

ELEKTRA VCDR

Heating Cables



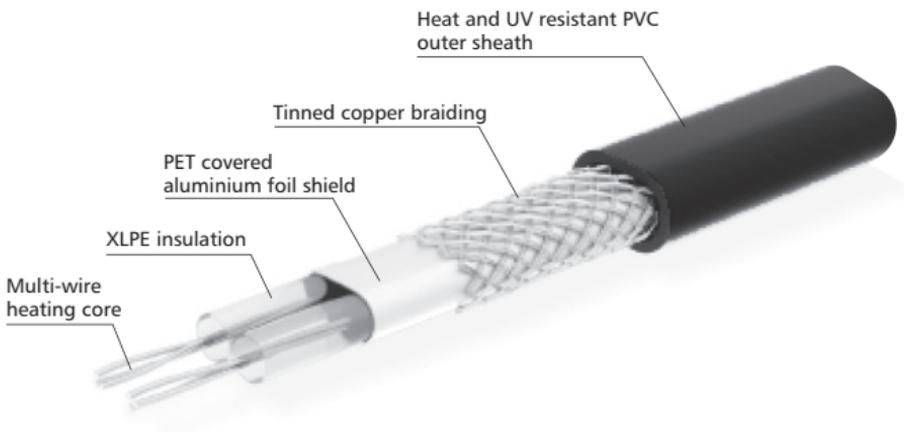
Applications

ELEKTRA VCDR heating cables with controller are intended for prevention of snow and ice deposition on:

- gutters,
- downpipes,
- roofs,
- roof troughs.

Anti-snow and anti-ice protection system will prevent:

- water freezing in gutters and downpipes along with the resulting damages,
- snow and ice accumulation on roofs,
- appearance of damp patches on wall elevations of buildings,
- icicle formation.



VCDR heating cable structure

Characteristics

- The heating cables are produced in ready-made units of the lengths from 9.5 up to 175 m,
- The cables are terminated at one end with a 4 m-long power supply conductor, and a connecting joint at the other,
- Specific heat output for VCDR cables: 20 W/m,
- Power supply voltage: 230 VAC, 50/60 Hz,
- External dimensions: $\approx 5 \times 7$ mm,
- Min. installation temperature: -5°C ,
- Min. cable bending radius: 3.5 D,
- Heating cables are screened, and their mains connection via a residual current device constitutes effective anti-shock protection,
- Heating cables and power supply conductors' sheaths are UV resistant.

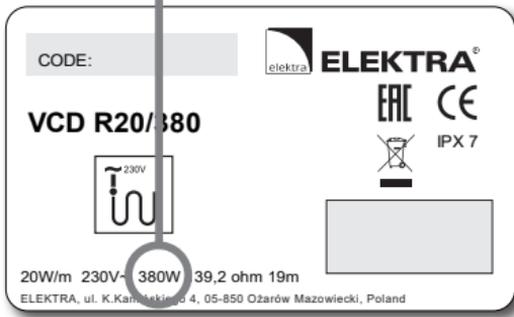


- 1 "cold tail" power supply conductor
- 2 ELEKTRA VCDR heating cable
- 3 connecting joint between the power supply conductor and the heating cable

Note:


VCDR heating cables are designed for the rated voltage 230 VAC, 50 Hz.

Heating cables' heat output may vary with +5% and -10% from the label values.



Self-adhesive label

The label features the following pictograph:



Single-side powered heating cables

Note:


Never cut the heating cable.

Never trim the heating cable, only the power supply conductor may be trimmed if required.

Never squash the "cold tail".

Never bend the joint and end seal.

Do **not ever** undertake on your own any attempts to repair the heating cables, and in case any damage is detected, report the damage to an ELEKTRA authorized installer.

Never stretch or strain the cable excessively, nor hit it with sharp tools.

Do **not** install the heating cables when ambient temperature drops below -5°C.

Note:

Heating cables **must** be installed in accordance with the instructions.

The mains connections of the heating cable **should** be carried out by an authorised electrician.

General information

Required heat output selection will depend on the regional climate conditions.

