

# Thermoplush RLM 3x40 Heating **Control Unit**



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## Details about operating instructions document

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## **Instructions** for assembly and operation

Keep in a safe place for future reference

1 -



## Contents

<b>1. Safety precautions and exclusion of liability.....</b>	<b>3</b>
1.1. About these instructions .....	3
1.2. Explanation of symbols.....	3
1.3. Intended use.....	3
1.4. General safety precautions.....	3
1.5. Exclusion of liability.....	3
 <b>2. Installation.....</b>	 <b>4</b>
2.1. Place of assembly.....	4
2.2. Assembly.....	4
2.3. Opening / closing the housing.....	4
2.4. Connecting the control unit.....	4
2.5. Adjustments with remote / direct start.....	5
 <b>3. Commissioning.....</b>	 <b>5</b>
3.1. Initial start-up.....	5
3.2. Arrangement of device.....	5
 <b>4. Operation .....</b>	 <b>5</b>
4.1. Switching on.....	5
4.2. Operating menu.....	6
4.2.1. Warm-up time.....	6
4.2.2. Operating time .....	6
4.3. Adjusting the temperature for the heated cushion.....	6
 <b>5. Troubleshooting.....</b>	 <b>7</b>
 <b>6. Guarantee .....</b>	 <b>8</b>
 <b>7. Technical specifications.....</b>	 <b>8</b>
 <b>8. Wiring diagram.....</b>	 <b>9</b>



## 1. Safety precautions and exclusion of liability

### 1.1. About these instructions

This document describes the assembly, installation and operation of the Thermoplush RLM 3x40 heating control unit and provides important advice about handling the Thermoplush heating control unit in compliance with safety regulations.

Do not start assembly, installation and operation until you are sure that you have understood the instructions from the technical aspect and only carry out the work in the exact order given in these instructions!

### 1.2. Explanation of symbols



This symbol is found in any advice regarding on-the-job safety in these operating instructions, where there is a risk of harm to life and limb.

Apart from the notes in these operating instructions, the general regulations for safety and accident prevention should be observed.

### 1.3. Intended use

The Thermoplush RLM 3x40 heating control unit is a control, operating and power unit in one housing. It is used to control Thermoplush heated cushions or Thermoplush heated carpets with an operating voltage of 230V/50Hz. Any other use other than that described above is not permitted and may cause destruction of the device.

### 1.4. General safety precautions



It is essential that the following is observed in assembly:

Any work must be carried out in conformance with national requirements governing electrical equipment and the appropriate local regulations.

It is essential that the following is observed when carrying out electrical work on the control unit:

The control unit was designed for controlling Thermoplush heating elements with a nominal voltage of 230V / 50Hz. Operation at different rated values than those given is not permitted.

Also observe the permissible rated current (refer to technical specifications).

The heating controls have a protective earth terminal and can be connected if required. The protective earth terminal is not required for the cushion heating (class II - double insulated).

A residual current circuit-breaker with a tripping current of 30mA is mandatory to provide additional personal safety (see attached circuit diagram).

No work can be performed while the controls are open unless the mains supply has been disconnected. All safety regulations for working with mains supply should be observed. Connection and/or any work requiring opening of the control unit may only be carried out by qualified electricians.

### 1.5. Exclusion of liability

If installation is not carried out correctly, it may cause damage to property and may pose a danger to people as a result. The manufacturer assumes no responsibility or liability for loss or damage, which results from faulty installation, improper operation, incorrect use and maintenance or which relate to this in any way whatsoever. Similarly, we assume no responsibility for violations of patents or violations of other rights of third parties, which ensue from use of this control unit.

The manufacturer reserves the right to make changes with regard to the product, technical specifications or the instructions for assembly and for operation without prior notice.

**Note: Opening the appliance - apart from the top section - and operation other than for the intended purpose will lead to voiding of the guarantee.**



## 2. Installation

### 2.1. Place of assembly

The RLM-3x40 is intended for mounting on vertical walls. Assembly is only permissible in areas where the type of protection for the control unit is sufficient (refer to technical specifications). Avoid any build-up of condensation. In order to ensure sufficient cooling, observe a minimum spacing of 30mm to the left and right of the control unit. Never allow the temperature at the place of assembly to exceed or drop below the maximum permissible ambient temperature (see technical specifications).

### 2.2. Assembly

The RLM-3x40 has a top cover, which must be removed for assembly, as described under 2.3. First insert two screws into the wall for mounting. The control unit is then attached, using these screws, by the recess (fig. 1, items 1 and 2).

