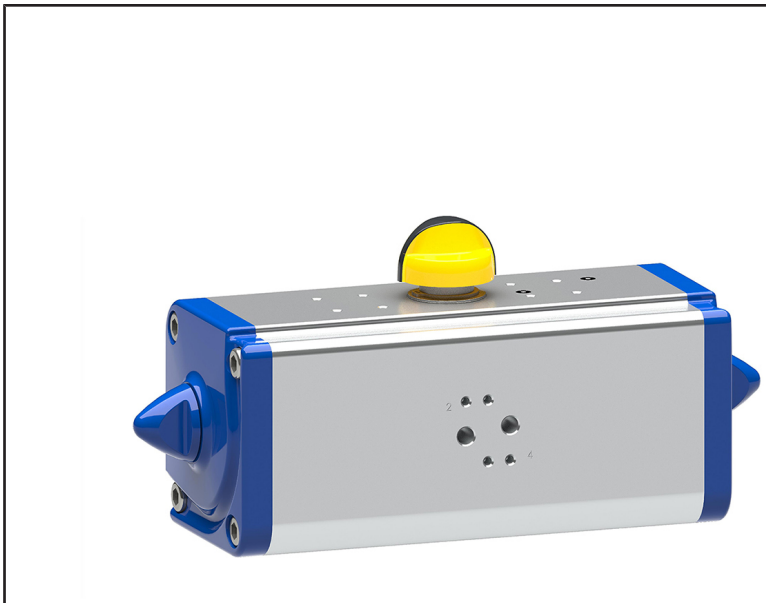
Pneumatic Actuator

ACTAIR EVO

Type Series Booklet



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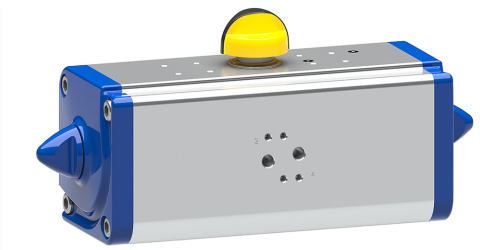
Type Series Booklet ACTAIR EVO

Contents

Pneumatic Actuators

Double-acting Pneumatic Quarter-turn Actuators

ACTAIR EVO



Main applications

- Water
- Waste water
- Energy
- Industry
- Shipbuilding
- Oil and gas

Operating data

Table 1: Operating properties

Characteristic	Value
Min. permissible pressure [bar]	3
Max. permissible pressure [bar]	8
Min. permissible temperature [°C]	≥ -50
Max. permissible temperature [°C]	≤ +150
Output torque [Nm]	≤ 8000
Enclosure	IP68 30 metres of water 169 hours

Design details

- Double-acting pneumatic actuators of the ACTAIR EVO type series are designed for actuating all types of quarter-turn valves (butterfly valves, ball valves). In conjunction with a control unit of the AMTROBOX, AMTRONIC U or SMARTRONIC U type series, they offer all the control and monitoring functions required by modern process control systems.
- This pneumatic actuator with scotch yoke mechanism delivers a variable torque, with peak torque at valve closure.
- The translatory movement of the pistons caused by the control air pressure or springs results in a clockwise quarter turn of the pinion and, consequently, of the valve shaft, causing the valve to close.
- Operated using compressed air to ISO 8573-1. Other gases on request.
- Pneumatic interface to NAMUR
- VDI/VDE 3845 interface for connecting control units
- Actuator/valve interface to ISO 5211 with bi-square
- Mounts directly on the top flange of quarter-turn valves (or via adapter, depending on the configuration).
- Standard actuator features include:
  - Position indicator
  - Adjustable mechanical travel stops:

    - Closed position: -1° to +9° for ACTAIR EVO 1 to 160

    - Closed and open position: -5° to + 5° for ACTAIR EVO 240 to 700
- The actuators are lubricated with silicone-free grease at the factory.
- Gear housing made of light metal alloy, anodised, thickness: 20 µm
- Middle gear housing section made of light metal alloy, hard anodised, thickness 20 µm for ACTAIR EVO 240 to 700
- End caps made of light metal alloy with polyurethane coating, thickness: 150 µm, colour: blue RAL 5002 for all ACTAIR EVO and EVOE sizes.
- Versions available:
  - Standard: -20 °C to +80 °C
  - Low-temperature version (-50 °C to +60 °C), optional
  - High-temperature version (-20 °C to +150 °C), optional

Variants

- Open / closed position signalling by AMTROBOX and all limit switch boxes with a VDI/VDE interface
- Position indication and compressed air control by AMTRONIC U
- Positioning by SMARTRONIC U
- Integral manual override – ACTAIR EVOE type series:
  - Max. torque: 4000 Nm
  - Scotch yoke mechanism
- Declutchable emergency manual override:
  - IP66 and IP68 rated enclosures (1 metre, 72 hours)
  - Epoxy coating, thickness: 90 µm + polyurethane coating, thickness: 60 µm, colour: blue RAL 5002
  - Temperature range: -20 °C to +120 °C
- ATEX-compliant model: ATEX-compliant design for installation in zones 1 and 21

Product benefits

- Actuator for all types of quarter-turn valves (butterfly valves, ball/plug valves)
- Position indicator and one or several adjustable travel stops

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- Unlike rack-and-pinion kinematics, the actuator's scotch yoke mechanism delivers peak torque at both valve opening and closure.
  - Reduced dimensions and actuating times
  - Reduced weight
  - Reduced control air consumption
  - Higher durability of piston seal rings
  - Versions with integral manual override
  - Actuator designed to require no lubricants, for long service life

Product information

Product information as per Regulation No. 1907/2006 (REACH)

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see https://www.ksb.com/en-global/company/corporate-responsibility/reach.

Product information as per Directive 2014/34/EU (ATEX)

As per Directive 2014/34/EU (ATEX):
- II 2G Ex h IIC T6...T3 Gb X
- II 2D Ex h IIIC T 85 °C...T 175 °C Gb X

Related documents

Table 2: Information/documents

Document	Reference number
DYNACTAIR EVO type series booklet	8519.53
EMO type series booklet	5360.1
AMTROBOX type series booklet	8525.1
AMTRONIC U type series booklet	8514.839
SMARTRONIC U AS-i type series booklet	8520.809
SMARTRONIC U MA type series booklet	8520.807
SMARTRONIC U PC type series booklet	8520.808
ACTAIR EVO / DYNACTAIR EVO operating manual	8513.84
ACTAIR EVO / DYNACTAIR EVO operating manual	8513.85
ACTAIR EVOE / DYNACTAIR EVOE operating manual	8513.86

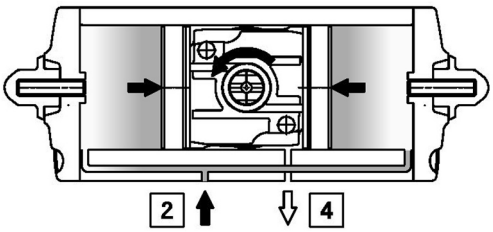
Technical data

Function

The scotch yoke mechanism develops a variable torque that is ideally suited for actuating quarter-turn valves.

