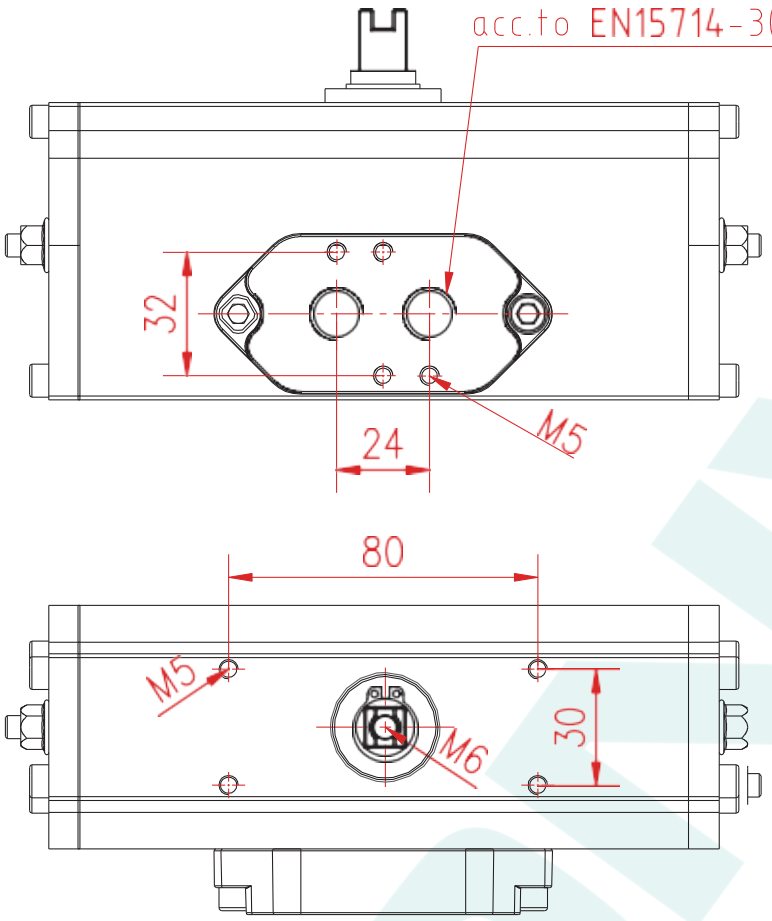


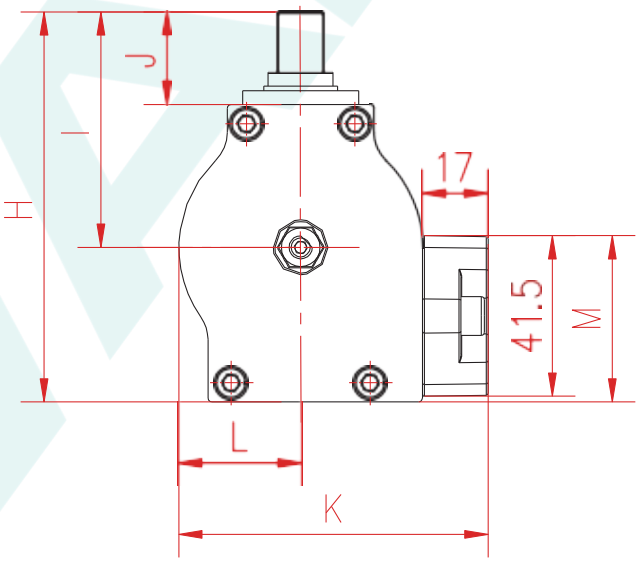
DOUBLE ACTING TORQUE TABLE

PRESSURE	3BAR			4BAR			5BAR			5.6BAR			6BAR			7BAR			8BAR		
Model	α=0°	α=45°	α=90°	α=0°	α=45°	α=90°	α=0°	α=45°	α=90°	α=0°	α=45°	α=90°	α=0°	α=45°	α=90°	α=0°	α=45°	α=90°	α=0°	α=45°	α=90°
DA40	15	8	12	20	10	16	25	13	20	28	14	22	30	15	24	35	18	28	40	20	32
DA60	44	23	36	59	30	48	74	38	60	83	42	68	89	45	72	104	53	84	118	60	96
DA70	86	44	70	114	58	93	143	73	116	160	81	130	171	87	140	200	102	163	228	116	186
DA80	138	70	113	184	94	150	230	117	188	258	131	210	276	141	225	322	164	263	368	188	300
DA90	206	105	168	274	140	224	343	175	280	384	196	313	412	210	336	480	245	392	549	280	448
DA100	303	154	247	404	206	329	505	257	411	565	288	461	605	309	494	706	360	576	807	411	658
DA125	494	252	403	659	336	537	823	420	671	922	470	752	988	504	806	1153	588	940	1317	672	1074
DA140	690	352	563	920	469	750	1150	586	938	1288	657	1050	1380	704	1125	1610	821	1313	1840	938	1501
DA160	1044	532	851	1392	709	1135	1740	887	1418	1948	993	1589	2088	1064	1702	2435	1241	1986	2783	1419	2269
DA180	1456	742	1187	1941	989	1583	2426	1237	1978	2718	1385	2216	2912	1484	2374	3397	1731	2770	3882	1979	3165
DA220	2485	1299	1878	3314	1732	2504	4142	2165	3130	4639	2425	3506	4971	2598	3756	5799	3031	4382	6627	3464	5008
DA260	5107	2669	3859	6810	3559	5146	8512	4449	6432	9534	4983	7204	10215	5339	7719	11917	6228	9005	13619	7118	10292

