Service Instruction
43/68-10 EN

Electrical Part Turn Actuators for Continuous Modulating Control
PME120AI / PME120AN (Contrac)
Rated Torque 100 Nm
(80 ft-lbs)
Service Instruction

Document No. 43/68-10 EN
Issued: December 2005

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# Content

<table>
<thead>
<tr>
<th>Important information</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>4</td>
</tr>
<tr>
<td>Symbols</td>
<td>4</td>
</tr>
<tr>
<td>Transport and storage</td>
<td>4</td>
</tr>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>Safety and precautions</td>
<td>5</td>
</tr>
<tr>
<td>Tools</td>
<td>5</td>
</tr>
<tr>
<td>Actuator versions</td>
<td>6</td>
</tr>
<tr>
<td>PME120 AI</td>
<td>6</td>
</tr>
<tr>
<td>PME120AN</td>
<td>6</td>
</tr>
<tr>
<td>Lubrication</td>
<td>7</td>
</tr>
<tr>
<td>Mounting position and filling capacity</td>
<td>7</td>
</tr>
<tr>
<td>Oil specifications</td>
<td>7</td>
</tr>
<tr>
<td>Oil change</td>
<td>8</td>
</tr>
<tr>
<td>Maintenance</td>
<td>8</td>
</tr>
<tr>
<td>Lever</td>
<td>9</td>
</tr>
<tr>
<td>Sealing ring of output drive shaft</td>
<td>11</td>
</tr>
<tr>
<td>Motor</td>
<td>13</td>
</tr>
<tr>
<td>Brake adjustment</td>
<td>15</td>
</tr>
<tr>
<td>Electrical Connection</td>
<td>15</td>
</tr>
<tr>
<td>General</td>
<td>15</td>
</tr>
<tr>
<td>Covers</td>
<td>17</td>
</tr>
<tr>
<td>Wiring diagrams (Integrated electronic unit)</td>
<td>17</td>
</tr>
<tr>
<td>Wiring diagram</td>
<td>18</td>
</tr>
<tr>
<td>Fuses</td>
<td>20</td>
</tr>
<tr>
<td>Exchange of position sensor</td>
<td>23</td>
</tr>
<tr>
<td>Dismounting</td>
<td>23</td>
</tr>
<tr>
<td>Mounting</td>
<td>24</td>
</tr>
<tr>
<td>Electrical Test Values</td>
<td>25</td>
</tr>
<tr>
<td>Test values (position sensor)</td>
<td>25</td>
</tr>
<tr>
<td>Test values</td>
<td>25</td>
</tr>
<tr>
<td>Winding resistance (motor)</td>
<td>25</td>
</tr>
<tr>
<td>Failure detection</td>
<td>27</td>
</tr>
<tr>
<td>LED signals at local control panel</td>
<td>27</td>
</tr>
<tr>
<td>Trouble Shooting</td>
<td>27</td>
</tr>
<tr>
<td>General</td>
<td>28</td>
</tr>
<tr>
<td>Failures at brake, fuse or wiring</td>
<td>29</td>
</tr>
<tr>
<td>Operation mode (MAN / AUT)</td>
<td>30</td>
</tr>
<tr>
<td>Input configuration</td>
<td>31</td>
</tr>
<tr>
<td>Operation behind step controller</td>
<td>32</td>
</tr>
<tr>
<td>Failure Diagram</td>
<td>32</td>
</tr>
<tr>
<td>Failure due to response of positioning loop monitoring</td>
<td>33</td>
</tr>
<tr>
<td>General</td>
<td>33</td>
</tr>
<tr>
<td>User Interface Menus</td>
<td>34</td>
</tr>
</tbody>
</table>
1 Important information

1.1 General
Read and save all instructions prior to installing, operating, and servicing this product. If any of the instructions are not understood, contact your ABB representative for clarification.

1.2 Symbols
In order that you can make the best use of this document and to ensure safety during commissioning, operation and maintenance of the equipment, please note the following explanation of the symbols used.

