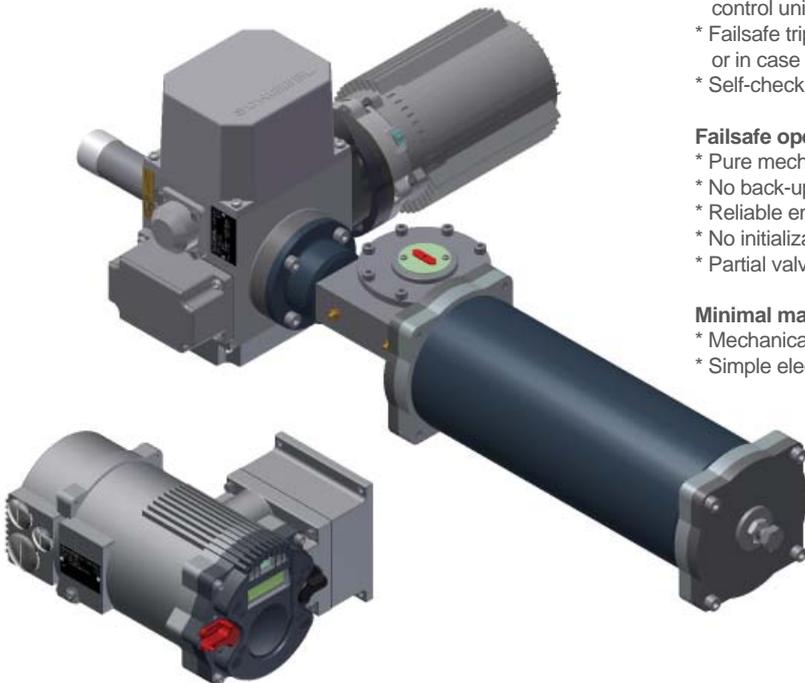


## ■ DATA SHEET

### AB.. FSQT .. CSC CSZ1 CSZx

# 90° Failsafe actuator with Smartcon actuator control unit



#### 90° part-turn failsafe actuator

- \* Reliable drive in safe position through a mechanical energy store
- \* Direct intervention of mechanical energy store on valve shaft and full actuator control unit override in case of a failsafe drive
- \* Failsafe tripping in case of a 24VDC failsafe power supply (holding brake) cut-off or in case of a main power supply cut-off available
- \* Self-check of failsafe function with each electrical drive

#### Failsafe operation

- \* Pure mechanical solution without any additional physical medium
- \* No back-up power supply or battery required
- \* Reliable energy store with a long lifetime through disc springs
- \* No initialization stroke after failsafe drive necessary
- \* Partial valve stroke test possible

#### Minimal maintenance costs

- \* Mechanical energy store construction for full actuator lifetime
- \* Simple electrical and mechanical actuator design

#### Actuator control unit

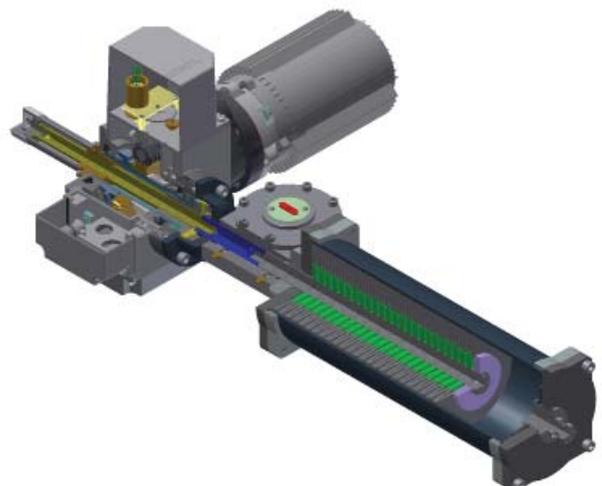
- \* Simple implementation in PLC system
- \* Many integrated software options, i.e. minimal effort in case of later PLC signal adaptations
- \* Customer specific functions in short time activatable
- \* Different fieldbus interfaces available

