

MIKOTERM

electronic



CE

Guidebook for installation, handling and maintenance – ENG

TK eLG 6kW – models IP20 / IP54

Electric boiler for heating systems

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1. Description of symbols and instructions for safe operation

1.1 Description of symbols

Warnings



Warnings in text are marked by gray triangle, background warnings are framed



Electric shock danger is marked by lightning symbol in warning triangle

The signal words at the beginning of the warning mean the way and level of consequences if protective measures are not applied.

- **NOTE** means that smaller material damages may occur
- **CAUTION** means that smaller to middle injuries may occur
- **WARNING** means that heavy injuries may occur
- **DANGER** means that heavy injuries may occur

Important information



Important information, meaning no danger for people and things, are marked by the symbol displayed in the following text. These are limited by lines, above and below the text.

Further symbols

Symbol	Meaning
▶	Action step
→	Directives to other places in document or to other documents
•	Enumeration/Entry from the list
–	Enumeration/Entry from the list (2.)

Table 1: Symbols

1.2 Instructions for safe work

General safety instructions

Non-compliance with safety instructions may cause heavy injuries – or lethal outcomes and material damages and environment pollution.

- Electrical installation should be examined by an expert prior to the device assembly.

- All electric works should be performed by authorised person in accordance with corresponding regulations.

- Commissioning and maintenance and repairs should be done by authorised service only.

- Technical acceptance of installations should be performed in accordance with corresponding regulations.

Danger because of disrespecting security rules in alert situations, for example fire.

- Never expose your-self to life danger. Own security always has priority.

Damage occurred because of wrong handling

Wrong handling may lead to injuries of persons and/or installation damage.

- Make sure that device is available only to professionals.
- Installation and commissioning, and maintenance and repair, must be done only by service authorised for electrical works.

Installation and commissioning

- Placement of device can be done only by authorised service.
- Boiler can be turned on only if installation is with corresponding pressure level and working pressure regular. Do not close security valves in order to avoid damage caused by too high pressure. During warming water can leak on security valve of the hot water circuit and hot water pipes.
- Install this device only in the room where freezing is not possible to occur.
- Do not store or dispose inflammable materials or liquids in the vicinity of this device.
- Keep safe distance in accordance with valid regulations.

Life threat of electric power shock

- Children aged 8 years and older, persons with reduced physical, motor or mental abilities, persons with a lack of experience or insufficient training, can use such devices if they are supervised or given instructions related to the safe use of the device, as well as presented the dangers arising from it. Appliances should not be cleaned or subjected to user maintenance by children without appropriate supervision.

- Secure electric power connecting is done by authorised service! Comply with connecting scheme.
- Prior to any work: turn off electric power supply. Secure against accidental turn on.
- Do not mount this device in moist rooms.

Control examination / Maintenance

- Recommendation for user: conclude agreement on maintenance with authorised service to perform annual maintenance and controlling examinations.
- User is responsible for safety and environmental acceptance of the installation.
- Comply with safety work instruction as given in the chapter *Cleaning and Maintenance*.

Authentic spare parts

There shall not be undertaken any responsibility for damage occurred due to spare parts not delivered by the manufacturer

- Use only original spare parts.

Material damages due to freezing

- When there is damage due to freezing drain water from the boiler, tank and pipelines for heating. Danger of freezing does not exist only when entire installation is dry.

Instructions for service

- Inform users about mode of work of device and instruct them in maintenance
- Inform users not to perform any modifications or repair on their own
- Warn users that children cannot stay near heating installations
- Fill in and submit Commissioning log and Handover log attached in this document
- Deliver technical documentation to the user.

Waste disposal

- Dispose packaging materials in ecologically Acceptable manner.
- Secure device in ecologically acceptable manner and in authorised place.

Cleaning

- Clean outside of device with wet cloth.

2. Device data

These instructions contain important information about safe and professional assembly, commissioning and maintenance of the boiler.

These instructions are for installers who have knowledge for work with heating installations due to their professionalism and experience.

2.1 Typology

These instructions are related to the following kind of device:

TK-eLG	6 kW
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2.2.1 Statement on compliances

We hereby state that devices are tested in accordance with the following directives: 2014/35/EU (low voltage directive, LVD) and 2014/30/EU (electro-magnetic compatibility directive, EMC).

2.2.2 Regular application

TK-ELG may only be used in conjunction with a heat pump, as a supplementary heat source controlled via a heat pump. Any other use will be considered improper and the manufacturer assumes no responsibility for damage caused by improper use.

To ensure proper use, it is necessary to follow the operating instructions, data on the nameplate and technical data.

2.3 Instructions for mounting



Use only original spare parts of the manufacturer or spare parts approved by the manufacturer. There shall not be any responsibility for damages caused by spare parts which have not been delivered by the manufacturer.

When mounting heating installations keep with the following instructions:

- Valid regulations in construction industry
- Regulations and norms on safety-technical equipment of heating installations
- Changes on the place of mounting according to valid regulations propisima

2.4 Instructions for work

When working with heating installation follow next instructions:

- ▶ Boiler should work in working range up to max temperature of 80°C and min pressure of 0.7 bars to max pressure of 2.6 bars, which should be controlled on regular basis.
- ▶ Boiler should be handled only by adults who are familiar with instructions and work of the boiler
- ▶ Do not close safety valve
- ▶ Inflammatory objects must not be put on the boiler surface or close to it (within safety distance)
- ▶ Boiler surface clean only with non-inflammatory products
- ▶ Inflammatory substances do not keep in the room for boiler installation (e.g. petroleum, oil, etc.)
- ▶ During the work no one lid must be open
- ▶ Keep safe distance in accordance with regulations

2.5 Inhibitors and anti-frost products

It is not allowed to use protective products against frost neither inhibitors. If it is not possible to avoid anti-frost protection then should use anti-frost products allowed for heating installations.



Anti-frost products:

- Reduce lifetime of the boiler and its parts
- Reduce heat transmission

2.6 Norms, regulations and standards

This product is in compliance with the following regulations:

- EN 50110-1:2013 – Operation of electrical installations - Part 1: General requirements
- EN 55014-1:2017; EN 55014-2:2015 – Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission - Part 2: Immunity - Product family standard
- EN 60335-1:2016 Household and similar electrical appliances - Safety - Part 1: General requirements
- EN 61000-3-2:2019 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions
- EN 61000-3-3:2014/A1:2020 Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems

2.7 Tools, materials and auxiliary measures

Standard tools for heating installations, water supply and electric-installations are needed for mounting and maintenance of the boiler.

2.8 Minimum distances and burnable construction materials

Inflammability of components		
A	Non-inflammable	
A1:	Non-inflammable	Asbestos, stone, wall tiles, baked clay, plaster (with no organic additives)
A2:	With smaller quantity of added elements (organic components)	Plaster cardboards plates, base felt, glass fibres, plates of ACUMIN, ISOMIN, RAIOT, LOGNOS, VELOX, AND HERACLITUS
B	Inflammable	
B1:	Hardly inflammable	Beech, oak, veneered wood, felt, HOBREX, VERSALIT and UMAKART plates
B2:	Normally inflammable	Pine, larch and spruce, veneered wood
B3:	Inflammable	Asphalt, cardboard, cellulose materials, tar-paper, plywood plates, cork plates, polyurethane, polystyrene, polyethylene, floor fibre materials

Table 2: Flammability materials and composition of elements according to DIN 4102

Depending on valid regulations, other minimum distances could be applied, different than mentioned below.

- Comply with regulations of electrical installations and minimum distances which are in force in the subject country.
- Minimum distance for heavy inflammable and self-extinguishing materials is 200 mm.
- The minimum distance for flammable materials is 400 mm.

2.9 Product description

The TK-eLG is designed to support a heat pump and can only work in conjunction with a heat pump. This device does not have a working thermostat (it has a protective thermostat), but forwards the information from the temperature sensor to the thermoregulator of the heat pump. The heat pump thermostat decides whether and when the electric heater will be switched on.

