

LME620-AI / PME120-AI / EAN823 / EBN853 / EBN861

Electronic unit for field installation (Contrac)



For the control of Contrac control actuators series PME, LME, RHD and RSD

—
Integrated
LME620-AI
PME120-AI

Field-mount
EAN823
EBN853
EBN861

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 LME620-AI / PME120-AI / EAN823 / EBN853 / EBN861 is available for download free of charge at www.abb.com/actuators. Alternatively simply scan this code:



Table of contents

1	Safety.....	3	6	Electrical connections	17
	General information and instructions.....	3		Safety instructions	17
	Warnings	3		Instructions on the use of Error Current Circuit Breakers (RCDs)	17
	Intended use	3		General.....	17
	Improper use.....	3		Conductor cross-section on universal plug	17
	Warranty provisions.....	3		Conductor cross-section on electronic unit	18
	Cyber security disclaimer	4		Cable glands	18
	Software downloads	4		Selection of suited connection cables	18
	Manufacturer's address	4		Potential equalization	18
	Service address.....	4		Integrated electronic unit for PME120-AI / LME620-AI... 19	
2	Design and function	5		Electronic unit EAN823 (Contrac) / EBN853 (Contrac) / EBN861 (Contrac)	21
	Design	5		Electronic unit EAN823 (Contrac) / EBN853 (Contrac) / EBN861 (Contrac)	22
	LME620-AI / PME120-AI (with integrated EAI823 electronic unit).....	5		Connection examples	23
	EAN823 / EBN853.....	5		Electrical data for inputs and outputs.....	25
	EBN861	6		Connection on the device.....	28
	Principle of operation.....	6		Connection of the power and signal cable on the actuator	29
	Overview	7	7	Commissioning and operation.....	30
	Device designs.....	8		General information.....	30
3	Product identification	10		Engineering Software ECOM688 and ECOM700.....	30
	Name plates	10		Checks prior to commissioning.....	30
	Scope of delivery	10		Before powering up the power supply.....	30
	Delivery status	11		After powering up the power supply	30
4	Transport and storage.....	12		Commissioning and service field.....	31
	Inspection.....	12		Meaning of the LED indicators.....	32
	Transporting the device.....	12		Hardware settings.....	33
	Safety instructions.....	12		Basic Setup	33
	Returning devices.....	12		Manual (MAN)- and Automatic Operation (AUT)	34
	Storing the device	12	8	Diagnosis / error messages	35
5	Installation	12		Definition – Alarms and Errors	35
	Safety instructions.....	12		Alarm Diagram	35
	Mounting	12		Error Diagram.....	36
	LME620-AI / PME120-AI (with integrated EAI823 electronic unit).....	13		Hardware Errors.....	37
	EAN823 / EBN853.....	13	9	Maintenance	38
	EBN861	13		Electronic unit	38
	Dimensions.....	14		Control actuator	38
	Electronic unit EAN823 (Contrac).....	14	10	Repair	38
	Electronic unit EBN853 (Contrac).....	15		Returning devices	38
	Electronic unit EBN861 (Contrac).....	16		Fuses	39
			11	Recycling and disposal	40
			12	Additional documents	40
			13	Appendix	41
				Return form.....	41

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.

Intended use

The electronic units of type LME620-AI / PME120-AI / EAN823 / EBN853 / EBN861 interconnected as illustrated in this operating instruction are used exclusively to control the PME120, LME620, RHD... and RSD... series control actuators.

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 especially 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.

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.

... 1 Safety

Cyber security disclaimer

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 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.

Software downloads

By visiting the web pages indicated below, you will find notifications about newly found software vulnerabilities and options to download the latest software. It is recommended that you visit this web pages regularly:

www.abb.com/cybersecurity

[ABB-Library – Contrac – Software Downloads](#)



Manufacturer's address

ABB AG

Measurement & Analytics

Schillerstr. 72

32425 Minden

Germany

Tel: +49 571 830-0

Fax: +49 571 830-1806

Service address

Customer service center

Tel: +49 180 5 222 580

Email: automation.service@de.abb.com

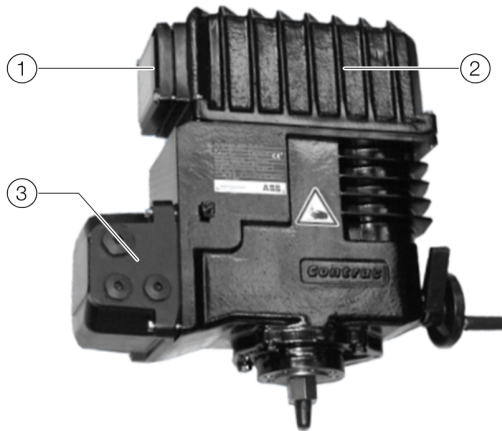
2 Design and function

Design

The actuators with integrated electronic unit (PME120-AI and LME620-AI) consist of two components. One component is the gearing which includes the connection components and the transformer. The other component is made up of the electronic unit (EAI823) and the commissioning and service field (ISF) for 'local operation' and actuator setup.

The electronic units EAN823, EBN853 and EBN861 consist of two housing halves, one holding the connection components and the transformer, the other holding the electronics and the commissioning and service field (ISF) for 'local operation' of the actuator.

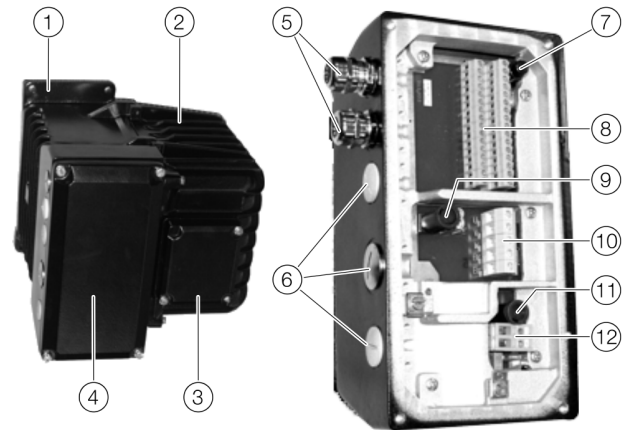
LME620-AI / PME120-AI (with integrated EAI823 electronic unit)



- | | |
|---|---|
| ① Cover for commissioning and service field | ③ Universal plug (power supply, signal cable) |
| ② Electronic unit cover | |

Figure 1: LME620-AI with integrated electronic unit (example)

EAN823 / EBN853



- | | |
|---|----------------------------|
| ① Connection housing | ⑦ Analog input fuse |
| ② Electronic unit cover | ⑧ Terminals (signals) |
| ③ Cover for commissioning and service field | ⑨ Anti-dew heater fuse |
| ④ Cover for terminal compartment | ⑩ Terminals (motor cable) |
| ⑤ Cable gland | ⑪ Power supply fuse |
| ⑥ Tap holes for cable glands | ⑫ Terminals (power supply) |

Figure 2: Presentation of terminal chamber

... 2 Design and function

... Design

EBN861

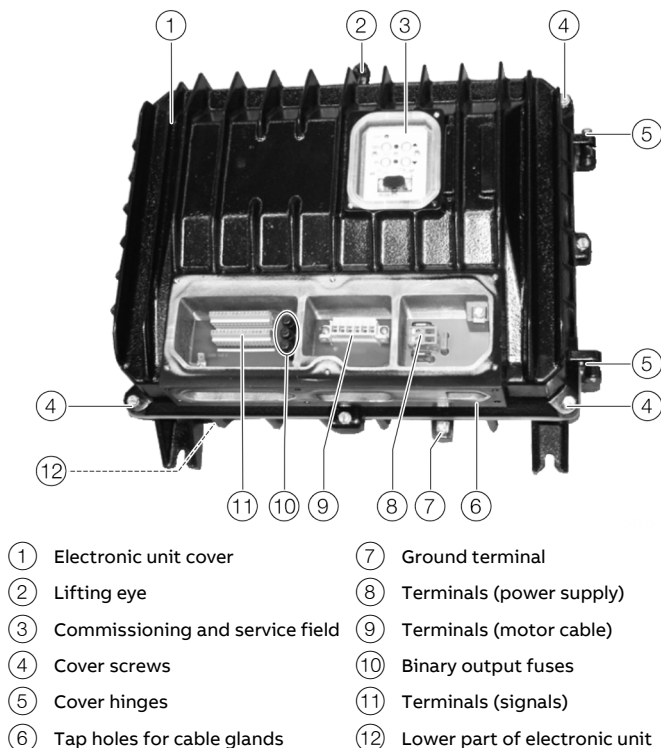


Figure 3: Presentation without cover for terminal compartment

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

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).

