Pneumatic Actuator

# DYNACTAIR NG

## Type Series Booklet

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Type Series Booklet DYNACTAIR NG

# Contents

## Pneumatic Actuators

### Pneumatic Quarter-turn Actuators, Single-acting

# DYNACTAIR NG

### 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] | ≤ 4000 |
| Enclosure | IP68<br>30 metres of water<br>169 hours |

### Design details

### Design

- Single-acting pneumatic actuators of the DYNACTAIR NG type series are designed for actuating all types of quarter-turn valves (butterfly valves, ball valves). In conjunction with an AMTROBOX/AMTRONIC/SMARTRONIC control unit, they offer all the control and monitoring functions required by process control systems.
- This pneumatic actuator with scotch-yoke kinematics develops a variable torque with a maximum at valve closure.
- The translatory movement of the pistons generated by the control pressure results in a clockwise quarter turn of the pinion and, consequently, a quarter turn of the valve shaft connected to the pinion, causing the valve to close.
- The control medium is air or any neutral gas in compliance with ISO 8573-1 Class 5.
- Pneumatic interface to NAMUR
- VDI/VDE 3845 interface for connecting control units
- Actuator/valve connection flange to ISO 5211
- Mounts on the top flange of quarter-turn valves either directly or via installation components
- Standard actuator features:
  - One position indicator
  - Adjustable mechanical travel stops:

    - Closed position of DYNACTAIR NG 1 to 80: -4° to +6°

    - Closed position and open position of DYNACTAIR NG 120 to 350: -5° to +5°
- The actuators are lubricated with silicone-free grease at the factory.
- Housing made of light metal alloy, anodised, thickness: 20 µm
- End caps made of light metal alloy, anodised, black, for DYNACTAIR NG 120 to 350
- End caps made of light metal alloy with polyurethane coating, thickness: 80 µm, colour: black, RAL 9011, for DYNACTAIR NG 1 to 80
- The valves meet the requirements of the REACH 1907/2006 regulation. None of the substances listed in the candidate list and in Annex XIV of the regulation is present in a concentration above 0.1 % (w/w) (Article 33/REACH).
- 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
- Integral manual override – DYNACTAIR NGV:
  - Maximum torque: 4000 Nm
  - Force transmission by scotch-yoke kinematics
- Declutchable manual override:
  - Protection against splashing water and dust ingress (IP65)
  - Design in accordance with IP67 on request
  - Polyurethane coating, thickness 80 µm, colour: RAL 7016 anthracite grey
  - Temperature range -20 °C to +80 °C

### 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 kinematics develops maximum torque at both valve opening and closure.
  - Reduced dimensions and actuating time
  - 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

## Related documents

**Table 2:** Information/documents

| Document | Reference number |
|---|---|
| AMTROBOX type series booklet | 8525.1 |
| AMTRONIC type series booklet | 8514.837 |
| SMARTRONIC MA type series booklet | 8520.803 |
| ACTAIR NG / DYNACTAIR NG operating manual | 8513.81 |
| ACTAIR NG / DYNACTAIR NG operating manual | 8513.82 |
| ACTAIR NGV / DYNACTAIR NGV operating manual | 8513.83 |

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## Technical data

### Function

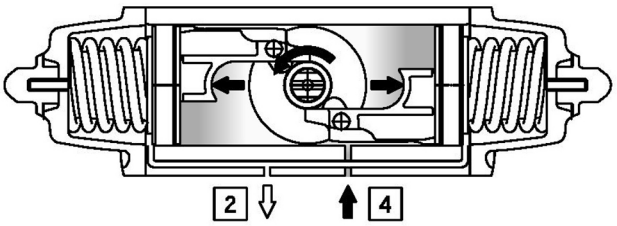
The scotch-yoke kinematics develop a variable torque that is ideally suited for actuating quarter-turn valves.

Open position

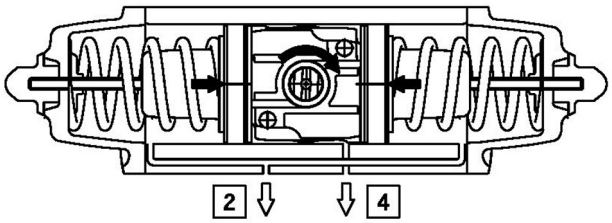
Port 4 communicates with both the left-hand and the right-hand cylinder chamber. When control air is supplied to port 4, the shaft of the single-acting pneumatic actuator rotates in anti-clockwise direction, causing the valve to open. The springs are pressed together.

Closed position

Ports 2 and 4 communicate with the intermediate chamber. When no control pressure is supplied, the shaft of the single-acting pneumatic actuator rotates in clockwise direction, causing the valve to close. This movement is generated by the springs relaxing.

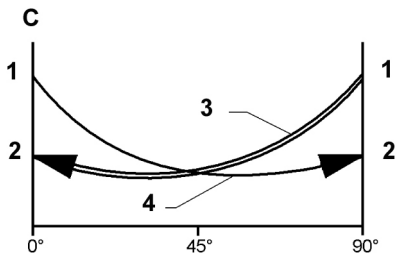



Top view

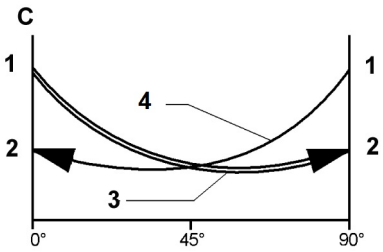



Top view

**Curve of scotch-yoke kinematics**




**Fail-close**




**Fail-open**

| | | | |
|---|---|---|---|
| C: | Output torque | 1: | Start |
| 0° to 90°: | Angle of rotation | 2: | End |
| 0°: | Closed | 3: | Springs |
| 90°: | Open | 4: | Air |

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

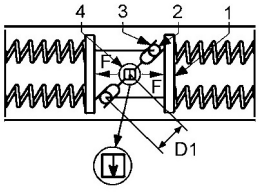



Fig. 1 - Closed

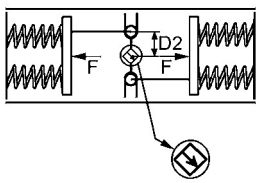



Fig. 2 - 45°

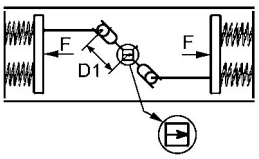



Fig. 3 - Open

The translation of the movement is achieved via the piston system **1**, the rollers **2**, the yoke **3** and the shaft. **4**.

The translatory movement of the pistons **1** generated 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.

The control pressure both actuates the valve and compresses the energy storage mechanism (spring cartridges).

On loss of control pressure, the valve is moved to fail-safe position by the spring-return action.

