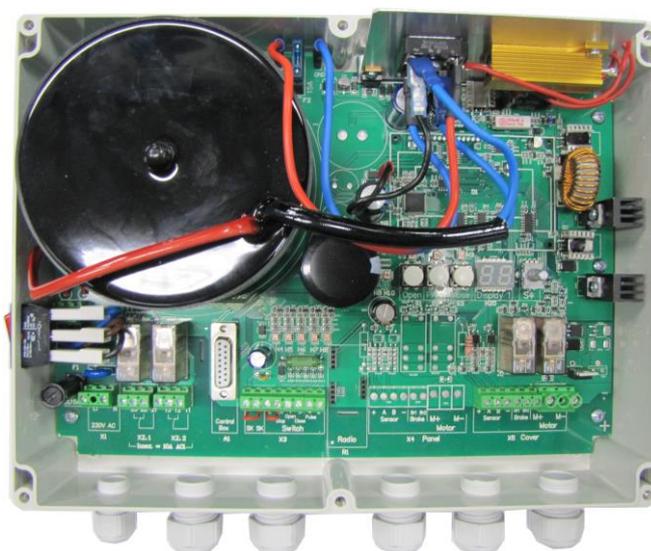


USERS MANUAL

Motor in REEL SYSTEM “ROM Typ. GRA”
with control board Typ.: ECB-1
24V/DC/250 Nm

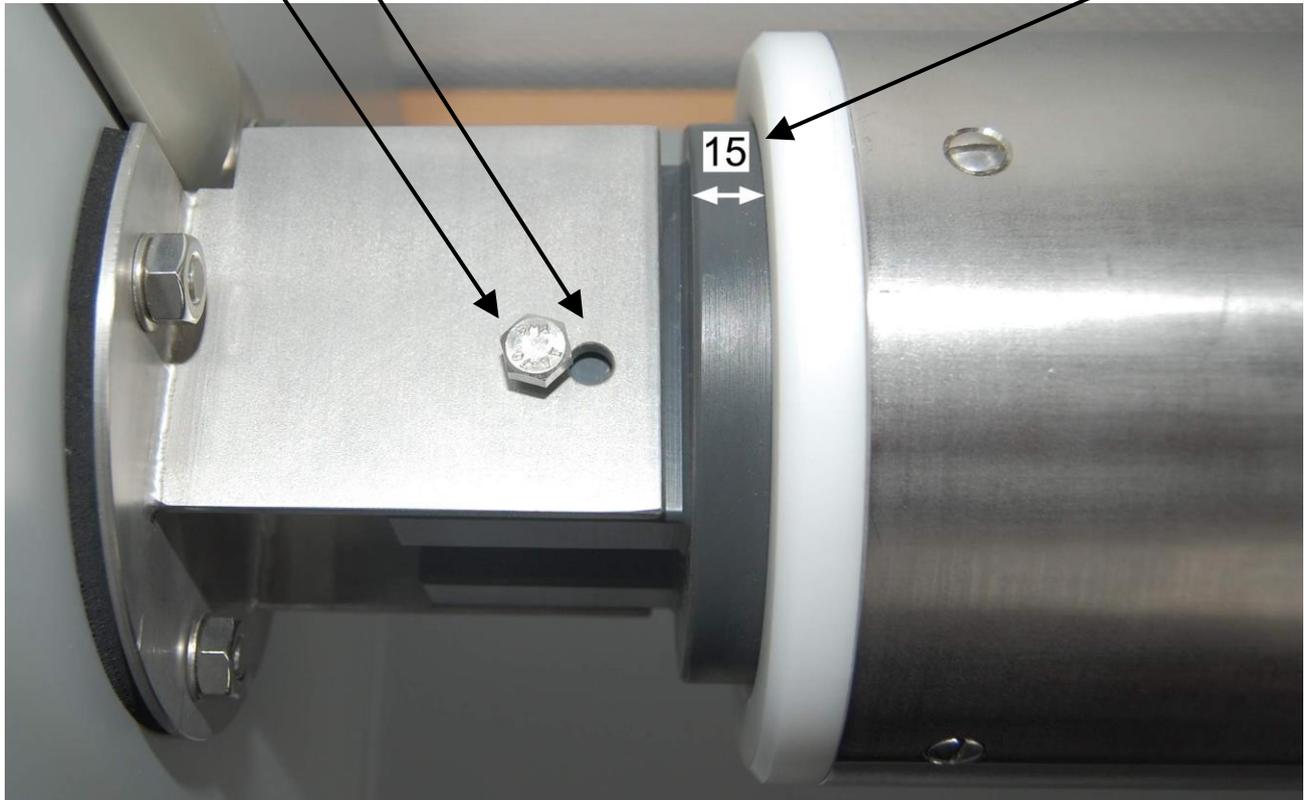


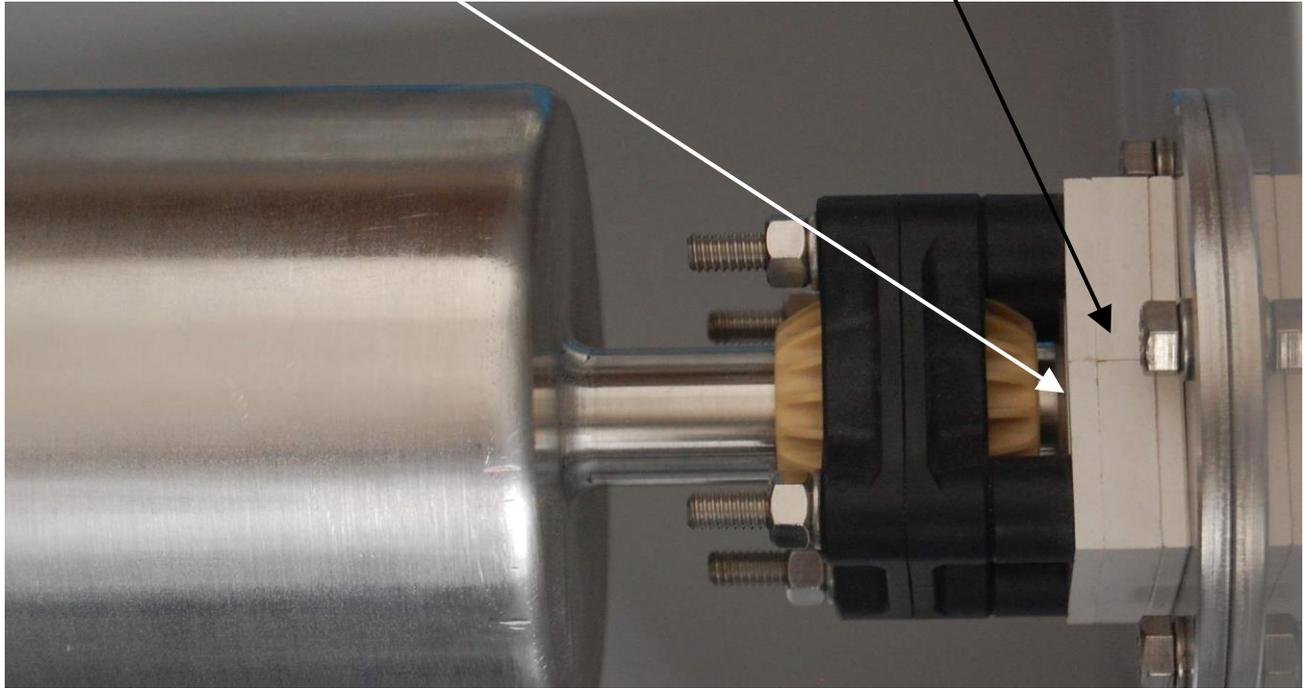