#### Construction

- \* Maintenance-free
- \* Rebuilding of failsafe function (Open/Close) possible
- \* No handwheel for highest priority of failsafe function and tamper-proof
- \* Adjustable mechanical end stop in failsafe direction

## ■ TECHNICAL DATA

Torque electric:	up to 30 000Nm
Spring torque in failsafe position:	up to 18 000Nm
Operating time electric:	approx. 6-30sec (depending on construction size)
Operating time failsafe mode:	approx. 3-60sec (load-dependent)
Power supply:	3x400VAC +/-10%
Failsafe Haltebremse:	24VDC
Electric equipment:	Smartcon actuator control unit



type	max. electric torque	max. spring torque in failsafe position	Electric operating time	Failsafe operating time 1)	valve flange
	[Nm]	[Nm]	[sec]	[sec]	ISO 5211
AB5 FSQT 05 CSC CSZ1	50	25	6	3 up to 12	F05   F07   F10
AB5 FSQT 10 CSC CSZ1	100	50	6	3 up to 12	F07   F10
AB5 FSQT 20 CSC CSZ1	200	100	6	3 up to 12	F07   F10
AB5 FSQT 30 CSC CSZ1	300	200	9	5 up to 20	F10
AB8 FSQT 50 CSC CSZ1	500	300	9	5 up to 20	F10   F12
AB8 FSQT 80 CSC CSZ1	800	500	12	6 up to 24	F12
AB8 FSQT 100 CSC CSZ1	1 000	600	15	8 up to 30	F12   F14
AB8 FSQT 200 CSC CSZ1	2 000	1 200	20	10 up to 40	F12   F14
AB18 FSQT 300 CSC CSZ1	3 000	2 000	20	10 up to 40	F14
AB18 FSQT 450 CSC CSZ1	4 500	2 300	20	10 up to 40	F16
AB40 FSQT 600 CSC CSZ1	6 000	3 750	30	15 up to 60	F16
AB40 FSQT 900 CSC CSZ1	9 000	4 500	30	15 up to 60	F25
AB40 FSQT 1000 CSC CSZ1	10 000	5 600	30	15 up to 60	F25
AB40 FSQT 1200 CSC CSZ1	12 000	8 000	30	15 up to 60	F25   F30
AB200 FSQT 1700 CSC CSZ1	17 000	11 000	30	15 up to 60	F30
AB200 FSQT 3000 CSC CZZ1	30 000	18 000	30	15 up to 60	F40

1) The failsafe operating time depends on the real valve torque load and valve type

### General information

Failsafe function	Opening (ccw) or Closing (cw) the valve (has to be defined)
Failsafe drive	In case of 24VDC failsafe power supply cut-off or loss of main power supply
Swing angle	90° with mechanical adjustable end stop in failsafe direction
Operation mode	Short-time duty S2-15min (On/Off duty)
Handwheel	without handwheel (for tamper-proof failsafe drive) - Handwheel as an option available (on request)
Position indicator	Mechanical position indicator to indicate valve position

### Valve mounting

Valve flange	Flange according to ISO 5210, depending on failsafe type and valve type
Output machining	two-flat, square or cylindrical bore with keys depending on valve shaft

### Service conditions

Enclosure protection according EN 60529	actuator: IP54 control unit: IP67
Ambient temperature	-25°C up to +60°C
Corrosion protection	K2 for installation in power plants, industries- and waste water plants with aggressive atmosphere
Painting / Colour	2 components painting / RAL7030 stone grey

### Motor

Insulation class	Insulation class F, max. 155°C permanent temperature
Main power supply	3x400V asynchronous motor +/-10%; 50Hz
Brake power supply	24VDC

### Smartcon actuator control unit CSC

Local control unit	
Design CSZ1	assembling set actuator-control unit (without cable) for separate on-site mounting
Cable connection CSZx	Connection cable actuator-control unit - cable length as required
Control elements	with additional language independent symbols Selector switch LOCAL - OFF - REMOTE, contact free with GMR-technology (lockable) Control switch OPEN - STOP - CLOSE, contact free with GMR-technology
Indication	lighted LC-display
Signal lamps	4 LED's for operation-, readiness-, warning- and error-messages
Communication	Infrared communication interface for programming and saving operation data

