# Отказоустойчивые электроприводы failsafe

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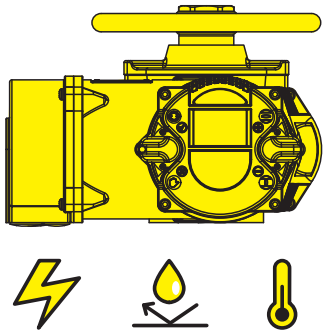
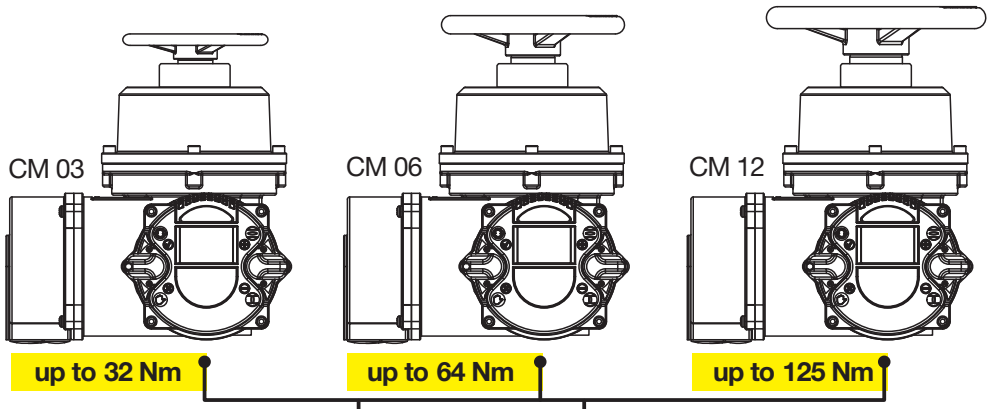
# 3 level concept

## 1 Basic Setting

Explosion Protection
Power Supply
Corrosion Protection
Ambient Conditions
Network Connection

