

Pneumatic rotary actuator

Double acting and spring return



Type 2051 QT can be combined with...



Type 6519

NAMUR Solenoid valve



Type 8792/93

Positioner SideControl



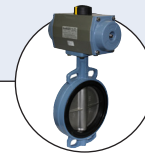
Type MV2650

Ball valve



Type 1062QT

Position feedback



Type VV2670

Butterfly valve

- Modular program for mounting of quarter turn valves such as ball valves and butterfly valves
- NAMUR and ISO 5211 interfaces
- Position feedback (including Ex-Versions)
- SideControl Positioner ready

The 2051 QT pneumatic rotary actuators are of the rack and pinion type where the linear kinetic energy is directly transformed into a "quarter turn" operation with a constant output torque over the full stroke.

Both double acting and spring return actuators have twin pistons horizontally opposed and incorporate piston guides to ensure correct contact between the rack and pinion at all pressures.

High quality materials are employed throughout the construction and the compact design is readily fitted to any type of ball valve, butterfly valve or other equipment requiring efficient pneumatic actuators.

The actuator is suitable for mounting a full range of accessories, such as limit switches, solenoid valves, positioners and manual override gearbox.

Technical data

Materials

Actuator body
End cap
Pinion
Piston
Guide
Seal

Extruded aluminium alloy, gold anodized
Pressure die cast aluminium alloy, black epoxy coated
Carbon steel, zinc plated
Pressure die cast aluminium alloy, natural
Acetal resin, natural
NBR

Control medium

Filtered compressed air,
with or without oil

Control pressure

2 to 8 bar double acting
3 to 8 bar spring return
Max. 10 bar

Temperature

-20 to +80 °C

Rotation

Double acting

90° (+/- 5°)

Single acting

Counterclockwise when port 'A' is pressurized
Clockwise when port 'B' is pressurized
Counterclockwise
(see functional principle for details)

Interfaces

Pilot air ports
Topwork
Valve mounting

NAMUR Flange interface VDE/VDI 3845
NAMUR VDE/VDI 3845
ISO 5211/DIN 3337

Lubrication

All moving parts are factory lubricated for cycle life of actuator

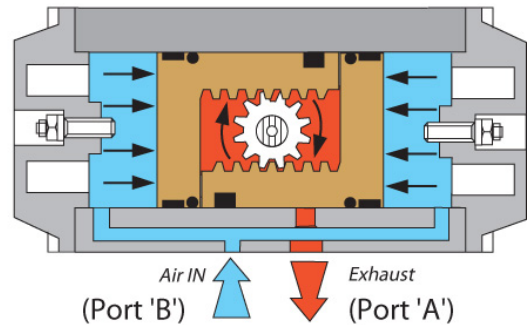
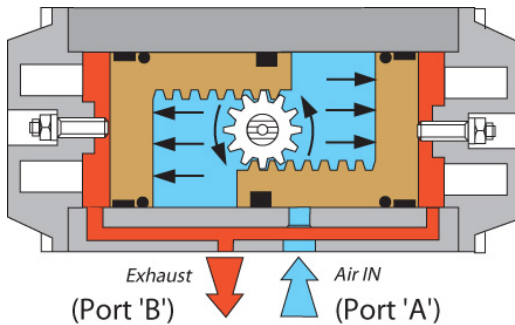
Construction

Suitable for indoor or outdoor application

Functional principle

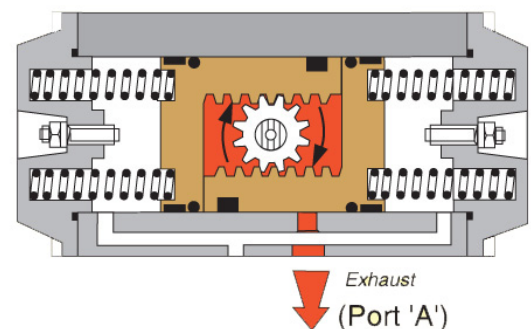
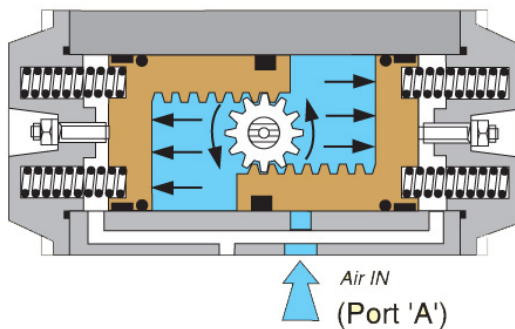
Double acting actuator (DA)

Counter clockwise output operation is achieved by inserting pressure into Port 'A', to force piston apart thus rotating the actuator pinion counter clockwise. During the operation, air from the outer chambers is exhausted through Port 'B'. Clockwise output operation is achieved by reverse of the above and inserting pressure into Port 'B'.



