

# Nice

Heat-Control

## Heat control with temperature measurement

EN - Instructions and warnings for installation and use

**Nice**

## 1 WARNINGS AND GENERAL PRECAUTIONS

- **CAUTION! – This manual contains important instructions and warnings for personal safety.** Carefully read all parts of this manual. If in doubt, suspend installation immediately and contact Nice Technical Assistance.
- **CAUTION! – Important instructions: keep this manual in a safe place to enable future product maintenance and disposal procedures.**
- **CAUTION! – Any use other than that specified herein or in environmental conditions other than those stated in this manual is to be considered improper and is strictly forbidden!**
- The product's packaging materials must be disposed of in full compliance with local regulations.
- Never apply modifications to any part of the device. Operations other than those specified may only cause malfunctions. The manufacturer declines all liability for damage caused by makeshift modifications to the product.
- Do not expose this product to moisture, water or other liquids.
- This product is designed for indoor use only. Do not use outside!
- This product is not a toy. Keep away from children and animals! CR2032 coin cell battery is harmful if swallowed!

### **⚠ Battery pack warning!**

The Heat-Control contains lithium-ion polymer battery pack, heed all following warnings:

- If an unusual odor or malfunction is detected, avoid sources of open flame and remove the device from the radiator.
- In the event of damage from crashes, etc., carefully remove to a safe place for at least a half hour to observe.
- Do not leave the device unattended while charging.
- Do not attempt to replace the battery!

## 2 PRODUCT DESCRIPTION

Heat-Control is a remotely controlled thermostatic head to control temperature in your room. It measures the temperature and automatically adjust the heat level.

It can be mounted without tools on three types of thermostatic radiator valves.

You can create schedules via app to easily manage temperature throughout the week.

### **Main features**

- can be installed on three types of valves: M30 x 1.5, Danfoss RTD-N and Danfoss RA-N,
- compatible with any certified Z-Wave™ Controller,
- supports Z-Wave™ network Security Modes: S0 with AES-128 encryption and S2 with PRNG-based encryption,
- built-in battery recharged through standard micro-USB port,
- easy installation - no tools required,
- supports heating schedules,
- automatic calibration,
- anti-freeze function,
- descaling function,
- unconstrained rotation spherical knob to set desired temperature.

### **Heat-Control is a fully compatible Z-Wave Plus™ device.**

This device may be used with all devices certified with the Z-Wave Plus™ certificate and should be compatible with such devices produced by other manufacturers. All non-battery operated devices within the network will act as repeaters to increase reliability of the network. The device is a Security Enabled Z-Wave Plus™ product and a Security Enabled Z-Wave™ Controller must be used in order to fully utilize the product. The device supports Z-Wave™ network Security Modes: S0 with AES-128 encryption and S2 Authenticated with PRNG-based encryption.

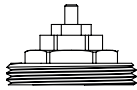
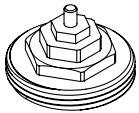


## 3 BASIC ACTIVATION

**⚠ If you use one of the adapters, double check that it is mounted properly. It should click when putting on the valve, hold tight after installing and not rotate!**

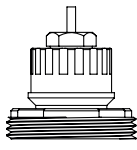
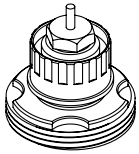
- If the device is installed in vertical position, set bit 5 in parameter 2.
  - Do not cover or veil the thermostatic head.
  - First charging may take up to 3 hours.
1. Connect the charger to the micro-USB port to charge the device. The LED ring will pulse red if it's not fully charged; otherwise, it will pulse green.
  2. Disconnect the charger when the LED ring pulses green (device fully charged).
  3. Dismount your current thermostatic head.

