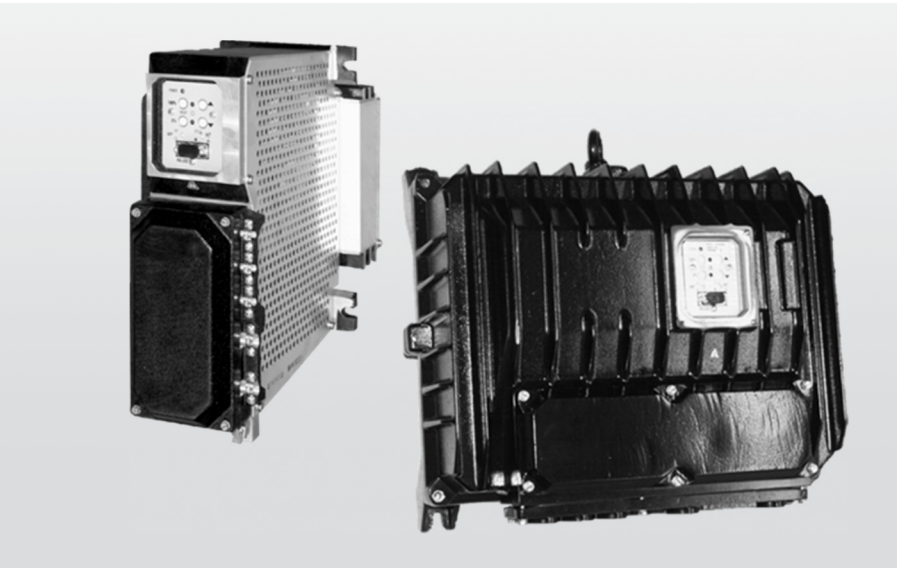
EBS852 / EBS862

Electronic unit for rack mount installation (Contrac)



For the control of Contrac control actuators in potentially explosive atmospheres

EBS852
EBS862

Introduction

The electronic unit builds the interface between the actuator and the control system.
During continuous positioning, the electronic unit varies the motor torque continuously until the actuator force and the control valve force are balanced.

High response sensitivity and high positioning accuracy with short positioning time ensure an excellent control quality and a long actuator life.

Additional Information

Additional documentation on EBS852 / EBS862 is available for download free of charge at www.abb.com/actuators.
Alternatively simply scan this code:

Table of contents

1 Safety

General information and instructions

These instructions are an important part of the product and must be retained for future reference.
Installation, commissioning, and maintenance of the product may only be performed by trained specialist personnel who have been authorized by the plant operator accordingly. The specialist personnel must have read and understood the manual and must comply with its instructions.
For additional information or if specific problems occur that are not discussed in these instructions, contact the manufacturer.
The content of these instructions is neither part of nor an amendment to any previous or existing agreement, promise or legal relationship.
Modifications and repairs to the product may only be performed if expressly permitted by these instructions.
Information and symbols on the product must be observed. These may not be removed and must be fully legible at all times.
The operating company must strictly observe the applicable national regulations relating to the installation, function testing, repair and maintenance of electrical products.

Warnings

The warnings in these instructions are structured as follows:

⚠ DANGER

The signal word '**DANGER**' indicates an imminent danger. Failure to observe this information will result in death or severe injury.

⚠ WARNING

The signal word '**WARNING**' indicates an imminent danger. Failure to observe this information may result in death or severe injury.

⚠ CAUTION

The signal word '**CAUTION**' indicates an imminent danger. Failure to observe this information may result in minor or moderate injury.

NOTICE

The signal word ***'NOTICE'*** indicates possible material damage.

Note

'**Note**' indicates useful or important information about the product.

… 1 Safety

Intended use

The electronic units of type EBS852 / EBS862 interconnected as illustrated in this operating instruction are used exclusively to control the RHDE... or RSDE... series control actuators.
The electronic unit must only be installed or commissioned outside of potentially explosive atmospheres.
Using these actuators for any other purpose will introduce a risk of personal injury and can also damage or impair the device's operational reliability.

Improper use

The following are considered to be instances of improper use of the device:

- For use as a climbing aid, for example for mounting purposes.
- For use as a bracket for external loads, for example as a support for piping, etc.
- Material application, for example by painting over the housing, name plate or welding/soldering on parts.
- Material removal, for example by spot drilling the housing.

Notes on data safety

This product is designed to be connected to and to communicate information and data via a network interface.
It is operator’s sole responsibility to provide and continuously ensure a secure connection between the product and your network or any other network (as the case may be).
Operator shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and / or theft of data or information.
ABB Automation Products GmbH and its affiliates are not liable for damages and / or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and / or theft of data or information.

Warranty provisions

Using the device in a manner that does not fall within the scope of its intended use, disregarding this manual, using underqualified personnel, or making unauthorized alterations releases the manufacturer from liability for any resulting damage. This renders the manufacturer's warranty null and void.

Manufacturer’s address

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Measurement & Analytics
Schillerstr. 72
32425 Minden
Germany
Tel: +49 571 830-0
Fax: +49 571 830-1806

Customer service center
Tel: +49 180 5 222 580
Email: automation.service@de.abb.com

2 Use in potentially explosive atmospheres

⚠ DANGER

Explosion hazard due to improper installation!
An explosion hazard is present when installing the electronic unit in potentially explosive atmospheres.
The electronic unit must only be installed and operated outside of potentially explosive atmospheres.

Before the commissioning of the electronic unit, observe the following points:

- The electronic unit must not be installed or commissioned in an Ex area.
- Check whether the actuator is connected to the right electronic unit, see section **Electrical data for inputs and outputs** on page 26.
- Check whether the associated electronic unit has been configured using the correct actuator parameters. To do this, check the relevant information on the name plate of the actuator and the electronic unit with respect to actuator type, ambient temperature range of actuator, and NL number, if applicable.
- On delivery, the positioning time-out function of the electronic unit associated with the actuator is activated. Deactivating this setting is not permitted.
- Rapid traverse mode is not allowed to be used on Ex actuators. Therefore, it is not possible to select it via the user interface.
- Activating the breakaway function is not permitted.
- Activating the 'Position dependent switch-off' function with 2 × torque/force is not permitted.
- The Contrac electronic unit must be upstream of the motor temperature monitoring unit SD241-B or a similar, certified tripping unit.

Thermal motor monitoring

In Contrac control actuators for use in potentially explosive atmospheres, additional independent monitoring of motor temperature is required.
Monitoring can be performed using the ABB SD241-B monitoring unit or a comparable certified tripping unit for thermistor temperature sensors.
The motor temperature monitoring unit interrupts the power supply as soon as the motor temperature up-scales the permissible limit value.

Cable harness for the connection of the actuator to the electronic unit

Installation information on the cable harness for actuators in Ex design
The electrical connection between the Contrac electronic unit and the Contrac actuator can be established using the cable set (order code 695). The cable harness is not part of the Ex prototype test certificate and must therefore be tested for safety-relevant functionality within the complete installation by the installer or operator.
If the specified cable harness does not meet all safety-relevant requirements, the proper installation material must be used.
For the specified motor connection cable, the shielding must be connected at both ends and connected with protective ground.

… 2 Use in potentially explosive atmospheres

… Cable harness for the connection of the actuator to the electronic unit

Specification

	Motor connection	Motor temperature monitoring	Signal terminal (option)
Wire conductor	8 × 1.5	2 × 1.5	8 × 0.5
Mat.-No.	9280271	9280272	9280183
Manufacturer	Huber + Suhner	Huber + Suhner	Bröckskes (Helu-Kabel)
Type	RX125 S2 B 8g1.5 mm2 BK	RX125 S2 2×1.5 mm2 BK	So-LTG-PUR-8 × 0.5 (HK-So-Li12YC11Y-OB-8 × 0.5)
Sheathing diameter	14.3 ±0.4 mm (0.56 ±0.02 in)	8.0 ±0.4 mm (0.31 ±0.02 in)	8.5 ±0.4 mm (0.33 ±0.02 in)
Nominal voltage Uo / U (Uo also applies to wire / shielding)	600 / 1000 V	600 / 1000 V	300 / 500 V
Wire / wire test voltage	3.5 kV	3.5 kV	1.2 kV

Temperature range	Motor connection	Motor temperature monitoring	Signal terminal (option)
Moving	−25 to 125 °C (−13 to 257 °F)	−25 to 125 °C (−13 to 257 °F)	−40 to 90 °C −40 to 194 °F)
Not moving	−40 to 125 °C (−40 to 257 °F)	−40 to 125 °C (−40 to 257 °F)	−50 to 90 °C (−58 to 194 °F)
Protective earth	GNYE		
Environment	UV-resistant and weather-proof	UV-resistant and weather-proof	UV-resistant and weather-proof

	Motor connection	Motor temperature monitoring	Signal terminal (option)
Cable gland	13.5 to 18 / M25 × 1.5 Exe	4 to 8.5 / M20 × 1.5 Exe	
Mat.-No.	9287589	9287588	
Manufacturer	Rabe-System-Technik	Rabe-System-Technik	
Type	CMDEL-T	ADE 1F	
Article no.	00222574	00816674	
Cable diameter	13.5 to 18 mm (0.53 to 0.71 in)	4 to 8.5 mm (0.16 to 0.33 in)	
Material	Brass, nickel-plated	Brass, nickel-plated	
Standard seal insert	Neoprene	Neoprene	
O-ring	Perbunan	Neoprene	
Temperature range	−40 to 100 °C (−40 to 212 °F)	−40 to 100 °C (−40 to 212 °F)	
IP rating	IP 68 - 10 bar (140.04 psi)	IP 68 - 5 bar (72.52 psi)	
Certificate	LCIE 97 ATEX 6005 X / 01	LCIE 97 ATEX 6008 X / 03	
Marking	Ⓔx II 2 G D Ex e II / Ex tD	Ex II 2 G D, Exe II	

Option			
	Motor connection	**Motor temperature monitoring**	**Signal terminal (option)**
Manufacturer	Pflitsch	Pflitsch	
Type	blue globe ATEX	blue globe ATEX	
Diameter	M25 × 1.5 KAD20-16/16-11	M20 × 1.5 KAD14-9/9-5	
Article no.	bg225 msex	bg220 msex	
Temperature range	−40 to 115 °C (−40 to 239 °F)	−40 to 115 °C (−40 to 239 °F)	
IP rating	IP 68	IP 68	
Certificate	PTB 06 ATEX 1036 X	PTB 06 ATEX 1036 X	
Marking	⟨Ex⟩ II 2 G Ex e II	⟨Ex⟩ II 2 D Ex tD A21 IP68	

Note

If the specified cable harness does not meet all safety-relevant requirements, the proper installation material must be used.

