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Actuator IC 50

OPERATING INSTRUCTIONS

Cert. Version · Edition 04.22 · EN · 03251384

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1 SAFETY

1.1 Please read and keep in a safe place

Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.docuthek.com.

1.2 Explanation of symbols

1, **2**, **3**, **a**, **b**, **c** = Action

➔ = Instruction

1.3 Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

1.4 Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

⚠ DANGER
Indicates potentially fatal situations.

⚠ WARNING
Indicates possible danger to life and limb.

⚠ CAUTION
Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

1.5 Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

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2 CHECKING THE USAGE

2.1 Intended use

Actuator IC 50 is designed for all applications that require precise, controlled rotary movement between 0° and 90°. If the voltage is disconnected, the actuator stops in its current position. The combination of actuator IC 50 and butterfly valve DKR or BVA/BVG is designed to adjust volumes of hot air and flue gas on various appliances and flue gas lines.

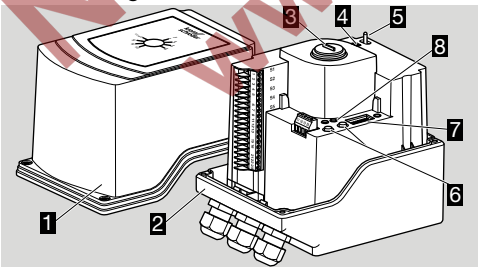
This function is only guaranteed when used within the specified limits – see page 8 (10 Technical data). Any other use is considered as non-compliant.

For information on butterfly valves DKR and BVA/BVG, see www.docuthek.com, Butterfly valve DKR and Butterfly valve BV.. operating instructions.

2.2 Type code IC 50

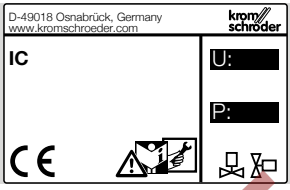
IC 50	Actuator
	Running time [s]/Adjustment angle [90°]
-03	3.7/90
-07	7.5/90
-15	15/90
-30	30/90
-60	60/90
	Mains voltage
W	230 V AC, 50/60 Hz
Q	120 V AC, 50/60 Hz
H	24 V AC, 50/60 Hz
	Torque
3	3 Nm
7	7 Nm
15	15 Nm
20	20 Nm
30	30 Nm
E	Controlled by continuous signal
T	Three-point step control
R10	With 1000 Ω feedback potentiometer

2.3 Part designations



1 Housing cover
2 Cover
3 Angle-of-rotation indicator
4 Slide switch (S10/S12)
5 Toggle switch (S11)
IC 50..E:
6 min/max buttons
7 DIP switches
8 Red and blue LEDs

2.4 Type label



Mains voltage, electrical power rating, enclosure, ambient temperature, torque and installation position – see type label.

2.5 IC 50 on butterfly valve DKR

Pre-assembled combinations of actuator IC 50 and butterfly valve DKR are available as models IDR up to nominal size DN 300.

Type	IDR + attachment set
IDR..GD	IDR + attachment set with linkage (DKR..D)
IDR..GDW	IDR + attachment set with linkage and heat deflector (DKR..D)
IDR..GA	IDR + attachment set with linkage (DKR..A)
IDR..GAW	IDR + attachment set with linkage and heat deflector (DKR..A)
IDR..AU	IDR + attachment set for axial mounting (IC 50 above the pipe)
IDR..AS	IDR + attachment set for axial mounting (IC 50 to the side of the pipe)

2.6 IC 50 on butterfly valves BVA/BVG

For the assembly of BVA/BVG and IC 50, an adapter set can be supplied, see page 2 (3 Installation).

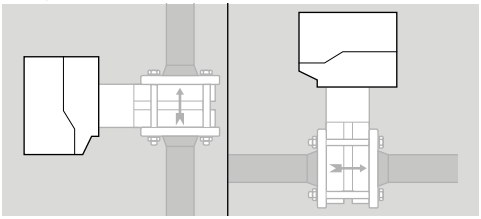
3 INSTALLATION

⚠ CAUTION

Please observe the following to ensure that the unit is not damaged during installation:

– Dropping the device can cause permanent damage. In this event, replace the entire device and associated modules before use.
– Do not store or install the unit in the open air.

➔ Installation in the vertical or horizontal position, not upside down.



➔ Do not insulate the actuator with thermal insulation.

