088L6576 Danfoss Heating ECiceguard Installation Guide

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Contents

EC iceguard 18 self-limiting heating cable

EC iceguard 18 is a self-limiting cable, which is mainly used for ice and snow melting on roofs and in gutters and down pipes.
Self-limiting heating cables are designed with a temperature dependant resistant element between two parallel copper conductors.
When the conductors are connected to the mains, a current goes through the temperature dependant resistant element which will then heat. As the element is heated the resistance value rises causing the current to decline and heating is reduced. This explains the self-limiting effect.
This limiting of the output takes independently place on the entire length of the cable according to the actual ambient temperature.
If the ambient temperature rises the heating effect of the cable is reduced. Due to this self-limiting capability, overheating of the cable can be avoided, also if two heating cables are touching or crossing.

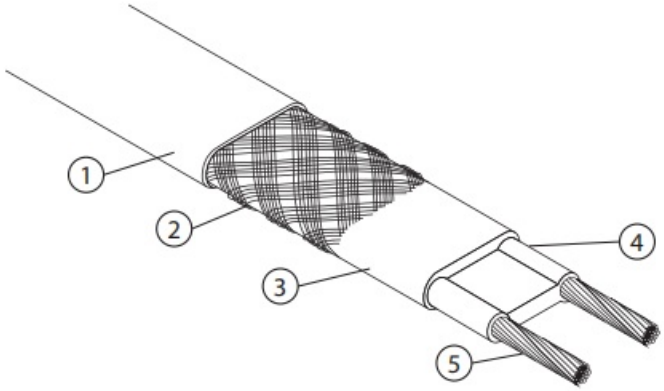
As self-limiting heating cables always give off a small amount of effect, it is recommended to connect the heating cable via a thermostat to disconnect the mains when heating is not required.

EC iceguard secures against ice formations in roof gutters:

- No water damages on/in the house
- No falling icicles or icebound roof gutters
- No risks for pedestrians
- No repair costs after winter

For further information about application of self-limiting heating cables or other Danfoss products, please see the Danfoss heating cable compendiums.

1. Outer sheath
2. Screen
3. Insulation
4. Self-limiting heating element
5. Bus wires



Safety instructions

Heating cables must always be installed according to local building regulations and wiring rules as well as the guidelines in this installation manual.

De-energize all power circuits before installation and service.

Residual current device (RCD) protection is required. RCD trip rating is max. 30 mA.

The screen from each heating cable must be earthed in accordance with local electricity regulations Heating cables must be connected via a switch providing all pole disconnection.

The heating cable must be equipped with a correctly sized fuse or circuit breaker according to local regulations.

Never exceed the maximum heat density (W/m) for the actual application.

Caution! Do use M2 classified cables in areas subject to high mechanical loads or impact.

The presence of a heating cable must be made evident by:

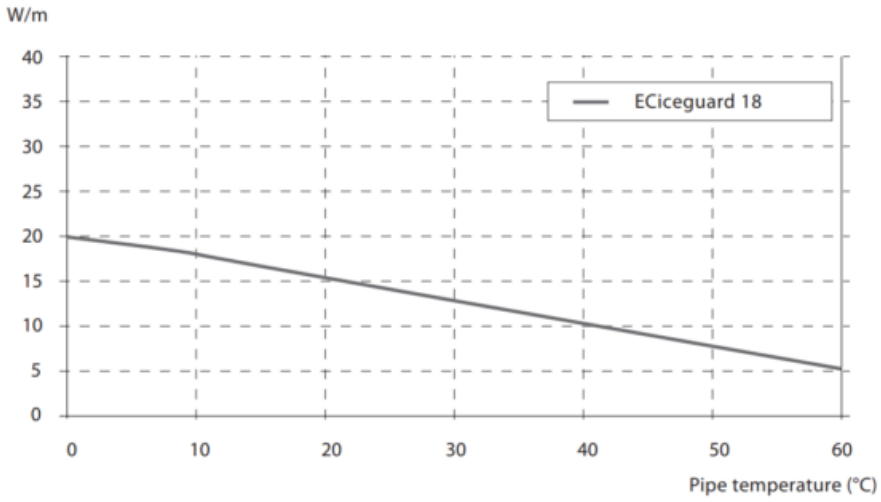
- affixing caution signs in the fuse box and in the distribution board or markings at the power connection fittings and/or frequently along the circuit line where clearly visible (tracing);
- be stated in any electrical documentation following the installation.