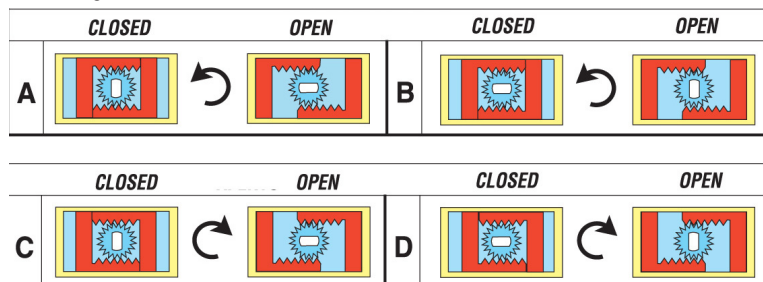
Single acting actuator (SR)

Pressure applied to Port 'A' will cause the inner chambers to be pressurized, forcing the pistons outward to compress the springs. The pinion is rotated counter clockwise. Upon release of pressure through Port 'A' the springs will exert pressure to close the pistons and rotate the pinion clockwise rapidly. This action will often be used to close a 90° turn valve in shutdown mode.



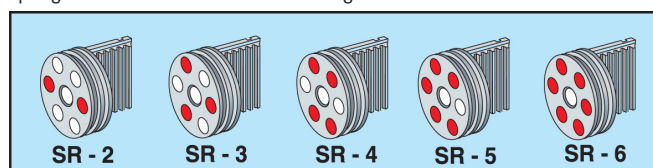
Pistons assembly variations

Actuator direction of rotation can be changed by switching both the pistons in accordance to the below diagram



Arrangement of springs for single acting actuator

Springs can be added or removed according to torque requirement. It is recommended to install springs in accordance to the below diagram



Air Consumption

Free Air per stroke (Liters)

Model	AP00 DA	AP01 DA/SR	AP02 DA/SR	AP03 DA/SR	AP35 DA/SR	AP04 DA/SR	AP45 DA/SR	AP05 DA/SR	AP55 DA/SR	AP06 DA/SR	AP08 DA/SR	AP10 DA/SR
Counter Clockwise	0.04	0.08	0.12	0.24	0.48	0.68	1.0	1.4	1.6	3.2	5.3	14.2
Clockwise	0.05	0.10	0.16	0.44	0.56	0.96	1.6	2.16	2.56	4.0	8.6	16.5

Opening / Closing time

at 5.6 bar air

Model	AP00	AP01	AP02	AP03	AP35	AP04	AP45	AP05	AP55	AP06	AP08	AP10
Double Acting	0.5 sec	1 sec	1 sec	1 sec	1 sec	1 sec	1 sec	1.25 sec	1.5 sec	1.5 ~ 2 sec	3 ~ 4 sec	5 ~ 6 sec
Single Acting	-	1 sec	1 sec	1 sec	1 sec	1 sec	1 sec	1.5 ~ 2 sec	2 sec	2 ~ 3 sec	4 ~ 6 sec	7 ~ 8 sec

Weight (kg)

Model	AP00	AP01	AP02	AP03	AP35	AP04	AP45	AP05	AP55	AP06	AP08	AP10
Double Acting	0.51	1.15	1.6	2.8	4.28	5.8	8.26	11.63	14.15	21.7	40.1	77.0
Single Acting	-	1.27	1.85	3.36	4.91	6.92	9.72	14.15	17.35	25.9	48.62	128.0

Torque Output (Nm) | Ordering Chart (other versions on request)

Double acting actuator (DA)