Application of the selected heat output

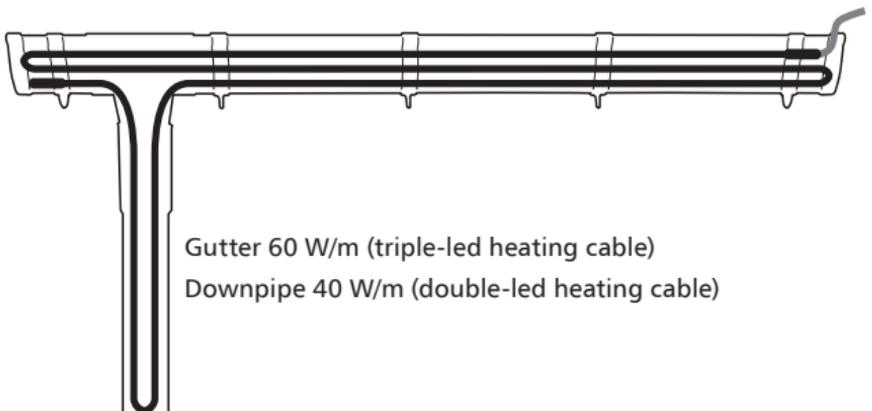
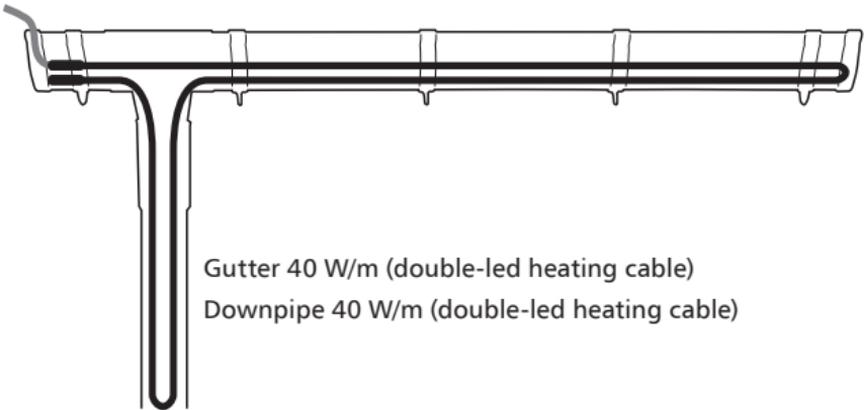
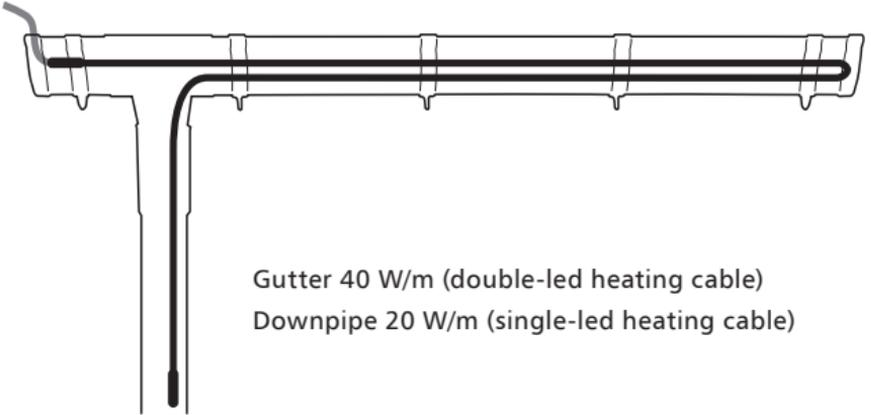
Ambient temperature	Heat output			
	> -5°C	-5°C ÷ -20°C	-20°C ÷ -30°C	< -30°C
Gutters	20W/m	20-40W/m	40-60W/m	60W/m
Downpipes	20W/m	20-40W/m	20-40W/m	40W/m
Roof troughs	200W/m ²	200-250W/m ²	250-300W/m ²	350W/m ²
Roof edges	~150W/m ²	~250W/m ²	~300W/m ²	~350W/m ²
Roof area extending beyond the building outline	~250W/m ²	~300W/m ²	~350W/m ²	~500W/m ²

The values given above refer to a gutter of the Ø 100-125 mm diameter.

