HRP
Heating Control Processor
The one with a twist

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HRP
Heating Control Processor –

Graphic Display

The graphic display guides the user in the form of plaintext. Trend values are represented graphically. Furthermore, the display is lit.

Single Knob Operation

The dialog-led manual operation level of the control processor is composed of the graphic display and the single knob operation. The single control knob enables all operational steps to be menu-driven, rendering a user manual superfluous.

Bus Capability

Up to eight control processors can be connected via the CAN-Bus to a HRP/LRP bus system. The bus communication makes all important system values available to all HRP units.

Remote Operation

Remote operation of a control processor is possible from any other control processor within the HRP bus system. The system parts can be selected in plaintext via the single knob operation.

Diagnosis

The diagnosis box enables data to be read using a PC. The data is used for data security purposes, for saving trend values, and for facilitating system diagnosis.

BMS Connection

HRP/LRP units, as well as HRP/LRP bus systems, can each be connected via a RS 232 serial interface to the BMS control center. Communication occurs via the Kieback&Peter standard P90 protocol.

The one with a twist

Manual intervention during running operation is signalized by the hand sign.

Fault alarm

Set Key

The set key is used to confirm an operational step.

Trend Function

The HRP trend function assists in logging important system trend values within the control processor. The collected HRP trend values can be viewed locally at the control processor, or if required, per modem transfer to the BMS control center.

System Macros

By setting HRP system macros, the control processor can be completely configured. The HRP software menus are automatically set, the parameters programmed and the input and output signals allocated.

Fault Alarms to a Mobile

Important reports can be sent via modem to a mobile telephone (GSM-SMS service).

Minitel

Minitel facilitates complete HRP remote operation functions with no additional software costs, either directly via any PC or per modem. A system-specific password protects system access from misuse.

Esc Key

With the "Esc" key, it is possible to undo one operational step at any time.

Modem-Enabled

The HRP Heating Control Processor is modem-enabled, rendering remote maintenance and diagnosis possible. Data transfer occurs per modem to the BMS control center

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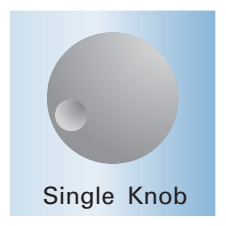
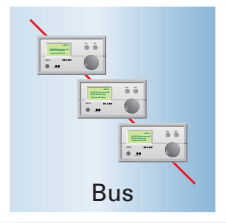
The HRP Heating Control Processor

Why is the HRP so special?



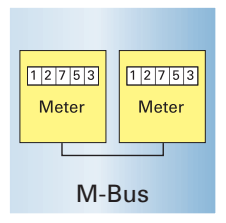
Single Knob Operation

The single knob operation, together with the graphical, lit display make the HRP Heating Control Processor very easy to handle. The manual operation level of the HRP Heating Control Processor is setting new standards. The user is guided through the menu system by means of plaintext dialog, rendering a manual superfluous. Everything is self-explanatory.



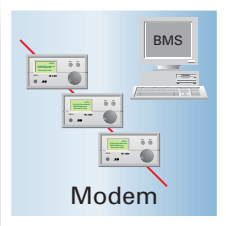
Bus-Enabled

The HRP Heating Control Processor is bus-enabled. Up to 8 Heating Control Processors can be connected to the HRP/LRP bus, resulting in important system values being made available to all Heating Control Processors via the bus communication. Remote operation of a Heating Control Processor is possible from any other HRP within the HRP/LRP bus system.



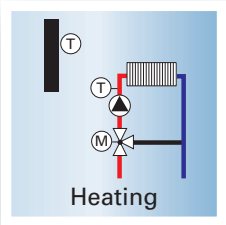
M-Bus

Via connection to the M-bus, it is possible in the case of the HRP22-M control processor to connect up to four meters with M-Bus interfaces, according to DIN-EN 1434-3. The meter values can be used for further processing in the HRP Heating Control Processor.



Modem-Enabled

The HRP Heating Control Processor is modem-enabled, making remote maintenance and diagnosis possible. The logging of important system trend values occurs locally in the HRP Heating Control Processor. Data transfer occurs via modem to the higher-level BMS control center. Important messages can be also sent via modem to a mobile telephone (SMS service). To achieve this, customer-specific plaintext can be set up for forwarding within the HRP.



HRP System Macros

System macros are integrated in the HRP Heating Control Processor. By setting HRP system macros, the HRP Heating Control Processor is completely configured. That means that with every HRP system macro, the corresponding HRP software menus are automatically set, the parameters programmed, and the input and output signals allocated. Corresponding functional descriptions and connection instructions form part of each system macro. Several HRP system macros are available.

HRP Types

HRP20:	A heating control loop with 3-point output
HRP23:	Like the HRP20 without the operation level
HRP21:	A heating control loop with a continuous output of 0-10V
HRP24:	Like the HRP21 without the operation level
HRP22:	Two heating control loops, each with continuous outputs of 0-10V or 3-point output; the device can be freely parameterised.
HRP22-M:	Like the HRP22 with an M-bus connection instead of two digital inputs
HRP22-V:	Like the HRP22 with an additional power supply 24V/7VA instead of two digital inputs

Single Knob Operation

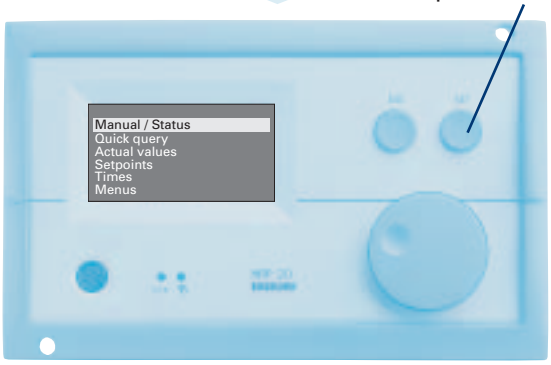
The manual operation level of the HRP Heating Control Processor is setting new standards. The single knob operation and the graphical, lit display render the HRP Heating Control Processor simple to use.