Open position

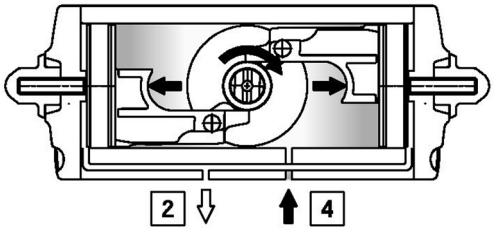
Port 2 communicates with both the left-hand and the right-hand cylinder chamber. When control air is supplied to port 2, the shaft of the double-acting pneumatic actuator rotates in anti-clockwise direction, causing the valve to open.



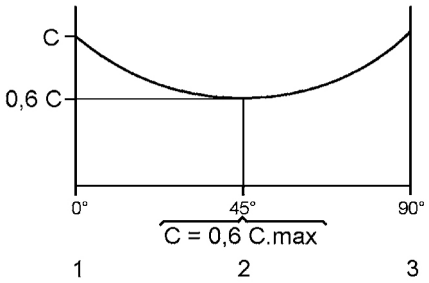
Top view

Closed position

Port 4 communicates with the intermediate chamber. When control pressure is supplied, the shaft of the double-acting pneumatic actuator rotates in clockwise direction, causing the valve to close.



Top view



C:	Output torque
0° to 90°:	Angle of rotation
0°:	Closed
90°:	Open

Curve of scotch yoke mechanism

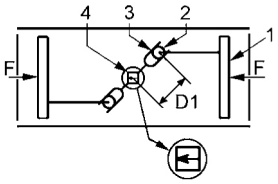


Fig. 1 – Closed
Output torque C = F x D1
(for F constant)

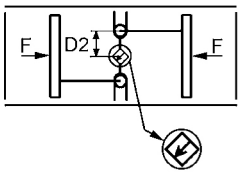


Fig. 2 – 45°
Output torque C = F x D2
(for F constant)

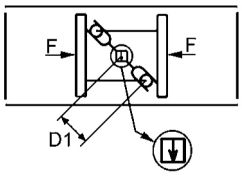


Fig. 3 – Open
Output torque C = F x D1
(for F constant)

The movement is transmitted via the pistons **1**, the rollers **2**, the yoke **3** and the shaft **4**. The translatory movement of the pistons **1** caused by the control pressure results in a sliding movement of the rollers **2** in the grooves of the yoke **3** . The yoke **3** then rotates the shaft **4** together with the valve shaft.

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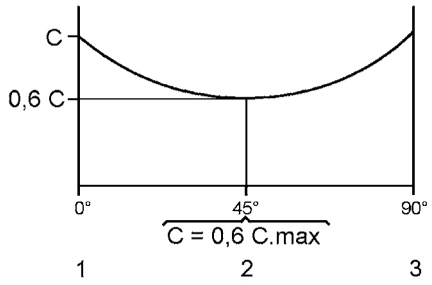
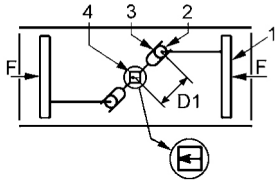
Force transmission curve

Curve of scotch yoke mechanism



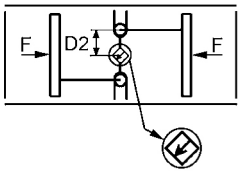
C:	Output torque
0° to 90°:	Angle of rotation
0°:	Closed
90°:	Open

Fig. 1 – Closed



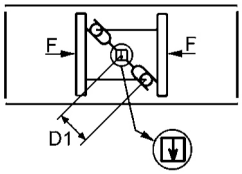
Output torque C = F x D1 for F constant

Fig. 2 – 45°



Output torque C = F x D2 for F constant

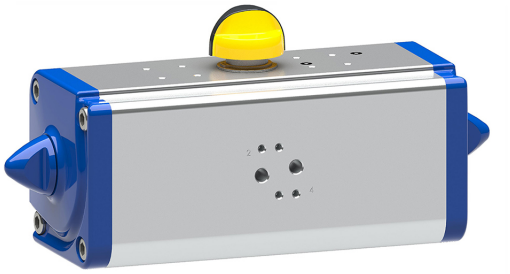
Fig. 3 – Open



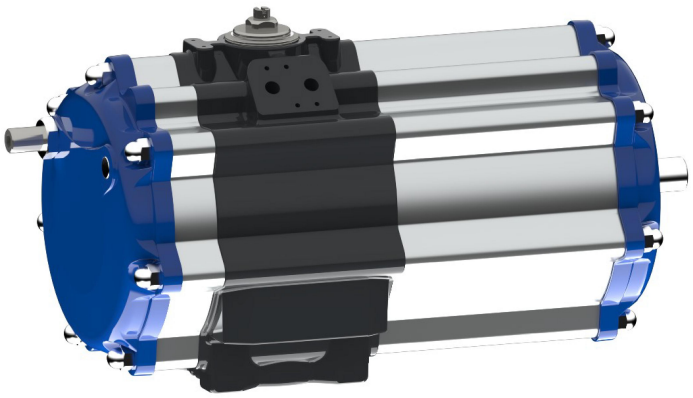
Output torque C = F x D1 for F constant

The movement is transmitted via the pistons **1**, the rollers **2**, the yoke **3** and the shaft **4**. The translatory movement of the pistons **1,** caused by the control pressure results in a sliding movement of the rollers **2** in the grooves of the yoke **3** . The yoke **3** then rotates the shaft **4** together with the valve shaft.

Type series



1 - 160



240 - 700

Fig. 1: 3D representation of ACTAIR EVO types 1 - 160 and 240 - 700

Table 3: Dimensions [mm]

Type	Actuator/valve interface to ISO 5211	Shaft end dimensions [mm]	
		Depth	Bi-square
1	F03	13,2	T11
	F04	13,2	T11
2	F03/F05	13,2	T11
5	F05/F07	16,5	T14
10	F05/F07	19,3	T17
15	F07/F10	24,8	T22
20	F07/F10	24,8	T22
30	F07/F10	24,3	T22
40	F10/F12	29,5	T27
60	F10/F12	29,5	T27
80	F10/F12	38,5	T36
	F14	38,5	T36
120	F12	38,5	T36
	F14	38,5	T36
160	F14	48,5	T46
	F12/F16	48,5	T46
240	F16	48,5	T46
340	F16	48,5	T46
500	F25	58	T55
700	F25	58	T55

Output torques (in Nm)

The output torque generated by the actuator depends on the control fluid pressure.

The following tables specify the achievable torques as a function of the control pressure applied (8 bar on request).

