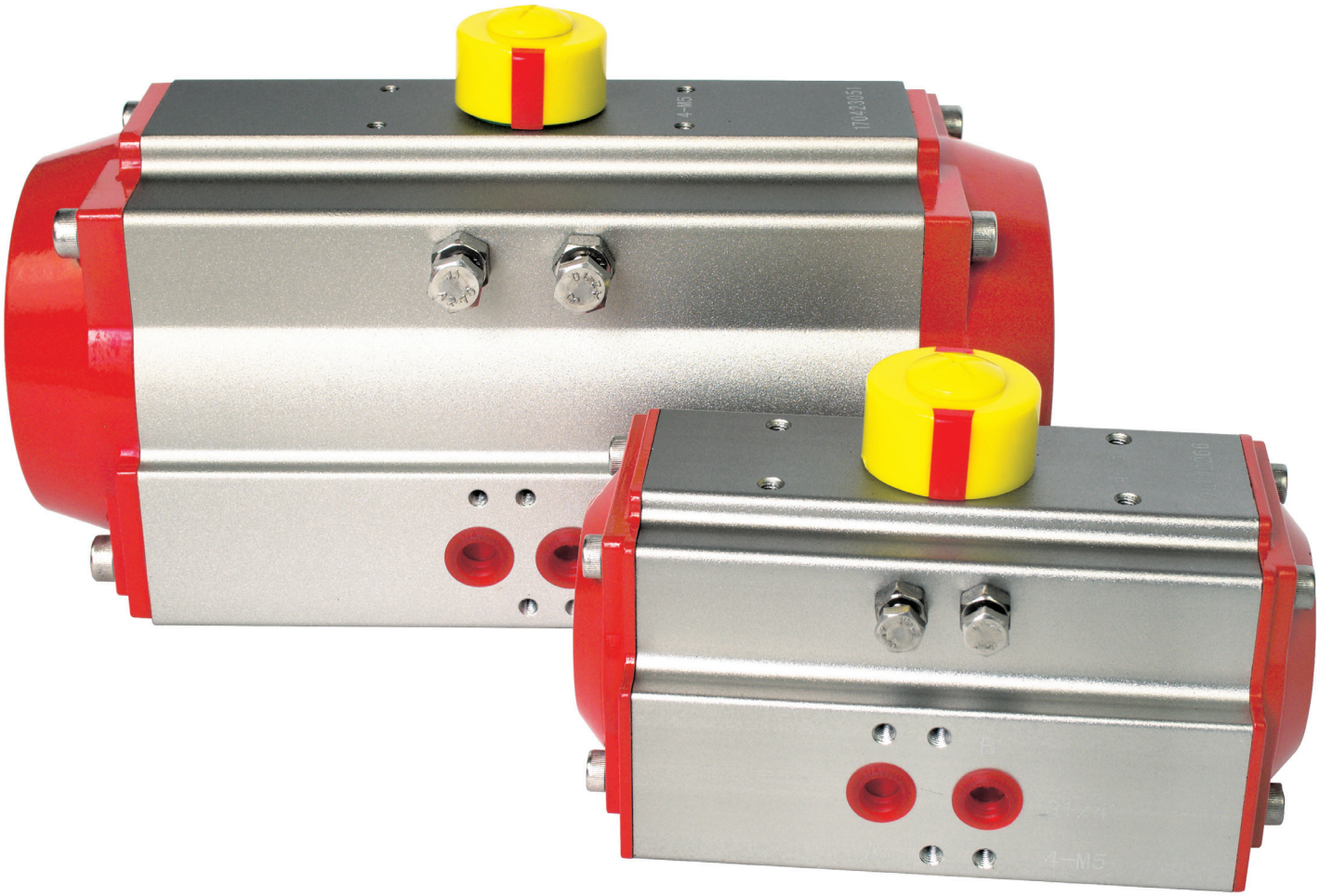
ABO



PNEUMATIC ACTUATORS SERIES 94

Double Acting / Single Acting
Torque up to 13024 Nm
Supply Pressure ranging from 2 to 8 bar