The user is guided through the menu system by means of plaintext, making an operation manual superfluous. Everything is self-explanatory.

Actual Value Display

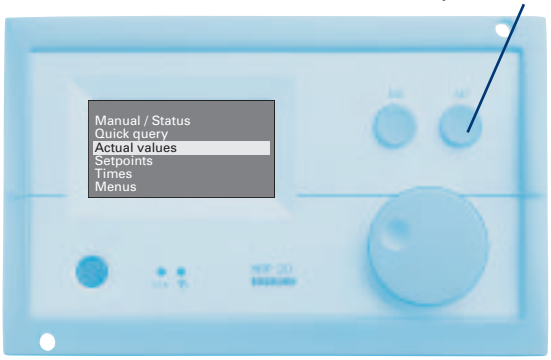
1 Start screen

press SET

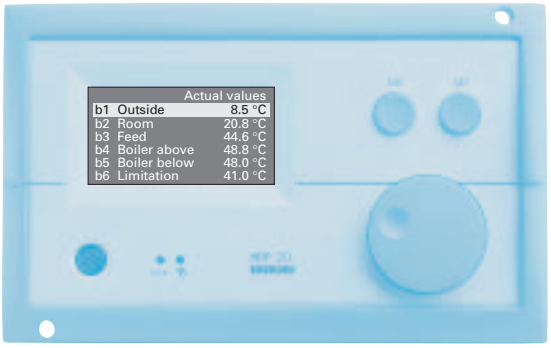


2 Initial menu display

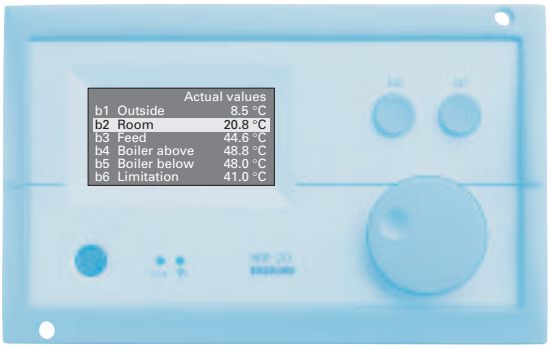
press SET



3 Twist the knob to "Actual Value"

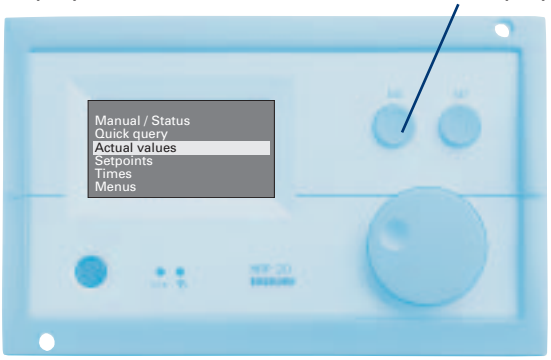


4 Actual value display: "b1 Outside 8.5°C"



5 Twist knob to "room 20,8°C"

press ESC to exit from the "Actual Value" display and return to the initial menu display



6 Initial menu display

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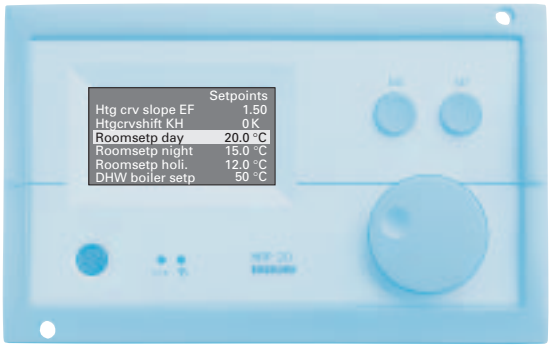
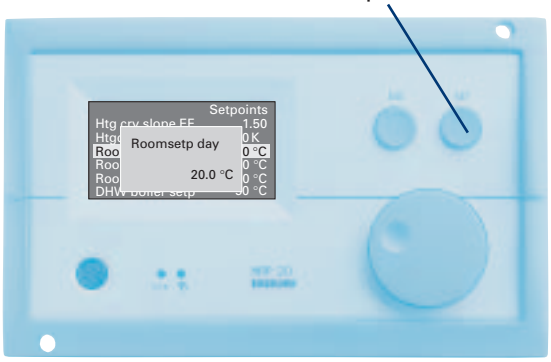
Further HRP Functions

