Electronic Units
EAS822, EBS852, EBS862 (Contrac)

For the Control of Contrac Actuators of the PME, LME, RHD or RSD Series
1. **Device Identification**

1.1 **ID Labels for Electronics EAS 822 + EBS 852**
The ID labels of the power electronics are located on top of the units.

1.1.1 **ID Label for Hardware Description**

1. **Elektronik / Electronics Type: ....**
2. **B-Nr./No. ...... NL**
3. **U = 190...260 V ... Jahr/Year**
4. **f = 50/60 Hz ± 5% P = max. ..... W**
5. **t = ..................°C IP 66**
6. **Ext. Sicherung / Fuse ......**

Automation
D-32425 Minden

1. **ID Label on the Base (for Hardware Description of the Base)**

1. **Elektronik / Electronics Type: ....**
2. **B-Nr./No. ...... NL**
3. **U = 190...260 V ... Jahr/Year**
4. **f = 50/60 Hz ± 5% P = max. ..... W**
5. **t = ..................°C IP 66**
6. **Ext. Sicherung / Fuse ......**

Automation
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1. **ID Label on the Cover (for Hardware Description of the Cover)**

1. **Elektronik / Electronics Type: ....**
2. **B-Nr./No. ...... NL**
3. **U = 190...260 V ... Jahr/Year**
4. **f = 50/60 Hz ± 5% P = max. ..... W**
5. **t = ..................°C IP 66**
6. **Ext. Sicherung / Fuse ......**

Automation
D-32425 Minden

1.1.2 **ID Label for Software Description**

1. **Für / For Antrieb / Actuator Typ / Type. . . . . . . .**
2. **Nennwerte / Rated values M=....... °/s**
3. **F-Nr. / No.: . . . . . . . . . . . . . . . . . . . . . . . .**
4. **NL. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .**
5. **SW Version . . . . . . . . . . . . . . . . . . . . . . . . .**
6. **Made in Germany**

1. **ID Label on the Cover for the Software Description**

1. **Für / For Antrieb / Actuator Typ / Type. . . . . . . .**
2. **Nennwerte / Rated values M=....... °/s**
3. **F-Nr. / No.: . . . . . . . . . . . . . . . . . . . . . . . .**
4. **NL. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .**
5. **SW Version . . . . . . . . . . . . . . . . . . . . . . . . .**
6. **Made in Germany**

1.2 **ID Label on Electronics EBS 862**
The electronics unit EBS862 is made up of a base carrying the ID label for the hardware description, and a cover carrying two ID labels for hardware and software description on its front.

1. **Assembly no. for transformer (interior)**

ID labels in the front on the cover
2. **Safety and Precautions**

- Use Contrac power electronics EAS 822, EBS 852, and EBS 862 for driving the Contrac actuators specified on the electronics ID label, only.
- Prior to maintenance or repair works always disconnect the electronics from mains and secure the respective control actuator against reactive process forces.
- All installation and maintenance works must only be performed by qualified specialists who have been trained for these tasks.
- Observe the locally valid accident prevention regulations and the regulations concerning works on electrical equipment.

2.1 **Software Update**

*Attention! Consider Hard- and Software compatibility!*

Read carefully the current manual of „Save & Restore“ or „ECOM688“. Consider the relevant hints concerning the assignment of firmware (UAPM) and hardware or contact the manufacturer.

3. **Transport and Storage**

Contrac electronics may be stored under moist and aggressive condition for a short time. The equipment is protected against external corrosive influences. However, direct exposure to rain, snow, etc. must be avoided.

Interior areas of the actuator with risk of condensation are protected by desiccant.

Desiccant in electronics: ............ terminal box
Transport temperature: ............. -30° C ... + 80° C
Storage temperature:. ................. preferably 0° C ... + 40° C

The desiccant guarantees sufficient protection for approximately 150 days. It can be regenerated at a temperature of 90° C within 4 h.

The desiccant must be removed prior to commissioning the actuator or the electronics.

The mounting rack must only be transported empty and by no means with installed electronic units.