SERIES 94 - PNEUMATIC ACTUATORS

WWW.ABOVALVE.COM

GENERAL INFORMATION

INTRODUCTION TO SERIES 94

ABO Series 94 pneumatic piston actuators offer a top-quality double or single acting, quarter-turn, rack and pinion design. Excellent quality and careful selection of materials of construction ensure long-lasting service life and outstanding reliability, and sophisticated, proven detail design allows easy maintenance, simplicity of repairs and quick replacement of worn parts. The vast majority of components are made of high quality aluminum alloy, protected by hard anodized surface, which results in low weight of the actuators, while maintaining ultimate strength and safety of the structure as a whole. The most stressed part – the pinion – is made of high quality carbon steel which is nickel-plated to increase corrosion, abrasion and wear resistance. All parts are precisely machined, thus minimizing unwanted mechanism backlash and ensuring the effective force transfer without excessive wear. The Series 94 provides complete compatibility according to the latest industry standards for direct connection to valve top flanges (ISO 5211) and for attachment of solenoid valves of solenoid valves, positioners, limit switch boxes and other accessories (NAMUR VDI/VDE 3845).

GENERAL CHARACTERISTICS

- Rack and pinion quarter-turn actuators
- Double and Single acting
- Wide inlet pressure range (2 -8 bar)
- Wide torque range (4 -13024 Nm)
- Highest quality materials
- Compact and lightweight
- Precision mechanism without backlash
- Design according to ISO 5211 and NAMUR VDI/VDE 3845 standards
- Easy maintenance and repairs

APPLICATIONS

Pneumatic actuators Series 94 are suitable for many applications where reliable valve operation is required, such as:

- Industrial Processing
- Power Generation
- Refineries
- Oil and Gas Processing
- Steel and Mining
- Chemical and Petrochemical Industry
- Food and Beverage
- Water and Wastewater
- Slurry Handling
- Pulp and Paper
- Dry Bulk Conveying
- Heating, Ventilation and Air Conditioning

OPERATING CONDITIONS

TORQUE RANGE

- 4–13024 Nm

OPERATING MEDIA

- Dry or lubricated air or inert gases. Maximal allowable particle size must not exceed 30 µm.

AIR SUPPLY PRESSURE

- Minimum required supply pressure: 2 bar (2,5 bar for single acting actuators)
- Maximum permissible supply pressure: 8 bar

OPERATING TEMPERATURE RANGE

- NBR O-ring: -20 °C to 80 °C
- Silicone (MVQ) O-ring: -35 °C to 80 °C
- Viton (FPM) O-ring: -15 °C to 150 °C

TRAVEL STOP ADJUSTMENT

- Sensitive adjustment of end positions by two bolts (±5° at each end position)