… 2 Use in potentially explosive atmospheres

Overview

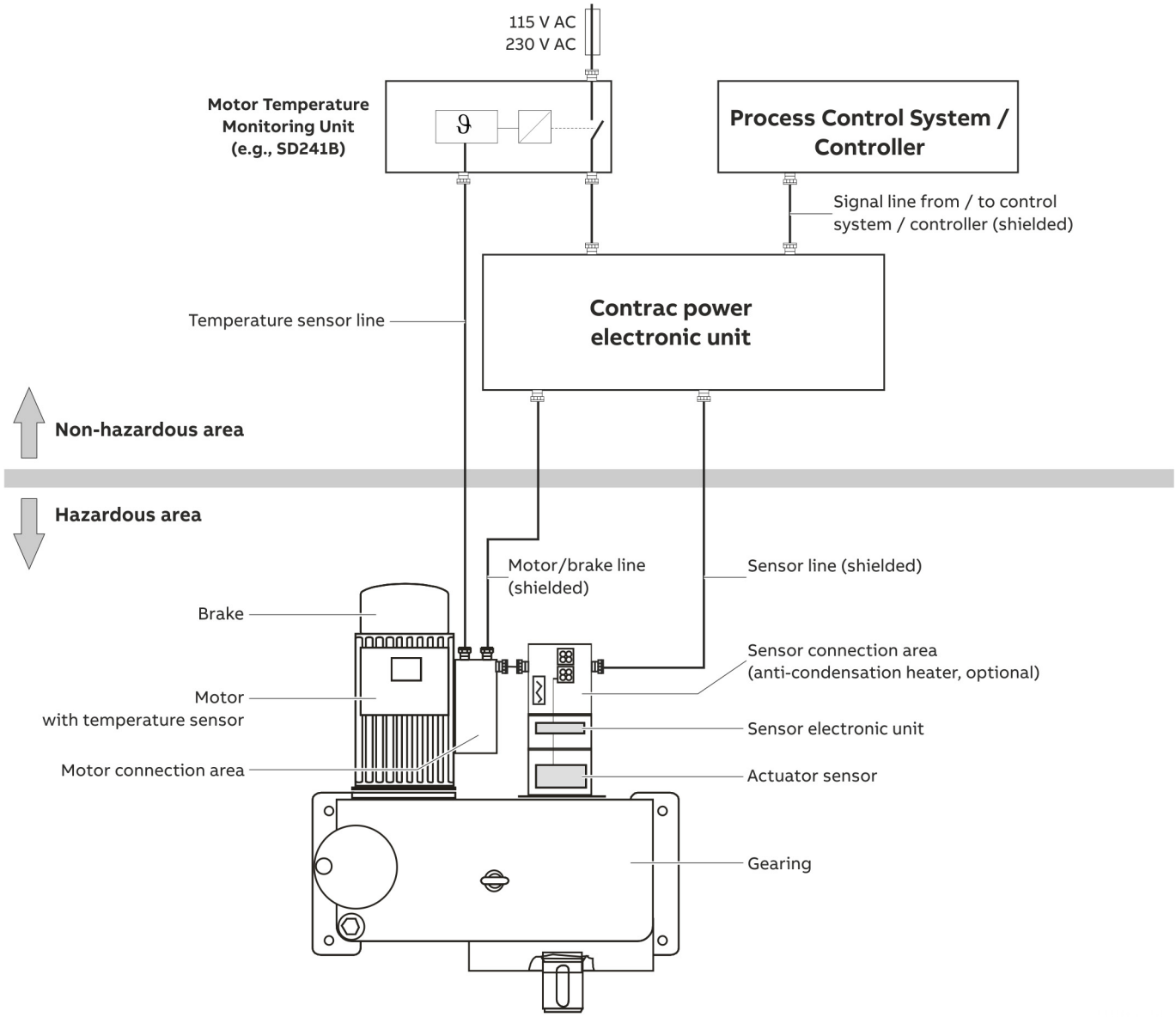
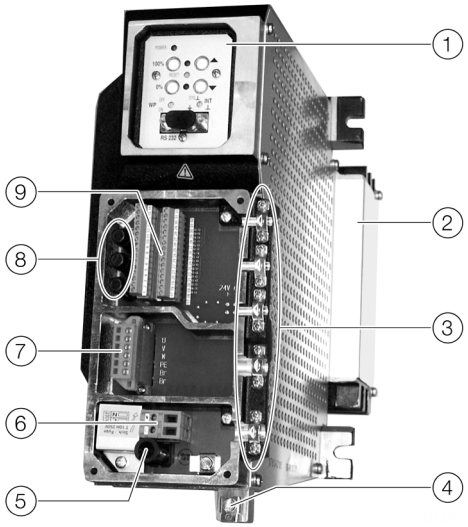


Figure 1: Allocation of the Contrac components when using in potentially explosive atmospheres (example)

3 Design and function

Design

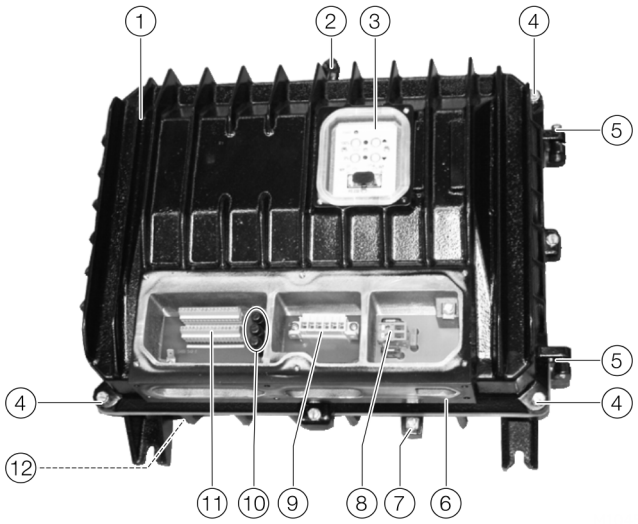
EBS852



1. Commissioning and service field
2. Transformer
3. Strain relief
4. Ground terminal
5. Mains fuse
6. Terminals (power supply)
7. Terminals (motor cable)
8. Binary output fuses
9. Terminals (signals)

Figure 2: Presentation without cover for terminal compartment

EBS862



1. Electronic unit cover
2. Lifting eye
3. Commissioning and service field
4. Cover screws
5. Cover hinges
6. Tap holes for cable entries
7. Ground terminal
8. Terminals (power supply)
9. Terminals (motor cable)
10. Binary output fuses
11. Terminals (signals)
12. Lower part of electronic unit

Figure 3: Presentation without cover for terminal compartment

The EBS862 electronic unit is made up of two housing halves (electronic cover / electronic unit lower part) which can be separated for easier assembly.

… 3 Design and function

Principle of operation

The electronic unit builds the interface between the actuator and the control system.
During continuous positioning, the electronic unit varies the motor torque continuously until the actuator force and the control valve force are balanced. High response sensitivity and high positioning accuracy with short positioning time ensure an excellent control quality and a long actuator life.

Electronic units are available for assembly in the field near the actuator, remotely in a mounting rack or for integrated assembly (smallest actuator type). In addition to the terminals, the electronic unit contains the microprocessor, frequency converter for motor control, analog and binary inputs and outputs, PROFIBUS® or HART® communication interfaces, the commissioning and service field and a plug connection to connect a PC.
No matter what the motor power of the respective actuator is, all electronic units are supplied single-phase by 230 V or 115 V mains supply (50 Hz or 60 Hz).
The commissioning and service field enables the end positions and direction of rotation to be set on the actuator. Moreover, status information is displayed using LEDs. Push buttons can be used to operate the actuator and set the operating mode (Automatic, Out of Service).

Device designs

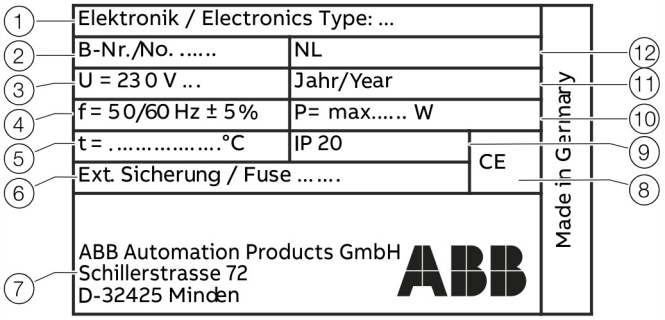
EBS852	
IP rating	IP 20
Humidity	≤ 75 % annual average; condensation not permitted
Rack air inlet temperature	0 to 45 °C (32 to 113 °F)
Transport and storage temperature	−25 to 70 °C (−13 to 158 °F)
Long-term storage temperature	−25 to 40 °C (−13 to 104 °F)
Mounting position	vertical; lateral connections, right
Vibration stress	2 to 9 Hz: maximum deflection: 3 mm (0.12 in) 9 to 200 Hz: acceleration: 1 g
Paint	2-layer component epoxy (RAL 9005, black)
Electrical connection	Mains supply via screw terminals; all other connections made via screw-type plug connectors Maximum cable length electronic unit – actuator: * 270 m at 1.5 mm^2 (885 ft at 16 AWG) 460 m at 2.5 mm^2 (1510 ft at 14 AWG)
Weight	11 kg (24 lbs)

* The maximum cable length depends on the actuator type and cable cross-section, see **Rotary actuators** on page 22.

EBS862	
IP rating	IP 20
Humidity	≤ 75 % annual average; condensation not permitted
Rack air inlet temperature	0 to 45 °C (32 to 113 °F)
Transport and storage temperature	−25 to 70 °C (−13 to 158 °F)
Long-term storage temperature	−25 to 40 °C (−13 to 104 °F)
Mounting position	vertical, cable glands down
Vibration stress	2 to 9 Hz: maximum deflection: 3 mm (0.12 in) 9 to 200 Hz: acceleration: 1 g
Paint	2-layer component epoxy (RAL 9005, black)
Electrical connection	Mains supply via screw terminals; all other connections made via screw-type plug connectors Maximum cable length electronic unit – actuator: * 470 m at 10 mm^2 (1542 ft at 8 AWG)
Weight	40 kg (88 lbs)

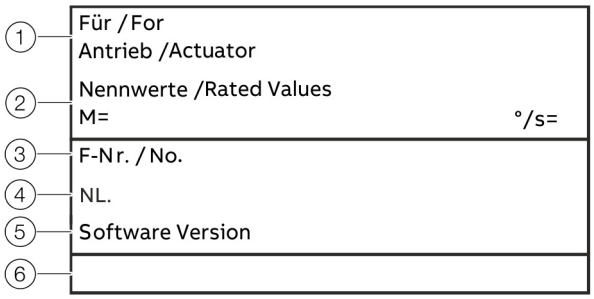
* The maximum cable length depends on the actuator type and cable cross-section, see **Rotary actuators** on page 22.

4 Product identification



1. Full type designation
2. Manufacturing number
3. Power supply
4. Permissible mains frequency
5. Ambient temperature range
6. Specifications for external fuse protection
7. Manufacturer address
8. CE mark
9. IP rating
10. Maximum power consumption
11. Year of manufacture
12. NL no. (for no-list design)

Figure 4: Hardware name plate (example)

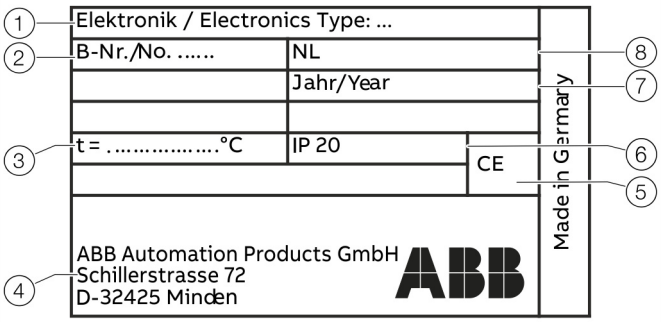


1. Associated Contrac control actuator
2. Nominal torque or rated actuator strength / set speed
3. Manufacturing number
4. NL no. (for no-list design)
5. Installed software version
6. Free for customer-specific information

Figure 5: Software name plate (example)

Note

In electronic units which can be separated for assembly, the name plate for the hardware is located on the lower part of the electronic unit (Figure 1). The name plate for the software (Figure 2) and an additional name plate for the hardware (Figure 3) are located on the electronic unit cover.
The lower part of the electronic unit and the electronic cover are independent assemblies, therefore the respective manufacturing numbers can differ.



1. Full type designation
2. Manufacturing number
3. Ambient temperature range
4. Manufacturer address
5. CE mark
6. IP rating
7. Year of manufacture
8. NL no. (for no-list design)

Figure 6: Additional name plate for hardware (example)

Scope of delivery

EBS852

- Cable clamps for strain relief of the connection cable

EBS862

- Metric tap holes for cable entries with IP 66 sealing plugs

Delivery status

The individual actuator configuration may vary from the standard setup above. This information can be displayed via the user interface.
Unless otherwise specified by the user, the electronic units are delivered with the following standard configuration:

Conventional communication	
Parameter	**Setting**
Function selection	Positioner, parameter: set point
Set point function	Analog set point
Set point range	4 to 20 mA
Set point characteristic	Linear; set point = position value
Actual value range	4 to 20 mA
Nominal torque / rated force in ±direction	100 %
Automatic speed in ±direction:	100 %
Action in 0 % / 100 % end position	Keep leak-tight with nominal torque / rated force
Digital inputs	Digital input 1 Manual / Automatic switching, Digital input 2 / 3 Travel command ±
Digital outputs	Digital output 1 ready for operation / error message, Digital output 2 / 3 end position signaling 0 % / 100 %
Brake Away Function	Deactivated
Shut-off function	Deactivated
Positioning loop monitoring	Deactivated
Set point monitoring	Deactivated
Alarm Type	Deactivated
Action after restoration of power	Switch to Automatic
Working range of actuator	Not set

5 Transport and storage

Inspection

Check the devices immediately after unpacking for possible damage that may have occurred from improper transport. Details of any damage that has occurred in transit must be recorded on the transport documents.
All claims for damages must be submitted to the shipper without delay and before installation.

Transporting the device

Safety instructions

⚠ DANGER

Danger to life due to falling or toppling loads.
Risk of death or serious injury due to the device falling down or toppling over!