### Control

Inputs	5 binary control inputs: OPEN - STOP - CLOSE - EMERGENCY OPEN - EMERGENCY CLOSE - free parametrizable Power supply: 24VDC (max. 30VDC) - current consumption with 24VDC: typical 5mA The common ground of the inputs is optical isolated from the rest of the electronic.
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## Status indication to PLC system

Outputs	<p>8 binary outputs: READY - OPEN - CLOSE - RUNNING OPEN - RUNNING CLOSE - TORQUE - LOCAL - REMOTE - free parametrizable</p> <p>power supply 24VDC +/- 6V (per actuator or through control system):</p> <p>max. allowed current per output: 50mA (short-circuit-proof)</p> <p>max. allowed current for all outputs with power supplied by actuator: 150mA</p> <p>max. allowed current for all outputs with power supplied by control system: 250mA</p> <p>All outputs are optical isolated if power is supplied by control system.</p>
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## Voltage In- & Output

Power supply - external	Input power range: 20-30VDC max. current consumption 320mA or 100mA in current save mode - status indication also in case of a main power supply failure.
Power supply - by actuator	Output voltage: typical 22V, max. output current 150mA Reference ground is the common ground of the control unit and of the analog inputs and outputs

## Functions

Standard	<p>Switch-off mode adjustable: travel- or torque dependent, according to valve type</p> <p>Torque adjustable: 25-100% of max. torque</p> <p>4 intermediate positions between 0 and 100% in both directions parametrizable</p> <p>Step-mode operation with adjustable step-start, step-stop, running- &amp; break time in both directions</p> <p>Writing- and reading protection via password</p> <p>Multi-lingual display indication: German - English - Czech - Russia - Danish, ...</p> <p>Status indication of binary inputs and outputs and also of the analog signals on LC-display</p> <p>History data for Service-planning and Error-analyses</p> <p>Motor protection with thermoswitches</p>
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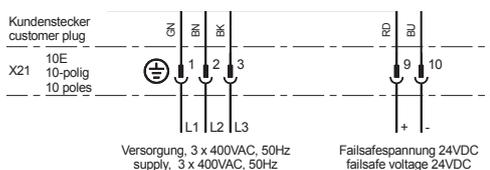
## Electrical connection

Motor	Industry-screw plug Han10E with 10pols in round plug casing
Control signals	Industry-screw plug Han24E with 24pols in round plug casing
Threads for cable entries	3 metric threads for cable glands: M40x1,5 / M32x1,5 / M25x1,5