4. Depending on type of your thermostatic valve:



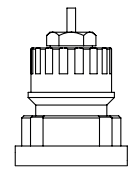
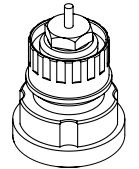
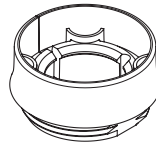
M30 x 1.5

Proceed normally



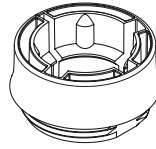
Danfoss RTD-N

Use adapter:



Danfoss RA-N

Use adapter:



5. Mount the device on the valve and tighten it by turning the cap clockwise.

6. Press and hold the button for at least one second. The LED ring will start blinking blue.

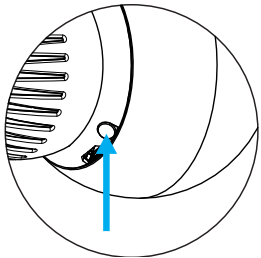
## 4 ADDING THE DEVICE

- Full DSK code is present only on the box, make sure to keep it or copy the code.
- In case of problems with adding the device, please reset the device and repeat the adding procedure.

**Adding (Inclusion) - Z-Wave™ device learning mode, allowing to add the device to existing Z-Wave™ network.**

To add the device to the Z-Wave™ network **manually**:

1. Make sure the device is within the direct range of your Z-Wave™ controller.
2. Set the main controller in (security/non-security) add mode (see the controller's manual).
3. Quickly triple click the button on the thermostatic head.



4. The LED ring will start blinking **white**.
5. If you are adding in S2 authenticated mode, type in the device pin code (underlined part of the public key on the label).
6. Wait for the adding process to end.
7. Successful adding will be confirmed by the Z-Wave™ controller and green LED colour.

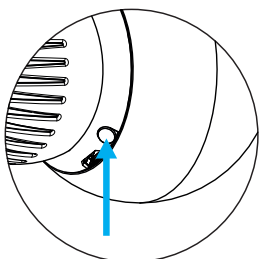
## 5 REMOVING THE DEVICE

**Removing (Exclusion) - Z-Wave™ device learning mode, allowing to remove the device from existing Z-Wave™ network.**

Removing the device restores all the default parameters of the device, but does not reset power metering data.

**To remove the device from the Z-Wave™ network:**

1. Make sure the device is within the direct range of your Z-Wave™ controller.
2. Set the main controller into remove mode (see the controller's manual).
3. Quickly triple click the button on the thermostatic head.



4. The LED ring will start blinking white.
5. Wait for the removing process to end.
6. Successful removing will be confirmed by the Z-Wave™ controller and red LED colour.

**Note.** Removing the device from the Z-Wave™ network restores all the default parameters of the device.

## 6 CONTROLLING THE TEMPERATURE

You can set temperature using app (10-30°C) or directly on the device (16-24°C).

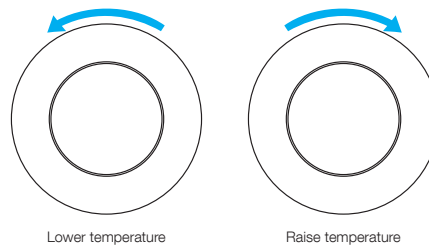
During manual temperature change LED ring colour corresponds to the temperature set-point.

### To check and change the temperature on the device:

1. Bring your hand close to the sphere.
2. LED ring will:
  - Glow if temperature was set manually,
  - Pulse slowly if device is in schedule mode,
  - Pulse quickly if device is in override schedule mode.
 » With colour depending on set temperature:

Table A1 - Meaning of colors in relation to temperatures		
Z-Wave™ Mode	Temperature [°C]	Colour
OFF	Valve closed (anti-freeze)	White
HEAT	16°C or lower	Blue
	17°C	Azure
	18°C	Cyan
	19°C	Spring green
	20°C	Green
	21°C	Chartreuse
	22°C	Yellow
	23°C	Orange
	24°C or higher	Red
MANUFACTURER SPECIFIC	Valve fully opened	Magenta

3. Turn the sphere counter-clockwise to lower temperature or turn clockwise to raise the temperature.



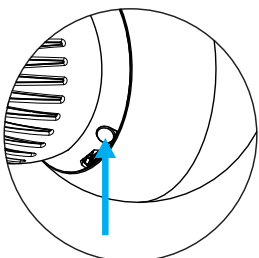
4. Remove the hand from the sphere, after 5 seconds LED will fade and new temperature will be set. You can set temperature using app (10-30°C) or directly on the device (16-24°C).