DIMENSION DA40-DA125

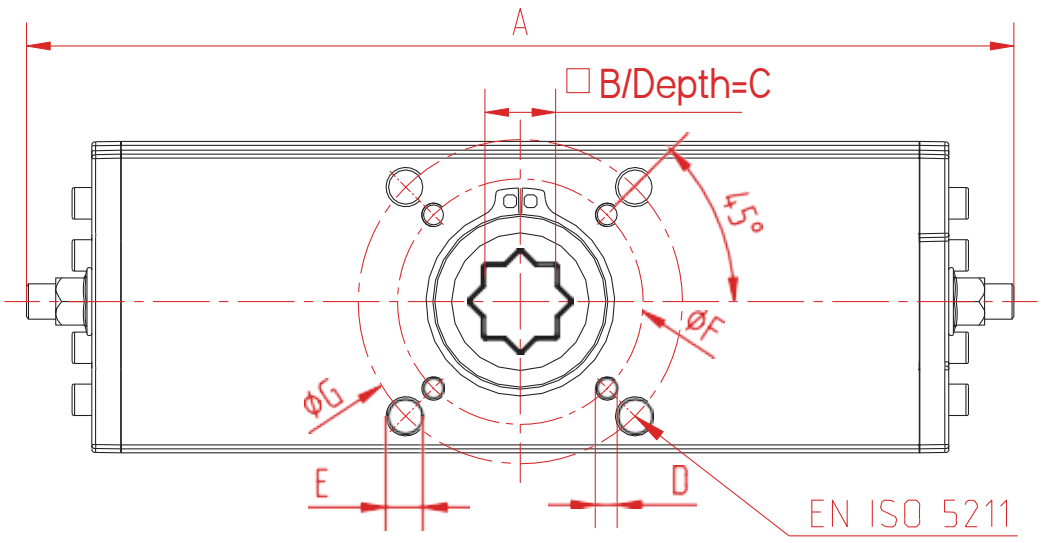


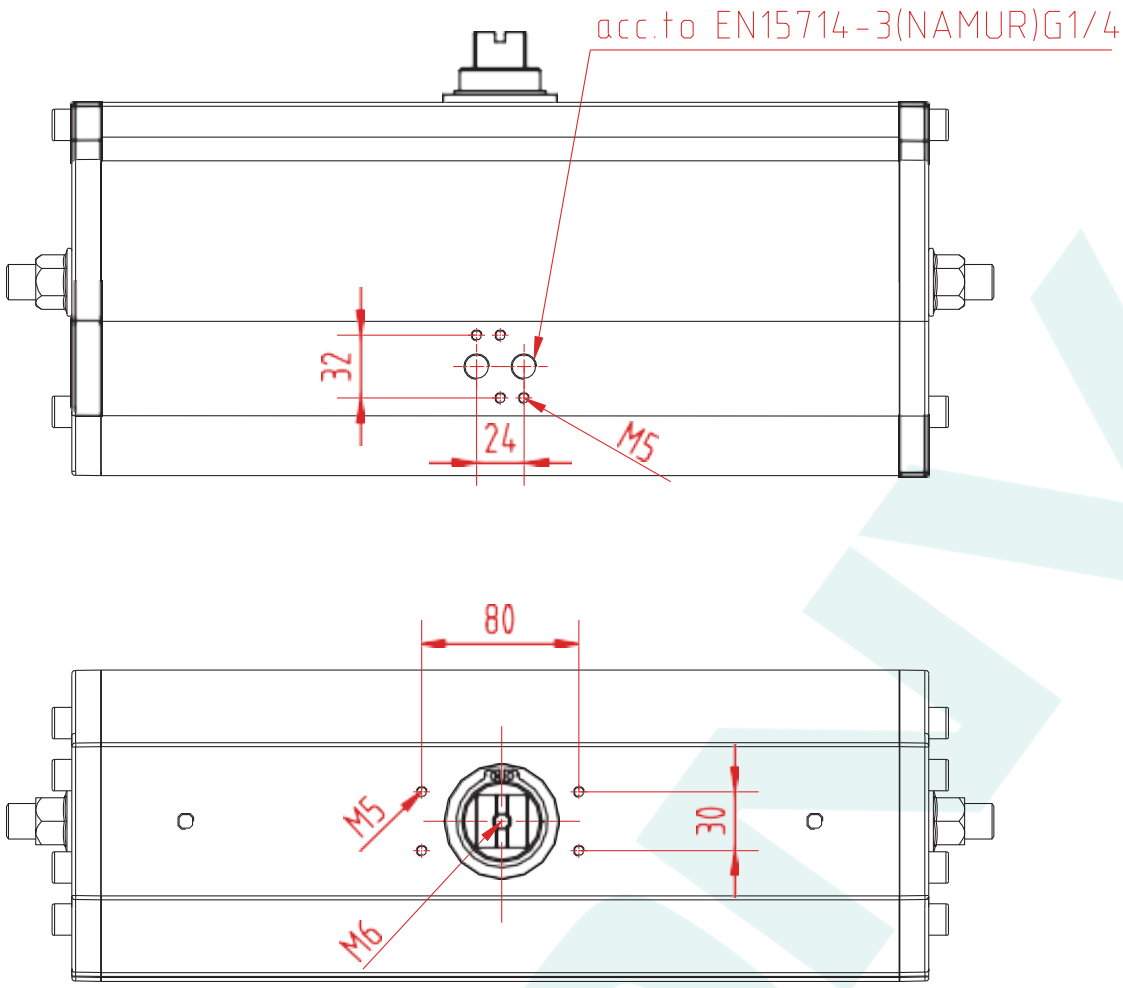


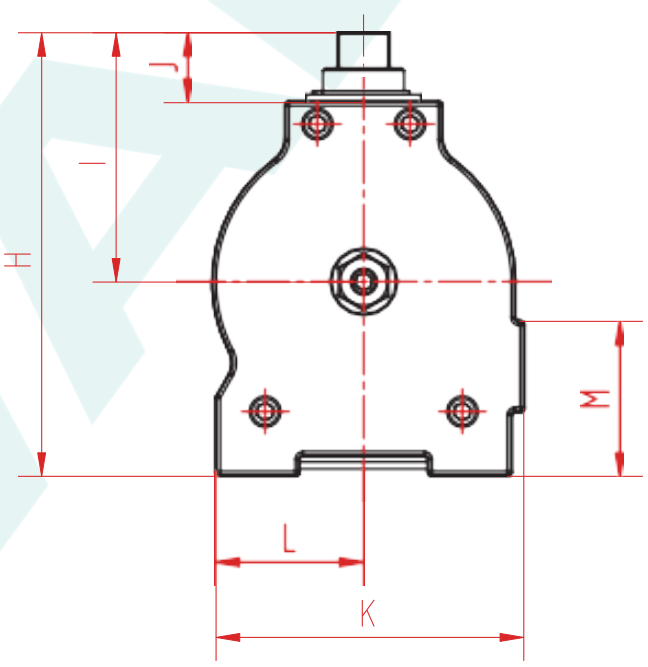


MODEL	DA40	DA60	DA70	DA80	DA90	DA100	DA125
ISO	F03/F05	F05/F07	F05/F07	F05/F07	F07/F10	F07/F10	F10/F12
A	170	208	271	295	341	389	445
B	11	14	17	17	22	22	27
C	16	16	18	22	26	26	30
D X DEPTH	M5x8	M6x9	M6x9	M6x9	M8x12	M8x12	M10x15
E X DEPTH	M6x9	M8x12	M8x12	M8x12	M10x15	M10x15	M12x18
F	36	50	50	50	70	70	102
G	50	70	70	70	102	102	125
H	86	97	111	128	140	149	186
I	48	57	65	72	76	83	106
J	20	20	20	20	20	20	30
K	69	80	96	108	121	131	156
L	25	31. 5	40	45. 5	51	57	70
M	45	43	46	53	54. 5	59	60
WEIGHT（G）	1.0	1.5	2.7	3.8	6.8	6.95	12.05
AIR CONSUMPTION(NL/CYCLE)	0.19	0.47	0.93	1.50	2.36	3.26	5.83
OPEN TIME (SECONDS)	0.1	0.2	0.3	0.4	0.6	0.9	1.6
CLOSE TIME (SECONDS)	0.2	0.2	0.4	0.5	0.6	1	1.7