The control unit can serve as a template to mark the positions of the two holes for mounting.

Important: Only use the control unit as a template for drawing. Never use it as a template for drilling holes.

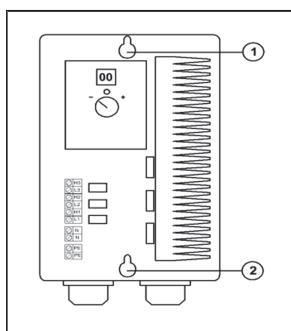


Fig. 1: Assembly diagram

### 2.3. Removing the housing cover:

Remove the red cap from the button, release the locking screw with a hex key and remove the knob.

**Note: never use force to remove the button!**

Then unscrew the screws at all four corners and lift the cover off carefully.

Close the cover by performing the steps in reverse order  
Important! Install the operating button so that the button can still be felt with your fingers.

### 2.4. Connecting the control unit

The cable can be fed via the cable glands. It is only possible to carry out the connection work described here when the top of the control unit is open. Disconnect from the mains! It is essential to observe all applicable rules for working with mains electricity!



Do not connect to mains until the control unit housing has been closed. The fitter must also ensure that the IP rating for the control unit is observed in installation.

Fig. 2.2 and the enclosed circuit diagram show how to connect the control unit. Use ferrules for fine strands.

Terminal definitions:

L1	Mains supply L1 – 230V 50 Hz
L2	Mains supply L2 – 230V 50 Hz
L3	Mains supply L3 – 230V 50 Hz
H1	Synchronised to heating circuit L1 - 230V 50
H2	Synchronised to heating circuit L2 - 230V 50
H3	Synchronised to heating circuit L3 - 230V 50
N	neutral conductor
PE	earth conductor

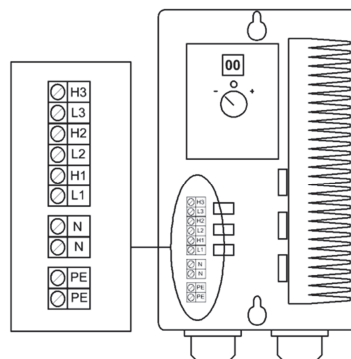


Fig. 2: Terminal plan



## 2.5. Regulation using remote direct start

It is possible to operate the heating using external controls (switch, timer, contactor...)

In this case, you will need to use a jumper on the control unit – see fig. 3.

The control unit will then start up immediately – as soon as it is supplied with power. It is still possible to switch the control unit on and off as before using the operating button on the controls.



Fig. 3

Direct start activated  
when using jumper  
(contacts bridged)  
- The contacts are  
below the circuit board

## 3. Commissioning

### 3.1. Initial start-up

After closing the housing, switch the mains supply back on.

In order to make a quick check for correct installation and proper working order of the RLM 3x40, you can change the warm-up phase and operating time in the operating menu as needed.

An introduction to the operating menu is given in item 4.2.

### 3.2. Arrangement of device

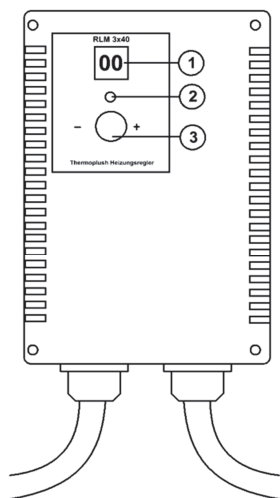


Fig. 3: Arrangement of device

	Display with indication of selected output
	In the operator menu – display of the preset warm-up time and operating time
	In the event of a fault – display of error code
	Indicator lamp (LED) – 3-colour
	Yellow for warm-up phase or for setting warm-up phase
	Green for operation at reduced power
	Red for fault or for setting operating time
	Push-button for switching heating on and off
	Turn to change the output
	To set the operating time (warm-up time) and automatic shut-off

## 4. Operating the control unit

### 4.1. Switching on

Once it has been connected to the electricity supply, the control unit is ready to operate. Press the operating button (3) to switch on the heating. The heating is supplied with maximum power - the LED control lamp is yellow. The numbers indicate the reduced output after the warm-up phase as a percentage.

After the preset warm-up phase (adjustable from 1-50 minutes) the controls change over to operation at reduced power - the LED is green. The power level indicated as a percentage in the display is accepted.



Turn the knob to adjust the reduced power level. In order to avoid faulty operation (too cold or too hot), the range for adjustment has been restricted (min. 10% and max. 75%).  
The heating can be switched off manually at any time after it has started by pressing the button again. In order to avoid heating continuously, the heating switches off automatically once the selected maximum operating time has been reached.