- Standing under suspended loads is prohibited.
- Do not detach the hoisting equipment until installation is complete.
- Only use the dedicated load pick-up devices (eyebolts) for suspending the components.

Consider the following items during transport:

- Pay attention to the device weight details.
- Do not expose the device to humidity during transport. Pack the device accordingly.
- Pay attention to the permissible transportation temperatures for the device.

Returning devices

For the return of devices, follow the instructions in **Repair** on page 38.

Storing the device

The electronic units EBS852 / EBS862 comply with IP rating IP 20. The electronic units should be stored in accordance with this IP rating. Condensation is not permitted.

The permissible storage temperatures as well as the ambient conditions (humidity) should be complied with (see **Device designs** on page 11).

For longer storage periods, we recommend packing the units in foil with a dessicant added.
The dessicant must be checked for regularly for effectivity.

6 Installation

Mounting

NOTICE

Damage to components!

Damage to components caused by ingress of foreign bodies or humidity.

- Keep all housing covers and terminal compartments closed during installation to prevent the ingress of foreign bodies such as drilling shavings, liquids or dust.

The electronic unit is installed in the vicinity of the drive outside the hazardous area. Screw-type terminals are used to connect the two modules on the actuator side and on the electronics side.

The cables are connected to the actuator through two terminal compartments:

- Motor connection compartment (Ex d)
- Sensor terminal compartment (through Ex e terminals)

The SD241-B motor temperature monitoring unit or a similar, certified tripping unit must be connected to the power supply of the electronic unit.
The motor temperature monitoring unit must be installed outside of the potentially explosive atmosphere.

When installing the electronic unit, observe the following points:

- You must be able to activate the power supply of the electronic unit on-site.
- All signal cables and the motor cable between the actuator and electronic unit must be shielded.
- The cable shield must be placed on both housings when connecting the electronic unit and the actuator.
- The maximum vibration load must be observed during installation, see **Device designs** on page 11.
- When mounting the electronic unit in work and traffic areas that may be accessed by unauthorized persons, the operator is required to take suited protective measures.

EBS852

1. Fasten the electronic unit to the vertical mounting rail of the mounting rack using grade 8.8 screws. Tensile strength 800 N/mm^2 (116032 pounds/square in.), yield strength 640 N/mm^2 (92826 pounds/square in.).
2. Provide adequate room for installation and ensure easy access.
3. The cable entries must be directed to the right.

EBS862

Note

The total weight of the electronic unit is 40 kg (88 lbs). For this reason, the electronic unit is equipped with a load-bearing eyelet.

If, for technical reasons, the load-bearing eyelet cannot be used, the two halves of the housing can be installed separately.

Separating the housing halves

1. Place the electronic unit on a horizontal surface.
2. Unscrew the cover screws(**Figure 3**).
3. Flip open the electronic unit cover.
4. Disconnect the internal plug connection between the housing halves.
5. Close the electronic unit cover.
6. Unscrew the hinge screw (**Figure 3**).
7. Flip the electronic unit cover forward while lifting it up and off the hinge pin. Precisely guide the cover of the electronic unit cover in the process.

Mounting

1. Fasten the electronic unit or the lower part of the electronic unit to the vertical mounting rail of the mounting rack using grade 8.8 screws. Tensile strength 800 N/mm^2 (116032 pounds/square in.), yield strength 640 N/mm^2 (92826 pounds/square in.).
2. Provide adequate room for installation and ensure easy access.
3. The cable entries must be directed down.

Mounting the housing halves

1. Set the electronic unit cover down on the hinge pin and screw in the hinge screw. Precisely guide the cover of the electronic unit cover in the process.
2. Reconnect the internal plug connection.
3. Close the electronic unit cover and screw in the cover screws (**Figure 3**).

Assembly and cable routing in the mounting rack

When installing the electronic units in a mounting rack (on site), we recommend laying the cables in accordance with the following illustrations.

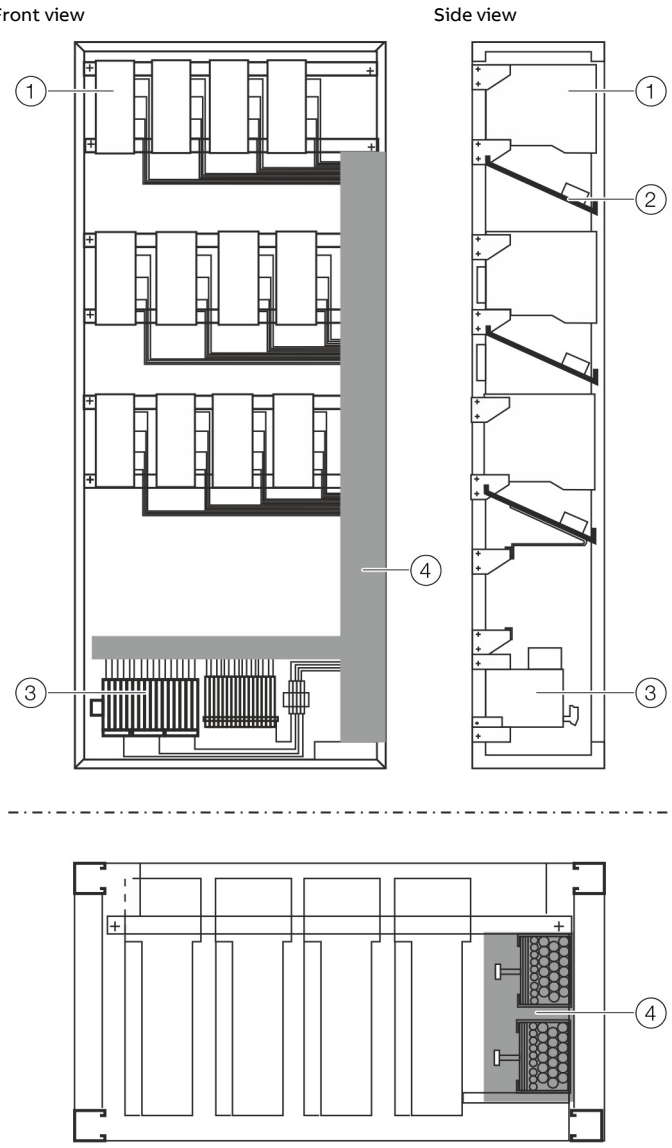


Figure 7: Installing the electronic unit and guiding the cable in the mounting rack (example)

… 6 Installation

Dimensions

Electronic unit EBS852 (Contrac)

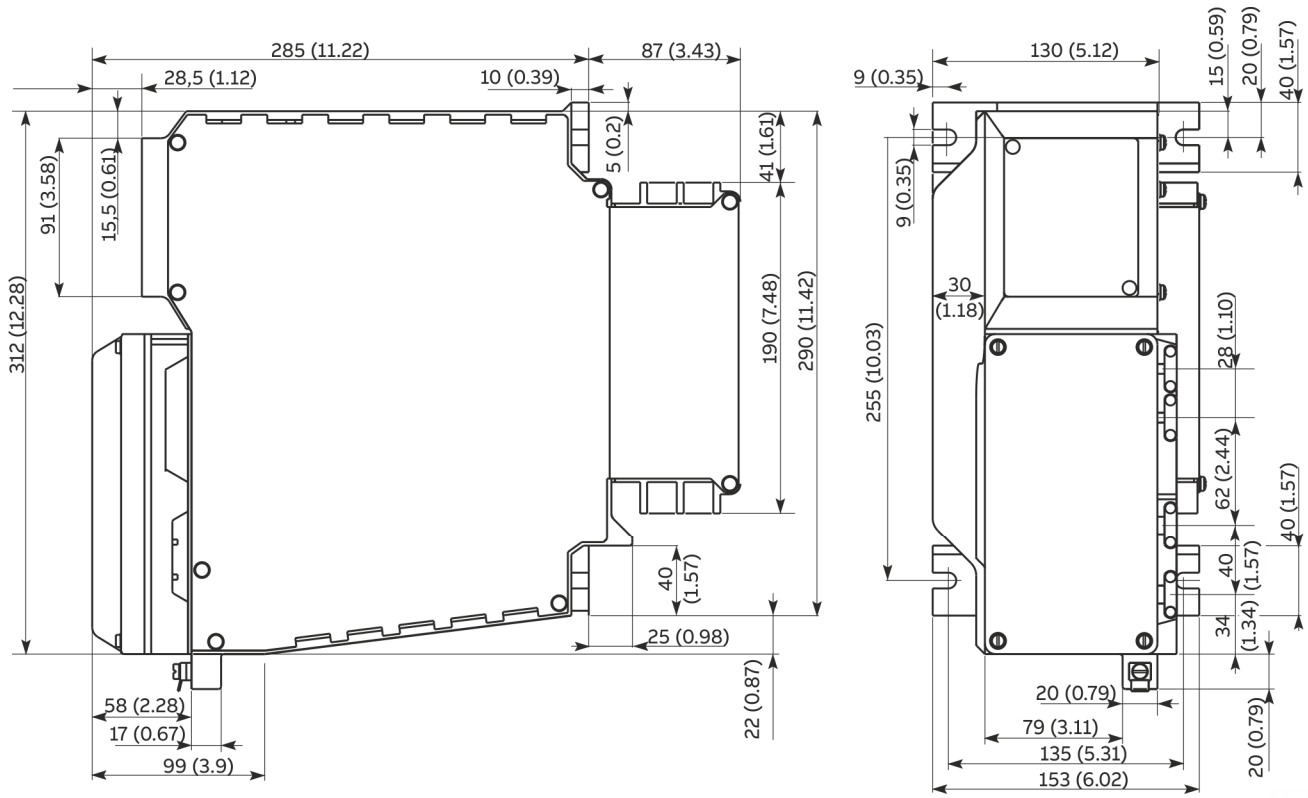
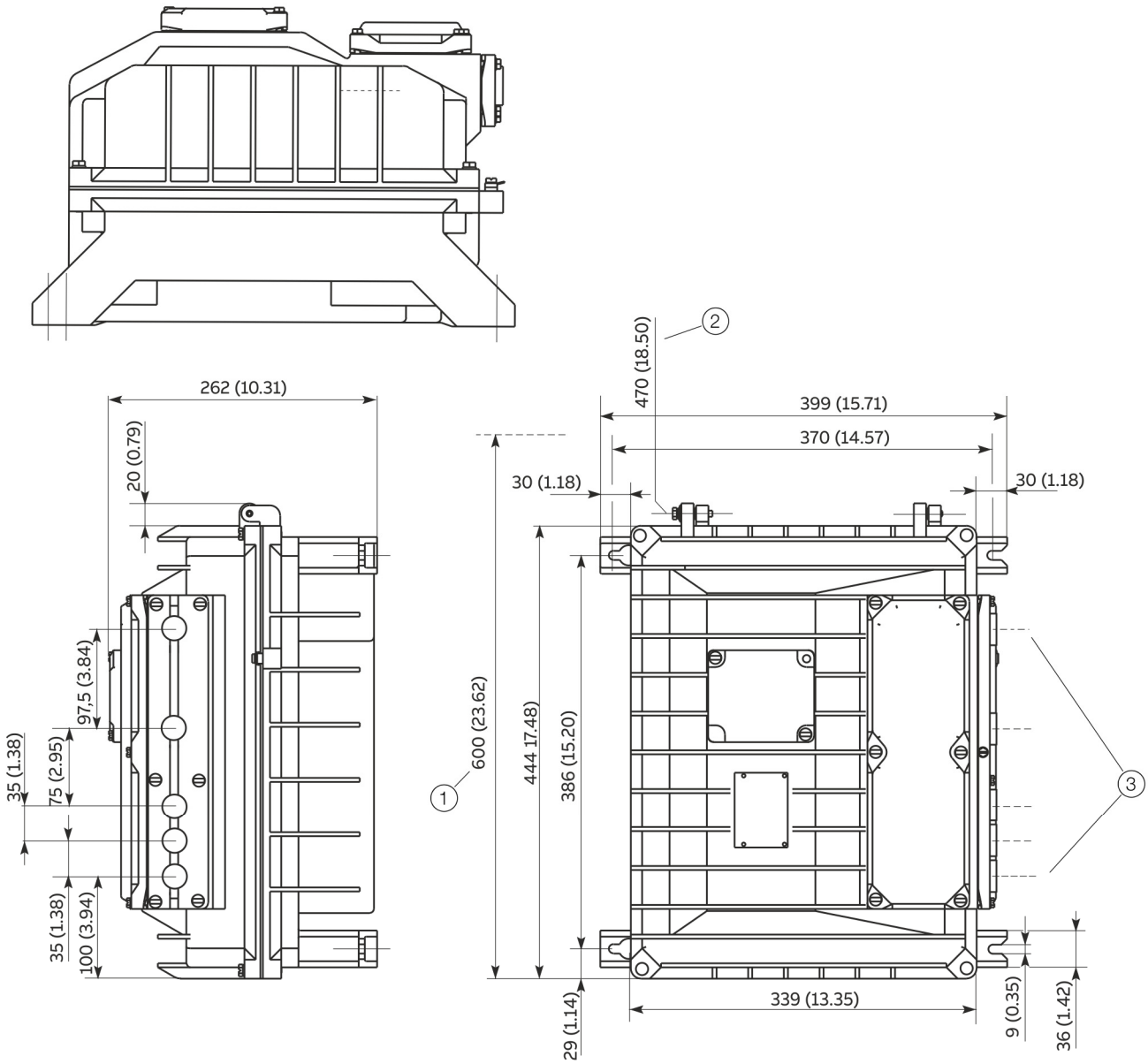


