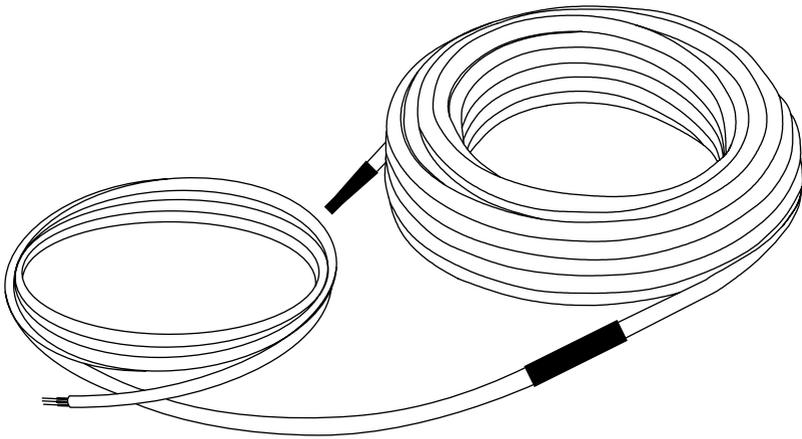


Warmup®

The World's **best-selling** floor heating brand™



Installation Manual

Snowmelt Cable 25W/m (W25SM)



TECHNICAL HELPLINE
0845 345 2288



IMPORTANT

Read this manual before attempting to install your heating system. Incorrect installation could damage the heating system and will void your warranty.

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1 - Introduction

The Warmup snowmelt cable is the ideal solution for installation in concrete, asphalt or sand for melting ice and snow in outdoor areas such as driveways, pathways, steps, roofs, gutters and downspouts. For other applications please contact a Warmup office or representative.

Covering materials such as concrete or asphalt, and pavers (in sand or concrete) may be used. The materials must be able to withstand temperatures of up to 70°C.

2 - Safety Guidelines

1. The heating cable should not be cut, shortened or lengthened. Cutting or damaging the heating element during installation will void the warranty.
2. The system must always be installed according to local regulations as well as the instructions in this installation manual.
 - Any other installation might affect the cable functionality or present a safety risk, and will void the warranty
3. The heating cables must always be connected by a qualified electrician as per the current electrical regulations, and using a fixed connection.
 - All power circuits must be de-energized before installation and service
 - Each heating cable must be earthed according to local electrical regulations and protected by a residual current device (RCD) with a maximum trip rating of 30mA
 - The installation must be equipped with a correctly sized fuse or circuit breaker in accordance with local electrical regulations.
4. The location/presence of the heating cables must be made evident by affixing caution signs or marks at the power connection and frequently along the circuit line where clearly visible.
 - The control card must be completed and fixed at distribution board indicating the location of the heating cables installed
 - This information must be stated in any electrical documentation following the installation
5. Incorrect design, handling, installation, could damage the system and may result in inadequate frost protection or electric shock. To minimize these risks and to ensure that the system performs reliably, read and carefully follow the information, warnings, and instructions in this guide.

3 - Product Information

The cables in the range have a constant wattage output of 25 Watts/meter. The Warmup snowmelt cables are FIMKO approved.

Technical specifications

Voltage	220-240V AC, 50Hz
Power output	25W/m
Cold Connection Cable	1 x 5m
Minimum Installation Temperature	-10°C
Max Temperature of outer sheath	70°C
Minimum Bending Radius	6 x diameter of cable
Resistance tolerance	-5% / +10%
Outer Diameter	W25SM: 6mm, W25SMAP: 7mm
Cable colour	W25SM: orange, W25SMAP: black
Inner insulation	Fluoropolymer
Metal sheathing	Aluminium mylar tape with copper drain wire
Outer sheath	W25SM: Polyolefin for concrete, UV resistant W25SMAP: High Temperature Polyolefin; UV resistant

Range specification

25 W/m for concrete application				
Model	Cable length (m)	Resistance (Ω)	Wattage (W)	Amps (A)
W25SM250	10	212	250	1.1
W25SM500	20	106	500	2.2
W25SM750	30	71	750	3.3
W25SM1000	40	53	1000	4.4
W25SM1250	50	42	1250	5.4
W25SM1750	70	30	1750	7.6
W25SM2250	90	24	2250	9.8
W25SM2750	110	19	2750	12.0
W25SM3300	132	16	3300	14.4
W25SM4250	170	12	4250	18.5
W25SM4750	190	11	4750	20.7

25 W/m for asphalt application				
Model	Cable length (m)	Resistance (Ω)	Wattage (W)	Amps (A)
W25SMAP3300	132	16	3300	14.4
W25SMAP4750	190	11	4750	20.7

Applications

Product selection	W25SM	W25SMAP
Roof and gutters	yes	yes
Ground applications (non-asphalt)	yes	yes
Ground applications (asphalt)	no	yes

4 - Planning the installation

Before you commence installation, ensure that you have carefully measured the area to be heated. Draw a plan detailing the spacing of the cable and location of the power connections, sensors, controllers and connection boxes (if applicable). It is important to know the precise location of the components for future reference in case of troubleshooting and repair.

When planning the installation please observe the following:

- ensure the safety guidelines are being met - see section 2
- ensure the installation guidelines are taken into account - see section 5
- calculate the correct cable spacing
- ensure the required installation depth and possible mechanical protection of the cold leads are in accordance with local regulations

Calculating cable spacing

Cable spacing is the distance in centimetres from the centre of one cable to the centre of the next cable. To calculate the cable spacing that should be used, measure the heated area and divide by the length of the cable to be used, using the following equation:

$$C_s \text{ [cm]} = (\text{Area [m}^2\text{]} / \text{Cable length [m]}) \times 100$$

Notes:

- the minimum spacing between cables is 80mm
- ensure the heating cable is at least 100mm from the edge of the pavement and from fixed obstacles such as drains, pipes, etc.

5 - Installation Guidelines

1. Properly prepare the installation site by removing sharp objects, dirt, or any other foreign objects. The installation surface must be even, stable, dry and clean.
2. Regularly check the continuity and ohmic resistance of the heating cable before, during and after installation.
3. Take into account the location of construction and expansion joints.
 - Do not install the heating cable under walls or other fixed obstacles.
 - The heating cable must not cross slab joints and be clear of insulation material, other heating sources and expansion joints.
 - The heating cables and the joints (cold-warm transitions) must be protected from stress and strain.
4. The heating cable must not cross or overlap itself at any point. This could cause the cable to overheat.
5. Before installing the heating cable, please observe the following:
 - a suitable 230V AC electrical supply must be available.
 - all wiring and controls must be capable of handling the load of the heating system - refer to the tables on page 4 and 5 for amperage figures.
 - Installation of the heating cable should not be undertaken if the ambient temperature is below -10°C.
 - the area is completely free of foreign objects, and is dry, clean, stable and even. Pay special attention to sharp edges.

Testing the cable

One of the most important steps to be taken when installing the mat is the testing process. You must ensure that the mat is tested BEFORE, DURING and AFTER installation.

The ohmic resistance of each cable should be measured across the conductors at the following stages:

- after unpacking
- after the heating cable is laid down and fixed
- after finalizing the installation

The resistance readings should be within -5% and + 10% of the measurements in the tables on page 4 and 5.

An insulation resistance test should be performed. The heating cable should be tested between the conductors and earth at 500V and 1000V.

All test results should be recorded on the control card at the end of this manual.

If at any time the heating cable does not pass the insulation resistance test or your readings are not in line with tolerance of the values, or you suspect there is a problem, please contact Warmup.

Junction boxes and conduits

The cold leads may be lengthened or shortened as necessary but, if possible, avoid extending the cold leads and use weatherproof junction boxes instead.

Be aware of the power loss in the cable when extending the cold leads.

A conduit should be used to place the cold leads. Multiple cold leads may be placed inside a single conduit.

Notes:

- the cold leads and sensor cables must be placed in separate conduits
- never run any part of the heating cable or joint inside the conduit
- always secure the conduit to the subfloor so it does not move during the pouring of concrete

6 - Controlling the system

It is mandatory to install controllers and sensors with the Warmup heating cables. The system can be controlled by the following devices:

- **ETR2-1550** (or equivalent) for small installations up to 16A
- **ETO2-4550** (or equivalent) for large installations up to 48A

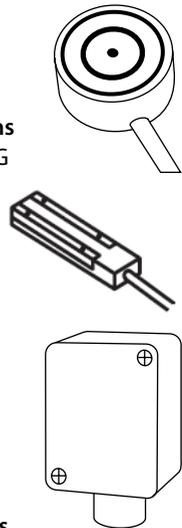
Depending on the application the following sensors must be used:

- **ETOG-55:** The sensor type ETOG is designed for **ground applications** and to be embedded into the surface of the outdoor area. The ETOG detects ground temperature and moisture, and should be installed in an open area away.

Note: up to two sensors can be installed.

- **ETOR-55:** The sensor type ETOR is designed for **roof and gutter applications** and to be mounted in gutters, downspouts, etc. It detects moisture and is mounted in combination with the outdoor ambient sensor ETF for temperature detection.

- **ETF-744/99:** The outdoor sensor type ETF detects temperature and must be used in combination with the sensor ETOR-55 in **roof and gutter applications**. Although ETF is designed for use with gutter sensor ETOR, it can also be used separately for the detection of temperature in combination with the ETOG for **ground applications**.



Placement of the sensors

The placement of the sensors is very important for better performance of the system.

In **ground applications** the sensor location should be decided between fast detection (place it where the snow will appear first) or a lasting melting period (place it where the snow will melt last).

The ETOG must be placed within the heated area between two of the wires runs. Always maintain a minimum distance of 40mm between the sensor conduits, sensors and the actual heating cable. The conduit for wiring of the sensor is to be installed **before** the concrete

surface is cured and finished. The sensor itself is to be installed **after** concrete surface is cured.

In roof and gutter applications the sensor ETOR must be placed on the sunny side of the building. The contact elements of the sensor must be placed in the direction of the flow of the melting water.

The ETF sensor should be installed on a sound exterior structure such as an outside wall of a building.

Note: Further information on the fitting of the sensor can be found in the thermostat instruction manual.

7 - Ground applications

Items for installation

Depending on the installation type, the following items are required:

- Heating cable: W25SM (for concrete and pavers) or W25SMAP (for asphalt)
- Controller: ETO2 or ETR2
- Sensors: ETOG-55 and optional ETF-744
- Accessories: metal fixing bands (MFB) or reinforcement mesh

Wattage density

The wattage density to be used depends on various factors such as the location and the type of application. In addition to these factors it may be influenced by the existing protection against wind and the recorded temperatures in the area.

The following table can be used as a guideline, however the project requirements may vary. Uninsulated areas may require a higher output.

Outside temperature	Recommended output W/m ²
-5°C	200W/m ²
-10°C	200W/m ² - 250W/m ²
-15°C	250W/m ²
-20°C	300W/m ²

Limited power supply

In case the power supply is limited it is still possible to install a snowmelt system without hampering the final result:

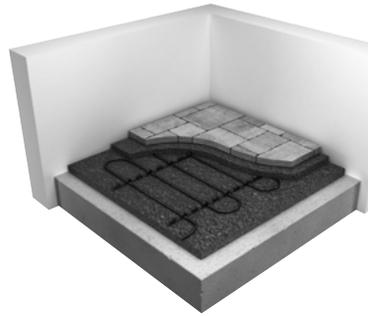
- The heated area can be reduced. Ex: heat the tire tracks instead of the whole driveway
- Install less W/m² which will slightly reduce the snowmelt performance. This should not be done in front of heated steps or areas of drainage

Fixing methods

The heating cable may be fixed at set spacing intervals using the Warmup metal fixing bands (MFB). If steel reinforcement mesh is already in place, the cable may be secured at set spacing intervals using plastic cable ties.

Do not use metal cable ties.

Note: The heating cable must not be installed closer than 80mm apart.



Installation in flat areas

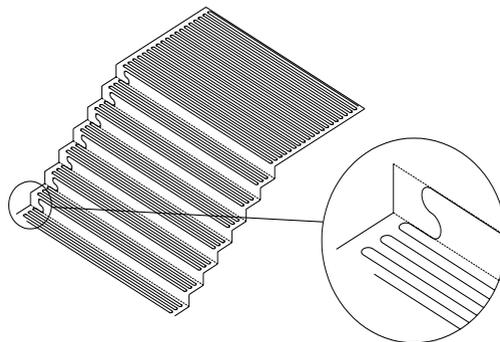
Start the installation at the point nearest to the junction box where the circuit will be terminated. Take the cold lead of the cable through conduit pipe.

Note: Take care when pulling the cold leads not to damage the cold lead connection joint.

Lay the cables according to the plan and fasten to the subfloor using your preferred method of fixing. Ensure that the cables are secured tightly so that they do not move during concrete pouring.

Installation in stairs

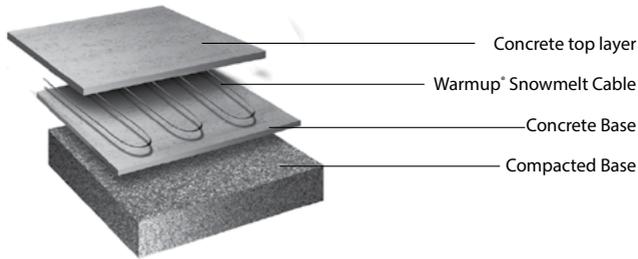
The cable should be laid lengthwise on the steps so that they only lie on the horizontal surfaces. For this type of installation it is essential to have a concrete step as a base. The cables should be installed with the first run no more than 50mm from the edge of the step, the cable should then be laid at even spacing in the remaining space between the outer cable run and the back of the step.



Allow for the addition of railings etc that will require cutting or drilling into the concrete as damage could occur to the heating cable allow a clearance of 100mm between the heating cable and any planned cuts/holes.

Note: When running the cable up the riser of the step a groove should be made in the riser in order to keep the cable flat to avoid any damage. Always observe the minimum bending radius.

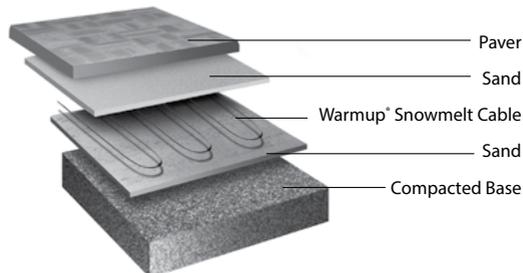
Embedding in concrete, mortar or screed



1. Clean the area so that it is free from any sharp objects.
2. Take the cold lead of the cable through conduit pipes into the junction box. Seal the ends of the conduit so that concrete does not seep in.
3. Lay the cables according to the plan and secure using your preferred method of fixing.
4. The concrete mixture must not contain sharp stones.
5. Pour the concrete onto the area covering the cables completely without leaving any air pockets. Ensure that all of the heating cable including the joints are completely embedded within the concrete.
6. The concrete should have a minimum thickness of 50 mm measured from the top of the snow melting cable.
7. Once the concrete has cured (approx. 30 days for concrete and 7 days for moulding compounds), position the sensor within the heated area in a location where it can sense moisture / snow fall, away from trees and bushes.

Note: The conduit for wiring of the sensor and supply cables must be installed BEFORE concrete surface is cured and finished. Further information on the fitting of the sensor can be found in the controller instruction manual.

Embedding in sand (installation under pavers)

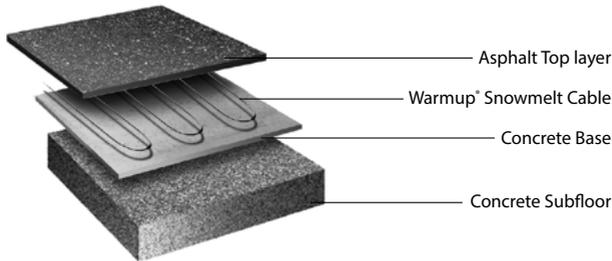


1. Do not install cable in sand only. The heating cables must be protected by a hard top layer.
2. Clean the area so that it is free from any sharp objects.
3. Take the cold lead of the cable through conduit pipes into the junction box.

4. Lay the cables according to the plan and secure using your preferred method of fixing.
5. Apply a minimum bedding of 30mm of sand over the heating cable to ensure easy positioning of the pavers.
6. Take care when spreading the sand not to use sharp tools that may damage the cable.
7. Position the sensor within the heated area in a location where it can sense moisture / snow fall, away from trees and bushes.

Note: The conduit for wiring of the sensor and supply cables must be installed BEFORE concrete surface is cured and finished. Further information on the fitting of the sensor can be found in the controller instruction manual.

Embedding in asphalt (model W25SMAP only)



The cable can be covered directly with asphalt as it can resist up to 240 °C for a short time. It is not necessary to cover the cable with sand or concrete prior to the asphalt. Rollers or asphalt laying machines should NOT be used on the cables.

1. Clean the area so that it is free from any sharp objects.
2. Take the cold lead of the cable through conduit pipes into the junction box. Seal the ends of the conduit so that the asphalt does not seep in.
3. Lay the cables according to the plan and secure using your preferred method of fixing.
4. Pour the asphalt onto the area covering the cables completely without leaving any air pockets. Ensure that all of the heating cable including the joints are completely embedded within the asphalt.

Note: Allow the asphalt to cool to a temperature of approx. 100°C before laying it over the heating cable and joints. The cold leads should be protected by a suitable conduit that is able to withstand high temperatures short term.

5. The asphalt should have a minimum thickness of 50 mm measured from the top of the snow melting cable.
6. After the Asphalt has hardened, position the sensor within the heated area in a location where it can sense the moisture / snow fall.

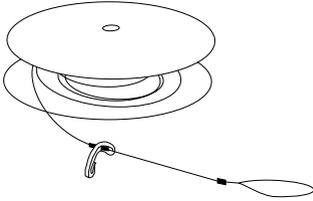
Note: Further information on the fitting of the sensor can be found in the thermostat instruction manual.

8 - Roof and gutter applications

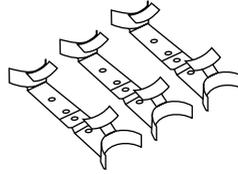
Items for installation

Depending on the installation type, the following items are required:

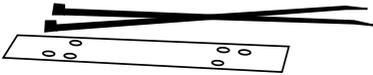
- Heating cable: W25SM
- Controller: ETO2 or ETR2
- Sensors: ETOR-55 and ETF-744
- Accessories: roof clips (WRC), gutter bars (WGB), aluminum adhesive tape (TAPEFH) and downspout hangers (WDSH)



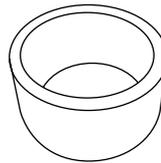
Downspout hangers (WDSH)



Roof clips (WRC)



Gutter bars (WGB)



Aluminum adhesive tape (TAPEFH)

Roof installation considerations

Before you commence installation ensure that you have carefully measured and the area to be heated. The heating cable must be arranged so that it routes melted water from warm areas (where ice on the roof usually melts first) to cold areas.

The heating cable is specifically intended for problem areas and does not need to be installed on all areas of the roof – install only in the sections that have been susceptible to ice dams in the past. If a gutter is present it must also be heated to allow for the drainage of melted snow/ice.

Before fitting the heating cable make sure that the area around the cable is freely accessible and that there are no sharp edges. Ensure gutter is clear removing any leaves or debris from the gutters and downspouts.

Start the installation at the junction box, leaving a drip loop where the cable exits the junction box.

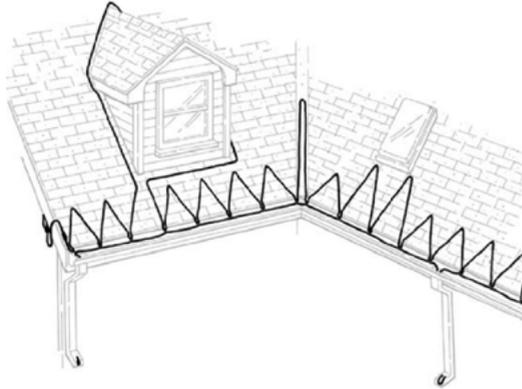
If working directly on the roof during installation, it is advised to mark the cable with chalk beforehand. A project drawing will help with planning the length of cable per roof feature.

Installation patterns

Methods for arranging the cable pattern for different parts of the roof can be found on the following pages.

Always install cable in valleys that are a part of any problem area on your roof. You may or may not need to install cable along the roof line or near skylights or dormers.

1. Roof Line Pattern



For installation in eaves the cable should be laid along the roof line in a triangular pattern.

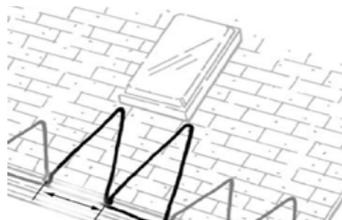
The cable must extend above the overhang into the warm section of the roof.

The height of each triangle will be dependant on the size of the roof overhang.

Measure the depth of the overhang and use the table on section XXX to determine the height of the triangle.

Note: The triangle heights are measured by the number of shingle rows from the edge of the roof (based on a standard shingle size of 14cm). This method allows for the heating cable to extend at least one shingle row into the roof area.

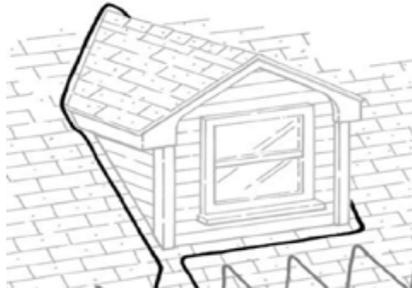
2. Skyline Pattern



Problem skylight areas should use the “triangle pattern” approach. However, the height of the triangles may need to be greater than those along the roof line.

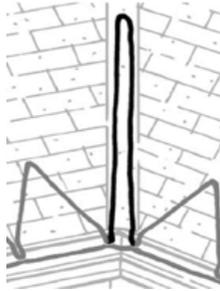
Increase the triangle height so that it extends to the base of the skylight.

3. Dormer Pattern



To treat a problem dormer area, the cable should run up and around the dormer.

4. Valley Pattern



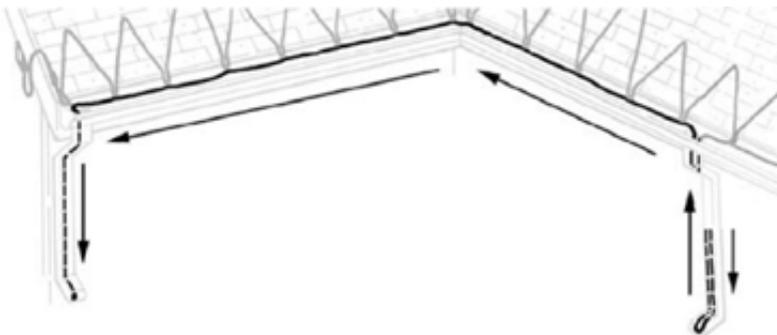
If a valley exists in a problem area of your roof, you must route cable up and back down the valley a minimum of 1 meter.

Extend the cable higher if the warm area of your roof is higher.

Gutter installation considerations

If a gutter is present, all gutters below the heated areas of the roof must also be heated to allow for the drainage of melted snow/ice.

If a downspout is present along the route of the gutter, the cable should run down the downspout and back up in a loop and continue along the gutter.



The simplest installation occurs when the project requires only de-icing of a gutter.

1. To attach the cable properly it must lie flat in the gutter. The cable should be uncoiled ensuring it is not twisted or tangled.
2. The cable should be held tightly.
3. Once the length of cable required is determined, the terminated cable end should be attached to the gutter using an appropriate method, ie aluminium adhesive tape. Permanent methods such as glue or adhesive should not be used.
4. For this installation the gutter bars are used (fig. 1). UV resistant cable ties are pushed through the holes on the bar and fasten loosely so that the cable is held, but not secured.
5. Repeat previous step with as many bars as required for the gutter length, using 1 bar every 20cm of gutter.
6. For round gutters the bar will need to be bent around the edge of the gutter, and the inside profile. Pliers can be used for this (fig 2).
7. Once all bars are attached along the cable, begin adhering them to the inside surface of the gutter. Check the spacing and use the aluminium adhesive tape to hold the bars down (fig 3).
8. All cable ties should be tightened and trimmed as in figure 2.

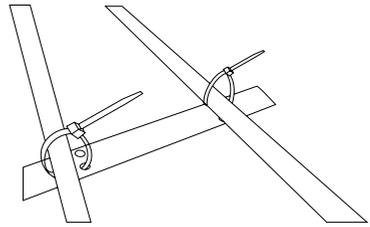


Figure 1. Gutter bar & cable ties

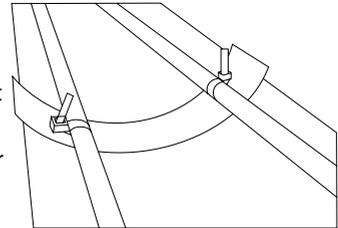


Figure 2. Bar attached to gutter

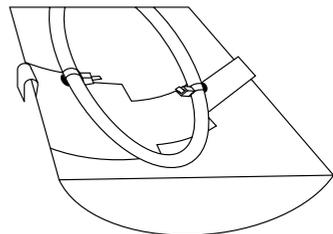


Figure 3. Bar adhered to gutter with aluminium tape

Note: The parallel runs of cable should be kept separate, and evenly spaced throughout.

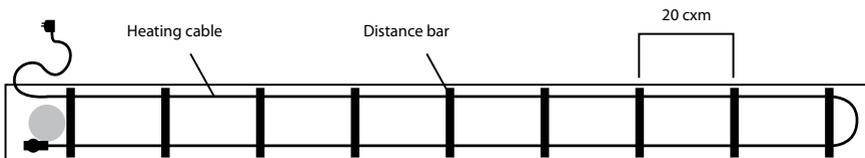


Figure 4. Final installation in a gutter

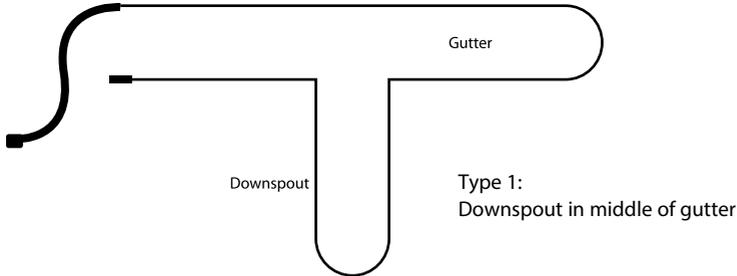
Downspout installation

There are 2 types of downspout installations:

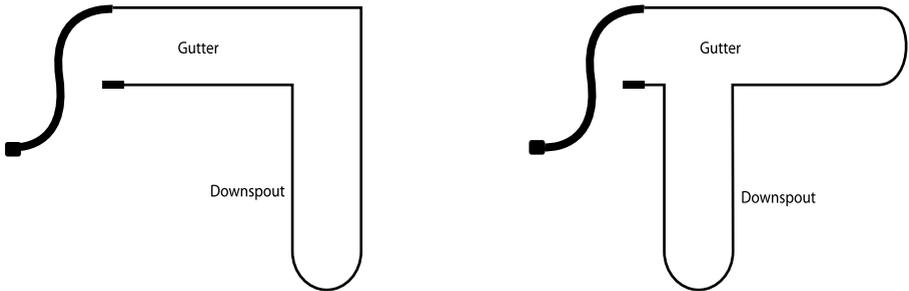
- those where the downspout is in the middle of a gutter length and
- those where the downspout is at the end of the gutter run

Where the downspout is in the middle of a gutter run, the cable will need to route down and back up, to continue along the gutter. The cable should not extend beyond the end of the downspout. Take this into account when calculating cable length for the project.

Remember to avoid overheating the cable, as this increases the risk of fire or electric shock. No part of the downspout should be inside a building.



1. For downspout installations running along the gutter, the cable should be routed down the pipe and back up.
2. Once the length of cable required is determined, the terminated cable end should be attached to the gutter before the downspout using an appropriate method, ie aluminium adhesive tape. Permanent methods such as glue or adhesive should not be used.



3. The length of steel wire needed should be measured from the looped end of the downspout hanger reel. This includes the length of gutter leading to the downspout, and for the downspout itself. The cable should be flush with the end of the spout.
4. The cable is then attached to the downspout hanger using the clips (see fig 3 in the next page). The clips are spaced at 40mm intervals.
5. On the end of the hanger reel is a looped end for holding the run in place and keeping the steel wire tensed. Attach this loop to a secure object which will not break or fall off with the weight of the cable being supported in the downspout.

6. Where the downspout is at the end of the gutter to be heated, parallel runs of the cable will be supported via the steel wire, and return via the same gutter. Where the gutter continues after the downspout, the cable will only have parallel double runs in the downspout itself, and will continue along the gutter as required.
7. Once all parts of the cable are clipped in, the cable with the steel wire can be dropped into the downspout, ensuring the steel wire is in tension to keep the cable in paralleled equal spacing.

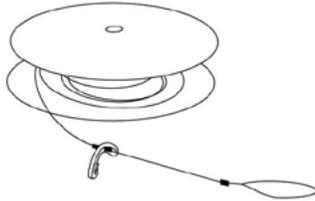


Figure 1. Downspout hanger

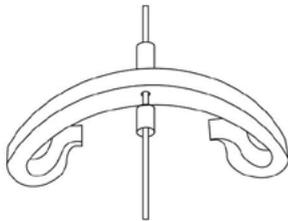


Figure 2. Downspout hanger clip

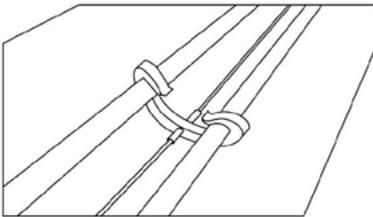


Figure 3. Downspout hanger clip holding cable

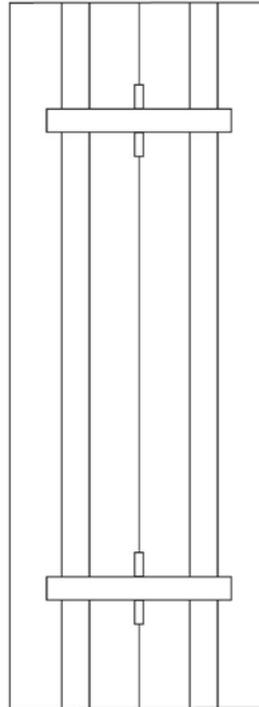


Figure 4. Cable held in parallel in the downspout

Estimating the amount of cable needed

Area	What to measure	How to calculate
Along roof	Overhang Length of Roof	Length of roof x overhang multiplier
Dormer	Distance around the dormer	Nr of dormers x distance around the dormers
Valley	Number of valleys	Number of valleys x 1.8 meters
Gutter	Length of gutter	Length of gutter
Downspouts	Number of downspouts Length of downspouts	Number of downspouts x Length of downspout x 2

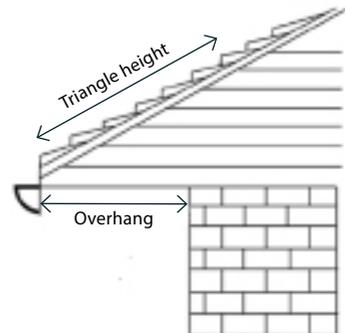
Table for overhang multiplier

Roof overhang (cm)	Multiplier for roof with gutter	Multiplier for roof without gutter
Less than 30cm	4.0	3.0
30	4.0	3.0
60	5.3	4.3
90	6.8	5.8
120	8.1	7.1
150	9.6	8.6
180	11.2	10.2
Downspouts	Number of downspouts Length of downspouts	Nr of downspouts x Length of downspout x2

Note: For overhangs that are not listed estimate multiplier. e.g. For an overhang of 45cm with a gutter, multiplier will be approx 4.7.

Triangle heights

Overhang (cm)	Triangle height (standard shingle row = 14cm)
Less than 30cm	3
30-46	4
46-60	5
60-76	6
76-91	7
91-106	8
106-120	9
120-137	10
137-152	11
152-167	12
167-183	13



9 - Installation checklist - part A

Planning phase

- Safety guidelines are being met (see section 3)
- Measure are to be heated
- Choose the desired wattage density
- Choose the correct cable and sizes for the application (see section 4)
- Calculate the correct cable spacing (see section 5)
- Draw plan detailing the location of power connections, sensors, controllers and connection boxes (if applicable)
- Ensure the required installation depth and possible mechanical protection of the cold leads are in accordance with local regulations
- A suitable 230V AC electrical supply is available
- All wiring and controls are capable of handling the load of the heating system (consult section 4)

Testing the cable

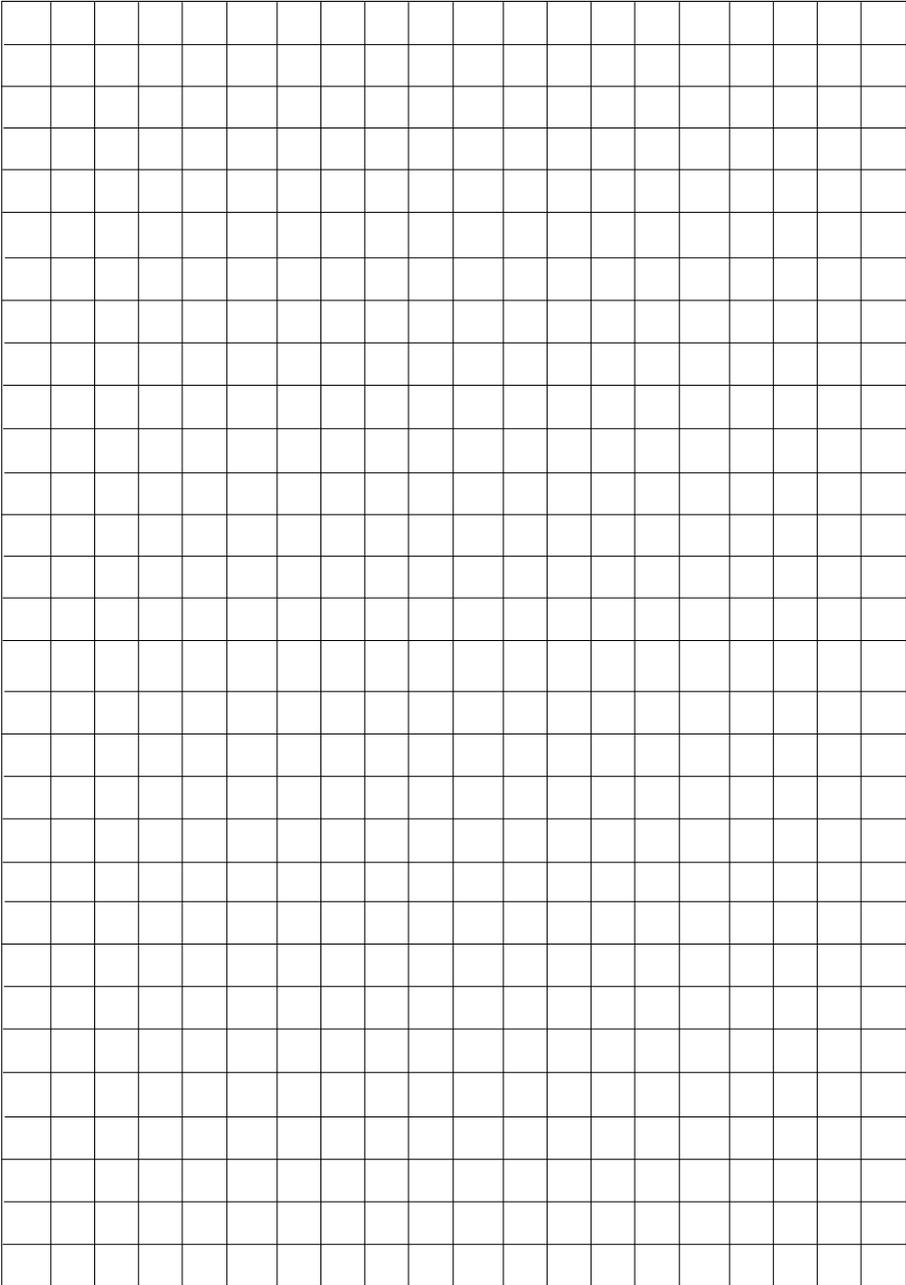
- Measure the ohmic resistance of each cable after unpacking, after the cable is laid down and after finalizing the installation
- Readings are between -5% and +10% of the values in the tables of section 4
- Perform an insulation resistance test between conductors and earth at 500V and 1000V
- Results of tests are recorded on the control card (section 11)

9 - Installation checklist - part B

Installation phase

- Ambient temperature is above -10°C
- Cables have been tested
- Prepare installation site by removing sharp objects, dirt or any other foreign objects
- Installation surface is even, stable, dry and clean
- Expansion joints are being taken into account
- Install weatherproof junction boxes (if required)
- Place cold leads and sensors in separate conduits
- Properly secure the heating cable to the surface before pouring concrete (or asphalt)
- Specifics for installation in stairs, roofs, gutters and downspouts are being met
- Fill up the control card and place in a visible place
- Presence of the heating cables as been made evident by affixing caution signs or marks at the power connection and frequently along the circuit

Plan



10 - Control Card

Place this card in a visible spot close to the consumer unit.

Warmup

The best underfloor heating - **guaranteed**

Heating cable location _____

Total wattage _____

Caution!

Risk of electric shock
Snowmelt heating cable installed
below floor.
Do not penetrate floor with sharp
devices that may damage the
heating cable.

Attention:

- Do not cut or shorten the heating element.
- Ensure that all of the heating wire including the joints completely embedded in the concrete/sand.
- Ensure that the heaters are used in conjunction with a 30mA RCD at all times.

Cable Model	Resistance Before	Resistance After	Insulation Resistance

Date _____

Signed _____

Company stamp/name _____

This form must be completed as part of the Warmup Guarantee. Ensure that the values are as per the instruction manual.

This card must be situated close to the consumer unit in a visible place.

Note: Draw a Plan showing the layout of the heater.

Warmup Plc 702 & 704 Tudor Estate Abbey Road London NW10 7UW T: 0845 345 2288 F: 0845 345 2299 www.warmup.co.uk

11 - Warranty



Warmup® Snowmelt Cable is guaranteed for a period of 10 years by WARMUP PLC ("Warmup") to be free from defects in materials and workmanship under normal use and maintenance, and is guaranteed to remain so subject to the limitations and conditions described below:

The 10 year Guarantee applies:

1. Only if the unit is registered with Warmup within 30 days after purchase. Registration can be completed online. In the event of a claim, proof of purchase is required, so keep your invoice or receipt – such invoice should state the exact model that has been purchased.
2. Only if the heater has been earthed and protected by a 30mA Residual Current Device (RCD) at all times.
3. Only if the heaters have been tested and electrical work and connections have been undertaken by a qualified electrician in accordance with IEE regulations and in accordance with these installation instructions.

During the period of guarantee, the manufacturer will arrange for the heater to be repaired or (at its discretion) have parts replaced.

If the heater fails due to damage caused during installation, this guarantee does not apply.

THE MANUFACTURER SHALL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO EXTRA UTILITY EXPENSES OR DAMAGES TO PROPERTY.

WARMUP® PLC is not responsible for:

1. Damage or repairs required as a consequence of faulty installation or application.
2. Damage as a result of floods, fires, winds, lightning, accidents, corrosive atmosphere or other conditions beyond the control of the manufacturer.
3. Use of components or accessories not compatible with the units.
4. Normal maintenance as described in the installation and operating manual.
5. Parts not supplied or designed by the manufacturer.
6. Damage or repairs required as a result of any improper use, maintenance, operation or servicing.
7. Failure to start due to interruption and/or inadequate electrical service.
8. Any damage caused by frozen or broken water pipes in the event of equipment failure.
9. Changes in the appearance of the product that does not affect its performance.

Warmup®

The World's **best-selling** floor heating brand™

Warmup PLC

702 & 704 Tudor Estate
Abbey Road
London
NW10 7UW

W: www.warmup.co.uk

E: uk@warmup.com

T: 0845 345 2288

F: 0845 345 2299