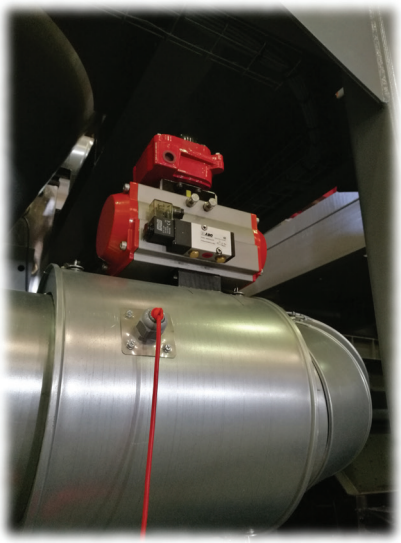
DETERMINATION OF USE

- Indoor and outdoor

STANDARDS

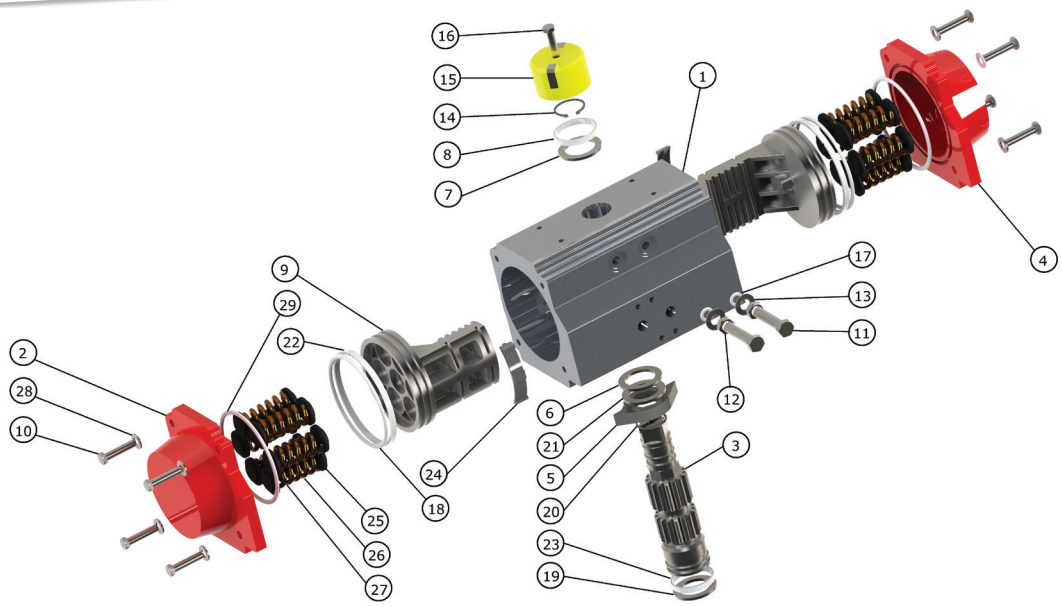
- Connection to valve top flange: ISO 5211
- Attachement of solenoid valves and other accessories: NAMUR VDI/VDE 3845

Series 94 – use in Industrial Production



Series 94 – use in HVAC Application

MATERIALS

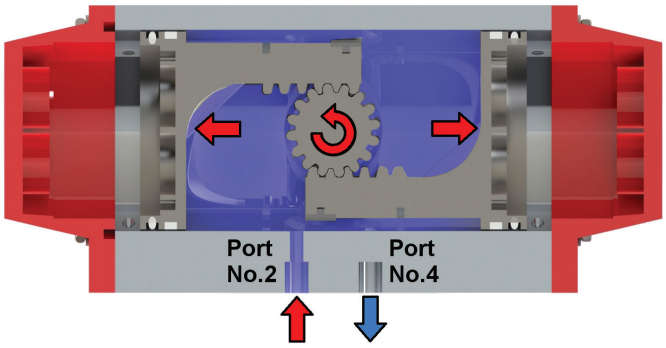


Item No.	Part description	Material	Quantity
1	Body	Aluminum alloy (anodized)	1
2	Left end cap	Aluminum alloy	1
3	Pinion	Carbon steel (nickel plated)	1
4	Right end cap	Aluminum alloy	1
5	Octi-CAM	Carbon steel	1
6	Thrust bearing	POM + PTFE	1
7	Thrust bearing	POM + PTFE	1
8	Thrust washer	Stainless steel	1
9	Piston	Aluminum alloy (anodized)	2
10	End cap screw	Stainless steel	8
11	Mechanical stop screw	Stainless steel	2
12	Nut (stop screw)	Stainless steel	2
13	Washer	Stainless steel	2
14	Circlip	Spring steel	1
15	Position indicator	High grade polymers	1
16	Indicator screw	High grade polymers	1
17	O-ring (stop screw)	NBR/FPM/Silicone	2
18	O-ring (piston)	NBR/FPM/Silicone	2
19	O-ring (pinion bottom)	NBR/FPM/Silicone	1
20	O-ring (pinion top)	NBR/FPM/Silicone	1
21	Bearing (pinion top)	POM + PTFE	1
22	Bearing (piston)	POM + PTFE	1
23	Bearing (pinion bottom)	POM + PTFE	1
24	Piston guide	POM + PTFE	2
25	Spring seat	High grade polymers	8–24
26	Spring	Spring steel	4–12
27	Rod	Copper pipe	4–12
28	Plug	NBR/FPM/Silicone	2
29	O-ring (end cap)	NBR/FPM/Silicone	2

