

LARX Resilient Carbon Film

LARX-RF150W050S

Installation manual for partners

A simple solution for efficient heating in households

For dry or wet installation



 **CARBON-FILM.COM**

Required material

- › LARX Resilient Carbon Film
LARX-RF150W050S
- › Clamp connectors
LARX-CLAMP001X20P
- › Butyl tape for cut and connector insulation, width 5 cm
LARX-BT005S020L
- › Power cables 2,5 mm² (brown, blue)
LARX-WBROWN-25D050L, LARX-WBLUE-25D050L
- › Grounding net (if required by standards, e.g. in bathrooms)
LARX-ZEMSIT-100S200L
- › 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 Resilient Carbon Film must be installed and used according to the valid local standards and requirements in that country.
- › LARX Resilient Carbon Film is designed to be installed dry or wet way. It must be fixed to the ground in a suitable way to prevent its displacement.
- › Inside the floor construction under LARX Resilient Carbon Film must be a waterproofing to prevent raising humidity to LARX Resilient Carbon Film. Humidity of the ground must be less than 2 %. LARX Resilient Carbon Film must not be installed on constructions with excessive humidity.
- › The ground for installation of LARX Resilient Carbon Film must be flat, without unevenness and dirt. It can't be installed bent.
- › LARX Resilient Carbon Film must be protected against damage during installation and after.
- › Individual LARX Resilient 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 Resilient Carbon Film. All cuts and connectors must be insulated by a butyl tape with enough overlap.
- › It is not possible to place LARX Resilient Carbon Film under non-movable furniture and bathroom equipment.
- › LARX Resilient Carbon Film can't be installed in temperatures under 3 °C and exposed to temperatures over 80 °C.
- › LARX Resilient Carbon Film can't be covered by flooring or a barrier with thermal resistance higher than 0,14 m²K/W.
- › LARX Resilient 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 Resilient Carbon Film, the distance of the disconnected contacts must be at least 3 mm.
- › The power circuit must have an RCD with $I_{\Delta n} = 30 \text{ mA}$.
- › In bathrooms, LARX Carbon Film can be installed only with a grounding net (fulfilling conditions of the local standards) which must be grounded (PE), e.g. our product LARX-ZEMSIT-100S200L.
- › Every supplier and user must be instructed to avoid drilling, digging or nailing into floor with LARX Resilient Carbon Film.
- › Flooring over LARX Resilient 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 Resilient Carbon Film.
- › Installation and use of LARX Resilient 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

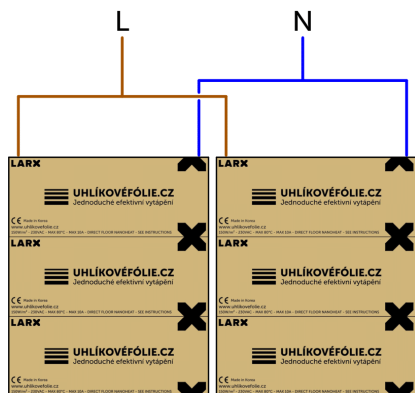
Regulation

Floor heating by LARX Resilient 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

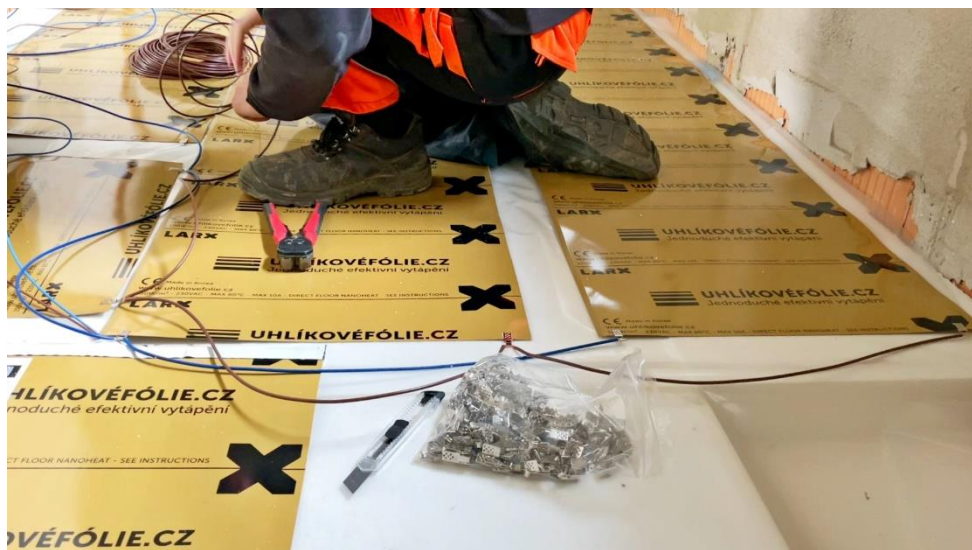
Connecting two LARX Resilient Carbon Film strips