4. **Delivery status**

Unless otherwise specifies the electronic units are supplied with the following standard configuration:

- end pos. behaviour for 0/100%: keep tight with rated torque / force
- setpoint settings: linear; setpoint = position value
- setpoint input: 4... 20 mA
- function selection: positioner, parameter: setpoint
- actual value: 4... 20 mA
- digital inputs: DI 1 M/A selection; DI 2 / DI 3 manual interaction +/-
- digital output: DO 1 ready for operation, DI 2/3 end position signal
- operating range: not adjusted

The individual actuator / electronic unit configuration may deviate from the standard settings. Use the graphical user interface to view the settings.
5. General

Electronic units of three different sizes are available for the Contrac actuator series. They can be adapted to the respective actuator type using special parameters. They are the interfaces between process control systems and actuators/valves.

The actuators/valves are continuously positioned, independent of the input signal type (analog or digital).

During positioning the motor torque is continuously changed without steps, until the forces between control actuator and valve are balanced.

High positioning accuracy combined with excellent control performance and long lifetime are achieved even for changing load situations and short actuation times.

5.1 Mounting

The electronic unit is designed for rail-mounting in a special rack providing four mounting levels. Either four units (EAS822 and/or EBS852) or one unit (EBS862) can be installed on each level. It is also possible to mix the units, as seen in figure 5. Do not transport the rack with the units installed; the total weight is too high.

Mains supply and location of the fuse units and junction boxes are as shown in figure 20. From there the cable connections are routed to the electronic units.

5.1.1 EAS822 / EBS852

1 Mounting eyelet
2 Clamp for strain relief and shield
3 Commissioning and service field (CSF)
4 Terminal strip for signal cable
5 Terminal strip for motor cable
6 Mains connection terminals

Fig. 1:
On the electronics side, the power supply and the motor cable are connected via screw terminals, and the signal cables are connected via an internal plug and socket connection.

The overall weight of the electronics EBS 862 is approx. 42 kg. For safety reasons it may be necessary to install the two housing halves separately.

The electronics unit is provided with 5 PG cable glands:

- **Item 1:** 1 x PG 16 for mains connection
- **Item 2:** 1 x PG 16 for motor connection cable
- **Item 3:** 3 x PG 16 for signal cable
  - Undo and remove cover screws (4).
  - Fold down front part and disconnect internal plug connection between housing halves.
  - Undo hinge screw (5).
  - Lift off front part from hinge bolts towards top.
  - First, mount rear housing half.
  - Attach front housing half to hinge bolts, insert screw into top bolt and fasten.
  - Connect internal plug connection.
  - Close housing and fasten with cover screws (4).

Connect cable according to figure 10 (when applying the shield refer to figure 2 for details).
5.2 Design

5.2.1 Electronic units
The aluminum cases of the units are mounted to four stay bolts on the mounting rails. The units are installed, electrically connected and operated from the front.

5.2.2 Mounting Rack
The rack is an open steel profile rack. Regarding construction and dimensions it is similar to commercially available cabinets (e.g., Contronic cabinet).

5.3 Labeling
The mounting racks can be labeled in a headline with approximately 20 characters. Vertically the four levels are designated with letters A, B, C, and D, resulting in a matrix of max. 4 x 4 mounting locations.

![Fig. 3: EBS852](image1)
![Fig. 4: EBS862](image2)
6. Possible Arrangement in the Mounting Rack