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Table 4: Scotch yoke mechanism

Type	[1)][Nm]	Control pressure [bar]											
		3			4			5			6		
		0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
1	15	8,0	4,0	6,1	10,7	5,4	8,1	13,4	6,7	10,1	16,1	8,0	12,1
2	30	16,1	8,0	12,1	21,4	10,7	16,1	26,8	13,4	20,1	32,1	16,1	24,1
5	60	32,1	16,1	24,1	42,9	21,4	32,1	53,6	26,8	40,2	64,3	32,1	48,2
10	106	56,8	28,4	42,9	75,7	37,9	57,1	94,6	47,3	71,4	113,6	56,8	85,7
15	180	96,4	48,2	72,3	128,6	64,3	96,4	160,7	80,4	120,5	192,9	96,4	144,6
20	240	128,6	64,3	96,4	171,4	85,7	128,6	214,3	107,1	160,7	247,1	128,6	192,9
30	360	192,9	96,4	144,6	257,1	128,6	192,9	321,4	160,7	241,1	385,7	192,9	289,3
40	480	257,1	128,6	192,9	342,9	171,4	257,1	428,6	214,3	321,4	514,3	257,1	385,7
60	720	385,7	192,9	289,3	514,3	257,1	385,7	642,9	321,4	482,1	771,4	385,7	578,6
80	960	514,3	257,1	385,7	685,7	342,9	514,3	857,1	428,6	642,9	1028,6	514,3	771,4
120	1440	771,4	385,7	578,6	1028,6	514,3	771,4	1285,7	642,9	964,3	1542,9	771,4	1157,1
160	1920	1028,6	514,3	771,4	1371,4	685,7	1028,6	1714,3	857,1	1285,7	2057,1	1028,6	1542,9
240	2880	1542,9	771,4	1157,1	2057,1	1028,6	1542,9	2571,4	1295,7	1928,6	3085,7	1542,9	2314,3
340	3840	2057,1	1028,6	1542,9	2742,9	1371,4	2057,1	3428,6	1714,3	2571,4	4114,3	2057,1	3085,7
500	5760	3085,7	1542,9	2314,3	4114,3	2057,1	3085,7	5142,9	2571,4	3857,1	6171,4	3085,7	4628,6
700	8000	4285,7	2142,9	3214,3	5714,3	2857,1	4285,7	7142,9	3571,4	5357,1	8571,4	4285,7	6428,6

Control fluid

Operating pressure	3 to 6 bar (44 to 87 psi)
Filtration	ISO 8573-1 Class 5 (< 40 µm)
Dew point	ISO 8573-1 Class 3 (< -20°C, and if temperature is 10 °C below ambient temperature)
Lubrication	ISO 8573-1 Class 5 (< 25 mg/m³)

Actuating time up to 5.5 bar: without valve

Table 5: Actuating time values

Type	Actuating time [+/-0.5 s]					
	5/2 directional control valve to NAMUR		AMTRONIC U A1300 / A1301		SMARTRONIC U A1310 / A1312 / A1313	
	0° to 90°	90° to 0°	0° to 90°	90° to 0°	0° to 90°	90° to 0°
1	On request					
2	0,08	0,08	1,0	1,0	1,0	1,0
5	0,1	00,9	1,0	1,0	1,0	1,0
10	0,12	0,13	1,0	1,0	1,0	1,0
15	0,2	0,21	1,2	1,2	1,5	1,5
20	0,28	0,25	1,7	1,7	2,0	2,0
30	0,38	0,36	2,0	2,0	2,7	2,7
40	0,46	0,4	2,6	2,6	3,9	3,9
60	0,64	0,59	3,0	3,0	4,5	4,5
80	0,81	0,73	4,5	4,5	6,3	6,3
120	1,36	1,21	6,5	6,5	7,5	7,5
160	1,59	1,44	8,5	8,5	9,5	9,5
240	1,77	1,41	16,5	16,5	17,0	17,0
340	2,09	1,68	18,0	18,0	18,0	18,0
500	3,12	2,52	28,5	28,5	28,5	28,5
700	3,91	3,4	37,5	37,5	37,5	37,5

1 Max. permissible output torque

Control air volume

Table 6: Control air values

Type	Control air volume [dm^3/cycle]
1	0,09
2	0,17
5	0,31
10	0,55
15	0,96
20	1,28
30	1,87
40	2,45
60	3,76
80	5,07
120	8,04
160	10,5
240	24,43
340	21,85
500	35,22
700	55,70

A cycle corresponds to one opening/closing process of the valve.