OPERATION

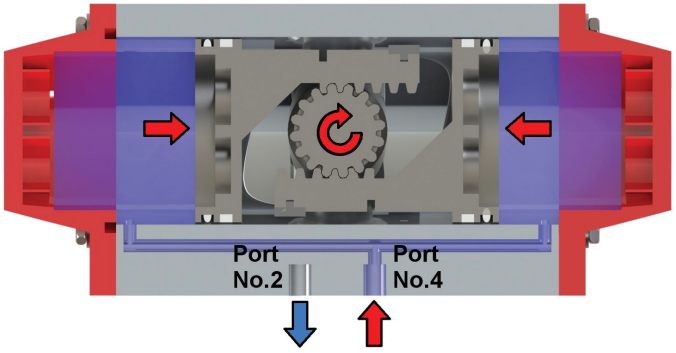
DOUBLE ACTING FUNCTION TOP VIEW (STANDARD ROTATION):

Standard rotation – CCW to OPEN



Pressurized air supplied to port No. 2 forces the pistons apart towards the actuator end caps. The air on the other side of the piston is pushed out from port No. 4. Rotation in counter-clockwise direction is achieved.

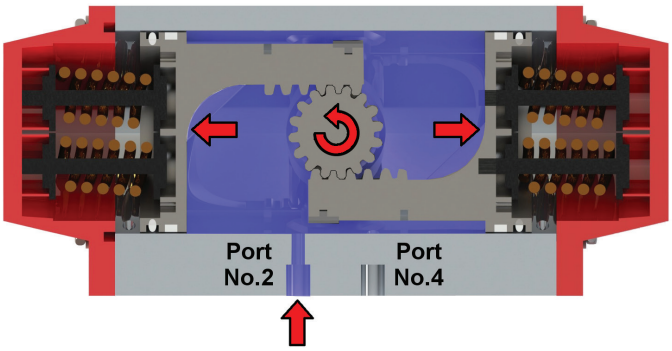
Standard rotation - CW to CLOSE



Pressurized air supplied to port No. 4 forces the pistons towards each other. The air between the pistons is pushed out from port No. 2. Rotation in clockwise direction is achieved.

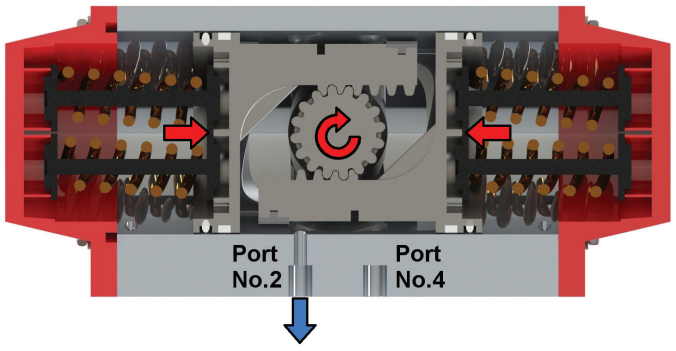
SINGLE ACTING FUNCTION TOP VIEW (STANDARD ROTATION):

Standard rotation – CCW to OPEN



Pressurized air supplied to port No. 2 forces the pistons apart towards the actuator end caps, compressing the springs. The air on the other side of the piston is pushed out from port No. 4. Rotation in counter-clockwise direction is achieved.