TK-eLG plays an important role in the proper operation of the heat pump. Its activation is necessary (sometimes desirable) in the following situations:

- If the water temperature is less than $\approx 20^{\circ}\text{C}$, the heat pump will not be able to start without preparation (heating) using an electric heater (it is necessary to turn on the electric TK-eLG)
- Defrosting when the air temperature is low can be long-lasting or impossible without the help of an electric heater (it is necessary to turn on the electric TK-eLG).
- On extremely cold days when the heat pump COP has the lowest value, TK-eLG is switched on as a backup to keep the heating of the building at a comfortable level (preferably switching on the electric TK-eLG).
- In case of failure (servicing) of the heat pump, the TK-eLG takes over the heating of the building - until the pump is operational (preferably switching on the electric TK-eLG).

For these reasons, this device does not have the option of manual on / off, because in that case - if it is manually turned off, the heat pump could enter the blockage. The TK-eLG must always be ready for operation, and the decision to switch on is made by the heat pump.

TK-eLG is designed for wall mounting. The TK-eLG is wall-mounted using the supplied mounting kit.

The basic components of TK-eLG are:

- TK-eLG body with electric heaters
- Safety valve 3bar
- Switchboard with automatic

The TK-eLG body consists of a welded heat-insulated sheet steel vessel in which an electric heater is mounted. The built-in thermal insulation is vapor-tight, reduces heat loss and prevents condensation on the TK-eLG vessel. This allows the TK-eLG not to have to be disconnected from the mains (by bypass valve) when the heat pump is running in cooling mode.

The safety thermostat and temperature sensor are located on top of the TK-eLG vessel.

TK-eLG formwork is made of pickled sheet metal, protected by electrostatic plasticization.

When the TK-eLG door is opened, a switchboard with a safety assembly, connection terminals and relays for switching on the heater is available.

2.10 Waste disposal

- ▶ Dispose packaging materials in ecologically sound manner
- ▶ Components that should be changed dispose in ecologically sound manner

2.11 Delivery scope

When delivery the TK-eLG, stick to the following:

- ▶ Check if packaging is damaged during delivery
- ▶ Check if delivery is complete

Part	Pieces
Electric boiler TK-eLG	1
Assembly Set	1
Instructions for handling	1

2.12 Factory plate

Factory data plate is placed on the external side of the TK-eLG and contains the following technical data:

- ▶ TK-eLG type
- ▶ Batch / Catalogue number
- ▶ Power
- ▶ Input power
- ▶ Maximum temperature
- ▶ Working pressure
- ▶ Mass
- ▶ Electric power supply
- ▶ Protection grade
- ▶ Manufacturer

2.13 Transportation



NOTE: Transport damages

- ▶ Pay attention on instructions for transportation on packaging
- ▶ Use adequate transportation means, i.e. carts for bags with tighten strip.
- ▶ The product should be **in horizontal position** during transportation
- ▶ Avoid shocks or collisions

- ▶ Packed TK-ELG put on carts for bags if needed secure it with strip and drive it to its mounting place.
- ▶ Remove packaging.
- ▶ Remove packaging materials and dispose it in ecologically acceptable manner.

3. Dimensions and technical data

3.1 Dimensions of TK-eLG models IP20 / IP54

Boilers of the TK-eLG series are intended for wall mounting.

TK-eLG 6 kW - IP20 for indoor installation

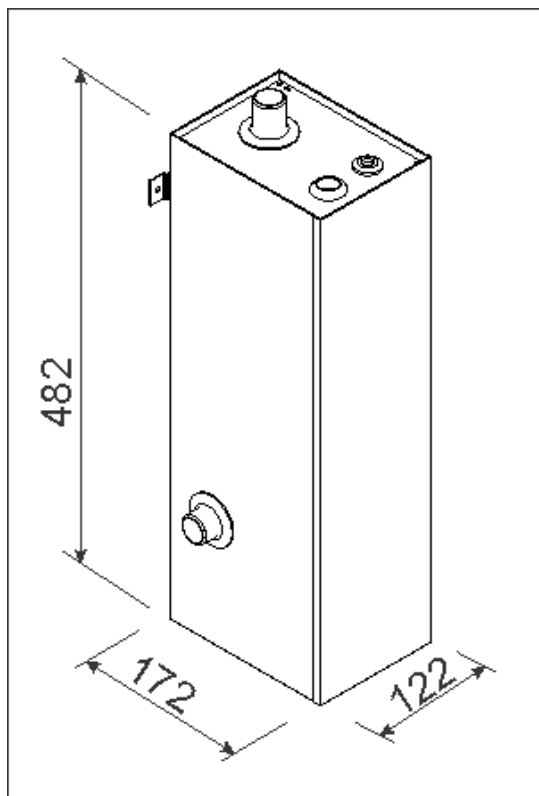


Figure 1a: Boiler dimensions TK-eLG 6kW - model IP20 for indoor installation with hydraulic connections on the top and left side.

IMPORTANT !
Model IP 20 is only for left mounting!

TK-eLG 6 kW - IP54 for outdoor installation

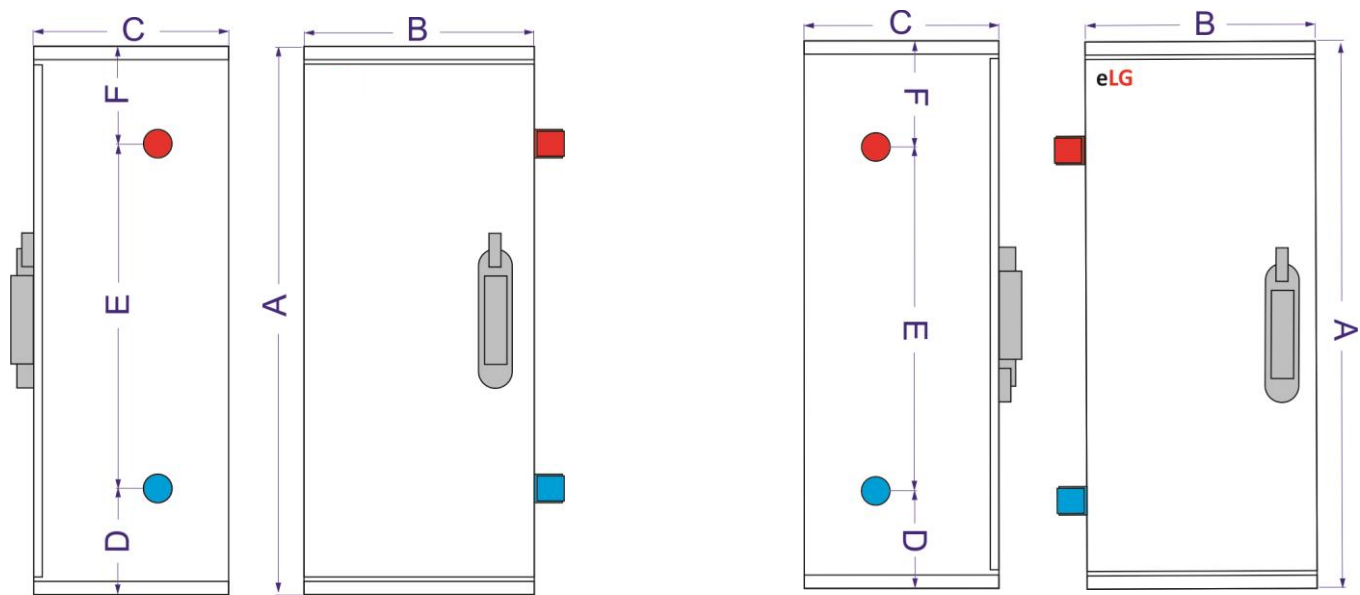


Figure 1b: Boiler dimensions TK-eLG 6 kW - model IP54 for outdoor installation with hydraulic connections on the right or left side

IMPORTANT !
Model IP 54 is produced separately with hydraulic connections left or right!