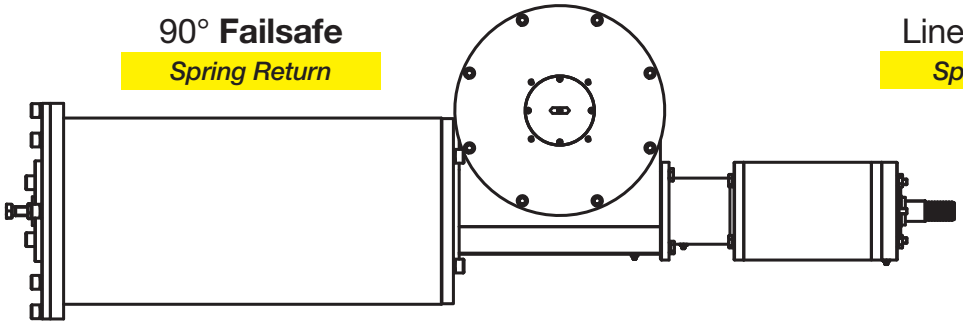


## 2 Sizing

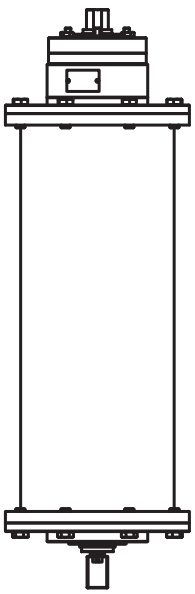



## 3 Components

90° **Failsafe**
*Spring Return*



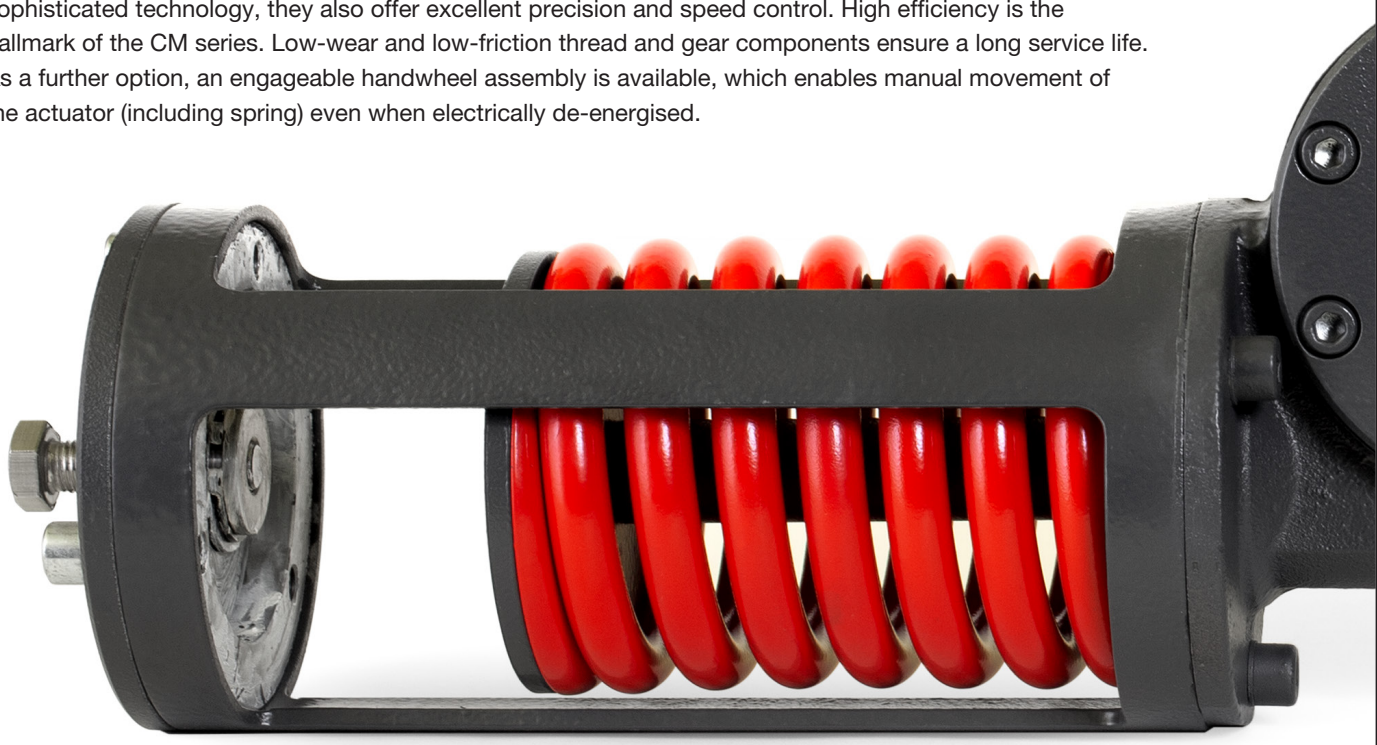
Linear **Failsafe**
*Spring Return*



# failsafe

## Technology

Safety Integrity Level (SIL) classification in accordance with IEC 61508 and reliability are at the core of SCHIEBEL's networked CM actuators, which are fitted with an optional failsafe function. Thanks to their sophisticated technology, they also offer excellent precision and speed control. High efficiency is the hallmark of the CM series. Low-wear and low-friction thread and gear components ensure a long service life. As a further option, an engageable handwheel assembly is available, which enables manual movement of the actuator (including spring) even when electrically de-energised.



## Design

The intelligent functional design and high-grade materials raise the CM failsafe actuators to a new level of quality. During the design process, SCHIEBEL paid particular attention to ensuring that the centre of gravity is located directly above the valve; this has a beneficial effect in terms of weight distribution and assembly so that there are no problems with vibrations on the piping. Furthermore, the design of the units is very straight-forward so they are easy for the end user to understand and operate.