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## Type series

Sizes 1 to 80

Sizes 120 to 350

**Table 3:** Dimensions [mm]

| Size | Actuator/valve interface to ISO 5211 | Shaft end dimensions [mm] | | |
|---|---|---|---|---|
| | | Depth | Flat end | Square end |
| 1 | F03/F05 | 13,2 | M11 | - |
| 2 | F05/F07 | 16,5 | M14 | - |
| 4 | F05/F07 | 19,3 | M14 | - |
| 6 | F07/F10 | 24,8 | M19 | - |
| 8 | F07/F10 | 24,8 | M19 | - |
| 12 | F07/F10 | 25,3 | M22 | - |
| 16 | F10/F12 | 29,5 | - | C30 |
| 25 | F10/F12 | 29,5 | - | C30 |
| 35 | F14 | 38,5 | - | C36 |
| 50 | F14 | 38,5 | - | C36 |
| 80 | F12/F16 | 48,5 | - | C50 |
| 120 | F16 | 49,5 | - | C50 |
| 160 | F16 | 49,5 | - | C50 |
| 240 | F25 | 49,5 | - | C50 |
| 350 | F25 | 58 | - | C60 |

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### Output torques (in Nm)

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

The following tables specify the torques that can be achieved depending on the control pressure applied (8 bar on request).

**Table 4: Force transmission: scotch yoke**

| Size | Spring size [Nm] | Output torque generated by energy storage mechanism (spring cartridge) [Nm] | | | Output torque in compression phase of energy-storage mechanism as a function of control fluid pressure | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Control pressure [bar] | | | | | | | | |
| | | | | | 4 bar | | | 5 bar | | | 6 bar | | |
| | | 0° | 50° | 90° | 0° | 50° | 90° | 0° | 50° | 90° | 0° | 50° | 90° |
| 1 | 4,2 | 7,5 | 5,6 | 11,3 | 11,3 | 5,6 | 7,5 | 14,9 | 7,7 | 11,1 | 19,4 | 10,4 | 15,6 |
| | 5,6 | 10,0 | 7,5 | 15,0 | - | - | - | 12,3 | 5,9 | 7,3 | 16,8 | 8,6 | 11,8 |
| 2 | 4,2 | 15,0 | 11,3 | 22,5 | 22,5 | 11,3 | 15,0 | 29,6 | 15,6 | 22,1 | 38,6 | 21,0 | 31,1 |
| | 5,6 | 20,0 | 15,0 | 30,0 | - | - | - | 24,6 | 11,8 | 14,6 | 33,6 | 17,1 | 23,6 |
| 4 | 4,2 | 26,0 | 19,5 | 40,0 | 40,0 | 19,5 | 26,0 | 52,6 | 26,9 | 38,6 | 68,3 | 36,2 | 54,3 |
| | 5,6 | 35,0 | 26,0 | 53,0 | - | - | - | 43,6 | 20,4 | 25,6 | 59,3 | 29,7 | 41,3 |
| 6 | 4,2 | 45,0 | 33,9 | 67,5 | 67,5 | 33,9 | 45,0 | 88,9 | 46,8 | 66,4 | 115,7 | 63,0 | 93,2 |
| | 5,6 | 60,0 | 45,0 | 90,0 | - | - | - | 73,9 | 35,4 | 43,9 | 100,7 | 51,4 | 70,7 |
| 8 | 4,2 | 60,0 | 45,0 | 90,0 | 90,0 | 45,0 | 60,0 | 118,6 | 62,1 | 88,6 | 154,3 | 83,6 | 124,3 |
| | 5,6 | 80,0 | 60,0 | 120,0 | - | - | - | 98,6 | 47,1 | 58,6 | 134,3 | 68,6 | 94,3 |
| 12 | 4,2 | 90,0 | 67,5 | 135,0 | 135,0 | 67,5 | 90,0 | 177,9 | 93,2 | 132,9 | 231,4 | 125,4 | 186,4 |
| | 5,6 | 120,0 | 90,0 | 180,0 | - | - | - | 147,9 | 70,7 | 87,9 | 201,4 | 102,9 | 141,4 |
| 16 | 4,2 | 120,0 | 90,0 | 180,0 | 180,0 | 90,0 | 120,0 | 237,1 | 124,3 | 177,1 | 308,6 | 167,1 | 248,6 |
| | 5,6 | 160,0 | 120,0 | 240,0 | - | - | - | 197,1 | 94,3 | 117,1 | 268,6 | 137,1 | 188,6 |
| 25 | 4,2 | 180,0 | 135,0 | 270,0 | 270,0 | 135,0 | 180,0 | 355,7 | 186,4 | 265,7 | 462,9 | 250,7 | 372,9 |
| | 5,6 | 240,0 | 180,0 | 360,0 | - | - | - | 295,7 | 141,4 | 175,7 | 402,9 | 205,7 | 282,9 |
| 35 | 4,2 | 240,0 | 180,0 | 360,0 | 360,0 | 180,0 | 240,0 | 474,3 | 248,6 | 354,3 | 617,1 | 334,3 | 497,1 |
| | 5,6 | 320,0 | 240,0 | 480,0 | - | - | - | 394,3 | 188,6 | 234,3 | 537,1 | 274,3 | 377,1 |
| 50 | 4,2 | 360,0 | 270,0 | 540,0 | 540,0 | 270,0 | 360,0 | 711,4 | 372,9 | 531,4 | 925,7 | 501,4 | 745,7 |
| | 5,6 | 480,0 | 360,0 | 720,0 | - | - | - | 591,4 | 282,9 | 351,4 | 805,7 | 411,4 | 565,7 |
| 80 | 4,2 | 480,0 | 360,0 | 720,0 | 720,0 | 360,0 | 480,0 | 948,6 | 497,1 | 708,6 | 1234,3 | 668,6 | 994,3 |
| | 5,6 | 640,0 | 480,0 | 960,0 | - | - | - | 788,6 | 377,1 | 468,6 | 1074,3 | 548,6 | 754,3 |
| 120 | 4,2 | 810,0 | 450,0 | 1080,0 | 1080,0 | 540,0 | 810,0 | 1440,0 | 745,7 | 1170,0 | 1890,0 | 1002,9 | 1620,0 |
| | 5,6 | 1080,0 | 720,0 | 1440,0 | - | - | - | 1170,0 | 565,7 | 810,0 | 1620,0 | 822,9 | 1260,0 |
| 160 | 4,2 | 960,0 | 720,0 | 1440,0 | 1440,0 | 720,0 | 960,0 | 1897,1 | 994,3 | 1417,1 | 2468,6 | 1337,1 | 1988,6 |
| | 5,6 | 1280,0 | 960,0 | 1920,0 | - | - | - | 1577,1 | 754,3 | 937,1 | 2148,6 | 1097,1 | 1508,6 |
| 240 | 4,2 | 1440,0 | 1080,0 | 2160,0 | 2160,0 | 1080,0 | 1440,0 | 2845,7 | 1491,4 | 2125,7 | 3702,9 | 2005,7 | 2982,9 |
| | 5,6 | 1920,0 | 1440,0 | 2880,0 | - | - | - | 2365,7 | 1131,4 | 1405,7 | 3222,9 | 1645,7 | 2262,9 |
| 350 | 4,2 | Contact KSB. | | | | | | | | | | | |
| | 5,6 | Contact KSB. | | | | | | | | | | | |