## 7 DISMOUNTING THE DEVICE

Before dismantling, the device must be put in Standby Mode to ensure safe removal. See chapter „Standby Mode” for more information.

### To dismantle the device:

1. Press and hold the button.



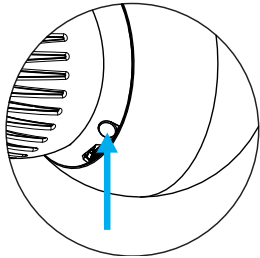
2. Release the button when you see **cyan** LED colour.
3. Click the button to confirm the selection.

4. Turn the cap counter-clockwise and remove adapter if used.
5. Store the device in temperature: -10°C to 25°C.

## 8 MENU

Menu allows to perform important configuration and maintenance actions. In order to use the menu:

1. Press and hold the button.



2. Release the button when you see desired LED colour:

Colour	Action
Blue	pair with temperature sensor (if equipped)
Red	enable/disable local control protection
White	perform head calibration
Green	adding/removing to/from Z-Wave™ network
Magenta	Z-Wave™ network's range test
Cyan	put device in Standby Mode
Yellow	factory reset

3. Click the button to confirm the selection.

## 9 LOCAL PROTECTION

After enabling the local protection changing temperature directly on the device (by turning it) will not be possible. Enabling local protection is recommended if you want to prevent accidental temperature change, e.g. by children.

- Local protection can also be enabled/disabled remotely through Z-Wave™ controller.

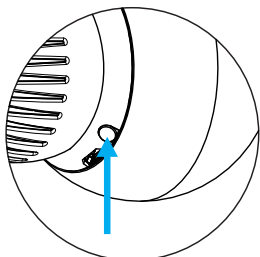
When attempting to change temperature if local protection is enabled:

- The device will not set new target temperature,
- The LED ring will blink red 3 times.

To change the temperature use the app or disable the local protection.

To enable/disable local protection using the menu:

1. Press and hold the button.



2. Release the button when you see **red** LED colour.
3. Click the button to confirm the selection.

## 10 HEAD CALIBRATION

- Calibration cannot be performed while the device is being charged.

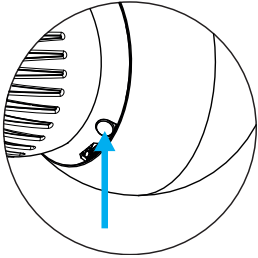
Calibrating the device to your radiator valve is required for proper controlling the temperature.

### Calibration is performed:

- Automatically, after 10 minutes from turning on if no operation on the device has been made (only at first installation),
- Automatically, after 10 minutes from last state change (only at first installation),
- Manually, using the menu (see below).

### To perform calibration using the menu:

1. Press and hold the button.



2. Release the button when you see **white** LED colour.
3. Click the button to confirm the selection.

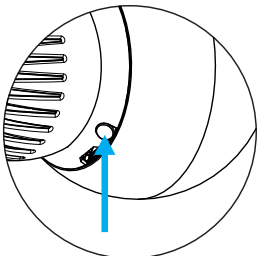
## 11 STANDBY MODE

In Standby Mode the device is in deep sleep state allowing safe dismounting, transporting and low as possible battery consumption. The device is shipped in Standby Mode. It should be fully charged before first use.

Entering the device in Standby Mode **will not** factory reset the device nor will result in losing any data, but calibration (after long Standby) is lost.