Model	Operating Pressure (bar)							Item No.
	2	3	4	5	6	7	8	
AP00 DA	2.4	3.6	4.8	6	7.3	8.5	9.7	97140181
AP01 DA	5.9	8.9	11.8	14.8	17.7	21.7	24.8	97140182
AP02 DA (F04)	9.4	14.1	18.8	23.5	28.2	32.9	37.6	97140183
AP02 DA (F05)	9.4	14.1	18.8	23.5	28.2	32.9	37.6	97140184
AP03 DA	20	30	40	50	60	70	80	97140185
AP35 DA	34	51	68	85	102	119	136	97140186
AP04 DA	48	71	95	119	142	168	192	97140187
AP45 DA	87.2	130.8	174.4	218	261.6	305.2	348.8	97140188
AP05 DA	111	167	222	278	333	388.5	444	97140189
AP 55 DA	157.6	236.4	315.3	394.1	473	551.8	630.6	97140190
AP06 DA	227	340	454	567	680	794.5	908	97140191
AP08 DA	426	638	851	1,064	1,276	1,491	1,704	97140192
AP10 DA	1,078	1,617	2,156	2,695	3,234	3,773	4,312	97140193

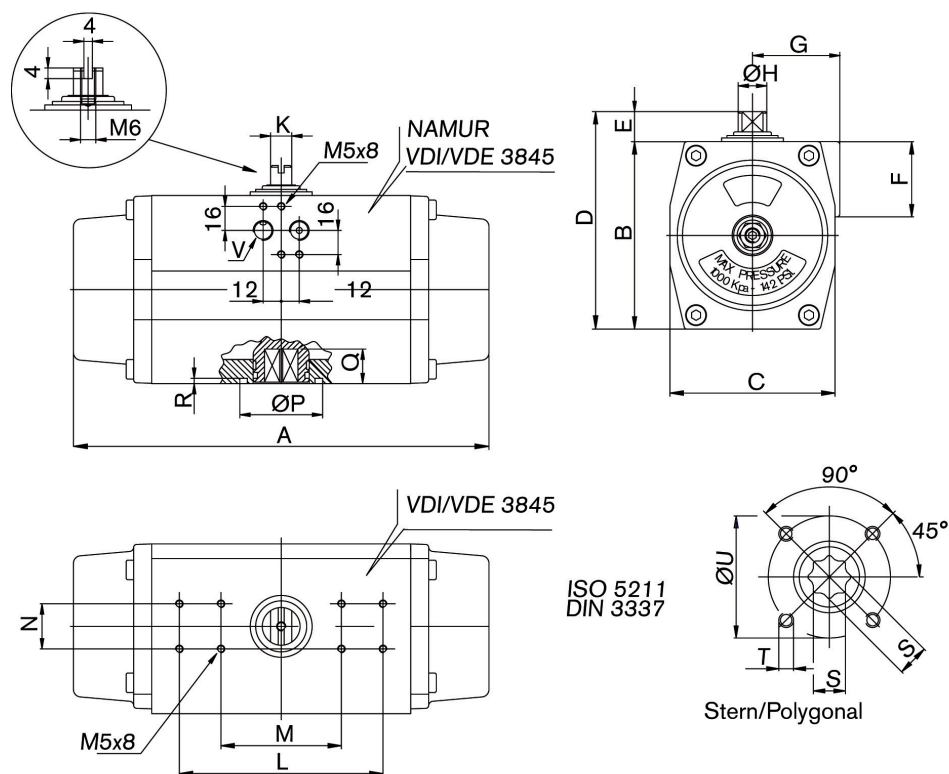
Torque Output (Nm) | Ordering Chart (other versions on request)

Single acting actuator (SR)

