Agromatic®
Stellantriebe · Actuators

# Main Catalogue

Valid from 2019

Actuators · Accessories · Valves

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# About Agromatic

Agromatic Regelungstechnik has been a leading German manufacturer of electric rotary, part-turn and linear actuators since 1972. Our greatest strength lies in developing and producing custom designs tailored to the needs of our customers.

We offer a variety of series-produced actuators as well as a wide range of accessories.

And our service also includes assembling actuators and valves.

We place a great deal of value on ensuring the particularly high quality and reliability of our products.

We give priority to providing the best-possible service, product availability and dedicated customer care. To guarantee we do what we say and provide you with a suitable benchmark with which to judge us, we work in accordance with the latest ISO 9001:2008 certification requirements.

# Company history

1972 Artur Gronowski, an engineer from Bielefeld, Germany, founded our company to produce electric actuators and their accessories under the name “Ing. A. Gronowski“.

1973 Ing. A. Gronowski granted the company “Siegfried Welke” exclusive rights to distribute the actuators and accessories. The actuators were marketed under the designation “ATIS”. The company Siegfried Welke was later renamed Aris Antriebe und Steuerungen GmbH; as a consequence the actuators were henceforth marketed under the brand name “Aris”. 1974 the exclusive rights to distribute the actuators were extended to include distribution rights worldwide.

1985 Ing. A. Gronowski was renamed and has traded since then under the name “Agromatic Regelungstechnik GmbH”.

1986 Agromatic Regelungstechnik moved into new premises in Oerlinghausen, near Bielefeld, located at the edge of the Teutoburger Forest.

2002 The company’s founder, Arthur Gronowski, dies. His son Peter Gronowski, who is still a co-shareholder of the company, established the Arthur Gronowski charitable foundation based in Oerlinghausen. The purpose of the foundation is to promote health services as well as training and education in this field.

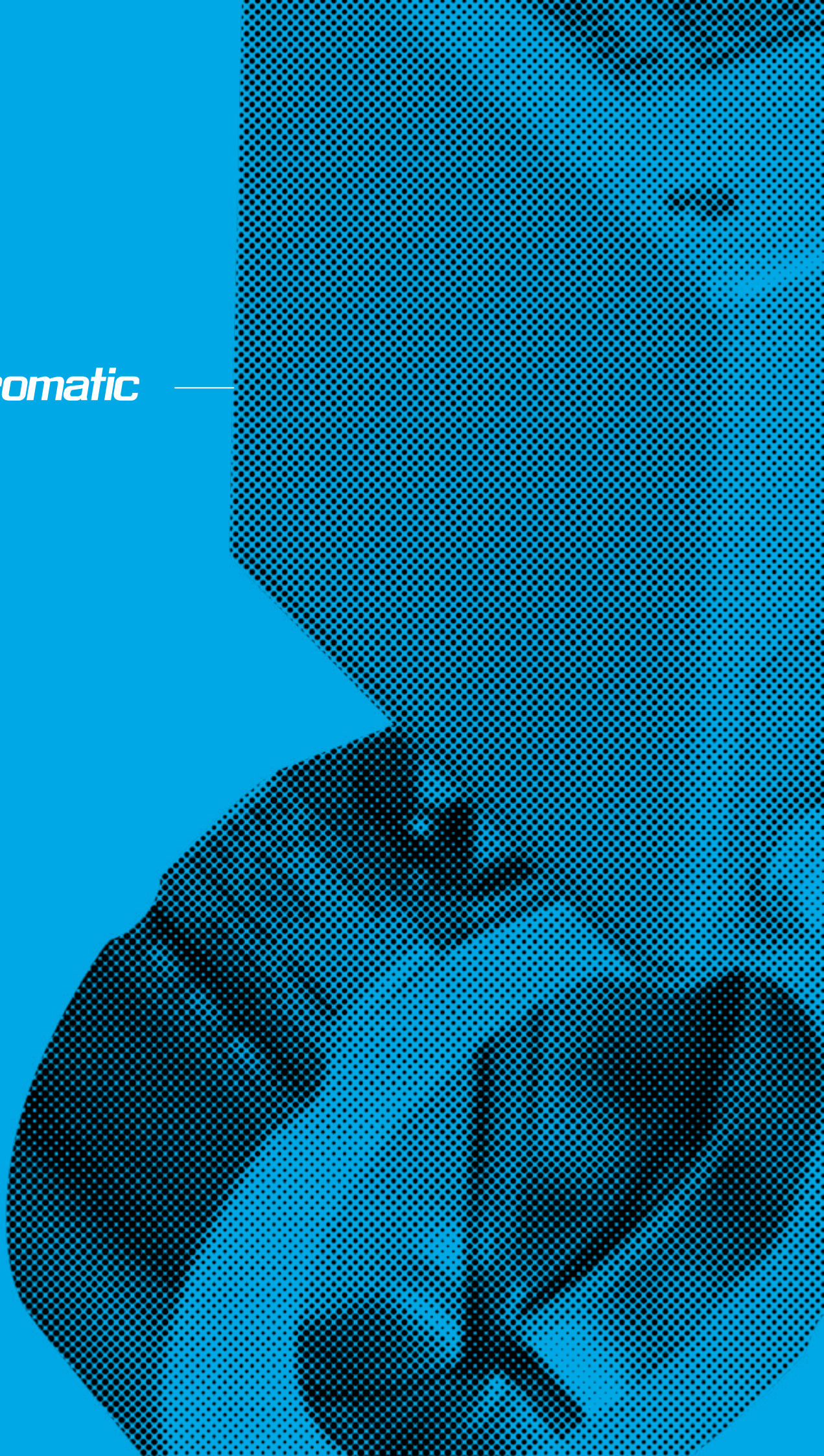
2006 The production, storage and workshop areas were increased considerably to 1500 square meters, and now include their own loading and unloading areas. The machine park was modernized with the addition of CNC lathe and milling machines; the company's management and administration personnel moved into a new building. A climate cabinet used to carry out temperature and air humidity tests, an extremely precise 3D measuring machine and test laboratories were added to the existing technical equipment.

In 2014 Agromatic Regelungstechnik GmbH began selling electric actuators and accessories under its own brand name to its own customers; until then these were sold by the previous trading partner Aris. Consequently, the well-known products continued their worldwide success under name of the original manufacturer.

2015 Agromatic Regelungstechnik GmbH successfully developed a new series of Ex-zone 1 actuators certified to ATEX and IECEx for the worldwide market. The rotary and part-turn actuator NEx operates across a torque range up to 500 Nm at user-definable positioning times. The linear actuator series of the NEx delivers up to 5000 N of force.

In 2016 Agromatic successfully introduced a fail-safe module to the market; designed in-house this module ensures the electrically powered actuator takes up a safe end position in the event the power supply fails or is disrupted.
In the same year Agromatic Regelungstechnik successfully developed an extremely high-quality but nevertheless favourable priced actuator designed to offer 25 Nm with a BLDC motor and a wide-range power supply unit.

Agromatic



# ACTUATORS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# nT 25

## Part-turn actuator



## Product features

- BLDC motor with wide-range power supply unit
- Constant positioning times under voltage fluctuations
- Constant positioning times under fluctuating loads
- Two limit switches
- Two auxiliary position switches possible
- 100% duty cycle
- BLDC control integrated in actuator
- Good holding torque
- Solid metal housing
- Maintenance-free gearing
- Operates in any position
- Wide temperature range

## Overview

A torque of 25 Nm plus various positioning times, the BLDC motor with a wide-range input and controller as standard across the series make the nT 25 a reliable actuator for a multitude of applications in process plant engineering. BLDC motors offer an unparalleled advantage with regard to endurance characteristics in the form of a long service life, which is far in excess of that possible with brushed commutator motors. Moreover, they do not generate particles through brush abrasion; this effectively avoids lubricant contamination and can as a consequence prevent gear performance deteriorating over time.

The design of the housing made of die-cast aluminium in combination with permanently lubricated gearing made of steel ensures their suitability for use in a broad range of temperatures and harsh operating environments.

# Product details

## HOUSING
- Housing and hood made of die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- Two cable entries M20×1.5 and one M12x1.5
- Protection class IP66 to DIN EN 60529
- Optional:

- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## BLDC MOTOR
- Brushless DC motor
- Constant positioning time thanks to electronic speed controller
- High holding torque when operating voltage applied
- ON time 100% duty cycle
- Insulation class A to VDE 0530

## GEARING
- Spur gearing with gears made of steel

- Helical gears improve smooth running characteristics of first gear step
- Rugged, maintenance-free
- Permanently lubricated gears
- Encapsulated version, operates in any position

## OUTPUT SHAFT
- Diameter 12 mm, with 5 mm diameter cross-hole

## ELECTRICAL CONNECTION
- Power supply: With power supply unit 90 ... 264 V AC, 50/60 Hz ± 5% and 120 ... 370 V DC; without power supply unit 24 V DC
- Connection terminals close to cable entry
- Connection terminals with push-in technology
- Conductor cross-section, solid: 0.14 mm² ... 2.5 mm²
- Conductor cross-section, flexible with ferrules: 0.25 mm² ... 1.5 mm²

## CONTROLLER
- Open/closed signal
- Control signals: 24 V DC ± 10% 24 ... 230 V AC ± 10%, 50/60 Hz ± 5%

## AMBIENT TEMPERATURE
- 0 °C to +60 °C
- -15 °C to +60 °C with heater

## REGULATING ANGLE LIMITED BY SNAP-ACTION POSITION OFF SWITCH
- Two limit switches (standard)
- All travel-dependent switches actuated by infinitely adjustable control cams
- CO switches with silver-plated contacts
- Switch connections routed to terminal strip
- Switching capacity: max. 2.5 A, 250 V AC

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)
- By means of potentiometer

- Turning range: 0 ... 300°
- By means of Hall effect absolute encoder

- Turning range: 0 ... 300°

- Supply voltage 24 V DC and

- Output signal 4 ... 20 mA or 0 ... 10 V
- By means of Transmitter 4 ... 20 mA
- Mechanical by means of lever coupling

## MANUAL OPERATION (OPTIONAL)
- By means of bracket and lever coupling

## OPTIONS
- 2 auxiliary position switches
- Potentiometer
- Hall effect absolute encoder
- Transmitter 4 ... 20 mA
- Electric anti-condensate heater
- Heating for extended temperature range

## ASSEMBLY

- **Easy to install thanks to a stable bracket**
- **No fuss coupling to valve stem by means of:**

- Hand-operated lever coupling
- Lever arm, clamp lever, ball-and-socket joint, connecting rods, sprung connecting rods
- Flexible shaft coupling
- Rigid shaft coupling

## ORDER DETAILS

- **Device type**
- **Power supply**
- **Positioning time**
- **Desired options**

- Two additional auxiliary position switches
- Potentiometers
- Hall effect absolute encoder
- Transmitter
- Mechanical position indication
- Electric anti-condensate heater for extended temperature range
- Preset limit switches and potentiometer
- Manual adjustment

- **Or order number**
- **Desired valve, where applicable**

# Technical data

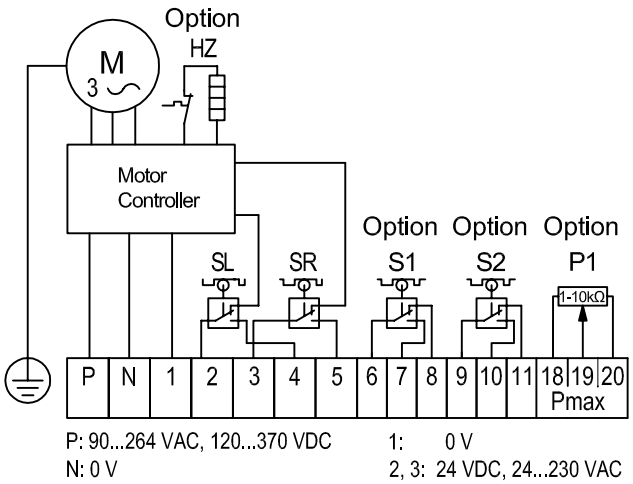
## nT 25 SERIES ACTUATORS, 90 ... 264 V AC UND 120 ... 370 V DC

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Weight | Order No. |
|---|---|---|---|---|---|---|---|
| nT 25 2506 AC/DC A | 6 s | 25 Nm | 18 W | 0 - 300° | Ø 12/ch.5 | 2,9 kg | 6100 |
| nT 25 2515 AC/DC A | 15 s | 25 Nm | 18 W | 0 - 300° | Ø 12/ch.5 | 2,9 kg | 6110 |
| nT 25 2530 AC/DC A | 30 s | 25 Nm | 18 W | 0 - 300° | Ø 12/ch.5 | 2,9 kg | 6120 |
| nT 25 2560 AC/DC A | 60 s | 25 Nm | 18 W | 0 - 300° | Ø 12/ch.5 | 2,9 kg | 6130 |

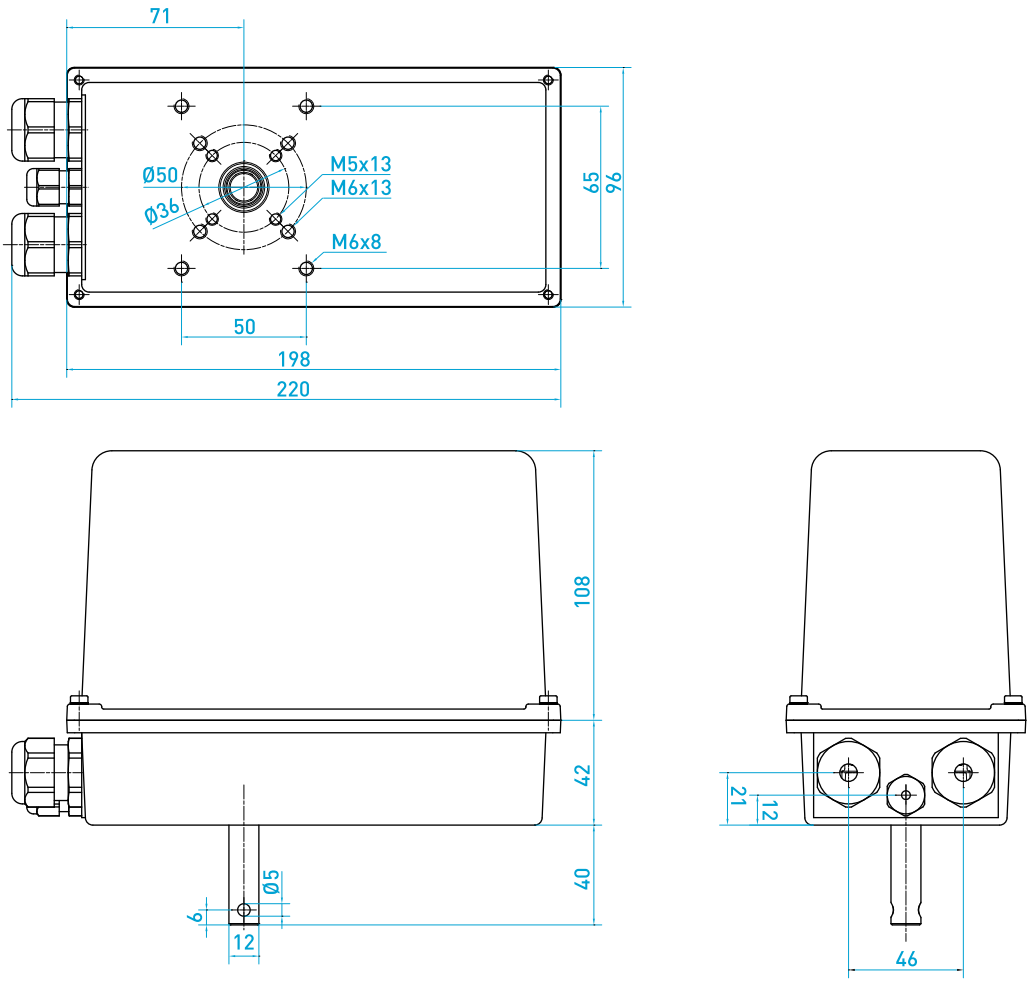
## nT 25 SERIES ACTUATORS, 24 V DC

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Weight | Order No. |
|---|---|---|---|---|---|---|---|
| nT 25 2506 DC A | 6 s | 25 Nm | 18 W | 0 - 300° | Ø 12/ch.5 | 2,9 kg | 6300 |
| nT 25 2515 DC A | 15 s | 25 Nm | 18 W | 0 - 300° | Ø 12/ch.5 | 2,9 kg | 6310 |
| nT 25 2530 DC A | 30 s | 25 Nm | 18 W | 0 - 300° | Ø 12/ch.5 | 2,9 kg | 6320 |
| nT 25 2560 DC A | 60 s | 25 Nm | 18 W | 0 - 300° | Ø 12/ch.5 | 2,9 kg | 6330 |

## SCHEMATIC DIAGRAM WIDE RANGE VOLTAGE POWER SUPPLY AC/DC



# Dimensions


71
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M5x13
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46


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Achtung!
Caution!
Attention!

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# NK

## Part-turn actuators (compact design)



## Product features

- Wide torque range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Up to four auxiliary position switches possible
- Wide selection of output shafts
- Custom shafts possible
- Solid metal housing
- Maintenance-free gearbox
- Operates in any position

## Overview

The NK series of compact actuators is designed to control smaller and smooth-running valves utilized in industrial applications.

The robust construction and metal housing made of a die-cast zinc alloy that offers protection class IP65 as well as the extremely compact design ensure these actuators are both suitable for harsh operating environments and installation in confined spaces.

When fitted with optional position indicators and TUV-approved potentiometers for electronic fuel/air ratio control systems these compact actuators are ideally suited for use in industrial furnace installations and combustion plants.

A diverse range of adapters ensure they can be easily mounted onto butterfly valves and smoothly operating ball valves.





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# Product details

## HOUSING

- Housing and hood made of corrosion-resistant die-cast zinc
- Coated, colour: RAL 7032 Pebble Grey
- One cable entry M20x1.5
- Two cable entries M16x1.5
- Protection class IP65 to DIN EN 60529
- Options:

- Custom colours
- Sealed with clear coating material and corrosion-preventative wax to improve corrosion resistance
- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## MOTOR

- Single-phase AC synchronous motor with permanent magnet, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Options:

- DC motor
- Custom voltages
- Custom frequencies

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## OUTPUT SHAFT

- Ø 10 mm, form D
- Options:

- Alternative diameters and forms to customer requirements on request

## ELECTRICAL CONNECTION

- Screw-type terminals
- Depending on the version it is possible to retrofit between one to four additional auxiliary position switches

## CONTROLS

- Open/close signals
- Options:

- Additional potential-free switching contacts
- Electronic position controller ESR-NK (integrated in actuator)
- Potentiometer 200 Ω ... 10 kΩ

## AMBIENT TEMPERATURE

- -15 °C to +60 °C
- 0 °C to +60 °C when utilizing electronic position controller ESR-NK
- Options:

- Up to +80 °C, duty cycle S3-50%
- Down to -40 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- Two limit switches
- All travel-dependent switches actuated by infinitely adjustable control cams
- CO switches with silver-plated contacts
- Switch connections routed to terminal strip
- Max. switching capacity: 2.5 A, 250 V AC
- Option:

- Switches with gold-plated contacts

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer

- Choice of wire-wound or conductive plastic potentiometer
- Tandem potentiometers possible
- It is possible to adapt the electrical angle of rotation of the potentiometer to the desired angle of rotation utilizing a gear train.
- Special potentiometers with TUV-approved form-fit attachment solution are available for electronic fuel/air ratio control.

- With 4 ... 20 mA transmitter

- Utilizing a gear train it is possible to adapt the electrical angle of rotation of the transmitter to the desired angle of rotation.

## MECHANICAL POSITION INDICATOR (OPTIONAL)

- Position indicator on hood
- Graduated scale OPEN/CLOSED, 0° ... 90°, blank or to customer specification

## MANUAL OPERATION (OPTIONAL)

- Using a handwheel it is possible to manually adjust the position of the output shaft and valve.
- Position switch-off setting is retained during manual operation.
- Handwheel remains motionless during electrical operation.

## OPTIONS

- Other voltage/frequency
- Other ambient temperature range
- Handwheel
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR-NK
- Position sensor
- Anti-condensate heater
- Relay to switch several actuators in parallel
- On the spot mechanical position indicator
- Potentiometer
- Components to UL standard

## INSTALLATION

- Easy to install thanks to a stable bracket
- Installation possible with stud bolts on request
- No fuss coupling to valve stem by means of:

- Hand-operated lever
- Lever arm, clamping lever, ball-and-socket joint, connecting rods, spring-loaded connecting rods
- Flexible shaft coupling
- Rigid shaft coupling

## ORDER DETAILS

- Device type
- Torque
- Positioning time
- Output shaft type
- Operating voltage/frequency
- Desired options
- When ordering a potentiometer:

- Resistance value
- Desired actuator angle of rotation

- Information to preset position switches and potentiometers
- Or order number
- Desired valve, where applicable

# Technical data

## ACTUATORS – NK SERIES, 230 V, 50(60) Hz (OPTIONAL 115 V, 50(60) Hz)

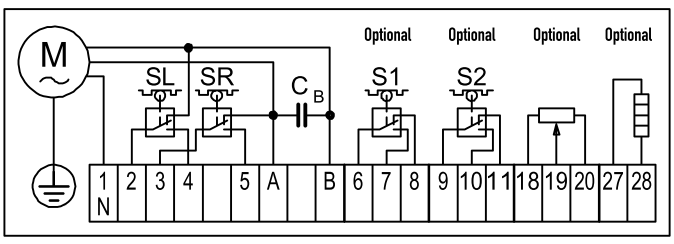
| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Weight | Order No. |
|---|---|---|---|---|---|---|---|
| NK 00803 * | 0.8(0.65) s | 3 Nm | 31 VA | 0 - 300° | 14.5/Ø 12/2-fl | 2.9 kg | 8060 |
| NK 0302 | 3(2.5) s | 2 Nm | 7 VA | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8020 |
| NK 0305 * | 3(2.5) s | 5 Nm | 18 VA | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8030 |
| NK 0310 * | 3(2.5) s | 10 Nm | 31 VA | 0 - 300° | 30/Ø 10/D/25 | 2.6 kg | 8040 |
| NK 1510 | 15(13) s | 10 Nm | 7 VA | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8002 |
| NK 3010 | 30(25) s | 10 Nm | 7 VA | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8003 |
| NK 6010 | 60(50) s | 10 Nm | 7 VA | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8004 |
| NK 0315 * | 3(2.5) s | 15 Nm | 31 VA | 0 - 300° | 30/Ø 10/D/25 | 2.6 kg | 8045 |
| NK 1515 * | 15(13) s | 15 Nm | 18 VA | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8002 |
| NK 3015 | 30(25) s | 15 Nm | 7 VA | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8003 |
| NK 6015 | 60(50) s | 15 Nm | 7 VA | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8004 |

*: duty cycle S3-50%

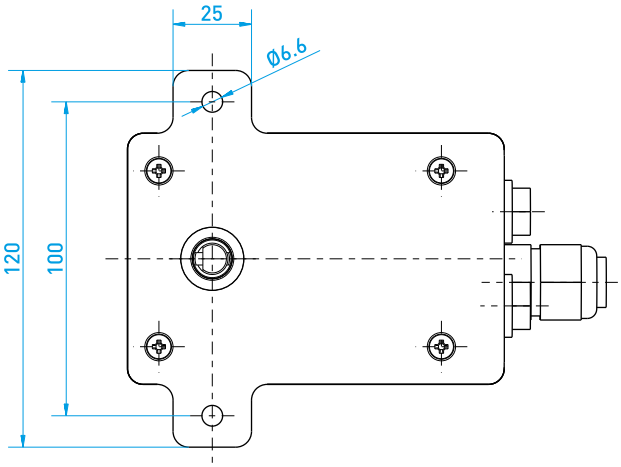
## ACTUATORS – NK DC SERIES, 24 V

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Weight | Order No. |
|---|---|---|---|---|---|---|---|
| NK DC0310 | 3 s | 10 Nm | 27 W | 0 - 300° | 30/Ø 10/D/25 | 2.6 kg | 8065 |
| NK DC0315 | 3 s | 15 Nm | 27 W | 0 - 300° | 30/Ø 10/D/25 | 2.6 kg | 8068 |
| NK DC0710 | 7 s | 10 Nm | 12 W | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8070 |
| NK DC0715 | 7 s | 15 Nm | 27 W | 0 - 300° | 30/Ø 10/D/25 | 2.6 kg | 8072 |
| NK DC3010 | 30 s | 10 Nm | 5 W | 0 - 300° | 30/Ø 10/D/25 | 2.5 kg | 8074 |

## SCHEMATIC DIAGRAM STANDARD AC

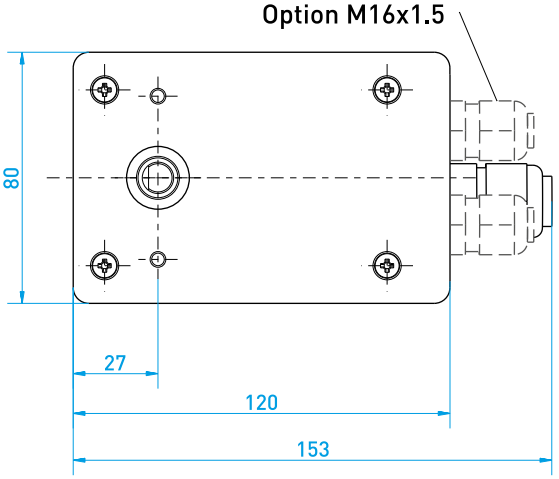


# Dimensions

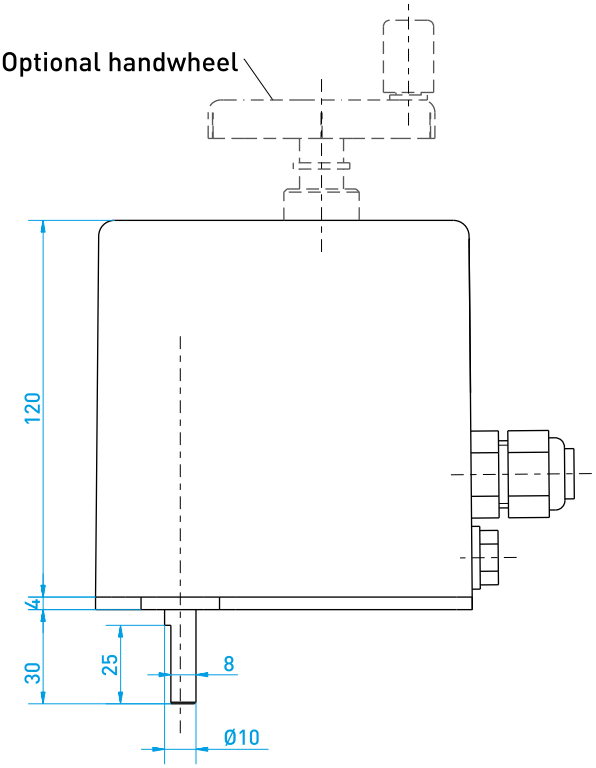



Option without lugs / with stud bolt underneath

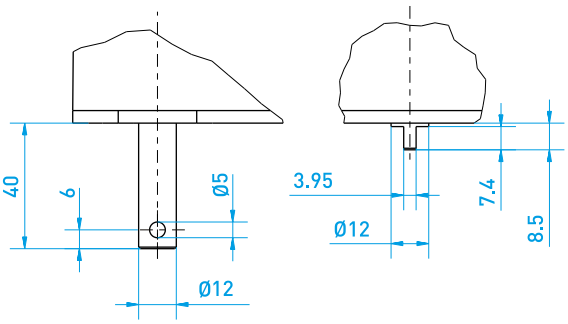
Option M16x1.5

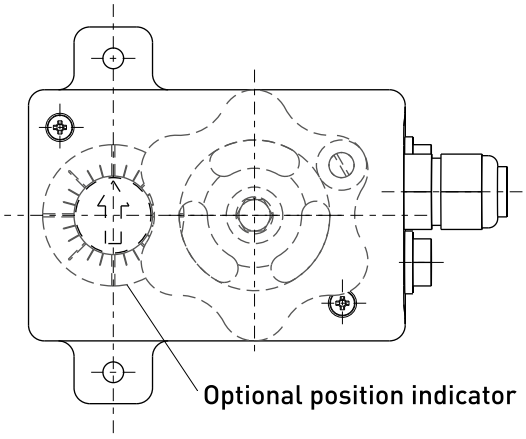



Optional handwheel




Additional shafts – versions



Optional position indicator


Achtung!
Caution!
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Agromatic.
Typ: NL-3020
S/N: 1408-6128-02001
(AC) 230V 50/60Hz 78mA 18VA
90° 30(25)s 20Nm (JT-15/+60°C IP65
Baujahr/Year Built: 2014
Agromatic Regelungstechnik GmbH
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+49 5202 9739-284
www.agromatic.de
Made in Germany

# NL

## Rotary and part-turn actuators



## Product features

- Wide torque range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Max. two additional auxiliary position switches possible
- Electronic position controller integrated in actuator
- Wide selection of output shafts
- Custom shafts possible
- Solid metal housing
- Maintenance-free gearbox
- Operates in any position

## Overview

The NL series is a favourably priced solution for applications in process plant engineering.
The wide range of torques from 1 Nm through to 120 Nm ensures the NL series of actuators is a reliable solution for a multitude of applications.

The design of the housing made of die-cast aluminium and die-cast zinc in combination with a permanently lubricated gearbox made of steel with sintered-bronze bearing bushes ensure their suitability for use in a broad range of temperatures and harsh operating environments.

Utilizing an (optional) ESR-NL electronic position controller can simplify integrating rotary and part-turn actuators into the controls of complex systems.





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# Product details

## HOUSING

- Housing made of die-cast zinc
- Hood (height 92 mm) made of corrosion-resistant die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- Three cable entries M20x1.5
- Protection class IP54 to DIN EN 60529
- Options:

- Protection classes IP65/IP66
- Custom colours
- Sealed with clear coating material and corrosion-preventative wax to improve corrosion resistance
- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## MOTOR

- Single-phase AC synchronous motor with permanent magnet, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Options:

- Custom voltages
- Custom frequencies

## GEARBOX

- Spur gearing with straight-toothed steel gears integrated in housing
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position
- Internal release mechanism mechanically disengages coupling between motor and gearbox

## OUTPUT SHAFT

**8 Nm, 20 Nm, 40 Nm**

- Output shaft with square socket WAF 14 mm (F05 to DIN ISO 5211)
- Options:

- Ø 12 mm, with Ø 5 mm cross-hole
- Ø 12 mm with feather key
- Other output shafts on request

**60 Nm, 80 Nm, 100 Nm, 120 Nm**

- Output shaft with square socket WAF 17 mm (F07 to DIN ISO 5211)
- Options:

- Ø 20 mm, with Ø 8 mm cross-hole
- Ø 20 mm with feather key
- Other output shafts on request

## ELECTRICAL CONNECTION

- Connection terminals positioned centrally close to cable entry
- Screw-type terminals
- It is possible to retrofit up to two additional auxiliary position switches

## CONTROLS

- Open/close signals
- Options:

- Two additional potential-free switching contacts
- Electronic position controller ESR-NL (integrated in actuator)
- Potentiometer 200 Ω ... 10 kΩ

## AMBIENT TEMPERATURE

- -15 °C to +60 °C
- 0 °C to +60 °C when utilizing electronic position controller ESR-NL
- Options:

- Up to +80 °C, duty cycle S3-50%
- Down to -40 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- Two limit switches (standard)
- All travel-dependent switches actuated by infinitely adjustable control cams
- No tools required to adjust control cams
- CO switches with silver-plated contacts
- Switch connections routed to terminal strip
- Max. switching capacity: 6 A, 250 V AC
- Option:

- Switches with gold-plated contacts

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer

- Choice of wire-wound or conductive plastic potentiometer
- Multiturn potentiometer up to 10 turns
- It is possible to adapt the electrical angle of rotation of the potentiometer to the desired angle of rotation utilizing a gear train.
- Special potentiometers with TUV-approved form-fit attachment solution are available for electronic fuel/air ratio control.

- With 4 ... 20 mA transmitter

- Utilizing a gear train it is possible to adapt the electrical angle of rotation of the transmitter to the desired angle of rotation.

## MECHANICAL POSITION INDICATOR (OPTIONAL)

- Position indicator on hood
- Graduated scale OPEN/CLOSED, 0° ... 90°, blank or to customer specification

## MANUAL OPERATION (OPTIONAL)

- Using a handwheel it is possible to manually adjust the position of the output shaft and valve.
- Position switch-off setting is retained during manual operation.
- Handwheel remains motionless during electrical operation.

## OPTIONS

- Other voltage/frequency
- Other ambient temperature range
- Higher protection class
- Handwheel
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller
- Position sensor
- Anti-condensate heater
- On the spot mechanical position indicator
- Potentiometer
- Components to UL standard

## INSTALLATION

- Easy to mount thanks to stable angle bracket/ISO bracket to DIN EN 5211
- No fuss coupling to valve stem by means of:

- Hand-operated lever
- Lever arm, clamping lever, ball-and-socket joint, connecting rods, sprung connecting rods
- Flexible shaft coupling
- Rigid shaft coupling

## ORDER DETAILS

- Device type
- Torque
- Positioning time
- Output shaft type
- Operating voltage /frequency
- Desired options
- When ordering potentiometers:

- Resistance value
- Desired actuator angle of rotation

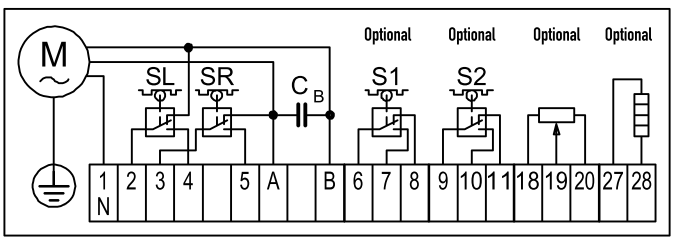
- Presetting information for position switches and potentiometer
- Or order number
- Desired valve, where applicable

# Technical data

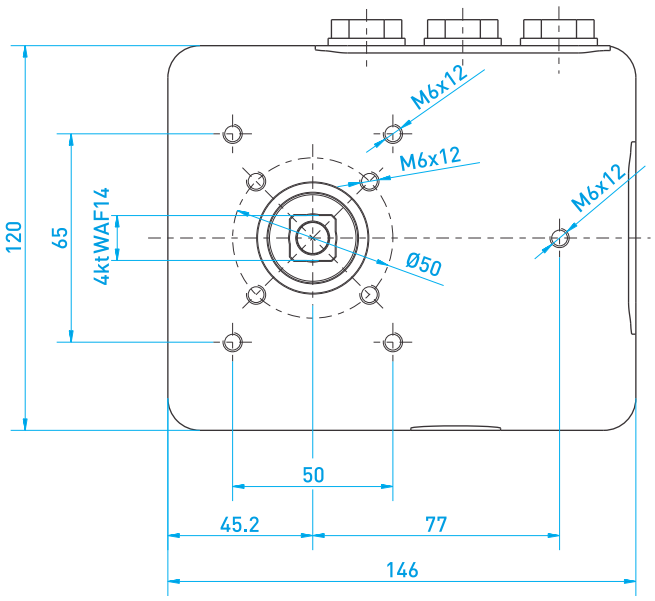
## ACTUATORS – NL SERIES, 230 V, 50(60) Hz (OPTIONAL: 115 V, 50(60) Hz)

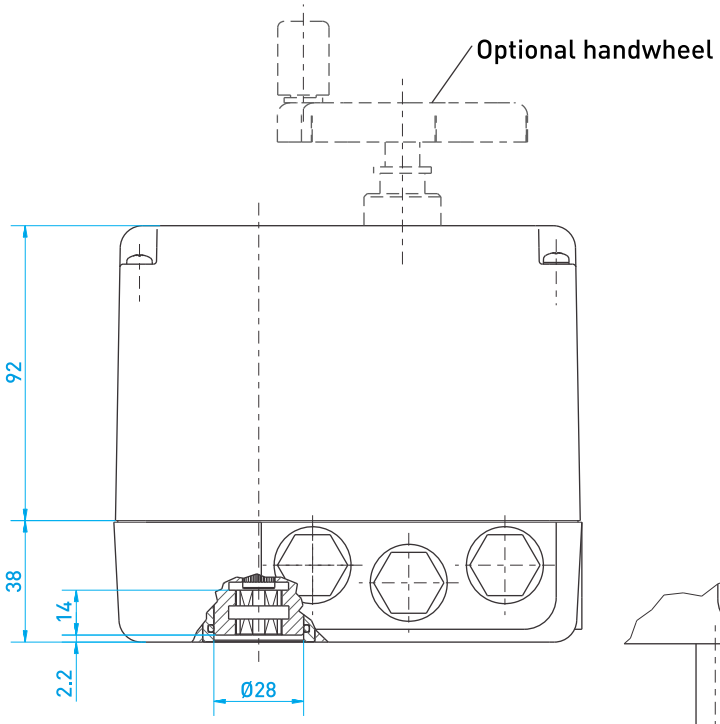
| Type | Positioning time 90° | Torque | Power | Turning rangee | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| NL 0608 | 6 s | 8 Nm | 18 VA | 0 - 330° | F05/WAF14 | 92 mm | 3.4 kg | 5006 |
| NL 1520 | 15 s | 20 Nm | 18 VA | 0 - 330° | F05/WAF14 | 92 mm | 3.4 kg | 5015 |
| NL 3020 | 30 s | 20 Nm | 18 VA | 0 - 330° | F05/WAF14 | 92 mm | 3.4 kg | 5030 |
| NL 6020 | 60 s | 20 Nm | 7 VA | 0 - 330° | F05/WAF14 | 92 mm | 3.1 kg | 5060 |
| NL 3040 | 30 s | 40 Nm | 18 VA | 0 - 330° | F05/WAF14 | 92 mm | 3.4 kg | 5070 |
| NL 6040 | 60 s | 40 Nm | 7 VA | 0 - 330° | F05/WAF14 | 92 mm | 3.5 kg | 5071 |
| | | | | Optionally up to 10 turns | | | | |
| NL 45/60 | 45 s | 60 Nm | 18 VA | 5 - 110° | F07/WAF17 | 92 mm | 5.4 kg | 5090 |
| NL 18/80 | 18 s | 80 Nm | 31 VA | 5 - 110° | F07/WAF17 | 92 mm | 4.9 kg | 5095 |
| NL 45/100 | 45 s | 100 Nm | 18 VA | 5 - 110° | F07/WAF17 | 92 mm | 4.9 kg | 5097 |
| NL 45/120 | 45 s | 120 Nm | 31 VA | 5 - 110° | F07/WAF17 | 92 mm | 4.9 kg | 5099 |
| NL 90/100 | 90 s | 100 Nm | 18 VA | 5 - 110° | F07/WAF17 | 92 mm | 4.9 kg | 5100 |
| NL 90/120 | 90 s | 120 Nm | 31 VA | 5 - 110° | F07/WAF17 | 92 mm | 4.9 kg | 5105 |
| | | | | Optionally up to 3 turns | | | | |

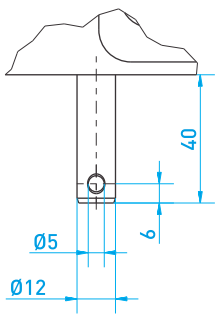
## SCHEMATIC DIAGRAM STANDARD AC



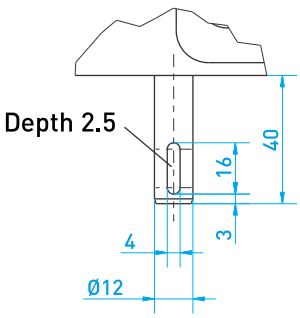
# Dimensions




Optional shaft coupling with drilled hole




Optional shaft coupling with feather key


Agromatic

# N1-N4A

## Rotary and part-turn actuators



## Product features

- Wide torque range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Large number of auxiliary position switches possible
- Electronic position controller ESR-N integrated in actuator
- Wide selection of output shafts
- Custom shafts possible
- Solid metal housing
- Maintenance-free gearbox
- Operates in any position

## Overview

The N series is the standard series with a wide range of options within the Agromatic program of products. The wide range of torques from 1 Nm through to 60 Nm and numerous options ensure the N series is the optimum solution for applications in process plant engineering.

The design of the housing made of die-cast aluminium and die-cast zinc in combination with a permanently lubricated gearbox made of steel with sintered-bronze bearing bushes ensure their suitability for use in a broad range of temperatures and harsh operating environments.

Utilizing an (optional) ESR-N electronic position controller can simplify integrating rotary and part-turn actuators into the controls of complex plant and systems.





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# Product details

## HOUSING

- Housing made of die-cast zinc
- Hood made of corrosion-resistant, die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- Three cable entries M20x1.5
- Protection class IP54 to DIN EN 60529
- Options:

- Protection classes IP65/IP66/IP67
- Custom colours
- Sealed with clear coating material and corrosion-preventative wax to improve corrosion resistance
- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## MOTOR

- Single-phase AC synchronous motor with permanent magnet, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Tropical insulation
- Options:

- Three-phase motor
- DC motor
- Custom voltages
- Custom frequencies

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## OUTPUT SHAFT

**N1 – N4**

- Ø 12 mm, with Ø 5 mm cross-hole
- Options:

- Ø 12 mm with feather key
- Output shaft with square socket WAF 14 mm (F05 to DIN ISO 5211)
- Other output shafts on request

**N4 A**

- Ø 14 mm, with Ø 6 mm cross-hole
- Options:

- Ø 14 mm with feather key
- Output shaft with square socket WAF 14 mm (F05 to DIN ISO 5211)
- Other output shafts on request

## ELECTRICAL CONNECTION

- Connection terminals positioned centrally close to cable entry
- Screw-type terminals
- Two free slots to retrofit additional auxiliary position switches
- Additional PCB terminals ensure retrofitting systems extensions is fully unproblematic

## CONTROLS

- Open/close signals
- Options:

- Additional potential-free contacts
- Electronic position controller ESR-N (integrated in actuator or external)
- Potentiometer 200 Ω ... 10 kΩ
- Electromechanical emergency torque limit switch shuts off the motor in the event a blockage occurs

## AMBIENT TEMPERATURE

- -15 °C to +60 °C
- 0 °C to +60 °C when utilizing electronic position controller ESR-N
- Options:

- Up to +80 °C, duty cycle S3-50%
- Down to -40 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCHN

- Two limit switches (standard)
- All travel-dependent switches actuated by infinitely adjustable control cams
- CO switches – silver-plated contacts
- Switch connections routed to terminal strip
- Max. switching capacity: 6 A, 250 V AC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts
- Switches designed for higher temperatures

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer

- Choice of wire-wound or conductive plastic potentiometer
- Multiturn potentiometer up to 10 turns
- Up to three potentiometers possible
- It is possible to adapt the electrical angle of rotation of the potentiometer to the desired angle of rotation utilizing a gearbox.

- With 4 ... 20 mA transmitter

- Utilizing a gearbox it is possible to adapt the electrical angle of rotation of the transmitter to the desired angle of rotation.

## MECHANICAL POSITION INDICATOR (OPTIONAL)

- Position indicator on hood
- Graduated scale OPEN/CLOSED, 0° ... 90°, blank or to customer specification

## MANUAL OPERATION (OPTIONAL)

- Using a handwheel it is possible to manually adjust the position of the output shaft and valve.
- Disengaging the gearbox and motor reduces the amount of force required.
- Position switch-off setting is retained during manual operation.
- Handwheel remains motionless during electrical operation.

## OPTIONS

- Other voltage/frequency
- Other ambient temperature range
- Higher protection class
- Handwheel
- Gearbox disengages manually
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller
- Position sensor
- Anti-condensate heater
- Relay
- Pulse relay
- Relays to switch several actuators in parallel
- On the spot mechanical position indicator
- Potentiometer
- Components to UL standard

## INSTALLATION

- Easy to mount thanks to stable angle bracket/ ISO bracket to DIN EN 5211
- No fuss coupling to valve stem by means of:

- Hand-operated lever
- Lever arm, clamping lever, ball-and-socket joint, connecting rods, sprung connecting rods
- Flexible shaft coupling
- Rigid shaft coupling

## ORDER DETAILS

- Device type
- Torque
- Positioning time
- Output shaft type
- Operating voltage /frequency
- Desired options
- When ordering potentiometers:

- Resistance value
- Desired angle of rotation of actuator

- Presetting information for position switches and potentiometer
- Or order number
- Desired valve, where applicable

# Technical data

## ACTUATORS – N1 - N4 A SERIES, 230 V, 50(60) Hz (OPTIONAL: 115 V, 50(60) Hz AND 24 V, 50(60) Hz)

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N1 | 15(13) s | 5 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.45 kg | 110040 |
| N1 | 30(25) s | 9 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.45 kg | 110050 |
| N1 | 60(50) s | 15 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.45 kg | 110060 |
| N1 | 120(100) s | 30 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.45 kg | 110070 |
| | | | | Optionally up to 300 turns | | | | |
| N2 | 15(13) s | 7 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 110110 |
| N2 | 30(25) s | 11 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 110120 |
| N2 | 60(50) s | 17 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 110130 |
| N2 | 120(100) s | 35 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 110140 |
| | | | | Optionally up to 300 turns | | | | |
| N2 A | 6(5) s | 3 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 110160 |
| N2 A | 15(13) s | 7 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 110170 |
| N2 A | 30(25) s | 13 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 110180 |
| N2 A | 60(50) s | 21 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3,55 kg | 110190 |
| | | | | Optionally up to 300 turns | | | | |
| N2 B | 25(21) s | 25 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.85 kg | 110210 |
| N2 B | 45(38) s | 25 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.65 kg | 110220 |
| N2 B | 60(50) s | 25 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.40 kg | 110230 |
| | | | | Optionally up to 300 turns | | | | |
| N3 | 6(5) s | 15 Nm | 31 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.85 kg | 110250 |
| N3 | 15(13) s | 15 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 110260 |
| N3 | 30(25) s | 30 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.85 kg | 110270 |
| N3 | 60(50) s | 35 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.65 kg | 110280 |
| N3 | 120(100) s | 40 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 110290 |
| | | | | Optionally up to 300 turns | | | | |
| N4 | 6(5) s | 40 Nm | 35 VA | 0 - 330° | Ø 12/40/CH5 | 28 mm+120 | 5.05 kg | 110310 |
| N4 | 12(10) s | 40 Nm | 31 VA | 0 - 330° | Ø 12/40/CH5 | mm | 3.95 kg | 110320 |
| N4 | 25(21) s | 40 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.85 kg | 110330 |
| N4 | 60(50) s | 40 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.85 kg | 110340 |
| | | | | Optionally up to 300 turns | | 92 mm | | |
| N4 A | 8(7) s | 60 Nm | 47 VA | 0 - 330° | Ø 14/40/CH6 | | 5.85 kg | 110370 |
| N4 A | 15(13) s | 60 Nm | 31 VA | 0 - 330° | Ø 14/40/CH6 | 176 mm | 3.95 kg | 110380 |
| N4 A | 25(21) s | 60 Nm | 18 VA | 0 - 330° | Ø 14/40/CH6 | 92 mm | 3.85 kg | 110390 |
| N4 A | 60(50) s | 60 Nm | 18 VA | 0 - 330° | Ø 14/40/CH6 | 92 mm | 3.85 kg | 110400 |
| N4 A | 120(100) s | 60 Nm | 7 VA | 0 - 330° | Ø 14/40/CH6 | 92 mm | 3.75 kg | 110410 |
| | | | | Optionally up to 300 turns | | 92 mm | | |

## ACTUATORS – N1 DC - N2 A-DC SERIES, 24 V DC

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N1 DC | 3 s | 4 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.55 kg | 110610 |
| N1 DC | 6 s | 7 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.55 kg | 110620 |
| N1 DC | 12 s | 16 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.55 kg | 110630 |
| N1 DC | 25 s | 16 Nm | 5 W | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.45 kg | 110640 |
| N1 DC | 60 s | 20 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.55 kg | 110650 |
| N1 DC | 120 s | 20 Nm | 5 W | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.45 kg | 110660 |
| | | | | Optionally up to 300 turns | | | | |
| N2 DC | 1.5 s | 3 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.55 kg | 110680 |
| N2 DC | 3 s | 7 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.55 kg | 110690 |
| N2 DC | 6 s | 12 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.55 kg | 110700 |
| N2 DC | 12 s | 20 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.55 kg | 110710 |
| | | | | Optionally up to 300 turns | | | | |
| N2 A-DC | 1.5 s | 6 Nm | 21 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.85 kg | 110730 |
| N2 A-DC | 3 s | 12 Nm | 21 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.85 kg | 110740 |
| N2 A-DC | 6 s | 20 Nm | 21 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.85 kg | 110750 |
| | | | | Optionally up to 300 turns | | | | |
| N2 B-DC | 25 s | 25 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.75 kg | 110770 |
| N2 B-DC | 45 s | 25 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.75 kg | 110780 |
| N2 B-DC | 90 s | 25 Nm | 5 W | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.65 kg | 110790 |
| | | | | Optionally up to 300 turns | | | | |
| N3 DC | 6 s | 30 Nm | 21 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.95 kg | 110830 |
| N3 DC | 12 s | 30 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.95 kg | 110840 |
| N3 DC | 25 s | 30 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.95 kg | 110850 |
| N3 DC | 45 s | 30 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.95 kg | 110860 |
| N3 DC | 90 s | 30 Nm | 5 W | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.65 kg | 110880 |
| | | | | Optionally up to 300 turns | | | | |
| N4 DC | 4 s | 40 Nm | 38 W | 0 - 330° | Ø 12/40/CH5 | 176 mm | 5.25 kg | 110900 |
| N4 DC | 6 s | 40 Nm | 38 W | 0 - 330° | Ø 12/40/CH5 | 176 mm | 5.25 kg | 110910 |
| N4 DC | 12 s | 40 Nm | 21 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.95 kg | 110920 |
| N4 DC | 25 s | 40 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.75 kg | 110930 |
| N4 DC | 45 s | 40 Nm | 11 W | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.75 kg | 110940 |
| N4 DC | 90 s | 40 Nm | 5 W | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.65 kg | 110950 |
| | | | | Optionally up to 300 turns | | | | |

## ACTUATORS – N1 DC - N2 A-DC SERIES, 24 V DC

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N4 A-DC | 4 s | 60 Nm | 38 W | 0 - 330° | Ø 14/40/CH6 | 176 mm | 5.35 kg | 110980 |
| N4 A-DC | 6 s | 60 Nm | 38 W | 0 - 330° | Ø 14/40/CH6 | 176 mm | 5.35 kg | 110990 |
| N4 A-DC | 12 s | 60 Nm | 38 W | 0 - 330° | Ø 14/40/CH6 | 176 mm | 5.35 kg | 111000 |
| N4 A-DC | 25 s | 60 Nm | 11 W | 0 - 330° | Ø 14/40/CH6 | 120 mm | 3.85 kg | 111010 |
| N4 A-DC | 45 s | 60 Nm | 11 W | 0 - 330° | Ø 14/40/CH6 | 120 mm | 3.85 kg | 111020 |
| N4 A-DC | 90 s | 60 Nm | 5 W | 0 - 330° | Ø 14/40/CH6 | 92 mm | 3.75 kg | 111030 |
| | | | | Optionally up to 300 turns | | | | |

## ACTUATORS – N1 DS - N4 A-DS SERIES, 400 V, 50(60) Hz

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N1 DS | 15(13 )s | 5 Nm | 23 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111780 |
| N1 DS | 30(25) s | 9 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111790 |
| N1 DS | 65(54) s | 15 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111800 |
| N1 DS | 130(108) s | 30 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111810 |
| | | | | Optionally up to 300 turns | | | | |
| N2 DS | 15(13) s | 6 Nm | 23 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111850 |
| N2 DS | 30(25) s | 11 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111860 |
| N2 DS | 65(54) s | 17 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111870 |
| N2 DS | 130(108) s | 35 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111880 |
| | | | | Optionally up to 300 turns | | | | |
| N2 A-DS | 6(5) s | 3 Nm | 23 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111900 |
| N2 A-DS | 15(13) s | 7 Nm | 23 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111910 |
| N2 A-DS | 30(25) s | 13 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111920 |
| N2 A-DS | 65(54) s | 21 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.4 kg | 111930 |
| | | | | Optionally up to 300 turns | | | | |
| N3 DS | 4(3) s | 15 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 111940 |
| N3 DS | 8(7) s | 15 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 111950 |
| N3 DS | 15(13) s | 15 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 111960 |
| N3 DS | 30(25) s | 30 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 111970 |
| N3 DS | 65(54) s | 35 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 111980 |
| N3 DS | 130(108) s | 40 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 111990 |
| | | | | Optionally up to 300 turns | | | | |

## ACTUATORS – N1 DS - N4 A-DS SERIES, 400 V, 50(60) Hz

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N4 DS | 6(5) s | 40 Nm | 36 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 4.0 kg | 112010 |
| N4 DS | 15(13) s | 40 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 112020 |
| N4 DS | 30(25) s | 40 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 112030 |
| N4 DS | 65(54) s | 40 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 112040 |
| N4 DS | 130(108) s | 40 Nm | 19 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.6 kg | 112050 |
| | | | | Optionally up to 300 turns | | | | |
| N4 A-DS | 6(5) s | 60 Nm | 44 VA | 0 - 330° | Ø 14/40/CH6 | 148 mm | 4.8 kg | 112070 |
| N4 A-DS | 15(13) s | 60 Nm | 19 VA | 0 - 330° | Ø 14/40/CH6 | 120 mm | 3.7 kg | 112080 |
| N4 A-DS | 30(25) s | 60 Nm | 19 VA | 0 - 330° | Ø 14/40/CH6 | 120 mm | 3.7 kg | 112090 |
| N4 A-DS | 50(42) s | 60 Nm | 27 VA | 0 - 330° | Ø 14/40/CH6 | 92 mm | 3.7 kg | 112100 |
| N4 A-DS | 130(108) s | 60 Nm | 19 VA | 0 - 330° | Ø 14/40/CH6 | 120 mm | 3.7 kg | 112110 |
| | | | | Optionally up to 300 turns | | | | |

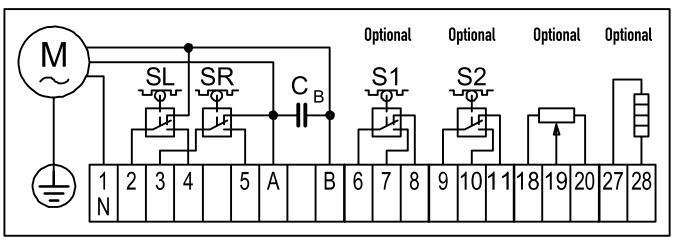
## ACTUATORS – N1 - N4 A SERIES, 230 V, 50(60) Hz (OPTIONAL: 115 V, 50(60) Hz AND 24 V, 50(60) Hz)

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N AS-10 | 1.8(1.5) s | 1 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 111200 |
| N AS-10 | 3.2(2.6) s | 2 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 111210 |
| N AS-10 | 6.3(5.3) s | 3 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 111220 |
| N AS-10 | 9.5(8) s | 5 Nm | 7 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.55 kg | 111230 |
| | | | | Optionally up to 300 turns | | | | |
| N AS-11 | 1.2(1) s | 1.5 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111235 |
| N AS-11 | 1.8(1.5) s | 2 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111240 |
| N AS-11 | 3.2(2.6) s | 4 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111250 |
| N AS-11 | 6.3(5.3) s | 8 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111260 |
| N AS-11 | 9.5(8) s | 10 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111270 |
| | | | | Optionally up to 300 turns | | | | |
| N AS-12 | 0.6(0.5) s | 1 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111290 |
| N AS-12 | 1.2(1) s | 2 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111300 |
| N AS-12 | 1.8(1.5) s | 4 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111310 |
| N AS-12 | 3.2(2.6) s | 8 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111320 |
| N AS-12 | 6.3(5.3) s | 12 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111330 |
| N AS-12 | 9.5(8) s | 20 Nm | 18 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.75 kg | 111340 |
| | | | | Optionally up to 300 turns | | | | |

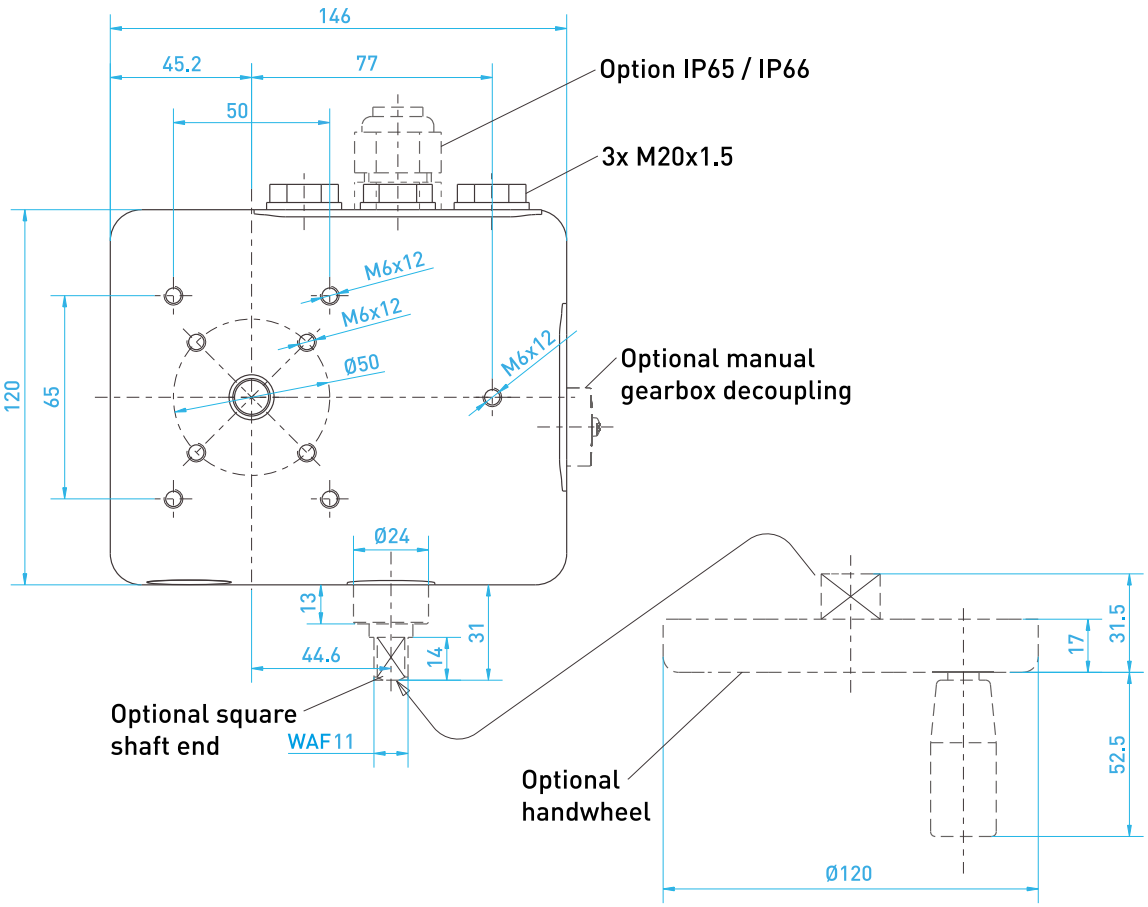
## ACTUATORS – N1 - N4 A SERIES, 230 V, 50(60) Hz (OPTIONAL: 115 V, 50(60) Hz AND 24 V, 50(60) Hz)

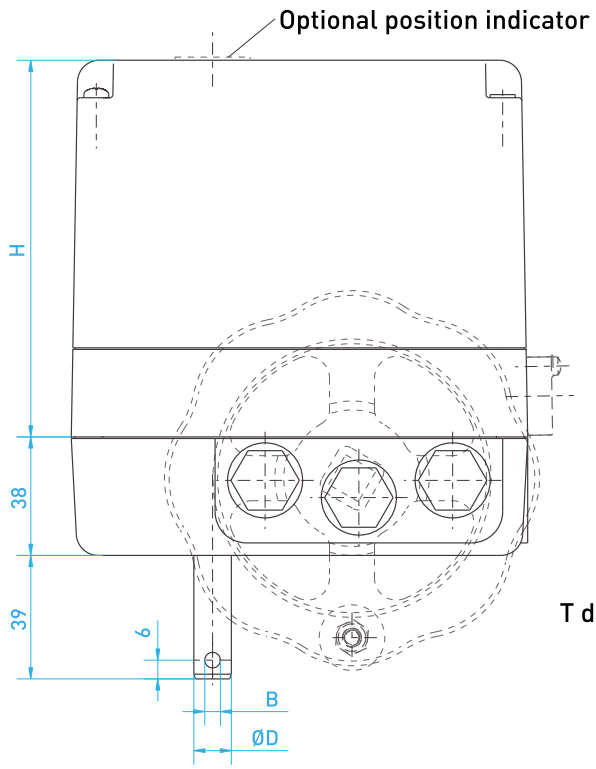
| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N AS-13 | 0.6(0.5) s | 2 Nm | 31 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.85 kg | 111350 |
| N AS-13 | 1.2(1) s | 4 Nm | 31 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.85 kg | 111360 |
| N AS-13 | 1.8(1.5) s | 8 Nm | 31 VA | 0 - 330° | Ø 12/40/CH5 | 92 mm | 3.85 kg | 111370 |
| N AS-13 | 3.2(2.6) s | 16 Nm | 31 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.85 kg | 111380 |
| N AS-13 | 6.3(5.3) s | 20 Nm | 31 VA | 0 - 330° | Ø 12/40/CH5 | 120 mm | 3.85 kg | 111390 |
| | | | | Optionally up to 300 turns | | | | |
| N AS-14 | 0.3(0.25) s | 2 Nm | 35 VA | 0 - 330° | Ø 12/40/CH5 | 28 mm+120 mm | 4.75 kg | 111410 |
| N AS-14 | 0.45(0.4) s | 4 Nm | 35 VA | 0 - 330° | Ø 12/40/CH5 | 28 mm+120 mm | 4.75 kg | 111420 |
| N AS-14 | 0.8(0.65) s | 7 Nm | 35 VA | 0 - 330° | Ø 12/40/CH5 | 28 mm+120 mm | 4.75 kg | 111430 |
| N AS-14 | 1.6(1.3) s | 12 Nm | 35 VA | 0 - 330° | Ø 12/40/CH5 | 28 mm+120 mm | 4.75 kg | 111440 |
| N AS-14 | 2.4(2) s | 18 Nm | 35 VA | 0 - 330° | Ø 12/40/CH5 | 28 mm+120 mm | 4.75 kg | 111450 |
| N AS-14 | 4(3.3) s | 20 Nm | 35 VA | 0 - 330° | Ø 12/40/CH5 | 28 mm+120 mm | 4.75 kg | 111460 |
| | | | | Optionally up to 300 turns | | | | |
| N AS-15 | 0.15(0.12) s | 2 Nm | 47 VA | 0 - 330° | Ø 12/40/CH5 | 176 mm | 5.65 kg | 111480 |
| N AS-15 | 0.3(0.25) s | 4 Nm | 47 VA | 0 - 330° | Ø 12/40/CH5 | 176 mm | 5.65 kg | 111490 |
| N AS-15 | 0.45(0.38) s | 6 Nm | 47 VA | 0 - 330° | Ø 12/40/CH5 | 176 mm | 5.65 kg | 111500 |
| N AS-15 | 0.8(0.65) s | 10 Nm | 47 VA | 0 - 330° | Ø 12/40/CH5 | 176 mm | 5.65 kg | 111510 |
| N AS-15 | 1.6(1.3) s | 18 Nm | 47 VA | 0 - 330° | Ø 12/40/CH5 | 176 mm | 5.65 kg | 111520 |
| N AS-15 | 2.4(2) s | 20 Nm | 47 VA | 0 - 330° | Ø 12/40/CH5 | 176 mm | 5.65 kg | 111530 |
| | | | | Optionally up to 300 turns | | | | |

## SCHEMATIC DIAGRAM STANDARD AC

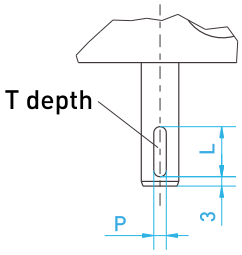


# Dimensions

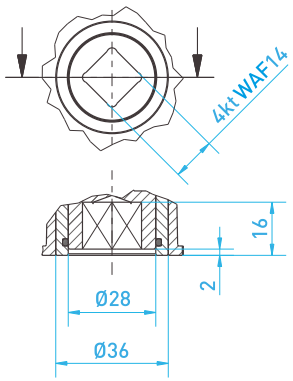



| Type | Positioning time | H | D | B | P | L | T |
|---|---|---|---|---|---|---|---|
| N1 - N3 | All | 92 | 12 | 5 | 4 | 16 | 2.5 |
| N4 | 12-120s / 90° | 92 | 12 | 5 | 4 | 16 | 2.5 |
| | 6s / 90° | 176 | 12 | 5 | 4 | 16 | 2.5 |
| N4 A | 15-120s / 90° | 92 | 14 | 6 | 5 | 22 | 3 |
| | 8s / 90° | 176 | 14 | 6 | 5 | 22 | 3 |




Feather key option




Optional ISO flange F05


Agromatic

# N5 - N6

## Rotary and part-turn actuators



## Product features

- Wide torque range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Large number of position switches possible
- Electronic position controller ESR-N integrated in actuator
- Wide selection of output shafts
- Custom shafts possible
- Solid metal housing
- Maintenance-free gearbox
- Operates in any position

## Overview

To increase the torque of N5 and N6 series solutions an additional gearbox is added to N1 to N4 series actuators. This increases the available torque range to between 80 Nm and 180 Nm.

The numerous options and actuators based on the same electrical design common to series N1 to N4 A ensure the N series is the optimum solution for applications in process plant engineering.

The design of the housing made of die-cast aluminium and die-cast zinc in combination with a permanently lubricated gearbox made of steel with sintered-bronze bearing bushes ensure their suitability for use in a broad range of temperatures and harsh operating environments.

Utilizing an (optional) ESR-N electronic position controller can simplify integrating rotary and part-turn actuators into the controls of complex plant and systems.





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# Product details

## HOUSING

- Housing made of die-cast zinc
- Hood made of corrosion-resistant, die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- Three cable entries M20x1.5
- Protection class IP54 to DIN EN 60529
- Options:

- Protection classes IP65/IP66/IP67
- Custom colours
- Sealed with clear coating material and corrosion-preventative wax to improve corrosion resistance
- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## MOTOR

- Single-phase AC synchronous motor with permanent magnet, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Tropical insulation
- Options:

- Three-phase motor
- DC motor
- Custom voltages
- Custom frequencies

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## SUPPLEMENTARY GEARBOX

- Spur gearbox with hardened gears
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Housing made of gravity die-cast aluminium

## OUTPUT SHAFT

**N5**

- Ø 20 mm, with Ø 8 mm cross-hole
- Options:

- Ø 20 mm with feather key
- Output shaft with square socket WAF 17 mm (F07 to DIN ISO 5211)

- Other output shafts on request

**N6**

- Ø 25 mm, with Ø 10 mm cross-hole
- Options:

- Ø 25 mm with feather key
- Output shaft with square socket WAF 17 mm (F07 to DIN ISO 5211)

- Other output shafts on request

## ELECTRICAL CONNECTION

- Connection terminals positioned centrally close to cable entry
- Screw-type terminals
- Two free slots to retrofit additional auxiliary position switches
- Additional PCB terminals ensure retrofitting systems extensions is fully unproblematic

## CONTROLS

- Open/close signals
- Options:

- Additional potential-free switching contacts
- Electronic position controller ESR-N (integrated in actuator or external)
- Potentiometer 200 Ω ... 10 kΩ
- Electromechanical emergency torque limit switch shuts off the motor in the event a blockage occurs

## AMBIENT TEMPERATURE

- -15 °C to +60 °C
- 0 °C to +60 °C when utilizing electronic position controller ESR-N
- Options:

- Up to +80 °C, duty cycle S3-50%
- Down to -40 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- Two limit switches (standard)
- All travel-dependent switches actuated by infinitely adjustable control cams
- CO switches with silver-plated contacts
- Switch connections routed to terminal strip
- Max. switching capacity: 6 A, 250 V AC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts
- Switches designed for higher temperatures

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer

- Choice of wire-wound or conductive plastic potentiometer
- Multiturn potentiometer up to 10 turns
- Up to three potentiometers possible
- It is possible to adapt the electrical angle of rotation of the potentiometer to the desired angle of rotation utilizing a gearbox.