Standard rotation - CW to CLOSE

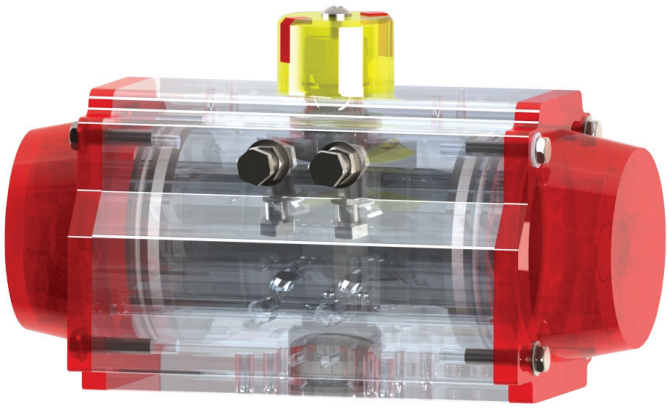


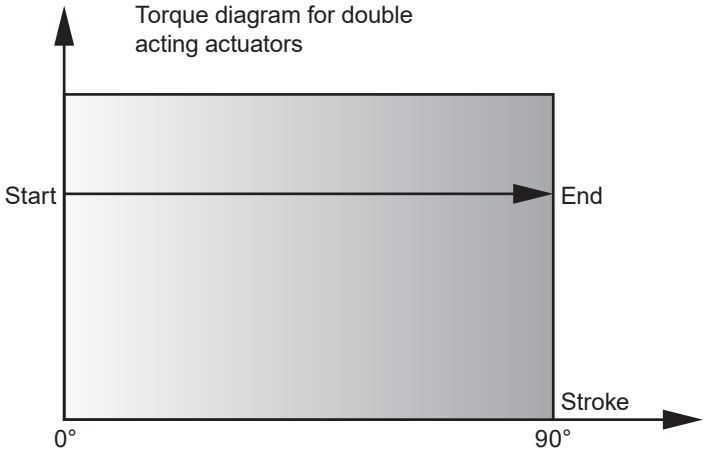
In the event of loss of air pressure between pistons (power or air failure), due to their potential energy the springs return the actuator back to its closed state. The air between pistons is pushed out from port No. 2. Rotation in clockwise direction is achieved.

DIRECTION OF ROTATION

Pneumatic piston actuators are by default supplied in the counter-clockwise (CCW) rotation version to open, clockwise rotation (CW) to close. Opening movement is achieved by pressurizing port No. 2 and closing is provided by pressurizing port No. 4 (double acting). On request, it is possible to supply pneumatic actuators with opposite direction of rotation than default setup.

DOUBLE ACTING ACTUATOR TORQUE RATINGS





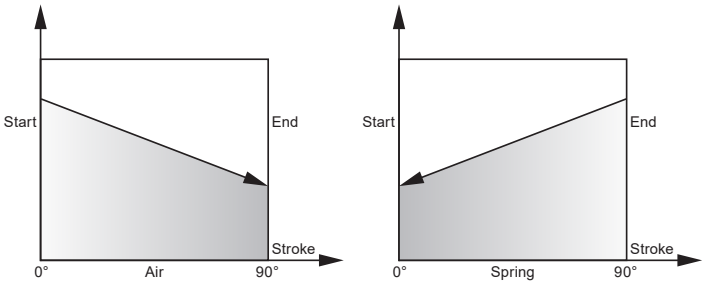
DOUBLE ACTING TORQUE RATINGS (NM)

Model	Supply pressure									
	2 bar	2,5 bar	3 bar	4 bar	4,5 bar	5 bar	5,5 bar	6 bar	7 bar	8 bar
AC052D	8	10	12	16	18	20	22	24	28	32
AC063D	15	18	22	29	33	36	40	44	51	58
AC075D	20	25	30	40	45	50	55	60	70	80
AC083D	31	39	47	63	70	78	86	94	110	125
AC092D	45	56	68	90	102	113	124	135	158	181
AC105D	66	83	99	132	149	165	182	198	231	264
AC125D	100	125	150	200	226	251	276	301	351	401
AC140D	171	214	256	342	385	427	470	513	598	684
AC160D	266	332	399	532	598	665	731	798	931	1064
AC190D	426	532	638	851	958	1064	1170	1277	1490	1702
AC210D	532	665	798	1064	1197	1330	1463	1596	1862	2128
AC240D	769	962	1154	1539	1731	1924	2116	2308	2693	3078
AC270D	1170	1462	1754	2339	2632	2924	3216	3509	4094	4679
AC300D	1526	1908	2289	3052	3434	3815	4197	4578	5341	6104
AC350D	2285	2856	3427	4570	5141	5712	6283	6854	7997	9139
AC400D	3256	4070	4884	6512	7326	8140	8954	9768	11396	13024

