DEVI

Installation Guide

Deviflex Heating Applications
DSIG DTIP

0 Index

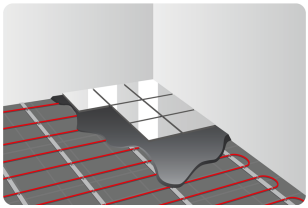
1 Introduction

In this installation manual, the word “element” refers to heating cables.

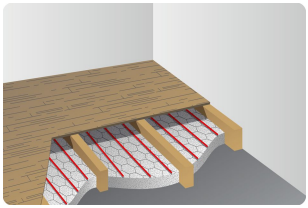
The intended uses of the heating elements covered by this installation manual are shown in the following.

For other applications please contact your local sales office.

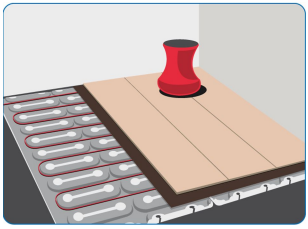
Floor heating in thin beddings (<3 cm)
- see section 4.1.



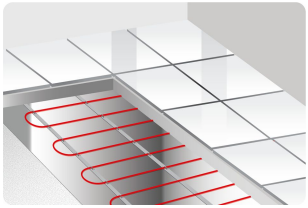
Floor heating in joist floor constructions - see section 4.2.



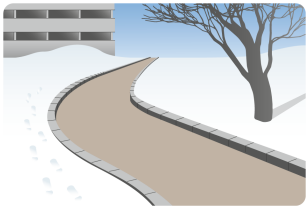
Floor heating with Devicell Dry
- see section 4.3.



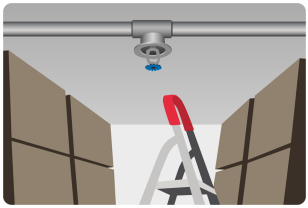
Floor Heating in Concrete Floors (>3 cm)
- see section 4.4.



Snow and ice melting on ground areas
- see section 5.1.



Frost protection of pipe systems
- see section 5.2.



1.1 Safety Instructions

Never cut or shorten the heating element

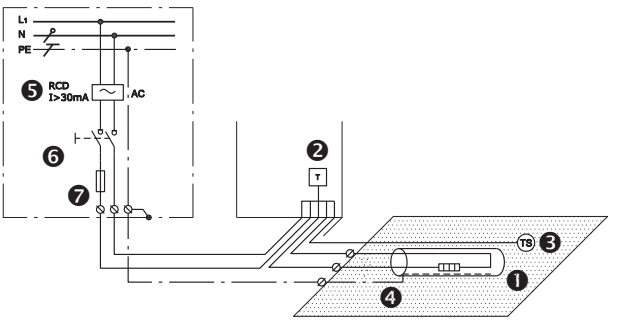
- Cutting the heating element will void the warranty.
- Cold leads can be cut or shortened to suit requirements, only.

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

- Any other installation may hamper element functionality or constitute a safety risk, and will void the warranty.
- Make sure that elements, cold leads, connection boxes, and other electrical components do not come into contact with chemicals or flammable materials during or after installation.

Elements must always be connected by an authorised electrician using a fixed connection.

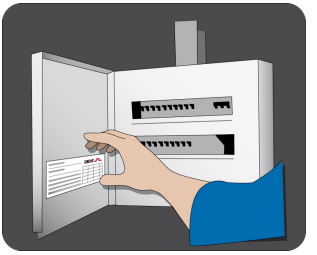
- De-energize all power circuits before installation and service.
- The connection to the power source must not be directly accessible to the end user.
- Each heating cable screen must be earthed in accordance with local electricity regulations and connected to a residual current device (RCD).
- Recommended RCD trip rating is 30 mA, but may be up to 300 mA where capacitive leakage may lead to nuisance tripping.
- Heating elements must be connected via a switch providing all pole disconnection.
- The element must be equipped with a correctly sized fuse or circuit breaker, e.g. 10/13 A for a 1.5 mm^2 cold lead and 16/20 A for a 2.5 mm^2 cold lead.



1. Heating cable
2. Thermostat
3. Sensor
4. Screen
5. RCD
6. All-pole switch
7. Fuse

Connections

- Phase - Black
- Neutral - Blue
- Earth - Screen



The presence of a heating element must

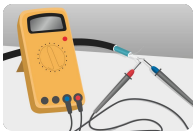
- be made evident by affixing caution signs or markings at the power connection fittings and/ or frequently along the circuit line where clearly visible.
- be stated in any electrical documentation following installation.

Never exceed the maximum heat density (W/m^2) for the actual application.