	A	B	C	D	E	F
TK-eLG IP54 - 6 kW D	620	260	220	120	390	110
TK-eLG IP54 - 6 kW L	620	260	220	120	390	110

Table 3b Dimensions (mm) TK-eLG 6 kW - model IP54 for outdoor installation with hydraulic connections on the right or left side

3.2 Components

- | | | | |
|---|-----------------------------------|----|---------------------------------|
| 1 | Return line | 9 | Thermal insulation TK-ELG |
| 2 | Fuse assembly | 10 | Safety valve 3bar |
| 3 | Hanging bracket | 11 | Safety valve drain pipe |
| 4 | Pressure line of the boiler | 12 | Electric heater in TK-ELG |
| 5 | Safety thermostat | 13 | Temperature sensor |
| 6 | Clamps | 14 | Power cable inlet |
| 7 | Relay for switching heating group | 15 | Screws for closing the formwork |
| 8 | Boiler vessel | 16 | Signal cable entry |

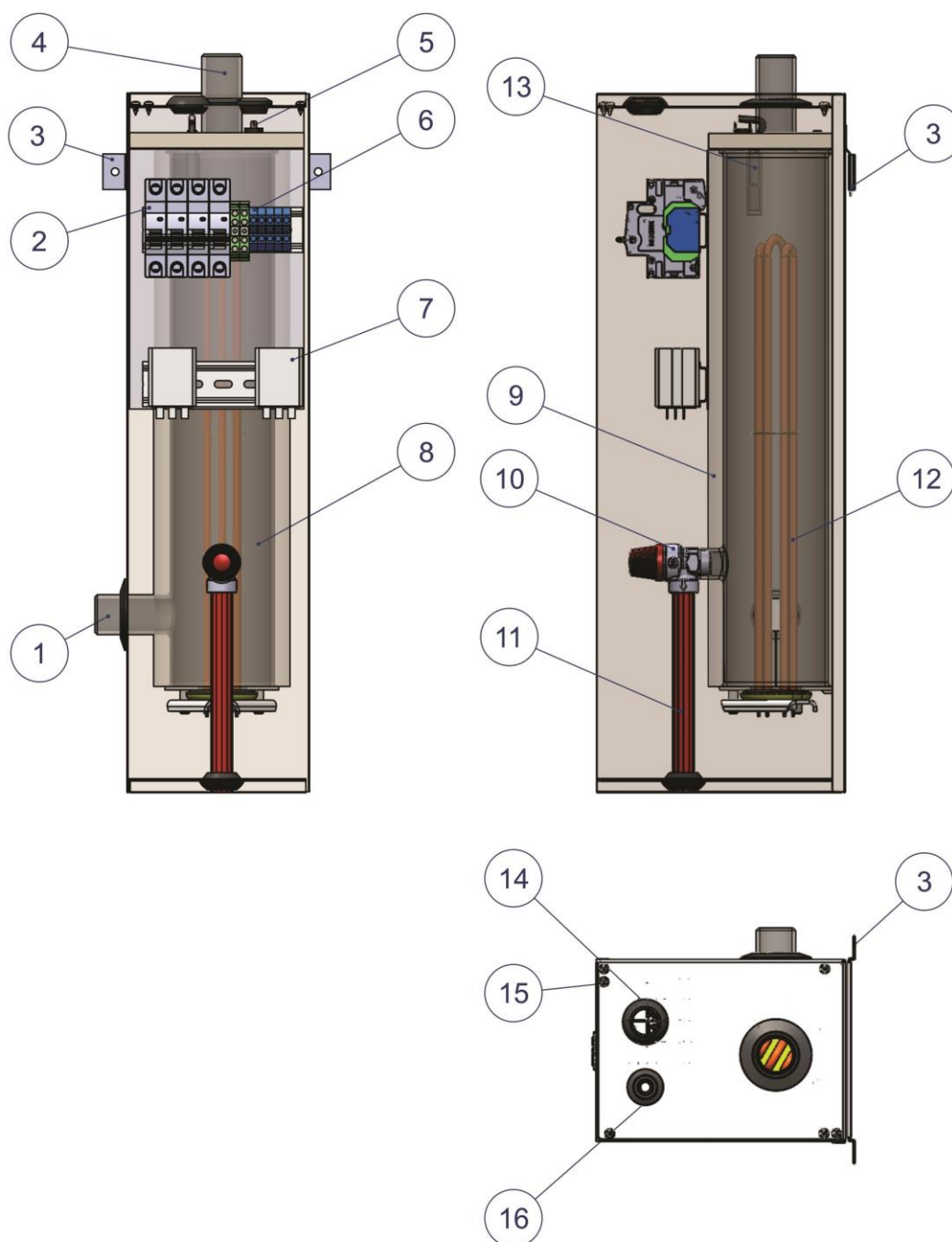


Image 2: TK-eLG components 6kW

3.3 Technical data TK-eLG

	Unit	Mono-phase power supply		Three-phase power supply
Power	kW	2	4	6
Usability level	%	99	99	99
Number of power grades		1	2	2
Division of power grades	kW	1×2	2×2	2+4
Network voltage	VAC	1N ~ 230V 50Hz		3N ~ 400/230V 50Hz
Ingress protection rating		IP54 / IP20		
Main fuse required	A	1×16	1×25	3×16
Min. cable cross-section	mm ²	3×2,5	3×4	5×2,5
Max. allowed working pressure	bar	3,0		
Min. allowed working pressure	bar	0,5		
Max. temperature	°C	80		
Water volume	ℓ	4,5		
Discharge line connection		DN25 (1") SN		
Return line connection		DN25 (1") SN		
Device weight (without water)	Kg	10,5		

Table 4: technical data TK-eLG 6kW

4. Installation of device



CAUTION: Human or material damages occurred because of irregular installation!

- ▶ Never install TK-eLG without expansion dish (AG) and safety valve.
- ▶ TK-eLG must not be installed in protective zone of important area or at the place of bath.



NOTE: Material damage due to freezing!

- ▶ TK-eLG must be installed only in room safe of freezing.

4.1 Be careful prior to assembly



NOTE: Material damage occurred due to incompliance with further instructions!

- ▶ Respect instructions for boiler and all installed components.

Prior to installing take care of the following:

- ▶ All electrical connectors, protective measures and fuses should be done by professional person respecting all valid norms, regulations and local laws
- ▶ Electric connector should be done according to the connecting plans
- ▶ After corresponding installation of device execute grounding of the plant
- ▶ Before opening device and all works turn off electric supply
- ▶ Non-professional and non-authorized attempts to connect device under voltage can produce material damage of device and hazardous electrical shocks.

4.2 Distances



DANGER: Fire threat due to burnable materials and liquids!

- ▶ Do not dispose burnable materials and liquids close to the TK-eLG.
- ▶ Let know the user the valid regulations for minimum distances from burnable materials (section 2.8).
- ▶ Comply with regulations on electric installations and minimum distances in force in subject countries.
- ▶ Place TK-eLG on the wall in such manner to leave free space as illustrated in the Image 3

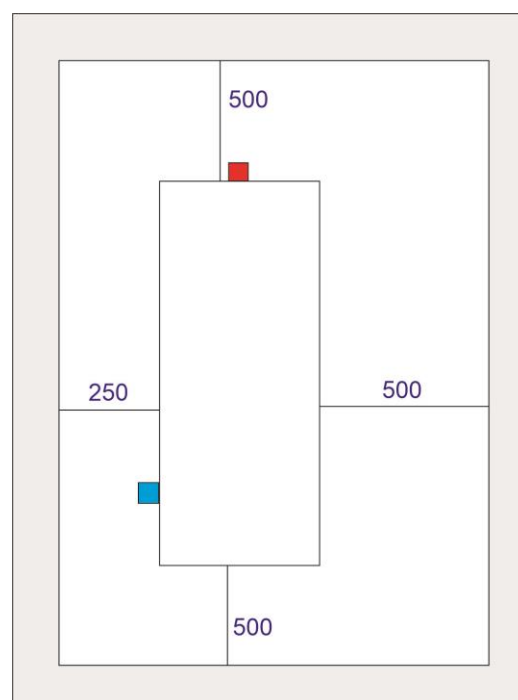


Figure 3a: Minimum free space dimensions for the model with hydraulic connections on the left
 A = 500mm / B = 250mm / C = 500mm / D = 500mm

4.3 Front door opening procedure for TK-eLG

The boiler front cover must be removed due to the connection to the electrical installation.

