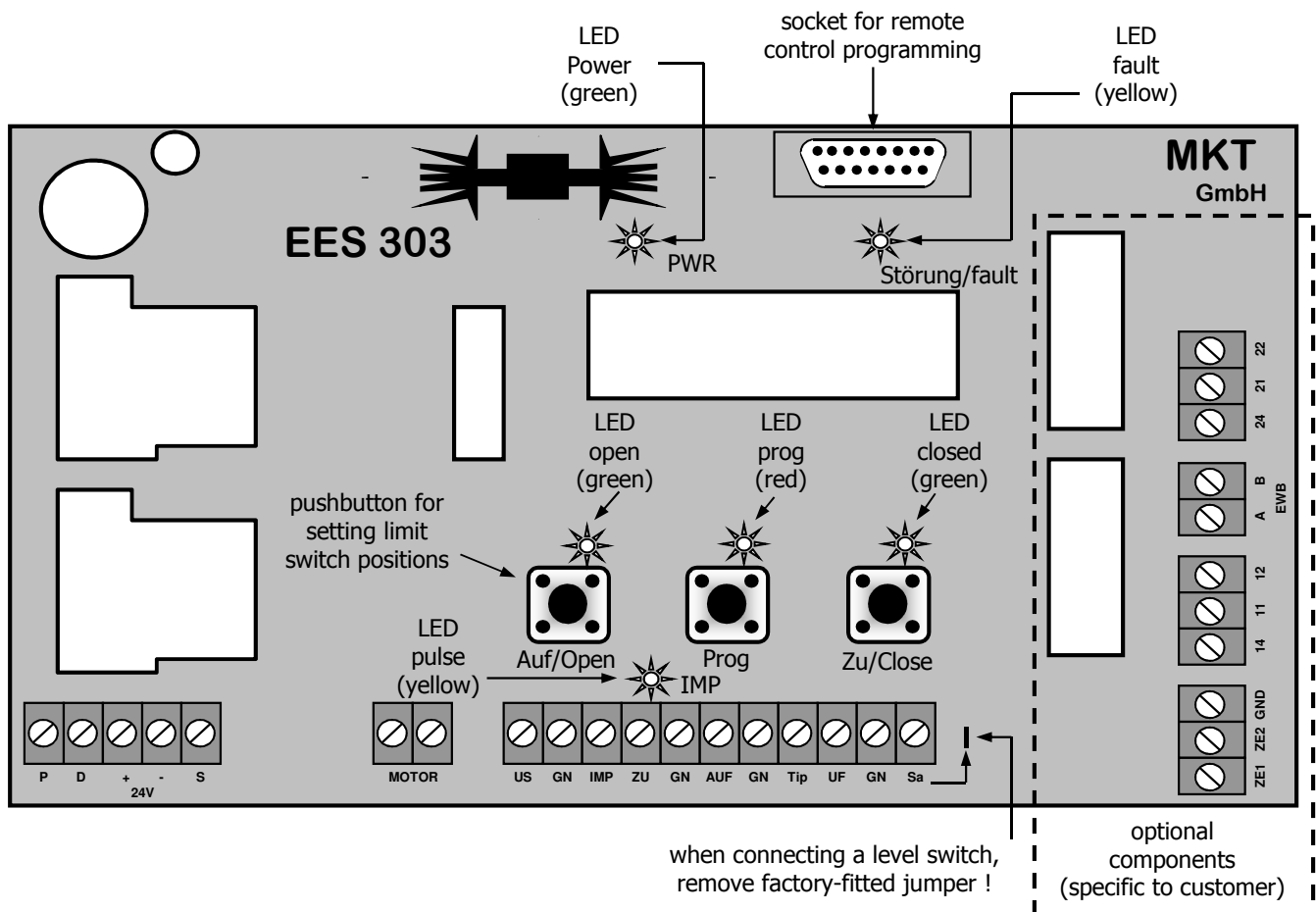


Electronic Drive Control EES 303

Introduction

This control board is a processor-controlled 24V DC reversing contactor for actuating MKT - xxExx series drives. It operates without mechanical limit switches in the motor. The limit positions are detected by a pulse signal from the motor. This makes it possible to adjust the limit positions without performing any action on the motor. They are programmed either directly on the control board or by means of an optional remote control unit. All settings are saved and remain intact even in the event of power failure. In addition, the motor signal is monitored.