Overview

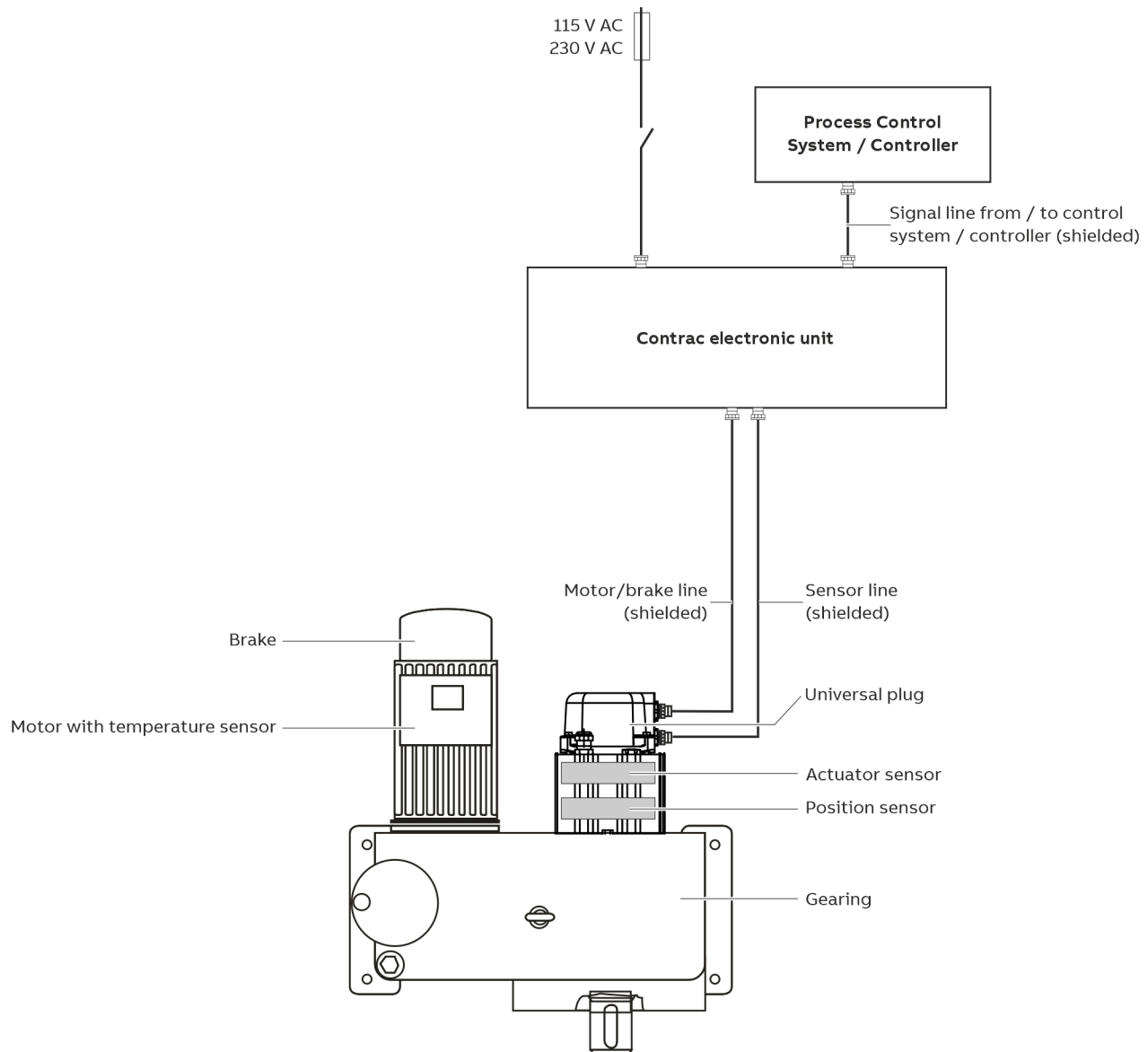


Figure 4: Structure of the Contrac components (example)

... 2 Design and function

Device designs

EAN823	
IP rating	IP 66 in accordance with IEC 60529 / EN 60529 NEMA 4X in accordance with CAN / CSA22.2 No. 94
Humidity	≤ 95% annual average; condensation not permitted
Ambient temperature	–25 to 55 °C (–13 to 131 °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	On vertical mounting plate, lateral cable gland, left
Vibration stress	Maximum 150 Hz: acceleration: 1 g (in accordance with EN 60068-2-6, Table C.2)
Electrical connection	Mains supply and connection cable to the control system through screw terminals. Connection cable between electronic unit and actuator tightly fastened optionally to the electronic unit, from the actuator side using a connector to the connection to the actuator. Available cable lengths 5 m (16 ft), 10 m (32 ft) or 20 m (65 ft). Maximum cable length for delivery without cable: 30 m (98 ft)
Weight	11 kg (24 lbs)
EBN853	
IP rating	IP 66 in accordance with IEC 60529 / EN 60529 NEMA 4X in accordance with CAN / CSA22.2 No. 94
Humidity	≤ 95% annual average; condensation not permitted
Ambient temperature	–25 to 55 °C (–13 to 131 °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	On vertical mounting plate, lateral cable gland, left
Vibration stress	Maximum 150 Hz: acceleration: 1 g (in accordance with EN 60068-2-6, Table C.2)
Paint	2-layer component epoxy (RAL 9005, black)
Electrical connection	Mains supply via screw terminals; all other connections made via screw-type plug connectors Connection cable between electronic unit and actuator tightly fastened to the electronic unit, from the actuator side using a connector to the connection to the actuator. Maximum cable length 100 m (328 ft). In actuators in explosion-proof design, the connection cable is tightly fastened to the actuator without a connector through the screw terminals. Optional, loose cable set supplied acc. to length requirements
Weight	11 kg (24 lbs)

EBN861	
IP rating	IP 66
Humidity	≤ 95% annual average; condensation not permitted
Ambient temperature	-25 to 55 °C (-13 to 131 °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	On vertical mounting plate, cable gland at the bottom
Vibration stress	Maximum 150 Hz: acceleration: 1 g (in accordance with EN 60068-2-6, Table C.2)
Paint	2-layer component epoxy (RAL 9005, black)
Electrical connection	<p>Mains supply via screw terminals; all other connections made via screw-type plug connectors</p> <p>Connection cable between electronic unit and actuator tightly fastened to the electronic unit, from the actuator side using a connector to the connection to the actuator. Maximum cable length 100 m (328 ft).</p> <p>In actuators in explosion-proof design, the connection cable is tightly fastened to the actuator without a connector through the screw terminals.</p> <p>Optional, loose cable set supplied acc. to length requirements</p>
Weight	40 kg (88 lbs)

3 Product identification

Name plates

①	Elektronik / Electronics Type: ...		Made in Germany	⑫
②	B-Nr./No.	NL		⑪
③	U = 230 V ...	Jahr/Year		⑩
④	f = 50/60 Hz ± 5 %	P= max..... W		⑨
⑤	t =°C	IP 20		⑧
⑥	Ext. Sicherung / Fuse	CE / UKCA		
⑦	ABB AG Schillerstrasse 72 D-32425 Minden			

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

Figure 5: Hardware name plate (example)

①	Für / For Antrieb / Actuator
②	Nennwerte / Rated Values M= °/s=
③	F-Nr. / No.
④	NL.
⑤	Software Version
⑥	

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

Figure 6: 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	Elektronik / Electronics Type: ...		Made in Germany	⑧
②	B-Nr./No.	NL		⑦
		Jahr/Year		
③	t =°C	IP 20		⑥
		CE / UKCA		⑤
④	ABB AG Schillerstrasse 72 D-32425 Minden			

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

Figure 7: Additional name plate for hardware (example)

Scope of delivery

- 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 \pm direction	100 %
Automatic speed in \pm 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 \pm
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

PROFIBUS DP® communication	
Parameter	Setting
Function selection	Positioner, parameter: set point
Set point function	Digital
Set point range	4 to 20 mA
Set point characteristic	Linear; set point = position value
Actual value range	Digital
Nominal torque / rated force in \pm direction	100 %
Automatic speed in \pm direction:	100 %
Action in 0 % / 100 % end position	Keep leak-tight with nominal torque / rated force
Digital outputs	Digital output 1 / 2 end position signal 0 % / 100 %
Brake Away Function	Deactivated
Shut-off function	Deactivated
Positioning loop monitoring	Deactivated
Communication monitoring	PROFIBUS DP® / V0: Activated Lock in last position PROFIBUS DP® / V1: Activated After delay time has elapsed (standard configuration 5 s) Lock in last position
Alarm Type	Deactivated
Action after restoration of power	Switch to Automatic
Working range of actuator	Not set

4 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 **Returning devices** on page 38.

Storing the device

The electronic units LME620-AI / PME120-AI / EAN823 / EBN853 / EBN861 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 8).

For longer storage periods, we recommend packing the units in foil with a dessicant added.

The dessicant must be checked for regularly for effectivity.

5 Installation

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.

Please observe the following safety instructions

- Only qualified specialists may mount and adjust the control actuator, and make the electrical connection.
- When working on the actuator or the electronics always observe the locally valid accident prevention regulations and the regulations concerning the construction of technical installations.
- Switch off the supply voltage and take precautions to prevent unintentional switch-on.

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.

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 8.
- 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.

LME620-AI / PME120-AI (with integrated EAI823 electronic unit)

Refer to the operating instruction of the linear actuator or rotary actuator for detailed information on the assembly of actuators with integrated electronics.

EAN823 / EBN853

1. Fasten the electronic unit to a vertical mounting plate using grade 8.8 screws. Tensile strength 800 N/mm² (116032 pounds/square in.), yield strength 640 N/mm² (92826 pounds/square in.).
2. Provide adequate room for installation and ensure easy access.
3. The cable entries must be directed to the left.

EBN861**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** on page 6).
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** on page 6).
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/mm² (116032 pounds/square in.), yield strength 640 N/mm² (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** on page 6).

