REHAU®
Unlimited Polymer Solutions

NEA SMART FAMILY CONTROL SYSTEM

Technical information

CONTENTS

More information on the NEA Smart control system and all documentation is available for download at www.rehau.uk/neafamily

1 INFORMATION AND SAFETY INSTRUCTIONS

1.1 Notes on this Technical Information

Validity
This Technical Information is valid for the United Kingdom.

Other applicable technical information
NEA Smart controller installation and operating manual.

Navigation
At the beginning of this Technical Information, you will find a detailed table of contents with the hierarchical headings and the corresponding page numbers.

Pictograms and logos

Electrical voltage! Danger to life! Warnings are indicated with the adjacent symbol.


Note

Most current Technical Information
For your own safety and in order to ensure correct use of our products, please regularly check whether an updated version of this Technical Information is available.
The date of issue of your Technical Information is always printed on the back cover.
The latest version of the Technical Information is available from your REHAU sales office, specialist wholesaler and it can be downloaded via the Internet at www.rehau.uk/neafamily.

Safety instructions and operating manuals
- For your own safety and that of others, please read this Technical Information and the installation and operating manuals carefully and completely before commencing installation.
- Keep the operating manuals and ensure that they are always available.
- If you do not understand the safety instructions or the individual installation regulations or if there is any uncertainty with regard to their content, please contact your local REHAU sales office.
- Ignoring the safety instructions may cause injury or property damage.


This Technical Information presents an overview of the features, the functions and the basic requirements for correct operation of the system. In addition to this information, the installation and operating manuals for the products and the additional documents are available from www.rehau.uk/neafamily and must be followed in the planning and installation phase.

1.2 Intended use

The NEA Smart control system must be configured, installed and operated only as described in this Technical Information and in the other installation manuals for the system. Any other use is deemed to be inappropriate and is therefore impermissible.
Observe the applicable national and international routing, installation, accident prevention and safety regulations and the instructions in this Technical Information when installing piping systems and electrical components and equipment.
Our applications engineering department must be consulted for areas of application which deviate from those described in this Technical Information (special applications).
Contact your REHAU sales office.

Requirements for personnel
- Only authorised and trained persons are permitted to install our systems.
- Work on electrical equipment or wiring may only be performed by authorised and qualified electricians.

General precautionary measures
- Keep your workplace clean and free of objects which could get in your way.
- Ensure that your workplace is adequately lit.
- Keep children, pets and unauthorised persons away from tools and the installation locations. This is particularly important when carrying out renovation work in occupied areas.

2 NEA SMART CONTROL SYSTEM

2.1 System overview

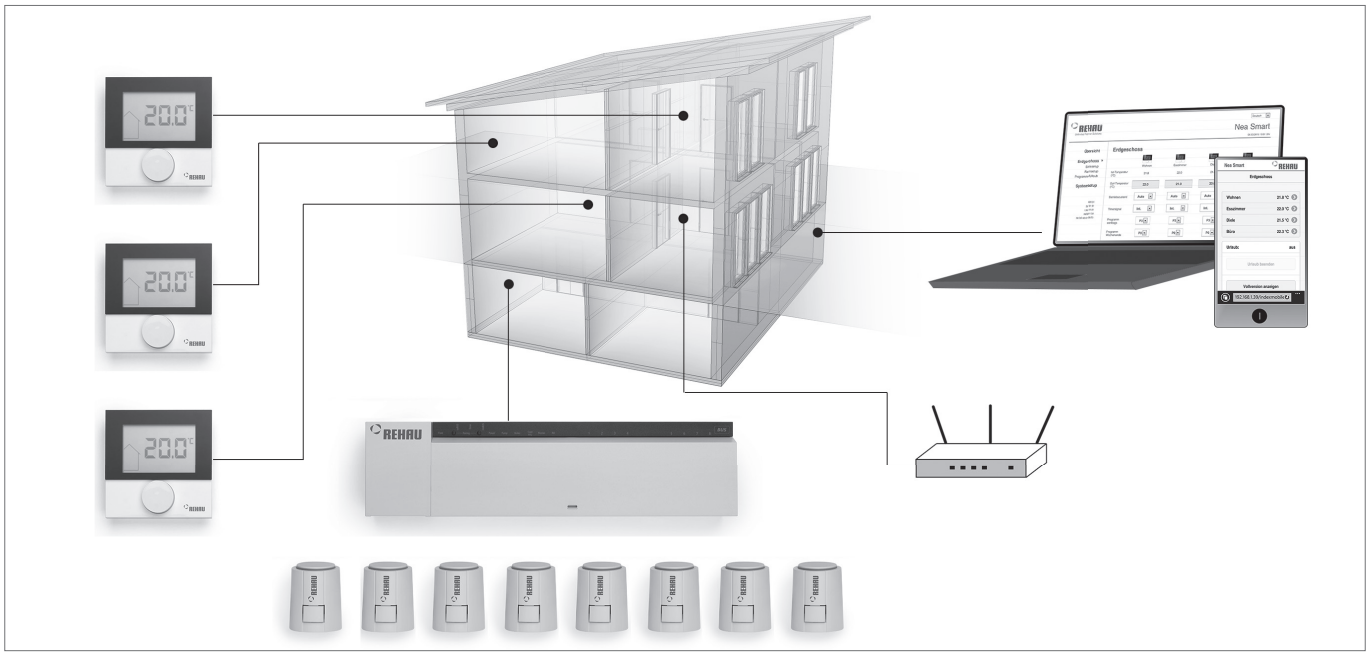

FIG. 2-1 NEA Smart control system

The NEA Smart room temperature control system offers modern technology, high energy efficiency and advanced design.
It can be conveniently operated from any location by smartphone, tablet or laptop. The wired and wireless versions of the system can be installed quickly and easily.