DIMENSION DA140-DA160

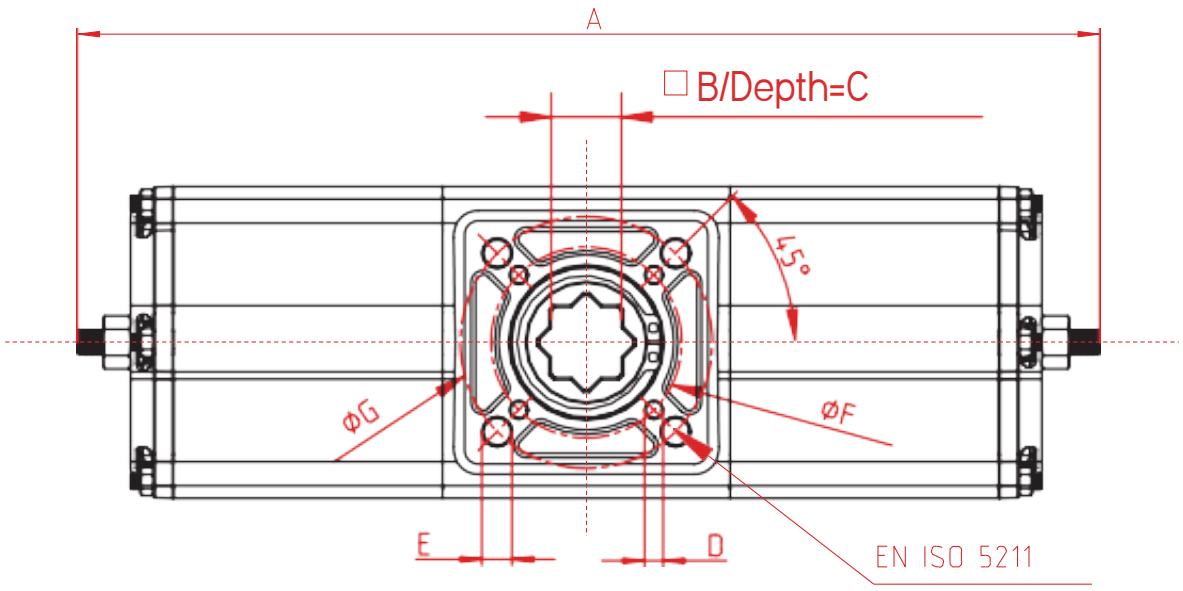


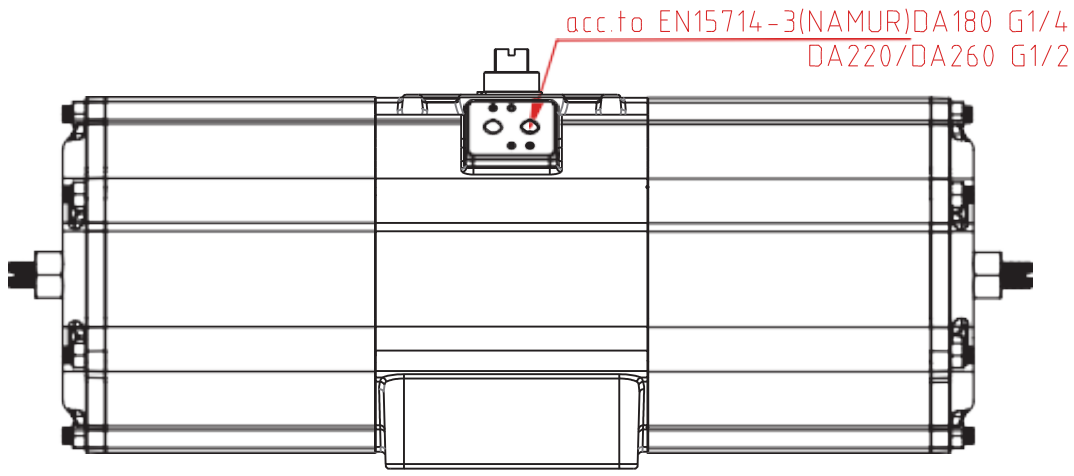


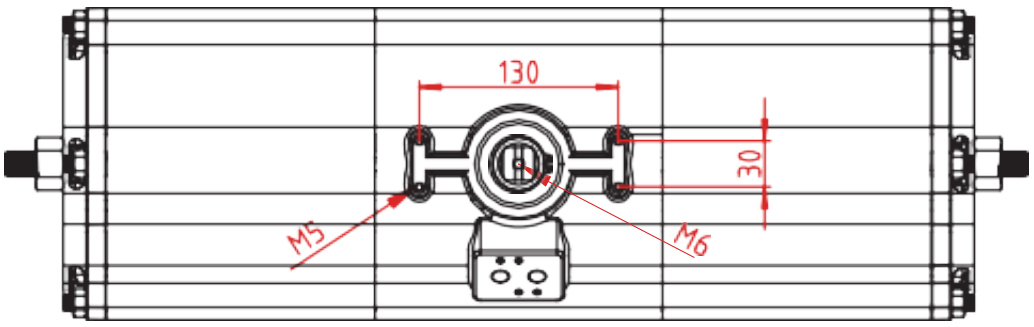


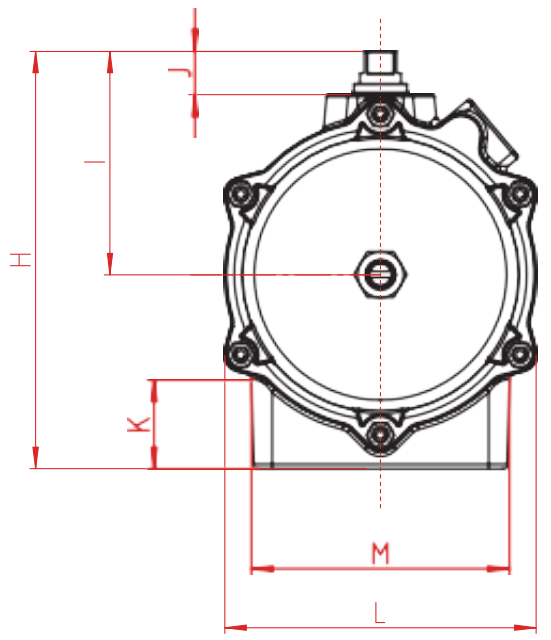
MODEL	DA140		DA160	
ISO	F12/F16	F14	F12/F16	F14
A	520		575	
B	36		46	
C	40		46	
D X DEPTH	M12x20	M16x24	M12x20	M16x24
E X DEPTH	M20x30	-	M20x30	-
F	125	140	125	140
G	165	-	165	-
H	220		242.5	
I	122		129	
J	30		30	
K	156.5		175	
L	75		85	
M	79		93. 5	
WEIGHT（G）	20. 05		27. 7	
AIR CONSUMPTION(NL/CYCLE)	7.5		11. 1	
OPEN TIME (SECONDS)	2		3.6	
CLOSE TIME (SECONDS)	2.2		3.4	

DIMENSION DA180-DA260







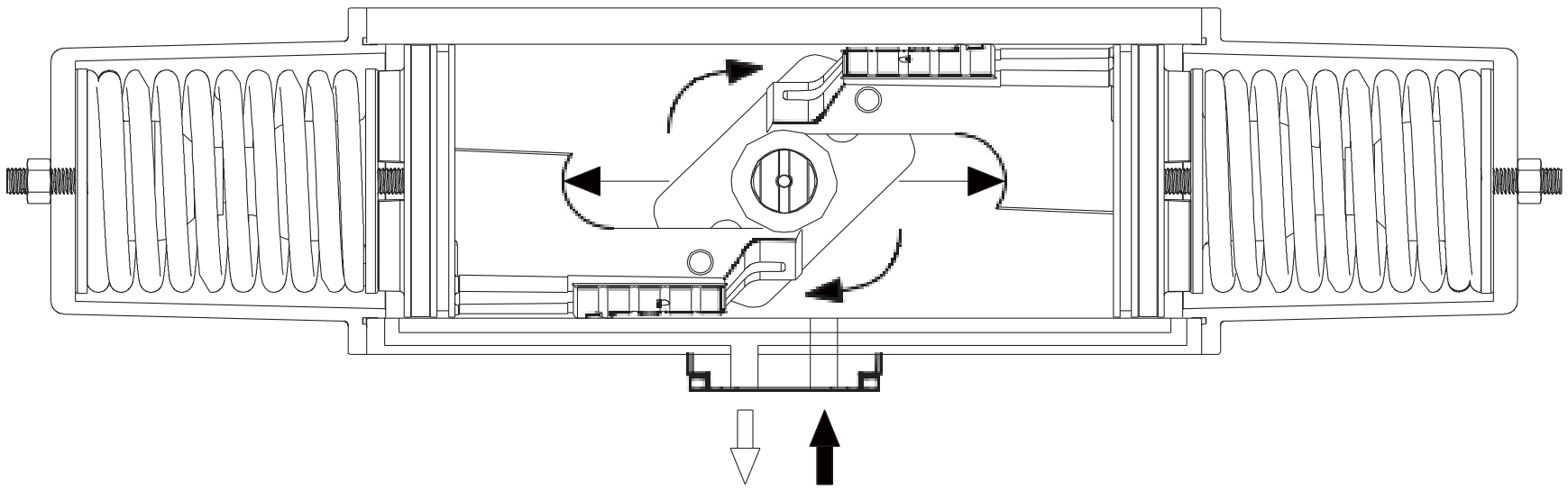


MODEL	DA180		DA220	DA260
ISO	F12/F16	F14	F16	F25
A	656		810	1005
B	46		55	55
C	50		57	57
D	M12x18	M16x24	M20x30	M16x30
E	M20x30	-	-	-
F	125	140	165	254
G	165	-	-	-
H	275		314	380
I	148		171	202
J	30		30	30
K	62		71	66
L	206		271	342
M	168		200	300
WEIGHT（G）	37.45		65.5	114
AIR CONSUMPTION(NL/CYCLE)	16.58		29.8	62.1
OPEN TIME (SECONDS)	4.4		3.8	6.7
CLOSE TIME (SECONDS)	4.3		4.3	7