... 5 Installation

Dimensions

Electronic unit EAN823 (Contrac)

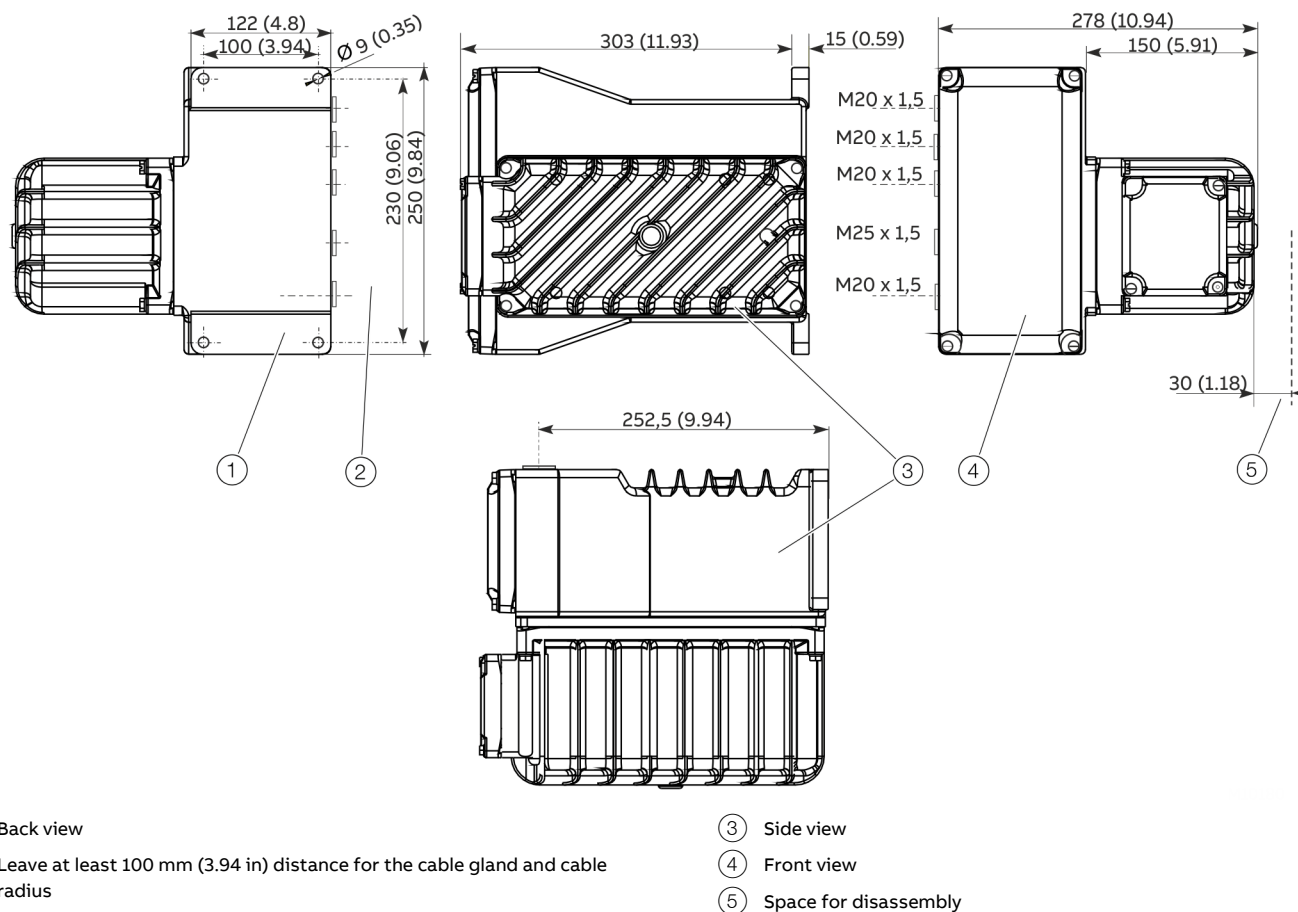
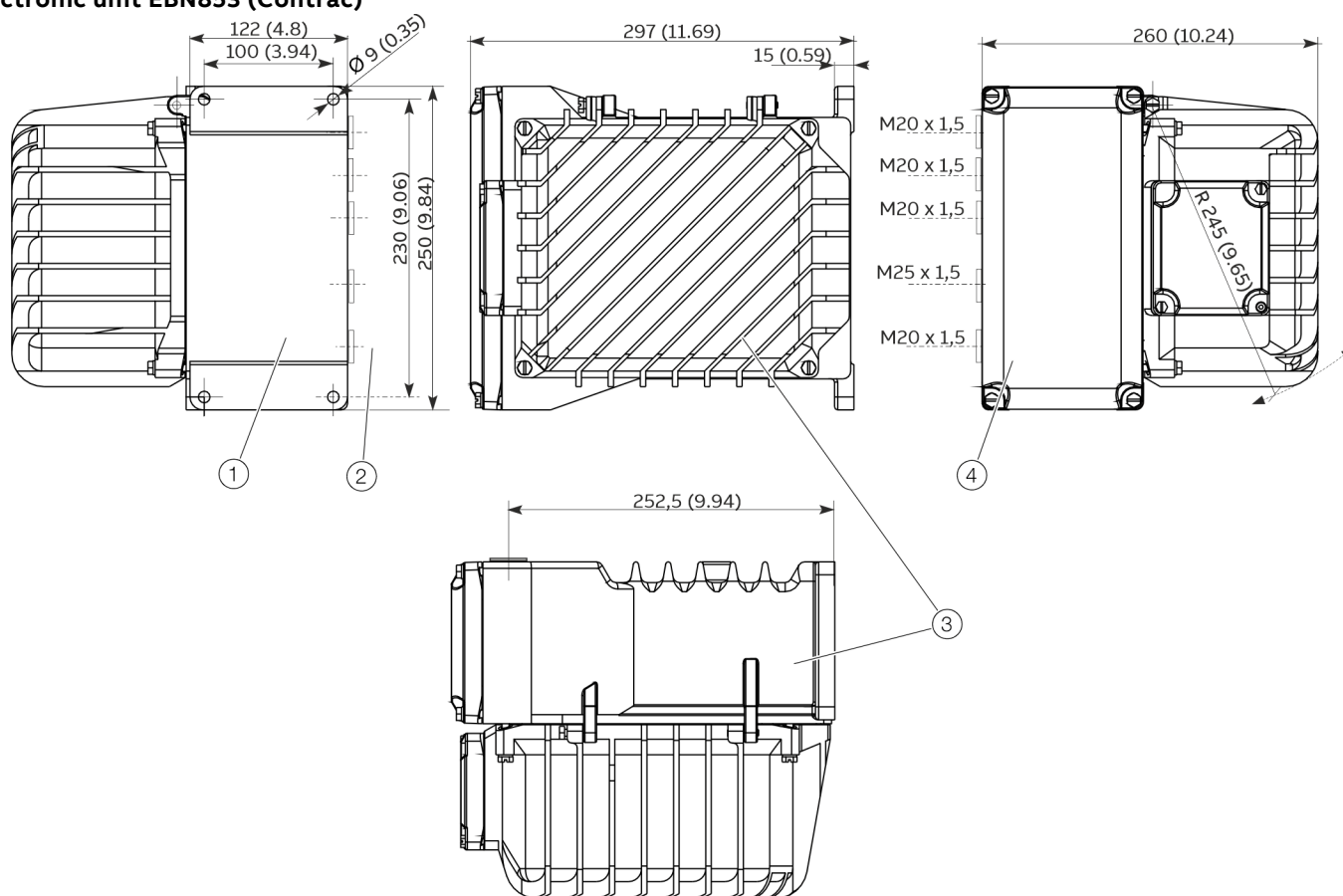


Figure 8: Dimensions in mm (in)

Electronic unit EBN853 (Contrac)

