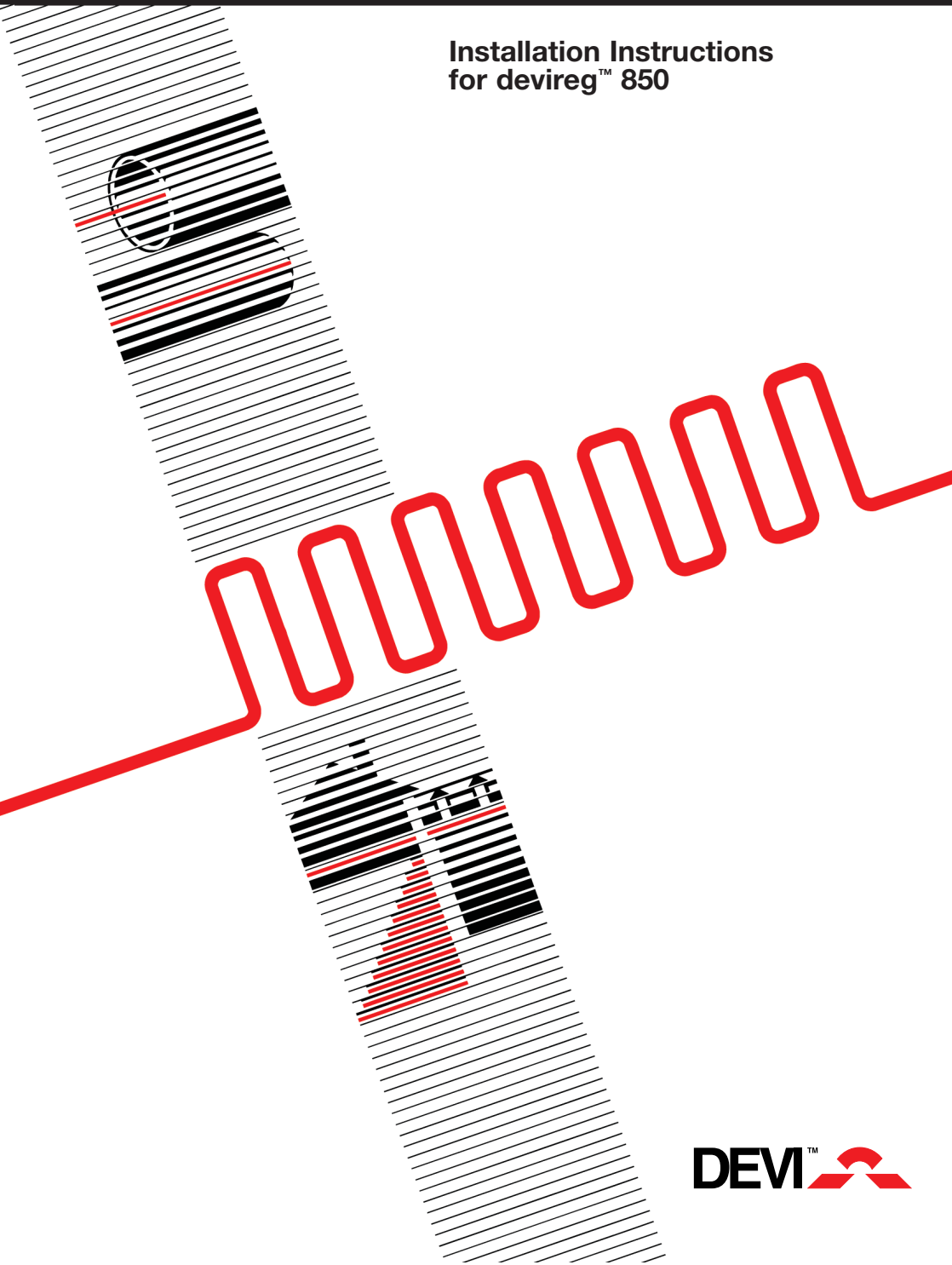


GB-DAS

**Installation Instructions
for devireg™ 850**



Contents:

- 1. **Installation Instructions**
 - 1.a. Placement of sensors/sensor tubes in heated terrain
 - 1.b. Installing feeder cables
 - 1.c. Installing sensors/sensor tubes
 - 1.d. Connecting diagrams
 - 1.e. Setup of devireg™ 850
 - 1.f. System description

- 2. **User Guidelines**
 - 2.a. Navigation structure
 - 2.b. The Info button
 - 2.c. Fault finding
 - 2.d. Maintenance

- 3. **Technical Specifications**

- 4. **Guarantee Conditions**

- 5. **Guarantee Certificate**

NB! The installation must only be carried out by an authorised electrician.