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### Control medium

| | |
|---|---|
| Operating pressure | 3 to 6 bar (44 to 87 psi) |
| Filtration level | ISO 8573-1 Class 5 (< 40 µm) |
| Dew point | ISO 8573-1 Class 5 (< 7 °C, and if temperature is 5 °C below ambient temperature) |
| Lubrication | ISO 8573-1 Class 5 (< 25 mg/m³) |

### Actuating time in seconds at 5.6 bar: without valve

**Table 5:** Actuating time values

| Size | Actuating time [+/-0.5 s] | | | | | |
|---|---|---|---|---|---|---|
| | 5/2-way directional control valve to NAMUR | | AMTRONIC R1300 / R1301 | | SMARTRONIC R1310 / R1311 / R1312 / R1313 | |
| | 0° to 90° | 90° to 0° | 0° to 90° | 90° to 0° | 0° to 90° | 90° to 0° |
| 1 | 0,13 | 0,09 | 0,9 | 1,0 | 0,9 | 1,0 |
| 2 | 0,13 | 0,1 | 1,0 | 1,0 | 1,0 | 1,0 |
| 4 | 0,2 | 0,17 | 1,0 | 1,0 | 1,0 | 1,0 |
| 6 | 0,31 | 0,33 | 2,8 | 2,8 | 1,3 | 2,4 |
| 8 | 0,4 | 0,33 | 3,2 | 3,2 | 2,0 | 2,8 |
| 12 | 0,58 | 0,44 | 4,0 | 4,0 | 2,5 | 3,5 |
| 16 | 0,65 | 0,53 | 5,5 | 5,2 | 3,0 | 3,8 |
| 25 | 0,96 | 0,72 | 7,5 | 7,0 | 4,0 | 5,0 |
| 35 | 1,16 | 0,9 | 10,6 | 9,7 | 5,5 | 7,0 |
| 50 | 1,65 | 1,49 | 16,0 | 13,0 | 7,5 | 8,0 |
| 80 | 2,6 | 2,14 | 22,5 | 18,3 | 10,5 | 11,3 |
| 120 | 1,37 | 1,4 | 14,0 | 23,5 | 17,5 | 24,5 |
| 160 | 1,62 | 2,03 | 16,0 | 27,0 | 20,0 | 28,0 |
| 240 | 2,17 | 2,42 | 27,0 | 45,0 | 33,5 | 47,0 |
| 350 | 3,83 | 3,97 | 37,0 | 62,5 | 46,0 | 65,0 |

### Control air volume

**Table 6:** Control air values

| Size | Control air volume [dm³/cycle] |
|---|---|
| 1 | 0,09 |
| 2 | 0,17 |
| 4 | 0,3 |
| 6 | 0,7 |
| 8 | 0,8 |
| 12 | 1 |
| 16 | 1,5 |
| 25 | 2 |
| 35 | 2,8 |
| 50 | 4,2 |
| 80 | 5,9 |
| 120 | 11 |
| 160 | 12,5 |
| 240 | 21 |
| 350 | 29,1 |

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

## Materials

### Materials DYNACTAIR NG 1 - 80

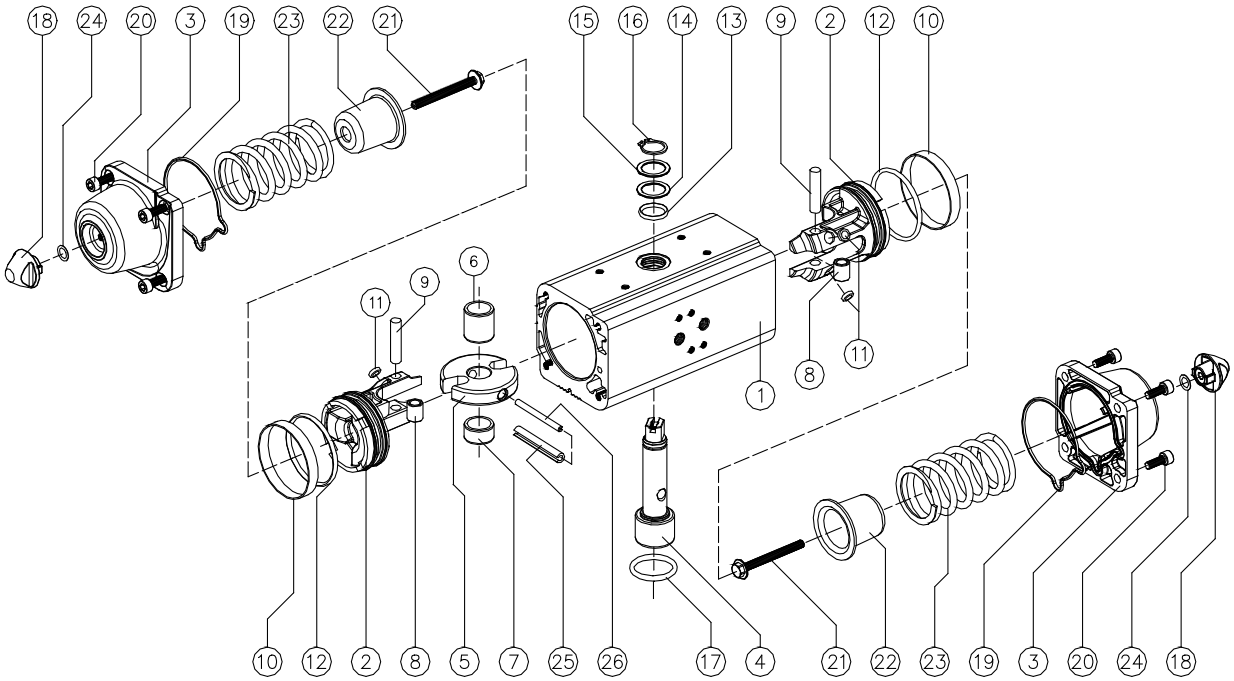


**Fig. 1:** Exploded view of size 1 - 80

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**Table 7:** List of components

| 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 | Acetal | 1 |
| 7 | | Guiding element | Acetal | 1 |
| 8 | | Roller | Steel | 2 |
| 9 | | Roller hinge pin | Steel | 2 |
| 10 | [1] | Dynamic piston seal ring | Polyurethane | 2 |
| 11 | [1] | Sliding pad | Reinforced PTFE | 4 |
| 12 | [1][2][3] | Piston seal ring | Nitrile | 2 |
| 13 | [2][3] | O-ring | FKM | 1 |
| 14 | | Seal retainer | Acetal | 1 |
| 15 | | Washer | Stainless steel | 1 |
| 16 | | Circlip | Stainless steel | 1 |
| 17 | [2][3] | O-ring | FKM | 1 |
| 18 | | Nut | Light metal alloy | 2 |
| 19 | [1] | End cap seal | Nitrile | 2 |
| 20 | | Screw | Stainless steel | 8 |
| 21 | | Spring fastening screw | Steel | 2 |
| 22 | | Spring cover | Steel | 2 |
| 23 | | Spring | Steel | 2 |
| 24 | [1][2][3] | O-ring | Nitrile | 2 |
| 25 | | Outer yoke pin | Steel | 1 |
| 26 | | Inner yoke pin | Steel | 1 |