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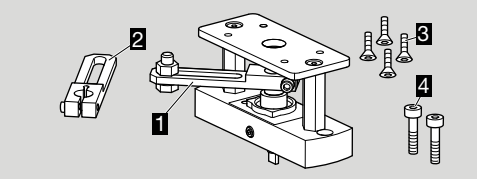
Installing IC 50 onto butterfly valve DKR

➔ For the assembly of actuator with butterfly valve and attachment sets, and for installation in a pipe, see Butterfly valve DKR operating instructions.

Installing IC 50 onto butterfly valves BVA/BVG

An adapter set can be supplied for the assembly of BVA/BVG and IC 50.

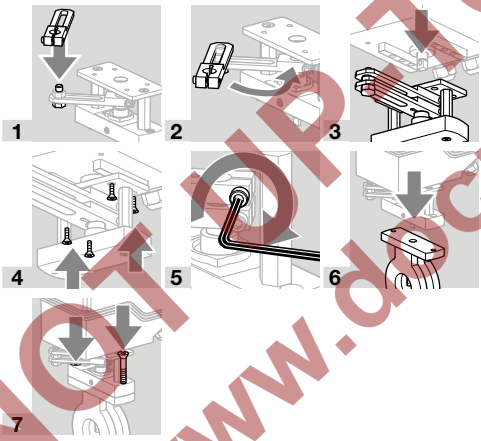


Order No.: 74926243.

1 Adapter set IC 50
2 Top oblong-hole lever for actuator IC 50
3 4 x M5 countersunk screws
4 2 x M6 set screws

➔ The actuator can be turned through 180° to be installed on the adapter set.

➔ Ensure that the connection cables are laid outside the levers' range of motion.



➔ For information on how to install the butterfly valve in the pipework, see Butterfly valve BV.. operating instructions.

4 WIRING

⚠ DANGER

Electric shocks can be fatal!

– Before working on possible live components, ensure the unit is disconnected from the power supply.
– It must be possible to isolate the actuator from the power supply. Provide a double pole switch.

➔ Use temperature-resistant cables (≥ 90°C).

➔ Install supply and signal lines separately.

➔ Cables should be installed well away from high-voltage lines of other devices.

➔ Observe EMC Directive for installation of signal lines.

➔ Conductors which have not been connected (spare conductors) must be insulated at their ends.

➔ Use cables with wire end ferrules.

➔ Cable cross-section: max. 2.5 mm².

➔ When operating two or more actuators in parallel, the three-point step controller (terminals 1 and 2) must be electrically isolated to avoid leakage currents. We recommend using relays.

➔ Interference suppression capacitors installed in the system must only be used in conjunction with a series resistor so as not to exceed the maximum current – see page 8 (10 Technical data).

➔ Running times are reduced by a factor of 0.83 at 60 Hz compared to 50 Hz.

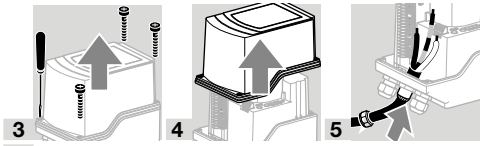
➔ External devices can be activated or intermediate positions can be checked via three additional, floating, infinitely adjustable switches (cams S1, S2 and S5).

➔ The input signals for the actuator can be set via DIP switches. DIP switch positions that are not indicated can be freely selected, see connection diagram for IC 50..E.

1 Disconnect the system from the electrical power supply.

2 Shut off the gas supply.

➔ Before opening the unit, the fitter should ground himself.