Overview



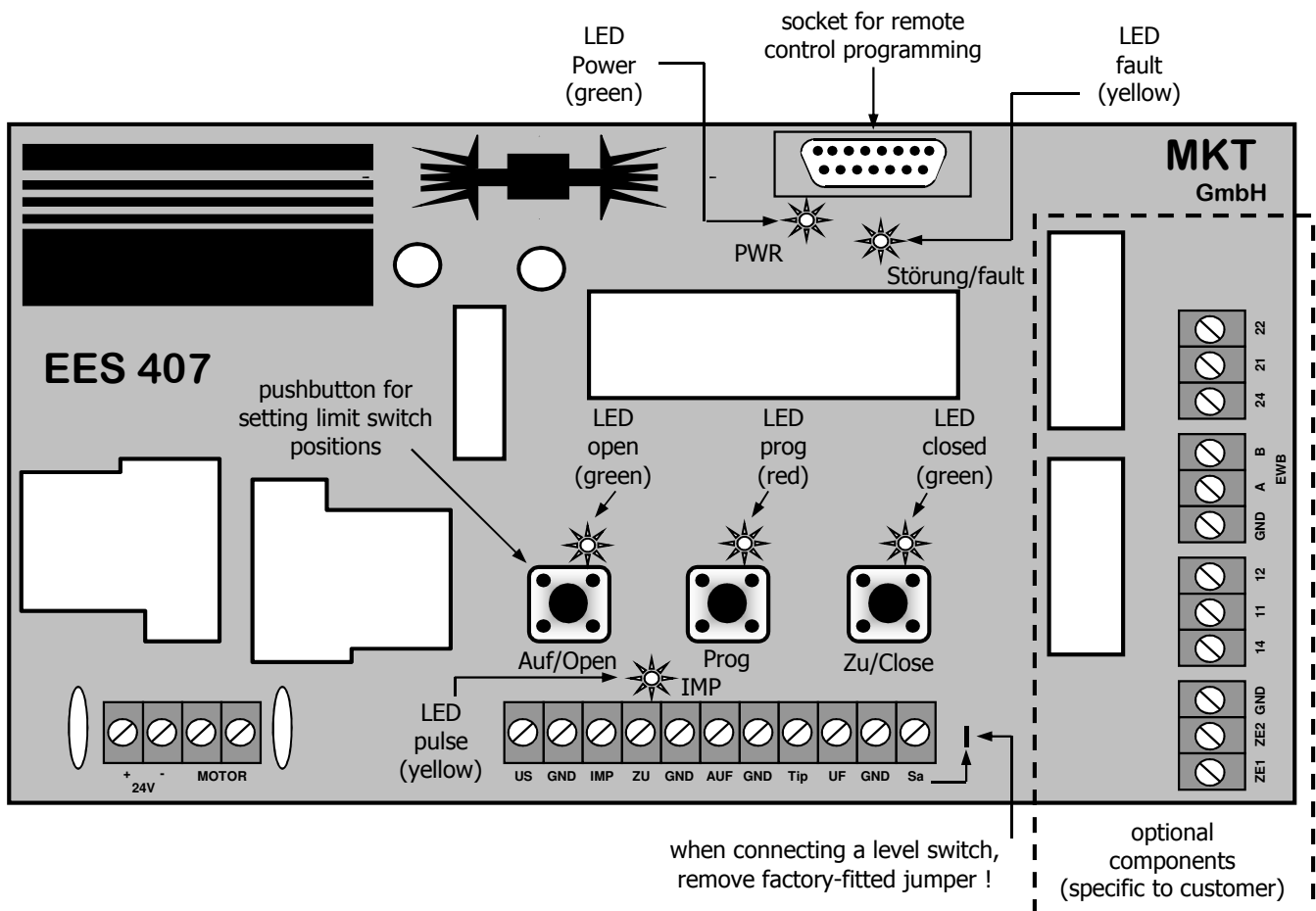
- Terminals P, D and S are pre-assigned or jumpered before leaving the factory. If they are unassigned, terminals D and S must be connected.
- The 24V +/- terminals are factory-connected to the 24V terminals of the transformer.

Electronic Drive Control EES 407

Introduction

This control board is a processor-controlled 24V DC reversing contactor for actuating MKT - xxExx series drives. It operates without mechanical limit switches in the motor. The limit positions are detected by a pulse signal from the motor. This makes it possible to adjust the limit positions without performing any action on the motor. They are programmed either directly on the control board or by means of an optional remote control unit. All settings are saved and remain intact even in the event of power failure. In addition, the motor signal is monitored. Through the drive control of the 407 series it is possible to let the motor start gently. This causes a whistling noise when starting the motor.

Overview



- The 24V +/- terminals are factory-connected to the 24V terminals of the transformer.

