

# LARX Carbon Film

LARX-CF180W050S

## Installation manual for partners

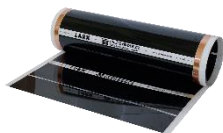
A simple solution for efficient heating in households  
For dry installation



 **CARBON-FILM.COM**

## Required material

- › LARX Carbon Film  
LARX-CF180W050S
- › Clamp connectors  
LARX-CLAMP001X20P
- › Butyl tape for cut and connector insulation, width 5 cm  
LARX-BT005S020L
- › Power cables 2,5 mm<sup>2</sup> (brown, blue)  
LARX-WBROWN-25D050L, LARX-WBLUE-25D050L
- › Protective PE film  
LARX-PE-120S2000L
- › Thermostat  
LARX-TERM-TOUCH or LARX-TERM-WIFI-T



## Required tools

- › Clamp plier  
LARX-CLAMPPLIER001
- › Wire stripper  
LARX-WIRESTRIPPER001
- › Nippers
- › Scissors
- › Snap-off knife
- › Screwdriver
- › Tape
- › Resistance meter
- › Thermal imager or contactless thermometer



## Mandatory installation conditions

- › LARX Carbon Film must be installed and used according to the valid local standards and requirements in that country.
- › LARX Carbon Film is designed to be installed dry way. Not suitable to install under screed. Not suitable for bathrooms. It must be fixed to the ground in a suitable way to prevent its displacement.
- › Inside the floor construction under LARX Carbon Film must be a waterproofing to prevent raising humidity to LARX Carbon Film. Humidity of the ground must be less than 2 %. LARX Carbon Film must not be installed on constructions with excessive humidity.
- › The ground for installation of LARX Carbon Film must be flat, without unevenness and dirt. It can't be installed bent.
- › LARX Carbon Film must be protected against damage during installation and after.
- › Individual LARX Carbon Film strips must not cover each other. LARX Carbon Kit can't be installed over expansion joints and under door.
- › It is not allowed to make holes in LARX Carbon Film. All cuts and connectors must be insulated by a butyl tape with enough overlap.
- › It is not possible to place LARX Carbon Film under non-movable furniture and bathroom equipment.
- › LARX Carbon Film can't be installed in temperatures under 3 °C and exposed to temperatures over 80 °C.
- › LARX Carbon Film can't be covered by flooring or a barrier with thermal resistance higher than 0,14 m<sup>2</sup>K/W.
- › LARX Carbon Film must be over the entire surface covered by a protective PE film with minimum thickness 0,2 mm and minimum overlap 10 cm. The

PE film must fulfil the local standards for electrical isolation (protection class II).

- › The installation must allow electrical disconnection of all poles of LARX Carbon Film, the distance of the disconnected contacts must be at least 3 mm.
- › The power circuit must have an RCD with  $I_{\Delta n} = 30$  mA.
- › Every supplier and user must be instructed to avoid drilling, digging or nailing into floor with LARX Carbon Film.
- › Flooring over LARX Carbon Film must be protected against unprofessional disassembly. During installation can be used only construction chemistry suitable for floor heating.
- › In the switchboard of the heating system must be placed filled and signed Warranty certificate. In the switchboard must be glued a label indicating floor heating.
- › User must be instructed how to operate LARX Carbon Film.
- › Installation and use of LARX Carbon Film must fulfil conditions listed in this manual. Other installation and use can be dangerous, and the warranty is void.

## Recommended minimal floor thermal insulation

Floor positioning	Polystyrene thickness
On terrain	60 mm
Above cellar	60 mm
Above heated space	20 mm
Above exterior	100 mm

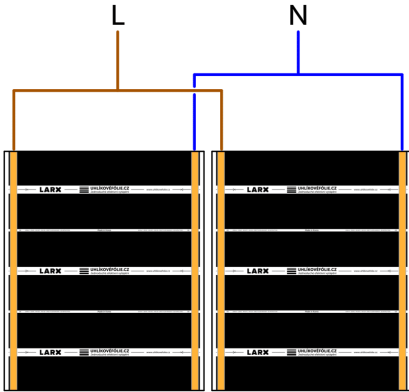
## Regulation

Floor heating by LARX Carbon Film must be controlled by a thermostat with a floor sensor. The floor sensor must limit the maximum floor temperature in living rooms according to the local standards.

The current through the thermostat must not exceed 80 % of the nominal maximum current indicated on the thermostat.