Features
- Access by smartphone, tablet and computer
- Wireless and wired system available
- Both systems can easily be upgraded
- Suitable for heating and cooling
- Energy efficiency with high degree of comfort
- Simple commissioning and operation
- High-quality room control unit with LCD display
- Can be expanded to 56 rooms
- Remote maintenance option by remote access

Area of application

The components of the NEA Smart system are designed for the regulation of room temperature by surface heating or surface heating and cooling systems in enclosed buildings.

Unified design

The NEA Smart R (wireless system) and NEA Smart (wired system) systems have identical control functions, operating concept and basic procedures for commissioning.
This unification offers significant advantages for planning and commissioning the system.

System features

The NEA Smart control system is available in 2 models:
NEA Smart R: wireless system (230 V)
NEA Smart: wired system (24 V)

The two available models – wireless and wired – are equally suitable for new installations and for retrofitting. Existing wiring for conventional room thermostats can also be used for the wired model (see planning information).
The NEA Smart control system allows simple installation and convenient operation. The standard Ethernet port in the base units enables operation and monitoring by smartphone, tablet, laptop or computer both at home or while travelling.
The system can be expanded to a total of 56 rooms with interconnected base units.

2.2 Components and system structure

2.2.1 Components of the wireless system

- NEA Smart R room control unit D (with display)
- NEA Smart R room control unit (with setpoint adjuster)
- NEA Smart R base station 230 V
- NEA Smart remote sensor
- UNI 230 V actuator
- NEA Smart R antenna
- NEA Smart R repeater

2.2.2 NEA Smart R – wireless system structure

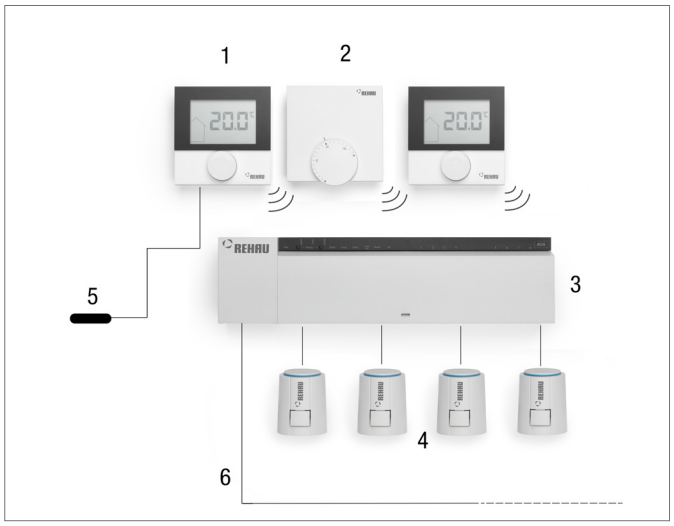

Fig. 2-2 NEA Smart R control system structure

1 NEA Smart R room control unit D
2 NEA Smart R room control unit
3 NEA Smart R base 230 V
4 UNI 230 V actuator
5 NEA Smart remote sensor
6 Ethernet port

The NEA Smart R room control unit is easily allocated to the channels of the NEA Smart R base station 230 V. The NEA Smart R room control unit D can optionally be fitted with the remote sensor to monitor the floor temperature. The thermal actuators are connected to the NEA Smart R base station. The standard Ethernet port can be connected to the computer or laptop directly or via a router.

2.2.3 Components of the wired system

- NEA Smart room control unit D (with display)
- NEA Smart room control unit (with setpoint adjuster)
- NEA Smart base station 24V
- NEA Smart remote sensor
- UNI 24 V actuator

2.2.4 NEA Smart – wired system structure

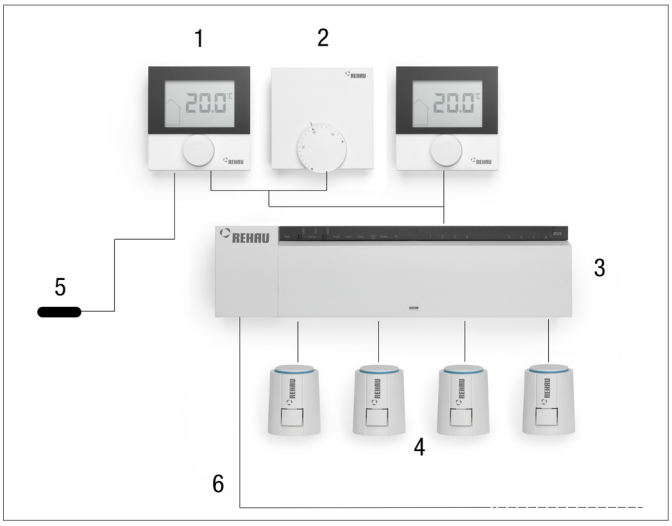

Fig. 2-3 NEA Smart control system structure

1 NEA Smart room control unit D
2 NEA Smart room control unit
3 NEA Smart base 24 V
4 UNI 24 V actuator
5 NEA Smart remote sensor
6 Ethernet port

The NEA Smart room control unit is easily linked to the communications port of the NEA Smart base station 24 V with a 2-wire cable. The wiring layout can be selected as desired. Existing wiring can generally be used (see planning information). All other features and system channels are identical to the NEA Smart R system.

2.3 Description of components

The room control unit described below is available for the wireless system (NEA Smart **R**) and the wired system (NEA Smart).