- ▶ Unscrew the 6 screws from the top cover and 6 from the bottom cover.
- ▶ Gently pull forward to remove the boiler front cover.

4.4 WALL MOUNTING TK-eLG



NOTE: Material damage occurred by irregular installation on the wall!

- ▶ It is necessary to use proper material for fixing

This chapter describes mounting the TK-eLG on a wall.

- ▶ Plot the drill hole positions for the mounting kit respecting the minimum free space dimensions next to the TK-eLG (Image 3a).
- ▶ Drill the holes according to the dimensions for the given type of TK-eLG.
- ▶ Insert plastic dowels that are part of the device packaging (or dowels adequate for a non-standard wall type) into the drilled holes.
- ▶ Then fasten the bracket with the screws supplied with the dowels.
- ▶ Carefully hang the device on the wall
- ▶ Make sure the TK-eLG is upright.

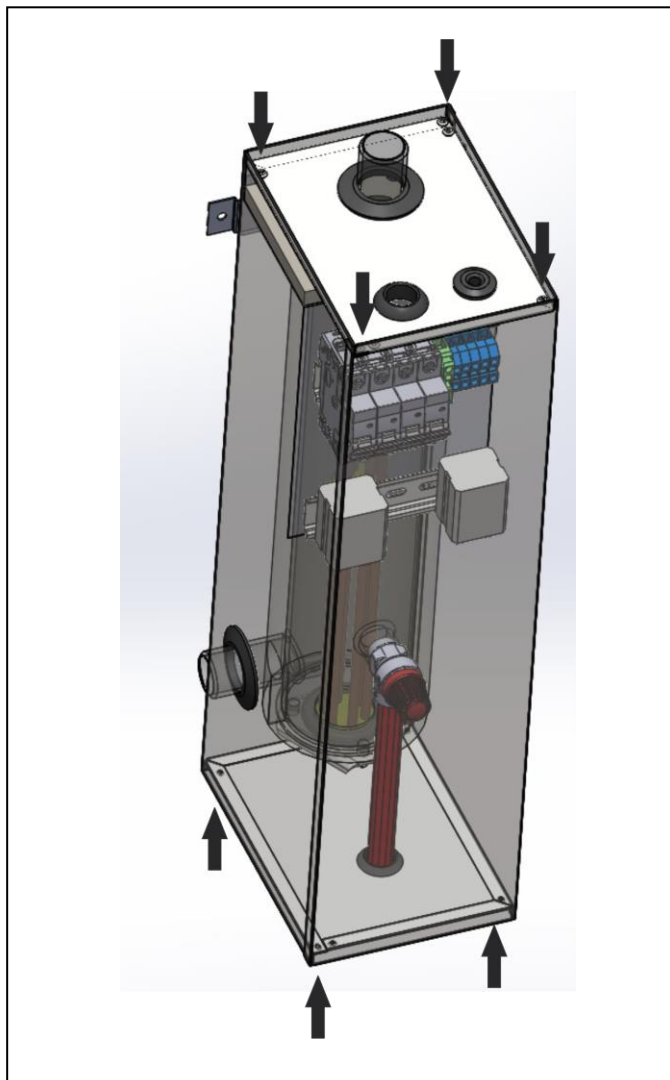
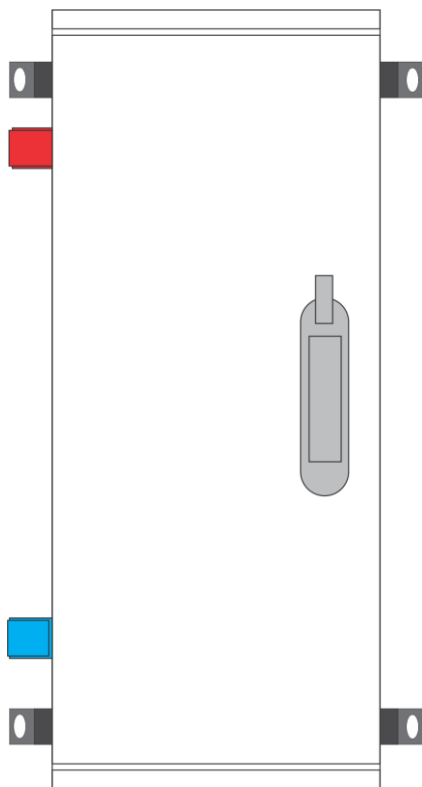
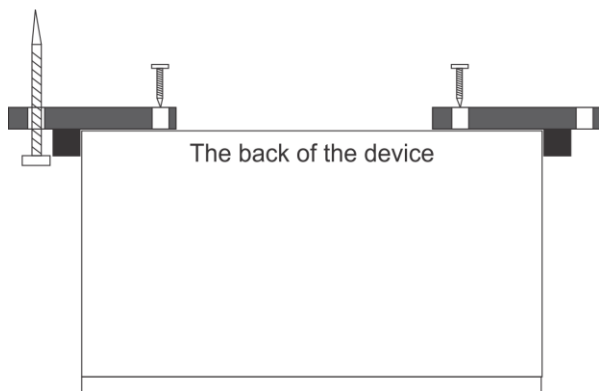


Image 4: Boiler opening (disassembly of the front cover)

TK-eLG 6kW - model IP54 for outdoor installation

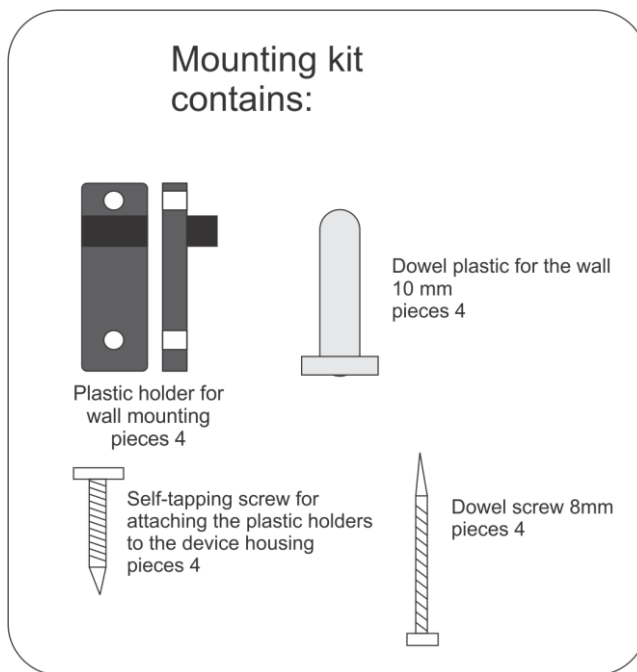
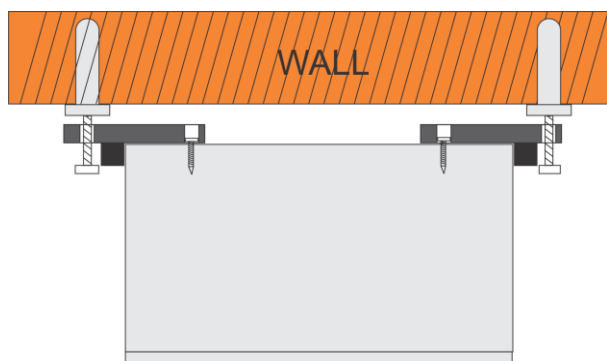