Version 05/2017

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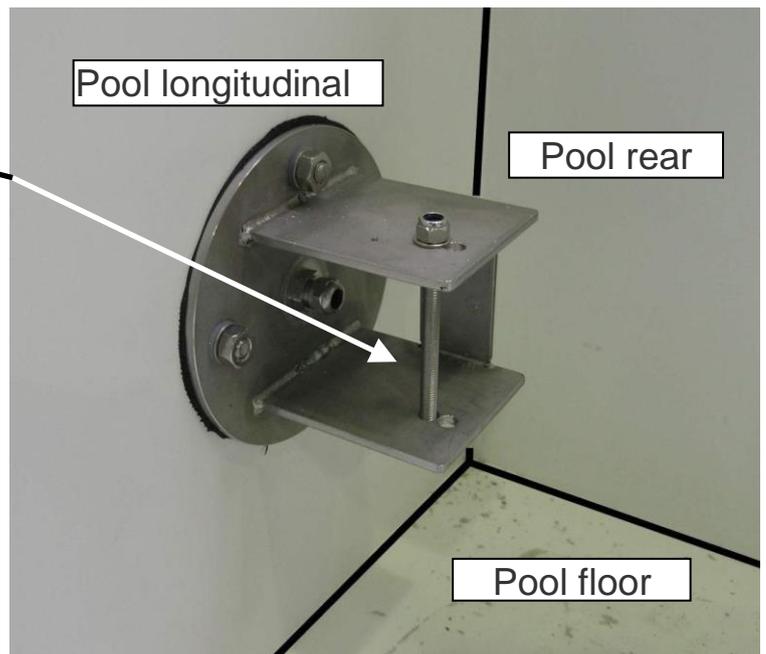
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1. Mounting Views

