LARX Carbon Film
LARX-CF180W050S

Installation manual for partners
A simple solution for efficient heating in households
For dry or wet installation
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 mm² (brown, blue)
  LARX-WBROWN-25D050L, LARX-WBLUE-25D050L

- Grounding net (if required by standards, e.g. in bathrooms)
  LARX-ZEMSIT-100S200L

- Thermostat
  LARX-TERM-LCD or LARX-TERM-WIFI
Required tools

- Clamp plier
  LARX-CLAMPLIERS001
- Wire stripper
- 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 or wet way. 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 m²K/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 $I_{\text{an}} = 30$ mA.

In bathrooms, LARX Carbon Film can be installed only through a wet process (application under screed). Into the screed over LARX Carbon Film a grounding net must be installed (fulfilling conditions of the local standards) which must be grounded (PE), e.g. galvanized welded mesh, mesh 12.7 mm, wire diameter 1.05 mm.

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

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<td>Above exterior</td>
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Connecting two LARX Carbon Film strips

Parallel connection

\[ \frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots \]

For application under screed, full power, any number of strips up to 10 A, when connecting in parallel different strip lengths can be connected.

Serial connection

\[ R = R_1 + R_2 + \ldots \]

Suitable for application directly under floating flooring, quarter power, always use same lengths of strips, never connect in serial strips with different lengths!
Application directly under floating flooring

Floor composition

Any flooring with click system (certified for 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. hobra). 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.
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.
7. With four butyl tapes (8 x 5 cm rectangles) insulate with 1 cm 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 (2300 W). The best way to connect them is inside a wiring box using e.g. WAGO clamps.
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.

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.

14. Check everything and lay flooring with click system according to instructions of the manufacturer. Be careful to avoid damage of LARX Carbon Film.
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 screed (anhydrite / concrete)

Floor composition

Any flooring / tiles (certified for floor heating)

Possible tile glue

Anhydrite / concrete > 45 mm

PE film 0.2 mm

LARX Carbon Film

Installation procedure

1. LARX Carbon Film is usually laid on a thermal insulation (polystyrene).

2. According to the project measure and cut strips of LARX Carbon Film.
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.
7. With four butyl tapes (8 x 5 cm rectangles) insulate with 1 cm 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. A professional person with the electrician certificate connects LARX Carbon Film inside a wiring box or a thermostat.

9. 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 (2300 W). The best way to connect them is inside a wiring box using e.g. WAGO clamps.
10. Cover all LARX Carbon Film strips with a protective PE film with minimum thickness 0,2 mm 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 Carbon Film and fix it against displacement.

12. In bathrooms, LARX 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-ZEMSLT-100S200L.

13. Measure the electrical resistance according to the Warranty certificate and draw the position of every LARX Carbon Film strip, cable, connection and device.
14. Check everything and pour the screed according to its manufacturer’s technological procedure. The minimum thickness of anhydrite or concrete above LARX Carbon Film is 45 mm. Be careful to avoid damage of LARX Carbon Film.

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.

› 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.
**Standard way of switchboard connection**

1. Circuit breaker
2. RCD ($I_{\Delta n} = 30$ mA)
3. Grounding net (rooms with higher moisture – e.g. bathrooms)
4. LARX Carbon Film
5. Thermostat for electric floor heating
**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)

**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

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