Gutters of larger diameters require application of the 20 W/m higher heat output.

Flat roofs, or when roof snow barriers are installed, which would cause snow deposition, require increase of the given values with approx. 15%.

Examples of VCDR heating cable installation in gutters and downpipes



Controls

For maintenance-free control of the anti-snow and anti-ice protection system of roofs and gutters, DIN-bus installed controllers ELEKTRA ETR2R, ELEKTRA SMCR or ELEKTRA ETOR2 with temperature and moisture sensors can be applied. The controller will keep the heating system on standby and only switch it on when necessary, i.e. both of the following conditions will be fulfilled:

- ambient temperature will reach the previously programmed value (e.g. $+1^{\circ}\text{C}$),
- moisture sensor will detect snowfall.



ELEKTRA ETR2R controller – max. load up to 16 A (total output of installed heating cables must not exceed 3600 W)



ELEKTRA ETOR2 controller – max. load up to 3x 16 A – two moisture sensors can be connected, suitable for controlling two different roof zones (for applications in extended heating systems).



ELEKTRA SMCR controller – max. load up to 2x16 A. For applications in extended heating systems. Enables remote operation via a web browser and signaling of operating status or errors.

As standard, equipped with one air temperature sensor and moisture sensor. Additional moisture sensor can be connected to this controller, which will enable protection of two independent roof areas.

Controllers are equipped with:

- ETF-744 air temperature sensor,
- ETOR-55 moisture sensor.



Stage 1

Installation in gutters and downpipes

Preliminary proceedings:

- measure the length of gutters and downpipes,
- assess the required heat output resulting from the climate conditions in which the installation is to be made,
- select the proper length of the heating cable taking into account the number of the cable's segments in the gutter and downpipe.

Note:



If the water from downpipes is discharged directly to the rain channel, the segment of the downpipe from the surface level to the soil freezing depth also should be heated.

If the calculated heating cable length has no direct equivalent in the available ready-made units, select the longer cable and lead excess cable in the pipe.

Heating cable fixing in gutters and downpipes

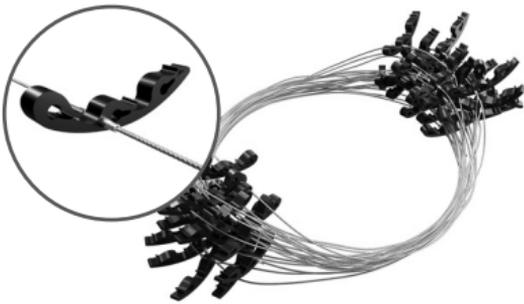
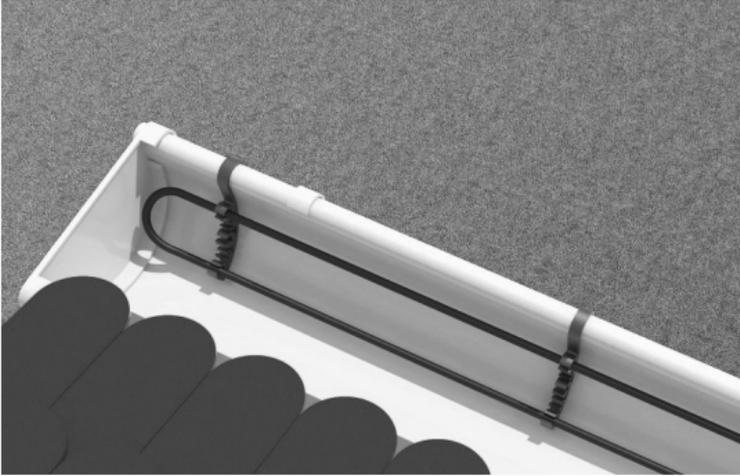
Heating cables should be fixed in order to maintain steady spacing between neighbouring cable's segments. The segments must not touch or cross.

Gutters

Heating pipes can be fixed with holders (holder spacing should not exceed 30 cm) or a wire with clips.