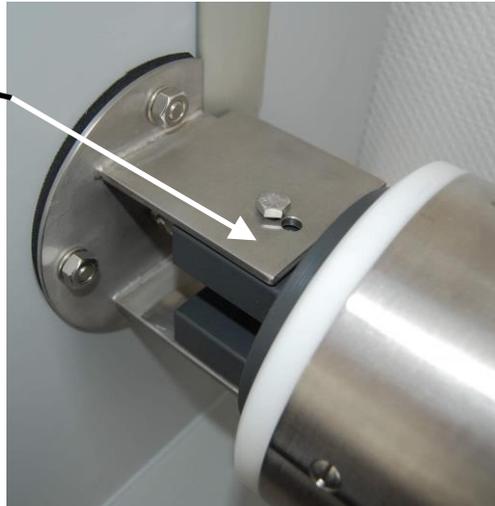
Screw position for standard installation	If pool width is more than indicated: screw position to increase width by 10mm	This 15mm MUST be kept
 A close-up photograph of a metal mounting bracket. A hexagonal screw is shown in a hole. A dimension line with arrows at both ends is positioned above the screw, with the number '15' written next to it. Three arrows point from the text boxes above to the screw and the dimension line.		

The shaft has to be in contact with the remaining PVC-plate	If pool width is less than indicated: a maximum of 2 PVC-plates can be removed to equalize.
 A close-up photograph of a shaft assembly. A metal shaft is visible on the left, connected to a black gear. To the right of the gear are several white PVC plates. A white arrow points from the text 'The shaft has to be in contact with the remaining PVC-plate' to the shaft. A black arrow points from the text 'If pool width is less than indicated: a maximum of 2 PVC-plates can be removed to equalize.' to the PVC plates.	

The opening of the motor mount points to the pool

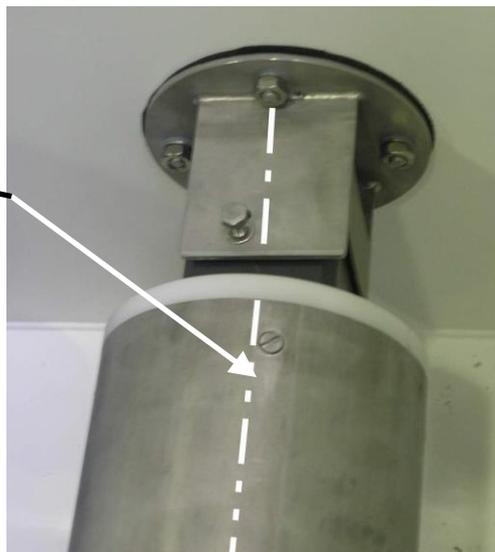


The tubular motor is mounted correctly into the motor mount.



That is:

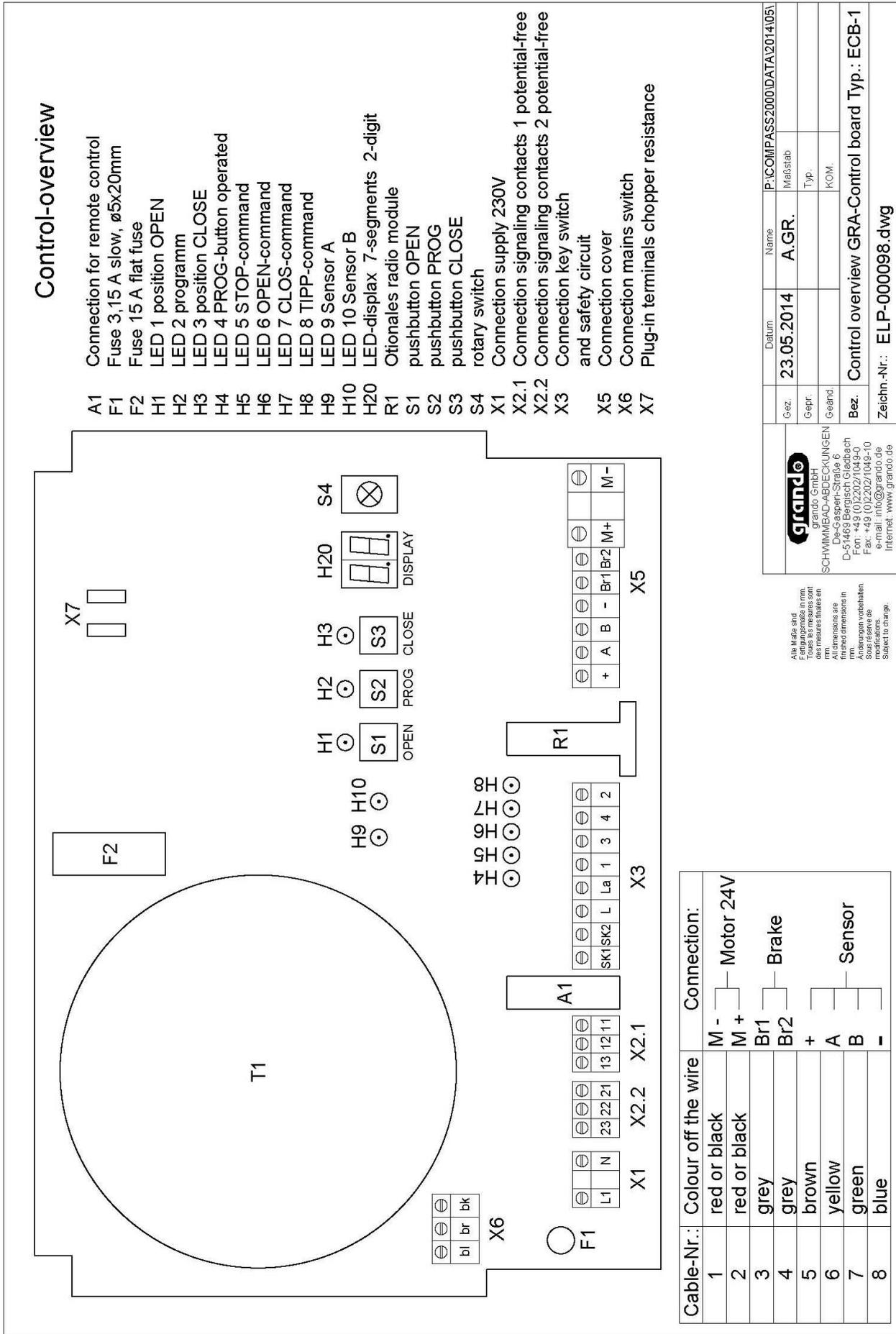
- the central axis of the engine mount and the center axis of the roller shutter shaft are in alignment
- the recess for the cable is visible
- the edge of the tubular motor and the edge of the motor bracket are flush.



2. Inside View of the Control Board



2.1. Component Overview



Gez.	23.05.2014	Name	P:\COMPASS2000\DATA\2014\051
Gepr.		Markstap	
Geend.		Typ.	
Bez.	Control overview GRA-Control board Typ.: ECB-1		
Zeichn.-Nr.: ELP-000098.dwg			

Alle Maße sind Fertigungsmaße in mm. Toutes les mesures sont en mm. Mesures finies en mm. All dimensions are finished dimensions in mm. Änderungen vorbehalten. Sous réserve de modifications. Subject to change.

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Cable-Nr.:	Colour off the wire	Connection:
1	red or black	M - Motor 24V
2	red or black	M +
3	grey	Br1 Brake
4	grey	Br2
5	brown	+ Sensor
6	yellow	A
7	green	B
8	blue	-

3. Control Drive Description

The control board is a processor-controlled 24 VDC reversing contactor with soft-start and soft-stop function for drives of the Aqua-IPG series. The detection of the travel way is done by sensors. The end positions are programmable, the system does not require mechanical limit switches. The programming of the end positions is carried out by buttons on the board or optionally by using a remote programming unit, which can be connected to the board. Further function settings can be made in a user-friendly way by means of a rotary button (S4).

The programming is protected against power failure. Additionally, the sensors are constantly monitored and the drive is protected against overload. For extra position report, potential-free contacts are provided.