Model	Springs on each side	Operating Pressure (bar)												Spring stroke		Item No.
		3		4		5		6		7		8				
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°	
AP01 SR	2	6.5	5.4	9.4	8.3	12.4	11.3	15.3	14.2	19.3	18.2	22.4	21.3	3.5	2.4	97140194
	3	5.3	3.7	8.2	6.6	11.2	9.6	14.1	12.5	18.1	16.5	21.2	19.6	5.2	3.6	
	4	4.1	1.9	7	4.8	10	7.8	12.9	10.7	16.9	14.7	20	17.8	7	4.8	
	5	-	-	3.1	2.7	8.8	6.1	11.7	9	15.7	13	18.8	16.1	8.7	6	
	6	-	-	-	-	7.6	4.3	10.5	7.2	14.5	11.2	17.6	14.3	10.5	7.2	
AP02 SR	2	10.3	8.5	15.0	13.2	19.7	17.9	24.4	22.6	29.1	27.3	33.8	32	5.6	3.8	97140195 (F04)
	3	8.4	5.7	13.1	10.4	17.8	15.1	22.5	19.8	27.2	24.5	31.9	29.2	8.4	5.7	
	4	-	-	11.2	7.6	15.9	12.3	20.6	17	25.3	21.7	30	26.4	11.2	7.6	97140196 (F05)
	5	-	-	-	-	14	9.5	18.7	14.2	23.4	18.9	28.1	23.6	14	9.5	
AP03 SR	2	22	18	32	28	42	38	52	48	62	58	72	68	12	8	97140197
	3	18	12	28	22	38	32	48	42	58	52	68	62	18	12	
	4	-	-	24	16	34	26	44	36	54	46	64	56	24	16	
	5	-	-	-	-	30	20	40	30	50	40	60	50	30	20	
	6	-	-	-	-	26	14	36	24	46	34	56	44	36	24	
AP35 SR	2	41.5	30	58.5	47	75.5	64	92.5	81	109.5	98	126.5	115	21	9.5	97140198
	3	32	20	49	37	66	54	83	71	100	88	117	105	31	19	
	4	-	-	43	20	60	37	77	54	94	71	111	88	48	25	
	5	-	-	-	-	53	33	70	50	87	67	104	84	52	32	
AP04 SR	2	52.7	42.4	76.7	66.4	100.7	90.4	123.7	113.4	149.7	139.4	173.7	175.2	28.6	18.3	97140199
	3	43	28	67	52	91	76	114	99	140	125	164	153.6	43	28	
	4	-	-	58	38	82	62	105	85	131	111	155	132	57	37	
	5	-	-	-	-	73	47	96	70	122	96	146	110.4	72	46	
	6	-	-	-	-	64	33	87	56	113	82	137	88.8	86	55	
AP45SR	2	96.8	77.5	140.4	121.1	184	164.7	227.6	208.3	271.2	251.9	314.8	295.5	53.3	34	97140179
	3	79.8	50.9	123.4	94.5	167	138.1	210.6	181.7	254.2	225.3	297.8	268.9	79.9	51	
	4	62.8	24.2	106.4	67.8	150	111.4	193.6	155	237.2	198.6	280.8	242.2	106.6	68	
	5	-	-	89.4	41.1	133	84.7	176.6	128.3	220.2	171.9	263.8	215.3	133.3	85	
	6	-	-	72.4	14.4	116	58	159.6	101.6	203.2	145.2	246.8	188.8	160	102	
AP05 SR	2	123.7	99.4	178.7	154.4	234.7	210.4	289.7	265.4	345.2	320.9	400.7	376.4	67.6	43.3	97140180
	3	103	66	158	121	214	177	269	232	324.5	287.5	380	343	101	64	
	4	-	-	136	87	192	143	247	198	302.5	253.5	358	309	135	86	
	5	-	-	-	-	170	109	225	164	280.5	219.5	336	275	169	108	
	6	-	-	-	-	148	75	203	130	258.5	185.5	314	241	203	130	
AP55 SR	2	176.2	132.8	258.7	215.3	337.5	294.1	416.4	373	495.2	451.8	574	530.6	100	56.6	97140200
	3	147.9	82.8	230.4	165.3	309.2	244.1	388.1	323	466.9	401.8	545.7	480.6	150	84.9	
	4	119.5	32.8	202	115.3	280.8	194.1	359.7	273	438.5	351.8	517.3	430.6	200	113.3	
	5	-	-	173.7	65.3	252.5	144.1	331.4	223	410.2	301.8	489	380.6	250	141.6	
	6	-	-	145.3	15.3	224.1	94.1	303	173	381.8	251.8	460.6	330.6	300	170	
AP06 SR	2	257	200	371	314	484	427	597	540	711.5	654.5	825	768	140	83	97140201
	3	215	130	329	244	442	357	555	470	669.5	584.5	783	698	210	125	
	4	-	-	287	174	400	287	513	400	627.5	514.5	741	628	280	167	
	5	-	-	-	-	358	217	471	330	585.5	444.5	699	558	350	209	
	6	-	-	-	-	316	147	429	260	543.5	374.5	657	488	420	251	
AP08 SR	2	478	386	691	599	904	812	1,116	1,024	1,331	1,239	1,704	1,452	252	160	97140202
	3	398	260	611	473	824	686	1,036	898	1,251	1,113	1,464	1,326	378	240	
	4	-	-	531	347	744	560	956	772	1,171	987	1,384	1,200	504	320	
	5	-	-	-	-	664	434	876	646	1,091	861	1,304	1,074	630	400	
	6	-	-	-	-	584	308	796	520	1,011	735	1,224	948	756	480	
AP10 SR	2	1,181	957	1,720	1,496	2,259	2,035	2,798	2,574	3,337	3,113	3,876	3,652	660	436	97140203
	3	963	628	1,502	1,167	2,041	1,706	2,580	2,245	3,119	2,784	3,658	3,323	989	654	
	4	-	-	1,284	837	1,823	1,376	2,362	1,915	2,901	2,454	3,440	2,993	1,319	872	
	5	-	-	-	-	1,605	1,046	2,144	1,585	2,683	2,124	3,222	2,663	1,649	1,090	
	6	-	-	-	-	-	-	1,909	1,254	2,448	1,793	2,987	2,332	1,980	1,325	