Gutter holder GH-2



Gutter spacing wire with clips GSW-2



Cable fixing in the gutter
with a wire with clips

Heating Cables

Downpipes

Single-led heating cables – do not require fixing if the length of the heated downpipe does not exceed 6 m.

Double-led heating cables – to be fixed with holders (holder spacing should not exceed 40 cm) or a wire with clips. Wire with clips are applied when the length of the heated downpipe exceeds 6 m.



Downpipe spacing clip DSC-2



Downpipe spacing wire with clips DSW-2



Leading the cables in gutters and downpipes

Protect the joining spot of the gutter and downpipe with a flexible cable support to prevent possible damage to the cable.

When using the wire with clips in the downpipe, suspend it on the support bar.

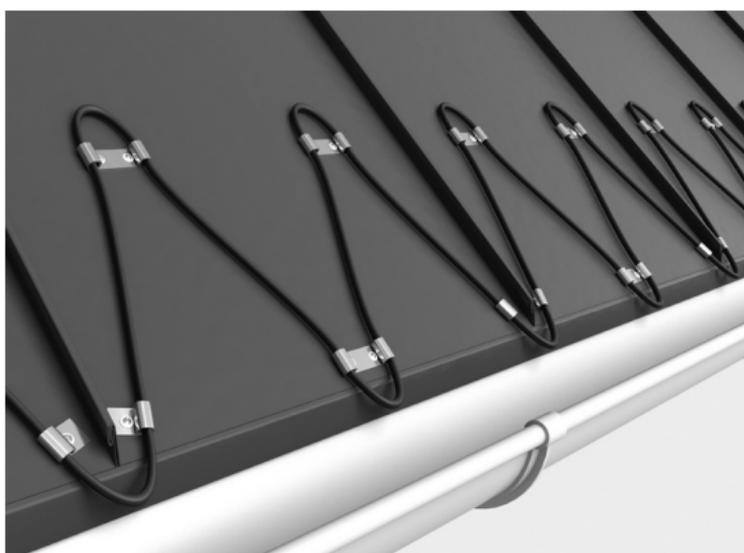


- ① support bar DSW-SB-1
- ② flexible cable support FCS-1-SS

Installation on roofs and in roof troughs

In regions of intense snowfall, gutter or down-pipe heating will not ensure complete removal of snow and ice. It is necessary to warm up the roof edge adjoining the gutter, at the width of approx. 50 cm. Especially roof valleys and drains are vulnerable to snow deposition.

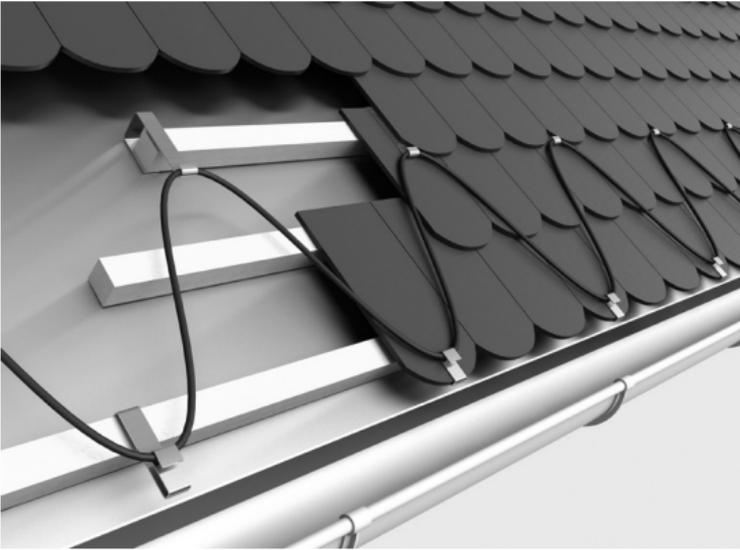
Roofs



Heating cables need to be fixed to the roof surface with copper or titanium zinc installation holders.