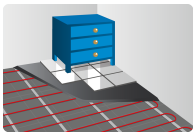
1.2 Installation Guidelines

- The product does not contain harmful substances.
- Store in a dry, warm place at temperatures between +5 °C to +30 °C.

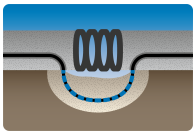
Prepare the installation site properly by removing sharp objects, dirt, etc.



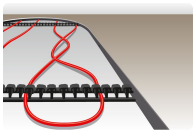
Regularly measure ohmic resistance and insulation resistance before and during installation.



Do not lay heating elements under walls and fixed obstacles. Min. 6 cm air is required.

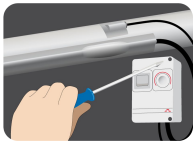


Keep elements clear of insulation material, other heating sources and expansion joints.

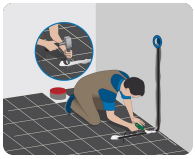


Elements may not touch or cross themselves or other elements and must be evenly distributed on areas.

The elements and especially the connection must be protected from stress and strain.



The element should be temperature controlled and not operate at ambient temperature higher than 10°C in outdoor applications.



A floor sensor is recommended in all floor heating applications and **mandatory** under wooden floors.

1.3 System Overview

Deviflex™	DSIG	DTIP
Floor heating in thin beddings (<3 cm)	D	D
Floor heating in joist floor constructions	-	P
Floor heating with Devicell™ Dry	-	P
Floor heating in concrete floors (>3 cm)	D	P
Snow and ice melting on ground areas	D	A
Frost protection of pipe systems	A	P

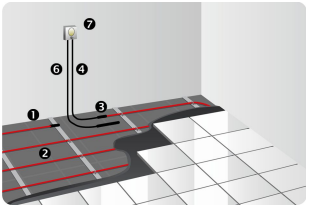
P Primary recommendation for this application.

D Designed and approved for this application.

A Applicable but there are better options.

- Not applicable! Do not use!

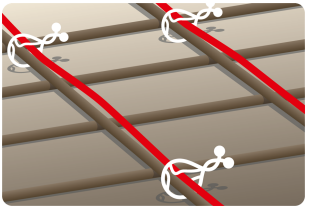
1.4 Functional Overview



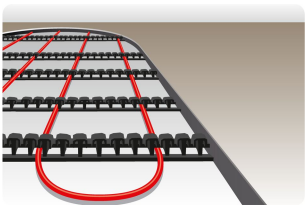
1. Element
2. C-C distance
3. Cold lead connection
4. Cold lead
5. Connection box (if any)
6. Sensor
7. Thermostat

2 Installation Step by Step

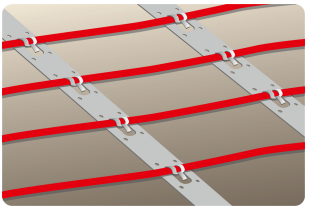
2.1 Fastening Methods



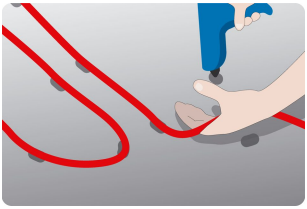
Deviclip™ Twist
For use on reinforcement mesh.



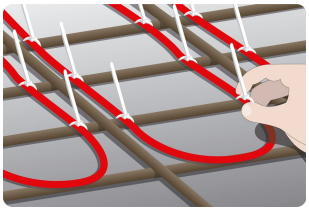
Deviclip™ CC
For keeping exact C-C distance (1 cm steps) on even surfaces, UV resistant.



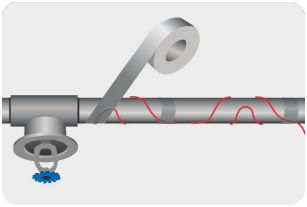
Devifast™
For keeping exact C-C distance (2.5 cm steps) on even surfaces.



Tape or hotmelt glue
For fixing elements to hard, dry, even surfaces.



Cable ties
For use on reinforcement mesh. Do NOT fix the loop. The cable must be able to move.

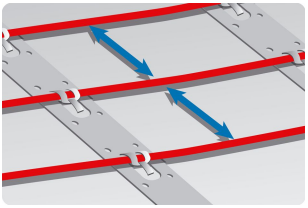


DEVI Aluminium Tape
For ensuring efficient heat transfer.

2.2 Calculating C-C Distance

For areas on roofs, grounds and fields, the C-C distance is the distance in centimetres from the centre of one cable to the centre of the next.