- With 4 ... 20 mA transmitter

- Utilizing a gearbox it is possible to adapt the electrical angle of rotation of the transmitter to the desired angle of rotation.

## MANUAL OPERATION (OPTIONAL)

- Using a handwheel it is possible to manually adjust the position of the output shaft and valve.
- Disengaging the gearbox and motor reduces the amount of force required.
- Position switch-off setting is retained during manual operation.
- Handwheel remains motionless during electrical operation.

## OPTIONS

- Other voltage/frequency
- Other ambient temperature range
- Higher protection class
- Handwheel
- Gearbox disengages manually
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller
- Position sensor
- Anti-condensate heater
- Relay
- Pulse relay
- Relays to switch several actuators in parallel
- On the spot mechanical position indicator
- Potentiometer
- Components to UL standard

## INSTALLATION

- Easy to mount thanks to stable angle bracket/ ISO bracket to DIN EN 5211
- No fuss coupling to valve stem by means of:

- Hand-operated lever
- Lever arm, clamping lever, ball-and-socket joint, connecting rods, sprung connecting rods
- Flexible shaft coupling
- Rigid shaft coupling

## ORDER DETAILS

- Device type
- Torque
- Positioning time
- Output shaft type
- Operating voltage /frequency
- Desired options
- When ordering potentiometers:

- Resistance value
- Desired actuator angle of rotation

- Presetting information for position switches and potentiometer
- Or order number
- Desired valve, where applicable

# Technical data

## ACTUATORS – N5 - N6 SERIES, 230 V, 50(60) Hz (OPTIONAL: 115 V, 50(60) Hz AND 24 V, 50(60) Hz)

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N5 A | 15(13) s | 80 Nm | 35 VA | 3 - 100° | Ø 20/45/CH8 | 28 mm+120 mm | 6.95 kg | 110430 |
| N5 A | 30(25) s | 80 Nm | 23 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 6.05 kg | 110440 |
| N5 A | 50(42) s | 80 Nm | 18 VA | 3 - 100° | Ø 20/45/CH8 | 92 mm | 5.85 kg | 110450 |
| N5 A | 80(67) s | 80 Nm | 18 VA | 3 - 100° | Ø 20/45/CH8 | 92 mm | 5.85 kg | 110460 |
| N5 A | 130(108) s | 80 Nm | 18 VA | 3 - 100° | Ø 20/45/CH8 | 92 mm | 5.85 kg | 110470 |
| | | | | Optionally up to 100 turns | | | | |
| N5 | 15(13) s | 110 Nm | 47 VA | 3 - 100° | Ø 20/45/CH8 | 176 mm | 7.75 kg | 110490 |
| N5 | 30(25) s | 110 Nm | 23 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 6.05 kg | 110500 |
| N5 | 50(42) s | 110 Nm | 18 VA | 3 - 100° | Ø 20/45/CH8 | 92 mm | 5.95 kg | 110510 |
| N5 | 75(63) s | 110 Nm | 18 VA | 3 - 100° | Ø 20/45/CH8 | 92 mm | 5.85 kg | 110520 |
| N5 | 130(108) s | 110 Nm | 18 VA | 3 - 100° | Ø 20/45/CH8 | 92 mm | 5.85 kg | 110530 |
| | | | | Optionally up to 100 turns | | | | |
| N6 | 25(21) s | 180 Nm | 47 VA | 3 - 100° | Ø 25/45/CH10 | 176 mm | 7.85 kg | 110550 |
| N6 | 45(38) s | 180 Nm | 31 VA | 3 - 100° | Ø 25/45/CH10 | 92 mm | 6.05 kg | 110560 |
| N6 | 70(58) s | 180 Nm | 31 VA | 3 - 100° | Ø 25/45/CH10 | 92 mm | 6.05 kg | 110570 |
| N6 | 130(108) s | 180 Nm | 18 VA | 3 - 100° | Ø 25/45/CH10 | 92 mm | 5.95 kg | 110580 |
| | | | | Optionally up to 100 turns | | | | |

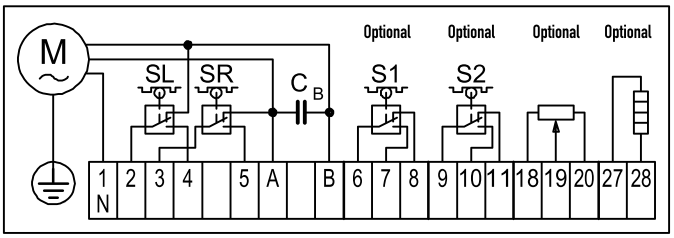
## ACTUATORS – N5 DC - N6 DC SERIES, 24 V DC

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N5 DC | 12 s | 110 Nm | 38 W | 3 - 100° | Ø 20/45/CH8 | 176 mm | 7.25 kg | 111050 |
| N5 DC | 20 s | 110 Nm | 38 W | 3 - 100° | Ø 20/45/CH8 | 176 mm | 7.25 kg | 111060 |
| N5 DC | 35 s | 110 Nm | 21 W | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.95 kg | 111070 |
| N5 DC | 70 s | 110 Nm | 11 W | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.75 kg | 111080 |
| N5 DC | 130 s | 110 Nm | 11 W | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.75 kg | 111090 |
| | | | | Optionally up to 100 turns | | | | |
| N6 DC | 20 s | 180 Nm | 38 W | 3 - 100° | Ø 25/45/CH10 | 176 mm | 7.35 kg | 111110 |
| N6 DC | 35 s | 180 Nm | 38 W | 3 - 100° | Ø 25/45/CH10 | 176 mm | 7.35 kg | 111120 |
| N6 DC | 70 s | 180 Nm | 11 W | 3 - 100° | Ø 25/45/CH10 | 120 mm | 6.05 kg | 111130 |
| N6 DC | 130 s | 180 Nm | 11 W | 3 - 100° | Ø 25/45/CH10 | 120 mm | 6.05 kg | 111140 |
| | | | | Optionally up to 100 turns | | | | |

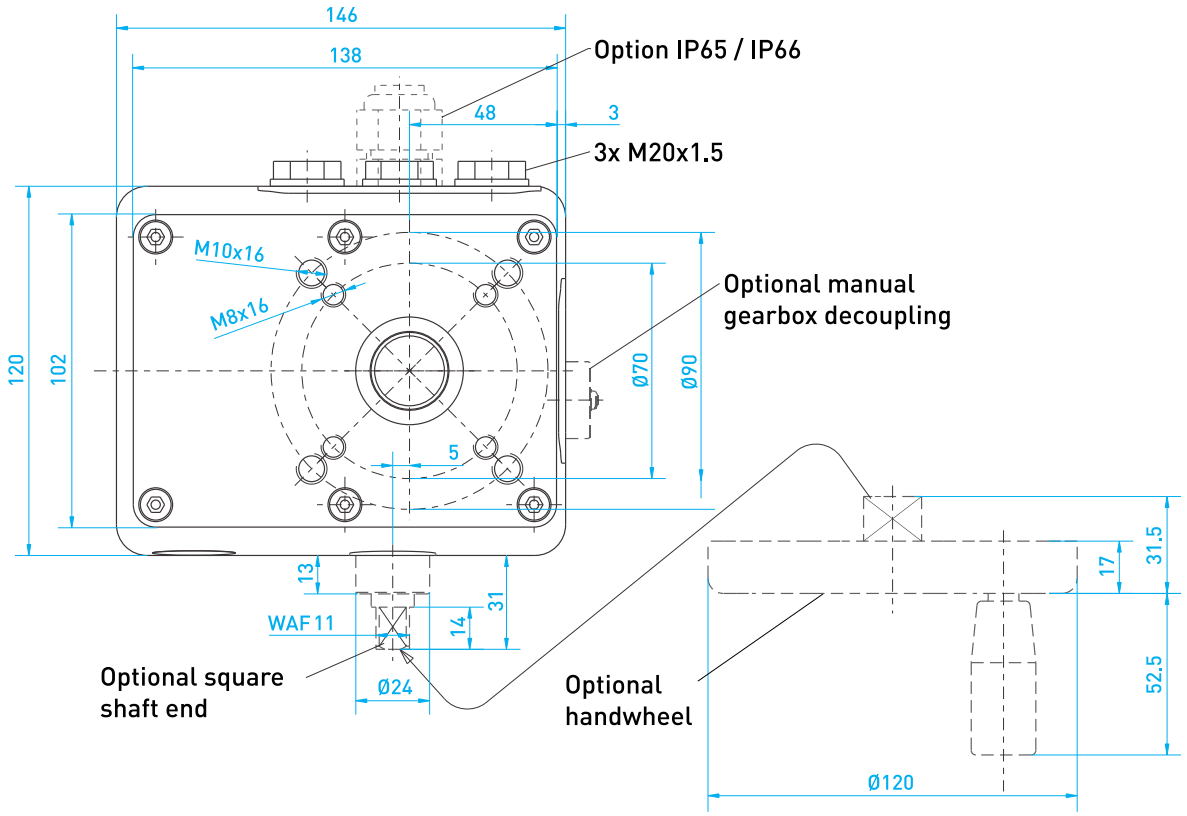
## ACTUATORS – N5 DS - N6 DS SERIES, 400 V, 50(60) Hz

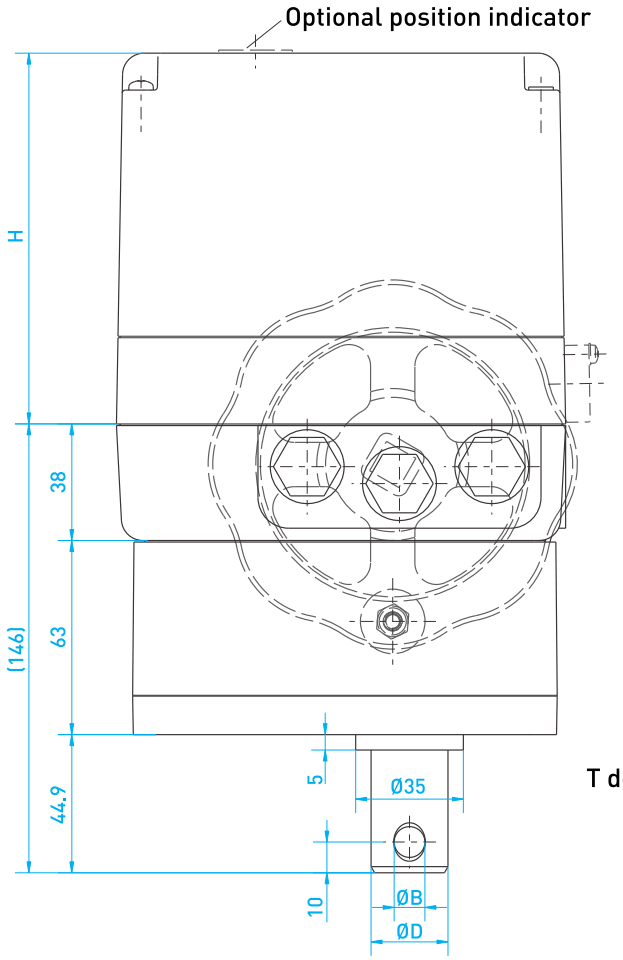
| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N5 A-DS | 10(8) s | 80 Nm | 44 VA | 3 - 100° | Ø 20/45/CH8 | 148 mm | 6.7 kg | 112130 |
| N5 A-DS | 20(17) s | 80 Nm | 19 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.6 kg | 112140 |
| N5 A-DS | 30(25) s | 80 Nm | 19 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.6 kg | 112150 |
| N5 A-DS | 50(42) s | 80 Nm | 19 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.6 kg | 112160 |
| N5 A-DS | 100(83) s | 80 Nm | 19 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.6 kg | 112170 |
| | | | | Optionally up to 100 turns | | | | |
| N5 DS | 10(8) s | 110 Nm | 76 VA | 3 - 100° | Ø 20/45/CH8 | 176 mm | 7.5 kg | 112190 |
| N5 DS | 20(17) s | 110 Nm | 36 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 6.0 kg | 112200 |
| N5 DS | 30(25) s | 110 Nm | 19 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.6 kg | 112210 |
| N5 DS | 50(42) s | 110 Nm | 19 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.6 kg | 112220 |
| N5 DS | 100(83) s | 110 Nm | 19 VA | 3 - 100° | Ø 20/45/CH8 | 120 mm | 5.6 kg | 112230 |
| | | | | Optionally up to 100 turns | | | | |
| N6 DS | 13(11) s | 180 Nm | 76 VA | 3 - 100° | Ø 25/45/CH10 | 176 mm | 7.6 kg | 112250 |
| N6 DS | 20(17) s | 180 Nm | 76 VA | 3 - 100° | Ø 25/45/CH10 | 176 mm | 7.6 kg | 112260 |
| N6 DS | 30(25) s | 180 Nm | 36 VA | 3 - 100° | Ø 25/45/CH10 | 120 mm | 6.7 kg | 112270 |
| N6 DS | 50(42) s | 180 Nm | 19 VA | 3 - 100° | Ø 25/45/CH10 | 120 mm | 5.8 kg | 112280 |
| N6 DS | 100(83) s | 180 Nm | 19 VA | 3 - 100° | Ø 25/45/CH10 | 120 mm | 5.8 kg | 112290 |
| | | | | Optionally up to 100 turns | | | | |

## SCHEMATIC DIAGRAM STANDARD AC

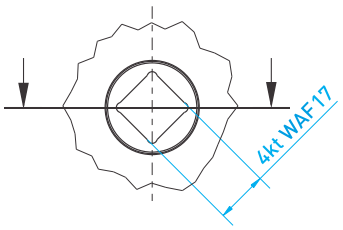


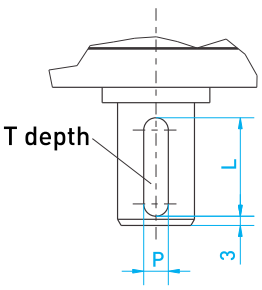
# Dimensions



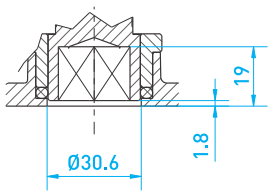




| Type | Positioning time | H | D | B | P | L | T |
|---|---|---|---|---|---|---|---|
| N5 | 50-130 s / 90° | 92 | 20 | 8 | 6 | 22 | 3.5 |
| | 30 s / 90° | 120 | 20 | 8 | 6 | 22 | 3.5 |
| | 15 s / 90° | 176 | 20 | 8 | 6 | 22 | 3.5 |
| N6 | 45-130 s / 90° | 92 | 25 | 10 | 8 | 32 | 4 |
| | 25 s / 90° | 176 | 25 | 10 | 8 | 32 | 4 |




Feather key option




Optional ISO flange F07

# Notes

Agromatic

# N8

## Rotary and part-turn actuators



## Product features

- Wide torque range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Large number of auxiliary position switches possible
- Electronic position controller ESR-N integrated in actuator
- Wide selection of output shafts
- Custom shafts possible
- Solid metal housing
- Maintenance-free gearbox
- Operates in any position

## Overview

To increase the torque of N8 series solutions an additional gearbox is added to N1 to N4 A series actuators. This increases the available torque range up to 500 Nm.

The numerous options and actuators based on the same electrical design common to series N1 to N4 A ensure the N series is the optimum solution for applications in process plant engineering.

The design of the housing made of die-cast aluminium and die-cast zinc in combination with a permanently lubricated gearbox made of steel with sintered-bronze bearing bushes ensure their suitability for use in a broad range of temperatures and harsh operating environments.

Utilizing an (optional) ESR-N electronic position controller can simplify integrating rotary and part-turn actuators into the controls of complex plant and systems.





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# Product details

## HOUSING

- Housing made of die-cast zinc
- Hood made of corrosion-resistant, die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- Three cable entries M20x1.5
- Protection class IP54 to DIN EN 60529
- Options:

- Protection classes IP65/IP66/IP67
- Custom colours
- Sealed with clear coating material and corrosion-preventative wax to improve corrosion resistance
- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## MOTOR

- Single-phase AC synchronous motor with permanent magnet, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Tropical insulation
- Options:

- Three-phase motor
- DC motor
- Custom voltages
- Custom frequencies

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## SUPPLEMENTARY GEARBOX

- Planetary gearbox with hardened gears
- Permanently lubricated gears
- Self-lubricating porous-bronze bearings and ball bearings
- Housing made of aluminium

## OUTPUT SHAFT

- Output shaft with square socket WAF 22 mm (F10 to DIN ISO 5211)
- Ø 36 mm with feather key
- Other output shafts on request

## ELECTRICAL CONNECTION

- Connection terminals positioned centrally close to cable entry
- Screw-type terminals
- Two free slots to retrofit additional auxiliary position switches
- Additional PCB terminals ensure retrofitting systems extensions is fully unproblematic

## CONTROLS

- Open/close signals
- Options:

- Additional potential-free switching contacts
- Electronic position controller ESR-N (integrated in actuator or external)
- Potentiometer 200 Ω ... 10 kΩ
- Electromechanical emergency torque limit switch shuts off the motor in the event a blockage occurs

## AMBIENT TEMPERATURE

- -15 °C to +60 °C
- 0 °C to +60 °C when utilizing electronic position controller ESR-N
- Options:

- Up to +80 °C, duty cycle S3-50%
- Down to -40 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- Two limit switches (standard)
- All travel-dependent switches actuated by infinitely adjustable control cam
- CO switches with silver-plated contacts
- Switch connections routed to terminal strip
- Max. switching capacity: 6 A, 250 V AC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts
- Switches designed for higher temperatures

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer
  - Choice of wire-wound or conductive plastic potentiometer
  - Multiturn potentiometer up to 10 turns
  - Up to three potentiometers possible
  - It is possible to adapt the electrical angle of rotation of the potentiometer to the desired angle of rotation utilizing a gearbox.
- With 4 ... 20 mA transmitter
  - Utilizing a gearbox it is possible to adapt the electrical angle of rotation of the transmitter to the desired angle of rotation.

## MANUAL OPERATION (OPTIONAL)

- Using a handwheel it is possible to manually adjust the position of the output shaft and valve.
- Disengaging the gearbox and motor reduces the amount of force required.
- Position switch-off settings are retained during manual operation.
- Handwheel remains motionless during electrical operation.

## OPTIONS

- Other voltage/frequency
- Other ambient temperature range
- Higher protection class
- Handwheel
- Gearbox disengages manually
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR-N
- Position sensor
- Anti-condensate heater
- Relay
- Pulse relay
- Relays to switch several actuators in parallel
- On the spot mechanical position indicator
- Potentiometer
- Components to UL standard

## INSTALLATION

- Easy to mount thanks to ISO flange
- Easily coupled to valve shaft

## ORDER DETAILS

- Device type
- Torque
- Positioning time
- Output shaft type
- Operating voltage /frequency
- Desired options
- When ordering potentiometers:
  - Resistance value
  - Desired actuator angle of rotation
- Presetting information for position switches and potentiometer
- Or order number
- Desired valve, where applicable

# Technical data

## ACTUATORS – N8 SERIES, 230 V, 50(60) Hz (OPTIONAL: 115 V, 50(60) Hz AND 24 V, 50(60) Hz)

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N8 | 50(42) s | 450 Nm | 47 VA | 10 - 95° | F10-SW22 | 176 mm | 11.1 kg | 110590 |
| N8 | 80(67) s | 500 Nm | 69 VA | 10 - 95° | F10-SW22 | 176 mm | 11.1 kg | 110592 |
| N8 | 120(100) s | 400 Nm | 31 VA | 10 - 95° | F10-SW22 | 120 mm | 9.1 kg | 110594 |

Optionally up to 2.5 turns

## ACTUATORS – N8 DC SERIES, 24 V DC

| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N8 DC | 50 s | 400 Nm | 38 W | 10 - 95° | F10-SW22 | 176 mm | 10.55 kg | 111150 |
| N8 DC | 75 s | 500 Nm | 38 W | 10 - 95° | F10-SW22 | 176 mm | 10.55 kg | 111152 |
| N8 DC | 120 s | 500 Nm | 21 W | 10 - 95° | F10-SW22 | 120 mm | 9.35 kg | 111154 |

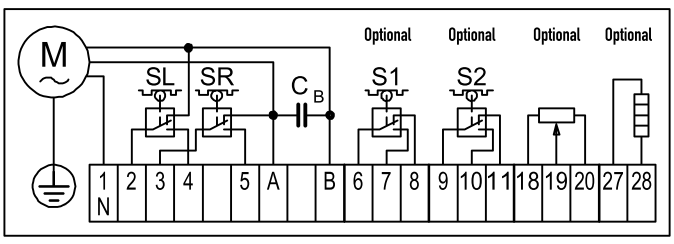
Optionally up to 2.5 turns

## ACTUATORS – N8 DS SERIES, 400 V, 50(60) Hz

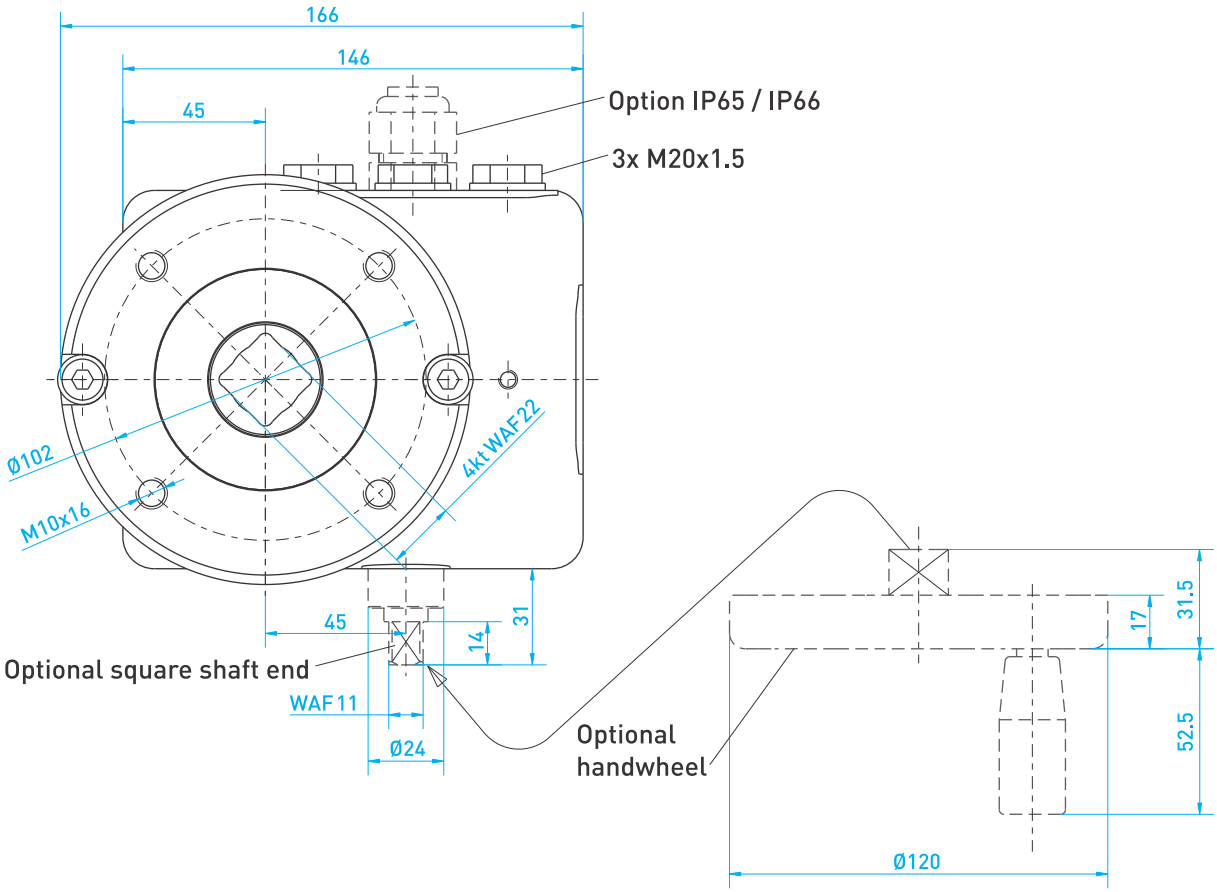
| Type | Positioning time 90° | Torque | Power consumption (max.) | Turning range | Shaft | Hood height | Weight | Order No. |
|---|---|---|---|---|---|---|---|---|
| N8 DS | 50(42) s | 500 Nm | 76 VA | 10 - 95° | F10-SW22 | 176 mm | 10.8 kg | 112310 |
| N8 DS | 80(67) s | 500 Nm | 63 VA | 10 - 95° | F10-SW22 | 176 mm | 10.8 kg | 112320 |
| N8 DS | 105(88) s | 400 Nm | 36 VA | 10 - 95° | F10-SW22 | 120 mm | 9.9 kg | 112330 |

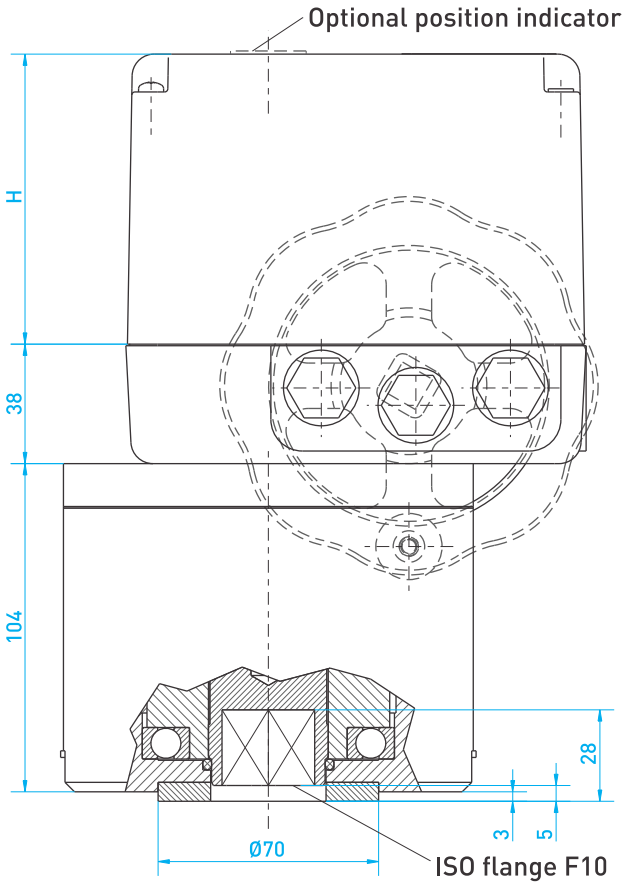
Optionally up to 2.5 turns

## SCHEMATIC DIAGRAM STANDARD AC

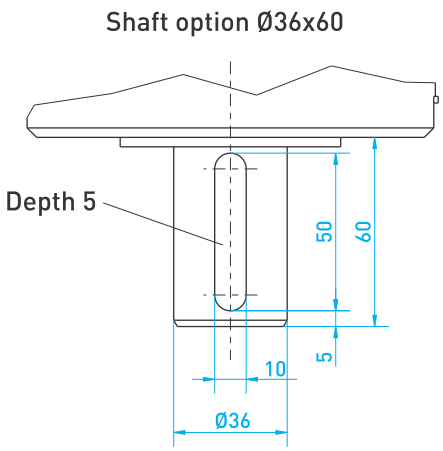


# Dimensions




| Positioning time | H |
|---|---|
| 120 s / 90° | 92 |
| 50-80 s / 90° | 176 |

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# NV 5 - NV 6

## Part-turn actuators (closed loop control)



## Product features

- Wide torque range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Large number of auxiliary position switches possible
- Custom shafts possible
- Solid metal housing
- Maintenance-free gearbox
- Operates in any position

## Overview

The NV 5 - NV 6 series was created from the N5 - N6 series. The primary objective was to fulfil a customer requirement for an actuator with integrated position sensing directly on the output shaft. A spacer ring created sufficient space to fit a potentiometer or an absolute encoder utilizing Hall effect sensing technology. Our solution means it is now possible to deploy a TUV-approved potentiometer for ratio control systems to DIN EN 12067-2:2004-06.

To satisfy customer demands to increase the service life of ratio control systems the rated torque was reduced and the bearings in the intermediate gearbox strengthened. These measures considerably increase service life.

The wide variety of options and actuators based on the same electrical design common to series N1 to N4 A ensure the NV series is the perfect solution for applications in process plant engineering.

The design of the housing made of die-cast aluminium and die-cast zinc in combination with a permanently lubricated gearbox made of steel with sintered-bronze bearing bushes ensure their suitability for use in a broad range of temperatures and harsh operating environments.

Utilizing an optional electronic position controller can simplify integrating rotary and part-turn actuators into the controls of complex systems.

# Product details

## HOUSING

- Housing made of die-cast zinc
- Hood made of corrosion-resistant, die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- Three cable entries M20x1.5
- Protection class IP54 to DIN EN 60529
- Options:

- Protection classes IP65/IP66/IP67
- Custom colours
- Sealed with clear coating material and corrosion-preventative wax to improve corrosion resistance
- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## MOTOR

- Single-phase AC synchronous motor with permanent magnet, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Options:

- Three-phase motor
- Custom voltages
- Custom frequencies

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## SUPPLEMENTARY GEARBOX

- Spur gearbox with hardened gears
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Housing made of gravity die-cast aluminium

## OUTPUT SHAFT

**NV 5**

- Ø 20 mm with feather key
- Options:

- Ø 20 mm, with Ø 8 mm cross-hole
- Output shaft with square socket WAF 17 mm (F07 to DIN ISO 5211)
- Other output shafts on request

**NV 6**

- Ø 25 mm with feather key
- Options:

- Ø 25 mm, with Ø 10 mm cross-hole
- Output shaft with square socket WAF 17 mm (F07 to DIN ISO 5211)
- Other output shafts on request

## ELECTRICAL CONNECTION

- Connection terminals positioned centrally close to cable entries
- Screw-type terminals
- Two free slots to retrofit additional auxiliary position switches
- Additional PCB terminals ensure retrofitting systems extensions is fully unproblematic

## CONTROLS

- Open/close signals
- Options:

- Additional potential-free switching contacts
- Electronic position controller ESR-N (integrated in actuator or external)
- Potentiometer 200 Ω ... 10 kΩ

## AMBIENT TEMPERATURE

- -15 °C to +60 °C
- 0 °C to +60 °C when utilizing electronic position controller ESR-N
- Options:

- Up to +80 °C, duty cycle S3-50%
- Down to -40 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- Two limit switches
- All travel-dependent switches actuated by infinitely adjustable control cams
- CO switches with silver-plated contacts
- Switch connections routed to terminal strip
- Max. switching capacity: 6 A, 250 V AC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts
- Switches designed for higher temperatures

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer

- Choice of wire-wound or conductive plastic potentiometer
- Solutions for electronic fuel/air ratio control utilizing special potentiometers featuring a TUV-approved form-fit attachment solution.

- With absolute encoder utilizing Hall effect sensing technology
- With 4 ... 20 mA transmitter

## MECHANICAL POSITION INDICATOR (OPTIONAL)

- Position indicator on hood
- Graduated scale OPEN/CLOSED, 0° ... 90°, blank or to customer specification

## OPTIONS

- Other voltage/frequency
- Other ambient temperature range
- Higher protection class
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR
- Position sensor
- Anti-condensate heater
- Relay

- Pulse relay
- Relays to switch several actuators in parallel

- On the spot mechanical position indicator
- Potentiometer
- Components to UL standard

## INSTALLATION

- Easy to mount thanks to stable angle bracket/ ISO bracket to DIN EN 5211
- No fuss coupling to valve stem by means of:

- Hand-operated lever
- Lever arm, clamping lever, ball-and-socket joint, connecting rods, sprung connecting rods
- Flexible shaft coupling
- Rigid shaft coupling

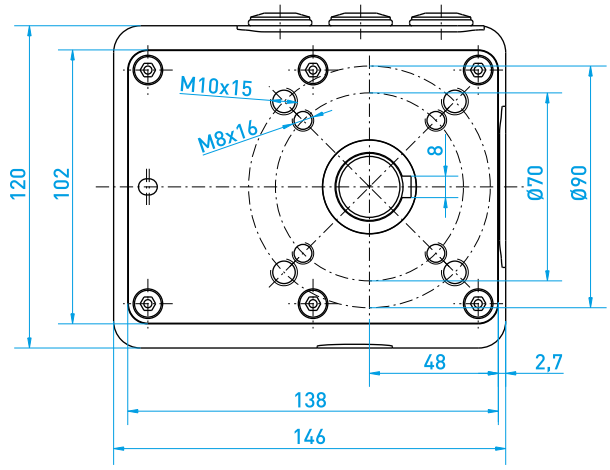
## ORDER DETAILS

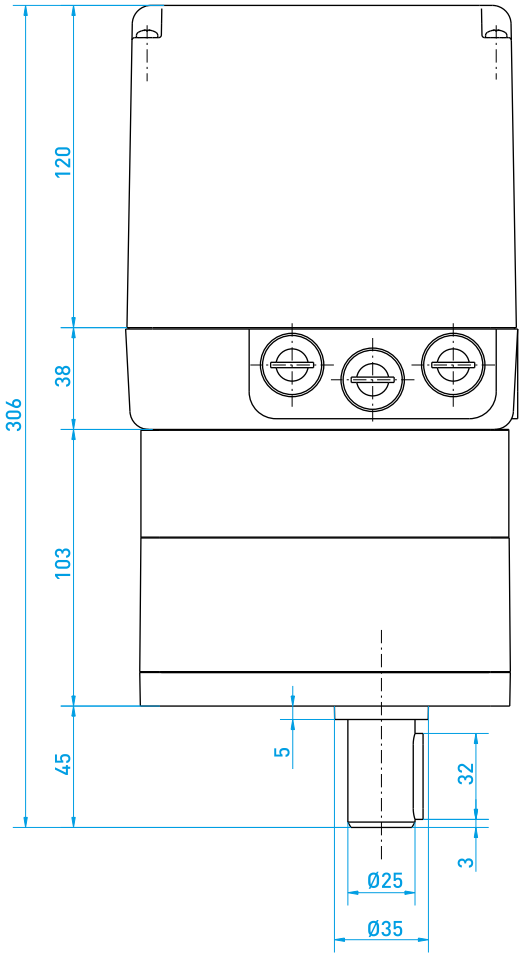
- Device type
- Torque
- Positioning time
- Output shaft type
- Operating voltage /frequency
- Desired options
- When ordering potentiometers:

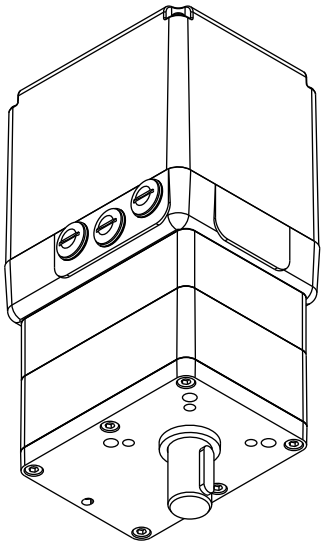
- Resistance value
- Desired actuator angle of rotation
- Standard: angle of rotation set to maximum, other angles of rotation possible on request

- Presetting information for position switches and potentiometer
- Or order number
- Desired valve, where applicable

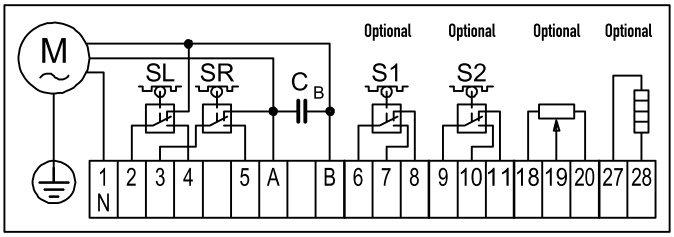
# Dimensions



## SCHEMATIC DIAGRAM STANDARD AC



# Notes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# K

# Linear actuators



## Product features

- Wide range of force outputs
- Large stroke range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Two additional force-sensitive switches possible
- Solid metal housing
- Maintenance-free gearbox
- Operates in any position

## Overview

K series linear actuators are utilized to precisely adjust dampers in air-conditioning, ventilation and heating systems as well as in furnace installations, process plant engineering and other fields of industry.

They are available with the following actuating forces: 600 N, 1200 N, 1800 N, 2500 N, 3000 N, 3500 N and 5000 N. The stroke units are designed for stroke lengths of 150-750 mm. The technical construction mirrors that of series N actuators. End position limit stop is path dependent. The standard scope of supply includes a limit switch for each end position. These are designed as changeover switches and can also perform supplementary functions such as end position indication or sequential control tasks.

Additional auxiliary position switches and potentiometers are also available. Fitting a relay makes it possible to control several actuators simultaneously via a common contact. A solid cast bracket as well as an angle section made of steel attached to the housing are provided to mount the actuator. A connecting pin is included to connect the actuator with the valve.

Depending on the positioning time it is possible to supply actuators from this series that offer force-dependent switch-off functionality (optional). This switch-off function prevents damage occurring to the actuators in the event of a blockage.

# Product details

## HOUSING

- Housing made of die-cast zinc
- Hood made of corrosion-resistant, die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- Standard hoods powder coating
- Three cable entries M20x1.5
- Protection class IP54 to DIN EN 60529
- Options:

- Protection class IP65 (actuator unit only)
- Custom colours
- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## MOTOR

- Single-phase AC synchronous motor with permanent magnet, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Tropical insulation
- Options:

- Three-phase motor
- DC motor
- Custom voltages
- Custom frequencies

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## STROKE UNIT

- Fixing bracket made of die-cast aluminium
- Spindle made of stainless steel
- Spindle self-locking
- Needle bearings to absorb axial forces
- Steel and bronze materials provide good anti-seizure properties.

## ELECTRICAL CONNECTION

- Connection terminals positioned centrally close to cable entry
- Screw-type terminals
- Two free slots to retrofit additional position switches
- Additional PCB terminals ensure retrofitting systems extensions is fully unproblematic
- Infinitely adjustable control cams
- Open/close signals
- Path dependent limit switch-off
- Limit switch for each end position
- Options:

- Additional potential-free switching contacts
- Electronic position controller ESR-N (integrated in actuator or external)
- Potentiometer 200 Ω ... 10 kΩ
- Electromechanical force-sensitive switch switches off the motor in the event of a seizure

## AMBIENT TEMPERATURE

- -15 °C to +60 °C
- 0 °C to +60 °C when utilizing electronic position controller ESR-N
- Options:

- Up to +80 °C, duty cycle S3-50%
- Down to -40 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- CO switches with silver-plated contacts
- Switch connections routed to terminal strip
- Max. switching capacity: 6 A, 250 V AC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts
- Switches designed for higher temperatures

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer
- Choice of wire-wound or conductive plastic potentiometer
- Multiturn potentiometer up to 10 turns
- Three potentiometers possible
- It is possible to adapt the electrical angle of rotation of the potentiometer to the desired angle of rotation utilizing a gearbox.
- With 4 ... 20 mA transmitter
- Utilizing a gearbox it is possible to adapt the electrical angle of rotation of the transmitter to the desired angle of rotation.

## MANUAL OPERATION (OPTIONAL)

- Using the handwheel it is possible to manually adjust the position of the output shaft and valves.
- Disengaging the gearbox and motor reduces the amount of force required.
- Position switch-off settings are retained during manual operation.
- Handwheel remains motionless during electrical operation.

## OPTIONS

- Other voltage/frequency
- Other ambient temperature range
- Protection class IP65 (actuator unit only)
- Handwheel
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR
- Position sensor
- Anti-condensate heater
- Relay
- Pulse relay
- Relay to switch several actuators in parallel
- Potentiometer
- Components to UL standard
- Spindle protected by bellows
- Force-sensitive switch off
- Set collars serve as external travel stops (recommended for force-sensitive switch off)

## INSTALLATION

- Easily mounted thanks to stable cast angle bracket and steel angle section attached to housing
- Connecting pin supplied to connect spindle with valve
- Straightforward connection to valve stem by means of:
- Lever arm, clamping lever, ball-and-socket joint, connecting rods, spring-loaded connecting rods

## ORDER DETAILS

- Device type
- Positioning force
- Positioning time
- Operating voltage /frequency
- Desired options
- When ordering a potentiometer:
- Resistance value
- Desired linear regulating distance
- Information to preset position switches and potentiometers
- Or order number
- Desired valve, where applicable

# Technical data

## ACTUATORS K SERIES, 230 V, 50(60) Hz (OPTIONAL: 115 V, 50(60) Hz AND 24 V, 50(60) Hz)

| Type | Positioning time | Positioning force | Power consumption (max.) | Selectable regulating distance | Hood height | Weight | Order No. | Order No. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| K ..06 | 1.7(2) mm/s | 600 N | 18 VA | 150 - 750 mm | 28 mm+120 mm | 3.7 kg | 112940 | See below |
| K ..06 | 2.3(2.7) mm/s | 600 N | 23 VA | 150 - 750 mm | 28 mm+120 mm | 3.8 kg | 112950 | See below |
| K ..06 | 4.5(5.4) mm/s | 600 N | 32 VA | 150 - 750 mm | 28 mm+120 mm | 4.6 kg | 112960 | See below |
| K ..06 | 6.7(8) mm/s | 600 N | 35 VA | 150 - 750 mm | 28 mm+120 mm | 4.6 kg | 112970 | See below |
| K ..12 | 1.7(2) mm/s | 1200 N | 31 VA | 150 - 750 mm | 28 mm+120 mm | 3.8 kg | 112990 | See below |
| K ..12 | 2.3(2.7) mm/s | 1200 N | 24 VA | 150 - 750 mm | 28 mm+120 mm | 4.0 kg | 113000 | See below |
| K ..12 | 4.5(5.4) mm/s | 1200 N | 69 VA | 150 - 750 mm | 176 mm | 5.6 kg | 113010 | See below |
| K ..12 | 6.7(8) mm/s | 1200 N | 47 VA | 150 - 750 mm | 176 mm | 5.6 kg | 113020 | See below |
| K ..18 | 1.5(1.8) mm/s | 1800 N | 24 VA | 150 - 750 mm | 28 mm+120 mm | 4.0 kg | 113040 | See below |
| K ..18 | 2.3(2.7) mm/s | 1800 N | 24 VA | 150 - 750 mm | 28 mm+120 mm | 4.0 kg | 113050 | See below |
| K ..25 | 1.5(1.8) mm/s | 2500 N | 32 VA | 150 - 750 mm | 28 mm+120 mm | 4.6 kg | 113060 | See below |
| K ..25 | 2.3(2.7) mm/s | 2500 N | 35 VA | 150 - 750 mm | 28 mm+120 mm | 4.6 kg | 113070 | See below |
| K ..35 | 1.5(1.8) mm/s | 3500 N | 69 VA | 150 - 750 mm | 176 mm | 5.6 kg | 113090 | See below |
| K ..30 | 2.3(2.7) mm/s | 3000 N | 47 VA | 150 - 750 mm | 176 mm | 5.6 kg | 113100 | See below |
| K ..50 | 1.3(1.5) mm/s | 5000 N | 47 VA | 150 - 750 mm | 176 mm | 5.6 kg | 113110 | See below |

| | | |
|---|---|---|
| Stroke units for regulating distance 150 mm | 5.3 kg | 113340 |
| Stroke units for regulating distance 300 mm | 7.6 kg | 113350 |
| Stroke units for regulating distance 450 mm | 9.6 kg | 113360 |
| Stroke units for regulating distance 600 mm | 11.6 kg | 113370 |
| Stroke units for regulating distance 750 mm | 13.6 kg | 113380 |

The actuator designation K 1506 is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

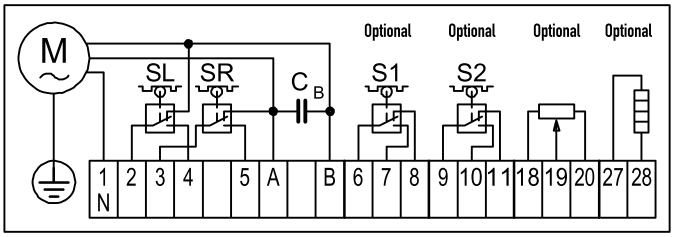
## ACTUATORS K DC SERIES, 24 V, DC

| Type | Positioning time | Positioning force | Power consumption (max.) | Selectable regulating distance | Hood height | Weight | Order No. | Order No. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| K ..06-DC | 1.7 mm/s | 600 N | 11 W | 150 - 750 mm | 28 mm+120 mm | 3.6 kg | 113180 | See below |
| K ..06-DC | 3.4 mm/s | 600 N | 21 W | 150 - 750 mm | 28 mm+120 mm | 3.8 kg | 113190 | See below |
| K ..06-DC | 6 mm/s | 600 N | 21 W | 150 - 750 mm | 28 mm+120 mm | 3.8 kg | 113200 | See below |
| K ..12-DC | 1.7 mm/s | 1200 N | 21 W | 150 - 750 mm | 28 mm+120 mm | 3.8 kg | 113220 | See below |
| K ..12-DC | 3.4 mm/s | 1200 N | 21 W | 150 - 750 mm | 28 mm+120 mm | 3.8 kg | 113230 | See below |
| K ..12-DC | 6 mm/s | 1200 N | 38 W | 150 - 750 mm | 28 mm+148 mm | 5.1 kg | 113240 | See below |
| K ..25-DC | 1.7 mm/s | 2500 N | 38 W | 150 - 750 mm | 28 mm+148 mm | 5.1 kg | 113260 | See below |
| K ..25-DC | 3.4 mm/s | 2500 N | 38 W | 150 - 750 mm | 176 mm | 5.1 kg | 113270 | See below |
| K ..50-DC | 1.7 mm/s | 5000 N | 38 W | 150 - 750 mm | 28 mm+148 mm | 5.1 kg | 113280 | See below |

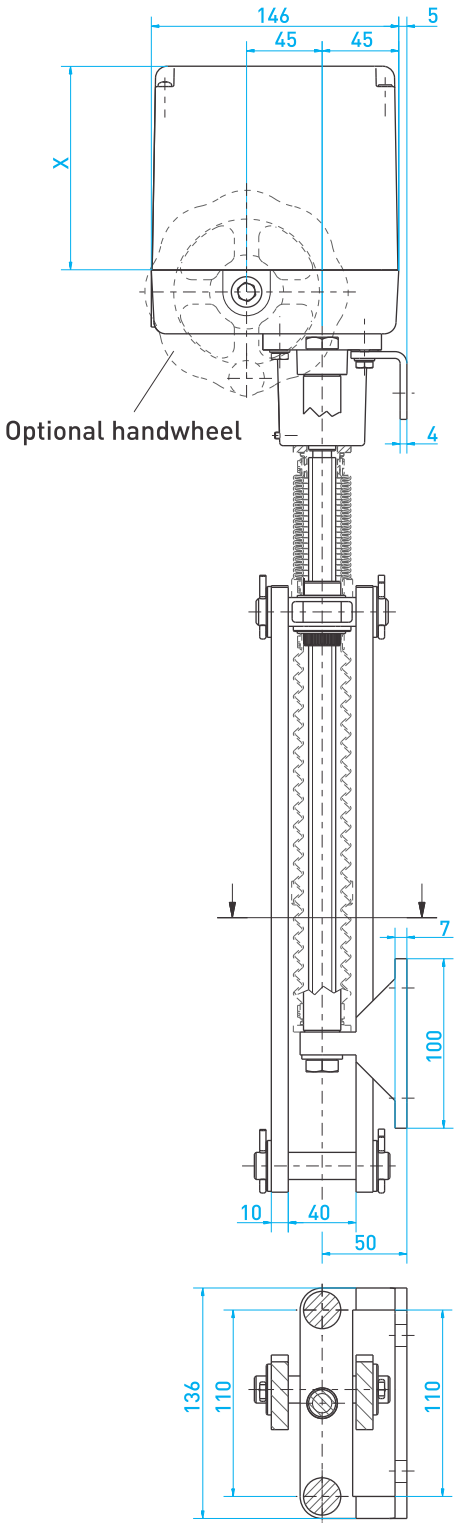
| | | |
|---|---|---|
| Stroke units for regulating distance 150 mm | 5.3 kg | 113340 |
| Stroke units for regulating distance 300 mm | 7.6 kg | 113350 |
| Stroke units for regulating distance 450 mm | 9.6 kg | 113360 |
| Stroke units for regulating distance 600 mm | 11.6 kg | 113370 |
| Stroke units for regulating distance 750 mm | 13.6 kg | 113380 |

The actuator designation K 1506-DC is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

## SCHEMATIC DIAGRAM STANDARD AC

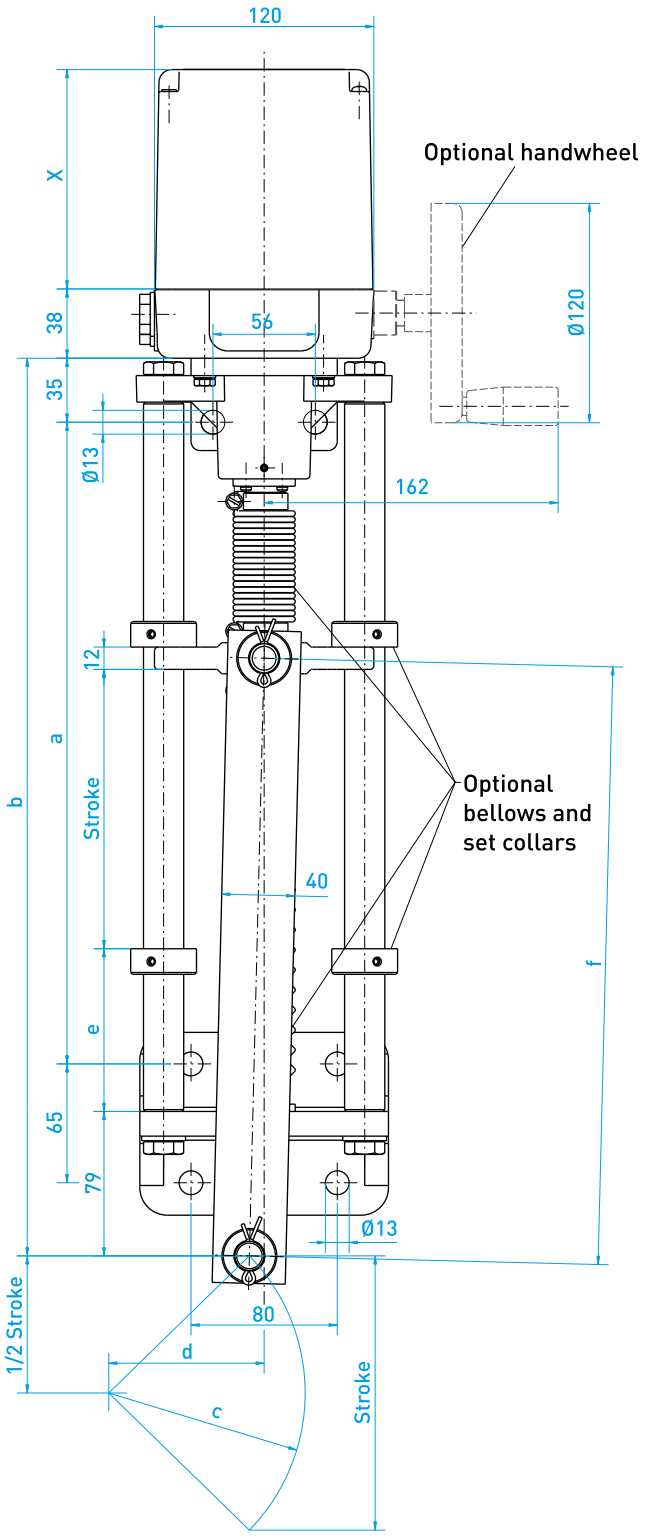


# Dimensions




## LINEAR ACTUATORS K

| Power | X |
|---|---|
| 6 - 31 VA | 120 |
| 32 - 40 | 148 |
| VA | 176 |
| > 40 VA | |




## LINEAR ACTUATORS K

| Type | Stroke | a | b | c | d | e | f |
|---|---|---|---|---|---|---|---|
| K | 150 | 201 | 341 | 106 | 85 | - | 252 |
| K + bellows | 150 | 351 | 491 | 106 | 85 | 89 | 327 |
| K | 300 | 351 | 491 | 212 | 170 | - | 402 |
| K + bellows | 300 | 611 | 751 | 212 | 170 | 144 | 532 |
| K | 450 | 501 | 641 | - | - | - | 552 |
| K | 600 | 651 | 791 | - | - | - | 702 |
| K | 750 | 801 | 941 | - | - | - | 852 |

All dimensions in mm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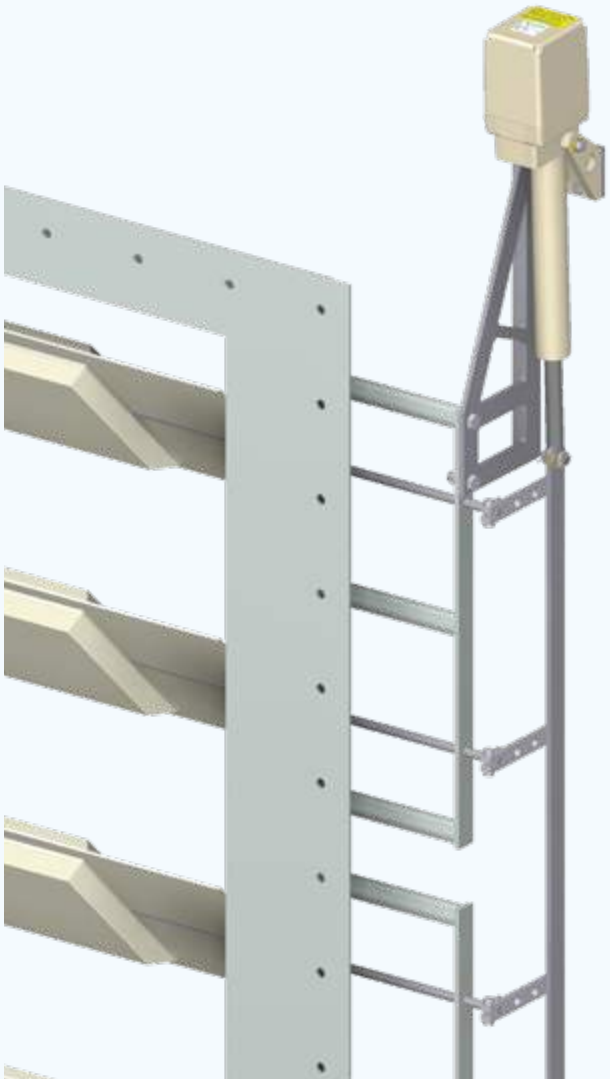


Agromatic

# KA

## Linear actuator

## Product features

- Wide range of force outputs
- Large stroke range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Large number of auxiliary position switches possible
- Solid metal housing
- Maintenance-free gearbox
- Operates in any position
- Protected spindle

## Overview

KA series linear actuators are utilized to precisely adjust dampers in air-conditioning, ventilation and heating systems as well as in furnaceinstallations, process plant engineering and other fields of industry.

They are available with the following actuating forces: 600 N, 1200 N, 1800 N, 2500 N, 3000 N, 3500 N and 5000 N. The stroke units are designed for stroke lengths of 150-1100 mm. The technical construction mirrors that of series N actuators. End position limit stop is path dependent. The standard scope of supply includes a limit switch for each end position. These are designed as changeover switches and can also perform supplementary functions such as end position indication or sequential control tasks. Additional auxiliary position switches and potentiometers are also available. Fitting a relay makes it possible to control several actuators simultaneously via a common contact. A solid cast bracket is available to mount the actuator. A connecting pin is included in the scope of supply to create the connection with the connecting rod.

The spindle is protected by a protective tube. Depending on the positioning time it is possible to supply actuators from this series that offer force-dependent switch-off functionality (optional). This switch-off function prevents damage occurring to the actuators in the event of a blockage.

# Product details

## HOUSING

- Housing made of die-cast zinc
- Hood made of corrosion-resistant, die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- Standard hoods powder coating
- Three cable entries M20x1.5
- Protection class IP54 to DIN EN 60529
- Options:

- Protection classes IP65/66
- Custom colours
- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## MOTOR

- Single-phase AC synchronous motor with permanent magnet, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Tropical insulation
- Options:

- Three-phase motor
- DC motor
- Custom voltages
- Custom frequencies

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## STROKE UNIT

- Fixing bracket made of die-cast aluminium
- Spindle and connecting rod made of stainless steel
- Spindle self-locking
- Needle bearings to absorb axial forces
- Steel / bronze materials provide good anti-seizure properties.

## ELECTRICAL CONNECTION

- Connection terminals positioned centrally close to cable entry
- Screw-type terminals
- Two free slots to retrofit additional position switches
- Additional PCB terminals ensure retrofitting systems extensions is fully unproblematic
- Infinitely adjustable control cams
- Open/close signals
- Path dependent limit switch-off
- Limit switch for each end position
- Options:

- Additional potential-free switching contacts
- Electronic position controller ESR-N (integrated in actuator or external)
- Potentiometer 200 Ω ... 10 kΩ
- Electromechanical force-sensitive switch switches off the motor in the event of a seizure

## AMBIENT TEMPERATURE

- -15 °C to +60 °C
- 0 °C to +60 °C when utilizing electronic position controller ESR-N
- Options:

- Up to +100 °C, duty cycle S3-2 min / 24 h
- Down to -40 °C

## REGULATING DISTANCE LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- CO switches with silver-plated contacts
- Switch connections routed to terminal strip
- Max. switching capacity: 6 A, 250 V AC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts
- Switches designed for higher temperatures

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer
- Choice of wire-wound or conductive plastic potentiometer
- Multiturn potentiometer up to 10 turns
- Three potentiometers possible
- It is possible to adapt the electrical angle of rotation of the potentiometer to the desired angle of rotation utilizing a gearbox.
- With 4 ... 20 mA transmitter
- Utilizing a gearbox it is possible to adapt the electrical angle of rotation of the transmitter to the desired angle of rotation..

## MANUAL OPERATION (OPTIONAL)

- Using the handwheel it is possible to manually adjust the position of the output shaft and valves.
- Disengaging the gearbox and motor reduces the amount of force required.
- Position switch-off settings are retained during manual operation.
- Handwheel remains motionless during electrical operation.