6 Wire as shown on the connection diagram for IC 50 or IC 50..E.

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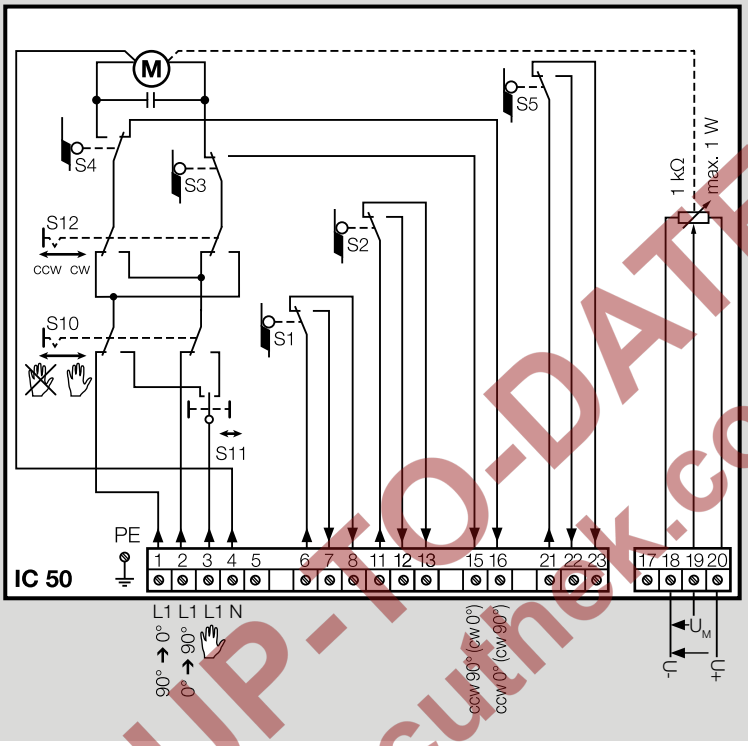


IC 50 connection diagram

a Set switch S10 to Automatic mode.

➔ Voltage is applied to terminals 3 and 4.

Three-point step control

In the case of default setting “Closed”:
the butterfly valve opens when voltage is applied to terminal 2.
The butterfly valve closes when voltage is applied to terminal 1.

➔ Terminals 6 to 13 must be operated with the same voltage potential.

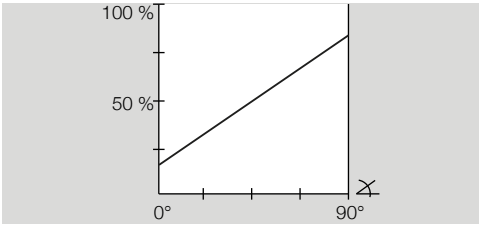
Feedback:

➔ A feedback potentiometer offers the option of monitoring the current position of the actuator.

➔ The potentiometer must be utilized as a voltage divider. The change in position of the potentiometer wiper (which corresponds to the actuator position) can be measured as a changing voltage between U_- and U_M.

➔ Other circuit layouts produce measurement results that are inaccurate and do not remain stable over a long period of time or are non-reproducible. They also reduce the service life of the feedback potentiometer.

➔ The available range depends on the adjustment of switching cams S3 and S4.



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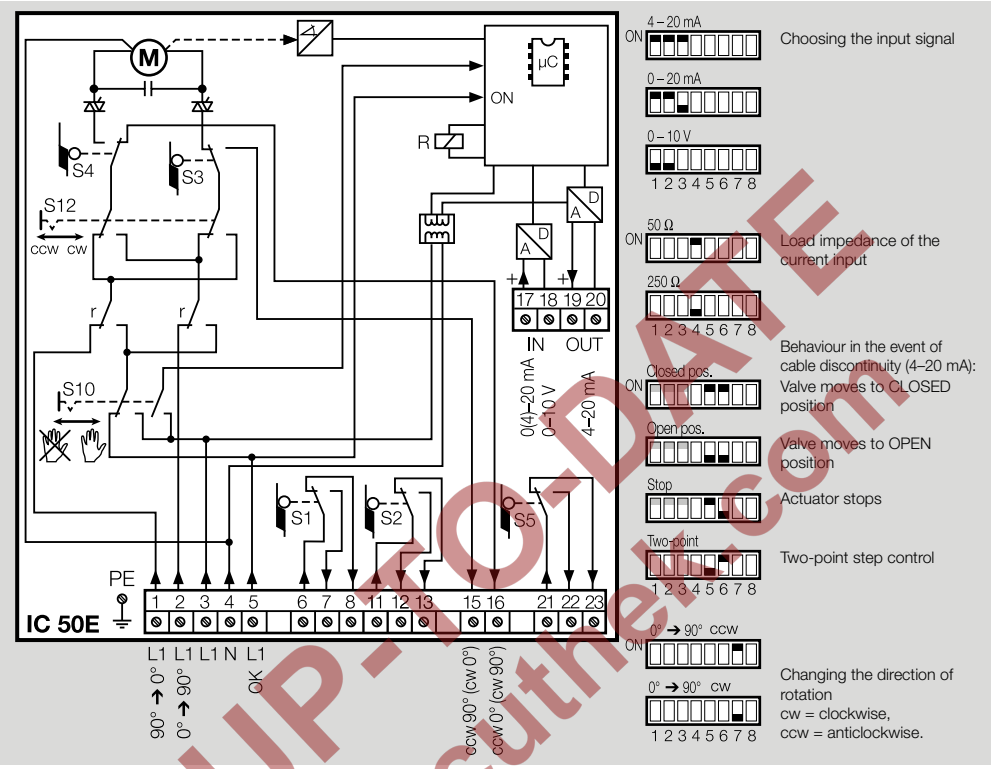


IC 50..E connection diagram

a Set switch S10 to Automatic mode.