Positions of plastic holders

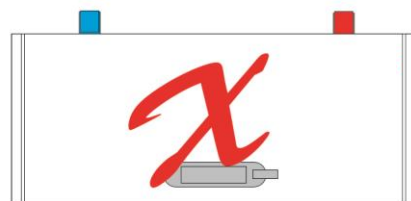
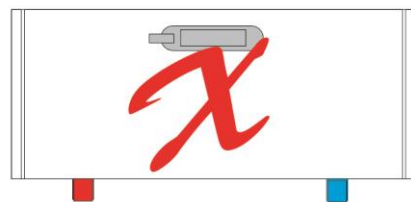
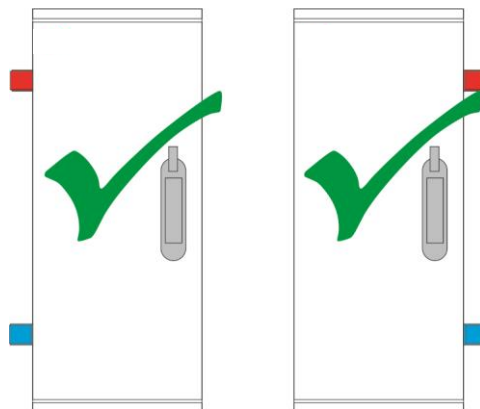


The back of the device

The front of the device



Take care of the correct position of the boiler



IMPORTANT !

Model IP 54 is produced especially with hydraulic connections on the left or right!

4.5 Hydraulic attachments execution



NOTE: Material damages caused by permeable connections!

- Attachment duct lines install without connecting on TK-ELG connections.

Heating duct lines connect as follows:

- Connect return line on connection **1** (image 2).
- Connect start line on connection **4** (image 2).

4.5.1 Filling the TK-eLG with heating water and sealing test

- Impermeability should be tested prior to put on the boiler.



DANGER: Injuries and/or material damages can occur with overpressure when testing watertight!

- High pressure can damage regulatory and safety devices and reservoir.
- After filling with water set the TK-ELG on pressure that is equal to the opening pressure of safety valve.
- Comply with maximum pressure of installed components.
- After testing sealing, open again closing valves.
- Make sure that all pressures, regulatory and safety parts work correctly



DANGER: Health threat due to mix of drinking water!

- It is demanding to respect state norms and regulations on avoiding mix drinking water (with water from heating installations).
- Comply with EN 1717.



NOTE: Material damage due to temperature tension.

- If you fill the TK-ELG in hot condition, temperature tension can cause cracks due to tensions. TK-ELG will start to leak
- Fill the TK-ELG only in cold condition (temperature of empty duct can be max 40°C)
- Fill the TK-ELG only through quick valve on pipe installation (return line) of the TK-ELG



NOTE: Installation damage due to bad quality of water! Heating installation can be damaged by corrosion or scale depending on water characteristics.

- Comply with filling requests for water according to VDI 2035 or project documentation and catalogue.

- Connect the filling hose to the water supply network and slowly fill it with water so that all the air comes out of it and the water starts to flow continuously.
- Close the tap on the water supply network and connect the free end of the hose to the tap for filling and emptying the heating installation. Secure the hose with a clamp.
- Open the installation filling and draining tap and slowly charge the TK-ELG. Monitor the pressure rise and close the tap when the operating pressure is reached.
- Bleed the installation via the valve on the radiator.
- If the operating pressure drops by venting, the water must be topped up.
- Test for leaks according to local regulations.
- After you have tested the tightness, open all the elements that you closed due to filling.
- Check that all safety elements are working properly.
- If the TK-ELG is tested for leaks and no leakage is observed, set the required operating pressure, according to the pre-pressure of the expansion vessel.
- Remove the hose from the filling and emptying tap.
- Enter the operating pressure and water quality values in the operating instructions.

4.5.2 Heating pump air emission and de-blocking

This device does not have a circulation pump in it. When the external pump is blocked, do the following:

- Unscrew the center screw in the middle of the "head" of the pump
- Carefully try to unlock the pump shaft with a suitable screwdriver.

4.5.3 TK-ELG venting and installation

- This device does not have a built-in vent, because the construction of the TK-ELG vessel is such that air cannot remain trapped in the boiler but exits the TK-ELG through the pressure pipe.
- Ventilation must be installed on the installation, so as to ensure venting of the air that can come out of the pressure pipe, as well as venting of the entire installation.

5. Electric connecting



DANGER: Life threat from electric shock!

- ▶ Electric works must be done only by qualified person.
- ▶ Turn off voltage supply before opening device and secure it against accidental turn on.
- ▶ Comply with assembly regulations.



When connecting TK-eLG on electric installation take care on connections scheme and connecting plans. Respect mandatory diameters of cables and fuses power outside the TK-eLG.



This device is manufactured for connection to three-phase power supply (3N ~ 400/230V 50Hz).

Connection to a single-phase network is possible with a power limit of 2kW or 4kW, where the connection must be fixed (no connection is allowed with a socket) and the cross-section of the connection cable must be according to Table 7a (7b).

5.1 Connecting TK-eLG to the electrical network

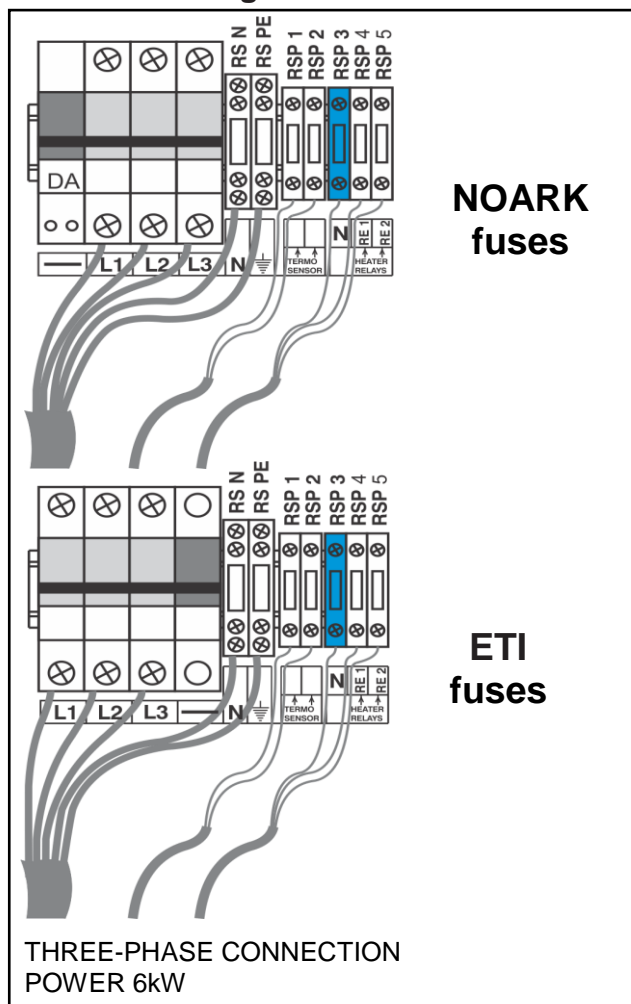


Image 6a: Connection to a three phase network POWER 6kW

RSP1, RSP2 – Temperature sensor connection clamps (with Heat Pump)
 RSP3 – Neutral line connection clamps (from Heat Pump)
 RSP4, RSP5 – Signal connection clamps (230V AC) for switching on the heater relay (from the Heat Pump).

3N ~ 400/230V 50Hz	TK - 6
In[A]	3 × 8,7
Main fuses [A]	3 × 16
Min. cable cross section	5 × 2,5mm ²

Table 6: Nominal current, el. fuses and cross-section of power cables for TK-ELG 6kW for three-phase power supply.