For heating of pipes, refer to the number of cables per metre - see section 5.2.



$$\text{C - C[cm]} = \frac{\text{Area [m}^2\text{]}}{\text{Cable length [m]}} \times 100 \text{ cm}$$

or

$$\text{C - C[cm]} = \frac{\text{Cable output [W/m]}}{\text{Heat density [W/m}^2\text{]}} \times 100 \text{ cm}$$

Max. C-C distance

Thin beddings (<3 cm)	10 cm
Joist floor constructions	20 cm
Devicell^{TM} Dry	20 cm
Concrete floors (>3 cm)	15 cm
Ground areas	15 cm

W/m^2 @ 220V/380V			
C-C [cm]	20 W/m	25 W/m	30 W/m
5	366	457	-
7,5	244	305	366
10	183	229	274
12,5	146	183	220
15	122	152	183
20	91	114	137
25	73	91	110

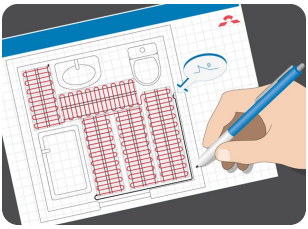
W/m² @ 230V/400V			
C-C [cm]	20 W/m	25 W/m	30 W/m
5	400	500	-
7,5	267	333	400
10	200	250	300
12,5	160	200	240
15	133	167	200
20	100	125	150
25	80	100	120

W/m² @ 240V/415V			
C-C [cm]	20 W/m	25 W/m	30 W/m
5	436	544	-
7,5	290	363	436
10	218	272	327
12,5	174	218	261
15	145	181	218
20	109	136	163
25	87	109	131

2.3 Planning the Installation

Draw a sketch of the installation which shows

- element layout
- cold leads and connections
- junction box/cable well (if applicable)
- sensor
- connection box
- thermostat



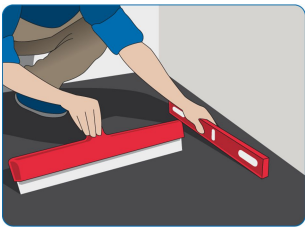
Save the sketch

- Knowing the exact location of these components makes subsequent troubleshooting and repair of faulty elements easier.

Bear in mind the following:

- Observe all guidelines in section 1.1 .
- Observe correct C-C distance (heating cables only) - see section 2.2.
- Observe required installation depth and possible mechanical protection of cold leads.
- When installing more than one element, never wire elements in series but route all cold leads in parallel to the connection box.
  - Two or more elements may be installed in the same room but a single element is not to be installed across two or more rooms.
  - All heating elements in the same room must have the same heat density (W/m²) unless they are connected to separate floor sensors and thermostats.
- For single conductor cables, both cold leads must be connected to the connection box.

2.4 Preparing the Installation Area



- Remove all traces of old installations, if applicable.
- Ensure that the installation surface is even, stable, smooth, dry and clean.
  - If necessary, fill out gaps around pipes, drains, or walls or apply foil covering
- There must be no sharp edges, leaves, dirt or foreign objects.

3 Installing Elements

It is not recommended to install elements at temperatures below -5 °C.

At low temperatures, heating cables can become rigid. After rolling out the element, briefly connect it to the mains supply to soften the cable before fastening.

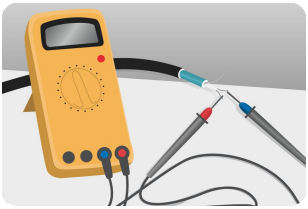
Measuring Resistance

Measure, verify and record element resistance during installation.

- After unpacking
- After fastening the elements
- After the installation in finalized

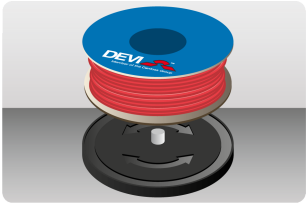
If ohmic resistance and insulation resistance are not as labelled, the element must be replaced.

- The ohmic resistance must be within -5 to +10 % of the value labelled.
- The insulation resistance should read >20 MΩ at min. 500 V, preferably 2.5 kV.



3.1 Installing Heating Elements

Observe all instructions and guidelines in section 1.1 and 1.2.



Heating Cables

- Position the heating element so that is at least half the C-C distance from obstacles.
- Elements must always be in good contact with the heat distributor (roof, sand, soil, concrete, pipe, etc.) - see section 4 and 5 for details.
- Observe correct C-C distance - see section 2.2.
- Position the heating cable so that it is at least half the C-C distance from obstacles.
- Heating cable bending diameter must be at least 6 times cable diameter.
- Heating cables have meter markings to aid you during installation
- The actual cable length may vary +/- 2 %.

Extending cold leads

- Avoid extending cold leads if possible. Wire cold leads to e.g. junction boxes or cable wells.
- Max. 5 % loss of potential power in the whole length of the cold cable.
- Extra length of cold lead will increase capacitive leakage current which means that RCD trip rating may need to be higher.