## Engineering

With its customer-specific solutions, SCHIEBEL offers all the software and hardware features that customers need for the use of failsafe actuators in their company. Thanks to in-house software engineering – one of SCHIEBEL's core competences – users can rely on optimal hardware coordination and advanced service support at all times.

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# Availability

CM actuators with failsafe function combine the advantages of electric drive and mechanical spring. Because of the lack of other technologies (e.g. hydraulic/pneumatic), as well as the simple design and sophisticated software options, accidental errors are reduced to a minimum, resulting in substantial cost savings in terms of operation, storage and servicing. In addition, an optional handwheel can be integrated in the unit.

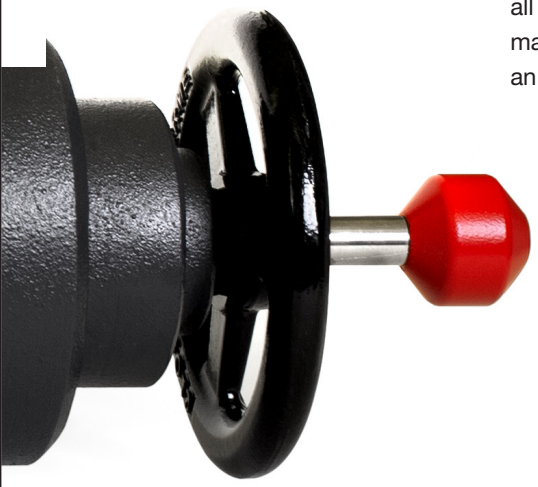
# Maintenance

The low-wear mechanical system with its frugal, highly energy-efficient electric drive with state-of-the-art power electronic modules and integrated energy-saving electronics reduces maintenance costs for the user. In addition, SCHIEBEL has integrated extensive monitoring and diagnostic functions into its actuators. Remote control features and SCHIEBEL‘s on-site service guarantee reliable operation.

# safety function

## Digitalisation

The sophisticated Smartcon control system developed in-house by SCHIEBEL ensures straightforward commissioning and simple, reliable operation. The control unit meets all requirements relating to digitalisation and IoT, as well as providing interfaces to all major fieldbus systems. In addition, the Single Pair Ethernet feature offers options for an auxiliary power supply (Power over Data Line).



## Modular concept

CM actuators with failsafe function are based on SCHIEBEL‘s proven modular concept. The basic modular structure of the actuator can be combined with a number of different failsafe units. To make the selection of the actuator as straightforward and user-friendly as possible, SCHIEBEL has designed its 3-level concept. It has also ensured compatibility with a range of different supply and communication networks. Thanks to this tool, it is now easier than ever to find the right product for the particular application.

## Solution

The failsafe function ensures that the actuator is quickly brought into a safe position in the event of an emergency. This is performed by means of a mechanically decoupled spring and therefore works even if the electrical power supply fails. It is possible to cover customer-specific requirements and problems thanks to the numerous options in terms of operation and parameterisation. Development activities at SCHIEBEL are always customer-oriented. No matter whether the requirement is for extremely fast positioning times or slow movement, CM actuators with failsafe function are able to meet these challenges.