Fig. 5: Mounting rack with EAS 822 / EBS 852, possible arrangement

Fig. 6: Mounting rack with EBS 862, possible arrangement
7. Technical Data

7.1 Electronics

<table>
<thead>
<tr>
<th>Table 1:</th>
<th>EAS822</th>
<th>EBS852</th>
<th>EBS862</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>≤ 75% annual average, no condensation permitted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intake air temperature at mounting rack</td>
<td>0 ... 45°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Vertical, connections from bottom or right</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varnish</td>
<td>2-component epoxy resin (RAL 9005, black)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 9 kg</td>
<td>approx. 11 kg</td>
<td>approx. 40 kg</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>Power supply via screw terminals, all other connections via plug-in connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable connection (solid or stranded)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal:</td>
<td>min 0.5²; max. 1.5²</td>
<td>min 0.5²; max. 1.5²</td>
<td></td>
</tr>
<tr>
<td>Motor:</td>
<td>min 0.5²; max. 2.5²</td>
<td>min 0.5²; max. 4.0²</td>
<td></td>
</tr>
<tr>
<td>Mains:</td>
<td>min 0.5²; max. 4.0²</td>
<td>min 0.5²; max. 4.0²</td>
<td></td>
</tr>
<tr>
<td>External series fuse</td>
<td>16 A (slow-blow)</td>
<td>35 A fuse</td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>230 V AC (190 V ... 260 V) or 115 V AC (94 V ... 130 V); 50/60 Hz ± 5%; 1 Ph</td>
<td>230 V AC (190 V ... 260 V)</td>
<td></td>
</tr>
<tr>
<td>Analog input, set value</td>
<td>0 / 4 ... 20 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog output, actual value</td>
<td>0 / 4 ... 20 mA; electrically isolated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output; U_V</td>
<td>24 VDC; 15 mA for supply of digital inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs, DI 1 ... 3</td>
<td>Electrically isolated via opto-couplers</td>
<td>Logical 0: -3V ... + 5 V or open; Logical 1: +12 V ... + 35 V</td>
<td></td>
</tr>
<tr>
<td>Digital outputs, DO 1 ...</td>
<td>Potential-free relay contact, max. 60 V DC / 25 V AC; 150 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog input, transmitter</td>
<td>Supply and signal input for 2-wire transmitter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital communication</td>
<td>RS 232 for commissioning and service; optionally HART®/FSK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default settings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function:</td>
<td>positioner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set value function:</td>
<td>linear, (set value = positioning value)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set value input:</td>
<td>4 ... 20 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual value output:</td>
<td>4 ... 20 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior in 0/100% end position:</td>
<td>shut-off with rated force / rated torque</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs:</td>
<td>DI 1 M/A selection; DI2 / DI3 manual interact. +/-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital outputs:</td>
<td>DO 1 ready;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DO 2/3 end position signalling 0/100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) The 35 A fuse and the thermal safety cutout are included in the scope of delivery. They ensure safe operation for the special switching conditions of power electronics EBS862. Note that the cable cross-sectional area between the fuse and the electronics must be at least 2.5 mm².

7.2 Mounting Rack

Weight of empty rack: approx. 40 kg
Weight of rack with units: approx. 210 kg
### 8. Actuator Assignment and Cable Cross-Sections

#### 8.1 Part-Turn Actuators

<table>
<thead>
<tr>
<th><strong>Electronic unit</strong></th>
<th><strong>Average power dissipation of electronic unit</strong></th>
<th><strong>Max. current consumption(^1)</strong></th>
<th><strong>Actuator</strong></th>
<th><strong>Cross-sectional area of motor cable / permissible length in [m] (^2)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>115 V</td>
<td>230 V</td>
<td>1.5 mm(^2)</td>
<td>2.5 mm(^2)</td>
</tr>
<tr>
<td>EAS822</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 W</td>
<td>1.0 A</td>
<td>0.55 A</td>
<td>PME120</td>
<td>180</td>
</tr>
<tr>
<td>EBS852</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 W</td>
<td>1.8 A</td>
<td>0.90 A</td>
<td>RHD250-10</td>
<td>270</td>
</tr>
<tr>
<td>75 W</td>
<td>2.2 A</td>
<td>1.1 A</td>
<td>RHD500-10</td>
<td>160</td>
</tr>
<tr>
<td>60 W</td>
<td>3.4 A</td>
<td>1.7 A</td>
<td>RHD800-10</td>
<td>70</td>
</tr>
<tr>
<td>80 W</td>
<td>6.0 A</td>
<td>3.0 A</td>
<td>RHD1250-12</td>
<td></td>
</tr>
<tr>
<td>80 W</td>
<td>4.8 A</td>
<td>2.4 A</td>
<td>RHD2500-25</td>
<td></td>
</tr>
<tr>
<td>80 W</td>
<td>4.0 A</td>
<td>2.0 A</td>
<td>RHD4000-40</td>
<td></td>
</tr>
<tr>
<td>EBS862</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 W</td>
<td>--</td>
<td>5.3 A</td>
<td>RHD2500-10</td>
<td>160</td>
</tr>
<tr>
<td>100 W</td>
<td>--</td>
<td>10.0 A</td>
<td>RHD4000-10</td>
<td>70</td>
</tr>
<tr>
<td>115 W</td>
<td>--</td>
<td>9.0 A</td>
<td>RHD8000-12</td>
<td></td>
</tr>
<tr>
<td>on request</td>
<td>--</td>
<td>10.2</td>
<td>RHD16000-30</td>
<td></td>
</tr>
</tbody>
</table>

Table 2:

#### 8.2 Linear Actuators

<table>
<thead>
<tr>
<th><strong>Electronic unit</strong></th>
<th><strong>Average power dissipation of electronics</strong></th>
<th><strong>Max. current input(^1)</strong></th>
<th><strong>Actuator</strong></th>
<th><strong>Cross-sectional area of motor cable / permissible length in [m] (^2)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>115 V</td>
<td>230 V</td>
<td>1.5 mm(^2)</td>
<td>2.5 mm(^2)</td>
</tr>
<tr>
<td>EAS 822</td>
<td>60 W</td>
<td>1.0 A</td>
<td>0.55 A</td>
<td>LME 620</td>
</tr>
<tr>
<td>EBS 852</td>
<td>55 W</td>
<td>3.4 A</td>
<td>1.0 A</td>
<td>RSD10-5.0</td>
</tr>
<tr>
<td></td>
<td>60 W</td>
<td>3.8 A</td>
<td>1.9 A</td>
<td>RSD10-10.0</td>
</tr>
<tr>
<td></td>
<td>60 W</td>
<td>4.8 A</td>
<td>2.4 A</td>
<td>RSD20-5.0</td>
</tr>
<tr>
<td></td>
<td>75 W</td>
<td>3.8 A</td>
<td>1.9 A</td>
<td>RSD20-7.5</td>
</tr>
<tr>
<td></td>
<td>75 W</td>
<td>4.0 A</td>
<td>2.0 A</td>
<td>RSD50-3.0</td>
</tr>
<tr>
<td></td>
<td>80 W</td>
<td>4.4 A</td>
<td>2.2 A</td>
<td>RSD100-1.5</td>
</tr>
<tr>
<td></td>
<td>80 W</td>
<td>5.0 A</td>
<td>2.5 A</td>
<td>RSD200-0.7</td>
</tr>
<tr>
<td>EBS 862</td>
<td>100 W</td>
<td>--</td>
<td>6.4 A</td>
<td>RSD50-10.0</td>
</tr>
<tr>
<td></td>
<td>115 W</td>
<td>--</td>
<td>12.5 A</td>
<td>RSD100-10.0</td>
</tr>
<tr>
<td></td>
<td>115 W</td>
<td>--</td>
<td>13.5 A</td>
<td>RSD200-5.0</td>
</tr>
</tbody>
</table>

Table 3:

1) At rated actuator power; current consumption in positioning mode around 40 \(\ldots\) 50% of \(I_{\text{max}}\).

2) Cable length between electronics and actuator. Cross-sectional area of signal cable 0.5 mm\(^2\).
9. Electrical Connection

The electronic units are installed in a mounting rack. Each actuator requires a Contrac electronic unit. Proper actuator operation requires an actuator specific software loaded in the associated electronic unit. Compare the data labels on both, electronic unit and actuator, in order to ensure a correct hardware and software assignment.

The electrical connection is done with a plug at the actuator and with screw terminals at the electronic unit.

9.1 General

Disconnect the electronics and the actuator prior to all installation and service works and secure against unintended switch-on.

9.1.1 Pre-condition

- Disconnection must be possible on mounting site.
- All signal cables and the motor cable between actuator and electronics must be shielded at both ends.

9.2 EAS822 / EBS852

![Diagram of Electrical Connection]

**Fig. 7:** Electrical connection (1) only for EAS822
9.3 EBS862

Sub distribution board

Screen connected to both ends one-sided screening in further wiring possible

Contrac electronic unit

Contrac actuator

Fig. 8: Electrical connection of EBS862

9.4 Connecting the shield

- remove approx. 2 cm of the cable sheath at the end (1)
- open the shielding and put it over the 2nd inner cable sheath
- push the cable through the cable gland and fasten it the terminal (3)
- make sure that the shielding is in contact with the terminal and the housing of the electronic unit (4)

Fig. 9: Shield connection

Connect the shield at the actuator accordingly.
9.5 Signal input / output (Examples)
(conventional analogue / binary control)

Premises to switch the actuator into automatic mode (AUT):
- digital inputs D1, D2, and D3 may not be activated via the configuration software (standard configuration with default factory settings).
- activate the AUT mode using the configuration software (standard configuration with default factory settings).

9.5.1 Standard wiring (analogue setpoint)

![Fig. 10: Possible wiring for standard terminal assignment](image)

9.5.2 Behind a step controller
(binary control without an analogue setpoint)

Contrac actuators feature smooth and continuous operation even if the electronic unit receives binary commands from a step controller. Use the configuration software for the appropriate settings. The electronic unit will then integrate the step commands and internally generate an analogue setpoint signal.