1. Installation Instructions

The devireg™ 850 system is used to keep outdoor areas free of ice and snow, e.g. parking areas, paths, garage entrances, steps, ramps, roadways, bridges.

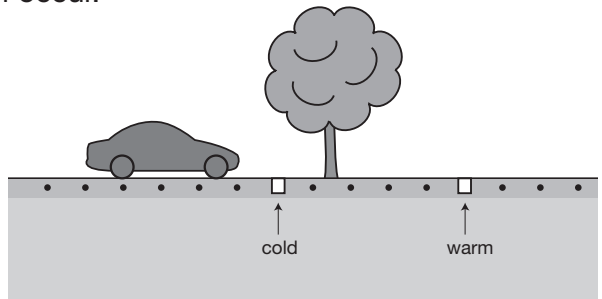
The devireg™ 850 is fully automatic and operated digitally by means of the intelligent sensors located in the heated terrain. Every sensor measures both temperature and moisture, and the system turns the heating elements on and off on the basis of these readings.

By combining moisture and temperature readings, the system is able to save around 75% energy compared with systems which only measure temperature readings. The digital sensors used for the devireg™ 850 also provide the most exact readings when compared with corresponding analogue systems. The result is optimum functionality and low energy consumption.

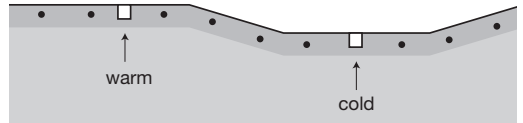
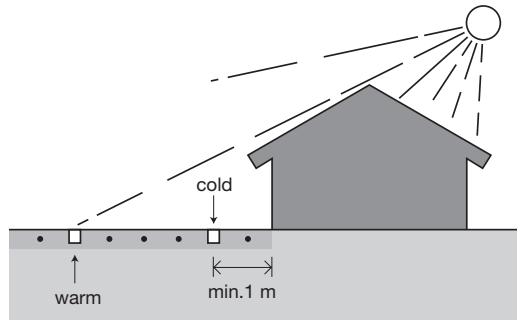
1.a. Placement of sensors/sensor tubes in heated terrain

The location of both sensors/tubes is crucial for the system's operation. As a result, you will need to adhere to the following guidelines when positioning the sensors (see also illustrations).

- 1: Two sensors must be installed in order for the system to function – one warm and one cold.
- 2: The "warm sensor" (marked with a red label on the bottom) should be located where the first water will hit the heated area, e.g. in the middle of the area, away from buildings and other screens. If possible, select a spot where snow drifting can occur.



3: The "cold sensor" (marked with a blue label on the bottom) should be located where the last water will disappear from the heated area, e.g. in areas that are in shadow or where the terrain is lower. The sensor must, however, be positioned at least 1 m away from buildings/screens.

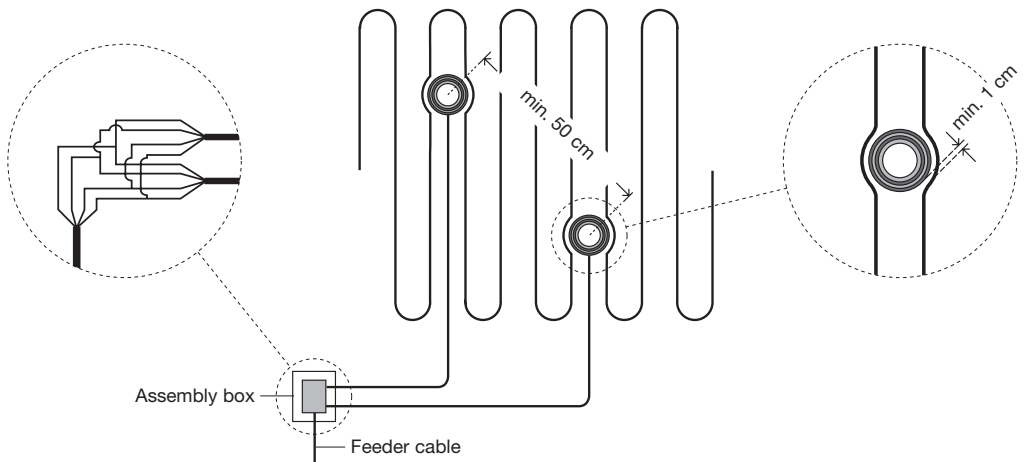


4: Both sensors must be located within the heated area – wherever possible at least 1 m from the edge of the area.