A suitable regulation is at [www.carbon-film.com/regulation](http://www.carbon-film.com/regulation)

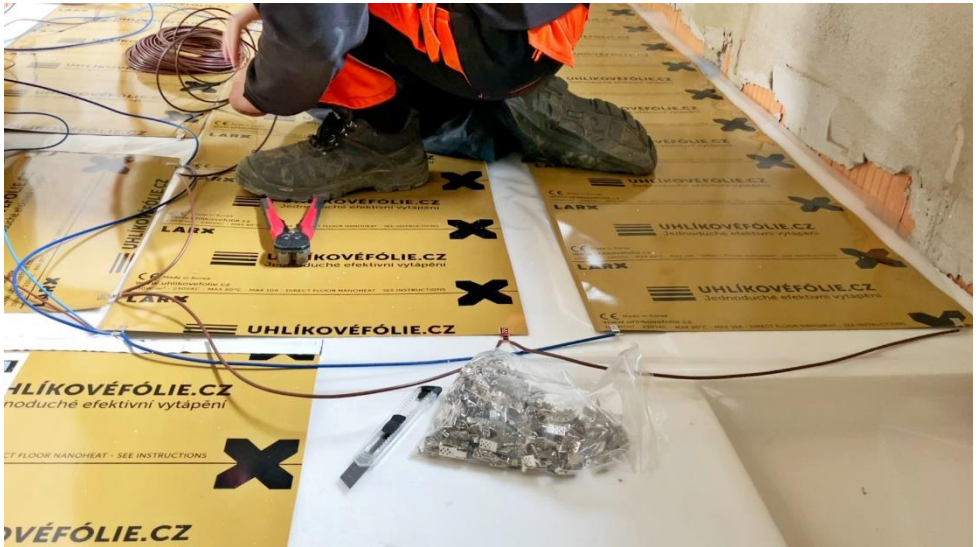
## Connecting two LARX Carbon Film strips



### Parallel connection

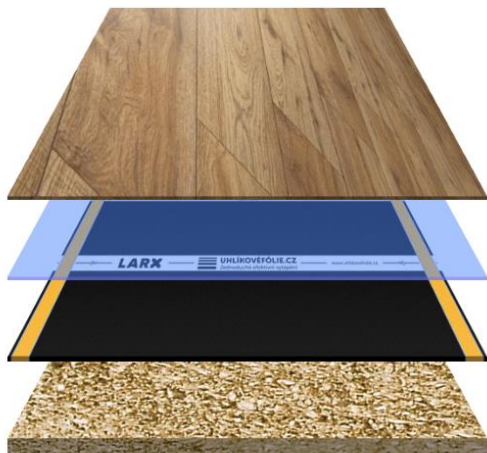
Full power, any number of strips up to 10 A, when connecting in parallel different strip lengths can be connected.

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$$



## Application directly under floating flooring

### Floor composition



Any flooring with click system (suitable for electric floor heating)

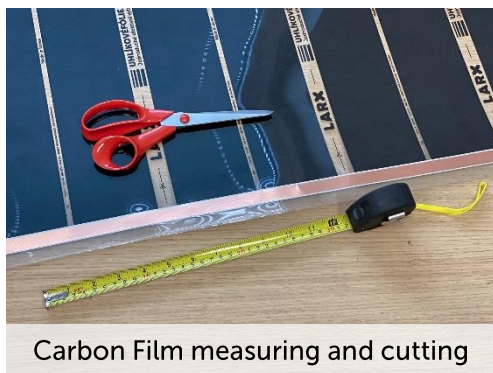
PE film 0,2 mm

**LARX Carbon Film**

Acoustic insulation

### Installation procedure

1. On a cleared floor without unevenness place an acoustic insulation (e.g. hobru). It serves also as a thermal insulation. The LARX Carbon Film's power cables are laid into grooves in this acoustic insulation.
2. According to the project measure and cut strips of LARX Carbon Film.



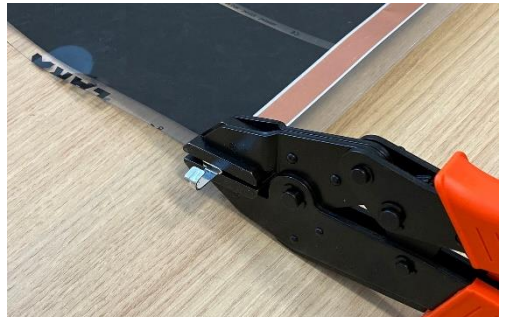
Carbon Film measuring and cutting



3. Lay LARX Carbon Film in the designated place and fix it against displacement in a suitable way (e.g. silver tape). Never use nails or screws.
4. Insert the connectors into a gap between bottom lamination and the copper bar (see the picture). By the clamp plier press the connectors to the film. The free end of the connector must be pointing upwards.
5. Measure the electrical resistance according to the Warranty certificate.
6. Strip the power cables by a wire stripper. For the first strip of LARX Carbon Film remove the insulation on the end of the cable. In the case of next strips, remove the insulation continuously (see picture). Press the cable into the connector by the clamp plier. Then check everything carefully.