![Fig. 11: Possible wiring for „operation behind step controller“](image)

This operating mode requires the switch for the reference potential SYS \( \downarrow \) to be set to \( \downarrow \).
9.6 Cable guidance at the plug
Pass and connect both the signal and the power cable separately within the plug housing in order to avoid electromagnetic interferences. A metal plate separates both cable areas from each other. Connect the screen acc. to fig. 12.

![Cable guidance within the plug](image)

Fig. 12: Cable guidance within the plug

9.7 Fuses

**9.7.1 EAS822**

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>( U_V = 115 \text{ V} )</th>
<th>( U_V = 230 \text{ V} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series fuse</td>
<td>external</td>
<td>16 A; slow-blow</td>
<td></td>
</tr>
<tr>
<td>Mains fuse</td>
<td>F1, in terminal box</td>
<td>6.3 A; slow-blow</td>
<td>3.15 A; slow-blow</td>
</tr>
<tr>
<td>Relay fuse for DO1, DO2, DO3</td>
<td>F2 ... F4; in terminal box</td>
<td>3 x 0.2 A; medium time-lag</td>
<td></td>
</tr>
</tbody>
</table>

Table 4:

**9.7.2 EBS852**

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>( U_V = 115 \text{ V} )</th>
<th>( U_V = 230 \text{ V} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series fuse</td>
<td>external</td>
<td>16 A; slow-blow</td>
<td></td>
</tr>
<tr>
<td>Mains fuse</td>
<td>F1, in terminal box</td>
<td>12.5 A; slow-blow</td>
<td>10 A; slow-blow</td>
</tr>
<tr>
<td>Relay fuse for DO1, DO2, DO3</td>
<td>F2 ... F4; in terminal box</td>
<td>3 x 0.2 A; medium time-lag</td>
<td></td>
</tr>
<tr>
<td>Brake fuse</td>
<td>on board (power section)</td>
<td>0.315 A; medium time-lag</td>
<td></td>
</tr>
<tr>
<td>Intermediate circuit fuse</td>
<td>Power board</td>
<td>10 A; super-quick</td>
<td></td>
</tr>
</tbody>
</table>

Table 5:
9.7.3 EBS862

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>$U_V = 230$ V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series fuse</td>
<td>external</td>
<td>35 A fuse $^a$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 A thermal safety cutout</td>
</tr>
<tr>
<td>Relay fuse for DO1, DO2, DO3</td>
<td>F2 ... F4; in terminal box</td>
<td>3 x 0.2 A; medium time-lag</td>
</tr>
<tr>
<td>Brake fuse</td>
<td>on board (power section)</td>
<td>0.315 A medium time-lag</td>
</tr>
<tr>
<td>Intermediate circuit fuse</td>
<td>power board</td>
<td>15 A; medium time-lag</td>
</tr>
</tbody>
</table>

Table 6:

$^a$The 35 A fuse and the thermal safety cutout (16 A) are included in the scope of delivery. They ensure safe operation for the special switching conditions of power electronics EBN 861. Note that the cable cross-sectional area between the fuse and the electronics must be at least 2.5 mm$^2$.

9.7.3.1 External fuses

The electronic unit EBS862 requires two additional fuses (1 fuse; 1 circuit breaker), which are supplied together with the unit.

![Fig. 13: External fuses](image)

![Fig. 14: external fuse; 35 A](image)

![Fig. 15: external circuit breaker; 16 A](image)
10. Operating and Connecting Elements

10.1 EAS822 / EBS852

Fig. 16: Position of operating and connecting elements on EAS822 / EBS852
Fig. 17: Position of operating and connecting elements on EBS862
Fig. 18: Cable routing in mounting rack
11.1 Mains distribution

Fig. 19: Cable arrangement and electronic unit installation in a mounting rack (top view)

max. 16 mm²

Fig. 20: Arrangement of mains cables
12. Dimensional Drawings

12.1 Mounting Rack

Fig. 21:
Fig. 22:

12.3 EBS852

Fig. 23:
Fig. 24:  

- 262 (front open, 90° swivelled / pivot radius)
- 399
- 370 (r00353x1)
13. Setup

The actuator only requires the basic settings (adaptation to the operating range) in order to be operated with the standard or customer specific configuration. Use the **Local Control Panel (LCP)** for these settings. Use the appropriate configuration software for more detailed parameter changes or diagnosis functions.