5: The sensors should be placed between the heating cables. Note, however, that a distance of minimum 1 cm should be maintained between the sensor tube and the heating cable.

6: Both sensors must be placed so that their upper brass surface is horizontal.

7: There must be a distance of minimum 50 cm between the two sensors.



In case of doubt, contact DEVI for advice on finding the best possible location for the sensors.

1.b. Installing feeder cables

Both sensor cables may be connected to a feeder cable. This is an advantage in cases where the distance between the sensors and the devireg™ 850 is relatively large (see diagram of connection).

With short distances, the sensors may be connected directly to the devireg™ 850.

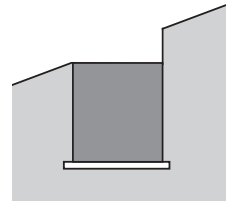
A 15-meter length of cable is supplied with each of the sensors.
Approx. 0.5 m of this cable should be coiled inside the bottom of the sensor tube. The remaining cable may be lengthened in accordance with the following table. The feeder cable must be a four-wire cable.

| Extension cable type (mm ²) | Max length (m) |
|---|----------------|
| 1 | 65 |
| 1,5 | 100 |
| 2,5 | 165 |
| 4 | 265 |
| 6 | 400 |

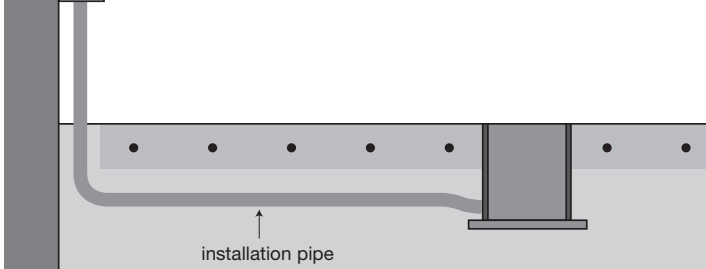
1.c. Installing sensors/sensor tubes

The sensor tubes may be installed in connection with the actual construction work and connected at a later date. The following applies for all types of installations:

- 1: Please ensure that the sensor tube is not sealed when the concrete is poured.
- 2: Both sensor tubes must be positioned so that they are flush with the surrounding terrain. Both sensors must be placed so that their upper brass surface is horizontal.
- 3: The base below both sensor tubes must be hard, e.g. a concrete plate or similar, in order to ensure that the sensors are not pushed into the ground if a lorry runs over them. The sensor tube is designed to be mounted on a plate using the two screw holes inside the sensor tube.

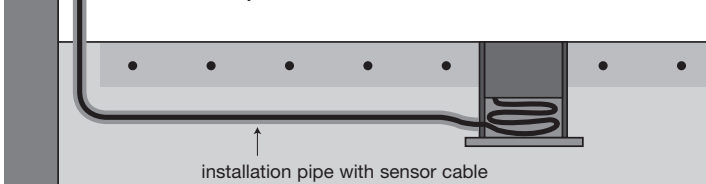


4: A metal/plastic pipe through which the sensor cable may be passed should be run as far as the sensor tube.



5: Coil approx. 0.5 m of the sensor cable inside the tube

6: Place the sensor inside the sensor tube until it is horizontally flush with the edge of the tube and "resting" on the internal collar inside the sensor tube. The sensor may be extracted at a later date using the two holes found around the edge of the sensor tube. The grooves on the outside of the sensor should correspond to the holes in the sensor tube.



NB! The sensors may also be installed without a sensor tube if it is impossible to use this tube because of a lack of space or for any other reason.

Installation in asphalt:

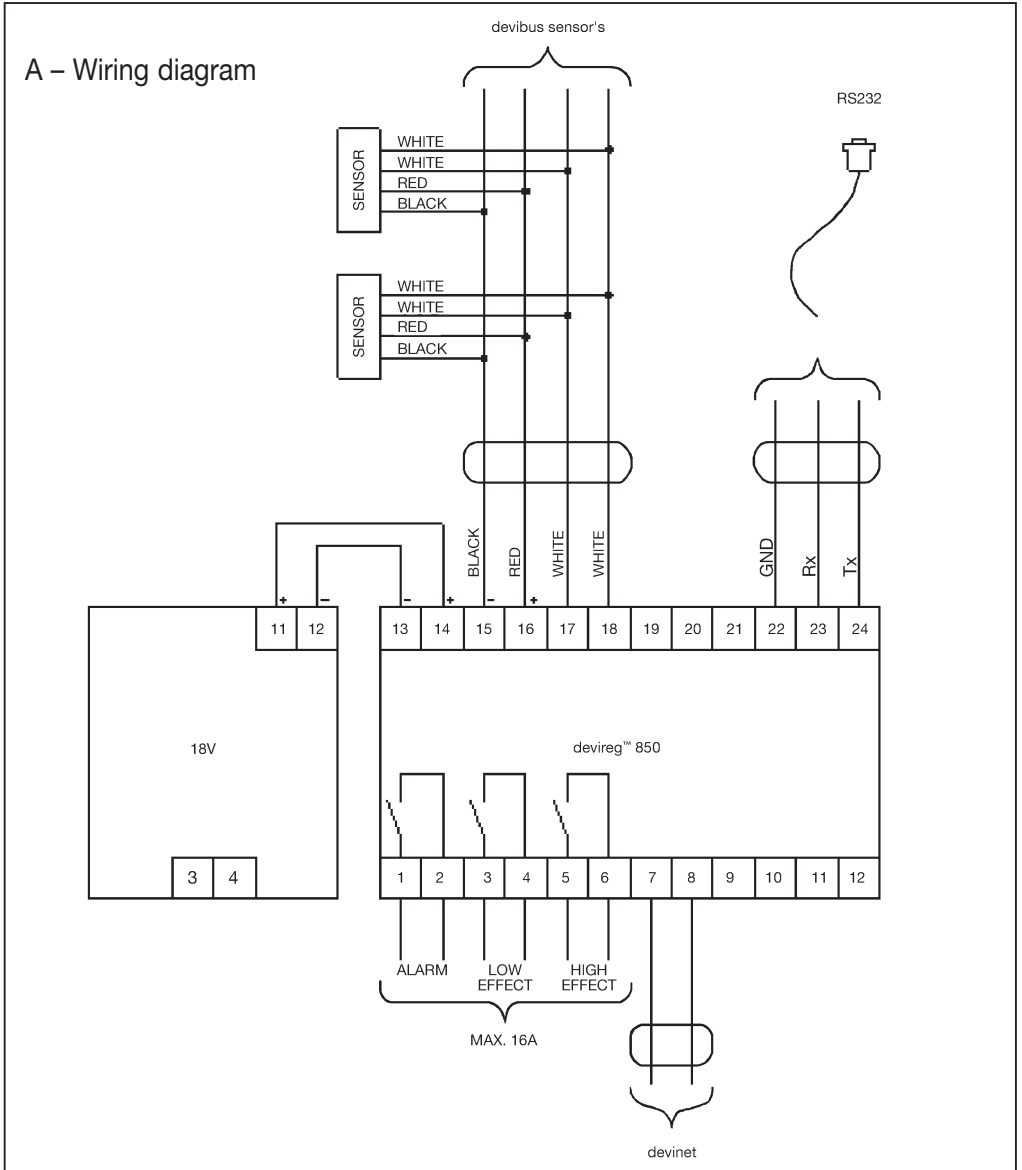
The temperature **must not exceed 80°C** around the sensors/sensor tube. A wooden block or similar may be placed in the area where the sensor tube/sensor can subsequently be placed.

The installation pipe used for the sensor cable should, in that case, be a metal tube that can withstand the high temperatures.

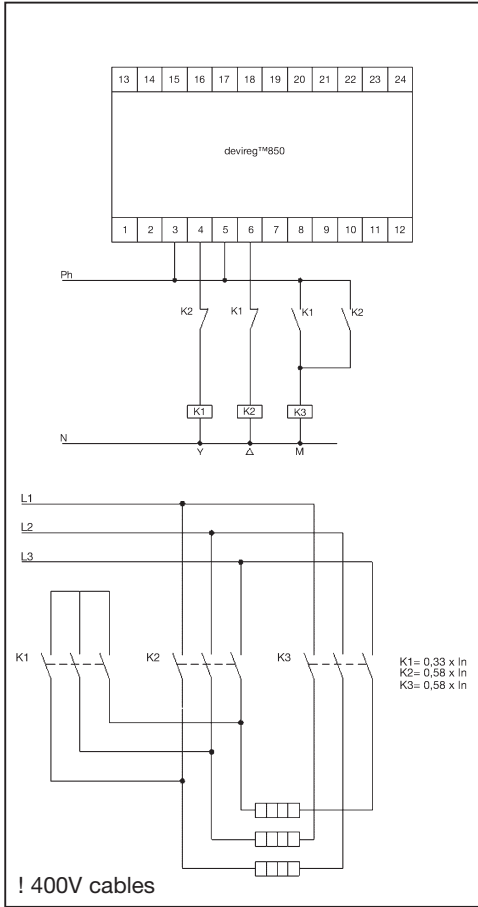
1.d. Connecting diagrams

Mount the devireg™ 850 and the transformer on a DIN rail and connect the transformer as well as the sensors to the devireg™ 850 (see Fig. A). Next, connect the heating element to the devireg™ 850 in line with one of the following guidelines (Fig. B-F):

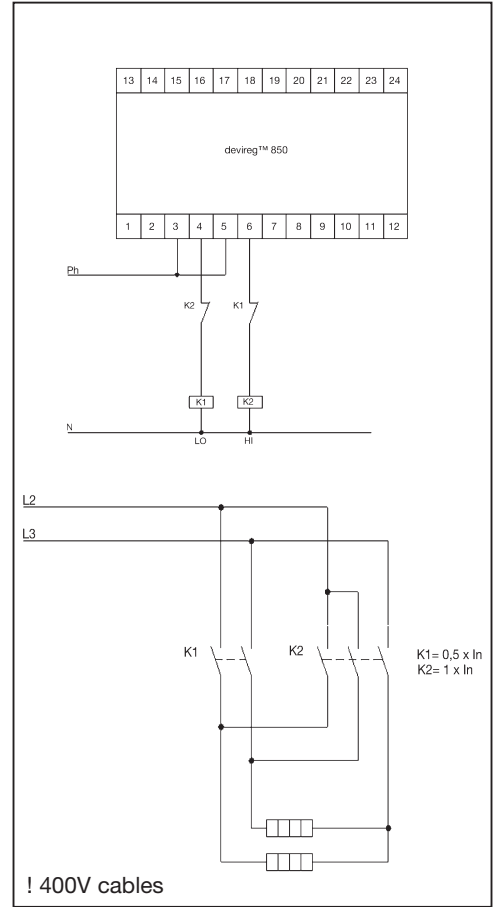
The RS232 is for future software upgrades. devinet is for future connection to other DEVI products.



B - Diagram for Y/ Δ connection



C - Diagram for serial/parallel connection



1.e. Setup of devireg™ 850

Once everything has been connected, the first menu item relates to the choice of language.

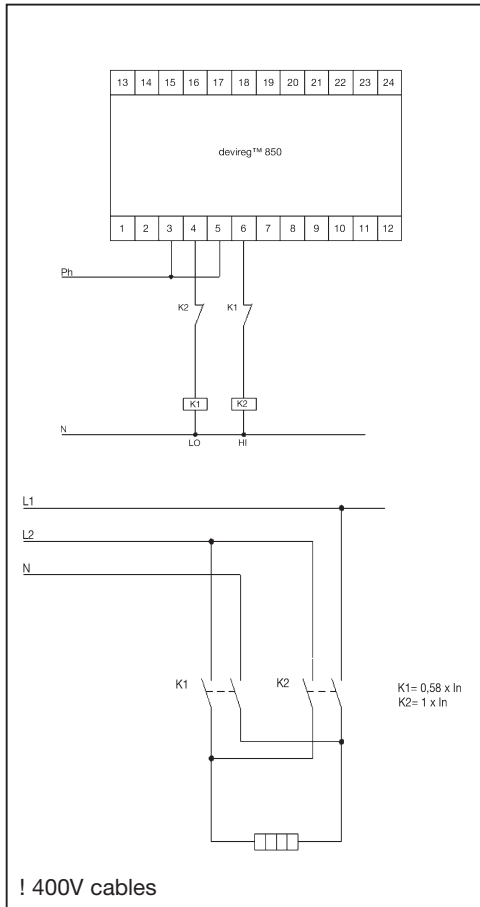
Press \blacktriangleright until the required language is shown on the display. Press \blacksquare to confirm your selection.

The system will check whether everything is running as required and proceed in accordance with the factory settings, see section 3.

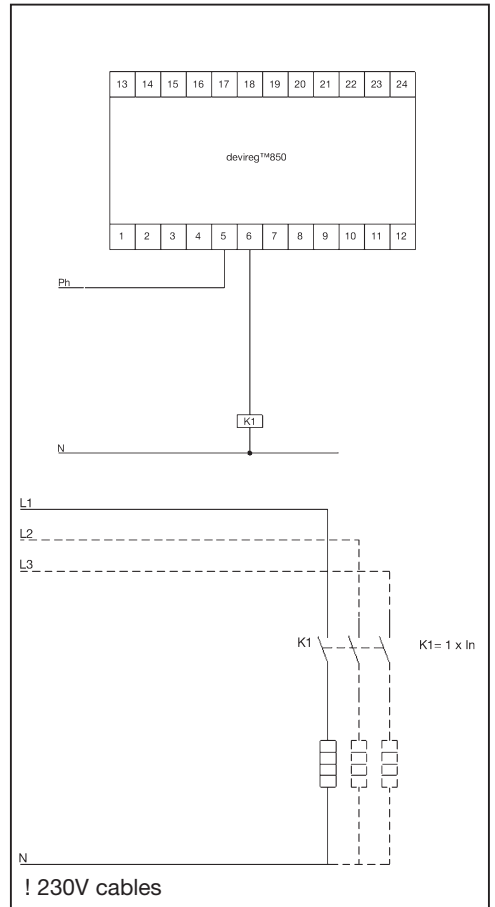
5–60 seconds later the message "System checking" will disappear from the display. The system will then display "OK" or "Error".

See errors, section 2.c.

D - Diagram for 230/400 V connection

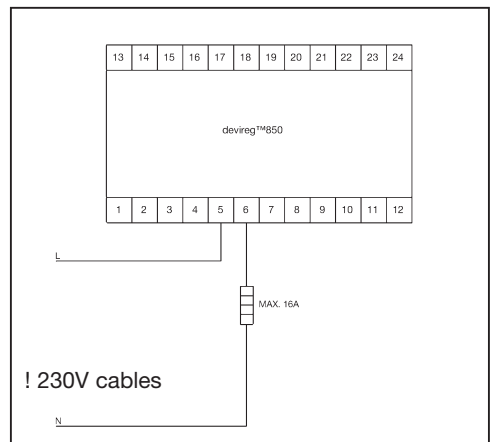


E - One step connection



NB! Is the system connected as "Single connection" (fig. E) or "Direct connection" (fig. F) the "operation mode" (see "installer site" 2.a.) must be changed in the devireg™ 850. The "operation mode" should be changed from "High/low drive" to "single drive". See section 2.a. for user guidelines.

F - Direct connection (one step)



1.f. System description

The devireg™ 850 functions on the basis of a combination of temperature and moisture. The temperature and the moisture are registered by the two sensors placed in the area. You must be aware of the following conditions if you choose to adjust the factory settings.

Melting temperature

Changing the "melting temperature" will affect when the system is activated in case of moisture and low temperatures. The factory setting is 4°C. This means that the heating system will be activated if the temperature falls below 4°C and moisture is detected.

Basic temperature

Changing the "basic temperature" will affect when the system is activated in case of low temperatures where the moisture level has yet to reach the prescribed level. The heating system will be activated at low temperatures as this ensures that the area does not become slippery in case of sudden moist. The factory setting is -3°C.

Moisture level

The "moisture level" decides when the system detects "moist" or "no moist". The lower the setting, the more sensitive the system is to moisture. The factory setting is 50.

Post-heat period

It is possible to modify the "post-heat" period, i.e. the period during which the heating system continues to be active once it has been detected that the area is dry. The factory setting is 1 hour.

High security – higher energy consumption

If you want a high degree of security against snow and ice, you need to set a high basic temperature (close to 0°C) and a high melting temperature. You also need to set the moisture level to a low level (close to setting 5). Finally, you should set the post-heat period to a long period. Selecting these values for the basic settings will provide a high degree of security for a dry area, but will also lead to a relatively higher energy consumption.




Low security – low energy consumption

Conversely, your priority may be low energy consumption and a moderate level of security against ice and snow. In that case, you should set a low "basic temperature"; a low "melting temperature"; a high "moisture level" and no "post-heat period". The result will be low energy consumption, but the area may remain wet and icy in short periods.



The factory settings are average values with a relatively high level of security. See factory settings, section 3.

2. User guidelines

The devireg™ 850 is controlled by means of three buttons.

-  Info
Info button – Can only be activated if lit
-  Scroll
See next page/screen
-  Enter
Confirm/Select
Hold down for 3 seconds to return to status

2.a. Navigation structure

Always use  to enter the next menu and  to go further down the menu.

- | |
|---|
| 1. The start screen displays the system status |
| 2. System settings. Used to set the system to a particular "mode". The new status will be displayed on the start screen. <ul style="list-style-type: none">a. Automaticb. Constant OFFc. Constant Low – also set the time interval before the system reverts to "automatic" (0–99 hours).d. Constant High – also set the time interval before the system reverts to "automatic" (0–99 hours). |
| 3. View measurements. Shows the sensor readings. <ul style="list-style-type: none">a. The temperature of the "cold" sensorb. The temperature of the "warm" sensorc. The moisture level of the "cold" sensord. The moisture level of the "warm" sensor |

4. View system parameters. Shows the basic settings that determine when the system is activated.
- Moisture level
 - Basic temperature
 - Melting temperature
 - Post-heat period

5. Alarm. Shows alarms/system errors. See also section 2.c.

WARNING: Only enter this menu, if you want to change the basic settings. This could affect the way the heating system operates.

6. Installer site. Used to set the system's basic settings. In order to select the settings, the following code: must be entered :
- Moisture level (5 to 95)
 - Basic temperature (-9.9°C to -0.1°C)
 - Melting temperature (1.0°C to 9.9°C)
 - Post-heat period (0 to 9 hours)
 - Set default. Indicates the system's connection, cf. section 1.e. (High/low drive or single drive)
 - Language: DK, NO, SE, FI, GB
 - Reset – reset to factory settings (see section 3).

Example: "Shut down system manually"

Press until you reach the menu: "Mode". Press to change "mode". Press until the required "mode" is shown on the display – in this case "Constant OFF". Press to confirm the selected "mode". The system is now set to be permanently turned off.

Example: "View temperature in the area"










Press until you reach "View sensor measurements" and then press . Press until you see "Temperature cold sensor". This will show the present temperature in the area.

Example: "Constant HI or Constant LOW" – also test of the heating system connection.


Press until you reach "operating mode" and then press . Press until you reach the desired "operating mode" and press to confirm your choice. When you choose "Constant HI" or "Constant LO" you must

enter the period you want this operating mode to be active. After the period has ended the operating mode will return to "automatic". As an installer you can test the connecting of the heating system by choosing "Constant HI" or "Constant LO". You will then be able to measure if the relays are active or not. Remember to set the operating mode back to "automatic".

Example: "Select language"

WARNING: Only enter this menu, if you want to change the basic settings. This could affect the way the heating system operates. Press  until you reach the menu: "Installer site". Press  to change the basic settings. Enter code:    to confirm. You are now in a position to make key changes to the system setup and thereby alter its functionality. Press  until "Language" is shown on the display. Press  to change the language. Press  until the required language is displayed. Press  to confirm your selection. The text on the display will now be shown in the selected language.

2.b. The Info button

When the Info button is lit, you can get help/information relating to the relevant function. Press the Info button once and scroll using . Press the Info button once again to turn off the help text.

2.c. Fault finding

The devireg™ 850 has an integral alarm function that monitors the attached sensors and the inbuilt microprocessor. An external alarm may also be connected to the system – see wiring diagram, devireg™ 850 (1.e. Fig. A).

The following errors may be shown on the display.







| |
|--|
| No contact with "cold" sensor. |
| No contact with "warm" sensor. |
| Two "cold" sensors connected. There must be one "hot" and one "cold" sensor connected. |

Two "warm" sensors connected. There must be one "warm" and one "cold" sensor connected.

Internal error in devireg™ 850.

Once the fault has been corrected, you will need to set the "mode" in order to return the system to the wanted status.

Example: "alarm"

Press  to stop the alarm and continue until all information has been read. The system will inform you what to do, and the "mode" will be set to Constant OFF. Press  to return to the start screen where the system status is displayed. Press  until the alarm menu is displayed to see more info. Press  to read the alarm status. Use  to see which of the errors listed above has occurred and what, if anything, you can do to remedy the situation. Hold down  for 3 seconds to return to the start screen. After fault has been corrected remember to set the "operating mode" back to the desired position (Automatic).

2.d. Maintenance

Sensors:

It is often advisable to set the moisture sensitivity of the devireg™ 850 to a slightly higher value where there is a high risk that the sensor surface may become covered in leaves, gravel, dust etc.

The surface of the sensors should be cleaned prior to every heating season, and on a more regular basis if there is a risk that they may be covered over.

3. Technical Specifications

| Technical data | |
|---|---|
| Voltage: | 230 VAC +10%/-20% |
| Power consumption: <ul style="list-style-type: none"> • devireg™ 850: • Sensors: | Max. 3 W Max. 13W |
| Relays (all incl. alarm): <ul style="list-style-type: none"> • Resistive load: • Inductive load: | 250V ~ 16A 1A (power factor 0,3) |
| IP class: <ul style="list-style-type: none"> • devireg™ 850/transformer: • Sensors: | IP 30 IP 67 |
| Ambient temperature: <ul style="list-style-type: none"> • devireg™ 850/transformer: • Sensors: | -10°C to +40°C -30°C to +70°C |
| Sensor type: | 2 devibus connected moisture sensors |
| Sensor lead: | 15 m of 4x1mm ² (may be extended in accordance with the table in section 1.b) |
| Indication: | 16-character illuminated display. |
| Measurements <ul style="list-style-type: none"> • devireg™ 850 (DIN rail) • Power supply (DIN rail) • Sensor • Sensor tube | Depth x Height x Width 53 mm x 86 mm x 105 mm 53 mm x 86 mm x 52,5 mm D = 87 mm; height = 74 mm D = 93 mm; height = 98 mm |

Factory settings

| Settings | | |
|---------------------|------------------|---|
| Function | Factory settings | Options |
| Basic temperature | -3,0°C | -9,9°C to -0,1°C |
| Post-heat period | 1 hour | 1 to 9 hours |
| Melting temperature | 4,0°C | 1,0°C to 9,9°C |
| Moisture level | 50 | 5 to 95 (5 being the most sensitive to moisture) |
| Power output | High/low drive | <ul style="list-style-type: none">• High/low drive (star/triangle)• Single drive |
| System mode | Automatic | <ul style="list-style-type: none">• Automatic• Constant low power (manual timer)• Constant high power (manual timer)• Manually shut down |

The DEVI Warranty:

You have purchased a DEVI heating system which we are sure will serve to improve the comfort and economy of your home.

DEVI provides a complete heating solution with deviflex™ heating cables or devimat™ heating mats, devireg™ thermostats and devifast™ fixing strips.

Should you, against all expectations, experience a problem with your DEVI heating system, you will find that DEVI, whose products are manufactured in Denmark and sold throughout the European Union, is subject to the standard regulations pertaining to product liability as specified in EU directive 85/374/CEE as well as all applicable legislation in the individual countries on the following conditions:

DEVI offers a 10-year guarantee on all deviflex™ heating cables and devimat™ heating mats, and a 2-year guarantee against material defects and production defects in connection with any other DEVI products.

The guarantee shall be valid only if the GUARANTEE CERTIFICATE is completed correctly and in accordance with the instructions, and provided the fault is inspected by or submitted to DEVI or an authorised DEVI dealer.

Please note that the GUARANTEE CERTIFICATE must be completed in english or local language.

DEVI shall undertake any repair free of charge or supply the customer with a new unit. Repairs shall be carried out at no further cost to the customer. In the case of faulty devireg™ thermostats, DEVI reserves the right to repair the unit free of charge and without any unreasonable delays for the customer.

The DEVI Guarantee shall not cover installations that have been carried out by non-authorised electricians, faults which arise as a result of misuse by other suppliers, damage caused by third parties, incorrect installations or consequential damage. All work will be invoiced in full if DEVI is required to inspect or repair faults that have arisen as a result of any of the above. The DEVI Guarantee shall not extend to equipment which has not been paid in full.

DEVI will, at all times, provide a rapid, effective and honest response to all queries and reasonable demands from our customers.

The above guarantee covers product liability only, while purchases are subject to national legislation.



Warranty Certificate

The DEVI Warranty is granted to:

Name:

Address:

Postal code:

Phone:

Please Observe!

In order to obtain The DEVI Warranty, the following must be carefully filled in. See other conditions on the overleaf

Electrical Installation by:

Installation date:

Type of thermostat

Production code

Suppliers Stamp

DE-VI A/S

Ulvehavevej 61

DK-7100 Vejle

Tel. +45 76 42 47 00

Fax +45 76 42 47 03