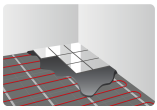
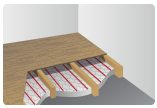
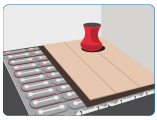
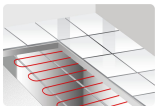
Sensors

- Sensors are live (230 V) components and must be wired inside plastic conduit
- Sensors can be extended using installation cable.
- See section 4 for specific applications.

Floor sensors (indoor applications only)

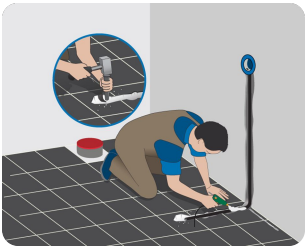
- Mandatory under wooden floors or in wooden sub floors.
- Shall be placed in an appropriate place.
  - Where not exposed to sunlight or draft from door openings
  - In between >2 cm from two heating cables
  - The conduit should be flush with the floor surface.
    - It may be necessary to countersink the conduit to achieve this.
- Route the conduit to the connection box.

4 Indoor Applications

				
Sub floor	**Thin beddings* (<3 cm)**	**Joist floor constructions**	**Devicell™ Dry**	**Concrete floors (>3 cm)**
Wood	Max. 10 W/m and 100 W/m^2			
Concrete	Max. 20 W/m and 225 W/m^2			
Floor type				
Wood, parquet, laminate	Max. 100 W/m^2	Max. 80 W/m^2	Max. 100 W/m^2	Max. 150 W/m^2
Carpet, vinyl, linoleum, etc.	Max. 100 W/m^2	-	-	Max. 150 W/m^2
Tiled floors in ▪ bathrooms, ▪ conservatories, ▪ cellars, etc.	100 - 200 W/m^2	-	-	100 - 200 W/m^2
Tiled floors in ▪ kitchens, ▪ living rooms, ▪ halls, etc.	100 - 150 W/m^2	-	-	100 - 150 W/m^2

* May be up to 225 W/m^2 in rim zones e.g. under large windows

- On concrete sub floors and under tiles, only
- If connected to a separate floor sensor and thermostat



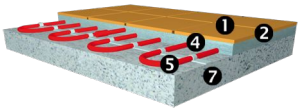
Wooden floor coverings

Wood shrinks and swells naturally depending on the relative humidity (RH) in the room. The optimal range is 30-60% RH.

- Avoid beech and maple in multilayered floor coverings unless press dried.
- Install a vapour barrier for sub floors <95% RH and a damp proof membrane >95%.
- Ensure 100% contact between element and floor materials above (no air pockets).
- Install the heating system in the whole floor area at 15°C surface temperature.
- Always install a floor sensor to limit the floor temperature. See section 7.1 for further information.

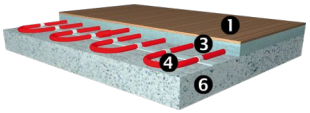
4.1 Floor Heating in Thin Beddings

New tiles floor in wet rooms



1. New tiles
2. Tile adhesive
3. Damp proof membrane (in wet rooms)
4. Self-levelling compound
5. Deviflex™ heating cable
6. Primer
7. Existing tiles or concrete floor

New floor covering in dry rooms



1. New tiles, wooden floor, laminate, or carpet
2. Vapour barrier and noise absorption mat (wooden floor / laminate)
3. Latex based compound/tile adhesive
4. Deviflex™ heating cable
5. Primer
6. Existing concrete or wooden floor

Wooden sub floors must be properly anchored

- Apply floor plaster before laying the heating element if necessary.

Additional insulation (tile backer boards)

- Can be applied between existing sub floor and heating element.
  - Polystyrene (XPS) with high compressive strength >300 kN/m^2.
  - Concrete or foil faced without cracks.
- Must be installed as prescribed by the manufacturer.
- Floor sensor must be installed above insulation.
- Output max. 10 W/m and 150 W/m2.

Damp proof membrane

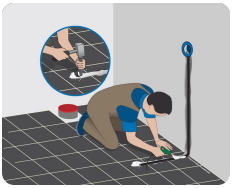
- Apply in wet rooms above the heating cables.
- Apply only if not already installed in existing floor.

Tile adhesive or self-levelling compound

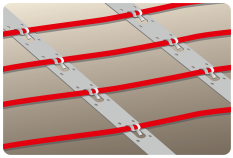
- Prime the sub floor as specified by the supplier.
- The heating element should be securely fastened before applying.
- The heating element must be fully embedded and at least 5 mm.