### To enter Standby Mode:

1. Press and hold the button.



2. Release the button when you see **cyan** LED colour.
3. Click the button to confirm the selection.

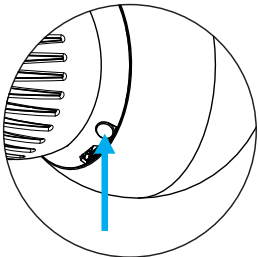
**To exit Standby Mode** click the button once, the device will enter first installation procedure.

## 12 FACTORY RESET

Reset procedure allows to restore the device back to its factory settings, which means all information about the network and user configuration will be deleted.

### To perform factory reset:

1. Press and hold the button.



2. Release the button when you see **yellow** LED colour.
3. Click the button to confirm the selection.
4. After finishing resetting the device will be put in Standby Mode. Click the button to activate it again.

**Note.** Resetting the device is not the recommended way of removing the device from the Z-Wave™ network. Use the reset procedure only if the primary controller is missing or inoperable.

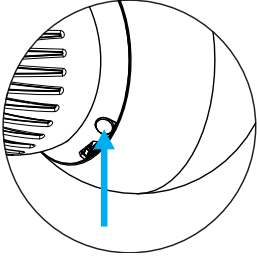
## 13 Z-WAVE™ RANGE TEST

The device has a built in Z-Wave™ network main controller's range tester.

- To make Z-Wave™ range test possible, the device must be added to the Z-Wave™ controller. Testing may stress the network, so it is recommended to perform the test only in special cases.

### To perform a range test:

1. Press and hold the button.



2. Release the button when you see **magenta** LED colour.
3. Click the button to confirm the selection.
4. LED ring will indicate the Z-Wave™ network's range:
  - Pulsing green - the device attempts to establish a direct communication with the main controller. If a direct communication attempt fails, the device will try to establish a routed communication, through other modules, which will be signaled by visual indicator pulsing yellow.
  - Glowing green - the device communicates with the main controller directly.
  - Pulsing yellow - the device tries to establish a routed communication with the main controller through other modules (repeaters).
  - Glowing yellow - the device communicates with the main controller through the other modules. After 2 seconds the device will retry to establish a direct communication with the main controller, which will be signaled with visual indicator pulsing green.
  - Pulsing magenta - the device does communicate at the maximum distance of the Z-Wave™ network. If connection proves successful it will be confirmed with a yellow glow. It's not recommended to use the device at the range limit.
  - Glowing red - the device is not able to connect to the main controller directly or through another Z-Wave™ network device (repeater).
5. To exit Z-Wave™ range test, press the button briefly.

## 14 BATTERY AND CHARGING

**⚠ Do not leave the device unattended while charging.**

- **Make sure you are using certified charger Class II, marked which complies with parameters specified in the manual.**
- **Set the device to OFF (white) before charging or dismantle the thermostatic head if not possible.**
- **Do not use cables longer than 3 meters for charging the device.**
- **Make sure the device won't discharge during the heating season or it may cause high temperatures!**

The device is equipped with a rechargeable lithium-polymer battery pack that can be charged via micro-USB port using standard 5V charger (not included).

When battery is low the LED ring will start to blink red. The device will also report low battery status of itself.

The device does not operate the valve during the charging and maintains the last valve position.

If the battery is discharged the device will open valve completely to allow easy dismantling.

### To charge the battery:

1. Connect charger to the micro-USB port.
2. During charging the LED ring will pulse red and valve control will be disabled.
3. When LED starts pulsing green, disconnect the charger.
4. The device will restore its previous operation.

## 15 NORMAL SCHEDULES

The device allows to create multiple heating schedules to manage temperature in the room throughout the week. Schedules are created via controller interface or app.

- Up to 253 normal schedules can be created.
- The lower the schedule ID number, the higher the priority.
- Schedules with higher priority override those with lower priority in case of overlapping schedules.
- Schedules can be disabled without deleting it.
- Schedules allow to set target temperature for HEAT mode (using Thermostat Setpoint CC) and one of operating modes: HEAT, OFF or MANUFACTURER SPECIFIC (using Thermostat Mode CC)
- Only SET commands are permitted.