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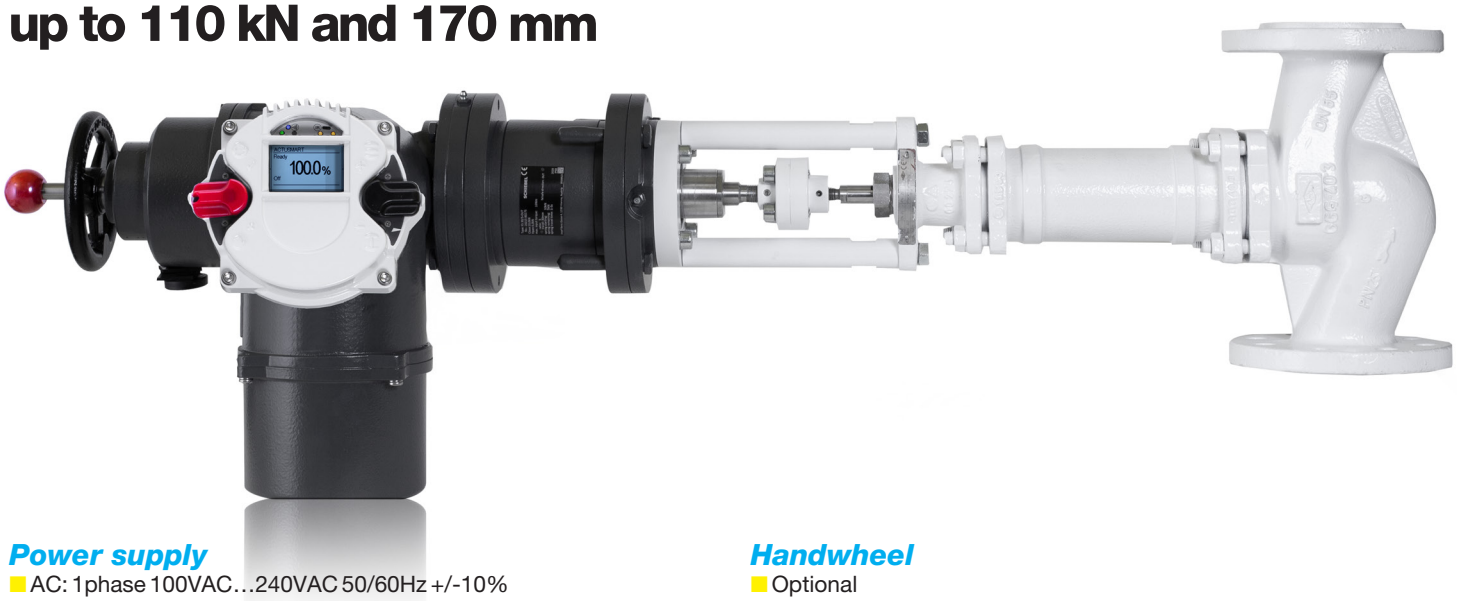
# failsafe series

## CM Failsafe Linear

### Modulating-Duty / On-Off-Duty
### up to 110 kN and 170 mm



### Power supply
AC: 1phase 100VAC…240VAC 50/60Hz +/-10%
DC: 24VDC +/-10% 3-phase: 380...480VAC 50/60Hz +-10%

### Motor
PM-motor Controlled via BLDC motor control board
Isolation class F

### Absolut encoder
(magnetic based) for high percion control with an accuracy of 0,1%

### Operation mode
CMxx: ON/OFF duty S2-15min & class A and B rCMxx: Modulating duty S4-1200 cycles/hour with 40% duty cycle & class C

### Local control
Selector switch LOCAL-OFF-REMOTE - lockable
Control switch OPEN-STOP-CLOSE Large LC-display for detailed visualization of status information & parameters - different languages selectable Red display backlight for alarms 5 RGB LEDs for status indication & control information Cover lid with display in 90° steps rotatable Bluetooth & infrared interface for data exchange and actuator control with Android App or Windows PC

### Remote control
5 binary inputs 24VDC: Open - Stop - Close - Emergency Open - Emergency Close, free programmable, 24VDC rated voltage with common ground potential, inputs with jumpers configurable in groups with separated commons

### Status signals
8 binary outputs 24VDC: Ready - Open - Closed - Opening - Closing - Torque - Local - Remote, free programmable, 24VDC supply, max. load 0,5A/channel

### Handwheel
Optional

### Explosion protection
Protection class Ex II 2 G Ex de IIC T4
Certifications ATEX, IECEx, NEC

### Features
Free programmable step mode control for open and close
4 intermediate positions definable Actuator torque adjustable beetween 25-100% from max. torque Alternative menu structure available Different user levels selectable Counter values for preventive Maintanance notification

### Valve connection
Flange and output shaft according ISO 5210

### Electric connectors
Power connection via 10pole screw plug Han10E+PE
Control and status signals via 24pole screw plug Han24E
Metric cable entries for cable glands, closed with dummy glands
Ex-design: terminal block