2.3.1 NEA Smart (R) room control unit D

Fig. 2-4 NEA Smart R room control unit D / NEA Smart room control unit D

- Flat housing can be mounted with a pattress box or directly onto the wall
- Large display (60 x 40 mm), white backlit with NEA Smart room control unit D
- Clear status display using easy to understand icons
- Operation with control knob
- Setpoint adjustment in 0.2 degree steps
- Remote sensor for monitoring floor temperature, room temperature controller **or** dew point sensor can be connected
- Adjustment range can be customised, setback is adjustable
- Selection of different operating modes: Automatic, Standard, Reduced and optionally Off (frost protection)
- Tamper proof option

2.3.2 NEA Smart (R) room control unit

Fig. 2-5 NEA Smart R room control unit / NEA Smart room control unit

- Flat housing can be mounted with a pattress box or directly onto the wall
- Operation with setpoint adjuster
- Setback adjustable

2.3.3 NEA Smart (R) room control unit D/NEA Smart (R) room control unit overview of functions

	NEA Smart (R) room control unit D	NEA Smart (R) room control unit
Heating	✓	✓
Cooling	✓	✓
Setpoint specified by time switch programs of the NEA Smart (R) base	✓	*)
Display with continuous display of room temperature, system time and operating status	✓	–
Operation with control knob	✓	–
Setpoint adjustment/operation can be locked	✓	–
Remote sensor can be connected	✓	–
Integrated frost and valve protection function	✓	✓
Party and holiday mode can be selected on device	✓	–

Tab. 2-1 Function overview

✓ Function included

– Function not included

*) Energy-saving mode of the controller without display can also be activated through the timer program. The setpoint for energy-saving mode is dropped by an adjustable amount from the setpoint on the controller.

2.3.4 Technical data of the NEA Smart room control unit

	NEA Smart R room control unit	NEA Smart room control unit
Colour	Housing signal white (RAL 9003); Panel on display (room control unit D) black, back of housing grey-black (RAL 7021)	
Material	ABS (housing, socket, rotary button) PMMA (screen on room control unit D)	
Voltage supply	2 LR03 AAA alkaline batteries, battery life > 2 years	24 V over bus line, polarity-reversal protected
Protection type/ protection class	IP20 / III	
Communication	Radio technology 868 MHz, range approx. 25 m in buildings	Bus technology, polarity-reversal protected 2-wire bus, maximum cable length 500 m
width x height x depth	room control unit D: 86 x 86 x 26.5 mm room control unit: 86 x 86 x 25.5 mm	
Size of display (room control unit D)	Visible area of display: H x W: 40 x 60 mm	
Setting range	room control unit D: 5 to 30 °C room control unit: 10 to 28 °C	
Ambient temperature	0 to 50 °C	
Ambient humidity	5 to 80%, non-condensing	
Area of application	in enclosed rooms	

Tab. 2-2 Technical data of the NEA Smart room control unit

2.3.5 NEA Smart remote sensor

Fig. 2-6 NEA Smart remote sensor

The NEA Smart remote sensor can be connected to the NEA Smart room control units with display, if required – NEA Smart room control unit D and NEA Smart R room control unit D.
The sensor can be configured as a floor temperature sensor or room temperature sensor.
Configured as a floor temperature sensor it can be used to maintain a minimum floor temperature in heating mode.
Configured as a room temperature sensor, it replaces the sensor integrated in the room temperature controller, so the room temperature controller can be installed in a different room.

Technical data of the NEA Smart remote sensor	
Cable length	3 m
Sensor diameter	5 mm
Operating temperature range	0 to 50 °C
Type of protection	IP 67

Tab. 2-3 Technical data of the NEA Smart remote sensor

The input of the NEA Smart (R) room control unit D can also be used to attach the potential-free contact of a dew point sensor. **Connection** of the contact triggers a dew point alarm and terminates the cooling mode of the zone controller by the room control unit.

2.3.6 UNI 230 V/24 V actuator

Fig. 2-7 UNI actuator

REHAU UNI actuators in the 230 V version are used for the NEA Smart R (radio wireless version) system, REHAU UNI actuators in the 24 V version are used for the NEA Smart (wired version) system.

Features:
- Thermal actuator, normally closed
- Energy-efficient, only 1 W power consumption
- Clear status display
- Easy installation
- Overhead installation possible
- "First-open function" for operation of area heating in the construction phase (before installation of controllers)
- Can be adjusted for different makes of valves and manifolds
- Protection type IP 54
- Available in 24 V or 230 V models

2.3.7 NEA Smart R base station 230 V / NEA Smart base station 24 V

Fig. 2-8 NEA Smart R base station 230 V

- For connecting a maximum of 8 NEA Smart R or NEA Smart room control units
- Actuation of 12 UNI 24 V thermal actuators (NEA Smart base station) or 12 UNI 230 V thermal controllers (NEA Smart R base station)
- Simple and intuitive installation and operation
- Standard Ethernet interface for integration of the system into the home network
- Smart Start function continuously optimises the start time for heating after the setback phase
- System can be extended with up to 6 additional base stations using wireless (wireless version only) or system BUS technology
- Connections for pump, high temperature limiter and dew point sensor
- Connections without screws using clamp connections
- For installation racks in distribution box
- Ease of installation using DIN Rail supplied