Electronic Drive Control EES 303 / EES 407

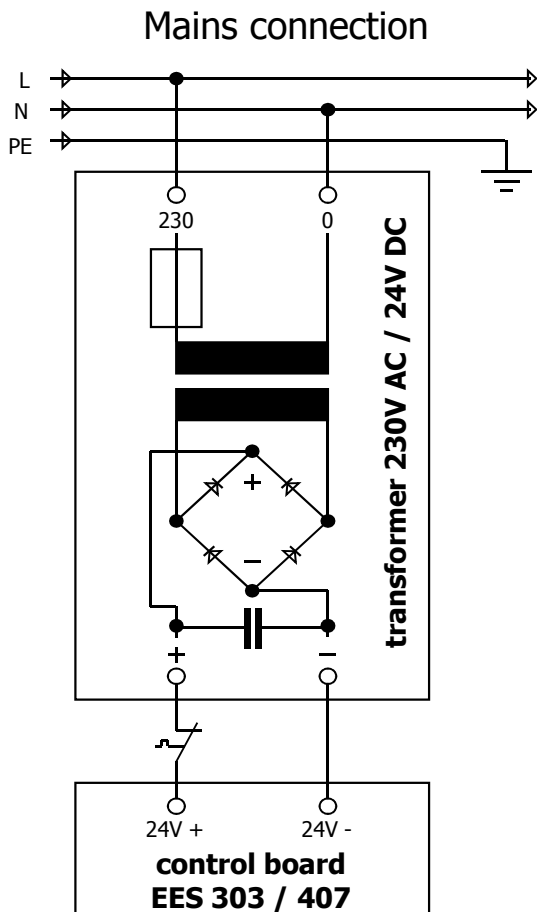
Installation instructions

- Make sure the power supply is disconnected before performing any work.
 - VDE (Association of German Electrotechnical Engineers) regulations must be observed.
 - The control board must be installed at a site that is protected from moisture.
 - All lead shields must be brought into contact with the PE conductor.
 - Terminal wiring must be inspected before start-up.
- Any errors may irreparably damage the control board and/or motor.

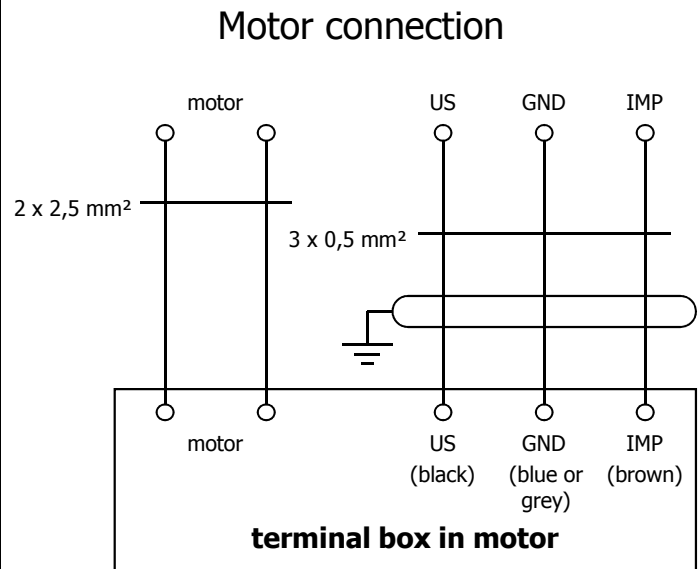


Observe polarity of the capacitor! (EES 407 only)

Connection and terminal assignment



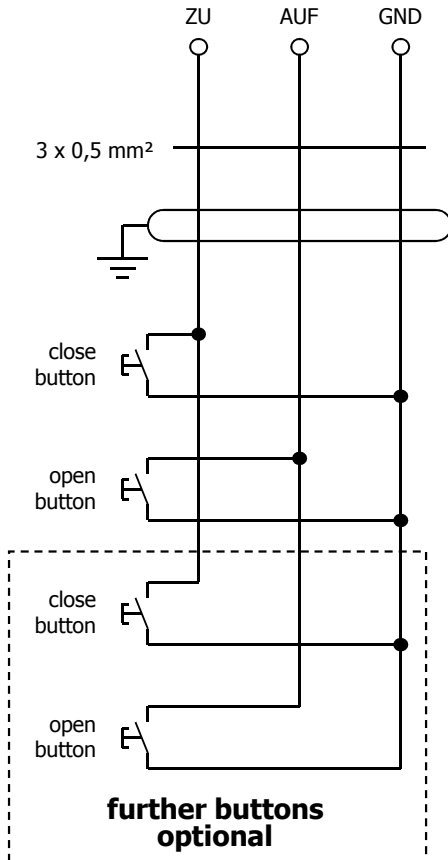
- The mains voltage must be applied to terminals 0 and 230 on the transformer.
- The transformer is protected by a fine-wire fuse on the primary side.
- The motor is protected from overload by a motor circuit-breaker. It is connected between transformer and printed circuit board.
- The capacitor must be connected to terminals + / - 24V on the transformer. (EES 407 only)



