ELEKTRA SnowTec heating mats

your protection against snow, ice and, unfortunately, all too common in the wintertime - accidents of slipping and falling

Applications and benefits

ELEKTRA SnowTec heating mats are intended for installation in places where snow and ice on the ground are either a concern, nuisance or outright safety hazard. In most cases, those are usually high traffic outdoor areas of your property or business, such as, steep or flat walkways, driveways, ramps, handicapped access areas, steps, staircases, parking areas, patios and many others. However, only cold installation into or under masonry and other solid finishes is permitted. Asphalt - due to its high temperatures while being poured could not be safely used with SnowTec heating mats.

There are five basic components of the SnowTec snow-melting system:
1. The heat accumulating mass of the walkway, driveway, steps etc.
2. The heating element (a mat)
3. The power source by means of electrical connection
4. The sensor to provide input to the system controller
5. The controller/thermostat/timer that ties all components together into one robust and intelligent system that is ready and able.

The cost of the system will vary depending upon the components used, the cost of local labor, the complexity of installation and its size.

Cost calculations:
Our system will pay for itself!
One of the most important benefits to you when using the ELEKTRA SnowTec surface heating system in typical wintry conditions in many areas of each country has to do with **safety and comfort** while entering or leaving your property or business.

Some of the other benefits are:
- **In the short run**
  - Time and money saved because of reduction of difficult repeated labor intensive shoveling, salting and up-keeping important access areas.
- **In the long run**
  - Time and money saved because heated areas are spared from repeated applications of salt, ice melting chemicals or ice chopping. Without salt, surfaces last much longer, therefore your important Real Estate Investment is protected from expensive resurfacing and rebuilding.
  - Time and money saved on landscaping.
    No salt or Calcium Chloride will saturate soil. Thus, summer grass and landscape plantings will remain environmentally safe.

Principles of operation

ELEKTRA SnowTec heating mats are permanently installed under masonry surface. Power supply of 230-240 VAC current - is controlled by means of dedicated thermostat with:

a. The temperature sensor
b. The microprocessor controller with a combination sensor for the temperature and humidity of the air, to automatically recognize near freezing or already icy conditions.

ELEKTRA SnowTec surface heating mats are made as ready to install systems. They are made of heating cables which are powered on one end, with power consumption of approx. 25W/running meter of the heating cable (23W/running yard of the heating cable) or 300W/m^2 (240W/sq. yard). All are 0,6m (2') wide and from 2m to 21m (6.5' to 69') long, depending on the model. The length of the power supply (cold) cable is 4m (13'). The voltage is 230-240 VAC.

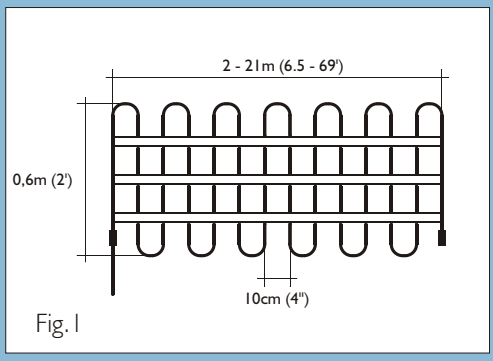

Fig. 1

Planning phase

ELEKTRA SnowTec				
TYPE	LENGTH m (ft)	WIDTH m (ft)	OUTPUT (W)	SURFACE m^2 (sq. ft.)
SnowTec 300/2	2 (6.5')	0,6 (2')	400	1,2 (13)
SnowTec 300/3	3 (10')	0,6 (2')	520	1,8 (20)
SnowTec 300/4	4 (13')	0,6 (2')	670	2,4 (26)
SnowTec 300/5	5 (16.5')	0,6 (2')	930	3,0 (33)
SnowTec 300/7	7 (23')	0,6 (2')	1140	4,2 (46)
SnowTec 300/10	10 (33')	0,6 (2')	1860	6,0 (66)
SnowTec 300/13	13 (42.5')	0,6 (2')	2560	7,8 (85)
SnowTec 300/16	16 (52.5')	0,6 (2')	2890	9,6 (105)
SnowTec 300/21	21 (69')	0,6 (2')	3730	12,6 (138)

Table 1. 230-240 VAC Only!

Other sizes, such as smaller mats for under individual steps of masonry staircase are available for special order.
When planning for concrete finished surfaces, consider heating each slab of concrete independently, therefore, not being forced to cross slab joints with the heating cable of larger models.

If you are planning more than one heating mat they should be connected to the controller as PARALLEL CIRCUITS and NEVER AS SERIES CIRCUITS

1. Measure and sketch system layout, sizes and models needed as in Table 1.
2. Consult your masonry or concrete contractors and electrician about all technical aspects of the job such as proper surface grading allowing for melted ice and snow to run off, power connections, 230-240 VAC service availability and about obtaining necessary local permits if required by your particular municipality.

3. When designing a snow melting system the installer should consider all local and particular property variables including slope and drainage, area microclimate related factors, such as, average humidity, typical snow density, and even wind velocity. Serious thought has to be given not only to snow but also to the ice that often comes after the snow melts.
4. After receiving the mats and before attempting actual installation:
   - Take electrical resistance and continuity measurements as specified in warranty requirements.
   - Layout the entire system at the actual location, number the mats, mark where and how they are to be positioned, where the sensor is going to be installed, take pictures and make sketches. Do not wait with installation planning and trial layout until concrete trucks arrive.

Pre-installation phase

- ELEKTRA SnowTec heating mats usually work best when installed 5 cm (2") bellow the surface.
- Important! While installing, the heating cable should not be:
  - stretched,
  - run across concrete slab joints,
  - cannot be cut or nicked - only heating cable spacing/connecting tape can be cut to achieve desired shape as per fig. 4.

  When using more than one heating mat - they should be connected to the controller as PARALLEL CIRCUITS and NEVER AS SERIES CIRCUITS
  Be prepared to:
  - measure continuity and resistance of each and every mat before covering them with finishing material.
  - document ACTUAL layout of the system.

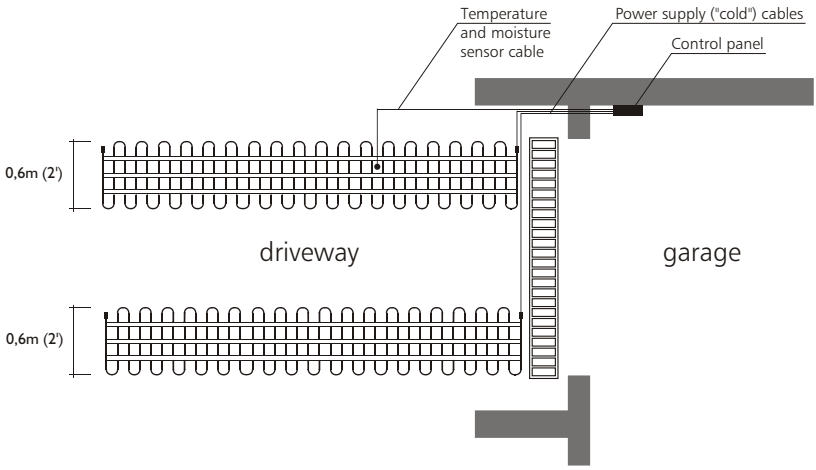

Fig.2 Example of the installation in front of the garage

If heated surface/area is to be made of concrete - sizes and number of heating mats need to be planned to avoid installing them across concrete slab joints.

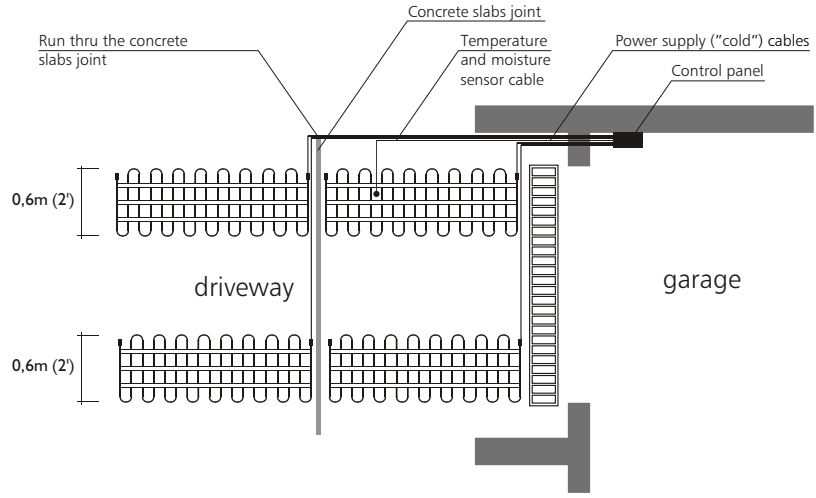

Fig.3 Example of installation in front of the garage, in the cement slabs with slab joint

Installation

It is strongly recommended to use a qualified electrician for consultation and safety checks of all connections. However, installation is considered simple and can be done by an average handyman. All local building and municipal codes should be followed. If a driveway is to be heated - an economical approach to installation could be used, such as heating only the area where car wheels are to be driven. For larger areas more mats would be needed. Before installing system permanently it is best to lay mats down on clean dry surface to assure a proper fit. If there is any cable or metal mesh concrete reinforcement planned - it is recommended that mats do not come in contact with the metal. Plastic mesh with openings not bigger than 5 cm x 5 cm (2"x2") should be installed on top of metal concrete reinforcement which helps to insulate bare metal parts and avoid mechanical contact with heating mat cables. Depending on the desired shape of the heated area it is recommended to cut the tape holding the mat together as long as actual heating cable IS NOT:

- cut or nicked,
- crisscrossed,
- positioned closer than 10cm (4") apart,
- run across joints of separate concrete slabs.

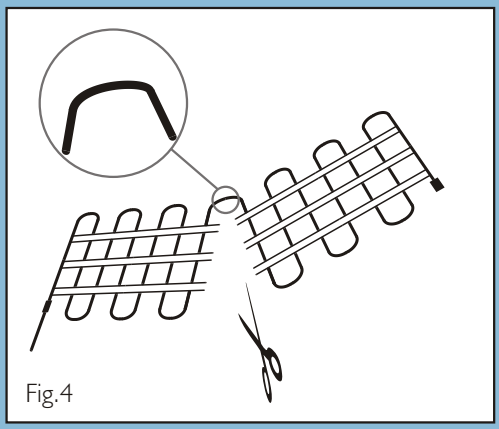

Fig.4

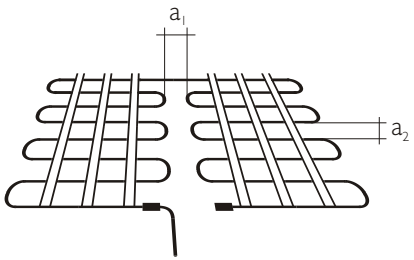

Fig.5 Heating cable distances: a_1 and a_2 should be about equal

At the beginning of actual installation the heating mats need to be secured to the underlying surface to prevent shifting or movement during installation. All the power supplying cables need to be run to or near the power connection without connecting them. A qualified electrician is to do the actual connection and if needed – to extend power supply cables using code acceptable materials and supplies. It is highly recommended that power supply cables be protected by code described conduits. The entire length of heating cables are to be completely covered either by dry sand or wet cement - depending on the type of finish. Fig. 6 and 7 show the recommended installation depths and the covering material thickness.

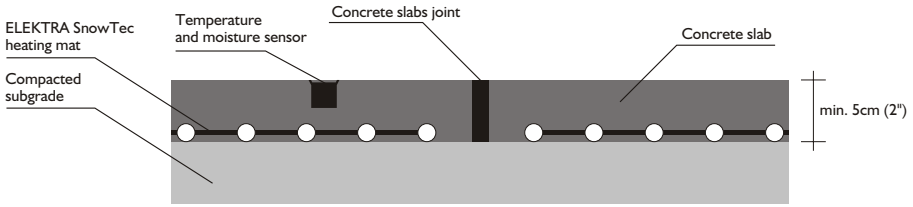

Fig.6 Cross-section of the concrete made walkway or driveway

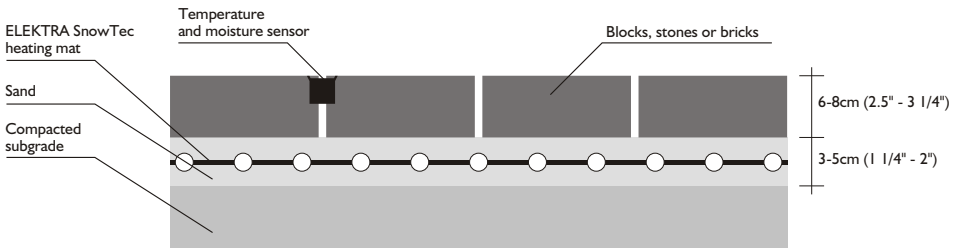

Fig.7 Cross-section of the concrete blocks, stones or bricks made walkway or driveway

When planning the installation of SnowTec heating mats - it is important to design the surface surrounding the heated area in the manner that melted water is channeled away and not able to refreeze nearby. It may be necessary to heat such drains as well - for instance with a piece of the same mat. Therefore consider ordering a slightly larger model than the one which a driveway or walkway alone would need. Another option is the application of selfregulating heating cable. Heating up drains channeling away melted ice or snow should be controlled by the same thermostat/ sensor combination as the main heating mats.

Controllers and sensors

ELEKTRA SnowTec heating mats are controlled by:

- ETOG - electronic controller with temperature and humidity sensors,
- ETR 1447 - electronic controller with just temperature sensor.

The best operational results are achieved when an ETOG controller is used. It starts the system when both conditions, moisture and freezing temperatures, are reached. This is always the case during or after snow or freezing rain precipitation. ETR 1447 starts the system only when the temperature drops below one preset by the user.

Either controller could be installed on or near an electric control panel where the system power supply cables are connected. It is strongly recommended that GFCI type protection is used for added safety even if the local code does not require it.

Installation and location of sensors depends on the type of controller used:
For measuring temperature alone (ETR 1447 controller) a sound exterior structure such as an outside wall of a building is good.
For measuring both, temperature and moisture, (ETOG type controller) an heated outside horizontal surface.

In general, a conduit for wiring of the sensor of temperature and moisture is to be installed BEFORE concrete, stone or other type of masonry surface is cured and finished. The sensor itself is to be installed AFTER concrete, stone or other type of masonry surface is cured and finished. It is best if the power supply cables are not extended for hookup to the electrical panel, however, if need be - a code acceptable electrical box is used.

It is advisable that the temperature and moisture sensor is installed in a shady area that will help keep the moisture and lower temperatures longer.

It is imperative that such a sensor be installed approx. 5 mm (1/4") below the surface (Fig. 8) in order for the water to be able to accumulate over it. If the surface is not leveled - the sensor needs to be installed leveled.

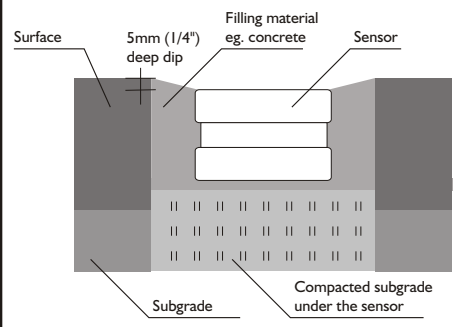

Fig.8 Cross-section of the typical surface temperature and moisture sensor installation

Connection

Power connection of the ELEKTRA SnowTec heating mats HAS TO BE accomplished by means of the controller unit. NEVER connect directly or with plug and outlet combination.

CAUTION: Grounding cable (green & yellow) of the SnowTec mat needs to be connected to the ground connector of the electrical installation by means of the appropriate connector of the controller unit.

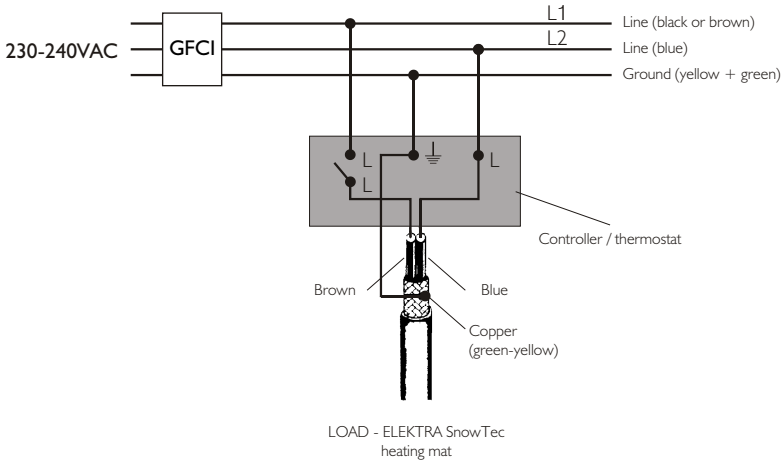

Fig.10 Typical Electrical Wiring Diagram and Control Panel Connections

CAUTION: If the sum of wattage of all the SnowTec mats exceeds allowable wattage of the controller unit, a dedicated relay needs to be installed.

Application

ELEKTRA SnowTec heating mats are intended to heat up masonry (but not asphalt) driveways, ramps, walkways, patios etc.
Construction: Heating mats are made of heating cables rated 25W/m (23W/yard), powered from one end. All are 0,6m (2') wide and from 2m to 21m (6.5' to 69') long depending on the model. The spacing between coils of heating cable is approx 10cm (4"). The length of the power supply (cold) cable is 4m (13'). Voltage is 230-240 VAC.

Installation

Installation is very simple. If a driveway is to be heated - an economical approach to installation could be used, such as, heating only the area where car wheels are to be driven. For larger areas more mats would be needed.

Controls/ System automation

A controller such as a thermostat is a must. In the case of a large heated area more advanced controller should be considered to measure both temperature and surface moisture. It also makes technical and economic sense since it will engage the system only when danger of icing is present, that is when the surface temperature drops below approx. 2°C (35° Fahrenheit) with precipitation or intense condensation.

ELEKTRA®


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BRONZE HELMET '97


SILVER HELMET '98


GOLD HELMET '97


GOLD MEDAL MTP Poznań '2001

QUALITY ISO 9001 SYSTEM

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