Torques mentioned in Nm

SINGLE ACTING ACTUATOR TORQUE RATINGS

Torque diagrams for single acting actuators



SINGLE ACTING TORQUE RATINGS (NM)

Supply Pressure		2,5 bar		3 bar		4 bar		5 bar		6 bar		7 bar		8 bar		Spring Return	
Model	Spring Qty.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
AC052	6	4,6	2,5	6,9	4,5	10,9	8,5									7,4	5
	8			5,2	2	9,2	6	13,2	9,1	17,2	14,1					9,9	6,7
	10					7,4	3,6	11,5	6,7	15,5	11,6	19,5	15,6			12,4	8,5
	12							9,7	4,2	13,8	9,1	17,8	12,2	21,8	17,1	14,8	10,2
AC063	6	10,1	5,7	13,6	9,3	20,9	16,6	28,3	23,9							12,5	8,2
	8			10,9	5,1	18,2	12,4	25,5	19,8	32,8	27	40,1	34,3			16,7	10,9
	10					1,4	8,2	22,8	15,6	30	22,8	37,3	30,1	44,7	37,4	20,9	13,7
	12							20	11,4	27,3	18,6	34,6	25,9	41,9	33,3	25	16,4
AC075	6	12,4	7,6	17,3	12,6	27,4	22,7	37,5	32,8							17,4	12,7
	8			13,1	6,8	23,1	16,9	33,3	27	43,2	37	53,3	47			23,2	16,9
	10					19	11,1	28,8	21,2	39	31,2	49,1	41,2	59,1	51,2	29	21,1
	12							24,9	15,4	34,9	25,4	44,9	35,4	54,9	45,4	34,7	25,3
AC083	6	20,1	11,5	28	19,3	43,7	35,1	59,4	50,7							27,6	19
	8			21,7	10,1	37,4	25,8	53,1	41,5	68,8	57,2	84,5	72,9			36,8	25,3
	10					31	16,6	46,7	32,3	62,4	48	78,1	63,7	93,8	79,3	46	31,6
	12							40,4	23,2	56,1	38,9	71,7	54,5	87,4	70,2	55,2	38
AC092	6	28,4	15,2	39,6	26,4	62,2	49	84,8	71,6							41,2	28
	8			31,3	12,6	52,9	35,2	75,5	57,9	98,1	80,5	120,7	103			55	37,3
	10					43,6	21,5	66,2	44,1	88,8	66,7	111,3	89,2	134	111,8	68,7	46,7
	12							56,8	30,4	79,4	53	101,9	75,5	124,5	98,1	82,5	56
AC105	6	44,7	23,5	61,1	40	94,2	73,2	127,3	106,2							59,1	38
	8			48,5	20,4	81,6	53,5	114,7	86,5	147,7	119,6	180,8	152,7			78,7	50,6
	10					68,9	33,4	102	66,5	135,1	99,6	168,2	132,6	201,2	165,7	98,4	63,3
	12							89,4	47,5	122,5	80,6	155,5	113,6	188,6	146,7	118,1	75,9
AC125	6	63	31	88	56	138	107	188	157							94	63
	8			67	25	117	75	167	125	217	176	268	226			125	84
	10					96	44	146	94	196	144	247	194	297	245	157	105
	12							125	63	176	113	226	163	276	213	188	125

Torques mentioned in Nm

SINGLE ACTING ACTUATOR TORQUE RATINGS

SINGLE ACTING TORQUE RATINGS (NM)