Dimensions [mm]

AP01 to AP10 DA/ SR



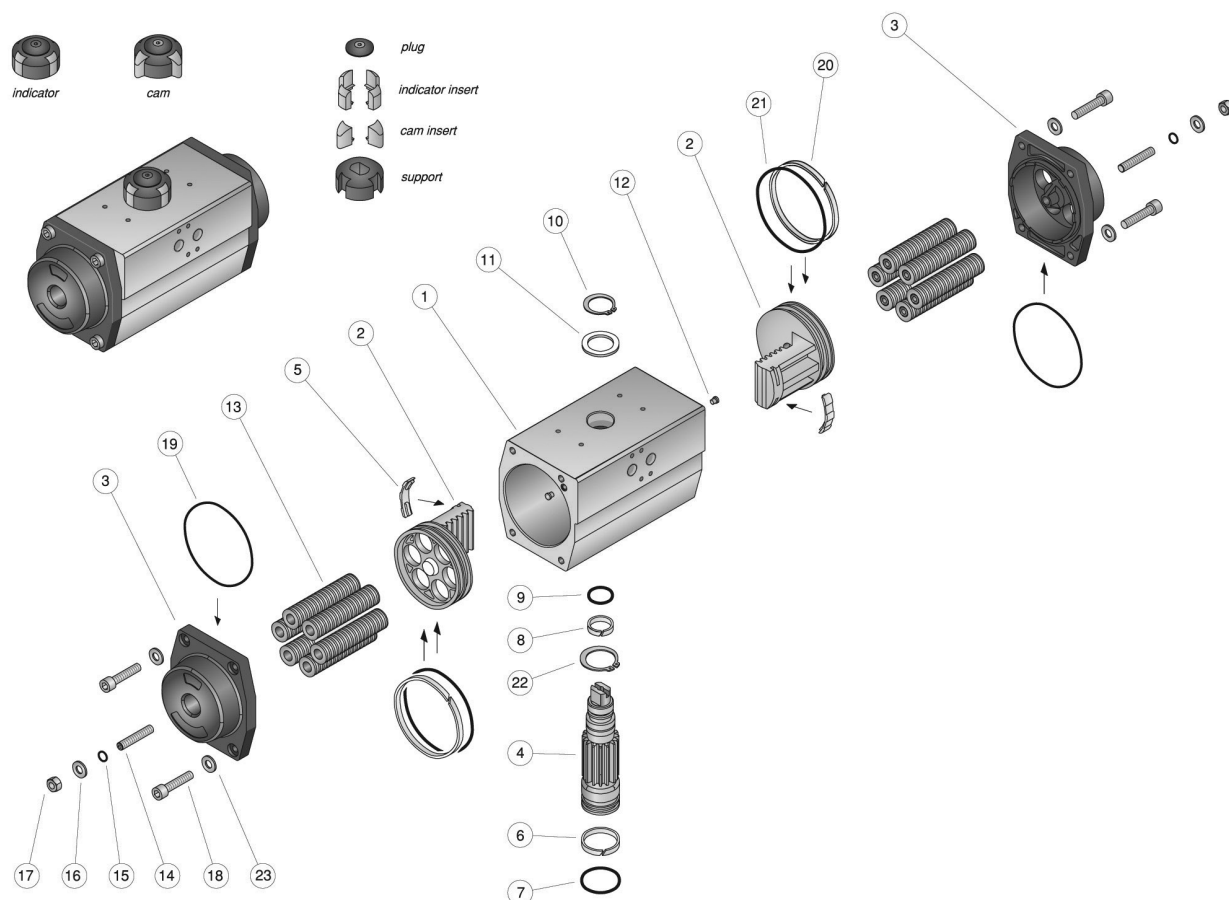
Model	A	B	C	D	E	F	G	H	K	L	M	N	P	Q	R	** S	T	U	V	ISO 5211
AP01 DA/SR	142	67	60	87	20	42	41	12	8	-	80	30	25	10	2	9	M5/M6	36/50	G1/8	F03/F05
AP02 DA/SR	155	83	73	103	20	42	44.5	12	8	-	80	30	30/35	12	2	11	M5/M6	42/50	G1/4	*** F04 or F05
AP03 DA/SR	213	100	85	120	20	50	49.5	14	10	-	80	30	35	16	3	14	M6/M8	50/70	G1/4	F05/F07
AP35 DA/SR	236	110	98	130	20	50	53	19	14	-	80	30	55	20	3.5	17	M8	70	G1/4	F07
AP04 DA/SR	276	125	110	145	20	50	58	19	14	-	80	30	55	20	3.5	17	M8/M10	70/102	G1/4	F07/F10
AP45 DA/SR	310	142	128	172	30	58	69	28	20	130	80	30	70	24	3.5	22	M10	102	G1/4	F10
AP05 DA/SR	366	155	140	185	30	-	-	28	20	130	80	30	70	24	3.5	22	M10	102	G1/4	F10
AP55 DA/SR	388	176	160	206	30	-	-	36	28	130	80	30	85	29	3.5	27	M12	125	G1/4	F12
AP06 DA/SR	468	200	175	230	30	-	-	36	28	130	80	30	85	29	3.5	27	M12	125	G1/4	F12
AP08 DA/SR	563	250	215	300	50	-	-	48	32	130	-	30	100	38	5	36	M16	140	G1/4	F14
AP10 DA/SR	750	335	290	385	50	-	-	48	32	130	-	30	130	50	5	46	M20	165	G1/4	F14