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Materials

Materials ACTAIR EVO 1 - 160

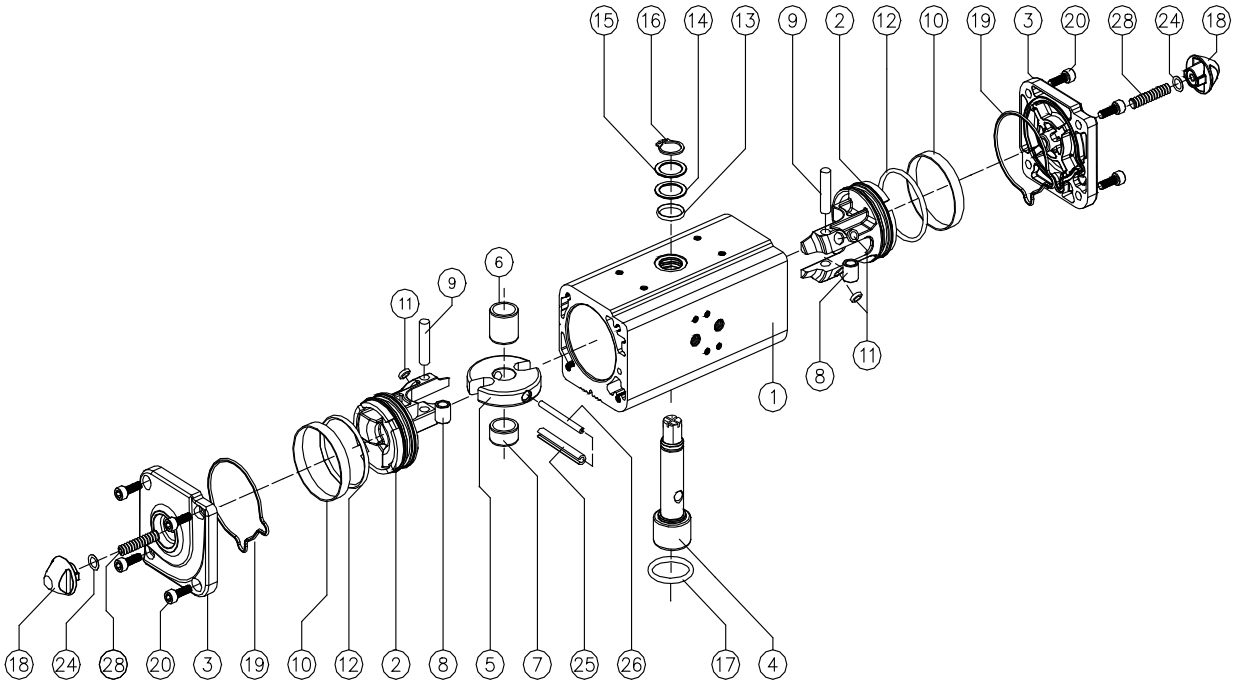

Fig. 2: Exploded view of type 1 - 160

Table 7: List of components ACTAIR EVO 1 - 160

Part No.		Description	Materials	Quantity
1		Cylinder	Light metal alloy, anodised	1
2		Piston	Light metal alloy	2
3		End cap	Light metal alloy	2
4		Shaft	Stainless steel AISI 303	1
5		Yoke	Steel	1
6		Bush	Light metal alloy	1
7		Guiding element	Acetal	2
8		Roller	Steel	2
9		Roller hinge pin	Steel	2
10	[2]	Dynamic piston seal ring	Reinforced PTFE	2
11	[2]	Sliding pad	Reinforced PTFE	4
12	[2][3][4]	Piston seal ring	Nitrile	2
13	[3][4]	O-ring	FKM	1
14		Seal retainer	Nitrile	1
15		Washer	Light metal alloy	1
16		Segment	Stainless steel	1
17	[3][4]	O-ring	FKM	1
18		Nut	Light metal alloy	2
19	[2]	End cap seal	Nitrile	2
20		Screw	Stainless steel	8
24	[2][3][4]	O-ring	Nitrile	2
25		Outer yoke pin	Steel	1
26		Inner yoke pin	Steel	1
27		Adjustable travel stop screw	Stainless steel 304	2

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2 Parts are included in the spare parts kit.
3 Low-temperature version (-50 °C to +120 °C): O-ring = fluorosilicone (FVMQ)
4 High-temperature version (-20 °C to +150 °C): O-ring = FKM

Materials ACTAIR EVO 240

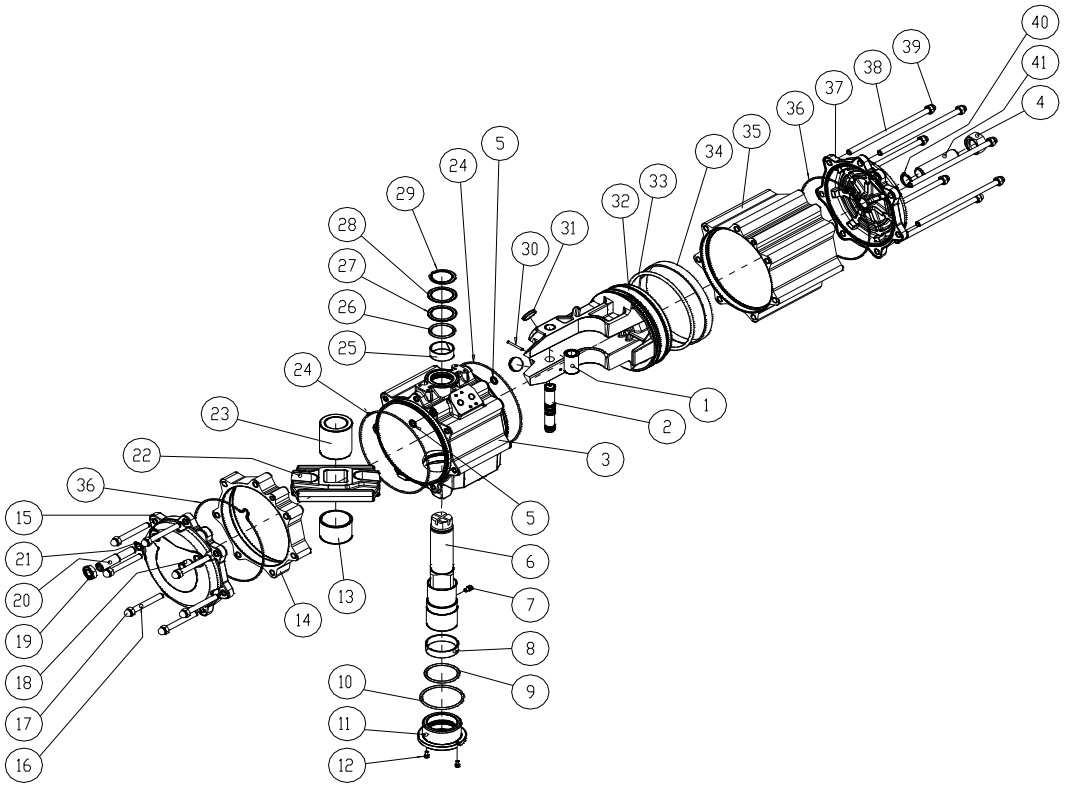

Fig. 3: Exploded view of type 240

Table 8: List of components ACTAIR EVO 240

Part No.		Description	Materials	Quantity
1		Ring	Steel	1
2		Pin	Steel	1
3		Housing	Light metal alloy, anodised	1
4		Nut	Stainless steel	1
5	5)6)7)	O-ring	Nitrile	2
6		Shaft	Steel	1
7		Screw	Steel	1
8	5)	Lower shaft bearing	Light metal alloy, anodised	1
9	5)6)7)	O-ring	FKM	1
10	5)6)7)	O-ring	FKM	1
11		Lower bearing bush	Light metal alloy, anodised	1
12		Screw	Steel	2
13		Shaft bearing	Acetal	1
14		Spacer ring	Light metal alloy, anodised	1
15		End cap	Light metal alloy, anodised	1
16		Tie bolt	Steel	7
17		End cap nut	Stainless steel	7
18		Grub screw	Stainless steel	1
19		Nut	Stainless steel	1
20		Grub screw	Stainless steel	1
21	5)6)7)	O-ring	Nitrile	1
22		Yoke	Steel	1
23		Shaft bearing	Acetal	1
24	5)6)7)	O-ring	Nitrile	2
25	5)	Upper shaft bearing	Acetal	1
26	5)6)7)	O-ring	FKM	1
27	5)	Fixed bearing	Acetal	1
28		Washer	Steel	1
29		Circlip	Steel	1
30		Spring-type straight pin	Steel	1
31	5)	Lower piston bearing	Acetal	2
32		Piston	Light metal alloy	1
33	5)6)7)	O-ring	Nitrile	1
34		Upper piston bearing	Acetal	1
35		Cylinder	Light metal alloy	1
36	5)6)7)	O-ring	Nitrile	2
37		End cap	Light metal alloy	1
38		Tie bolt	Steel	7
39		End cap nut	Stainless steel	7
40	5)6)7)	O-ring	Nitrile	1
41		Grub screw	Stainless steel	1

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5 Parts are included in the spare parts kit.
6 Low-temperature version (-50 °C to +120 °C): O-ring = fluorosilicone (FVMQ)
7 High-temperature version (-20 °C to +150 °C): O-ring = FKM