Figure 8: Dimensions in mm (in)

Electronic unit EBS862 (Contrac)



(1) Front section open, rotated 90°

(2) Rotational radius

(3) Tap holes

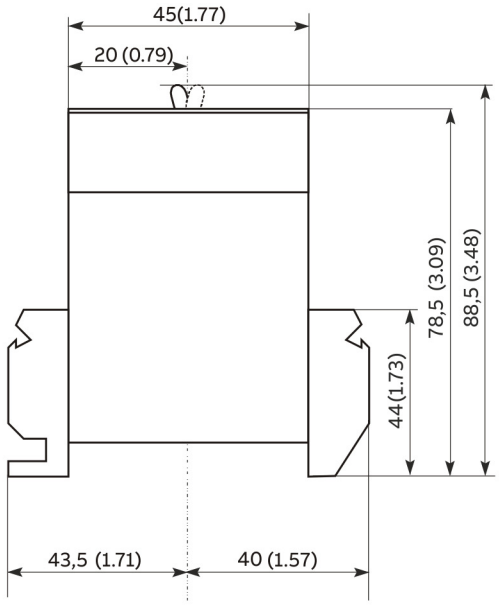
Figure 9: Dimensions in mm (in)

… 6 Installation

… Dimensions

Fuses

Thermal circuit breaker



Safety fuse

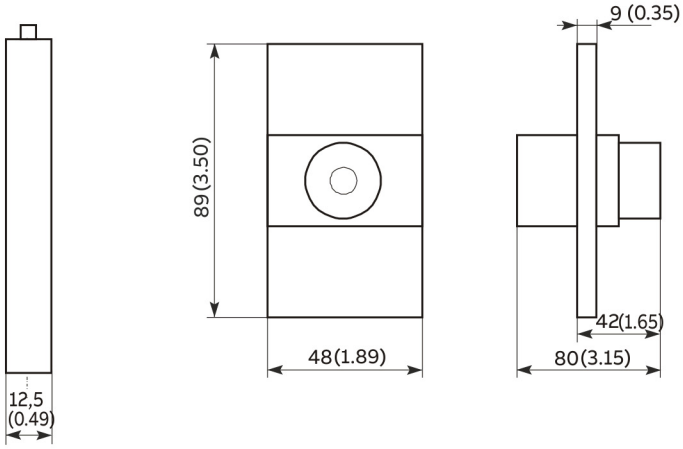


Figure 10: Dimensions in mm (in)

7 Electrical connections

Safety instructions

⚠ WARNING

Risk of injury due to live parts!
When the housing is open, contact protection is not provided and EMC protection is limited.
- Before opening the housing, switch off the power supply.

⚠ WARNING

Danger due to electric current!
Danger of electric shock by residual voltage at the terminals after switching off the power supply.
- Before opening the terminal compartment, switch off the power supply and wait for > 2 minutes.

NOTICE

Damage to the device due to improper handling!
- When replacing the defective safety fuses, only fuses with types and characteristics should be used (see **Fuses** on page 39).

The electrical connection may only be established by authorized specialist personnel.
Notices on electrical connection in this instruction must be observed; otherwise, electric safety and the IP-rating may be adversely affected.
Safe isolation of electric circuits which are dangerous if touched is only guaranteed when the connected devices fulfill the requirements of EN 61140 (basic requirements for secure separation).
To ensure safe isolation, install supply lines so that they are separate from electrical circuits which are dangerous if touched, or implement additional isolation measures for them.

General

Each actuator requires a suited Contrac electronic unit with installed actuator-specific software. Observe the information in the operating instruction. The specifications on the name plates of the electronic unit and actuator must match to guarantee correct hardware and software allocation.

Please observe the following information when installing the cable set:
- The specific regulations governing the installation of electric systems in potentially explosive atmospheres must be observed during electric installation work. The provisions in accordance with EN 60079-14 must be observed, particularly in respect of installing the shield bonding and potential equalization between the actuator, electronic unit, and motor protection equipment, see **Connection of cable shielding** on page 29.
- The motor and position sensor may only be connected using IP 66 Ex cable glands in accordance with EN 60079 ff with EU type examination certificate in accordance with Directive 2014/34/EU.
- Use a cable lug or a solid wire, bended to a ‘U’, to connect the motor cable
- Make sure that sufficient strain relief measures are in place for all cable connections.
- Protect all cables in the connection chambers sufficiently against contact with metal components. Guarantee a gap of at least 6 mm (0.24 in) between all conductive components.
- Remove the desiccant in the connection chamber of the motor and position sensor.
- Do not change the factory-set installation position of the motor junction box.
- Close off any cable entries that are not required using ATEX-certified IP 66 sealing plugs.

Conductor cross-section on control actuator

Screw terminals	
Motor/brake	max. 2.5 mm^2 (14 AWG)
Signals	max. 2.5 mm^2 (14 AWG)

… 7 Electrical connections

Conductor cross-section on electronic unit

Note
Detailed information on separate electronic units can be found in the corresponding data sheets.

EBS852 – Clamping connection		
	Suited for cable Ø	**Terminals for conductor cross-section**
Mains cable	13 mm (0.51 in)	max. 4 mm² (12 AWG)
Signal cable (DCS)	8 mm (0.31 in)	max. 1.5 mm² (16 AWG)
Transmitter (option)	8 mm (0.31 in)	max. 1.5 mm² (16 AWG)
Motor cable	13 mm (0.51 in)	max. 4 mm² (12 AWG)
Sensor cable	8 mm (0.31 in)	max. 1.5 mm² (16 AWG)

EBS862 – Clamping connection	
	Terminals for conductor cross-section
Mains cable	max. 6 mm² (10 AWG)
Signal cable (DCS)	max. 4 mm² (12 AWG)
Transmitter (option)	max. 4 mm² (12 AWG)
Motor cable	max. 6 mm² (10 AWG)
Sensor cable	max. 4 mm² (12 AWG)

Cable glands

⚠ DANGER

Risk of explosion!
Risk of explosion due to the use of unsuitable cable glands.
- The cable glands used must be approved for type of protection ‘Ex e – increased safety’.
- The cable glands used must guarantee correct contact of the cable shielding.

The actuators and electronic units are supplied without cable glands. Suited cable glands must be installed on site.

Tap holes for cable glands	
	metric
Power supply	M20 × 1.5 (1 ×)
Signal cable	M20 × 1.5 (3 ×)
Motor cable	M25 × 1.5 (1 ×)

Selection of suited connection cables

Please observe the following information when selecting cables:
- Use suited cables only for the electric connection between the Contrac control actuator in potentially explosive atmospheres and the components outside of the potentially explosive atmospheres.
- Use shielded cables for the motor / brake cable, the sensor cable, and the signal cable to the control system / controller.
- Connect the shielding of the motor / brake cable and the sensor cable on both sides (to the actuator and to the Contrac electronic unit).
- For the connection between the motor and motor temperature monitoring unit and for the power supply, shielded cables are not required.

Installation information on the cable harness for actuators in Ex design
The electrical connection between the Contrac electronic unit and the Contrac actuator can be established using the cable set (order code 695). The cable harness is not part of the Ex prototype test certificate and must therefore be tested for safety-relevant functionality within the complete installation by the installer or operator.
If the specified cable harness does not meet all safety-relevant requirements, the proper installation material must be used.
For the specified motor connection cable, the shielding must be connected at both ends and connected with protective ground.

Please observe the following information when installing the cable set:

- The specific regulations governing the installation of electric systems in potentially explosive atmospheres must be observed during electric installation work. The provisions in accordance with EN 60079-14 must be observed, particularly in respect of installing the shield bonding and potential equalization between the actuator, electronic unit, and motor protection equipment, see **Connection of cable shielding** on page 29.
- The motor and position sensor may only be connected using IP 66 Ex cable glands in accordance with EN 60079 ff with EU type examination certificate in accordance with Directive 2014/34/EU.
- Use a cable lug or a solid wire, bended to a 'U', to connect the motor cable
- Make sure that sufficient strain relief measures are in place for all cable connections.
- Protect all cables in the connection chambers sufficiently against contact with metal components. Guarantee a gap of at least 6 mm (0.24 in) between all conductive components.
- Remove the desiccant in the connection chamber of the motor and position sensor.
- Do not change the factory-set installation position of the motor junction box.
- Close off any cable entries that are not required using ATEX-certified IP 66 sealing plugs.

Potential equalization

In order to avoid the risk of an electric shock, it must not be possible to come into contact with dangerous live parts and conductive parts that can be touched should not become dangerous live parts either under standard conditions or under conditions when a single fault occurs.
The actual current flowing in the event of a fault is obtained from the phase to ground voltage and the total impedance present in the fault circuit.
For long cables, the voltage drop may be dangerous to come into contact with high current flowing.
Preferably, the electronic unit and the actuator must be connected with low resistance (ground resistance < 0.1 Ω) to the potential equalization.
In the process, the respective standards of the VDE 100 series must be observed.

Scenario 1

If the PE of the actuator is done only via the PE conductor of the motor cable, the maximum permissible cable lengths for the electronic units EAS822 and EBS852 are reduced in accordance with the following table.
The maximum permissible shutdown time of 200 ms in case of a fault is complied with in the process.

Max. cable length		
Conductor cross-section	**EBS852**	**EBS862**
1.5 mm^2 (16 AWG)	176 m (577 ft)	48 m (157 ft)
2.5 mm^2 (14 AWG)	235 m (771 ft)	79 m (259 ft)
4 mm^2 (12 AWG)	460 m (1509ft)	127 m (416 ft)
6 mm^2 (10 AWG)	–	190 m (623 ft)

Scenario 2

By laying an extra potential equalization conductor between the electronic unit and the actuator, with a small conductor cross-section of the motor cable (e.g. 1.5 mm^2), the maximum permissible cable length can be increased.
The ground resistance of the potential equalization conductor must be < 0.1 Ω.
The maximum permissible shutdown time of 200 ms in case of a fault is complied with in the process.

Max. cable length		
Conductor cross-section	**EBS852**	**EBS862**
4 mm^2 (12 AWG)	460 m (1509ft)	127 m (416 ft)
6 mm^2 (10 AWG)	460 m (1509ft)	190 m (623 ft)
10 mm2 (8 AWG)	460 m (1509ft)	317 m (1040 ft)

Scenario 3

If the cable lengths specified in **Actuator assignment and maximum cable lengths** on page 22 are fully utilized, an additional protective potential equalization must be connected. To do this, the electronic unit and the actuator must be connected via a short cable with a minimum cross-section of 4 mm^2 (12 AWG) to the on-site potential equalization.
The installation regulations for setting up grounding systems must be observed and followed.