➔ Voltage is applied to terminals 3 and 4.

Three-point step control

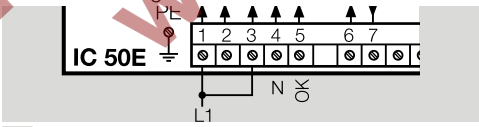
➔ No voltage at terminal 5: three-point step control.

➔ Voltage must be applied to terminals 3 and 4 continuously.

➔ The low-fire rate (CLOSED) and the high-fire rate (OPEN) are controlled via terminals 1 and 2.

Two-point step control

b Connect bridge between terminals 1 and 3.



c Set the DIP switches to 2-point step control.

➔ When voltage is applied to terminal 5, the actuator opens. When no voltage is applied to terminal 5, the actuator closes.

➔ Terminals 17 and 18 for continuous control are not required in the case of 2-point control.

Continuous control

➔ Voltage at terminal 5: continuous control.

➔ The actuator reacts to the setpoint specification (0 (4)–20 mA, 0–10 V) via terminals 17 and 18.

➔ The continuous signal corresponds to the adjustment angle to be approached (e.g. with a 0 to 20 mA signal, 10 mA correspond to a valve angle of 45°).

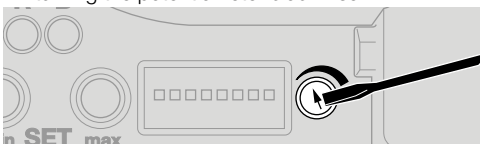
4.1 Feedback

➔ Terminals 19 and 20: the IC 50..E offers the option of monitoring the current position of the actuator via the continuous 4–20 mA output signal.

4.2 Input signal

➔ The positioning control hysteresis can be adjusted on a potentiometer to suppress fluctuations or interference in the input signal.

➔ The hysteresis can be increased accordingly by turning the potentiometer clockwise.



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5 COMMISSIONING

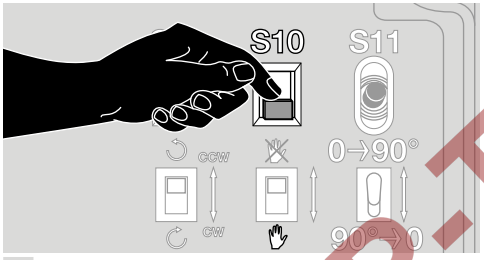
→ The maximum opening angle of the valve can be set using switching cam S3 and the minimum opening angle can be set using S4.
→ Switching cams S1/S2/S5 can be optionally adjusted.

⚠ DANGER

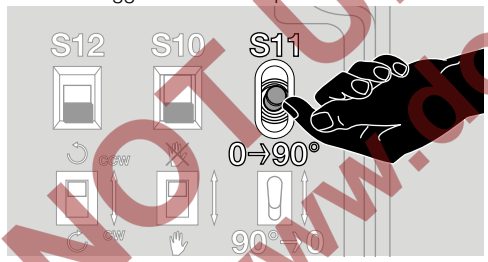
Electric shocks can be fatal!
– Before working on possible live components, ensure the unit is disconnected from the power supply.

Manual mode facilitates setting

→ The positions in the low-fire rate range can be precisely adjusted.
1 Set slide switch S10 to Manual mode. The blue LED lights up.



2 Voltage must be continuously applied to the actuator to allow the valve to open.
3 Press toggle switch S11 upwards.



→ The valve opens.
4 Press toggle switch S11 downwards.
→ The valve closes.

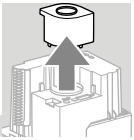
⚠ CAUTION

Please observe the following to ensure that the actuator is not damaged:
The function of switching cams S3/S4 changes if the direction of rotation ccw/cw (anticlockwise/clockwise) is modified.
– ccw (factory setting): S3 = maximum angle, S4 = minimum angle.
– cw: S3 = minimum angle, S4 = maximum angle.