① Back view

② Leave at least 100 mm (3.94 in) distance for the cable gland and cable radius

③ Side view

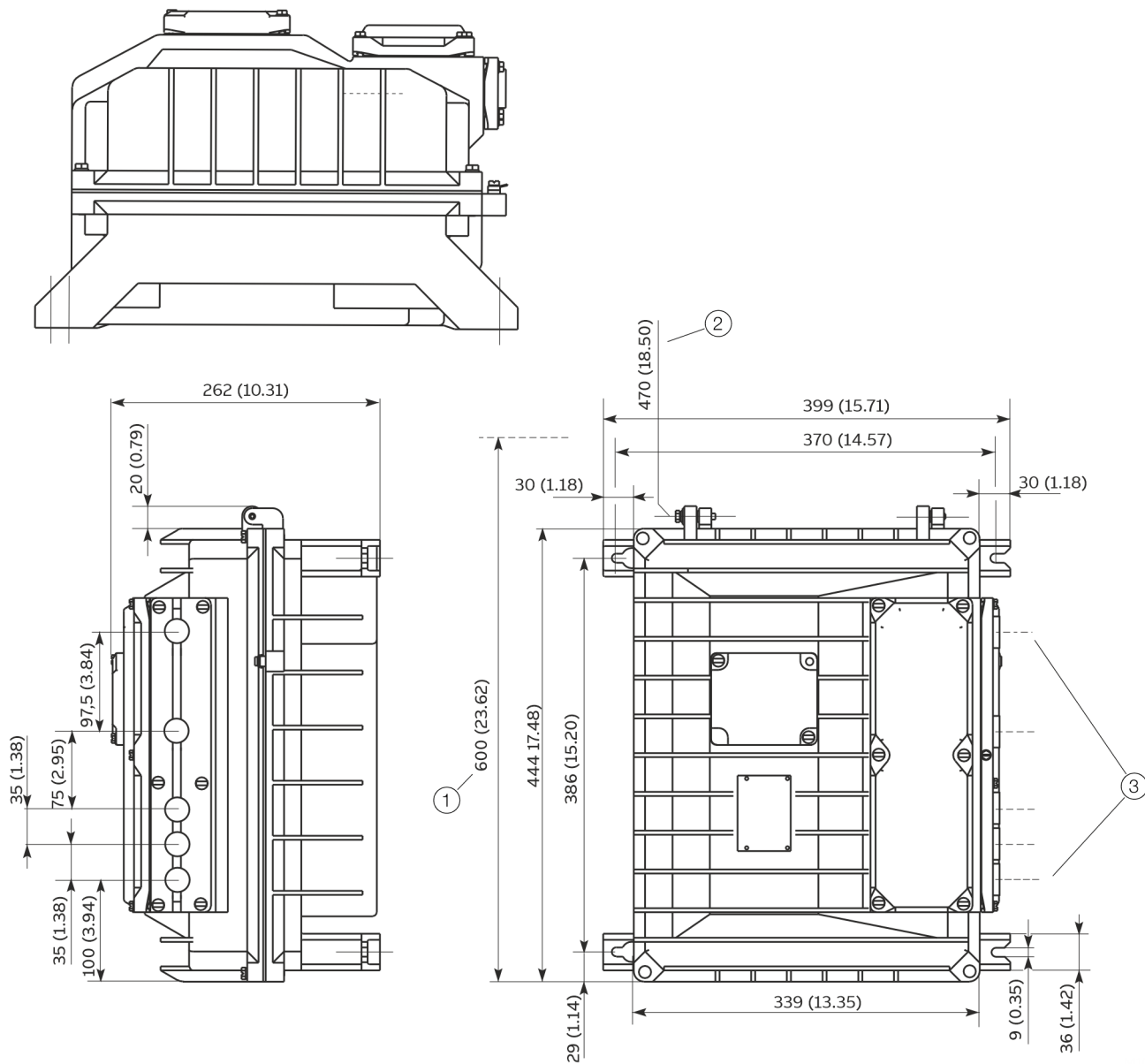
④ Front view

Figure 9: Dimensions in mm (in)

... 5 Installation

... Dimensions

Electronic unit EBN861 (Contrac)



① Front section open, rotated 90°

② Rotational radius

③ Tap holes

Figure 10: Dimensions in mm (in)

6 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.

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.

Instructions on the use of Error Current Circuit Breakers (RCDs)

If additional protection against accidental contact due to the use of an RCD is required by local regulations, the following items should be observed:

- For the electronic unit EAN823, the use of a type B RCD is **not necessary**, since from a design viewpoint, no voltage levels > 60 V DC which can be dangerous upon contact can occur.
- The use of a Type B RCD is recommended for the electronic units EBN853 and EBN861.
- The operator is responsible for the correct layout of additional protection against accidental contact due to the use of an RCD!

General

Each actuator requires a suited Contrac electronic unit with installed actuator-specific software.

Conductor cross-section on universal plug

Actuators with integrated electronic unit LME620-AI / PME120-AI

Crimp pins

Mains	max. 1.5 mm ² (16 AWG)
Signals	max. 0.5 mm ² (20 AWG)
Contact surface	Gold-plated

Actuators with integrated electronic unit LME620-AI / PME120-AI

Screw terminals (optional)

Power supply, signals	0.2 to 2.5 mm ² (24 to 14 AWG)
Contact surface	Gold-plated

... 6 Electrical connections

... Conductor cross-section on universal plug

PME / LME

		Crimp pins		Screw terminals (optional)	
Separate electronic unit	Cable cross-section	Motor / brake / heater:	max. 1.5 mm ² (16 AWG)	Motor / brake / heater /	0.2 to 2.5 mm ²
		Signals:	max. 0.5 mm ² (20 AWG)	signals:	(24 to 14 AWG)
	Contact surface	Motor / brake / signals:	Gold-plated	Motor / brake / signals:	Gold-plated
		Heater:	Silver-plated	Heater:	Silver-plated
integrated electronic unit	Cable cross-section	Power supply:	max. 2.5 mm ² (14 AWG)	Power supply / signals:	0.2 to 2.5 mm ²
		Signals:	max. 0.5 mm ² (20 AWG)		(24 to 14 AWG)
	Contact surface	Power supply / signals:	Gold-plated	Power supply / signals:	Gold-plated

Conductor cross-section on electronic unit

EAN823 – Screw terminals

Motor/brake	fixed: 1.5 to 6 mm ² (16 to 10 AWG) flexible: 1.5 to 4 mm ² (16 to 12 AWG)
Mains	fixed: 0.5 to 6 mm ² (20 to 10 AWG) flexible: 0.5 to 4 mm ² (20 to 12 AWG)
Signals	fixed: 0.5 to 6 mm ² (20 to 10 AWG) flexible: 0.5 to 4 mm ² (20 to 12 AWG)

EBN853 – Screw terminals

Motor/brake	fixed: 1.5 to 6 mm ² (16 to 10 AWG) flexible: 0.2 to 4 mm ² (24 to 12 AWG)
Mains	fixed: 1.5 to 6 mm ² (16 to 10 AWG) flexible: 0.5 to 4 mm ² (20 to 12 AWG)
Signals	fixed: 0.5 to 4 mm ² (20 to 12 AWG) flexible: 0.5 to 2.5 mm ² (20 to 14 AWG)

EBN861 – Screw terminals

Motor/brake	fixed: 1.5 to 6 mm ² (16 to 10 AWG) flexible: 1.5 to 4 mm ² (16 to 12 AWG)
Mains	fixed: 0.5 to 6 mm ² (20 to 10 AWG) flexible: 0.5 to 4 mm ² (20 to 12 AWG)
Signals	fixed: 0.5 to 4 mm ² (20 to 12 AWG) flexible: 0.5 to 2.5 mm ² (20 to 14 AWG)

Cable glands

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

Tap holes for cable glands

	metric	optional adapters for*	
Signal cable	M20 × 1.5 (2 ×)	PG 16 (2 ×)	NPT ½ in (2 ×)
Motor cable	M25 × 1.5 (1 ×)	PG 21 (1 ×)	NPT ¾ in (1 ×)

* Adapter for PG or NPT thread must be ordered separately

Selection of suited connection cables

Please observe the following information when selecting cables:

- 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).

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.

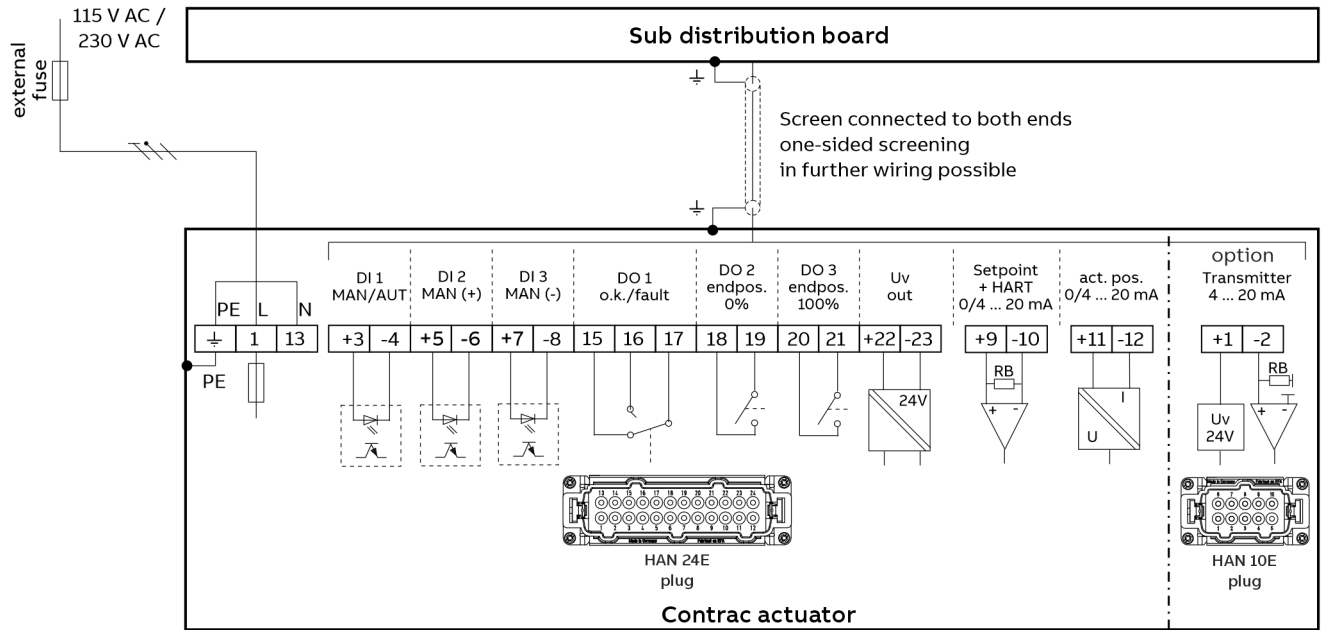
In the process, the respective standards of the VDE 100 series must be observed.

Integrated electronic unit for PME120-AI / LME620-AI

Analog / digital

Note

The electrical connection is established via a universal plug on the actuator.