Explanation of the symbols used:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Signal Word</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>🚫</td>
<td>DANGER</td>
<td>DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. (High level of risk.)</td>
</tr>
<tr>
<td>⚠️</td>
<td>WARNING</td>
<td>WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. (Medium level of risk.)</td>
</tr>
<tr>
<td>🚩⚠️</td>
<td>CAUTION</td>
<td>CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. (Low level of risk.)</td>
</tr>
<tr>
<td>🚩⚠️</td>
<td>NOTICE</td>
<td>NOTICE indicates a potentially harmful situation which, if not avoided, may result in damage of the product itself or of adjacent objects. (Damage to property)</td>
</tr>
<tr>
<td>📌</td>
<td>IMPORTANT</td>
<td>IMPORTANT indicates useful hints or other special information which, if not observed, could lead to a decline in operating convenience or affect the functionality. (Does not indicate a dangerous or harmful situation.)</td>
</tr>
</tbody>
</table>

As well as the instructions in this document, you must also follow the generally applicable accident prevention and safety regulations.

If the information in this document is insufficient in any situation, please contact our service department, who will be happy to help you.

Please read this document carefully before installation and commissioning.

To ensure proper performance, use qualified personnel who have been trained, qualified and certified by ABB to install, operate, update, tune, and maintain the actuator, the electronic units and the wiring. ABB will not take any responsibility for personal injuries or material damages which were caused by non-trained, non-qualified or non-certified personnel.

1.3 Transport and storage
Carefully inspect for shipping damage. Damage to the shipping carton is usually a good indication that it has received rough handling. Report all damage immediately to the freight carrier and your ABB representative. Verify that the items on the packing list or bill of lading agree with your own.
2 Introduction

This service instruction refers to the ABB part-turn actuators PME120 AI (with integrated electronic unit) and PME120AN (for separate electronic unit). It amends and deepens the routine maintenance description in the standard instruction, which we strongly recommend to be also available for all maintenance work.

2.1 Safety and precautions

When mounting the actuator in areas which may be accessed by unauthorized persons, take the required protective measures.

- The actuators perform movements for positioning vanes and valves. Handle properly and with care. Otherwise, a hazard of bruise injuries may arise.
- When changing the oil of the actuator, thoroughly remove any oil that may have run down on the floor during the procedure to avoid accidents.
- Dispose of the waste oil in compliance with the respective local regulations. Make sure that no waste oil reaches the water cycle.
- Only qualified specialists who have been trained for these tasks are authorized to mount and adjust the control actuator, and to make the electrical connection.
- When working on the actuator itself or the electronics always observe the locally valid accident prevention regulations and the regulations concerning the construction of technical installations.
- Use the eye bolt at the actuator to lift or lower it. Only load it vertically. Do not lift or lower the actuator when it is mounted on a valve or similar final control element.
- Switch-off the voltage supply; make sure that unintentional switching on is not possible
- Make sure that switching off the power supply does not affect the plant process.
- Make sure that the final control element is not exposed to process forces.
- Refill the oil and check all mechanical and electrical interfaces for proper connection once the installation, commissioning, service or maintenance work is done.

2.2 Tools

Maintenance at CONTRAC actuators requires tools which are usually available in a workshop. Please consider that all dimensions are based on the metrical system. This applies also for the wrench sizes, threads etc. Using improper tools may damage the actuator or its components.

Use appropriate sleeves for the installation of the sealing rings (see chpt. 5.3.2.2 for details).
3 Actuator versions

Part-tun actuators PME120 are available in two versions:
- PME120 AI (with integrated electronics)
- PME120 AN (for separate electronics)

3.1 PME120 AI

Fig. 2: PME120AI with dismounted electronic unit

3.2 PME120AN

Fig. 3: PME120AN with available, separate electronic units
4 Lubrication

The spur wheel gearings of PME120AI / PME120AN are oil lubricated. They contain the max. oil quantity when leaving the manufacturer. In order to avoid any overpressure in the gearbox (e. g. due to thermal influence) replace the uppermost check plug by the separately supplied venting plug once the actuator is installed.

Standard actuators are delivered with a venting plug with a metal cap. Actuators which are equipped with an anti-condensation heater are delivered with a venting plug with a plastic cap.