## OPTIONS

- Other voltage/frequency
- Other ambient temperature range
- Protection class IP65/66 (complete actuator)
- Handwheel
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR-N
- Position sensor
- Anti-condensate heater
- Relay
- Pulse relay
- Relays to switch several actuators in parallel
- Potentiometer
- Components to UL standard
- Connecting rod protected by bellows
- Force-sensitive switch off

## INSTALLATION

- Easily mounted thanks to stable cast angle bracket attached to housing
- Connecting pin supplied to connect connecting rod with valve
- No fuss coupling to valve stem by means of:
- Lever arm, clamping lever, ball-and-socket joint, connecting rods, sprung connecting rods

## ORDER DETAILS

- Device type
- Positioning force
- Positioning time
- Operating voltage /frequency
- Desired options
- When ordering potentiometers:
- Resistance value
- Desired linear regulating distance
- Presetting information for position switches and potentiometer
- Or order number

# Technical data

## ACTUATORS – KA SERIES, 230 V, 50(60) Hz (OPTIONAL: 115 V, 50(60)HZ AND 24 V, 50(60) Hz)

| Type | Positioning time | Positioning force | Power consumption (max.) | Selectable regulating distance | Hood height | Weight | Order No. | Order No. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| KA ..06 | 1.7(2) mm/s | 600 N | 18 VA | 150 - 1100 mm | 28 mm+120 mm | 3.7 kg | 112940 | See below |
| KA ..06 | 2.3(2.7) mm/s | 600 N | 23 VA | 150 - 1100 mm | 28 mm+120 mm | 3.8 kg | 112950 | See below |
| KA ..06 | 4.5(5.4) mm/s | 600 N | 32 VA | 150 - 1100 mm | 28 mm+120 mm | 4.6 kg | 112960 | See below |
| KA ..06 | 6.7(8) mm/s | 600 N | 35 VA | 150 - 1100 mm | 28 mm+120 mm | 4.6 kg | 112970 | See below |
| KA ..12 | 1.7(2) mm/s | 1200 N | 31 VA | 150 - 1100 mm | 28 mm+120 mm | 3.8 kg | 112990 | See below |
| KA ..12 | 2.3(2.7) mm/s | 1200 N | 24 VA | 150 - 1100 mm | 28 mm+120 mm | 4.0 kg | 113000 | See below |
| KA ..12 | 4.5(5.4) mm/s | 1200 N | 69 VA | 150 - 1100 mm | 176 mm | 5.6 kg | 113010 | See below |
| KA ..12 | 6.7(8) mm/s | 1200 N | 47 VA | 150 - 1100 mm | 176 mm | 5.6 kg | 113020 | See below |
| KA ..18 | 1.5(1.8) mm/s | 1800 N | 24 VA | 150 - 1100 mm | 28 mm+120 mm | 4.0 kg | 113040 | See below |
| KA ..18 | 2.3(2.7) mm/s | 1800 N | 24 VA | 150 - 1100 mm | 28 mm+120 mm | 4.0 kg | 113050 | See below |
| KA ..25 | 1.5(1.8) mm/s | 2500 N | 32 VA | 150 - 1100 mm | 28 mm+120 mm | 4.6 kg | 113060 | See below |
| KA ..25 | 2.3(2.7) mm/s | 2500 N | 35 VA | 150 - 1100 mm | 28 mm+120 mm | 4.6 kg | 113070 | See below |
| KA ..35 | 1.5(1.8) mm/s | 3500 N | 69 VA | 150 - 1100 mm | 176 mm | 5.6 kg | 113090 | See below |
| KA ..30 | 2.3(2.7) mm/s | 3500 N | 47 VA | 150 - 1100 mm | 176 mm | 5.6 kg | 113100 | See below |
| KA ..50 | 1.3(1.5) mm/s | 5000 N | 47 VA | 150 - 1100 mm | 176 mm | 5.6 kg | 113110 | See below |

| | | | |
|---|---|---|---|
| Stroke units for regulating distance | 150 mm | | 113440 |
| Stroke units for regulating distance | 300 mm | | 113450 |
| Stroke units for regulating distance | 450 mm | | 113460 |
| Stroke units for regulating distance | 600 mm | Max. 4000 N in push direction | 113470 |
| Stroke units for regulating distance | 750 mm | Max. 2500 N in push direction | 113480 |
| Stroke units for regulating distance | 1100 mm | Max. 1800 N in push direction | 113490 |

The actuator designation KA 1506 is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

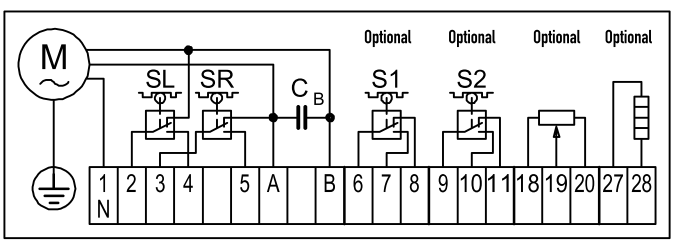
## ACTUATORS – KA DC SERIES, 24V DC

| Type | Positioning time | Positioning force | Power consumption (max.) | Selectable regulating distance | Hood height | Weight | Order No. | Order No. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| KA ..06-DC | 1.7 mm/s | 600 N | 11 W | 150 - 1100 mm | 28 mm+120 mm | 3.6 kg | 113180 | See below |
| KA ..06-DC | 3.4 mm/s | 600 N | 21 W | 150 - 1100 mm | 28 mm+120 mm | 3.8 kg | 113190 | See below |
| KA ..06-DC | 6 mm/s | 600 N | 21 W | 150 - 1100 mm | 28 mm+120 mm | 3.8 kg | 113200 | See below |
| KA ..12-DC | 1.7 mm/s | 1200 N | 21 W | 150 - 1100 mm | 28 mm+120 mm | 3.8 kg | 113220 | See below |
| KA ..12-DC | 3.4 mm/s | 1200 N | 21 W | 150 - 1100 mm | 28 mm+120 mm | 3.8 kg | 113230 | See below |
| KA ..12-DC | 6 mm/s | 1200 N | 38 W | 150 - 1100 mm | 28 mm+148 mm | 5.1 kg | 113240 | See below |
| KA ..25-DC | 1.7 mm/s | 2500 N | 38 W | 150 - 1100 mm | 28 mm+148 mm | 5.1 kg | 113260 | See below |
| KA ..25-DC | 3.4 mm/s | 2500 N | 38 W | 150 - 1100 mm | 176 mm | 5.1 kg | 113270 | See below |
| KA ..50-DC | 1.7 mm/s | 5000 N | 38 W | 150 - 1100 mm | 28 mm+148 mm | 5.1 kg | 113280 | See below |

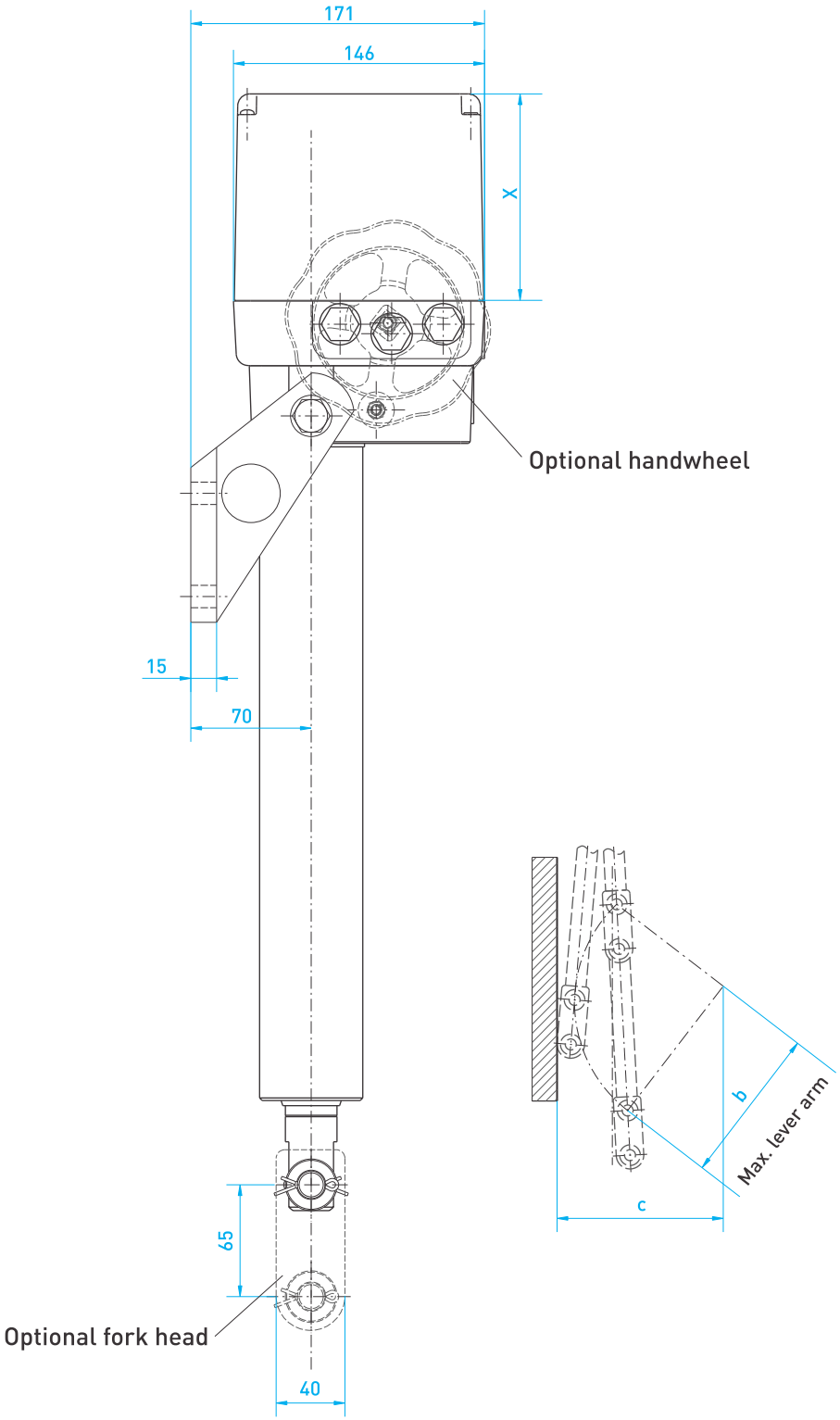
| | | | |
|---|---|---|---|
| Stroke units for regulating distance | 150 mm | | 113440 |
| Stroke units for regulating distance | 300 mm | | 113450 |
| Stroke units for regulating distance | 450 mm | | 113460 |
| Stroke units for regulating distance | 600 mm | Max. 4000 N in push direction | 113470 |
| Stroke units for regulating distance | 750 mm | Max. 2500 N in push direction | 113480 |
| Stroke units for regulating distance | 1100 mm | Max. 1800 N in push direction | 113490 |

The actuator designation KA 1506 is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

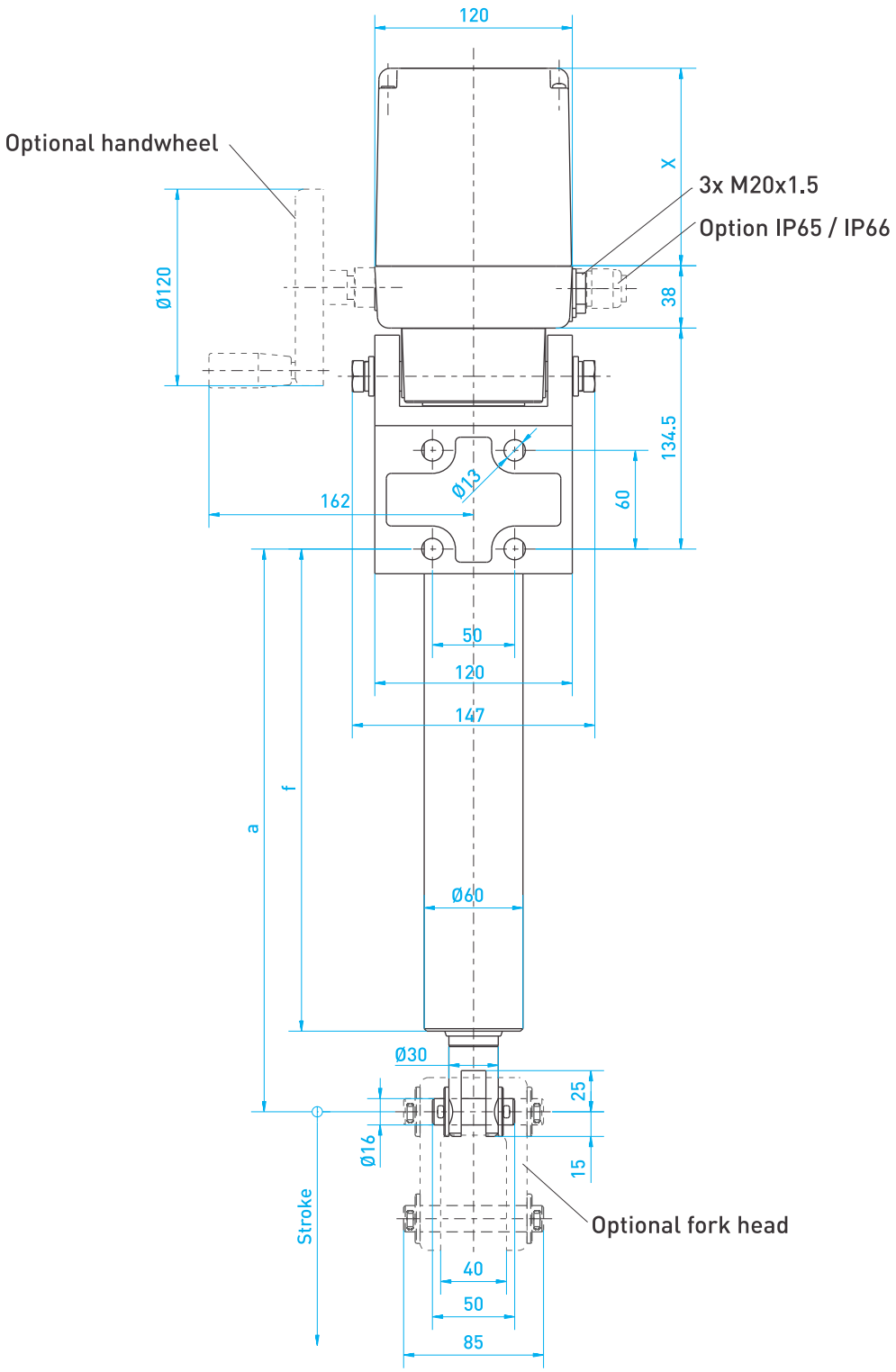
## SCHEMATIC DIAGRAM STANDARD AC



# Dimensions




| Power (VA) | X |
|---|---|
| > 40 | 176 |
| 32-40 | 148 |
| 6-31 | 120 |




| Stroke | a | b | c | f | Max. compressive load F (N) | Max. tensile load F (N) |
|---|---|---|---|---|---|---|
| 1100 | 1185 | 778 | 800 | 1138 | 1800 | 5000 |
| 750 | 820 | 530 | 560 | 773 | 2500 | 5000 |
| 600 | 670 | 424 | 455 | 623 | 4000 | 5000 |
| 450 | 520 | 318 | 350 | 473 | 5000 | 5000 |
| 300 | 340 | 212 | 245 | 293 | 5000 | 5000 |
| 150 | 190 | 106 | 140 | 143 | 5000 | 5000 |

All dimensions in mm


Agromatic

# V

# Linear actuator



## Product features

- Wide range of force outputs
- Large stroke range
- Constant positioning times under fluctuating loads
- Two additional force-sensitive switches possible
- Four additional auxiliary position switches possible
- Wide selection of column adapters
- Wide selection of flanges
- Solid metal housing
- Maintenance-free gearbox
- Operates in any position

## Overview

V series linear actuators are utilized when precision linear adjustments are required to control elements in heating, ventilation and air conditioning systems as well as in industrial applications. V series linear actuators are available with the following actuating forces: 1000 N, 2000 N, 3000 N, 4000 N and 5000 N plus a maximum stroke of 85 mm. The design of the housing made of die-cast aluminium and die-cast zinc in combination with a permanently lubricated gearbox made of steel with sintered-bronze bearing bushes ensure their suitability for use in a broad range of temperatures and harsh operating environments. The technical construction mirrors that of series N actuators. End position limit stop is force dependent. The standard scope of supply includes a limit switch for each end position.

These are designed as changeover switches and can also perform supplementary functions such as end position indication or sequential control tasks.

Additional auxiliary force and position switches as well as potentiometers are also available. Fitting a relay makes it possible to control several actuators simultaneously via a common contact.

The respective position of the valve is indicated by "Open/Closed" markings on one of the columns of the stroke unit in conjunction with the bearing surfaces of the spindle nut. A solid flange is available to mount the actuator. A driver pin is included to create the connection with the threaded spindle.

# Product details

## HOUSING

- Housing made of die-cast zinc
- Hood made of corrosion-resistant, die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- Standard hoods powder coating
- Three cable entries M20x1.5
- Protection class IP54 to DIN EN 60529
- Options:

- Protection class IP65
- Custom colours
- Electric anti-condensate heater (helps prevent build-up of condensate in the actuator)

## MOTOR

- Single-phase AC synchronous motor with permanent magnet, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Tropical insulation
- Options:

- Three-phase motor
- DC motor
- Custom voltages
- Custom frequencies

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## SPINDLE

- Self-locking
- "Open/Closed" markings indicate position
- Made of stainless steel

## ELECTRICAL CONNECTION

- Connection terminals positioned centrally close to cable entry
- Screw-type terminals
- Two free slots to retrofit additional force/position switches
- Additional PCB terminals ensure retrofitting systems extensions is fully unproblematic
- Infinitely adjustable control cams
- Open/close signals
- Limit switch for each end position
- Options:

- Path dependent limit switch-off
- Additional potential-free switching contacts
- Electronic position controller ESR-N (integrated in actuator or external)
- Potentiometer 200 Ω ... 10 kΩ

## AMBIENT TEMPERATURE

- -15 °C to +60 °C
- 0 °C to +60 °C when utilizing electronic position controller ESR-N
- Options:

- Up to +80 °C, duty cycle S3-50%
- Down to -40 °C

## REGULATING DISTANCE LIMITED BY FORCE-SENSITIVE SNAP-ACTION POSITION OFF SWITCH

- CO switches with silver-plated contacts
- Switch connections routed to terminal strip
- Max. switching capacity: 6 A, 250 V AC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts
- Switches designed for higher temperatures

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer
  - Choice of wire-wound or conductive plastic potentiometer
  - Multiturn potentiometer up to 10 turns
  - Up to three potentiometers possible
  - It is possible to adapt the electrical angle of rotation of the potentiometer to the desired regulating distance utilizing a gearbox.
- With 4 ... 20 mA transmitter
  - Utilizing a gearbox it is possible to adapt the electrical angle of rotation of the transmitter to the desired angle of rotation.

## MANUAL OPERATION (OPTIONAL)

- Using the handwheel it is possible to manually adjust the position of the output shaft and valves.
- Disengaging the gearbox and motor reduces the amount of force required.
- Position switch-off settings are retained during manual operation.
- Handwheel remains motionless during electrical operation.

## OPTIONS

- Other voltage/frequency
- Other ambient temperature range
- Higher protection class
- Handwheel
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR-N
- Position sensor
- Anti-condensate heater
- Relay
  - Pulse relay
  - Relay to switch several actuators in parallel
- Potentiometer
- Components to UL standard
- Encapsulated stroke unit
- Position switch-off
- Set collars serve as external travel stops (recommended for force-sensitive switch off)

## INSTALLATION

- Easy to mount thanks to modified column adapters/flanges
- Easily coupled to the spindle nut by means of a wide variety of threaded, through hole and split driving collars

## ORDER DETAILS

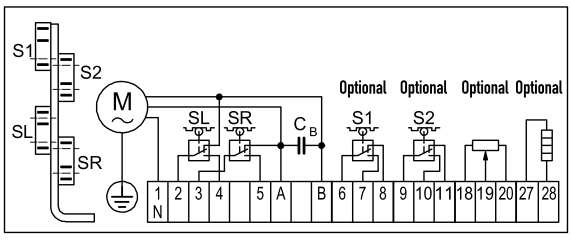
- Device type
- Positioning force
- Stroke
- Positioning time
- Column clearance/flange fitting dimensions
- Operating voltage /frequency
- Desired options
- When ordering a potentiometer:
  - Resistance value
  - Desired linear regulating distance
  - Standard: regulating distance set to maximum, other regulating distances possible on request
- When ordering position switches:
  - Standard: regulating distance set to maximum, other regulating distances possible on request
- Or order number
- Desired valve, where applicable

# Technical data

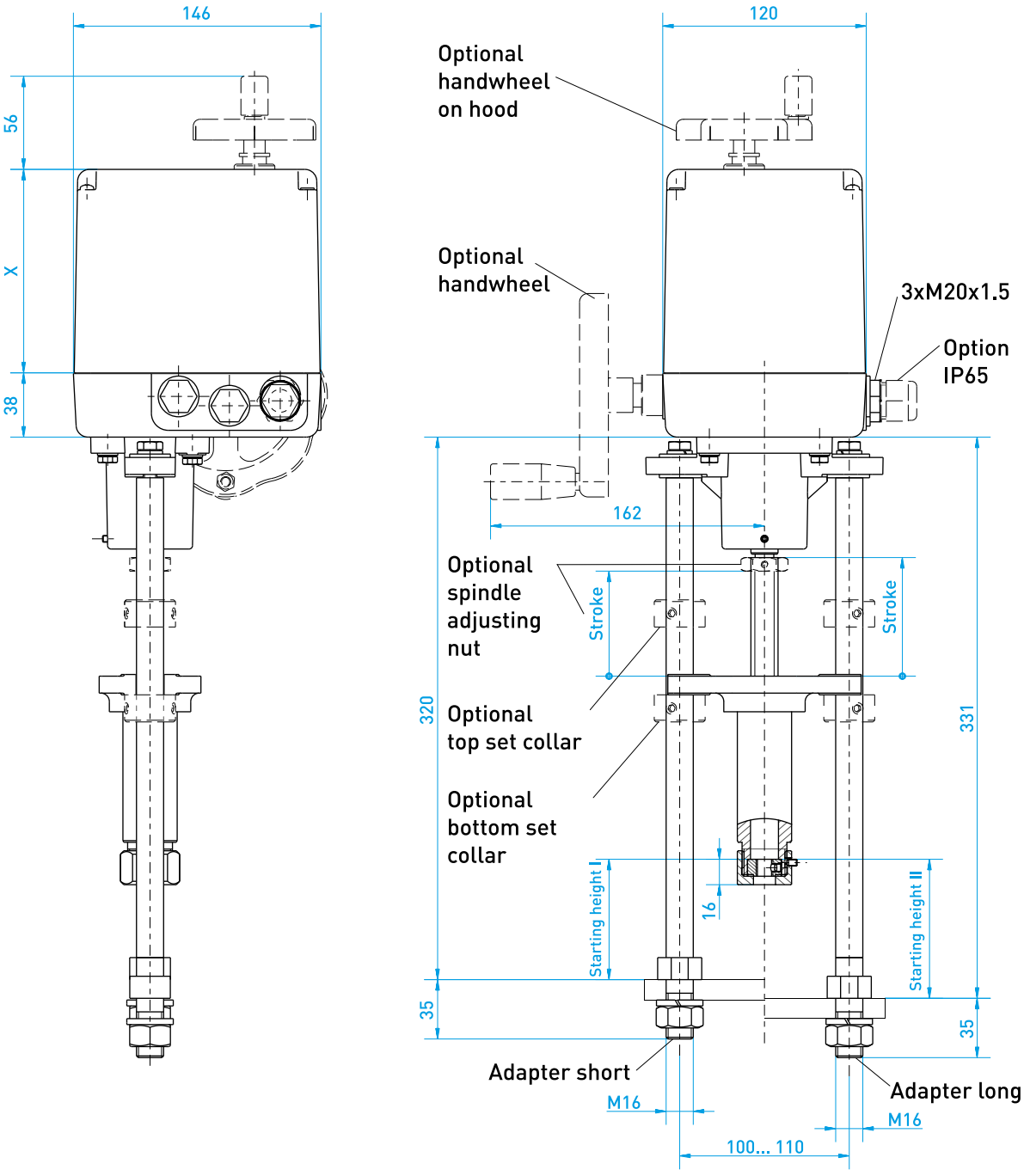
## ACTUATORS – V SERIES, 230 V, 50/60 Hz

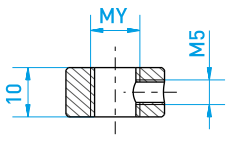
| Type | Positioning time | Positioning force | Power consumption (max.) | Hood | Weight | Order No. |
|---|---|---|---|---|---|---|
| V 1 | 0.1(0.12) mm/s | 1000 N | 7 VA | 120 mm | 5.5 kg | 80110 |
| V 1 | 0.3(0.4) mm/s | 1000 N | 7 VA | 120 mm | 5.6 kg | 80111 |
| V 1 | 0.6(0.7) mm/s | 1000 N | 18 VA | 120 mm | 5.7 kg | 80112 |
| V 2 | 0.3(0.4) mm/s | 2000 N | 18 VA | 120 mm | 5.8 kg | 80120 |
| V 2 | 0.6(0.7) mm/s | 2000 N | 31 VA | 120 mm | 5.8 kg | 80121 |
| V 3 | 0.3(0.4) mm/s | 3000 N | 18 VA | 120 mm | 5.7 kg | 80130 |
| V 3 | 0.8(1.0) mm/s | 3000 N | 31 VA | 120 mm | 5.8 kg | 80131 |
| V 4 | 0.3(0.4) mm/s | 4000 N | 31 VA | 120 mm | 5.8 kg | 80140 |
| V 4 | 0.8(1.0) mm/s | 4000 N | 32 VA | 28 mm+120 mm | 6.7 kg | 80141 |
| V 5 | 0.4(0.5) mm/s | 5000 N | 32 VA | 28 mm+120 mm | 6.8 kg | 80150 |
| V 5 | 0.8(1.0) mm/s | 5000 N | 69 VA | 28 mm+148 mm | 7.6 kg | 80151 |

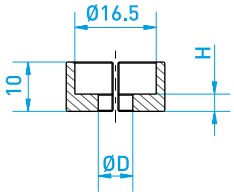
## SCHEMATIC DIAGRAM STANDARD AC



# Dimensions




| Stroke = 138 - starting height I |
|---|
| Starting height I > 53<br>and<br>Starting height I < 133 |

| Stroke = 149 - starting height II |
|---|
| Starting height II > 64<br>and<br>Starting height II < 144 |

| With optional spindle adjusting nut |
|---|
| Stroke = 128 - starting height I<br>Starting height I > 53<br>and<br>Starting height I < 123 |

| With optional spindle adjusting nut |
|---|
| Stroke = 139 - starting height II<br>Starting height II > 64<br>and<br>Starting height II < 134 |

| Type | X |
|---|---|
| V 1 (0.3 mm/s) | 120 |
| V 2 (0.3 mm/s) | 120 |
| V 3 (0.3 mm/s) | 120 |
| V 4 (0.3 mm/s) | 120 |
| V 4 (0.8 mm/s) | 148 |
| V 5 (0.4 mm/s) | 148 |
| V 5 (0.8 mm/s) | 176 |

| MY Options |
|---|
| M6 |
| M10 |
| M12 |
| M12x1 |
| M14x1.5 |
| M16x1.5 |

| Ø D | H |
|---|---|
| 7 | 3,5 |
| 9 | 6,0 |

All dimensions in mm

Agromatic

# NEx

## Rotary and part-turn actuators

## Product features

- Ex-Zone 1 marking CE 2004 Ex II 2G Ex d IIC T6 Gb
- Wide torque range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Large number of positioning switches possible
- Electronic position controller ESR-N (integrated in the actuator)
- Variety of motors available: BLDC, synchronous motor, DC motor
- Wide selection of output shafts
- Custom shafts possible
- Solid housing made of aluminium
- Maintenance-free gearbox
- Operates in any position

## Overview

NEx series rotary and part-turn actuators fulfil the requirements of Ex zone 1 marking CE 2004 Ex II 2G Ex d IIC T6 Gb. The actuators have the following registered IECEx and ATEX certificate numbers: IECEx EPS 15.0061X and EPS 15 ATEX 1 044 X. They are deployed primarily in industrial plants and systems, for example in machines operating in the chemical industry, in refineries, in fuel depots and in painting facilities.

The NEx is available with a synchronous motor as well as a DC version (BLDC) with a torque up to 500 Nm. Featuring a high holding torque and self-adapting wide-range input power pack the programmable BLDC motor supports almost all positioning times and torques within a range of 2-500 Nm.

The NEx is based on the extremely successful N series. That means it is possible to guarantee combination options with existing extensions such as supplementary gear trains and linear modules. Boasting a wide variety of options NEx offers the best-possible solution for applications in process plant engineering subject to IECEx and ATEX regulations.

The design of the housing made of die-cast aluminium in combination with permanently lubricated gearing made of steel with sintered-bronze bearing bushes ensure their suitability for use in a broad range of temperatures and harsh operating environments.

# Product details

## HOUSING

- Housing and hood made of corrosion-resistant gravity die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- The motor compartment is designed as a type "d" flameproof enclosure to DIN EN 60079-1.
- Protection class IP66/67
- Options:

- Custom colours

## SYNCHRONOUS MOTOR

- Single-phase AC synchronous motor with permanent magnets, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Options:

- Custom voltages
- Custom frequencies

## BLDC MOTOR

- Brushless DC motor
- Constant positioning time thanks to electronic speed controller
- Wide-range input 90 V AC ... 264 V AC, 120 V DC ... 370 V DC
- High holding torque when operating voltage applied
- Manufacturer configured start-up and brake ramp
- ON time 100% duty cycle
- Insulation class E to VDE 0530

## DC MOTOR

- DC commutator motor
- Voltage: 12 VDC or 24 VDC
- Insulation class E to VDE 0530

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## OUTPUT SHAFT

**NEx 1 - NEx 4**

- Ø 14 mm, with Ø 6 mm cross-hole
- Options:

- Ø 14 mm with feather key
- Ø 12 mm, with Ø 5 mm cross-hole
- Ø 12 mm with feather key
- Drive shaft with square socket WAF 14 mm (F05 DIN ISO 5211)

**NEx 5**

- Ø 20 mm, with Ø 8 mm cross-hole
- Options:

- Ø 20 mm with feather key
- Output shaft with square socket WAF 17 mm (F07 DIN ISO 5211)

**NEx 6**

- Ø 25 mm, with Ø 10 mm cross-hole
- Options:

- Ø 25 mm with feather key
- Output shaft with square socket WAF 17 mm (F07 DIN ISO 5211)

**NEx 8**

- Square socket SW 22
- Optional:

- Ø 30 or Ø 36 mm with feather key

## ELECTRICAL CONNECTION

- Connection by means of 1 m cable end or Ex "e" rated terminal box with tension clamp terminals
- Customer-side wiring outside of the flameproof housing
- Electric anti-condensate heater
- Manual reset temperature switch 80 °C

## CONTROLS

- Open/closed signal
- Options:

- Additional potential-free contacts
- Electronic position controller ESR-N with Profibus and USB interfaces for synchronous motors
- Potentiometer 200 Ω ... 10 kΩ
- Blocking protection by monitoring changes to the actual value of the potentiometer (only in conjunction with position controller ESR-N)

## AMBIENT TEMPERATURE

- -20 °C to +60 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- Two limit switches (standard)
- All travel-dependent switches actuated by infinitely adjustable control cams
- CO switches with silver-plated contacts
- Switch connections routed to terminals
- Max. switching capacity: 6 A, 250 VAC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts
- Additional auxiliary position switches on request

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer

- Conductive plastic potentiometer (standard) or wire-wound potentiometer (including TUV approval)
- Multiturn potentiometer up to 10 turns
- Gearing facilitates adapting the electrical angle of rotation of the potentiometer to the desired angle of rotation of the actuator.
- Special potentiometers with TUV-approved form-fit attachment solution are available for electronic fuel/air ratio control.

- With 4 ... 20 mA transmitter

- Gearing facilitates adapting the electrical angle of rotation of the transmitter to the desired angle of rotation of the actuator.

- With Hall sensor

- The wear-free absolute encoder that makes use of the Hall effect is particularly suitable for continuous operation in potentially explosive atmospheres

## MANUAL OPERATION (OPTIONAL)

- Using a handwheel it is possible to manually adjust the position of the output shaft and valves..
- Disengaging the gear train and motor reduces the amount of force required.
- Position switch-off settings are retained during manual operation.
- Handwheel remains motionless during electrically powered operation.

## OPTIONS

- Other voltage/frequency
- Gear train disengages mechanically
- Handwheel
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR-N (in conjunction with synchronous motor)
- Position sensor
- Relay to switch several actuators in parallel
- Potentiometer
- Components to UL standard

## ASSEMBLY

- Easy to mount thanks to stable angle bracket/ISO bracket
- No fuss coupling to valve stem by means of:

- Hand-operated lever coupling
- Lever arm, clamping lever, ball-and-socket joint, connecting rods, sprung connecting rods
- Flexible shaft coupling
- Rigid shaft coupling

## SAFETY INSTRUCTIONS

- Ensure the device is isolated from the power supply before the hood of the flameproof encapsulated housing is opened by a skilled tradesperson in a hazardous area. It is imperative to observe the wait time stated on the rating plate!

# Product details

## TEMPERATE CLASSES

| Temperature class | Wait time | Actuator |
|---|---|---|
| T3 | None | NEx 3, NEx 4, NEx 5, NEx 6, NEx 8 |
| T4 | None | NEx 1, NEx 2 |
| T4 | 30 min | NEx 3, NEx 4, NEx 5, NEx 6, NEx 8 |
| T5/T6 | 40 min | NEx 1, NEx 2 |
| T5/T6 | 60 min | NEx 3, NEx 4, NEx 5, NEx 6, NEx 8 |

## ORDER DETAILS

- Device type
- Torque
- Positioning time
- Output shaft type
- Motor type
- Operating voltage/frequency
- Desired options
- When ordering a potentiometer:

- Resistance value
- Desired angle of rotation of actuator

- Preset position switches and potentiometer
- Or order number
- Desired valve, where applicable

# Notes

# Technical data

## SERIES NEx 1 TO NEx 8 ACTUATORS WITH SYNCHRONOUS MOTOR, 230 V, 50(60) Hz (OPTIONS 115 V, 50(60) Hz UND 24 V, 50(60) Hz)

| Type | Positioning time 90° | Torque | Power consumption (max.) | Temperature range | Shaft | Hood | Weight | Order Nr |
|---|---|---|---|---|---|---|---|---|
| NEx 1 | 25(21) s | 6 Nm | 7 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12 kg | 147360 |
| NEx 1 | 45(38) s | 10 Nm | 7 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12 kg | 147370 |
| NEx 1 | 65(54) s | 15 Nm | 7 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12 kg | 147380 |
| NEx 1 | 130(108) s | 30 Nm | 7 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12 kg | 147390 |
| Optionally up to 300 turns | | | | | | | | |
| NEx 2 | 5(4) s | 10 Nm | 18 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12,2 kg | 147405 |
| NEx 2 | 13(11) s | 15 Nm | 18 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12,2 kg | 147410 |
| NEx 2 | 18(15) s | 20 Nm | 18 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12,2 kg | 147420 |
| NEx 2 | 25(21) s | 25 Nm | 18 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12,2 kg | 147430 |
| NEx 2 | 45(38) s | 45 Nm | 18 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12,2 kg | 147440 |
| NEx 2 | 65(54) s | 60 Nm | 18 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12,2 kg | 147450 |
| NEx 2 | 130(108) s | 60 Nm | 18 VA | -20/+60 °C | Ø 14/6 | 156 mm | 12,2 kg | 147460 |
| Optionally up to 300 turns | | | | | | | | |
| NEx 3 | 1,3(1,1) s | 6 Nm | 24 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147470 |
| NEx 3 | 2(1,6) s | 7 Nm | 24 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147475 |
| NEx 3 | 5(4) s | 17 Nm | 24 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147480 |
| NEx 3 | 7(6) s | 20 Nm | 24 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147490 |
| NEx 3 | 10(8) s | 30 Nm | 24 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147500 |
| NEx 3 | 17(14) s | 50 Nm | 24 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147510 |
| NEx 3 | 25(21) s | 60 Nm | 24 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147520 |
| NEx 3 | 50(42) s | 60 Nm | 24 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147530 |
| Optionally up to 300 turns | | | | | | | | |
| NEx 4 | 1,3(1,1) s | 10 Nm | 35 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147540 |
| NEx 4 | 2(1,6) s | 13 Nm | 32 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147545 |
| NEx 4 | 5(4) s | 35 Nm | 32 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147550 |
| NEx 4 | 7(6) s | 45 Nm | 32 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147560 |
| NEx 4 | 10(8) s | 60 Nm | 32 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147570 |
| NEx 4 | 17(14) s | 60 Nm | 24 VA | -20/+40 °C | Ø 14/6 | 156 mm | 12,5 kg | 147580 |
| Optionally up to 300 turns | | | | | | | | |
| NEx 5 | 15(13) s | 110 Nm | 32 VA | -20/+40 °C | Ø 20/8 | 156 mm | 12,8 kg | 147600 |
| NEx 5 | 30(25) s | 110 Nm | 32 VA | -20/+40 °C | Ø 20/8 | 156 mm | 12,8 kg | 147610 |
| NEx 5 | 50(42) s | 110 Nm | 24 VA | -20/+40 °C | Ø 20/8 | 156 mm | 12,8 kg | 147620 |
| NEx 5 | 75(63) s | 110 Nm | 24 VA | -20/+40 °C | Ø 20/8 | 156 mm | 12,8 kg | 147630 |
| Nex 5 | 130(108) s | 110 Nm | 18 VA | -20/+40 °C | Ø 20/8 | 156 mm | 12,8 kg | 147640 |
| Optionally up to 300 turns | | | | | | | | |

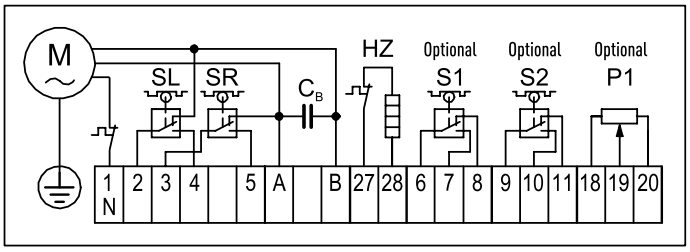
| Type | Positioning time 90° | Torque | Power consumption (max.) | Temperature range | Shaft | Hood | Weight | Order Nr |
|---|---|---|---|---|---|---|---|---|
| NEx 6 | 20(17) s | 180 Nm | 35 VA | -20/+40 °C | Ø 25/10 | 156 mm | 12,8 kg | 147650 |
| NEx 6 | 30(25) s | 180 Nm | 32 VA | -20/+40 °C | Ø 25/10 | 156 mm | 12,8 kg | 147660 |
| NEx 6 | 50(42) s | 180 Nm | 32 VA | -20/+40 °C | Ø 25/10 | 156 mm | 12,8 kg | 147670 |
| NEx 6 | 75(63) s | 180 Nm | 24 VA | -20/+40 °C | Ø 25/10 | 156 mm | 12,8 kg | 147680 |
| NEx 6 | 130(108) s | 180 Nm | 18 VA | -20/+60 °C | Ø 25/10 | 156 mm | 12,8 kg | 147690 |
| | | | Optionally up to 300 turns | | | | | |
| NEx 8 | 80(67)s | 400 Nm | 32 VA | -20/+60 °C | F10/SW22 | 156 mm | 14 kg | 147694 |
| NEx 8 | 106(88)s | 500 Nm | 35 VA | -20/+60 °C | F10/SW22 | 156 mm | 14 kg | 147692 |
| NEx 8 | 160(132)s | 500 Nm | 32 VA | -20/+60 °C | F10/SW22 | 156 mm | 14 kg | 147696 |
| | | | Optionally up to 300 turns | | | | | |

## NEx-BLDC SERIES, MULTI-VOLTAGE 90 - 264 V AC , 120 - 370 V DC

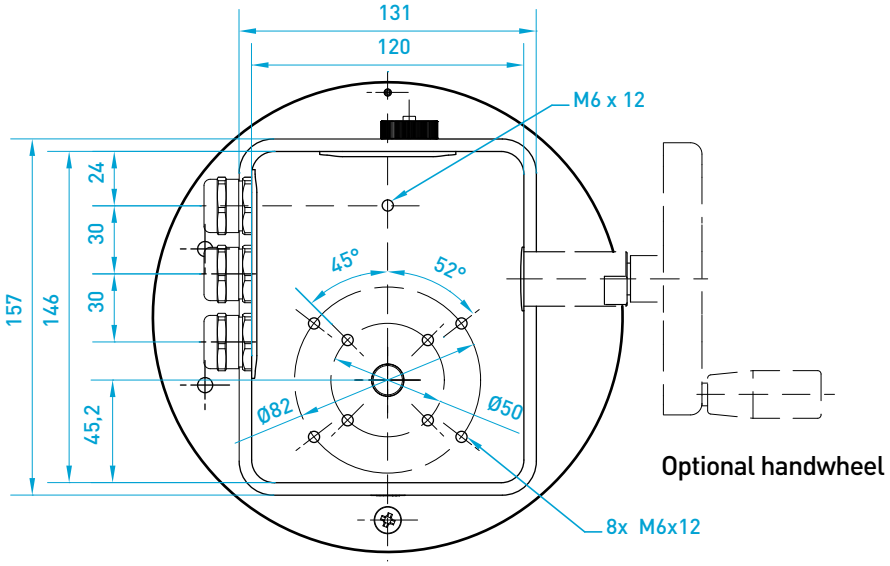
| Type | Positioning time 90° | Torque | Power consumption (max.) | Temperature range | Shaft | Hood | Weight | Order Nr |
|---|---|---|---|---|---|---|---|---|
| NEx 5-BLDC | 10 s | 60 Nm | 60 W | -20/+60 °C | Ø 14/6 | 156 mm | 12 kg | 147700 |

Wide range of positioning times and torques available on request - wide range of rotations possible.

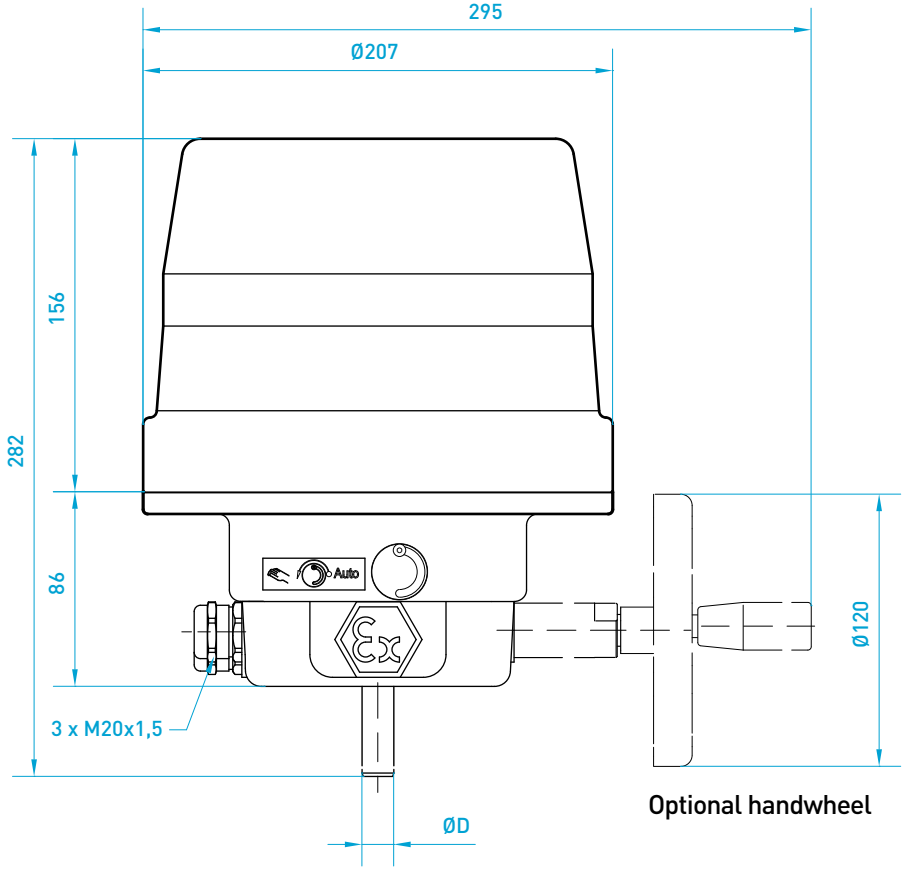
## SCHEMATIC DIAGRAM SYNCHRONOUS MOTOR STANDARD AC



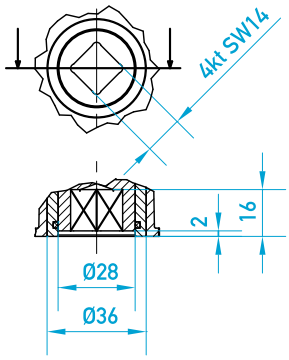
# Dimensions



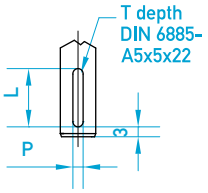

Optional handwheel



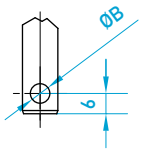

Optional handwheel




Option ISO flange F05



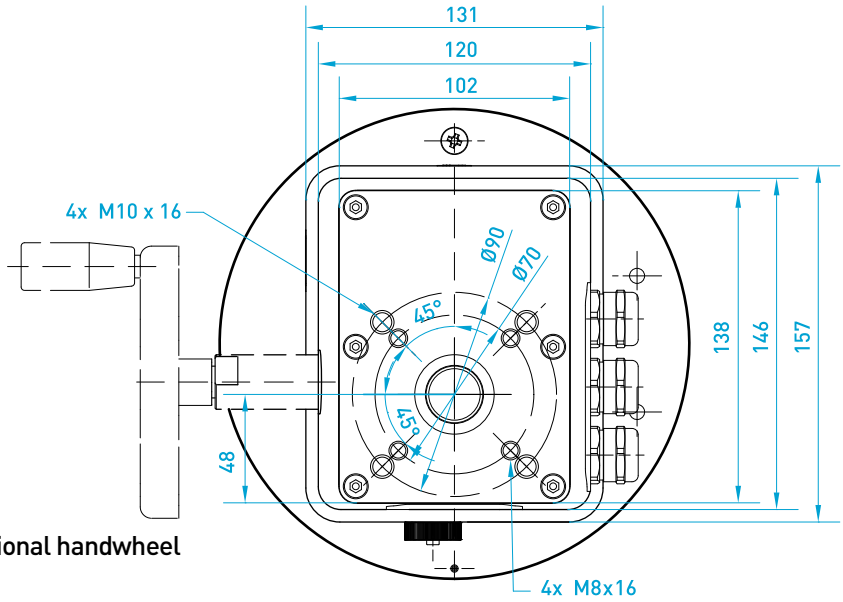

Shaft type "B"



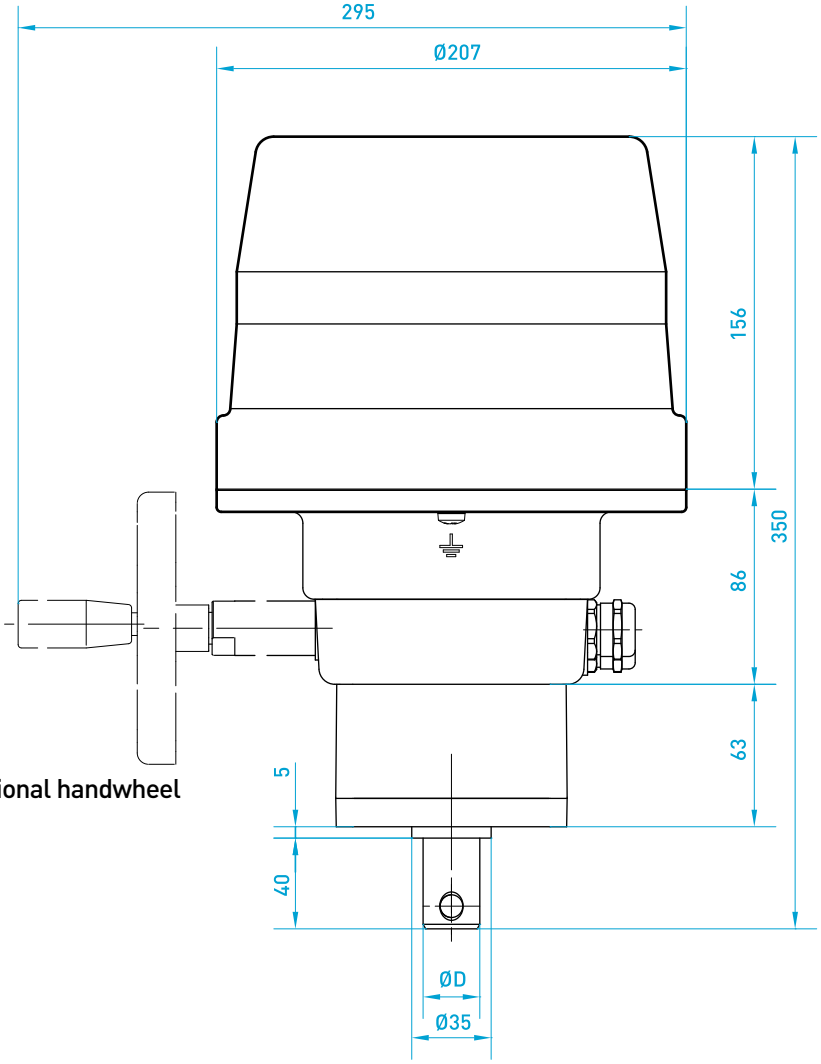

Shaft type "A"

| Type | Positioning time | D | B | P | L | T |
|---|---|---|---|---|---|---|
| NEx 1-3 | all | 12 | 5 | 4 | 16 | 2,5 |
| NEx 4 | 12-120 s / 90° | 12 | 5 | 4 | 16 | 2,5 |
| NEx 4 | 6 s / 90° | 12 | 5 | 4 | 16 | 2,5 |
| NEx 4 A | 15-120 s / 90° | 14 | 6 | 5 | 22 | 3 |
| NEx 4 A | 8 s / 90° | 14 | 6 | 5 | 22 | 3 |
| NEx 5 | 50-130 s / 90° | 20 | 8 | 6 | 22 | 3,5 |
| NEx 5 | 30 s / 90° | 20 | 8 | 6 | 22 | 3,5 |
| NEx 5 | 15 s / 90° | 20 | 8 | 6 | 22 | 3,5 |
| NEx 6 | 45-130 s / 90° | 25 | 10 | 8 | 32 | 4 |
| NEx 6 | 25 s / 90° | 25 | 10 | 8 | 32 | 4 |

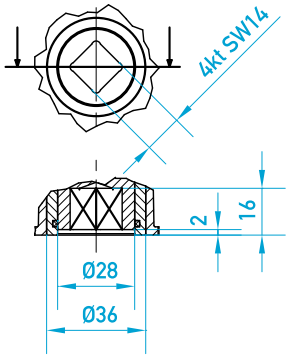
All dimensions in mm



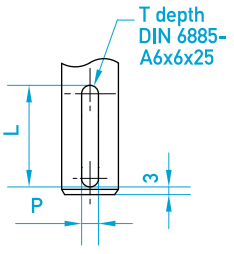

Optional handwheel



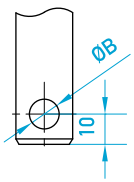

Optional handwheel




Option ISO flange F05




Shaft type "B"




Shaft type "A"

# NEx-K

## Linear actuators



## Product features

- Ex zone 1 marking CE 2004 Ex II 2G Ex d IIC T6 Gb
- Wide range of force outputs
- Large stroke range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Solid metal housing
- Maintenance-free gearing
- Operates in any position

## Overview

The NEx-K linear drive for Ex zone applications is a further development of the flameproof housing of the NEx rotary and part-turn actuator with Ex zone 1 marking CE 2004 Ex II 2G Ex d IIC T6 Gb, based on IECEx certification IECEx EPS 15.0061X and ATEX certification EPS 15 ATEX 1 044 X.

NEx-K series linear actuators are utilized to precisely adjust dampers installed in all systems in air-conditioning, ventilation and heating systems as well as in furnace installations, process plant engineering and other fields of industry.
They are available with the following actuating forces: 600 N, 1200 N, 1800 N, 2500 N, 3000 N, 3500 N and 5000 N.

The stroke units are designed for stroke lengths of 150-750 mm. The technical construction mirrors that of NEx series actuators. Switch-off at limit is path dependent. The standard scope of supply includes a limit switch for each end position. These are designed as changeover switches and can also perform supplementary functions such as end position indication or sequential control tasks. Additional auxiliary position switches and potentiometers are also available. Fitting a relay makes it possible to control several actuators simultaneously via a common contact.
A solid cast bracket as well as an angle section made of steel attached to the housing are provided to mount the actuator. A connecting pin is included to connect the actuator with the valve.

# Product details

## HOUSING

- Housing and hood made of corrosion-resistant gravity die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- The motor compartment is designed as a type "d" flameproof enclosure to DIN EN 60079-1.
- Protection class IP66/67
- Options:

- Custom colours

## SYNCHRONOUS MOTOR

- Single-phase AC synchronous motor with permanent magnets, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Options:

- Custom voltages
- Custom frequencies

## BLDC MOTOR

- Brushless DC motor
- Constant positioning time thanks to electronic speed controller
- Wide-range input 90 V AC ... 264 V AC, 120 V DC ... 370 V DC
- High holding torque when operating voltage applied
- Manufacturer configured start-up and brake ramp
- ON time 100% duty cycle
- Insulation class E to VDE 0530

## DC MOTOR

- DC commutator motor
- Voltage: 12 VDC or 24 VDC
- Insulation class E to VDE 0530

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## STROKE UNIT

- Fixing bracket made of aluminium
- Spindle made of stainless steel
- Spindle self-locking
- Needle bearings to absorb axial forces
- Steel and bronze materials provide good anti-seizure properties

## SPINDLE

- Self-locking
- "Open/Closed" markings indicate position
- Made of stainless steel

## ELECTRICAL CONNECTION

- Connection by means of 1 m cable end or Ex "e" rated terminal box with tension clamp terminals
- Customer-side wiring outside of the flameproof housing
- Electric anti-condensate heater
- Manual reset temperature switch 80 °C

## CONTROLS

- Open/closed signal
- Options:

- Additional potential-free contacts
- Electronic position controller ESR-N with Profibus and USB interfaces for synchronous motors
- Potentiometer 200 Ω ... 10 kΩ
- Blocking protection assured by monitoring changes to actual value of the potentiometer (only in conjunction with position controller ESR-N)

## AMBIENT TEMPERATURE

- -20 °C to +60 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- CO switches with silver-plated contacts
- Switch connections routed to terminals
- Max. switching capacity: 6 A, 250 VAC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer

- Conductive plastic potentiometer (standard) or wire-wound potentiometer (including TUV approval)
- Multiturn potentiometer up to 10 turns
- Gearing facilitates adapting the electrical angle of rotation of the potentiometer to the desired linear regulating distance of the actuator.

- With 4 ... 20 mA transmitter

- Gearing facilitates adapting the electrical angle of rotation of the transmitter to the desired linear regulating distance of the actuator.

- With Hall sensor

- The wear-free, absolute encoder that makes use of the Hall effect is particularly suitable for continuous operation in potentially explosive atmospheres.

## MANUAL OPERATION (OPTIONAL)

- Using a handwheel it is possible to manually adjust the position of the output shaft and valves.
- Position switch-off settings are retained during manual operation.
- Handwheel remains motionless during electrically powered operation.

## OPTIONS

- Other voltage/frequency
- Handwheel
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR-N (in conjunction with synchronous motor)
- Position sensor
- Relay to switch several actuators in parallel
- Potentiometer
- Components to UL standard
- Spindle protected by bellows
- Set collars serve as external travel stops

## ASSEMBLY

- Easily mounted thanks to stable cast angle bracket and steel angle section attached to housing
- Connecting pin supplied to connect spindle with valve
- No fuss coupling to valve stem by means of:

- Lever arm, clamping lever, ball-and-socket joint, connecting rods, sprung connecting rods

## SAFTY INSTRUCTIONS

- Ensure the device is isolated from the power supply before the hood of the flameproof encapsulated housing is opened by a skilled tradesperson in a hazardous area. It is imperative to observe the wait time stated on the rating plate!

## ORDER DETAILS

- Device type
- Positioning force
- Positioning time
- Motor type
- Operating voltage/frequency
- Desired options
- When ordering a potentiometer:

- Resistance value
- Desired linear regulating distance of actuator

- Preset position switches and potentiometer
- Or order number
- Desired valve, where applicable

# Technical data

## NEx-K SERIES ACTUATORS, WITH SYNCHRONOUS MOTOR 230 V, 50(60) Hz (OPTIONAL: 115 V, 50(60) Hz AND 24 V, 50(60) Hz)

| Type | Positioning time | Positioning force | Power consumption (max) | Selectable regulating distance | Hood height | Weight | Order No. | Order No.. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| NEx-K ..06 | 1.7(2) mm/s | 600 N | 18 VA | 150 - 750 mm | 156 mm | 12 kg | 147940 | See below |
| NEx-K ..06 | 2.3(2.7) mm/s | 600 N | 23 VA | 150 - 750 mm | 156 mm | 12 kg | 147950 | See below |
| NEx-K ..06 | 4.5(5.4) mm/s | 600 N | 32 VA | 150 - 750 mm | 156 mm | 12 kg | 147960 | See below |
| NEx-K ..06 | 6.7(8) mm/s | 600 N | 35 VA | 150 - 750 mm | 156 mm | 12 kg | 147970 | See below |
| NEx-K ..12 | 1.5(1.7) mm/s | 1200 N | 24 VA | 150 - 750 mm | 156 mm | 12 kg | 147990 | See below |
| NEx-K ..12 | 2.3(2.7) mm/s | 1200 N | 24 VA | 150 - 750 mm | 156 mm | 12 kg | 148000 | See below |
| NEx-K ..12 | 3.5(4) mm/s | 1200 N | 24 VA | 150 - 750 mm | 156 mm | 12 kg | 148010 | See below |
| NEx-K ..18 | 1.5(1.8) mm/s | 1800 N | 24 VA | 150 - 750 mm | 156 mm | 12 kg | 148040 | See below |
| NEx-K ..18 | 2.3(2.7) mm/s | 1800 N | 24 VA | 150 - 750 mm | 156 mm | 12 kg | 148050 | See below |
| NEx-K ..25 | 1.5(1.8) mm/s | 2500 N | 32 VA | 150 - 750 mm | 156 mm | 12 kg | 148060 | See below |
| NEx-K ..25 | 2.3(2.7) mm/s | 2500 N | 35 VA | 150 - 750 mm | 156 mm | 12 kg | 148070 | See below |
| NEx-K ..35 | 0.8(1) mm/s | 3500 N | 32 VA | 150 - 750 mm | 156 mm | 12 kg | 148090 | See below |

| | | |
|---|---|---|
| Stroke units for regulating distance 150 mm | 5.3 kg | 148340 |
| Stroke units for regulating distance 300 mm | 7.6 kg | 148350 |
| Stroke units for regulating distance 450 mm | 9.6 kg | 148360 |
| Stroke units for regulating distance 600 mm | 11.6 kg | 148370 |
| Stroke units for regulating distance 750 mm | 13.6 kg | 148380 |

The actuator designation NEx-K 1506 is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

## NEx-K-DC SERIES ACTUATORS, 24 V DC

| Type | Positioning time | Positioning force | Power consumption (max) | Selectable regulating distance | Hood height | Weight | Order No. | Order No.. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| NEx-K ..06-DC | 1.7 mm/s | 600 N | 11 W | 150 - 750 mm | 156 mm | 12 kg | 148180 | See below |
| NEx-K ..06-DC | 3.4 mm/s | 600 N | 21 W | 150 - 750 mm | 156 mm | 12 kg | 148190 | See below |
| NEx-K ..06-DC | 6 mm/s | 600 N | 21 W | 150 - 750 mm | 156 mm | 12 kg | 148200 | See below |
| NEx-K ..12-DC | 1.7 mm/s | 1200 N | 21 W | 150 - 750 mm | 156 mm | 12 kg | 148220 | See below |
| NEx-K ..12-DC | 3.4 mm/s | 1200 N | 21 W | 150 - 750 mm | 156 mm | 12 kg | 148230 | See below |

| | | |
|---|---|---|
| Stroke units for regulating distance 150 mm | 5.3 kg | 148340 |
| Stroke units for regulating distance 300 mm | 7.6 kg | 148350 |
| Stroke units for regulating distance 450 mm | 9.6 kg | 148360 |
| Stroke units for regulating distance 600 mm | 11.6 kg | 148370 |
| Stroke units for regulating distance 750 mm | 13.6 kg | 148380 |

The actuator designation NEx-K 1506-DC is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

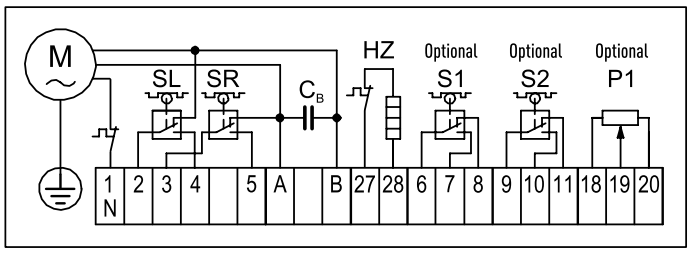
## NEx-K-BLDC SERIES ACTUATORS, MULTI-VOLTAGE 90-264 V AC, 120-370 V DC

| Type | Positioning time | Positioning force | Power consumption (max) | Selectable regulating distance | Hood height | Weight | Order No. | Order No.. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| NEx-K ..12-BLDC | 6 mm/s | 1200 N | 60 W | 150 - 750 mm | 156 mm | 12 kg | 148240 | See below |
| NEx-K ..25-BLDC | 1.7 mm/s | 2500 N | 60 W | 150 - 750 mm | 156 mm | 12 kg | 148260 | See below |
| NEx-K ..25-BLDC | 3.4 mm/s | 2500 N | 60 W | 150 - 750 mm | 156 mm | 12 kg | 148270 | See below |
| NEx-K ..50-BLDC | 1.7 mm/s | 5000 N | 60 W | 150 - 750 mm | 156 mm | 12 kg | 148280 | See below |

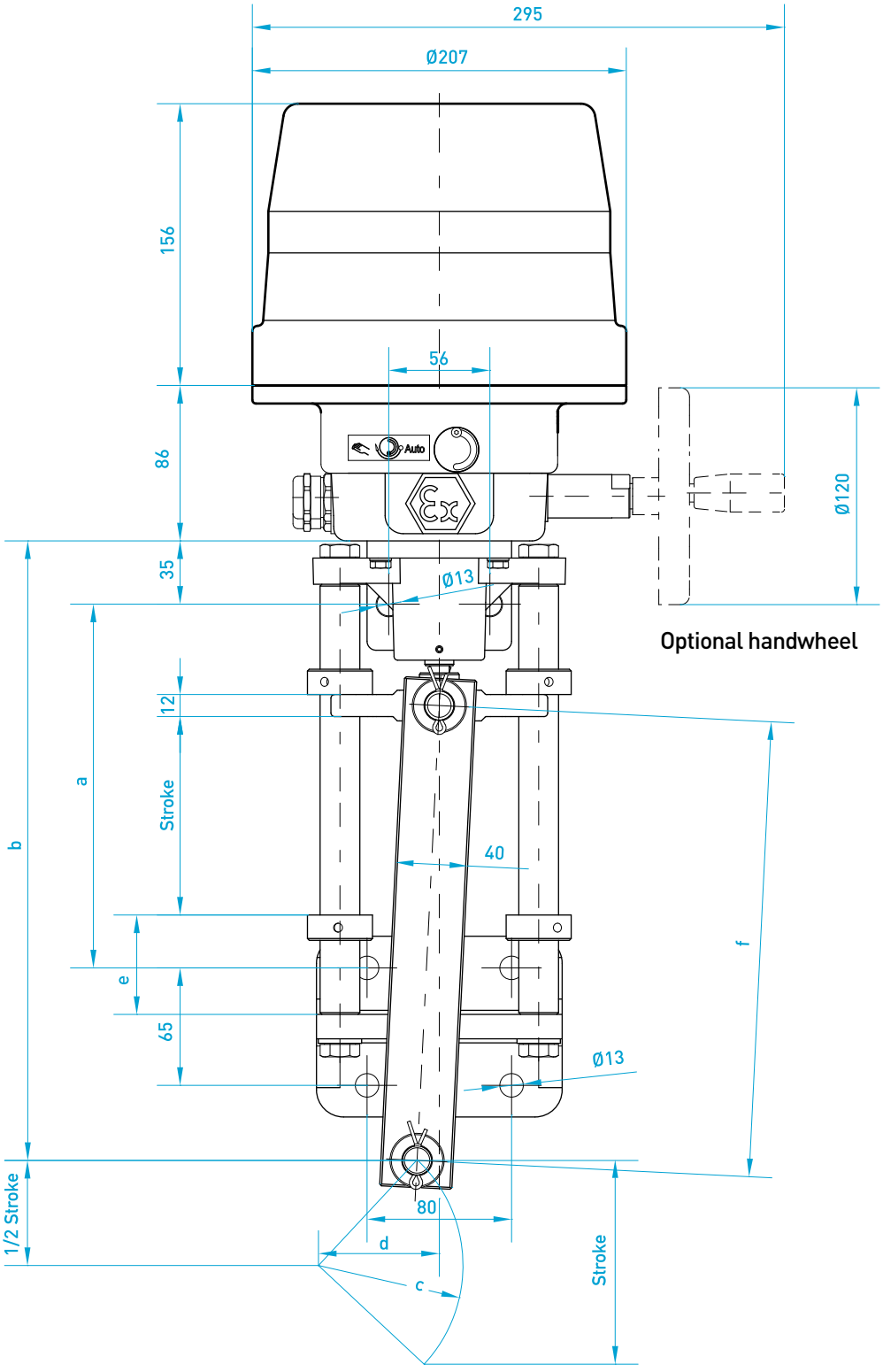
| | | |
|---|---|---|
| Stroke units for regulating distance 150 mm | 5.3 kg | 148340 |
| Stroke units for regulating distance 300 mm | 7.6 kg | 148350 |
| Stroke units for regulating distance 450 mm | 9.6 kg | 148360 |
| Stroke units for regulating distance 600 mm | 11.6 kg | 148370 |
| Stroke units for regulating distance 750 mm | 13.6 kg | 148380 |

The actuator designation NEx-K 1506-BLDC is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

## SCHEMATIC DIAGRAM SYNCHRONOUS MOTOR STANDARD AC

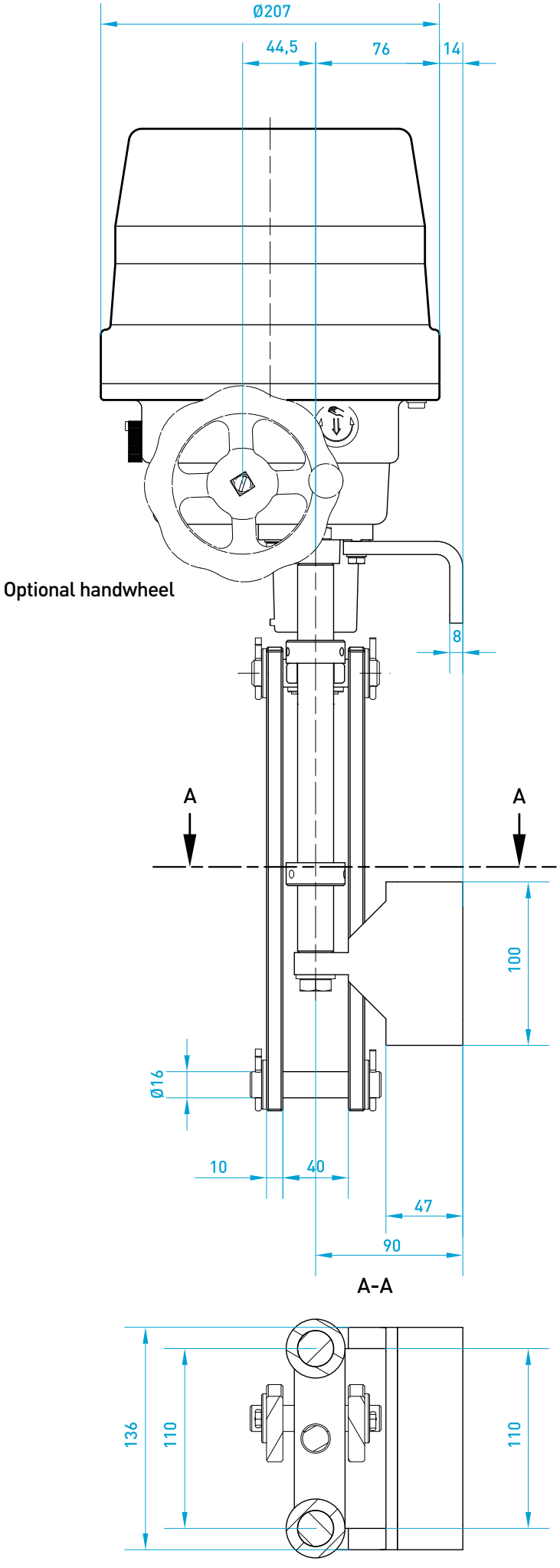


# Dimensions




| Typ | Stroke | a | b | c | d | e | f |
|---|---|---|---|---|---|---|---|
| NEx-K | 150 | 201 | 341 | 106 | 85 | - | 252 |
| NEx-K + bellows | 150 | 351 | 491 | 106 | 85 | 89 | 327 |
| NEx-K | 300 | 351 | 491 | 212 | 170 | - | 402 |
| NEx-K + bellows | 300 | 611 | 751 | 212 | 170 | 144 | 532 |
| NEx-K | 450 | 501 | 641 | - | - | - | 552 |
| NEx-K | 600 | 651 | 791 | - | - | - | 702 |
| NEx-K | 750 | 801 | 941 | - | - | - | 852 |

All dimensions in mm


Ø207
44,5
76
14
Optional handwheel
8
A
A
100
Ø16
10
40
47
90
A-A
136
110
110

# NEx-KA

## Linear actuators



## Product features

- Ex zone 1 marking CE 2004 Ex II 2G Ex d IIC T6 Gb
- Wide range of force outputs
- Large stroke range
- Wide range of positioning times
- Constant positioning times under fluctuating loads
- Large number of auxiliary position switches possible
- Solid metal housing
- Maintenance-free gearing
- Operates in any position
- Protected spindle

## Overview

The NEx-KA linear drive for Ex zone applications is a further development of the flameproof housing of the NEx rotary and part-turn actuator with Ex zone1 marking CE 2004 Ex II 2G Ex d IIC T6 Gb, based on IECEx certification IECEx EPS 15.0061X and ATEX certification EPS 15 ATEX 1 044 X and the linear module of the KA series actuator.

NEx-KA series linear actuators are utilized to precisely adjust dampers installed in all systems in air-conditioning, ventilation and heating systems as well as in furnace installations, process plant engineering and other fields of industry. They are available with the following actuating forces: 600 N, 1200 N, 1800 N, 2500 N, 3000 N, 3500 N and 5000 N. The stroke units are designed for stroke lengths of 150-1100 mm.

The technical construction mirrors that of NEx series actuators. Switch-off at limit is path dependent. The standard scope of supply includes a limit switch for each end position. These are designed as changeover switches and can also perform supplementary functions such as end position indication or sequential control tasks. Additional auxiliary position switches and potentiometers are also available. Fitting a relay makes it possible to control several actuators simultaneously via a common contact.

A solid cast bracket is available to mount the actuator. A connecting pin is included in the scope of supply to create the connection with the connecting rod. The spindle is protected by a protective tube.

# Product details

## HOUSING

- Housing and hood made of corrosion-resistant gravity die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- The motor compartment is designed as a type "d" flameproof enclosure to DIN EN 60079-1.
- Protection class IP66/67
- Options:

- Custom colours

## SYNCHRONOUS MOTOR

- Single-phase AC synchronous motor with permanent magnets, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Options:

- Custom voltages
- Custom frequencies

## BLDC MOTOR

- Brushless DC motor
- Constant positioning time thanks to electronic speed controller
- Wide-range input 90 V AC ... 264 V AC, 120 V DC ... 370 V DC
- High holding torque when operating voltage applied
- Manufacturer configured start-up and brake ramp
- ON time 100% duty cycle
- Isolationsklasse E nach VDE 0530

## DC MOTOR

- DC commutator motor
- Voltage: 12 VDC or 24 VDC
- Insulation class E to VDE 0530

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## STROKE UNIT

- Fixing bracket made of aluminium
- Spindle and connecting rod made of stainless steel
- Spindle self-locking
- Needle bearings to absorb axial forces
- Steel / bronze materials provide good anti-seizure properties

## ELECTRICAL CONNECTION

- Connection by means of 1 m cable end or Ex "e" rated terminal box with tension clamp terminals of the cable entry port
- Customer-side wiring outside of the flameproof housing
- Electric anti-condensate heater
- Manual reset temperature switch 80 °C

## CONTROLS

- Open/closed signal
- Options:

- Additional potential-free contacts
- Electronic position controller ESR-N with Profibus and USB interfaces for synchronous motors
- Potentiometer 200 Ω ... 10 kΩ
- Blocking protection by monitoring changes to the actual value of the potentiometer (only in conjunction with position controller ESR-N)

## AMBIENT TEMPERATURE

- -20 °C to +60 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITCH

- CO switches with silver-plated contacts
- Switch connections routed to terminals
- Max. switching capacity: 6 A, 250 V AC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer
- Conductive plastic potentiometer (standard) or wire-wound potentiometer (including TUV approval)
- Multiturn potentiometer up to 10 turns
- Gearing facilitates adapting the electrical angle of rotation of the potentiometer to the desired linear regulating distance of the actuator.
- With 4 ... 20 mA transmitter
- Gearing facilitates adapting the electrical angle of rotation of the transmitter to the desired linear regulating distance of the actuator
- With Hall sensor
- The wear-free absolute encoder that makes use of the Hall effect is particularly suitable for continuous operation in potentially explosive atmospheres.

## MANUAL OPERATION (OPTIONAL)

- Using a handwheel it is possible to manually adjust the position of the output shaft and valves.
- Position switch-off settings are retained during manual operation.
- Handwheel remains motionless during electrically powered operation.

## OPTIONS

- Other voltage/frequency
- Handwheel
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR-N (in conjunction with synchronous motor)
- Position sensor
- Relay to switch several actuators in parallel
- Potentiometer
- Components to UL standard
- Connecting rod protected by bellows
- Encapsulated stroke unit

## ASSEMBLY

- Easily mounted thanks to stable cast angle bracket attached to housing
- Connecting pin supplied to connect connecting rod with valve
- No fuss coupling to valve stem by means of:
- Lever arm, clamping lever, ball-and-socket joint, connecting rods, sprung connecting rods

## SAFTY INSTRUCTIONS

- Ensure the device is isolated from the power supply before the hood of the flameproof encapsulated housing is opened by a skilled tradesperson in a hazardous area.
  It is imperative to observe the wait time stated on the rating plate!