BE = digital input

BA = digital output

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

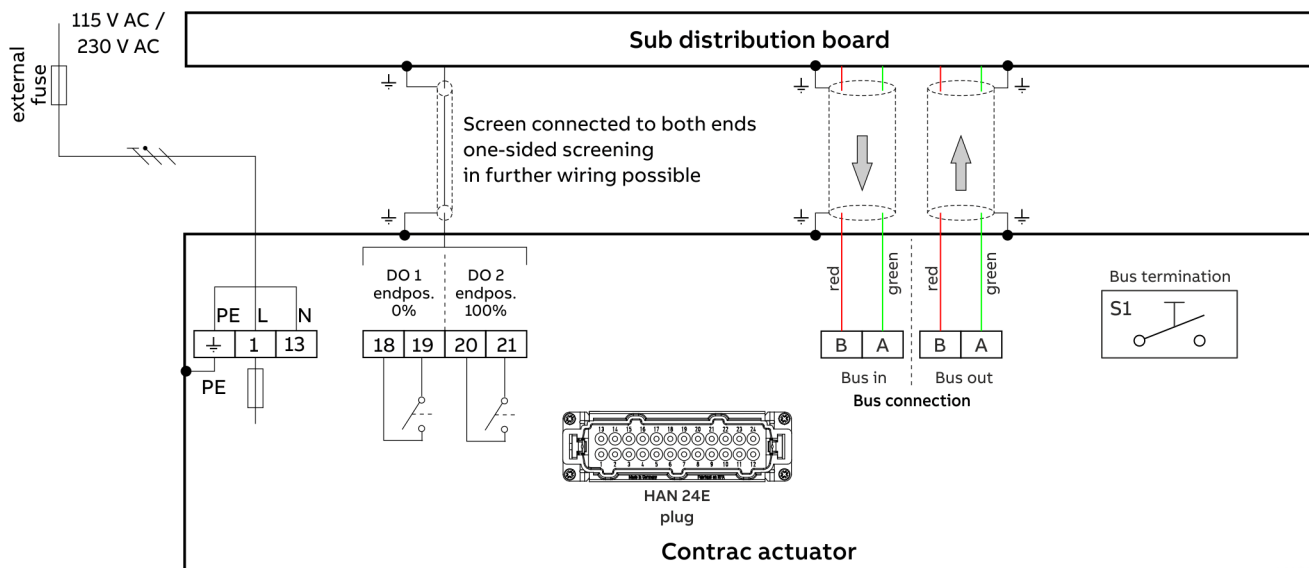
... 6 Electrical connections

... Integrated electronic unit for PME120-AI / LME620-AI

PROFIBUS DP

Note

The electrical connection is established via a universal plug on the actuator.



DO = digital output

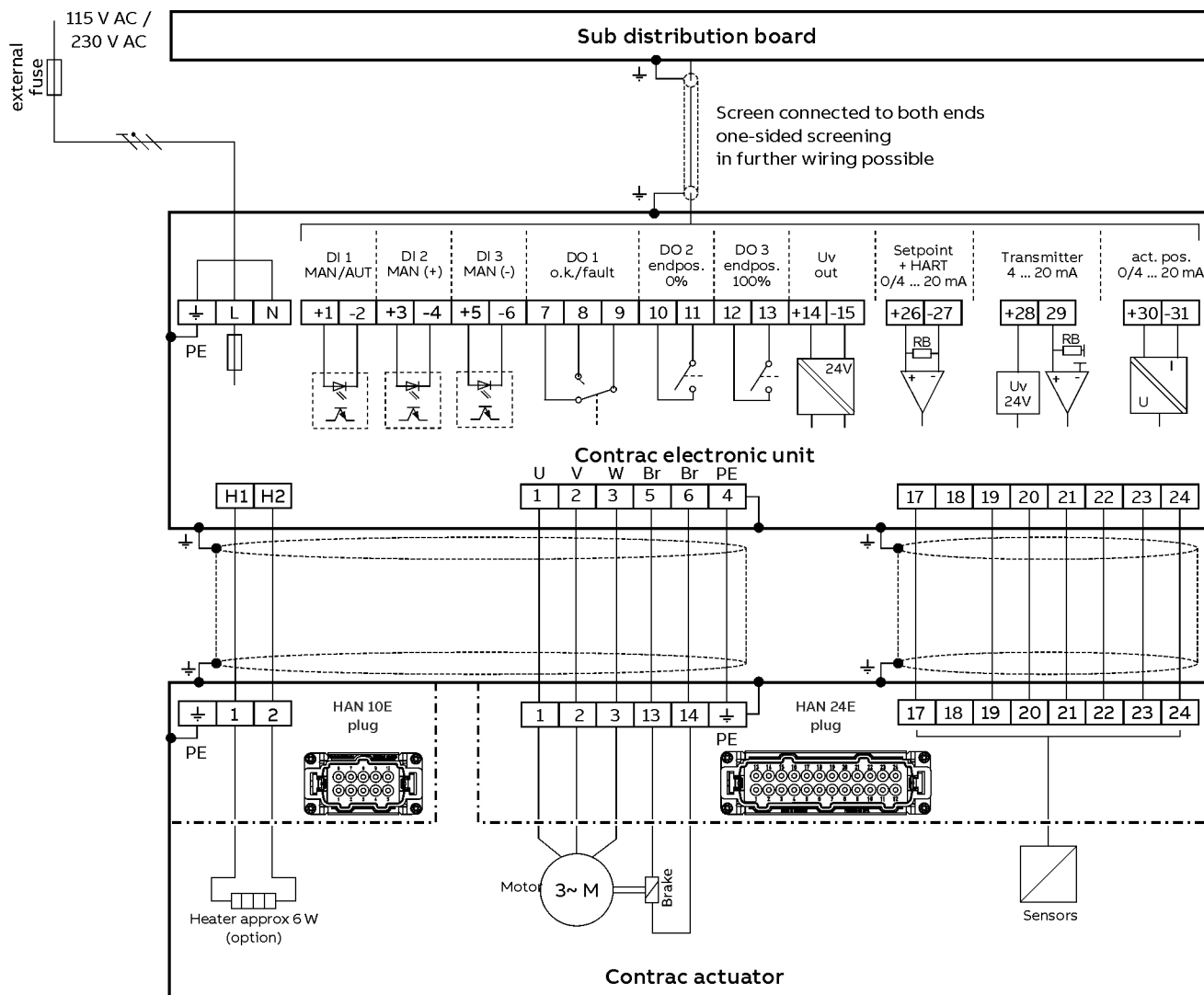
Figure 12: Control via fieldbus PROFIBUS DP® (PME120-AI, LME620-AI)

Electronic unit EAN823 (Contrac) / EBN853 (Contrac) / EBN861 (Contrac)

Analog / digital

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 13: Control via analog input 0/4 to 20 mA, HART® communication or binary inputs

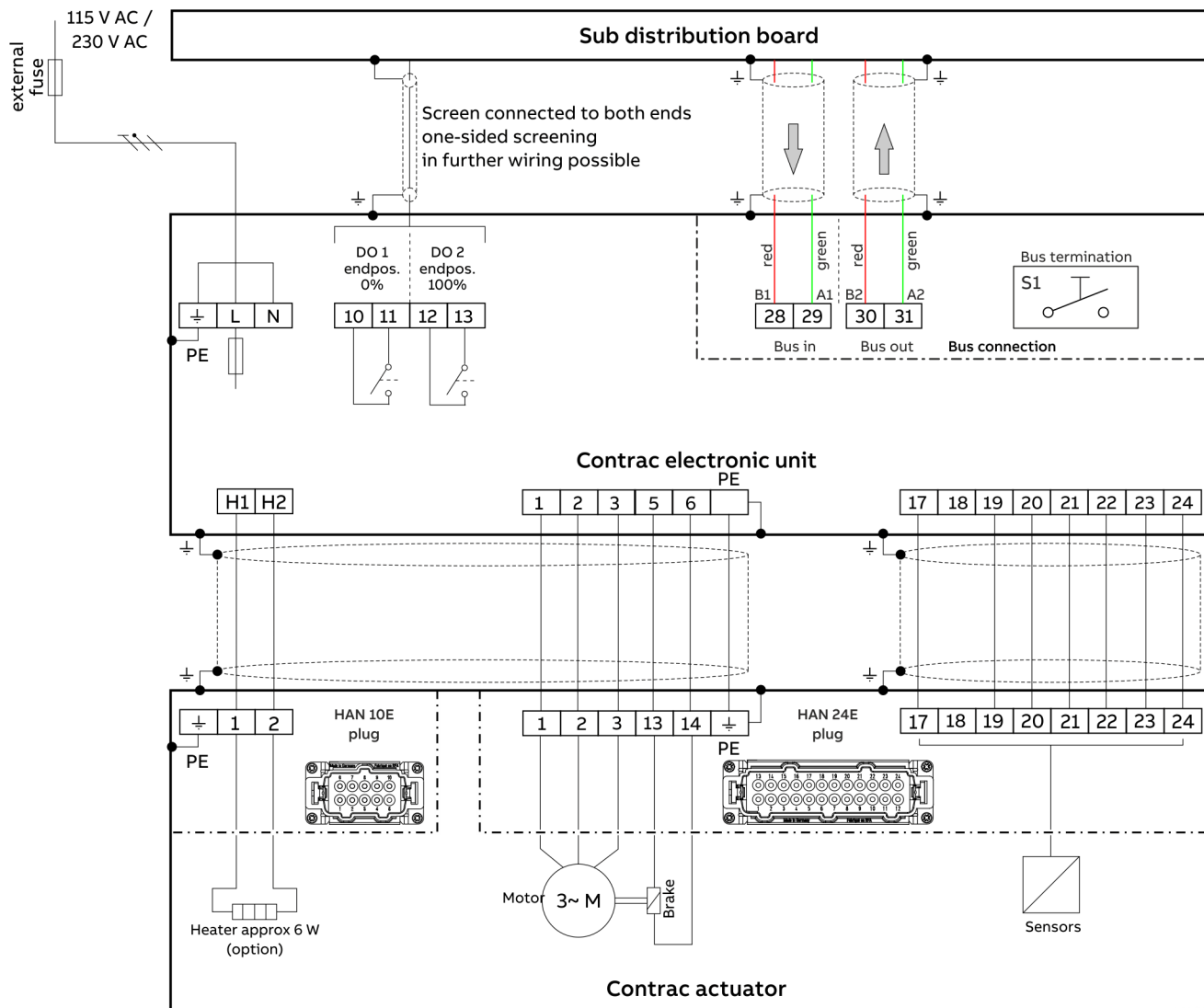
... 6 Electrical connections

Electronic unit EAN823 (Contrac) / EBN853 (Contrac) / EBN861 (Contrac)

PROFIBUS DP

Note

The electrical connection is provided by a universal plug on the actuator and the screw terminals on the electronic unit.