… 7 Electrical connections

Actuator assignment and maximum cable lengths

Rotary actuators

Electronic unit	Actuator	Cross-section of the motor cable / maximum permissible cable length*				
		1.5 mm² (16 AWG)	2.5 mm² (14 AWG)	4 mm² (12 AWG)	6 mm² (10 AWG)	10 mm² (8 AWG)
EBS852	RHDE250-10	270 m (886 ft)	460 m (1509 ft)	–	–	–
	RHDE500-10					
	RHDE800-10					
	RHDE1250-12					
	RHDE2500-25					
	RHDE4000-40					
	RHDE8000-80					
EBS862	RHDE2500-10					
	RHDE4000-10	160 m (525 ft)	270 m (886 ft)	430 m (1411 ft)	–	–
	RHDE8000-15	70 m (230 ft)	120 m (394 ft)	190 m (623 ft)	280 m (919 ft)	460 m (1509 ft)
	RHDE16000-30					

* Cable length between electronic unit and actuator. Signal cable cross-section 0.5 mm² (20 AWG)

Linear actuators

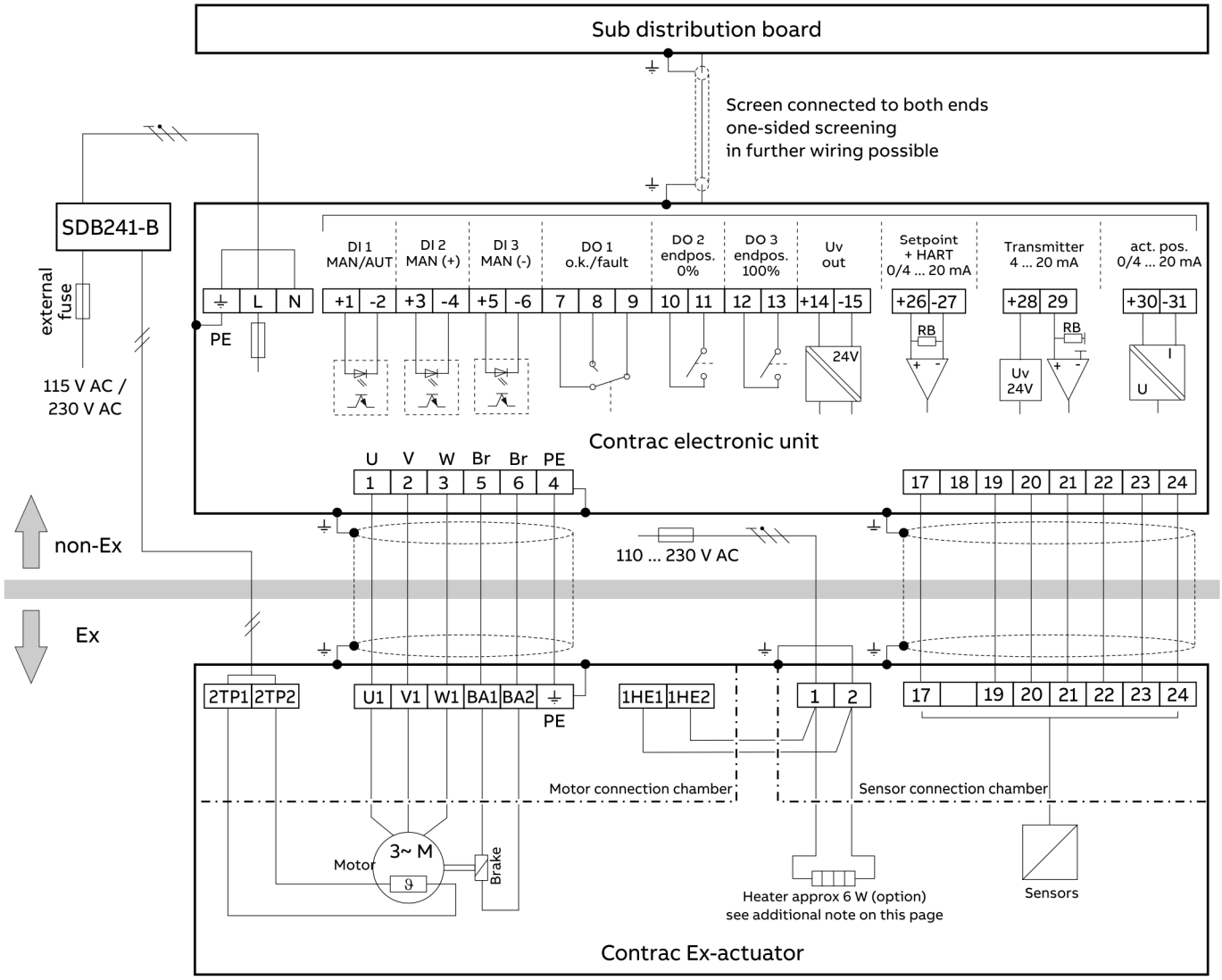
Electronic unit	Actuator	Cross-section of the motor cable / maximum permissible cable length*				
		1.5 mm² (16 AWG)	2.5 mm² (14 AWG)	4 mm² (12 AWG)	6 mm² (10 AWG)	10 mm² (8 AWG)
EBS852	RSDE10-5.0	270 m (886 ft)	460 m (1509 ft)	–	–	–
	RSDE10–$110.0					
	RSDE20-5.0					
	RSDE20–$17.5					
	RSDE50–3.0					
EBS862	RSDE50-10.0	160 m (525 ft)	270 m (886 ft)	430 m (1411 ft)	–	–

* Cable length between electronic unit and actuator. Signal cable cross-section 0.5 mm² (20 AWG)

Electronic unit EBS852 (Contrac) / EBS862 (Contrac)

Note

- The electrical connection is established via screw terminals on the control actuator and on the electronic unit.
- If you are using a separate heat supply, the heater must be protected with a 2 to 6 A medium time-lag fuse (e.g. **NEOZED D01 E14**).



BE = digital input

BA = digital output

Figure 11: Control via analog input 0/4 to 20 mA, HART® communication or digital inputs

… 7 Electrical connections

Connection examples

Operation following a continuous set point (standard)

In the standard configuration, the binary inputs are configured as ‘MANUAL OPERATION’.

To switch the actuator to automatic mode (AUT), the following conditions must be met:

- The binary input 1 must be connected with +24 V DC (automatic operation).
- The ‘AUT’ operating mode must be selected through the graphic user interface.

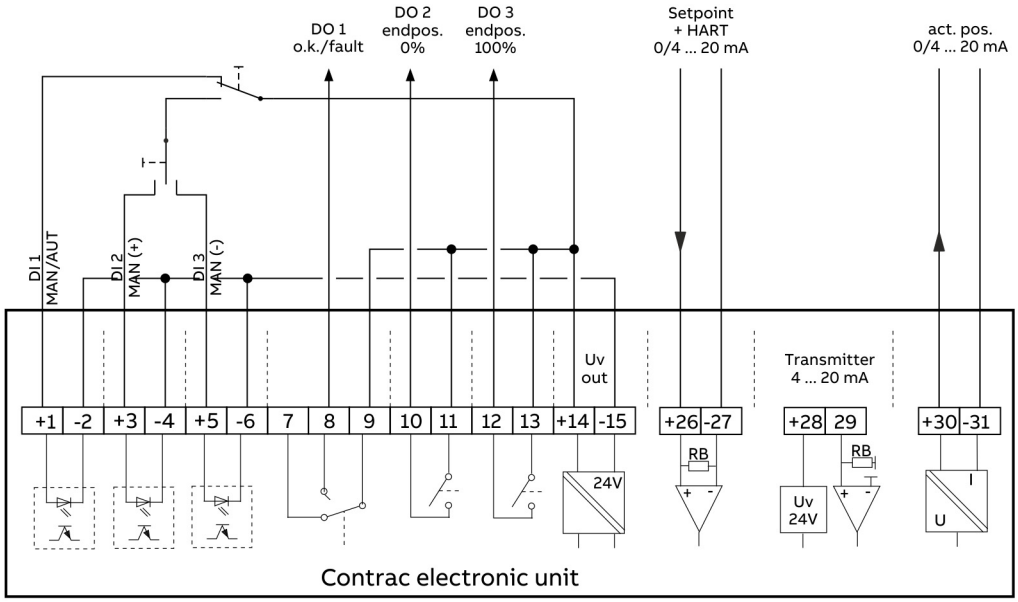


Figure 12: Connection example for operation following a continuous set point (standard configuration)

Operation downstream from step controller

Contrac actuators can be driven using step controller pulses instead of an analog setpoint. The following conditions must be fulfilled in order to implement the step controller pulses:

- The binary inputs must be configured using the ‘STEP CONTROLLER’ function.
- The binary input 1 must be connected with +24 V DC (automatic operation).
- The ‘AUT’ operating mode must be selected through the graphic user interface.

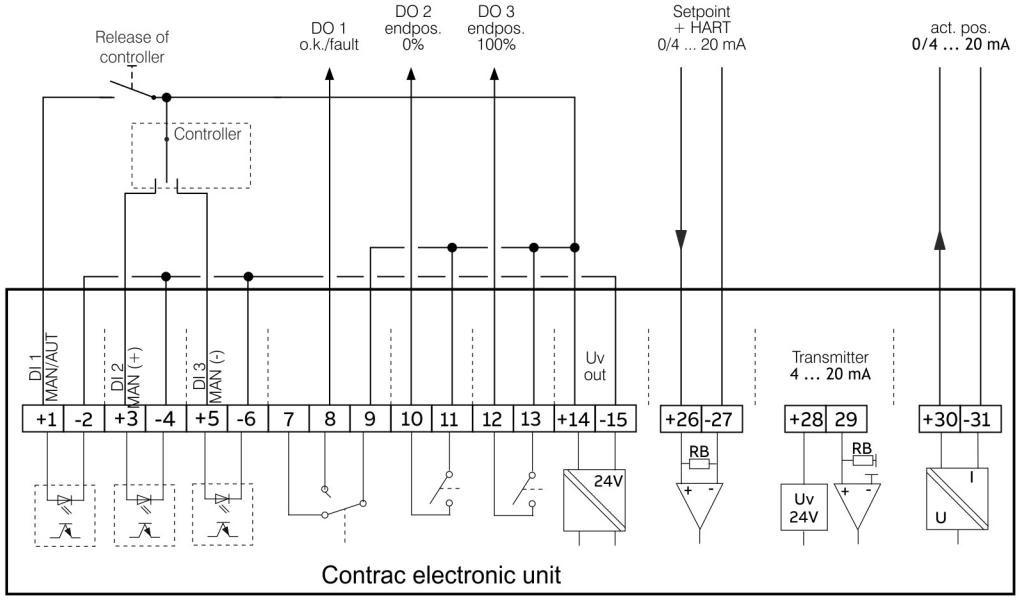


Figure 13: Connection example for operation downstream from a step controller

… 7 Electrical connections

Electrical data for inputs and outputs

Power supply

EBS852					
Supply voltage (standard actuators)	115 V AC (94 to 130 V) or 230 V AC (190 to 260 V); 47.5 to 63 Hz; single-phase				
Supply voltage (Ex actuators)	115 V AC (94 to 127 V) or 230 V AC (190 to 253 V); 47.5 to 63 Hz; single-phase				
Average power loss P_{avg} and power consumption I_{max} of the electronic unit	Actuator	P_{avg}	I_{max} at 115 V	I_{max} at 230 V	I_{pos} (115 V + 230 V): approx. 40 to 50 % of I_{max}
	RHD(E)250-10	60 W	1.8 A	0.9 A	
	RHD(E)500-10	75 W	2.2 A	1.1 A	
	RHD(E)800-10	60 W	5.0 A	2.5 A	
	RHD(E)1250-12	80 W	5.0 A	2.5 A	
	RHD(E)2500-25	80 W	5.0 A	2.5 A	
	RHD(E)4000-40	80 W	5.8 A	2.7 A	
	RHD(E)8000-80	80 W	5.0 A	2.5 A	
	RSD(E)10-5,0	55 W	2.2 A	1.1 A	
	RSD(E)10-10,0	60 W	3.6 A	1.8 A	
	RSD(E)20-5,0	60 W	3.6 A	1.8 A	
	RSD(E)20-7,5	75 W	4.8 A	2.4 A	
	RSD(E)50-3,0	75 W	5.0 A	2.5 A	
	RSD100-1.5	75 W	5.0 A	2.5 A	
External fuse for electronic unit	16 A, time-lag				
External fuse for heating (dewing protection)	2 to 6 A, medium time-lag				

EBS862				
Supply voltage (standard actuators)	230 V AC (190 to 260 V); 47.5 to 63 Hz; single-phase			
Supply voltage (Ex actuators)	230 V AC (190 to 253 V); 47.5 to 63 Hz; single-phase			
Average power loss P_{avg} and power consumption I_{max} of the electronic unit	Actuator	P_{avg}	I_{max} at 230 V	I_{pos} (230 V): approx. 40 to 50 % of I_{max}
	RHD(E)2500-10	80 W	5.3 A	
	RHD(E)4000-10	100 W	10.0 A	
	RHD8000-12	115 W	8.0 A	
	RHDE8000-15	115 W	8.0 A	
	RHD(E)16000-30	115 W	12.5 A	
	RSD(E)50-10,0	100 W	6.4 A	
	RSD100-10.0	115 W	12.5 A	
External fuse for electronic unit	Safety fuse 35 A (Lindner) + thermal circuit breaker 16 A (ETA) (fuses are in the scope of delivery)			
External fuse for heating (dewing protection)	2 to 6 A, medium time-lag			

Binary inputs and outputs - communication

Conventional communication	
Analog input	0 / 4 to 20 mA, internal load: 300 Ω
Analog output	0 / 4 to 20 mA, electrically isolated, maximum load: 500 Ω
3 digital inputs, 1 to 3	Digital 0: −3 to 5 V or open, electrically isolated Digital 1: 12 to 35 V, electrically isolated
3 digital outputs, 1 to 3	Potential-free relay contact, max. 60 V, 150 mA
Digital communication	RS232 for commissioning and service, optionally FSK / HART®
Default settings	**Conventional communication** on page 13
Voltage output U_V	24 V, 15 mA, electrically isolated, for scanning external contacts, or similar applications
Connection for transmitter (optional)	Supply for two-wire transmitter with activated process controller in Contrac
Individual settings	See data sheet ‘DS/CONTRAC/SETTING’ or available upon request.