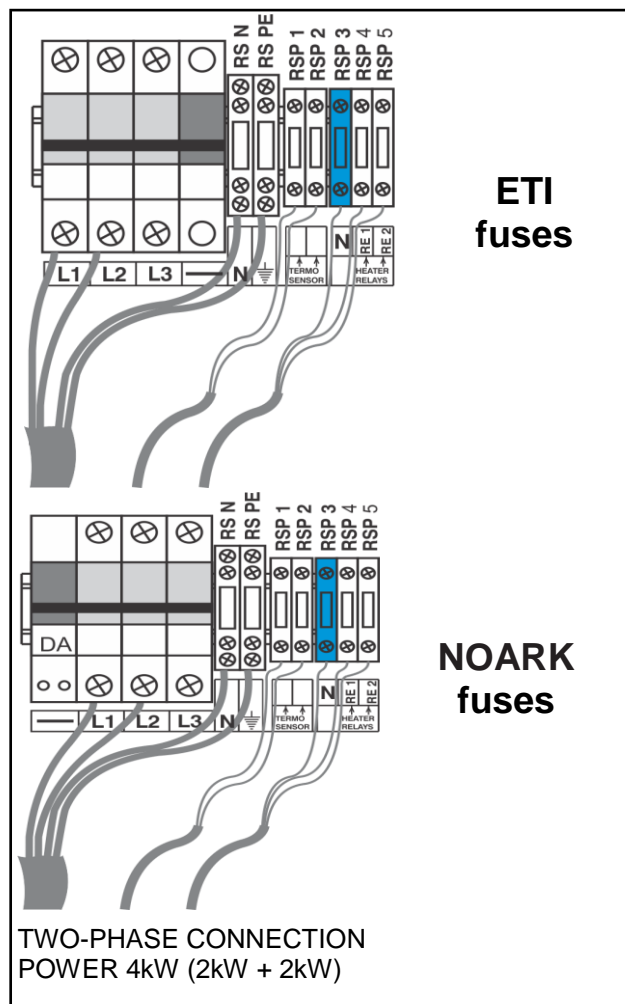


Image 6b Connecting in two phases POWER 4kW (2kW + 2kW)

In case only 2 phases are available, the boiler can be connected according to Figure 6b, where the power is limited to 4kW, the cross-sectional dimensions of the cable and fuse from Table 6 apply.

NOTE:

If the heat pump is supplied via a differential current protection device - RSD (FID switch), and the SIGMAAIR is supplied directly from the mains, or via another FID switch, **the neutral line (N) from the heat pump must be connected to the RSP3 clamps** - to prevent until the FID switches "fall"

If both the SIGMAAIR and the Heat Pump are supplied from the same place or there are no FID switches on the installation, a neutral line from the RSN clamps can be fed to the RSP3 clamps.

5.2 Connection of TK-eLG to single phase mains

Connection to a single phase network is possible with a power limit of 2kW or 4kW, where the connection must be fixed (no connection is allowed with a socket) and the cross-section of the connection cable must be according to Table 7a, or 7b for 4kW power.

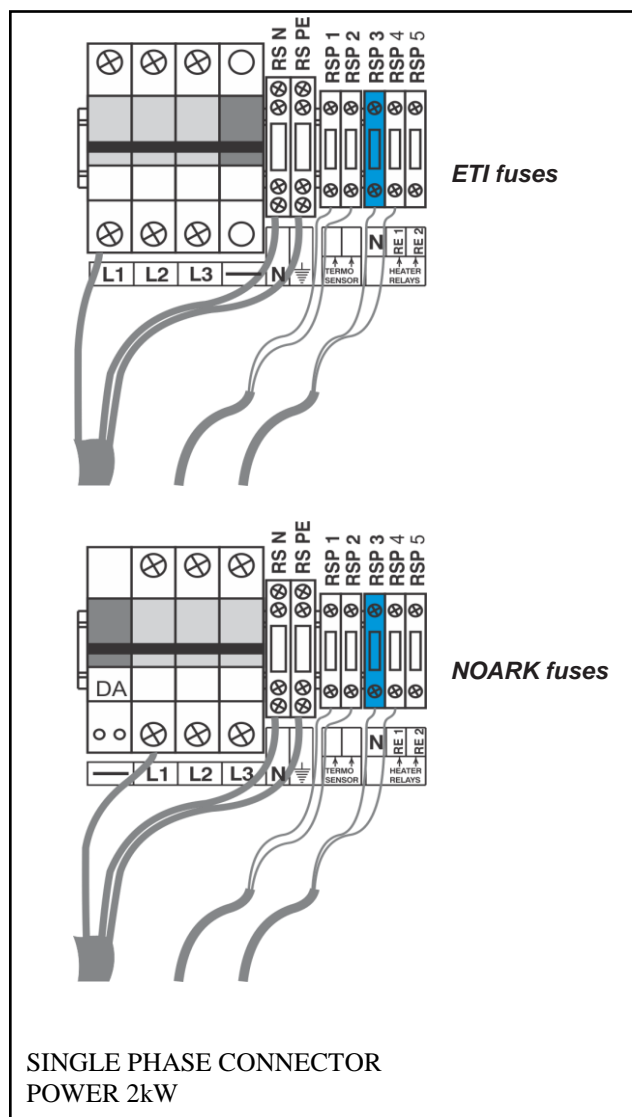


Image 7a: Shema for connecting cable to mono-phase power supply SINGLE PHASE CONNECTION POWER 2kW

RSP1, RSP2 – Temperature sensor connection terminals (with heat pump)
 RSP3– Neutral line connection clamps (from Heat Pump)
 RSP4– Signal connection clamps (230V AC) for switching on the heater relay (from the Heat Pump).

1N ~ 230V 50Hz	LIMITED POWER – 2kW
In[A]	1 × 8,7
Fuses [A]	1 × 16
Min. cable cross section	3 × 2,5mm ²

Table 7a: Nominal current, el. fuses and cross section of power supplies 2kW limited power cables for **single phase** power supply.

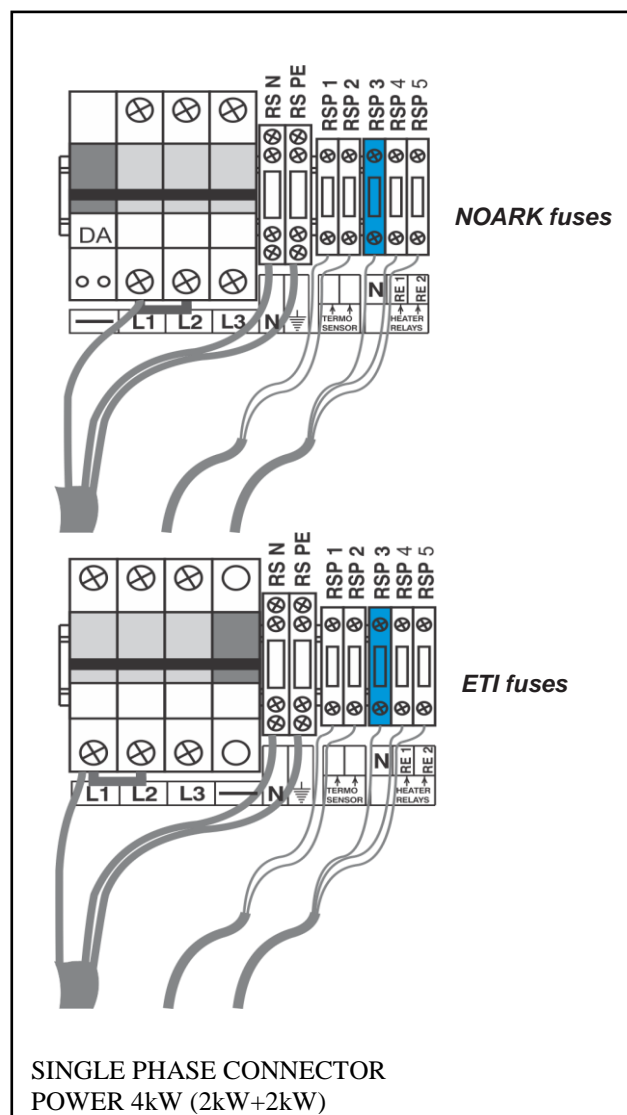


Image 7b: Shema for connecting cable to mono-phase power supply SINGLE PHASE POWER CONNECTION 4kW (2kW + 2kW)

RSP1, RSP2 – Temperature sensor connection terminals (with heat pump)
 RSP3– Neutral line connection clamps (from Heat Pump)
 RSP4, RSP5 – Signal connection clamps (230V AC) for switching on the heater relay (from the Heat Pump).