## ORDER DETAILS

- Device type
- Positioning force
- Positioning time
- Motor type
- Operating voltage/frequency
- Desired options
- When ordering a potentiometer:
- Resistance value
- Desired linear regulating distance of actuator
- Preset position switches and potentiometer
- Or order number
- Desired valve, where applicable

# Technical data

## NEx-KA SERIES ACTUATORS WITH SYNCHRONOUS MOTOR, 230 V, 50(60) Hz (OPTIONS 115 V, 50(60) Hz AND 24 V, 50(60) Hz)

| Type | Positioning time | Positioning force | Power consumption (max) | Selectable regulating distance | Hood height | Weight | Order No. | Order No.. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| NEx-KA ..06 | 1.7(2) mm/s | 600 N | 18 VA | 150 - 1100 mm | 156 mm | 12 kg | 147940 | See below |
| NEx-KA ..06 | 2.3(2.7) mm/s | 600 N | 23 VA | 150 - 1100 mm | 156 mm | 12 kg | 147950 | See below |
| NEx-KA ..06 | 4.5(5.4) mm/s | 600 N | 32 VA | 150 - 1100 mm | 156 mm | 12 kg | 147960 | See below |
| NEx-KA ..06 | 6.7(8) mm/s | 600 N | 35 VA | 150 - 1100 mm | 156 mm | 12 kg | 147970 | See below |
| NEx-KA ..12 | 1.5(1.7) mm/s | 1200 N | 24 VA | 150 - 1100 mm | 156 mm | 12 kg | 147990 | See below |
| NEx-KA ..12 | 2.3(2.7) mm/s | 1200 N | 24 VA | 150 - 1100 mm | 156 mm | 12 kg | 148000 | See below |
| NEx-KA ..12 | 3.5(4) mm/s | 1200 N | 24 VA | 150 - 1100 mm | 156 mm | 12 kg | 148010 | See below |
| NEx-KA ..18 | 1.5(1.8) mm/s | 1800 N | 24 VA | 150 - 1100 mm | 156 mm | 12 kg | 148040 | See below |
| NEx-KA ..18 | 2.3(2.7) mm/s | 1800 N | 24 VA | 150 - 1100 mm | 156 mm | 12 kg | 148050 | See below |
| NEx-KA ..25 | 1.5(1.8) mm/s | 2500 N | 32 VA | 150 - 1100 mm | 156 mm | 12 kg | 148060 | See below |
| NEx-KA ..25 | 2.3(2.7) mm/s | 2500 N | 35 VA | 150 - 1100 mm | 156 mm | 12 kg | 148070 | See below |
| NEx-KA ..35 | 0.8(1) mm/s | 3500 N | 32 VA | 150 - 1100 mm | 156 mm | 12 kg | 148090 | See below |

| | | | | |
|---|---|---|---|---|
| Stroke units for regulating distance | 150 mm | | 4 kg | 148440 |
| Stroke units for regulating distance | 300 mm | | 5 kg | 148450 |
| Stroke units for regulating distance | 450 mm | | 6.2 kg | 148460 |
| Stroke units for regulating distance | 600 mm | Max. 4000 N in push direction | 7.2 kg | 148470 |
| Stroke units for regulating distance | 750 mm | Max. 2500 N in push direction | 8.2 kg | 148480 |
| Stroke units for regulating distance | 1100 mm | Max. 1800 N in push direction | 10.5 kg | 148490 |

The actuator designation NEx-KA 1506 is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

## NEx-KA-DC SERIES ACTUATORS, 24 V DC

| Type | Positioning time | Positioning force | Power consumption (max) | Selectable regulating distance | Hood height | Weight | Order No. | Order No.. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| NEx-KA ..06-DC | 1.7 mm/s | 600 N | 11 W | 150 - 1100 mm | 156 mm | 12 kg | 148180 | See below |
| NEx-KA ..06-DC | 3.4 mm/s | 600 N | 21 W | 150 - 1100 mm | 156 mm | 12 kg | 148190 | See below |
| NEx-KA ..06-DC | 6 mm/s | 600 N | 21 W | 150 - 1100 mm | 156 mm | 12 kg | 148200 | See below |
| NEx-KA ..12-DC | 1.7 mm/s | 1200 N | 21 W | 150 - 1100 mm | 156 mm | 12 kg | 148220 | See below |
| NEx-KA ..12-DC | 3.4 mm/s | 1200 N | 21 W | 150 - 1100 mm | 156 mm | 12 kg | 148230 | See below |

| | | | | |
|---|---|---|---|---|
| Stroke units for regulating distance | 150 mm | | 4 kg | 148440 |
| Stroke units for regulating distance | 300 mm | | 5 kg | 148450 |
| Stroke units for regulating distance | 450 mm | | 6.2 kg | 148460 |
| Stroke units for regulating distance | 600 mm | Max. 4000 N in push direction | 7.2 kg | 148470 |
| Stroke units for regulating distance | 750 mm | Max. 2500 N in push direction | 8.2 kg | 148480 |
| Stroke units for regulating distance | 1100 mm | Max. 1800 N in push direction | 10.5 kg | 148490 |

The actuator designation NEx-KA 1506-DC is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

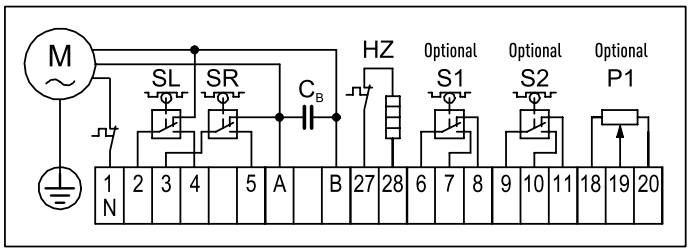
## NEx-KA-BLDC SERIES ACTUATORS, MULTI-VOLTAGE 90 - 264 V AC, 120 - 370 V DC

| Type | Positioning time | Positioning force | Power consumption (max) | Selectable regulating distance | Hood height | Weight | Order No. | Order No.. Stroke unit |
|---|---|---|---|---|---|---|---|---|
| NEx-KA ..12-BLDC | 6 mm/s | 1200 N | 60 W | 150 - 1100 mm | 156 mm | 12 kg | 148240 | See below |
| NEx-KA ..25-BLDC | 1.7 mm/s | 2500 N | 60 W | 150 - 1100 mm | 156 mm | 12 kg | 148260 | See below |
| NEx-KA ..25-BLDC | 3.4 mm/s | 2500 N | 60 W | 150 - 1100 mm | 156 mm | 12 kg | 148270 | See below |
| NEx-KA ..50-BLDC | 1.7 mm/s | 5000 N | 60 W | 150 - 1100 mm | 156 mm | 12 kg | 148280 | See below |

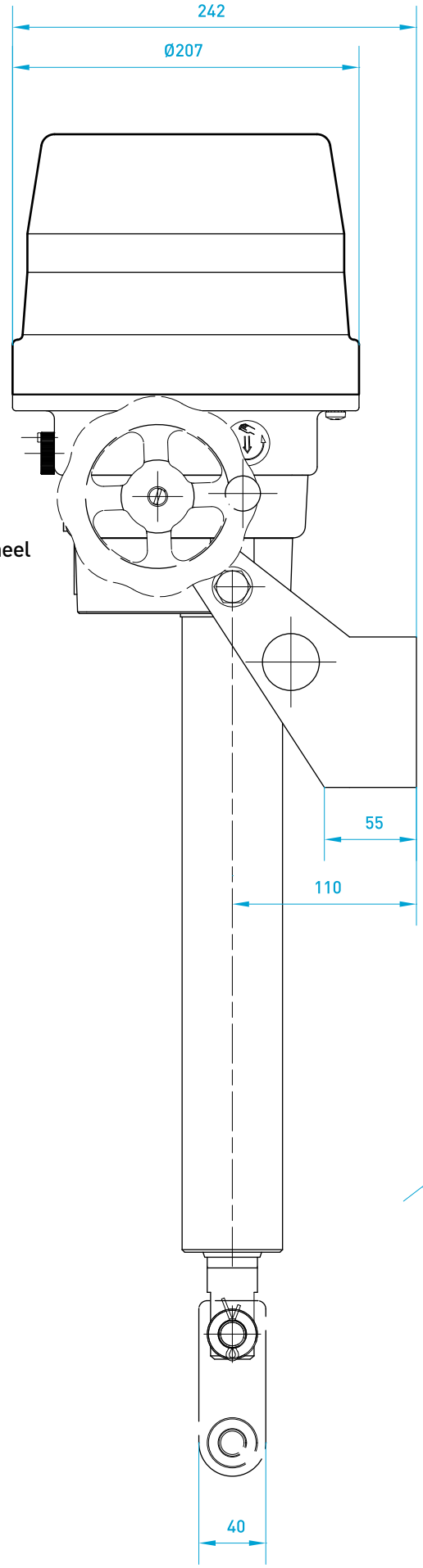
| | | | | |
|---|---|---|---|---|
| Stroke units for regulating distance | 150 mm | | 4 kg | 148440 |
| Stroke units for regulating distance | 300 mm | | 5 kg | 148450 |
| Stroke units for regulating distance | 450 mm | | 6.2 kg | 148460 |
| Stroke units for regulating distance | 600 mm | Max. 4000 N in push direction | 7.2 kg | 148470 |
| Stroke units for regulating distance | 750 mm | Max. 2500 N in push direction | 8.2 kg | 148480 |
| Stroke units for regulating distance | 1100 mm | Max. 1800 N in push direction | 10.5 kg | 148490 |

The actuator designation NEx-KA 1506-BLDC is created from the regulating distance (150 mm) = 15 and positioning force (600 N) = 06

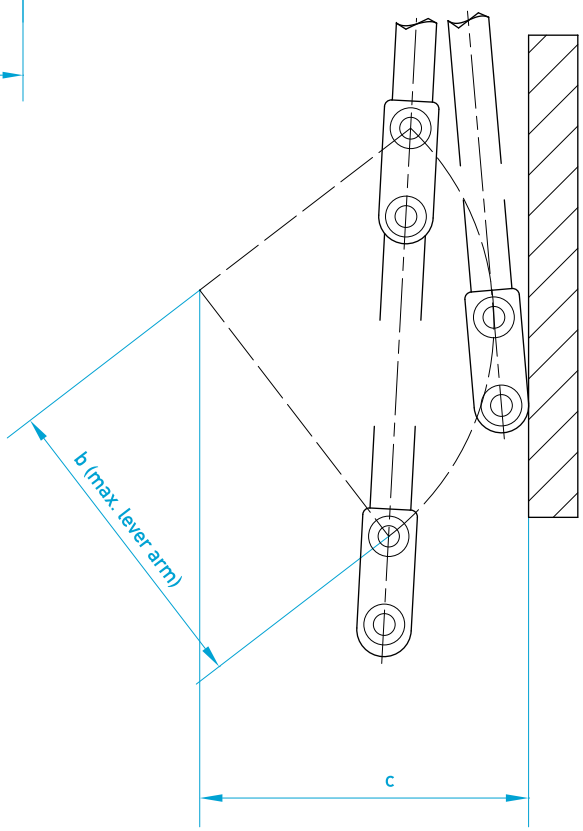
## SCHEMATIC DIAGRAM SYNCHRONOUS MOTOR STANDARD AC

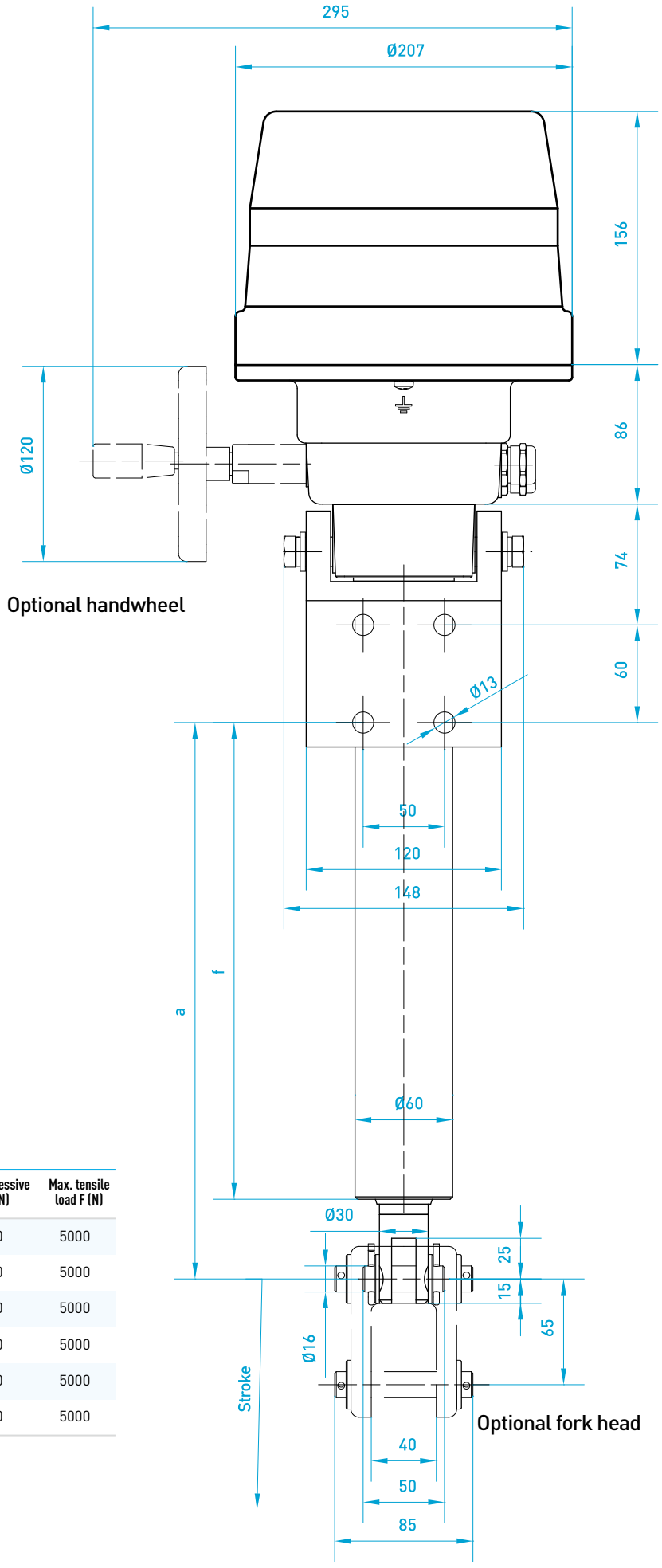


# Dimensions




Optional handwheel






| Stroke | a | b | c | f | Max. compressive load F (N) | Max. tensile load F (N) |
|---|---|---|---|---|---|---|
| 1100 | 1185 | 778 | 800 | 1138 | 1800 | 5000 |
| 750 | 820 | 530 | 560 | 773 | 2500 | 5000 |
| 600 | 670 | 424 | 455 | 623 | 4000 | 5000 |
| 450 | 520 | 318 | 350 | 473 | 5000 | 5000 |
| 300 | 340 | 212 | 245 | 293 | 5000 | 5000 |
| 150 | 190 | 106 | 140 | 143 | 5000 | 5000 |

All dimensions in mm

# NEx-V

## Linear actuators



## Product features

- Ex zone 1 marking CE 2004 Ex II 2G Ex d IIC T6 Gb
- Wide range of force outputs
- Large stroke range
- Constant positioning times under fluctuating loads
- Four additional auxiliary position switches possible
- Wide selection of column adapters
- Wide selection of flanges
- Solid metal housing
- Maintenance-free gearing
- Operates in any position

## Overview

The NEx-V linear drive for Ex zone applications is a further development of the flameproof housing of the NEx rotary and part-turn actuator with Ex zone 1 marking CE 2004 Ex II 2G Ex d IIC T6 Gb, based on IECEx certification IECEx EPS 15.0061X and ATEX certification EPS 15 ATEX 1 044 X and the linear module of the V-series actuator.

NEx-V series linear actuators are utilized when precision linear adjustments are required to control elements in heating, ventilation and air conditioning systems as well as in industrial applications. NEx-V series linear actuators are available with the following actuating forces: 1000 N, 2000 N, 3000 N, 4000 N and 5000 N as well as a maximum stroke of 85 mm.

The design of the housing made of die-cast aluminium and die-cast zinc in combination with a permanently lubricated gearing made of steel with sintered-bronze bearing bushes ensure their suitability for use in a broad range of temperatures and harsh operating environments. The technical construction mirrors that of N series actuators. End position limit stop is path dependent. The standard scope of supply includes a limit switch for each end position. These are designed as changeover switches and can also perform supplementary functions such as end position indication or sequential control tasks. Additional auxiliary position switches and potentiometers are also available. Fitting a relay makes it possible to control several actuators simultaneously via a common contact.

The respective position of the valve is indicated by "Open/Closed" markings on one of the columns of the stroke unit in conjunction with the bearing surfaces of the spindle nut. A solid flange is available to mount the actuator. A driver pin is included to create the connection with the threaded spindle.

# Product details

## HOUSING

- Housing and hood made of corrosion-resistant gravity die-cast aluminium
- Coated, colour: RAL 7032 Pebble Grey
- The motor compartment is designed as a type "d" flameproof enclosure to DIN EN 60079-1.
- Protection class IP66/67
- Options:

- Custom colours

## SYNCHRONOUS MOTOR

- Single-phase AC synchronous motor with permanent magnets, reversible
- 230 V ± 10%, 50/60 Hz ± 5%
- ON time 100% duty cycle on request
- Short start/stop times
- Insulation class B to VDE 0530
- Synchronous motors maintain speed and constant positioning times irrespective of the load
- Options:

- Custom voltages
- Custom frequencies

## BLDC MOTOR

- Brushless DC motor
- Constant positioning time thanks to electronic speed controller
- Wide-range input 90 VAC ... 264 VAC, 120 VDC ... 370 VDC
- High holding torque when operating voltage applied
- Manufacturer configured start-up and brake ramp
- ON time 100% duty cycle
- Insulation class B to VDE 0530

## DC MOTOR

- DC commutator motor
- Voltage: 12 VDC or 24 VDC
- Insulation class E to VDE 0530

## GEARBOX

- Spur gearing with straight-toothed steel gears
- Robust, maintenance-free
- Permanently lubricated gears
- Self-lubricating sintered bronze bearing
- Encapsulated version, operates in any position

## STROKE UNIT

- Self-locking
- "Open/Closed" markings indicate position
- Made of stainless steel

## ELEKTRICAL CONNECTION

- Connection by means of 1 m cable end or Ex "e" rated terminal box with tension clamp terminals
- Customer-side wiring outside of the flameproof housing
- Electric anti-condensate heater
- Manual reset temperature switch 80 °C

## CONTROLS

- Open/closed signal
- Options:

- Additional potential-free contacts
- Electronic position controller ESR-N with Profibus and USB interfaces for synchronous motors
- Potentiometer 200 Ω ... 10 kΩ
- Blocking protection assured by monitoring changes to actual value of the potentiometer (only in conjunction with position controller ESR-N)

## AMBIENT TEMPERATURE

- -20 °C to +60 °C

## ANGLE OF ROTATION LIMITED BY SNAP-ACTION POSITION OFF SWITSCH

- CO switches with silver-plated contacts
- Switch connections routed to terminals
- Max. switching capacity: 6 A, 250 VAC
- Options:

- Switches with gold-plated contacts
- Switches with positive-break contacts

## POSITION SENSOR FOR EXTERNAL POSITION INDICATION (OPTIONAL)

- With potentiometer
- Conductive plastic potentiometer (standard) or wire-wound potentiometer (including TUV approval)
- Multiturn potentiometer up to 10 turns
- Gearing facilitates adapting the electrical angle of rotation of the potentiometer to the desired linear regulating distance of the actuator.
- With 4 ... 20 mA transmitter
- Gearing facilitates adapting the electrical angle of rotation of the transmitter to the desired linear regulating distance of the actuator.
- With Hall sensor
- The wear-free absolute encoder that makes use of the Hall effect is particularly suitable for continuous operation in potentially explosive atmospheres.

## MANUAL OPERATION (OPTIONAL)

- Using a handwheel it is possible to manually adjust the position of the output shaft and valves.
- Position switch-off settings are retained during manual operation.
- Handwheel remains motionless during electrically powered operation.

## OPTIONS

- Other voltage/frequency
- Handwheel
- Additional auxiliary position switches
- Custom control cams
- Electronic position controller ESR-N (in conjunction with synchronous motor)
- Position sensor
- Relay to switch several actuators in parallel
- Potentiometer
- Components to UL standard
- Encapsulated stroke unit
- Set collars serve as external travel stops

## ASSEMBLY

- Easy to mount thanks to modified column adapters/flanges
- Easily coupled to the spindle nut by means of a wide variety of threaded, through hole and split driving collars

## SAFETY INSTRUCTIONS

- Ensure the device is isolated from the power supply before the hood of the flameproof encapsulated housing is opened by a skilled tradesperson in a hazardous area.
  It is imperative to observe the wait time stated on the rating plate!

## ORDER DETAILS

- Device type
- Positioning force
- Stroke
- Positioning time
- Column clearance/flange fitting dimensions
- Motor type
- Operating voltage/frequency
- Desired options
- When ordering a potentiometer:
- Resistance value
- Desired linear regulating distance of the actuator
- Standard: regulating distance set to maximum, other regulating distances possible on request
- Preset position switches and potentiometer
- Or order number
- Desired valve, where applicable

# Technical data

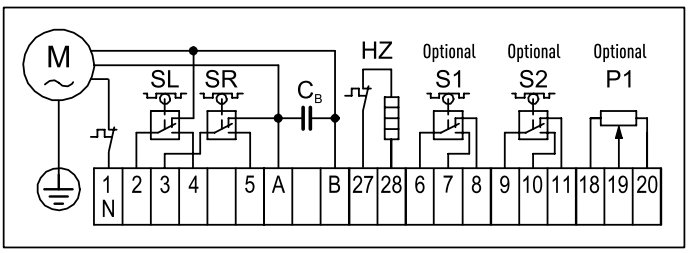
## NEx-V SERIES ACTUATORS, 230 V, 50/60 Hz (OPTION 115 V, 50(60) Hz UND 24 V, 50(60) Hz)

| Type | Positioning time | Positioning force | Power consumption (max.) | Hood | Weight | Order No. |
|---|---|---|---|---|---|---|
| NEx-V 1 | 0.1(0.12) mm/s | 1000 N | 7 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90110 |
| NEx-V 1 | 0.3(0.4) mm/s | 1000 N | 7 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90111 |
| NEx-V 1 | 0.6(0.7) mm/s | 1000 N | 18 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90112 |
| NEx-V 2 | 0.3(0.4) mm/s | 2000 N | 18 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90120 |
| NEx-V 2 | 0.6(0.7) mm/s | 2000 N | 18 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90121 |
| NEx-V 3 | 0.3(0.4) mm/s | 3000 N | 18 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90130 |
| NEx-V 3 | 0.8(1.0) mm/s | 3000 N | 24 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90131 |
| NEx-V 4 | 0.3(0.4) mm/s | 4000 N | 31 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90140 |
| NEx-V 4 | 0.8(1.0) mm/s | 4000 N | 32 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90141 |
| NEx-V 5 | 0.4(0.5) mm/s | 5000 N | 32 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90150 |
| NEx-V 5 | 0.8(1.0) mm/s | 5000 N | 32 VA | including stroke unit H85 universal156 mm | 18,4 kg | 90151 |

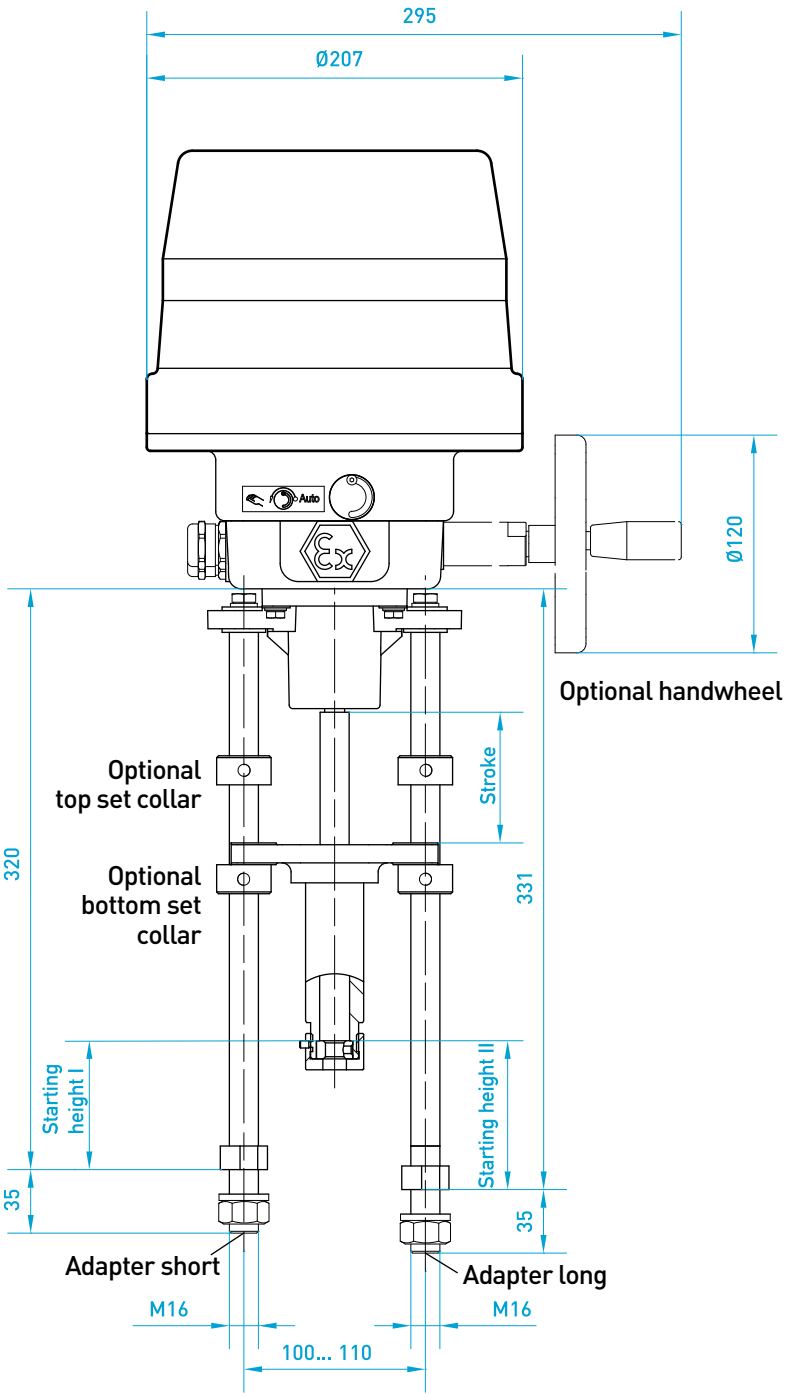
## NEx-V-BLDC SERIES ACTUATORS, MULTI-VOLTAGE 90-264 V AC, 120-370 V DC

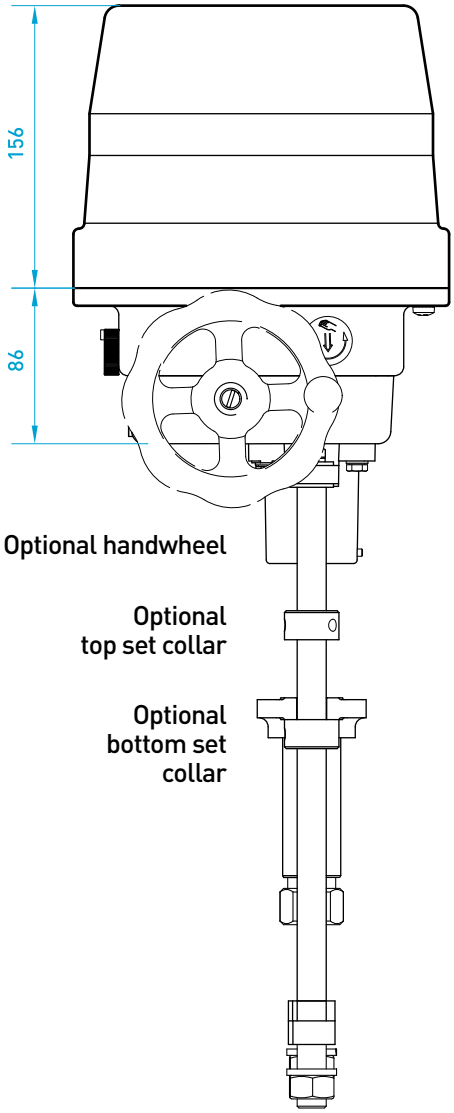
Versions available with a wide-range of positioning forces and positioning times on request.

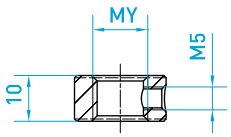
## SCHEMATIC DIAGRAM SYNCHRONOUS MOTOR STANDARD AC

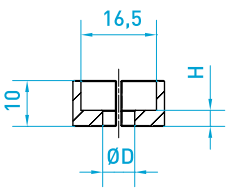


# Dimensions




| Stroke = 138 - Starting height I |
|---|
| Starting height I > 53<br>and<br>Starting height I < 133 |

| Stroke = 149 - Starting height II |
|---|
| Starting height II > 64<br>and<br>Starting height II < 144 |

| With optional spindle adjusting nut |
|---|
| Stroke = 128 - Starting height I<br>Starting height I > 53<br>and<br>Starting height I < 123 |

| With optional spindle adjusting nut |
|---|
| Stroke = 139 - Starting height II<br>Starting height II > 64<br>and<br>Starting height II < 134 |

| MY Options |
|---|
| M6 |
| M10 |
| M12 |
| M12x1 |
| M14x1,5 |
| M16x1,5 |

| Ø D | H |
|---|---|
| 7 | 3,5 |
| 9 | 6,0 |

All dimensions in mm


Agromatic

Agromatic

# DR/SC

## Pneumatic part-turn actuators

## Product features

- Complies with requirements for use in safety-related systems to EN 61508
- Designed for use in Zone 2 and Zone 22
- Wide torque range
- Solid, corrosion-resistant housing made of aluminium
- Maintenance-free
- Operates in any position

## Overview

Our pneumatic part-turn actuators are dual-piston drives based on a rack and pinion design principle. This proven principle of operation guarantees the highest levels of reliability.

Available versions include double-acting and single-acting part-turn actuators with integrated (fail-safe) spring return.

The honed surface of the cylinder bore ensures the pneumatically driven part-turn actuators achieve a long service life. Control pressures range between 2.5 bar and 8 bar. That achieves torques ranging from 5 Nm up to 10 000 Nm. The anodized aluminium housing and powder-coated cover ensure excellent corrosion protection, including in outdoor applications. The connections comply with DIN/ISO and Namur requirements. The part-turn actuators are also suitable for deployment in hazardous areas. Exposed to hazards from gases and vapours they are suitable for deployment in Zone 2, and Zone 22 areas when exposed to dust hazards.

They are also suitable for use as actuators in protective and safety-related systems in accordance with EN 61508.

# Product details

## HOUSING
- Housing made from extruded, anodized aluminium
- Cover made of corrosion-resistant, powder coated die-cast aluminium
- Protection class IP67 to DIN EN 60529

## OUTPUT SHAFT
- Steel, hard nickel plated (ENP)
- With square socket (position parallel and diagonal) or double square socket to ISO 5211 (adaptation through a wide programme of adapter shafts and sleeves)
- Anti-blowout output shaft (complies with tightened US regulations)

## OUTPUT SHAFT BEARINGS
- Plain bearings made of high-quality plastic

## OPERATING ANGLE
- Nominal operating angle: 90°

## CONTROLS
- Open/closed
- Position controller

## AMBIENT TEMPERATURE
- -40 °C to +80 °C
- Options:

- -15 °C to +150 °C
- -55 °C to +80 °C

## END POSITION LIMITS
- Each end position can be set externally
- Wide setting range from +5° to -15°

## ACTUATION MEDIA
- Filtered, dry or oiled air

- Pressure dew point ⩽ -20 °C
- Particle size < 30 µm

- Non-corrosive media

## ACTUATION PRESSURE
- 2.5 bar to 8 bar

## TORQUE
- 6 Nm to 10 000 Nm for double-acting actuators
- 5 Nm to 7 000 Nm for single-acting actuators

## INSTALLATION POSITION
- Any

## PRINCIPLE OF OPERATION
- Pneumatically powered dual-piston drive based on the rack and pinion design principle
- Double-acting piston (DR) or single-acting piston with fail-safe spring return (SC)

## DIRECTION OF TURN (DOUBLE- AND SINGLE-ACTING, PART-TURN ACTUATORS)
- Clockwise closing (standard, air supply to connection 4)
- It is possible to reverse the direction of turn of the part-turn actuator by turning the piston 180°.

## OPERATING PRINCIPLE OF SPRING IN SINGLE-ACTING, PART-TURN ACTUATORS
- The force of the spring closes the part-turn actuator (standard, fail-safe) or the spring force opens the part-turn actuator.

## PISTONS
- Aluminium, black anodized

## SPRINGS
- Preloaded spring made of spring steel with plastic safety ring
- Customers are able to convert the part-turn actuators from a single-acting to double-acting actuators without the need for special jigs or tools.

## SEALS
- NBR

## ATTACHMENT ACTUATOR/VALVE
- Flange to ISO 5211

## ATTACHMENT ACTUATOR/CONTROL VALVE
- Hole pattern to VDI/VDE 3845 (NAMUR) G1/8" and G1/4" or G3/8" and G1/2"

## ATTACHMENT ACTUATOR/SIGNALLING DEVICES

- To VDI/VDE 3845 (Namur)
- Easily visible position indicator with 5° scale graduation as standard

## EX PROTECTION CLASS

- CE Ex II 2 GD c T6 T5 T85 °C T95 °C
  Deployment possible in Zone 2 areas exposed to hazards from gases and vapours.
  Ambient temperature T6 = 70 °C and T5 = 80 °C
  Deployment in Zone 22 possible when exposed to hazards from dust.
  Ambient temperature T85 °C = 70 °C and T95 °C = 80 °C

## CERTIFIED BY TUV RHEINLAND (GERMANY) FOR USE IN SAFETY RELATED SYSTEMS TO EN 61508

- Double-acting part-turn actuator rated up to SIL 2
- Single-acting part-turn actuator rated up to SIL 3

## OPTIONS

- Limit switches (force activated)
- Position controller
- Solenoid valve
- Mounting adapters to DIN EN 15081
- Adapter shafts
- Stainless steel versions
- Nominal operating angle:
  120°, 135°, 145° and 180° on request
- Rapid closing/opening versions on request
- Control medium water

## INSTALLATION

- Easy installation thanks to flange to ISO 5211
- Installation using mounting adapters to DIN EN 15081

## ORDER DETAILS

- Actuator type (double-acting/single-acting)
- Torque
- Nominal operating angle
- Basic setting on delivery (valve closed/open)
- Direction of turn beginning at basic setting (clockwise/anti-clockwise)
- Installation position in relation to direction of flow through valve (parallel/at right angles)
- Flange size for single-acting actuator
- Number of springs each side (S/S*)
- Safety function (spring closing/spring opening)
- Desired options
- Or order number

# Technical data

## TORQUES FOR SINGLE-ACTING ACTUATORS IN Nm

| SC | S/S* | 2.5 bar | | 3 bar | | 3.5 bar | | 4 bar | | 4.2 bar | | Spring torque | | S/S* | 4.2 bar | | 4.5 bar | | 5 bar | | 5.5 bar | | 6 bar | | 8 bar | | Spring torque | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° |
| **00015** | **S1** | **5** | **3** | 7 | 4.7 | 8 | 6.3 | 10 | 8 | 10.7 | 8.7 | 3.3 | 5.3 | **S4** | **7.6** | **5.8** | 9.7 | 6.4 | 11.3 | 8.1 | 13 | 9.8 | 14.7 | 11.4 | | | 5.3 | 8.5 |
| | **S2** | 4 | 1.9 | **6** | **3.6** | 7.7 | 5.3 | 9.3 | 6.9 | 10 | 7.6 | 4 | 6.4 | **S5** | 7 | 4.9 | **9** | **5.4** | 10.7 | 7 | 12.3 | 8.7 | 14 | 10 | 20.6 | 17 | 5.9 | 9.6 |
| | **S3** | | | 5.3 | 2.5 | **7** | **4.2** | 8.7 | 5.8 | 9.4 | 6.6 | 4.6 | 7.4 | **S6** | | | 8.4 | 4.3 | **10** | **6** | 11.7 | 7.6 | 13.3 | 9.3 | 20 | 16 | 6.6 | 10.6 |
| | **S4** | | | | | 6.3 | 3 | **8** | **5** | **8.7** | **5.5** | 5.3 | 8.5 | **S7** | | | | | 9.4 | 4.9 | **11** | **6.6** | 13 | 8.2 | 19.3 | 14.9 | 7.3 | 11.7 |
| | **S5** | | | | | | | 7.3 | 3.7 | 0.1 | 4.4 | 5.9 | 9.6 | **S8** | | | | | | | 10.4 | 6 | **12** | **7.2** | **18.7** | **13.8** | 7.9 | 12.8 |
| **00030** | **2/3** | **9.1** | **6.2** | 12 | 9.2 | 15 | 12.1 | 17.9 | 15 | 19.1 | 16.2 | 6 | 8.4 | **4** | **15.7** | **11.1** | 17.5 | 12.9 | 20.4 | 15.8 | 23.4 | 18.7 | 26.3 | 21.7 | | | 9 | 13.5 |
| | **3** | 8 | 4.5 | **10.9** | **7.5** | 13.9 | 10.4 | 16.8 | 13.3 | 18 | 14.5 | 7 | 10.1 | **4/5** | 14.6 | 9.4 | **16.4** | **11.2** | 19.3 | 14.1 | 22.3 | 17.1 | 25.2 | 20 | 36.9 | 31.7 | 10 | 15.2 |
| | **3/4** | | | 9.8 | 5.8 | **12.8** | **8.7** | 15.7 | 11.6 | 16.9 | 12.8 | 7.8 | 11.8 | **5** | | | 15.3 | 9.5 | **18.2** | **12.4** | **21.1** | 15.4 | 24.1 | 18.3 | 35.8 | 30 | 11.1 | 169 |
| | **4** | | | | | 11.6 | 7 | **14.6** | **10** | **15.7** | **11.1** | 9 | 13.5 | **5/6** | | | | | 17.1 | 10.8 | **20** | **13.7** | 23 | 16.6 | 34.7 | 28.3 | 12 | 18.6 |
| | **4/5** | | | | | | | 13.5 | 8.3 | 14.6 | 9.4 | 10 | 15.2 | **6** | | | | | | | 18.9 | 12 | **21.9** | **14.9** | **33.6** | **26.7** | 13.3 | 20.2 |
| **00060** | **2/3** | **18** | **11.8** | 23.8 | 17.6 | 29.7 | 23.4 | 35.5 | 29.9 | 37.8 | 31.6 | 11.1 | 17.3 | **4** | **31.2** | **21.2** | 34.7 | 24.7 | 40.5 | 30.5 | 46.3 | 36.8 | 52.1 | 42.1 | | | 17.7 | 27.7 |
| | **3** | 15.8 | 8.3 | **21.6** | **14.1** | 27.5 | 19.9 | 33.3 | 25.8 | 35.6 | 28.1 | 13.3 | 20.8 | **4/5** | 29 | 17.7 | **32.5** | **21.2** | 38.3 | 27 | 44.1 | 32.8 | 49.9 | 38.6 | 73.2 | 61.9 | 19.9 | 31.2 |
| | **3/4** | | | 19.4 | 10.7 | **25.2** | **16.5** | 31.1 | 22.3 | 33.4 | 24.6 | 15.5 | 24.2 | **5** | | | 30.2 | 17.7 | **36.1** | **23.6** | 41.9 | 29.4 | 47.7 | 35.2 | 71 | 58.5 | 22.1 | 34.6 |
| | **4** | | | | | 23 | 13 | **28.8** | **18.8** | **31.2** | **21.2** | 17.7 | 27.7 | **5/6** | | | | | 33.8 | 20.1 | **39.7** | **25.9** | 45.5 | 31.7 | 68.7 | 55 | 24.3 | 38.1 |
| | **4/5** | | | | | | | 26.2 | 15.4 | 29 | 17.7 | 19.9 | 31.2 | **6** | | | | | | | 37.5 | 22.4 | **43.3** | **28.3** | **66.5** | **51.5** | 26.5 | 41.5 |
| **00100** | **2/3** | **27.4** | **16.9** | 36.6 | 26 | 45.74 | 35.2 | 54.9 | 44.3 | 58.5 | 48 | 18.3 | 28.9 | **4** | **47.5** | **30.7** | 53 | 36.2 | 62.2 | 45.3 | 71.3 | 54.5 | 80.5 | 63.6 | | | 29.3 | 46.2 |
| | **3** | 23.8 | 11.1 | **32.9** | **20.3** | 42.1 | 29.4 | 51.2 | 38.6 | 54.9 | 42.2 | 22 | 34.7 | **4/5** | 43.9 | 24.9 | **49v4** | **30.4** | 58.5 | 39.5 | 67.7 | 48.7 | 76.8 | 57.8 | 113 | 94.5 | 33 | 52 |
| | **3/4** | | | 29.2 | 14.5 | **38.4** | **23.6** | 47.5 | 32.8 | 51.2 | 36.4 | 25.7 | 40.4 | **5** | | | 45.7 | 24.6 | **54.8** | **33.8** | 64 | 42.9 | 73.1 | 52.1 | 110 | 88.7 | 36.7 | 57.8 |
| | **4** | | | | | 34.7 | 17.9 | **43.9** | **27** | **47.5** | **30.7** | 29.3 | 46.2 | **5/6** | | | | | 51.2 | 28 | **60.3** | **37.1** | 69.5 | 46.3 | 106 | 82.9 | 40.3 | 63.5 |
| | **4/5** | | | | | | | 40.2 | 21.2 | 43.9 | 24.9 | 33 | 52 | **6** | | | | | | | 56.7 | 31.4 | **65.8** | **40.5** | **102** | **77.1** | 44 | 69.3 |
| **00150** | **2/3** | **41.1** | **27.1** | 54.4 | 40.4 | 67.7 | 53.7 | 81 | 67 | 86.3 | 72.3 | 25.3 | 39.4 | **4** | **71.1** | **48.7** | 79.1 | 56.6 | 92.4 | 69.9 | 106 | 83.2 | 119 | 96.5 | | | 40.5 | 63 |
| | **3** | 361 | 19.2 | **49.4** | **32.5** | 62.7 | 45.8 | 76 | 59.1 | 81.3 | 64.4 | 30.4 | 47.3 | **4/5** | 66 | 40.8 | **74** | **48.8** | 87.3 | 62.1 | 101 | 75.3 | 114 | 88.6 | 167 | 142 | 45.6 | 70.9 |
| | **3/4** | | | 44.3 | 24.6 | **57.6** | **37.9** | 70.9 | 51.2 | 76.2 | 56.5 | 35.5 | 55.1 | **5** | | | 69 | 40.9 | **82.3** | **54.2** | 95.6 | 67.5 | 109 | 80.8 | 162 | 134 | 50.7 | 78.8 |
| | **4** | | | | | 52.5 | 30 | **65.8** | **43.3** | **71.1** | **48.7** | 40.5 | 63 | **5/6** | | | | | 77.2 | 46.3 | **90.5** | **59.6** | 104 | 72.9 | 157 | 126 | 55.7 | 86.7 |
| | **4/5** | | | | | | | 60.8 | 35.5 | 68.1 | 40.8 | 45.6 | 70.9 | **6** | | | | | | | 85.4 | 51.7 | **99** | **65** | **152** | **118** | 60.8 | 94.5 |
| **00220** | **2/3** | **66.5** | **41.9** | 87.9 | 63.4 | 109 | 84.9 | 131 | 106 | 140 | 115 | 41 | 65.5 | **4** | **115** | **75.7** | 128 | 88.6 | 149 | 110 | 171 | 132 | 192 | 153 | | | 65.6 | 105 |
| | **3** | 58.3 | 28.8 | **79.7** | **50.3** | 101 | 71.8 | 123 | 93.3 | 131 | 102 | 49.2 | 78.6 | **4/5** | 107 | 62.6 | **120** | **75.5** | 141 | 97 | 163 | 118 | 184 | 140 | 270 | 226 | 73.8 | 118 |
| | **3/4** | | | 71.5 | 37.2 | **93** | **59** | 115 | 80.2 | 123 | 88.8 | 57.4 | 91.7 | **5** | | | 111 | 62 | **133** | **83.9** | 154 | 105 | 176 | 127 | 262 | 213 | 82 | 131 |
| | **4** | | | | | 84.8 | 45.6 | **106** | **67.1** | **115** | **75.7** | 65.6 | 105 | **5/6** | | | | | 125 | 71 | **146** | **92.3** | 168 | 114 | 254 | 200 | 90.2 | 144 |
| | **4/5** | | | | | | | 98.1 | 54 | 107 | 62.6 | 73.8 | 118 | **6** | | | | | | | 138 | 79 | **159** | **101** | **245** | **187** | 98.4 | 157 |
| **00300** | **2/3** | **86** | **56.1** | 114 | 83.8 | 141 | 111 | 169 | 139 | 180 | 150 | 52.5 | 82.4 | **4** | **149** | **101** | 165 | 117 | 193 | 145 | 221 | 173 | 248 | 201 | | | 84 | 132 |
| | **3** | 75.5 | 39.6 | **103** | **67.3** | 131 | 95 | 159 | 123 | 170 | 134 | 63 | 98.9 | **4/5** | 138 | 84.3 | **155** | **101** | 182 | 129 | 210 | 156 | 238 | 184 | 349 | 295 | 94.5 | 148 |
| | **3/4** | | | 93 | 50.8 | **120** | **78.5** | 148 | 106 | 159 | 117 | 73.5 | 115 | **5** | | | 144 | 84 | **172** | **112** | 200 | 140 | 227 | 168 | 338 | 278 | 105 | 165 |
| | **4** | | | | | 110 | 62 | **138** | **89.7** | **149** | **101** | 84 | 132 | **5/6** | | | | | 161 | 96 | **189** | **123** | 217 | 151 | 328 | 262 | 116 | 181 |
| | **4/5** | | | | | | | 127 | 73.3 | 138 | 84.3 | 94.5 | 148 | **6** | | | | | | | 179 | 107 | **206** | **135** | **317** | **245** | 126 | 198 |
| **00450** | **2/3** | **135** | **88.6** | 179 | 132 | 222 | 176 | 265 | 219 | 283 | 236 | 82.4 | 129 | **4** | **233** | **159** | 260 | 185 | 303 | 229 | 347 | 272 | 390 | 316 | | | 132 | 206 |
| | **3** | 119 | 63.0 | **162** | **106** | 206 | 150 | 249 | 193 | 266 | 211 | 99 | 155 | **4/5** | 217 | 133 | **243** | **159** | 287 | 203 | 330 | 246 | 374 | 290 | 547 | 464 | 148 | 232 |
| | **3/4** | | | 146 | 80 | **189** | **124** | 233 | 167 | 250 | 185 | 115 | 180 | **5** | | | 227 | 134 | **270** | **177** | 314 | 221 | 357 | 264 | 531 | 438 | 165 | 258 |
| | **4** | | | | | 173 | 98 | **216** | **142** | **233** | **159** | 132 | 206 | **5/6** | | | | | 254 | 151 | **297** | **195** | 341 | 238 | 515 | 412 | 181 | 283 |
| | **4/5** | | | | | | | 200 | 116 | 217 | 133 | 148 | 232 | **6** | | | | | | | 281 | 169 | **324** | **213** | **498** | **386** | 198 | 309 |
| **00600** | **2/3** | **171** | **118** | 228 | 174 | 285 | 231 | 342 | 288 | 364 | 310 | 112 | 166 | **4** | **297** | **211** | 331 | 245 | 388 | 302 | 444 | 358 | 501 | 415 | | | 180 | 266 |
| | **3** | 149 | 84 | **206** | **141** | 262 | 198 | 319 | 255 | 342 | 277 | 135 | 199 | **4/5** | 275 | 178 | **309** | **212** | 365 | 268 | 422 | 325 | 479 | 382 | 706 | 609 | 202 | 299 |
| | **3/4** | | | 183 | 108 | **240** | **165** | 297 | 221 | 319 | 244 | 157 | 233 | **5** | | | 286 | 178 | **343** | **235** | 400 | 292 | 456 | 349 | 683 | 575 | 224 | 332 |
| | **4** | | | | | 218 | 131 | **274** | **188** | **297** | **211** | 180 | 266 | **5/6** | | | | | 320 | 202 | **377** | **259** | 434 | 315 | 661 | 542 | 247 | 365 |
| | **4/5** | | | | | | | 252 | 155 | 275 | 178 | 202 | 299 | **6** | | | | | | | 355 | 225 | **411** | **282** | **638** | **509** | 269 | 399 |
| **00900** | **2/3** | **225** | **146** | 301 | 223 | 378 | 299 | 455 | 376 | 485 | 406 | 158 | 237 | **4** | **390** | **264** | 436 | 310 | 513 | 387 | 589 | 464 | 666 | 540 | | | 253 | 379 |
| | **3** | 193 | 99 | **270** | **175** | 346 | 252 | 423 | 329 | 454 | 359 | 190 | 284 | **4/5** | 359 | 217 | **405** | **263** | 481 | 340 | 558 | 416 | 634 | 493 | 941 | 799 | 285 | 426 |
| | **3/4** | | | 238 | 128 | **315** | **205** | 391 | 281 | 422 | 312 | 221 | 332 | **5** | | | 373 | 216 | **450** | **292** | 526 | 369 | 603 | 445 | 909 | 752 | 316 | 474 |
| | **4** | | | | | 283 | 157 | **360** | **234** | **390** | **264** | 253 | 379 | **5/6** | | | | | 418 | 245 | **495** | **321** | 571 | 398 | 877 | 704 | 348 | 521 |
| | **4/5** | | | | | | | 328 | 186 | 359 | 217 | 285 | 426 | **6** | | | | | | | 463 | 274 | **540** | **351** | **846** | **657** | 379 | 568 |
| **01200** | **2/3** | **319** | **217** | 426 | 323 | 532 | 430 | 638 | 536 | 681 | 578 | 213 | 315 | **4** | **553** | **390** | 617 | 453 | 723 | 560 | 830 | 666 | 936 | 772 | | | 340 | 504 |
| | **3** | 277 | 154 | **383** | **260** | 489 | 367 | 596 | 473 | 638 | 515 | 255 | 378 | **4/5** | 511 | 327 | **575** | **390** | 681 | 497 | 787 | 603 | 894 | 709 | 1319 | 1135 | 383 | 567 |
| | **3/4** | | | 341 | 197 | **447** | **304** | 553 | 410 | 596 | 453 | 298 | 441 | **5** | | | 532 | 327 | **638** | **434** | 745 | 540 | 851 | 646 | 1277 | 1072 | 425 | 630 |
| | **4** | | | | | 404 | 241 | **511** | **347** | **553** | **390** | 340 | 504 | **5/6** | | | | | 596 | 371 | **702** | **477** | 809 | 583 | 1234 | 1009 | 468 | 693 |
| | **4/5** | | | | | | | 468 | 284 | 511 | 327 | 383 | 567 | **6** | | | | | | | 660 | 414 | **766** | **520** | **1192** | **946** | 510 | 756 |
| **2000** | **2/3** | **533** | **372** | 712 | 551 | 890 | 730 | 1069 | 908 | 1141 | 980 | 360 | 521 | **4** | **924** | **667** | 1032 | 774 | 1210 | 953 | 1389 | 1132 | 1568 | 1310 | | | 577 | 834 |
| | **3** | 461 | 268 | **640** | **447** | 818 | 625 | 997 | 804 | 1068 | 876 | 433 | 625 | **4/5** | 852 | 563 | **959** | **670** | 1138 | 849 | 1317 | 1028 | 1495 | 1206 | 2210 | 1921 | 649 | 938 |
| | **3/4** | | | 568 | 343 | **746** | **521** | 925 | 700 | 996 | 771 | 505 | 730 | **5** | | | 887 | 566 | **1066** | **745** | 1245 | 923 | 1423 | 1102 | 2138 | 1817 | 721 | 1042 |
| | **4** | | | | | 674 | 417 | **853** | **596** | **924** | **667** | 577 | 834 | **5/6** | | | | | 994 | 640 | **1173** | **819** | 1351 | 998 | 2066 | 1713 | 793 | 1146 |
| | **4/5** | | | | | | | 781 | 491 | 852 | 563 | 649 | 938 | **6** | | | | | | | 1101 | 715 | **1279** | **894** | **1994** | **1608** | 865 | 1251 |
| **03000** | **2/3** | **751** | **496** | 1011 | 755 | 1270 | 1015 | 1529 | 1274 | 1633 | 1378 | 546 | 801 | **4** | **1306** | **897** | 1461 | 1053 | 1721 | 1312 | 1980 | 1571 | 2239 | 1831 | | | 873 | 1281 |
| | **3** | 642 | 336 | **902** | **595** | 1161 | 854 | 1420 | 1114 | 1524 | 1217 | 655 | 961 | **4/5** | 1197 | 737 | **1352** | **893** | 1612 | 1152 | 1871 | 1411 | 2130 | 1671 | 3168 | 2708 | 982 | 1442 |
| | **3/4** | | | 793 | 435 | **1053** | **694** | 1312 | 954 | 1415 | 1057 | 764 | 1121 | **5** | | | 1245 | 732 | **1504** | **992** | 1763 | 1251 | 2023 | 1510 | 3060 | 2548 | 1091 | 1602 |
| | **4** | | | | | 943 | 534 | **1202** | **793** | **1306** | **897** | 873 | 1281 | **5/6** | | | | | 1395 | 832 | **1654** | **1091** | 1914 | 1350 | 2951 | 2388 | 1200 | 1762 |
| | **4/5** | | | | | | | 1093 | 633 | 1197 | 737 | 982 | 1442 | **6** | | | | | | | 1545 | 931 | **1805** | **1190** | **2842** | **2228** | 1309 | 1922 |
| **04000** | **2/3** | **1064** | **703** | 1423 | 1062 | 1782 | 1421 | 2141 | 1780 | 2284 | 1924 | 731 | 1092 | **4** | **1846** | **1269** | 2061 | 1484 | 2420 | 1843 | 2779 | 2202 | 3138 | 2561 | | | 1170 | 1746 |
| | **3** | 918 | 485 | **1277** | **844** | 1636 | 1203 | 1995 | 1562 | 2138 | 1706 | 877 | 1310 | **4/5** | 1700 | 1051 | **1915** | **1266** | 2274 | 1625 | 2633 | 1984 | 2992 | 2343 | 4428 | 3779 | 1316 | 1965 |
| | **3/4** | | | 1131 | 626 | **1489** | **985** | 1848 | 1344 | 1992 | 1487 | 1023 | 1528 | **5** | | | 1769 | 1048 | **2128** | **1407** | 2487 | 1766 | 2846 | 2125 | 4282 | 3560 | 1462 | 2183 |
| | **4** | | | | | 1343 | 766 | **1702** | **1125** | **1846** | **1269** | 1170 | 1746 | **5/6** | | | | | 1982 | 1188 | **2341** | **1547** | 2700 | 1906 | 4135 | 3342 | 1608 | 2401 |
| | **4/5** | | | | | | | 1556 | 907 | 1700 | 1051 | 1316 | 1965 | **6** | | | | | | | 2194 | 1329 | **2553** | **1688** | **3989** | **3124** | 1754 | 2620 |

| SC | S/S* | 2.5 bar | | 3 bar | | 3.5 bar | | 4 bar | | 4.2 bar | | Spring torque | | S/S* | 4.2 bar | | 4.5 bar | | 5 bar | | 5.5 bar | | 6 bar | | 8 bar | | Spring torque | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° |
| **05000** | **2/3** | **1332** | **1014** | 1783 | 1465 | 2233 | 1915 | 2684 | 2365 | 2864 | 2546 | 920 | 1238 | **4** | **2312** | **1803** | 2582 | 2073 | 3033 | 2524 | 3483 | 2974 | 3934 | 3424 | | | 1472 | 1981 |
| | **3** | 1149 | 767 | **1599** | **1217** | 2049 | 1667 | 2500 | 2118 | 2680 | 2298 | 1104 | 1486 | **4/5** | 2128 | 1555 | **2398** | **1825** | 2849 | 2276 | 3299 | 2726 | 3750 | 3177 | 5551 | 4978 | 1656 | 2229 |
| | **3/4** | | | 1415 | 969 | **1865** | **1420** | 2316 | 1870 | 2496 | 2050 | 1288 | 1733 | **5** | | | 2215 | 1578 | **2665** | **2028** | 3115 | 2479 | 3566 | 2929 | 5386 | 4731 | 1839 | 2476 |
| | **4** | | | | | 1682 | 1172 | **2132** | **1623** | **2312** | **1803** | 1472 | 1981 | **5/6** | | | | | 2481 | 1781 | **2931** | **2231** | 3382 | 2682 | 5184 | 4483 | 2023 | 2724 |
| | **4/5** | | | | | | | 1948 | 1375 | 2128 | 1555 | 1656 | 2229 | **6** | | | | | | | 2748 | 1983 | **3198** | **2434** | **5000** | **4236** | 2207 | 2971 |
| **10000** | **2/3** | **2474** | **1695** | 3308 | 2529 | 4142 | 3362 | 4976 | 4196 | 5310 | 4530 | 1695 | 2475 | **4** | **4292** | **3045** | 4793 | 3545 | 5627 | 4379 | 6461 | 5213 | 7294 | 6047 | | | 2712 | 3960 |
| | **3** | 2135 | 1200 | **2969** | **2034** | 3803 | 2867 | 4637 | 3701 | 4971 | 4035 | 2034 | 2970 | **4/5** | 3953 | 2550 | **4454** | **3050** | 5288 | 3884 | 6122 | 4718 | 6955 | 5552 | 10291 | 8887 | 3051 | 4455 |
| | **3/4** | | | 2630 | 1539 | **3464** | **2373** | 4298 | 3206 | 4632 | 3540 | 2373 | 3465 | **5** | | | 4115 | 2555 | **4949** | **3389** | 5783 | 4223 | 6616 | 5057 | 9952 | 8393 | 3390 | 4949 |
| | **4** | | | | | 3125 | 1878 | **3959** | **2711** | **4292** | **3045** | 2712 | 3960 | **5/6** | | | | | 4610 | 2894 | **5444** | **3728** | 6277 | 4562 | 9613 | 7898 | 3729 | 5444 |
| | **4/5** | | | | | | | 3620 | 2217 | 3953 | 2550 | 3051 | 4455 | **6** | | | | | | | 5105 | 3233 | **5938** | **4067** | **9274** | **7403** | 4068 | 5939 |

**S/S* Springs per cover in bold type →** Recommended design (springs arranged symmetrically)

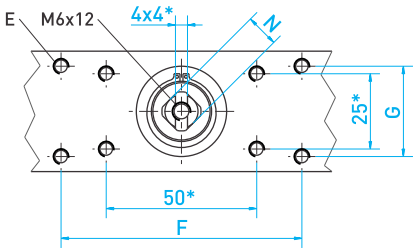
## TORQUES FOR DOUBLE-ACTING ACTUATORS IN Nm

| DR | 2.5 bar | 3 bar | 3.5 bar | 4 bar | 4.2 bar | 4.5 bar | 5 bar | 5.5 bar | 6 bar | 6.5 bar | 7 bar | 7.5 bar | 8 bar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00010U | 6 | 7.2 | 8.4 | 9.6 | 10.1 | 10.8 | 12 | 13.2 | 14.4 | 15.6 | 16.8 | 18 | 19.1 |
| 00015U | 8.3 | 10 | 11.6 | 13.3 | 14 | 15 | 16.6 | 18.3 | 19.9 | 21.6 | 23.3 | 24.9 | 26.6 |
| 00030U | 14.7 | 17.6 | 20.5 | 23.5 | 24.6 | 26.4 | 29.3 | 32 | 35.2 | 38.1 | 41 | 44 | 46.9 |
| 00060U | 29.1 | 34.9 | 40.7 | 46.5 | 48.9 | 52.4 | 58.2 | 64 | 69.8 | 75.6 | 81.4 | 87.3 | 93.1 |
| 00100U | 45.8 | 54.9 | 64.1 | 73.2 | 76.9 | 82.4 | 91.5 | 101 | 110 | 120 | 128 | 138 | 146 |
| 00150U | 66.5 | 79.8 | 93.1 | 106 | 112 | 120 | 133 | 146 | 160 | 173 | 186 | 199 | 213 |
| 00220U | 107 | 129 | 150 | 172 | 181 | 193 | 215 | 236 | 258 | 279 | 301 | 322 | 344 |
| 00300U | 138 | 166 | 194 | 222 | 233 | 249 | 277 | 305 | 332 | 360 | 388 | 415 | 443 |
| 00450U | 217 | 261 | 304 | 348 | 365 | 391 | 435 | 478 | 522 | 565 | 609 | 652 | 696 |
| 00600U | 284 | 340 | 397 | 454 | 477 | 511 | 567 | 624 | 681 | 737 | 794 | 851 | 908 |
| 00900U | 383 | 459 | 536 | 613 | 643 | 689 | 766 | 842 | 919 | 996 | 1072 | 1149 | 1225 |
| 01200U | 532 | 638 | 745 | 851 | 893 | 957 | 1064 | 1170 | 1276 | 1383 | 1489 | 1595 | 1702 |
| 02000U | 893 | 1072 | 1251 | 1430 | 1501 | 1608 | 1787 | 1966 | 2144 | 2318 | 2502 | 2684 | 2859 |
| 03000U | 1297 | 1556 | 1815 | 2075 | 2179 | 2334 | 2594 | 2853 | 3112 | 3372 | 3631 | 3890 | 4150 |
| 04000U | 1795 | 2154 | 2513 | 2872 | 3015 | 3231 | 3590 | 3949 | 4308 | 4667 | 5026 | 5400 | 5744 |
| 05000U | 2252 | 2703 | 3153 | 3604 | 3784 | 4054 | 4504 | 4955 | 5405 | 5855 | 6306 | 6756 | 7207 |
| 10000U | 4169 | 5003 | 5837 | 6671 | 7005 | 7505 | 8339 | 9173 | 10007 | 10841 | 11674 | - | - |

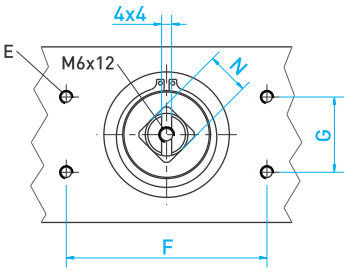
# Dimensions

## Top view

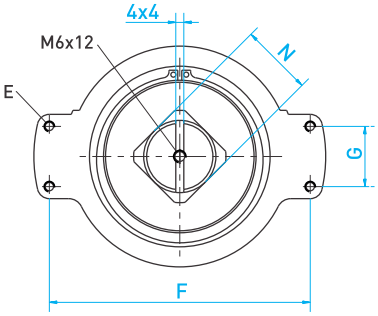
DR/SC 10 – DR/SC 30
*DR/SC 10 only



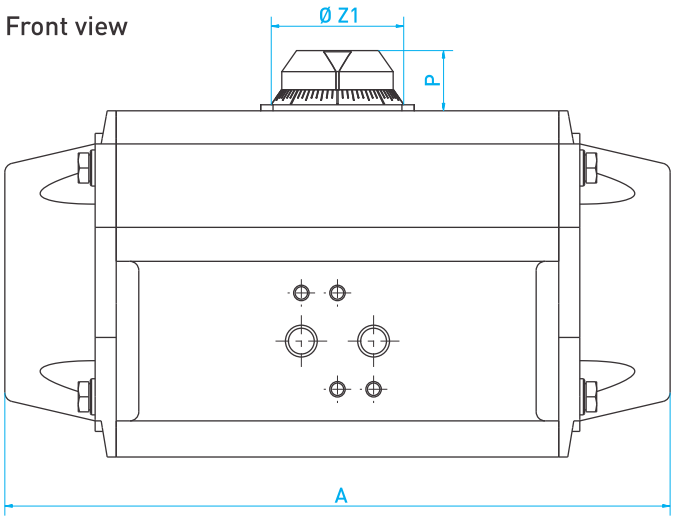

DR/SC 10 - DR/SC 3000



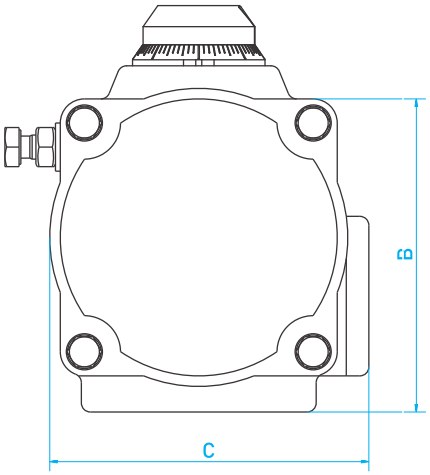

DR/SC 5000 - DR/SC 10000



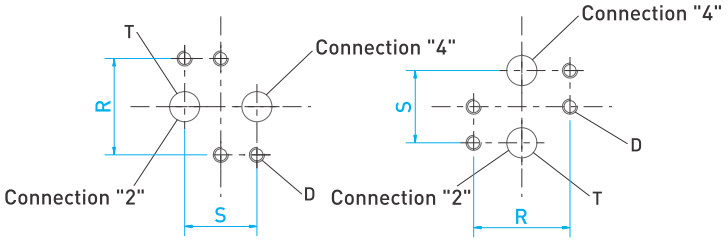

## Front view



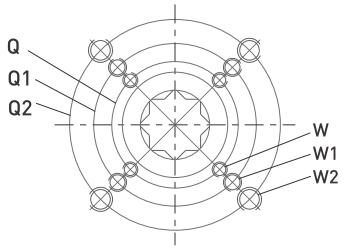

## Left side view

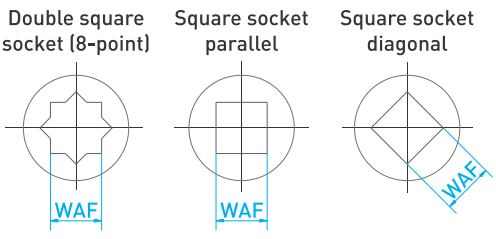



## Air connection to VDI/VDE 3845




## Bottom view ISO 5211



## DR/SC 10 - 450

| Type | 00010 DR/SC | 00015 DR/SC | 00030 DR/SC | 00060 DR/SC | 00100 DR/SC | 00150 DR/SC | 00220 DR/SC | 00300 DR/SC | 00450 DR/SC |
|---|---|---|---|---|---|---|---|---|---|
| DR Nm* | 15 | 20 | 35 | 70 | 110 | 160 | 258 | 332 | 522 |
| SC Nm** | 5 | 8 | 13 | 27 | 44 | 61 | 99 | 126 | 198 |
| ISO flange | F04 | F04 | F05-07 | F05-07 | F05-07 | F07-10 | F07-10 | F07-10 | F10-12 |
| WAF x depth | 11 x 12 | 11 x 12 | 14 x 16 | 14 x 18 | 17 x 19 | 17 x 24 | 22 x 30 | 22 x 34 | 27 x 3 9 |
| T-ISO 228 | 1/8" | 1/8" | 1/8" | 1/8" | 1/8" | 1/4" | 1/4" | 1/4" | 1/4" |
| A | 118 | 136 | 153.5 | 203.5 | 241 | 259 | 304 | 333 | 394.5 |
| B | 66 | 69 | 85 | 102 | 115 | 127 | 145 | 157 | 177 |
| C | 62 | 72 | 84.5 | 93 | 106 | 118.5 | 136 | 146.5 | 166 |
| D | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 |
| E | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 |
| F | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| G | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| N | 11 | 11 | 11 | 17 | 17 | 17 | 27 | 27 | 27 |
| P | 15 | 20 | 20 | 20 | 20 | 20 | 30 | 30 | 30 |
| Q | 42 | 42 | 50 | 50 | 50 | 70 | 70 | 70 | 102 |
| Q1 | - | - | - | 70 | 70 | 102 | 102 | 102 | 125 |
| Q2 | - | - | - | - | - | - | - | - | - |
| R | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| S | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| W | M5 | M5 | M6 | M6 | M6 | M8 | M8 | M8 | M10 |
| W1 | - | - | M8 | M8 | M8 | M10 | M10 | M10 | M12 |
| W2 | - | - | - | - | - | - | - | - | - |
| Z1 | 42 | 42 | 42 | 42 | 42 | 42 | 58 | 58 | 67.5 |
| *Torque at 6 bar control pressure ** Minimum spring moment (safety function) All dimensions in mm | | | | | | | | | |
| Time OPEN [1] | 0.15 / 0.2 | 0.2 / 0.25 | 0.25 / 0.3 | 0.3 / 0.35 | 0.4 / 0.5 | 0.5 / 0.6 | 0.7 / 0.8 | 0.9 / 1.1 | 1.2 / 1.4 |
| Time CLOSED [1] | 0.2 / 0.25 | 0.25 / 0.3 | 0.3 / 0.35 | 0.4 / 0.5 | 0.5 / 0.6 | 0.7 / 0.8 | 0.9 / 1.1 | 1.2 / 1.4 | 1.5 / 1.8 |
| Vol. OPEN [2] | 0.06 / 0.06 | 0.09 / 0.09 | 0.16 / 0.16 | 0.31 / 0.31 | 0.51 / 0.51 | 0.71 / 0.71 | 1.19 / 1.19 | 1.54 / 1.54 | 2.41 / 2.41 |
| Vol. CLOSED [2] | 0.1 / 0.1 | 0.15 / 0.15 | 0.26 / 0.26 | 0.49 / 0.49 | 0.78 / 0.78 | 1.11 / 1.11 | 1.8 / 1.8 | 2.34 / 2.34 | 3.78 / 3.78 |
| Approx. weight [3] | 0.75 / 0.9 | 1 / 1.1 | 1.6 / 1.7 | 2.7 / 3.1 | 3.7 / 4.3 | 5.2 / 6.1 | 8 / 9.3 | 9.8 / 12 | 14 / 17 |