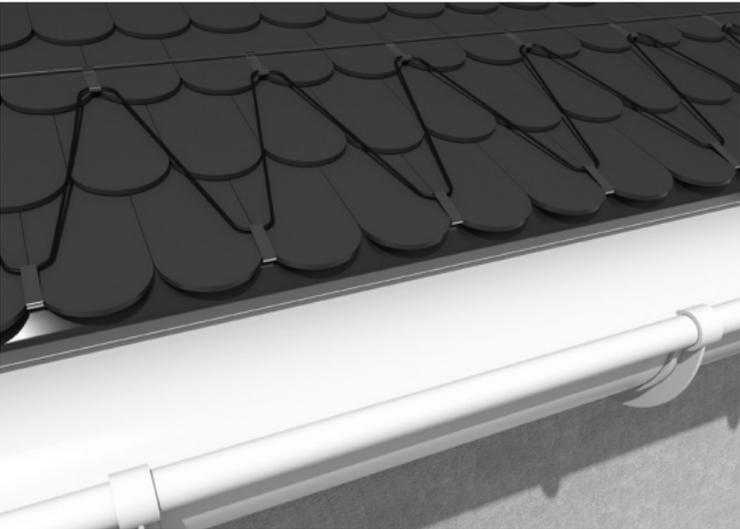
If the roof covering is metal sheet, the holders can be:

- glued to the roof surface,
- fixed with screws (fixing spots needs to be carefully sealed with silicone),
- suspended on the insulated structural wire.



If the roof covering is tiles, the holders can be:

- fixed to the battens,
- fixed both to the battens and the structural wire.



Copper RE-IH-1-CU or titanium zinc RE-IH-1-ZNTI
installation holders

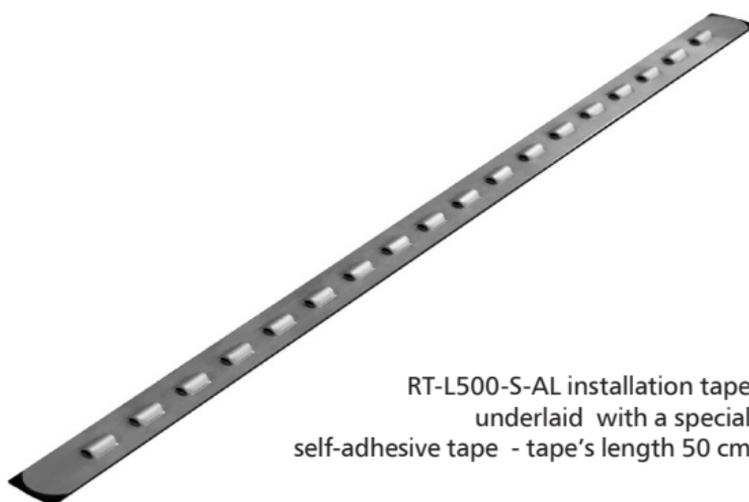
Heating Cables

Roof troughs

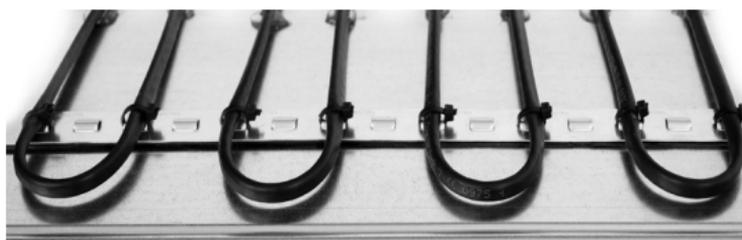
Heating cables need to be fixed in roof troughs with aluminium installation tape underlaid with self-adhesive tape (modified acrylic glue) used for permanent fixing with metal or plastic surfaces.

Minimal temperature for cable installation is -5°C .

Before fixing the installation strip, remove grease from the metal or plastic surface.



RT-L500-S-AL installation tape underlaid with a special self-adhesive tape - tape's length 50 cm



Note:

Cable ties must be UV resistant.



Note:

Spacing between tapes should not drop below 30 cm.



For roof troughs of small gradient (when tape fixing to the surface is not necessary), it is possible to apply plastic installation band.



RT-IB-1-P plastic
installation band
- band's length 100 cm



Note:



Spacing between bands should not drop below 30 cm.