- The motor must be connected to the MOTOR terminals.
- The lead should have a cross section of at least 2.5 mm². This must be increased to 4.0 mm² for lead lengths of approx. 20 m and over, and to 6.0 mm² for lead lengths of approx. 50 m and over.
- The pulse generator integrated in the motor must be connected to terminals US, GND and IMP.
- If the motor does not turn in the direction shown on the control board labelling, the MOTOR terminals must be transposed.

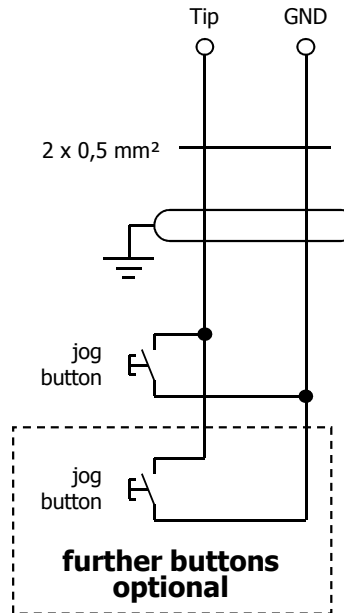
Electronic Drive Control EES 303 / EES 407

Connecting open & close buttons



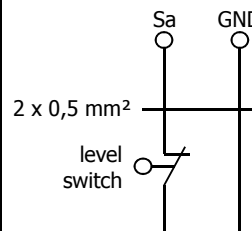
- To operate the system it is possible to use separate open and close buttons or one open/close button.
- The potential connected is GND.
- Latching switches are not suitable as they do not provide the stop function.
- Several buttons may be connected in parallel.

Connecting a jog button



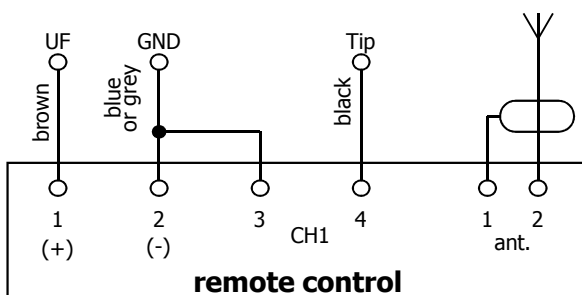
- A sequence control button may be connected to terminals Tip and GND: when actuated, it switches alternately in the sequence open - stop - closed etc. If the system is already at one of the limit positions, it will be moved in the other direction when this switch is operated.
- Several buttons may be connected in parallel.

Connecting a level switch



- A level switch may be connected to terminals Sa and GND. It must open in the event of a fault.
- When using this function, the float switch jumper next to terminal Sa must be opened.
- The input has a delay of several seconds so as to prevent it from responding to normal movement at the water surface. It is therefore not possible to use the Sa input for any stop function.

Connecting a wireless remote control unit



- A remote control unit is available as an accessory. If used, this must be connected to terminals UF, GND and Tip as shown on the left. (When ordering in conjunction with the control board, the remote control comes ready connected)
- Depending on where the control board is positioned, the flexible antenna must be routed out of the housing or replaced with a rod antenna.

Electronic Drive Control EES 303 / EES 407

Starting up and programming the limit positions

- Clear any programmed limit positions:
 1. Press Prog button and hold down.
 2. Additionally press and hold down open (Auf) and close (Zu) buttons.
 3. Keep all three buttons pressed for approx. 5 seconds until Prog LED flashes.
 4. Limit positions are now cleared.

No limit positions are programmed when the control board leaves the factory.

- Function of LEDs in programming mode:

Prog LED lights up	- programming mode initiated
Auf/Open LED lights up	- open (Auf) limit position not yet programmed
Zu/Close LED lights up	- closed (Zu) limit position not yet programmed

- Programming limit positions:

In the programming mode (Prog LED constantly lit) the system can only be operated in dead man's mode (drive only runs while button is pressed).
It does not matter which limit position you program first.
Positions can either be selected using the buttons on the printed circuit board or by means of buttons connected externally (apart from jog).
Once one of the limit positions has been programmed, the associated LED will go out to signalise that the position has been saved.
After one of the limit positions has been saved it is not longer possible to move beyond it!
Once both limit positions have been saved, the control board will automatically switch to normal mode (Prog LED goes out).