Materials ACTAIR EVO 340

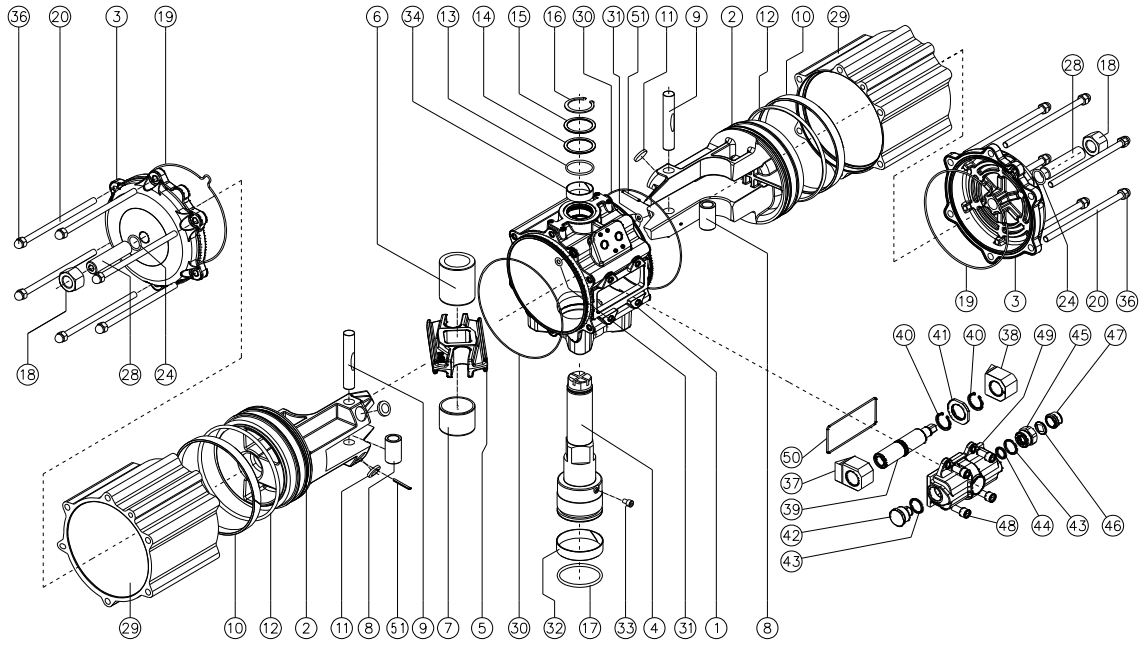

Fig. 4: Exploded view of type 340

Table 9: List of components ACTAIR EVO 340

Part No.		Description	Materials	Quantity
1		Cylinder	Light metal alloy, anodised	1
2		Piston	Light metal alloy	2
3		End cap	Light metal alloy, anodised	2
4		Shaft	Stainless steel	1
5		Yoke	Steel	1
6		Support bush	Acetal	1
7		Shaft sleeve	Acetal	1
8		Bush	Steel	2
9		Rotation ring	Steel	2
10	[8]	Dynamic piston seal ring	Acetal	2
11	[8]	Piston damper	Acetal	4
12	[8][9][10]	Piston seal ring	Nitrile	2
13	[8][9][10]	Joint ring for upper shaft	FKM	1
14	[8]	Outer support ring	Acetal	1
15		Washer	Stainless steel	1
16		Circlip	Stainless steel	1
17	[8][9][10]	O-ring for lower shaft	FKM	1
18		Nut	Stainless steel	2
19	[8][9][10]	Joint ring for end cap	Nitrile	2
20		End cap screw	Steel	12
24	[8][9][10]	O-ring	Nitrile	2
28		Adjustable travel stop screw	Stainless steel	2
29		Cylinder	Light metal alloy, anodised	2
30	[8][9][10]	O-ring for cylinder	Nitrile	2
31	[8][9][10]	O-ring	Nitrile	2
32	[8]	Lower support ring	Acetal	1
33		Safety screw	Stainless steel	1
34	[8]	Upper support ring	Acetal	1
36		End cap nut	Stainless steel	12
37		Spring-type straight pin	Steel	2

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8 Parts are included in the spare parts kit.
9 Low-temperature version (-50 °C to +120 °C): O-ring = fluorosilicone (FVMQ)
10 High-temperature version (-20 °C to +150 °C): O-ring = FKM