Required tools

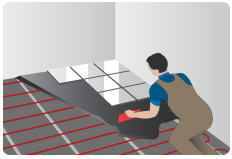
- Hammer.
- Chisel.
- Glue gun.



Cut out a wall groove and fix cable ducts and connection box. Chisel off a groove for the sensor conduit and cold cable. Fix the sensor conduit e.g. with a glue gun.

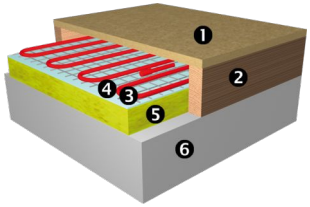


Roll out the cable and attach it to the sub floor by means of Deviclip™ fastening accessories or similar.



Apply flexible self-levelling compound, damp proof membrane, and/or tile adhesive, depending on the floor finish.

4.2 Floor Heating in Joist Floor Constructions



1. Wooden floor covering.
2. Floor joists.
3. Deviflex™ Heating Cable .
4. Chicken wire and/or aluminium foil.
5. Insulation.
6. Sub floor construction.

The sub floor construction must be well insulated

- Insulate thermal bridges and close vents, e.g. between the floor construction and walls/roofs.

The heating cables may not touch the insulation or woodwork

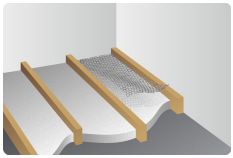
- The distance between the heating cable and the planks and joists should be at least 30 mm.
- The optimal distance between the heating cables and the floor covering is 3-5 cm.
- The heating cable must be fastened to the wire/ foil at 30 cm intervals.

Heating cables may cross a joist

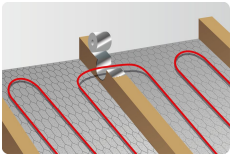
- Through a 50 mm recess lined with aluminium tape
- Make sure the cable is never in contact with the joist
- Only one cable in each recess

Required tools

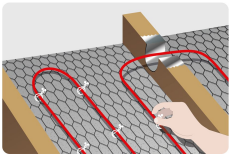
- Compass saw.
- Aluminium tape.
- Deviclip™ Twist or similar.



Apply chicken wire or similar onto the insulation.

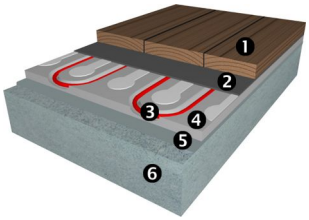


Cut a 50 mm recess and cover with aluminium tape where cables cross a joist.

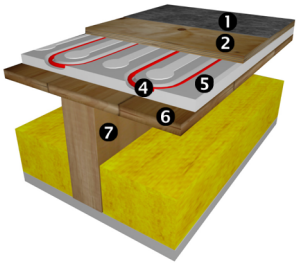


Attach the cable and sensor properly with Deviclip™ Twist , cable ties, or heat resistant tape.

4.3 Floor Heating with Devicell Dry



1. Timber / parquet /laminate.
2. Noise absorption mat / rag felt.
3. Deviflex™ DTIP .
4. Devicell™ Dry .
5. Damp proof membrane.
6. Existing floor construction (e.g. concrete, gypsum, polystyrene)



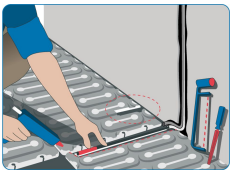
1. Linoleum / vinyl, carpet.
2. Pressure distribution board (e.g. plywood).
3. Noise absorption mat / rag felt.
4. Deviflex™ DTIP .
5. Devicell™ Dry .
6. Damp proof membrane.
7. Existing wooden floor construction.

Installation under carpets, linoleum or vinyl

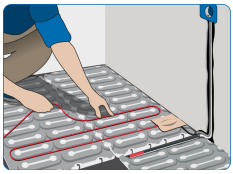
- Must be separated from cables by at least 5 mm of pressure distribution board.
- Observe the insulation value above the pressure distribution board.
  - R < 0.10 m^2K/W corresponding 1 Tog or a thin carpet.

Required tools

- Compass saw.
- File.
- Glue gun.
- Aluminium tape.



Cut out a hole for the warm/cold cable connection and the floor sensor conduit and file any sharp edges. Fix the conduit to the sub floor with glue or screws.

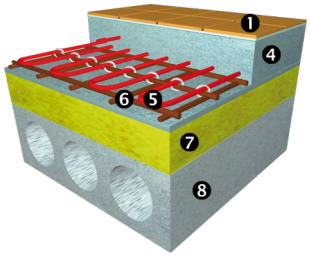


Install the Deviflex™ heating cable. Make sure that the cable, end termination, and warm/cold cable connection are in contact with the aluminium plate or aluminium tape at all times.