4. Technical data

Power supply:	230 V~, 50Hz
Internal fuse:	3,15A
Motor voltage:	24 V DC
Motor current:	10A 11A (temporary)
Control voltage:	24 V DC
Signal relay:	changeover potential-free 230 V AC 1/10A max.
Ambient temperature:	0° C tot 50°C
Protection Class:	IP 54

5. Assembly Instructions

- When connecting, the relevant standards and regulations must be observed, in particular the VDE regulations, the local EVU regulations and the accident prevention regulations.
- Before installation and also during subsequent work, switch the control to zero potential.
- Separate cable routing is a general principle. The sensor cable in particular must be routed separately and in a shielded cable. (Exception "Blue cable" - Integrated motor and sensor cable with shielding)
- Just one motor can be connected to the control. Voltage tap for on-site periphery such as light is not permitted.

<p>NOTE</p>	<p>Ensure correct direction of rotation!</p> <p>The rotation direction must correspond to the buttons OPEN and CLOSE. If not:</p> <ul style="list-style-type: none"> ○ Interchange drive phases ○ Interchange sensor channel A and B
<p> WARNING!</p>	<p>Danger of electric current!</p> <p>When connecting the control, there is the danger of an electric shock.</p> <ul style="list-style-type: none"> ○ Before connecting the control, it must be switched to zero potential. ○ Before accessing the connecting terminals, all poles of the control must be disconnected from the supply circuit.
<p> WARNING!</p>	<p>Danger due to improper use!</p> <p>Unauthorized opening and improper intervention may lead to bodily injuries or damage to property.</p> <p>Allow only trained or qualified personnel (e.g. electrically skilled person) to work on the system.</p>
<p>NOTE</p>	<p>In order to avoid severe bodily injuries or substantial damage to property, only qualified persons, who are familiar with the electrical drive equipment, are allowed to work on the control. Qualified persons are persons, who are familiar with set-up, installation, commissioning and operation of electrical systems and have the necessary qualifications according to their activities. They must be able to evaluate the work assigned to them, recognize potential sources of danger and take suitable safety precautions.</p>

6. Connection

- Turn off main switch of control box.
- Reconnect tubular motor according to wiring diagram without a key switch.
- Make a temporary jumper from terminal No. L to terminals No. La.
- Turn on main switch of control box.
- Reset the settings.

Press and hold the PROG button (S2). Then additionally the OPEN button (S1) and CLOSE button (S3) button same time and hold about 5 seconds until all the LEDs above the buttons are on (H1-H3).

- Synchronize OPEN and CLOSE button with the direction of rotation of the motor in the reel
- OPEN = cover rolls up onto the shaft,
CLOSE = cover move onto the pool.

In case of incorrect function, change the two cables from the tubular motor (terminal M + and M-) to change the direction of rotation.

- **Remove the temporary jumper from terminal No. L to terminals No. La.**
- **Attention! Do not change previously clamped cables.**
- Connect external key switch according to wiring diagram. Correction of the direction of rotation by swapping the terminals 1 and 3



= " CLOSE " / CLOSE-button

means cover is moving on the pool.

= " OPEN " / OPEN-button

means open the pool.

- Turn off the main switch of the control again

7. Setting of limit positions

Setting and programming of the end positions is done by using the installed buttons

The end positions can only be saved on the board.

- Turn on main switch of control.

Delete all storages and initiate programming mode:

Press and hold PROG-button. In addition, press and hold OPEN and CLOSE button simultaneously. Keep the 3 buttons pressed for approx. 3 seconds, until all LEDs positioned above each button are illuminated (H1–H3).

7.1. LED display in the programming mode: (no position is programmed)

- H1 is illuminated = OPEN position is not yet programmed
- H2 is illuminated = Programming is initiated
- H3 is illuminated = CLOSE position is not yet programmed

7.2. Storage of positions:

After activating the program mode, the travel button pushed first determines the order of programming end positions. If it is travelled in OPEN direction first, the OPEN end position must be programmed first, and afterwards the CLOSE position. If it is travelled in CLOSE direction first, the CLOSE end position has to be set first, and afterwards the OPEN end position. If a travel button has already been operated after activating the programming mode, but the other end position shall be saved first, the programming mode can be reset by pressing again all three buttons for 3 seconds. The order of setting is now selected again by travelling towards the desired first end position.