## **4.2. Operating menu**

The preset values in this menu are standard values that have been set by the manufacturer on the basis of typical operating figures. However it is possible to change these values if required.

The following values can be set:

### **4.2.1. Warm-up time (100% output)**

The warm-up phase is intended for heating up the cushions or carpets rapidly and is preset at 20 minutes in the factory.

Next level in menu, for warm-up time:

Press the button (3) for about 5 seconds – the yellow LED will light up. The current warm-up time is shown in minutes in the display. Turn the knob to adjust the value between 1 and 50. Press the button (3) to save the changed setting, and the control unit will switch off.

### **4.2.2. Maximum operating time**

Automatic shut-off once the maximum operating time has been reached prevents the heating from running continuously when it is not switched off manually. However this can be deactivated if required.

Next level menu, for operating time:

Press the button (3) for about 10 seconds until the red LED lights up. The display shows the maximum operating time that is currently set. Turn the button to adjust the value between 0 and 60. The number shown in the display indicates the time in intervals of 10 minutes, e.g. 15 in the display = 150 minutes for maximum operating time. In this case, the heating will switch off automatically 2.5 hours after it was switched on.

If it is set to '00', automatic shut-off will be deactivated, i.e. the heating will not switch off automatically. Press the button (3) to save the changed setting, and the control unit will switch off.

## **4.3. Adjusting the temperature for the cushion heating**

Setting of the correct temperature depends on the following factors:

- ambient temperature
  - The lower the ambient, or room, temperature is, the higher the output needs to be set. Churches are subject to hardly any fluctuations in temperature. As a rule, it is only necessary to make adjustments once in autumn and in spring.
- seating times
  - As soon as people stand up or kneel (seat not occupied), the surface of the cushion will cool down slightly, but it will warm up again fast as soon as the person sits back down (refer to table 1).
  - On the other hand, if there is a church concert, people will remain seated the whole time and they will therefore provide their own body heat to the cushion without interruption. Therefore, 10% heat output is sufficient as a rule in these cases (refer to table 2).

By coordinating the warm-up phase and the heat output, it is possible to adjust the cushion heating to suit your particular requirements.



As a rule of the thumb: a seat surface temperature of 30°C to 35°C maximum is sufficient and perceived as pleasant

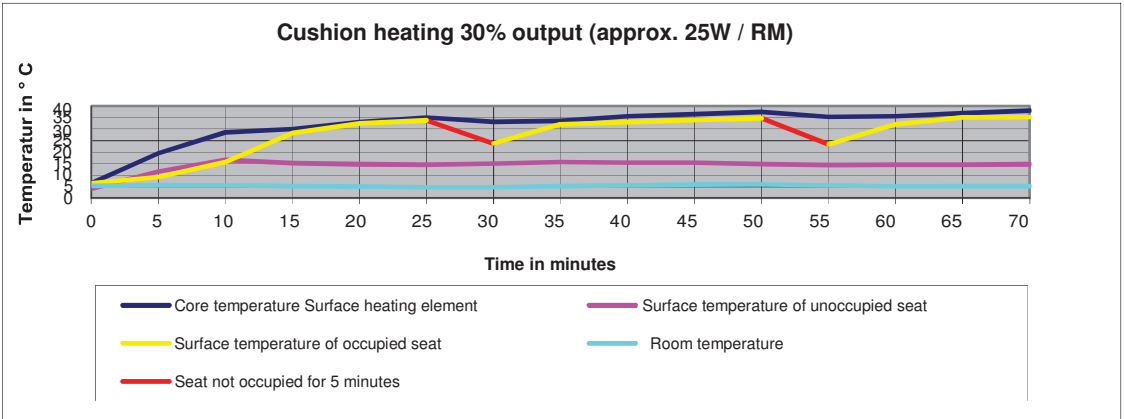


Table 1: Setting: 10 minutes warm-up phase / 30% heating operation at 5°C room temperature