Adjusting the Setpoint



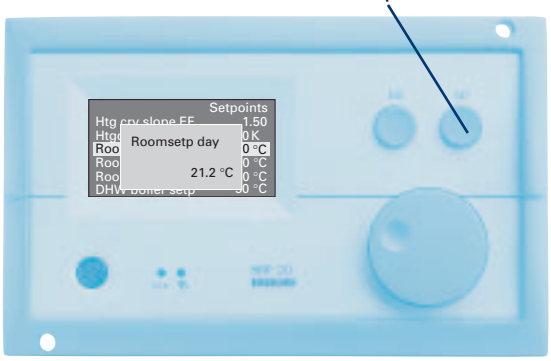
1. Follow the same steps as for the "Actual Value". Twist knob to "Roomsetp day"

press SET twice



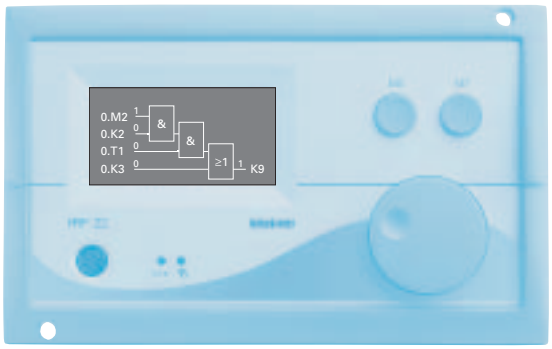
2. Display: "Roomsetp day 20.0°C"

press SET to confirm the new setpoint of 21.2 °C



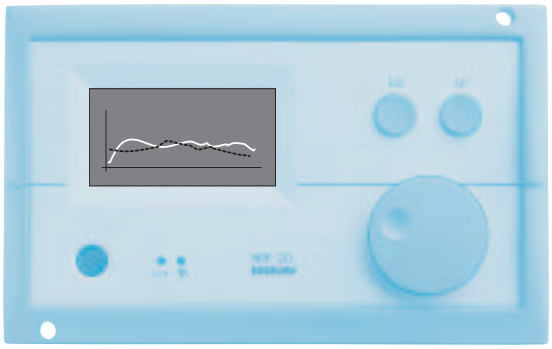
3. Twist knob to the new setpoint of 21.2°C

Viewing the Control System (HRP 22 only)



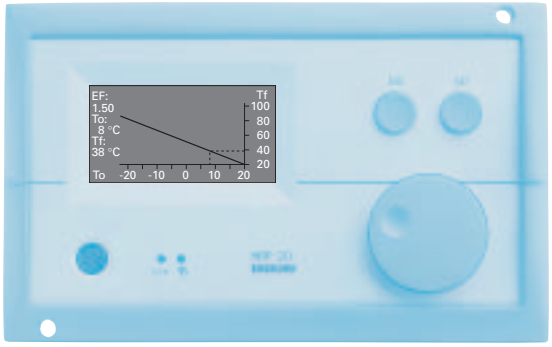
Control links can be parameterised easily. The status of the digital outputs and internal relays is displayed.

Viewing Trend Values



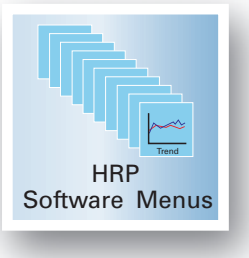
A maximum of two HRP values can be displayed at the same time on the HRP graphic display Trend values from 1 day up to 7 days can be chosen depending on the resolution.

Viewing / Changing the Heating Curve



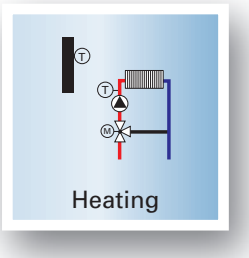
Any changes made to the HRP heating curve are shown on the graphic display

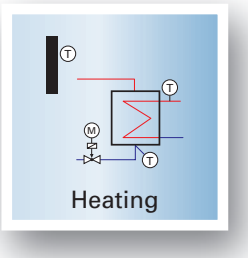
HRP Menus



HRP Software Menus

The multitude of standard HRP software menus available ensures that the HRP Heating Control Processor can be adapted to meet different demands. The HRP software menus come delivered with the HRP Heating Control Processor.





Heating/Long distance Heating

The HRP basic program within the HRP Heating Control Processor offers inlet temperature control based on weather conditions.

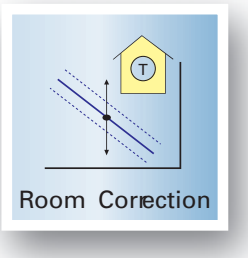
The HRP calculates an inlet setpoint according to the programmed heating characteristic curve.

A deviated heating characteristic curve can be programmed. A parallel shift of the heating characteristic curve forms a component part of the HRP basic program.

The inlet temperature can be lowered during night operation. The HRP basic program contains an integrated frost protection function. Eight switching periods per weekday are available to the HRP basic program (4 x On, 4 x Off). The HRP software menus for precontrol and limiting are intended for long distance heating purposes.

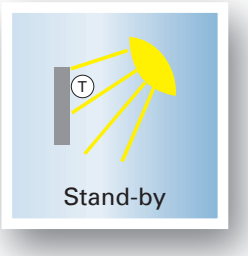
These HRP software menus together with the HRP basic program form a functional unit.

Serial Perfection. The HRP software menus facilitate the universal application of the HRP Heating Control Processor.



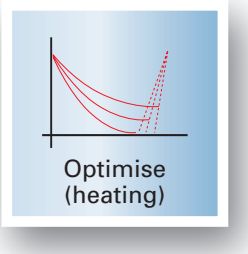
Room Correction

By means of a room sensor connected to the HRP Heating Control Processor, the inlet temperature can be adapted to the desired room setpoint. Comfort and energy savings in one.



Stand-by

Via the HRP software menu “Stand-by” the heating system can be switched on and off dependent on the daily average temperature. Whenever the heating system is switched off, the circulating pumps are likewise turned off. If required, the heating system may be switched on again. The HRP software menu “Stand By” thus ensures that electrical energy is used efficiently.



Optimise (heating)

The HRP software menu “Optimise” in connection with the HRP basic program offers adaptive optimisation in heating systems. The starting and switching off time of the heating system is calculated dependent on the adaptive building ratings obtained. The HRP Heating Control Processor monitors the room temperature setpoints for day and night operation.