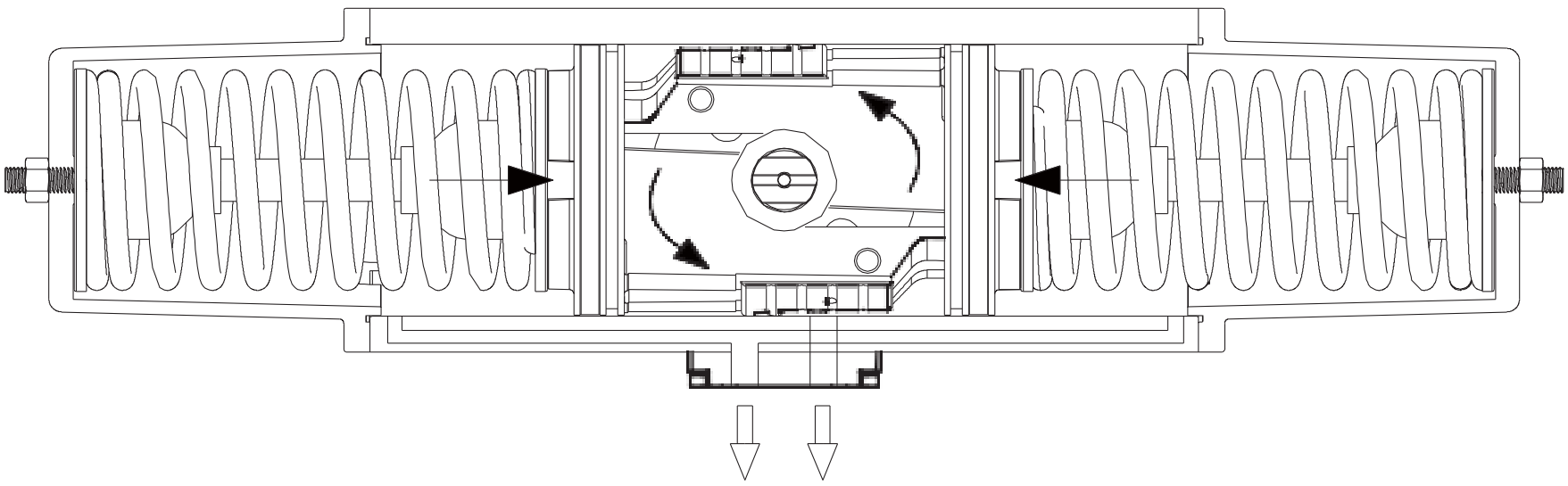
SINGLE ACTING OUTPUT TORQUE

OPEN AND CLOSE DEMONSTRATION

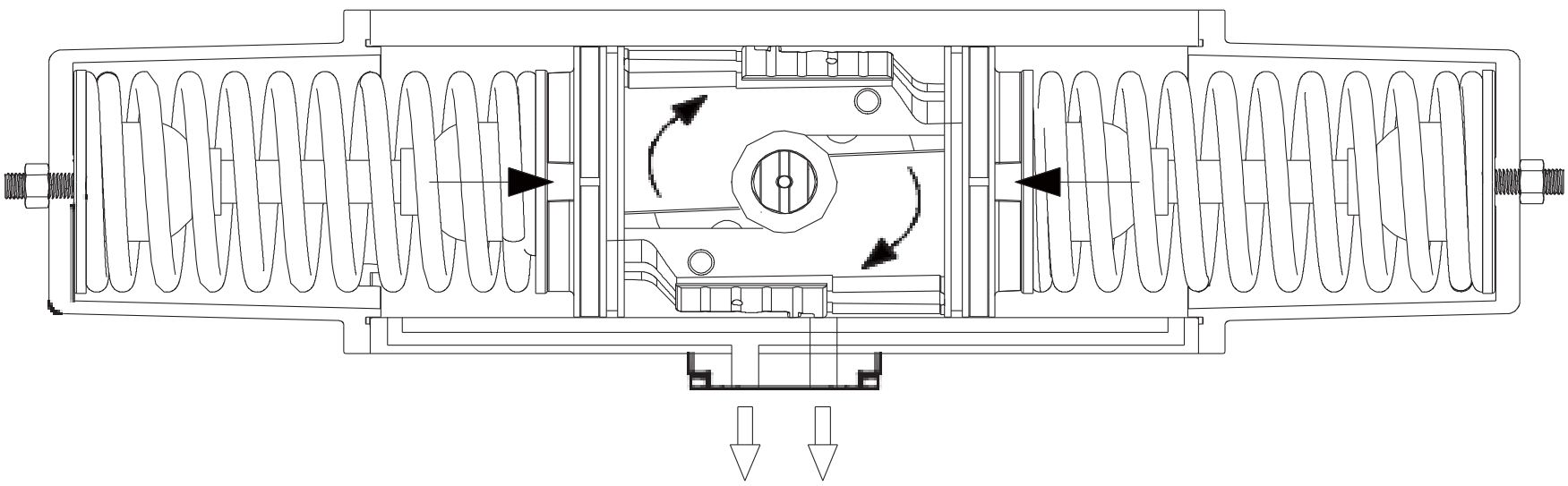
SINGLE ACTING FO OPEN



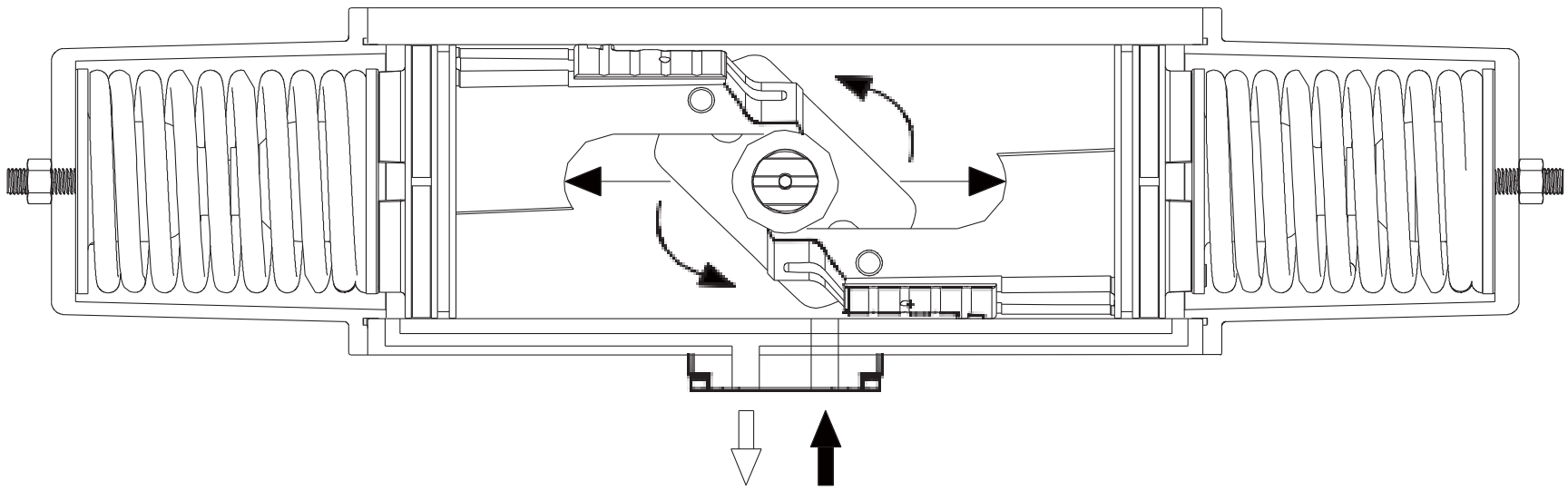
SINGLE ACTING FO CLOSE



SINGLE ACTING FC OPEN



SINGLE ACTING FC CLOSE



SINGLE ACTING OUTPUT TORQUE

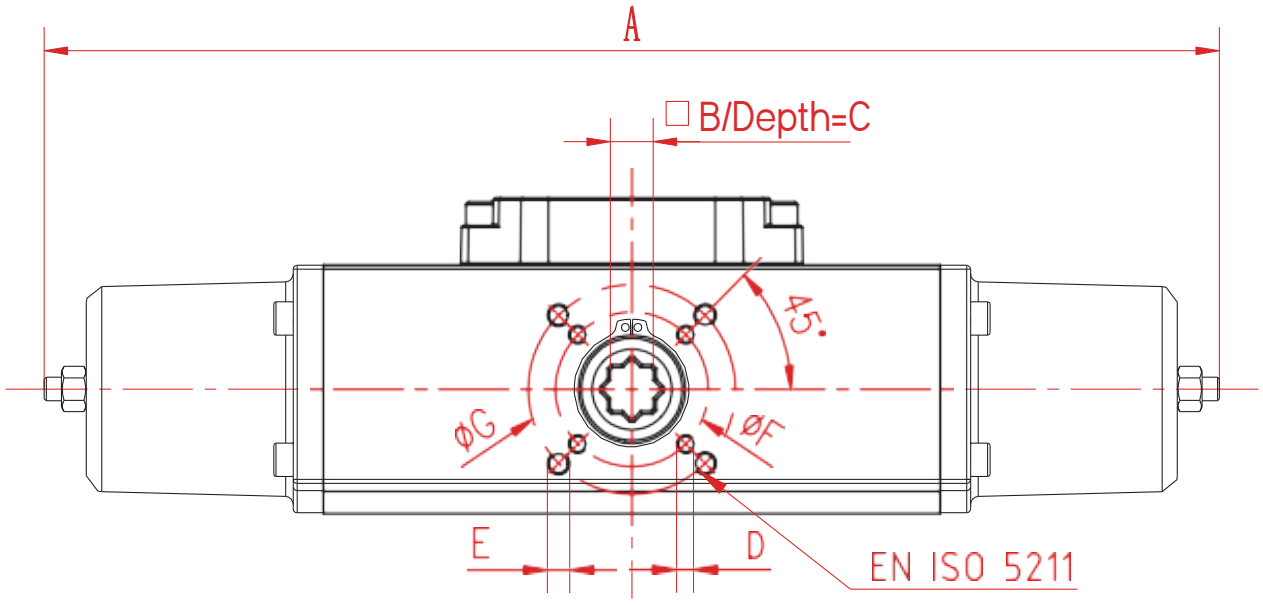
SINGLE ACTING TORQUE TABLE

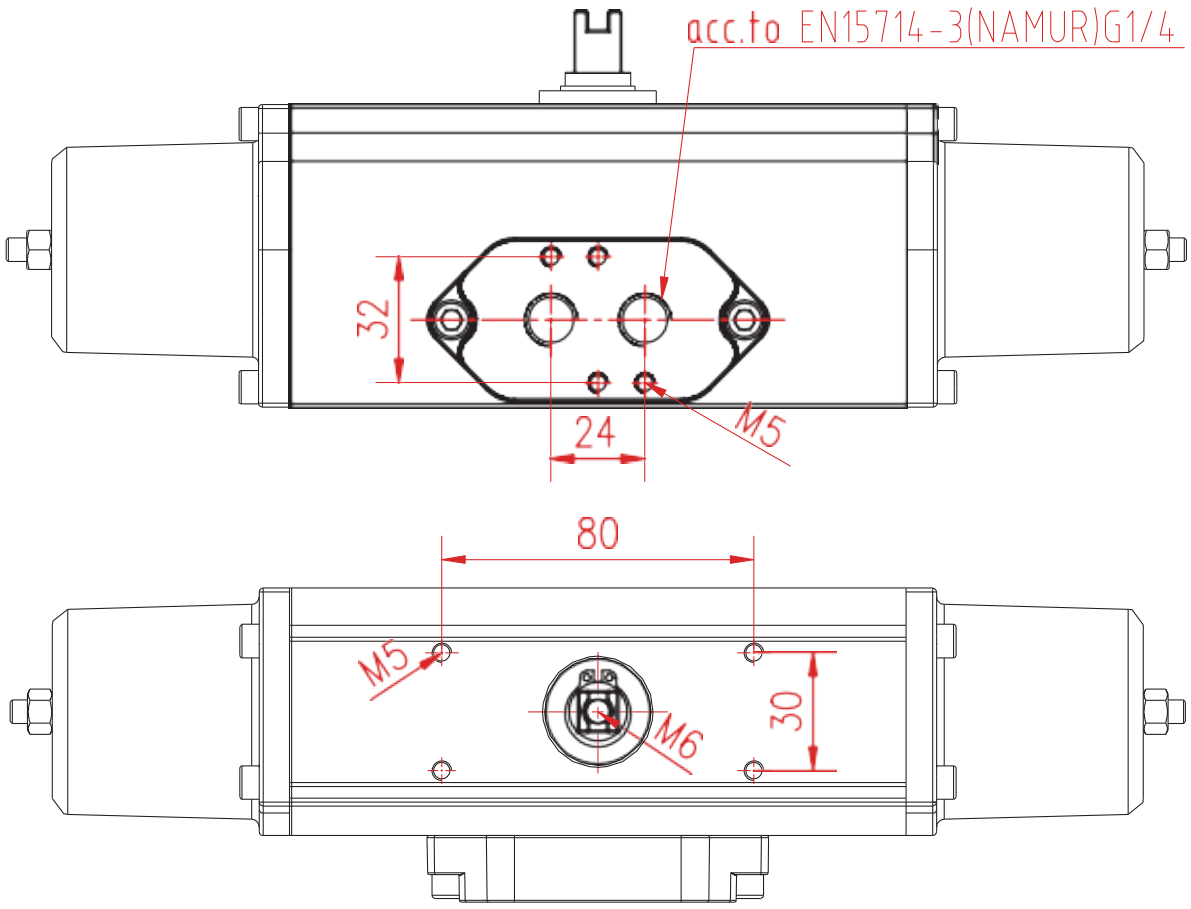
Model	Spring	Spring Torque Nm. 0° 45 ° 90 °			Torque output under different pressure Nm 0° 45 ° 90 °																							
					2,5 bar / 36psi			3,0 bar / 44psi			4,0 bar / 58psi			5,0 bar / 73psi			5,5 bar / 80psi			6,0 bar / 87psi			7,0 bar / 102psi			8,0 bar / 116psi		
		0°	45 °	90 °	0°	45 °	90 °	0°	45 °	90 °	0°	45 °	90 °	0°	45 °	90 °	0°	45 °	90 °	0°	45 °	90 °	0°	45 °	90 °	0°	45 °	90 °
SA60	K11	14	10	19	19	8	10	26	12	15	38	19	26															
SA60	K12	18	13	25				22	9	10	34	16	21	47	23	32												
SA60	K22	22	16	31							30	13	15	43	20	26	49	23	32									
SA60	K13	25	18	34										41	18	23	47	22	29	53	25	34						
SA60	K23	29	21	40													43	19	23	50	22	29	62	29	40			
SA60	K33	36	26	50																43	18	20	56	25	31	69	32	42
SA70	K11	26	18	36	38	16	19	50	23	30	74	36	51															
SA70	K12	34	24	47				43	18	19	67	31	41	91	44	62												
SA70	K22	42	30	59							60	26	30	84	39	51	96	45	62									
SA70	K13	47	34	65										80	36	45	92	42	56	104	49	66						
SA70	K23	55	39	77													85	37	45	97	44	56	121	57	77			
SA70	K33	68	49	95																85	35	39	110	49	60	134	62	82
SA80	K11	42	29	56	60	27	33	80	37	50	119	59	84															
SA80	K12	57	39	74				67	29	33	106	50	68	146	71	102												
SA80	K22	71	49	92							93	41	51	133	63	85	152	73	103									
SA80	K13	78	54	103										127	58	76	146	69	93	166	79	110						
SA80	K23	92	63	120													133	60	76	156	71	98	192	92	128			
SA80	K33	114	78	149																134	57	67	173	79	101	213	100	135