### Ambient temperature
-25°C up to +60°C, extended temperature range on request

### Enclosure protection
IP67 according EN 60 529, IP68 on request

### Corrosion protection
C2 according EN ISO 12944-5 for installation in aggressive atmosphere, C3 to C5 on request

### Color
RAL7024 - graphite grey, all others on request

# CM Failsafe Linear

## Modulating-Duty / On-Off-Duty / up to 85 kN and 170 mm

### Failsafe Actuators for Shut-Off Valves

| Size | | (r)CM03 FS 30/5 | (r)CM03 FS 50/8 | (r)CM03 FS 100/12 | (r)CM06 FS 100/30 | (r)CM06 FS 170/25 | (r)CM12 FS 120/45 |
|---|---|---|---|---|---|---|---|
| Electric force for valve against FS Direction | kN | 8 | 19 | 16 | 22 | 22 | 56 |
| Max. force S4-operation | kN | 5 | 10 | 12 | 15 | 15 | 30 |
| Max. force S9-operation | kN | 3 | 7 | 8 | 10 | 10 | 20 |
| Spring remaining torque in failsafe mode | kN | 5 | 8 | 12 | 30 | 25 | 45 |
| Max.valve stroke | mm | 30 | 50 | 100 | 100 | 170 | 120 |
| Stroke speed electrical, adjustable | mm/sec | 0,21-5,83 | 0,21-5,83 | 0,21-5,83 | 0,13-3,93 | 0,13-3,93 | 0,16-4,53 |
| Stroke speed electrical, adjustable 24VDC | mm/sec | 0,21-5,83 | 0,21-5,83 | 0,21-5,83 | 0,21-1,62 | 0,21-1,62 | -- |
| Stroking time in failsafe mode | sec | 1-5 | 1-5 | 2-10 | 4-15 | 4-15 | 5-10 |
| Valve flange | ISO 5210 | F10 | F10 | F10&F14 | F10&F14 | F10&F14 | F14 |
| Weight | kg | 80 | 99 | 104 | 159 | 165 | 312 |
| Failsafe direction / Failsafe action | | spindle extending close / spindle retracting open | | | | | |
| Power supply Failsafe brake – 24VDC | A | 0,67A (16W) | | | 0,875A (21W) | | 1,17A (28W) |
| Power supply 1ph (Standard) | | AC: 1phase 100VAC…240VAC 50/60Hz +/-10% | | | | | |
| Nominal current @1x230VAC | A | 1,47A (16Nm / 72rpm) | | 2,17A (20Nm / 60rpm) | | | 3,8A (40Nm / 70rpm) |
| Power supply 3ph (Option) | | AC: 3phase 380...480VAC 50/60Hz +/-10% | | | | | |
| Nominal current @3x400VAC | A | 0,46A (16Nm / 72rpm) | | 0,9A (32Nm / 60rpm) | | | 1,4A (64Nm/60rpm) |
| Power supply 24VDC (Option) | | DC: 24VDC +/-10% | | | | | -- |
| Nominal current | A | 4,6A (10Nm / 20rpm) | | 9,2A (32Nm / 20rpm) | | | -- |