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

## Materials DYNACTAIR NG 120

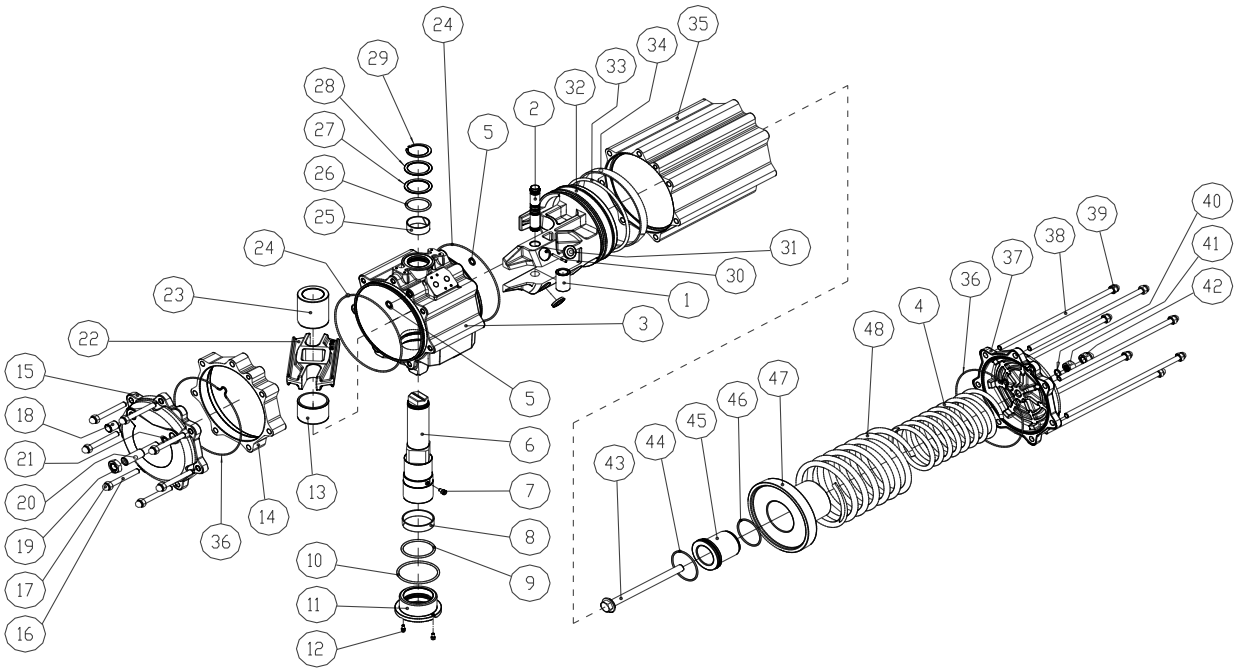


**Fig. 2:** Exploded view of size 120

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**Table 8:** List of components

| Part No. | | Description | Materials | Quantity |
|---|---|---|---|---|
| 1 | | Ring | Steel | 1 |
| 2 | | Pin | Steel | 1 |
| 3 | | Housing | Light metal alloy, anodised | 1 |
| 4 | | Inner spring | Steel | 1 |
| 5 | 4)5)6) | O-ring | Nitrile | 2 |
| 6 | | Shaft | Steel | 1 |
| 7 | | Screw | Steel | 1 |
| 8 | 4) | Lower shaft bearing | Light metal alloy, anodised | 1 |
| 9 | 4)5)6) | O-ring | FKM | 1 |
| 10 | 4)5)6) | 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 rod | 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 | 4)5)6) | O-ring | Nitrile | 1 |
| 22 | | Yoke | Steel | 1 |
| 23 | | Shaft bearing | Acetal | 1 |
| 24 | 4)5)6) | O-ring | Nitrile | 2 |
| 25 | 4) | Upper shaft bearing | Acetal | 1 |
| 26 | 4)5)6) | O-ring | FKM | 1 |
| 27 | 4) | Fixed bearing | Acetal | 1 |
| 28 | | Washer | Steel | 1 |
| 29 | | Circlip | Steel | 1 |
| 30 | | Spring-type straight pin | Steel | 1 |
| 31 | 4) | Lower piston bearing | Acetal | 2 |
| 32 | | Piston | Light metal alloy | 1 |
| 33 | 4)5)6) | O-ring | Nitrile | 1 |
| 34 | 4) | Upper piston bearing | Acetal | 1 |
| 35 | | Cylinder | Light metal alloy | 1 |
| 36 | 4)5)6) | O-ring | Nitrile | 2 |
| 37 | | End cap | Light metal alloy | 1 |
| 38 | | Tie rod | Steel | 7 |
| 39 | | End cap nut | Stainless steel | 7 |
| 40 | 4)5)6) | O-ring | Nitrile | 1 |
| 41 | | Nut | Stainless steel | 1 |
| 42 | | Nut | Stainless steel | 1 |
| 43 | | Screw | Stainless steel | 1 |
| 44 | | O-ring | FKM | 1 |
| 45 | | Spring cover | Light metal alloy, anodised | 1 |
| 46 | 5)6) | O-ring | FKM | 1 |
| 47 | | Spring cover | Light metal alloy, anodised | 1 |
| 48 | | Outer spring | Steel | 1 |