BA = digital output

Figure 14: Control via fieldbus PROFIBUS DP®

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.

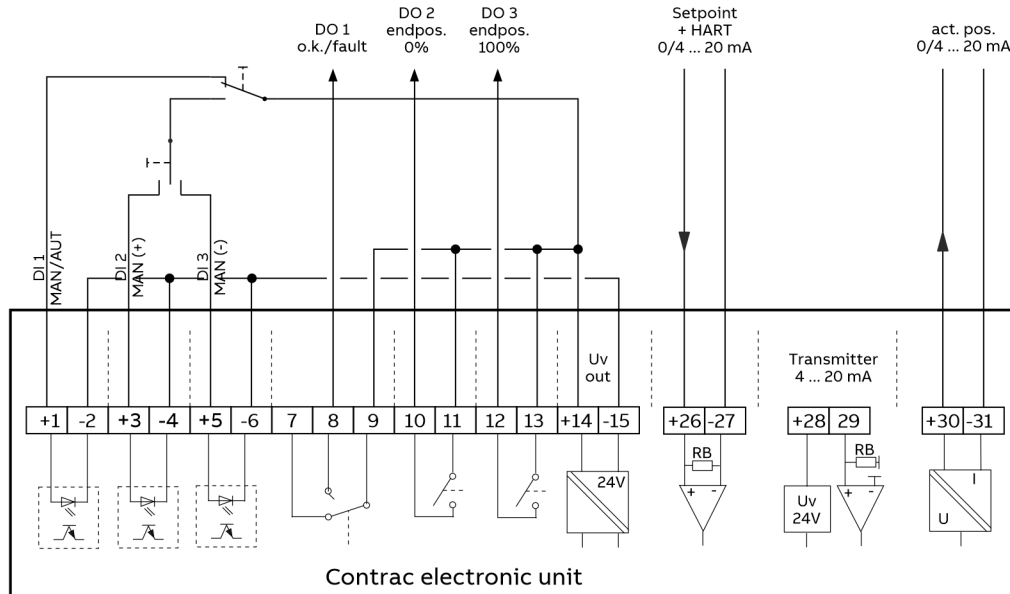


Figure 15: Connection example for operation following a continuous set point (standard configuration)

... 6 Electrical connections

... Connection examples

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.

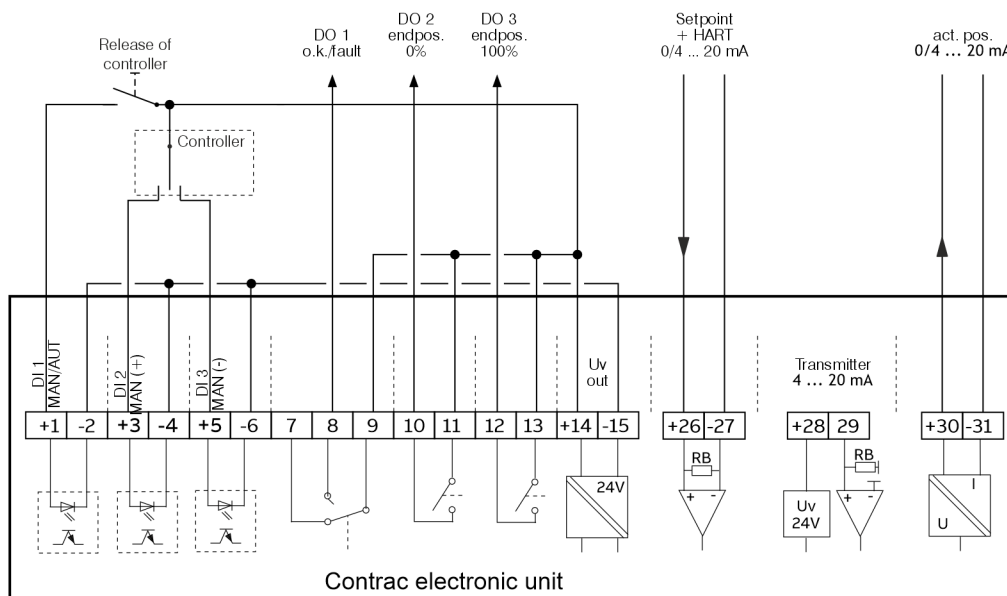


Figure 16: Connection example for operation downstream from a step controller

Electrical data for inputs and outputs

Power supply

PME120-AI / LME620-AI

Supply voltage	115 V AC (94 to 130 V) or 230 V AC (190 to 260 V); 47.5 to 63 Hz; single-phase			
Current consumption at the electronic unit [A] (AC 115 V / AC 230 V)	LME620-AI, PME120	I_{\max} at 115 V: 1.0 A	I_{\max} at 230 V: 0.5 A	I_{pos} (115 V + 230 V): approx. 40 to 50 % of I_{\max}
Actuators for low temperature design	LME620-AI, PME120	I_{\max} at 115 V: 1.4 A	I_{\max} at 230 V: 0.7 A	
External fuse	16 A; time-lag			

EBN853

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			
Current consumption at the electronic unit (AC 115 V / AC 230 V)	Actuator	I_{\max} at 115 V	I_{\max} at 230 V	I_{pos} (115 V + 230 V): approx. 40 to 50 % of I_{\max}
	RHD250-10	1.8 A	0.9 A	
	RHD500-10	2.2 A	1.1 A	
	RHD800-10	5.0 A	2.5 A	
	RHD1250-12	5.0 A	2.5 A	
	RHD2500-25	5.0 A	2.5 A	
	RHD4000-40	5.8 A	2.7 A	
	RHD8000-80	5.0 A	2.5 A	
	RSD10-5.0	2.2 A	1.1 A	
	RSD10-10.0	3.6 A	1.8 A	
	RSD20-5.0	3.6 A	1.8 A	
	RSD20-7.5	4.8 A	2.4 A	
	RSD50-3.0	5.0 A	2.5 A	
	RSD100-1.5	5.0 A	2.5 A	
	RSD200-0.7	5.0 A	2.5 A	
External fuse for electronic unit	16 A; time-lag			

... 6 Electrical connections

... Electrical data for inputs and outputs

EBN861			
Supply voltage (standard actuators)	230 V AC (190 to 260 V); 47.5 63 Hz; single-phase		
Supply voltage (Ex actuators)	230 V AC (190 to 253 V); 47.5 63 Hz; single-phase		
Current consumption at the electronic unit (AC 230 V)	Actuator	I_{\max} at 230 V	I_{pos} (230 V): approx. 40 to 50 % of I_{\max}
	RHD2500-10	5.3 A	
	RHD4000-10	10.0 A	
	RHD8000-12	8.0 A	
	RHDE8000-15	8.0 A	
	RHD16000-30	12.5 A	
	RSD50-10	6.4 A	
	RSD100-10.0	12.5 A	
	RSD200-5.0	13.0 A	
External fuse for electronic unit	Safety fuse 35 A (Lindner) + thermal circuit breaker 16 A (ETA); fuses are in the scope of delivery		

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 11
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.

PROFIBUS DP® Communication

PNO ID no.	0×9655 Actuators with DP/V0 communication (cyclic data traffic)
	0×09EC Actuators with DP/V1 communication (cyclic and acyclic data traffic)
Communication protocol	PROFIBUS PA® Profile V3.0 Class B in accordance with IEC 50170 / EN 50170 (DIN 19245)
Bus cable	Twisted, shielded copper wire acc. to IEC 50170 / EN 50170
Interface	EIA-485 (RS485) acc. to IEC 50170 / EN 50170
Permissible baud rates	93.75 Kbit/s
	187.5 Kbit/s
	500 Kbit/s
	1500 Kbit/s
	Automatic baud rate detection
Bus address	0 to 126, default address 126
	Set Slave Address service is supported
Bus termination	Connectable active bus termination. Power supply from electronic unit
Block types	1 analog input function block
	1 transducer block
	1 physical block
Failsafe	Failsafe function is supported.
	Configurable function for downtime of bus communication
	<ul style="list-style-type: none"> • Lock in last position • Drive to safety position • Adjust with last effective set point
	Adjustable time delay
Modules for cyclic communication	8 standards-compliant modules and 3 manufacturer-specific modules are available.*
	SP (Short)
	SP (Long)
	RCAS_IN+RCAS_OUT
	SP+READBACK+POS_D
	SP+CHECKBACK
	SP+READBACK+POS_D+CHECKBACK
	RCAS_IN+RCAS_OUT+CHECKBACK
	SP+RCAS_IN+READBACK+RCAS_OUT+POS_D+CHECKBACK
	STANDARD
	SP+RB+MESSEING
	SP+RB+ENL_DIAG
Acyclic communication	Full parameterization and configurability via Master Class 2 and DTM
Default settings	PROFIBUS DP® communication on page 11
Digital outputs 1 and 2	In addition to the PROFIBUS®-communication, there are 2 digital outputs.
	Potential-free relay contact, max. 60 V, 150 mA
	Default setting:
	Digital output 1 End position signal 0 %
Individual settings	Digital output 2 End position signal 100 %
	See data sheet 'DS/CONTRAC/SETTING' or available upon request.