Important is exact connector place

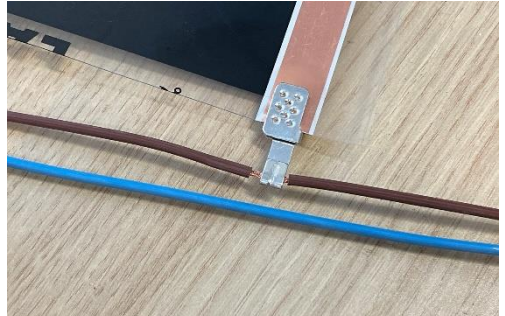


Connector pressing by clamp pliers



Wire stripping

7. With four butyl tapes (8 x 5 cm rectangles) insulate with 1cm overlap the connectors. The connectors must be completely covered and insulated! On the other end of the strip insulate the copper bars each with one butyl tape rectangle folded in half.
8. Prepare grooves in the acoustic insulation and lay into them the power cables and eventually the insulated ends of LARX Carbon Film. The cables are not allowed to cross and must be fully imbedded.
9. A professional person with the electrician certificate connects LARX Carbon Film inside a wiring box or a thermostat.
10. In the case of more LARX Carbon Film strips in one room it is possible to connect them in series or in parallel (according to the required power) up to maximum current 10 A (2 300 W). The best way to connect them is inside a wiring box using e.g. WAGO clamps.



Pressing power cables in connector



Bottom insulation of connectors



Upper insulation of connectors

**11.** For a floor heating it is necessary to place a temperature sensor into a groove in the acoustic insulation (directly under LARX Carbon Film) and fix it against displacement (sensor is sold with thermostat).



Opposite end insulation

**12.** Cover all LARX Carbon Film strips with a protective PE film with minimum thickness 0,2 mm and minimum overlap 10 cm.

**13.** Measure the electrical resistance according to the Warranty certificate and draw the position of every LARX Carbon Film strip, cable, connection and device.



Floor sensor under Carbon Film

**14.** Check everything and lay flooring with click system according to instructions of the manufacturer. Be careful to avoid damage of LARX Carbon Film.



PE film cover, note el. resistance into the Warranty certificate

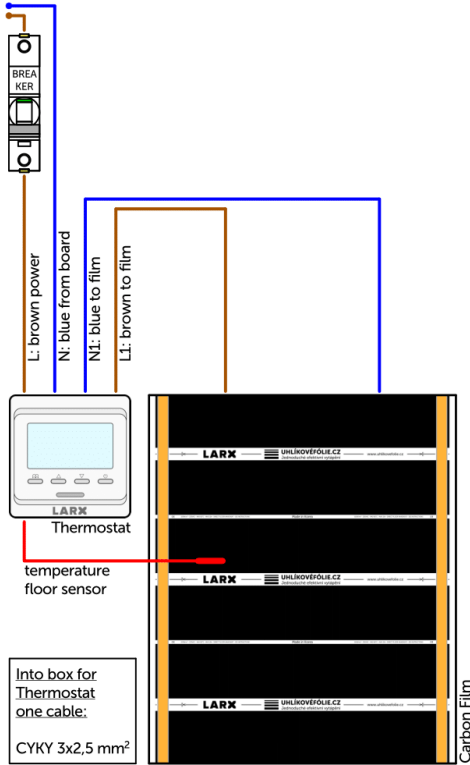
### **Application directly under floating flooring – first heating**

- › On the first day set the floor temperature to current room air temperature (but maximum 18 °C).
- › In the following days increase the floor temperature gradually by 2 °C per day up to 28 °C.
- › Keep the floor temperature at 28 °C for next three days.
- › Then lower the floor temperature by 4 °C per day to 20 °C..

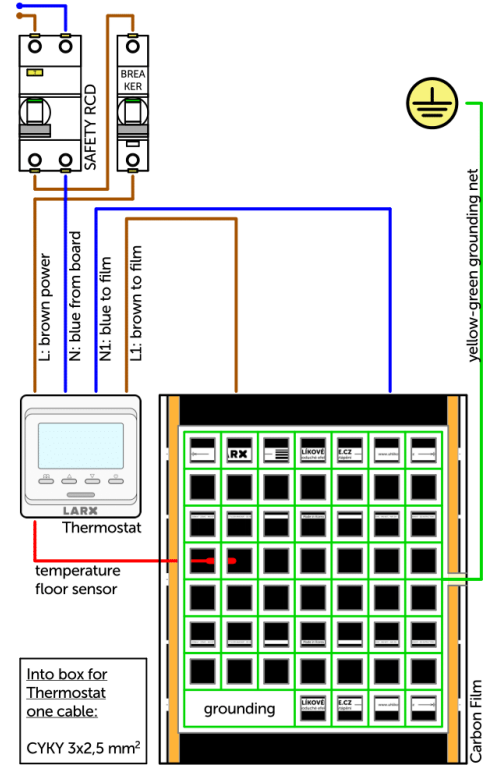
## Simple way of switchboard connection

Basic way of connection. Thermostat directly switches carbon film power.

