



gaia

Design, supply and installation specialists
of wet and electric underfloor heating
systems, latex and insulation

Unit 4 Brickfields Business Park, Woolpit
Bury St. Edmunds, Suffolk, IP30 9QS

Registered in England 2424430

Tel: 01359 242400 | Fax: 01359 242525

www.gaia.co.uk

10-15%
Energy Savings

Why Underfloor Heating?

Underfloor heating is an energy efficient way to heat your entire home and studies have proven it will help reduce your running costs.

The perfect solution to a warmer home.

Our philosophy revolves around providing a professional service, using the highest quality products and tailoring each design to each individual project. Creating solutions that provide either sole source heating or floor warming, Gaia gives you the luxury of a comfortable warm floor.

With over 25 years experience pioneering total underfloor heating solutions across the UK and Ireland; Gaia specialises in the design, supply and installation of both wet and electric underfloor heating systems. With a wide range of underfloor heating solutions, we at Gaia can advise and design the most suitable system for you, whether it's a refurbishment, new build project, tiled or timber flooring; providing a professional service from initial project stage through to project completion. We are so confident of our product performance; we offer market leading warranties and an after-sales service to ease all concerns.

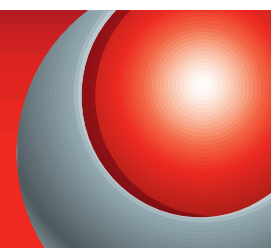
Along with underfloor heating solutions, we at Gaia specialise in the supply and installation of insulation and latex - giving complete project management service and peace of mind installation. Gaia maintains its strong links with DEVI/Danfoss as the only DEVI Project Solution Partner in the UK and Ireland designing, supplying and installing the complete DEVI underfloor heating solution.

Gaia Climate Solutions Limited

Unit 4 Brickfields Business Park, Woolpit
Bury St. Edmunds, Suffolk, IP30 9QS

www.gaia.co.uk

Tel: 01359 242400 | Fax: 01359 242525
Registered in England 2424430



Snow and Ice Melting on Ground Areas

When heating cables are installed to melt the snow or slippery ice from ground areas, safety and cost savings go hand in hand. This system can be used at home on pavements, driveways and walkways or in commercial car parks, ramps, steps and areas of drainage. It is even possible to melt snow and ice from mastic asphalt surfaces by using our DEVIflex DTIK heating cables.

The system is usually designed taking the available power supply into account. If the available power supply is limited, then:

- 1) *Reduce the area to be heated e.g. by heating tire tracks instead of the whole driveway*
- 2) *Divide and prioritise the area in 2 zones by means of the DEVIreg 850*
- 3) *Install less W/m^2 than recommended, knowing that the snow melting performance is reduced*
- 4) *Do not install less W/m^2 than recommended in areas of drainage e.g. in front of heated steps*

Product Overview

DEVIflex DTCE-30

DEVI loose cable system. Perfect as a frost protection solution to be installed under driveways and paths within a concrete or sand layer under the final finish.



DEVIflex DTIK-30

DEVI loose cable system. Perfect as a frost protection solution to be installed where the final finish is to be mastic or asphalt concrete.

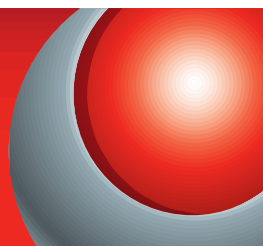
DEVImat DTCE-250 / 300

DEVI matting system. Perfect as a frost protection solution to be installed under driveways and paths within a concrete or sand layer under the final finish.



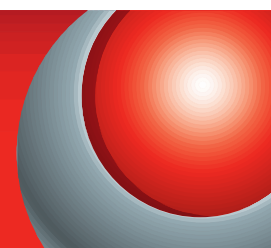
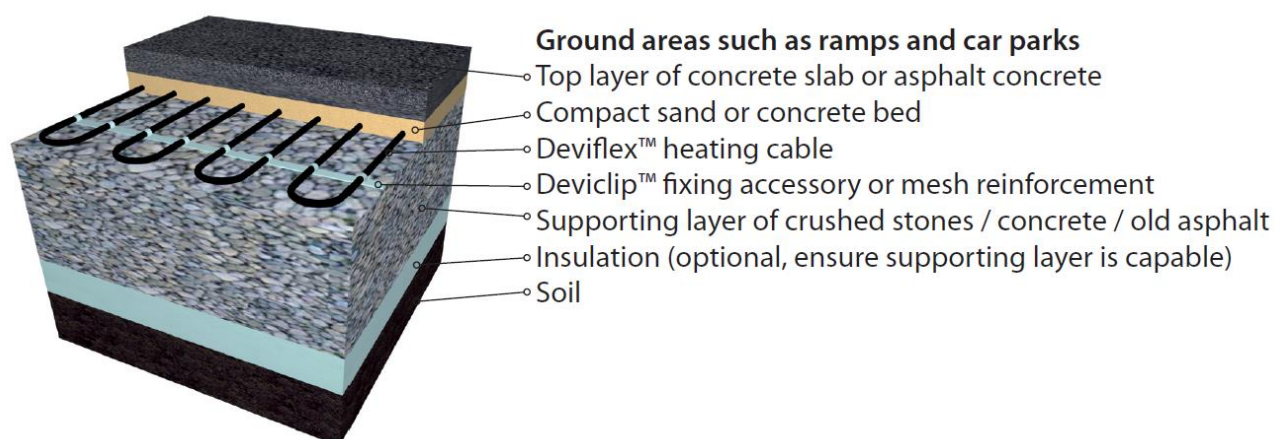
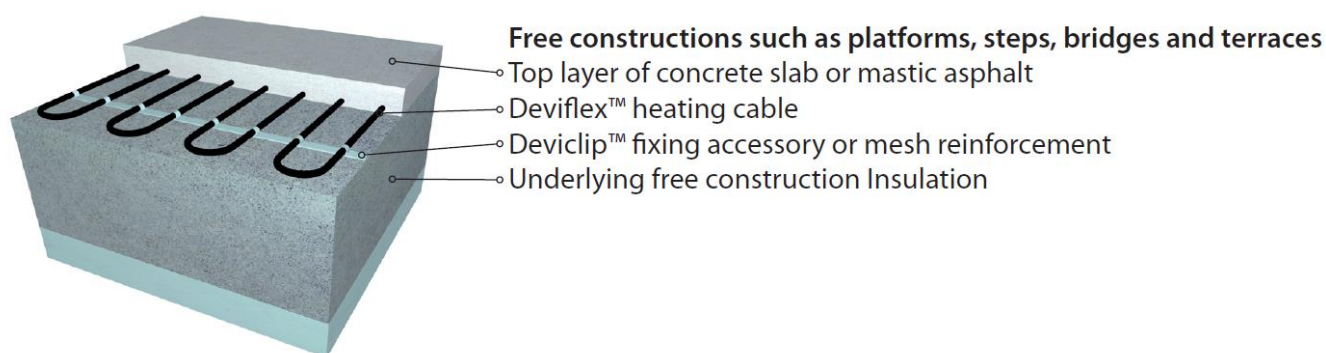
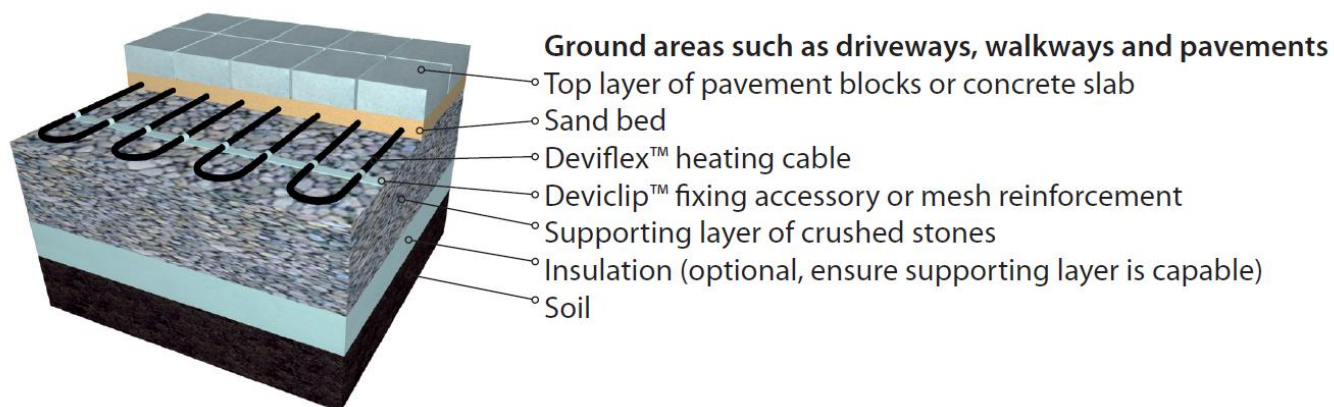
DEVImat DTIK-300

DEVI matting system. Perfect as a frost protection solution to be installed where the final finish is to be mastic or asphalt concrete.



Installation

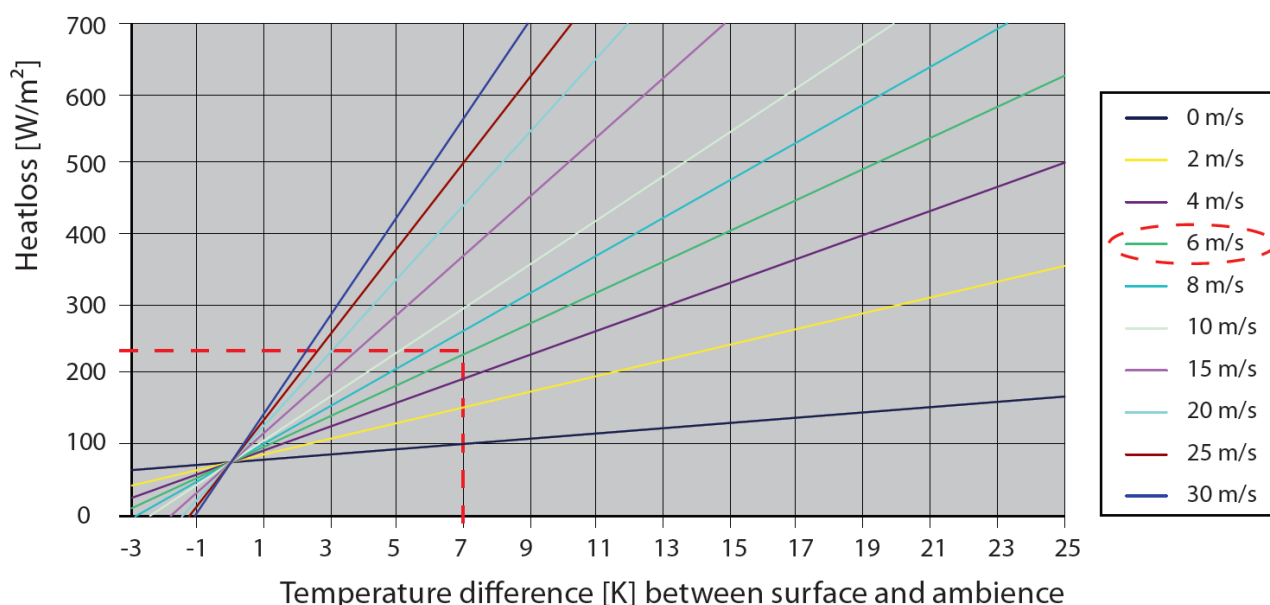
Our outdoor underfloor heating products are quick and easy to install. Thermal insulation is significant for free standing constructions such as ramps or bridges, steps, etc. Insulation of the free sides of the construction must also be considered. For example, a 6m wide bridge is exposed to snow at -3 °C air temperature and 4,5 m/s crossing wind. Please always follow the manufacturers installation instructions for each surface type you install on to.



Performance

Our outdoor heating products offer quick responding floor heat when you need it. Evaluation of the specific output for ice and snow melting systems can be done based on the diagram and other similar documents. For example, for medium weather conditions and 6 m/s wind speed, if choosing $\Delta T = 10$ K (from -3 K to +7 K) the heat loss value is approx. 230 W/m² (marked with the red dotted line in fig. 3). In other words, surface heating up to 10 degrees requires 230 W/m² or $230 / 10 = 23$ W/(m²·K). All in all, for medium winter weather conditions, heating of 1 m² outdoor surface up to 1°C needs power of approx. 23 Watts. Or the calculation heat exchange coefficient for outdoor surfaces is approx. 23 W/(m²·K).

No back loss & area width 6 m & 50% cloud cover
Surface temp. - 3 °C & 70% relative humidity



Complete Floor Guard Warranty

A floor heating system which does not work causes not only dissatisfied customers - it also causes angry customers and with good reason.

A heating cable which is not working is not so easy to replace. The fault has to be found the floor must be taken up before the fault can be corrected. It is a difficult, dirty and expensive process.

Gaia places great importance on the manufacture of extremely high quality products and, in return, offers the market's highest security for unproblematic heating, backed with the promise of the best warranty in the market.

In the event of a fault that can be traced back to a manufacturing defect in a DEViflex™ or DEVImat™ product, DEVI will repair or replace the product itself and cover any costs associated with the floor covering, at no extra cost to the customer.

20
YEAR
WARRANTY

For ultimate insurance we offer up to 20 year product warranties on all heating mats and cables – which even include the floor cost!

Roof and Gutter Systems

When the winter sun melts the snow and ice, icicles start to form on the cold roof edges and gutters which over time can do a great deal of damage to the building and be a danger for vehicles and people passing by. First, in order to avoid this or, the manual work to remove the ice, heating cables are installed in all drains such as gutter valleys, gutters and down pipes.

The benefits of roof and gutter frost protection systems are:

- *No risk of icicles forming or falling in the cold season which cause injuries or damage to vehicles or other property*
- *Reduces risk of roof collapse due to extra snow loads or roof gutters and downpipes damage due to ice loads*
- *Cost reduction for renovation following the winter season by keeping the façade walls dry*
- *Designed for various weather conditions with automatic operation based on 24hour monitoring and ice and snow removal, it ensures payback period of just one snowy winter*

Product Overview

DEViflex DTCE-20

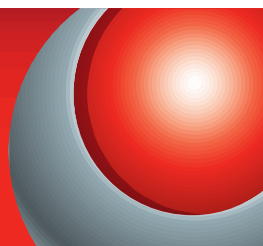
DEVI's twin conductor flexible and easy to install loose cable system can be cut to length in situ and can be installed directly on the roof or in the gutter. Cable design provides for 230V and 400V power supply and ensures installation in a safe, efficient and cost-saving manner.



DEViflex DTCE-30

DEVI's twin conductor flexible and easy to install loose cable system can be cut to length in situ and can be installed directly on the roof or in the gutter. Cable design provides for 230V and 400V power supply and ensures installation in a safe, efficient and cost-saving manner.

Important: Always install thermostat over 3m away from the self-limiting cables, this will help to prolong cable lifetime and minimize energy consumption in a standby mode.



System Design

To determine the required output (W/m^2) of the roof ice and snow melting system it is important to take into account the type of roof construction and local weather conditions. Generally, all roofs can be divided into two categories:

1. **Cold roofs.** These are well-insulated roofs with low upward heat losses. Typically, they are subject to ice formations during periods of snow melting under the sunlight on the roof surface.
2. **Hot roofs.** These are not properly insulated roofs and/or buildings with habitable attics. Hot roofs provide snow melting to a certain extent followed by meltwater moving to the roof edge where it freezes up.

The rated output in gutters should therefore be higher for hot roofs than for cold ones. This will ensure proper efficiency even at low temperatures.

Area	Cold roof	Hot roof	Max. rating	Cable rating
Valley gutter, roof surface	200-300 W/m^2	250-350 W/m^2	400 W/m^2	20-30 W/m
Downpipes, plastic roof gutters	30-60 W/m	40-60 W/m	60 W/m^*	20-30 W/m
Downpipes, metal roof gutters	30-60 W/m	40-60 W/m	100 W/m^*	20-30 W/m
Downpipes, wooden roof gutters	30-40 W/m	40 W/m	40 W/m	20 W/m

* We recommend 2 x 30 W/m cable lines or 3 x 20 W/m cable lines in downpipes with diameter of $\varnothing 120$ mm and above.

Installation

Roof Gutter and Down Pipe

For roof applications, cables of 20-30 W/m output should be used. In case of cable installation on the roof top by means of dissolvable materials (like bitumen) the heating cable rating must not exceed 20 W/m . Gutters running along the cold roof edge generally require 30-40 W/m . As a reference the required rating for the hot roof is 40-50 W/m .

In this case in order to provide adequate output per meter, 2 or 3 DEVI cables are required and in some cases even more. The cable must be laid along the gutter in both directions to provide required thermal power. Usually two lines of heating cable are sufficient.



Ensure that the number of cable lines n complies with the gutter/pipe diameter from the table below. If not applicable, you can choose cables for roofs and gutters separately. The exact number of cable lines (n) to ensure proper heating in gutters and downpipes depends mainly on two factors:

- Design temperature
- Diameter of the gutter/downpipe

Gutter/pipe diameter	No. of cable lines n
Ø75-120 mm	1
Ø120-150 mm	2*
Ø150-200 mm	3

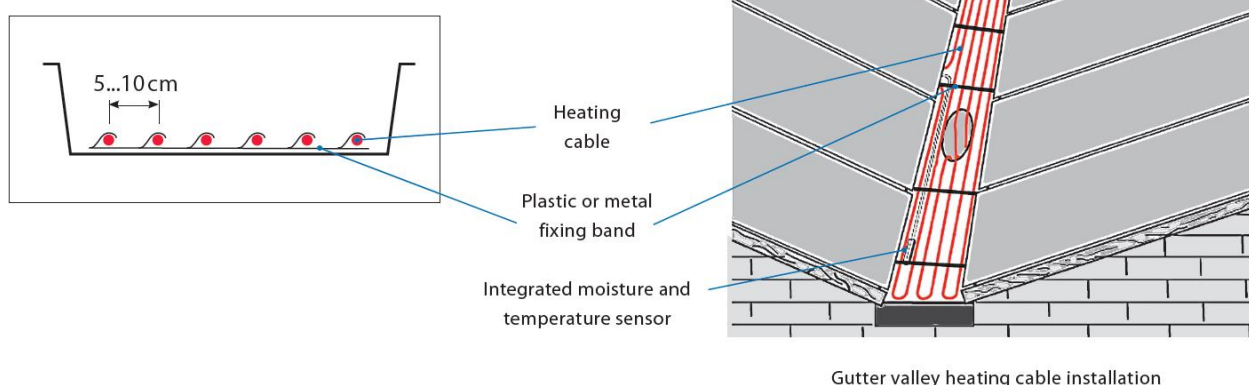
The following tables list the recommended amount of heating cable sections in typical gutters and downpipes, according to the above parameter.

Design temperature	20 W/m n [-]	30 W/m n [-]
0 to -5	1	-
-6 to -15	2	1
-16 to -25	2	2*
-26 to -35	3	2*

* 2 lines of 30 W/m (60 W/m) cable require minimum Ø120 mm downpipe and a controller with a moisture sensor, e.g. DEVReg™ 850.

Gutter Valley and Drain Pipe

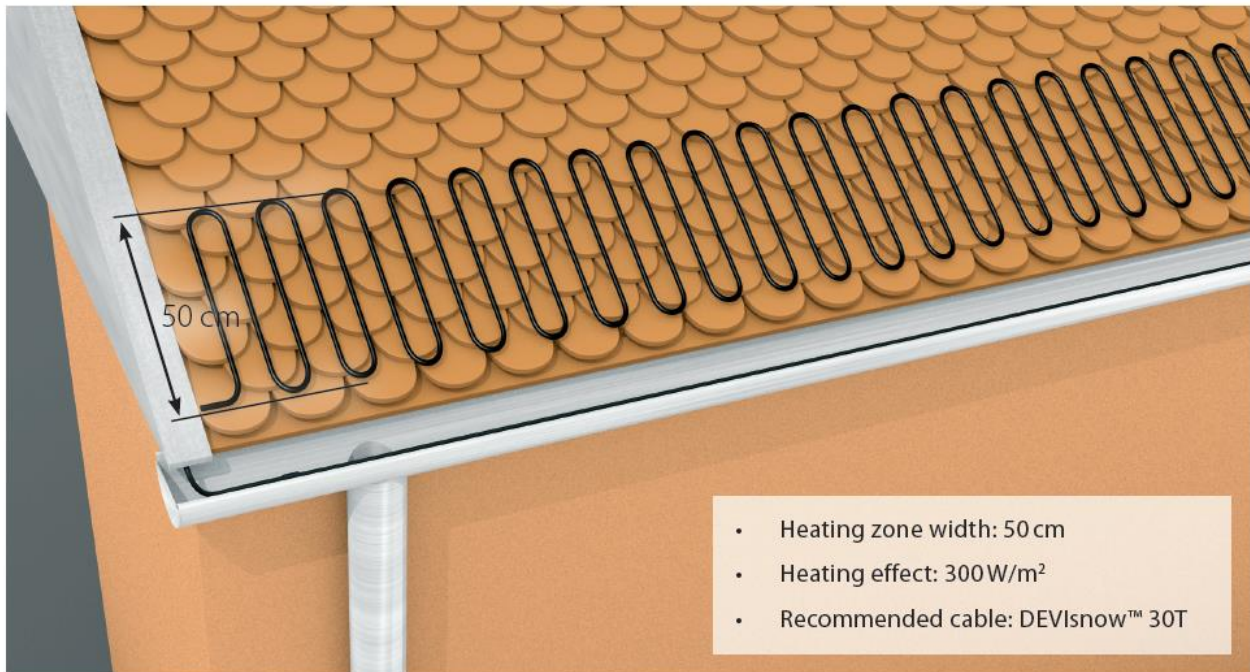
The installation of heating cables in valley gutters typically concerns larger buildings. The heating cable is led backwards and forwards along the gutter so the correct output per m^2 is achieved. Typically downpipes are connected to roof drains to ensure adequate water evacuation. Even if there is no need to protect downpipe along its full length, e.g. in case of installation in continuously heated building, arrangement of a 1m cable loop is required. Otherwise a standard installation method by means of chain and fixing accessories should be used along the full length of the drain pipe.



Roof Edges

Often lower unheated parts of roofs (especially hot roofs) are subject to accumulation of large amount of snow and ice. This will slowly transform into large and heavy overhang.

During thaw periods, it may break down leading nearly always to gutter destruction and contributing serious danger for passer-by. To prevent overhang formation lower parts of the roof should be equipped with a heating system. Usually the roof heating system uses special fencing (as shown in the picture) to avoid snow slides.



Roof edges and gutter with heating installation.

Complete Floor Guard Warranty

A floor heating system which does not work causes not only dissatisfied customers - it also causes angry customers and with good reason.

A heating cable which is not working is not so easy to replace. The fault has to be found the floor must be taken up before the fault can be corrected. It is a difficult, dirty and expensive process.

Gaia places great importance on the manufacture of extremely high quality products and, in return, offers the market's highest security for unproblematic heating, backed with the promise of the best warranty in the market.

In the event of a fault that can be traced back to a manufacturing defect in a DEVIflex™ or DEVI-mat™ product, DEVI will repair or replace the product itself and cover any costs associated with the floor covering, at no extra cost to the customer.

20
YEAR
WARRANTY

For ultimate insurance we offer up to 20 year product warranties on all heating mats and cables – which even include the floor cost!

Frost Protection Thermostats

Frost protection systems are different and require different thermostat types. DEVIreg thermostats are fitted with a complete set of control functions for heating systems for ice and snow melting of any type and allow attaching external measuring sensors for air or ground temperature measuring as well as control of moisture conditions.

Electronic thermostats feature high-speed operation and good repeatability. Correctness of thermostat selection and control accuracy impact significantly on reliability and power consumption of the heating system.

Product Overview

DEVIreg 330

To control simple or low output systems, a thermostat with a ground temperature sensor is recommended. The DEVIreg DIN rail thermostats can be used for various purposes, for example for controlling: Electrical underfloor heating systems and frost protection. The DEVIreg 330 wall mounted range consist different thermostats – each with separate temperature ranges depending of the application where it will be used.



- DEVIreg 330 (-10°C to 10°C) is mainly used for frost protection applications.
- DEVIreg 330 (5°C to 45°C) is mainly used for underfloor heating.

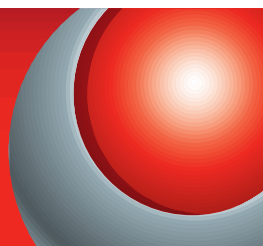
DEVIreg 850

To control ice and snow melting systems especially with high output the best solution is DEVIreg 850 regulator/controller with integrated ground and roof moisture and temperature sensors.

The DEVIreg 850 is an advanced thermostat with LED display used for outdoor ground or roof applications. The sensors provide information about both moisture level and temperature, resulting in an optimal control of the heating system.

The system can be set up in three ways; as a single system for roof or ground (1 to 4 sensors), as a dual system for roof or ground (2 - 4 sensors) or as a combination system for roof and ground (2 - 4 sensors).

In the dual / combination systems it is possible to prioritize between the zones, e.g. if only a limited power output is available.

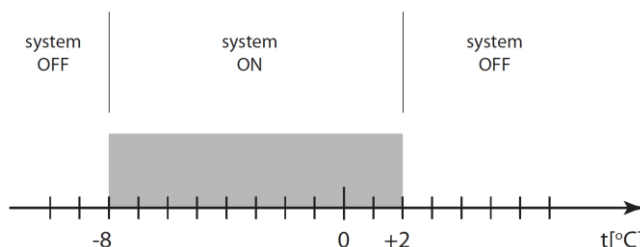


Performance

DEVireg 330

The DEVireg 330 thermostat operates based on temperature measurements only, therefore, it is expected that there will be higher running costs when compared to the DEVireg 850.

The diagram is an example of the DEVireg 330 operation in differential mode: the thermostat switches ON the heating cable only if the temperature is in the range -8°C to +2°C. It is assumed that it snows only when the temperature is about 0°C and snowfalls outside of this temperature range rarely happen. This is applicable for certain weather conditions only.

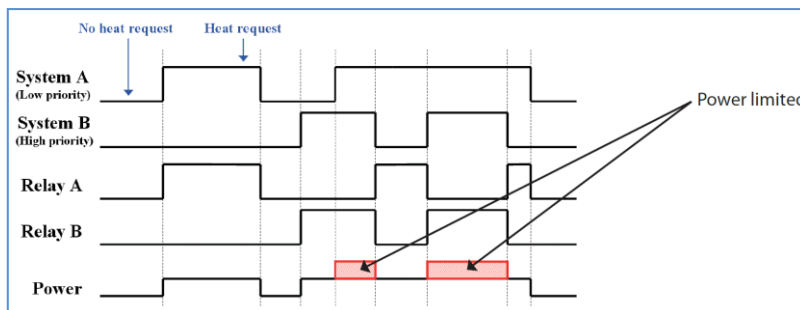


DEVireg 850

Devireg 850 is a very economical thermostat as its moisture sensor enables it to turn off on cold dry days. The diagram shows what is detected and requested by the 2 zones (System A+B) and how the DEVireg 850 prioritises and operates the corresponding relays. The result is power limitation.

Zone support saves energy

The DEVireg 850 lets you divide your area in to 2 zones, e.g. a north and south side. In this way it is possible to save energy, when the south side is free of ice and snow faster because of the heat from the sun. The connection of up to 4 sensors provides maximum control of the outdoor heating system and compared to installations with typical ground temperature measuring the DEVireg 850 guarantees a reduction in energy consumption costs by up to 40%.



Prioritizing – for limited power output

You can prioritize between the zones, e.g. if you have limited power output. This way one zone is made ice and snow free before focus is put on the other zone.

Market Leading Warranties

We provide you with the most up to date thermostats, which help to increase energy saving and minimise costs. However, controls that don't work cause dissatisfied customers and as such we ensure that all our thermostats come with market leading warranties.

Gaia places great importance on the manufacture of extremely high quality products and, in the event of a fault, that can be traced back to a manufacturing defect in the product, be repaired or replaced free of charge.

To apply for this warranty the installation must be performed by an authorised installer and the warranty certificate has to be stamped, signed and provided.