[1]Seconds [2]Litres [3]kg

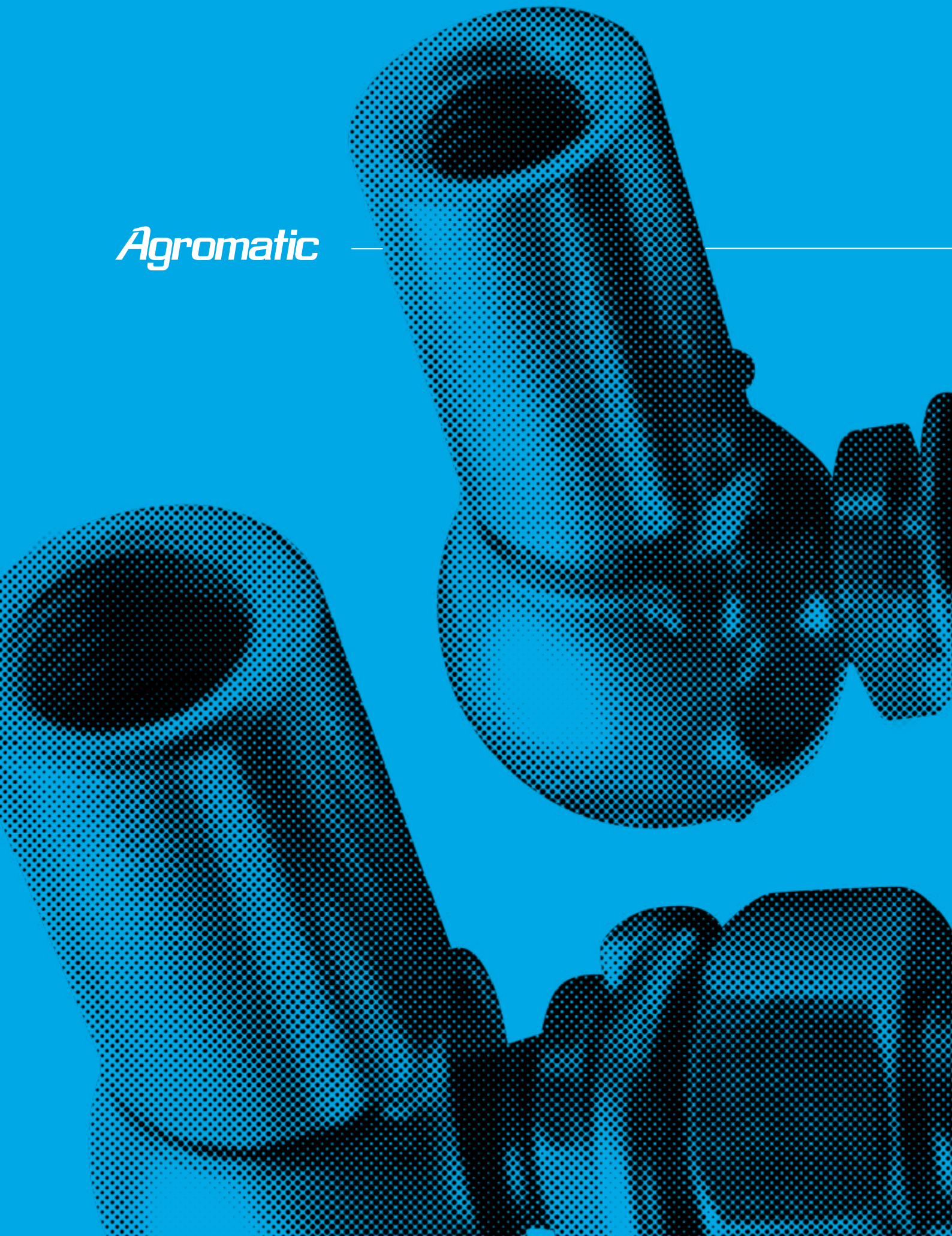
## DR/SC 600 – 10000

| Type | 00600 DR/SC | 00900 DR/SC | 01200 DR/SC | 02000 DR/SC | 03000 DR/SC | 04000 DR/SC | 05000 DR/SC | 10000 DR/SC |
|---|---|---|---|---|---|---|---|---|
| DR Nm* | 881 | 919 | 1276 | 2144 | 3112 | 4 308 | 5 405 | 10 007 |
| SC Nm** | 269 | 379 | 510 | 865 | 1309 | 1688 | 2207 | 4067 |
| ISO flange | F10-12 | (F12)F14 | (F12)F14 | (F14)F16 | (F14)F16 | F16(F25) | F16-25 | F16-25-30 |
| WAF x depth | 27 x 40 | 36 x 39 | 36 x 40 | 46 x 63 | 46 x 51 | 46 x 51 | 55 x 60 | 75 x 80 |
| T-ISO 228 | 1/4" | 1/4" | 1/4" | 3/8" | 1/2" | 1/2" | 1/2" | 1/2" |
| A | 422.5 | 474 | 528 | 605 | 710 | 812 | 876 | 950 |
| B | 196 | 220.5 | 245 | 298.5 | 330 | 383 | 410 | 518 |
| C | 181 | 200 | 221.5 | 262 | 330 | 371 | 418 | 528 |
| D | M5x8 | M5x8 | M5x8 | M6x10 | M6x10 | M6x10 | M6x10 | M6x10 |
| E | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M5x8 | M6x10 |
| F | 80 | 130 | 130 | 130 | 130 | 130 | 130 | 200 |
| G | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 50 |
| N | 27 | 36 | 36 | 36 | 36 | 36 | 36 | 36 |
| P | 30 | 50 | 50 | 50 | 50 | 50 | 50 | 80 |
| Q | 102 | 140 | 140 | 165 | 165 | 165 | 165 | 165 |
| Q1 | 125 | - | - | - | - | - | 254 | 254 |
| Q2 | - | - | - | - | - | - | - | 298 |
| R | 32 | 32 | 32 | 45 | 45 | 45 | 45 | 45 |
| S | 24 | 24 | 24 | 40 | 40 | 40 | 40 | 40 |
| W | M10 | MI6 | MI6 | M20 | M20 | M20 | M20 | M20 |
| W1 | M12 | - | - | - | - | - | MI6 | M16 |
| W2 | - | - | - | - | - | - | - | M20 |
| Z1 | 67.5 | 80 | 80 | 115 | 115 | 115 | 115 | 115 |
| *Torque at 6 bar control pressure ** Minimum spring moment (safety function) All dimensions in mm | | | | | | | | |
| Time OPEN [1] | 1.5 / 1.7 | 2 / 2.2 | 2.7 / 3.2 | 3.5 / 4 | 4 / 4.5 | 5 / 6 | 6 / 7.5 | 8 / 10 |
| Time CLOSED [1] | 1.8 / 2.1 | 2.4 / 2.8 | 3.5 / 4 | 4.1 / 4.6 | 4.5 / 5 | 6 / 7 | 7 / 8.5 | 9 / 11 |
| Vol. OPEN [2] | 3.14 / 3.14 | 4.26 / 4.26 | 5.94 / 5.94 | 10 / 10 | 14.5 / 14.5 | 20 / 20 | 25 / 25 | 49 / 49 |
| Vol. CLOSED [2] | 4.92 / 4.92 | 6.89 / 6.89 | 9.46 / 9.46 | 15.2 / 15.2 | 21.38 / 21.38 | 33 / 33 | 40 / 40 | 84 / 84 |
| Approx. weight [3] | 18 / 22 | 24 / 33 | 34 / 42 | 53 / 67 | 74 / 93 | 123 / 155 | 127 / 169 | 170 / 238 |

[1]Seconds [2]Litres [3]kg

**Please note:**
Actuator switching times were achieved under the following test conditions:
Type DR/SC 10 – DR/SC 600: Room temperature 21 °C; angle of rotation 90°; solenoid valve with Ø 4 mm and a nominal flow rate Qn 400 l/min; inside diameter compressed-air pipe 8 mm; medium: filtered air; control pressure 5.5 bar (79.75 psi); actuator not subjected to external load.
Type DR/SC 900 – DR/SC 10000: Room temperature 21 °C; angle of rotation 90°; solenoid valve with Ø 11 mm and a nominal flow rate Qn 6000 l/min; inside diameter compressedair pipe 11 mm; medium: filtered air; control pressure 5.5 bar (79.75 psi); actuator not subjected to external load.
**Caution! Closing times can differ if ambient operating conditions deviate.**

Agromatic



# ACCESSORIES

## SPECIAL REQUIREMENTS

We are always willing to fulfil customer-specific requirements.

## Electrical accessories
120 - 131

Utilizing original electrical accessories it is possible to adapt Agromatic actuators to fulfil special requirements. Our range of products includes a variety of switches and position indicators.

## Mounting accessories
132 - 147

Mounting accessories are designed to join valves and actuators as well as securely install actuators.

Agromatic Regelungstechnik GmbH
Post Box 1162 | 33804 Oerlinghausen | Germany
Tel. +49 5202 9739 284 | Fax +49 5202 9739 25
Email: sales@agromatic.de

Utilizing a suitable analog input module, angle encoders provide position feedback to the internal closed-loop controller or a higher-level control system, for example a PLC.



## Potentiometers

Potentiometers are favourably priced, robust angle encoders for actuators. Several different versions are available to choose from:

- Conductive plastic potentiometers (standard) or wire-wound potentiometers (on request)
- Single-turn or multiturn potentiometers
- Single or tandem potentiometers
- Potentiometers approved for gas/air ratio control systems to DIN EN 12067-2:2004-06
- Custom potentiometers (resistance value, angle of rotation and so forth) on request

Depending on the actuator model and its configuration it is possible to fit up to three potentiometers.

To obtain highly accurate evaluation results the resolution of the maximum angle of rotation of rotary and part-turn actuators is set to the electrical angle of rotation of the potentiometer. Other resolutions are available on request.

The resolution of the maximum linear regulating distance of linear actuators is set to the electric angle of rotation of the potentiometer.

## Hall effect absolute encoder

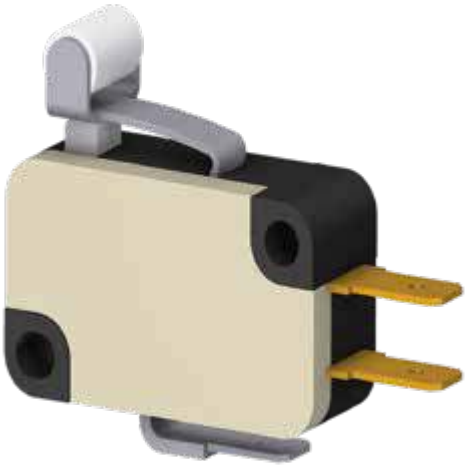
Absolute encoders using the Hall effect operate contact-free; consequently, they offer very high levels of reliability and a long service life. A variety of models are available on request:

- Analog output 0 ... 5 V (ratiometric)
- Analog output 0 ... 10 V
- Analog output 4 ... 20 mA
- Digital output, e.g. Serial Peripheral Interface (SPI) or Synchronous Serial Interface (SSI)

- All switch contacts routed to terminals
- Switching angles infinitely adjustable by means of cams
- Retrofit switch sets available
- Changeover contact (SPDT)

## Switches for series NK NL

- Contact material: Silver
- Max. switching capacity: 2.5 A (series NK), 6 A (series NL), 250 V AC
- Gold contacts for switching smallest loads (optional)



## Switches for series N NV NE K KA V

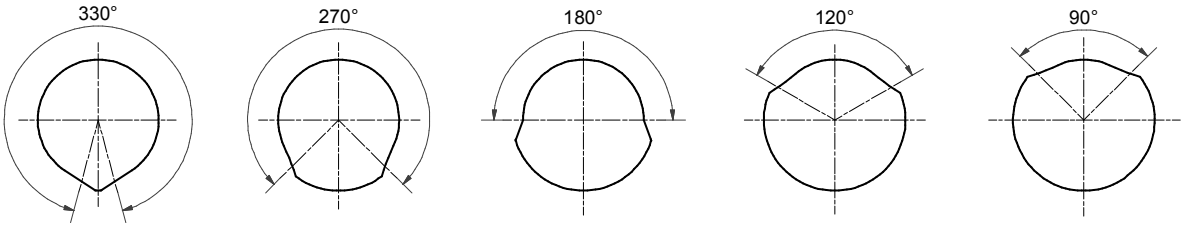
- Contact material: Silver
- Max. switching capacity: 6 A, 250 V AC
- Positive-break switches (optional)
- Gold contacts for switching smallest loads (optional)

## CONTROL CAMS

Limit switches and auxiliary position switches are operated by cams. Cam contours are available with a variety of switching angles to meet different application requirements (see graphic).

The cams are designed to ensure the actuator is able to travel in the lobe area, in which the auxiliary position switch is actuated.

Cam shapes (approx. switching angle):




## JNO

N | K | KA | V | NV | NEx

- Adjustable cam that can be adjusted from above, consisting of brass body and plastic cam ring
- Grub screw ensures cam is reliably secured to the shaft
- Different cam shapes available

## JNS

N | K | KA | V | NV | NEx

- Adjustable cam that can be adjusted from the side, consisting of plastic body and plastic cam ring
- Grub screw ensures cam is reliably secured to the shaft
- Different cam shapes available

## Brass cam

all

- High quality control cam made of brass
- Three grub screws ensure the cam is very reliably secured to the shaft
- Different cam shapes available

## Aluminium cam

NL | NK

- High quality control cam made of aluminium
- Three grub screws ensure the cam is very reliably secured to the shaft
- Different cam shapes available

## Plastic cam

NL | NK

- Easily adjustable cam made of plastic
- Integrated O-ring ensures the cam is reliably secured to the shaft
- Different cam shapes available

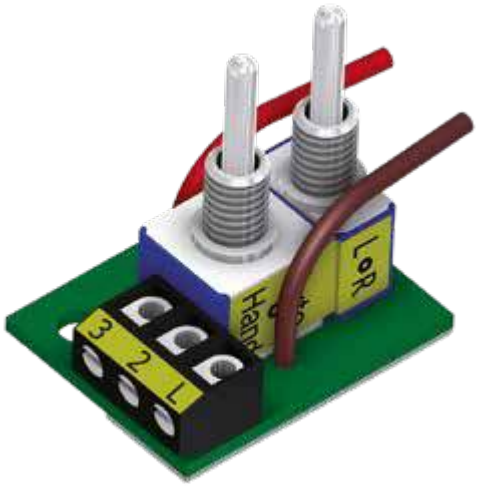
CURRENT OUTPUT

## Current output

Current output facilitates position feedback by means of a current loop.

- Standard 4 ... 20 mA position feedback signal
- Programmable limit switches
- Two-wire technology (loop powered current output)
- Higher level controls detect cable break (current < 4 mA)

SERVICE SWITCH



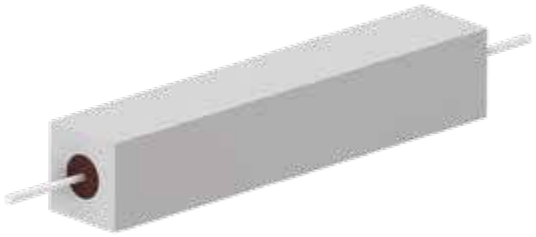

## Service switch

With the aid of a service switch it is possible to operate the actuator no matter the status of the higher-level controls.

- Manual / automatic operation switch selection (toggle switch)
- Clockwise/anti-clockwise rotation (toggle switch)
- Integrated in actuator or operated externally

## ANTI-CONDENSATE HEATER

An anti-condensate heater can help prevent the build-up of condensate if the actuator is exposed to high levels of humidity and fluctuating ambient temperatures.
The heater is also avilable as retrofit kit.



## RELAYS

Relays are available to implement customer-specific circuit arrangements; these are integrated in the actuator and wired to customer specifications (relays available as retrofit kit on request). As a rule, the coil voltage corresponds to the operating voltage of the motor.

### Monostable relays

- For single-wire control
- To operate several actuators in parallel via a single control cable

### Bistable relays (pulse relays)

- To change direction of actuator operation, for example, by means of a control pulse



Agromatic Regelungstechnik GmbH | Stukenbrocker Weg 38 | 33813 Oerlinghausen | Germany | Tel. +49 5202 9739 284 | Fax +49 5202 9739 25 | sales@agromatic.de

## ELECTRONIC POSITION CONTROLLER ESR

To facilitate simple and accurate positioning of Agromatic actuators, electronic position controllers are available for the following series: N, NEx, NV, NL, NK, K, KA and V. Position controllers are actuated by external set-point inputs by means of standard industrial DC current and DC voltage signals. They are quick and easy to program for use in applications where reliable and precision actuator control is required.

- Quick and easy initial startup
- High thermal stability
- EMC tested
- Can be integrated in the actuator (does not apply to NEx)
- External mounting possible in some configurations
- Rapid response times
- Control behaviour finely tuned to Agromatic actuators


# Electronic position controller ESR-N

Internal integration | N | NV | K | KA | V | Mounted externally | all

## Product details

### CONSTRUCTION
- Industrial-standard multilayer PCB
- EMC tested PCB layout
- Control electronics internally fused
- Relay output stage with RC snubber circuit across relay contacts for motor control

### ACCURACY
- 12 bit setpoint value input
- 12 bit actual value output

### EXTERNAL INTERFACES
- Setpoint value input via standard signal or potentiometer
- Actual value output via standard signal
- Fault message output (optional)

### CONTROL PARAMETERS (ADJUSTABLE)
- Follow-on time
- Hysteresis

### ACTUATOR MONITORING
- Monitored direction of rotation
- Blocking protection

### OPERATION
- 3 push-buttons for menu-assisted programming
- Selector switch to select manual / closed-loop control
- 7-segment LED indicator
- Plain text display (optional)

### CONNECTIONS
- Mains connection terminals designed for 2.5 mm² conductor cross-section
- Mains connection terminals based on extra-large, 7.5 mm grid spacing to prevent arcing in actuators subject to high humidity
- Mains and extra-low voltage terminals differently sized to prevent incorrect termination

### VERSIONS
- Built-in version, integrated in actuator (standard)
- External version in device base (for mounting onto standard 35 mm mounting rails; for example, the NEx series)

# Technical data

### POWER SUPPLY CONNECTION

- 230 V, 115 V or 24 V ± 10%, 50/60 Hz (depending on operating voltage of motor)

### SETPOINT VALUE INPUT

- Current input: 0(4) ... 20 mA; burden resistor: 250 Ω
- Voltage input: 0(2) ... 10 V
- Voltage input:: 0(1) ... 5 V (e.g. for potentiometer powered via controller)
- Type of input configurable via jumpers
- Conditional overvoltage and reverse polarity protection

### ACTUAL VALUE OUTPUT

- Actual value sensor: Conductive plastic potentiometer 1 ... 10 kΩ
- Output electrically isolated
- Current output: 0(4) ... 20 mA
- Max. burden resistor: 500 Ω; max. output excursion: 10 V
- Minimum burden resistor 100 Ω at $T_a$ > 50 °C, 0 Ω at $T_a$ < 50 °C
- Voltage output: 0(2) ... 10 V (optional)

### AMBIENT TEMPERATURE

- In actuator: 0 °C to +60 °C (ambient temperature of actuator)
- In the switchgear cabinet: 0 °C to +70 °C

### DEGREE OF PROTECTION (IP CODE)

- Internal version: Degree of protection of actuator
- External version: IP00

# Accessories

### FAULT INDICATION

Potential-free power contact, which opens if a fault occurs. This solution monitors the correct functioning of the actuator.

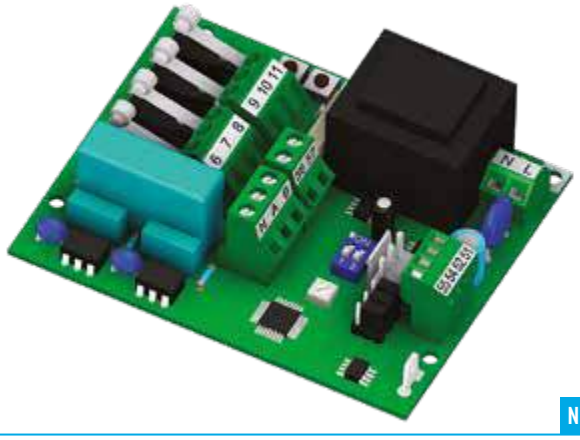
- Plug-in piggyback board available for PMR3, retrofits
- Potential-free contact for max. 24 V DC or max. 1 A, max. 15 W
- Contact opens as soon as a fault occurs

The contact opens if the following fault events occur:

- Mains voltage failure
- Controller manual mode is active
- Actuator blocked (blocking protection active)
- Output shaft rotating in wrong direction; e.g. due to external torque (monitored direction of rotation)

### CLEAR TEXT DISPLAY

- Two-line LC display
- Operating status, setpoint and actual value indication, programmable parameters
- Request when ordering



# Electronic position controller ESR-NK

NK

## Product details

### CONSTRUCTION
- Industrial-standard multilayer PCB
- EMC tested PCB layout
- Short-circuit proof transformer
- Triac output stage with RC snubber circuit for motor control
- Integrated limit switches

### ACCURACY
- 10 bit setpoint value input
- 10 bit actual value output

### EXTERNAL INTERFACES
- Setpoint input via standard signal
- Actual value output via standard signal
- Fault message output (integrated)
- Max. two additional auxiliary position switches

### CONTROL PARAMETERS (ADJUSTABLE)
- Hysteresis

### ACTUATOR MONITORING
- Open circuit monitoring at setpoint value input

### OPERATION
- 3 push-buttons for simple programming
- Selector switch to select manual / closed-loop control
- Four different coloured LEDs to indicate current operating status and support simple programming

### CONNECTIONS
- Mains connection terminals designed for 1.5 mm² conductor cross-section
- Mains and extra-low voltage terminals differently sized to prevent incorrect termination

### VERSIONS
- ESR-NK for actuator NK

## Technical data

### POWER SUPPLY CONNECTION
- 230 V, 115 V or 24 V ± 10%, 50/60 Hz (depending on operating voltage of motor)

### SETPOINT VALUE INPUT
- Current input: 0(4) ... 20 mA; burden resistor: 250 Ω
- Voltage input: 0(2) ... 10 V (optional)
- Conditional overvoltage and reverse polarity protection

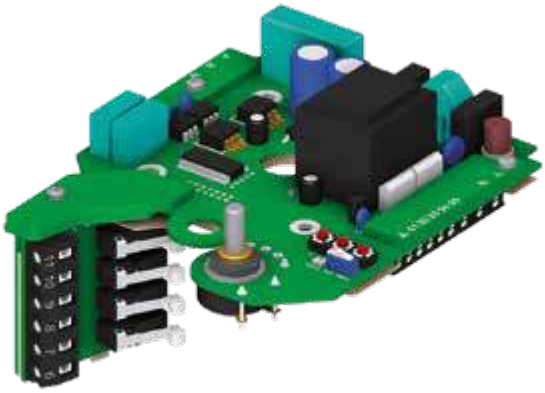
### ACTUAL VALUE OUTPUT
- Actual value sensor: Conductive plastic or wire-wound potentiometers 1 ... 10 kΩ
- Current output: 0(4) ... 20 mA
- Max. burden resistor: 500 Ω; max. output excursion: 10 V
- Minimum burden resistor 100 Ω at $T_a$ > 50 °C, 0 Ω at $T_a$ < 50 °C
- Voltage output: 0(2) ... 10 V (optional)

### AMBIENT TEMPERATURE
- 0 °C to +60 °C (ambient temperature of actuator)

### DEGREE OF PROTECTION (IP CODE)
- Degree of protection of actuator

### FAULT INDICATION (INTEGRATED)
Potential-free power contact, which opens if a fault occurs. This solution monitors the correct functioning of the actuator.
- Potential-free contact for max. 125 V AC, 10 VA (resistive) or 125 V DC, 10 W (resistive)
- Contact opens as soon as a fault occurs

The contact opens if the following fault events occur:
- Mains voltage failure
- Controller manual mode is active
- Open circuit monitoring for setpoint value (only when set to 4 ... 20 mA or 2 ... 10 V)



# Electronic position controller ESR-NL

NL

## Product details

### CONSTRUCTION
- Industrial-standard multilayer PCB
- EMC tested PCB layout
- Control electronics internally fused
- Triac output stage with RC snubber circuit for motor control
- Integrated limit switches

### ACCURACY
- 10 bit setpoint value input
- 10 bit actual value output

### EXTERNAL INTERFACES
- Setpoint value input via standard signal or potentiometer
- Actual value output via standard signal
- Max. two additional auxiliary position switches

### OPERATION
- 3 push-buttons for menu-assisted programming
- Selector switch to select manual / closed-loop control
- Dual colour LED indicates current operating status and support menu guidance

### CONNECTIONS
- Mains connection terminals designed for 2.5 mm² conductor cross-section
- Mains connection terminals based on extra-large, 7.5 mm grid spacing to prevent arcing in actuators subject to high humidity
- Mains and extra-low voltage terminals differently sized to prevent incorrect termination

## Technical data

### POWER SUPPLY CONNECTION
- 230 V or 115 V ± 10%, 50/60 Hz (depending on operating voltage of motor)

### SETPOINT VALUE INPUT
- Current input: 0(4) ... 20 mA; burden resistor: 250 Ω
- Voltage input: 0(2) ... 10 V (optional)
- Voltage input: 0(1) ... 5 V (e.g. for potentiometer powered via controller, optional)
- Conditional overvoltage and reverse polarity protection

### ACTUAL VALUE OUTPUT
- Actual value sensor: 5 kΩ wire-wound potentiometer integrated on PCB
- Output electrically isolated
- Current output: 0(4) ... 20 mA
- Max. burden resistor: 500 Ω; max. output excursion: 10 V
- Minimum burden resistor 100 Ω at $T_a$ > 50 °C, 0 Ω at $T_a$ < 50 °C
- Voltage output: 0(2) ... 10 V (optional)

### AMBIENT TEMPERATURE
- 0 °C to +60 °C (ambient temperature of actuator)

### DEGREE OF PROTECTION (IP CODE)
- Degree of protection of actuator

## FAIL-SAFE-MODULE FOR DC ACTUATORS

The fail-safe module ensures the electrically powered actuator takes up a safe end position in the event the power supply fails or is disrupted. Suitable for actuators powered by an operating voltage of 24 VDC it is possible to integrate the module in an existing actuator circuit.

### MODE OF OPERATION

The fail-safe module is connected to the same supply voltage as the actuator controls. The module permanently monitors the supply voltage.

During normal operations, meaning when the 24 VDC supply voltage is applied, actuator movements are regulated by signals from the actuator controls.

If the supply voltage suffers a failure the fail-safe module switches to battery operation and moves the actuator to the selected safe end position. In this mode of operation signals from the actuator controls have no effect.

The module switches back to normal operations when the supply voltage is restored and the energy accumulator recharged.

The direction of rotation of the actuator to take up the safe end position is selected by means of a plug-in jumper on the fail-safe module - and can be altered as required.

# Fail-Safe Module

## Product details

### CONSTRUCTION

- Housing: polystyrene/ABS
- Storage medium: long-lasting, rechargeable lead AGM battery
- Internal electronics move the actuator to the safe end position

### EXTERNAL INTERFACES

- Fault message output “BAT.-MODE”: battery/normal operation
- Fault message output “ALARM”: internal error or input voltage error

### OPERATION

- Safe end position selected with plug-in jumper

### CONNECTIONS

- Conductor cross-section, solid: 0,5 $mm^2$ ... 2,5 $mm^2$
- Conductor cross-section, flexible: 0,5 $mm^2$ ... 2,5 $mm^2$

### INSTALLATION

- On TS35/15 or TS35/7,5 mounting rail to EN 60715
- Mounting position: horizontal; convection must be guaranteed

# Technical data

### INPUT DATA

- Nominal input voltage: 24 V DC (SELV)
- Allowable input voltage: 22,5 V DC ... 29,5 V DC
- Maximum current consumption: 2,8 A

### OUTPUT DATA

- Nominal output voltage: 24 V DC (SELV)
- Maximum output current: 2,5 A

### AMBIENT CONDITIONS

- Ambient temperature: –15 °C ... 50 °C
- Allowable humidity (operation):

⩽ 95% (at 25 °C, no condensation)

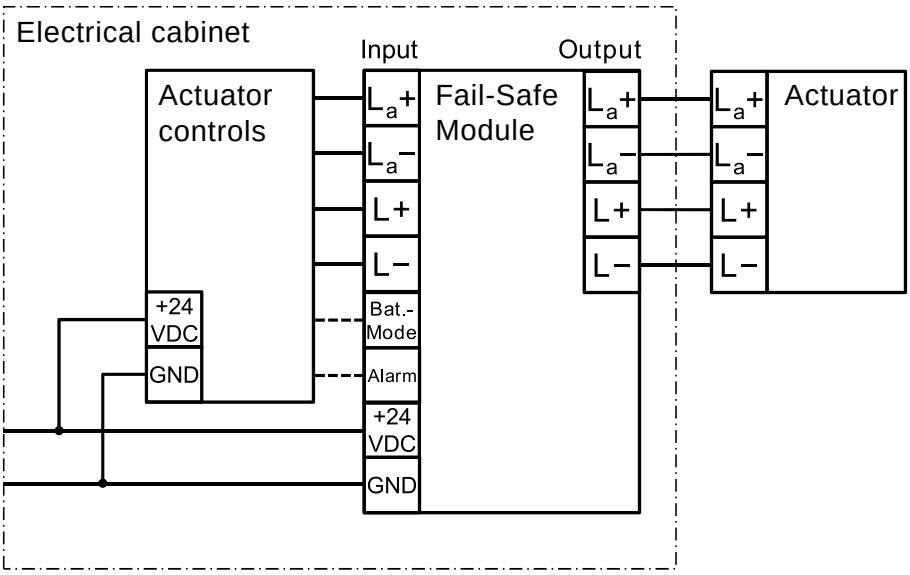
### PROTECTION CLASS (IP CODE)

- IP20

### DIMENSIONS

- 188 mm/110 mm/103 mm (width/height/depth)

## SCHEMATIC DIAGRAM

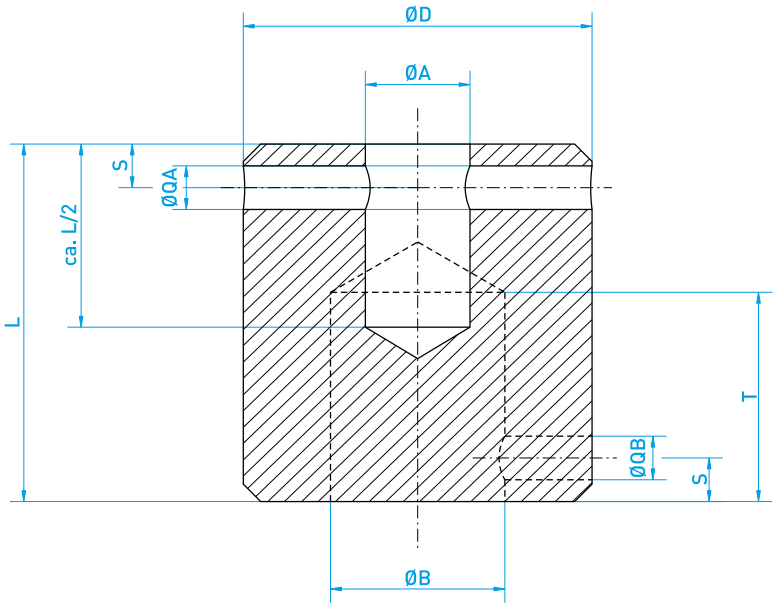


# Shaft coupling WK

NK | NL | N1 - N6 | NEx 1 - NEx 6

Consisting of a coupling and spring dowel pins the shaft coupling securely connects output shafts with valve stems.

| Designation | M / Nm | Ø D | L | Ø A | Ø QA | Ø B | S | T | Order No. |
|---|---|---|---|---|---|---|---|---|---|
| WK 22.1 | 40 | 22 | 41 | 12 | 5 | max. 14 | 5 | max. 25 | 128200 |
| WK 22.4 | 60 | 22 | 41 | 14 | 6 | max. 14 | 5 | max. 25 | 128210 |
| WK 40.1 | 40 | 40 | 41 | 12 | 5 | max. 30 | 5 | max. 25 | 128220 |
| WK 40.4 | 60 | 40 | 41 | 14 | 6 | max. 30 | 5 | max. 25 | 128230 |
| WK 40.5 | 110 | 40 | 64 | 20 | 8 | max. 30 | 8 | max. 40 | 128240 |
| WK 40.6 | 180 | 40 | 64 | 25 | 10 | max. 30 | 8 | max. 40 | 128250 |
| WK 60.5 | 110 | 60 | 64 | 20 | 8 | max. 50 | 8 | max. 40 | 128260 |
| WK 60.6 | 180 | 60 | 64 | 25 | 10 | max. 50 | 8 | max. 40 | 128270 |



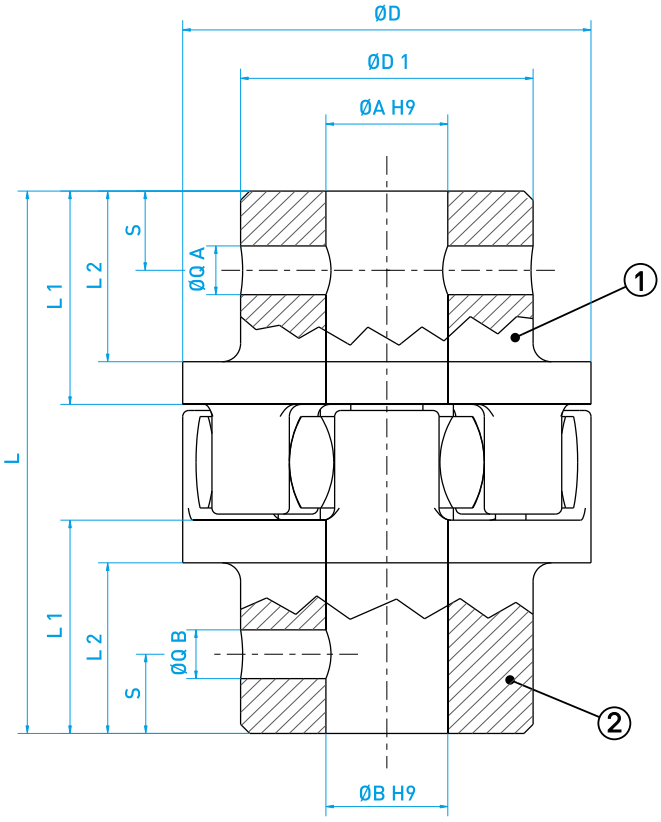
# Flexible shaft coupling
# EWK ROTEX

NK | NL | N1 - N6 | NEx 1 - NEx 6

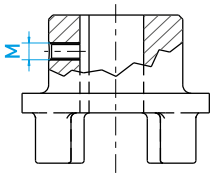
Consisting of a two-piece coupling with elastic insert (spider) and spring dowel pins, the couplings serve to create valves with a stop bar.
Damping is effective on both sides.

| Designation | M / Nm | Ø D | Ø D 1 | L | L 1 | L 2 | Ø A | Ø Q A | Ø B | S | M | P | T | Order No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EWK 41.1 | 5 | 41 | 32 | 66 | 25 | 20 | 12 | 5 | max. 20 | 8 | M5 | 4 | 13.8 | 128300 |
| EWK 41.2 | 10 | 41 | 32 | 66 | 25 | 20 | 12 | 5 | max. 20 | 8 | M5 | 4 | 13.8 | 128310 |
| EWK 41.3 | 20 | 41 | 32 | 66 | 25 | 20 | 12 | 5 | max. 20 | 8 | M5 | 4 | 13.8 | 128320 |
| EWK 56.1 | 40 | 56 | 40 | 78 | 30 | 24 | 12 | 5 | max. 25 | 8 | M5 | 4 | 13.8 | 128330 |
| EWK 56.4 | 60 | 56 | 40 | 78 | 30 | 24 | 14 | 6 | max. 25 | 8 | M5 | 5 | 16.3 | 128340 |
| EWK 67.5 | 110 | 67 | 48 | 90 | 35 | 28 | 20 | 8 | max. 30 | 13 | M6 | 6 | 22.8 | 128350 |
| EWK 67.6 | 180 | 67 | 48 | 90 | 35 | 28 | 25 | 10 | max. 30 | 13 | M6 | 8 | 28.3 | 128360 |

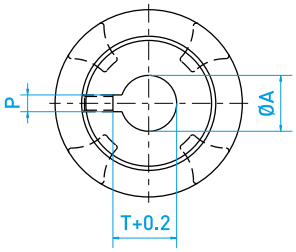
Holes Ø B and Ø Q B drilled to customer specifications



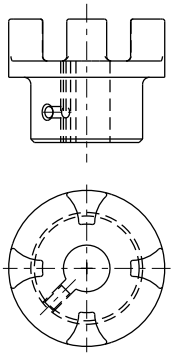

Pos. (1)
option "feather key"



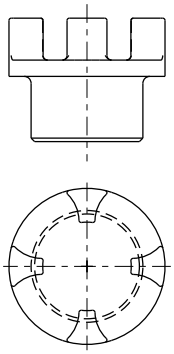

Hub material: Aluminium
Insert (spider) Special polyurethane




Pos. (2)
option "feather key"



Pos. (2)
option "not drilled"



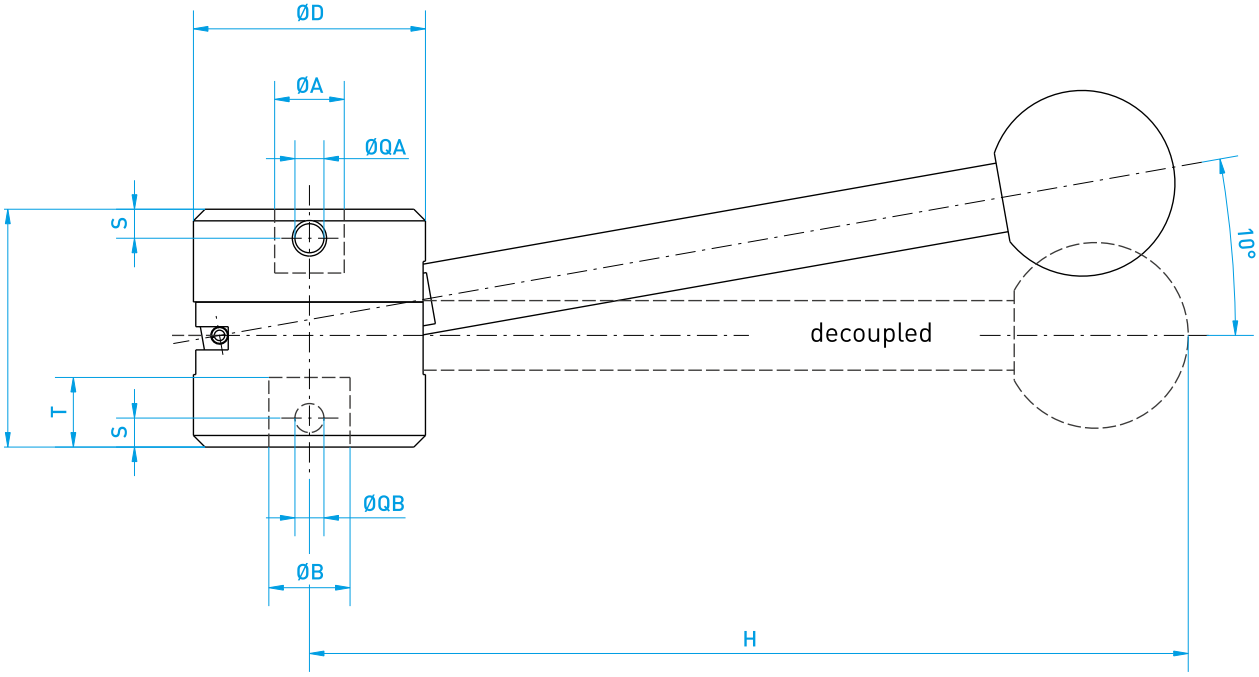
# Lever coupling HK

NK | NL | N1 - N6 | NEx 1 - NEx 6

This is used to create valves solutions where manual operation is possible. It also serves as a visual position indicator.
It consists of a two-piece coupling with hand lever and spring dowel pins.

CAUTION: Unguarded moving machine components are an injury hazard!

| Designation | M / Nm | Ø D | L | Ø A | Ø QA | Ø B | S | T | H | Order No. |
|---|---|---|---|---|---|---|---|---|---|---|
| HK 40.1 | 40 | 40 | 41 | 12 | 5 | max. 20 | 5 | 12 | ca. 150 | 128010 |
| HK 40.4 | 60 | 40 | 41 | 14 | 6 | max. 20 | 5 | 12 | ca. 150 | 128020 |
| HK 60.5 | 110 | 60 | 64 | 20 | 8 | max. 40 | 8 | 20 | ca. 200 | 128030 |
| HK 60.6 | 180 | 60 | 64 | 25 | 10 | max. 40 | 8 | 20 | ca. 200 | 128040 |



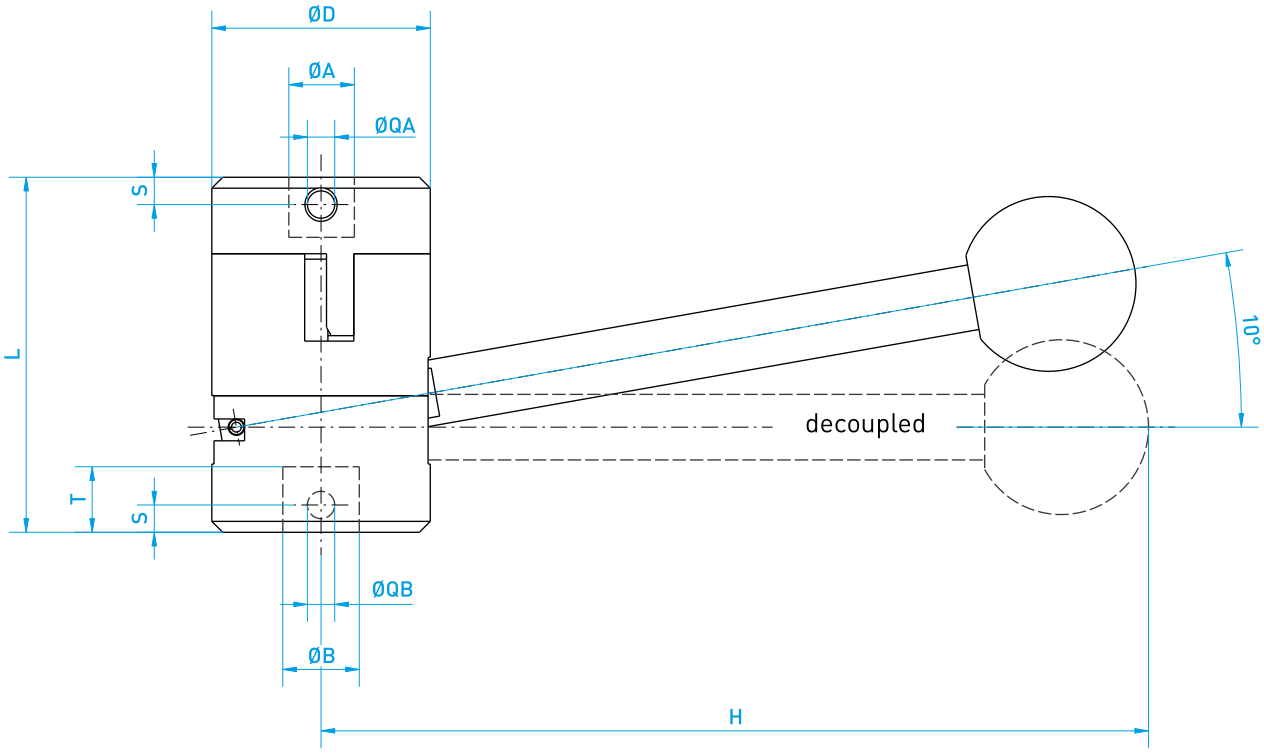
# Flexible lever coupling HFK

NK | NL | N1 - N6 | NEx 1 - NEx 6

Providing elastic damping on one side, it serves to create a valve solution with stop bar where manual operation is possible. Consisting of a three-part coupling with hand lever, spring elements and spring dowel pins, it also serves as a visual position indicator.

CAUTION: Unguarded moving machine components are an injury hazard!

| Designation | M / Nm | Ø D | L | Ø A | Ø QA | Ø B | S | T | H | Order No. |
|---|---|---|---|---|---|---|---|---|---|---|
| HFK 40.1 | 20 | 40 | 65 | 12 | 5 | max. 20 | 5 | 12 | ca. 150 | 128100 |
| HFK 40.2 | 40 | 40 | 65 | 12 | 5 | max. 20 | 5 | 12 | ca. 150 | 128110 |
| HFK 40.4 | 60 | 40 | 65 | 14 | 6 | max. 20 | 5 | 12 | ca. 150 | 128120 |
| HFK 60.5 | 110 | 60 | 112 | 20 | 8 | max. 40 | 8 | 20 | ca. 200 | 128130 |
| HFK 60.6 | 180 | 60 | 112 | 25 | 10 | max. 40 | 8 | 20 | ca. 200 | 128140 |



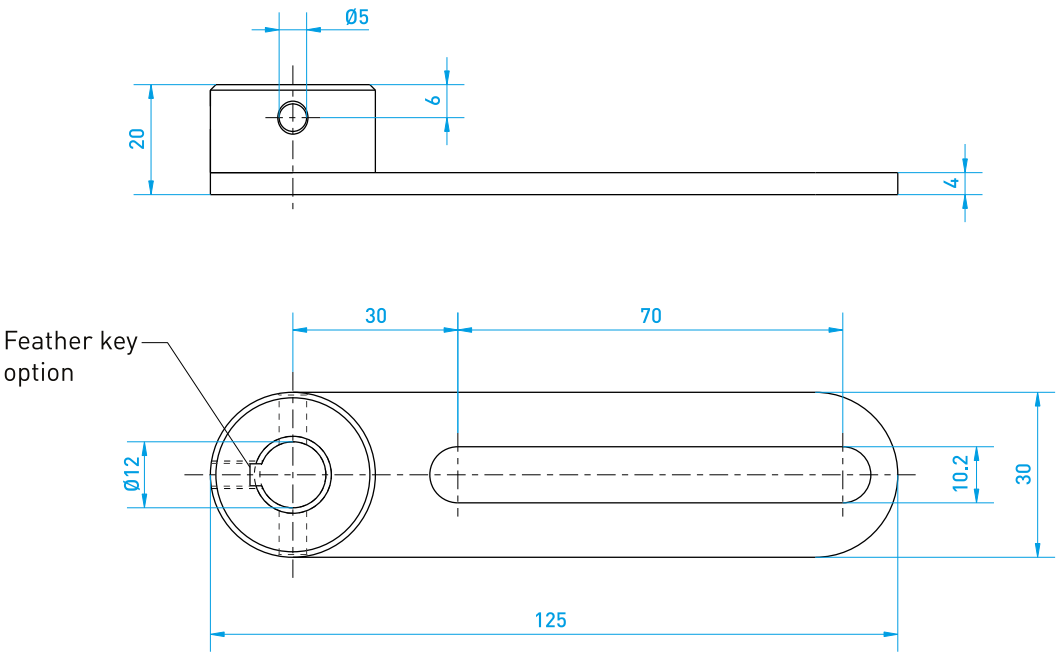
# Lever arm HA

NK | NL | N1 - N4 | NEx 1 - NEx 4

This serves to actuate valves by means of a lever arm, angle ball joints and rods when it is not possible to mount the actuator directly above the valve or if several discs are to be actuated simultaneously. It is secured by means of a spring dowel pin or feather key with clamping screw.

CAUTION: Unguarded moving machine components are an injury hazard!

Order No. 129010



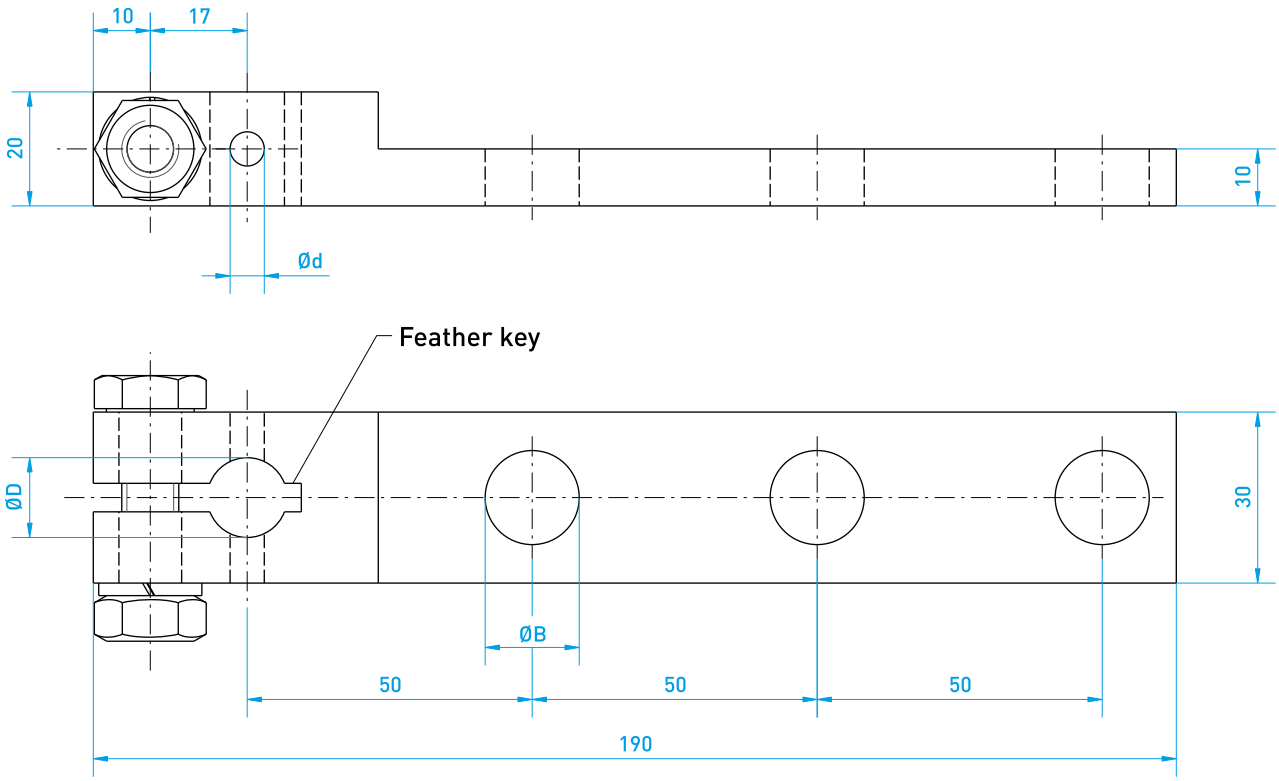
# Clamp lever KHA

NK | NL | N1 - N5 | NEx 1 - NEx 5

This serves to actuate valves by means of a lever arm, angle ball joints and rods when it is not possible to mount the actuator directly above the valve or if several discs are to be actuated simultaneously. It can be secured in any position, including when shafts are slightly misaligned, optionally by means of a spring dowel pin, feather key with clamping screw or clamped or a combination of the above.

CAUTION: Unguarded moving machine components are an injury hazard!

| Designation | M / Nm | Ø D | Ø d | Ø B | Order No. |
|---|---|---|---|---|---|
| KHA 3 | 30 | 12 | 5 | 10.5 | 129110 |
| KHA 4 | 40 | 12 | 5 | 10.5 | 129120 |
| KHA 4A | 60 | 14 | 6 | 16.5 | 129130 |
| KHA 5 | 110 | 20 | 8 | 16.5 | 129140 |



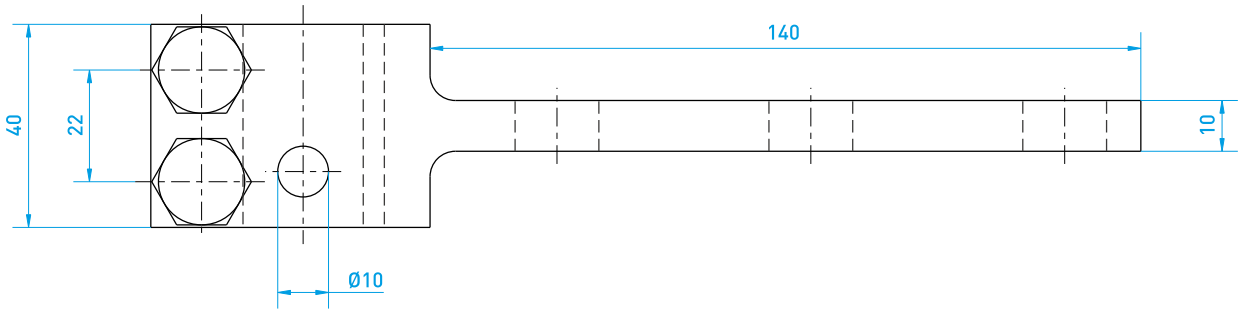
# Clamp lever KHA

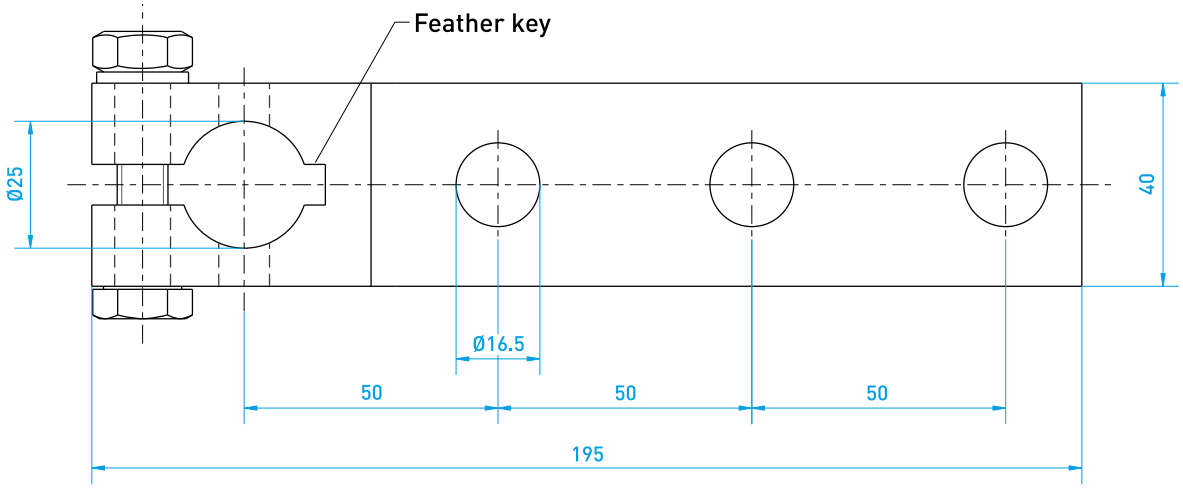
N6 | NEx 6

This serves to actuate valves by means of a lever arm, angle ball joints and rods when it is not possible to mount the actuator directly above the valve or if several dampers are to be actuated simultaneously. It can be secured in any position, including when shafts are slightly misaligned, optionally by means of a spring dowel pin, feather key with clamping screw or clamped or a combination of the above.

CAUTION: Unguarded moving machine components are an injury hazard!

Order No. 129150



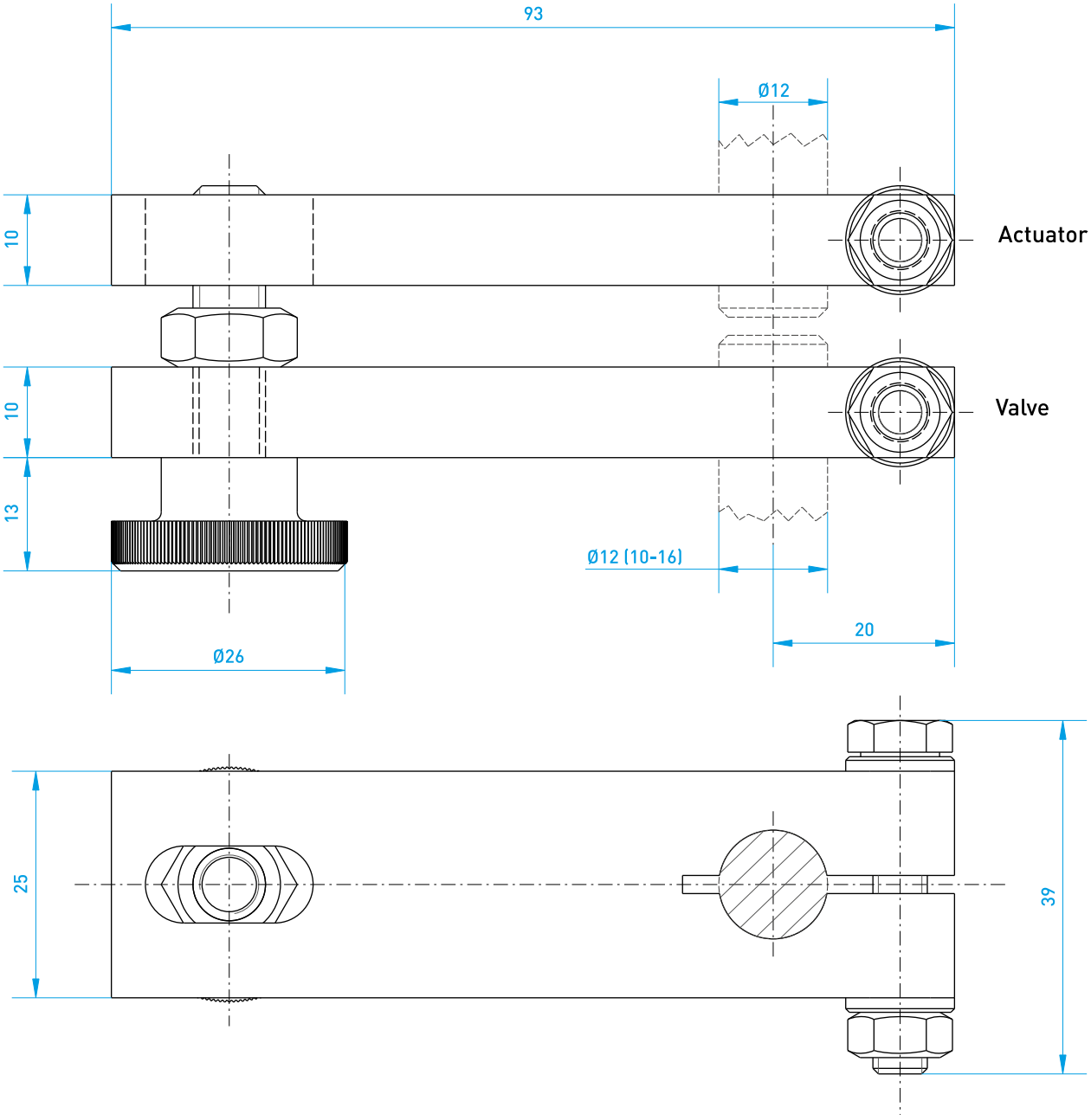
# Clamp lever coupling KHK

NK | NL | N1 - N3

This coupling is used to actuate valves; by undoing the locking screw it can also be used to actuate the valve in an emergency. It can be secured in any position, including when the shafts are slightly misaligned. It consists of two clamping levers and a drive pin; it also includes an adapter sleeve for NK.

CAUTION: Unguarded moving machine components are an injury hazard!

Order No. 129210



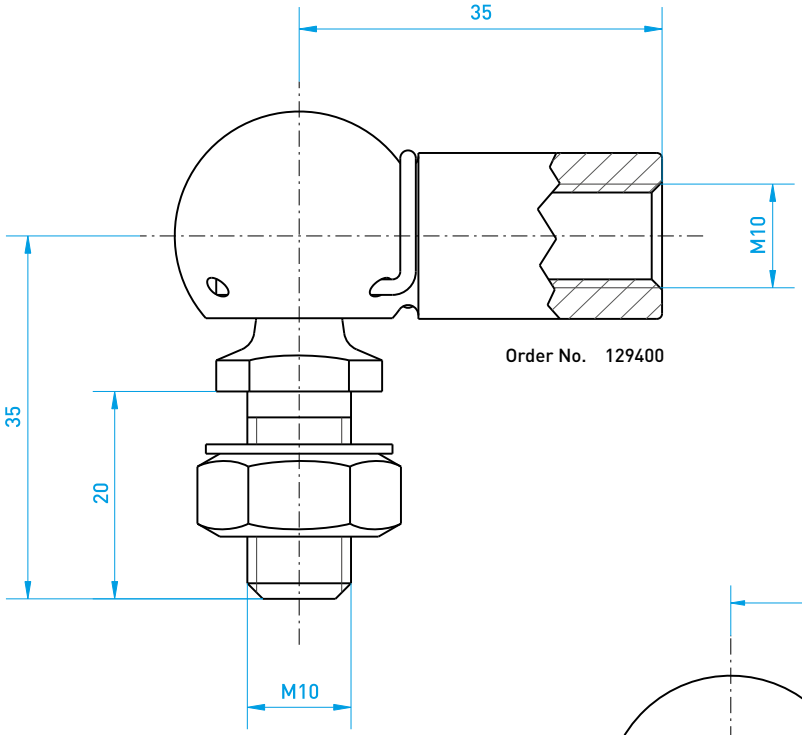
# Angle ball joint GK

NL | N1 - N6 | NEx 1 - NEx 6

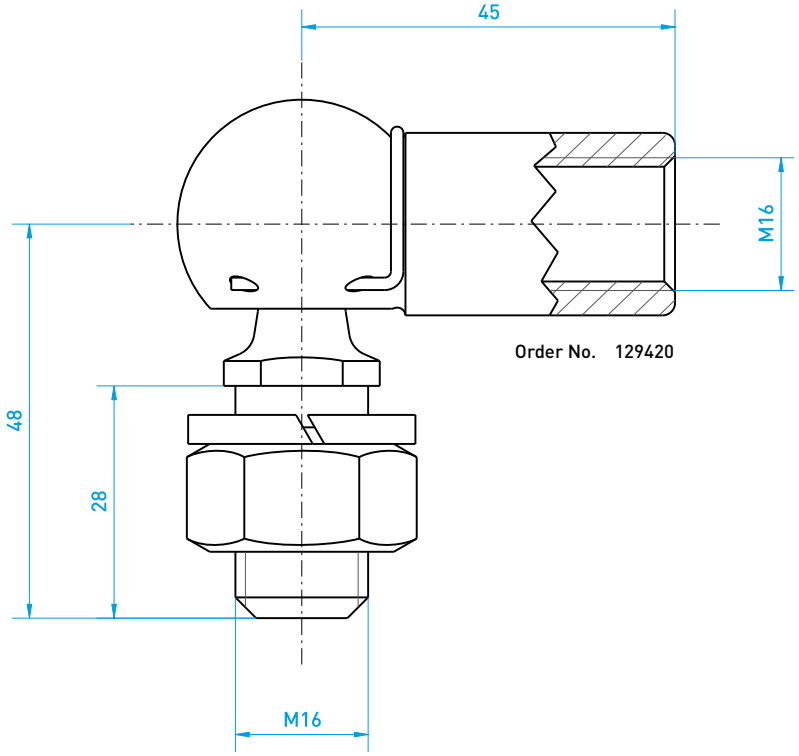
This is used in conjunction with a lever arm or clamping lever and rods.