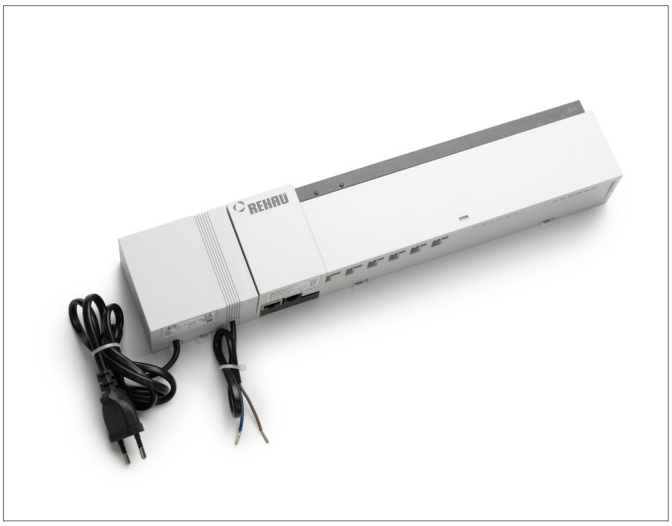

Fig. 2-9 NEA Smart base station 24 V

Function

The NEA Smart R base station 230 V (wireless) and the NEA Smart base station 24 V (wired) are the central and intelligent units to which up to 8 room control units can be allocated. The REHAU UNI actuators for the valves on the heating circuit manifold are connected to the base stations.

The base stations provide terminals for a heating circuit pump, boiler or chiller, high temperature limiter and dew point sensor. The CO input sets the "heating" or "cooling" operating modes.

The base stations can be configured from the room temperature controller display and a laptop which is directly connected to the Ethernet port or by connecting the base station to the router via LAN or WLAN in the home network.

System expansion with slave units

Up to 7 base stations can be networked over system BUS or wirelessly with the wireless version.

Every base station has a separate web server: The base station can be selected with access over the Internet (remote access) via the password-secured REHAU portal.

Global information is exchanged in the system:
- Heating or cooling mode
- Demand heating circuit pump
- Demand heating unit

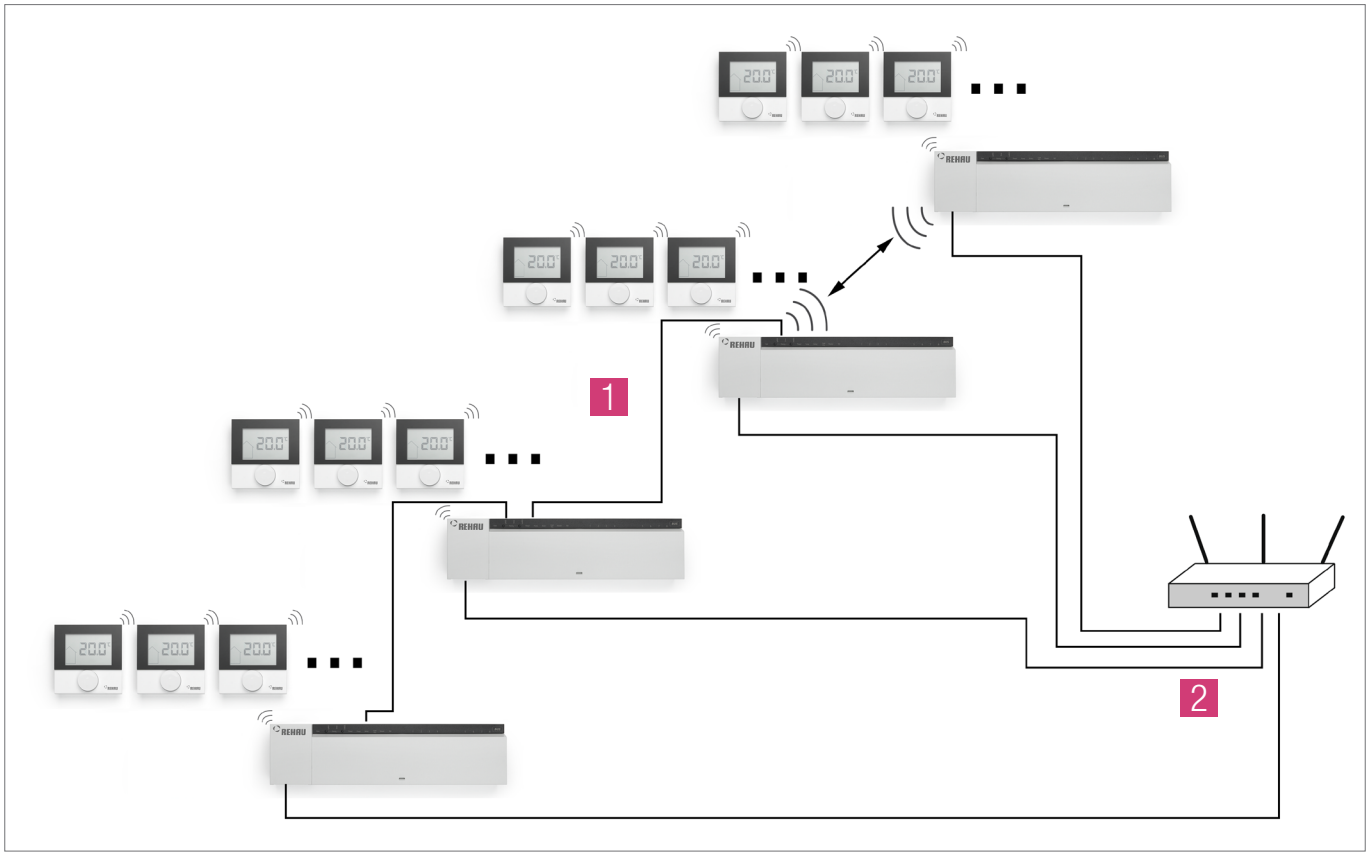

Fig. 2-10 System with a total of 4 base stations networked over system BUS (1), base stations connected to router by network cable (2)

Overview of technical data of NEA Smart R base station 230 V, NEA Smart base station 24 V