See the installation manual for the Devicell™ product for further information.

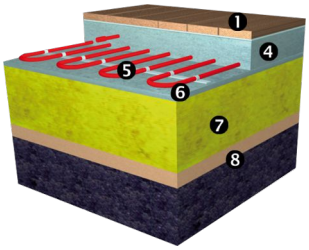
4.4 Floor Heating in Concrete Floors

Heated tiles in bathrooms



1. New tiles.
2. Tile adhesive.
3. Damp proof membrane.
4. Concrete.
5. Deviflex™ heating cable.
6. Mesh reinforcement.
7. XPS insulation.
8. Concrete slab.

New floor in dry rooms



1. Wooden floor, laminate or carpet.
2. Noise absorption mat / rag felt (under wood).
3. Vapour barrier.
4. Concrete.
5. Deviflex™ heating cable.
6. Concrete slab or foil.
7. XPS insulation.
8. Sand and soil.

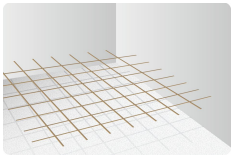
Other combinations of floor covering and existing floor construction are also possible.

The heating cables may not touch the insulation

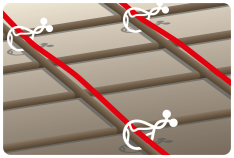
- The heating cable must be separated by mesh reinforcement, concrete slab or foil.

Embedding in concrete, mortar or screed

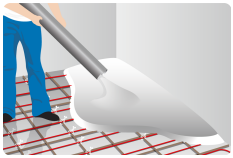
- The bedding must not contain sharp stones
- Must be sufficiently wet, homogeneous, free of air voids
  - Pour at a moderate delivery speed to avoid displacement of the element
  - Avoid excessive use of rakes, shovels, vibrators, and rollers
- The heating element must be fully embedded and at least 5 mm
- Allow a drying time of approximately 30 days for concrete and 7 days for moulding compounds.



Apply reinforcement mesh, concrete slab or foil onto the insulation.



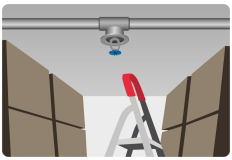
Roll out the cable and attach it to the sub floor or mesh reinforcement by means of Deviclip™ fastening accessories or similar.



Pour at a moderate delivery speed to avoid displacement of the element.

5 Outdoor Applications

Observe following heat densities (W/m2) for the actual application.

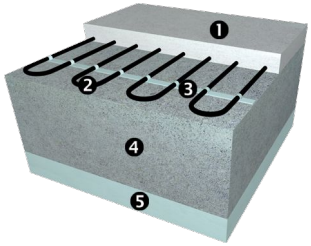
Design temperature [°C]	Snow and ice melting on ground areas [W/m2] 	Frost protection of pipe systems [W/m2] 
0 to -5	200	See table below.
-6 to -15	300	
-16 to -25	400	
-26 to -35	500	

Frost protection of pipe systems [W/m]

Δt [K]	Insulation [mm]	Pipe diameter DN [mm]											
		15	20	25	32	40	50	65	80	100	125	150	200
20	10	8	9	11	14	16	19	24	29	36	44	-	-
	20	5	6	7	8	9	11	14	16	19	24	28	36
	30	4	5	5	6	7	8	10	12	14	17	19	25
	40	4	4	5	5	6	7	8	9	11	13	15	19
	50	3	4	4	5	5	6	7	8	9	11	13	16
30	10	12	14	17	20	24	29	37	44	-	-	-	-
	20	8	9	10	12	14	17	20	24	29	35	42	-
	30	6	7	8	9	11	12	15	18	21	25	29	37
	40	5	6	7	8	9	10	12	14	17	20	23	29
	50	5	6	6	7	8	9	11	12	14	17	19	24
40	10	15	19	22	27	32	39	49	-	-	-	-	-
	20	10	12	14	16	19	22	27	32	39	47	-	-
	30	8	9	11	12	14	17	20	23	28	33	39	50
	40	7	8	9	10	12	14	16	19	22	26	31	39
	50	6	7	8	9	10	12	14	16	19	22	26	32