EC iceguard 18 cable specifications

Application	Roof / gutters / downpipes
Colour	Black
Dimensions	11,3 x 5,8 mm
Sheath	Black TPE, UV
Voltage	230 V
Effect	18 W/m at 10°C (approx. 36 W/m in ice)
Capacitive leak current	30 mA/km cable
Min. installation temperature	-50°C
Min. start-up temperature	-40°C
Max. temperature ON / OFF	65 / 85 °C
Length of cold-lead	5 m, 2 x 1,5 mm2 , screened

- The effect stated is measured with the Iceguard heating cable installed on an insulated metal pipe.
- When self-limiting cables are installed in the open, the effect may be reduced by approx. 50%.
- When planning the installation it must be considered that self-limiting cables may reduce the operational effect over several years.v

EC iceguard 18 heating power output of heating cable installed and meagered on pipe



General installation instructions

1. Danfoss self-limiting heating cables are only for safe (non hazardous) areas.
2. Measure the insulating resistance of the heating cable immediately before the installation is begun.
3. Make sure that the necessary materials are present at the building site.
4. Remove any sharp objects and irregularities on the pipe system, so the heating cable are not damaged.
5. Finished or painted pipes or containers must be completely dry when installing. The heating cable must only be used in the manners recommended by Danfoss and should be properly connected to the main electrical source.
6. Connection of the heating cable must be done by an authorised electrician according to local legislation.
7. The maximum effect for the different installations and operating effects must be observed.

8. The heating cable must be protected against excess strain and tension.
9. The surface onto which the heating cable is to be installed must be non-combustible, clean and free from sharp objects.
10. The heating cables bending diameter must not be less than 50 mm. The cable must only be bend on the flat side.
11. The heating cables screen must be earthed in accordance with local electricity legislation.
12. The power circuit must be equipped with an isolation switch or a similar overload protection device.
13. Residual current device (RCD) protection is required.
14. To reduce energy consumption we strongly recommend to switch off the heating cable, if this is longer than 3 m, i.e. by using a EC temp thermostat (see „Regulation“).
15. At low temperatures the heating cable can become stiff and difficult to work with. This problem can be solved by connecting the cable shortly to the mains
16. The cable insulation resistance must be measured before and after installation.
17. The presence of a heating cable must be made evident by caution signs or markings at the power connection fittings and/or frequently along the circuit line, as well as being stated in any electrical documentation following the installation.

Storage of self-limiting cables

- Heating cables and connecting leads must be kept in a **clean** and **dry** place.
- Avoid contact with **chemicals and petrochemical** products during storage of the cables.
- Do not expose the heating cables to **mechanical strain.**
- The storage temperature may not drop below **-40°C** and may not exceed **+60°C.**
- Are the heating cables and connecting leads kept in moist rooms or at building sites, they must be **protected against moisture** – also during storage for a short period (e.g. when installing the cable terminal).

Frost protection of roofs

During periods with cold and precipitation dangerous and damaging ice formations are often formed on the roof, in roof gutters and down pipes, especially when the temperature is around freezing point.

Later, when the weather changes the melt water cannot be carried off which often causes damages on buildings. These problems can be prevented with EC iceguard heating cables installed on the roof and in gutters and down pipes.

Concerning roof constructions with low slope it is often sufficient to install EC iceguard in roof gutter and down pipe to ensure an efficient draining off of the melt water.