### To create normal schedules user must specify:

- Day of the week,
- Starting time (hour and minute),
- Duration,
- Temperature Setpoint for HEAT mode in range 10-30°C (using Thermostat Setpoint CC)
- One of the operating modes (using Thermostat Mode CC):
  - » HEAT for setting temperature,
  - » OFF for valve fully closed,
  - » MANUFACTURER SPECIFIC for valve fully opened.

**Note.** Schedule CC Set command payload must not be greater than 22 bytes limit or it would be rejected.

## 16 OVERRIDE SCHEDULE

**Override Schedule** is a special type schedule with highest priority; thus it overrides other schedules.

The Override Schedule starts right after setting and lasts for specified time, then it is removed and current schedule or normal operation is restored.

### To create Override Schedule user must specify:

- Starting time (START NOW),
- Duration,
- Temperature Setpoint for HEAT mode in range 10-30°C (using Thermostat Setpoint CC)
- One of the operating modes (using Thermostat Mode CC):
  - » HEAT for setting temperature,
  - » OFF for valve fully closed,
  - » MANUFACTURER SPECIFIC for valve fully opened.

Override Mode can be **enabled** in two ways:

- By turning the knob, while normal schedule is active. The LED ring will pulse with selected adjustment.
- Via controller, by creating schedule with ID set 255, start time set to NOW and duration (in minutes/hours/days).

To **exit** Override Mode grab knob with your hand for 5 seconds.

## 17 Z-WAVE™ SPECIFICATION

### Endpoint 1:

Generic Device Class: GENERIC\_TYPE\_THERMOSTAT

Specific Device Class: SPECIFIC\_TYPE\_THERMOSTAT\_GENERAL\_V2

Description: represents thermostatic head, allows to set temperature, schedules and check its battery level.

### Endpoint 2:

Generic Device Class: GENERIC\_TYPE\_SENSOR\_MULTILEVEL

Specific Device Class: SPECIFIC\_TYPE\_ROUTING\_SENSOR\_MULTILEVEL

Description: represents temperature sensor:

- Extra temperature sensor paired – reports temperature measured by the extra sensor and its battery level,
- No extra temperature sensor paired – reports temperature measured by the built-in sensor and head battery level.

### Association Command Class:

The device supports only “Lifeline” association group that reports the device status and allows for assigning single device only (main controller by default).



**Table A3 - Response to Basic Command Class**

Value	Action
0	Set OFF mode (unfreeze function)
99	Set HEAT mode (last set temperature)
255	Set MANUFACTURER SPECIFIC mode (valve fully opened)

**Table A4 - Supported Command Classes**

Command Class	Version	Secure
ZWAVEPLUS_INFO [0x5E]	V2	
ASSOCIATION [0x85]	V2	YES
MULTI_CHANNEL_ASSOCIATION [0x8E]	V3	YES
BASIC [0x20]	V1	YES
APPLICATION_STATUS [0x22]	V1	
THERMOSTAT_MODE [0x40]	V3	YES
THERMOSTAT_SETPOINT [0x43]	V3	YES
SCHEDULE [0x53]	V1	YES
TRANSPORT_SERVICE [0x55]	V2	
ASSOCIATION_GRP_INFO [0x59]	V2	YES
DEVICE_RESET_LOCALLY [0x5A]	V1	YES
MULTI_CHANNEL [0x60]	V4	YES
SUPERVISION [0x6C]	V1	YES
NOTIFICATION [0x71]	V8	YES
MANUFACTURER_SPECIFIC [0x72]	V2	YES
POWERLEVEL [0x73]	V1	YES
PROTECTION [0x75]	V1	YES
FIRMWARE_UPDATE_MD [0x7A]	V4	
BATTERY [0x80]	V1	YES
CLOCK [0x81]	V1	YES
VERSION [0x86]	V2	YES
SECURITY [0x98]	V1	
SECURITY_2 [0x9F]	V1	
CONFIGURATION [0x70]	V1	YES
CRC_16_ENCAP [0x56]	V1	
SENSOR_MULTILEVEL [0x31]	V5	YES