… 7 Electrical connections

… Electrical data for inputs and outputs

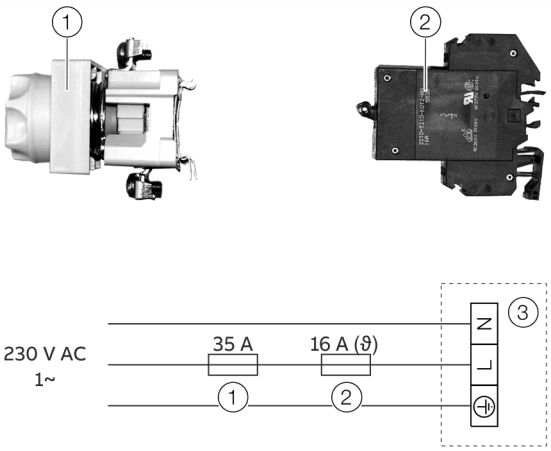
Connection on the device

Power supply

Observe the following points when connecting the power supply:

- You must be able to activate the power supply of the electronic unit on-site.
- In the power supply, the supplied fuses must be installed for certain electronic units (see **External fuses for EBS862** on page 28).
- Connect the power supply to the corresponding terminals of the electronic unit (see electrical connections starting on page 23).

External fuses for EBS862



① External safety fuse 35 A
② External safety fuse 16 A
③ Electronic unit

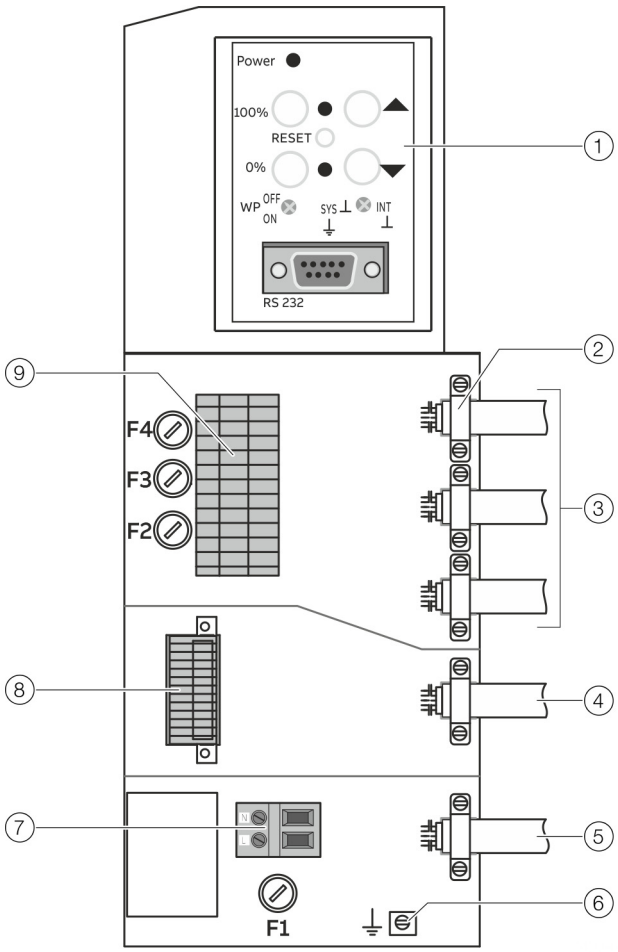
Figure 14: External fuses

Note

The conductor cross-section between the fuses and the electronic unit must be at least 2.5 mm² (AWG 14).

In addition to the internal fuses, the EBS862 electronic unit requires two additional external fuses which are supplied separately with the assembly.
The fuses are switched externally in the power supply.
The fuses guarantee safe operation under the special starting conditions of the electronic unit.

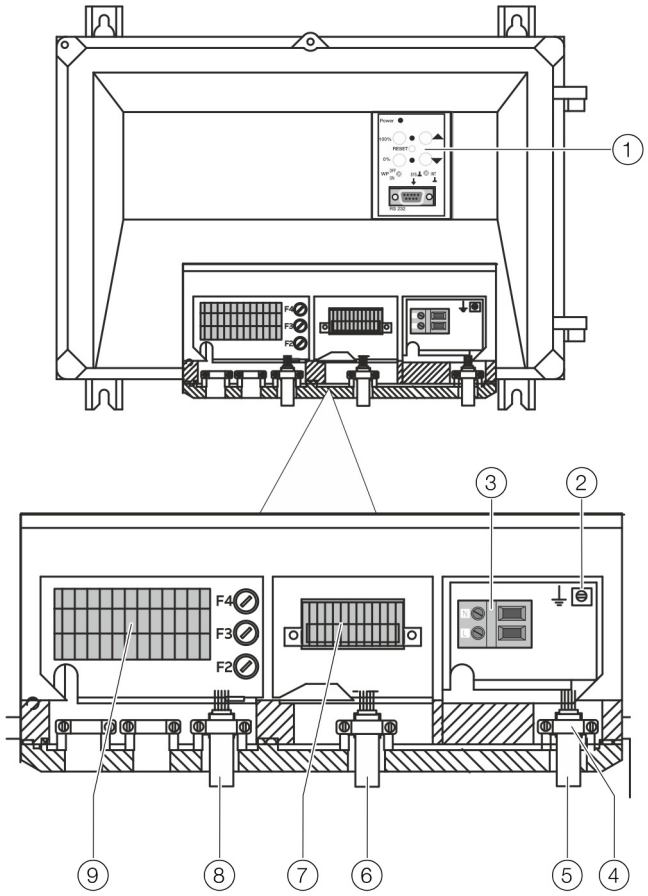
EBS852



① Commissioning and service field
② Cable clamps (shielding)
③ Signal cable
④ Motor cable
⑤ Power supply cable
⑥ Ground terminal
⑦ Terminals (power supply)
⑧ Terminals (motor)
⑨ Terminals (signals)

Figure 15: Terminal box

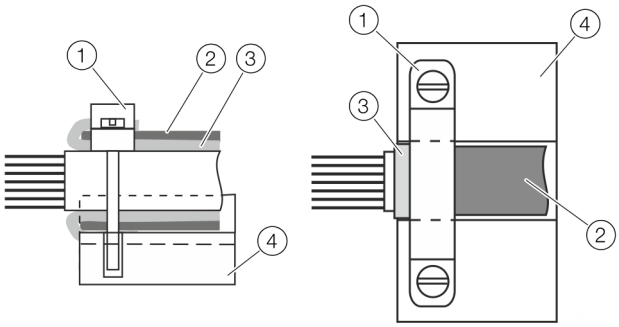
EBS862



1. Commissioning and service field
2. Ground terminal
3. Terminals (power supply)
4. Cable clamps (shielding)
5. Power supply cable
6. Motor cable
7. Terminals (motor)
8. Signal cable
9. Terminals (signals)

Figure 16: Terminal box

Connection of cable shielding



1. Cable clip
2. Cable sheath
3. Shielding
4. Housing

Figure 17: Cable shielding

1. Remove the cover for the terminal compartment.
2. Cut the cable sheath to the required length.
3. Separate the cable shield and pull it back over the outer sheath
4. Push the cable through the cable gland and fasten it with the clamp.
5. Make sure that the cable shield is in contact with the clip and the housing.
6. Connect the cable (see electrical connections starting on page 23).
7. Check the cable connections for tight fit and fasten the cable gland.
8. Screw the cover of the connection chamber back on tight.

Note

When installing the cover for the connection area, take care not to damage the sealing ring. If the sealing ring is damaged, contact the manufacturer.

8 Commissioning and operation

Note
It is imperative that you observe the operating instruction of the corresponding actuator for the commissioning of the electronic unit!

Note
The operating range of the actuator is not factory-set.
Set up the mechanical end stops in accordance with the operating instruction for the relevant actuator.

If there is a chance that safe operation is no longer possible, take the device out of operation and secure it against unintended startup.

General information

The basic settings ‘Define end positions’ and ‘Initial diagnosis’ can be configured via the commissioning and service field on the electronic unit.
The commissioning and service field is used to adjust the actuator to the working area and set the direction of action without using a PC.

The following configuration types are available for advanced adjustment of the actuator and its parameterization:

- With DTM
  Configuration can be performed within an FDT frame application that is approved for use with the DTM.
- With EDD
  Configuration can be performed within an EDD frame application that is approved for use with the EDD.

Communication with the electronic unit is optionally done through the RS 232 interface on the commissioning and service field or in field electronic units through digital communication with HART® or PROFIBUS®.

Note
For detailed information on the parameterization of the actuator, consult the associated configuration and parameterization instruction.

Engineering Software ECOM688 and ECOM700
Using the ECOM688 / ECOM700 engineering software, the user can read out, store, and write back the actuator-related data from the electronic unit of a Contrac control actuator.
Depending on the software version of the electronic unit, two different engineering software versions are available.

- Contrac electronic units with software version ≥ 2.00 require ECOM700.
- Contrac electronic units with software version < 2.00 require ECOM688.

Data cannot be read or written with an incorrect ECOM version.

Note
For detailed information, observe the corresponding operating instruction of the ECOM688 / ECOM700 Engineering Software.

Checks prior to commissioning

Before powering up the power supply
Before switching on the power supply and commissioning the device, check the following points:

- Correct wiring (see **Electrical connections** on page 19).
- Close all housing covers and terminal compartments.
- Do not open the housing cover or terminal compartments during operation!
- The actuator must have been installed in accordance with the corresponding operating instruction. The working zone and mechanical end stops must have been adjusted.
- Make sure that there is no danger of injury for persons due to movement of the actuator!

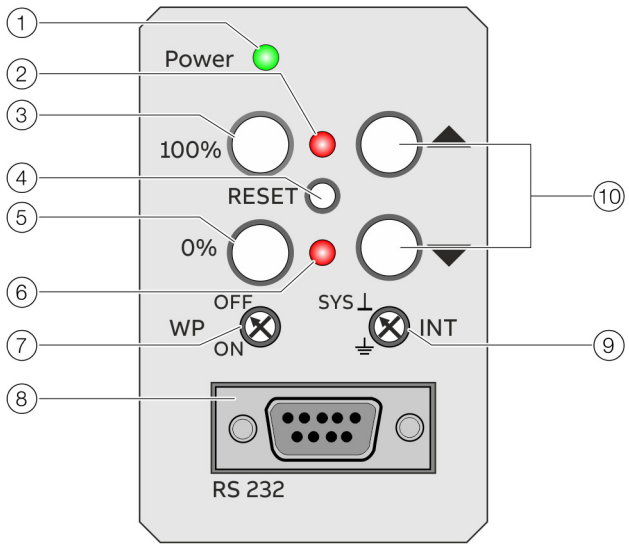
1. Switch on the power supply.

After powering up the power supply
Check the following items after powering up the power supply:

- The write protection switch on the commissioning and service field is in the ‘OFF’ position.
- The electronic unit is in the ‘MAN’ operating mode; there is no +24 V signal on binary input 1.
- No error (if an error is pending, both LEDs on the commissioning and service field will flash alternately at 4 Hz).