	NEA Smart R base station 230 V	NEA Smart base station 24 V
Communication with NEA Smart room control units	Radio, 868 MHz SRD band	2-wire bus, polarity-reversal protected
Number of room control units per base station	8	
Number of actuators per base station	12 UNI 230 V actuators	12 UNI 24 V actuators
Terminals for actuators	4 x 2 actuators/channel, 4 x 1 actuator/channel	
Max. nominal load of all actuators	24 W	
Power consumption in unloaded status	2.4 W	1.4 W
Fuses	T4AH, 5 x 20 mm	T2A, 5 x 20 mm
Protection class	II	
Type of protection	IP 20	
Permissible ambient temperature	0 °C to 60 °C	
Permissible storage temperature	-25 °C to +70 °C	
Relative humidity	5% - 80%, non-condensing	
width x height x depth	290 x 52 x 75 mm	370 x 52 x 75 mm
Area of application	in enclosed rooms	

Tab. 2-4 Technical data of NEA Smart R base station 230 V, NEA Smart base station 24 V

2.4 Notes on planning

2.4.1 NEA Smart (wired system, bus technology)

The wired NEA Smart system only requires a 2-wire cable for communication between the NEA room control unit and the NEA Smart base station. The topology can be selected as desired (but not ring topology), the polarity is irrelevant for connecting the room temperature controllers.

Recommended lines:

From **NEA Smart base station** to **NEA Smart room control units**:

Recommended cable:	Standard beldon 0.8mm two pair or similar
also permissible:	existing wiring with at least 2 wires, but country-specific standards and regulations must always be observed!

From **NEA Smart base station** to **NEA Smart base station**:

Cable to be used:	Standard beldon 0.8mm^2 two pair or similar Connect shield to device earth (GND) at both ends!

From **NEA Smart base station** to **router**:

Network cable

Use of existing wiring (retrofit)

If the existing wiring of previously installed 24 V or 230 V room thermostats is used, it is very important to ensure that the existing lines are totally disconnected from the mains power.
Both 230 V power supply voltage and 24 V voltage must not share a line.

2.4.2 NEA Smart (wireless system, wireless technology)

The NEA Smart R base station can be networked wirelessly or by a communication line as with the wired version. The wired version must be preferred if problems with range could be anticipated. **The specified range of 25m for the wireless components in buildings may be reduced under unfavourable installation conditions.**

Dew point sensors are required at critical points of the system to detect condensation during cooling.

