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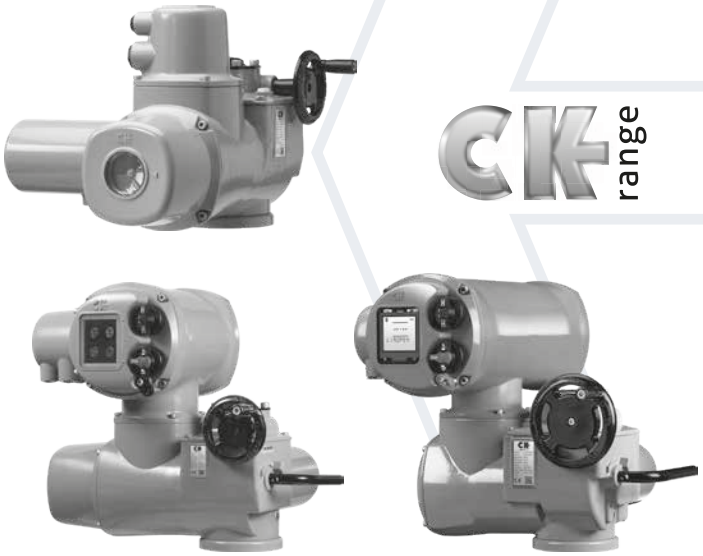
Keeping the World Flowing
for Future Generations



Title: Technical Data and Features, Multi-Turn Actuators. AC 3-Phase

Models: CK, CKA CKC, CKR, CKRA, CKRC

Application:

Multi-turn electric actuators designed for use worldwide in non-hazardous water, power and industrial applications, for valve motorisation and actuation.

Series:

- CK: Standard isolating duty, multi-turn electric actuator. External motor controls are required. CK actuators can be retrofitted/upgraded, by adding a Centronik control module to provide intelligent valve automation
- CKA: Comprising all the features of the CK actuator with the addition of a dedicated Atronik control module.
- CKC: Comprising all the features of the CK actuator with the addition of a dedicated Centronik control module
- CKR: Standard modulating duty, multi-turn electric actuator. External motor controls are required. CK actuators can be retrofitted/upgraded, by adding a Centronik control module to provide intelligent valve automation
- CKRA: Comprising all the features of the CKR actuator with the addition of a dedicated Atronik control module.
- CKRC: Comprising all the features of the CKR actuator with the addition of a dedicated Centronik control module

Torque range:

- The tripping torque is independently adjustable for directions OPEN and CLOSE within the range (40%-100%)
- Default factory setting is 100%
- Actuator duty cycle is rated at nominal torque, see datasheets

Duty:

Motor duty ratings are in compliance with EN 15714-2 and IEC 60034-1

- Isolating: Short-time duty S2-15 min and S2-30 min, refer to electrical datasheet for details
- Modulating: S4-25% and S4-50%, refer to electrical datasheet for details

Motors:

- 3-phase AC asynchronous motor
- Motor protection: Self-resetting thermo-switches embedded in the motor windings which are designed to trip as soon as the motor temperature exceeds +132 °C. Once the motor has cooled to normal operating temperature, the thermo-switch will reset and electrical operation can resume.
- Insulation class F, tropicalised (Class H available on request)

Mains voltage and frequency:

Compatible power supplies for CK range actuators are shown below. Not all actuator versions or sizes are available with all motor types or voltages/frequencies. For detailed information please refer to the separate motor datasheets.

- 3-phase AC Isolating Duty, available voltages:

  50 Hz 220V, 240V, 380V, 400V, 415V, 440V, 500V
  60 Hz 220V, 240V, 380V, 440V, 460V, 480V, 600V

- 3-phase AC Modulating Duty, available voltages:

  50 Hz 220V, 240V, 380V, 400V, 415V, 440V, 500V
  60 Hz 220V, 240V, 380V, 440V, 460V, 480V, 600V

Power supply tolerances

Voltage tolerance ± 10% – Applies for rated performance, duty cycle and speed is not guaranteed.

Frequency ± 5% – Applies for rated performance, duty cycle and speed is not guaranteed.

Max. starting volt drop -15% – Applies for rated performance, duty cycle and speed is not guaranteed.

Manual operation:

- All actuators are fitted with a handwheel for commissioning and emergency operation. This is engaged via a low speed clutch, operable at all times to provide a manual override even when the motor is running. Handwheel does not rotate during electrical operation.
- Hand/Auto lever: The manual operation engagement lever can be padlocked in place, restricting manual operation to authorized personnel only. This will suit a padlock with hasp diameter of 6.5 mm.