Order No. 129400

Order No. 129420




Order No. 129400




Order No. 129420

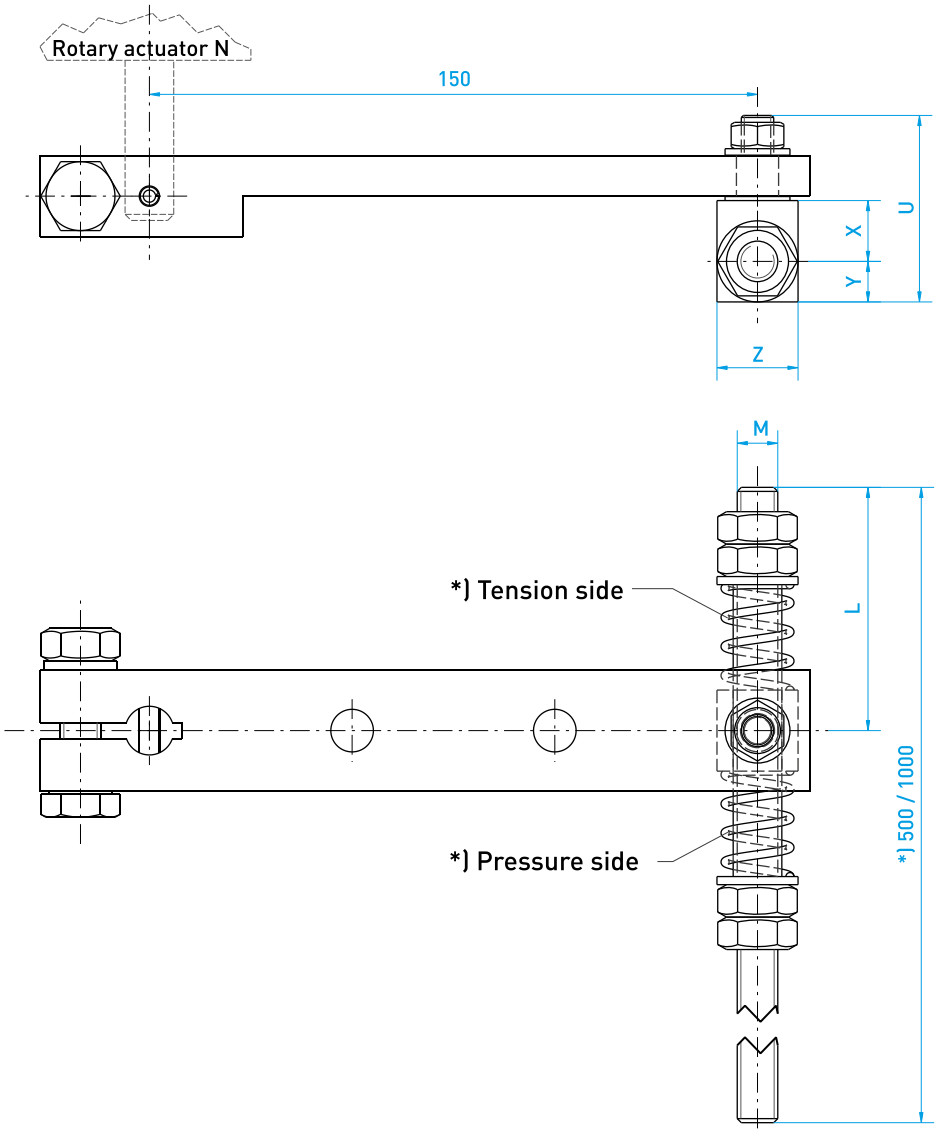
# Spring loaded rod FGT

NL | N1 - N6 | NEx 1 - NEx 6

This is used to actuate valves with stop bar by means of a lever arm or clamping lever and angle ball joint. The end position is cushioned on one or two sides by the spring-loaded connecting rods. It consists of a threaded rod with a hex. nut, spring set and joint.

| Designation | Nm | L | M | X | Y | Z | U | Order No. | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | One sided | Two sided |
| FGT1 (500) | 5-40 | ca. 60 | M10 | 16 | 10 | 20 | 46 | 129650 | 129670 |
| FGT1 (1000) | 5-40 | ca. 60 | M10 | 16 | 10 | 20 | 46 | 129660 | 129680 |
| FGT5 (500) | 60-180 | ca. 80 | M16 | 21 | 20 | 40 | 68 | 129750 | 129770 |
| FGT5 (1000) | 60-180 | ca. 80 | M16 | 21 | 20 | 40 | 68 | 129760 | 129780 |

Include details of desired length and spring arrangement

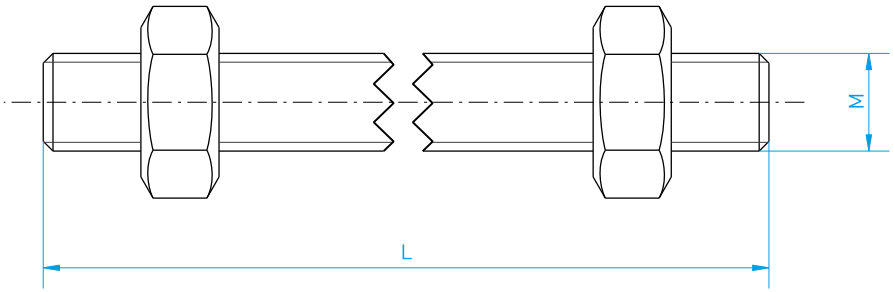


# Rod GT

NL | N1 - N6 | NEx 1 - NEx 6

This is used in conjunction with a lever arm or clamping lever and angle ball joint. It consists of a threaded rod and two hex. nuts.

| Designation | Nm | M | Order No. | |
|---|---|---|---|---|
| | | | L=500 | L=1000 |
| GT 1 | 40 | M10 | 129500 | 129510 |
| GT 2 | 180 | M16 | 129540 | 129550 |



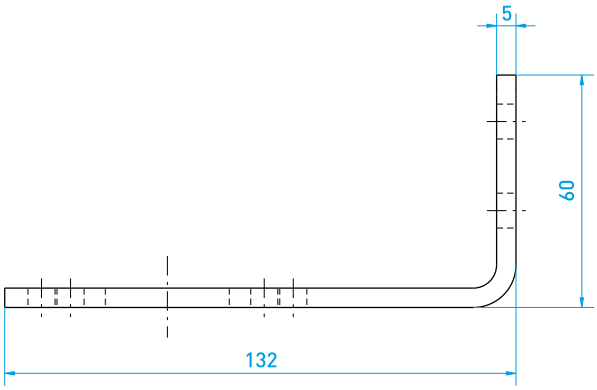
# Angle bracket WKN 1

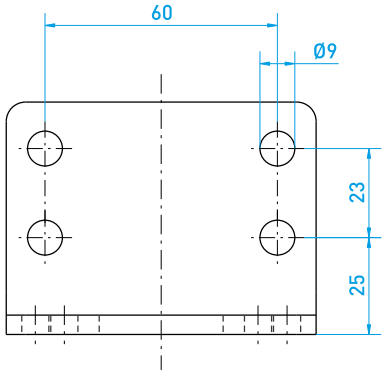
NL | N1 - N4

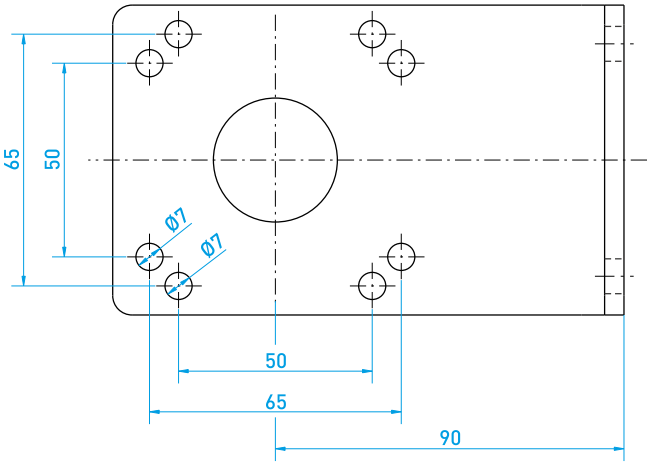
Designed to securely attach actuators.

It is possible to mount the actuator with 90° offset.

Order No. 130010



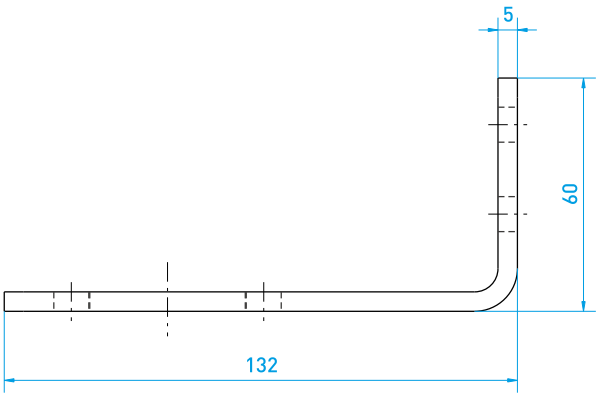
# Angle bracket WKN 5

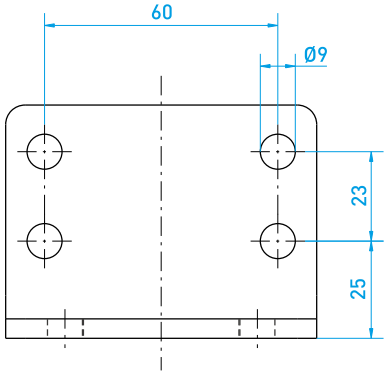
N5 - N6

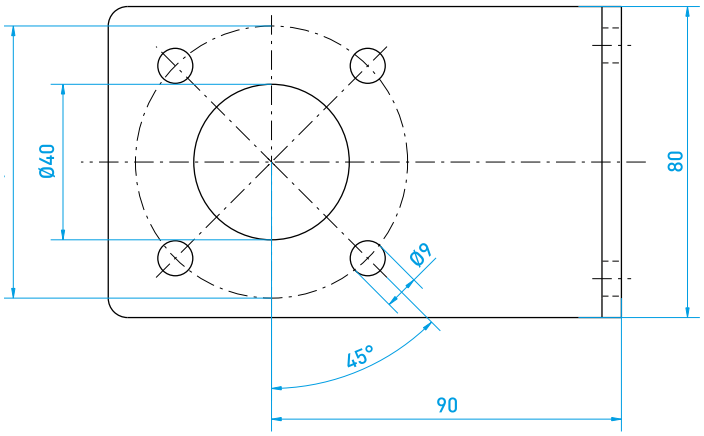
Designed to securely attach actuators.

It is possible to mount the actuator with 90° offset.

Order No. 130020



# Assembly bracket AKN

NL | N1 - N6 | NEx 1 - NEx 6

This is designed to attach actuators to valves and dampers. It consists of a mounting plate on the actuator side and bolts with internal threads.

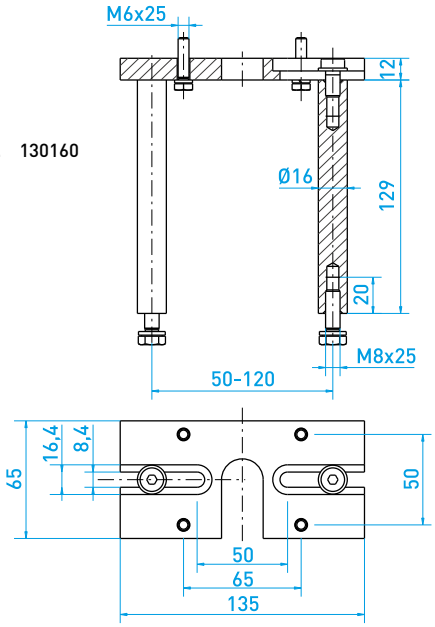
AKN1 offers an adjustable column clearance ranging between 50 - 120 mm. AKN4/5 has a fixed column clearance of 120 mm.

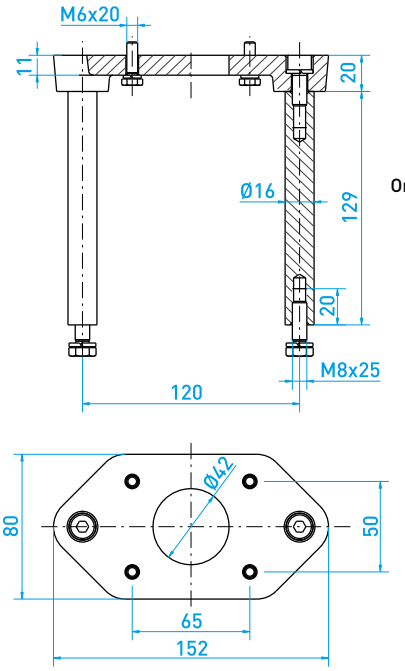
Order No. 130160

Order No. 130162

Order No. 130166

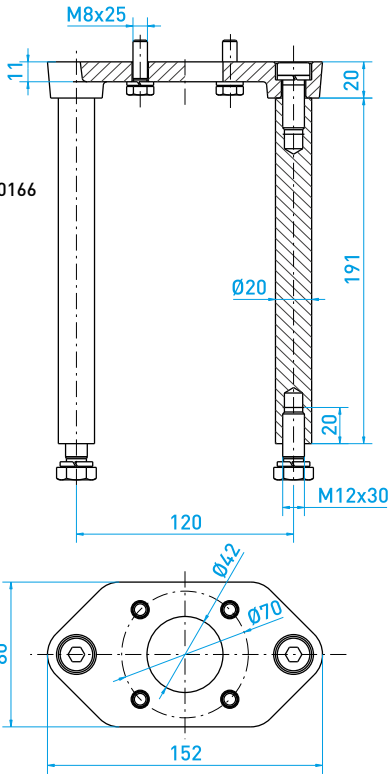
Order No. 130160




Order No. 130162

Order No. 130166

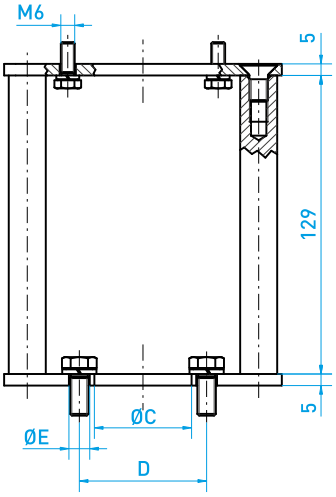


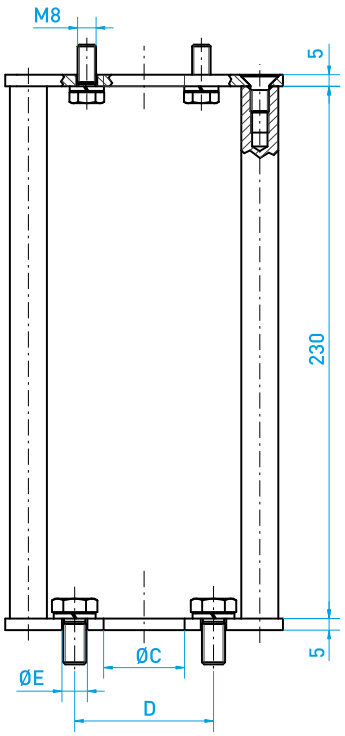
# Bracket

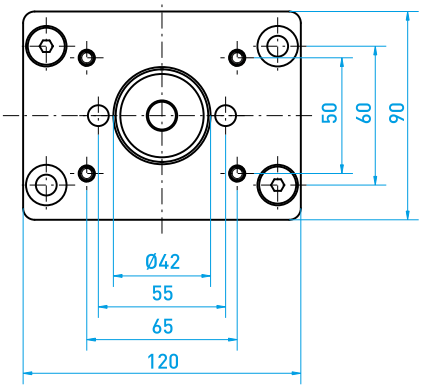
NL | N1 - N6 | NEx 1 - NEx 6

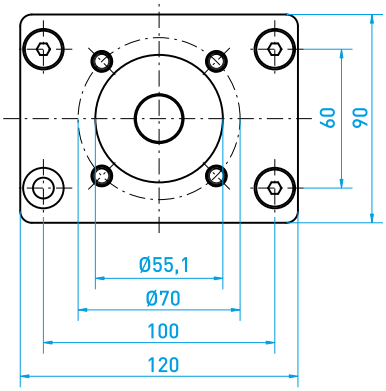
This is designed to attach actuators to valves and dampers.
It consists of a mounting plate on the actuator and valve side as well as bolts with internal threads.

Order No. 130100



# Notes

Agromatic

# VALVES

## Special Requirements

We are always willing to fulfil customer-specific requirements.

## Valves

150 – 217

Agromatic Regelungstechnik GmbH
Post Box 1162 | 33804 Oerlinghausen | Germany
Tel. +49 5202 9739 284 | Fax +49 5202 9739 25
Email: sales@agromatic.de

# Butterfly valve RD 08

## Overview

The butterfly valve RD 08 is a tight-sealing and smooth-running ring-type valve with a bare stem end to clamp between weld-neck flanges PN 6 and PN 16. It is made from high-quality grey cast iron with carefully fitted disc made of red brass.

The butterfly valve RD 08 is eminently suitable for the media water and air; consequently, it is extremely well suited for deployment in heating installations as well as district heating and air ventilation systems.

# Product details

## NOMINAL DIAMETER
- DN 25 to DN 250

## NOMINAL PRESSURE
- PN 6 to PN 16

## BODY
- Grey cast iron EN-GJL-250 (EN-JL-1040)
- Body seat lined with PTFE ring

## VALVE DISC
- Red brass Rg 5 (CC491K)
- Body stop

## STEM
- Stainless steel X17CrNi16-2 (1.4057)

## STEM SEAL
- O-ring
- EPDM (synthetic rubber)
- Body seat lined with PTFE ring
- Option:

- Body seat without PTFE ring

## MEDIA TEMPERATURE
- Max. +120 °C
- CAUTION: Observe temperature range of actuator!

## ACTUATION
- Electric actuators N, NL or NK
- Pneumatic part-turn actuator
- Manual

## LEAKAGE RATE
- 0.05% of Kv possible with flexible coupling

## ORDER DETAILS
- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options

- Desired options

# Technical data

## BUTTERFLY VALVE RD 08

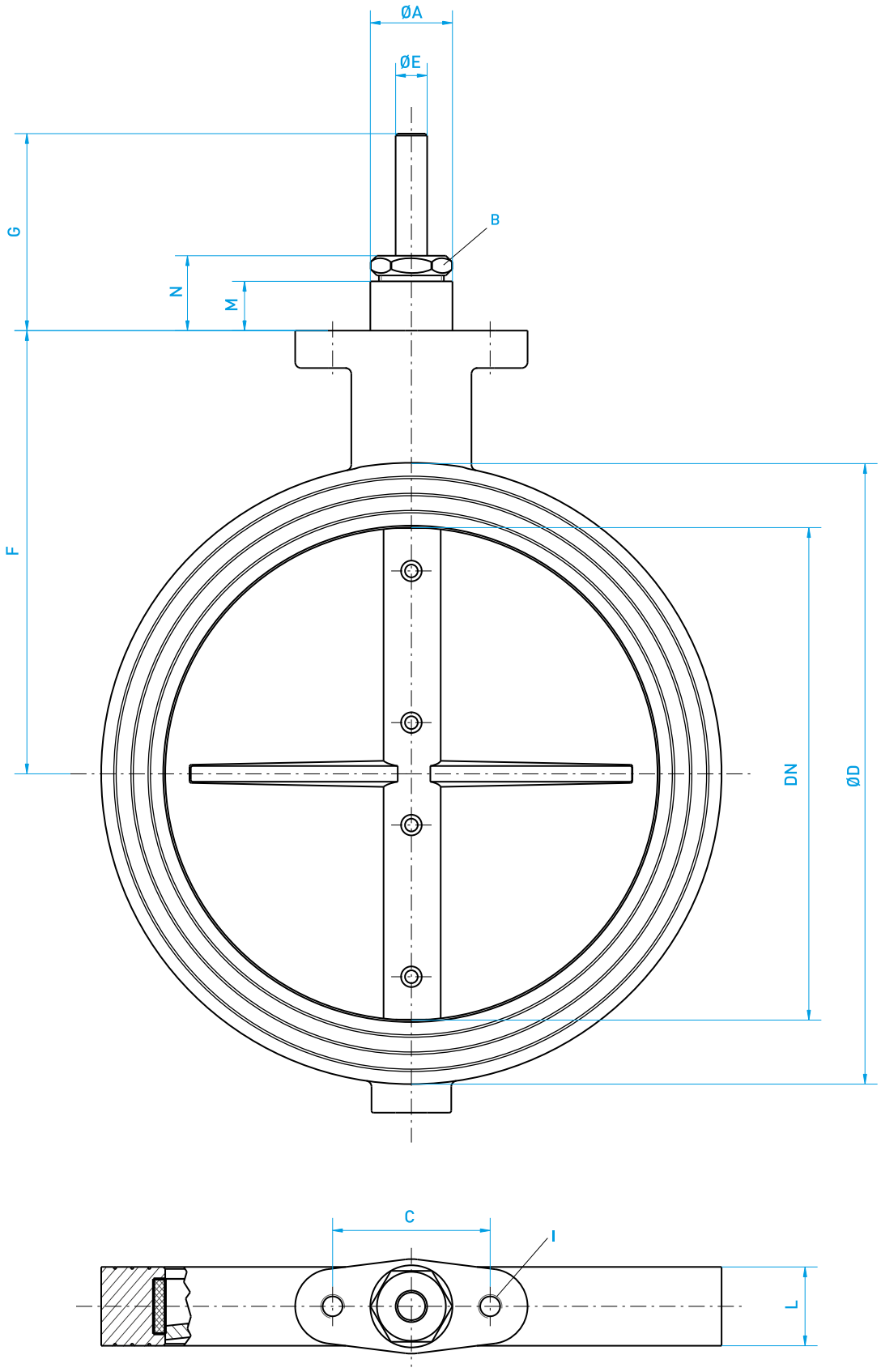
| DN | Ø D | Ø A | B | C | Ø E | F | G | I | L | M | N | Kv | Weight / kg | Order No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 62 | 35.9 | SW32 | 55 | 12 | 75 | 80 | M8 | 30 | 20 | 27 | 19 | 1.15 | 200200 |
| 32 | 75 | 35.9 | SW32 | 55 | 12 | 85 | 80 | M8 | 30 | 20 | 27 | 28 | 1.45 | 200201 |
| 40 | 85 | 35.9 | SW32 | 55 | 12 | 90 | 80 | M8 | 30 | 20 | 27 | 62 | 1.65 | 200202 |
| 50 | 95 | 35.9 | SW32 | 55 | 12 | 100 | 80 | M8 | 35 | 20 | 27 | 115 | 2.00 | 200203 |
| 65 | 115 | 35.9 | SW32 | 55 | 12 | 105 | 80 | M8 | 35 | 20 | 27 | 185 | 2.65 | 200204 |
| 80 | 130 | 35.9 | SW32 | 55 | 12 | 115 | 80 | M8 | 40 | 20 | 27 | 290 | 3.30 | 200205 |
| 100 | 150 | 35.9 | SW32 | 55 | 12 | 125 | 80 | M8 | 40 | 20 | 27 | 480 | 3.90 | 200206 |
| 125 | 180 | 35.9 | SW32 | 55 | 12 | 140 | 80 | M8 | 45 | 20 | 27 | 785 | 5.65 | 200207 |
| 150 | 205 | 35.9 | SW32 | 55 | 12 | 160 | 80 | M8 | 45 | 20 | 27 | 1400 | 6.50 | 200208 |
| 200 | 260 | 41.9 | SW32 | 80 | 16 | 195 | 100 | M12 | 50 | 25 | 38 | 2400 | 11.70 | 200209 |
| 250 | 315 | 41.9 | SW32 | 80 | 16 | 225 | 100 | M12 | 60 | 25 | 38 | 3750 | 17.40 | 200210 |

All dimensions in mm

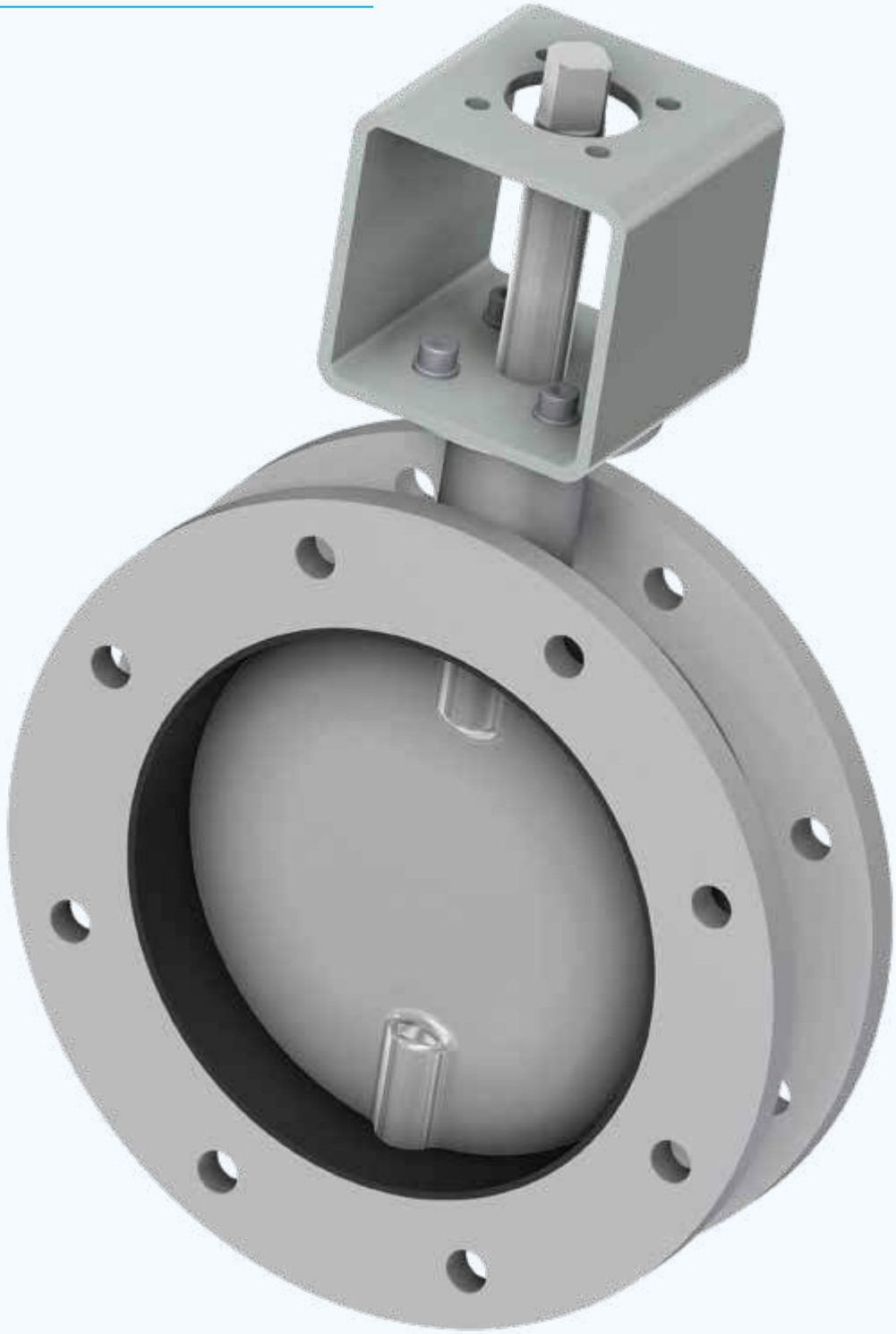
Other sizes on request

# Dimensions

## BUTTERFLY VALVE RD 08



# Butterfly valve, flange design BKLK



## Overview

The low torque, centrally mounted stem is a distinguishing feature of this valve. The short face-to-face dimension facilitates space-saving installation. Customized adaptations are possible on request. This flange-type butterfly valve is designed to shut off and regulate gaseous and liquid media as well as all kinds of bulk material. It is suitable for use in process plant engineering, the pharmaceutical, food processing and chemical industries as well as ventilation engineering solutions in temperatures up to 1100 °C.

# Product details

## NOMINAL DIAMETER

- DN 100 to DN 2000

## NOMINAL PRESSURE

- DIN 24154, series 2 and 4

## BODY

- Body made of steel S 235 JR (1.0038)
- Options:

- Steel (1.0570), stainless steel

## VALVE DISC

- Disc made of steel S 235 JR (1.0038)
- Options:

- Stainless steel or Hastelloy

## STEM

- Stem made of steel S 235 JR (1.0038)
- Options:

- Stainless steel or Hastelloy

## FLANGE HEAD

- ISO flange

## SEALING

- No seal

## MEDIA TEMPERATURE

- 400 °C / 500 °C / 600 °C / 700 °C / 800 °C
- Option:

- 1100 °C on request
- CAUTION: Observe temperature range of actuator!

## ACTUATION

- Electric actuators N or NL
- Pneumatic part-turn actuator
- Manual

## ORDER DETAILS

- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

## BUTTERFLY VALVE, FLANGE DESIGN BKLK

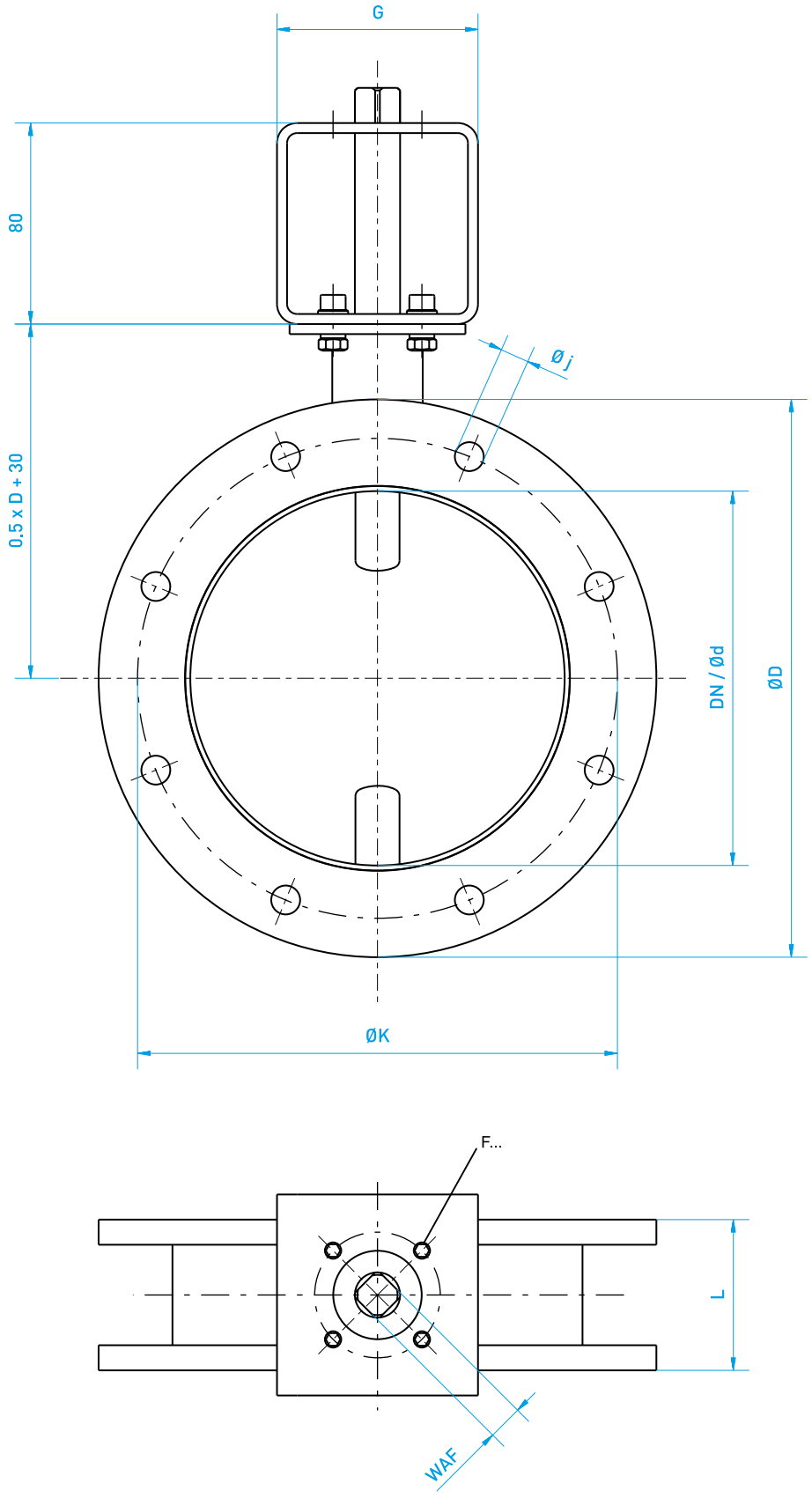
| DN | Ø d | Ø D | L | Ø K | Number x Ø j | ISO-F... | WAF | G | Order No. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 400 °C | 500 °C | 600 °C | 700 °C | 800 °C |
| 100 | 95 | 155 | 60 | 139 | 4 x Ø 9.5 | 05 | 14 | 80 | 200303 | 200332 | 200359 | 200386 | 200413 |
| 112 | 105 | 165 | 60 | 151 | 4 x Ø 9.5 | 05 | 14 | 80 | 200304 | 200333 | 200360 | 200387 | 200414 |
| 125 | 120 | 180 | 60 | 165 | 4 x Ø 9.5 | 05 | 14 | 80 | 200305 | 200334 | 200361 | 200388 | 200415 |
| 140 | 135 | 205 | 60 | 182 | 8 x Ø 11.5 | 05 | 14 | 80 | 200306 | 200335 | 200362 | 200389 | 200416 |
| 160 | 155 | 225 | 60 | 200 | 8 x Ø 11.5 | 05 | 14 | 80 | 200308 | 200336 | 200363 | 200390 | 200417 |
| 180 | 175 | 240 | 60 | 219 | 8 x Ø 11.5 | 05 | 14 | 80 | 200309 | 200337 | 200364 | 200391 | 200418 |
| 200 | 195 | 265 | 60 | 241 | 8 x Ø 11.5 | 05 | 14 | 80 | 200310 | 200338 | 200365 | 200392 | 200419 |
| 224 | 220 | 280 | 60 | 265 | 8 x Ø 11.5 | 05 | 14 | 80 | 200311 | 200339 | 200366 | 200393 | 200420 |
| 250 | 245 | 315 | 60 | 292 | 8 x Ø 11.5 | 07 | 17 | 100 | 200312 | 200340 | 200367 | 200394 | 200421 |
| 280 | 275 | 355 | 60 | 332 | 8 x Ø 11.5 | 07 | 17 | 100 | 200313 | 200341 | 200368 | 200395 | 200422 |
| 315 | 310 | 390 | 65 | 366 | 8 x Ø 11.5 | 07 | 17 | 100 | 200315 | 200342 | 200369 | 200396 | 200423 |
| 355 | 350 | 430 | 65 | 405 | 8 x Ø 11.5 | 07 | 17 | 100 | 200316 | 200343 | 200370 | 200397 | 200424 |
| 400 | 395 | 475 | 65 | 448 | 12 x Ø 11.5 | 07 | 17 | 100 | 200317 | 200344 | 200371 | 200398 | 200425 |
| 450 | 445 | 525 | 65 | 497 | 12 x Ø 11.5 | 07 | 17 | 100 | 200318 | 200345 | 200372 | 200399 | 200426 |
| 500 | 495 | 575 | 65 | 551 | 12 x Ø 11.5 | 07 | 17 | 100 | 200319 | 200346 | 200373 | 200400 | 200427 |
| 560 | 555 | 655 | 100 | 629 | 16 x Ø 14.0 | 07 | 17 | 100 | 200320 | 200347 | 200374 | 200401 | 200428 |
| 630 | 625 | 725 | 100 | 698 | 16 x Ø 14.0 | 10 | 22 | 120 | 200321 | 200348 | 200375 | 200402 | 200429 |
| 710 | 705 | 805 | 100 | 775 | 16 x Ø 14.0 | 10 | 22 | 120 | 200322 | 200349 | 200376 | 200403 | 200430 |
| 800 | 795 | 895 | 100 | 861 | 24 x Ø 14.0 | 10 | 22 | 120 | 200323 | 200350 | 200377 | 200404 | 200431 |
| 900 | 895 | 995 | 100 | 958 | 24 x Ø 14.0 | 10 | 22 | 120 | 200324 | 200351 | 200378 | 200405 | 200432 |
| 1000 | 995 | 1095 | 100 | 1067 | 24 x Ø 14.0 | 10 | 22 | 120 | 200325 | 200352 | 200379 | 200406 | 200433 |
| 1120 | 1115 | 1235 | 140 | 1200 | 32 x Ø 18.0 | 10 | 22 | 120 | 200326 | 200353 | 200380 | 200407 | 200434 |
| 1250 | 1245 | 1365 | 140 | 1337 | 32 x Ø 18.0 | 10 | 22 | 120 | 200327 | 200354 | 200381 | 200408 | 200435 |
| 1400 | 1395 | 1515 | 140 | 1475 | 32 x Ø 18.0 | 12 | 27 | 140 | 200328 | 200355 | 200382 | 200409 | 200436 |
| 1600 | 1580 | 1700 | 140 | 1675 | 40 x Ø 18.0 | 12 | 27 | 140 | 200329 | 200356 | 200383 | 200410 | 200437 |
| 1800 | 1775 | 1895 | 140 | 1875 | 40 x Ø 18.0 | 12 | 27 | 140 | 200330 | 200357 | 200384 | 200411 | 200438 |
| 2000 | 1995 | 2115 | 140 | 2073 | 40 x Ø 18.0 | 12 | 27 | 140 | 200331 | 200358 | 200385 | 200412 | 200439 |

All dimensions in mm

1100 °C and other sizes on request

# Dimensions

## BUTTERFLY VALVE, FLANGE DESIGN BKLK



# Flanged butterfly valve FD 12 with body stop

## Overview

The standard version of these butterfly valves is designed with a bare shaft end and body stop. Bearings support the continuous stem at both ends.

Flange versions of the butterfly valves are designed to be clamped between type PN 16 weld-neck flanges.

# Product details

### NOMINAL DIAMETER
- DN 25 to DN 250

### NOMINAL PRESSURE
- PN 16

### BODY
- Body made of grey cast iron EN-GJL-250 (EN-JL 1040)

### VALVE DISC
- Valve disc made of red brass Rg 5 (CC491K)

### STEM
- Stem made of stainless steel X20CrNi17-2 (1.4057)

### STEM SEAL
- Stem seal made of asbestos-free, graphite packing; max. temperature: 120 °C

### MEDIA TEMPERATURE
- Max. +120 °C
- CAUTION: Observe temperature range of actuator!

### ACTUATION
- Electric actuators N, NK or NL
- Pneumatic part-turn actuator
- Manual

### LEAKAGE RATE
- 0.05% of Kv possible with flexible coupling

### ORDER DETAILS
- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

## FLANGED BUTTERFLY VALVE FD12 PN16

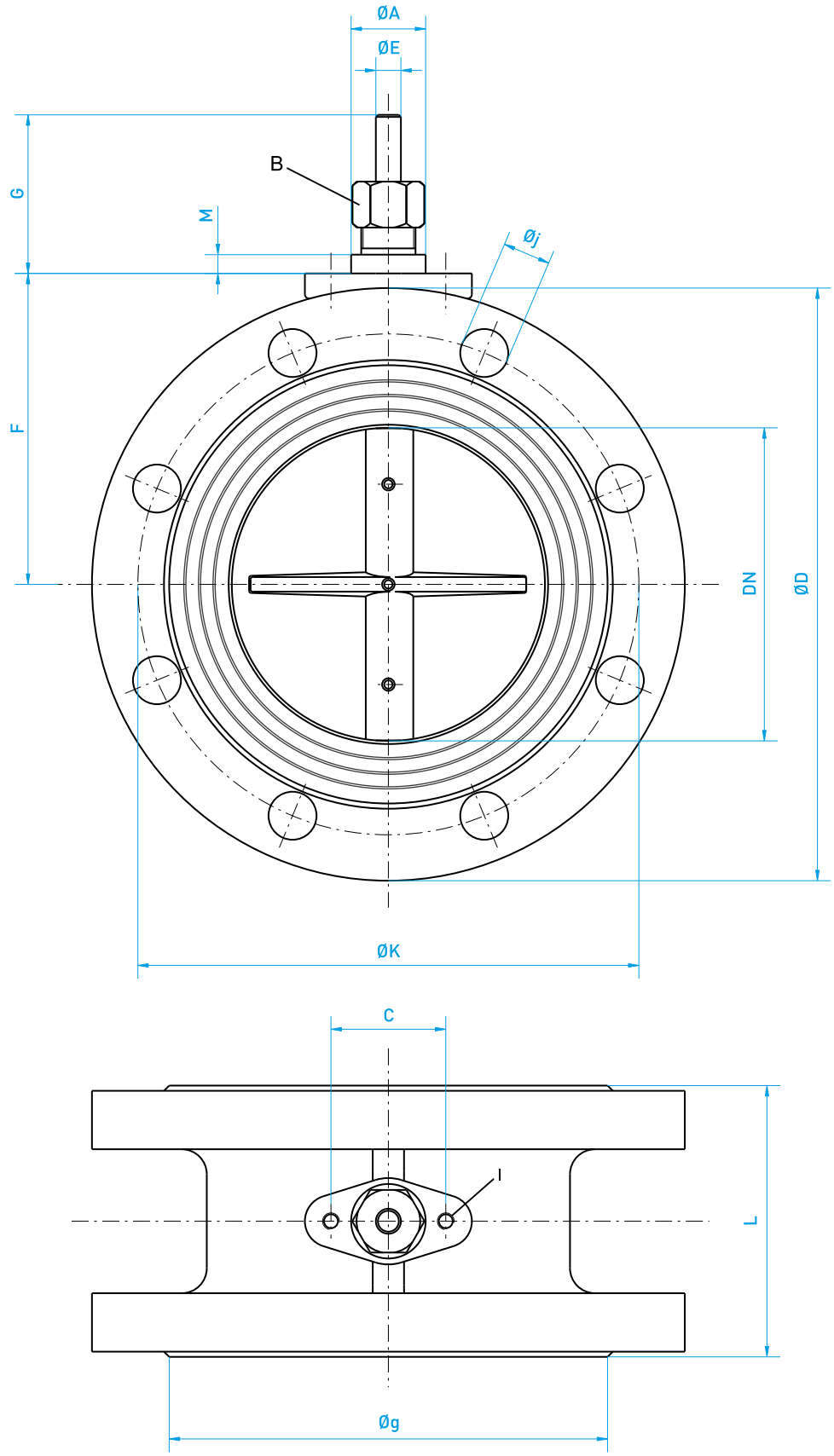
| Dimensions | Ø A | B | C | Ø D | Ø E | F | G | I | Ø g | Ø K | Ø j | L | M | Weight / kg | Order No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 35.9 | SW30xG3/4" | 55 | 115 | 12 | 62 | 80 | M8 | 68 | 85 | 4x14 | 70 | 10 | 3.10 | 200480 |
| 32 | 35.9 | SW30xG3/4" | 55 | 140 | 12 | 75 | 80 | M8 | 78 | 100 | 4x18 | 75 | 10 | 3.80 | 200481 |
| 40 | 35.9 | SW30xG3/4" | 55 | 150 | 12 | 79 | 80 | M8 | 88 | 110 | 4x18 | 75 | 10 | 4.85 | 200482 |
| 50 | 35.9 | SW30xG3/4" | 55 | 165 | 12 | 85 | 80 | M8 | 102 | 125 | 4x18 | 80 | 10 | 5.90 | 200483 |
| 65 | 35.9 | SW30xG3/4" | 55 | 185 | 12 | 95 | 80 | M8 | 122 | 145 | 4x18 | 80 | 10 | 8.40 | 200484 |
| 80 | 35.9 | SW30xG3/4" | 55 | 200 | 12 | 104 | 80 | M8 | 138 | 160 | 8x18 | 90 | 10 | 9.20 | 200485 |
| 100 | 35.9 | SW30xG3/4" | 55 | 220 | 12 | 113 | 80 | M8 | 158 | 180 | 8x18 | 90 | 10 | 11.80 | 200486 |
| 125 | 35.9 | SW30xG3/4" | 55 | 250 | 12 | 118 | 80 | M8 | 188 | 210 | 8x18 | 110 | 10 | 16.80 | 200487 |
| 150 | 35.9 | SW30xG3/4" | 55 | 285 | 12 | 149 | 80 | M8 | 212 | 240 | 8x23 | 130 | 10 | 21.00 | 200488 |
| 200 | 41.9 | Ø 42xG1" | 80 | 340 | 16 | 179 | 100 | M12 | 268 | 295 | 12x23 | 150 | 15 | 35.00 | 200489 |
| 250 | 41.9 | Ø 42xG1" | 80 | 405 | 16 | 208 | 100 | M12 | 320 | 355 | 12x27 | 160 | 15 | 52.00 | 200490 |

All dimensions in mm

Other sizes on request

# Dimensions

## FLANGED BUTTERFLY VALVE FD12 PN16



# High-temperature butterfly valve, light-weight design BKL

## Overview

Wafer-type – butterfly valve BKL designed to shut off and regulate gaseous and liquid media as well as all kinds of bulk material in process plant engineering, the pharmaceutical, food processing and chemical industries as well as in ventilation engineering and water industry applications.

# Product details

### NOMINAL DIAMETER
- DN 50 to DN 500

### NOMINAL PRESSURE
- PN 6 / 10 / 16

### BODY
- Body made of S355J2G3 (1.0570)
- Options:

- Aluminium, grey iron or stainless steel

### VALVE DISC
- Disc made of S235JRG2 (1.0038)
- Options:

- Stainless steel or Hastelloy

### STEM
- Stem made of E295+C (1.0050)
- Options:

- Stainless steel or Hastelloy

### FLANGE HEAD
- Flange to ISO 5211

### SEALING
- No seal

### MEDIA TEMPERATURE
- Max. +1100 °C
- CAUTION: Observe temperature range of actuator!

### ACTUATION
- Electric actuators N or NL
- Pneumatic part-turn actuator
- Manual

### ORDER DETAILS
- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

## HIGH-TEMPERATURE BUTTERFLY VALVE, LIGHT-WEIGHT DESIGN BKL

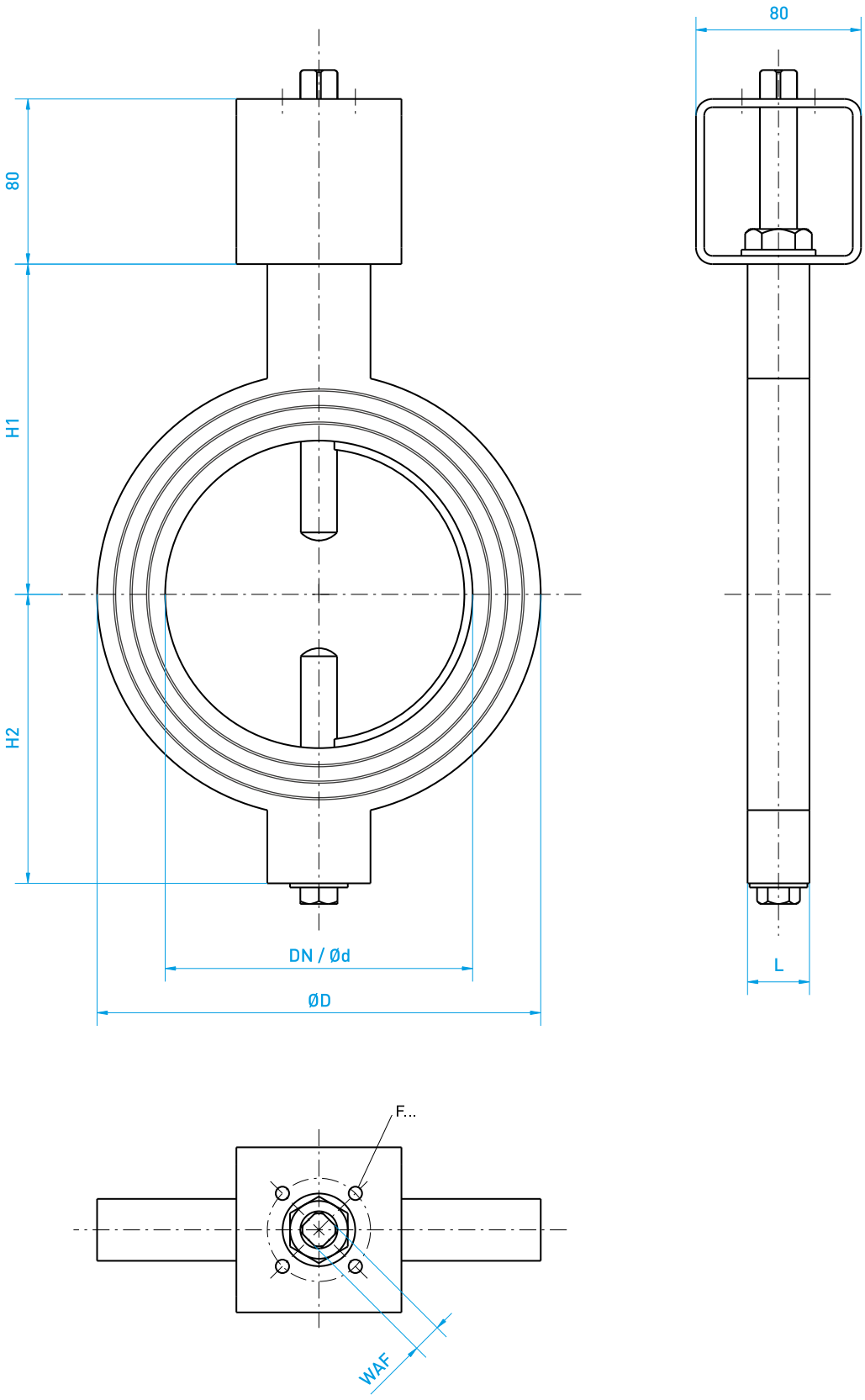
| DN | Ø d | H1 | H2 | Ø D | L | ISO-F... | WAF | Order No. Stainless steel | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 400 °C | 600 °C | 700 °C | 600 °C | 700 °C | 800 °C |
| 50 | 49 | 100 | 80 | 105 | 30 | 05 | 14 | 200500 | 200517 | 200534 | 200551 | 200568 | 200585 |
| 65 | 64 | 110 | 90 | 125 | 30 | 05 | 14 | 200501 | 200518 | 200535 | 200552 | 200569 | 200586 |
| 80 | 79 | 120 | 100 | 140 | 30 | 05 | 14 | 200502 | 200519 | 200536 | 200553 | 200570 | 200587 |
| 100 | 99 | 130 | 110 | 160 | 30 | 05 | 14 | 200503 | 200520 | 200537 | 200554 | 200571 | 200588 |
| 125 | 124 | 140 | 120 | 190 | 30 | 05 | 14 | 200504 | 200521 | 200538 | 200555 | 200572 | 200589 |
| 150 | 149 | 160 | 140 | 215 | 30 | 05 | 14 | 200505 | 200522 | 200539 | 200556 | 200573 | 200590 |
| 200 | 199 | 190 | 170 | 270 | 40 | 05 | 14 | 200506 | 200523 | 200540 | 200557 | 200574 | 200591 |
| 250 | 249 | 220 | 200 | 325 | 40 | 07 | 17 | 200507 | 200524 | 200541 | 200558 | 200575 | 200592 |
| 300 | 295 | 250 | 230 | 375 | 40 | 07 | 17 | 200508 | 200525 | 200542 | 200559 | 200576 | 200593 |
| 350 | 340 | 270 | 250 | 430 | 50 | 07 | 17 | 200509 | 200526 | 200543 | 200560 | 200577 | 200594 |
| 400 | 390 | 300 | 280 | 485 | 50 | 07 | 17 | 200510 | 200527 | 200544 | 200561 | 200578 | 200595 |
| 500 | 490 | 360 | 345 | 590 | 50 | 07 | 17 | 200511 | 200528 | 200545 | 200562 | 200579 | 200596 |

All dimensions in mm

Other sizes on request

# Dimensions

## HIGH-TEMPERATURE BUTTERFLY VALVE, LIGHT-WEIGHT DESIGN BKL



# Butterfly valve, heavy-duty design BKS

## Overview

The low torque, centrally mounted stem is a distinguishing feature of this valve. The short face-to-face dimension facilitates space-saving installation. Customized adaptations are possible on request. This wafer-type butterfly valve is designed to shut off and regulate gaseous and liquid media as well as all kinds of bulk material.

It is suitable for use in process plant engineering, the pharmaceutical, food processing and chemical industries as well as ventilation engineering solutions in temperatures up to 1100 °C.

# Product details

## NOMINAL DIAMETER

- DN 80 to DN 700

## NOMINAL PRESSURE

- PN 6 / 10 / 16

## BODY

- Body made of S335J263 (1.0570)
- Options:

- Aluminium, grey cast iron or stainless steel

## VALVE DISC

- Disc made of steel
- Options:

- Stainless steel or Hastelloy

## STEM

- Stem made of steel
- Options:

- Stainless steel or Hastelloy

## FLANGE HEAD

- ISO flange

## SEALING

- No seal

## MEDIA TEMPERATURE

- 400 °C / 600 °C / 700 °C / 800 °C
- Option:

- 1100 °C on request
- CAUTION: Observe temperature range of actuator!

## ACTUATION

- Electric actuators N or NL
- Pneumatic part-turn actuator
- Manual

## ORDER DETAILS

- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

## BUTTERFLY VALVE, HEAVY-DUTY DESIGN BKS

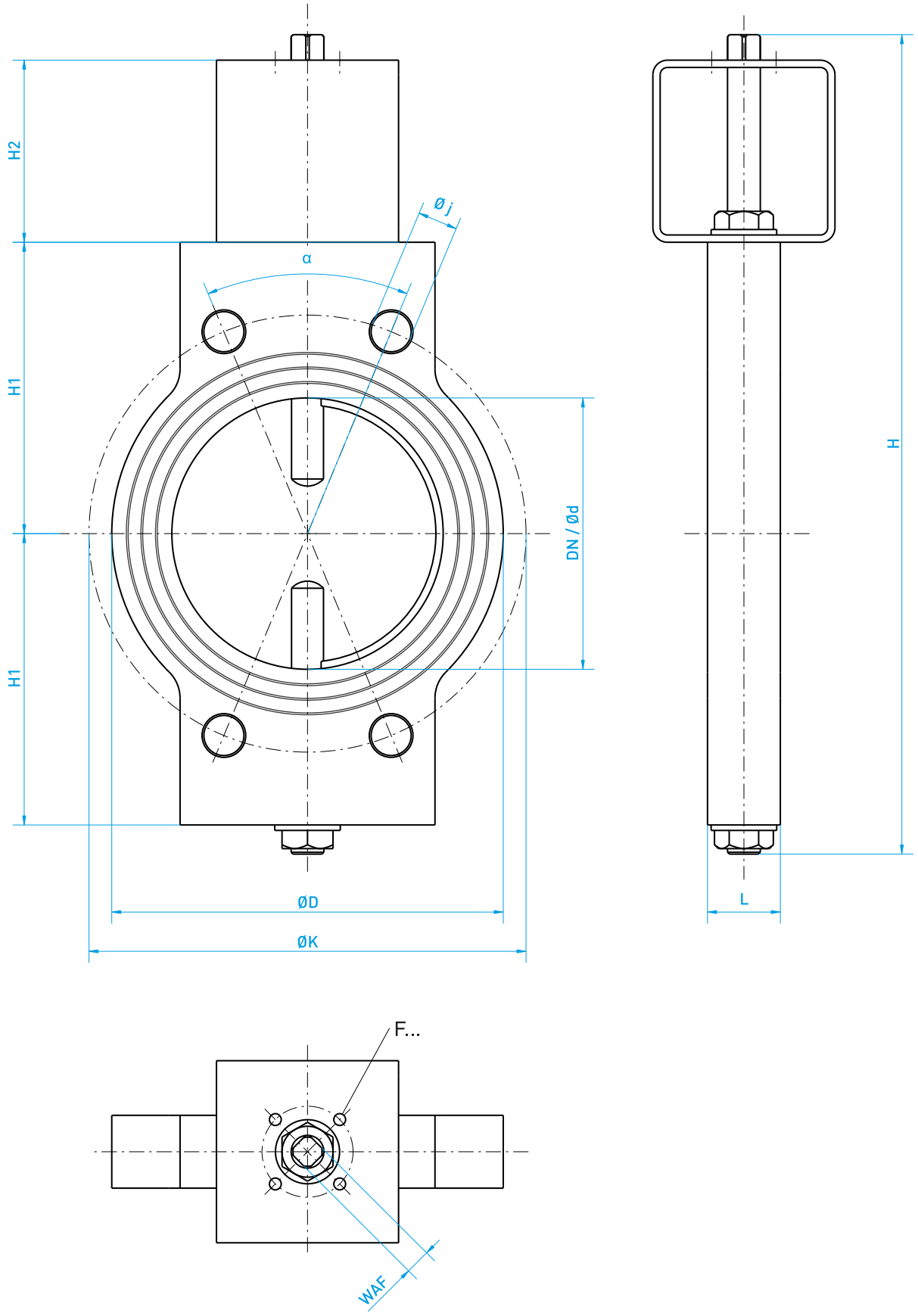
| DN | Ø d | H1 | Ø D | H2 | L | Ø K | Ø j | α | ISO-F... | WAF | H | Order No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Stainless steel | | |
| | | | | | | | | | | | | 400 °C | 600 °C | 700 °C | 600 °C | 700 °C | 800 °C |
| 80 | 79 | 120 | 140 | 100 | 30 | 160 | 18 | 360°/8=45° | 05 | 14 | 370 | 200100 | 200116 | 200131 | 200146 | 200161 | 200176 |
| 100 | 99 | 130 | 160 | 100 | 30 | 180 | 18 | 360°/8=45° | 05 | 14 | 390 | 200101 | 200117 | 200132 | 200147 | 200162 | 200177 |
| 125 | 124 | 140 | 190 | 100 | 40 | 210 | 18 | 360°/8=45° | 05 | 14 | 410 | 200102 | 200118 | 200133 | 200148 | 200163 | 200178 |
| 150 | 149 | 160 | 215 | 100 | 40 | 240 | 22 | 360°/8=45° | 05 | 14 | 450 | 200103 | 200119 | 200134 | 200149 | 200164 | 200179 |
| 200 | 199 | 190 | 270 | 100 | 50 | 295 | 22 | 360°/8=45° | 07 | 17 | 510 | 200104 | 200120 | 200135 | 200150 | 200165 | 200180 |
| 250 | 249 | 220 | 325 | 100 | 50 | 350 | 22 | 360°/12=30° | 07 | 17 | 570 | 200105 | 200121 | 200136 | 200151 | 200166 | 200181 |
| 300 | 295 | 250 | 375 | 100 | 50 | 400 | 22 | 360°/12=30° | 07 | 17 | 630 | 200106 | 200122 | 200137 | 200152 | 200167 | 200182 |
| 350 | 340 | 270 | 435 | 120 | 50 | 460 | 22 | 360°/16=22.5° | 10 | 22 | 700 | 200107 | 200123 | 200138 | 200153 | 200168 | 200183 |
| 400 | 390 | 300 | 480 | 120 | 50 | 515 | 26 | 360°/16=22.5° | 10 | 22 | 760 | 200108 | 200124 | 200139 | 200154 | 200169 | 200184 |
| 500 | 490 | 355 | 590 | 120 | 60 | 620 | 26 | 360°/20=18° | 10 | 22 | 870 | 200109 | 200125 | 200140 | 200155 | 200170 | 200185 |
| 600 | 590 | 410 | 695 | 140 | 60 | 725 | 30 | 360°/20=18° | 12 | 27 | 1000 | 200110 | 200126 | 200141 | 200156 | 200171 | 200186 |
| 700 | 690 | 470 | 810 | 140 | 60 | 840 | 30 | 360°/24=15° | 12 | 27 | 1120 | 200111 | 200127 | 200142 | 200157 | 200172 | 200187 |

All dimensions in mm

1100 °C and other sizes on request

# Dimensions

## BUTTERFLY VALVE, HEAVY-DUTY DESIGN BKS



# Mono flange shut-off valve BKMF

## Overview

The low torque, centrally mounted stem is a distinguishing feature of this shut-off valve. The short face-to-face dimension facilitates spacesaving installation in conjunction with a low-weight. The soft sealing mono flange shut-off valve is designed to shut off and regulate gaseous and liquid media as well as all kinds of bulk material. It is suitable for deployment in process plant engineering, vehicle construction, the pharmaceutical, food processing and chemical industries as well as ventilation engineering and water industry applications.

# Product details

### NOMINAL DIAMETER
- DN 50 to DN 500

### NOMINAL PRESSURE
- PN 10 / 16

### BODY
- Housing made of aluminium
- Options:

- S355J2G3 (1.0570), grey iron or stainless steel

### VALVE DISC
- Disc made of steel
- Options:

- Stainless steel, aluminium, Hastelloy

### STEM
- Stem made of steel
- Options:

- Stainless steel, aluminium, Hastelloy

### FLANGE HEAD
- ISO 5211 / NAMUR

### SEALING
- Hermetic to DIN EN 12266-1
- Replaceable sealing elements
- NBR
- Options:

- EPDM, Vulkollan, Hypalon, Viton, silicone, BUNA, ELL and PTFE

### MEDIA TEMPERATURE
- 0 °C to +100 °C
- Options:

- Other temperature ranges on request
- CAUTION: Observe temperature range of actuator!

### ACTUATION
- Electric actuators N or NL
- Pneumatic part-turn actuator
- Manual

### ORDER DETAILS
- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

## MONO FLANGE SHUT-OFF VALVE BKMF

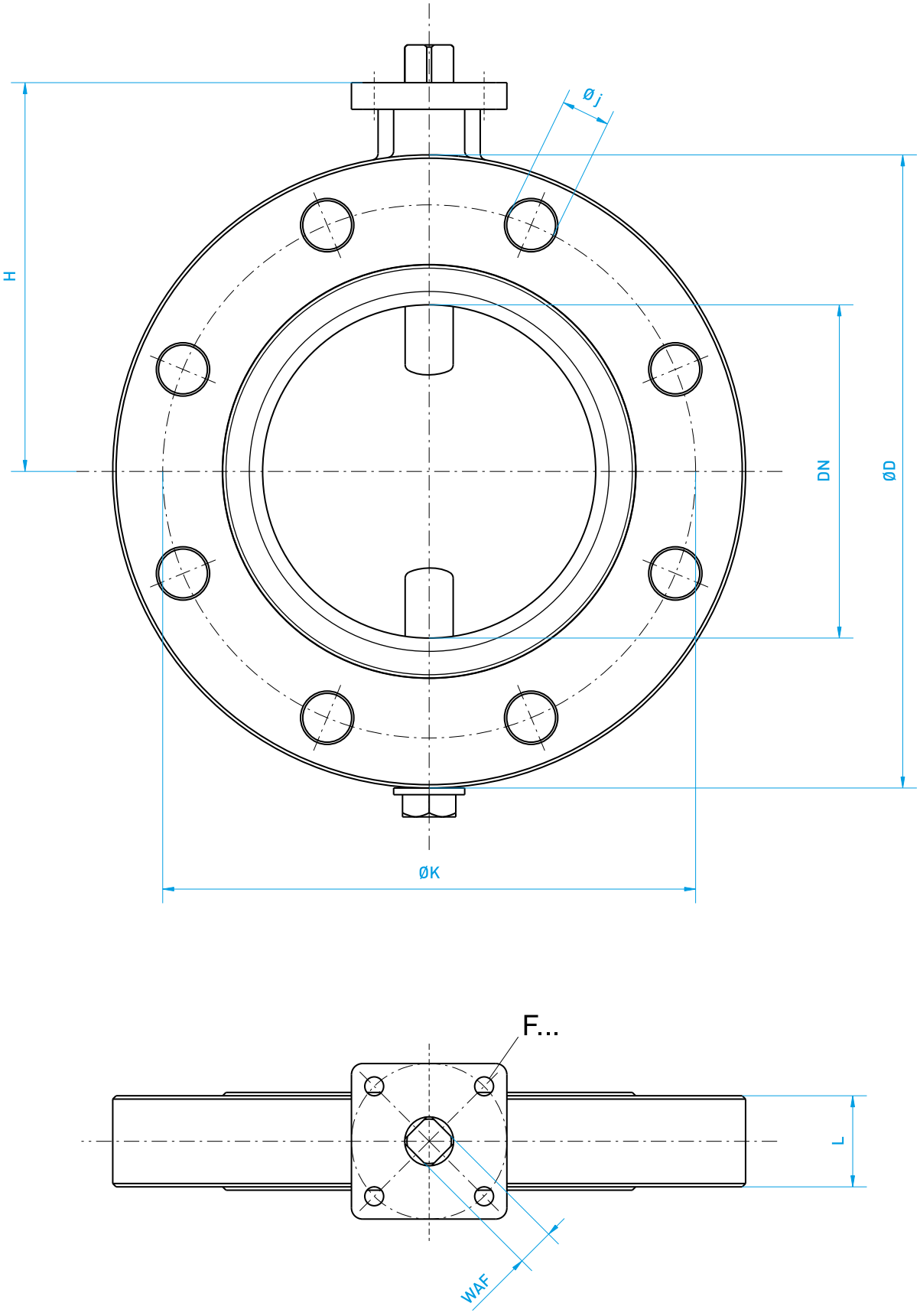
| DN | H | Ø D | L | Ø K | Number x Ø j | ISO-F... | WAF | Order No. |
|---|---|---|---|---|---|---|---|---|
| 50 | 135 | 165 | 35 | 125 | 4 x Ø 18 | 05 | 14 | 200440 |
| 65 | 130 | 185 | 35 | 145 | 4 x Ø 18 | 05 | 14 | 200441 |
| 80 | 135 | 200 | 35 | 160 | 4 x Ø 18 | 05 | 14 | 200442 |
| 100 | 140 | 220 | 35 | 180 | 8 x Ø 18 | 05 | 14 | 200443 |
| 125 | 165 | 250 | 41 | 210 | 8 x Ø 18 | 07 | 17 | 200444 |
| 150 | 175 | 285 | 41 | 240 | 8 x Ø 22 | 07 | 17 | 200445 |
| 200 | 220 | 340 | 51 | 295 | 8 x Ø 22 | 07 | 17 | 200446 |
| 250 | 255 | 395 | 66 | 350 | 12 x Ø 22 | 10 | 22 | 200447 |
| 300 | 285 | 445 | 66 | 400 | 12 x Ø 22 | 10 | 22 | 200448 |
| 350 | 325 | 505 | 66 | 460 | 16 x Ø 22 | 12 | 27 | 200449 |
| 400 | 340 | 570 | 66 | 515 | 16 x Ø 26 | 12 | 27 | 200450 |
| 500 | 380 | 670 | 75 | 620 | 20 x Ø 26 | 14 | 36 | 200451 |

All dimensions in mm

Other sizes on request

# Dimensions

## MONO FLANGE SHUT-OFF VALVE BKMF



# Wafer-type shut-off valve BKRI

## Overview

The low torque, centrally mounted stem is a distinguishing feature of this valve. The short face-to-face dimension facilitates space-saving installation in conjunction with a low-weight. The soft sealing, wafer-type shut-off valve is designed to shut off and regulate gaseous and liquid media as well as all kinds of bulk material. It is suitable for deployment in process plant engineering, vehicle construction, the pharmaceutical, food processing and chemical industries as well as ventilation engineering and water industry applications.

# Product details

### NOMINAL DIAMETER
- DN 50 to DN 500

### NOMINAL PRESSURE
- PN 10 / 16

### BODY
- Body made of aluminium
- Options:

- Steel 1.0570, grey iron or stainless steel

### VALVE DISC
- Disc made of steel
- Options:

- Stainless steel, aluminium, Hastelloy

### STEM
- Stem made of steel
- Options:

- Stainless steel, aluminium, Hastelloy

### FLANGE HEAD
- ISO 5211 / NAMUR

### SEALING
- Hermetic to DIN EN 12266-1
- Replaceable sealing elements
- NBR
- Options:

- EPDM, Vulkollan, Hypalon, Viton, silicone, BUNA, ELL and PTFE

### MEDIA TEMPERATURE
- 0 °C to +100 °C
- Options:

- Other temperature ranges on request
- CAUTION: Observe temperature range of actuator!