Stage 2

After the heating cable has been laid:

- stick into the Warranty Card the self-adhesive label, on the power supply conductor of the heating cable,
- feed the power supply conductor (“cold tail”) of the heating cable into the enclosure,
- perform the measurements of:
 - heating core’s resistance,
 - insulation’s resistance.

The measurement results of the heating core’s resistance should not vary from the label value with more than -5%, +10%.

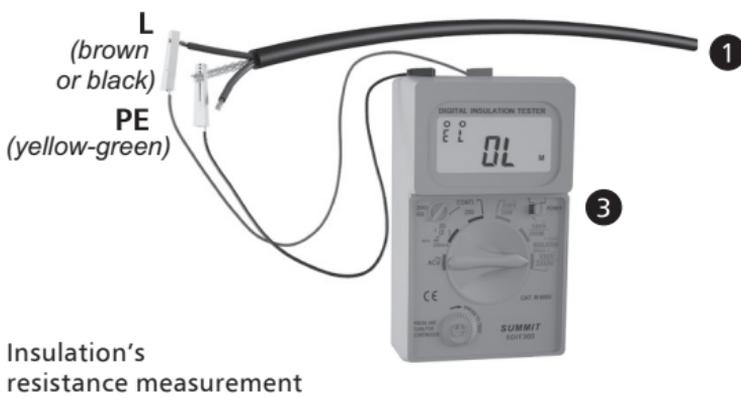
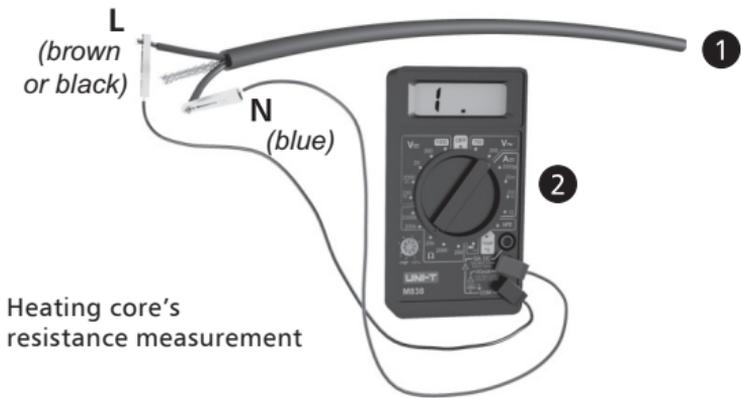
The heating cable insulation’s resistance, as measured with an appliance of the rated voltage 1000 V (megaohmmeter), for at least 30 seconds and its value should not drop below 50 M Ω . Enter the results into the Warranty Card.

After the cables have been laid, repeat the measurements to check whether the heating cable has not been damaged during installation works (the power supply conductor can be extended with a junction box or a heat shrink joint set).

Note:



In case of planned delay in connection of the heating cable to the electrical installation, seal the power supply cable of the heating cable against the possibility of internal moisture penetration using a protective cap placed on the conduit or a heat shrinkable end cap.

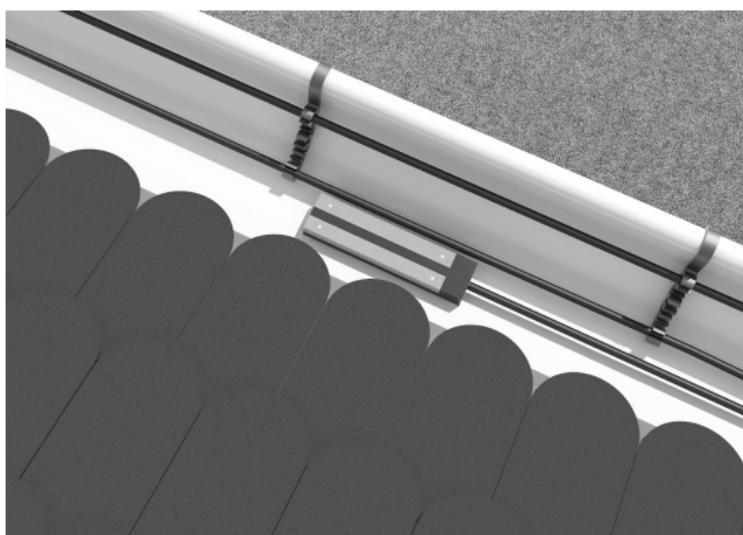


- 1 Power supply conductors
- 2 Ohmmeter
- 3 Megaohmmeter

Stage 3

Installation of temperature and moisture sensors

The moisture sensor should be placed at the bottom of the gutter, on the south facing wall. The external temperature sensor should be installed on the north facing wall, not directly exposed to sunlight.