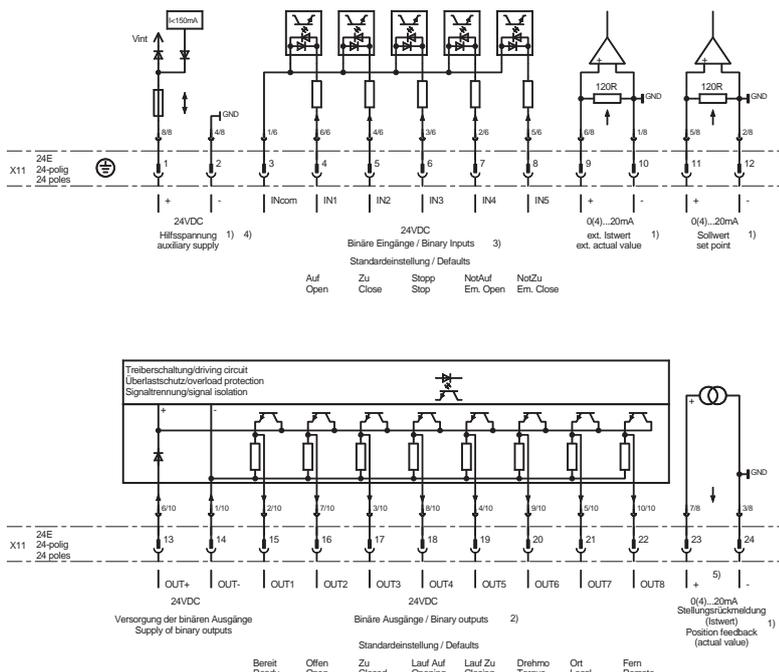
## Important Options

- Handwheel for emergency operation against failsafe direction	- positioner for analog 0/4-20mA input signal from control system
- Low temperature design up to -60°C	- PID positioner for 2 input signals 0/4-20mA (setpoint, external actual value)
- High temperature design up to 100°C	- Signal isolator for galvanic isolation of position feedback signal
- Fieldbus interface (Profibus DP-V0, DeviceNet, Powerlink, Modbus TCP)	- Signal isolator for galvanic isolation of positioner signal
- Relay board for 250VAC, 2A with 4 or 8 outputs	- Higher actuator protection degree on request
- Analog position indication 0/4-20mA (2-wire, activ signal)	- Other main power supply voltages on request

### Typical power supply wiring:



### Typical control wiring:



## Functional description AB.. FSQT.. failsafe actuator

In normal shifting operation, a three-phase motor (1) equipped with an electromagnetic brake with positive operation (positive action brake) (2), powers the 3-gear, non-self-locking worm gear (3) of the actuator via an intermediate spur gear (4). During shifting, the operating current brake is open (de-energized = no braking).

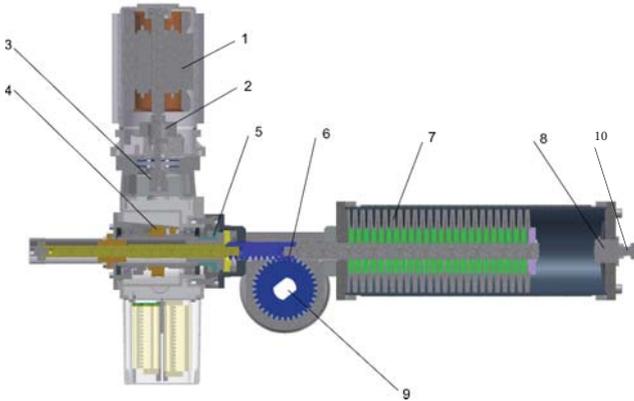
The drive shaft of the worm gearing is positive locked and torsion-proof keyed to the nut of a spherical spindle drive (5), which has axial roller bearings for the absorption of the resulting forces.

The spherical spindle drive transforms the rotational movement of the gear into an axial (linear) movement (thrust). On the one hand, the linear movement is transferred to the valve shaft (9) via a 90°-gearing (rack and pinion gear) (6) and on the other, to the energy storage mechanism (disc spring package) (7). There are no disengaging or engaging parts between the three-phase motor, the valve shaft and the energy store, with the result of a permanent power flow. During the opening movement of the valve, the three-phase motor must supply the shifting power required for the valve shaft, while also charging or preloading the energy store for fail safe switching.

A discharge from the energy store is prevented by the holding power of the brake. A discharge is only possible if the motor is running free and can be driven or pulled (reversed power flow as in the case of an electric motor opening thrust, actuated by the unloading of spring tension in the energy store). The positive action brake holds the valve in the position despite the stored fail safe energy.

In the case of fail safe switching, the operating current supply of the motor brake is interrupted.

The tension on the accumulator disc springs eases and moves the thrust spindle (also simultaneously turning the nut of the spherical spindle drive, which in turn pulls the 3-gear worm gearing and the spur gears of the three-phase motor) until a mechanic end position buffer (8) is reached, which mechanically limits, or ends the movement. This mechanic end position buffer is combined with the adjustable mechanical end stop (10), which allows to preset the fail-safe position.



- 1...three-phase motor
- 2...electromagnetic brake
- 3...intermediate spur gear
- 4...non-self-locking worm gear
- 5...spherical spindle drive
- 6...rack and pinion gear
- 7...disc spring package
- 8...end position buffer
- 9...valve shaft
- 10...mechanical end stop

## Dimension overview 90° failsafe actuators AB-series