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

## Materials DYNACTAIR NG 160

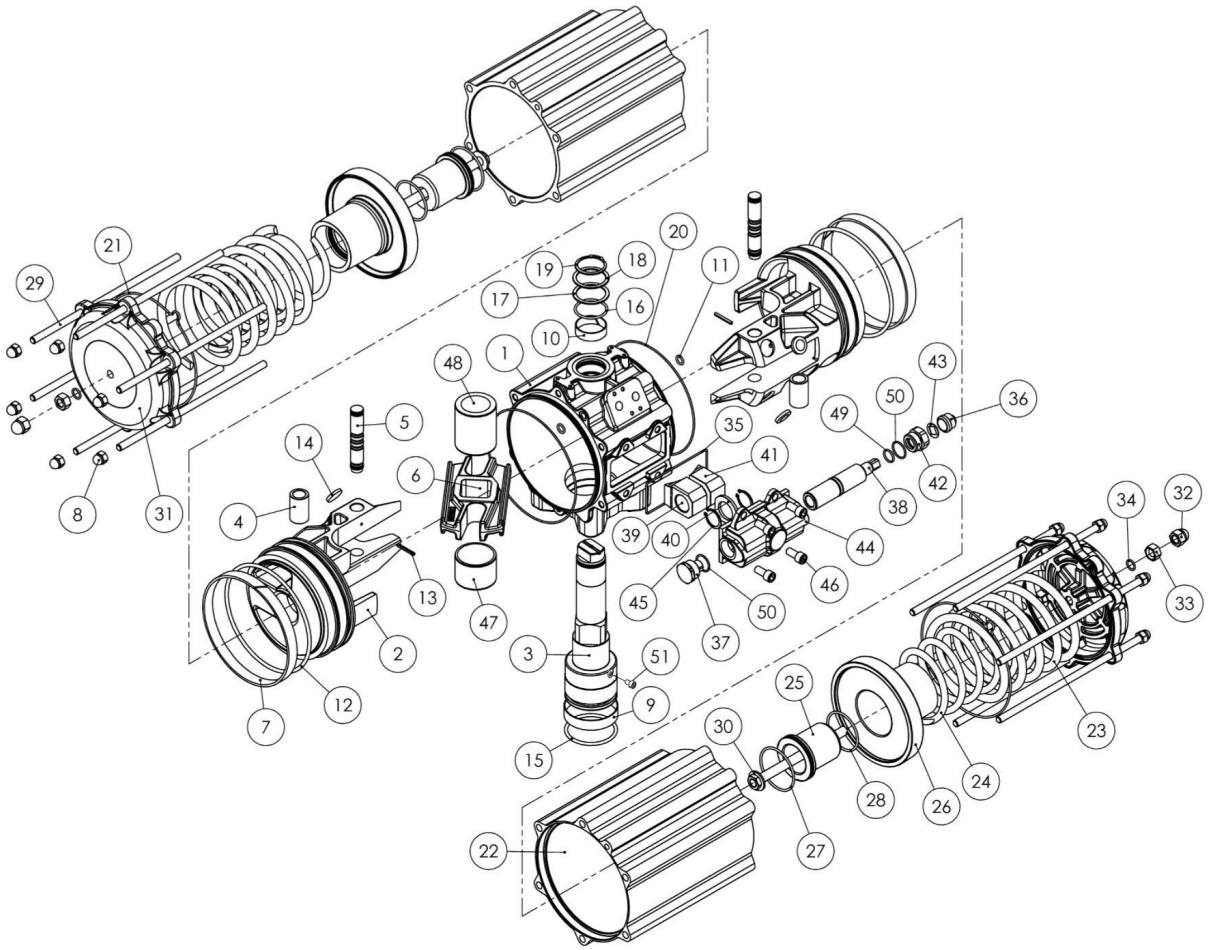


**Fig. 3:** Exploded view of size 160

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**Table 9:** List of components

| Part No. | | Description | Materials | Quantity |
|---|---|---|---|---|
| 1 | | Cylinder | Light metal alloy, anodised | 1 |
| 2 | | Lateral cylinder | Light metal alloy | 2 |
| 3 | | Shaft | Stainless steel | 1 |
| 4 | | Yoke | Steel | 1 |
| 5 | | Shaft sleeve | Acetal | 1 |
| 6 | | Bush | Acetal | 1 |
| 7 | | Upper support ring | Acetal | 1 |
| 8 | | Lower support ring | Acetal | 1 |
| 9 | [7] | Joint ring for end cap | Nitrile | 2 |
| 10 | | Safety screw | Stainless steel | 1 |
| 11 | [7] | Outer support ring | Acetal | 1 |
| 12 | | Circlip | Stainless steel | 1 |
| 13 | | Washer | Stainless steel | 1 |
| 14 | | Piston | Light metal alloy | 2 |
| 15 | | Bush | Steel | 2 |
| 16 | [7] | Piston damper | Acetal | 4 |
| 17 | | Spring-type straight pin | Steel | 2 |
| 18 | | Rotation ring | Steel | 2 |
| 19 | | End cap | Light metal alloy, anodised | 2 |
| 20 | | Inner spring cover | Light metal alloy | 2 |
| 21 | | Outer spring cover | Light metal alloy | 2 |
| 23 | [7][8][9] | O-ring | Nitrile | 2 |
| 24 | | End cap nut | Stainless steel | 2 |
| 25 | [8][9] | O-ring | Nitrile | 2 |
| 26 | [8][9] | O-ring | Nitrile | 2 |
| 27 | | Nut | Stainless steel | 2 |
| 28 | | Inner spring | Steel | 2 |
| 29 | | Outer spring | Steel | 2 |
| 30 | [7] | Dynamic piston seal ring | Acetal | 2 |
| 31 | [7][8][9] | O-ring for lower shaft | FKM | 1 |
| 32 | [7][8][9] | Piston seal ring | Nitrile | 2 |
| 33 | [7][8][9] | Joint ring for upper shaft | FKM | 1 |
| 34 | [8][9] | O-ring | Nitrile | 2 |
| 35 | [7][8][9] | O-ring for cylinder | Nitrile | 2 |
| 36 | | End cap screw | Steel | 12 |
| 37 | | End cap nut | Stainless steel | 12 |