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 / tiles
(suitable for electric
floor heating)

PE film 0,2 mm

LARX Res. Carbon Film

Acoustic insulation

Installation procedure

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



Carbon Film measuring and cutting

3. Lay LARX Resilient 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. By the clamp plier press the connectors to the film. Exact positioning is important – the connector must be in place of the copper strip inside 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 Resilient 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

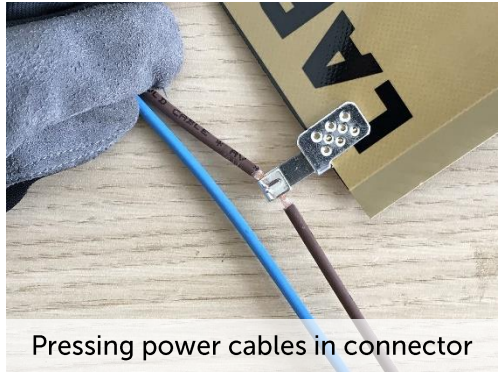


Connector pressing by clamp pliers



Wire stripping

7. With two butyl tapes insulate the cut and the connectors. Both must be completely covered and insulated! Insulate the other end of the strip with one butyl tape folded in half.
8. Prepare grooves in the acoustic insulation and lay into them the power cables and eventually the insulated ends of LARX Resilient Carbon Film. The cables are not allowed to cross and must be fully imbedded.
9. A professional person with the electrician certificate connects LARX Resilient Carbon Film inside a wiring box or a thermostat.
10. In the case of more LARX Resilient 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 cut and conn.



Upper insul. of cut and connectors

- 11.** For a floor heating it is necessary to place a temperature sensor into a groove in the acoustic insulation (directly under LARX Resilient Carbon Film) and fix it against displacement (sensor is sold with thermostat).
- 12.** Cover all LARX Resilient 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 Resilient Carbon Film strip, cable, connection and device.
- 14.** Check everything and lay flooring with click system according to instructions of the manufacturer. Be careful to avoid damage of LARX Resilient Carbon Film.



Opposite end insulation



PE film cover (0,2 mm)



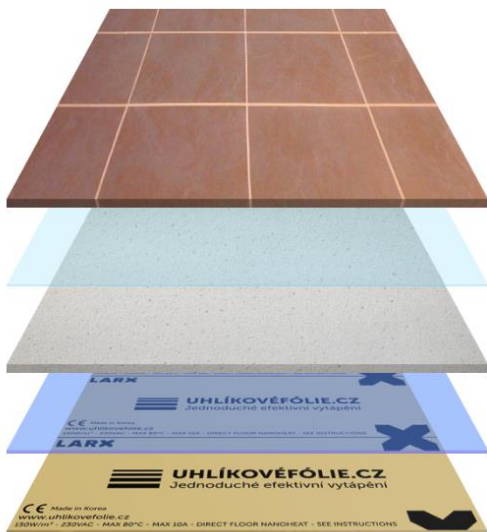
Electrical resistance measurement, note into the Warranty certificate

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..

Application under anhydrite / concrete / floor boards

Floor composition



Any flooring / tiles
(suitable for electric
floor heating)

Possible tile glue

Anhydrite / concrete > 45
mm

PE film 0,2 mm and screed
separation film

LARX Res. Carbon Film

Installation procedure

1. LARX Resilient Carbon Film is usually laid on a thermal insulation (polystyrene).
2. According to the project measure and cut strips of LARX Resilient Carbon Film.