### Without grounding net



### With grounding net (bathrooms)

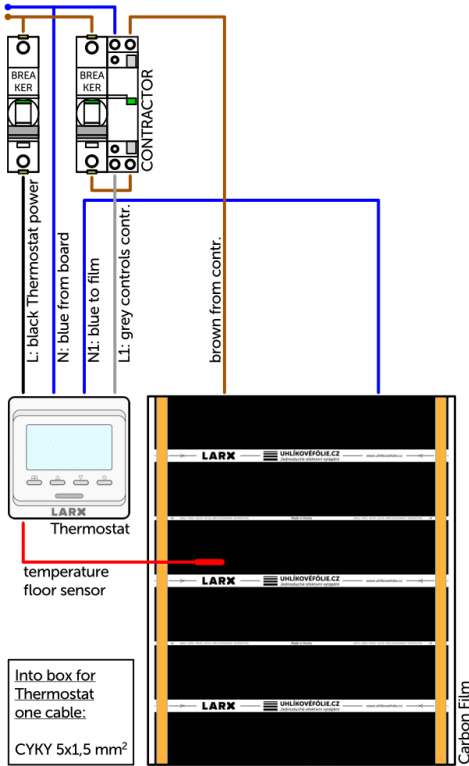


Note: Outputs marking is valid for LARX LCD Thermostat. For other thermostats check their manual.

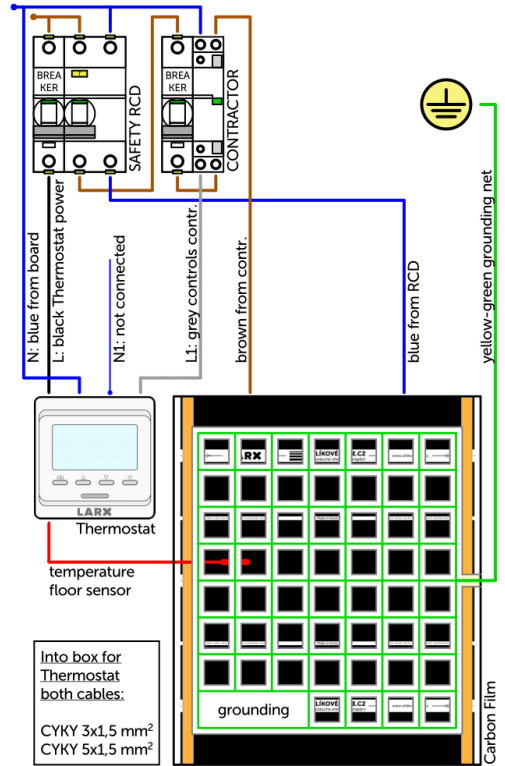
## Recommended way of switchboard connection

More complicated but more convenient way of connection. Thermostat only controls contractor in switchboard. The contractor switches carbon film power. The advantage is extended life of the thermostat and more possibilities.

### Without grounding net



### With grounding net (bathrooms)



Note: Outputs marking is valid for LARX LCD Thermostat. For other thermostats check their manual.

## **Your notes**

## Warranty

Supplier of LARX Carbon Film provides a warranty on its operation for 2 years. The warranty period starts from the date of its installation, but not later than 6 months from the date of its sale.

Also, these conditions must be fulfilled:

- › Mandatory installation conditions and installation procedures in this manual have been fulfilled without an exception.
- › Installation has been done by a professional person with the electrician certificate.
- › Filled and signed Warranty certificate is submitted.
- › LARX Carbon Film delivery note or invoice is submitted.
- › LARX Carbon Film has not been damaged by its user or a third person.

If not fulfilled the supplier does not guarantee functionality of the system and installation. Warranty is then void.

The Complaints procedure is at [www.carbon-film.com/complaints-procedure](http://www.carbon-film.com/complaints-procedure)

## For more information



[www.carbon-film.com](http://www.carbon-film.com)

[info@carbon-film.com](mailto:info@carbon-film.com)

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