1N ~ 230V 50Hz	LIMITED POWER – 4kW
In[A]	1 × 17,4
Fuses [A]	1 × 25
Min. cable cross section	3 × 4mm ²

Table 7b: Nominal current, el. fuses and cross section of power supplies 4kW limited power cables for **single phase** power supply.

5.3 Connecting the power cable – Safety circuit

- The connection is made according to the wiring diagram given for each type of connection.
- Phase conductors are connected to circuit breakers, and line terminals of appropriate dimensions according to TK-ELG power are provided for connecting neutral and protective conductors.

A remote voltage trigger has been upgraded to the automatic fuses, so that together they form a SAFETY ASSEMBLY. In the event of overheating of the TK-ELG, the safety thermostat sends a signal to the remote voltage trigger, which activates and switches off the "fuse" of the circuit breakers, ie the TK-ELG remains without power - thus preventing any major breakdown. In order for the TK-ELG to continue to operate, the automatic fuses must be activated manually, which must be done by a service technician, after determining the cause of the overheating.



ATTENTION! When connecting phase conductors, be sure to tighten the screws in the terminal blocks well to achieve the best possible connection between the conductors and the clamps.



DANGER! Failure to connect the conductor and clamps properly may result in overheating of the terminal and failure.



NOTE! The connection of this device must be carried out by a qualified person who is qualified to perform this type of work.

- The neutral (neutral) line is connected to the appropriate clamps block (N). The neutral clamps line is blue.
- Connect the earth conductor to the clamps block marked with the earth sign. The line clamps for grounding the device is yellow-green.
- When inserting the power cord into the TK-ELG, carefully route the cable to the clamps blocks, taking care not to damage the cables inside the device.

5.4 Electrical scheme

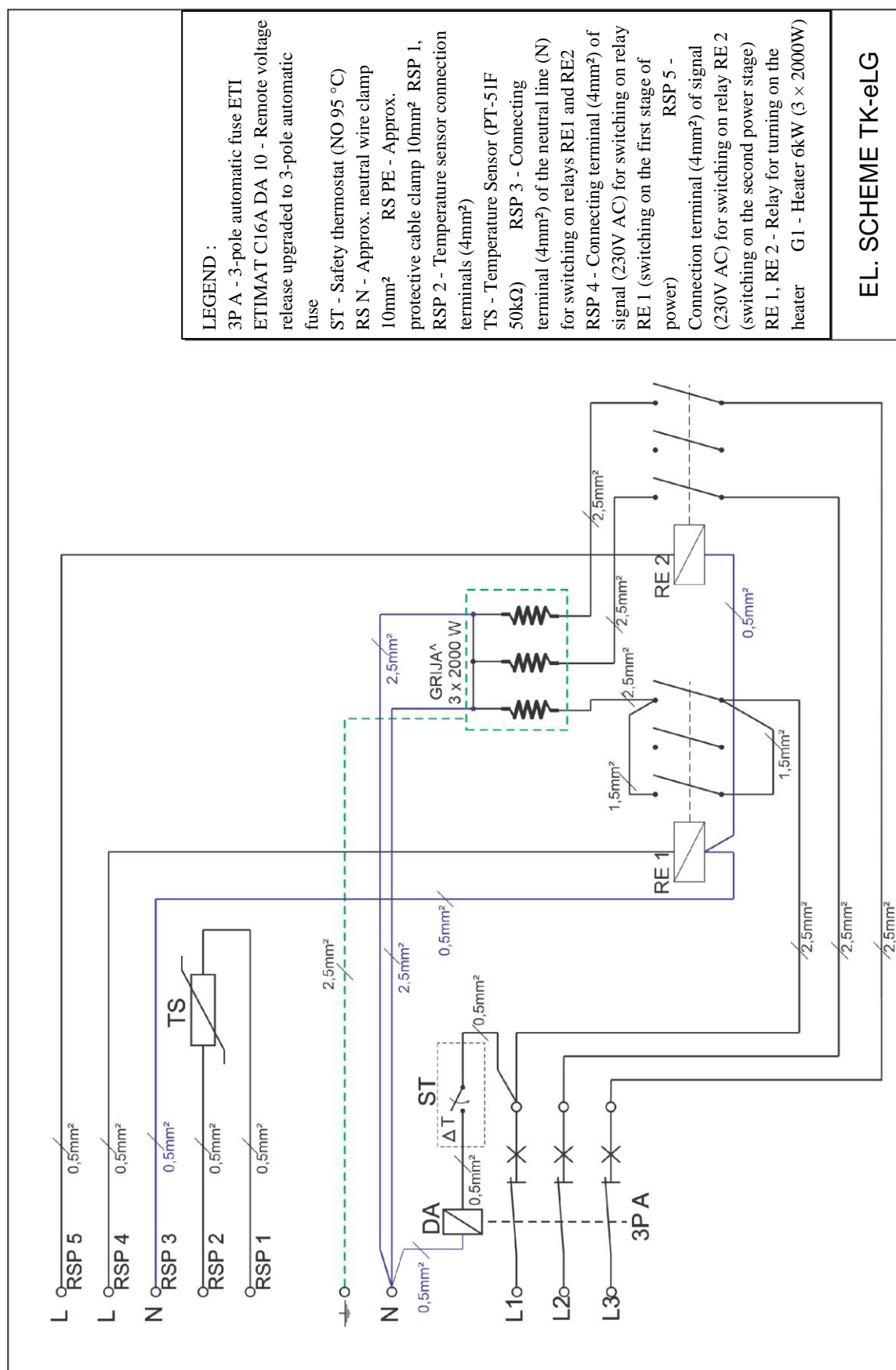


Image 8: Electrical scheme TK-eLG rated power 6 kW

6. Commissioning

When complete below described works fill in the Commissioning log (chapter 6.3)

6.1 Before commissioning



NOTE: Material damage occurred due to unprofessional operating!
Start-up without sufficient quantity of water destroys device.

- Turn on the TK-eLG and use it only if there is sufficient quantity of water



TK-eLG must work with minimum pressure of 0.5 bars

Before turn on, test if the following elements and joints are connector correctly and work correctly:

- Watertight of heating installation
- All pipes connected into ducts
- All electric connectors

6.2 First turn on



NOTE: Material damage due to incorrect handling!
Klijenta/korisnika uređaja uputite u rukovanje uređajem.

- Prior to commissioning for the first time, make sure that the heating system is filled with water and vented
- Check all electrical connections
- Switch on circuit breakers (protective circuit)

6.3 Start-up log

Commissioning works		Measured values	Notes
1.	TK-eLG type		
2.	Serial number		
3.	Set thermostat regulation	<input type="checkbox"/>	
4.	Fill and air-vent heating installation and check sealing of all connectors	<input type="checkbox"/>	
5.	Operating pressure established • Checked expansion vessel pressure	<input type="checkbox"/> _____ bar	
6.	Test safety devices	<input type="checkbox"/>	
7.	Set electric connection according to local regulations	<input type="checkbox"/>	
8.	Test function	<input type="checkbox"/>	
9.	Users informed, technical documentation submitted	<input type="checkbox"/>	
10.	Confirmation of professional commissioning	Service seal / Signature / Date	

Table 5: Start-up log

7. Operating the electric heater

7.1 Operating instructions

Safety instructions

- ▶ Only adults familiar with instructions and working mode may operate the TK-eLG
- ▶ Make sure there are no children in the TK-eLG area
- ▶ Do not dispose or store inflammable materials within safe distance of 400 mm round the boiler
- ▶ Inflammable materials must not be placed on the TK-eLG
- ▶ User must comply with instructions for operating the TK-eLG
- ▶ User may only turn on the TK-eLG (except the first start-up), adjust temperature on the regulating device and turn off the TK-eLG. All other operations must be performed by authorised service
- ▶ Authorised person who performed installation is obliged to inform the user about handling and correct and safe work of TK-eLG
- ▶ In the event of alert situation, explosion, fire, gas or steam leaking, the TK-eLG must not work
- ▶ Be aware of inflammable characteristics of components (**Instructions on installations and maintenance**)

8. Cleaning and maintenance



DANGER! Life threat of electric power shock!