Carbon Film measuring and cutting

3. Lay LARX Resilient 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. By the clamp plier press the connectors to the film. Exact positioning is important – the connector must be in place of the copper strip inside 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 Resilient 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

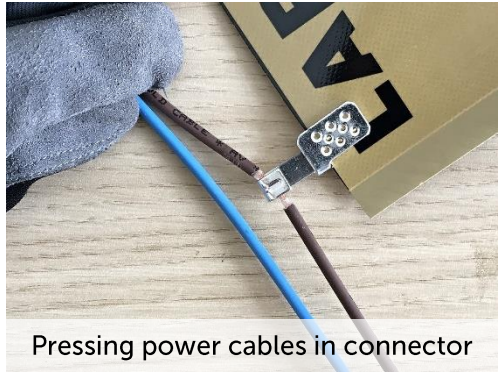


Connector pressing by clamp pliers



Wire stripping

7. With two butyl tapes insulate the cut and the connectors. Both must be completely covered and insulated! Insulate the other end of the strip with one butyl tape folded in half.
8. A professional person with the electrician certificate connects LARX Resilient Carbon Film inside a wiring box or a thermostat.
9. In the case of more LARX Resilient 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 cut and conn.



Upper insul. of cut and connectors

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

11. For a floor heating it is necessary to place a temperature sensor on the PE film directly above LARX Resilient Carbon Film and fix it against displacement (sensor is sold with thermostat).

12. In bathrooms, LARX Resilient Carbon Film must be fully covered by a grounding net. This grounding net must fulfil the local standards and must be grounded (PE), e.g. galvanized welded mesh, our product LARX-ZEMSIT-100S200L.

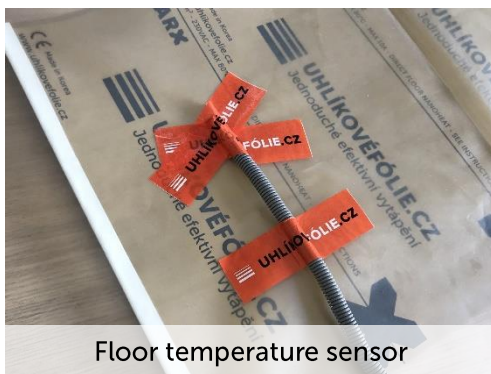
13. Measure the electrical resistance according to the Warranty certificate and draw the position of every LARX Resilient Carbon Film strip, cable, connection and device.



Opposite end insulation



PE film cover (0,2 mm)



Floor temperature sensor

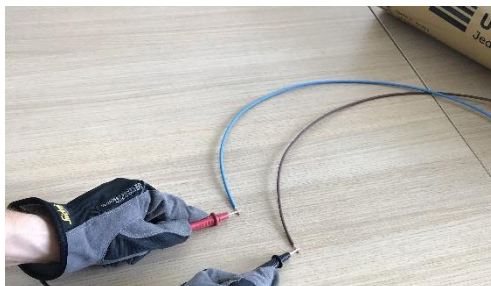
- 14.** Check everything and pour the screed according to its manufacturer's technological procedure. Don't forget the separation film! The minimum thickness of anhydrite or concrete above LARX Resilient Carbon Film is 45 mm. Be careful to avoid damage of LARX Resilient Carbon Film.



Grounding net accord. to standards

Application under screed (anhydrite / concrete) – first heating

- > On the first and second day set the floor temperature at 20 °C. From the third day add 5 °C every day up to 35 °C.
- > The next day after the floor temperature has reached 35 °C start to lower the floor temperature by 5 °C per day to 20 °C.



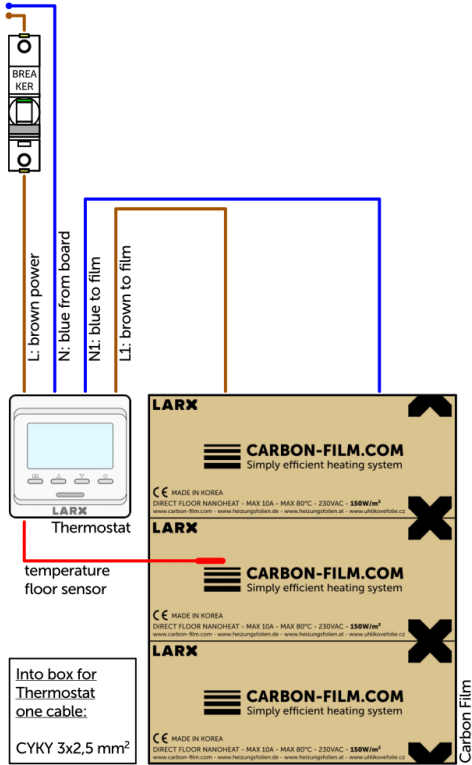
Electrical resistance measurement note into the Warranty certificate

- > If the first heating is done in winter, it is recommended to start at 15 °C on the first day and on the next day increase the floor temperature to 20 °C.