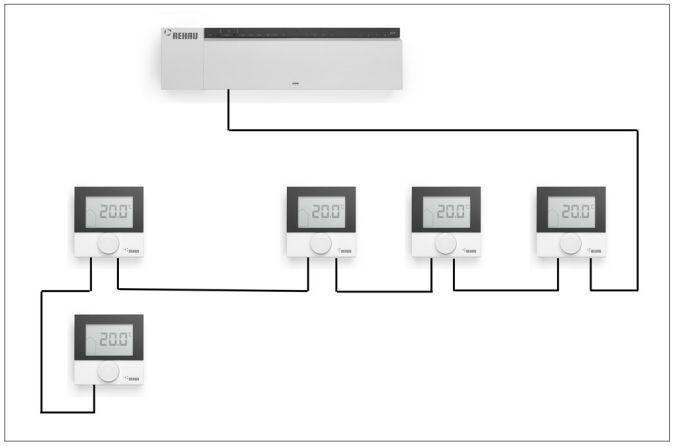

Fig. 2-11 Linear bus structure

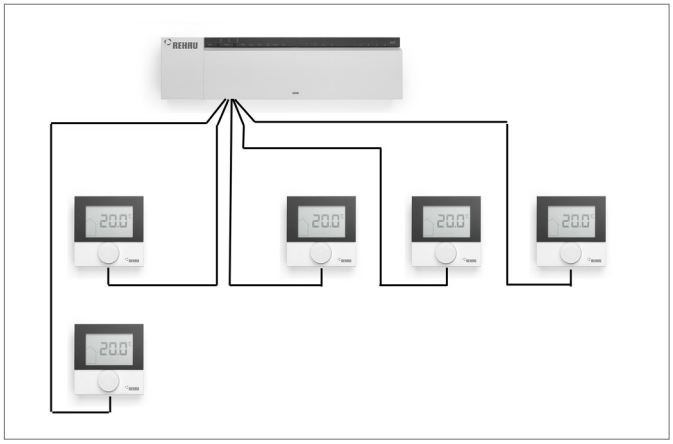

Fig. 2-13 Star bus structure

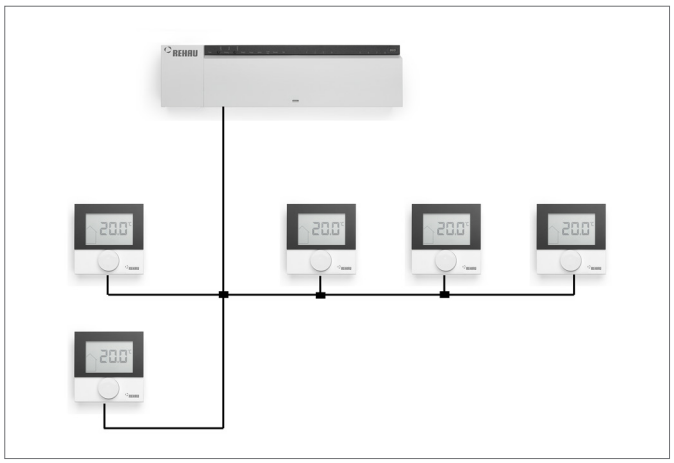

Fig. 2-12 Tree bus structure

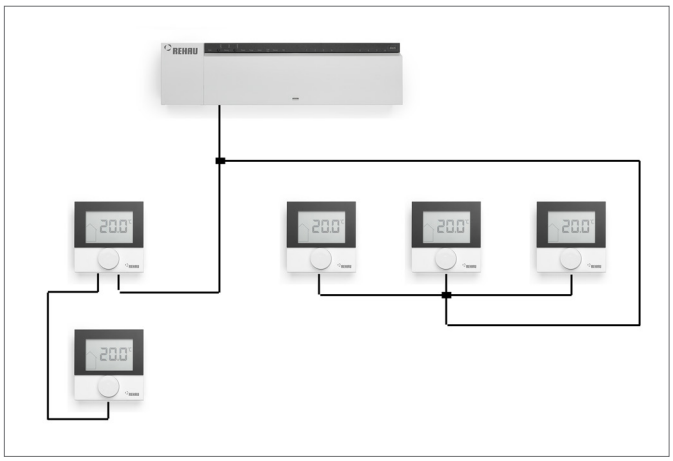

Fig. 2-14 Mixed structure

2.4.3 Data exchange in a system with several base stations

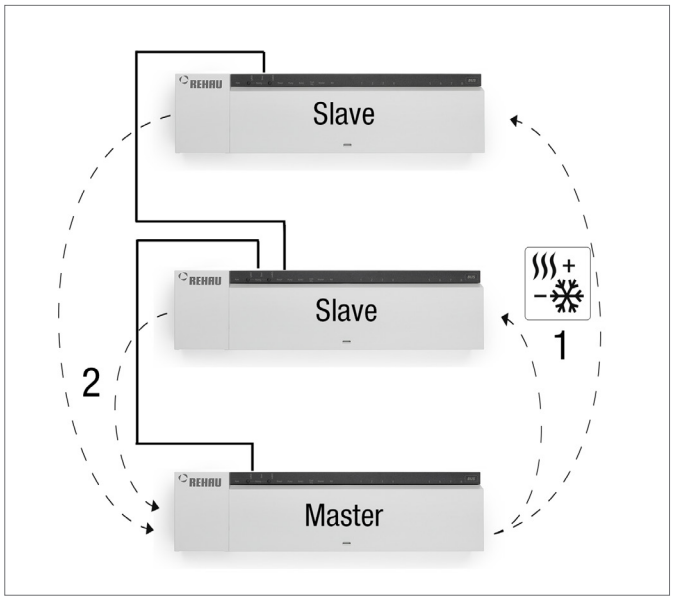

Fig. 2-15 Data exchange between master and slaves

The base station designated as master is defined during configuration. It sends the heating/cooling operating mode (1) to all connected slave stations. It receives and processes the demand signals of the slave stations for pumping and heat/cooling actuation (2)

2.4.4 Connection options for base stations

Outputs:

- **Heating circuit pump**
  A potential-free contact is provided for the heating circuit pump. The parameters can be defined as follows:
  - High efficiency or standard pump
  - Heating circuit pump for the entire system (global) or local (to one distributor)
  - Run times
  - Pump protection function
- **Heating/cooling/CO pilot function**
  Potential-free contact. The delay and follow-up time of the heating or cooling can be configured. The heating/cooling output at the master is activated by every active heating/cooling demand in the entire system. The heating/cooling output at the slave base stations is activated only by a demand at that base station (local, decentralised heating/cooling).
  The output can also be defined as a heating/cooling switching signal for other devices (pilot function).

Inputs:

- **High temperature limiter**
  If the high temperature limiter is triggered, all heating circuit distributor valves that are connected to the relevant base station are closed.
- **External timer (ECO)**
  Potential-free input. When a potential-free contact is closed all rooms **of the relevant base station** are switched to reduced operation, which is not controlled by an internal timer programme.
- **Dew point sensor**
  Potential-free input. The **closing** of the contact triggers a dew point alarm and all heating circuit valves that are connected to the relevant base station are closed.
- **Heating/cooling switching signal (CO)**
  Potential-free contact **on master**. The signal switches the **entire system** to cooling mode:
  All connected NEA Smart base stations are switched to the same operating mode.

2.5 Installation

The electrical installation must comply with the applicable national regulations and the requirements of the local power supplier. The installation must only be carried out by persons who are officially certified as electricians or electronic technicians or comparable trades as defined by specific national legislation.

- Controllers are installed on all standard pattress boxes in accordance with DIN 49073 **or** directly on the wall.
- The NEA Smart base stations should have a separate fuse.

Position

To ensure operation without interference and efficient control, the NEA Smart room control unit should be installed in an area without drafts at a height of 130 cm from the floor.