Supply Pressure		2,5 bar		3 bar		4 bar		5 bar		6 bar		7 bar		8 bar		Spring Return	
Model	Spring Qty.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
AC140	6	111	59	154	102	239	187	325	273							155	103
	8			120	50	205	136	291	221	376	307	462	392			206	137
	10					170	84	256	169	341	255	427	340	512	426	258	172
	12							221	118	307	203	392	289	478	374	310	206
AC160	6	165	83	232	149	365	282	498	415							250	168
	8			176	66	309	199	442	237	575	465	708	598			333	223
	10					253	115	386	248	519	381	652	514	485	647	417	279
	12							330	165	463	298	596	431	729	564	500	335
AC190	6	292	161	398	267	611	480	824	693							371	240
	8			318	143	531	356	744	569	957	782	1169	995			495	320
	10					451	233	664	446	877	658	1090	871	1302	1084	618	400
	12							584	322	797	535	1010	748	1223	960	742	480
AC210	6	335	209	468	342	734	608	1000	874							456	330
	8			358	190	624	456	890	722	1156	988	1422	1254			608	440
	10					514	304	780	570	1046	836	1312	1102	1578	1368	760	550
	12							670	418	936	684	1202	950	1468	1216	912	660
AC240	6	470	297	662	489	1047	874	1432	1259							665	492
	8			498	268	883	653	1267	1037	1652	1422	2037	1807			886	656
	10					718	431	1103	816	1488	1201	1872	1586	2257	1970	1108	821
	12							939	594	1323	979	1708	1363	2093	1748	1330	985
AC270	6	790	519	1083	811	1667	1396	2252	1981							943	672
	8			860	497	1444	1081	2029	1666	2614	2252	3199	2836			1258	895
	10					1220	767	1805	1352	2390	1937	2974	2521	3560	3107	1572	1119
	12							1582	1037	2167	1623	2751	2207	3336	2792	1887	1342
AC300	6	935	494	1316	875											1273	876
	8			991	403	1754	1166	2517	1929							1697	1168
	10					1430	695	2193	1458	2956	2221	3719	2984	4482	3747	2122	1460
	12							1868	986	2631	1749	3394	2512	4157	3275	2546	1752
AC350	6	1292	586	1863	1157											2043	1408
	8			1341	401	2484	1544	3626	2686							2724	1877
	10					1963	787	3105	1929	4247	3071	5390	4214	6532	5356	3405	2346
	12							2584	1172	3726	2314	4869	3457	6011	4599	4086	2816
AC400	8	1736	411	2550	1225											3292	2100
	10			1967	311	3595	1939	5223	3567							4115	2624
	12					3012	1025	4640	2653	6268	4281	7895	5908	9523	7536	4938	3149
	14							4057	1738	5685	3366	7312	4993	8940	6621	5761	3674
	16									5101	2452	6728	4079	8356	5707	6584	4199

Torques mentioned in Nm

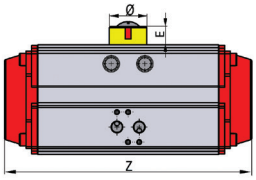
METRIC DIMENSIONS

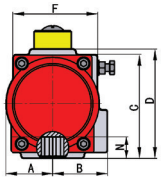
FRONT VIEW

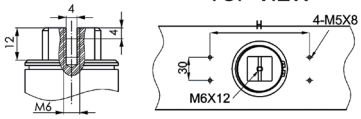
SIDE VIEW

TOP VIEW

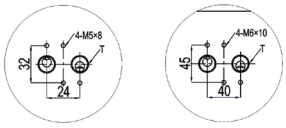
AC052-AC160







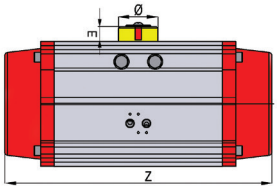
AIR CONNECTION

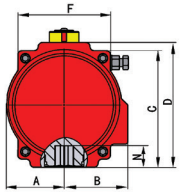


NAMUR G¼"
(AC052-AC240)