**Table A5 - Multichannel Command Class**

Command Class	Version	Secure
<b>Endpoint 1</b>		
ZWAVEPLUS_INFO [0x5E]	V2	
ASSOCIATION [0x85]	V2	YES
MULTI_CHANNEL_ASSOCIATION [0x8E]	V3	YES
BASIC [0x20]	V1	YES
THERMOSTAT_MODE [0x40]	V3	YES
THERMOSTAT_SETPOINT [0x43]	V3	YES
SCHEDULE [0x53]	V1	YES
ASSOCIATION_GRP_INFO [0x59]	V2	YES
SUPERVISION [0x6C]	V1	YES
NOTIFICATION [0x71]	V8	YES
BATTERY [0x80]	V1	YES
CLOCK [0x81]	V1	YES
PROTECTION [0x75]	V1	YES

SECURITY [0x98]	V1	
SECURITY_2 [0x9F]	V1	
<b>Endpoint 2</b>		
ZWAVEPLUS_INFO [0x5E]	V2	
ASSOCIATION [0x85]	V2	YES
MULTI_CHANNEL_ASSOCIATION [0x8E]	V3	YES
SENSOR_MULTILEVEL [0x31]	V5	YES
ASSOCIATION_GRP_INFO [0x59]	V2	YES
SUPERVISION [0x6C]	V1	YES
NOTIFICATION [0x71]	V8	YES
BATTERY [0x80]	V1	YES
SECURITY [0x98]	V1	
SECURITY_2 [0x9F]	V1	

#### Notification Command Class:

The device uses Notification Command Class to report different events to the controller (“Lifecycle” group).

**Table A6 - Notification Command Class (Endpoint 1)**

Notification Type	Event	Event Parameters
Power Management [0x08]	Charge battery soon [0x0E]	
	Charge battery now! [0x0F]	
	Battery is charging [0x0C]	
	Battery is fully charged [0x0D]	
System [0x09]	System Hardware Failure [0x03]	External sensor remove [0x02]
		Motor error [0x03]
		Calibration error [0x04]

**Table A7 - Notification Command Class (Endpoint 2)**

Notification Type	Event	Event Parameters
Power Management [0x08]	Replace battery soon [0x0A]	
	Replace battery now! [0x0B]	

## 18 ADVANCED PARAMETERS

The device allows to customize its operation to user’s needs using configurable parameters.

The settings can be adjusted via Z-Wave™ controller to which the device is added. The way of adjusting them might differ depending on the controller.

**Table A8 - Heat-Control - Available parameters**

Parameter:	1. Override Schedule duration		
Description:	This parameter determines duration of Override Schedule after turning the knob while normal schedule is active (set by Schedule CC).		
Available settings:	10-10 000 (in minutes)		
Default setting:	240 (4h)	Parameter size:	4 [bytes]
Parameter:	2. Additional functions		
Description:	This parameter allows to enable different additional functions of the device.		

Available settings:	1 (bit 0) - open window detection (normal) 2 (bit 1) - open window detection (rapid) 4 (bit 2) - increase receiver sensitivity (shortens battery life) 8 (bit 3) - LED indications when controlling remotely 16 (bit 4) - protect from setting Full ON and Full OFF mode by turning the knob manually 32 (bit 5) - device mounted in vertical position 64 (bit 6) - Moderate regulator behaviour (instead of Rapid) 128 (bit 7) - inverted knob operation 256 (bit 8) - heating medium demand reports 512 (bit 9) - detecting heating system failures		
Default setting:	1	Parameter size:	4 [bytes]
Parameter:	3. Additional functions status (read-only)		
Description:	This parameter allows to check statuses of different additional functions.		
Available settings:	1 (bit 0) - optional temperature sensor connected and operational 2 (bit 1) - open window detected 4 (bit 2) - provide heat in order to maintain set temperature 8 (bit 3) - malfunctioning heating system (cannot reach set temperature)		
Default setting:	0	Parameter size:	4 [bytes]