Materials ACTAIR EVO 500

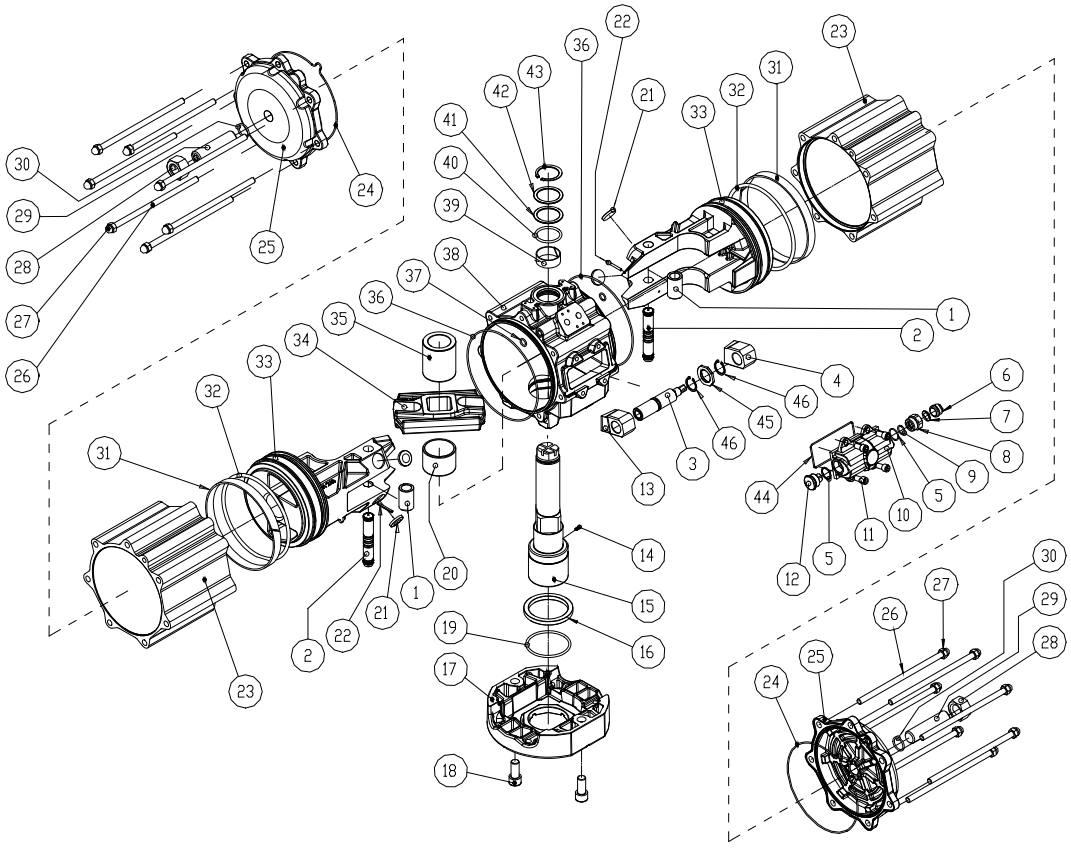

Fig. 5: Exploded view of type 500

Table 10: List of components ACTAIR EVO 500

Part No.		Description	Materials	Quantity
1		Ring	Steel	1
2		Pin	Steel	1
3		Adjusting screw	Steel	1
4		Locking device, left	Steel	1
5	11)12)13)	O-ring	Nitrile	2
6		Protective cover	Light metal alloy, anodised	1
7		Lock washer	Steel	1
8		Metal ring	Stainless steel	1
9	11)12)13)	O-ring	Nitrile	1
10		Gear housing	Light metal alloy, anodised	1
11		Screw	Steel	4
12		Metal ring	Stainless steel	1
13		Lock washer	Steel	1
14		Screw	Steel	1
15		Shaft	Steel	1
16	11)	Lower shaft bearing	Acetal	1
17		Connection flange	Light metal alloy, anodised	1
18		Screw	Steel	2
19	11)12)13)	O-ring	FKM	1
20		Shaft bearing	Acetal	1
21	11)	Lower piston bearing	Acetal	4
22		Spring-type straight pin	Steel	2
23		Cylinder	Light metal alloy, anodised	2
24	11)12)13)	O-ring	Nitrile	2
25		End cap	Light metal alloy, anodised	2
26		Tie bolt	Steel	14
27		End cap nut	Stainless steel	14
28		Nut	Stainless steel	2
29		Grub screw	Stainless steel	2
30	11)12)13)	O-ring	Nitrile	2
31	11)	Upper piston bearing	Acetal	2
32	11)12)13)	O-ring	Nitrile	2
33		Piston	Light metal alloy	2
34		Yoke	Steel	1
35		Shaft bearing	Acetal	1
36	11)12)13)	O-ring	Nitrile	2
37	11)12)13)	O-ring	Nitrile	2
38		Housing	Light metal alloy, anodised	1
39	11)	Upper shaft bearing	Acetal	1
40	11)12)13)	O-ring	FKM	1
41	11)	Fixed bearing	Acetal	1
42		Washer	Steel	1
43		Circlip	Steel	1
44	11)12)13)	Joint ring	Nitrile	1
45		Washer	Steel	1
46		Circlip	Steel	2

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11 Parts are included in the spare parts kit.
12 Low-temperature version (-50 °C to +120 °C): O-ring = fluorosilicone (FVMQ)
13 High-temperature version (-20 °C to +150 °C): O-ring = FKM

Materials ACTAIR EVO 700

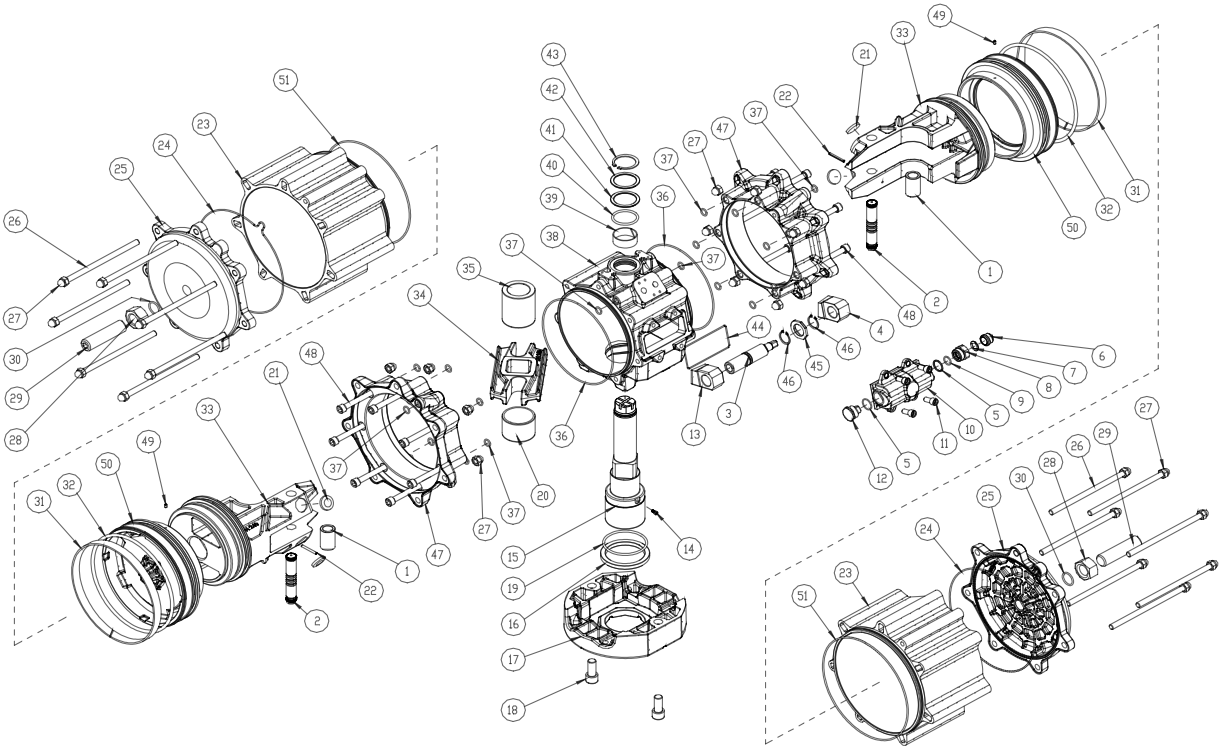


Fig. 6: Exploded view of type 700

Table 11: List of components ACTAIR EVO 700

Part No.		Description	Materials	Quantity
1		Ring	Steel	2
2		Pin	Steel	2
3		Adjusting screw	Steel	1
4		Locking device, left	Steel	1
5	14)15)16)	O-ring	Nitrile	2
6		Protective cover	Light metal alloy, anodised	1
7		Lock washer	Steel	1
8		Metal ring	Stainless steel	1
9	14)15)16)	O-ring	Nitrile	1
10		Gear housing	Light metal alloy, anodised	1
11		Screw	Steel	4
12		Metal ring	Stainless steel	1
13		Lock washer	Steel	1
14		Screw	Steel	1
15		Shaft	Steel	1
16	14)	Lower shaft bearing	Acetal	1
17		Connection flange	Light metal alloy, anodised	1
18		Screw	Steel	2
19	14)15)16)	O-ring	FKM	1
20		Shaft bearing	Acetal	1
21	14)	Lower piston bearing	Acetal	4
22		Spring-type straight pin	Steel	2
23		Cylinder	Light metal alloy, anodised	2
24	14)15)16)	O-ring	Nitrile	2
25		End cap	Light metal alloy, anodised	2
26		Tie bolt	Steel	14
27		End cap nut	Stainless steel	28
28		Nut	Stainless steel	2
29		Grub screw	Stainless steel	2
30	14)15)16)	O-ring	Nitrile	2
31	14)	Upper piston bearing	Acetal	2
32	14)15)16)	O-ring	Nitrile	2
33		Piston	Light metal alloy	2
34		Yoke	Steel	1
35		Shaft bearing	Acetal	1
36	14)15)16)	O-ring	Nitrile	2
37	14)15)16)	O-ring	Nitrile	18
38		Housing	Light metal alloy, anodised	1
39	14)	Upper shaft bearing	Acetal	1
40	14)15)16)	O-ring	FKM	1
41	14)	Fixed bearing	Acetal	1
42		Washer	Steel	1
43		Circlip	Steel	1
44	14)15)16)	Joint ring	Nitrile	1
45		Washer	Steel	1
46		Circlip	Steel	2
47		Flange	Light metal alloy, anodised	2
48		Screw	Steel	14
49		Grub screw	Steel	2
50		Flange	Light metal alloy	2
51	14)15)16)	O-ring	Nitrile	2