* A full description of communication modules can be found in parameterization and configuration instructions 45/68-10

... 6 Electrical connections

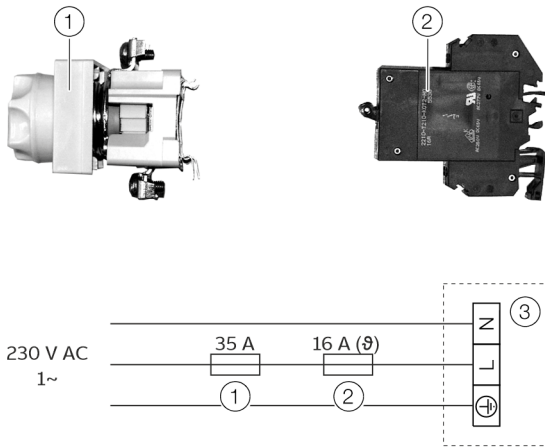
Connection on the device

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 EBN861** on page 28).
- Connect the power supply to the corresponding terminals of the electronic unit (see electrical connections starting on page **Integrated electronic unit for PME120-AI / LME620-AI** on page 19).

External fuses for EBN861



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

Figure 17: External fuses

Note

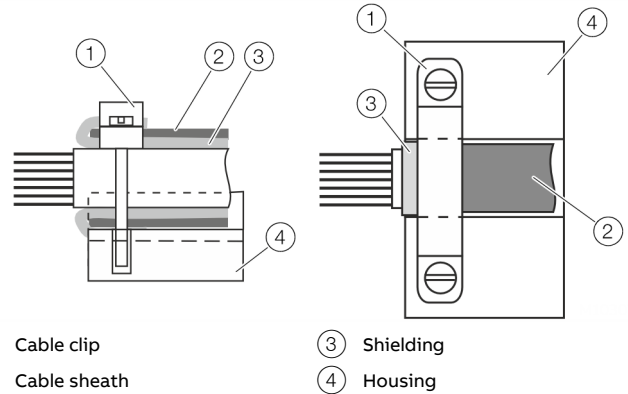
The conductor cross-section between the fuses and the electronic unit must be at least 2.5 mm² (AWG 14).

In addition to the internal fuses, the EBN861 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.

Connection of cable shielding



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

Figure 18: Cable shield

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 **Integrated electronic unit for PME120-AI / LME620-AI** on page 19).
7. Check the cable connections to ensure they are seated firmly and fasten the cable gland.
8. Screw the cover of the connection area back on tight.

Note

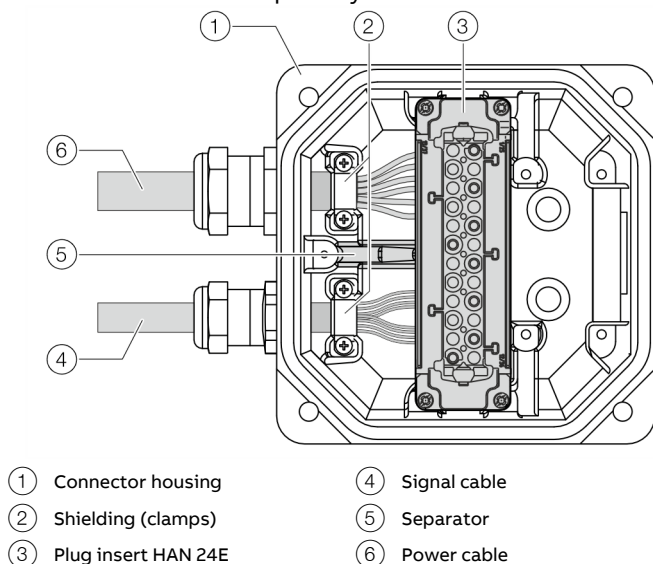
When installing the cover for the connection area, take care not to damage the sealing ring. If the sealing ring is damaged, contact the manufacturer.

Connection of the power and signal cable on the actuator

Note

A metal divider separates the two cable areas inside the universal plug.

To exclude mutual interference from electromagnetic fields, the signal and power cables in the connector housing must be routed and connected separately.



1. Remove the connector housing.
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 clamp and the connector housing.
6. Connect the cable (see **Integrated electronic unit for PME120-AI / LME620-AI** on page 19).
7. Check the cable connections to ensure they are seated firmly and fasten the cable gland.
8. Insert the connector housing and re-tighten.

Figure 19: Universal plug on the actuator

NOTICE

Damage due to improper installation!

When connecting the shielding, make sure that the individual wires of the cables are not damaged.

- When installing the connector housing, make sure that the sealing ring is not damaged.
- If the sealing ring is damaged, contact the manufacturer.

7 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 FDI – Field Device Integration
Configuration is based on FDI technology and is either integrated in the control system or possible with the ABB Ability™ Field Information Manager (FIM).
- 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 17).
- 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.

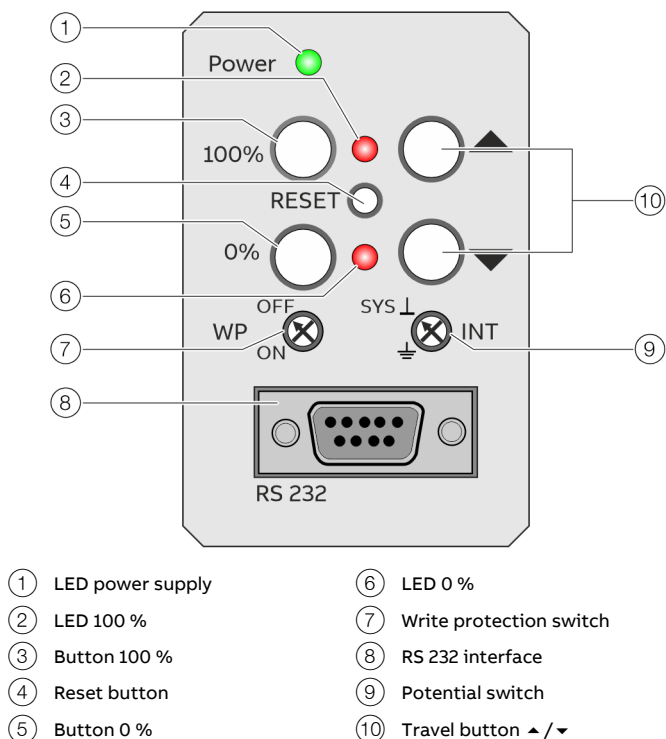
After powering up the power supply

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

Figure 20: 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.

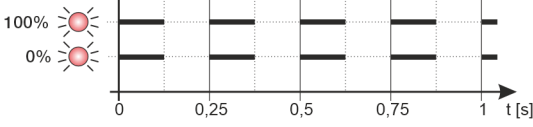
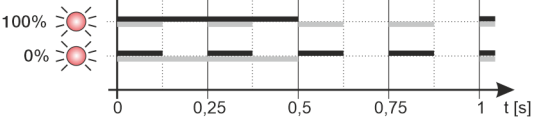
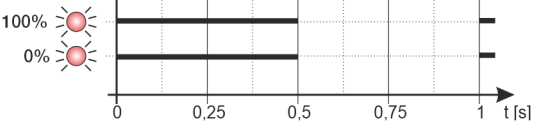
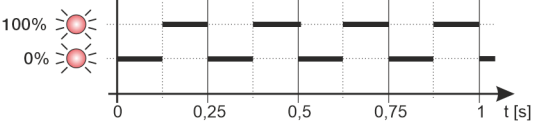
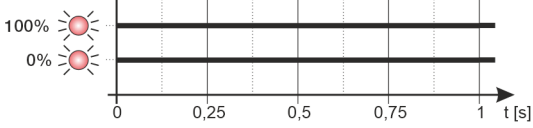
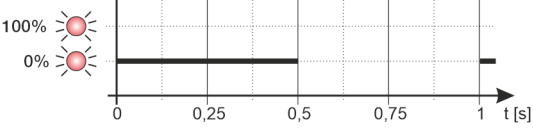
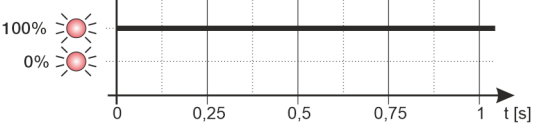
Operating element	Description
Write protection switch	Activates the hardware write protection. Factory setting: OFF – Write protection deactivated. Refer to Hardware write protection on page 33.
Potential switch	Selection of reference potential. Factory setting: SYS – Reference potential on the system. Refer to Figure 20 on page 31.
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.

... 7 Commissioning and operation

... Commissioning and service field

Meaning of the LED indicators

The LEDs 100 % / 0 % on the commissioning and service field (**Figure 20** 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.
	Error 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 20** on page 31, ⑦) protects the device against tampering.

Number	Function
ON	Write protection active
OFF	Write protection deactivated

Potential switch

The potentials switch INT  (**Figure 20** on page 31, ⑨) connects the reference potential either to the system or the protective ground.

Number	Function / setting recommendation
SYS 	Reference potential on system potential Conventional control with analog set point without external electrical isolation
SYS 	Reference potential on ground potential Conventional control with analog set point and with external electrical isolation
SYS 	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 20** on page 31, pos. ⑩) for approx. 5 seconds, until both LEDs (**Figure 20** on page 31, 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 20** on page 31, 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.