#### Notes:

- Entering invalid value of parameter will result in not setting the value and response with Application Rejected or Supervision CC frame (depending on the controller).
- Parameter 2 values may be combined, e.g. 1+8=9 means that Open Window Detector and LED indications when controlling remotely are enabled.
- Parameter 3 values may be combined, e.g. 1+2=3 means optional sensor works properly and open window detection was triggered.

## 19 TECHNICAL SPECIFICATIONS

The product Heat-Control is produced by Nice S.p.A. (TV). Warnings: - All technical specifications stated in this section refer to an ambient temperature of 20 °C (± 5 °C) - Nice S.p.A. reserves the right to apply modifications to the product at any time when deemed necessary, while maintaining the same functionalities and intended use.

Heat-Control	
Power supply	3.7V Li-Poly battery pack (non-replaceable)
Charging port	micro-USB
Charger voltage (not included)	5V DC (±5%)
Minimum charger current (not included)	0.5A
Operating temperature	0–40°C
Storage temperature (standby mode)	-10–25°C
Maximum water temperature	90°C
Temperature measuring accuracy	0.5°C (within 0–40°C range)
Regulator class	Type 1 class
Device Firmware Class	A-grade
Motor protection	Impedance Protected
Actuator action	Linear variable position actuator
Actuator stroke	5mm
Purpose of control	Operating control
Construction of control	Integrated control
Degree of protection by enclosure	IP20
Classification of control according to protection against electric shock	Class III
Action type	type 1
Control pollution degree	pollution degree 2
Rated impulse voltage	330V (when connected to the USB power supply)
Dimensions (Diameter x Length)	56 x 74 mm (without the adapter); 56 x 87 mm (with the adapter)

- Radio frequency of individual device must be same as your Z-Wave™ controller. Check information on the box or consult your dealer if you are not sure.

- Charger type: Unit shall be supplied by a source certified as Limited Power Source (LPS) as defined in clause 2.5 of IEC60950-1 2nd edition + Amd. 1 + Amd. 2.
- SELV power supply (USB supply) is used only for battery charging. The device does not operate the valve during the charging.

Heat-Control (radio transceiver)	
Radio protocol	Z-Wave™ (500 series chip) Bluetooth
Frequency band	868.0-868.6 MHz 869.7-870.0 MH
Max. transmit power	6dBm (Z-Wave™) 7dBm (Bluetooth)

(\*) The transceiver range is strongly influenced by other devices operating at the same frequency with continuous transmission, such as alarms and radio headphones which interfere with the control unit transceiver.

- Using batteries other than specified may result in explosion. Dispose of properly, observing environmental protection rules.
- CR2032 coin cell battery is harmful if swallowed!

## 20 PRODUCT DISPOSAL

This product is an integral part of the automation and therefore must be disposed together with the latter.

As in installation, also at the end of product lifetime, the disassembly and scrapping operations must be performed by qualified personnel. This product is made of various types of material, some of which can be recycled while others must be scrapped. Seek information on the recycling and disposal systems envisaged by the local regulations in your area for this product category.

**Caution!** – some parts of the product may contain pollutant or hazardous substances which, if disposed of into the environment, may cause serious damage to the environment or physical health.

As indicated by the symbol alongside, disposal of this product in domestic waste is strictly prohibited. Separate the waste into categories for disposal, according to the methods envisaged by current legislation in your area, or return the product to the retailer when purchasing a new version.

**Caution!** – local legislation may envisage serious fines in the event of abusive disposal of this product.



## 21 DECLARATION OF CONFORMITY

Hereby, Nice S.p.A., declares that the radio equipment type Heat-Control is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: <http://www.niceforyou.com/en/support>



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