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

## Materials DYNACTAIR NG 260

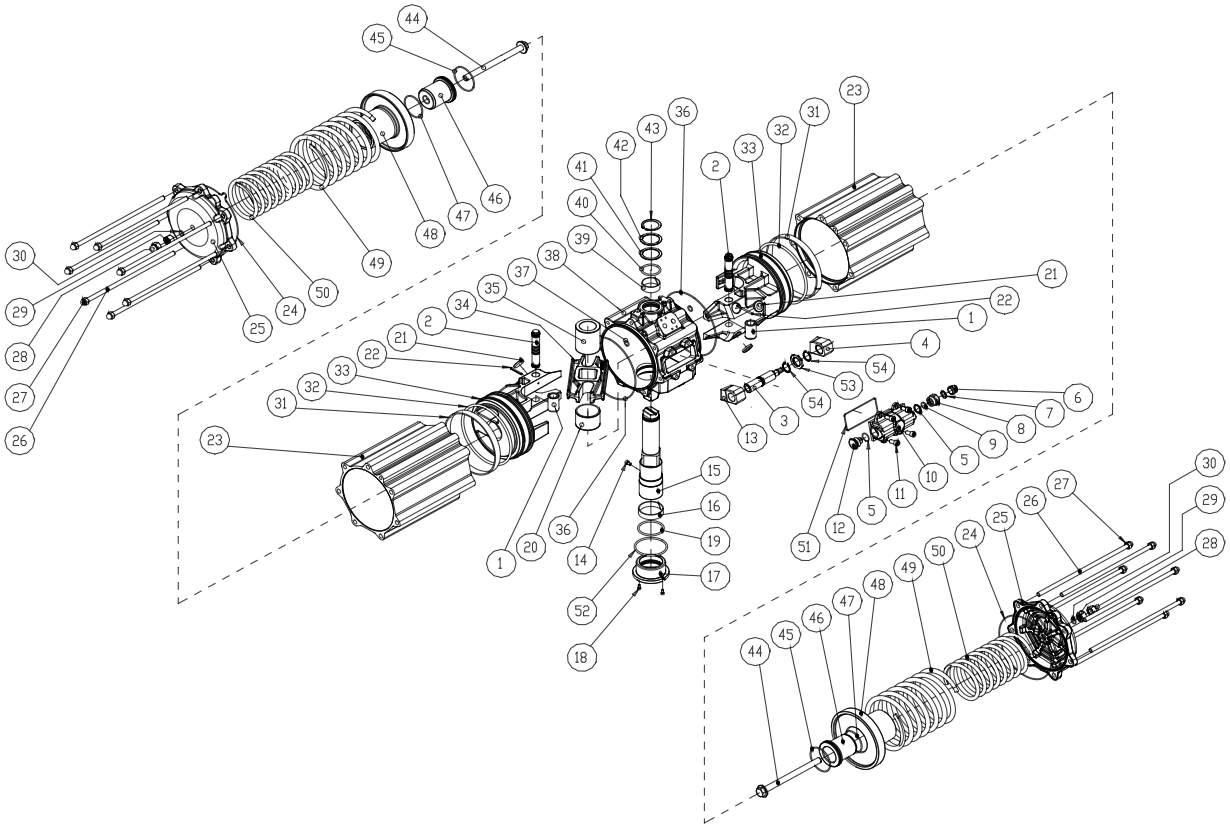


**Fig. 4:** Exploded view of size 260

**Table 10:** List of components

| 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 | 10)11)12) | O-ring | Nitrile | 2 |
| 6 | | Protective cover | Light metal alloy, anodised | 1 |
| 7 | | Thrust washer | Steel | 1 |
| 8 | | Metal ring | Stainless steel | 1 |
| 9 | 10)11) | 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 | 10) | Lower shaft bearing | Acetal | 1 |
| 17 | | Bearing | Light metal alloy, anodised | 1 |
| 18 | | Screw | Steel | 2 |
| 19 | 10)11)12) | O-ring | FKM | 1 |
| 20 | | Shaft bearing | Acetal | 1 |
| 21 | 10) | Lower piston bearing | Acetal | 4 |
| 22 | | Spring-type straight pin | Steel | 2 |
| 23 | | Cylinder | Light metal alloy, anodised | 2 |
| 24 | 10)10)12) | O-ring | Nitrile | 2 |
| 25 | | End cap | Light metal alloy, anodised | 2 |
| 26 | | Tie rod | Steel | 14 |
| 27 | | End cap nut | Stainless steel | 14 |
| 28 | | End cap nut | Stainless steel | 2 |
| 29 | | Nut | Stainless steel | 2 |
| 30 | 10)11)12) | O-ring | Nitrile | 2 |
| 31 | 10) | Upper piston bearing | Acetal | 2 |
| 32 | 10)11)12) | O-ring | Nitrile | 2 |
| 33 | | Piston | Light metal alloy | 2 |
| 34 | | Yoke | Steel | 1 |
| 35 | | Shaft bearing | Acetal | 1 |
| 36 | 10)11)12) | O-ring | Nitrile | 2 |
| 37 | 10)11)12) | O-ring | Nitrile | 2 |
| 38 | | Housing | Light metal alloy, anodised | 1 |
| 39 | 10) | Upper shaft bearing | Acetal | 1 |
| 40 | 11)12) | O-ring | FKM | 1 |
| 41 | 10) | Fixed bearing | Acetal | 1 |
| 42 | | Washer | Steel | 1 |
| 43 | | Circlip | Steel | 1 |
| 44 | | Screw | Stainless steel | 2 |
| 45 | 11)12) | O-ring | Nitrile | 2 |
| 46 | | Spring cover | Light metal alloy | 2 |
| 47 | 11)12) | O-ring | Nitrile | 2 |
| 48 | | Spring cover | Light metal alloy | 2 |
| 49 | | Outer spring | Steel | 2 |
| 50 | | Inner spring | Steel | 2 |
| 51 | 10)11)12) | Joint ring | Nitrile | 1 |

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

| Part No. | | Description | Materials | Quantity |
|---|---|---|---|---|
| 52 | 10)11)12) | O-ring | FKM | 1 |
| 53 | | Washer | Steel | 1 |
| 54 | | Circlip | Steel | 2 |