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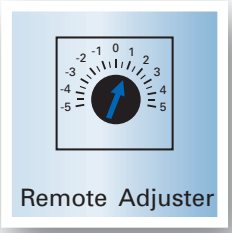
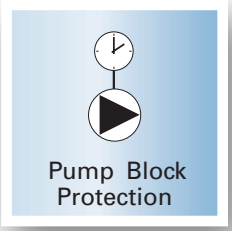
HRP Menus



Remote Adjuster

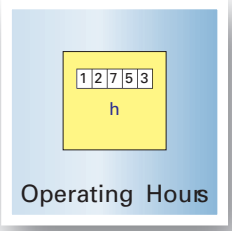
The HRP software menu "Remote Adjuster" provides increased user comfort. By means of an additional remote adjuster, the room setpoint can be corrected.



Pump Block Protection

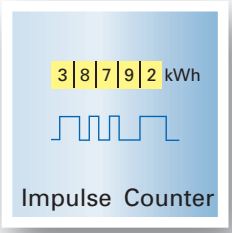
The HRP software function "Pump Block Protection" guarantees pump block protection in heating systems which are completely switched off by means of the HRP Heating Control Processor for a long period of time.

This is the case during stand-by operation, for example. The HRP Heating Control Processor initiates a forced start-up of the circulating pumps once in 24 hours.



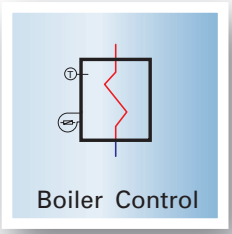
Operating Hours

The HRP software menu "Operating Hours" facilitates the obtainment of running times. Two digital inputs of the HRP Heating Control Processor are used as the source for operating time readings.



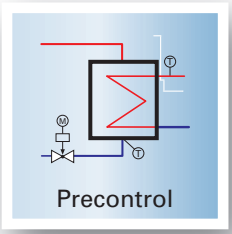
Impulse Counter

The HRP software menu "Impulse Counter" incorporated in the HRP Heating Control Processor determines the heat quantities from two connected pulse generators. Scaling serves to establish the heat quantity per pulse. The calculated value can be forwarded to a higher level BMS control center for evaluation.



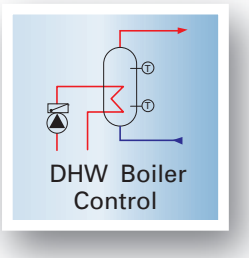
Boiler Control

The HRP software menu "Boiler Control" in the HRP Heating Control Processor serves to control a single-stage or double-stage burner. The setpoint for the boiler temperature is specified by the current inlet setpoint of the HRP basic program and by Domestic Hot Water (DHW) boiler control menu upon loading. It is possible to cause a step up in the boiler temperature via a parameter



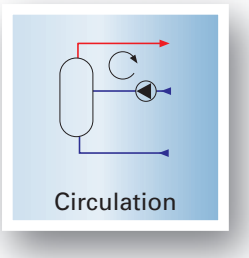
Precontrol

In addition to the basic program "Weather-Based Inlet Temperature Control", the HRP software menu "Precontrol" is available for an precontrol loop. The setpoint is calculated from the current inlet setpoint temperature of the connected control loops plus a step-up. In the case of long distance heating systems, the menu "Limitation" assists in ensuring that the heating return temperature does not exceed the preset maximum value.



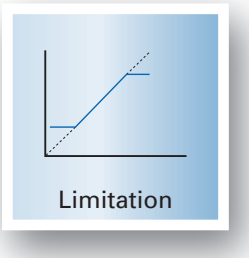
DHW Boiler Control

The HRP software menu "DHW Boiler Control" in the HRP Heating Control Processor achieves DHW control with either one or two DHW temperature sensors for loading. If necessary, the menu "Legionels" is available.



Circulation

With the HRP software menu "Circulation" in the HRP Heating Control Processor, the usage time for a connected circulating pump can be preset.



Limitation

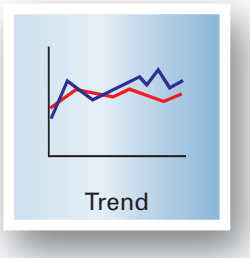
For long distance heating, the HRP software menu "Limiting" can be used to parameterise the maximum limiting value for the long distance heating return temperature. A sliding maximum limit can be depending on the outdoor temperature. In order to prevent a drop to below the end point temperature at the boiler, a minimum limiting value for the boiler return temperature can be parameterised using the HRP software menu "Limitation".

Modem

With the aid of the HRP software menu "Modem", it is possible to connect the HRP Heating Control Processor to the higher level BMS control center via the telephone network. Remote transmission and maintenance of the heating system is thus enabled. Automatic dialing to the BMS control center can be parameterised for certain important alarm messages in the heating system.

GSM-SMS

Important alarm messages from the operating system are transmitted with the aid of the HRP software menu "GSM-SMS" to a mobile telephone. 160 is the maximum number of characters allowed for each SMS message. Users of the HRP Heating Control Processor thus have at their disposal yet another method of monitoring the operating system with a high level of transmission security.



Trend

The task of the HRP trend function is to store defined system values in the HRP Heating Control Processor and, if necessary, to transmit these via a modem to the BMS control center. This leads to savings in telephone costs. The HRP software menu, "Trend" enables trend values from the heating system to be shown on the display of the Heating Control Processor.

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HRP System Macros

The HRP Heating Control Processor has several system macros. By setting the HRP system macros, the HRP Heating Control Processor is completely configured. That means that with every HRP system macro, the corresponding HRP software menus are automatically set, the parameters programmed, and the input and output signals allocated. The relevant functional descriptions and connection instructions come with each system macro.