Mechanical Switch Mechanism (MSM)

Limit switching:

- Counter gear mechanism for end positions OPEN and CLOSED
- Operating range: 2 - 1,500 turns per stroke.
  Extended optional version: 2 - 15,000 turns per stroke.
- 2 end position switches - 1 for each direction. DPDT, with a NO and NC contact, sealed to IP67
- 2 extra end position switches (optional) - 1 for each direction. DPDT, with a NO and NC contact, sealed to IP67

Torque switching:

- Torque switching adjustable for directions OPEN and CLOSE
- Configuration range: 40% - 100% of the rated torque (Max tripping torque)
- 2 torque switches - 1 for each direction. DPDT, with a NO and NC contact, sealed to IP67
- 2 extra torque switches (optional) - 1 for each direction. DPDT, with a NO and NC contact, sealed to IP67

Running indication:

Blinker contact for movement indication.

Intermediate position switches (optional):

- Up to 4 intermediate position switches adjustable for any position. Snap action switch, 2 wires, NO/NC contact configurable by cam.

Heater:

A resistive heater maintains a stable and humidity free environment for the internal switch mechanism compartment. This requires an independent power supply to ensure the integrity of the switch mechanism is maintained during a mains power loss.

Available types: 110 VAC, 220 VAC and 24 VDC

Electrical Ratings

Specification for position/torque limit switches, intermediate position switches and blinker switch:

- Switch voltage
  - AC inductive load (cos Φ > 0.8): 5A (30 VAC), 5A (125 VAC), 5A (250 VAC)
  - DC resistive load: 0,5A (30 VDC), 0,5A (125 VDC), 0,5A (250 VDC)
- Lever action: Snap action
- Contact material: Silver

Analogue position feedback (options)

- Precision potentiometer
  - Linearity ≤ 2 %
  - Power 0.5 W
  - Resistance (standard) 10 kΩ, (optional) 1 kΩ, 5 kΩ. Other values under request.
- Electronic current position transmitter, two versions:
  - 2 wire CPT (current position transmitter)
  - 2, 3 and 4 wire CPT (current position transmitter)

Mechanical position indicator (optional):

Continuous indication, adjustable indicator disc with OPEN and CLOSED symbols.

Digital Switch Mechanism (DSM) - for CKc and CKRC range only.

- The DSM uses absolute encoder technology to permit non-intrusive configuration of the actuator position and torque trip limits via the local display interface.
- Position and torque are measured using only five moving parts. The orientation of the position spur gears dictates the current actuator position between the set travel limits, up to 8,000 output turns apart.
- Torque sensing is performed through an integral calibrated sensor providing accurate torque measurement up to rated torque.
- DSM is compatible with the following optional feedback solutions:
  - Mechanical position indicator: Continuous indication, adjustable indicator disc with symbols OPEN and CLOSED.
  - Up to 4 intermediate position switches adjustable for any position. Snap action switch, 2 wires, NO/NC contact configurable by cam.
  - Analogue position feedback.

CK Range – Technical Data and Features

Electrical connection:

Universal plug & socket, with separate power and control field wiring terminals.

- Motor contacts:
  - Max. rated current. 20 A
  - Customer connection type: Screw
  - Max. cross section: 6 mm^2
  - Pin socket carrier material Polyamide
  - Contact material: Brass
- Protective earth contact:
  - Max. rated current. -
  - Customer connection type: Ring tag
  - Max. cross section: M4 Ring Tag
  - Pin socket carrier material Polyamide
  - Contact material: Brass
- Control contacts:
  - Max number of contacts: 52
  - Max. rated current. 5A
  - Customer connection type: Screw
  - Max. cross section: 2.5 mm^2 (recommended 1.5 mm^2)
  - Pin socket carrier material Polyamide
  - Contact material: Brass, Tin Plated
- Conduits/cable entries:
  - Metric threads (standard) 1 x M20 x 1.5, 1 x M25 x 1.5, 1 x M32 x 1.5
  - Pg threads (option) 1 x Pg 13.5, 1 x Pg 21, 1 x Pg 29
  - NPT threads (option) 2 x ¾" NPT, 1 x 1¼" NPT
- Contact Rotork if more than 3 conduit entries are required.

Enclosure protection:

Watertight - IP68 (8m / 96hrs) according to EN 60529, NEMA 4 & 6 rating as standard providing enhanced environmental protection.