## Materials DYNACTAIR NG 350

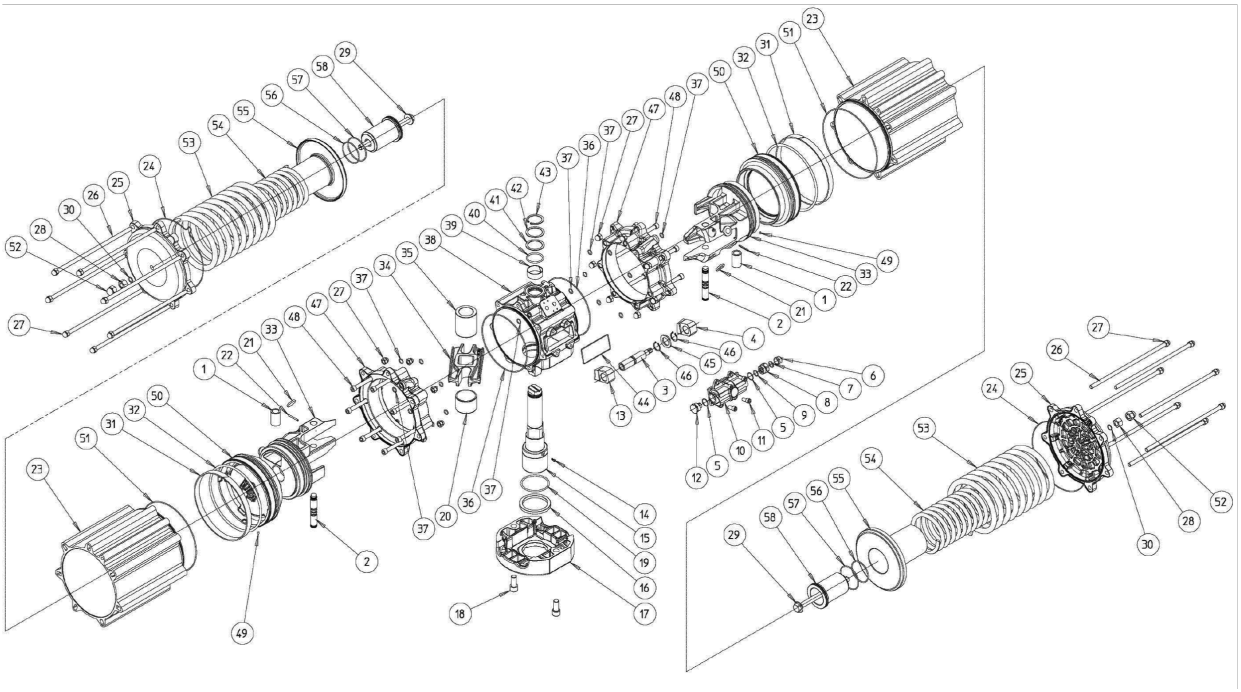

**Fig. 5:** Exploded view of size 350

**Table 11:** List of components

| 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 | 13)14)15) | O-ring | Nitrile | 2 |
| 6 | | Protective cover | Light metal alloy, anodised | 1 |
| 7 | | Thrust washer | Steel | 1 |
| 8 | | Metal ring | Stainless steel | 1 |
| 9 | 13)14)15) | 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 | 13) | Lower shaft bearing | Acetal | 1 |
| 17 | | Connection flange | Light metal alloy, anodised | 1 |
| 18 | | Screw | Steel | 2 |
| 19 | 13)14)15) | O-ring | FKM | 1 |
| 20 | | Shaft bearing | Acetal | 1 |
| 21 | 13) | Lower piston bearing | Acetal | 4 |
| 22 | | Spring-type straight pin | Steel | 2 |
| 23 | | Cylinder | Light metal alloy, anodised | 2 |
| 24 | 13)14)15) | O-ring | Nitrile | 2 |
| 25 | | End cap | Light metal alloy, anodised | 2 |
| 26 | | Tie rod | Steel | 14 |
| 27 | | End cap nut | Stainless steel | 28 |
| 28 | | Nut | Stainless steel | 2 |
| 29 | | Screw | Stainless steel | 2 |
| 30 | 13)14)15) | O-ring | Nitrile | 2 |
| 31 | 13) | Upper piston bearing | Acetal | 2 |
| 32 | 13)14)15) | O-ring | Nitrile | 2 |
| 33 | | Piston | Light metal alloy | 2 |
| 34 | | Yoke | Steel | 1 |
| 35 | | Shaft bearing | Acetal | 1 |
| 36 | 13)14)15) | O-ring | Nitrile | 2 |
| 37 | 13)14)15) | O-ring | Nitrile | 18 |
| 38 | | Housing | Light metal alloy, anodised | 1 |
| 39 | 13) | Upper shaft bearing | Acetal | 1 |
| 40 | 13)14)15) | O-ring | FKM | 1 |
| 41 | 13) | Fixed bearing | Acetal | 1 |
| 42 | | Washer | Steel | 1 |
| 43 | | Circlip | Steel | 1 |
| 44 | 13)14)15) | 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 | 13)14)15) | O-ring | Nitrile | 2 |
| 52 | | End cap nut | Stainless steel | 2 |
| 53 | | Outer spring | Steel | 2 |

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

| Part No. | | Description | Materials | Quantity |
|---|---|---|---|---|
| 54 | | Inner spring | Steel | 2 |
| 55 | | Spring cover | Light metal alloy | 2 |
| 56 | 13)14)15) | O-ring | Nitrile | 2 |
| 57 | 13)14)15) | O-ring | Nitrile | 2 |
| 58 | | Spring cover | Light metal alloy | 2 |

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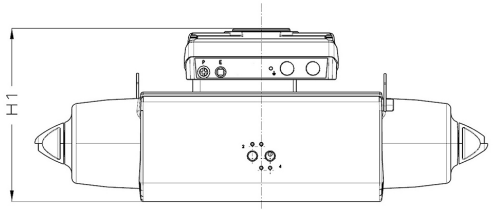
## Variants

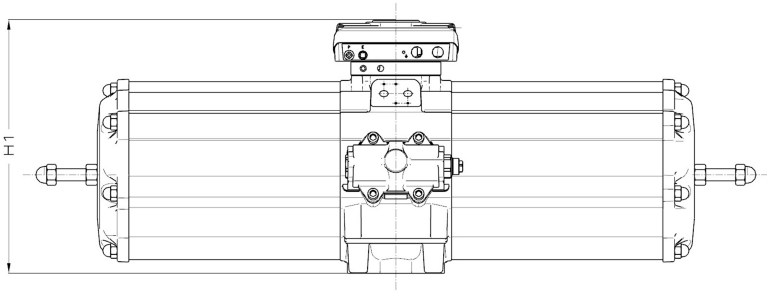
### Open/closed position signalling function

**AMTROBOX and all limit switch boxes with a VDI/VDE interface**

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).




Size 1 - 80




Size 120 - 350

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

| Size | H1 | Weight |
|---|---|---|
| 1 | 145,2 | 3,3 |
| 2 | 156,4 | 4,1 |
| 4 | 169,3 | 5,1 |
| 6 | 193,5 | 8 |
| 8 | 197,1 | 8,9 |
| 12 | 204 | 11 |
| 16 | 220,9 | 13,9 |
| 25 | 234 | 18,6 |
| 35 | 254 | 24,8 |
| 50 | 272 | 35,1 |
| 80 | 293,7 | 44,1 |
| 120 | 422 | 76,8 |
| 160 | 377 | 72,8 |
| 240 | 422 | 119,8 |
| 350 | 437 | 185,8 |

## Control function

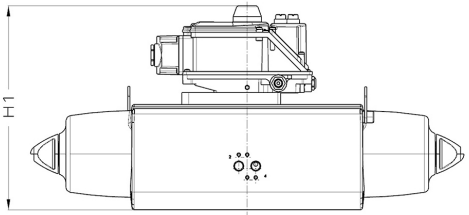
Control by AMTRONIC positioner
Positioner functions:

- 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

**Options**

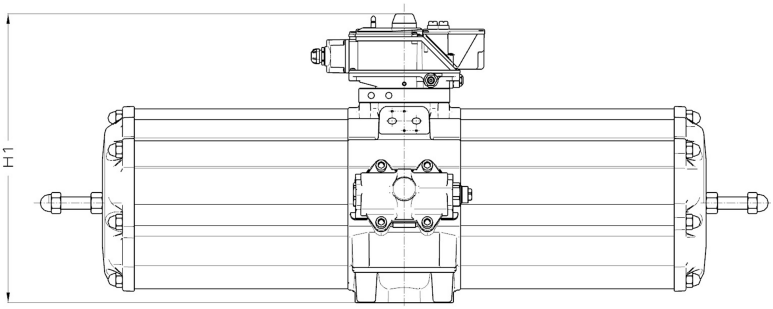
- Open/closed position signalling (2 microswitches or inductive proximity sensors)
- Proportional position signalling via 4-20 mA signal
- Field bus AS-i, Profibus DP

**DYNACTAIR NG 1 - 80**




Size 1 - 80

**DYNACTAIR NG 120 - 350**




Size 120 - 350

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

| Size | H2 | Weight |
|---|---|---|
| 1 | 198,2 | 3,7 |
| 2 | 209,4 | 4,5 |
| 4 | 222,3 | 5,5 |
| 6 | 246,5 | 8,4 |
| 8 | 250,1 | 17,7 |
| 12 | 257 | 11,4 |
| 16 | 273,9 | 14,3 |
| 25 | 287 | 19 |
| 35 | 307 | 25,2 |
| 50 | 325 | 35,5 |
| 80 | 346,7 | 44,5 |
| 120 | 475 | 77,2 |
| 160 | 430 | 73,2 |
| 240 | 475 | 120,2 |
| 350 | 490 | 186,2 |