SA90	K11	68	48	91	85	36	42	114	52	68	173	84	119															
SA90	K12	87	61	117				98	40	44	156	72	95	215	104	146												
SA90	K22	105	74	142							140	60	71	198	92	122	228	108	148									
SA90	K13	121	85	162										184	82	104	213	98	129	243	114	155						
SA90	K23	140	98	188													197	86	105	226	102	131	285	134	182			
SA90	K33	174	122	234																195	80	88	254	112	139	313	144	190
SA100	K11	92	64	122	132	59	74	176	82	111	262	129	187															
SA100	K12	122	85	162				149	63	74	235	110	149	321	157	225												
SA100	K22	152	106	202							208	91	112	294	138	187	337	162	225									
SA100	K13	168	117	223										280	128	167	323	151	205	366	175	243						
SA100	K23	198	137	263													296	132	168	339	156	205	425	203	281			
SA100	K33	244	169	324																297	127	148	383	174	223	470	220	299
SA125	K11	158	109	209	227	101	126	301	141	190	448	221	319															
SA125	K12	208	144	275				256	109	129	403	190	257	551	270	386												
SA125	K22	257	178	341							358	158	195	506	238	324	580	278	389									
SA125	K13	286	199	379										480	220	288	554	260	352	627	300	417						
SA125	K23	336	233	445													509	229	291	583	269	355	730	349	484			
SA125	K33	415	288	550																511	219	257	659	299	386	807	379	515
SA140	K11	214	148	281	298	132	165	397	186	251	594	293	423															
SA140	K12	275	190	362				342	147	176	538	254	347	735	361	519												
SA140	K22	337	232	442							483	216	272	680	323	443	778	376	529									
SA140	K13	383	264	502										638	294	387	737	347	473	835	401	558						
SA140	K23	444	306	583													682	309	397	780	362	483	977	469	655			
SA140	K33	551	380	723																683	295	351	880	402	523	1077	509	694
SA160	K11	323	223	425	452	201	250	601	281	380	899	443	639															
SA160	K12	408	282	536				525	228	275	822	390	535	1120	551	794												
SA160	K22	493	340	648							746	337	431	1043	498	690	1192	579	820									