→ The factory setting ccw is described here.

Setting the maximum opening angle using switching cam S3 (ccw)

→ Only adjust S3 between 40° and 90°.
→ Feedback signal to terminal 15.
→ S3 can only be accessed when the valve is in an open position.
1 Move the actuator to its maximum opening angle.



2
3 Adjust the trip point of cam S3 using a screwdriver.

ccw:
Anticlockwise = smaller opening angle.
Clockwise = greater opening angle.
cw:
Anticlockwise = greater opening angle.
Clockwise = smaller opening angle.

⚠ CAUTION

Remove the screwdriver again before attempting to actuate the switching cams.

Setting the minimum opening angle using switching cam S4 (ccw)

→ Only adjust S4 between 0° and 30°.
→ Feedback signal to terminal 16.
4 Move the actuator to its minimum opening angle.
5 Adjust the trip point of cam S4 using a screwdriver.

Adjusting switching cams S1/S2/S5

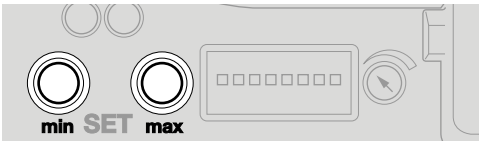
6 Adjust the trip point of cams S1/S2/S5 using a screwdriver.
→ The cams can be adjusted over the full angle of rotation (0–90°) of the actuator.

IC 50..E, continuous control: adapting the input signal to the adjustment angle

→ Maximum input signal = maximum angle. Minimum input signal = minimum angle.
→ The IC 50..E is in Manual mode and the blue LED is lit.

Automatic calibration

→ The minimum and maximum opening angle corresponds to the setting of switching cams S3 and S4 in the case of automatic calibration.
1 Press the min and max buttons simultaneously for approx. 3 seconds until the red (R) and blue (B) LEDs flash.



→ Calibration is completed when the blue LED is lit continuously and the red LED goes out.

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Manual calibration

➔ The minimum and maximum opening angle can be anywhere within the range set using switching cams S3 and S4.

1 Move the valve to the required min. position by pressing toggle switch S11.

2 Press the min button (approx. 3 seconds) until the blue LED goes out briefly (approx. 0.5 seconds).

3 Move the valve to the required max. position by pressing toggle switch S11.

4 Press the max button (approx. 3 seconds) until the blue LED goes out briefly (approx. 0.5 seconds).

Characteristic curve inversion

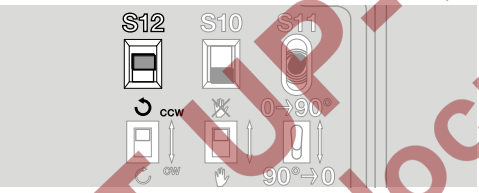
➔ The mA value for low fire has to be greater than the mA value for high fire.

1 Press the min or max button until the red LED lights up briefly (approx. 0.5 seconds) and hold it in for approx. 3 seconds more until the blue LED goes out briefly (approx. 0.5 seconds).

6 CHANGING THE DIRECTION OF ROTATION

IC 50

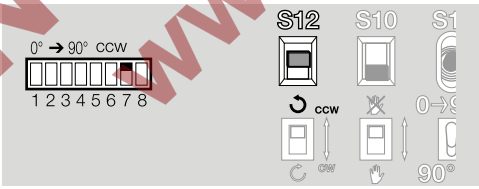
➔ The direction of rotation is defined using slide switch S12.



cw (blue mark on the cover) = valve opens clockwise.
ccw (white mark) = valve opens anticlockwise.

IC 50..E

➔ The direction of rotation is defined using DIP switch 7 and slide switch S12.



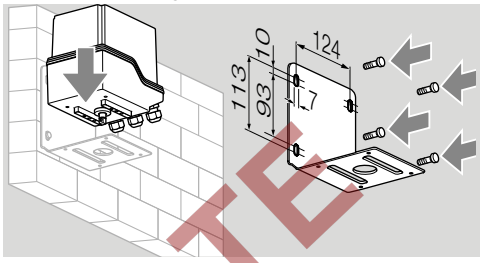
IC 50, IC 50..E

➔ When changing the direction of rotation, these two switches must be set to the same position: cw (blue mark on the cover) and ccw (white mark).