### Failsafe Actuators for Reverse Acting Gate Valves

| Size | | (r)CM03 FS 80/4 | (r)CM06 FS 80/4 | (r)CM12 FS 120/20 |
|---|---|---|---|---|
| Electric force for valve against FS Direction | kN | 23 | 46 | 85 |
| Max. force S4-operation | kN | 8 | 15 | 30 |
| Max. force S9-operation | kN | 5 | 10 | 20 |
| Spring remaining torque in failsafe mode | kN | 4 | 4 | 20 |
| Max.valve stroke | mm | 30 | 100 | 120 |
| Stroke speed electrical, adjustable | mm/sec | 0,21-5,83 | 0,13-3,93 | 0,16-4,53 |
| Stroke speed electrical, adjustable 24VDC | mm/sec | 0,21-5,83 | 0,21-1,62 | -- |
| Stroking time in failsafe mode | sec | 1-5 | 4-15 | 5-10 |
| Valve flange | ISO 5211 | F10 | F10&F14 | F14 |
| Weight | kg | 49 | 56 | 258 |
| Failsafe direction / Failsafe action | | spindle retracting close / spindle extending open | | |
| Power supply Failsafe brake – 24VDC | A | 0,67A (16W) | 0,875A (21W) | 1,17A (28W) |
| Power supply 1ph (Standard) | | AC: 1phase 100VAC…240VAC 50/60Hz +/-10% | | |
| Nominal current @1x230VAC | A | 1,47A (16Nm / 72rpm) | 2,17A (20Nm / 60rpm) | 70rpm) |
| Power supply 3ph (Option) | | AC 3~380-480V 50/60Hz +/-10% | | |
| Nominal current @3x400VAC | A | 0,46A (16Nm / 72rpm) | 0,9A (32Nm / 60rpm) | 1,4A (64Nm/60rpm) |
| Power supply 24VDC (Option) | | DC: 24VDC +/-10% | | -- |
| Nominal current | A | 4,6A (10Nm / 20rpm) | 9,2A (32Nm / 20rpm) | -- |

**All informations are subject to change without notice. Values provided for guidance only.**
**Due to production tolerance variation, the electrical values are averages compiled from actuator production test data.**

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# failsafe series

## 90° Failsafe

### Modulating-Duty / On-Off-Duty up to 12.000 Nm


### Power supply
AC: 1phase 100VAC…240VAC 50/60Hz +/-10%
DC: 24VDC +/-10% 3-phase: 380...480VAC 50/60Hz +-10%

### Motor
PM-motor Controlled via BLDC motor control board
Isolation class F

### Absolut encoder
(magnetic based) for high percion control with an accuracy of 0,1%

### Operation mode
CMxx: ON/OFF duty S2-15min & class A and B rCMxx: Modulating duty S4-1200 cycles/hour with 40% duty cycle & class C

### Local control
Selector switch LOCAL-OFF-REMOTE - lockable
Control switch OPEN-STOP-CLOSE Large LC-display for detailed visualization of status information & parameters - different languages selectable Red display backlight for alarms 5 RGB LEDs for status indication & control information Cover lid with display in 90° steps rotatable Bluetooth & infrared interface for data exchange and actuator control with Android App or Windows PC

### Remote control
5 binary inputs 24VDC: Open - Stop - Close - Emergency Open - Emergency Close, free programmable, 24VDC rated voltage with common ground potential, inputs with jumpers configurable in groups with separated commons

### Status signals
8 binary outputs 24VDC: Ready - Open - Closed - Opening - Closing - Torque - Local - Remote, free programmable, 24VDC supply, max. load 0,5A/channel

### Handwheel
Optional

### Explosion protection
Protection class Ex II 2 G Ex de IIC T4
Certifications ATEX, IECEx, NEC

### Features
Free programmable step mode control for open and close
4 intermediate positions definable Actuator torque adjustable beetween 25-100% from max. torque Alternative menu structure available Different user levels selectable Counter values for preventive Maintanance notification

### Valve connection
Flange and output shaft according ISO 5211

### Electric connectors
Power connection via 10pole screw plug Han10E+PE
Control and status signals via 24pole screw plug Han24E
Metric cable entries for cable glands, closed with dummy glands
Ex-design: terminal block