2. Perform parameterization and basic settings on the electronic unit.

Commissioning and service field



1. LED power supply
2. LED 100 %
3. Button 100 %
4. Reset button
5. Button 0 %
6. LED 0 %
7. Write protection switch
8. RS 232 interface
9. Potential switch
10. Travel button ▲ / ▼

Figure 18: Commissioning and service field

Operating element	Description
Button 100 %	Press to set the current position as 100 %; press briefly in combination with the 0 % button to end the adjustment process. Simultaneously pressing the 0 % button for at least 5 seconds switches the actuator to MAN operating mode (manual). (Software version 2.00 and higher)
Button 0 %	Press to set the current position as 0 %; press in combination with the 100 % button to end the adjustment process.
LED 100 % / 0 %	Depending on the flash rate, this LED indicates the adjustment process, position saved, MAN operating mode (manual via commissioning and service field from software version 2.00 or higher) or an error.
Reset button	Press to restart the processor. If the adjustment is not yet terminated, the set end positions are deleted.

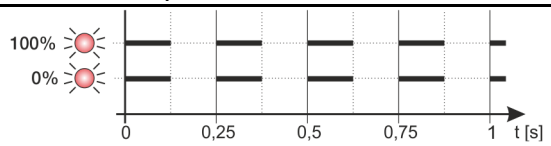
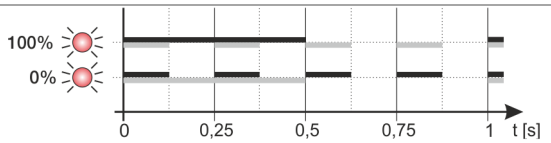
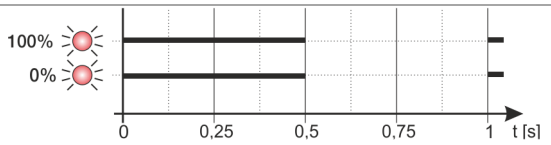
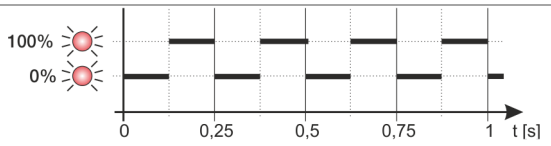
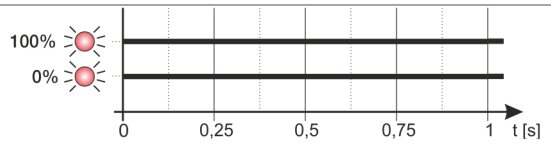
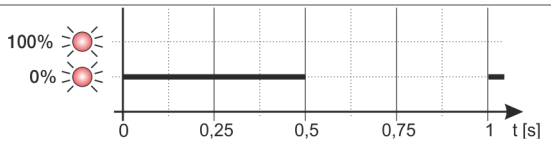
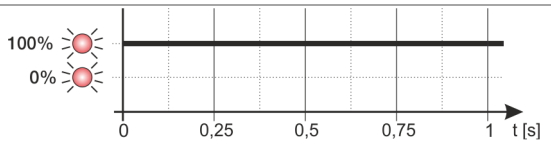
Operating element	Description
Write protection switch	Activates the hardware write protection. Factory setting: OFF – write protection deactivated. Refer to **Hardware write protection** on page 33.
Potential switch	Selection of reference potential. Factory setting: SYS – Reference potential on the system. Refer to **Hardware write protection** on page 33.
Travel button	Pressing a button moves the actuator in the selected direction. Press and hold both buttons at the same time for at least 5 seconds to delete the existing end position setting.

… 8 Commissioning and operation

… Commissioning and service field

Meaning of the LED indicators

The LEDs 100 % / 0 % on the commissioning and service field (**Figure 18** on page 31, Pos. ② + ⑥) flash at different rates, depending on the function that has been initiated.

LED Flash code 0 % / 100 %	Description
	**Adjustment mode** Both LEDs flash synchronously at 4 Hz.
	**Accept 1. Position correct** Depending on which position is approached first, either LED 100 % flashes at 1 Hz and LED 0 % continues to flash at 4 Hz, or vice versa.
	**Accept 2 Position correct** Both LEDs flash at 1 Hz.
	**Failure** Both LEDs flash alternately at 4 Hz.
	**ECOM688 or ECOM700 mode** Both LEDs light continuously (from software version 2.00).
	**MAN operating mode (manual) through ISF** The LED 0 % flashes at 1 Hz, LED 100 % is off (from software version 2.00).
	**MAN (Manual) operating mode via binary input or graphical user interface** The LED 100 % lights continuously, LED 0 % is off (from software version 2.00).

Note

The flash codes for MAN (manual) operating mode through ISF or binary input / graphic user interface can also occur at the same time.

Hardware settings

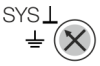
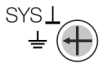
Hardware write protection

If write protection is active, the device parameterization cannot be changed.
Activating and sealing the write protection switch WP (**Figure 18**, (7)) protects the device against tampering.

Number	Function
ON	Write protection active
OFF	Write protection deactivated

Potential switch

The potentials switch INT ⊥ (**Figure 18**, (9)) connects the reference potential either to the system or the protective ground.

Number	Function / setting recommendation
	**Reference potential on system potential** Conventional control with analog set point without external electrical isolation
	**Reference potential on ground potential** Conventional control with analog set point and with external electrical isolation
	**Reference potential on ground potential** With step control

Basic Setup

Setting the end positions 0 % / 100 %

Note
Once commissioning is complete, set the write protection switch to 'ON'.

1. Switch the electronic unit to the 'Adjustment' operating mode. Press and hold down both travel buttons (**Figure 18**, pos. (10)) for approx. 5 seconds, until both LEDs (**Figure 18**, pos. (2) and (6)) flash in synch at approx. 4 Hz.

Defining the initial position (0 % or 100 %)

2. Use one of the travel buttons to move to the desired position.
3. Press the Accept button to accept the position (**Figure 18**, pos. (3) or (5)); if successful, the corresponding LED flashes at a rate of 1 Hz. The other LED will continue to flash at approx. 4 Hz.

Defining the second position (0 % or 100 %)

4. Use one of the travel buttons to move to the second position.
5. To accept the position, press the Accept button. If successful, both LEDs will flash at a rate of approx. 1 Hz.

Saving the settings

6. Press both Accept buttons to accept the settings. The LEDs will stop flashing after a short period of time and the setup process is complete.

Note
If the range selected for the actuator is too small, both LEDs begin to flash again at 4 Hz and the setup procedure must be repeated with a larger value (min. actuator travel). (Information regarding actuator travel appears on the actuator name plate.)

Correcting your settings

- If after accepting the initial value for the settings you need to make a correction, press the reset button and repeat the setting procedure.
- If you need to make a correction after saving your settings, you will need to repeat the entire setup procedure from the beginning.

After commissioning

After commissioning has been performed, it is recommended that you use the control system to operate the actuator and that you check the actuator's response and its signaling behavior.
In order for the actuator to go into automatic mode after commissioning, there must be a 24 V DC-signal on binary input 1 in actuators with active binary input function (standard setting). If the digital input function is switched off, the actuator will switch to automatic mode immediately on completion of the setup process.

… 8 Commissioning and operation

Manual (MAN)- and Automatic Operation (AUT)

Software version 2.00 and higher
In the manual operating mode (MAN), the actuator solely reacts upon actuation of either of the two travel buttons on the commissioning and service field. Any control via the setpoint or digital input will be ignored.
The operating mode is saved in the non-volatile memory of the electronic unit. As a result, the actuator will not start up unintentionally after a power failure.

Activating manual operating mode (MAN) on the commissioning and service field

- Simultaneously press the Accept buttons 100 % / 0 % (**Figure 18** on page 31, ③, ⑤) for at least 5 seconds.

The LED for the 0%-Position will begin to flash.

Activating automatic operating mode (AUT) on the commissioning and service field

- Simultaneously press the Accept buttons 100 % / 0 % (**Figure 18** on page 31, ③, ⑤) for a brief amount of time.

The LED for the 0 %-Position will go out.

Activating the automatic operating mode (AUT) through the binary input or the graphic user interface

- Apply a +24 V DC signal to binary input 1 and / or select the AUT operating mode on the graphic user interface.

With the manual operating mode (MAN) activated, the LED for the 100 % position is continually lit up.

Signaling on the commissioning and service field

Function	Display
Device setup	
Switch to Device setup: Press and hold down both travel buttons for approx. 5 s.	After this time, both LEDs will then flash in sync at 4 Hz.
Approach an end position: Move to the desired end position by pressing the travel button.	Both LEDs will continue to flash at 4 Hz during actuator travel.
Save the initial end position: Press the 0% or 100% button.	The corresponding LED will flash at approx. 1 Hz, the other will continue to flash at 4 Hz.
Save the second end position: Press the 0% or 100% button.	The related LED will flash at approx. 1 Hz in sync with the first LED.
Special Requirements	
Standard operation: MAN / AUT.	The LEDs are not lit.
Travel via the operating button on the commissioning and service field takes priority over the control system.	The LEDs are not lit.
Error (both LEDs flashing alternately at 4 Hz)	
Press the RESET button to reset the error messages.	If there are no other errors pending, both LEDs will go out.
Reset if the operating range is overshot: Press and hold down both travel buttons for 5 seconds and then press the RESET button.	After approx. 5 seconds, the LEDs will stop flashing briefly. After a ‘reset’, the electronic unit will be in Adjustment Mode!
ECOM Mode	
The ECOM688 engineering tool is used to access the electronic unit.	Both LEDs light up continuously.

9 Diagnosis / error messages

Definition – Alarms and Errors

Alarms

The actuator / electronic unit is in a critical state (e.g., high temperature), which currently does not affect the actuator, electronic unit, process or persons.

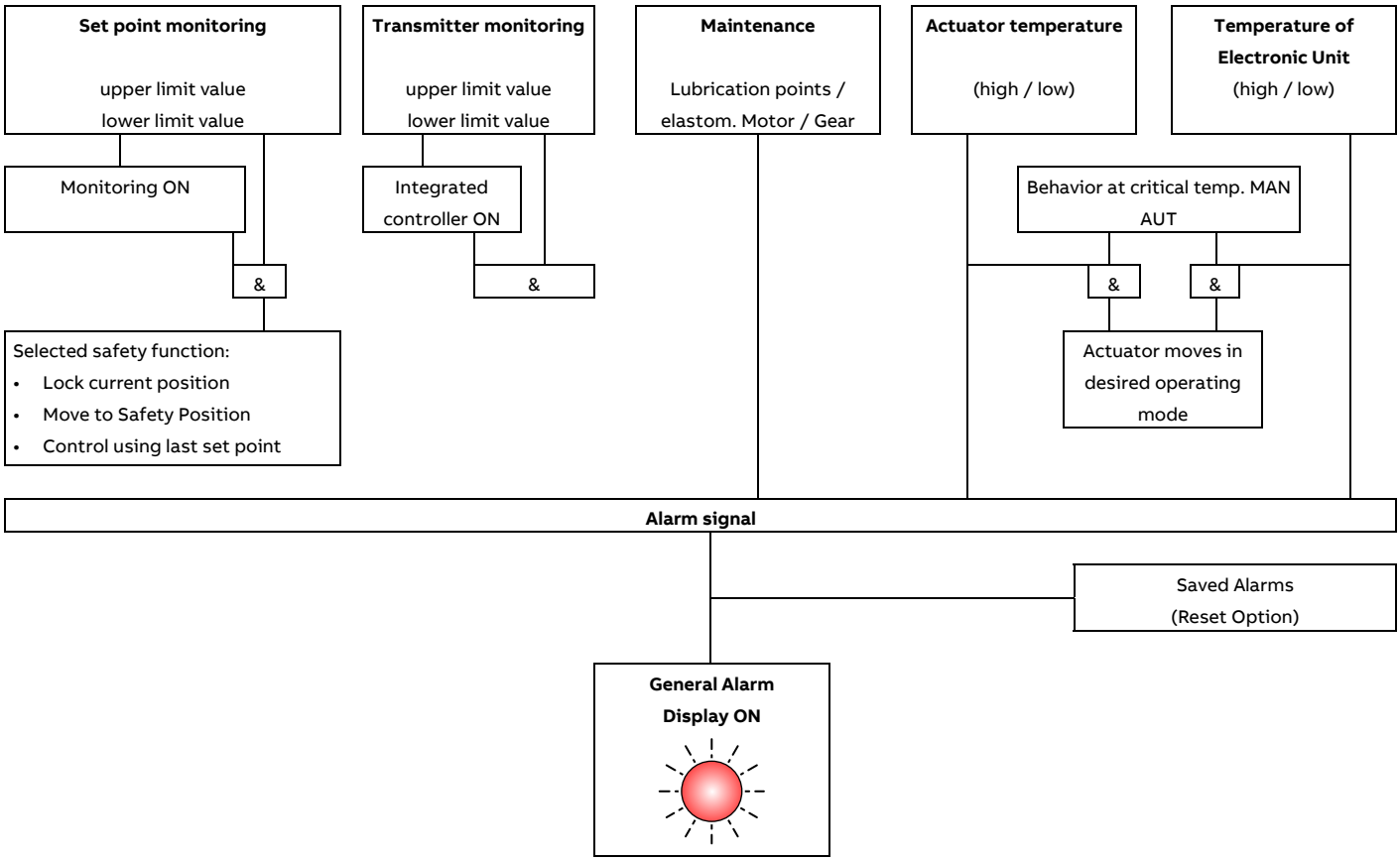
The actuator functions are available. Previous alarms are stored in the 'Saved Alarms' area in the electronic unit. Use the graphic user interface to read out saved alarms.