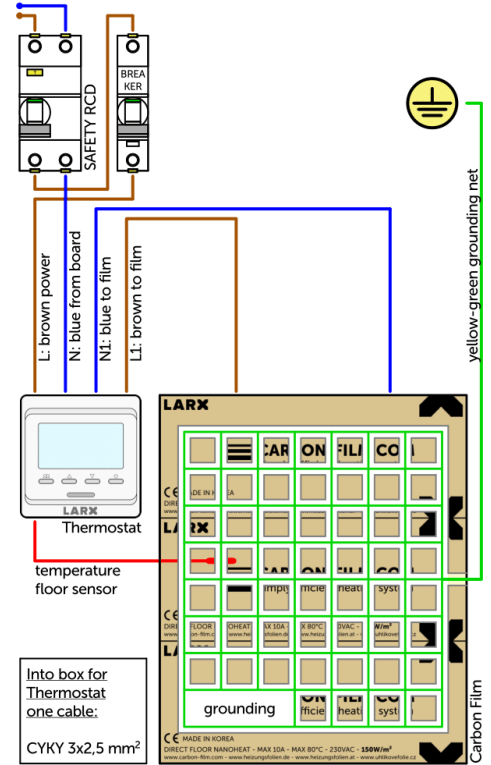
Simple way of switchboard connection

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

Without grounding net



With grounding net (bathrooms)

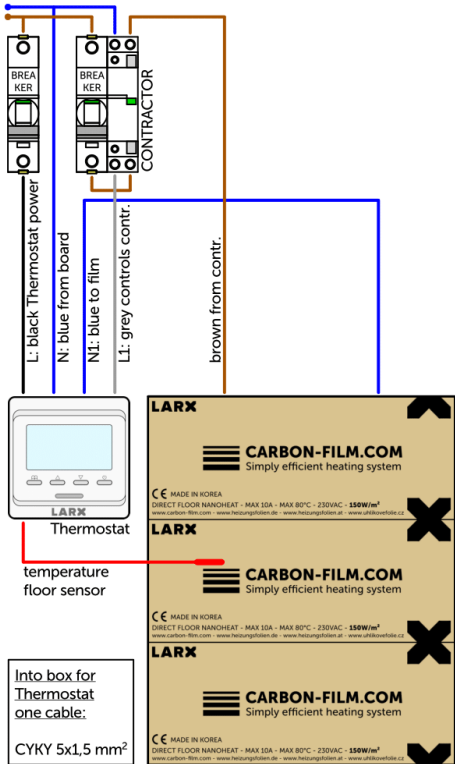


Note: Outputs marking is valid for LARX LCD Thermostat. For other thermostats check their manual.

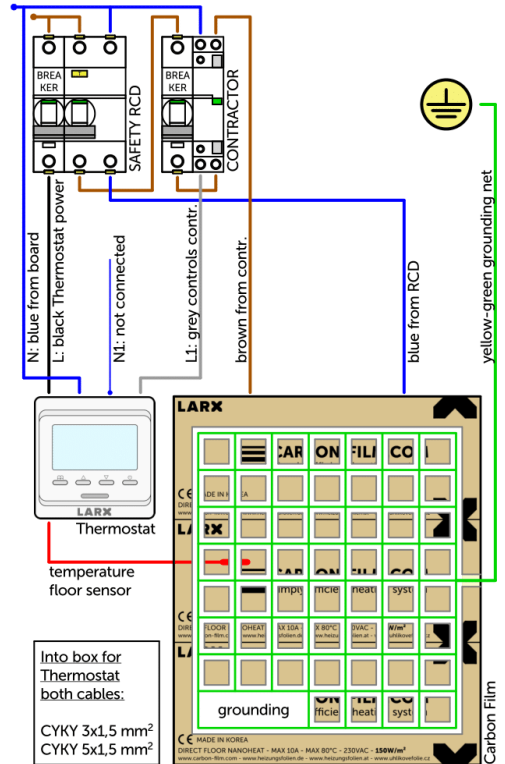
Recommended way of switchboard connection

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.

Warranty

Supplier of LARX Resilient 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 Resilient Carbon Film delivery note or invoice is submitted.
- › LARX Resilient 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

For more information



www.carbon-film.com

info@carbon-film.com

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