SA160	K13	569	393	749										974	450	595	1123	530	725	1271	611	854						
SA160	K23	654	452	860													1046	477	620	1195	558	750	1492	720	1010			
SA160	K33	816	563	1073																1049	456	551	1347	618	810	1644	779	1070
SA180	K11	408	305	593	630	279	348	837	392	529	1252	617	891															
SA180	K12	524	392	763				721	311	370	1137	536	732	1552	762	1094												
SA180	K22	639	479	933							1021	456	573	1436	681	935	1643	794	1116									
SA180	K13	728	544	1060										1348	620	816	1555	733	997	1763	845	1178						
SA180	K23	843	631	1230													1439	652	838	1647	764	1019	2062	990	1380			
SA180	K33	1047	783	1526																1443	622	740	1858	848	1102	2273	1073	1464
SA220	K11	708	531	1035	1215	550	706	1599	759	1042	2369	1176	1712															
SA220	K12	945	709	1383				1363	593	715	2132	1010	1386	2901	1428	2057												
SA220	K22	1182	887	1732							1895	844	1060	2664	1262	1730	3049	1471	2066									
SA220	K13	1299	974	1901										2547	1181	1572	2932	1390	1907	3316	1599	2242						
SA220	K23	1536	1152	2249													2695	1224	1580	3080	1433	1916	3849	1850	2587			
SA220	K33	1890	1417	2767																2725	1185	1431	3495	1603	2101	4264	2021	2772
SA260	K11	1187	1046	2235	2765	1171	1351	3555	1600	2040	5136	2459	3418															
SA260	K12	1746	1406	2865				2997	1265	1449	4578	2123	2827	6158	2981	4206												
SA260	K22	2304	1766	3496							4019	1787	2236	5600	2646	3615	6390	3075	4304									
SA260	K13	2339	1929	3983										5565	2494	3158	6355	2923	3847	7146	3352	4536						
SA260	K23	2898	2289	4613													5797	2588	3256	6587	3017	3945	8168	3875	5324			
SA260	K33	3492	2812	5730																5993	2529	2898	7574	3388	4276	9155	4246	5654

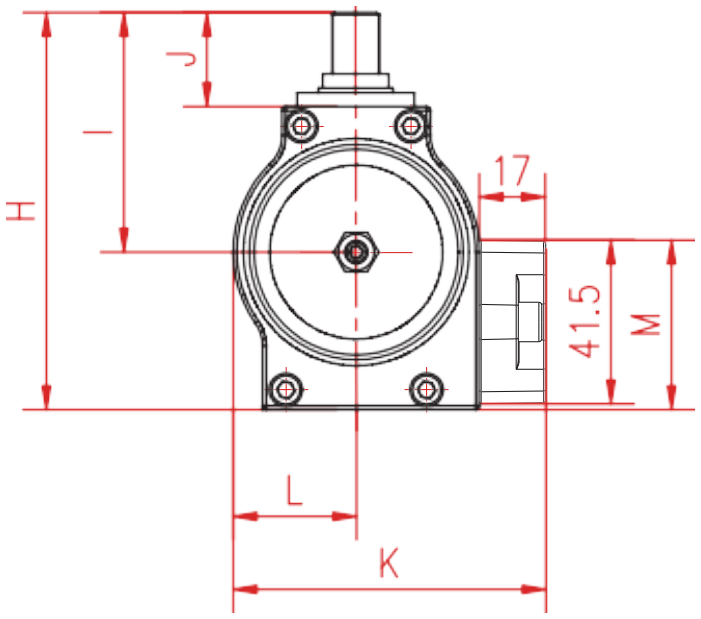
FC selection : Spring 0°-ETC, Spring 45°-RTC, Spring 90°-BTC; Pressure 0°-BTO, Pressure 45°-RTO, Pressure 90°-ETO

FO selection: Spring 0°-ETO, Spring 45°-RTO, Spring 90°-BTO; Pressure 0°-BTC , Pressure 45°-RTC, Pressure 90°-ETC