13.1 Set-up via local control panel (LCP)

13.1.1 Operating elements

1. **Write-protect switch**: (Default setting: OFF)
2. **LED for 100% position**: Indication if adjustment procedure, saved position, or fault by different flash frequencies.
3. **Drive buttons**: Press to cause drive motion
4. **Reset button**: Press to restart processor
5. **Power LED**: Indicates available mains supply
6. **RS 232 socket**: Connection socket to PC
7. **Potential toggle switch**: Connection of reference potential to the system or protective earth (by default set to system) of electronic unit
8. **LED for 0% position**: Indication if adjustment procedure, saved position, or fault by different flash frequencies.
9. **Accept button (0%)**: Press to define current position as 0%; simultaneously press push button 9 + 10 to complete the adjustment procedure.
10. **Accept button (100%)**: Press to define current position as 100%; simultaneously press push button 9 + 10 to complete the adjustment procedure

![Figure 25: Local Control Panel (LCP)](image)

*The actuator range is not preset in factory!*

13.1.2 Setup procedure

- Undo the screws of the LCP cover
- Swing the cover to the side

13.1.3 Initial situation

- Electronics connected to power supply and actuator
- Write-protect switch (1) set to “OFF” position
- Electronics in operating mode “MAN” (no signal on DI 1)
- No fault (if a fault occurs, both LEDs flash alternately at 4 Hz)
13.1.4 Setting

13.1.4.1 “Setting” mode
- Set electronics to “setting” mode by pressing both push buttons (3) simultaneously for approx. 5 seconds, until both LEDs (2 + 8) are flashing synchronously at approx. 4Hz. (“setting mode” is the standard electronic unit status after passing the final factory test)

13.1.4.2 Defining first position (0% or 100%)
(Higher precision in 2nd position)
- Move to desired position by pressing one of the push buttons (3).
- To accept the position for 0% or 100%, press push button (10) or (9); the associated LED flashes at approx. 2 Hz when value is correctly accepted, the other one continues to flash at approx. 4Hz

13.1.4.3 Defining second position (0% or 100%)
- Move to second position by pressing the other of the push buttons (3).
- To accept the position, press push button (10) or (9); both LEDs (2) and (8) are flashing at approx. 2 Hz when values are accepted correctly.

13.1.4.4 Saving the settings
- Save the settings by simultaneously and shortly pressing the push buttons (10 + 9); the LEDs (2 + 8) are “ON” (without flashing) for approx. 5 sec before they extinguish and the setting procedure is completed.
- If the selected range is too small for the actuator, both LEDs will flash again at 4Hz. Repeat the adjustment procedure with a wider range (min. positioning travel).
(See positioning travel specification on actuator ID label)

13.1.4.5 Correction after setup
- If the setting is to be corrected after accepting the first value, first press the Reset button (4) and then repeat the setting.
- If the correction is to be re-done after saving the settings, the entire adjustment procedure must be repeated.

13.2 Adjustment using the configuration program
Context-sensitive help information is available in the configuration program at all times. For basic handling and installation instructions refer to the associated manual, number 41/68-001.
A conductive ground connection is established between the PC and the CONTRAC electronics with the RS 232 communication cable. If the PC is grounded, this may cause a ground loop in the installation.

13.3 Functions and signals at the LCP

<table>
<thead>
<tr>
<th>Function</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change-over to adjustment mode:</td>
<td>Both LEDs flash synchronously at approx 4Hz after time has expired.</td>
</tr>
<tr>
<td>Press and hold both drive buttons for approx. 5 seconds</td>
<td></td>
</tr>
<tr>
<td>Moving to an end position</td>
<td>Both LEDs continue to flash at 4Hz while driving.</td>
</tr>
<tr>
<td>Use associated drive button on LCP</td>
<td></td>
</tr>
<tr>
<td>Saving the first end position</td>
<td>The associated LED flashes at approx. 2Hz, the other continues at 4Hz.</td>
</tr>
<tr>
<td>Press button 0% or 100%</td>
<td></td>
</tr>
<tr>
<td>Saving the second end position</td>
<td>The associated LED flashes at approx. 2Hz synchronously to the first one.</td>
</tr>
<tr>
<td>Press button 0% or 100%</td>
<td></td>
</tr>
<tr>
<td>Confirm settings</td>
<td>Both LEDs are briefly “ON” together and then extinguish.</td>
</tr>
<tr>
<td>Press 0% and 100% buttons simultaneously</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal operation: MAN / AUT</td>
<td>LED off</td>
</tr>
<tr>
<td>Driving with button on CSF</td>
<td>LED off</td>
</tr>
<tr>
<td>Priority over control system</td>
<td></td>
</tr>
</tbody>
</table>