Concerning roof constructions with high slope it is often necessary also to install the heating cable on the lowest section of the roof.

If the roof is supplied with snow fence the cable can be installed from this to the roof edge with advantage.

Concerning valleys, the cable must be mounted in the valley. To achieve efficient protection the C-C distance should not exceed 15 cm.

For control of roof systems Danfoss offers different thermostats such as EC temp 316, EC temp 330 or EC temp

850.

Installation

install one cable length in roof gutter and down pipe.

Typically, the cables should be installed with a C-C distance of approx. 15 cm. To ensure the distance spacing clips can be used.

With the above mentioned installation the system will typically ensure ice and snow melting down to a temperature of approx. -10°C.

If you want to frost protect the roof down to -20°C, a general rule will be to double the effect, and for -30°C to triple the effect.

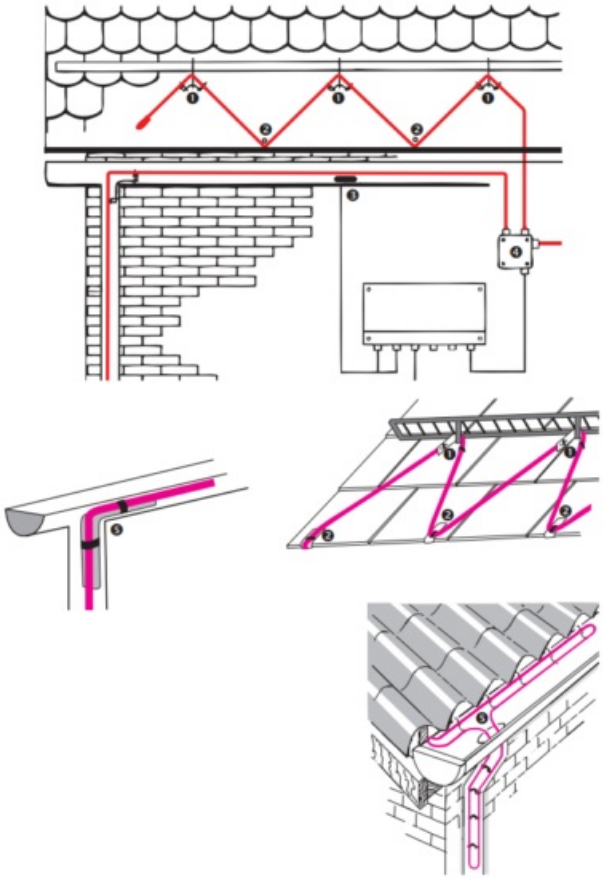
If the cable lies across an edge etc. the spacing clips can be used to relieve strain on the cables, e.g. where the cable enters the down pipe.

Relief of a cable hanging in the down pipe is necessary when the cable length in the pipe exceeds approx. 25 cm.

The cable in the down pipe should continue to frost-proof depth under the surface of the ground (approx. 1 m).

Cables installed on the roof must always be positioned upwards/downwards and not along the roof. The installation can be made with a zigzag pattern as shown on the illustration on the next page.

1. DEVI clip Guard hook™ / Space clip
2. DEVI clip Roof hook™ / Space clip
3. Temperature sensor
4. Connection box
5. DEVI clip Gutterrelief™ / Space clip



Regulation

As self-limiting heating cables always draw current regardless of the temperature Danfoss recommend a thermostat that disconnects the cable in periods where heating is unnecessary in order to save energy.

The optimal control of Danfoss self-limiting heating cables is achieved by using EC temp electronic thermostats. EC temp thermostats give a quick and effective regulating and take both comfort and economy into consideration.

There is a wide variety of EC temp thermostats to choose from according to the demands of the individual installation.