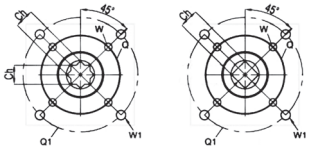
NAMUR G¼"
(AC240-AC400)

AC190-AC350

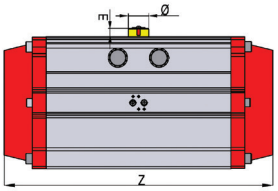


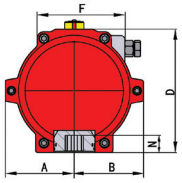


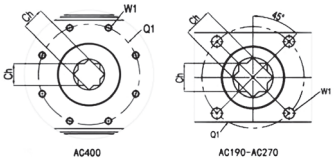
BOTTOM



AC400







ATTENTION:

AC052 – suitable mostly for controlling ABO ball valves (not suitable for ABO butterfly valves)
AC063 and AC075 – a square diagonally bore is recomended in combination with ABO butterfly valves

Model	A	B	C	D	E	F	H	FLANGE CODE	Q	Q1	W	W1	Ch	N	Z	Ø	T	WEIGHT	
																		Double	Single
AC052	30	41,5	65,5	72	20	65	80	F03/05	Ø36	Ø50	M5x8	M6x10	11	14	147	Ø40	NAMUR G¼"	1,4	1,5
AC063*	36	47	81	87,5	20	72	80	F05/07	Ø50	Ø70	M6x10	M8x13	14	18	168	Ø40	NAMUR G¼"	2	2,1
AC075*	42	53	94	99,5	20	81	80	F05/07	Ø50	Ø70	M6x10	M8x13	14	18	184	Ø40	NAMUR G¼"	2,7	2,9
AC083	46	57	98,5	108,7	20	92	80	F05/07	Ø50	Ø70	M6x10	M8x13	17	21	204	Ø40	NAMUR G¼"	3,1	3,6
AC092	50	58,5	111	116,5	20	98	80	F05/07	Ø50	Ø70	M6x10	M8x13	17	21	262	Ø40	NAMUR G¼"	4,6	5,2
AC105	57,5	64	122,5	133	20	109,5	80	F07/10	Ø70	Ø102	M8x13	M10x16	22	26	268	Ø40	NAMUR G¼"	6,8	6,9
AC125	67,5	74,5	145,5	155	30	127,5	80	F07/10	Ø70	Ø102	M8x13	M10x16	22	26	301	Ø55	NAMUR G¼"	8,9	10,1
AC140	75	77	161	172	30	137,5	80	F10/12	Ø102	Ø125	M10x16	M12x20	27	31	390	Ø55	NAMUR G¼"	13	15
AC160	87	87	184	197	30	158	80	F10/12	Ø102	Ø125	M10x16	M12x20	27	31	458	Ø55	NAMUR G¼"	20	24
AC190	104,5	112	213	232	30	186	130	F14	-	Ø140	-	M16x25	36	40	525	Ø80	NAMUR G¼"	31	35
AC210	116	122	235,5	255	30	210	130	F14	-	Ø140	-	M16x25	36	40	532	Ø80	NAMUR G¼"	47	55
AC240	131	131	266	292	30	230	130	F16	-	Ø165	-	M20x25	46	50	602	Ø80	NAMUR G¼"	67	80
AC270	147	147	301,5	331	30	252	130	F16	-	Ø165	-	M20x25	46	50	722	Ø80	NAMUR G½"	97	118
AC300	162	162	330	354	30	290	130	F16/21	Ø165	Ø215	M20x25	M20x25	46	50	742	Ø80	NAMUR G½"	110	130
AC350	190	195	383	410	30	336	130	F16/21	Ø165	Ø215	M20x25	M20x25	46	50	860	Ø80	NAMUR G½"	186	234
AC400	260	260	-	466	30	330	130	F16/25	Ø165	Ø254	M20x25	8-M16x25	55	60	924	Ø80	NAMUR G½"	289	360

*A square diagonally bore recomended in combination with ABO butterfly valves
Dimensions mentioned in mm, weight in kg.

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