HRP System Macro 1

- Weather-based heating control loop
- Room correction, heating optimisation
- Inputs for 1 collective fault, 2 operating hours counters, 2 heat quantity pulse meters, remote adjuster
- With the HRP22-M connection of 4 heat quantity meters via M-Bus

HRP Macro Function:

Heating Circuit: weather-based inlet temperature control. Based on the control setpoint, the regulating valve of the heating circuit is activated until the calculated setpoint is reached. The circulating pump is automatically powered by the control loop.

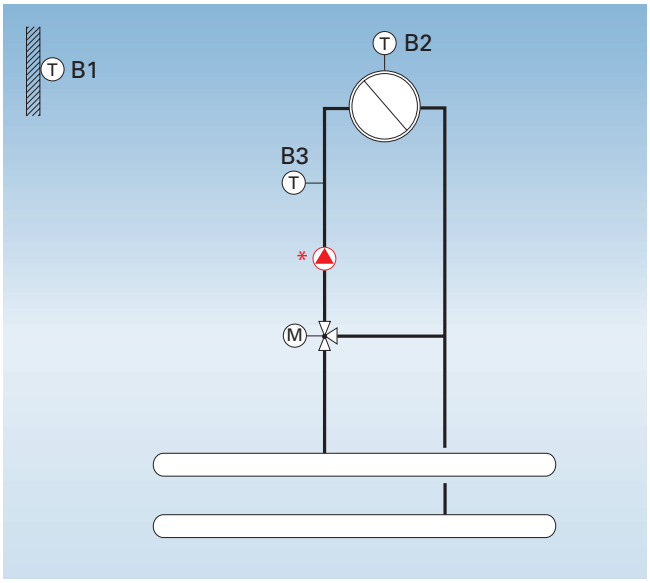
Option with Macro 11: the circulating pumps are automatically powered by the control loop. A cyclical alternation between circulating pump 1 and circulating pump 2 occurs.

Upon connecting a room temperature sensor (B2), the HRP menus "Heating Optimise" and "Room Correction" automatically take effect.

The menu "Optimise" calculates the latest possible starting up time and the earliest possible switching off time for the heating system. During night operation, the minimum room temperature is monitored.

The Stand-by function switches the heating off. During summer operation, it closes the valve and turns off the pumps. Should the temperature fall below the limiting value for summer operation, the heating system is switched on again.

Digital Inputs:
HRP20/21/22/23/24: 5 input contacts
HRP22-M/22-V: 3 input contacts
The input contacts enable the receipt of messages, collective faults, operating time readings, as well as pulse counting readings relating to heat quantity.



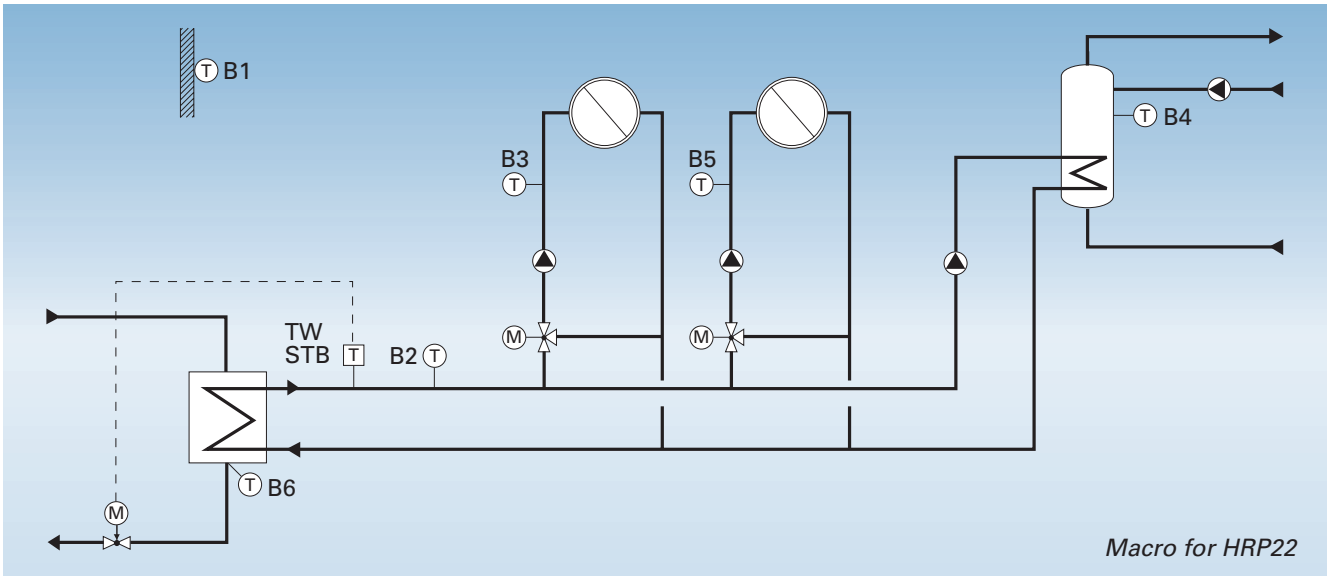
Macro 11: like Macro 1, but with a double pump function

Set HRP Menus:
Room Correction, Stand-by, Optimise, Pump Block Protection, Operating Hours, Impulse Counter.

From a building perspective, the safety features, such as safety temperature limiters, temperature guards, and overpressure switches, etc, should be wired directly, according to the appropriate rules and regulations!