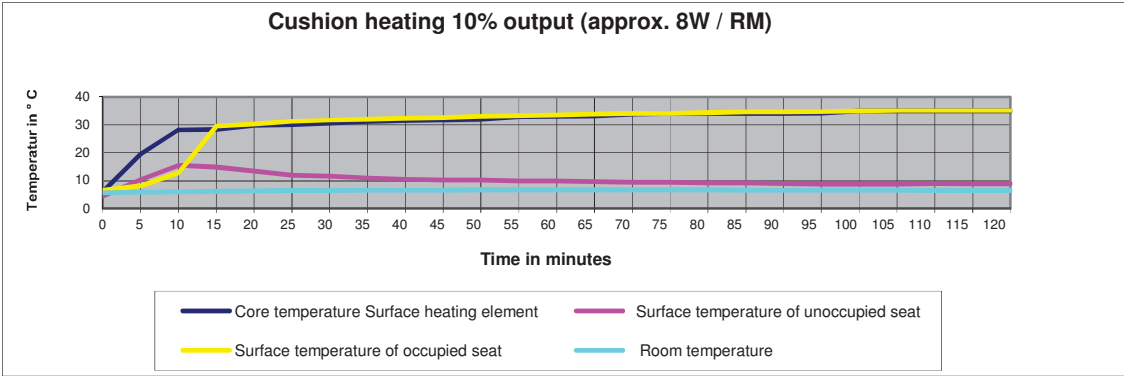


Table 2: Setting: 10 minutes warm-up phase / 10% heating operation at 5°C room temperature (e.g. during concert)

### 5. Troubleshooting



Important! Disconnect the device from the mains before opening the housing!  
The control unit has been designed to provide many years of continuous use. Nonetheless faults may occur, of course. The following description should help the technician and the operator to find the cause of any problem:

Controls do not appear to be working

Error:	Possible cause:
Nothing shown in display	No power supply, check fuse and power lead
	Automatic shut-off has turned the unit off – press the operating button to turn back on again

Display lamp (2) is red

Error:	Possible cause:
Red LED is on and numbers are shown in the display	There has been an interruption in the power supply – check fuse and power lead
	There is a fault in the electronics – call customer service and inform them of the error code shown in the display
	The control unit has not been connected properly – check connections according to terminal diagram



The heating temperature is not right

Error:	Possible cause:
Connected heating is cold	Automatic shut-off has switched the heating off too soon – check the shut-off time in the operating menu Output is set too low – in the case of very cold temperatures, the output might be set too low, e.g. at 10%, and is hardly noticeable – check the output settings on the control unit
Connected heating is too hot	The heating can be adjusted between 10% and 75% – if cushions are too warm, reduce the output
The heating only warms up slowly or does not heat up properly at all	The built-in warm-up phase is set too short (standard = 20 minutes) – reset in operating menu

## 6. Guarantee

The manufacturer accepts the following obligations towards end customers under the guarantee:

The manufacturer will rectify all manufacturing and material faults, which occur with the controls during the guarantee period and which impair the working order of the unit.

The guarantee shall not apply if the fault can be attributed to the end customer or a third party after conclusion of the purchase contract with the end customer, in particular as a result of improper assembly or incorrect initial start-up, improper or negligent handling, excess load, inappropriate equipment, faulty construction, an unsuitable foundation or improper operation or use. The guarantee shall only be fulfilled if your dealer is notified of the fault immediately after it is discovered. The notice of fault should be sent by the dealer to the manufacturer. A copy of the purchase receipt should be enclosed. It is essential that an accurate description of the fault is provided in order to process the complaint. The guarantee expires 24 months after conclusion of the purchase contract with the end customer, unless the manufacturer explicitly agrees to an extension of the guarantee period in writing. The dealer's guarantee based on the purchase contract with the end customer is not affected by obligations under this present guarantee. The guarantee shall be satisfied at the manufacturer's discretion through repair or replacement. This does not include any costs that are incurred for replacement, shipping or new installation. If repair or replacement is not possible or if this does not occur within a reasonable time despite the customer's extending a period of grace through written notification, the decrease in value caused by the fault shall be reimbursed or, insofar as this is not adequate in view of the end customer's interests, the contract shall be cancelled. Any further claims against the manufacturer resulting from obligations under this guarantee, in particular claims for damages on account of lost income, compensation for loss of use and consequential damage are excluded, unless mandated by law.

## 7. Technical specifications

Operating voltage	3x230V/400V / 50 Hz
Output per outlet	3000W at 230V 50 Hz /
Total output power	9000W at 230V 50 Hz /
Current load per outlet	13A
IP rating	IP 30
Permissible ambient temperature	-10 °C to +25 °C
Assembly	wall mounting
Weight	950 g
Housing	recyclable plastic housing
Dimensions without cable glands	L x W x H 227 x 110 x 90 mm