DIMENSION SA60-SA125

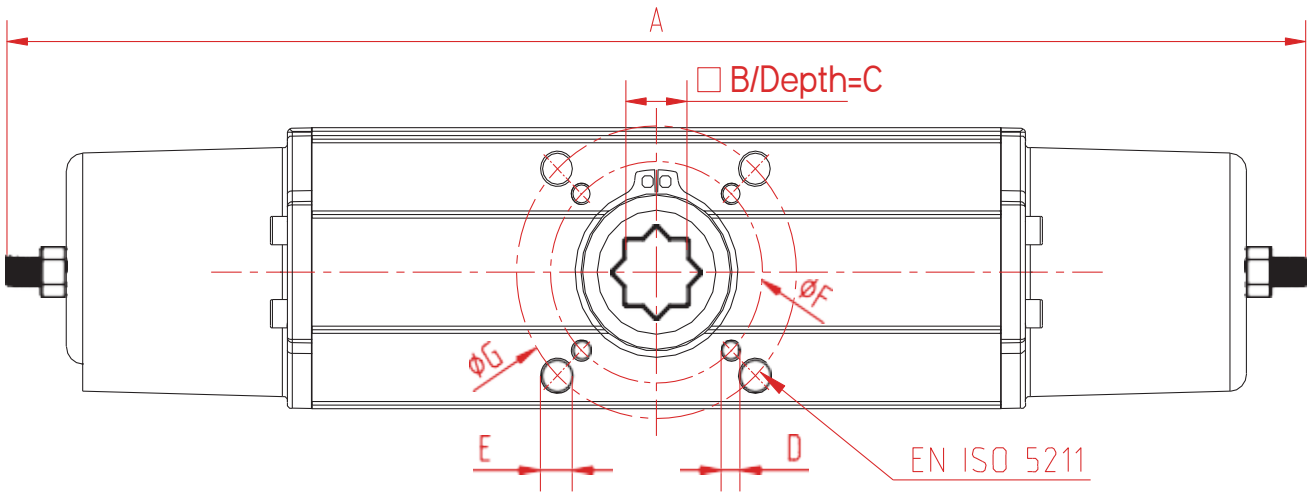


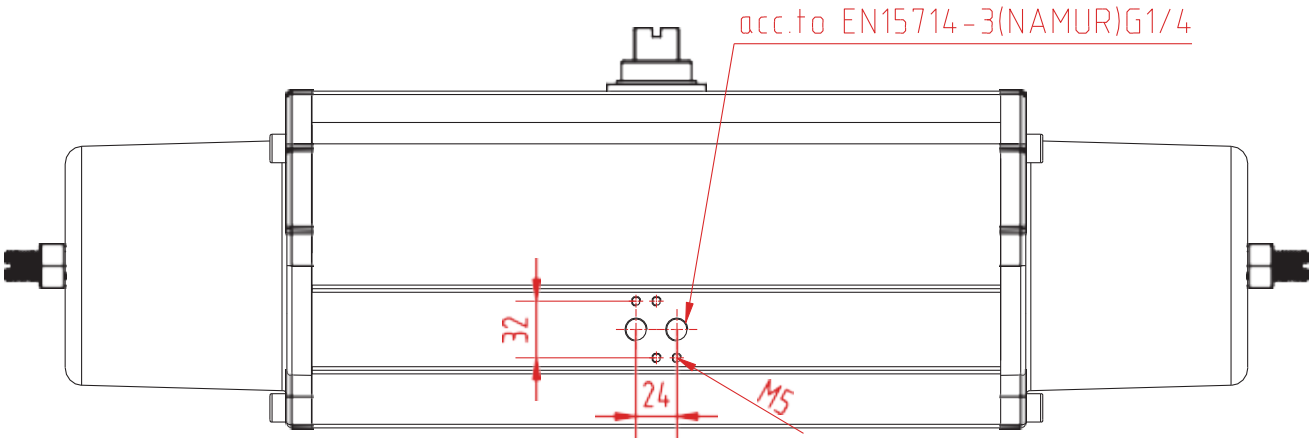


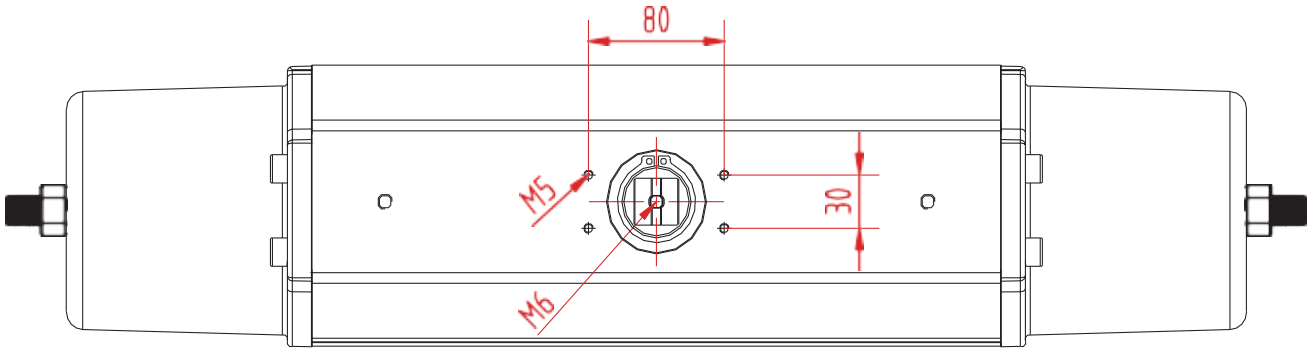


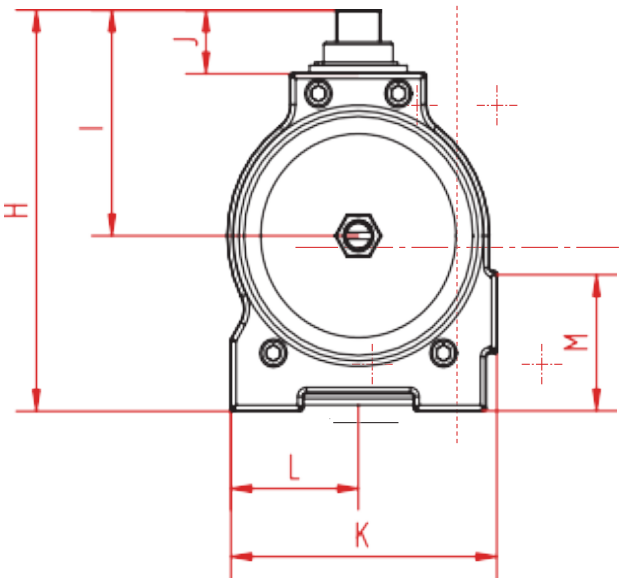
MODEL	SA60	SA70	SA80	SA90	SA100	SA125
ISO	F05	F05/F07	F05/F07	F07/F10	F07/F10	F10/F12
A	310	410	457	510	596	720
B	14	17	17	22	22	27
C	16	18	22	26	26	30
D X DEPTH	M6x9	M6x9	M6x9	M8x12	M8x12	M10x15
E X DEPTH	-	M8x12	M8x12	M10x15	M10x15	M12x18
F	50	50	50	70	70	102
G	-	70	70	102	102	125
H	97	111	128	140	149	186
I	57	65	72	76	83	106
J	20	20	20	20	20	30
K	80	96	108	121	131	156
L	31.5	40	45.5	51	57	70
M	43	46	53	54.5	59	60
WEIGHT（G）	2.1	4.1	5.9	8.9	12.3	20.8
AIR CONSUMPTION(NL/CYCLE)	0.28	0.6	0.95	1.44	1.97	3.41
OPEN TIME (SECONDS)	0.29	0.34	0.5	0.78	1.05	1.8
CLOSE TIME (SECONDS)	0.25	0.31	0.46	0.65	0.82	1.18