Moisture sensor positioned in the gutter

The air temperature and moisture sensors' wires should be fed into the enclosure where the controller will be positioned.

The sensors' wires can be extended using a control cable (the temperature sensor's wire using a $2 \times 1.5 \text{ mm}^2$ -diameter wire, and the moisture sensor's wire using a $4 \times 1.5 \text{ mm}^2$ -diameter wire), with a heat shrink joint set.

Stage 4

Temperature controller's installation

Note:



The heating cable connection to the domestic electric circuit should be performed by an authorised electrician.

The controller is to be installed in an enclosure.

The power supply should be equipped with the following protective devices:

- residual current device,
- circuit breaker with overload protection.

The connection of the:

1. mains,
2. power supply conductors ("cold tails") of the heating cable,
3. temperature sensor's wires,
4. moisture sensor's wires,

in the temperature controller should be executed according to the schematics included in the temperature controller's Instructions.

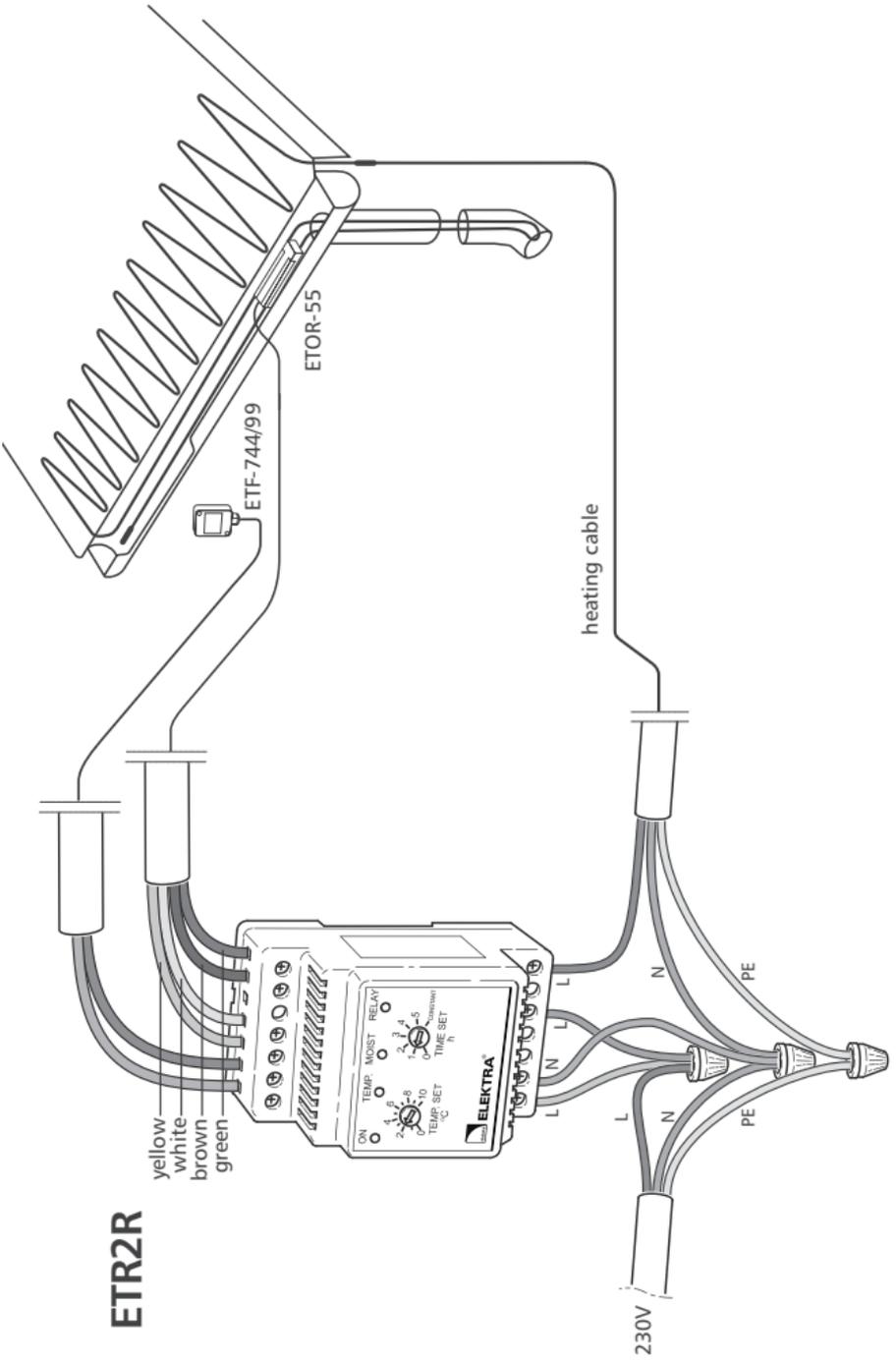
Note:



Protective (green-yellow) wire of the heating cable should be connected to the PE terminal clamp in the enclosure.

If more than one heating cable has been installed, the cables must be connected in parallel, i.e. the same type of cables (cables of the same colour) should be connected to the same controller's terminal.

Heating Cables



Connection diagram for the ETR2R temperature controller

Anti-shock protection

The domestic electric circuit of the heating cable should be equipped with a residual current device of the sensitivity level $\Delta \leq 30$ mA.

Maintenance

The protection system is maintenance-free. The User should, though, clean the gutters and down-pipes from leaves and other waste before each heating season.

Warranty

ELEKTRA company grants a 10 year-long warranty (from the date of purchase) for the ELEKTRA VCDR heating cables.

Warranty Conditions

1. Warranty claims requires:
 - a. that the heating system has been executed in full accordance with the Installation Instructions herein, by a certified electrician,
 - b. presentation of the properly completed Warranty Card,
 - c. presentation of the proof of purchase of the heating cable under complaint.
2. The Warranty loses validity if any attempt at repair has been undertaken by an unauthorised installer.
3. The Warranty does not cover the damages inflicted as a result of:
 - a. mechanical fault,
 - b. incompatible power supply,
 - c. lack of adequate overload and differential protection measures,
 - d. discord of the domestic heating circuit with the current regulations in force.
4. Within the Warranty herein, ELEKTRA company undertakes to bear exclusively the costs required to cover the necessary repairs to the heating cable itself, or to exchange the cable.
5. The Warranty covering the purchased commercial goods does not exclude, limit or suspend other Buyer's rights resulting from the incompatibility of the goods purchased with the agreement of purchase.

Note:



The Warranty claims must be registered with the Warranty Card and proof of purchase, in the place of purchase or the offices of ELEKTRA company.

The Warranty Card must be retained by the Client for the entire warranty period of 10 years.
The Warranty period starts on the date of purchase.

ELEKTRA VCDR

Heating cables

PLACE OF INSTALLATION

Address	
Zip code	City/town

The Warranty claims must be registered with the Warranty Card and proof of purchase, in the place of purchase or the offices of ELEKTRA company.

TO BE COMPLETED BY AN INSTALLER

Name and Surname		Electrical authorisation certificate N°	
Address		E-mail	
Zip code	City/town	Phone N°	Fax

Heating cable's core resistance	Ω
Insulation's resistance	$M\Omega$

Date	
Installer's signature	
Company's stamp	

Note: Heating core's resistance measurement result should not vary from the nameplate with more than -5%, +10%.
 The heating cable's insulation resistance, as measured with a megohmmeter of the rated voltage 1000 V, should not drop below 50 $M\Omega$.



NOTE!

**Please stick here the self-adhesive label
positioned on the product
(to be done before the heating cable
has been installed)**