HRP System Macro 25

- Input control for remote heating connection via heat transfer device with return high limit temperature for remote heating
- 2 weather-based heating control loops
- Domestic hot water
- Inputs for 1 collective fault, remote adjuster, 2 operating hours counters, or 2 heat quantity pulse meters
- With the HRP22-M connection of 4 heat quantity meters via M-Bus



Macro for HRP22

HRP Macro Function:

Heat Transfer Device: the precontrol establishes the inlet setpoint from the current inlet setpoint of the heating control loop and the domestic hot water control plus a step-up.

Based on the control offset, the regulating valve is powered until the calculated setpoint is reached. The return flow temperature of the remote heat is captured with the aid of the remote heating return flow sensor (B6). Should the maximum return flow temperature (B6) be exceeded, the regulating valve closes continuously.

Heating Circuit 1: weather-based inlet temperature control. Based on the control offset, the regulating valve of the heating circuit is activated until the calculated setpoint is reached. The circulating pump is automatically powered by the control loop.

Heating Circuit 2: weather-based inlet temperature control. Based on the control offset, the regulating valve of the heating circuit is activated until the calculated setpoint is reached. The circulating pump is automatically powered by the control loop.

The **Stand-by** function switches the heating off during summer operation, it closes the valves and turns off the pumps. Should the temperature fall below the limiting value for summer operation, the heating system is switched on again.

Domestic HotWater: should the temperature of domestic hot water sink to below the setpoint, the DHW pump is enabled. If the temperature of the domestic hot water = the DHW setpoint, the loading process is completed and the pumps switched off. The circulating pump is switched on with the operating time "Circulation".

Digital Inputs:
HRP20/21/22/23/24: 5 input contacts
HRP22-M/22-V: 3 input contacts
The input contacts enable the receipt of messages, collective faults, operating time readings, as well as pulse counting readings relating to heat quantity.

Set HRP Menus:
Room Correction, Stand-by, Basic Menu2, Pump Block Protection, Operating Hours, Impulse Counter, Precontrol, Limitation, DHW (domestic hot water) Boiler Control, Legionels.

From a building perspective, the safety features, such as safety temperature limiters, temperature guards, and overpressure switches, etc, should be wired directly, according to the appropriate rules and regulations!

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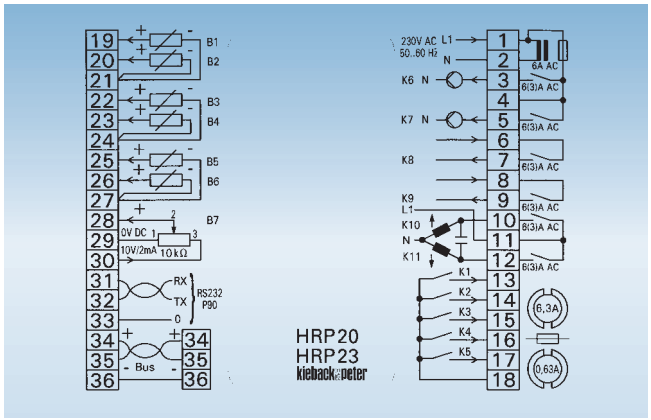
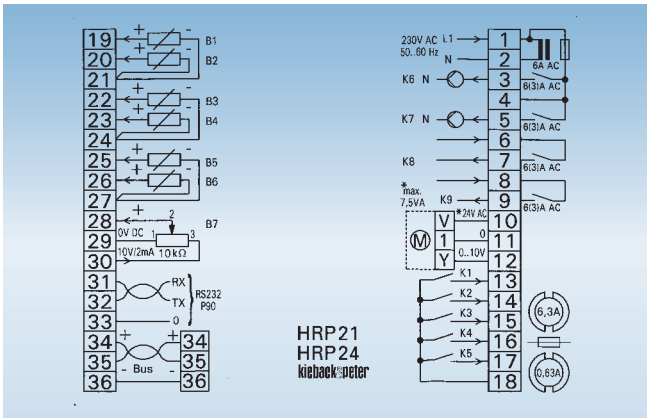
Connection Diagrams / Technical Specifications

HRP20 (HRP23), HRP21 (HRP24)



HRP20 (3-Point) and HRP23 (3-Point)
Without Operation Level

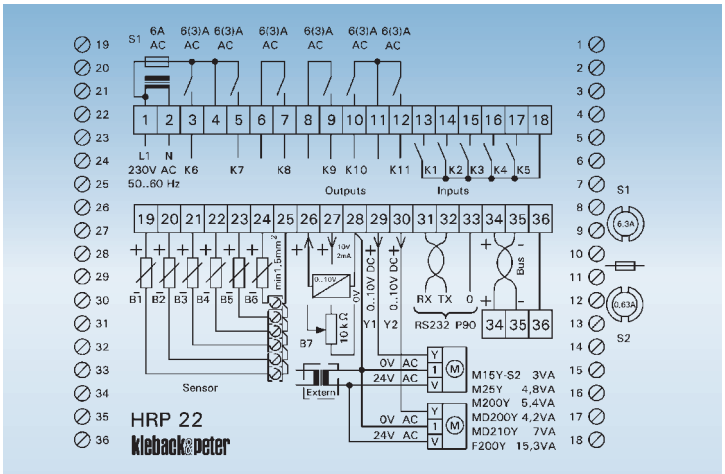


HRP21 (continuous, 0..10V) and HRP24
(continuous, 0..10V) Without Operation Level