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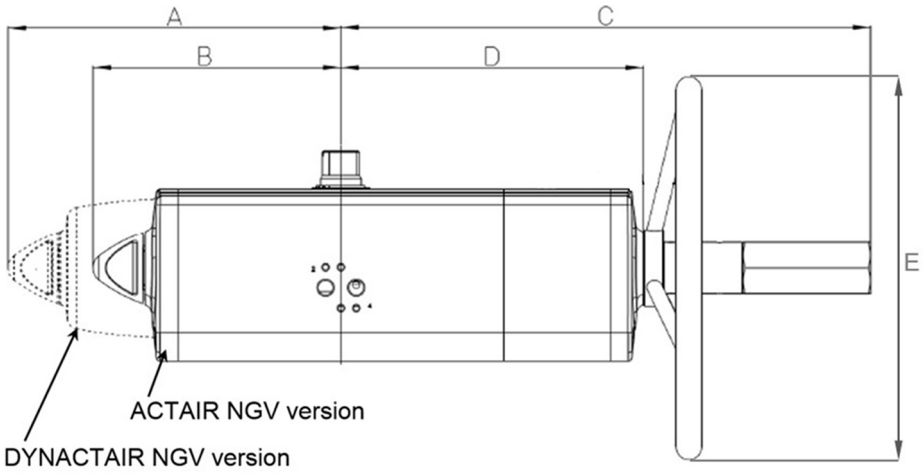
## Integral manual override – DYNACTAIR NGV

The design of this manual override is based on the DYNACTAIR NG 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. It is irreversible.
Like RMD manual gearboxes, the manual override must not be operated unless the control air has been completely evacuated from the actuator.

Dimensions and weights




Type NGV

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

| Type NGV | A | C | D | E | Weight |
|---|---|---|---|---|---|
| 2 | 129,4 | 263,3 | 137,6 | 180 | 3,2 |
| 4 | 152,1 | 279,6 | 154,8 | 180 | 4,5 |
| 6 | 196,8 | 338,7 | 183,5 | 220 | 6,8 |
| 8 | 204,8 | 354,3 | 199,1 | 220 | 9,0 |
| 12 | 237,0 | 398,4 | 220,8 | 300 | 11,7 |
| 16 | 260,2 | 414,2 | 236,4 | 300 | 15,2 |
| 25 | 306,6 | 504,5 | 282,3 | 350 | 19,5 |
| 35 | 324,1 | 518,8 | 297,1 | 350 | 28,1 |
| 50 | 399,0 | 637,1 | 365,6 | 400 | 38,8 |
| 80 | 414,0 | 653,7 | 382,9 | 400 | 50,6 |
| 160 | 509,0 | 890,2 | 537,5 | 575 | 90,5 |

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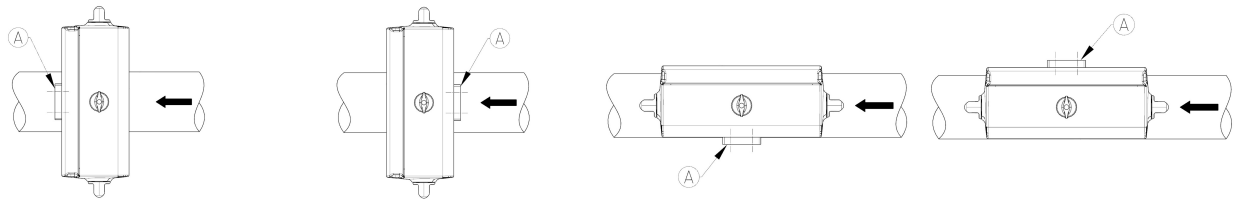
## Mounting onto the valve

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.

**DYNACTAIR NG**

**Mounting option N** | **Mounting option M**




Position 1 | Position 2 | Position 1 | Position 2

← Flow direction of fluid handled – Valve shown in closed position

Interface A: for direct pneumatic connection / NAMUR or ISO

Every pneumatic actuator size is available in two non-interchangeable versions:

- Version for mounting option N
- Version for mounting option M

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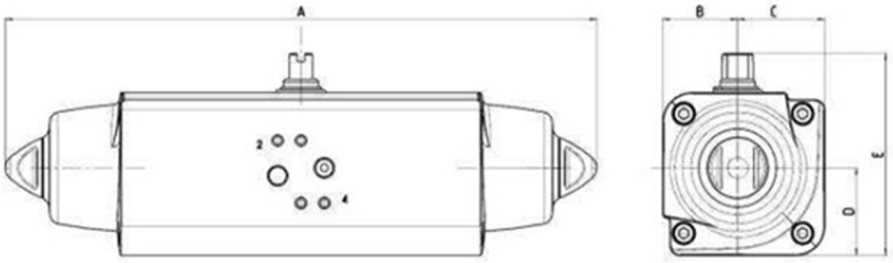
## Dimensions and weights

### Dimensions and weights of DYNACTAIR NG 1 - 80

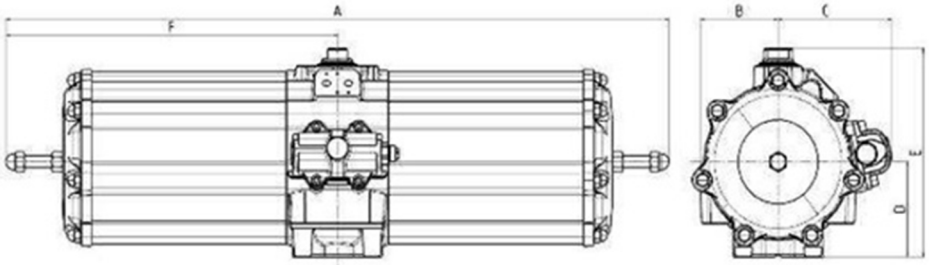



Size 1 - 80

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

| Size | A | B | C | D | E | Weight |
|---|---|---|---|---|---|---|
| 1 | 233,3 | 27,7 | 31,5 | 31,5 | 79,2 | 1,2 |
| 2 | 259 | 32,7 | 37,7 | 37,7 | 90,4 | 2,0 |
| 4 | 304,3 | 38,5 | 44,8 | 44,8 | 103,3 | 3,0 |
| 6 | 393,7 | 51 | 56,5 | 56,5 | 127,5 | 5,9 |
| 8 | 409,6 | 51 | 60,1 | 60,1 | 131,1 | 6,8 |
| 12 | 474 | 56 | 62 | 62 | 148 | 8,9 |
| 16 | 520,5 | 62 | 72,9 | 72,9 | 164,9 | 11,8 |
| 25 | 613 | 69,5 | 78,5 | 78,5 | 178 | 16,5 |
| 35 | 648,2 | 74,5 | 93,5 | 93,5 | 198 | 22,7 |
| 50 | 798 | 84,5 | 101,5 | 101,5 | 216 | 33,0 |
| 80 | 828 | 93 | 114,7 | 114,7 | 237,7 | 42,0 |

### Dimensions and weights of DYNACTAIR NG 120 - 350




Size 120 - 350

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

| Size | A | B | C | D | E | F | Weight |
|---|---|---|---|---|---|---|---|
| 120 | 834 | 155,5 | 155,5 | 164 | 359 | 234 | 74 |
| 160 | 1001 | 120 | 178 | 148 | 314 | 500,5 | 70 |
| 240 | 1201 | 155,5 | 206 | 164 | 359 | 600,5 | 117 |
| 350 | 1370 | 188 | 206 | 179 | 374 | 685 | 183 |

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