Thermostats

Type	Mounting	Temp. range	Min. temp. adjustment	Hysteresis	Sensor	Colour
EC temp 610	Outdoor IP 44	-10° – +50°C		0,4°C	Wire	Polar-white
EC temp 330	DIN rail	-10° – +10°C +5° – +45°C		0,4°C 0,4°C	Wire Wire	Grey
EC temp 316	DIN rail	-10° – +50°C	-10° – +5°C	0,2° – 6°C	Wire	Grey
EC temp 850	DIN rail	-10° – +40°C		–	Moisture + temperature	Grey

EC temp 316 Frost protection of roofs gutters and down pipes.
EC temp 330 Frost protection of pipes/hot-water supply, ground.
EC temp 610 Frost protection of pipes.
EC temp 850 Frost protection of roofs gutters and down pipes, ground.

Sensors and other accessories

- Wire sensors 2,5 m, 6,0 m and 10,0 m (EC temp 330, 316, 610)
- Wire sensor for roof gutter (EC temp 850)
- Moist sensor for roof gutter (EC temp 850)
- Aluminium tape, 38 mm x 50 m rolls with ‘WARNING’ text
- Connection kit to terminal box, including cable terminal
- Connection kit to cold tail, including cable teminal
- Fitting set for two heating cables
- Cable glands
- Space clips
- DEVIclip Guard hook™
- DEVIclip Roof hook™
- DEVIclip Gutter relief™

Warranty

A 20-year full service warranty is valid for:

- heating cables incl. ECflex, ECsafe, ECsnow, ECasphalt, ECaqua, ECbasic, ECmulti, ECsport (DSM3), ECfreeze;
- heating mats incl. ECsnow, ECasphalt, ECflex, ECsafe.
  Not only does this warranty include costs of reparation or replacement, but also installation and floor materials, such as damage to brickwork and tiles.
  A 10-year product warranty is valid for:
- Danfoss Reflect, ECcell insulation plates.
  A 5-year product warranty is valid for:
- self-limiting cables incl. EC iceguard, ECpipeheat, ECpipeguard, EChotwatt.

Should you, against all expectations, experience a problem with your Danfoss product, you will find that Danfoss offers Danfoss warranty from the date of purchase on the following conditions: During the warranty period Danfoss shall offer a new comparable product or repair the product in case the product is found to be faulty by reason of defective design, materials or workmanship. The repair or replacement shall be carried out free of charge providing that the warranty claim is valid.

The decision to either repair or replace will be solely at the discretion of Danfoss. Danfoss shall not be liable for any consequential or incidental damages including, but not limited to, damages to property or extra utility expenses. An extension of the warranty period following repairs undertaken cannot be granted. The warranty shall be valid only if the WARRANTY CERTIFICATE is completed correctly and in accordance with the instructions, and provided the fault is submitted to the installer or the seller without undue delay and proof of purchase is provided. Please note that the WARRANTY CERTIFICATE must be completed in English or local language.

Danfoss warranty shall not cover any damage caused by incorrect conditions of use, incorrect installation or if installation has been carried out by non-authorized electricians. All work will be invoiced in full if Danfoss is required to inspect or repair faults that have arisen as a result of any of the above. The Danfoss warranty shall not extend to products which have not been paid in full. Danfoss will, at all times, provide a rapid and effective response to all complaints and inquiries from our customers.

The warranty explicitly excludes all claims exceeding the above conditions.

For full warranty text **visit** www.danfoss.com, www.danfoss.com/en/warranty/

CUSTOMER SUPPORT

Danfoss A/S
Heating Segment• heating.danfoss.com • +45 7488 2222 • **E-Mail:** heating@danfoss.com

Documents / Resources

	[Danfoss 088L6576 Danfoss Heating ECiceguard](#) [pdf] Installation Guide 088L6576 Danfoss Heating ECiceguard, 088L6576, Danfoss Heating ECiceguard, ECiceguard

References

- [Engineering Tomorrow | Danfoss](#)

- **User Manual**