### Ambient temperature
-25°C up to +60°C, extended temperature range on request

### Enclosure protection
IP67 according EN 60 529, IP68 on request

### Corrosion protection
C2 according EN ISO 12944-5 for installation in aggressive atmosphere, C3 to C5 on request

### Color
RAL7024 - graphite grey, all others on request

# 90° Failsafe

## Modulating-Duty / On-Off-Duty / up to 12.000 Nm

| Size | | (r)CM03 FSQT 30 | (r)CM03 FSQT 60 | (r)CM06 FSQT 100 | (r)CM06 FSQT 200 | (r)CM06 FSQT 300 | (r)CM06 FSQT 500 |
|---|---|---|---|---|---|---|---|
| Max. torque electric mode | Nm | 300 | 600 | 1000 | 2000 | 3000 | 5000 |
| Max. modulating torque rCM | Nm | 150 | 300 | 500 | 1000 | 1500 | 2500 |
| Spring remaining torque in failsafe mode | Nm | 150 | 300 | 500 | 1000 | 1500 | 2500 |
| Stroking time 90° electric mode (adjustable) | sec | 15-400 | 15-400 | 20-500 | 30-650 | 30-650 | 44-650 |
| Stroking time 90° electric mode (24VDC) | sec | 54-400 | 54-400 | 60-500 | 90-650 | 90-650 | 132-650 |
| Stroking time 90° in failsafe mode | sec | 1-5 | 1-5 | 1-5 | 2-10 | 3-15 | 5-20 |
| Valve flange | ISO 5211 | F07&F10 | F10&F12 | F12&F14 | F14&F16 | F14&F16 | F16&F25 |
| Max. Ø valve shaft with bushing | mm | 25 | 40 | 49 | 60 | 60 | 75 |
| Max. valve square with bushing | mm | 22 | 32 | 41 | 46 | 46 | 60 |
| Max. valve stem length | mm | 80 | 99 | 104 | 124 | 127 | 127 |
| Weight | kg | 43 | 53 | 140 | 200 | 215 | 353 |
| Failsafe direction / Failsafe action | | cw close / ccw open / cw open / ccw close | | | | | |
| Power supply Failsafe brake – 24VDC | A | 0,67A (16W) | | | 0,875A (21W) | | 1,17A (28W) |
| Power supply 1ph (Standard) | | AC: 1phase 100VAC…240VAC 50/60Hz +/-10% | | | | | |
| Nominal current @1x230VAC | A | 1,47A (16Nm / 72rpm) | | 2,17A (20Nm / 60rpm) | | | |
| Power supply 3ph (Option) | | AC: 3phase 380...480VAC 50/60Hz +/-10% | | | | | |
| Nominal current @3x400VAC | A | 0,46A (16Nm / 72rpm) | | 0,9A (32Nm / 60rpm) | | | |
| Power supply 24VDC (Option) | | DC: 24VDC +/-10% | | DC: 24VDC +/-10% | | | |
| Nominal current | A | 4,6A (10Nm / 20rpm) | | 9,2A (32Nm / 20rpm) | | | |

| Size | | (r)CM12 FSQT 800 | (r)CM12 FSQT 1200 |
|---|---|---|---|
| Max. torque electric mode | Nm | 8000 | 12000 |
| Max. modulating torque rCM | Nm | 4000 | 6000 |
| Spring remaining torque in failsafe mode | Nm | 4000 | 6000 |
| Stroking time 90° electric mode (adjustable) | sec | 57-1555 | 70-1885 |
| Stroking time 90° in failsafe mode | sec | 10-30 | 10-30 |
| Valve flange | ISO 5211 | F25&F30 | F30&F35 |
| Max. Ø valve shaft with bushing | mm | 120 | 120 |
| Max. valve square with bushing | mm | 90 | 90 |
| Max. valve stem length | mm | 200 | 200 |
| Weight | kg | 602 | 950 |
| Failsafe direction / Failsafe action | | cw close / ccw open / cw open / ccw close | |
| Power supply 1ph (Standard) | | AC: 1phase 100VAC…240VAC 50/60Hz +/-10% | |
| Nominal current @1x230VAC | A | 3,8A (40Nm / 70rpm) | |
| Power supply 3ph (Option) | | AC: 3phase 380...480VAC 50/60Hz +/-10% | |
| Nominal current @3x400VAC | A | 1,4A (64Nm/60rpm) | |

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