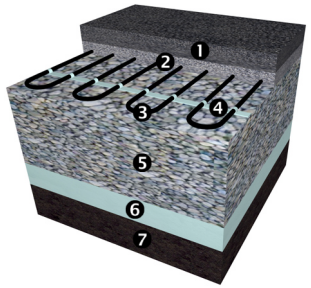
5.1 Snow Melting on Ground Areas

Free constructions, e.g. platforms, steps, bridges, and terraces



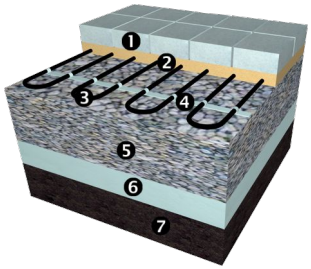
1. Top layer of concrete slab.
2. Deviflex™ heating cable.
3. Deviclip™ fastening accessory or mesh reinforcement.
4. Underlying free construction.
5. Insulation

Ground areas, e.g. ramps and car parks



1. Top layer of concrete slab or asphalt concrete.
2. Sand bed or concrete.
3. Deviflex™ heating cable.
4. Deviclip™ fastening accessory or mesh reinforcement.
5. Supporting layer of crushed stones/concrete /old asphalt.
6. Insulation (optional, ensure supporting layer is suitable).
7. Soil.

Ground areas, e.g. driveways, walkways, and pavements



1. Top layer of pavement blocks or concrete slab
2. Sand bed
3. Deviflex™ heating cable
4. Deviclip™ fastening accessory or mesh reinforcement
5. Supporting layer of crushed stones
6. Insulation (optional, ensure supporting layer is suitable)
7. Soil

Ground thermostat is mandatory

- In sand bed: mat output from 250 W/m^2 and cable output from 25 W/m.
- In concrete bed: cable output from 30 W/m with a heat density > 500 W/m^2 (C-C < 6 cm).

Limited power supply

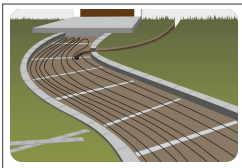
- Reduce the area to be heated, e.g. by heating tire tracks instead of the whole driveway.
- Divide and prioritise the area into 2 zones by means of Devireg™ 850 .
- Install less W/m^2 than recommended. Snow melting performance will be reduced. Do not install less W/m^2 than recommended in areas of drainage, e.g. in front of heated steps.

Do not install cables in sand only

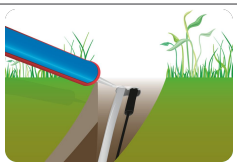
- The heating cables must be protected by a hard top layer.
- Otherwise contact your local sales office.

Embedding in concrete, mortar or screed

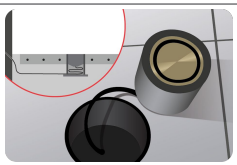
- The bedding must not contain sharp stones.
- Must be sufficiently wet, homogeneous, free of air voids:
  - Pour at a moderate delivery speed to avoid displacement of the element.
  - Avoid excessive use of rakes, shovels, vibrators, and rollers.
- The heating element must be fully embedded and at least 5 mm.
- Allow a drying time of approximately 30 days for concrete and 7 days for moulding compounds.



Prepare installation surface with Deviclip™ fastening accessories and/or mesh reinforcement. Fix conduit for sensor cable and sensor tube/dummy for Devireg™ 850 sensor, if any.



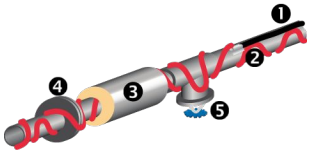
Extend cold leads with shrink tubes, and place connections in a dry place. Seal all penetrations through walls or similar structures. Apply caution tape above cold leads.



After laying blocks or pouring concrete/asphalt, install external sensor(s), and extend sensor cable(s) according to sensor manual.

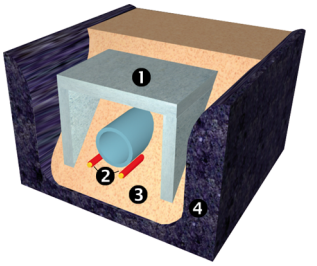
5.2 Frost Protection of Pipes

Pipe tracing



1. Sensor.
2. Deviflex™ heating cable.
3. Insulation.
4. Fitting.
5. Valve.

Subsurface pipe tracing



1. Concrete breeze block (optional) and/or XPS insulation (optional).
2. Deviflex™ heating cable.
3. Sand bed.
4. Soil.
5. Sensor (not shown).