➔ The function of switching cams S3/S4 changes if the direction of rotation (ccw/cw) is modified, see page 6 (5 Commissioning).

7 ACCESSORIES

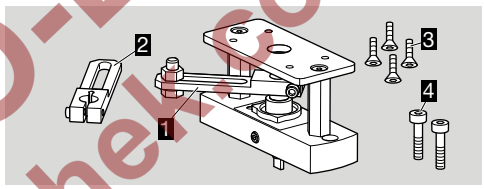
7.1 Wall mounting bracket



The actuator can be attached to a solid structure using the wall mounting bracket.
Order No.: 74924791

7.2 Adapter set IC 50 for BVA/BVG

An adapter set can be supplied for the assembly of BVA/BVG and IC 50.



Order No.: 74926243
1 Adapter set IC 50
2 Top oblong-hole lever for actuator IC 50
3 4 x M5 countersunk screws
4 2 x M6 set screws

8 MAINTENANCE

The products IC 50 suffer little wear and require little servicing. We recommend a function check once a year.

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9 ASSISTANCE IN THE EVENT OF MALFUNCTION

⚠ DANGER

Electric shocks can be fatal!

– Before working on possible live components, ensure the unit is disconnected from the power supply.

⚠ WARNING

To avoid harm to persons and damage to the unit, please observe the following:

– Never remove the circuit board!
– Unauthorized repairs or incorrect electrical connections may cause defects which can cause the butterfly valve to open.

? Fault

! Cause
- Remedy

? The valve disc does not move.

! The actuator is in Manual mode (IC 50..E: blue LED is lit).
- Set slide switch S10 to Automatic mode.

! No voltage at terminal 5.
- Check voltage at terminal 5.

! Motor coil or electronics defective as a result of excessive ambient temperature and/or excessive operating voltage.
- Check ambient temperature and/or operating voltage, see type label or page 8 (10 Technical data).

! Cam trip points maladjusted. S4 has been set to a wider angle than S3 (IC 50..E: red LED lights up, blue LED flashes once if the unit has been automatically calibrated).
- Adjust the trip points, see page 6 (5 Commissioning). Then calibrate the IC 50..E.

! Electrical fault!
- Remember the minimum distance from ignition cables.

IC 50..E

! DIP switch position is incorrect.
- Set correct input signal using the DIP switches.

! The adjustment range has been set too small during manual calibration. The red LED flashes three times.
- Increase adjustment range using min and max buttons, see page 6 (5 Commissioning).

! The input signal on the 4–20 mA setpoint input is < 3 mA. The red LED flashes once.
- Check input signal, remedy cable discontinuity.

? Valve disc moves constantly.

! IC 50..E: current signal fluctuates. The red LED flashes twice.
- Check control loop, if possible, attenuate it.
- Increase the hysteresis using the potentiometer, see page 5 (4.2 Input signal).

! IC 50: 3-point step signal fluctuates.
- Check/adjust the 3-point step controller.

? Is it not possible for the fault to be eliminated with the measures described above?

! IC 50..E: internal error. The red LED lights up, the blue LED flashes twice.
- Remove the unit and return it to the manufacturer for inspection.

10 TECHNICAL DATA

Ambient conditions

Icing, condensation and dew in and on the unit are not permitted.
Avoid direct sunlight or radiation from red-hot surfaces on the unit. Note the maximum medium and ambient temperatures!
Avoid corrosive influences, e.g. salty ambient air or SO_2.
The unit may only be stored/installed in enclosed rooms/buildings.
The unit is suitable for a maximum installation height of 2000 m AMSL.
Ambient temperature: -20 to +60°C, no condensation permitted.
Storage temperature: -20 to +40°C.
Enclosure: IP 65, safety class: I.
This unit is not suitable for cleaning with a high-pressure cleaner and/or cleaning products.

Mechanical data

Medium temperature = ambient temperature.
Housing cover: PC + ABS.
Lower housing section: aluminium.
Angle of rotation: 0–90°, adjustable.
Holding torque = torque.