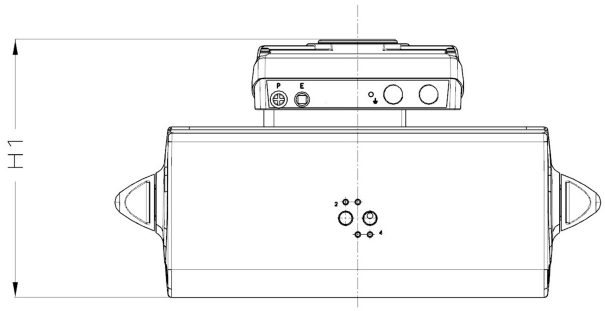
14 Parts are included in the spare parts kit.
15 Low-temperature version (-50 °C to +120 °C): O-ring = fluorosilicone (FVMQ)
16 High-temperature version (-20 °C to +150 °C): O-ring = FKM

Variants

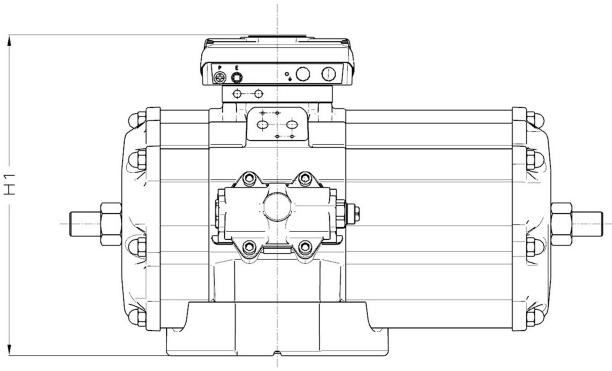
Open/closed position signalling function

AMTROBOX type series

This limit switch box provides open/closed position signalling via electrical microswitches or inductive proximity sensors (1 for Open and 1 for Closed, 1 for one intermediate position on request).



Type 1 - 160



Type 240 - 700

Table 12: Dimensions [mm] and weights [kg]

Type	H1	Weight
1	On request	
2	145,2	3,1
5	156,4	3,7
10	169,3	4,6
15	193,5	6,7
20	197,1	7,5
30	204	8,6
40	220,9	11,7
60	234	14,1
80	254	19,5
120	272	25,5
160	293,7	34,1
240	422	58,8
340	377	54,8
500	437	88,8
700	467	108,1

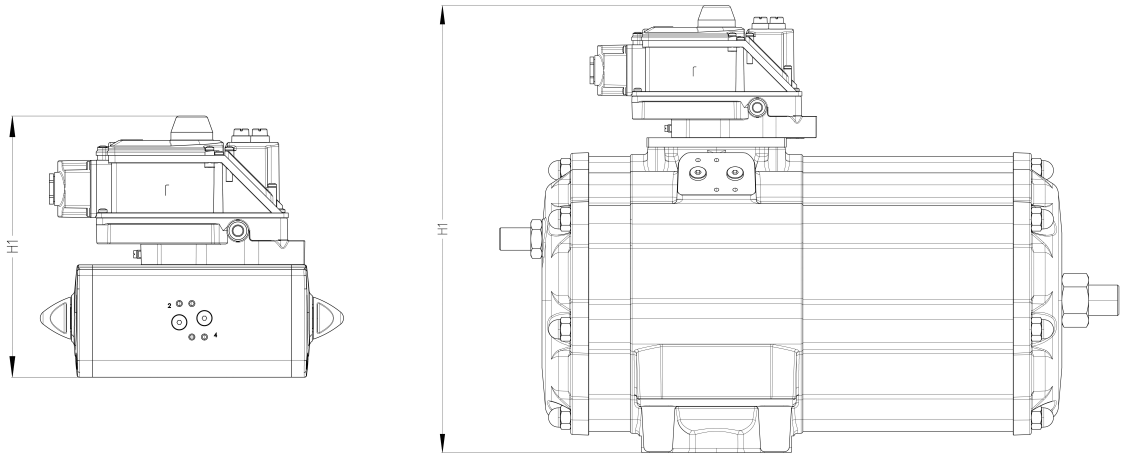
Control function

Control by AMTRONIC U control unit
Control unit functions:

- Control air supply via a monostable or bistable 4/2 or 4/3 directional control valve, power supply: alternating or direct current
- Setting of actuating times
- Open/closed position signalling (2 microswitches or inductive proximity sensors)

Options

- Proportional position signalling via 4-20 mA signal
- Field bus AS-i, Profibus DP



1- 160 240 - 700

Fig. 7: ACTAIR EVO 1 - 160 and 240 - 700

Table 13: Dimensions [mm] and weights [kg]

Type	H1	Weight
1	On request	
2	198,2	3,5
5	209,4	4,1
10	222,3	5,0
15	246,5	7,1
20	250,1	7,9
30	257	9,0
40	273,9	12,1
60	287	14,5
80	307	19,9
120	325	25,9
160	346,7	34,5
240	475	59,2
340	430	55,2
500	490	89,2
700	520	109,2

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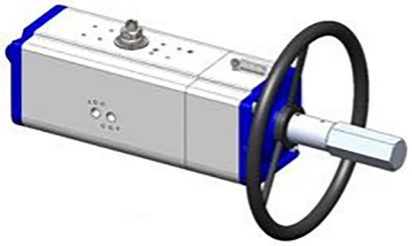
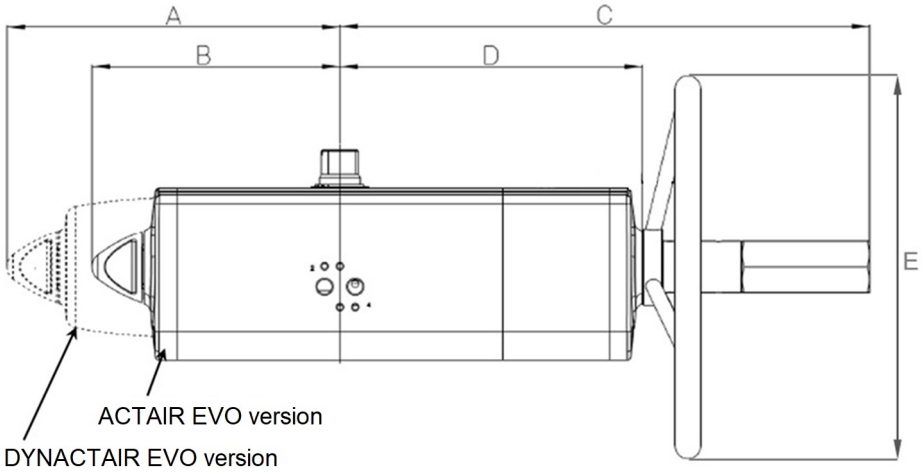
Integral manual override – ACTAIR EVOE type series



The design of this manual override is based on the ACTAIR EVO pneumatic actuator.
The integral manual override comprises a steel handwheel for manual actuation in emergencies.
No separate manual override is required, reducing both dimensions and weight.
The actuator can be locked in open or closed position.
Like EMO manual overrides, this manual override must not be operated unless the control air has been completely evacuated from the actuator.