When programming the first position, the associated LED turns off to confirm.

After having programmed the second and last position, the control switches to normal mode automatically (H2 off). The associated LED H1 or H3 is illuminated as position report (see Normal mode / LED displays).

“OPEN” Position:

- Using the OPEN button, travel to the desired OPEN position.
- Subsequently, press the PROG button and keep it pressed.
- Press the OPEN button to save the position OPEN. Release both buttons.

“CLOSE” Position:

- a) Using the CLOSE button, travel to the desired CLOSE position.
- b) Subsequently, press the PROG button and keep it pressed.
- c) Press the CLOSE button to save the position CLOSE. Release both buttons.

7.3 Fine Tuning of the positions

A position already programmed can be corrected. (Example: OPEN position)

- a) Travel the system to OPEN position.
- b) Press and hold the PROG button.
- c) Additionally, press the OPEN button briefly (approx. 1 sec.). H2 is illuminated, programming mode is initiated. Release all buttons.
- d) Travel to the new OPEN position.
- e) Subsequently, press and hold the PROG button.
- f) Press the OPEN button in order to store the position OPEN. H1 is switched on and the OPEN position is changed. Release both buttons.
- g) After approx. 3 seconds, H2 goes out and the programming change is complete.

8. Standard operation

After programming has been completed, the drive travels in the desired direction by tapping the OPEN and CLOSE button. The drive can be stopped by tapping one of the buttons again.

The LEDs H1 and H3 show the status of the cover.

While operating the cover, the control executes the following operation sequences:

OPEN-travel from CLOSE position:

- CLOSE position: H3 on (Cover in CLOSE position)
- Command initiation OPEN command
- Cover moves in OPEN
- After the end of the travel in OPEN position, H1 is on (Cover in OPEN position)

CLOSE travel from OPEN position

- OPEN position: H1 on (Cover in OPEN position)
- Command initiation CLOSE command
- Cover moves in CLOSE
- After the end of the travel in CLOSE position, H3 is on (Cover in CLOSE position)

9. Failure indication codes

In case of a failure, one of the following error codes will be denoted on the display. Any failure leads to an immediate stop (exception: Error no. 41). The following list shows the possible error codes:

Error no.	Error message	Remedial action
11	Safety circuit is interrupted	Check the connections on the terminals SK and determine the cause.
21	Short-circuit in the motor circuit	Check the motor connections for short-circuits and the cables for damage.
22	Sensor failure	Check the sensor connection. Replace the sensor, if necessary. See also chapter 16 : sensor monitoring.
23	Volatge Excess	Drive feeds too much energy back into the control. Install a chopper resistor.
24	Motor overload	Drive is blocked. Check the unobstructed movement of the system. In case of a freely moving system, maybe an insufficiently dimensioned drive.
25	Motor too fast	Install a chopper resistor; if necessary, check the drive type for suitability.
26	Error according to direction of rotation	Interchange the motor cables or the sensor cables A+B
27	Temperature of heat sink is too high	Reduce the mechanical loading, check the motor supply cable. Check whether the motor is defective
28	Overload / speed too low	Drive is blocked. Check the unobstructed movement of the system. In case of a freely moving system, maybe an insufficiently dimensioned drive.
29	Current Excess	Drive is blocked. Check the unobstructed movement of the system. In case of a freely moving system, maybe an insufficiently dimensioned drive.
33	Runtime error	Set the permissible running time (menu 33) determine the cause for a longer running time e.g. overload (reducing the speed) or defect in the power transmission
41	Voltage Excess / warning	Install a chopper resistor; if necessary, check the drive type for suitability. The control does not switch off the drive.

10. Protective functions

Overload protection:

When exceeding the maximum motor voltage by feeding back of the drive with regard to pulling loads, the control reduces the speed permanently, until the voltage is once again within the permissible range. (Note: When falling below the minimum speed, error 24 may occur). By using a chopper resistor, such behaviour may be eliminated.

When reaching motor voltages which may cause damage to the control, travelling is stopped (Error 23). By error 41, a warning is displayed in advance.

Current excess:

In order to protect the control board, a current monitor is integrated additionally. When exceeding the current limit value provided for the set drive, the control board reduces the speed of the drive.