### ACTUATION
- Electric actuators N or NL
- Pneumatic part-turn actuator
- Manual

### ORDER DETAILS
- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options

- Desired options

# Technical data

## WAFER-TYPE SHUT-OFF VALVE BKRI

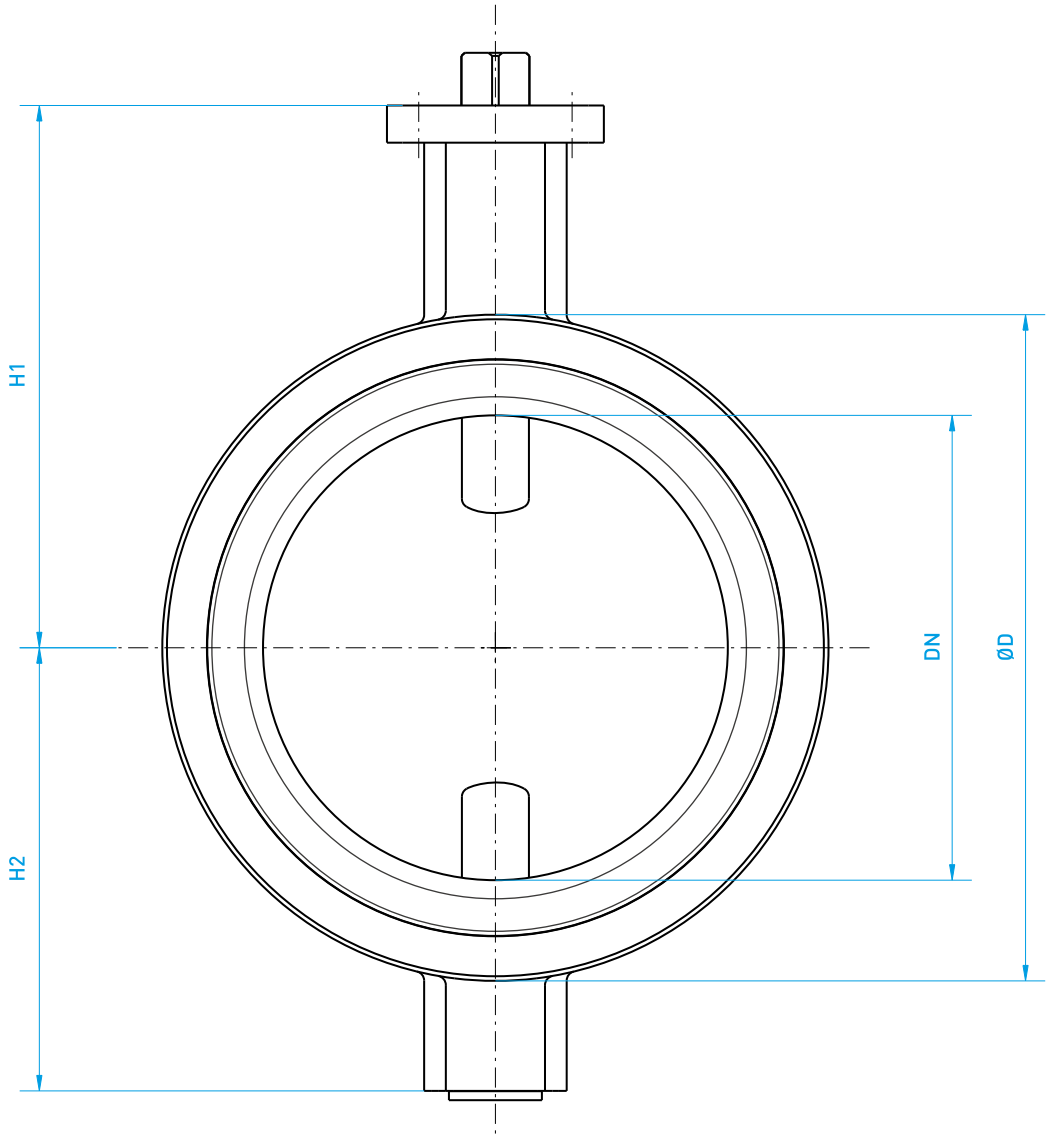
| DN | H1 | H2 | Ø D | L | ISO-F... | WAF | Order No. |
|---|---|---|---|---|---|---|---|
| 50 | 120 | 88 | 105 | 35 | 05 | 14 | 200460 |
| 65 | 130 | 98 | 125 | 35 | 05 | 14 | 200461 |
| 80 | 135 | 105 | 140 | 35 | 05 | 14 | 200462 |
| 100 | 140 | 115 | 160 | 35 | 05 | 14 | 200463 |
| 125 | 155 | 130 | 190 | 41 | 07 | 17 | 200464 |
| 150 | 175 | 143 | 215 | 41 | 07 | 17 | 200465 |
| 200 | 200 | 170 | 270 | 51 | 07 | 17 | 200466 |
| 250 | 255 | 198 | 325 | 66 | 10 | 22 | 200467 |
| 300 | 285 | 223 | 370 | 66 | 10 | 22 | 200468 |
| 350 | 325 | 253 | 430 | 66 | 10 | 27 | 200469 |
| 400 | 350 | 275 | 485 | 66 | 12 | 27 | 200470 |
| 500 | 390 | 330 | 590 | 75 | 14 | 36 | 200471 |

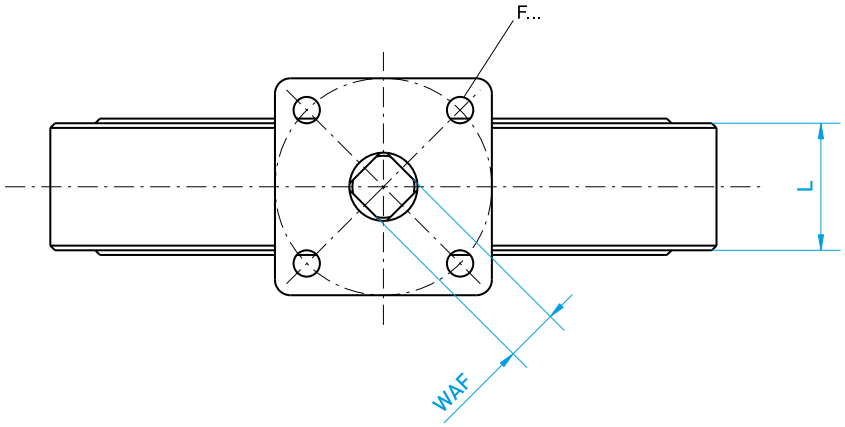
All dimensions in mm

Other sizes on request

# Dimensions

## WAFER-TYPE SHUT-OFF VALVE BKRI



# Shut-off valve SYLAX

## Overview

SYLAX shut-off valves for heating and cooling applications are functionally reliable by design, built with robust components and easy to maintain. Thanks to the robust splined gear engagement between the stem and the valve plate they offer a good transmission of force.

They are designed to be installed in either an upright or horizontal position. SYLAX shut-off valves are designed to DIN EN 593 for media temperatures ranging from -10 °C to +120 °C.

# Product details

## NOMINAL DIAMETER
- DN 25 to DN 300

## NOMINAL PRESSURE
- PN 6 / 10 / 16

## BODY
- Body made of grey cast iron EN-GJL-250 (EN-JL 1040) with epoxy coating
- Self-lubricating bearing bushes
- No contact made with media

## VALVE DISC
- Disc made of stainless steel
- Spherical form

## STEM
- Stem made of stainless steel
- Blowout proof, continuous stem with secondary sealing
- No contact made with media

## FLANGE HEAD
- ISO 5211

## MEDIA TEMPERATURE
- -10 °C to +120 °C
- CAUTION: Observe temperature range of actuator!

## ACTUATION
- Electric actuators N or NL
- Pneumatic part-turn actuator
- Manual

## ORDER DETAILS
- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

## SHUT-OFF VALVE SYLAX

| DN | H1 | H2 | L | Ø D1 | Ø D2 | W | ISO-F... | WAF | Weight / kg |
|---|---|---|---|---|---|---|---|---|---|
| 25 | 50 | 125 | 32 | 100 | 65 | 19 | 05 | 11 | 2.3 |
| 32 / 40 | 57 | 130 | 32 | 114 | 65 | 19 | 05 | 11 | 2.4 |
| 50 | 62 | 136 | 43 | 121 | 65 | 19 | 05 | 11 | 3.2 |
| 65 | 70 | 145 | 46 | 136 | 65 | 19 | 05 | 11 | 3.6 |
| 80 | 89 | 151 | 46 | 127 | 65 | 19 | 05 | 11 | 4.2 |
| 100 | 106 | 175 | 52 | 153 | 90 | 19 | 07 | 14 | 5.6 |
| 125 | 120 | 190 | 56 | 182 | 90 | 19 | 07 | 14 | 7.5 |
| 150 | 131 | 203 | 56 | 209 | 90 | 19 | 07 | 14 | 8.5 |
| 200 | 164 | 246 | 60 | 265 | 125 | 25 | 10 | 17 | 16.5 |
| 250 | 200 | 271 | 68 | 317 | 125 | 32 | 10 | 22 | 23.0 |
| 300 | 235 | 296 | 78 | 370 | 150 | 32 | 12 | 22 | 32.0 |
| 350 | 270 | 305 | 78 | 424 | 150 | 35 | 12 | 27 | 39.0 |

All dimensions in mm

Other sizes on request

## Kv TABLE SYLAX AS WAFER-TYPE DESIGN WITH ALIGNMENT LUGS

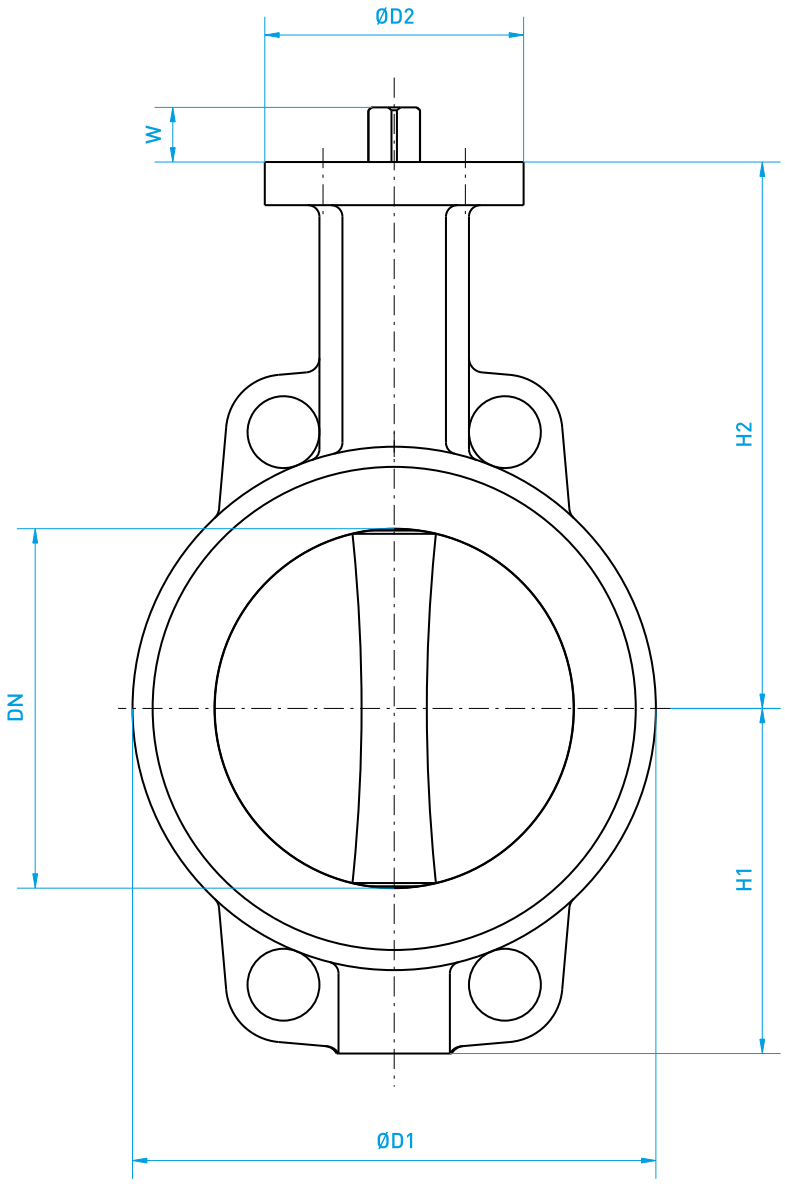
| DN | Kv / m³/h | PN | Order No. |
|---|---|---|---|
| 25 | 40 | 6 / 10 / 16 | 210100 |
| 32/40 | 62 | 6 / 10 / 16 | 210101 |
| 50 | 79 | 6 / 10 / 16 | 210102 |
| 65 | 174 | 6 / 10 / 16 | 210103 |
| 80 | 275 | 6 / 10 / 16 | 210104 |
| 100 | 496 | 6 / 10 / 16 | 210105 |
| 125 | 883 | 6 / 10 / 16 | 210106 |
| 150 | 1212 | 6 / 10 / 16 | 210107 |

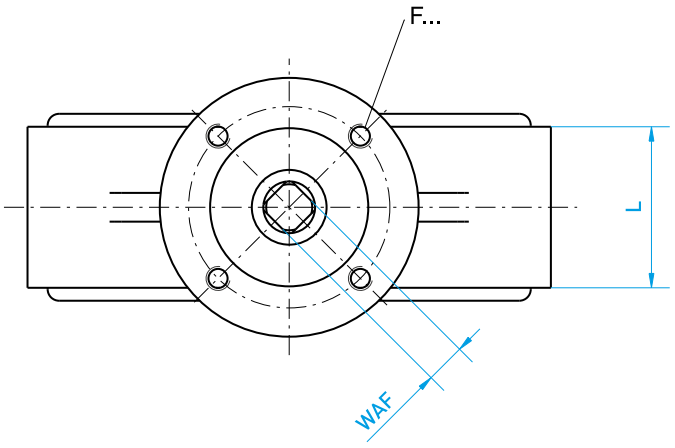
## Kv TABLE SYLAX AS END FLANGE DESIGN WITH THREADED HOLES

| DN | Kv / m³/h | PN | Order No. |
|---|---|---|---|
| 50 | 79 | 10 / 16 | 210120 |
| 65 | 174 | 10 / 16 | 210121 |
| 80 | 275 | 10 / 16 | 210122 |
| 100 | 496 | 10 / 16 | 210123 |
| 125 | 883 | 10 / 16 | 210124 |
| 150 | 1212 | 10 / 16 | 210125 |

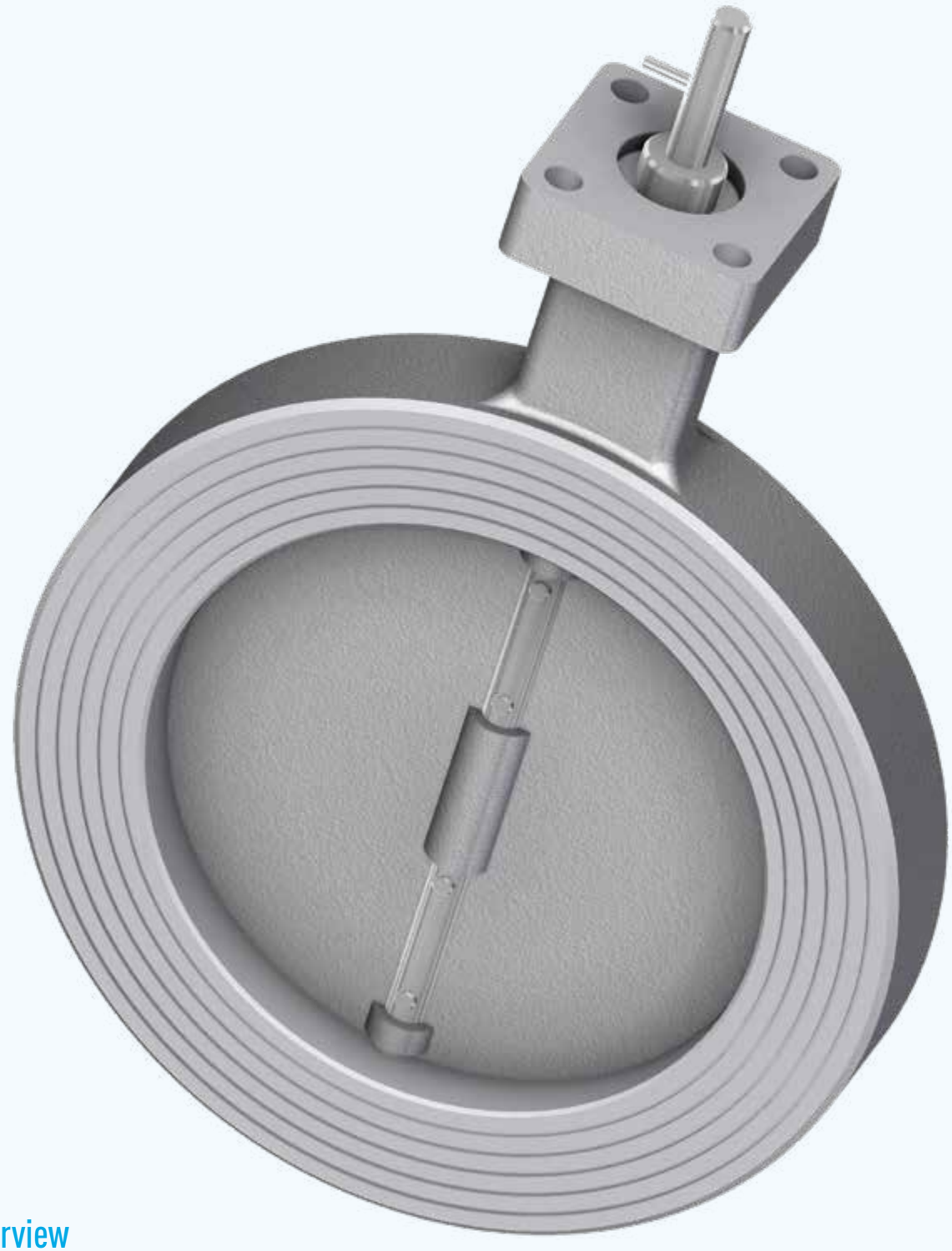
# Dimensions

## SHUT-OFF VALVE SYLAX



# Gas regulating valve MRK



## Overview

The DVGW approved gas regulating valve MRK is designed to be clamped between PN 6 to PN 16 rated flanges (DVGW = German Technical and Scientific Association for Gas and Water). Consequently, our MRK gas regulating valve is eminently suitable for deployment in process plant engineering, the chemical industry, heating engineering as well as oven construction.

# Product details

### NOMINAL DIAMETER
- DN 15 to DN 400

### NOMINAL PRESSURE
- PN 4

### BODY
- Body made of grey cast iron EN-GJL-250 (EN-JL 1040), painted

### VALVE DISC
- Disc made of steel, painted

### STEM
- Stem made of stainless steel

### FLANGE HEAD
- See drawing and table

### SEALING
- Adapted to suit thermal stability requirements

### MEDIA
- Gases belonging to the 1st, 2nd and 3rd gas families in accordance with G260
- Neural gases and air
- Options:

- hot air, flue gas, exhaust gases and aggressive gases

### MEDIA TEMPERATURE
- -20 °C to +60 °C
- Option:

- Up to 200 °C (not DVGW approved – DVGW = German Technical and Scientific Association for Gas and Water)
- Up to 550 °C (not DVGW approved)
- Up to 700 °C (not DVGW approved)

- CAUTION: Observe temperature range of actuator!

### APPROVAL
- Type tested to 90/396/EEC
  Prod. ID. No. CE-0085-AR0408
  DIN 3394-1 Class $R_o$
  DIN 3391
- Media temperature -20 °C to +60 °C
- Operating pressure: 0 to 4 bar
- Gases belonging to the 1st, 2nd, 3rd gas families in accordance with G260 and air

### ACTUATION
- Electric actuators N, NL or NK
- Pneumatic part-turn actuator
- Manual

### ORDER DETAILS
- Valve type
- Nominal diameter DN
- Options:

- Desired options

# Technical data

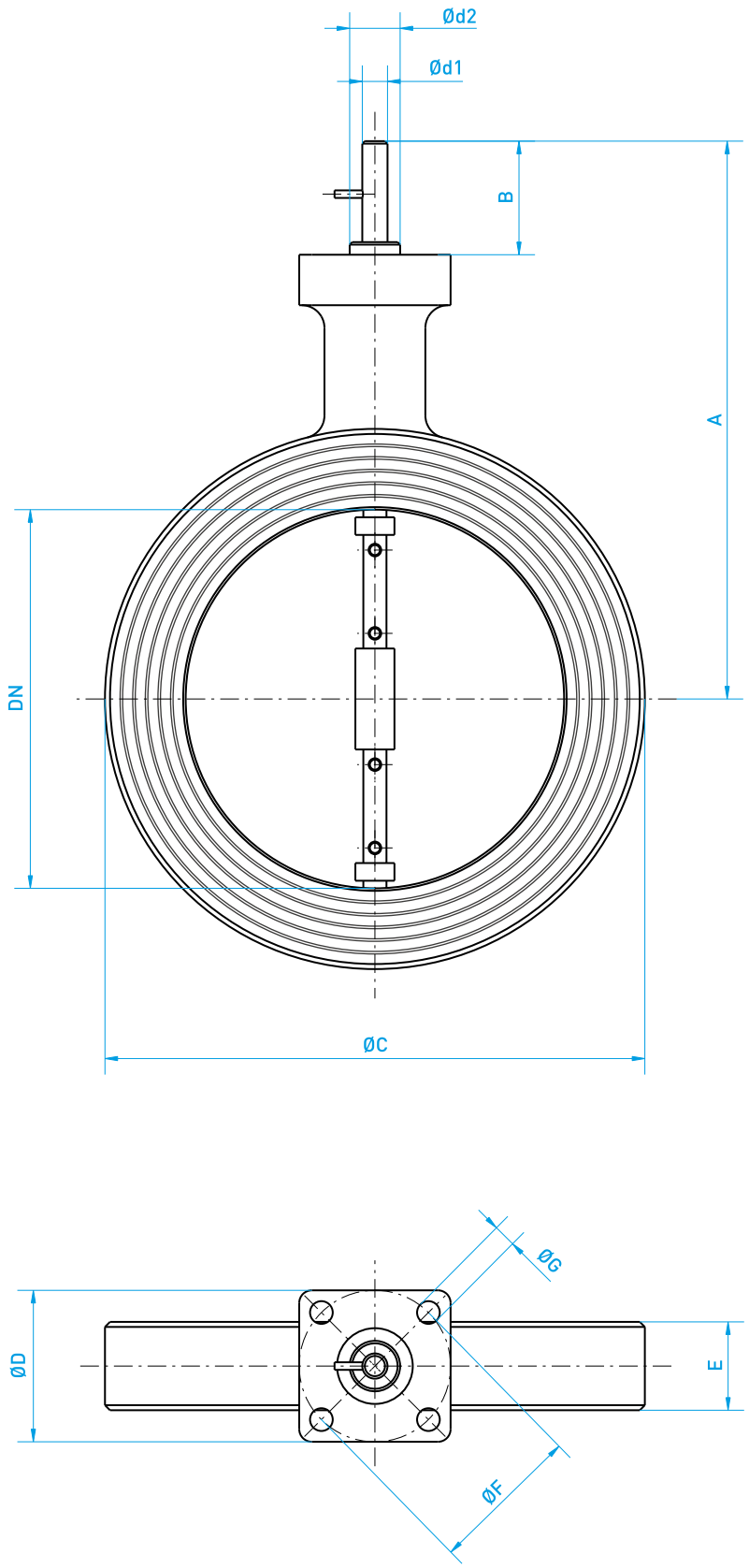
## GAS REGULATING VALVE MRK

| DN | A | B | Ø C | D | Ø d1 | Ø d2 | E | Ø F | Ø G | Weight / kg | Order No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 157 | 45 | 45 | 60 | 10 | 20 | 25 | 60 | 9 | 1.0 | 210140 |
| 20 | 161 | 45 | 58 | 60 | 10 | 20 | 25 | 60 | 9 | 1.1 | 210141 |
| 25 | 163 | 45 | 70 | 60 | 10 | 20 | 25 | 60 | 9 | 1.5 | 210142 |
| 32 | 163 | 45 | 70 | 60 | 10 | 20 | 25 | 60 | 9 | 1.5 | 210143 |
| 40 | 166 | 45 | 90 | 60 | 10 | 20 | 25 | 60 | 9 | 1.8 | 210144 |
| 50 | 171 | 45 | 104 | 60 | 10 | 20 | 25 | 60 | 9 | 2.0 | 210145 |
| 65 | 178 | 45 | 124 | 60 | 10 | 20 | 25 | 60 | 9 | 2.4 | 210146 |
| 80 | 186 | 45 | 139 | 60 | 10 | 20 | 30 | 60 | 9 | 3.1 | 210147 |
| 100 | 196 | 45 | 161 | 60 | 10 | 20 | 30 | 60 | 9 | 3.7 | 210148 |
| 125 | 208 | 45 | 191 | 60 | 10 | 20 | 35 | 60 | 9 | 5.2 | 210149 |
| 150 | 221 | 45 | 214 | 60 | 10 | 20 | 35 | 60 | 9 | 5.6 | 210150 |
| 200 | 259 | 48 | 270 | 80 | 20 | 25 | 40 | 80 | 11 | 12.0 | 210151 |
| 250 | 284 | 48 | 320 | 80 | 20 | 25 | 40 | 80 | 11 | 13.0 | 210152 |
| 300 | 309 | 48 | 370 | 80 | 20 | 25 | 45 | 80 | 11 | 15.5 | 210153 |
| 350 | 359 | 48 | 428 | 80 | 20 | 25 | 45 | 80 | 11 | 27.0 | 210154 |
| 400 | 379 | 48 | 465 | 80 | 20 | 34 | 50 | 80 | 11 | 38.0 | 210155 |

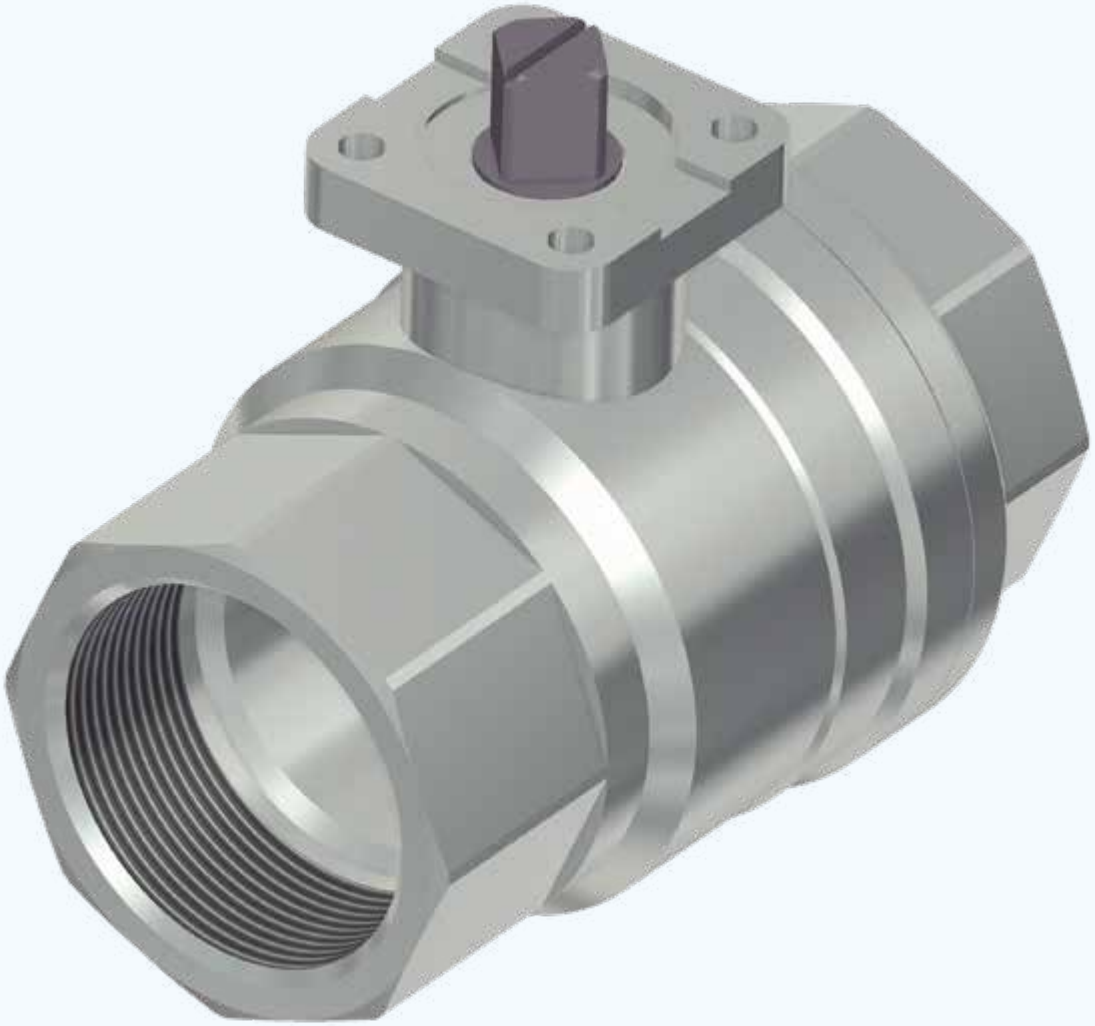
All dimensions in mm

# Dimensions

## GAS REGULATING VALVE MRK



# Ball valves k.64 made of brass



## Overview

These ball valves are used to ensure tight shut-off of compressed-air, water, paints, solvents, oils, heating oils, fuels and gases (gases to DIN-DVGW / MOP5 on request). They consist of a nickel-plated brass body enclosing a chrome-plated brass ball and blowout proof actuating stem. They are silicone free by design. Thanks to the mounting flange to DIN ISO 5211 and DIN 3337 the ball valves are suitable for direct actuation solutions.

# Product details

### NOMINAL DIAMETER
- DN 6 to DN 50

### NOMINAL PRESSURE
- PN 30 to 65 (depending on nominal diameter)

### BODY
- Body made of brass, nickel plated

### BALL
- Ball made of brass, chrome plated

### BALL SEAL
- Ball made of PTFE, chrome plated

### STEM SEAL
- Stem seal made of Viton

### MEDIA TEMPERATURE
- -20 °C to max. +170 °C
  (depending on operating pressure)
- CAUTION: Observe temperature
  range of actuator!

### REMARK
- Face-to-face M3 to DIN 3202-4
- 1/4" and 3/8" types are 1/2" ball valves with
  reducing nipple

### ACTUATION
- Electric actuators N, NL or NK
- Pneumatic actuator
- Manual

### ORDER DETAILS
- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

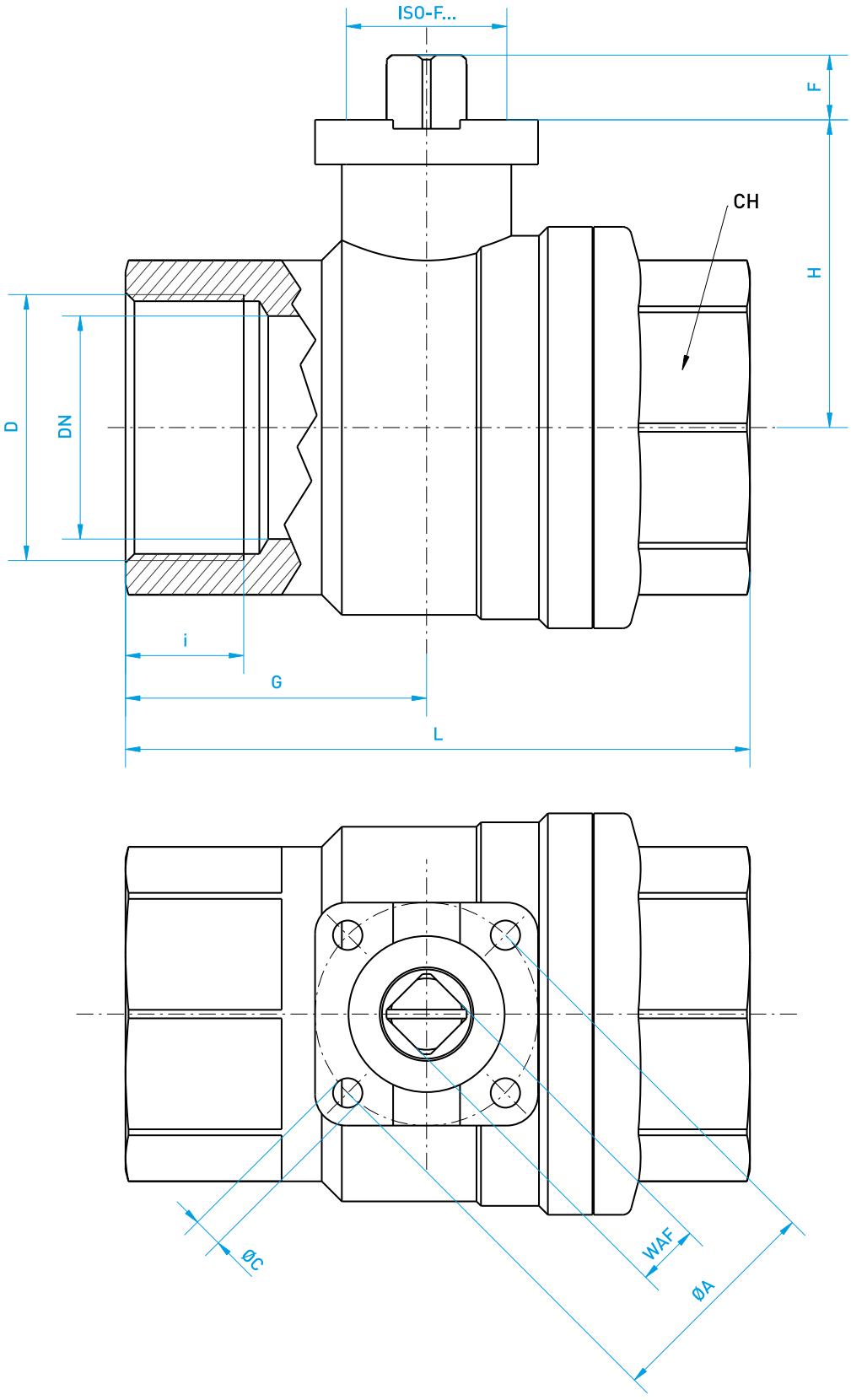
## BALL VALVES MADE OF BRASS k.64

| DN | PN / bar | D | i | L | G | CH | H | F | Ø A | WAF | Ø C | ISO-F... | Order No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 65 | Rp 1/4" | 15.5 | 75 | 30.5 | 27 | 31.0 | 7.5 | 36 | 9 | 5.6 | 03 | 200700 |
| 10 | 65 | Rp 3/8" | 15.5 | 75 | 30.5 | 27 | 31.0 | 7.5 | 36 | 9 | 5.6 | 03 | 200701 |
| 15 | 65 | Rp 1/2" | 15.5 | 75 | 30.5 | 27 | 31.0 | 7.5 | 36 | 9 | 5.6 | 03 | 200702 |
| 20 | 40 | Rp 3/4" | 18.0 | 80 | 37.0 | 32 | 38.5 | 8.5 | 36 | 9 | 5.6 | 03 | 200703 |
| 25 | 40 | Rp 1" | 21.0 | 90 | 45.5 | 41 | 42.5 | 8.5 | 36 | 9 | 5.6 | 03 | 200704 |
| 32 | 30 | Rp 1 1/4" | 23.0 | 110 | 52.0 | 50 | 55.5 | 14.5 | 50 | 11 | 6.6 | 05 | 200705 |
| 40 | 30 | Rp 1 1/2" | 24.5 | 120 | 59.0 | 55 | 62.0 | 14.5 | 50 | 11 | 6.6 | 05 | 200706 |
| 50 | 30 | Rp 2" | 26.5 | 140 | 67.5 | 70 | 69.0 | 14.5 | 50 | 14 | 6.6 | 05 | 200707 |

All dimensions in mm

# Dimensions

## BALL VALVES MADE OF BRASS k.64



# Ball valves made of stainless steel 87E PN16-DVGW/ PN40/ PN100

(DVGW= German Technical and Scientific Association for Gas and Water)

## Overview

87E PN16-DVGW ball valves are designed to ensure tight shut-off of combustion gases in accordance with the relevant technical guidelines G260/1 and G262. 87E PN40 and 87E PN100 ball valves are deployed to ensure tight shut-off of compressed air, water, gases, oils, fuels, solvents and aggressive media. They consist of a two-piece body with floating ball and blowout proof, maintenance-free actuating stem. The actuating stem is designed for high switching cycles. Thanks to the mounting flange to DIN ISO 5211 the ball valves are suitable for direct actuation solutions.

# Product details

### NOMINAL DIAMETER
- DN 15 to DN 50

### NOMINAL PRESSURE
- Depends on packing system:
- PN 16 / 40 / 100

### BODY
- Body made of stainless steel GX5CrNiMo19-10-2 (1.4408)

### BALL
- Ball made of stainless steel GX5CrNiMo19-10-2 (1.4408)

### BALL SEAL
- 87E PN16-DVGW: PTFE
- 87E PN40: PTFE + GF
- 87E PN100: TFM

### STEM SEAL
- Stem seal made of PTFE / Viton

### MEDIA TEMPERATURE
- Depends on operating pressure:
- 87E PN16-DVGW: -20 °C to +60 °C
- 87E PN40: -20 °C to +180 °C
- 87E PN100: -20 °C to +215 °C
- CAUTION: Observe temperature range of actuator!

### APPROVALS
- 87E PN16-DVGW
- GAD CE-0085 BN 0204 Gas-Approval to DIN EN 13774 and DVGW VP 303 DG 4313AP1152 (DVGW = German Technical and Scientific Association for Gas and Water)

### ACTUATION
- Electric actuators N, NL or NK
- Pneumatic actuator
- Manual

### ORDER DETAILS:
- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

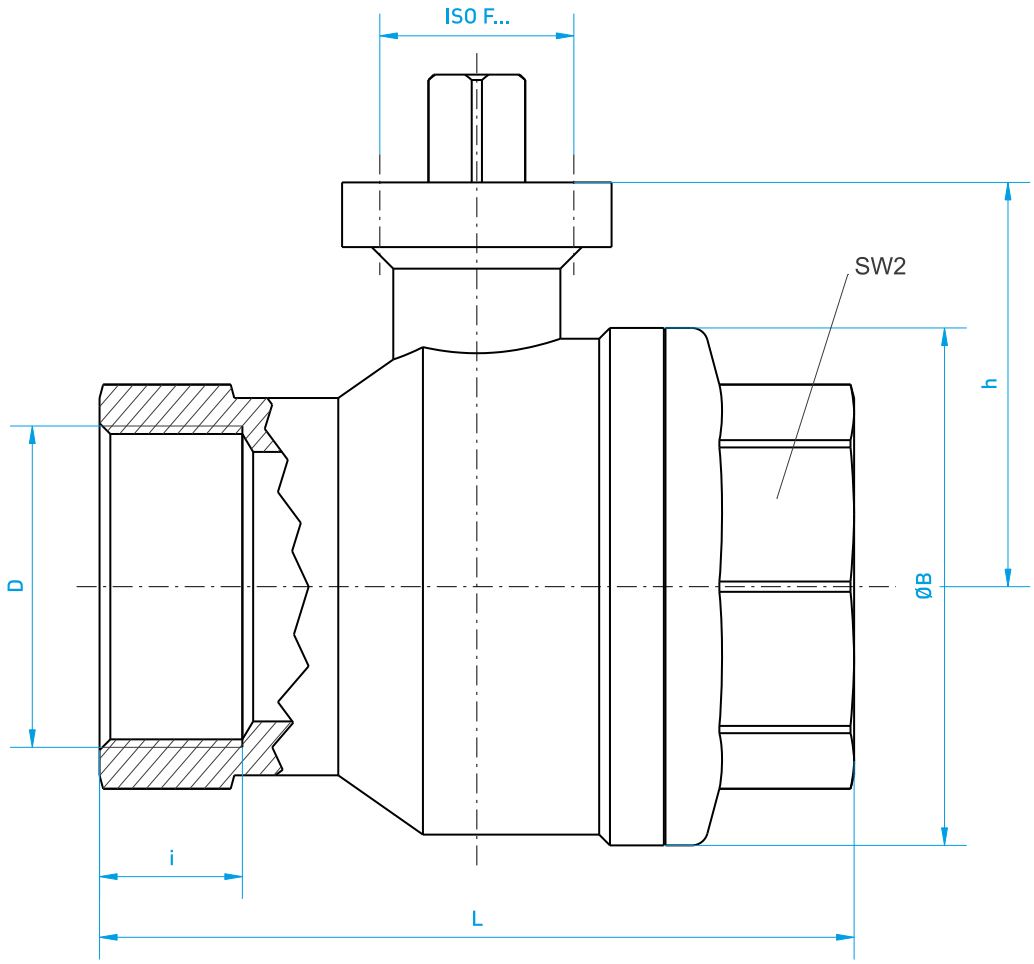
## BALL VALVES MADE OF STAINLESS STEEL 87E PN16-DVGW/ PN40/ PN100
**(DVGW = GERMAN TECHNICAL AND SCIENTIFIC ASSOCIATION FOR GAS AND WATER)**

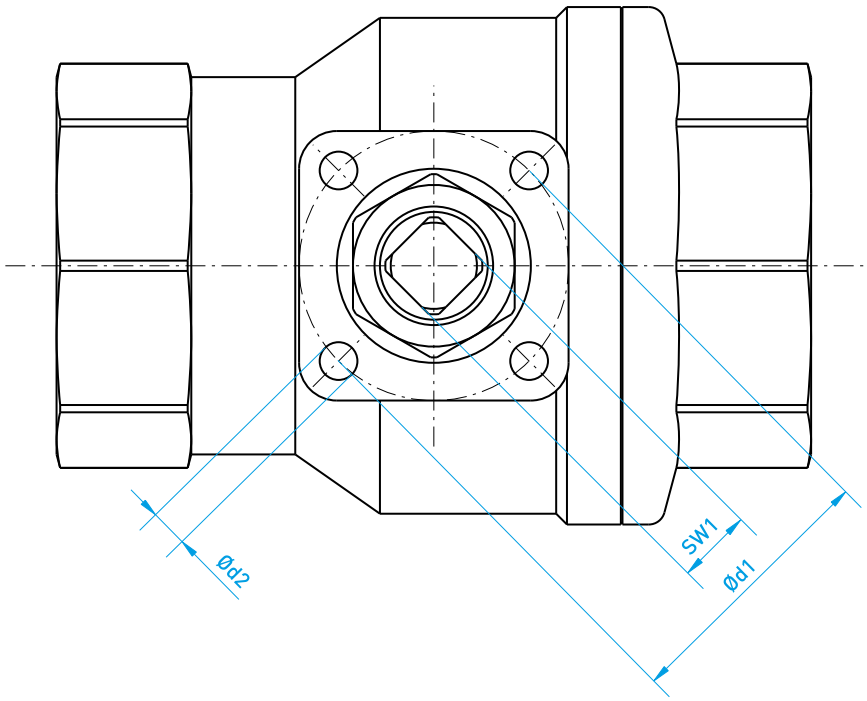
| DN | PN / bar | D | i | L ± 2 | B | h | WAF2 | Ø d1 | WAF1 | Ø d2 | ISO-F... | Weight / kg | Order No. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | PN 16 | PN 40 | PN 100 |
| 15 | 16 / 40 / 100 | Rp 1/2" | 14.5 | 75 | 36 | 33.5 | 27 | 36 | 9 | 6 | 03 | 0.500 | 200710 | 200716 | 200722 |
| 20 | 16 / 40 / 100 | Rp 3/4" | 16.5 | 80 | 45 | 37.0 | 32 | 36 | 9 | 6 | 03 | 0.625 | 200711 | 200717 | 200723 |
| 25 | 16 / 40 / 100 | Rp 1" | 18.5 | 90 | 55 | 50.5 | 41 | 50 | 11 | 7 | 05 | 1.180 | 200712 | 200718 | 200724 |
| 32 | 16 / 40 / 100 | Rp 1 1/4" | 23.5 | 110 | 68 | 56.5 | 50 | 50 | 11 | 7 | 05 | 1.680 | 200713 | 200719 | 200725 |
| 40 | 16 / 40 / 100 | Rp 1 1/2" | 24.5 | 120 | 80 | 67.0 | 55 | 50 | 14 | 7 | 05 | 2.355 | 200714 | 200720 | 200726 |
| 50 | 16 / 40 / 100 | Rp 2" | 26.5 | 140 | 96 | 75.0 | 70 | 50 | 14 | 7 | 05 | 3.730 | 200715 | 200721 | 200727 |

All dimensions in mm

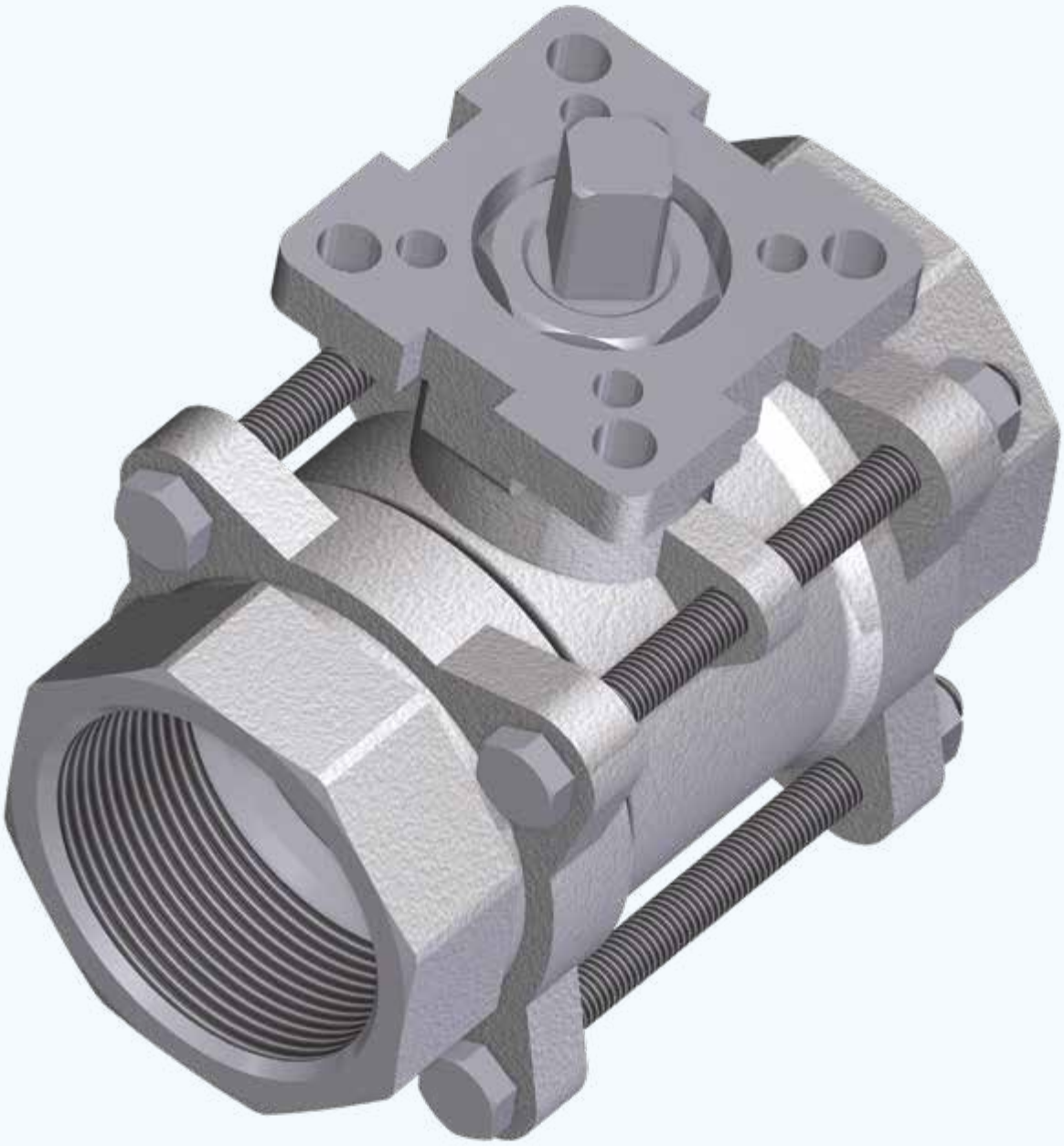
# Dimensions

## BALL VALVES MADE OF STAINLESS STEEL 87E PN16-DVGW/ PN40/ PN100
**(DVGW = GERMAN TECHNICAL AND SCIENTIFIC ASSOCIATION FOR GAS AND WATER)**



# Ball valves made of stainless steel 851E / 853E



## Overview

These ball valves are designed to ensure tight shut-off of compressed air, water, steam, oils, fuels, solvents, aggressive media, foodstuff and beverages. They consist of a three-part, full bore body, maintenance-free stem bushing and blowout proof actuating stem. Silicone free and antistatic by design, they are approved in accordance with the German air pollution control code. Thanks to the mounting flange to DIN ISO 5211 the ball valves are suitable for direct actuation solutions.

# Product details

## NOMINAL DIAMETER

- DN 8 to DN 100

## NOMINAL PRESSURE

- PN 63

## BODY

- Body made of stainless steel
  GX5CrNiMo19-11-2 (1.4408)

## BALL

- Ball made of stainless steel
  GX5CrNiMo19-11-2 (1.4408)

## BALL SEAL

- Ball seal made of TFM 1600

## STEM SEAL

- Stem seal made of PTFEE

## MEDIA TEMPERATURE

- Depends on operating pressure:
  -20 °C to +180 °C
- CAUTION: Observe temperature
  range of actuator!

## APPROVALS

- Pressure Equipment Directive 97/23/EC
  Category III, Module H
- Meets TA Luft 2002
  (German air pollution control code)

## ACTUATION

- Electric actuators N, NL or NK
- Pneumatic actuator
- Manual

## ORDER DETAILS

- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

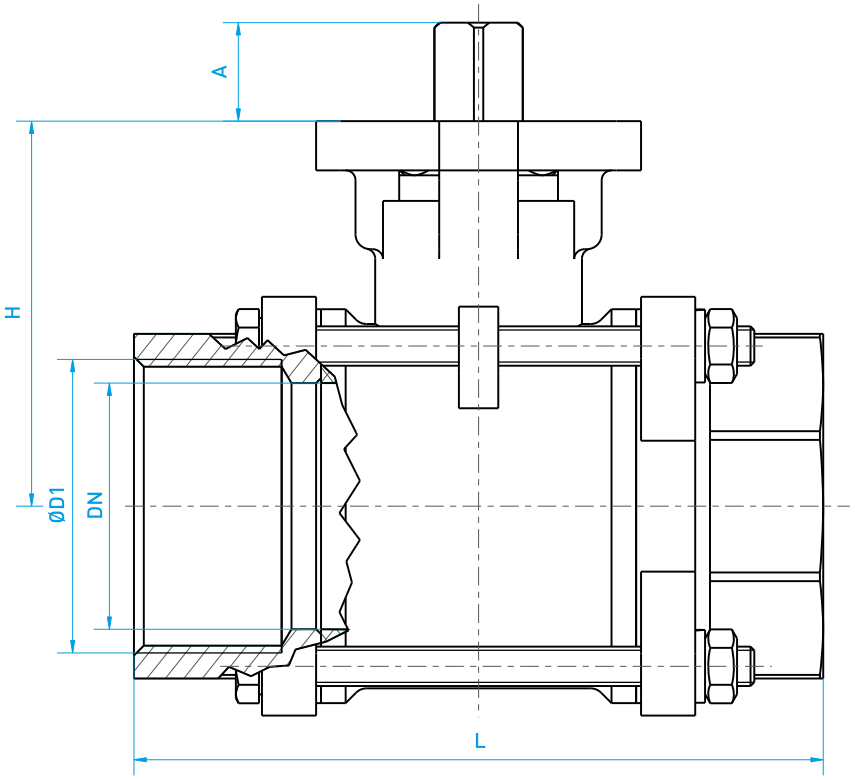
## BALL VALVES MADE OF STAINLESS STEEL 851E / 853E

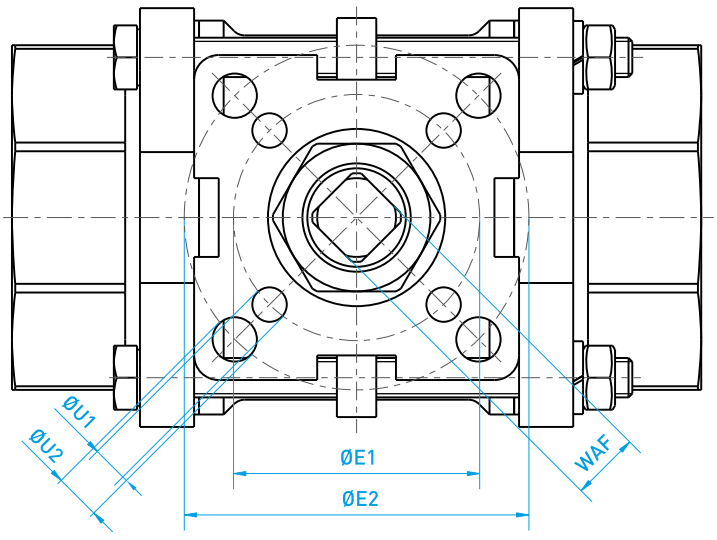
| DN | Ø d | Ø D1 | L | LB | Ø B2 | Ø B3 | H | A | WAF | Ø E1 | Ø E2 | Ø U1 | Ø U2 | Weight / kg | | Order No. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | 851 | 853 | 851 | 853 |
| 6 | 10.6 | Rp 1/4" | 75 | 72 | 10.6 | 18 | 42.0 | 9 | 9 | 36 | 42 | 6 | 6 | 0.64 | 0.64 | 200730 | 200750 |
| 10 | 12.7 | Rp 3/8" | 75 | 72 | 12.7 | 18 | 42.0 | 9 | 9 | 36 | 42 | 6 | 6 | 0.60 | 0.60 | 200731 | 200751 |
| 15 | 15.0 | Rp 1/2" | 75 | 75 | 15.8 | 22 | 42.0 | 9 | 9 | 36 | 42 | 6 | 6 | 0.65 | 0.66 | 200732 | 200752 |
| 20 | 20.0 | Rp 3/4" | 80 | 90 | 20.9 | 28 | 48.5 | 9 | 9 | 36 | 50 | 6 | 7 | 0.89 | 0.94 | 200733 | 200753 |
| 25 | 25.0 | Rp 1" | 90 | 100 | 26.7 | 34 | 58.5 | 11 | 11 | 42 | 50 | 6 | 7 | 1.32 | 1.33 | 200734 | 200754 |
| 32 | 32.0 | Rp 1 1/4" | 110 | 110 | 35.1 | 43 | 63.0 | 11 | 11 | 42 | 70 | 6 | 9 | 2.13 | 2.02 | 200735 | 200755 |
| 40 | 38.0 | Rp 1 1/2" | 120 | 125 | 40.9 | 50 | 71.3 | 14 | 14 | 50 | 70 | 7 | 9 | 2.87 | 2.97 | 200736 | 200756 |
| 50 | 50.0 | Rp 2" | 140 | 150 | 52.5 | 61 | 78.2 | 14 | 14 | 50 | 70 | 7 | 9 | 4.33 | 4.20 | 200737 | 200757 |
| 65 | 63.5 | Rp 2 1/2" | 185 | 190 | 62.7 | 76 | 100.0 | 17 | 17 | 70 | 102 | 9 | 11 | 8.22 | 8.22 | 200738 | 200758 |
| 80 | 76.0 | Rp 3" | 205 | 220 | 78.0 | 92 | 108.5 | 17 | 17 | 70 | 102 | 9 | 11 | 11.85 | 11.90 | 200739 | 200759 |
| 100 | 100.0 | Rp 4" | 240 | 270 | 102.4 | 115 | 140.0 | 22 | 22 | - | 102 | - | 11 | 22.06 | 22.72 | 200740 | 200760 |

All dimensions in mm

# Dimensions

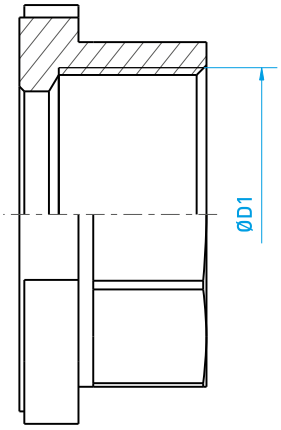
## BALL VALVES MADE OF STAINLESS STEEL 851E / 853E



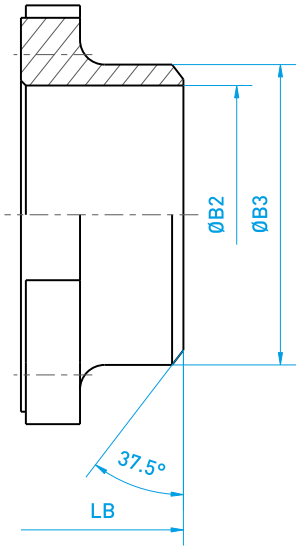




### Connections

851E:
Female thread




853E:
Weld end



# Flanged ball valves made of stainless steel 71 ME

## Overview

These flanged ball valves are deployed to ensure tight shut-off of gases, oils, solvents, lyes, acids and aggressive media. They consist of a two-part, full bore body and blowout proof actuating stem. Antistatic and silicone free by design, they are approved in accordance with the German air pollution control code. The ball valves are optionally available with DVGW (German Technical and Scientific Association for Gas and Water), VD-TUV (German Technical inspectorate) and fire-safe approvals.

# Product details

## NOMINAL DIAMETER

- DN 15 to DN 200

## NOMINAL PRESSURE

- PN 16: DN 15 - DN 200
- PN 40: DN 15 - DN 100

## BODY

- Stainless steel GX5CrNiMo19-11-2 (1.4408)

## BALL

- Stainless steel GX5CrNiMo19-11-2 (1.4408)

## BALL SEAL

- Three-sided cavity filler seats
- A variety of packing systems are available, see table Packing systems

## DIMENSIONS

- Flanged ball valves to DIN 3357
- Face-to-face length to DIN EN 558-1
- Sealing surfaces to EN 1092-1 (other versions on request)
- Face-to-face length to DIN EN 1092-1

## MEDIA TEMPERATURE

- Gas: -20 °C to +60 °C
- In general: -20 °C to +180 °C (depending on nominal pressure and packing system)
- CAUTION: Observe temperature range of actuator!

## ACTUATION

- Electric actuators N, NL or NK
- Pneumatic actuator
- Manual

## ORDER DETAILS

- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Packing system
- Face-to-face length L (series)
- Required approvals
- Options:

- Desired options

## 71 ME ORDER CODE FOR APPROVALS

| Approval type | Code |
|---|---|
| TA Luft ISO 15848-1/VDI 2440 Standard | 0 |
| DVGW DG-4313BU0129 DIN EN 13774 PN16 for gases to G260/1 (DVGW = German Technical and Scientific Association for Gas and Water) | 1 |
| PN16 for biogases to G262 | 2 |
| DVGW DG-4313AU0131 DIN EN 14141 PN 40 for gases to G260/1 | 3 |
| PN 40 for biogases to G262 | 4 |
| VdTUV Valve 100 AD 2000 TUV (TUV = German technical inspectorate). A 353-09 Vd TUV | 5 |
| Fire Safe ISO 10497 TUV IS-DDB-MAN/001/08 | 6 |
| GGVSEB/ADR/RID TÜ.AGG.429.09 DIN EN 14432 | 7 |

# Technical data

## FLANGED BALL VALVES MADE OF STAINLESS STEEL 71 ME

| | L (series) | | | | | PN 16 | | | | | PN 40 | | | | | Weight / kg | | Order No. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | R 27 | | R 1 | |
| DN | R 27 | R 1 | ISO-F... | WAF | h | Ø D | Ø g | Ø K | b | nxØ d | Ø D | Ø g | Ø K | b | nxØ d | R 27 | R 1 | PN 16 | PN 40 | PN 16 | PN 40 |
| 15 | 115 | 130 | 03 | 9 | 9 | 95 | 45 | 65 | 15 | 4x14 | 95 | 45 | 65 | 15 | 4x14 | 2.35 | 2.55 | 200770 | 200782 | 200800 | 200809 |
| 20 | 120 | 150 | 03 | 9 | 9.5 | 105 | 58 | 75 | 17.5 | 4x14 | 105 | 58 | 75 | 17.5 | 4x14 | 2.95 | 3.35 | 200771 | 200783 | 200801 | 200810 |
| 25 | 125 | 160 | 05 | 11 | 12.5 | 115 | 68 | 85 | 17 | 4x14 | 115 | 68 | 85 | 17 | 4x14 | 4.1 | 4.5 | 200772 | 200784 | 200802 | 200811 |
| 32 | 130 | 180 | 05 | 11 | 12.5 | 140 | 78 | 100 | 17.5 | 4x18 | 140 | 78 | 100 | 17.5 | 4x18 | 5.6 | 6.2 | 200773 | 200785 | 200803 | 200812 |
| 40 | 140 | 200 | 05 | 14 | 14 | 150 | 88 | 110 | 17 | 4x18 | 150 | 88 | 110 | 17 | 4x18 | 6.65 | 7.35 | 200774 | 200786 | 200804 | 200813 |
| 50 | 150 | 230 | 05 | 14 | 14 | 165 | 102 | 125 | 19 | 4x18 | 165 | 102 | 125 | 19 | 4x18 | 9.1 | 9.8 | 200775 | 200787 | 200805 | 200814 |
| 65 (PN 16) | 170 | 290 | 07 | 17 | 18 | 185 | 122 | 145 | 17.5 | 4x18 | | | | | | 13.3 | 15.85 | 200776 | | 200806 | |
| 65 (PN 40) | 170 | 290 | 07 | | | | | | | | 185 | 122 | 145 | 21 | 8x18 | 14.3 | 17.3 | | 200788 | | 200815 |
| 80 | 180 | 310 | 10 | 22 | 22.2 | 200 | 138 | 160 | 23 | 8x18 | 200 | 138 | 160 | 23 | 8x18 | 19.2 | 22 | 200777 | 200789 | 200807 | 200816 |
| 100 (PN 16) | 190 | 350 | 10 | 22 | 22.3 | 220 | 158 | 180 | 19 | 8x18 | | | | | | 25.2 | 29.9 | 200778 | | 200808 | |
| 100 (PN 40) | 190 | 350 | 10 | | | | | | | | 235 | 162 | 190 | 23 | 8x22 | 29.6 | 34.4 | | 200790 | | 200817 |
| 125 | 325 | | 10 / 12 | 27 | 27 | 250 | 188 | 210 | 21 | 8x18 | | | | | | 46.2 | | 200779 | | | |
| 150 | 350 | | 10 / 12 | 27 | 27 | 285 | 212 | 240 | 21 | 8x22.5 | | | | | | 71 | | 200780 | | | |
| 200 | 400 | | 10 / 14 | 27 | 28 | 340 | 268 | 295 | 23 | 12x22.5 | | | | | | 125 | | 200781 | | | |

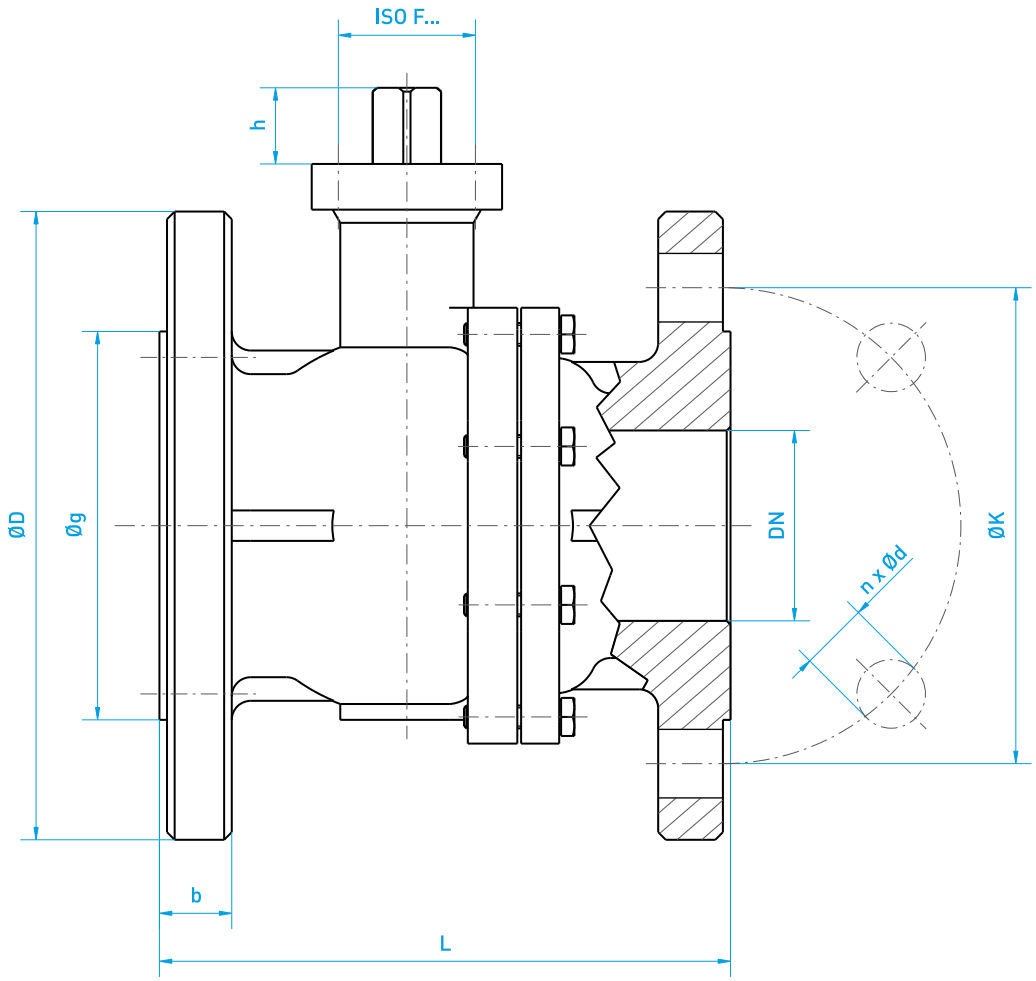
All dimensions in mm

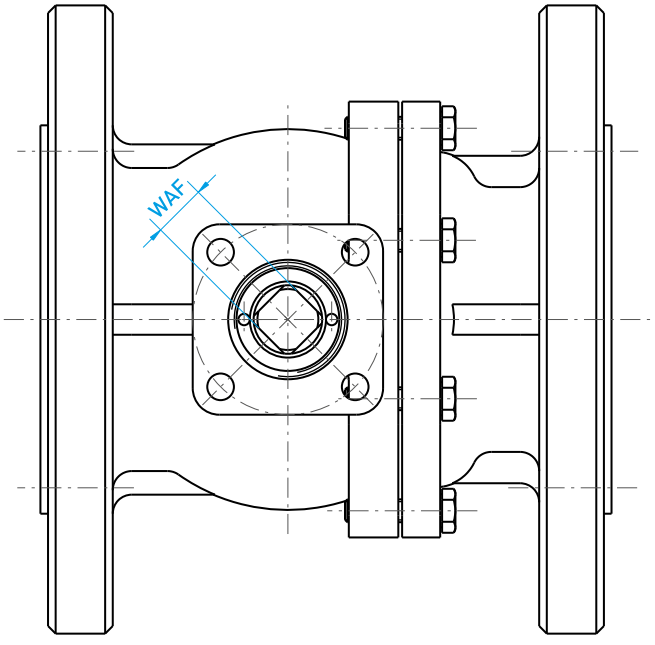
## 71 ME PACKING SYSTEMS

| Packing system | Ball seal | Stem seal | Body seal | Approvals | Order code for approvals |
|---|---|---|---|---|---|
| A | PTFE | PTFE+FKM | PTFE+FKM | Technical instructions Air / VdTUV PED / Gas PN16 | 0 / 1 / 5 |
| B | PTFE/TFM | PTFE+FKM | PTFE+FKM | Technical instructions Air / VdTUV PED / Gas PN40 | 0 / 3 / 5 |
| D | Antimony Carbon | Graphite | Graphite | - | 0 |
| E | PTFE+GF | PTFE+FKM | PTFE+FKM | Technical instructions Air / VdTUV PED | 0 / 5 / 7 |
| G | PTFE/TFM | PTFE+EPDM | PTFE+FKM | Technical instructions Air / VdTUV PED | 0 / 5 |
| H | Peek | Graphite | Graphite | PED | - |
| L | PTFE compound | PTFE compound | PTFE flat seal | PED | - |
| S | PTFE+GF | Fire Safe (FKM+PTFE +Graphite) | Graphite+FKM | Technical instructions Air / Fire Safe ISO 10497 | 6 |
| T | PTFE Cavity filler | PTFE+FKM | PTFE+FKM | Technical instructions Air / PED | 0 |

# Dimensions

## FLANGED BALL VALVES MADE OF STAINLESS STEEL 71 ME



# Three-way flanged ball valve 640E

## Overview

The three-way flanged ball valve 640E is designed with a specially seated ball, is tightly sealed with negative overlap and mixed during actuation. The flanged ball valve is designed to offer a variety of port settings. The flow can be set to any direction to suit application requirements, while the full bore complies with DIN EN 1983.