Valve attachment:

- Mounting flange dimensions are in compliance with ISO 5210 or MSS SP-102. Please refer to the PUB111-028 for further details.
- Output drive couplings
  - All CK range actuators have a B1 output drive type as standard. B3 and B4 are available through the use of adapter sleeves designed to mate with the standard B1 coupling.
  - A detachable thrust base can be fitted for thrust bearing applications. The A type drive assembly is supplied as a self-contained cartridge assembly, facilitating quick removal and reassembly. Please refer to PUB111-028 for details.

Vibration resistance:

According to EN 60068-2-6: CK actuators are resistant to vibration up to 2g over a frequency range of 10 - 200 Hz.

Noise level:

The noise level originated by CK range actuators does not exceed 70 dB(A) at a distance of 1 m under normal operating conditions.

Design life:

Design life according to EN15714-2:2010. An actuator start is any operation that requires the motor to start movement in either direction. Starts in the same direction as present operation do not count as a start in this context.

- CK Standard & CKC actuators for isolating duty: 500,000 output turns, seating at rated torque, 33% rated torque through stroke.
- CKR & CKRC actuators for S4-50% modulating duty: up to 1,800,000 starts at 30% rated torque, minimum 1° movement.
- CKR & CKRC actuators for S4-25% modulating duty: up to 1,200,000 starts at 50% rated torque, minimum 1° movement.

Mounting position:

CK range actuators (with or without Centronik module) can be operated without restriction in any mounting orientation.

Corrosion protection:

- Rotork actuators are designed for use worldwide in non-hazardous water, power and industrial applications. Corrosion protection is a vital part of a reliable actuation solution to ensure a long service life is achieved for the product. CK range offers two levels of protection (refer to PUB111-029 for further details):
  - Standard corrosion protection.
  - High corrosion and protection: Coastal and off-shore areas
- Actuator standard colour is RAL5024 blue, handwheel & lever to be RAL9005 black and cover tube (if required) to be RAL9005 black. Contact Rotork for non-standard paint colours.

Temperature range:

- 3-phase CK range: Standard -30 to +70 °C (-22 to +158 °F).
- 3-phase CK range: Low temperature (optional) -40 to +60 °C (-40 to +140 °F).
- 1-phase CK range: Standard -25 to +70 °C (-13 to +158 °F).

Multi-turn electric actuators combined with external gearboxes:

Multi-turn electric actuators can be mounted on Rotork gearboxes (bevel, spur and worm type) in order to operate any industrial valve. Contact Rotork for an accurately sized solution for your application.

Atronik (optional)

- The Atronik control module provides a robust integral control solution for cost effective automation of a CK or CKR actuator.
- Atronik is designed to function with the CK Standard mechanical switch mechanism (MSM).
- Compact form factor to suit difficult installation locations.
- Features:
  - Microprocessor based controls
  - Simple control and indication configuration via DIP switches
  - Integral local control selectors with mode and direction selection
  - High visibility LED status indication
  - Configurable LED colours to suit site standard form
  - Optional extra relay contacts for additional remote indication
  - Optional analogue control input and output transmitter (4-20 mA)
  - Basic network bus connectivity

Centronik (optional)

- The Centronik control module provides an intelligent integral control solution designed to maximise functionality of the attached CK or CKR actuator.
- Centronik is designed to work with either the CK Standard mechanical switch mechanism (MSM) or the optional digital switch mechanism (DSM) ensuring upgrade opportunities for every type of CK actuator.
- Features:
  - Microprocessor based controls
  - Multilingual user interface
  - Configurable LCD display:

    All actuator configuration settings are shown in a logical menu structure on the Centronik LCD display. The multilingual user interface display on the Centronik module shows text and numerical figures relevant to actuator operation.

    Graphical symbols are also visible for appropriate functions. The display backlight is designed to provide good visibility in direct sunlight or challenging weather conditions.
  - Configuration via local controls or using a handheld Rotork Bluetooth® Setting Tool *Pro*
  - *Bluetooth*® wireless connectivity is also available for the Centronik module to increase data logging, analysis and asset management capabilities
  - Optional analogue control input and output (0-5V, 0-10V, 0-20V or 4-20mA)
  - Optional Current Torque Transmitter (CTT) 0-20 or 4-20 mA for DSM equipped actuators
  - Fieldbus connectivity ensuring compatibility with *Pakscan*™, Profibus®, Modbus®, Foundation Fieldbus®, HART® and DeviceNet®
  - Data logging and analysis with Insight 2 software
- Rotork provide an option to remotely mount the Centronik module of a CKC or CKRC actuator for applications where high ambient temperatures or excessive levels of vibration are present at the valve location, Centronik unit can be remotely mounted, up to 100 metres.

A full listing of the Rotork sales and service network is available on our website.

www.rotork.com

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Electric Actuators and Control Systems
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