** Standard version comes with Star (polygonal) connection type. Square connection type on request

*** To be specified during order. Please refer to Ordering Chart.

Parts list

AP01 to AP10 DA/ SR

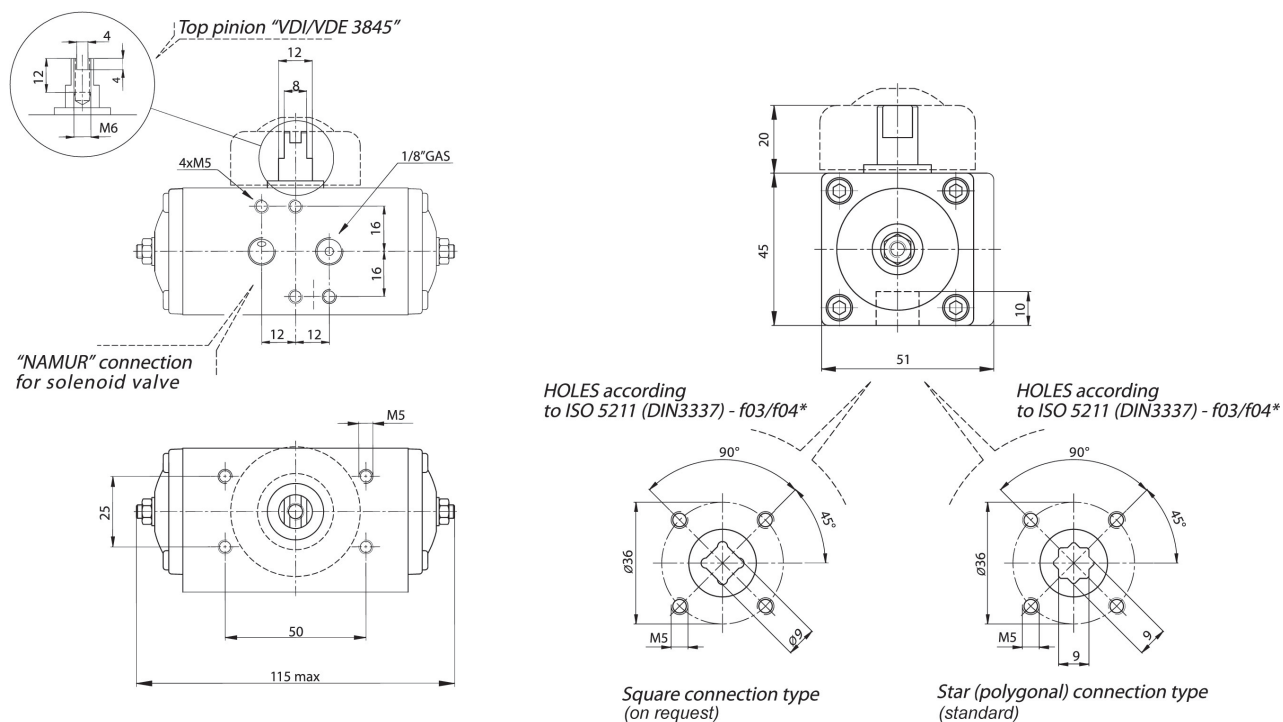


Item	Description	Qty	Item	Description	Qty
1	Actuator body	1	13	Springs	4~12
2	Piston	1+1	14	External adjusting screw	1
3	End cap	1+1	15*	O-ring	2
4	Pinion	1	16	Washer	2
5*	Piston guide	2	17	Stop nut	2
6*	Lower pinion guide ring	1	18	Screw end cap	8
7*	O-ring	1	19*	O-ring	2
8*	Upper Pinion guide ring	1	20*	Piston guide ring	2