Errors

The actuator / electronic unit is in a critical state, e.g. control circuit monitoring, which is directly impairing the actuator, electronic unit, process or persons.

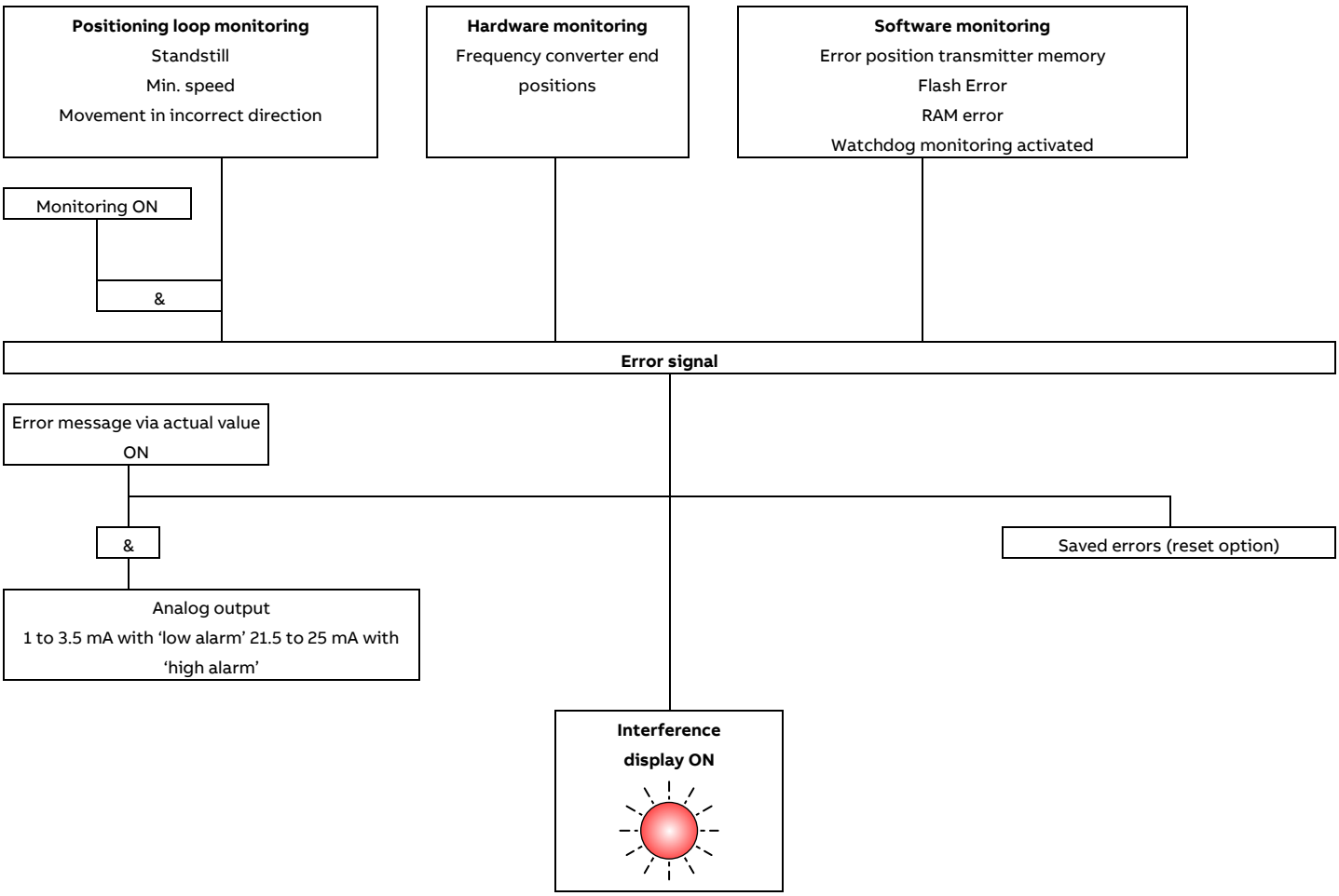
The actuator is switched off and the actuator functions are no longer available. Previous error messages are stored in the 'Saved Errors' area in the electronic unit. Use the graphic user interface to read out saved errors. Error messages cannot be reset until the cause of the error has been eliminated.

Alarm Diagram



… 9 Diagnosis / error messages

Error Diagram



Hardware Errors

This chapter only covers hardware-related errors. For additional troubleshooting information, refer to the online help for the operator interface.

Error	Possible cause	Troubleshooting the Instrument
Valve cannot be moved by actuator.	Failure either on the actuator or the final control element (e.g. packed gland too tight).	Disconnect actuator from valve. If the actuator moves, the valve is the possible cause. If the actuator does not move, the actuator is the possible cause.
The actuator does not respond.	Incorrect electronic unit or incorrect data set.	Compare information on name plates for actuator and electronic unit.
	Incorrectly configured electronic unit.	Check / change. Change the settings via the parameterization software.
	No communication with the control system.	Check wiring.
	Incorrect wiring between actuator and electronic unit.	Check wiring.
	Motor / brake defective.	Check the winding resistance of the motor and brake. Check the brake lock.
	Binary inputs on the electronic unit are not wired.	Make connection.
	Brake does not release (no mechanical ‘click’)	Check the brake air gap (approx. 0.25 mm (0.010 in)) and electrical connection to the brake. Check winding resistance of the brake coil.
Actuator does not run in automatic mode, although automatic mode is selected in the user interface.	Digital input 1 (BE 1) not wired.	Make connection. Check the software settings for the digital inputs.
Actuator does not respond to control (LED 5 flashing at 1 Hz) (software version 2.00 and higher).	Actuator in manual mode (MAN) through commissioning and service field.	Switch actuator to automatic mode (AUT).
LEDs in the commissioning and service panel (ISF) are flashing synchronously.	Actuator is not adjusted properly.	Adjust actuator.
LEDs flash alternately.	Electronic unit / drive malfunction.	Drive the actuator beyond the adjusted end position, either manually or using the buttons on the commissioning and service field; (if necessary disconnect from final control element first). Drive the actuator back into the operating range and connect it to the valve. Readjust the actuator for the operating range.
Malfunction when approaching the end position.	Actuator in limit range of positioning sensor.	

10 Maintenance

Electronic unit

The electronic unit does not require any maintenance if it operated in line with intended use under normal operating conditions.

Note
Manipulation by users shall immediately render the warranty for the device invalid.

Control actuator

Note
For detailed information on the maintenance of the actuator, consult the operating instruction of the actuator!

Contrac actuators feature a robust construction. As a result, they are highly reliable and require minimal maintenance. The maintenance intervals depend upon the effective load and are therefore not specified here.
The built-in microprocessor evaluates the actual load factors (e.g. torques, forces, temperatures, etc.) and derives the remaining operating time until the next routine maintenance is required.
Use the configuration program to view this information.

11 Repair

Repair and maintenance activities may only be performed by authorized customer service personnel.
When replacing or repairing individual components, use original spare parts.

Returning devices

Use the original packaging or a secure transport container of an appropriate type if you need to return the device for repair or recalibration purposes.
Fill out the return form (see **Return form** on page 41) and include this with the device.
In accordance with the EU Directive governing hazardous materials, the owner of hazardous waste is responsible for its disposal or must observe the following regulations for shipping purposes:
All devices delivered to ABB must be free from any hazardous materials (acids, alkalis, solvents, etc.).

Please contact Customer Center Service acc. to page 4 for nearest service location.

Fuses

Type	Fuse	Installation location	Design	Rated current of fuse	
				at 115 V AC	**at 230 V AC**
EBS852	External fuse	External	–	16 A, time-lag	16 A, time-lag
	Mains fuse	Connection area	G-fuse cartridge 5 × 20 mm	12.5 A, time-lag	10 A, time-lag
	Brake fuse	Power supply board	G-fuse cartridge 5 × 20 mm	0.315 A, medium time-lag	0.315 A, medium time-lag
	DC link fuse	Power supply board	G-fuse cartridge 6.3 × 32 mm	10 A, super fast-acting	10 A, super fast-acting
	Fuse for binary outputs (3x)	Connection area	G-fuse cartridge 5 × 20 mm	–	0.2 A, medium time-lag
EBS862	External fuse*	External	Safety fuse / thermal circuit breaker	–	35 A / 16 A
	Brake fuse	Power supply board	G-fuse cartridge 5 × 20 mm	–	0.315 A, medium time-lag
	DC link fuse	Power supply board	G-fuse cartridge 6.3 × 32 mm	–	15 A, super fast-acting
	Fuse for binary outputs (3x)	Connection area	G-fuse cartridge 5 × 20 mm	–	0.2 A, medium time-lag

* The 35 A safety fuse and the 16 A thermal circuit breaker are included in the scope of delivery. The conductor cross-section between the fuse and the electronic system must be at least 2.5 mm^2 (14 AWG).

12 Recycling and disposal

Note

Products that are marked with the adjacent symbol may **not** be disposed of as unsorted municipal waste (domestic waste).
They should be disposed of through separate collection of electric and electronic devices.

This product and its packaging are manufactured from materials that can be recycled by specialist recycling companies.

Bear the following points in mind when disposing of them:

- As of 8/15/2018, this product will be under the open scope of the WEEE Directive 2012/19/EU and relevant national laws (for example, ElektroG - Electrical Equipment Act - in Germany).
- The product must be supplied to a specialist recycling company. Do not use municipal waste collection points. These may be used for privately used products only in accordance with WEEE Directive 2012/19/EU.
- If there is no possibility to dispose of the old equipment properly, our Service can take care of its pick-up and disposal for a fee.

Notice on RoHS II-Directive 2011/65/EU

As of 7/22/2019, the products provided by ABB Automation Products GmbH fall within the scope of regulations on hazardous substances with restricted uses or the directive on waste electrical and electronic equipment in accordance with ElektroG.

Note
Detailed information on the RoHS Directive is available in the ABB download area.
www.abb.com/actuators

13 Approvals and certifications

CE mark

CE

The version of the device as provided by us meets the requirements of the following EU directives:

- EMC directive 2014/30/EU
- Machinery Directive 2006/42/EC / 2006/42/EG
- Low Voltage Directive 2014/35/EU
- RoHS II Directive 2011/65/EU (as of 7/22/2019)

14 Additional documents

Note
All documentation, declarations of conformity and certificates are available in ABB's download area.
www.abb.com/actuators

15 Appendix

Return form

Statement on the contamination of devices and components

Repair and/or maintenance work will only be performed on devices and components if a statement form has been completed and submitted.
Otherwise, the device/component returned may be rejected. This statement form may only be completed and signed by authorized specialist personnel employed by the operator.

Customer details:

Company:	
Address:	
Contact person:	Telephone:
Fax:	Email:

Device details:

Type:	Serial no.:
Reason for the return/description of the defect:	

Was this device used in conjunction with substances which pose a threat or risk to health?

☐ Yes ☐ No

If yes, which type of contamination (please place an X next to the applicable items):

☐ biological	☐ corrosive / irritating	☐ combustible (highly / extremely combustible)
☐ toxic	☐ explosive	☐ other toxic substances
☐ radioactive		

Which substances have come into contact with the device?

1.
2.
3.

We hereby state that the devices/components shipped have been cleaned and are free from any dangerous or poisonous substances.

Town/city, date	Signature and company stamp

Trademarks

HART is a registered trademark of FieldComm Group, Austin, Texas, USA

Notes

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ABB Measurement & Analytics

For your local ABB contact, visit:
www.abb.com/contacts

For more product information, visit:
www.abb.com/actuators

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OI/EBS852/EBS862/EX-EN Rev. C 11.2020 Original instruction