Bootstrap mode

Electronic is in bootstrap mode during the data transfer of e. g. firmware, objects or motor characteristics; use ECOM688 software for this procedure.
Both LED are “ON“; actuator is not available

Fault (both LEDs flash alternately at 4Hz)

| Reset: | If no „Failure“ conditions exist, both LEDs extinguish (if the actuator had been moved out of its operating range, drive it back prior to the reset). |
| Resets fault indications | |

Table 7:
14. Alarms / Failures

14.1 Definition

14.1.1 Alarms
The actuator / electronic unit is exposed to critical conditions (e.g. high temperature) which currently do not affect the actuator, the electronic unit, the process or persons. The actuator functions are still available. Previous alarms are saved in the „Saved Alarms“ memory of the electronic unit. Use the configuration software to display the current and saved alarms.

14.1.2 Failures
The actuator / electronic unit is exposed to critical conditions (e.g. setpoint monitoring signal) which instantly might affect the actuator, the electronic unit, the process or persons. The actuator will be switched off and the actuator functions are no longer available. Previous failures are saved in the „Saved Failures“ memory of the electronic unit. Use the configuration software to display the current and saved failures. Failure messages can not be reset as long as the reason for the failure exists.

14.2 Alarm scheme

Fig. 26:
14.3 Failure scheme

**positioning loop monitoring**
- standstill
- min. speed
- movem. to wrong direct.

**hardware monitoring**
- frequency converter
- end position

**software monitoring**
- position sensor memory error
- flash error
- RAM error
- watchdog monitoring activated

Monitoring ON

Failure Signal

Failure message via act. value ON

&

analogue output
1 ... 3.5 mA at „low alarm“
21.5 ... 25 mA at „high alarm“

saved failures (reset option)

Fig. 27:
## 15. Troubleshooting

This section mainly describes how to handle hardware errors. Refer to the configuration program’s on-line help for errors related to the software.

<table>
<thead>
<tr>
<th>Error</th>
<th>Possible reason</th>
<th>Measures to be taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve cannot be moved by actuator</td>
<td>Malfunction of actuator or valve (e.g. stuffing box tightened too much)</td>
<td>Disconnect the actuator from the valve. If the actuator is working properly then, the valve is likely to be defective. Otherwise, the actuator seems to be the error source.</td>
</tr>
<tr>
<td>Actuator does not react</td>
<td>Wrong electronic unit or wrong data</td>
<td>Compare data labels of actuator and electronic unit</td>
</tr>
<tr>
<td></td>
<td>Faulty electronic unit settings</td>
<td>Check / modify settings using the configuration software</td>
</tr>
<tr>
<td></td>
<td>Faulty communication to DCS</td>
<td>Check wiring</td>
</tr>
<tr>
<td></td>
<td>Faulty wiring between the electronic unit and the actuator</td>
<td>Check wiring</td>
</tr>
<tr>
<td></td>
<td>Motor / brake is defective</td>
<td>Check the winding resistances of the motor and brake. Check the brake fuse.</td>
</tr>
<tr>
<td></td>
<td>Digital inputs of electronic unit are not connected</td>
<td>Connect</td>
</tr>
<tr>
<td>Actuator does not work in automatic mode, although &quot;AUT&quot; has been selected in the configuration program</td>
<td>Digital input 1 (DI 1) has not been connected.</td>
<td>Connect DI 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check software settings for digital inputs</td>
</tr>
<tr>
<td>LEDs on the commissioning and service field are flashing simultaneously</td>
<td>Actuator operating range has not been adjusted properly</td>
<td>Adjust the actuator operating range (see instruction for electronic unit).</td>
</tr>
<tr>
<td>Fault when approaching an end position</td>
<td>Actuator is working in the limit range of the position sensor</td>
<td>Move the actuator either manually or with the LCP buttons to a position beyond the end position (disconnect from valve if required). Move actuator back. If required, reconnect to the valve (if applicable) Adapt actuator to new operating range</td>
</tr>
</tbody>
</table>

Table 8:
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