- ▶ Electric power work must be done only by qualified person.
- ▶ Before opening device: turn heating installation off electric power supply using safety switcher and disconnect it from power supply net through corresponding fuse
- ▶ Secure heating installation against accidental turn on.
- ▶ Comply with instructions for installation.



WARNING: Material damage due to unprofessional maintenance!

Insufficient or unprofessional maintenance of TK-eLG can lead to damage or destruction and to loss of Warranty rights

- ▶ Secure regular, entire and professional maintenance of heating installation.
- ▶ Electric parts and work units protect against water and humidity.



Use only spare parts delivered by the manufacturer or those approved by manufacturer. There will be no responsibility for damage occurred due to spare parts not delivered by the manufacturer.



Control examination log is provided on chapter 8.4

- ▶ Perform works in accordance with log on control and maintenance
- ▶ All deficiencies remove immediately.

8.1 TK-eLG cleaning

Clean this device externally with wet cloth.

8.2 Check working pressure; re-fill water and air-vent installation



DANGER: Health threat due to mix of drinking water!

- ▶ It is demanding to respect state regulations to avoid mix of drinking water (with water from heating installations)
- ▶ Comply with EN 1717.



Establish an operating pressure of at least 0.5 bar, depending on the installation height

The volume of newly filled water is reduced in the first days after charging due to heating. This creates airbags that create interference in the heating system.

Testing working pressure

- ▶ Working pressure of new heating installation should control on daily basis at the beginning of its work. If needed, re-fill water and air vent the system
- ▶ Later check working pressure once per month. If needed, re-fill water and air vent the system
- ▶ Check working pressure. If it decreases below 1 bar re-fill water
- ▶ Re-fill the water
- ▶ Air vent the heating installation
- ▶ Check working pressure again

8.3 Re-fill the water and air-vent the installation



WARNING: Material damage due to heat tension. Filling heating installations in warm condition can produce cracks due to tension

- ▶ Fill heating installation only in cold condition (temperature of starting duct lines of max 40 °C)



WARNING: Material damage due to frequent re-filling!

Due to frequent water re-filling installations can be damaged by corrosion and carbonate layers depending on water characteristics

- ▶ Test sealing and watertight of heating installations and expansion dish on functionality.

- ▶ Connect hose on water faucet
- ▶ Fill the hose with water and connect to connector for filling/draining
- ▶ Tighten the hose and open the water faucet for filling/draining
- ▶ Slowly fill the heating installation while following up with pressure (manometer)
- ▶ During filling procedure air vents the system
- ▶ When reach working pressure close the drainage faucet
- ▶ When reach working pressure close the drainage faucet
- ▶ Remove the hose from filling/drainage faucet

8.4 Inspection and maintenance log



At least once a year perform maintenance or when a check shows the status of installations that require maintenance.

The commissioning, inspection and maintenance record serves as an attachment for copying

- Executed works should be authorised by signature and date.

Inspection and maintenance works when needed		Date: _____	Date: _____	Date: _____
1.	Check condition of installations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Visual and functional control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Making working pressure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Check pre-pressure of expansion dish	_____ bar	_____ bar	_____ bar
	• Working pressure set on ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Heating installation air vent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	• Check safety heating valve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Clean water filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Check if there is any damage on electric duct lines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Check if electric control connections and used elements are fitted; tighten it if needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Check thermo-regulator on boiler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Check function of safety parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Check remote control function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Check insulation of the rod heater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Check function of grounding device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Check insulation of electric switchboard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Check heating pump function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Make final control of inspection works and document results of measuring and inspecting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Seal/Signature	Seal/Signature	Seal/Signature
15.	Certification of professionally conducted inspection			

Table 13: Inspection and maintenance log

9. Environment protection /Waste disposal

One of the basic concepts of business is environment protection. Quality of products, thriftiness and environment protection are equally valuable goals for us.

It is critical to strictly comply with law and regulations on environment protection. In order to protect environment and respecting economy concepts we use only the best technique and materials.

Packaging

Regarding packaging, we respect system of recycling which is specific in certain states and which secure optimal recycling. All materials applied for packaging do not harm environment and it is possible to recycle it.

Old devices

Old devices contain valuable materials that can recycle. Structures are easily demountable and plastic materials are labeled. In such manner structures can be sorted and delivered for recycling.

10. Troubles and troubleshooting



Troubleshooting on regulations and hydraulics must be done by an authorised firm.





For repairs use only original spare parts.

TROUBLE	DESCRIPTION	CAUSE	MEASURE
TK-ELG does not react after turn on of main switcher	Display does not react, other components do not work	<ul style="list-style-type: none"> TK-ELG is out of power supply Fuses on bottom plate are off Vanishing of managing phase Damage of main fuse ON/ OFF 	<ul style="list-style-type: none"> Provide power supply Turn on fuses Check if fuses have three phases on output Change damaged part
TK-ELG does not heat or insufficiently heat/heating pump works	All on display are within recommended values but TK-ELG does not make hot water	<ul style="list-style-type: none"> Lack of 1 or 2 phases Small power of TK-ELG Some relay damaged Some heater damaged 	<ul style="list-style-type: none"> Check all three phases Check set power of TK-ELG Change damaged part Change damaged part
TK-ELG heats but it is very noisy	Higher level of noise during work	<ul style="list-style-type: none"> Air in the system Small water flow Possible carbonate layer on heater 	<ul style="list-style-type: none"> Check if the system is air vented and vent it Check valves below boiler and open it Clean filter below TK-ELG Take out heaters and clean it (this is not included in claims during warranty period)
TK-ELG turns on quickly	Reaches temperature too quickly and turns on	<ul style="list-style-type: none"> Valves below the TK-ELG off Pump fuse stop to work Pump inaccurate 	<ul style="list-style-type: none"> Open valves Change inaccurate part Change inaccurate part
Great oscillations of working pressure	Too fast and too big changes of working pressure	<ul style="list-style-type: none"> One valve off Expansion dish pressure inadequate Inaccurate dish 	<ul style="list-style-type: none"> Open the valve Check pressure in expansion dish and if needed set dish pressure adequately Change inaccurate part

Table 14: Troubles and troubleshooting

11. Product data sheet (in accordance with EU regulation no. 811/2013)

1.	Manufacturer	MIKOTERM DOO
2.	Brand name	TK-eLG
3.	Models	TK-eLG - 6kW, IP20
		TK-eLG - 6kW, IP54 left
		TK-eLG - 6kW, IP54 right

4.	Room heating: Seasonal energy-efficiency class			D
5.	Room heating: Nominal heat output(*8) (*11)	P_{rated}	kW	6
6.	Room heating: Seasonal energy efficiency(*8)	η_s	%	37,43
7.	Annual energy consumption(*8)	Q_{HE}	kWh	6600
8.	Sound power level, indoor	L_{WA} indoor	dB(A)	32
9.	 All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions.			
10.	 All of the data that is included in the product information was determined by applying the specifications of the relevant European directives. Differences to product information listed elsewhere may result in different test conditions. Only the data that is contained in this product information is applicable and valid.			

(*8) For average climatic conditions

(*11) For boilers and combination boilers with a heat pump, the nominal heat output " P_{rated} " is the same as the design load in heating mode " $P_{designh}$ ", and the nominal heat output for an auxiliary boiler " P_{sup} " is the same as the additional heating output " $sup(T_j)$ "



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