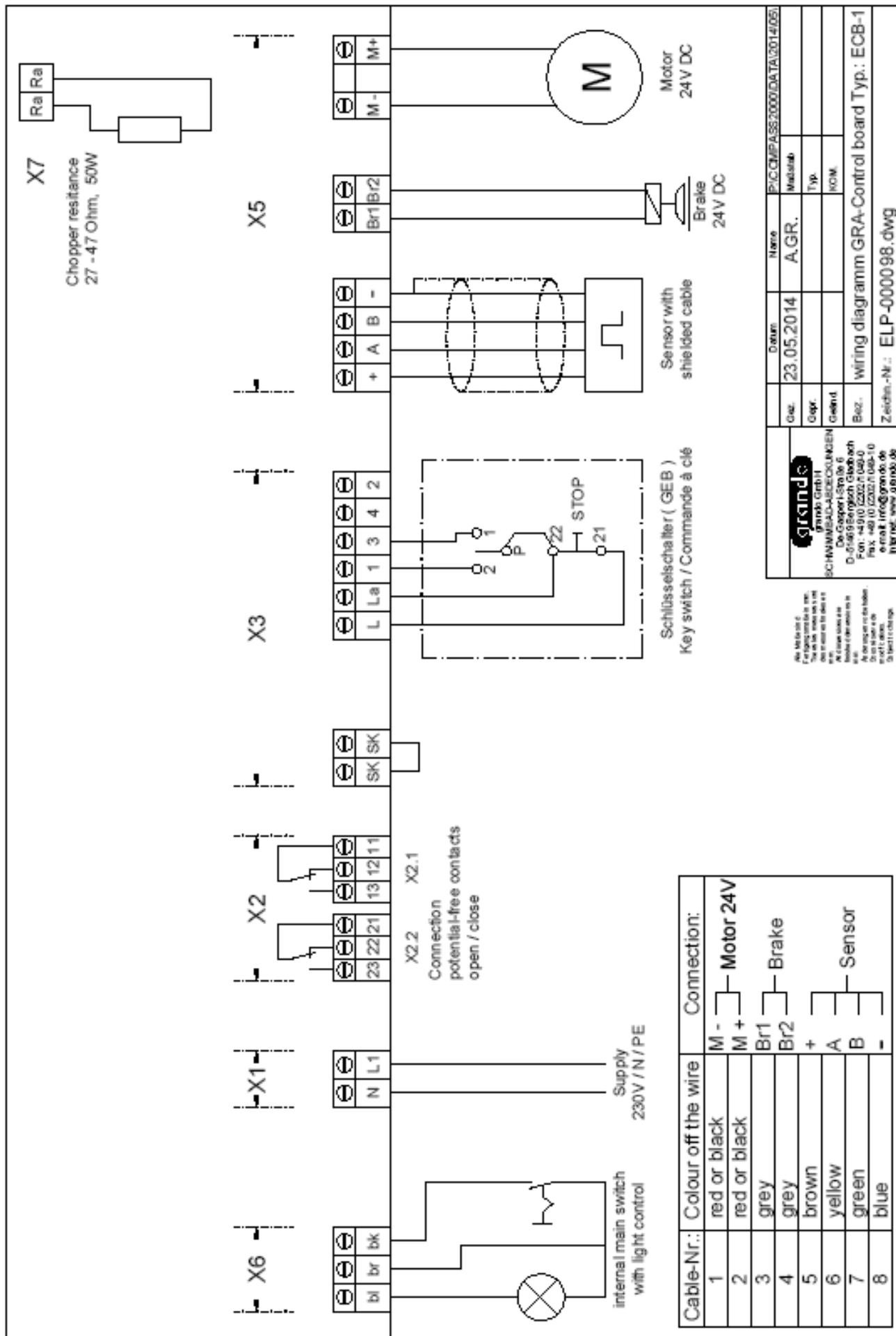
In doing so, the impermissible current consumption is reduced (if necessary) and the system is still operational. However, in case of continuing current excess (>10 sec), the control switches off (Error 29).

Speed monitoring:

The drive speed of the set drive is monitored. When deceeding or exceeding the speed, the drive is switched off. The fault is displayed by the error message 24, 25 or 28.

11. Chopper resistor

Drives with low self-locking (such as e.g. tubular motors) can increase their drive speed when operating with pulling loads. For example, this can occur if the cover is installed underwater. Due to the increased speed, electrical power can be fed back into the control board which may cause damage to the control. The speed and the feed-back process are monitored and, if necessary, output with an error message. By connecting a chopper resistor (27-47 Ohm, 50W, cooled) to the two contact points X7, the power feed back can be converted into heat.



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