Motor Operating Device    UEMC 50

Installation, operating and recycling guide
<table>
<thead>
<tr>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General ........................................................... 3</td>
</tr>
<tr>
<td>2. Standards .......................................................... 4</td>
</tr>
<tr>
<td>3. Transport and storage ........................................... 5</td>
</tr>
<tr>
<td>4. Construction ....................................................... 5</td>
</tr>
<tr>
<td>5. Installation of the motor operating devices .......... 6</td>
</tr>
<tr>
<td>6. Installation of accessories .................................... 13</td>
</tr>
<tr>
<td>7. Operating instructions ........................................... 13</td>
</tr>
<tr>
<td>8. Service ............................................................... 13</td>
</tr>
<tr>
<td>9. Repairs ............................................................... 14</td>
</tr>
<tr>
<td>10. Spare parts .......................................................... 14</td>
</tr>
<tr>
<td>11. Cable selection ..................................................... 15</td>
</tr>
<tr>
<td>12. Heating the operating device ............................... 15</td>
</tr>
<tr>
<td>13. Selection of operating device ............................... 15</td>
</tr>
<tr>
<td>14. Changing direction of rotation ............................ 16</td>
</tr>
<tr>
<td>15. Circuit diagram key .............................................. 16</td>
</tr>
<tr>
<td>16. Accessories .......................................................... 17</td>
</tr>
<tr>
<td>17. Range of models ................................................... 21</td>
</tr>
<tr>
<td>18. Technical data ...................................................... 22</td>
</tr>
<tr>
<td>19. Instructions for recycling the product ................. 23</td>
</tr>
<tr>
<td>20. Dimension drawings ............................................... 27</td>
</tr>
<tr>
<td>21. Circuit diagrams ................................................... 31</td>
</tr>
</tbody>
</table>
1. General

Motor operating device type UEMC 50 is intended for the operation of outdoor pole mounted disconnectors. The device is available in four enclosure sizes and with two different operating speeds.

Type designation

<table>
<thead>
<tr>
<th>Type designation</th>
<th>Construction type</th>
<th>Voltage</th>
<th>Circuit diagram or specific model</th>
</tr>
</thead>
<tbody>
<tr>
<td>UEMC 50 L 1 - 24VDC /1</td>
<td>L=Low speed, H=High speed</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

a. UEMC 50 H1
   – operation time 1,2 s
   – low torque

b. UEMC 50 L1
   – operation time 3 s
   – high torque

Enclosure

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Height</th>
<th>Width</th>
<th>Depth</th>
<th>Material</th>
<th>Degree of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>135 UEMC 1</td>
<td>480 mm</td>
<td>300 mm</td>
<td>205 mm</td>
<td>stainless steel AISI 304</td>
<td>IP 44</td>
</tr>
</tbody>
</table>

Refer to fig. F1.1

Fig. F1.1

c. UEMC 50 H2
   – operation time 1,2 s
   – low torque

d. UEMC 50 L2
   – operation time 3 s
   – high torque

Enclosure

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Height</th>
<th>Width</th>
<th>Depth</th>
<th>Material</th>
<th>Degree of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>135 UEMC 2</td>
<td>570 mm</td>
<td>520 mm</td>
<td>220 mm</td>
<td>stainless steel AISI 304</td>
<td>IP 44</td>
</tr>
</tbody>
</table>

Refer to fig. F1.2

Fig. F1.2
e. UEMC 50 H3_
   - operation time 1,2 s
   - low torque

f. UEMC 50 L3_
   - operation time 3 s
   - high torque

Enclosure
Dimension drawing: 135 UEMC 17_
Height: 570 mm
Width: 620 mm
Depth: 300 mm
Material: stainless steel AISI 304
Degree of protection: IP 44
Refer to fig. F1.3

Enclosure
Dimension drawing: 135 UEMC 36
Height: 620 mm
Width: 500 mm
Depth: 330 mm
Material: stainless steel AISI 304
Degree of protection: IP 55
Refer to fig. F1.4

Note!
Enclosures UEMC 50 H5_ and UEMC 50 L5_ are for example used with the remote monitoring and control units REC 501 and REC 523.

2. Standards
The motor operating device complies with the following standards:
   - IEC 265
   - SS 428 12 00
   - voltage withstand test 2 kV, 50 Hz, 1 min, except for the motor 1,5 kV
3. **Transport and storage**

It is preferable to transport the motor operating device with the door upwards. If the devices are to be stored for long periods they should be kept in a dry room.

4. **Construction**

4.1 **Power transfer mechanism**

The mechanism consists of a gear wheel and a screw system. The screw is self-locking, so that forces from the disconnector do not affect the operating mechanism.

Material:
- frame, screw and axle: stainless steel
- nut and gear wheel: bronze
- fork lever: aluminium alloy (Al-Si)

Control torque and time depend on which of the two alternatives is chosen.

- UEMC 50 H\_: fast operation 1,2 s low torque
- UEMC 50 L\_: slow operation 3 s high torque

4.2 **Motor**

- UEMC 50 H\_: series wound motor DC voltage
- UEMC 50 L\_: permanent magnet motor DC voltage

Alternative motor voltages: see range of models point 17.

4.3 **Relay sub-assembly**

The relay sub-assembly is fixed with two screws to the power transfer mechanism and is easily changed. Components and contactor voltages used in the relay sub-assembly are described in point 17.

Material: stainless steel

The power transfer mechanism, motor and relay sub-assembly form a functioning unit independent of the enclosure. See fig. F4.1.

4.4 **Control lever and tube fixing elements**

The effective length of the control lever can be adjusted by moving the pin to a suitable hole.

Tube clamp: tube outside diameter 30 mm

Material:
- control lever: stainless steel
- tube clamp: hot dipped galvanized steel
- pin and bolts: stainless steel

4.5 **Pole fixing elements**

The pole fixing elements are intended for use with wooden poles, but can easily be modified for other fixing arrangements due to the detachable parts used. See fig. F5.2.

Material: hot dipped galvanized steel
5. Installation of the motor operating devices

5.A Installation of the motor operating device to the pole

A.1 Place the motor operating device on the pole in a position permitting an easy installation of the operating tube between the disconnector and the operating device. See fig. F5.1.

A.2 Define the installation height H
(Recommended H = 1400 mm)

A.3 Drill 2 fixing holes in the pole,
diameter: 12 mm
depth: 75 mm

Dimension A:
UEMC 50 H1_ and L1_: 525 ± 5 mm
UEMC 50 H2_ and L2_: 615 ± 5 mm
UEMC 50 H3_ and L3_: 615 ± 5 mm
UEMC 50 H5_ and L5_: 665 ± 5 mm

*) The correct position is given in the installation instruction of the disconnector.

A.4 Install the operating device using screws a, washers b and tube clamp c provided, type UEMZ 1065. Refer to dimension drawing.

Move the clamping plates sideways if required so that the operating device fixing bracket does not rotate. See fig. F5.2

A.5 Make the electrical connections and earth the operating device.

Fig. F5.1

Fig. F5.2
5. B Installation of UEMC 50_ to drive NPS disconnector

This section describes the installation method for the motor operating device control lever, operating tubes, and adjustment of the tubes.

The operating tubes are to be adjusted so that there is a small pretension. The pretension is to be in the form of a upwardly directed force on the operating tubes which will ensure that the disconnector closes when operated, and compensates for the changes in dimensions, looseness or flexibility.

Pretension of the tubes is important to safeguard long trouble free operation of the disconnector.

B.1 Fit the control lever and tube fixing elements, type UEMZ 590, taking note of aligning the marks on the lever and shaft, see the mounting of washers fig. F5.5.

B.2 Using the hand crank move the operating device to the closed position, i.e. the power transfer mechanism nut is at the bottom and the control lever at about 45° upwards.

B.3 Fit the pin and tube clamp in the correct hole. For NPS disconnectors:
- R110mm: NPS 24 A2
- NPS 24 B1
- NPS 24_-K4
- NPS 24_-K5
- NPS 36_
- R155 mm: NPS 24 A2-K2

Refer to fig. F5.3

B.4 Place the lower end of the control tube clamp on the motor operating device without tightening the screws so that the tube still moves freely.

B.5 Drive the disconnector to the fully closed position by pushing the control tube upwards against the limiter. Remove any free-play by pushing the control tube upwards and pulling the lever downwards. Mark on the tube with a felt-tip pen, the position of the upper edge of the tube clamp. Refer to fig. F5.7.

B.6 Operate the motor operating device in the opening direction with the crank until the mark on the tube moves about 20 mm upwards, Y = 20 mm. Tighten the tube clamp screw to a torque of 20 Nm. Refer to fig. F5.3.

B.7 Check the minimum opening gap of the disconnector when it is in the open position. Refer to the disconnectors installation instructions.

B.8 Test operate electrically.

B.9 Cut the tube leaving at least 20 mm for adjustment.

Fig. F5.3
5.C Installation of UEMC 50 to drive SECTOS type NXA_A1

The installation of the control levers and operation tube is described in this chapter. Adjustment is made by marking the fully closed and open end positions and then adjusting the operating tube.

C.1 Fit the cast metal lever to the SECTOS-switch taking note of aligning the marks on the lever and shaft. Fit the pin to the outer hole, R = 155 mm. See fig. F5.4.

C.2 Fit the operating lever and tube fixing elements, type UEMZ 590, to the motor operating device taking note of aligning the marks on the lever and shaft. See the mounting of washers fig. F5.5. Fit the pin to the hole in the lever, R = 190 mm. See fig. F5.5.

C.3 Insert the control tube into the tube clamp of the switch, and tighten the screws to 20 Nm (14.7 lbf ft). Install the insulator and tube guides according to the installation instructions of the switch.

C.4 Check that both the switch and motor operating device are in open positions and the operating levers are pointing inclined downwards. See fig. F5.4 and F5.5.

C.5 Put the control tube into the tube clamp of the lever of the motor operating device, but do not tighten the screws. The tube shall easily slide inside the clamp.

C.6 Pull the control tube downwards against the end position of the open switch, and simultaneously push the lever on the motor operating device upwards. In this position, make a mark onto the tube on top of the tube clamp e.g. a felt-tip pen. See fig. F5.6

C.7 Turn the motor operating device to closed position by the hand crank, letting the tube slide inside the tube clamp. Move also the switch to closed position by pushing the tube upwards.

C.8 Keep the operating tube pushed upwards against the stop and simultaneously pull the operating lever downwards. In this position make a second mark onto the tube on top of the clamp. See fig. F5.7.
C.9 Measure the distance between the two marks. If the distance is more than 22 mm, increase the lever length by changing the pin to the next hole outwards, and repeat the points C.6...C.9. If the first mark stays inside the tube clamp, reduce the lever length by changing the pin to the next hole inwards.

C.10 Make a third mark in the middle of the two marks. Adjust the operating tube until this mark is in line with the top of the tube clamp and tighten the screws to 20 Nm (14.7 lbf ft). See fig. F5.8.

C.11 Cut the operating tube leaving min. 20 mm adjustment area.

C.12 Test the operation by using the hand crank, and check the function of the switch. The switch should open and close with some margin of operating angle in the operating device, and the operating device should easily reach its end positions. Finally test operate by the motor.
5.D Installation of UEMC 50_ to drive
SECTOS type NXA_B1

The installation of the control levers, adjuster coupling, operation tube and the adjustment of the tube length between the switch-disconnector and the motor operating device is described in this chapter. The right adjustment is obtained by adjusting the adjuster coupling until the springs are compressed to a certain extent in both the open and closed position.

D.1 Install the switch-disconnector, according to installation guide for the switch.

D.2 Install the motor operation device on the pole according to chapter 5.A. See also fig. F5.10.

D.3 Fit the operation lever to the switch disconnector taking note of the marks on the lever and shaft. Fit the pin with tube clamp in the outer hole, R= 155 mm. Refer to fig. F5.11.

D.4 Put the control tube into the tube clamp on the switch, and tighten the screws to 20 Nm. Install the insulator and tube guides according to the installation guide for the switch.

D.5 Check that the switch is in the open position and the operating lever is pointing slightly upwards.

D.6 Fit the operating lever and tube fixing elements, type UEMZ 590, onto the motor operating device taking note of the marks on the lever and shaft. See the mounting of washers fig. F5.12. Fit the pin in the hole, R= 206 mm. Refer to fig. F5.12.

D.7 Cut the operating tube such that it ends at 470 mm from the center of the shaft of the motor operating device.

D.8 Fit the adjuster coupling to the operating tube with gap Y = 20 mm, and tighten the screws to 20 Nm. Refer to fig. F5.13.

Warning!
There is a risk of injuring the fingers if the screws on the adjuster coupling are so loose that the tube can slide inside the coupling while adjusting the springs.
D.9 Operate the motor operating device using the handcrank to the closed position until the adjuster coupling can be fitted to the pin. Fit the washer and the split pin.

D.10 Operate the motor operating device using the handcrank to fully the closed position.

D.11 Adjust the lower adjusting nut until the spring compresses to $A_1 = 81$ mm. Check while adjusting, that the upper spring is free and that the screw does not hit against the tube. Tighten the locking nut. Refer to fig. F5.13.

D.12 Using the handcrank, operate the motor operating device to the fully open position.

D.13 Adjust the upper adjusting nut until the upper spring compresses to $A_2 = 81$ mm. Check that the lower spring is free. Tighten the locking nut. Refer to fig. F5.13. If the lower spring has started to compress, operate the motor operating device to the middle position and move the pin out to the next hole in the lever, $R = 222$ mm. Open the adjustment nuts and start adjustment again from point D.10.

D.14 Test the operation by using the handcrank, and check the function of the switch-disconnector as well as the distances $A_1$ and $A_2$. The switch-disconnector should close with some margin before the motor operating device reaches its closed end position. When operating to the open position the switch-disconnector shall open after a short operating distance, and latching of the charged spring inside the switch-disconnector can be heard (if listening carefully) as a small click before reaching the open endposition.

D.15 Finally test operate with the motor.
5.E Installation of UEMC 50 to drive SECTOS types

NXA_A2
NXA_A3
NXA_A4
NXB_A2
NXB_A3
NXB_A4

E.1 Fit the shaft and the cast metal lever to the switch with the screw M12*80 mm, so that the arrow on the lever is pointing to about 40°, when the free-play is removed by pushing the lever upwards.

NOTE! The length of the screw should not exceed 80 mm.
Fit the pin to the outer hole, R = 155 mm. See fig. F5.14.

Fig. F5.14

E.2 Fit the operating lever and tube fixing elements, type UEMZ 590, to the motor operating device taking note of aligning the marks on the lever and shaft. See the mounting of washers fig. F5.15.
Fit the pin to the hole in the lever, R = 190 mm. See fig. F5.15.

Fig. F5.15

E.3 Insert the control tube into the tube clamp of the switch, and tighten the screws to 20 Nm (14.7 lbf ft).
Install the insulator and tube guides according to the installation instructions of the switch.

E.4 Check that both the switch and motor operating device are in open positions and the operating levers are pointing inclined downwards. See fig. F5.14 and F5.15.

E.5 Put the control tube into the tube clamp of the lever of the motor operating device, but do not tighten the screws. The tube shall easily slide inside the clamp.

E.6 Make a mark on the tube at 30 mm above the top of the tube clamp, with a felt tip pen. Check that the tube can be pulled down by hand until this mark is in line with the top of the tube clamp. Operate by using the hand crank until the mark is in line with the top of the tube clamp and tighten the screws to 20 Nm (14.7 lbf ft).

E.7 Cut the operating tube leaving min. 20 mm adjustment area.

E.8 Test the operation by using the hand crank, and check the function of the switch. The switch should open and close with some margin of operating angle in the operating device, and the operating device should easily reach its end positions. Finally test operate by the motor.
6. Installation of accessories

Normally the manufacturer installs all accessories. However if the client wishes to complete the assembly refer to:
- 31 UEMC 129 (Point 21)
- 31 UEMC 130 (      )
- 31 UEMC 138 (      )
- accessories (Point 16)

7. Operating instructions

7.1 Electrical control

OPEN, CLOSED
Push buttons
- for local control

MOTOR
Miniature circuit breaker
I and O
- for motor protection

REMOTE
Remote selector switch
I and O
- functions as remote control switch
- can affect local control
  see point 15.2 for details

7.2 Manual operation

The operating device is equipped with a hand crank for manual operation. Method of manual operation:
- switch the m.c.b. "MOTOR" to the 0-position
- fit the crank to the bottom of the operating device and operate
- the operation is complete when the nut presses against the limit switch and the crank becomes heavy to turn
- return the m.c.b. "MOTOR" to the I-position

Blocking switch S3 will open the electrical operating circuit automatically when the device is being manually operated to increase safety.

7.3 Interlocking

The operating device can be mechanically locked with a padlock to prevent both the motor and the manual operation mechanism being used. Method of locking:
- switch the m.c.b. "MOTOR" to the 0-position
- fit a padlock to the locking flap under the operating device, see fig. F1.1

Blocking switch S3 will open the control circuit automatically when the unit is padlocked.
To ensure additional safety it is suggested that the m.c.b. is also open.

The locking point is also designed to withstand the motor's torque if the motor should start.

NOTE! Remember to switch the m.c.b. to the I-position when removing the padlock.

The door of the enclosure can also be locked with a padlock.

8. Service

Grease the power transfer mechanism screw and gears every 5 years or after 1000 operations.

Grease: Isoflex Topas NCA 52.

Check the functioning of the heater.

Charging batteries for UEMC 50_1 (small enclosure):
- loosen battery charger and fixing bracket
- move the battery to the upper corner and then it can be pulled out
9. Repairs
The operating device is assembled from several modules which can be easily changed or removed for repair.

NOTE! Isolate the supply voltage to the heater and motor before commencing repair work.

9.1 Relay sub-assembly
The relay sub-assembly is attached to the power transfer mechanism by two screws and connected to the motor via a plug and socket.

When fitting the relay sub-assembly as a spare part:
- UEMC 50 H_: relay sub-assembly fits directly
- UEMC 50 L_: limit switches S1 and S2 are to be moved outwards to the next fixing holes

9.2 Motor
Changing the motor:
a) Remove the relay sub-assembly and motor plug.
b) Remove the motor's fixing base - 2 pcs M8-bolts.
c) Transfer the motor's fixing base and gear wheel to the new motor. Drill diameter 2.5 mm for the gear wheel on the motor axle.
d) Fit the motor and relay sub-assembly.
e) Check the motor's direction of rotation as follows:
   - using the hand crank move the operating device to the middle position
   - press the "0" push button. The nut should then move upwards.
   - if it does not, immediately switch off the "MOTOR" m.c.b. and swap the motor's anchor circuit wiring (red wires on the motor in the UEMC 50 H_ device).

9.3 Power transfer mechanism
Removal and repairs:
- remove the relay sub-assembly and motor plug.
- remove the operating lever
- remove the power transfer mechanisms fixing bolts M8 and then the whole power transfer mechanism

If the power transfer mechanism is disassembled:
- note the use of spring washers. The outer washers are to be turned so that they press onto the outer rings of the bearings.
- gear wheel tightening torque 60 Nm

10. Spare parts
When ordering spare parts, all details on the rating plate are to be mentioned.

Typical spare parts:

<table>
<thead>
<tr>
<th>Spare part</th>
<th>Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay</td>
<td>UEZJ N/U</td>
<td>N = circuit diag. no eg. 121</td>
</tr>
<tr>
<td>sub-assembly</td>
<td></td>
<td>U = voltage eg. 24 VDC</td>
</tr>
<tr>
<td>complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor + gear</td>
<td>UEZM 2/U/1</td>
<td>UEMC 50 H_</td>
</tr>
<tr>
<td>wheel</td>
<td>UEZM 5/U/1</td>
<td>UEMC 50 L_</td>
</tr>
<tr>
<td>Power transfer</td>
<td>UEZA 7</td>
<td>UEMC 50 H_</td>
</tr>
<tr>
<td>mechanism</td>
<td>UEZA 6</td>
<td>UEMC 50 L_</td>
</tr>
<tr>
<td>Contactor</td>
<td>- ABB VBC6-30-01/U</td>
<td>U = Voltage for DC</td>
</tr>
<tr>
<td>K1 + K2</td>
<td>- ABB VB6-30-01/U</td>
<td>U = voltage for AC</td>
</tr>
<tr>
<td>Micro switch</td>
<td>- OMR Z-15GW22-B7</td>
<td></td>
</tr>
<tr>
<td>S1, S2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diode</td>
<td>SK 1/16</td>
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</tr>
<tr>
<td>Heater</td>
<td>UEZR1 230 VAC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-220 V</td>
<td>220 VDC</td>
</tr>
<tr>
<td>Heater</td>
<td>UEZR1 110 VAC/DC</td>
<td></td>
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<tr>
<td></td>
<td>-110 V</td>
<td></td>
</tr>
<tr>
<td>Heater</td>
<td>- TEG HG45 45 W, 110...250 VAC/DC</td>
<td></td>
</tr>
<tr>
<td>Rectifier</td>
<td>- REC 36 MB 160 A</td>
<td></td>
</tr>
</tbody>
</table>
11. Cable selection
If the power source is outside the operating device, choose the cross-sectional area of the supply cables in accordance with the following list:

L = distance from to operating device to power source
a = min. cable cross-sectional area

<table>
<thead>
<tr>
<th>L/m</th>
<th>24 V a/mm²</th>
<th>48 V a/mm²</th>
<th>60 V a/mm²</th>
<th>110 V a/mm²</th>
<th>220 V a/mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2.5</td>
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<td>500</td>
<td></td>
<td>2.5</td>
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</tbody>
</table>

For 24 V voltages, we recommend the use of battery and charger in each operating device, for longer distances.

12. Heating the operating device
The motor operating device includes heater which keeps the box dry and increases the reliability of the electric components.
- Heater 20 W, 220 VDC/230 VAC, for all types, except for types UEMC 50 H5 and L5,
- Heater 45 W, 110 V...250 VAC/DC, self-regulating, only for types UEMC 50 H5 and L5.

It is also important to note that the life time of the batteries is reduced with increased temperature.

A thermostat is available for disconnecting the heater at higher temperatures. See section 16.9.

13. Selection of operating device

a) for NPS disconnectors

UEMC 50 L_: slow operation
- NPS 24 kV disconnectors with "K5" breaking chamber (making capacity 8 kA)
- NPS 24 kV disconnectors with "K2" oil filled breaking chamber (making capacity 12.5 kA)
- NPS 36 kV disconnectors

UEMC 50 H_: fast operation
- NPS 24 kV disconnectors with whips (making capacity 5 kA)
- NPS 24 kV disconnectors with "K4" breaking chamber (making capacity 5 kA)

NOTE! 24 kV disconnectors fitted with breaking whips can also be operated using the UEMC 50 L_ (slow) device, unless fault current making capacity is required.

b) for NXA disconnectors

UEMC 50 L_: slow operation
- NXA_A1 disconnectors
- NXA_B1 disconnectors

UEMC 50 H_: fast operation
- NXA_A1 disconnectors if fast operation is needed

UEMC 50 L5_: slow operation
- UEMC 50_2_
- UEMC 50_3_
- UEMC 50_5_

UEMC 50 L5_/1

This is the recommended circuit diagram for most applications.

Circuit diagram no: 31 UEMC 121
Included in types: UEMC 50_ _/1

Circuit diagram no: 31 UEMC 311
Included in types: UEMC 50 H1_/11
UEMC 50 L5_/11

This circuit diagram is recommended if the motor operating device is to be equipped with remote monitoring and control device REC 501 or REC 523.

Other circuit diagrams are also available. See section 17 and 21.
14. Changing direction of rotation

Sometimes it is necessary to change the direction of rotation.
- swap the "OPEN" and "CLOSED" labels and fasteners
- swap I and O labels
- swap position indication labels on enclosure outside
- swap terminals X1:7 and X1:8 incoming I and O control impulse signals.

15. Circuit diagram key

15.1 Alarm function

Terminal block X1:3 is live under normal conditions.

During an alarm, the voltage to terminal block X1:3 is interrupted, the reason being:
- F1 has tripped
- S6 is open
- voltage supply to operating device is interrupted

Refer to circuit diagram for respective type.
See also points 16.7 and 16.12.

15.2 Remote control

CLOSE: Impulse to terminal X1:7
OPEN: Impulse to terminal X1:8

The voltage for the impulse can be taken from:

a) terminal X1:3 via the relay contact
b) directly from the remote control unit

15.3 Separate motor and control circuits

Type: UEMC 50_ UU/1
Circuit diagram no. 31 UEMC 166

For this type, the voltage for the motor and control circuit can be different, however if separate circuits are required for the motor and control with the same voltage then this type will be delivered.

A zero-voltage relay is required so that the standard alarm circuit will give an alarm when the m.c.b. operates, or when the motor voltage is interrupted. Refer to point 16.14.
## 16. Accessories

Accessories are to be ordered separately using the type numbers given.

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Type number</th>
<th>Description</th>
<th>Suitable for</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.1 Extra aux. contacts</td>
<td>UEZS 2/S10</td>
<td>3NC/NO</td>
<td>UEMC 50 L_</td>
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<td>16.2 Batteries (G2, G3)</td>
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<tr>
<td></td>
<td>UEZGL 24 Ah-24 V</td>
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<td>UEZGL 38 Ah-24 V</td>
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<td>UEMC 50_2_ and 50_3_</td>
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<td>UEZGP 17 Ah-12 V</td>
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<td>UEZGL 38 Ah-12 V</td>
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<td>UEZGC 24V/1A/230VAC</td>
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<td>UEMZ 199</td>
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<td>16.5 Charg. and heat. switch (S8)</td>
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<td>16.6 Heater</td>
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<td>16.7 Voltage free alarm circuit</td>
<td>UEMZ 247</td>
<td>Closing circuit</td>
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<td>16.11 M.c.b. for heater (F2)</td>
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<td>16.12 Separate alarm circuits</td>
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<td>Opening circuits</td>
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<td>16.13 Counter</td>
<td>UEMZ 444</td>
<td>Mechanical</td>
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<td>16.14 Zero voltage relay (K4)</td>
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<td>16.15 Lifting hook</td>
<td>UEMZ 1010</td>
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<td>UEMC 50 H5 and L5 models</td>
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<td>16.16 Ice protection for doorknob and padlock</td>
<td>UEMZ 1144</td>
<td></td>
<td>All models</td>
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</tbody>
</table>
16.1 Extra auxiliary contacts

Type: UEZS_

Extra auxiliary contacts can not be wired to terminal blocks. Each contact is 3-way, and the user can choose the contact function for example NC or NO.
See circuit diagram no 31 UEMC 129.

NOTE! All models already have 1NC + 1NO contacts as standard. Refer to table of models, point 17.

Charger can not be fitted in models UEMC 50 H1_ and L1_ when using extra auxiliary contacts.

16.2 Batteries

The batteries are hermetically sealed, with suspension electrolytes, maintenance-free and usable in any position.

Manufacturer: YUASA BATTERY GMBH
Manufacturers type: NPL 24-12 (long life type)
NPL 38-12 (long life type)
NP 17-12

When ordering batteries from ABB, please use the type designations mentioned in points a...e.

The expected life of batteries depends on ambient temperature:

![Graph showing the relationship between temperature and battery life](image)

Designed life for NPL batteries (information by YUASA Battery Gmbh).

The battery voltage chosen is to be 24 V, otherwise if the lower voltage of 12 V is chosen the electrical components reliability is reduced.

The battery capacity is dependent on what type of radio and remote control system is to be supplied, and how long the station is to operate after battery charging voltage is removed.

Without other loading a 24 V-17 Ah battery can be used to operate a motor operating device open-closed 800 times without needing recharging.

a. NPL batteries for 24V

Type: UEZGL 24Ah-24V
Includes: 2 pcs NPL batteries connected in series and fixing components
Suitable for: All models except UEMC 50 H1- and UEMC 50 L1-

Type: UEZGL 38Ah-24V
Includes: 2 pcs NPL batteries connected in series and fixing components
Suitable for: UEMC 50 H2_, UEMC 50 L2_, UEMC 50 H3_ and UEMC 50 L3_

b. NPL batteries for 12V

Types: UEZGL 24Ah-12V
UEZGL 38Ah-12V
Includes: One NPL battery connected and fixing components
Suitable for: All models except UEMC 50 H1- and UEMC 50 L1-

c. NP batteries for 24V

Type: UEZGP 17Ah-24V
Includes: 2 pcs. NP batteries connected in series and fixing components
Suitable for: All models

d. NP batteries for 12V

Type: UEZGP 17Ah-12V
Includes: One NP battery connected and fixing components
Suitable for: All models

e. Spare part batteries

NOTE! The types do not include fixing components and cables.

Type: -YUA NP17-12
Dimensions: 181 x 76 x 167 mm (length, width, height)
Weight: 5.6 kg/pc

Type: -YUA NPL24-12
Dimensions: 166 x 175 x 125 mm (length, width, height)
Weight: 9 kg/pc

Type: -YUA NPL38-12
Dimensions: 197 x 165 x 170 mm (length, width, height)
Weight: 13.8 kg/pc

16.3 Charger

Types: UEZGC_
Includes: 1 pc charger and fixing components
16.4 Heater switch (S7)

Type: UEMZ 199

- label text

HEATING

- circuit diagram no. 31 UEMC 130

Suitable for: all models

16.5 Charging and heating switch (S8)

Type: UEMZ 200

- label text

CHARGING AND HEATING

- circuit diagram no. 31 UEMC 130

Suitable for: all models

16.6 Heater 20 W, 110 V

Type: UEZR 1-110 V

Power: 20 W
Voltage: 110 V
Suitable for: all models

16.7 Voltage free alarm circuit

Type: UEMZ 247

Circuit diagram no. 31 UEMC 130
Suitable for: UEMC50_/1
UEMC 50_/2 *)

*) Alarm circuit from S6 omitted.

Refer to detailed description of operating devices normal alarm circuit, point 15.

16.8 Interlocking coil

Type: UEZY 2/U

Circuit diagram no. 31 UEMC 138
Suitable for: all models except for small enclosure (UEMC 50 H1 and UEMC 50 L1) equipped with batteries.
16.9 Thermostat
Type: UEMZ 318
Recommended setting value: +20 °C...+25 °C
Circuit diagram no. 31 UEMC 138
Function: The thermostat disconnects the heater if the temperature rises above the set value. See also chapter 12.
Suitable for: all models

16.10 M.c.b for charging and heater circuits
Type: UEMZ 319
Circuit diagram no. 31 UEMC 138
Rated current: 2 A
Suitable for: all models

16.11 M.c.b. for heater
Type: UEMZ 376
Rated current: 2 A
Circuit diagram no. 31 UEMC 138
Suitable for: all models

16.12 Separate alarm circuits
Type: UEMZ 450
Function: The circuit open when the alarm function
Circuit diagram no. 31 UEMC 138
Suitable for: all models *)

*) Alarm circuits only from components according to order.

Refer to detailed description of normal alarm circuit, point 15.1.

16.13 Counter
Type: UEMZ 444
Function: Mechanical
Suitable for: all models

16.14 Zero-voltage relay (K4)
Type: UEZK 2/U
Circuit diagram no. 31 UEMC 166
Suitable for: UEMC 50_ UU/1
Function: The zero-voltage relay interrupts the contactor holding voltage when the motor voltage is broken. This prevents the motor operating device from responding to an earlier operating impulse and from automatically starting the motor when the voltage returns. The power required by the zero-voltage relay is 3 W continuous. Refer to point 15.3
NOTE! The zero-relay is required only for separate motor and control circuits, for types UEMC 50_ UU/1.

16.15 Lifting hook
Type: UEMZ 1010
Suitable for: UEMC 50 H5 and L5 models

16.16 Iceprotection foor doorknob and padlock
Type: UEMZ 1144
Suitable for: all models
## 17. Range of models

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Fast Operation</th>
<th>Slow Operation</th>
<th>Endobuse no. 1</th>
<th>Endobuse no. 2</th>
<th>Endobuse no. 3</th>
<th>Limit switches</th>
<th>Heater</th>
<th>Operating contacts</th>
<th>1 NC + 1 NO aux. contacts</th>
<th>M.C.B.</th>
<th>Remote control selector</th>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>-24 VDC/1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>-24 VDC/11</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

*) Type _UU/1 for device with different motor and auxiliary voltages. Voltages to be specified when ordering.

**) For voltage 220...240 VAC
18. Technical data

Weight | Operating time
---|---
UEMC 50 H1: 22 kg | 1,2 s
L1: 22 kg | 3 s
UEMC 50 H2: 31 kg | 1,2 s
L2: 31 kg | 3 s
UEMC 50 H3: 36 kg | 1,2 s
L3: 36 kg | 3 s
UEMC 50 H5: 36 kg | 1,2 s
L5: 36 kg | 3 s

Contactors, power consumption 3 W
Min. operating impulse 0,1 s
Terminals Motor + heater = 10 mm², others = 6 mm²
Aux. contacts S1.2 and S2.2
norm. voltage/current 380 VAC/15 A, 125 VDC/0,5 A, 220 VDC/0,25 A

Motor

<table>
<thead>
<tr>
<th>Nom. voltage</th>
<th>Nom. current</th>
<th>Max. current</th>
<th>M.c.b</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 VDC</td>
<td>18 A</td>
<td>40 A</td>
<td>- STO S271 K10</td>
</tr>
<tr>
<td>24 VDC</td>
<td>12 A</td>
<td>40 A</td>
<td>- STO S271 K8</td>
</tr>
<tr>
<td>48 VDC</td>
<td>6 A</td>
<td>20 A</td>
<td>- STO S272 K4</td>
</tr>
<tr>
<td>60 VDC</td>
<td>5 A</td>
<td>17 A</td>
<td>- STO S272 K4</td>
</tr>
<tr>
<td>110 VDC</td>
<td>2 A</td>
<td>5,5 A</td>
<td>- STO S272 K2</td>
</tr>
<tr>
<td>220 VDC</td>
<td>1 A</td>
<td>3 A</td>
<td>- STO S282 UCK 1</td>
</tr>
<tr>
<td>110 VAC</td>
<td>2 A</td>
<td>6 A</td>
<td>- STO S272 K2</td>
</tr>
<tr>
<td>230 VAC</td>
<td>1 A</td>
<td>3 A</td>
<td>- STO S272 K1</td>
</tr>
</tbody>
</table>

Energy consumption: 0.01 Ah / operation
equivalent to 800 OPEN- CLOSE operations with 24V- 17Ah battery without recharging.
19. Instruction for recycling the product

Contents

19.1 Introduction ..................................................... 23
19.2 The products casing ....................................... 23
19.3 Material of the product ................................. 23
  19.3.1 Material of the main components ......... 24
  19.3.2 Spare parts and accessories ............... 24
19.4 Recycling the product ..................................... 25
  19.4.1 Manual demolition ............................... 25
  19.4.2 Mechanical crushing ............................ 25
  19.4.3 Eventual damaging material and problem waste .............................. 25
  19.4.3.1 Directory over eventual damaging material and problem waste ............... 26
  19.4.4 Possible recycling methods ................. 26

19.1 Introduction

This document includes instructions for recycling the product UEMC 50. The document includes which material that are used in the products and handling instructions when the product is taking out of use. The document is to be used together with the installation- and operating guide.

The environment regulation varies from country to country and develops fast. Due to this it is recommended to contact the local customers and inform them about how to handle when the product is taking out of use.

Together with this document it should be given information to the local customers about returning of the product that is taking out of use.

ABB Oy can give more information.

Information that is in this document is not part of an extract or deal, it supposes to be the most correct and trustful and can be changed without notice. The publisher will not take any responsibility for the consequences.

19.2 The products casing

The product is cased in card, paper and foamplastic. The card and the paper can be recycled normally. The foamplastic can be i.e. used for energy production in a facility build for this purpose.

To avoid pollution when making unnecessary transports the manufacturer will not accept used package. Recycling has to be arranged locally according to local instructions.

Recycling is recommended when it saves rawmaterial and reduces the waste.

19.3 Material of the product

Information about the construction, main parts and their material can be found in the installation- and operating guide, point 4. Construction on page 5.
19.3.1 Material of the main parts

**Power transfer mechanism**

<table>
<thead>
<tr>
<th>Parts</th>
<th>Material</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame, screw and axle</td>
<td>Stainless steel</td>
<td>3.9 kg</td>
</tr>
<tr>
<td>Nut and gear wheel</td>
<td>Bronze</td>
<td>0.5 kg</td>
</tr>
<tr>
<td>Operating lever</td>
<td>Aluminium (Al-Si)</td>
<td>2.3 kg</td>
</tr>
</tbody>
</table>

**Motor**
The materials depend on the type of the motor. Usually it consists of iron, copper, sink and aluminium.

**Relay unit**
Material: Stainless steel
Weight: 1.0 kg

**Control lever and tube fixing elements**

<table>
<thead>
<tr>
<th>Parts</th>
<th>Material</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating lever</td>
<td>Stainless steel</td>
<td>0.7 kg</td>
</tr>
<tr>
<td>Tube fixing element</td>
<td>Hotgalvanized steel</td>
<td>0.7 kg</td>
</tr>
<tr>
<td>Pin and bolt</td>
<td>Stainless steel</td>
<td></td>
</tr>
</tbody>
</table>

**Pole fixing elements**
Material: Hotgalvanized steel
Weight: 3.5 – 6.5 kg (depending on the model)

**Box**
Material: Stainless steel AlSi 304
Weight: 8.3 – 19.2 kg (depending on the model)

19.3.2 Spare parts and accessories

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Material</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Contactor</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Micro switch</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Diode</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Heating resistor</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rectifier</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Auxiliary contacts</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Batteries</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>*)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Charger</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>M.c.b.</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Interlocking magnet</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Thermostat</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Counter</td>
<td>Several</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>0 voltage relay</td>
<td>Several</td>
<td></td>
</tr>
</tbody>
</table>

*) More information under point 19.4.3.
The weight for the really light parts are not printed, the operating device also contains screws, nuts, washes and rivets of steel and also some parts that are not important when recycling.

70 – 90% of the weight of the product are big metal parts, which are easy to recycle (3.1 metal parts). The motor is 7 – 11% of the weight and it is also easy to recycle.

19.4 Recycling the product

To deal with junk requires in most countries permission and you have to get permission for your own company. Information about local junkyards can be obtained from the agency of environment.

A product that is not in use anymore can be taking care of in two alternatively ways. The product can be manually demolished or be crushed mechanically.

Before the process all parts that are containing problem waste have to be removed and send to a facility made for this purpose.

Information about the facilities can be obtained from the local agency of environment.

19.4.1 Manual demolition

The product can be demolished manually and the parts are sorted depending of what material they are containing according this table:

- stainless steel*
- steel*
- bronze*
- aluminium*
- plastic
- cablejunk
- electronics*
- other

The metal parts are easy to recycle the others according to locally arrangements. No especially tools are needed for the demolition.

*) More information, see 19.4.3.1 Directory over eventual damaging material and problem waste.

19.4.2 Mechanical crushing

In this process the whole product will be crushed to small metal pieces and will be sorted automatically. Components containing dangerous material must be removed before the crushing (for more information see 19.4.3.1 Directory over eventual damaging material and problem waste).

19.4.3 Eventual damaging material and problem waste

Definition and regulation for damaging material varies from country to country and changes all the time. Materials used in the manufacturing are typical for electrically- and electronically products. Some are classed as problem waste, if they can be found in ministry of environments waste- and problem waste catalogue. It is based on the EU regulations. The directory over different parts material content is based on EACEM (European Association of Consumer Electronics Manufacturers) directory and problem waste catalogue. In the note column it is marked if the part is problem waste.
19.4.3.1 Directory over eventual damaging material and problem waste

<table>
<thead>
<tr>
<th>Part</th>
<th>Damaging material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery</td>
<td>Lead</td>
<td>Problem waste</td>
</tr>
<tr>
<td>Circuitboard (i.e. in the charger)</td>
<td>Can contain Lead TBBA</td>
<td></td>
</tr>
<tr>
<td>Plastic</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Steel</td>
<td>Grease *)</td>
<td>Problem waste</td>
</tr>
<tr>
<td>Bronze</td>
<td>Grease *)</td>
<td>Problem waste</td>
</tr>
<tr>
<td>Aluminium</td>
<td>Grease *)</td>
<td>Problem waste</td>
</tr>
<tr>
<td>Cables</td>
<td>PVC **)</td>
<td>Problem waste</td>
</tr>
<tr>
<td>Other</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

*) The screw and the gear wheel are greased with grease (Isoflex Topas NCA 52).
**) Does not inhibit granulating in suitable facility

More information about the grease can be ordered from the manufacturer:

Klüber Lubrication München KG
Geisenhauserstrasse 7
D-81379 München
Phone: +49 89 7876-0
Fax: +49 89 7876-333
Internet: [www.klueber.com](http://www.klueber.com)

19.4.4 Possible recycling method

The mentioned way to recycle is one possible method but there are also many other methods:

- stainless steel recycles as material
- steel recycles as material
- bronze recycles as material
- plastic burns for energy production
- cables to cable granulating facility
- electronics to facility specially made for recycling electronics
- other to be burnt or is transported to a dumping ground
20. Dimension drawings

UEMC 50 H1_
UEMC 50 L1_
Dimension drawings

UEMC 50 H3
UEMC 50 L3

*) Free space
  Vapaata tilaa
  Fritt utrymme

Open door
  Ovi auki
  Öppen dörr

38Ah, 2x12V  15Ah, 2x12V
167  78
253 *)  342 *)
Dimension drawings

135 UEMC 36 C

UEMC 50 H5_
UEMC 50 L5_

- Ø 22
- Ø 30
- 1xB

- 30
- 665
- 500
- 20
- 190
- 16
- 25
- 153
- 95
- 95
- 330
- 20
- 620
- min. 230

- R 238
- R 222
- R 206
- R 190
- R 174
- R 155
- R 110

- M12

- 3 x Pg 16 + 1 x Pg 21
- 3 x PK 16 + 1 x PK 21
- 3 x Pr 22.5 + 1 x Pr 28.3
Motor operating device  UEMC 50_ - 24 VDC/1

M1 = Motor
K1, K2 = Operating contactors
S1.1 = Limit switch
S2.1 = Limit switch
S1.2 = Aux. contact NO
S2.2 = Aux. contact NC
S3 = Blocking switch for hand operating and locking
S4, S5 = Push buttons
F1 = M.c.b.
R1 = Heater
S6 = Remote control switch
Motor operating device  UEMC 50_ - 24 VDC/2

M1  = Motor
K1, K2  = Operating contactors
S1.1  = Limit switch
S2.1  = Limit switch
S1.2  = Aux. contact NO
S2.2  = Aux. contact NC
S3  = Blocking switch for hand operating and locking
S4, S5  = Push buttons
F1  = M.c.b.
R1  = Heater
Motor operating device  UEMC 50_ - 24 VDC/3

M1 = Motor
K1, K2 = Operating contactors
S1.1 = Limit switch
S2.1 = Limit switch
S1.2 = Aux. contact NO
S2.2 = Aux. contact NC
S3 = Blocking switch for hand operating and locking
R1 = Heater
Motor operating device  
UEMC 50_ - 24 VDC/4

M1 = Motor  
S1.1 = Limit switch for closed position X1:5-6  
S2.1 = Limit switch for open position X1:10-11  
S3 = Blocking switch for hand operating and locking X1:15-16  
S4, S5 = Push buttons  
R1 = Heater
Motor operating device

UEMC 50 - 48 VDC/1
- 60 VDC/1
- 110 VDC/1
- 125 VDC/1
- 220 VDC/1

M1  = Motor
K1, K2  = Operating contactors
S1.1  = Limit switch
S2.1  = Limit switch
S1.2  = Aux. contact NO
S2.2  = Aux. contact
S3  = Blocking switch for hand operating and locking
S4, S5  = Push buttons
F1  = M.c.b.
R1  = Heater
S6  = Remote control selector
K3  = Relay, only for UEMC 50 L_
Motor operating device UEMC 50_ - 110 VAC/1
- 230 VAC/1

M1 = Motor
K1, K2 = Operating contactors
S1.1 = Limit switch
S2.1 = Limit switch
S1.2 = Aux. contact NO
S2.2 = Aux. contact
S3 = Blocking switch for hand operating and locking
S4, S5 = Push buttons
F1 = M.c.b.
R1 = Heater
S6 = Remote control selector
K3 = Relay, only for UEMC 50 L_
V5 = Rectifier
Motor operating device  UEMC 50_ - UU/1  UU  Voltage to be specified when ordering

M1  =  Motor
K1, K2  =  Operating contactors
S1.1  =  Limit switch
S2.1  =  Limit switch
S1.2  =  Aux. contact NO
S2.2  =  Aux. contact
S3  =  Blocking switch for hand operating and locking
S4, S5  =  Push buttons
R1  =  Heater
F1  =  M.c.b.
S6  =  Remote control selector
K3  =  Relay for UEMC 50 L_, 48-230 V
V5  =  Rectifier only for AC
K4  =  Zero voltage relay, to be ordered separately

only with DC ainoastaan DC:lle
endast vid DC
Motor operating device

- UEPMC 50_ - 24 VDC/11

M1 = Motor
K1, K2 = Operating contactors
S1.1 = Limit switch
S2.1 = Limit switch
S1.2 = Aux. contact NO
S2.2 = Aux. contact
S3 = Blocking switch for hand operating and locking
S4, S5 = Push buttons
F1 = M.c.b. for motor
R1 = Heater
S6 = Remote control selector
F6 = M.c.b. for remote control
F7 = M.c.b. for power supply
Function of aux. contacts
Apukoskettimien toiminta
Hjälpkont. funktion

- Disconnecter
- Erotin
- Frånskilajre
- NO
- NC
- C
- D

Cont. open
Kosk. auki
Kont. öppen

Cont. closed
Kosk. kiinni
Kont. sluten

Nom. voltage 500 V
Nom. current 16 A
Breaking capacity (L/R = 40 ms)

- 24 VDC = 16 A
- 48 VDC = 10 A
- 60 VDC = 10 A
- 110 VDC = 5 A
- 220 VDC = 2 A
- 230 VAC = 16 A
Circuit diagram

1. (L1) +
   X1:20 G1 F10
   G2 (R1)
   X1:21 G3
   (N) X1:2

2. (L1) (N)
   X1:20 21 S8
   12 22
   13 23
   24 14

Type, see points 16.2 and 16.3
Laji, katso kohdat 16.2 ja 16.3
Typ, se punkterna 16.2 och 16.3

3. X1:13
   11 21
   12 22
   13
   14

4. (L1) (N)
   X1:20 21 S7
   13 23
   14 24
   (R1)

G1 = Charger
G2, G3 = Batteries
R1 = Heater
S3 = Blocking switch for hand operating and locking
S6 = Remote control selector switch
S7 = Heating switch
S8 = Charging and heater switch
F1 = M.c.b.
F10 = Fuse
Circuit diagram

F2 = M.c.b.
Automaattivaroke
Automatsäkring

T1 = Thermostat
Termostaatti
Termostat

Y1 = Interlocking coil
Lukitusmagneetti
Förreglingsmagnet

S9 = Aux. contact
Apukosketin
Hjälpkontakt

Separate alarm circuits
Erillisä hälytyspiiriä
Separata alarmkretsar

F1 = M.c.b. for motor
F2 = M.c.b. for heater
R1 = Heater
S6 = Remote control selector sw.
S3 = Blocking switch for hand
      operating and locking
G1 = Charger
Circuit diagram 31 UEMC 217 A

DTU 115

REC 501 Remote Monitoring and Control Unit

UEMC 50_ Motor operating device 31 UEMC 311

REC 501    Remote Monitoring and Control Unit

UEMC 50_    Motor operating device
Information given in this publication is generally applicable to equipment described. Changes may be made in future without notice.