First check whether the motor turns in the direction shown in the button labelling on the control board (open/Auf and close/Zu). If it doesn't, you must transpose the leads at the MOTOR terminals. If limit positions were set before you transpose the leads, you must now set them again.

Programming the open (AUF) limit position:

1. Using open (Auf) and close (Zu) buttons or external button, move system to chosen position.
2. Press and hold down the Prog button.
3. Additionally press the open (Auf) button to program the open limit position.
4. Release the buttons.



Attention: if there is a catch device for the shutter, observe its cord length and do not overrun maximum end point !

Programming the closed (ZU) limit position:

1. Using open (Auf) and close (Zu) buttons or external button, move system to chosen position.
2. Press and hold down the Prog button.
3. Additionally press the close (Zu) button to program the open limit position.
4. Release the buttons.

- Correcting a limit position:

If you wish to correct either of the limit positions without clearing the other, proceed as follows:

1. Move system to position you wish to change.
2. Press and hold down Prog button.
3. Additionally press open (Auf) and close (Zu) buttons and hold down for approx. 1 second.
4. Prog LED lights up to signalise programming mode. Open and closed LEDs do not light up.
5. Using the open (Auf) and close (Zu) buttons or external button, move system to the new position.
6. Press and hold down Prog button to save the position setting. Now additionally press the open (Auf) button if you wish to correct the open limit position, or press the close (Zu) button if you wish to correct the closed limit position.
7. Prog LED goes out, control board switches to normal mode.

Electronic Drive Control EES 303 / EES 407

Normal mode

Once the limit positions have been programmed, the control board will automatically switch to normal mode. The system will move in the chosen direction by pressing either the open (Auf), close (Zu) or jog (Tip) buttons. The jog button changes its function in relation to the current position and direction of the last movement.

The drive shuts down as soon as the system reaches one of the limit positions.

By pressing either the open, close or jog button, the system can be stopped while it is in motion.

- Function of LEDs in normal mode (Prog LED does not light up):

Auf/Open LED lights up	- system is in open position
Auf/Open LED flashes	- system opening
Zu/Closed LED lights up	- system is in closed position
Zu/Closed LED flashes	- system closing
Störung/Fault LED flashes slowly	- any wind detector connected has responded

Fault

A fault is signalled by the fault LED (Störung) lighting up or flashing.

If the system ceases to operate, check the following points:

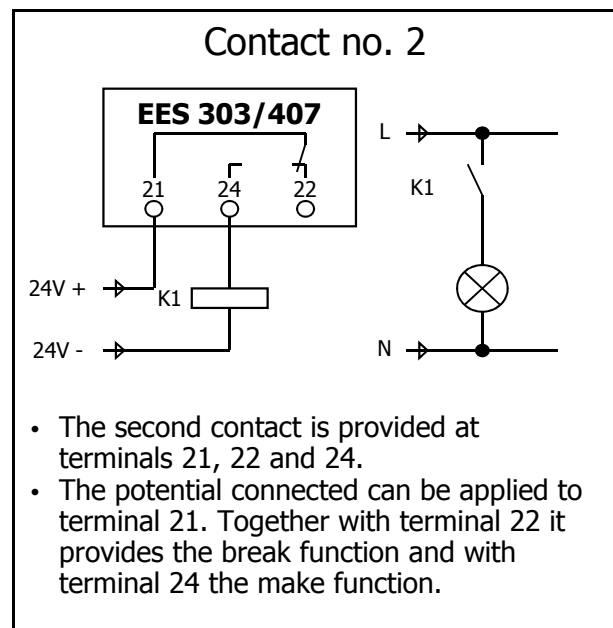
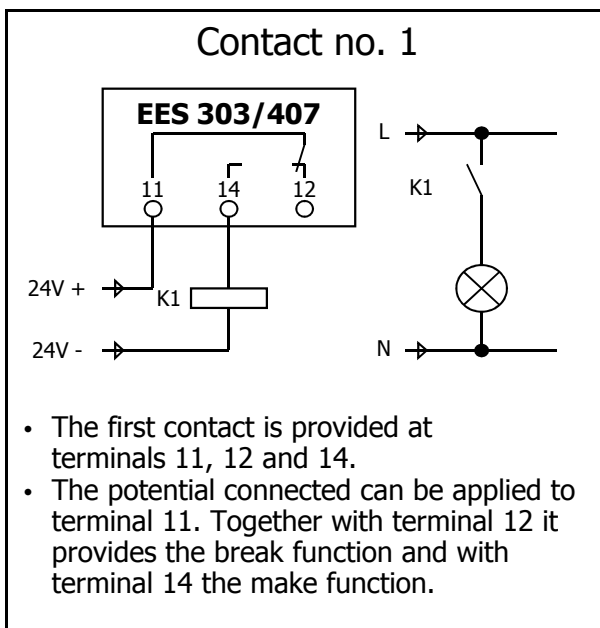
Power LED illuminated ?	<p>If it isn't, no power is being supplied. Possible causes:</p> <ol style="list-style-type: none"> 1. Mains power has been disconnected in fuse box. 2. Motor circuit-breaker (at side of housing) has responded. It can be reset by pressing. 3. The fine-wire fuse in the transformer (230V terminal) has blown.
Fault/ Störung LED flashing rapidly, open/Auf LED illuminated	<p>No pulse signal has been received from motor. Possible causes:</p> <ol style="list-style-type: none"> 1. Motor will not start (jammed or lead damaged?). 2. Pulse/Impuls LED must flash while motor is running. If it doesn't, the pulse generator in the motor (terminals US, GND and IMP) is not connected, not connected properly or faulty.
Fault/ Störung LED flashing rapidly, closed/Zu LED illuminated	<p>The input for the level switch (Sa) has been tripped. Possible causes:</p> <ol style="list-style-type: none"> 1. Any level switch connected has responded. 2. The factory-fitted jumper has been damaged.
Fault/ Störung LED illuminated	<p>The extension bus is malfunctioning. Possible causes:</p> <ol style="list-style-type: none"> 1. Terminals EWB A/B between the control systems not connected properly. 2. Lead damaged between terminals EWB A/B of both control systems.
Fault/ Störung LED flashing slowly	<p>Any wind detector has responded.</p>

Electronic Drive Control EES 303 / EES 407

Optional components

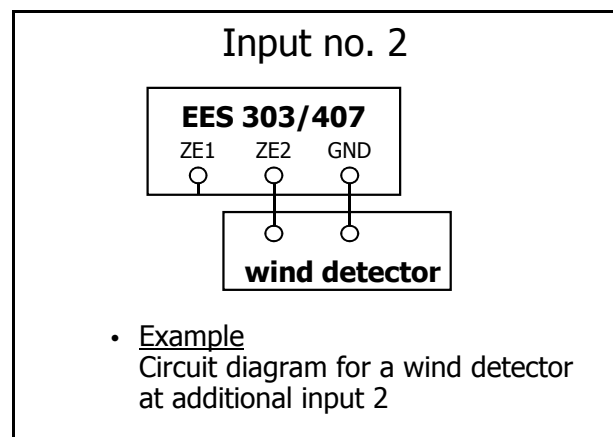
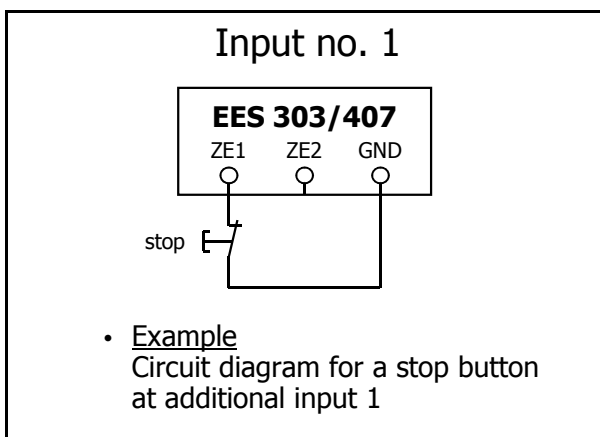
- Additional switching outputs**

Depending on customer specifications, the control board can be equipped with one or two floating switch contacts. The contacts are configured as changeover contacts. The contact output states are shown on the enclosed sheet. Depending on the configuration you require, it is possible, for example, to operate the underwater lighting in relation to the cover position (see example for contact no. 1).



- Additional inputs**

Depending on customer specifications, the control board can be equipped with two additional inputs. The function of the inputs is shown on the enclosed sheet. The potential connected for the inputs is GND.



Electronic Drive Control EES 303 / EES 407

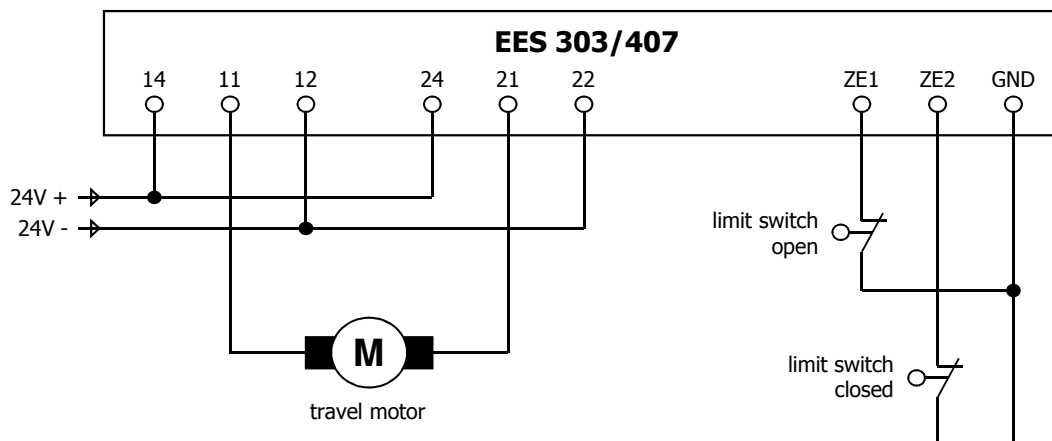
Circuit diagram for drive Quadro mobile

The surface-level "Quadro mobile" drive type (type running on rails to pool edge) is equipped with an additional drive. In conjunction with two limit switches, it has the purpose of moving the cover reel along the track.

The drive for the slatted cover is ready connected on leaving the factory (see ► [Motor connection](#)).

The travel drive as well as the limit switches also come ready connected (as shown in the diagram below).

The switches can be connected as described in ► [Connecting open and close buttons](#) and ► [Connecting a jog button / wireless remote control unit](#).



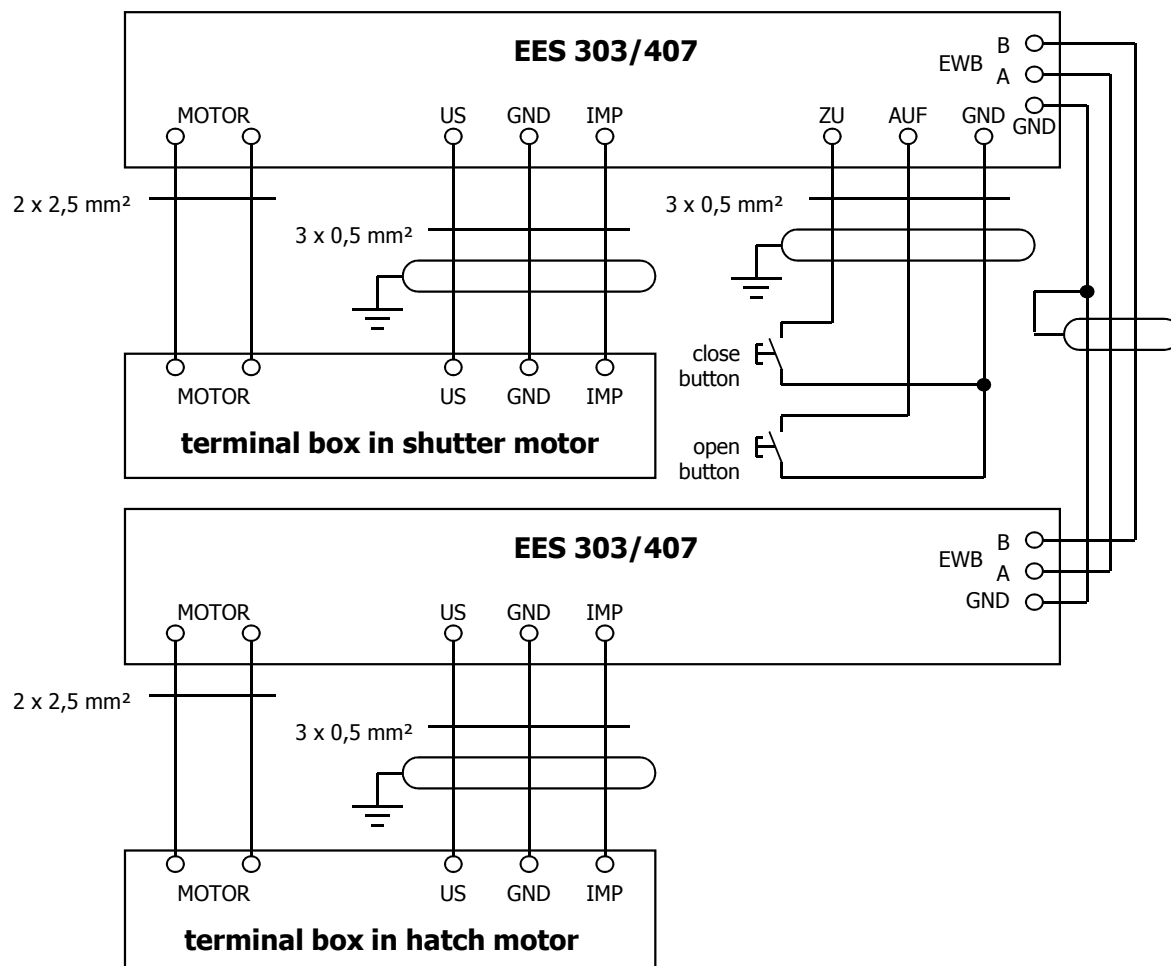
- The voltage supply (24V +/-) is taken from the transformer.

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Circuit diagram for drive Type AUK with automatic shaft cover

With the "AUK" submerged drive type installed in a shaft below the pool floor behind a hatch that opens automatically, two control boards are integrated in the transformer housing. One of the control boards is for the the slatted cover drive, the other for operating the hatch. Each of the control boards must be connected to the relevant drive as shown in ► [Motor connection](#). The switches for operating the system must be connected to the roller shutter drive control system as described in ► [Connecting open and close buttons](#) and ► [Connecting a jog button / wireless remote control unit](#). The terminals on the control board for the hatch drive are without any function.

Example: Connecting open (Auf) and close (Zu) buttons



- In addition, the control boards must be interconnected using terminals **EWB A** and **EWB B** (see ► [Programming the limit positions for system with automatic shaft cover](#)).
- The hatch drive must open on pressing the open (Auf) button. If it doesn't, you must transpose the MOTOR terminal leads.

Electronic Drive Control EES 303 / EES 407

Programming the limit positions for system with automatic shaft cover

Before applying the supply voltage, interrupt the connection between the control boards on the extension bus (terminal EWB A and EWB B) (remove at least one of the leads).

Now you can apply the supply voltage. Both control boards will now work fully independently and can be adjusted as described in ► Starting up and programming the limit positions. The motors must turn in the direction indicated by the button labelling on the control boards.

If it doesn't, the leads must be transposed at the MOTOR terminals on the relevant control boards.

Once the limit positions have been programmed for one control board, it can be operated independently, allowing you to check or correct the limit positions.

Therefore, make sure that the hatch is not closed while the slatted cover is not completely rolled up.

- Example:
1. Open hatch
 2. Save hatch open limit position (Auf)
 3. Save slatted cover limit positions
 4. If necessary, check limit positions of slatted cover by opening and closing it
 5. Open slatted cover
 6. Close hatch
 7. Save closed hatch limit position (Zu)
 8. If necessary, check limit positions of hatch by opening and closing it

Once the limit positions have been saved and, if necessary, checked, the control boards must be connected on the extension bus (terminals EWB A and EWB B). As soon as the bus starts to work the Prog LED will flash by way of acknowledgement.

Once the control board have been connected, a fault will be triggered as soon as they are disconnected again.

The controls are logically connected through the extension bus. The system is operated by means of the control buttons for the slatted cover. Pressing the close (Zu) button will first open the hatch and then close the slatted cover. Pressing the open (Auf) button will first open the slatted cover and close the hatch. Operation is also possible using the jog button. The system can be stopped in any state by pressing any button.

- Function of LEDs in hatch mode:

Prog LED flashes	- extension bus operating
Auf/Open LED lights up	- slatted cover / hatch is in open (Auf) position
Auf/Open LED flashes	- slatted cover / hatch opening
Zu/Closed LED lights up	- slatted cover / hatch is in closed (Zu) position
Zu/Closed LED flashes	- slatted cover / hatch closing

If you wish to clear or correct the limit positions after connecting the control boards, you must first interrupt the extension bus (terminals EWB A and EWB B).

Now you must disconnect the supply voltage and re-connect it after approx. 10 seconds.

Both control boards can now be operated independently of each other again. Clearing or correcting the limit positions may be carried out as described in ► Starting up and programming the limit positions.

After saving the new limit positions, you must re-connect the extension bus after which normal operation may be resumed.

Electronic Drive Control EES 303 / EES 407

Technical specifications

Operating temperature	0 - 50° C
<u>Primary</u>	
Rated voltage	220 - 240 V AC / 50 Hz
Rated current	max. 3,2 A
Rated power	max. 750 VA
<u>Secondary</u>	
Rated voltage	24 V DC
Rated current	10 A / 16 A (see motor circuit-breaker)
Control voltage	5 V DC / 200 mA max.
Supply voltage (wireless)	24 V DC / 300 mA max.
Terminal tightening torque	0,5 - 0,6 Nm
Capacitor	10.000 µF / 63 V DC (EES 407 only)