... 7 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 20 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 20 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:	After this time, both LEDs will then flash in sync at 4 Hz.
Press and hold down both travel buttons for approx. 5 s.	
Approach an end position:	Both LEDs will continue to flash at 4 Hz during actuator travel.
Move to the desired end position by pressing the travel button.	
Save the initial end position:	The corresponding LED will flash at approx. 1 Hz, the other will continue to flash at 4 Hz.
Press the 0% or 100% button.	
Save the second end position:	The related LED will flash at approx. 1 Hz in sync with the first LED.
Press the 0% or 100% button.	
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 overshoot:	After approx. 5 seconds, the LEDs will stop flashing
Press and hold down both travel buttons for 5 seconds and then press the RESET button.	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.

8 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.

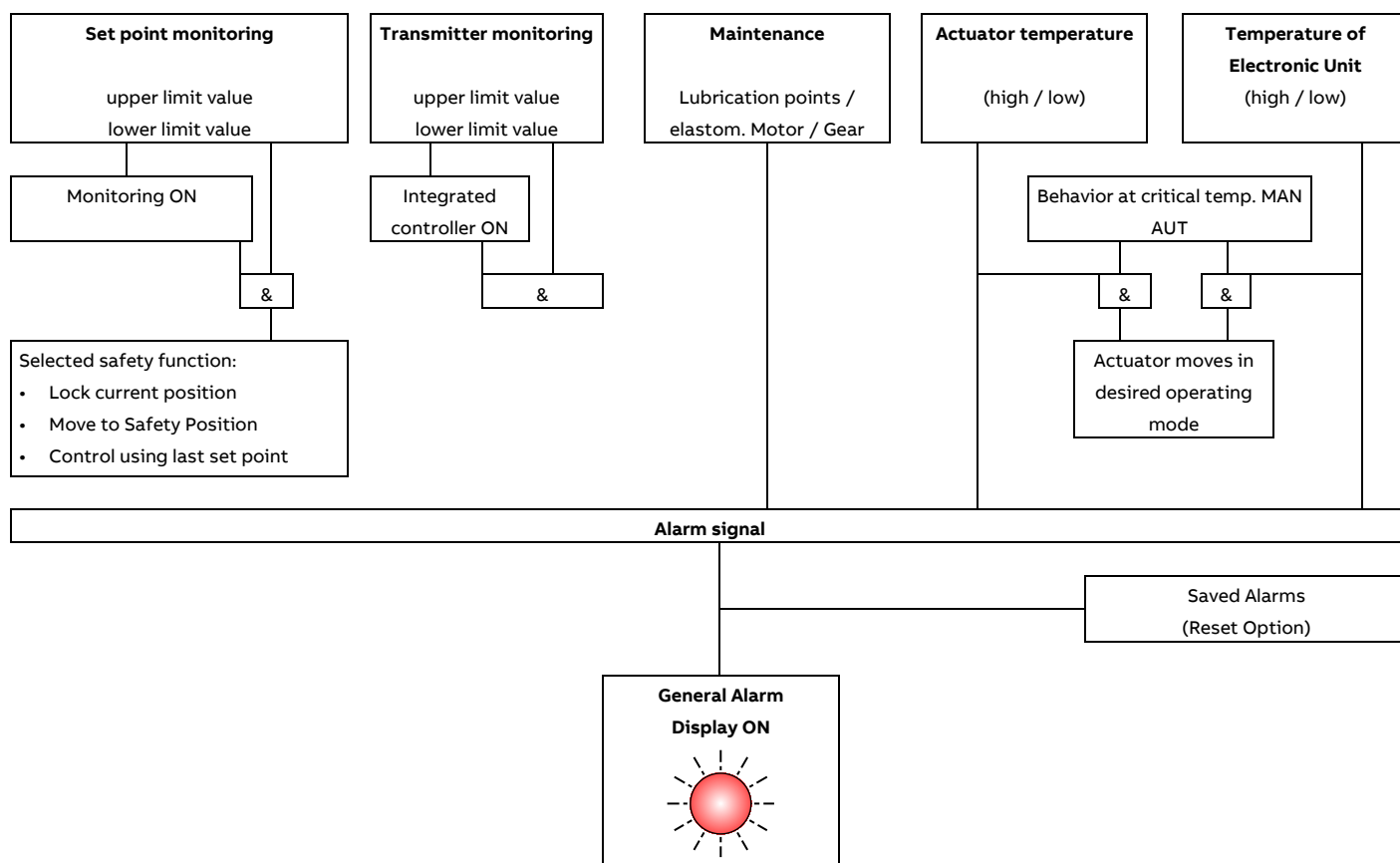
The actuator functions are available. Previous alarms are stored in the 'Saved Alarms' area in the electronic unit. Use the graphic user interface to read out saved alarms.

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.

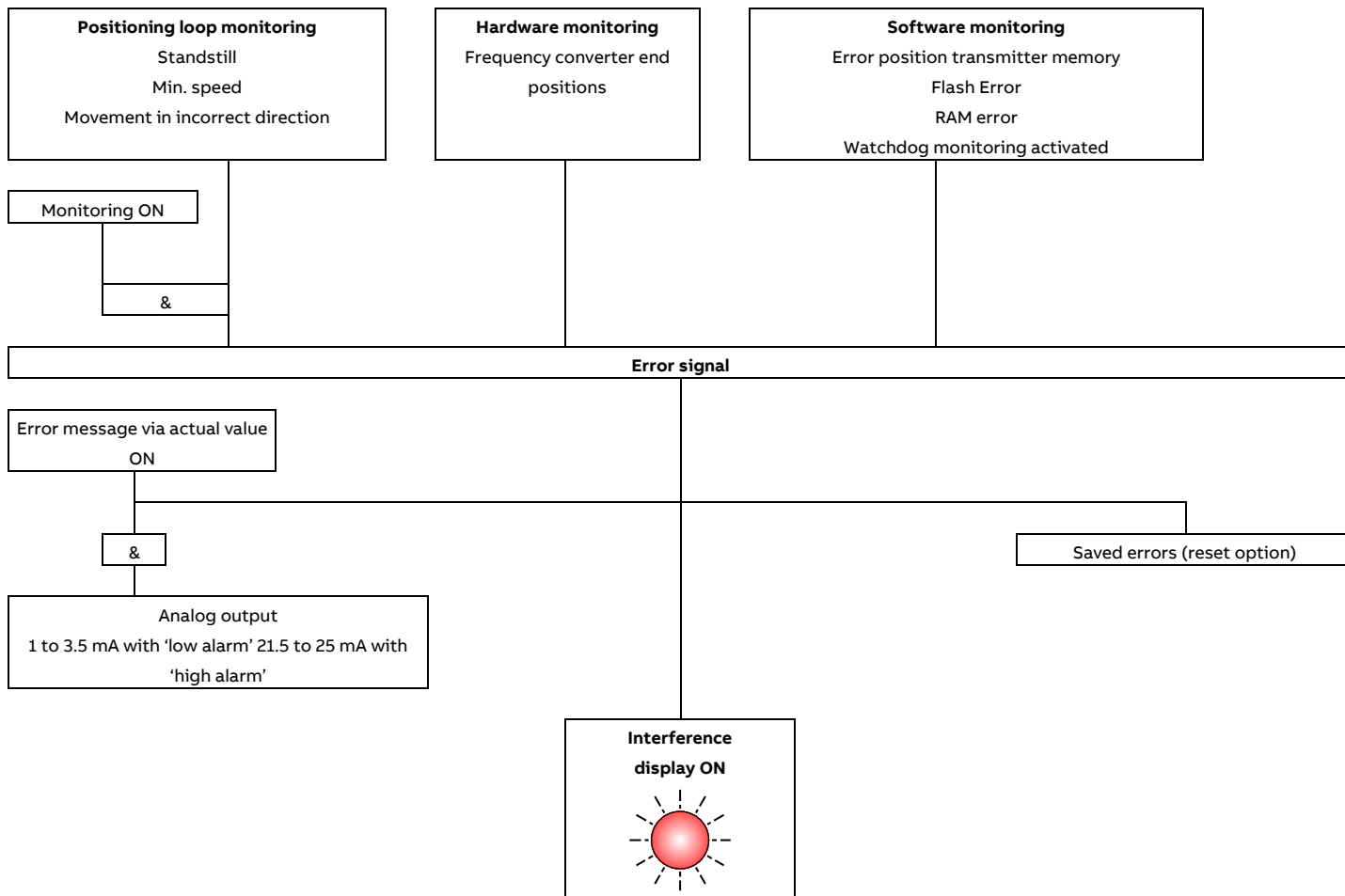
The actuator is switched off and the actuator functions are no longer available. Previous error messages are stored in the 'Saved Errors' area in the electronic unit. Use the graphic user interface to read out saved errors. Error messages cannot be reset until the cause of the error has been eliminated.

Alarm Diagram



... 8 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.	

9 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.

10 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.).

Address for return shipment:

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
EBN853	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
	Analog input	Connection area	G-fuse cartridge 5 × 20 mm	40 mA, fast-acting	40 mA, fast-acting
	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
	Heater (optional)	Connection area	G-fuse cartridge 5 × 20 mm	2 A, time-lag	2 A, time-lag
EBN861	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	–	16 A, super fast-acting
	Fuse for binary outputs (3x)	Connection area	G-fuse cartridge 5 × 20 mm	–	0.2 A, medium time-lag
	Heater (optional)	Connection area	G-fuse cartridge 5 × 20 mm	2 A, time-lag	2 A, 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 mm² (14 AWG).

11 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.

12 Additional documents

Note

All documentation, declarations of conformity, approvals, certificates and additional documentation are available in the ABB download area.

www.abb.com/actuators

13 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

PROFIBUS and PROFIBUS DP are registered trademarks of PROFIBUS & PROFINET International (PI)

Notes

ABB Measurement & Analytics

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

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

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail.
ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB.