Installation Guide

DEVIreg™ Opti

Electronic Timer Thermostat fulfilling

Eco Design Directive

www.DEVI.com

DEVI® by Danfoss

Table of Contents

1 Introduction

DEVIreg™ Opti is an electronic programmable timer thermostat used for controlling electrical floor heating elements. The thermostat is designed for fixed installation only and can be used for both direct heating of the entire room and for comfort heating of the floor. Among others, the thermostat has the following features:

- A screen display operated by buttons.
- An easy-to-follow, menu driven programming and operation.
- Pre-installed timer settings.
- Offered with integrated frame.
- Using DEVI standard NTC floor sensor (15 k Ohm at 25°C).
- Open window detection.
- Low stand-by energy consumption.
- Weekly timer.

More information about this product can be found at: devi.com

2 Technical Specifications

Operation voltage	220-240 V~, 50Hz
Standby power consumption	Max. 0,5 W
Relay: Resistive load Inductive load	 Max. 13 A / 2990 W @ 230 V Max. 1 A cos = 0,3

Sensing units (floor sensor)	NTC 15 kOhm at 25°C (Default)
Sensing values: 0°C 20°C 50°C	 42 kOhm 18 kOhm 6 kOhm
Control	PWM (Pulse Width Modulation)
Cable specification max.	1x4 mm^2 and 2x2,5 mm^2
Ambient temperature	0° to +35°C
Frost protection temperature	5°C to +9°C (default 5°C)
Temperature range	Room temperature: 5-35°C. Floor temperature: 5-45°C. Max. floor: 20-35°C (if unrecoverable seal is broken then up to 45°C). Min. floor: 10-34,5°C, only with combination of room and floor sensor.
Sensor failure monitoring	The thermostat has a built-in monitoring circuit, which will switch off the heating if the floor sensor is disconnected or short-circuited
Ball pressure test temperature	75°C
Pollution degree	2 (domestic use)

Controller type	1B
Software class	A
Storage temperature	-25°C to +60°C
IP class	21
Protection class	Class II - ⧈
Dimensions	85 x 85 x 44 mm (in-wall depth: 24 mm)
Weight	138 g

Electrical safety and Electro-Magnetic Compatibility for this product is covered by the compliance with the EN/IEC Standard "Automatic electrical controls for household and similar use":

- EN/IEC 60730-1 (general)
- EN/IEC 60730-2-9 (thermostat)

3 Safety Instructions

Important: When the thermostat is used to control a floor heating element in connection with a wooden floor or similar material, always use a floor sensor and never set the maximum floor temperature to more than 35°C.

Make sure the mains supply to the thermostat is turned off before installation.

Please also note the following:

- The installation of the thermostat must be done by an authorized and qualified installer according to local regulations.
- The thermostat must be connected to a power supply via an all-pole disconnection switch.
- Always connect the thermostat to continuous power supply.
- Do not expose the thermostat to moisture, water, dust, and excessive heat.
- This thermostat can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, if they have been given supervision or instruction concerning use of the appliance in a

safe way and understand the hazards involved, by a person responsible for their safety.

- Children should be supervised to ensure that they do not play with the thermostat.
- Cleaning and user maintenance shall not be made by children without supervision.

4 Mounting Instructions

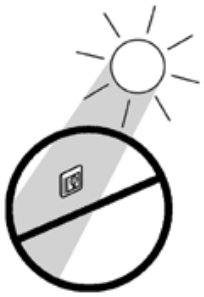
Please observe the following placement guidelines:

Place the thermostat at a suitable height on the wall (typically 80-170 cm.).

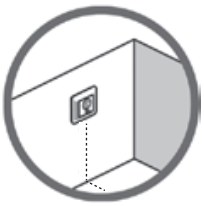
The thermostat should not be placed in wet rooms. Thermostat must be placed outside zone 2. Place it in an adjacent room and use floor sensor only. Always place the thermostat according to local regulation on IP classes.

Do not place the thermostat on the inner side of a poorly insulated exterior wall.

Always install the thermostat at least 50 cm from windows and doors, due to draft, when using regulation in: floor and room mode or room alone mode.

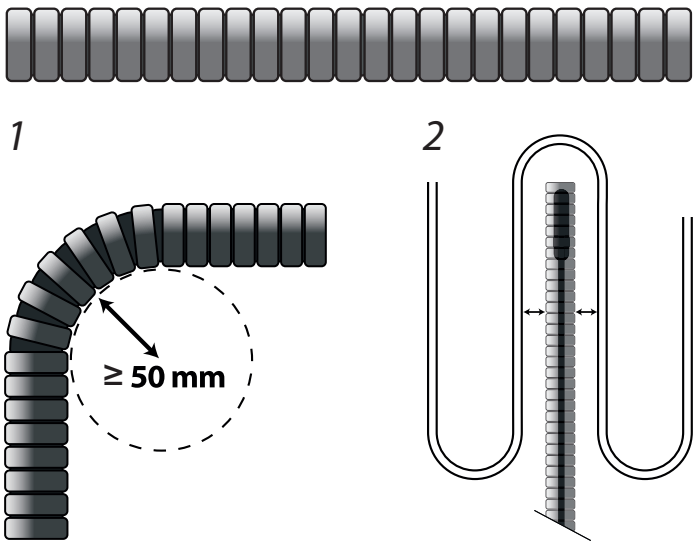


Do not place the thermostat in a way that it will be exposed to direct sunlight.



Note: A floor sensor is recommended in all floor heating applications and **mandatory** to thin matsand under wooden floors to reduce the risk of overheating the floor.

- Place the floor sensor in a protecting plastic conduit in the floor construction in an appropriate place, where the floor is not exposed to sunlight or draft from door openings.

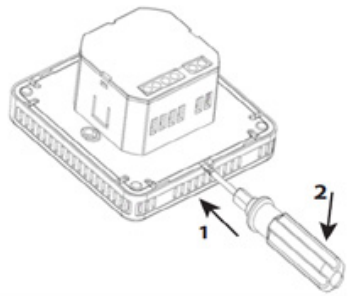


- Equally distant and >2 cm from the heating cables on both sides.

- The conduit should be flush with the floor surface, countersink the conduit if necessary and possible.
- Route the conduit to the connection box.
- The bending radius of the conduit must be min 50 mm.

Follow the steps below to mount the thermostat:

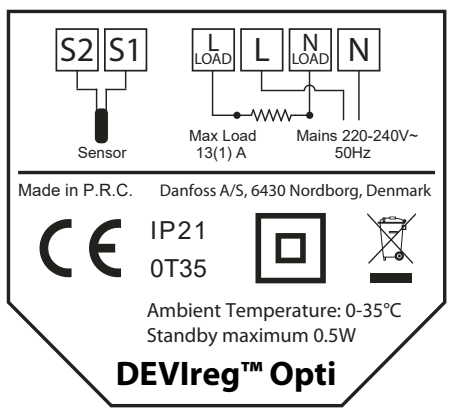
1. Unpack thermostat
2. Remove the front cover as showed on Pic. 1.



Pic. 1

3. Connect the thermostat according to the connection diagram.

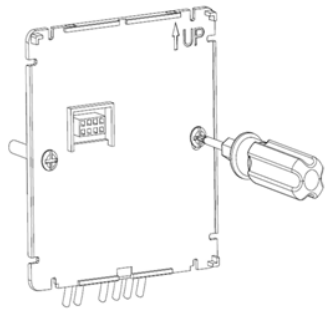
   The screen of the heating cable must be connected to the earth conductor of the power supply cable by using a separate connector.



Pic. 2

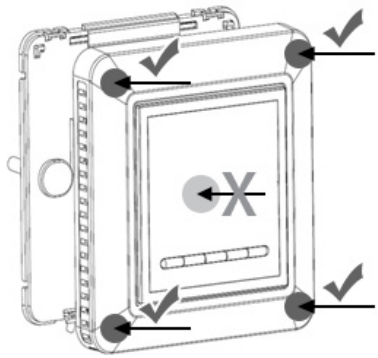
Note: Always install the floor sensor in a conduit in the floor.

4. Fasten the thermostats back part firmly to a flush mounted wall box or an exterior wall box by driving the screws through the holes in each side of the thermostat.



Pic. 3

5. Click the front part module in place. Pay attention, in relation to the female header, in not to bending the connectors. Press carefully until the frame is fixed firmly.



Pic. 4

When mounting and reassembling the thermostat.

Important: Do NOT press in the center of the display screen.

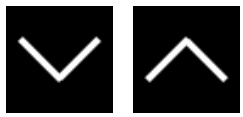
Battery:

The current time and day is kept for min. 60 days if mains supply is off. All other settings are stored permanently.

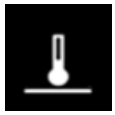
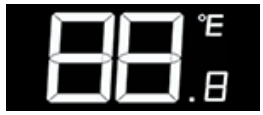
5 Display Symbols

Top part main functionalities are to support user interface through display and hold all the controller logic.

Display main functionalities are to show the current status of the Thermostat and recognize the user actions from the buttons. Display consists of different buttons, numbers and symbols.

Nr.	Type	Description
1		ON/OFF button
2		Arrow Up / Down button
3		Mode button
4		Timer button

Symbol indications

Symbol	Description	Symbol	Description
	Week Day		Heating is ON
	Time Display, 24 Hour		Safety Lock
	Floor Temperature		Open Window indication
	Room Temperature		Current Temperature
	Away Mode		Comfort Temperature
	Timer Mode		Economy Temperature
	Manual Mode		Alarm/Error
	Frost Protection Mode		
		Periode Symbol at timer mode	The shorter line indicates the current period.

Interaction directly on thermostat

Function	Button	Description
Turn thermo-stat on / off	Activate button: Hold for 2 sec. 	Thermostat switch on and display current temperature and other settings
Setting of different modes	Activate button: 	Display cycles through following modes: Timer / Manual / Away / Frost protection
Adjust temperature	Up: activation button 	Increases active mode/ temporary set point
	Down: activation button 	Decreases active mode/ temporary set point
Floor tem-perature	Activate simultane-ously buttons 	Hold 8 sec.: Display shows current floor temperature. Floor temp. icon appears.  From timer, manual, frost mode

Safety lock	Activate simultaneously buttons 	To Activate/Deactivate safety lock, hold for 8 sec. Safety lock icon appears. 
Factory restore	Activate simultaneously buttons 	Turn thermostat OFF, hold for 10 sec. 5 sec. count down appears.
Setting timer mode	Activate button 	Display cycles through timer setting modes. Activates in all modes.

To save energy, when no interaction from user for >20 sec., thermostat will go into a stand by mode, where currently measured temperature is displayed continuously. Interaction from user, by pushing any of the buttons, will reactivate the display (On/Off button, push and hold for 2 sec.).

Error codes

When the error occurs, the heating is turned off. When error is resolved the thermostat, in some cases, will require a restart to start heating again.

Error type	Nr.	Description	Solution
Floor Sensor short circuited	E1	Floor sensor is measuring very high temperature values.	Contact service
Floor Sensor disconnect	E2	Floor sensor is measuring very low temperature values.	Is floor sensor connected? Contact service
Room or Floor Sensor short circuited	E3	Sensor is measuring too high temperature (>50°C).	Turn Off. Cool down. If persist, contact service.
Room or Floor Sensor disconnect	E4	Sensor is measuring too low temperature (<0°C).	Turn Off and On. If persist, contact service.
Battery missing		Battery is missing or needs a replacement	Contact service

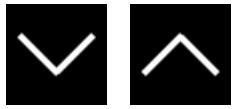
6 Configuring - Start up

Setting time

When the thermostat is connected first time, it will open a start up wizard (for further description see following pages).

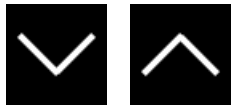
When unit is On (any of the modes) press Timer button (once), "hh:mm" will start to blink.

Adjust the "hh" value with Up & Down buttons, than when reached the desired value press

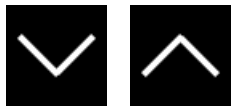


Timer button to move to "mm" (minutes).

Set the "mm" value with Up & Down buttons, than when reached the desired value press Timer button to move to Weekday.



Adjust the Weekday with Up & Down buttons.



Press the Timer button again, to confirm.

Timer programming

The thermostat comes with 3 preset programs (P1, P2 and P3). Default is set to program P3. Programs can be changed with Up and Down arrows (P3->P2->P1).

The values in the programs (time and temperature) can be adjusted, see the following page. For preset program settings, see the following table:

Programs		**P1** Working day	**P2** Days at home	**P3** Mon-Fri: P1 Sat - Sun: P2	
Days		MON to SUN	MON to SUN	MON to FRI	SAT to SUN
Morning	06:00-08:00	Comfort	Comfort	Comfort	Comfort
Day	08:00-16:00	Economy	Comfort	Economy	Comfort
Evening	16:00-22:30	Comfort	Comfort	Comfort	Comfort
Night	22:30-06:00	Economy	Economy	Economy	Economy

	Room & Floor	Floor only
Comfort default temperature	21°C	27°C
Economy default temperature	17°C	20°C

Adjusting timer programming:

When in timer mode, to adjust current program, press and hold timer button  for 2 sec. When timer program name (i.e. P3) appears, press timer button  again, to change the

settings of this program. First, hour and minute settings for all periods (for preset values see table on previous page), than temperatures for comfort and economy periods can be adjusted, with help of up and down buttons.

Push timer button , for going to next value/period. When programming is finished, operating screen will appear.

Period indicator:

P3:

- Comfort

- Economy

P2:

- Comfort

- Economy

The shorter line indicates, the current period (comfort or economy), corresponding to the time setting of the watch.

Note:

The floor and room takes time to heat up. Start comfort heating period before the time, you need them warm.

Away mode:

Is set by pushing mode button M, until away icon appears. Push the timer button, for 2 sec., to choose the number of away days (between 0-99 days), with up / down buttons . Start is at "0" days and it can be increased by pushing the Up arrow button.

Push timer button again to adjust the away temperature, can be set between 5-20°C, with up or down arrows. The last set value is used. No confirmation needed. Mode will end if user is pushing any button (Off button, turns the unit off). Away icon will disappear from screen.

Frost protection:

Is set by pushing M until frost protection icon appears.

Desired temperature for frost protection can be set in installer menu. Value is between 5-9°C.

If the current room temperature is below the set frost protection temperature, the heating ON icon will appear, and the thermostat will start heating.

Installer menu:

Settings described in next point (Start up wizard) will be available, uppon accessing this menu.

It's strongly advised: **ONLY** for the trained installer, to access this menu, as changes of settings can lead into damage of a floor surface.

It can be accessed from OFF state (thermostat is turned off), by holding the timer button for 10 sec.

The mode button M is used for cycling through the parameters (starting at 1), up & down buttons, for

setting the desired value. Push and hold  button, for 2 sec., to exit this menu at any time, into a manual operation mode.

Start up wizard:

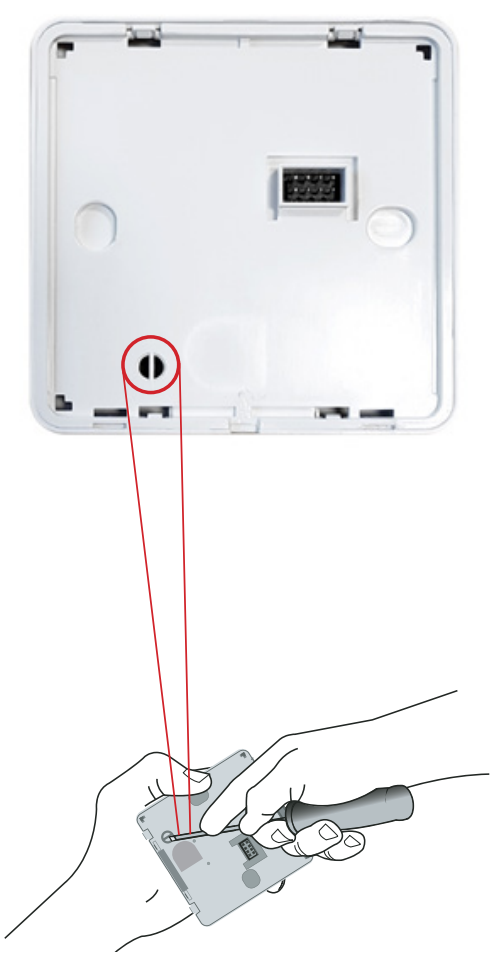
When first time connecting the thermostat to power, or by accessing installer menu, following parameters can be adjusted:

No.	Parameter settings	Settings range	Default
P01	Set time (Set Hour)	0 - 24	00:
P02	Set time (Set Minute)	0 - 60	:00
P03	Set weekday	Monday to Sunday	MON
P04	Temperature control mode	01: Room and floor temp. 02: Only floor temp. 03: Only room temp*	2
P05	Max. floor temperature	20-35° C (only for 01 & 02 in P04)	33
P06	Window open function	0: Disable; 1: Enable;	1
P07	Frost protection funciton	0: Disable; 1: Enable;	1
P08	Set frost protection temp.	5-9° C	5
P09	Set minimum floor temperature	0: Disable; 1: Enable;	0
P10	Minimum floor temperature	18-29° C	23
P11	Startup wizard	0: Disable; 1: Enable;	0

P09 and P10 are only accessible if Room and Floor is chosen in P04 (temperature control mode).

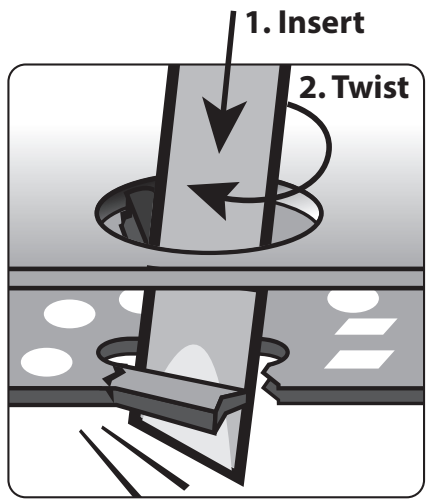
* Only room temperate, possible only after break-out (see next page).
** Max. temperature is 0,5°C below value set in P05.

7 Settings & Break out



Room sensor or floor temperature higher than max. 35°C

A “room only” option is also available, but requires that you have to break the small plastic seal on the the back of the display module, e.g. using a



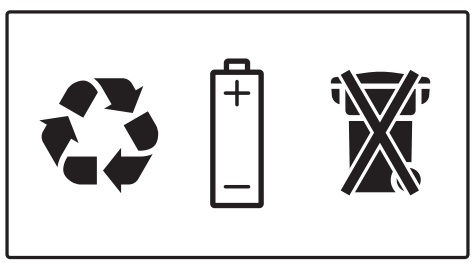
screw driver (insert all the way in and twist). It will be possible to set the maximum floor temperature up to 45°. Furthermore, it will be possible to use only a room sensor. However, this option is not recommendable due to an increased risk of overheating the floor.

Note: Please contact the floor supplier before changing the maximum floor temperature and be aware of the following:

- The floor temperature is measured there, where the sensor is placed.
- The temperature of the bottom of a wooden floor can be up to 10˚C higher than the top.
- Floor manufactures often specify the max. temperature on the top surface of the floor.

Thermal resist-ance [m^2K/W]	Examples of flooring	Details kg/m^3	Approximate setting for 25°C floor temperature
0,05	8 mm HDF based laminate	> 800	28°C
0,10	14 mm beech parquet	650 – 800	31°C
0,13	22 mm solid oak plank	> 800	32°C
< 0,17	Max. carpet thick-ness suitable for floor heating	acc. to EN 1307	34°C
0,18	22 mm solid fir planks	450 – 650	35°C

8 Disposal Instruction



9 Warranty

The products will, in the event of a fault that can be tracked back to a manufacturing defect in the DEVI product, be repaired or replaced free of charge. To apply for this warranty the installation must be performed by an authorized installer and the warranty certificate has to be stamped, signed and provided. For more details read our warranty terms and conditions.

Danfoss A/S
Electric Heating Systems
Ulvehavevej 61
7100 Vejle
Denmark
Phone: +45 7488 8500
Fax: +45 7488 8501
E-mail: EH@DEVI.com
www.DEVI.com

08096400 & VIJWM102

Produced by Danfoss © 06/2019