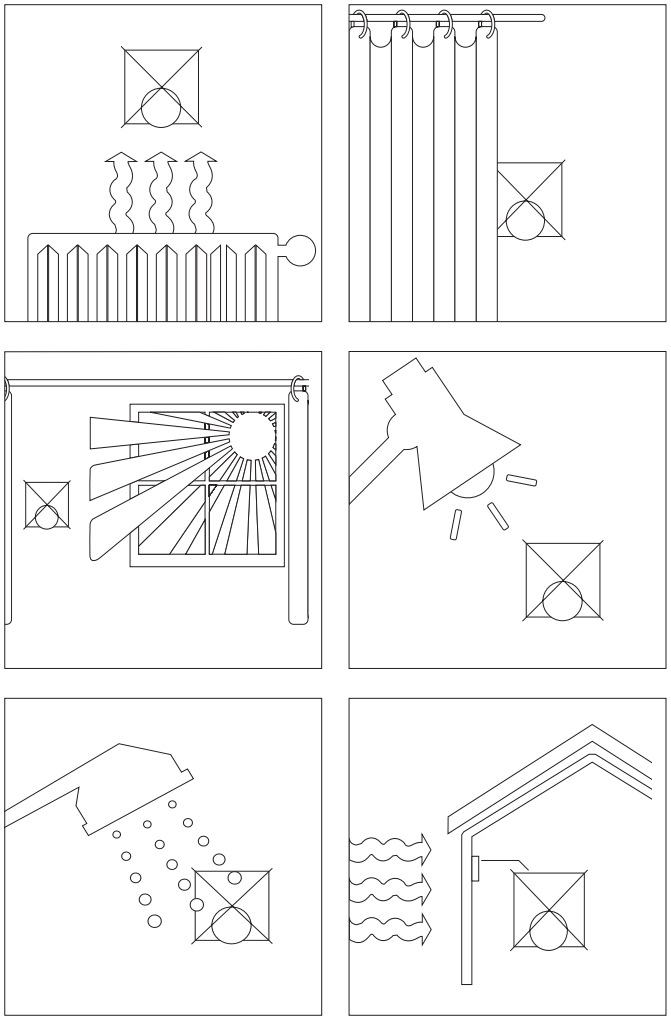

Fig. 2-16 Unsuitable locations for the room control unit

- Do not install the controller close to a heat source, behind curtains, places exposed to direct sunlight, areas of drafts or areas of high humidity.
- Do not install the controller on an exterior wall.
- A suitable empty conduit is required for connecting the remote sensor. The sensor element must be installed to ensure a good temperature transition to the measured building component.

If the controller is not installed in a pattress box, the cable connection on the wall must be about 10 mm below the centre of the controller.

For instructions for installing the NEA Smart and NEA Smart base stations see the instruction manuals supplied with the products and www.rehau.uk/neafamily.

2.6 Commissioning, function test

Commissioning can be divided into the following steps

1. Function test and unlocking the actuators
2. Assignment (pairing) the room temperature controllers
3. Optional: Assignment of additional NEA Smart base stations.
4. Optional: Connection to the home network

The procedure for commissioning is identical for the wired and wireless versions of NEA Smart.

To unlock the first-open function of the UNI actuators, all outputs of the NEA Smart base stations are activated for an adjustable time after connecting the mains voltage. During this period the room control units can be assigned to the various zones.

The base stations are in installation mode for the first 30 minutes after switching on to simplify the process of checking the allocation of the room control units. In this mode the base responds immediately to changes in the setpoints at the room control unit to allow immediate recognition of the channel allocation. This mode can also be started subsequently for inspection of the system by switching the mains voltage off briefly.

2.7 Using the integrated web interface

The NEA Smart system can be operated and monitored with a browser on any device (computer, laptop, tablet, smartphone).
The user can decide whether the system is to be exclusively integrated into the home network **without allowing access from outside** the network **or with access** over the Internet, and therefore from anywhere in the world.
Access to the system over the Internet is via the REHAU server with a user name and password.

To enable access **inside the house**, only the network connection between the NEA Smart base station and the router, and no other settings to the base station are required. See the configuration page of the router for the IP address that the NEA Smart base station has received from the router.

If a network cable from the installation location of the NEA Smart base station to the router is not available, the connection can be made without difficulty with standard components using the installed power lines or WLAN.
To enable **access from anywhere in the world** to the NEA Smart base station, only a few inputs on the system page of the NEA Smart base station and registration on the REHAU server are required.

Heating technicians can also access the system from outside the home network to troubleshoot any problems with the system.

Display and operation with web browser

Usage with smartphone

The NEA Smart base station web server detects access via smartphone and switches to the optimum display for this type of device.
The entry screen shows an overview of the rooms with the current room temperature.
If the system is in holiday mode, this mode can be terminated.