Dimensions and weights



Type EVOE

Table 14: Dimensions [mm] and weights [kg]

Type NGV	B	C	D	E	Weight
5	99	263,3	137,6	180	2,8
10	118,5	279,6	154,8	180	4
15	144,9	338,7	183,5	220	6
20	156,8	354,3	199,1	220	8
30	169,6	398,4	220,8	300	10,2
40	193,8	414,2	236,4	300	13,2
60	216,6	504,5	282,3	350	17,8
80	239,7	518,8	297,1	350	23,8
120	283,5	637,1	365,6	400	33,6
160	300,4	653,7	382,9	400	43
340	353,3	890,2	537,5	575	75

EMO declutchable emergency manual override

An emergency manual override via declutchable manual gearbox with handwheel can be mounted between the valve and the actuator.

It overrides the pneumatic actuator and can be used in either clutched (engaged) or declutched (disengaged) position.

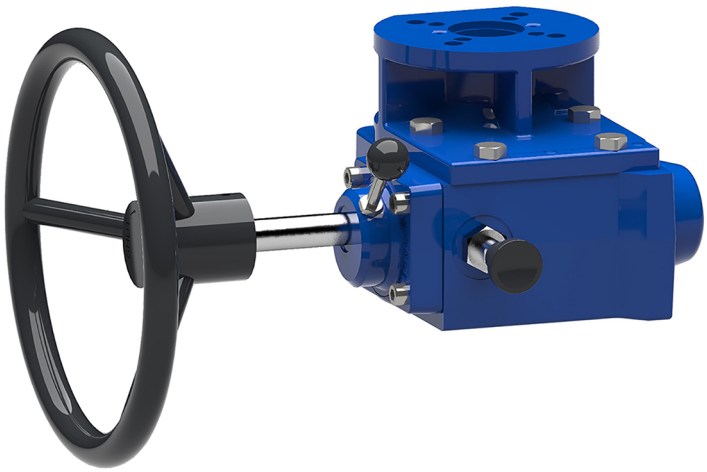
A worm reduction gearbox is used.

Please contact us.

The manual override must not be operated unless

- **the control air has been completely evacuated from the actuator and**
- **all pressure has been released from the actuator's internal chambers**

Do not engage the emergency manual override as long as the actuator is pressurised.

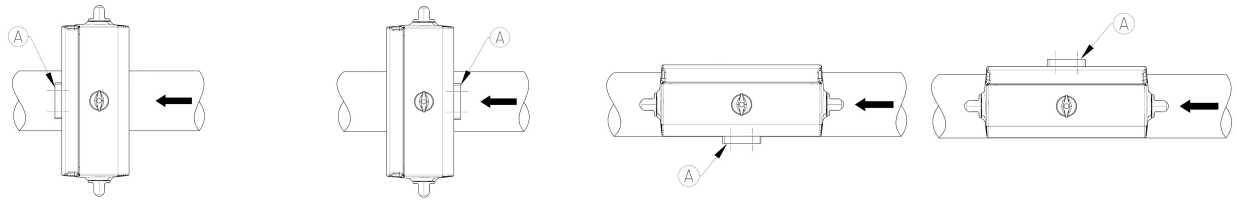


EMO declutchable manual override

Mounting the pneumatic actuators onto the valve

The actuator can be mounted onto the valve in 4 different positions, offset by 90°. Unless otherwise specified, the actuator is mounted onto the valve according to mounting option N, position 1.

Mounting option N **Mounting option M**



Position 1 Position 2 Position 1 Position 2

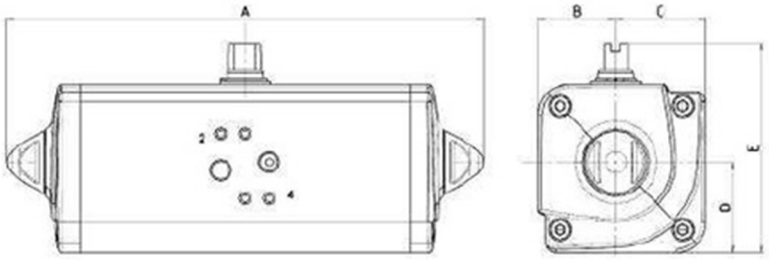
Flow direction of fluid handled The valve is shown in closed position.

A: pneumatic connection

The required mounting option must be specified in the purchase order. As the actuator's shaft end is designed with a bi-square, the mounting position can be easily changed by the customer at the site.

Dimensions and weights

Dimensions and weights of ACTAIR EVO 1 - 160

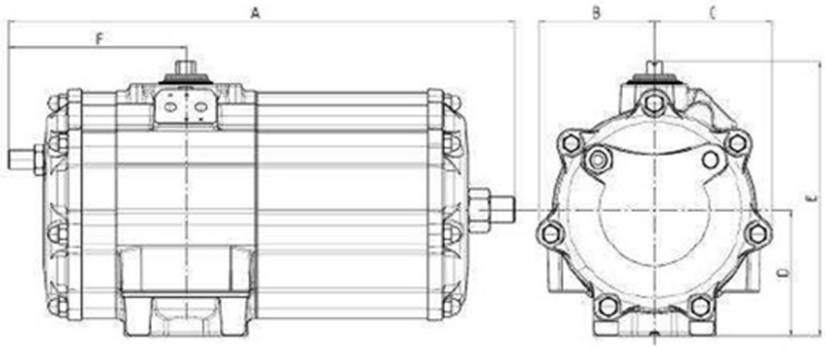


Type 1 - 160

Table 15: Dimensions [mm] and weights [kg]

Type	A	B	C	D	E	Weights
1	159	24,2	28	28	72,2	0,75
2	174,3	27,7	31,5	31,5	79,2	1,0
5	198,1	32,7	37,7	37,7	90,4	1,6
10	237,1	38,5	44,8	44,8	103,3	2,5
15	289,9	51,0	56,5	56,5	127,5	4,6
20	313,6	51,0	60,1	60,1	131,1	5,4
30	339,3	56,0	62,0	62,0	148,0	6,5
40	387,7	62,0	72,9	72,9	164,9	9,6
60	433,0	69,5	78,5	78,5	178,0	12,0
80	479,4	74,5	93,5	93,5	198,0	17,4
120	567,0	84,5	101,5	101,5	216,0	23,4
160	601,0	93,0	114,7	114,7	237,7	32,0

Dimensions and weights of ACTAIR EVO 240 - 700



Size 240 - 700

Table 16: Dimensions [mm] and weights [kg]

Size	A	B	C	D	E	F	Weight
240	667	155,5	155,5	164	359	234	56
340	765	120,0	178	148,5	314,5	382,5	52
500	885	155,5	206	179	374	442,5	86
700	1044	188	206	179	374	522	106

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