9*	O-ring	1	21*	O-ring	2
10	Circlip	1	22	Circlip anti-blow out	1
11	Distance ring	1	23	Washer	8
12*	Plug	2			

* Suggested spare parts for routine maintenance

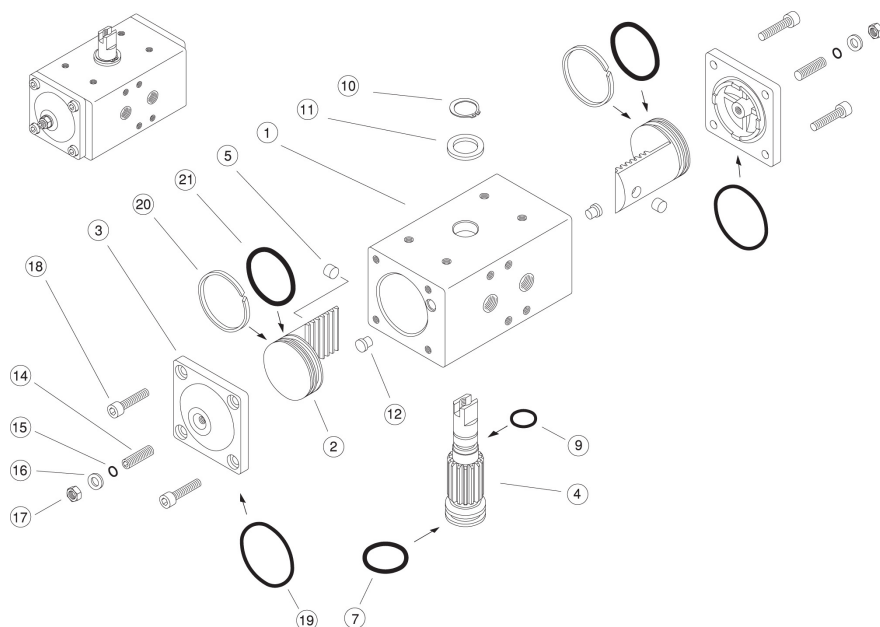
Dimensions [mm]

AP00 DA



Parts list

AP00 DA

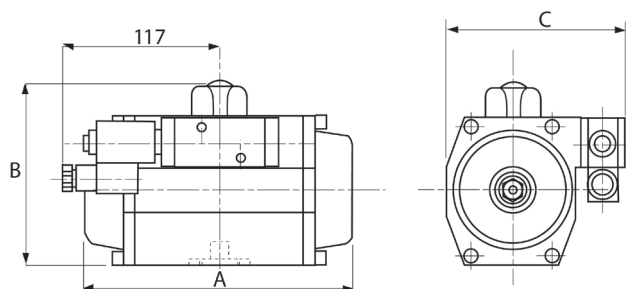


Item	Description	Qty
1	Actuator body	1
2	Piston	2
3	End cap	2
4	Pinion	1
5*	Piston guide	2
7*	O-ring	1
9*	O-ring	1
10	Circlip	1
11	Thrust Washer	1
12*	Plug	2
14	Screw external stroke	2
15*	O-ring	2
16	Plain washer	2
17	Stop nut	2
18	End cap bolts	8
19*	O-ring	2
20*	Piston guide ring	2
21*	O-ring	2