4.1 Mounting position and filling capacity

<table>
<thead>
<tr>
<th>Mounting position</th>
<th>IMB 3</th>
<th>IMB 6</th>
<th>IMB 7</th>
<th>IMB 8</th>
<th>IMV 5</th>
<th>IMV 6</th>
</tr>
</thead>
</table>

Fig. 4: Mounting position PME... 1) = inspection screw, 2) = venting screw

| Min. oil quantity; approx. [l] | 2.2 | 2.5 | 2.2 | 2.2 | 2.5 | 2.5 |
| Min. oil level [mm] under inspection screw | 45 | 2 | 42 | 20 | 23 | 17 |

Table 1: Filling capacity PME...

4.2 Oil specifications

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>Ambient temperature</th>
<th>Oil type</th>
<th>Motor bearing (grease)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PME 120 AI</td>
<td>-10°C ... +55°C</td>
<td>Mobil SHC 629</td>
<td>Calypsol H442</td>
</tr>
<tr>
<td>(with integrated electronic unit)</td>
<td>-25°C ... +55°C</td>
<td></td>
<td>ESSO Beacon 325</td>
</tr>
<tr>
<td>PME 120 AN</td>
<td>-10°C ... +65°C</td>
<td></td>
<td>Calypsol H442</td>
</tr>
<tr>
<td>(for separate electronic unit)</td>
<td>-25°C ... +65°C</td>
<td></td>
<td>ESSO Beacon 325</td>
</tr>
<tr>
<td></td>
<td>+1°C ... +85°C 1)</td>
<td></td>
<td>Calypsol H442</td>
</tr>
</tbody>
</table>

Table 2:

1) actuator is equipped with an additional heater
4.3 Oil change
Use the lowermost plug to drain the oil. If the actuator basement does not allow to put an appropriate catchment device under the lowermost drain plug keep this one closed and open the uppermost drain plug. Push the pipe of a hand pump through this opening until the end reaches the bottom. Use the hand pump to get the oil manually out into the catchment device.

NOTICE Do not mix oil for different temperature ranges. Dispose of the waste oil in compliance with the respective local regulations. Make sure that no waste oil reaches the water cycle.

Proceed as follows to drain or change the oil (consider previous hints):
- provide a container capable to take the expected oil quantity acc. to table 1
- open or undo the venting plug
- unscrew the lowermost inspection screw and use it to drain the oil
- make sure that the entire oil is out of the actuator
- screw in and tighten the drain plug
- complete other maintenance work (if required)
- refill the appropriate amount of oil and tighten the venting plug

5 Maintenance
Contrac actuators feature a robust construction. As a result, they are highly reliable and require only little maintenance. The maintenance intervals depend upon the effective load.

The built-in microprocessor evaluates the actual load factors (e.g. torques, movements, temperatures, etc.) and derives the remaining operating time until the next routine maintenance is required. Use the configuration program for viewing this information.

CAUTION All maintenance work must be carried out by qualified specialists who have been trained for this task. Switch-off the power supply and protect the actuator against unintentional switch-on prior to any maintenance. Make sure that disconnecting the power or any mechanical linkage does not endanger the any process or person. Make sure that the actuator is not exposed to process forces during the maintenance work.

Apart from the load dependent maintenance intervals determined by the microprocessor we recommend routine maintenance at least every 10 years.

The following description of the maintenance work provides that the actuator is disconnected from the damper and that all electrical supply is disconnected.
5.1 Lever

5.1.1 Lever removal
In some cases it may be useful to detach the linkage bar from the ball-and-socket joint, however, it is not absolutely necessary. Refer to fig. 5 and 6 for the removal procedure!
- screw-off the nut on the lever clamping bolt (1) and put the bolt aside
- put an appropriate draw-off tool (2) onto lever and shaft (see fig. 6 for details); make sure that the claws (3) are symmetrically behind the lever and that the bolt tip is on the shaft center (5)
- put a wrench onto the opposite bolt end and turn the bolt;
- put the lever carefully aside once it is off the shaft

5.1.2 Lever installation

**NOTICE**
Make sure that the shaft surface and the shaft bore in the lever are clean and free of grease or any other lubricant
- put the appropriate key into the groove in the shaft
- use an expanding screw to spread the lever seat
- push a counter part (soft metal) into the lever gap in order to protect the expanding screw thread
- push the lever onto the shaft until it is nearly in the same position as it was before
- put the lever clamping bolt into the lever and tighten the nut with a torque of 23 Nm (17 lbf-ft)
5.1.3 Ball-and-socket-joint

The ball-and-socket joint may be mounted / removed with the lever mounted on the shaft or with dis-mounted lever. If the lever remains mounted on the shaft, move it into a position, where you get free access from the rear lever side.

![Fig. 7: Ball-and-socket-joint](image1)

![Fig. 8: Use of draw-off tool](image2)

In some cases, it may be useful to detach the linkage bar from the ball-and-socket-joint, however, it is not absolutely necessary.

5.1.3.1 Removal
- pull the cotter pin (1) out of the castle nut (2)
- screw-off the castle nut
- put an appropriate draw-off tool (3) onto lever (4) and joint bolt (5) (see fig. 8 for details); make sure that the claws (6) grip symmetrically behind the lever and that the bolt tip is on the joint bolt center
- put a wrench onto the opposite bolt end and turn the bolt clockwise
- press the joint bolt out of the lever

5.1.3.2 Installation
- push the bolt of the ball-and-socket joint into the lever hole
- put the crown nut onto the bolt and tighten it with the required torque of 80 Nm (60 lbf-ft).
- secure the crown nut with a NEW cotter pin
5.2 Sealing ring of output drive shaft

Fig. 9: Sectional view of PME120...
In order to change the O-ring (2) and sealing ring (4) of the output drive shaft proceed as follows:
- remove lever or coupling from the output shaft
- make sure that the oil level is below the O-ring (1)
- if necessary drain the oil (see chpt. 4.1)
- remove the key (2)
- loosen and remove the flange screws
- two tap holes (thread size: M6) on the bolt circle for the flange screws allow to use forcing screws; turn these screws clockwise to remove the flange (3); the thread length of the forcing screws should be at least 25 mm
- pull the flange (3) from the shaft
- turn the forcing screws out
- take the O-ring (1) and the sealing ring (2) out
- clean the shaft and the flange; slightly grease the sealing ring
- replace the O-ring and the sealing ring
- cover the key groove in the shaft prior to the flange re-installation in order to avoid any damage of the new sealing ring
- push the flange carefully over the shaft and fasten the flange screws crosswise; tightening torque for the flange screws = 2.8 Nm (2.01 ft-lbs)
- remove key cover and re-install key (4), lever or coupling

**IMPORTANT** Make sure that the “open“ side of the sealing ring points towards the oil.

Use of auxiliary tool for sealing ring installation (exemplary picture)
5.3 Motor
PME120 uses an integrated motor. The stator is integrated into the actuator housing which makes the motor housing a part of the actuator housing.

5.3.1 Motor removal
Note that the actuator position may be changed accidentally by the external load on the drive when the brake is released or the motor is removed.

STOP

- remove the rear cover (cover with electronics at PME120 AI)
- unscrew the 4 motor fastening screws (1)
- loosen the 4 grub screws (2)
- take the brake body with rotor out (3)
- take the stator (4) out

NOTICE
The lower end of the stator shaft is supported by 2 separated disk springs. Make sure you get them out with the motor.

Fig. 12: Rear view of PME120 (without cover / electronics) Fig. 13:
5.3.2 Motor shaft sealing ring
The motor shaft sealing ring prevents the oil in the gearbox to penetrate into the motor housing. Once the stator is out, use two appropriate hooks (1) to pull the motor sealing ring (2) out; see fig. 14.

5.3.2.1 Removal

![Image of motor shaft sealing ring removal](image1.png)

Fig. 14:

5.3.2.2 Installation

![Image of motor shaft sealing ring installation](image2.png)

- grease the new sealing ring and press it in the flange as shown in fig. 15
- make sure that the „open“ part of the sealing ring points towards the oil; see fig. 15.
- use appropriate squeezer or similar device to press the sealing ring uniformly into the flange (see right part of fig. 15)

5.3.3 Motor installation
- put the stator into the actuator housing
- make sure, the hose protected cables are within the groove (see fig. 16)
- put the rotor with the brake body into the stator housing
- tighten the 4 motor screws
- tighten the 4 grub screws to tense rotor / stator housing
- use appropriate retainer (DELO-ML 5228 or LOCTITE 243; both medium-firm; detachable) to secure the grub screws
(refer to fig. 12 + 13 for reference no.)
5.4 Brake adjustment

Note that the actuator position may be changed accidentally by the external load on the drive when the brake is released or the motor is removed.

In automatic mode the brake is permanently released. Therefore, it is not exposed to wear and does usually not require any re-adjustment.

However, if you want to check the brake gap, proceed as follows:
- disconnect the actuator from mains supply
- remove hood (PME120AI incl. electronic unit)
- remove the rubber cover of the motor
- unscrew the two grub screws (1)
- put two thickness gauges (0.15 mm / 0.0059”) diametrically opposed between the two plates (3 + 4)
- press plate 1 down
- tighten the two grub screws (1)

6 Electrical Connection

6.1 General

The cable between actuator and electronic unit is connected to the electronic unit via terminals and to the actuator via a plug. The plug housing may contain a carrier for terminals or for the cable ends with crimp sockets.

Fig. 16: Brake (rubber cap removed)

Fig. 17: Exemplary illustration of cable connection to the actuator; plug housing may contain alternatively a terminal carrier or a crimp carrier.
6.1.1  Actuator versions
Part-turn actuators PME120 are available in two versions:
- PME120 AI (with integrated electronic unit)
- PME120 AN (for separate electronic unit)

6.1.1.1  PME120 AI

Fig. 18: PME120AI with dismounted electronic unit

6.1.1.2  PME120AN

Fig. 19: PME120AN with available, separate electronic units

STOP
Disconnect the actuator and electronic unit from the mains supply before you start working at the electrical components. Make sure that switching off the actuator does not affect the process!

6.1.2  Removal of integrated electronic unit

NOTICE
If you want to use a faultless running electronic unit for another actuator, it is absolutely necessary to delete the basic settings of the operating range before you remove it. Press the drive buttons ▲ and ▼ on the LCP for at least 5 sec. until both LED flash simultaneously.

For the removal proceed as follows:
- switch-off the power supply and disconnect the plug
- loosen the 4 fastening screws (1)
- pull the electronic unit slightly apart

Fig. 20: PME120AI
6.2 Covers
Terminal covers and other components at the Contrac actuators and electronic units are fastened with 4 or more screws (only 2 screws for local control panel cover). In some cases they are additionally sealed with a soft rubber gasket. In order to avoid a gap between the housing and the cover (or the other component) tighten these screws evenly crosswise according to the order in the basic sketch in fig. Fig. 21: to get an even load.

Start with one screw and tighten it slightly. Then tighten the 2nd, opposite screw in the same manner. Continue with the remaining screws. Finally tighten the screws in the same order. This will ensure a tight seal.

6.3 Wiring diagrams (Integrated electronic unit)
6.3.1 HART
The electrical connection is done with a plug on the actuator.

6.3.2 PROFIBUS DP
Fig. 22:

Fig. 23:
6.4 Wiring diagram
(for separate electronic unit)

6.4.1 EAN823 (HART)

**sub distribution board**

- Screen connected at both ends
- One-side screening
- In further wiring possible

---

**Fig. 24:**

- Contrac actuator
- Contrac electronic unit
- Heater (approx. 6 W, option)
- Motor brake
- Sensors

---

[Diagram showing the wiring connections, including terminals for DI1, DI2, DI3, DO1, DO2, DO3, Uv, RB, H1, H2, U, V, W, Br, PE, MAN/AUT, MAN (+), MAN (-), etc.]
6.4.2  EAN823 (PROFIBUS DP)

Fig. 25:

6.4.3  EAS822

Fig. 26:
6.5 Fuses

<table>
<thead>
<tr>
<th>Electronic Unit</th>
<th>Fuse type</th>
<th>Fuse dimens.</th>
<th>Location</th>
<th>U = 115 V</th>
<th>U = 230 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integr.</td>
<td>Mains fuse</td>
<td>5 x 20 mm</td>
<td>main pcb</td>
<td>6.7 A, slow</td>
<td>3.15 A, slow</td>
</tr>
<tr>
<td></td>
<td>Analogue setpoint input</td>
<td>5 x 20 mm</td>
<td>main pcb</td>
<td>40 mA; fast</td>
<td></td>
</tr>
<tr>
<td></td>
<td>heater (only f. actuators f. -25°C ambient temperature)</td>
<td>5 x 20 mm</td>
<td>main pcb</td>
<td>2 A; slow</td>
<td></td>
</tr>
<tr>
<td>EAN 823</td>
<td>Mains fuse</td>
<td>5 x 20 mm</td>
<td>in connection chamber</td>
<td>6.7 A, slow</td>
<td>3.15 A, slow</td>
</tr>
<tr>
<td></td>
<td>Analogue setpoint input</td>
<td>5 x 20 mm</td>
<td>in connection chamber</td>
<td>40 mA; fast</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anti condensation heater + heater (only f. actuators f. -25°C ambient temperature)</td>
<td>5 x 20 mm</td>
<td>in connection chamber</td>
<td>2 A; slow</td>
<td></td>
</tr>
<tr>
<td>EAS822</td>
<td>Mains fuse</td>
<td>5 x 20 mm</td>
<td>in connection chamber</td>
<td>6.7 A, slow</td>
<td>3.15 A, slow</td>
</tr>
<tr>
<td></td>
<td>fuse for digital output DO1, DO2, DO3</td>
<td>5 x 20 mm</td>
<td>in connection chamber</td>
<td>3 x 0.2 A; medium time lag</td>
<td></td>
</tr>
</tbody>
</table>

Table 3:

6.5.1 Fuse location

6.5.1.1 Integrated electronic unit (PME120AI)

Fig. 27:
6.5.1.2 EAN823

NOTICE
Remove the cover of the connection chamber carefully in order to avoid any damage

---

Fig. 28: Fuses in EAN823
6.5.1.3 EAS822

Details: digital output fuses

- fuse f. DO3
- fuse f. DO2
- fuse f. DO1

(detail view of output fuses)

Fig. 29: Fuses in EAS822
7 Exchange of position sensor

7.1 Dismounting
- drive actuator into 50% position
- delete the current position settings by pressing the drive buttons ▲ and ▼ on the LCP for at least 5 sec.
- switch-off the voltage supply

7.1.1 PME120AN (for separate electronic unit)

![Fig. 30:](image1)
- remove the rear actuator cover
- undo the two fastening screws (1) of the position sensor and pull the sensor out of the gears
- disconnect the plug of the cable (2) on the pcb

7.1.2 PME120AI (with integrated electronic unit)

![Fig. 31:](image2)
- remove the electronic unit (see 6.1.2)
- loosen the 4 screws (1) of the connection pcb and push the pcb aside
- undo the two fastening screws (2) of the position sensor and pull the sensor out of the gears
- disconnect the plug of the cable (3) on the pcb
7.2 Mounting

The toothed gear pair of the position sensor is held in place by a tension spring (3), to ensure sufficient free motion when the direction of rotation is reversed.

- set the stop pin to the center position, as seen in figure 33
- connect the plug of the cable (2) to the sensor pcb
- align the sensor and its gears with the actuator; set the first toothed gear in 11:00 o’clock position (see Figure 33) onto the drive shaft gear (4)
- slightly move the sensor back and forth to pre-tension the toothed gears until the second toothed gear snaps in
- fasten the screws (1) tightly.
- fasten the rear cover (or cover with electronic unit for PME120Ai if applies)
- finally readjust the actuator range as described in the setup section of the actuator and / or electronic unit instruction manual

Fig. 33: Position sensor
Fig. 34: Mounting position (example shows PME120AN)
8 Electrical Test Values

NOTICE Check wiring and proper terminal connections before you start the test procedure.

8.1 Test values (position sensor)
The in-/ output signals are assigned to terminals of the electronic unit as follows:

- term. 17: DC +15 V; +/- 15% (supply); refer to term. 22
- term. 18: only used for cable length detection with EAS822
- term. 19: clock
- term. 20: data
- term. 21: reference potential for position signal
- term. 22: reference potential for temp. signal and supply voltage
- term. 23: position proportional voltage signal (0.4... 4.4 V); refer to term. 21; end positions of actuator must be adjusted
- term. 24: temperature proportional voltage signal; refer to term. 22;
  (∆V approx. 22.4 mV / °C; approx. 1.8 V at 20°C)

(see fig. 35 for terminal position)

Fig. 35: Signal terminal location

8.2 Test values
Brake voltage: DC 135 V with AC 115/AC230 V mains supply

Motor voltage: check for currents symmetry (i.e. with clip-on ammeter)

8.3 Winding resistance (motor)

STOP Disconnect the voltage supply and the actuator plug prior to any resistance measuring. Make sure that switching off the actuator does not affect the process.

Depending on the actuator version proceed as follows:

8.3.1 PME120 AI (integrated electronic unit)
- remove the plug
- remove the actuator hood with electronics
- check pins at pin carrier; see fig. 27 for pin reference

8.3.2 PME120 AN (separate electronic unit)
- remove plug
- measure between pins at actuator plug; see fig. 24 + 26 for pin reference
### Table 4: Winding resistance

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Numbers</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated electronic unit (refer to pin carrier in fig. 27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winding resistance ± 5% at 20°C (motor); pin. 6-7 / 7-8 / 6-8</td>
<td>pin. 1-2 / 2-3 / 1-3</td>
<td>3.4 Ohm</td>
</tr>
<tr>
<td>Winding resistance ± 5% at 20°C (brake); term. 9 - 10</td>
<td></td>
<td>50 Ohm</td>
</tr>
<tr>
<td>Separated electronic unit; refer to pin carrier of actuator plug (see fig. 24 + 26)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winding resistance ± 5% at 20°C (motor); pin. 1-2 / 2-3 / 1-3</td>
<td></td>
<td>3.4 Ohm</td>
</tr>
<tr>
<td>Winding resistance ± 5% at 20°C (brake); term. 9 - 10</td>
<td></td>
<td>50 Ohm</td>
</tr>
</tbody>
</table>

Fig. 36:
9 Failure detection

9.1 LED signals at local control panel
Provided the electronic unit is supplied with voltage (green LED on LCP „ON“), the red LED on the local control panel provide some basic status information:

both LED are „OFF“ actuator is ok
both LED are „ON“ actuator is in bootstrap mode (e. g. during data loading procedure); in this case the actuator is not available for the positioning loop
both LED flash simultaneously actuator end positions are not set; actuator does not accept commands to the digital inputs and can only be moved via drive buttons on the local control panel (see also electronic unit instruction)
both LED flash alternatively actuator failure (e. g. out of adjusted range); actuator can not be moved via command buttons or commands from the process control system; reset is only possible once the failure reason is eliminated

Fig. 37: Local Control Panel

10 Trouble Shooting

NOTICE Check wiring, polarity and all plug and terminal connections before you start detailed trouble shooting.

The following chapter specifies various possible failure events or conditions, which should be checked. Follow the block diagrams to find the associated reason, result or measure to solve the malfunction.

Example:
condition: E6.1 LED signal: Failure
possible failure: E6.3 sensor memory failure
one reason / measure to solve the malft. R6.2 replace sensor; see chpt. 7
(in this case the user will find more detailed information about the sensor replacement in chapter 7)
10.1 General

Actuator does not move

E1.1: LEDs signalize „malfunction“ (see chpt. 9)

No Yes

E1.2: power LED on local control panel is „ON“

No Yes

E1.3: internal mains fuse ok?

No Yes

E1.4: power supply „ON“?

No Yes

E1.5: voltage level acc. to data label?

No Yes

R1.1: see chpt. 10.6

R1.2: see chpt. 10.2

R1.3: replace fuse see E1.5 if the fuse blows again

R1.4. Hook-up the voltage supply check external fuse

R1.5: Use electronic unit for appropriate voltage level or ensure appropriate voltage level

R1.6: Electronic unit defective; replace electronic unit
10.2 Failures at brake, fuse or wiring

E1.1: Yes

E 2.1: actuator can be moved over entire range via drive buttons on LCP

No Yes R 2.1 See 10.3

E2.2: Motor / brake wiring acc. to wiring diagram? (see chpt. 6.3

No Yes

E 2.3: Disconnect actuator and valve. Actuator can be moved?

No Yes

E3.4: Motor winding resistance acc. to table 4

No Yes

E 3.5: Check brake. "Click sound" audible?

No Yes

E 3.7: Remove motor (Oill) Gearing smoothly rotatable over entire range?

No Yes

R 2.2: Correct wiring

R 2.3: Motor defective

R 2.4: Adjust brake gap

R 2.6: Act. runs mech. hard

R 2.7: Motor / brake defective

R 2.8: Valve runs hard
10.3 Operation mode (MAN / AUT)

E 2.1: Yes →

E 3.1: Actuator is set to AUTO
mode via software (A 1 chpt. 10.9)

No → Yes

E 3.2: „Simulation” mode active? (D 3 chpt. 10.9)

Yes → No

E 3.3: „Test” mode active? (D 2 chpt. 10.9)

Yes → No

R 3.1: Set actuator to AUTO mode via confi. soft-ware.

If the actuator is still in MAN mode after switching on again, change the set-
tings for „Behaviour after voltage recovery” to „Switch to AUTO”
(C 2 chpt. 10.9)

R 3.2: De-activate „Simulation” mode
(D 3 chpt. 10.9)

R 3.3: De-activate „Test” mode
(D 2 chpt. 10.9)

R 3.4 see chpt. 10.4
(pos. after setpoint)
(C 4 chpt. 10.9)

R 3.5 see chpt. 10.5
(pos. after step control-
er)
(C 4 chpt. 10.9)
10.4 Input configuration

E 3.3: No

E 4.1: actuator is set to AUTO mode
(A 1 chpt. 10.9)

No

E4.2: Fuse for setpoint signal ok? see chpt. 6.5

No

E4.3: Setpoint signal measurable and polarity ok?

No

E4.4: Setpoint function adjusted to „analog setpoint“?
(C 4 chpt. 10.9)

No

E4.5: Permanent drive command at dig. input 2 or 3?

No

R4.1: De-activate digital input contacts
(C 4 chpt. 10.9)

Provide „DC 24 V „high“ signal to dig. input 1

R4.2: Replace fuse

R4.3: Provide setpoint signal

R4.4: Select „analog setpoint“ in user interface
(C 4 chpt. 10.9)

R4.5: Electronic unit defective

R4.6: De-activate permanent drive command

Yes

Yes

Yes

Yes
10.5 Operation behind step controller

R 3.5: No

E5.1: actuator is set to MAN mode (user interface; A 1 chpt. 10.9)

No

E4.2: pulses are measurable and polarity ok?

No

R5.1: provide controller signal and check wiring

Yes

R5.2: Electronic unit defective

R5.3: Select „AUTO“ mode in user interface (A 1 chpt. 10.9)

10.6 Failure Diagram

E 1.1: Yes

E6.1: LED signal: Failure

E6.2 sensor failure

E6.3: sensor memory failure

E6.4 RAM failure

E6.5: flash failure

E6.6: CPU failure

E6.7: fr. conv. failure

E6.8: pos. loop monitoring

R6.1 check wiring between electronic unit and actuator pos. sensor out of oper. range; see chpt. 9; replace sensor see chpt. 7

R6.2 replace sensor see chpt. 7

R6.3 replace electronic unit

R6.4 see 10.7
10.7 Failure due to response of positioning loop monitoring

10.8 General

Actuator runs with creeping speed in one or both end positions
- check the software settings for leaving the end position; if „break-away“ is activated, the actuator moves with increased torque / force but with reduced speed

Imprecise behaviour in step-control mode
- use graphical user interface to check function assignment of digital input settings; select „step controller“

Actuator over-runs end position(s)
- change the software settings for the end position behaviour to „Position-dependent switch-off“ and enter the associated switch-off position
- adjust the mechanical limit stops in order to avoid an end position over-run

Actuator moves into an end position once it reaches a setpoint
- de-activate „close tight“ in the software settings for modulating control near the end position

Actuator position does not correspond to setpoint although the position signal corresponds to the setpoint
- de-activate the programmable setpoint in the software settings for the setpoint characteristic

Actuator follows the setpoint only within a limited range
- de-activate „split range“ in the software settings for the setpoint characteristic
10.9 User Interface Menus

Fig. 38: Trouble shooting related menus in the user interface (digitally manipulated screen shot)

The following table represents the first 2 menu levels (see also fig. 38) of the graphical user interface as far as the trouble shooting is concerned. Some of the subjects in chpt. 10 refer to the user interface. Use the numbering in table 5 to facilitate the navigation. The user interface software does not use any numbering in the menus.

A Operate
B Diagnosis
C Configure
D Service

Table 5: Trouble shooting related menus of the user interface