## 8. Circuit diagram



# Elektroplan

**Steuer- und Leistungsteil RLM 3x40  
Leistungs: 3x3kW /400/230V 50Hz**

**zur Steuerung von  
Thermoplush Sitzpolsterheizung**

## LEGENDE:

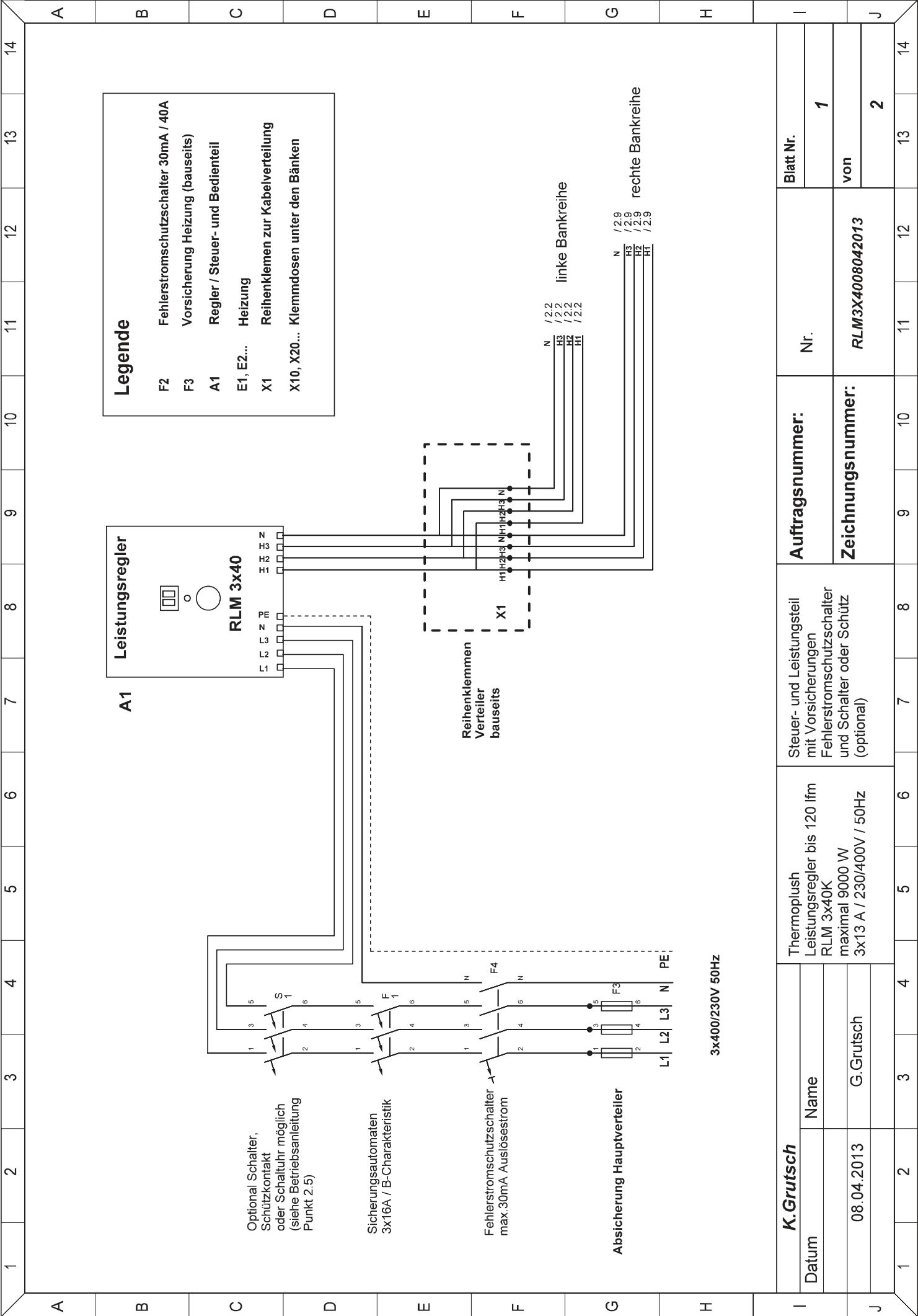
Elektroplan= Circuit diagram

Control and power unit RLM 3x40

Output: 3x3 kW /400/230V 50 Hz

for regulating Thermoplush seat cushion heating

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K. Grutsch				Steuer- und Leistungsteil mit Versicherungen Fehlerstromschutzschalter und Schalter oder Schutz (optional)				Auftragsnummer:				Nr.				Blatt Nr.										
Datum		Name																								
				Thermoplush Leistungsregler bis 120 lfm RLM 3x40K maximal 9000 W 3x13 A / 230/400V / 50Hz								1														
08.04.2013		G.Grutsch						Zeichnungsnummer:				RLM3X4008042013				von										
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