Electrical data

Mains voltage:
24 V AC, -15/+10%, 50/60 Hz,
120 V AC, -15/+10%, 50/60 Hz,
230 V AC, -15/+10%, 50/60 Hz.
Duty cycle: 100%.
Contact rating of the cam switches:

Voltage	Min. current (resistive load)	Max. current (resistive load)
24–230 V, 50/60 Hz	1 mA	2 A
24 V DC	1 mA	100 mA

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Typical designed lifetime:

Switching current	Switching cycles	
	cos φ = 1	cos φ = 0.3
1 mA	1,000,000	–
22 mA	–	1,000,000
100 mA	1,000,000	–
2 A	100,000	–

1) Typical contactor application (230 V, 50/60 Hz, 22 mA, cos φ = 0.3)

Line entrance for electrical connection:
3 x M20 plastic cable glands.
Screw terminals using the elevator principles for cables up to 4 mm² (single core cables) and for cables up to 2.5 mm² with wire end ferrules.
Three-point step signal to terminals 1 and 2: minimum pulse duration: 100 ms,
minimum pause between 2 pulses: 100 ms.
Running time:

Type	Running time [s/90°]		Torque [Nm]
	50 Hz	60 Hz	50 Hz/60 Hz
IC 50-03	3.7	3.1	3
IC 50-07	7.5	6.25	7
IC 50-15	15	12.5	15
IC 50-30	30	25	20
IC 50-60	60	50	30

IC 50
Power consumption:
16 VA at 60 Hz, 13 VA at 50 Hz.
Resistance of the feedback potentiometer: 1 kΩ, max. 1 W, max. wiper current: 0.1 mA.
IC 50..E
Power consumption:
terminals 1, 2 and 5: 16 VA at 60 Hz, 13 VA at 50 Hz,
terminal 3: 19 VA at 60 Hz, 16 VA at 50 Hz,
in total not exceeding: 19 VA at 60 Hz, 16 VA at 50 Hz.
Feedback output:
electrically isolated, max. 500 Ω load impedance.
The output is always active when mains voltage is applied to terminal 3.
Input: electrically isolated,
4 (0)–20 mA: load impedance switchable between 50 Ω and 250 Ω,
0–10 V: 100 kΩ input resistance.

11 CERTIFICATION

Declaration of conformity

CE

We, the manufacturer, hereby declare that the product IC 50 complies with the requirements of the listed Directives and Standards.
Directives:
– 2014/35/EU – LVD
– 2014/30/EU – EMC
– 2011/65/EU – RoHS II
– 2015/863/EU – RoHS III
Standards:
– EN 60730:2011
The production is subject to the stated conformity assessment procedure pursuant to 2014/35/EU Annex II Module A, 2014/30/EU Annex II Module A.
Elster GmbH
Scan of the Declaration of conformity (D, GB) – see www.docuthek.com

ANSI/CSA approved for 120 V AC

C SA US

Canadian Standards Association – ANSI/UL 429 (7th Edition) and CSA C22.2 No. 139-13

11.1 Eurasian Customs Union

EAC

The products IC 50 meet the technical specifications of the Eurasian Customs Union.

11.2 REACH Regulation

The device contains substances of very high concern which are listed in the Candidate List of the European REACH Regulation No. 1907/2006. See Reach list HTS at www.docuthek.com.

11.3 China RoHS

Directive on the restriction of the use of hazardous substances (RoHS) in China. Scan of the Disclosure Table China RoHS2, see certificates at www.docuthek.com.

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12 LOGISTICS

Transport

Protect the unit from external forces (blows, shocks, vibration).

Transport temperature: see page 8 (10 Technical data).

Transport is subject to the ambient conditions described.

Report any transport damage on the unit or packaging without delay.

Check that the delivery is complete.

Storage

Storage temperature: see page 8 (10 Technical data).

Storage is subject to the ambient conditions described.

Storage time: 6 months in the original packaging before using for the first time. If stored for longer than this, the overall service life will be reduced by the corresponding amount of extra storage time.

13 DISPOSAL

Devices with electronic components:

WEEE Directive 2012/19/EU – Waste Electrical and Electronic Equipment Directive

At the end of the product life (number of operating cycles reached), dispose of the packaging and product in a corresponding recycling centre. Do not dispose of the unit with the usual domestic refuse. Do not burn the product. On request, old units may be returned carriage paid to the manufacturer in accordance with the relevant waste legislation requirements.

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FOR MORE INFORMATION

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschröder and Maxon. To learn more about our products, visit ThermalSolutions.honeywell.com or contact your Honeywell Sales Engineer.

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We reserve the right to make technical modifications in the interests of progress.

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