Digital Inputs	5 x potential-free contact inputs (including two HRP20 pulse inputs)
Digital Outputs	4 x potential-free relay outputs, max. 6(3) A 230 V AC
Analog Inputs	6 x KP10 active measurement system 1 x 0..10 V
Analog / Digital Conversion	10 Bit
Actuator Output for HRP20 / HRP23	1 x 3-point (2 potential-free relay outputs), max. 6(3) A 230 V AC
Actuator Output for HRP21 / HRP24	1 x 0..10 V continuous (max. load capacity = 5 mA at 10 V), 1 drive, 24 V AC (max. load capacity = 7 VA)
Serial Interface	RS 232 for connection of BMS control center or modem
Bus Connection	CAN bus for connection of up to a maximum of 8 HRP to one bus system
Rated Voltage	230 VAC ± 10%; 50..60 Hz
Rated Power	HRP20: 12 VA, current rating = 52 mA at 230 V AC HRP21: 18 VA, current rating = 78 mA at 230 V AC HRP23: 10 VA, current rating = 43 mA at 230 V AC HRP24: 17 VA, current rating = 74 mA at 230 V AC
Displays	Backlit graphic display, LED for error messages and manual operation mode
Diagnosis Box	Diagnosis / data security
Operation HRP20 / HRP21	Rotating knob and two keys (HRP23 / HRP24 without operation level)
Fuses	S1 6A(T); S2 630 mA(T)
Degree of Protection	IP20
Ambient Temperature	0..45 ºC
Ambient Humidity	20..80 % relative humidity while in operation, condensation not possible 5..90 % relative humidity while not in operation, condensation not possible
Enclosure	Plastic housing, flame-retardant
Dimensions	HRP20 / HRP21 110.0 mm high x 198.5 mm wide x 75 mm deep (15.0 mm deeper with HW/HRP wall mount) HRP23 / HRP24 110.0 mm high x 198.5 mm wide x 74.0 mm deep (15.0 mm deeper with HW/HRP wall mount)
Front Panel Section	200.4 mm x 112.0 mm
Weight	1.2 kg
Identification Sign	CE

Connection Diagrams / Technical Specifications

HRP22, HRP22-M, HRP22-V



Digital Inputs	5 x potential-free contact inputs (including two H22 pulse inputs) HRP22-M, HRP22-V: 3 x potential-free contact inputs
Digital Outputs	6 x potential-free relay outputs, max. 6(3)A; 230 VAC
Analog Inputs	6 x KP10 active measurement system 1 x continuous 0..10 V
Analog / Digital Conversion	10 Bit
Actuator Output	2 x continuous 0..10 V (5 mA at 10 V) HRP22-V: additional Power supply 24 V/7VA instead of two contact inputs
Serial Interface	RS 232 for connection of BMS control center or modem (possible to switch to RS 485)
Bus Connection	CAN bus for connection of up to a maximum of 8 HRP22 to one bus system M-Bus with HRP22-M
Rated Voltage	230 VAC ± 10%; 50..60 Hz
Rated Power	18 VA, current rating = 78 mA at 230 V AC
Displays	Backlit graphic display, LED for manual operation mode and error messages
Diagnosis Box	Diagnosis / data security
Operation	Rotating knob and two keys
Fuses	S1 6A(T); S2 630 mA(T)
Degree of Protection	IP20
Ambient Temperature	0..45 °C
Ambient Humidity	20..80 % relative humidity while in operation, condensation not possible 5..90 % relative humidity while not in operation, condensation not possible
Enclosure	Plastic housing, flame-retardant
Dimensions	110.0 mm high x 198.5 mm wide x 77.5 mm deep (15.0 mm deeper with HW/HRP wall mount)
Front Panel Section	200.4 mm x 112.0 mm
Weight	1.2 kg
Identification Sign	CE