The required output [W/m]is found in the table on page 17 and depends on:

λ	W/mK	Thermal conductivity for insulation ≈ 0.04 used in table
Δt	K	Temp. diff. between media/ surroundings
D	mm	Outer insulation diameter
d	mm	Outer pipe diameter

$$q_{pipe} = 1.3 \cdot \frac{2\pi \cdot \lambda \cdot \Delta t}{ln\frac{D}{d}}$$

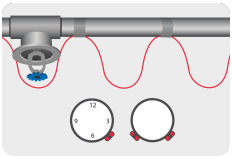
The number of cables n

- Relation between required output and cable output
- Number of cables per metre in the length direction
- Min. 2 for DN125-200
- Integer = straight cables (easier installation)
- Decimal = wrapped around pipe

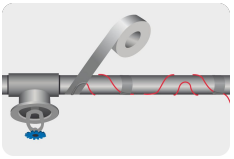
$$n = \frac{q_{pipe}}{q_{cable}}$$

For plastic pipes:

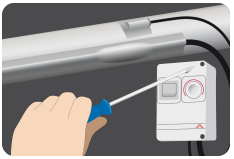
- Cable output max. 10 W/m.
- Apply aluminium tape below and on top on the whole length of the cable.



Cables wrapped around pipes are attached as shown for every 20-30 cm of pipe with aluminium tape. Straight cables must be fitted as shown at 5 or 7 o'clock. In-pipe cables are fitted directly in the pipe with compression gland.



Apply aluminium tape below (mandatory for plastic pipes) and on top of pipe for the whole length of cable.

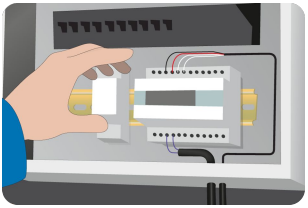


Extend cold leads/terminate cables, and place connections in a dry place. Mount connection box on or close to pipe, and install thermostat next to pipe.

6 Finalizing the Installation

Connecting cables

- See the installation manual for the thermostat.
- See wiring diagram and other important informationin section 1.1.
- Observe that the total Amps do not exceed the capacity of the thermostat. Otherwise install a contactor.

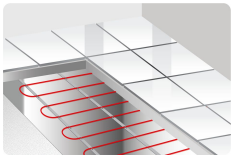
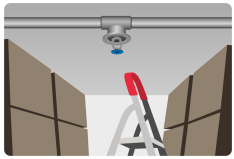


Final check and documentation

- Make sure that the heat distributor (e.g. floor, pipe) can withstand the heat from the element. This is particularly important if the element is connected to a thermostat that does not allow configuration of maximum temperature. See section 4 for details.
    - This is particularly important if the element is connected to a thermostat that does not allow configuration of maximum temperature.
- Document the following using text, drawings, or photos:
    - cable type, spacing, depth, layout, circuit ID, sensors.
    - location of connections between cold lead and heating element.
    - location of end caps (twin conductors only).
    - location of expansion joints, if any.
- Complete the warranty form.
- Instruct the end-user or the daily supervisor in the operation and maintenance of the heating system.
- Before every period of continuous use, check for faults in the distribution board, thermostat, and sensors.
    - Re-check and compare the ohm rating and insulation resistance.

7 Optional Settings

If the element is connected to a thermostat such as a Devireg™ , configure basic settings according to the table below and as described in the thermostat installation manual.

Thermostat	Max. load	 Floor heating in general	 Snow and ice melting on ground areas	 Frost protection of pipe systems
Devireg™ 13x	16 A	Room temp. 20-22 °C Floor Temp.: see section 7.1	-	-
Devireg™ 330/610	16/10 A		On < +3 °C	On < +5 °C
Devireg™ 53x	15A		-	-
Devireg™ 550	16A		-	-
Devilink™	15A (FT)		-	-
Devireg™ 850	2 x 15A	-	Melting < +3 °C, Standby < -3 °C	-

If applicable, adjust the temperature limit in accordance with the manufacturer's recommendations in order to prevent damage to e.g. the floor or the pipe.

- For most wooden floor products, the temperature is usually around 27 °C.

7.1 Floor Temperature Settings

According to ISO 13732-2, the comfortable floor temperature depends on the floor covering material.

All floor temperature settings must be a few degrees higher to compensate for the heat resistance in the floor covering.

Concrete floor (tiles)	26 - 28,5°C
Soft wood (pine)	22,5 - 28°C
Hard wood (oak)	24,5 - 28°C
Textiles (rugs, carpets)	21 - 28°C

Thermal resistance [m^2K/W]	Examples of flooring	Details	Approximate setting for 25°C floor temperature
0.02	15 mm tile	Stone or ceramic	26°C
0.05	8 mm HDF based laminate	>800 kg/m^3	28°C
0.10	14 mm beech parquet	650 - 800 kg/m^3	31°C
0.13	22 mm solid oak plank	>800 kg/m^3	32°C
<0.17	Max. carpet thickness suitable for floor heating	acc. to EN 1307	34°C
0.18	22 mm solid fir planks	450 - 650 kg/m^3	35°C

The floor temperature must be increased slowly during the first week to allow the new floor to settle. This is also recommended at the beginning of a heating season.

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