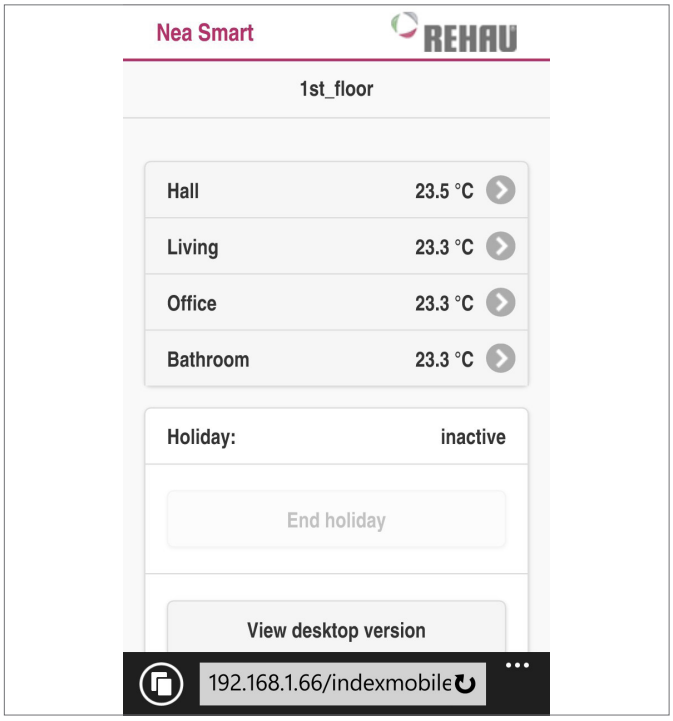

Fig. 2-17 Room selection with smartphone

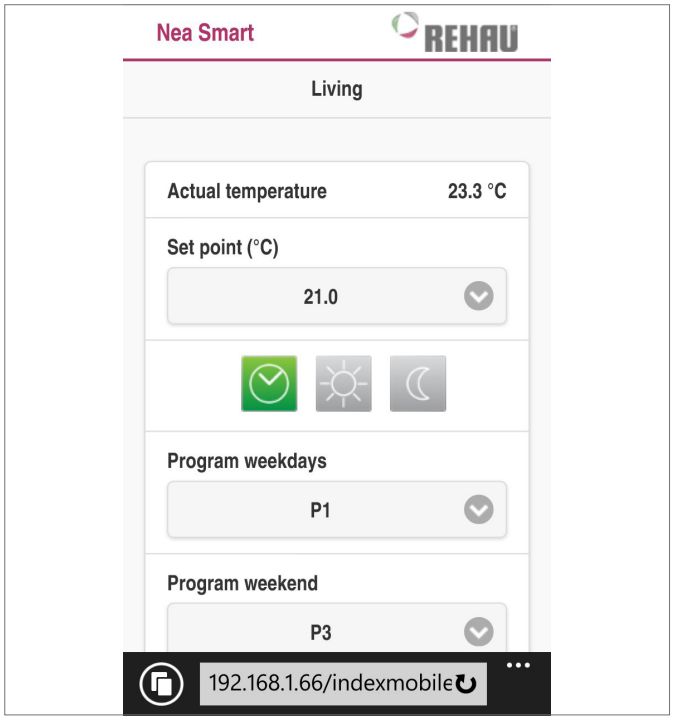

Fig. 2-18 Room operation with smartphone

The set temperature, mode and timer programme can be set for every room with a smartphone.

Symbols:

timer-controlled operation (currently active)

comfort mode, day mode

reduced mode, night mode

Usage with tablet, computer, laptop

All websites listed here can also be opened and operated with a smartphone.

The overview page shows the current status of the NEA Smart base station. In this example the base station is given the name "ground floor"..

Fig. 2-19 Overview page

The "ground floor" page shows the room control units in this zone with the setpoint and actual temperatures and the defined timer programmes, all of which can be changed. The wireless version also shows the battery level and the quality of the wireless connection.

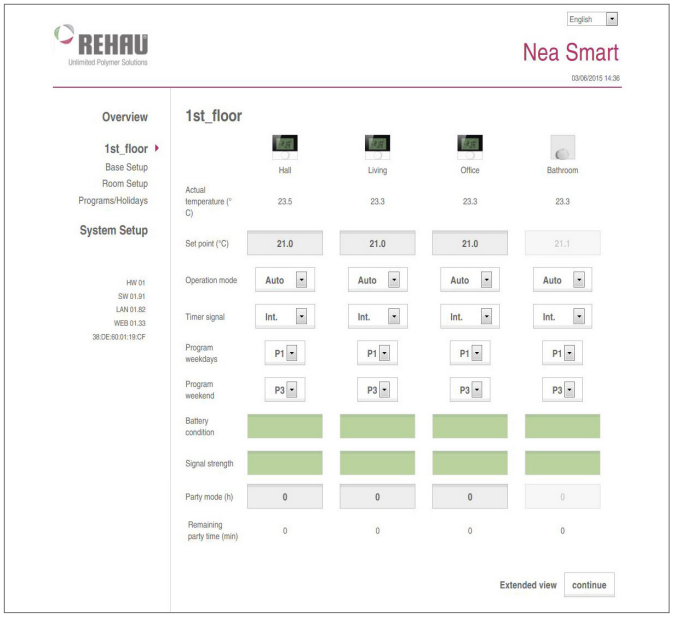

Fig. 2-20 Display of the rooms

The menu "room setup" allows the selection of the temperature setpoints for heating and cooling mode according to the timer programme as well as for comfort mode (day) and setback mode (night). In the menu "Operating mode" the user can select whether heating/cooling or only heating mode is active for the room

Fig. 2-21 Room setup

The four timer programmes can be customised in the "programmes/ holiday" menu . In the example shown below a holiday is planned from 30.03.2015 – 08.04.2015.

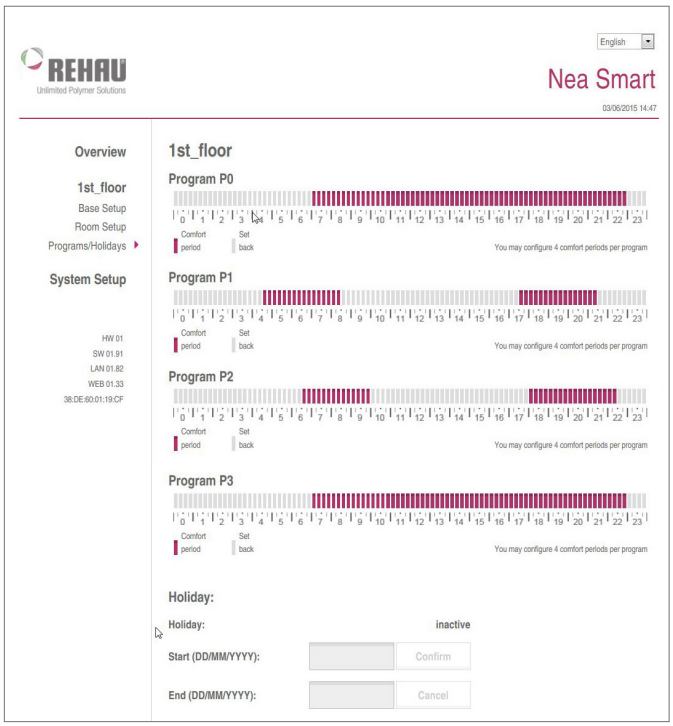

Fig. 2-22 Programmes/holiday

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