* Suggested spare parts for routine maintenance

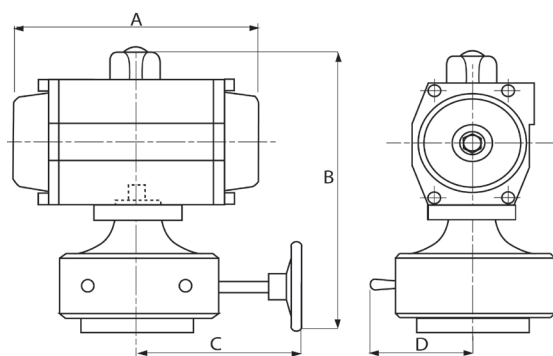
Dimensions [mm] - with accessories

With Type 6519 NAMUR solenoid valve



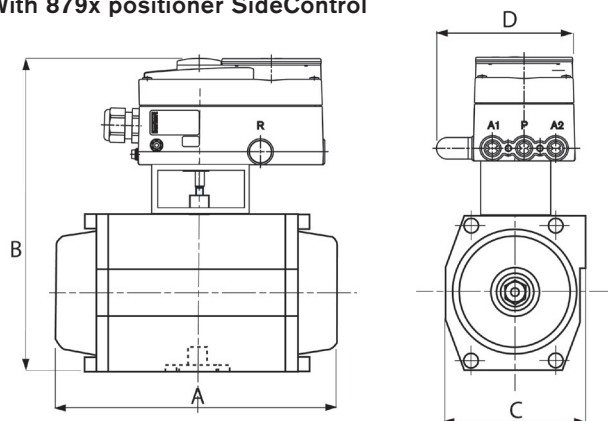
Model	A	B	C
AP01 DA/SR	142	97	108
AP02 DA/SR	155	113	118
AP03 DA/SR	213	130	129
AP35 DA/SR	236	140	139
AP04 DA/SR	276	155	150
AP45 DA/SR	310	182	170
AP05 DA/SR	366	197	177
AP55 DA/SR	388	218	197
AP06 DA/SR	468	242	212
AP08 DA/SR	563	312	252
AP10 DA/SR	750	397	327

With declutchable manual override gearbox



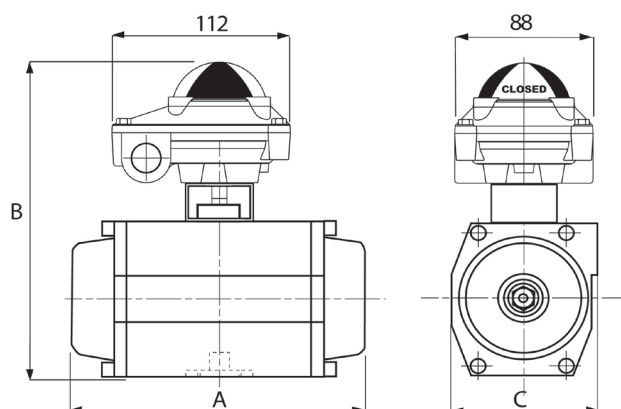
Model	A	B	C	D
AP01 DA/SR	142	313	214	167
AP02 DA/SR	155	329	214	167
AP03 DA/SR	213	346	214	167
AP35 DA/SR	236	356	214	167
AP04 DA/SR	276	371	214	167
AP45 DA/SR	310	398	214	167
AP05 DA/SR	366	413	214	167
AP55 DA/SR	388	511	343	247
AP06 DA/SR	468	535	343	247
AP08 DA/SR	563	605	343	247
AP10 DA/SR	750	690	-	-

With 879x positioner SideControl



Model	A	B	C	D
AP01 DA/SR	142	199	71	110
AP02 DA/SR	155	215	81	110
AP03 DA/SR	213	232	92	110
AP35 DA/SR	236	242	102	110
AP04 DA/SR	276	257	113	110
AP45 DA/SR	310	274	133	110
AP05 DA/SR	366	287	140	110
AP55 DA/SR	388	308	160	110
AP06 DA/SR	468	332	175	110
AP08 DA/SR	563	402	215	110
AP10 DA/SR	750	487	290	110

With 1062QT position feedback



Model	A	B	C
AP01 DA/SR	142	180	71
AP02 DA/SR	155	186	81
AP03 DA/SR	213	213	92
AP35 DA/SR	236	223	102
AP04 DA/SR	276	238	113
AP45 DA/SR	310	265	133
AP05 DA/SR	366	278	140
AP55 DA/SR	388	299	160
AP06 DA/SR	468	323	175
AP08 DA/SR	563	393	215
AP10 DA/SR	750	478	290

In case of special application conditions,
please consult for advice.

We reserve the right to make technical changes without notice

2051QT/EN/R1_12/2013