DIMENSION SA140-SA160



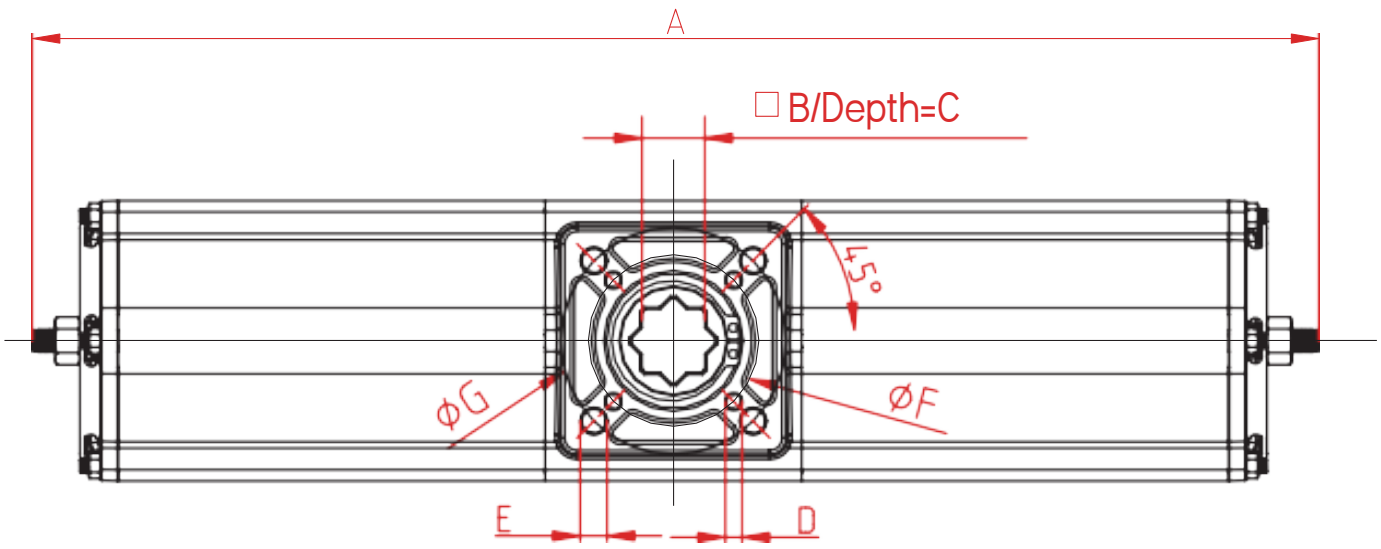


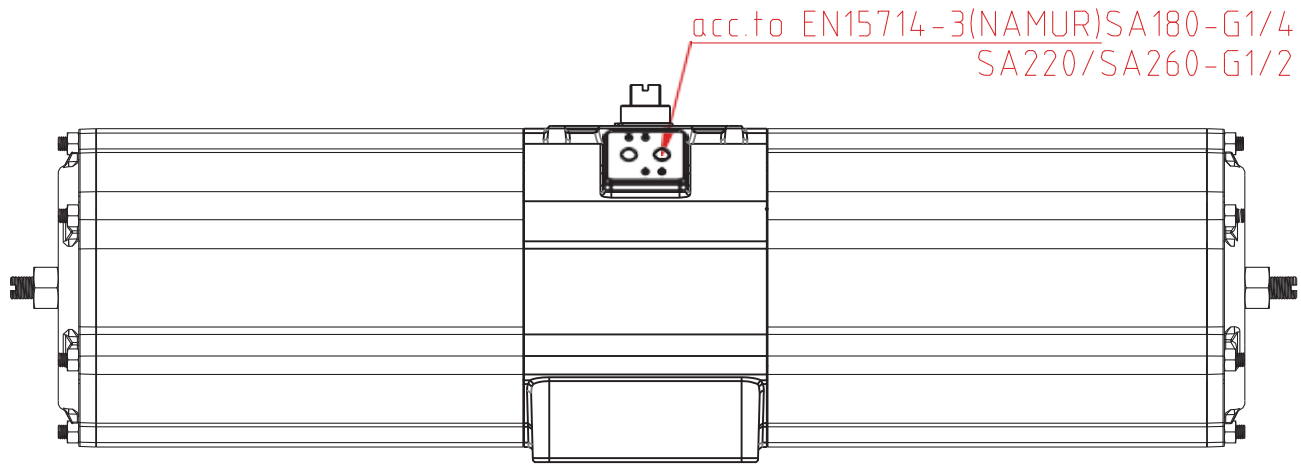


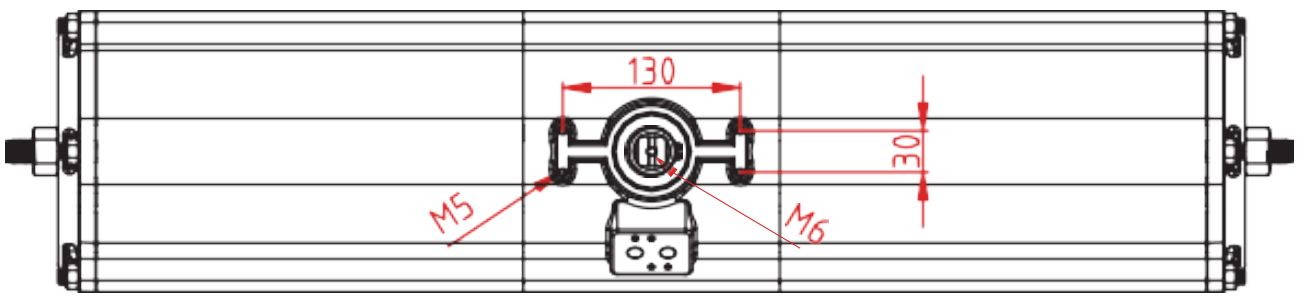


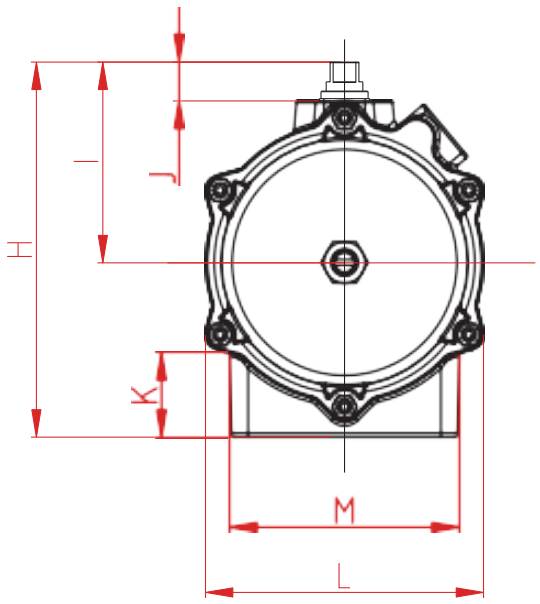
MODEL	SA140		SA160	
ISO	F12/F16	F14	F12/F16	F14
A	780		880	
B	36		46	
C	40		46	
D X DEPTH	M12x20	M16x24	M12x20	M16x24
E X DEPTH	M20x30	-	M20x30	-
F	125	140	125	140
G	165	-	165	-
H	220		242.5	
I	122		129	
J	30		30	
K	156.5		175	
L	75		85	
M	79		93.5	
WEIGHT（G）	32.1		47.6	
AIR CONSUMPTION(NL/CYCLE)	4.51		6.49	
OPEN TIME (SECONDS)	2.51		4.14	
CLOSE TIME (SECONDS)	1.68		2.47	

DIMENSION SA180-SA260









MODEL	SA180		SA220	SA260
ISO	F12/F16	F14	F16	F25
A	965		1199	1543
B	46		55	55
C	50		57	57
D	M12x18	M16x24	M20x30	M16x30
E	M20x30	-	-	-
F	125	140	165	254
G	165	-	-	-
H	275		314	380
I	148		171	202
J	30		30	30
K	62		71	66
L	206		271	342
M	168		206	300
WEIGHT（G）	60.1		108.7	211.9
AIR CONSUMPTION(NL/CYCLE)	10.22		17.6	36.4
OPEN TIME (SECONDS)	9.6		4.92	9.82
CLOSE TIME (SECONDS)	6.07		3.11	6.2

OPEN TIME TEST：

DA/SA（40-180）：Entry G1 /4,ϕ8mm air tube, empty load
DA/SA（220 - 260）：Ent ry G1/2,ϕ12mm air t ube, empty load