The three-way flanged ball valve is suitable for applications controlling oils, compressed air, water, steam and aggressive media.

# Product details

## NOMINAL DIAMETER

- DN 15 to DN 100

## NOMINAL PRESSURE

- PN 16 / 40

## BODY

- Body made of stainless steel GXCrNiMo19-11-2 (1.4408)
- Option:

- Anti-static version

## BALL

- Ball made of stainless steel GXCrNiMo19-11-2 (1.4408)

## MOUNTING FLANGE

- DIN ISO 5211

## MEDIA TEMPERATURE

- -20° C to max. +180° C
- CAUTION: Observe temperature range of actuator!

## ACTUATION

- Electric actuators N or NL
- Pneumatic part-turn actuator
- Manual

## ORDER DETAILS

- Valve type
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Port settings (basic settings: L = 1, T = 3)
- Desired options

# Technical data

## THREE-WAY FLANGED BALL VALVE 640E

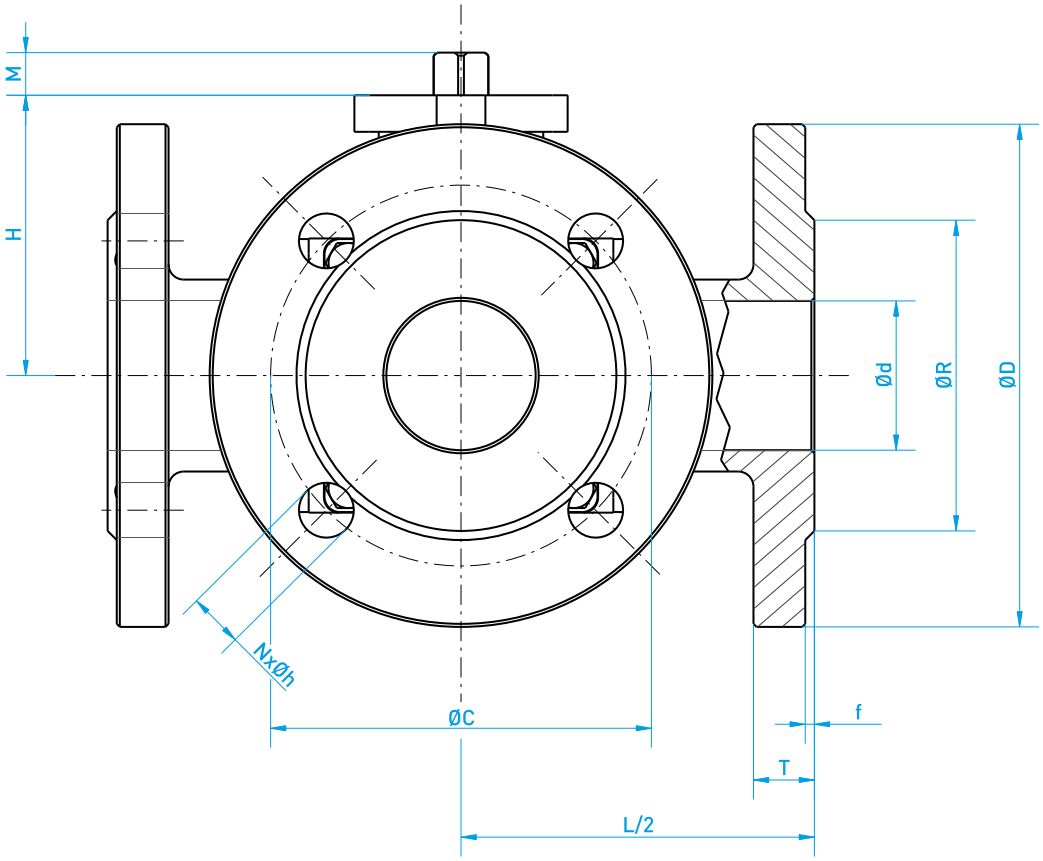
| Size | | Ø d | PN/bar | L | Ø R | Ø D | Ø C | f | T | H | H1 | N | Ø h | W | Mounting flange | Ø B1 | Ø B2 | WAF | M | K | Ø A1 | Ø A | Weight / kg | Order No. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DN | Inch | | | | | | | | | | | | | | ISO-F... | | | | | | | | | 640 ET | | 640 EL | |
| | | | | | | | | | | | | | | | | | | | | | | | | PN 16 | PN 40 | PN 16 | PN 40 |
| 15 | 1/2" | 15 | 16/40 | 150 | 45 | 95 | 65 | 2 | 16 | 53 | 83 | 4 | 14 | 145 | 03-04 | 36 | 42 | 9 | 9 | 7/16-20UNF | 6 | 6 | 4.40 | 200830 | 200839 | 200850 | 200859 |
| 20 | 3/4" | 20 | 16/40 | 165 | 58 | 105 | 75 | 2 | 18 | 57 | 87 | 4 | 14 | 145 | 03-05 | 36 | 50 | 9 | 9 | 7/16-20UNF | 6 | 7 | 5.85 | 200831 | 200840 | 200851 | 200860 |
| 25 | 1" | 25 | 16/40 | 181 | 68 | 115 | 85 | 2 | 18 | 68 | 99 | 4 | 14 | 175 | 04-05 | 42 | 50 | 11 | 11 | 9/16-18UNF | 6 | 7 | 8.57 | 200832 | 200841 | 200852 | 200861 |
| 32 | 1 1/4" | 32 | 16/40 | 190 | 78 | 140 | 100 | 2 | 18 | 72 | 103 | 4 | 18 | 175 | 04-07 | 42 | 70 | 11 | 11 | 9/16-18UNF | 6 | 9 | 18.88 | 200833 | 200842 | 200853 | 200862 |
| 40 | 1 1/2" | 38 | 16/40 | 212 | 88 | 150 | 110 | 3 | 18 | 85 | 119 | 4 | 18 | 200 | 05-07 | 50 | 70 | 14 | 14 | 3/4-18UNF | 7 | 9 | 14.26 | 200834 | 200843 | 200854 | 200863 |
| 50 | 2" | 49 | 16/40 | 232 | 102 | 165 | 125 | 3 | 20 | 92 | 126 | 4 | 18 | 200 | 05-07 | 50 | 70 | 14 | 14 | 3/4-18UNF | 7 | 9 | 19.01 | 200835 | 200844 | 200855 | 200864 |
| 65 | 2 1/2" | 63 | 16 | 290 | 122 | 185 | 145 | 3 | 18 | 107 | 175 | 4 | 18 | 400 | 07-10 | 70 | 102 | 17 | 17 | 7/8-14UNF | 9 | 11 | 31.40 | 200836 | | 200856 | |
| 80 | 3" | 75 | 16 | 310 | 138 | 200 | 160 | 3 | 20 | 119 | 187 | 8 | 18 | 400 | 03-12 | 70 | 102 | 17 | 17 | 7/8-14UNF | 9 | 11 | 42.40 | 200837 | | 200857 | |
| 100 | 4" | 99 | 16 | 353 | 158 | 220 | 180 | 3 | 20 | 150 | 217 | 8 | 18 | 400 | 03-14 | 102 | 102 | 22 | 22 | 11/8-12UNF | N/A | 11 | 63.56 | 200838 | | 200858 | |

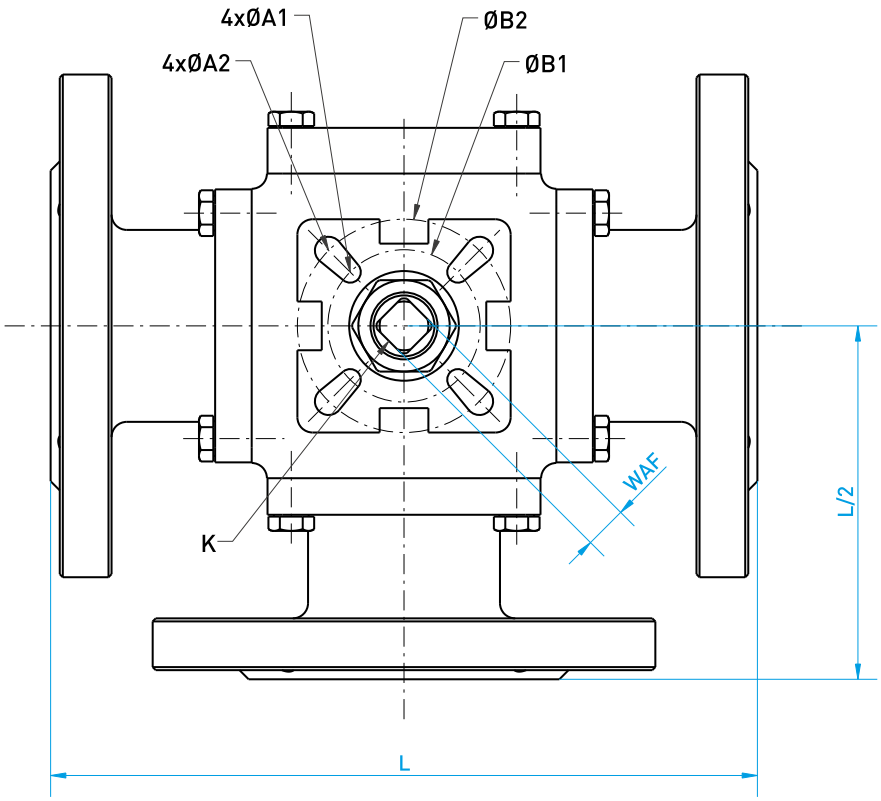
All dimensions in mm

Other sizes on request.

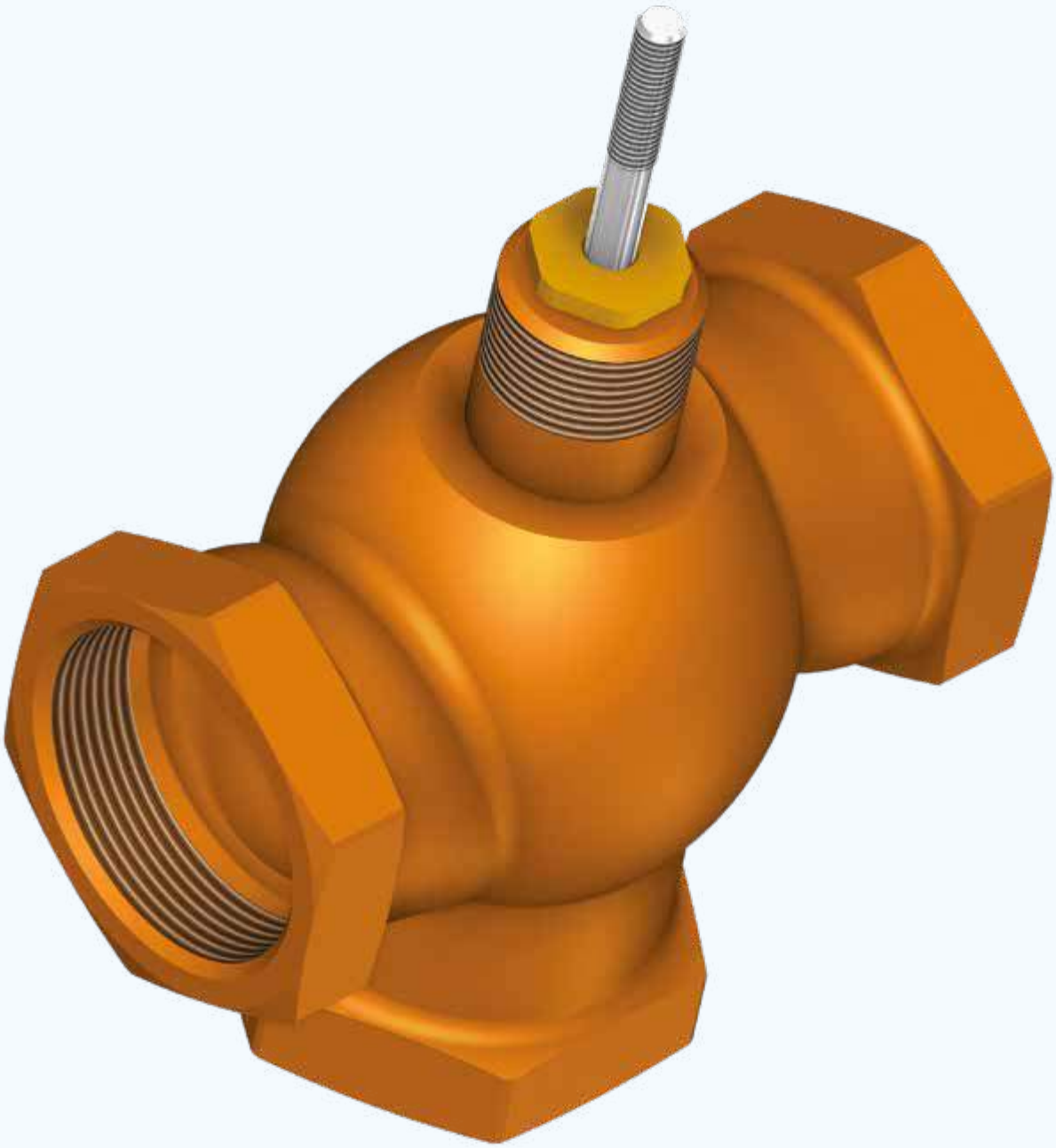
# Dimensions

## THREE-WAY FLANGED BALL VALVE 640E



# Control valves RV 102



## Overview

Control valves belonging to the RV 102 series are made of brass; they are available as two-way and three-way valves with threaded ports in the following versions:

- **RV 102-2** (2-way version): Straight-way control valve to control and shut off media
- **RV 102-3** (3-way version): Three-way control valve incorporating mixing or diverting functionality

These valves are deployed in heating, ventilation and air conditioning systems to control the flow rate as well as the pressure of liquid and gaseous media. The medium must not contain additional abrasive particles; the pH value should be between 4.5 and 9.5. The maximum media temperature is +150 °C. To guarantee reliable media control, it is recommended to install a particulate filter upstream of the valve.

# Product details

### NOMINAL DIAMETER
- DN 15 to DN 50

### NOMINAL PRESSURE
- PN 16

### BODY
- Body made of red brass CuSn5Pb5Zn5 (CSN 423135)

### CONE
- Cone made of brass CuZn40M (CSN 423234)
- Cylindrical with cut-outs

### CONNECTION
- Female thread to EN ISO 228-1

### PACKING GLAND SEAL
- O-ring EPDM (synthetic rubber)

### MEDIA TEMPERATURE
- 0 °C to +150 °C
- CAUTION: Observe temperature range of actuator!

### ACTUATION
- Electric actuators V

### OPTIONS
- RV 102-2: Angle-way type valve

### FLOW RATE CHARACTERISTICS
- Straight-through flow: equal percentage or linear
- branch: linear

### LEAKAGE RATE
- Class III to EN 1349 (< 0.1% Kv) in path A-AB

### RANGEABILITY
- 50:1

### INSTALLATION POSITION
- Upright or horizontal
- CAUTION: Do not mount the actuator vertically below the tube axis!

### ORDER DETAILS
- Valve type
- Version
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

## CONTROL VALVES RV 102

| DN | C | L1 | L2 | L3 | V1 | V2 | WAF | H | D | Weight / kg | Order No. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | RV 102-2 | RV 103-3 |
| 15 | G ½" | 85 | 9 | 12 | 43 | 25 | 27 | 10 | M8x1 | 0.55 | 200900 | 200910 |
| 20 | G ¾" | 95 | 11 | 14 | 48 | 25 | 32 | 10 | M8x1 | 0.65 | 200901 | 200911 |
| 25 | G 1" | 105 | 12 | 16 | 53 | 25 | 41 | 10 | M8x1 | 0.80 | 200902 | 200912 |
| 32 | G 1¼" | 120 | 14 | 18 | 66 | 35 | 50 | 16 | M8x1 | 1.40 | 200903 | 200913 |
| 40 | G 1½" | 130 | 16 | 20 | 70 | 35 | 58 | 16 | M8x1 | 2.00 | 200904 | 200914 |
| 50 | G 2" | 150 | 18 | 22 | 80 | 42 | 70 | 16 | M8x1 | 2.95 | 200905 | 200915 |

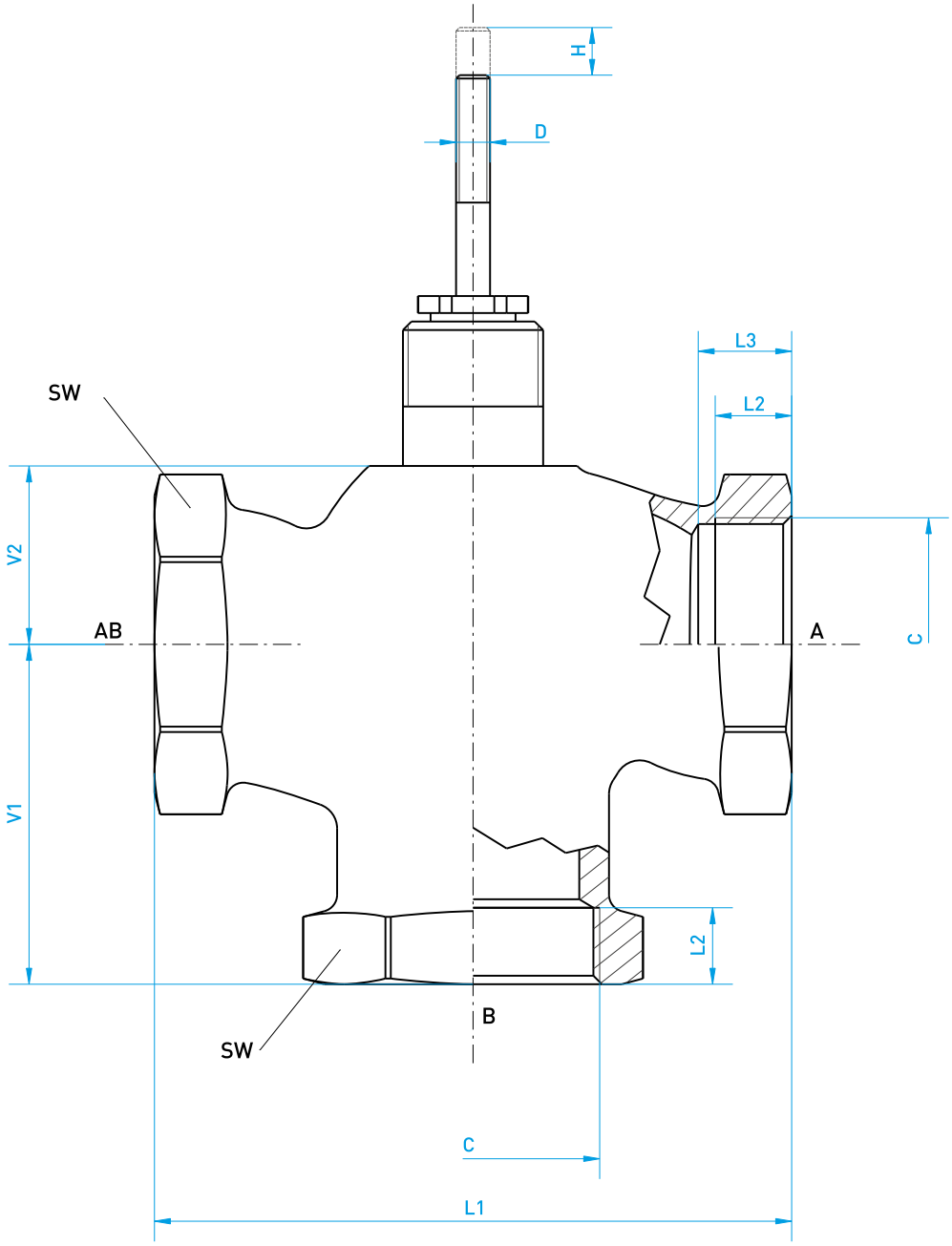
All dimensions in mm

## Kv TABLE

| DN | Kv max. / m³/h |
|---|---|
| 15 | 4 |
| 20 | 6.3 |
| 25 | 10 |
| 32 | 16 |
| 40 | 25 |
| 50 | 40 |

# Dimensions

## THREE-WAY CONTROL VALVE RV 102-3



# Control valves RV 103

## Overview

Control valves belonging to the RV 103 series are made of grey cast iron; they are available as two-way and three-way valves with flange type connections in the following versions:

- **RV 103-2** (2-way version): Straight-way control valve to control and shut off media
- **RV 103**-3 (3-way version): Three-way control valve incorporating mixing or diverting functionality

These valves are deployed in heating, ventilation and air conditioning systems to control the flow rate as well as the pressure of liquid and gaseous media. However, they are not suitable for steam or condensate. The medium must not contain additional abrasive particles; the pH value should be between 4.5 and 9.5. The maximum media temperature is +150 °C. To guarantee reliable media control, it is recommended to install a particulate filter upstream of the valve.

# Product details

## NOMINAL DIAMETER
- DN 15 to DN 50

## NOMINAL PRESSURE
- PN 16

## BODY
- Body made of grey cast iron EN-GJL-250 (EN-JL 1040)

## CONE
- Cone made of brass CuZn40M (CSN 423234)
- Cylindrical with cut-outs

## CONNECTION
- Flange type B1 (raised face) to EN 1092-1

## PACKING GLAND SEAL
- O-ring EPDM (synthetic rubber)

## MEDIA TEMPERATURE
- 0 °C to +150 °C
- CAUTION: Observe temperature range of actuator!

## ACTUATION
- Electric actuators V

## OPTIONS
- RV 103-2: Angle-way type valve

## FLOW RATE CHARACTERISTICS
- Straight-through flow: equal percentage or linear
- branch: linear

## LEAKAGE RATE
- Class III to EN 1349 (< 0.1% Kv) in path A-AB

## RANGEABILITY
- 50:1

## INSTALLATION POSITION
- Upright or horizontal
- CAUTION: Do not mount the actuator vertically below the tube axis!

## ORDER DETAILS
- Valve type
- Version
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

## CONTROL VALVES RV 103

| DN | D1 | D2 | D3 | n | d | a | f | L1 | V1 | V2 | H | D | Weight / kg | | Order No. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | RV 103-2 | RV 103-3 | RV 103-2 | RV 103-3 |
| 15 | 95 | 65 | 45 | 4 | 14 | 16 | 2 | 130 | 65 | 25 | 10 | M8x1 | 4.0 | 3.2 | 200920 | 200930 |
| 20 | 105 | 75 | 58 | 4 | 14 | 18 | 2 | 150 | 75 | 25 | 10 | M8x1 | 5.4 | 4.3 | 200921 | 200931 |
| 25 | 115 | 85 | 68 | 4 | 14 | 18 | 2 | 160 | 80 | 25 | 10 | M8x1 | 6.8 | 5.5 | 200922 | 200932 |
| 32 | 140 | 100 | 78 | 4 | 18 | 18 | 2 | 180 | 90 | 35 | 16 | M8x1 | 9.7 | 7.7 | 200923 | 200933 |
| 40 | 150 | 110 | 88 | 4 | 18 | 18 | 3 | 200 | 100 | 35 | 16 | M8x1 | 10.9 | 8.5 | 200924 | 200934 |
| 50 | 165 | 125 | 102 | 4 | 18 | 20 | 3 | 230 | 115 | 42 | 16 | M8x1 | 15.6 | 11.9 | 200925 | 200935 |

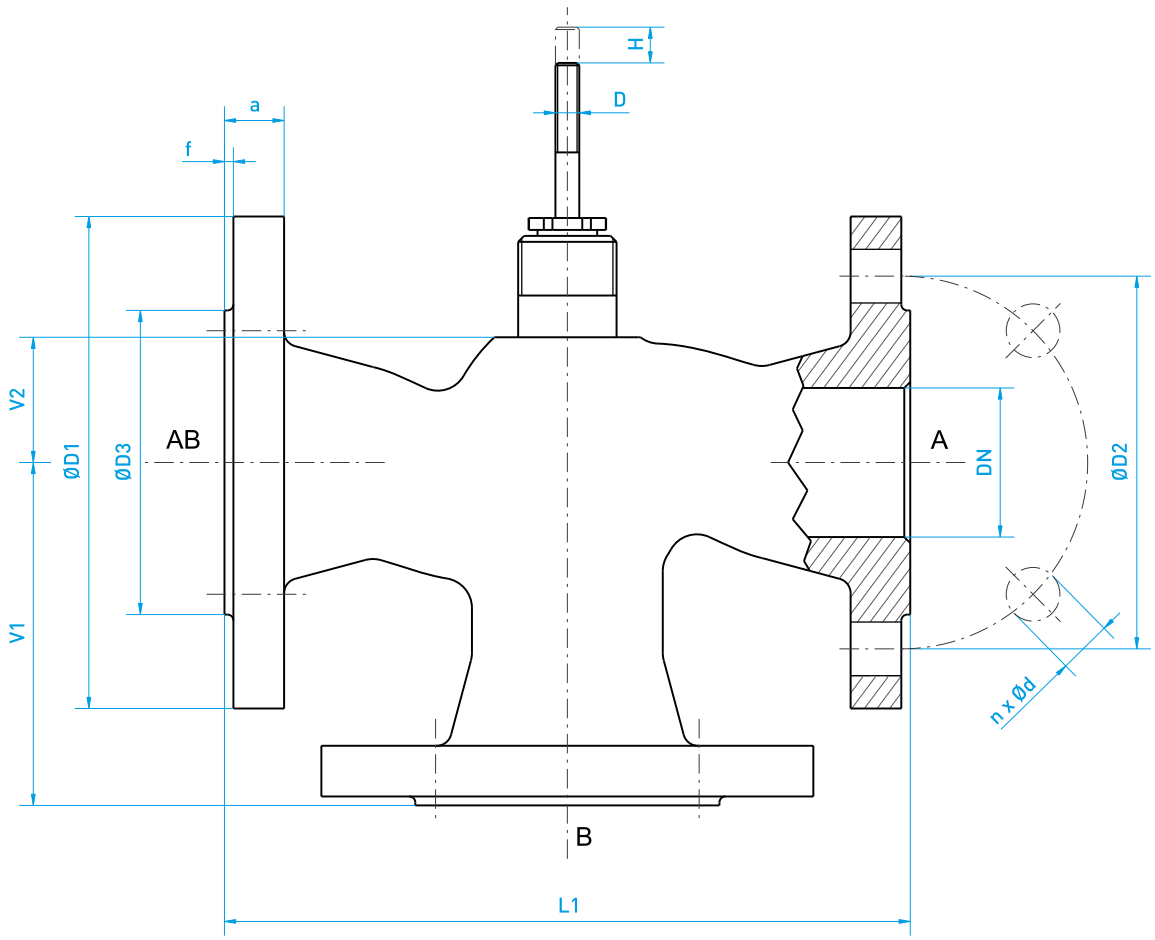
All dimensions in mm

## Kv TABLE

| DN | Kv max. / m³/h |
|---|---|
| 15 | 4 |
| 20 | 6.3 |
| 25 | 10 |
| 32 | 16 |
| 40 | 25 |
| 50 | 40 |

# Dimensions

## THREE-WAY CONTROL VALVE RV 103-3



# Control valves RV 113

## Overview

Control valves belonging to the RV 113 series are made of grey cast iron; they are available in the following versions as two-way and three-way valves with flange type connection and high levels of leak tightness:

- **RV 113R** (2-way version): Straight-way control valve to control and shut off media
- **RV 113M** (3-way version): Three-way control valve incorporating mixing or diverting functionality

These valves are deployed in heating, ventilation and air conditioning systems to control the flow rate as well as the pressure of liquid and gaseous media. However, they are not suitable for steam or condensate. The LDMspline® flow characteristic has been optimized to control thermodynamic processes. As a consequence, it is ideal for heating and air-conditioning systems. The maximum media temperature is +150 °C. The cone and seat sealing surfaces are resistant to the ingress of normal contamination. To guarantee reliable media control, it is imperative to install a filter upstream of the valve if it is possible that abrasive particles are present in the media.

# Product details

### NOMINAL DIAMETER
- DN 15 to DN 50

### NOMINAL PRESSURE
- DN 15 to DN 40: PN 6
- DN 15 to DN 150: PN 16

### BODY
- Body made of grey cast iron EN-GJL-250 (EN-JL 1040)

### CONE
- Cone made of stainless steel GX20Cr14 (1.4027), X30Cr13 (1.4028)
- Cylindrical with cut-outs and soft seal seat

### STEM
- Stem made of stainless steel X8CrNiS18-9 (1.4305)

### CONNECTION
- Flange type B1 (raised face) to EN 1092-2

### PACKING GLAND SEAL
- O-ring EPDM (synthetic rubber)

### SEAL SEAT
- EPDM (synthetic rubber)

### MEDIA TEMPERATURE
- 0 °C to +150 °C
- CAUTION: Observe temperature range of actuator!

### ACTUATION
- Electric actuators V

### FLOW RATE CHARACTERISTICS
- RV 113R: LDMspline®
- RV 113M: in direct path LDMspline®, linear in angle path

### LEAKAGE RATE
- Class IV - S1 to EN 1349 (0.0005% Kv)

### RANGEABILITY
- 50:1

### INSTALLATION POSITION
- Upright or horizontal
- CAUTION: Do not mount the actuator vertically below the tube axis!

### ORDER DETAILS
- Valve type
- Version
- Nominal diameter DN
- Nominal pressure PN
- Options:

- Desired options

# Technical data

## CONTROL VALVES RV 113, PN 6

| DN | D1 | D2 | D3 | d | n | a | f | D4 | L | V | V1 | V2 | H | Weight / kg | | Order No. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | RV 113R | RV 113M | RV 113R | RV 113M |
| 15 | 80 | 55 | 38 | 11 | 4 | 12 | 2 | 44 | 130 | 167 | 65 | 96 | 20 | 2.6 | 2.6 | 200940 | 200960 |
| 20 | 90 | 65 | 48 | 11 | 4 | 14 | 2 | 44 | 150 | 167 | 75 | 96 | 20 | 3.5 | 3.5 | 200941 | 200961 |
| 25 | 100 | 75 | 58 | 11 | 4 | 14 | 3 | 44 | 160 | 167 | 80 | 96 | 20 | 4.1 | 4.1 | 200942 | 200962 |
| 32 | 120 | 90 | 69 | 14 | 4 | 16 | 3 | 44 | 180 | 177 | 90 | 96 | 20 | 6.3 | 6.3 | 200943 | 200963 |
| 40 | 130 | 100 | 78 | 14 | 4 | 16 | 3 | 44 | 200 | 187 | 100 | 96 | 20 | 7.9 | 7.9 | 200944 | 200964 |

All dimensions in mm

## CONTROL VALVES RV 113, PN 16

| DN | D1 | D2 | D3 | d | n | a | f | D4 | L | V | V1 | | V2 | H | Weight / kg | | Order No. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | RV 113R | RV 113M | | | RV 113R | RV 113M | RV 113R | RV 113M |
| 15 | 95 | 65 | 46 | 14 | 4 | 14 | 2 | 44 | 130 | 167 | 65 | 65 | 96 | 20 | 3.5 | 3.5 | 200945 | 200965 |
| 20 | 105 | 75 | 56 | 14 | 4 | 16 | 2 | 44 | 150 | 167 | 75 | 75 | 96 | 20 | 4.6 | 4.6 | 200946 | 200966 |
| 25 | 115 | 85 | 65 | 14 | 4 | 16 | 3 | 44 | 160 | 167 | 80 | 80 | 96 | 20 | 5.4 | 5.4 | 200947 | 200967 |
| 32 | 140 | 100 | 76 | 19 | 4 | 18 | 3 | 44 | 180 | 177 | 90 | 90 | 96 | 20 | 8.5 | 8.5 | 200948 | 200968 |
| 40 | 150 | 110 | 84 | 19 | 4 | 18 | 3 | 44 | 200 | 187 | 100 | 100 | 96 | 20 | 10.5 | 10.5 | 200949 | 200969 |
| 50 | 165 | 125 | 99 | 19 | 4 | 20 | 3 | 44 | 230 | 182 | 155 | 115 | 96 | 20 | 16.7 | 13.0 | 200950 | 200970 |
| 65 | 185 | 145 | 118 | 19 | 4 | 20 | 3 | 44 | 290 | 192 | 185 | 145 | 96 | 20 | 23.0 | 18.3 | 200951 | 200971 |
| 80 | 200 | 160 | 132 | 19 | 8 | 22 | 3 | 44 | 310 | 212 | 193 | 155 | 96 | 20 | 29.5 | 24.1 | 200952 | 200972 |
| 100 | 220 | 180 | 156 | 19 | 8 | 24 | 3 | 44 | 350 | 247 | 216 | 175 | 116 | 40 | 40.5 | 33.8 | 200953 | 200973 |
| 125 | 250 | 210 | 184 | 19 | 8 | 26 | 3 | 44 | 400 | 272 | 239 | 200 | 116 | 40 | 58.8 | 49.3 | 200954 | 200974 |
| 150 | 285 | 240 | 211 | 23 | 8 | 26 | 3 | 44 | 480 | 297 | 284 | 240 | 116 | 40 | 80.7 | 69.3 | 200955 | 200975 |

All dimensions in mm

## Kv TABLE PN 6

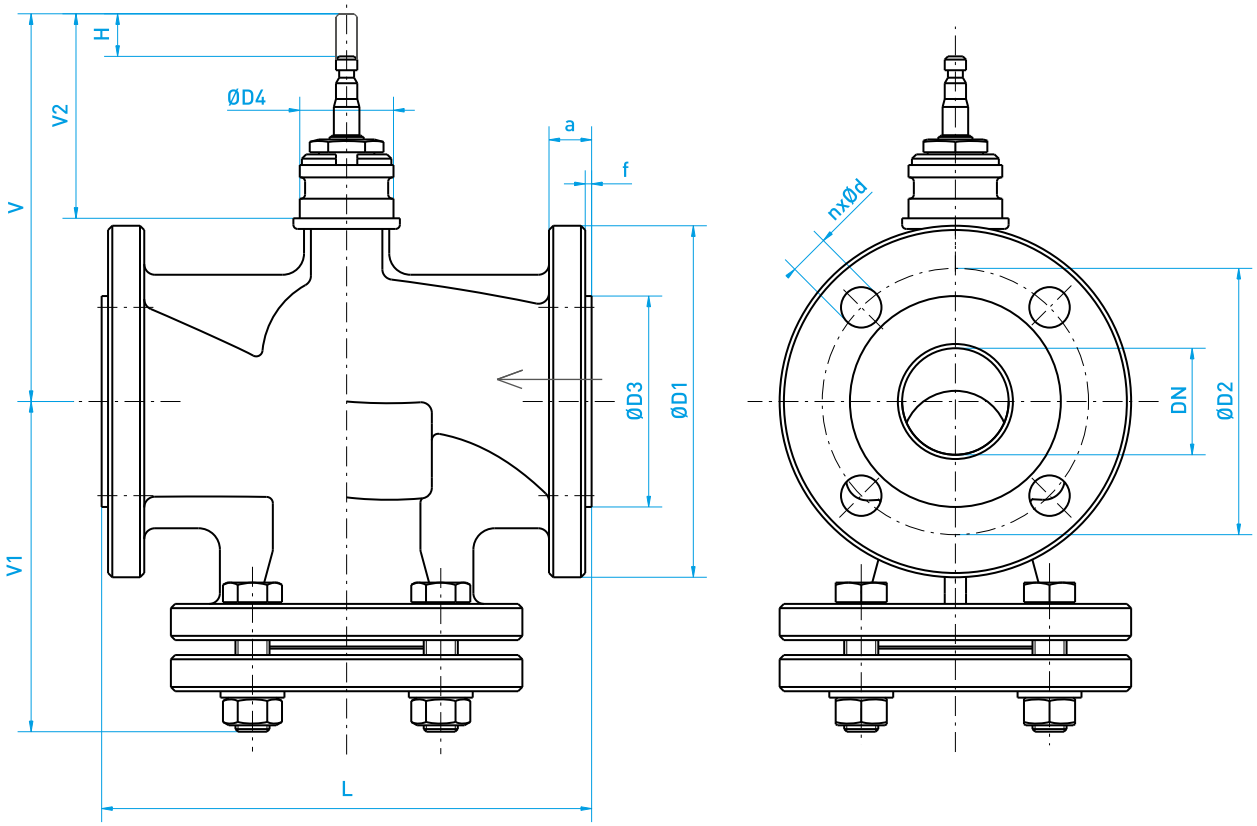
| DN | H | Kv max. / m³/h |
|---|---|---|
| 15 | 20 | 4 |
| 20 | 20 | 6.3 |
| 25 | 20 | 10 |
| 32 | 20 | 16 |
| 40 | 20 | 25 |

## Kv TABLE PN 16

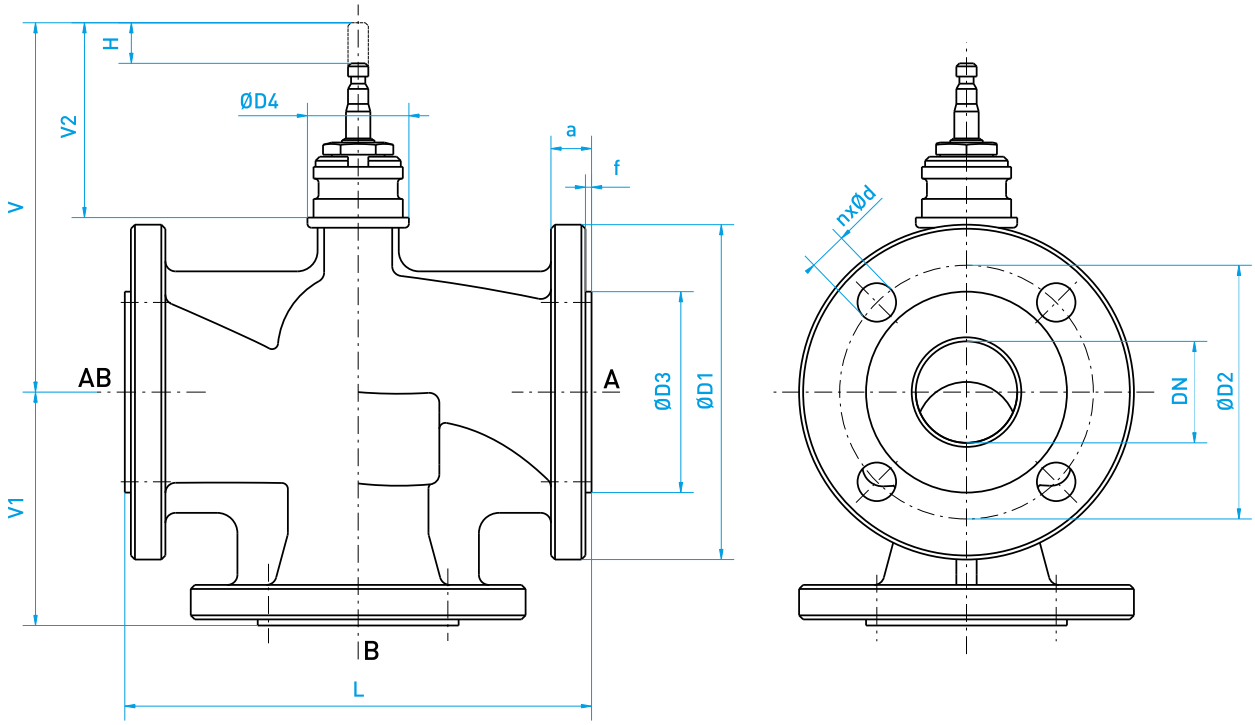
| DN | H | Kv max. / m³/h |
|---|---|---|
| 15 | 20 | 4 |
| 20 | 20 | 6.3 |
| 25 | 20 | 10 |
| 32 | 20 | 16 |
| 40 | 20 | 25 |
| 50 | 20 | 40 |
| 65 | 20 | 63 |
| 80 | 20 | 100 |
| 100 | 40 | 160 |
| 125 | 40 | 250 |
| 150 | 40 | 360 |

# Dimensions

## TWO-WAY CONTROL VALVE RV 113R




## THREE-WAY CONTROL VALVE RV 113M



# General Terms and Conditions

for the Supply of Products and Services of the Electrical and Electronics Industry ("Grüne Lieferbedingungen" - GL)*

for commercial transactions between businesses recommended by ZVEI-Zentral Verband Elektrotechnik und Elektronikindustrie as of June 2011

*The original German text shall be the governing version.

**Article I: General Provisions**

1 Legal relations between Supplier and Purchaser in connection with supplies and/or services of the Supplier (hereinafter referred to as "Supplies") shall be solely governed by the present GL. The Purchaser's general terms and conditions shall apply only if expressly accepted by the Supplier in writing. The scope of delivery shall be determined by the congruent mutual written declarations.

2 The Supplier herewith reserves any industrial property rights and/or copyrights pertaining to its cost estimates, drawings and other documents (hereinafter referred to as "Documents"). The Documents shall not be made accessible to third parties without the Supplier's prior consent and shall, upon request, be returned without undue delay to the Supplier if the contract is not awarded to the Supplier. Sentences 1 and 2 shall apply mutatis mutandis to the Purchaser's Documents; these may, however, be made accessible to those third parties to whom the Supplier has rightfully subcontracted Supplies.

3 The Purchaser has the non-exclusive right to use standard software and firmware, provided that it remains unchanged, is used within the agreed performance parameters, and on the agreed equipment. Without express agreement the Purchaser may make one back-up copy of standard software.

4 Partial deliveries are allowed, unless they are unreasonable to accept for the Purchaser.

5 The term "claim for damages" used in the present GL also includes claims tor indemnification for useless expenditure.

**Article II: Prices, Terms of Payment, and Set-Off**

1 Prices are ex works and excluding packaging; value added tax shall be added at the then applicable rate.

2 If the Supplier is also responsible for assembly or erection and unless otherwise agreed, the Purchaser shall pay the agreed remuneration and any incidental costs required e. g. for traveling and transport as well as allowances.

3 Payments shall be made free Supplier's paying office.

4 The Purchaser may set off only those claims which are undisputed or non- appealable.

**Article III: Retention of Title**

1 The items pertaining to the Supplies ("Retained Goods") shall remain the Supplier's property until each and every claim the Supplier has against the Purchaser on account of the business relationship has been fulfilled. If the combined value of the Supplier's security interests exceeds the value of all secured claims by more than 20 %, the Supplier shall release a corresponding part of the security interest if so requested by the Purchaser; the Supplier shall be entitled to choose which security interest it wishes to release.

2 For the duration of the retention of title, the Purchaser may not pledge the Retained Goods or use them as security, and resale shall be possible only tor resellers in the ordinary course of their business and only on condition that the reseller receives payment from its customer or makes the transfer of to the customer dependent upon the customer fulfilling its obligation to effect payment.

3 Should Purchaser resell Retained Goods, it assigns to the Supplier, already today, all claims it will have against its customers out of the resale, including any collateral rights and all balance claims, as security, without any subsequent declarations to this effect being necessary. If the Retained Goods are sold on together with other items and no individual price has been agreed with respect to the Retained Goods, Purchaser shall assign to the Supplier such fraction of the total price claim as is attributable to the price of the Retained Goods invoiced by Supplier.

4 a) Purchaser may process, amalgamate or combine Retained Goods with other items. Processing is made for Supplier. Purchaser shall store the new item thus created for Supplier, exercising the due care of a diligent business person. The new items are considered as Retained Goods.

b) Already today, Supplier and Purchaser agree that if Retained Goods are combined or amalgamated with other items that are not the property of Supplier, Supplier shall acquire co-ownership in the new item in proportion of the value of the Retained Goods combined or amalgamated to the other items at the time of combination or amalgamation. In this respect, the new items are considered as Retained Goods.

c) The provisions on the assignment of claims according to No. 3 above shall also apply to the new item. The assignment, however, shall only apply to the amount corresponding to the value invoiced by Supplier for the Retained Goods that have been processed, combined or amalgamated.

d) Where Purchaser combines Retained Goods with real estate or movable goods, it shall, without any further declaration being necessary to this effect, also assign to Supplier as security its claim to consideration for the combination, including all collateral rights for the pro-rata amount of the value the combined Retained Goods have on the other combined items at the time of the combination.

5 Until further notice, Purchaser may collect assigned claims relating to the resale. Supplier is entitled to withdraw Purchaser's permission to collect funds for good reason, including, but not limited to delayed payment, suspension of payments, start of insolvency proceedings, protest or justified indications for overindebtedness or pending insolvency of Purchaser. In addition, Supplier may, upon expiry of an adequate period of notice disclose the assignment, realize the claims assigned and demand that Purchaser informs its customer of the assignment.

6 The Purchaser shall inform the Supplier forthwith of any seizure or other act of intervention by third parties. If a reasonable

interest can be proven, Purchaser shall, without undue delay, provide Supplier with the information and/or Documents necessary to assert the claims it has against its customers

**7** Where the Purchaser fails to fulfill its duties, fails to make payment due, or otherwise violates its obligations the Supplier shall be entitled to rescind the contract and take back the Retained Goods in the case of continued failure following expiry of a reasonable remedy period set by the Supplier; the statutory provisions providing that a remedy period is not needed shall be unaffected. The Purchaser shall be obliged to return the Retained Goods. The fact that the Supplier takes back Retained Goods and/or exercises the retention of title, or has the Retained Goods seized, shall not be construed to constitute a rescission of the contract, unless the Supplier so expressly declares.

**Article IV: Time for Supplies; Delay**

**1** Times set for Supplies shall only be binding if all Documents to be furnished by the Purchaser, necessary permits and approvals, especially concerning plans, are received in time and if agreed terms of payment and other obligations of the Purchaser are fulfilled. If these conditions are not fulfilled in time, times set shall be extended reasonably; this shall not apply if the Supplier is responsible for the delay.

**2** If non-observance of the times set is due to:

a) force majeure, such as mobilization, war, terror attacks, rebellion or similar events (e. g. strike or lockout);

b) virus attacks or other attacks on the Supplier's IT systems occurring despite protective measures were in place that complied with the principles of proper care;

c) hindrances attributable to German, US or otherwise applicable national, EU or international rules of foreign trade law or to other circumstances for which Supplier is not responsible; or

d) the fact that Supplier does not receive its own supplies in due time or in due form

such times shall be extended accordingly.

**3** If the Supplier is responsible for the delay (hereinafter referred to as "Delay") and the Purchaser has demonstrably suffered a loss therefrom, the Purchaser may claim a compensation as liquidated damages of 0.5 % for every completed week of Delay, but in no case more than a total of 5 % of the price of that part of the Supplies which due to the Delay could not be put to the intended use.

**4** Purchaser's claims for damages due to delayed Supplies as well as claims for damages in lieu of performance exceeding the limits specified in No. 3 above are excluded in all cases of delayed Supplies, even upon expiry of a time set to the Supplier to effect the Supplies. This shall not apply in cases of liability based on intent, gross negligence, or due to loss of life, bodily injury or damage to health. Rescission of the contract by the Purchaser based on statute is limited to cases where the Supplier is responsible for the delay. The above provisions do not imply a change in the burden of proof to the detriment of the Purchaser.

**5** At the Supplier's request, the Purchaser shall declare within a reasonable period of time whether it, due to the delayed Supplies, rescinds the contract or insists on the delivery of the Supplies.

**6** If dispatch or delivery, due to Purchaser's request, is delayed by more than one month after notification of the readiness for dispatch was given, the Purchaser may be charged, for every additional month commenced, storage costs of 0.5 % of the price of the items of the Supplies, but in no case more than a total of 5 %. The parties to the cotract may prove that higher or, as the case may be, lower storage costs have been incurred.

**Article V: Passing of Risk**

**1** Even where delivery has been agreed freight free, the risk shall pass to the Purchaser as follows:

a) if the delivery does not include assembly or erection, at the time when it is shipped or picked up by the carrier. Upon the Purchaser's request, the Supplier shall insure the delivery against the usual risks of transport at the Purchaser's expense;

b) if the delivery includes assembly or erection, at the day of taking over in the Purchaser's own works or, if so agreed, after a successful trial run.

**2** The risk shall pass to the Purchaser if dispatch, delivery, the start or performance of assembly or erection, the taking over in the Purchaser's own works, or the trial run is delayed for reasons for which the Purchaser is responsible or if the Purchaser has otherwise failed to accept the Supplies.

**Article VI: Assembly and Erection**

Unless otherwise agreed in written form, assembly and erection shall be subject to the following provisions:

**1** Purchaser shall provide at its own expense and in due time:

a) all earth and construction work and other ancillary work outside the Supplier's scope, including the necessary skilled and unskilled labor, construction materials and tools;

b) the equipment and materials necessary for assembly and commissioning such as scaffolds, lifting equipment and other devices as well as fuels and lubricants;

c) energy and water at the point of use including connections, heating and lighting;

d) suitable dry and lockable rooms of sufficient size adjacent to the site for the storage of machine parts, apparatus, materials, tools, etc. and adequate working and recreation rooms for the erection personnel, including sanitary facilities as are appropriate in the specific circumstances; furthermore, the Purchaser shall take all measures it would take for the protection of its own possessions to protect the possessions of the Supplier and of the erection personnel at the site;

e) protective clothing and protective devices needed due to particular conditions prevailing on the specific site.

**2** Before the erection work starts, the Purchaser shall unsolicitedly make available any information required concerning the location of concealed electric power, gas and water lines or of similar installations as well as the necessary structural data.

**3** Prior to assembly or erection, the materials and equipment necessary for the work to start must be available on the site of assembly or erection and any preparatory work must have advanced to such a degree that assembly or erection can be started as agreed and carried out without interruption. Access roads and the site of assembly or erection must be level and clear.

**4** If assembly, erection or commissioning is delayed due to circumstances for which the Supplier is not responsible, the Purchaser shall bear the reasonable costs incurred for idle times and any additional traveling expenditure of the Supplier or the erection personnel.

**5** The Purchaser shall attest to the hours worked by the erection personnel towards the Supplier at weekly intervals and the Purchaser shall immediately confirm in written form if assembly, erection or commissioning has been completed.

6 If, after completion, the Supplier demands acceptance of the Supplies, the Purchaser shall comply therewith within a period of two weeks. The same consequences as upon acceptance arise if and when the Purchaser lets the two-week period expire or the Supplies are put to use after completion of agreed test phases, if any.

**Article VII: Receiving Supplies**

The Purchaser shall not refuse to receive Supplies due to minor defects.

**Article VIII: Defects as to Quality**

The Supplier shall be liable for defects as to quality ("Sachmängel", hereinafter referred to as "Defects",) as follows:

1 Defective parts or defective services shall be, at the Supplier's discretion, repaired, replaced or provided again free of charge, provided that the reason for the Defect had already existed at the time when the risk passed.

2 Claims for repair or replacement are subject to a statute of limitations of 12 months calculated from the start of the statutory statute of limitations; the same shall apply mutatis mutandis in the case of rescission and reduction. This shall not apply where longer periods are prescribed by law according to Sec. 438 para. 1 No. 2 (buildings and things used for a building), Sec. 479 para. 1 (right of recourse), and Sec. 634a para. 1 No. 2 (defects of a building) German Civil Code ("Bürgerliches Gesetzbuch"), in the case of intent, fraudulent concealment of the Defect or non-compliance with guaranteed characteristics ("Beschaffenheitsgarantie").
The legal provisions regarding suspension of the statute of limitations ("Ablaufhemmung", "Hemmung") and recommencement of limitation periods shall be unaffected.

3 Notifications of Defect by the Purchaser shall be given in written form without undue delay.

4 In the case of notification of a Defect, the Purchaser may withhold payments to an amount that is in a reasonable proportion to the Defect. The Purchaser, however, may withhold payments only if the subject-matter of the notification of the Defect involved is justified and incontestable. The Purchaser has no right to withhold payments to the extent that its claim of a Defect is time-barred. Unjustified notifications of Defect shall entitle the Supplier to demand reimbursement of its expenses by the Purchaser.

5 The Supplier shall be given the opportunity to repair or to replace the defective good ("Nacherfüllung") within a reasonable period of time.

6 If repair or replacement is unsuccessful, the Purchaser is entitled to rescind the contract or reduce the remuneration; any claims for damages the Purchaser may have according to No. 10) shall be unaffected.

7 There shall be no claims based on Defect in cases of insignificant deviations from the agreed quality, of only minor impairment of usability, of natural wear and tear, or damage arising after the passing of risk from faulty or negligent handling, excessive strain, unsuitable equipment, defective civil works, inappropriate foundation soil, or claims based on particular external influences not assumed under the contract, or from non-reproducible software errors. Claims based on defects attributable to improper modifications or repair work carried out by the Purchaser or third parties and the consequences thereof are likewise excluded.

8 The Purchaser shall have no claim with respect to expenses incurred in the course of supplementary performance, including costs of travel, transport, labor, and material, to the extent that expenses are increased because the subject-matter of the Supplies has subsequently been brought to another location than the Purchaser's branch office, unless doing so complies with the normal use of the Supplies.

9 The Purchaser's right of recourse against the Supplier pursuant to Sec. 478 BGB is limited to cases where the Purchaser has not concluded an agreement with its customers exceeding the scope of the statutory provisions governing claims based on Defects. Moreover, No. 8 above shall apply mutatis mutandis to the scope of the right of recourse the Purchaser has against the Supplier pursuant toSec. 478 para. 2 BGB.

10 The Purchaser shall have no claim for damages based on Defects.This shall not apply to the extent that a Defect has been fraudulently concealed, the guaranteed characteristics are not complied with, in the case of loss of life, bodily injury or damage to health, and/or intentionally or grossly negligent breach of contract on the part of the Supplier. The above provisions do not imply a change in the burden of proof to the detriment of the Purchaser. Any other or additional claims of the Purchaser exceeding the claims provided for in this Article VIII, based on a Detect, are excluded.

**Article IX: Industrial Property Rights and Copyrights; Defects in Title**

1 Unless otherwise agreed, the Supplier shall provide the Supplies free from third parties' industrial property rights and copyrights (hereinafter referred to as "IPR") with respect to the country of the place of delivery only. If a third party asserts a justified claim against the Purchaser based on an infringement of an IPR by the Supplies made by the Supplier and used in conformity with the contract, the Supplier shall be liable to the Purchaser within the time period stipulated in Article VIII No. 2 as follows:

a) The Supplier shall choose whether to acquire, at its own expense, the right to use the IPR with respect to the Supplies concerned or whether to modify the Supplies such that they no longer infringe the IPR or replace them. If this would be impossible for the Supplier under reasonable conditions, the Purchaser may rescind the contract or reduce the remuneration pursuant to the applicable statutory provisions;

b) The Supplier's liability to pay damages is governed by Article XII;

c) The above obligations of the Supplier shall apply only if the Purchaser (i) immediately notifies the Supplier of any such claim asserted by the third party in written form, (ii) does not concede the existence of an infringement and (iii) leaves any protective measures and settlement negotiations to the Supplier's discretion. If the Purchaser stops using the Supplies in order to reduce the damage or for other good reason, it shall be obliged to point out to the third party that no acknowledgement of the alleged infringement may be inferred from the fact that the use has been discontinued.

2 Claims of the Purchaser shall be excluded if it is responsible for the infringement of an IPR.

3 Claims of the Purchaser are also excluded if the infringement of the IPR is caused by specifications made by the Purchaser, by a type of use not foreseeable by the Supplier or by the Supplies being modified by the Purchaser or being used together with products not provided by the Supplier.

4 In addition, with respect to claims by the Purchaser pursuant to No. 1 a) above, Article VIII Nos. 4, 5, and 9 shall apply mutatis mutandis in the event of an infringement of an IPR.

5 Where other defects in title occur, Article VIII shall apply mutatis mutandis.

6 Any other claims of the Purchaser against the Supplier or its agents or any such claims exceeding the claims provided for in this Article IX, based on a defect in title, are excluded.

**Article X: Conditional Performance**

1 The performance of this contract is conditional upon that no hindrances attributable to German, US or otherwise applicable national, EU or international rules of foreign trade law or any embargos or other sanctions exist.

2 The Purchaser shall provide any information and Documents required for export, transport and import purposes.

**Article XI: Impossibility; Adjustment of the Contract**

1 To the extent that delivery is impossible, the Purchaser is entitled to claim damages, unless the Supplier is not responsible for the impossibility. The Purchaser's claim for damages is, however, limited to an amount of 10 % of the value of the part of the Supplies which, owing to the impossibility, cannot be put to the intended use. This limitation shall not apply in the case of liability based on intent, gross negligence or loss of life, bodily injury or damage to health; this does not imply a change in the burden of proof to the detriment of the Purchaser. The Purchaser's right to rescind the contract shall be unaffected.

2 Where events within the meaning of Article IV No. 2 (a) to (c) substantially change the economic importance or the contents of the Supplies or considerably affect the Supplier's business, the contract shall be adapted taking into account the principles of reasonableness and good faith. To the extent this is not justifiable for economic reasons, the Supplier shall have the right to rescind the contract. The same applies if required export permits are not granted or cannot be used. If the Supplier intends to exercise its right to rescind the contract, it shall notify the Purchaser thereof without undue delay after having realized the repercussions of the event; this shall also apply even where an extension of the delivery period has previously been agreed with the Purchaser.

**Article XII: Other Claims for Damages**

1 Unless otherwise provided for in the present GL, the Purchaser has no claim for damages based on whatever legal reason, including infringement of duties arising in connection with the contract or tort.

2 This does not apply if liability is based on:

a) the German Product Liability Act ("Produkthaftungsgesetz");

b) intent;

c) gross negligence on the part of the owners, legal representatives or executives;

d) fraud;

e) failure to comply with a guarantee granted;

f) negligent injury to life, limb or health; or

g) negligent breach of a fundamental condition of contract ("wesentliche Vertragspflichten").

However, claims for damages arising from a breach of a fundamental condition of contract shall be limited to the foreseeable damage which is intrinsic to the contract, provided that no other of the above case applies.

3 The above provision does not imply a change in the burden of proof to the detriment of the Purchaser.

**Article XIII: Venue and Applicable law**

1 If the Purchaser is a businessman, sole venue for all disputes arising directly or indirectly out of the contract shall be the Supplier's place of business. However, the Supplier may also bring an action at the Purchaser's place of business.

2 This contract and its interpretation shall be governed by German law, to the exclusion of the United Nations Convention on contracts for the International Sale of Goods (CISG).

**Article XIV: Severability Clause**

The legal invalidity of one or more provisions of this Agreement in no way affects the validity of the remaining provisions. This shall not apply if it would be unreasonably onerous for one of the parties to be obligated to continue the contract.



Agromatic Stellantriebe · Actuators

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Germany

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Fax +49 5202 9739 25
Email: sales@agromatic.de

# For your peace of mind

Agromatic Regelungstechnik GmbH offers a twelve (12) month guarantee in accordance with our General Terms and Conditions (GT&C), which are also printed in this catalogue.

When asserting a claim under guarantee you will be required to return the actuator together with the original invoice and the Returns Material Authorisation number (RMA number). To ensure the repair process is carried out quickly and efficiently the customer is kindly requested to obtain an RMA number from the Agromatic Service department before making any returns.

ZERTIFIKAT ■ CERTIFICATE ■ 認證證書 ■ СЕРТИФИКАТ ■ CERTIFICADO ■ CERTIFICAT

TÜV SÜD Management Service

CERTIFICATE

The Certification Body
of TÜV SÜD Management Service GmbH
certifies that

Agromatic
Stellantriebe · Actuators

AGROMATIC Regelungstechnik GmbH
Stukenbrocker Weg 38
33813 Oerlinghausen
Germany

has established and applies
a Quality Management System for

Development, Production and distribution of
part-turn, rotary and linear actuators,
transmission components and valves.

An audit was performed, Report No. 70004091.
Proof has been furnished that the requirements
according to

ISO 9001:2008

are fulfilled.

The certificate is valid from 2016-03-01 until 2018-09-14.
Certificate Registration No.: 12 100 14190 TMS.

Product Compliance Management
Munich, 2016-02-10

IAF DAkkS

TÜV SÜD Management Service GmbH • Zertifizierungsstelle • Ridlerstraße 65 • 80339 München • Germany
www.tuev-sued.de/certificate-validity-check

TÜV

All electrical connection work must be carried out by a qualified electrician in accordance with the terminal connection diagram in the hood. Adhere to all Health and Safety measures specified by the VDE (German Association for Electrical, Electronic and Information Technologies) and your local utility company.

Agromatic actuators fulfil all statutory and employers' liability insurance requirements. However, if an actuator should develop a fault the Agromatic guarantee ensures the matter is dealt with quickly and without too much red tape.

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

| | | | |
|---|---|---|---|
| Certificate No.: | IECEx EPS 15.0061X | Issue No: 0 | Certificate history: Issue No. 0 (2015-12-07) |
| Status: | Current | Page 1 of 3 | |
| Date of Issue: | 2015-12-07 | | |
| Applicant: | AGROMATIC Regelungstechnik GmbH<br>Stukenbrocker Weg 38<br>D-33813 Oerlinghausen<br>Germany | | |
| Electrical Apparatus:<br>*Optional accessory:* | Electric actuator type NEx... | | |
| Type of Protection: | "d" | | |
| Marking: | Ex d IIC T6 Gb<br>Ex d e IIC T6 Gb | | |

*Approved for issue on behalf of the IECEx Certification Body:* Dieter Zitzmann

*Position:* Certification manager

*Signature: (for printed version)*

*Date:* 2015-12-07

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:
Bureau Veritas Consumer Products Services Germany GmbH
Businesspark A96
86842 Türkheim
Germany

# IECEx Certificate of Conformity

| | | |
|---|---|---|
| Certificate No: | IECEx EPS 15.0061X | Issue No: 0 |
| Date of Issue: | 2015-12-07 | Page 2 of 3 |
| Manufacturer: | AGROMATIC Regelungstechnik GmbH<br>Stukenbrocker Weg 38<br>D-33813 Oerlinghausen<br>Germany | |
| Additional Manufacturing location(s): | | |

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

| | |
|---|---|
| IEC 60079-0 : 2011<br>Edition:6.0 | Explosive atmospheres - Part 0: General requirements |
| IEC 60079-1 : 2014-06<br>Edition:7.0 | Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d" |

*This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

Test Report:

DE/EPS/ExTR15.0082/00

Quality Assessment Report:

DE/EPS/QAR15.0009/00

# IECEx Certificate of Conformity

Certificate No: IECEx EPS 15.0061X Issue No: 0

Date of Issue: 2015-12-07 Page 3 of 3

Schedule

EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The NEx... actuators are used for actuation of valves and gates of industrial control equipment. The enclosure is constructed flameproof with bushings for cable glands, drive shaft and control shaft. Additional certified Ex-e junction box can be mounted external.

Electrical data:

BLDC-Motor 90 V AC ... 264 V AC, 120 V DC ... 370 V DC)

Synchronmotor 24 V AC, 115 V AC, 230 V AC)

DC-motor 24 V DC

CONDITIONS OF CERTIFICATION: YES as shown below:

All unused openings must be closed by certified blind plugs.

A repair of flameproof joints is not allowed according to the values of IEC 60079-1.

Maximum ambient temperature range: -20°C to +60°C.

BUREAU VERITAS

# (1) EG-Baumusterprüfbescheinigung

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen – **Richtlinie 94/9/EG**

(3) EG-Baumusterprüfbescheinigungsnummer

**EPS 15 ATEX 1 044 X** **Revision 0**

(4) Gerät: Elektrischer Stellantrieb Typ NEx...

(5) Hersteller: AGROMATIC Regelungstechnik GmbH

(6) Anschrift: Stukenbrocker Weg 38
D-33813 Oerlinghausen

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Die Bureau Veritas Consumer Products Services Germany GmbH bescheinigt als Benannte Stelle Nr. 2004 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaft vom 23. März 1994 (94/9/EG) die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie. Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht 15TH0256 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit:

**EN 60079-0:2012** **EN 60079-1:2014**

(10) Falls das Zeichen „X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf Konzeption und Bau des festgelegten Gerätes gemäß Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das in Verkehrbringen dieses Gerätes.

(12) Die Kennzeichnung des Geräts muss die folgenden Angaben enthalten:

II 2G Ex d IIC T6 Gb
II 2G Ex d e IIC T6 Gb

Zertifizierungsstelle Explosionsschutz

Nürnberg, 07.12.2015

D. Zitzmann





BUREAU VERITAS
Consumer Products Services Germany GmbH
Thurn-und-Taxis-Straße 18, 90411 Nürnberg, Germany
Phone: +49 40 74041-0
cps-muernberg@de.bureauveritas.com
www.bureauveritas.de/cps

(13) **Anlage**

(14) **EG-Baumusterprüfbescheinigung EPS 15 ATEX 1 044 X** **Revision 0**

(15) Beschreibung des Gerätes:

Die NEX Antriebe dienen für die Betätigung von Industriearmaturen, wie z. B. Ventilen, Schiebern, Klappen und Hähnen. Das Gehäuse besteht aus einem druckfesten Gehäuse mit Wellendurchführungen und Kabeleinführungen.

Elektrische Daten:

| | |
|---|---|
| BLDC-Motor | (Eingangsspannung 90 V AC ... 264 V AC, 120 V DC ... 370 V DC) |
| Synchronmotor | (Eingangsspannung 24 V AC, 115 V AC, 230 V AC) |
| Gleichstrommotor | (Eingangsspannung 24 V DC) |

(16) Prüfbericht: 15TH0256

(17) Besondere Bedingungen:

Unbenutzte Einführungen müssen mit zugelassenen Verschlussstopfen verschlossen werden.

Eine Reparatur der Ex-Spalte ist nur nach Rücksprache mit dem Hersteller erlaubt.

Umgebungstemperaturbereich: -20°C bis +60°C.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen:

Durch Normen abgedeckt.

Zertifizierungsstelle Explosionsschutz Nürnberg, 07.12.2015

D. Zitzmann





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