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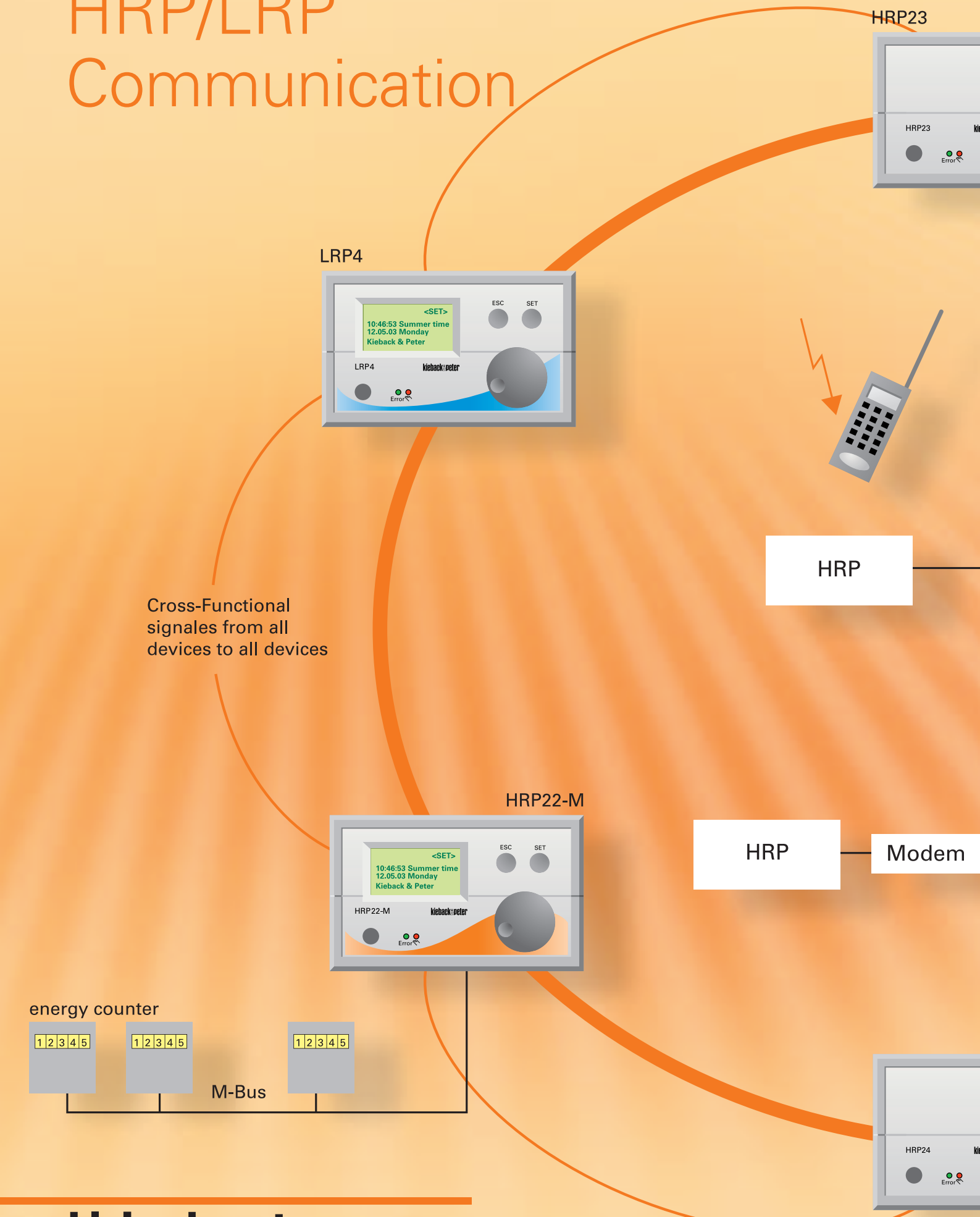
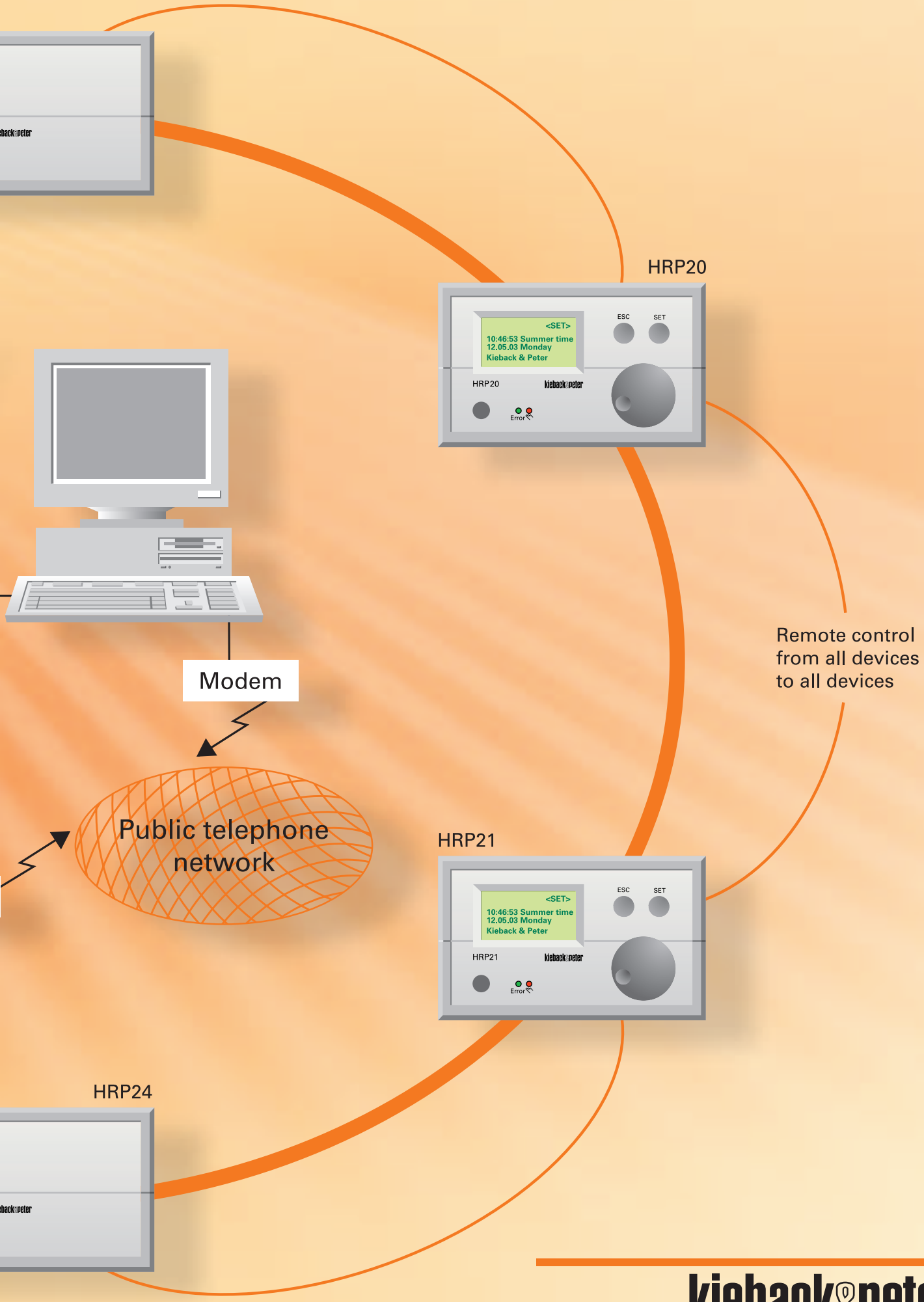
HRP/LRP Communication





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