**SURFACE HEATING**

Electrical Frost Heave Protection Heating, Approved Design

Complete ready-to-install heating mats, with or without spare heating cable, consisting of heating cable – completely embedded in a hard PVC film – and cold lead, length to customer specification, up to 180 m possible. The approved heating mat developed by Klöpper-Therm works against the penetration of cold in to the ground and prevents upheaval of the ground and destruction of the foundations.

Cold stores and cooling chambers give off cold to their environments. In the area of partly or fully sunk in the ground supports, foundations and floors the underlying soil receives the cold. If the natural heat flow from the environment and the earth is insufficient, the moisture in the ground freezes, expands and the ground is lifted. Depending on the nature of the ground, this may cause substantial damage to buildings. Frost heave protection in cold stores and cooling chambers is, therefore, an essential and a reliable preventative measure against frost damage and damp.

Applications:

Electrical frost heave protection heating for: ► floors and foundations, walls and ceilings, support feet and heads

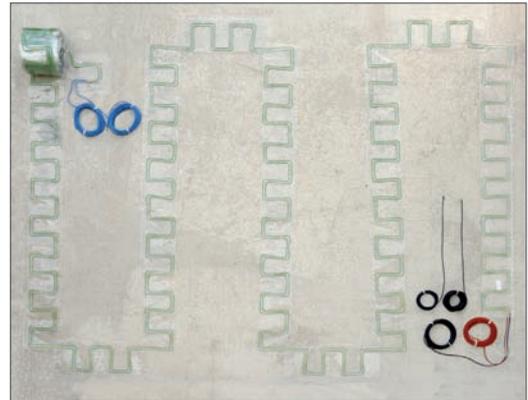
Advantages:

Simple, quick and cost-effective to install: heating mats from Klöpper-Therm are rolled out directly onto the damp course and glued point-wise with industrial adhesive – the direction of lay is a matter of choice. Specially prepared layout drawings and wiring diagrams for your project enable the problem-free laying and connection of the Klöpper-Therm heating mats to the electricity supply.

- 5-Year Warranty for Heating mats
- High operational security and protection from damage by the installation as the heating cable is embedded in a hard PVC film
- Heating mats are laid under the insulation and are protected from damage from external influences
- Fully automatic operation of the heating mats is possible via control and switching units from Klöpper-Therm
- Areas from 3 m² to 20,000 m² may be heated by connecting together multiple heating mats
- Supply with spare heating cable possible

Technical Data

Nominal voltage:	230 V AC or 400 V AC
Resistance tolerance at 20 °C:	-5 %/+10 %
Mat width:	approx. 0.27 m
Min. installation temperature:	+5 °C
Installation clearance:	max. 0.9 m
Heating cable:	NH6YMY90 in accordance with VDE 0253
Cold lead:	1.5 mm ² , NYM-flex, for standard length see table
Cable coupler:	vapour pressure proof, high voltage test with 1 kV in water for 10 minutes



Example installation: approved design with spare heating cable and temperature sensors

Product Description		Area (m ²)	Mat length ± 1 % (m)	Nominal power per heating circuit (W)	Nominal voltage (V)	Nominal resistance at 20 °C (Ohm)	Nominal electric current (A)	Cold lead length* (m)
Without spare	With spare							
KM72-230	--	3.0 – 7.0	7.1	230	230	230	1.0	6.0
KM51-255	KM51-R-255	7.0 – 12.0	12.9	255	230	207	1.1	15.0
KM51-275	KM51-R-275	12.0 – 18.0	16.9	275	230	192	1.2	15.0
KM14-520	KM14-R-520	18.0 – 34.0	32.5	520	230	102	2.3	15.0
KM78-695	KM78-R-695	34.0 – 46.0	43.5	695	230	76	3.0	15.0
KM44-920	KM44-R-920	46.0 – 61.0	57.3	920	230	57	4.0	30.0
KM78-1205	KM78-R-1205	61.0 – 80.0	75.5	1205	400	133	3.0	30.0
KM44-1600	KM44-R-1600	80.0 – 107.0	99.0	1600	400	100	4.0	30.0

* other lengths on request up to max. 180 m

Other Products:

Individually equipped control units, temperature sensors, emergency alarm systems, concrete floor heating, frost heave protection heating in simple design, heat tracing for melt-water pipes and drains

Klöpper-Therm offers complete electrical heating systems from planning to installation.
Components matched with each other guarantee trouble-free and economic operation.
All services from one source.