SCHNEID

SCHNEID MR-12

SPS - Heating Regulator

Modern Life - Modern Solutions

Universally useable, modulary structured heating regulator with basis on a freely programmable micro-controller with extensive possibilities for Bus-Connections, system display, remote maintenance and web-connection.

SCHNEID

Schneid GesmbH | Gewerbering 16 | A-8054 | Graz/Pirka | Tel: +43 (316) 285022

Products, data sheets, documentation, MR12-SCHEMA-calculator: www.schneid.at

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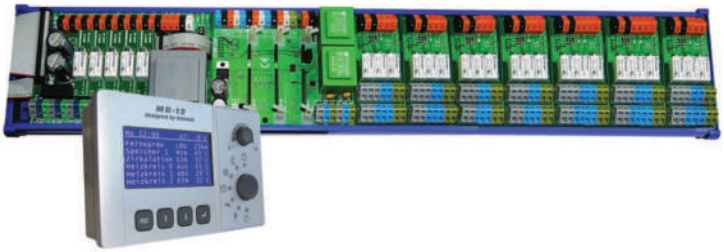
MR12 PLC module controller with base board AKP and 5 plug-in modules relay standard and control unit in top hat rail

Order number:	**190.15519**
Order code:	**MR12 SPS-Modulregler mit Basisplatine AKP + STM**

Overview:

The module controller MR12-SPS is a microprocessor-controlled device for controlling district heating transfer stations with the option of modular expansion for a further seven mixer circuits and additional acquisition of the heat meter data and forwarding of all data to a higher-level network optimization computer in the boiler house consisting of:

1. HEATING REGULATOR



- Three-point output for primary valve
- - Two-point output for one heating circuit
- - Two-point outlet for boiler 1
- - Two-point outlet for boiler 2
  (Circulation circuit)

The first heating circuit can also be configured as a charging module circuit for the boiler.

Control features:

- Heating curve control dependent on outside temperature	- Return temperature-dependent return limitation
- Three heating times for each day and heating circuit	- Heating times can also be configured as setback times
- Third period configurable as a blocking time	- Pump shutdown dependent on room temperature
- Pump shutdown dependent on outside temperature	- Outside temperature averaging up to nine hours
- Building coefficient (= building storage capacity)	- Boiler priority circuit / parallel boiler operation
- Boiler module load / boiler with changeover valve	- Boiler loading criteria: a) two adjustable boiler loading periods b) Falling below the minimum boiler setpoint c) Manual preselection using the preselection switch
- Boiler shutdown criteria: a) reaching the boiler setpoint b) reaching the lower boiler sensor setpoint c) End of boiler loading time	- Boiler load lock: a) if the boiler charging temperature is too low b) if the target boiler temperature is not reached

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There are connection options for seven further heating circuit modules and an I / O module on the basic module controller. With the heating circuit modules "Heating circuit module-HK06 (standard)" or "Heating circuit module-HK12 with relay plug-in modules", the basic module controller can be expanded by seven additional mixer heating circuits.

Additional functions after expansion with appropriate modules:

- Optimization of the on / off times with a room sensor	- optional control via room sensor
- Control via adjustable room influence	- Room control via thermostat function
- Remote control for each heating circuit	- A maximum of 8 remote controls can be connected
- 8 external 0-10V (4-20mA) inputs e.g. for target values via additional print	

2.CONTROL UNIT :

The SCHNEID module controller MR12 is equipped with an analog operating level for easy operation of the most important functions. A graphic display with 128x64 pixels serves as the display.
A six-stage switch is available for setting the heating program. A setting potentiometer for normal operation or setback operation is available for fine adjustment of the room temperature. The rest of the operation and setting of the control unit is done digitally via the display using a further six-step switch and three input buttons.

3. CONTROLLER COMMUNICATION

Connection options for a communication module are available on the module controller MR12.
With the communication board, the MR12 module controller can be equipped with up to three bus interfaces.

1. Standard bus for controller networking and system visualization
   via SCHNEID-WinMIOCS 70 / Facelift or SinVIS
2. Bus interface for consumption data acquisition (e.g. Meter)
3. Internal controller bus for control networking (SubCOM)

A corresponding bus module can be fitted for each of the three bus interfaces, depending on the application.

-RS232 Bus module	-TCP/IP Ethernet Bus module
-RS485 Bus module	-BT (Bluetooth) Radio module
-RS422 Bus module	-RF (RadioFrequency) Radio module
-MBUS-Master Bus module	-GPRS module
-MBUS-Slave Bus module	-MP-Bus module
-USB Bus module	PGW-Bacnet module

Examples of networking:
COM-A: All data from the controller and the heat meter are transferred to the host computer in the boiler house via the special interface SCHNEID-FSS. (see WINMIOCS and FW-MANAGEMENT)

COM-B: Reading out the measurement data from heat meters, electricity meters and other external devices using the M-Bus interface (M-Bus protocol according to CEN TC176 WG4 and IEC1107).
Recorded data using the example of a heat meter: amount of heat, flow rate, flow temperature, return temperature, spread, power, flow rate, etc.

COM-C: Various SCHNEID control devices can be linked on the control side via an internal data bus. Corresponding setpoints and the centrally measured outside temperature are exchanged under the control devices to enable optimized control.

Mechanical design:
The controller is delivered split. The control panel is provided with a plastic cover on the back, which can snap into a standard cutout. A flat cable connects the control unit to the rest of the control unit, which is installed in a plastic tray for top-hat rail mounting. The length of the connecting cable is approx. 500mm.

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MR12-PLC module controller

Innovations to the MR08 PLC module controller:

- The outputs on the REL board, which is now called "AKP" (terminal board), are designed on plug-in modules and are available in the following variants:

Equipment variants:

MR12 PLC module controller with AKP + STM base board and control unit in top hat rail, 5 plug-in modules, relay standard
Order number: 190.15519
Order code: MR12 SPS-Modulregler mit Basisplatine AKP + STM

MR12 plug-in module relay standard
Order number: 190.15206
Order code: MR12 Steckmodul Relais Standard

MR12 plug-in module relay R16
Order number: 190.16614
Order code: MR12 Steckmodul Relais R16

MR12 plug-in module PWM
Order number: 190.15209
Order code: MR12 Steckmodul PWM
PWM for controlling pumps with a PWM signal. In this case, the 230V terminal on the AKP is permanently connected to 230V. The PWM signal is connected to the plug-in module.

MR12 plug-in module TRIAC
Order number: 190.15210
Order code: MR12 Steckmodul TRIAC
TRIAC module for controlling drives with a very high switching frequency (primary valves).

MR12 plug-in module analog signal
Order number: 190.15300
Order code: MR12 Steckmodul Analogsignal
0-10V for controlling pumps with 0-10V signal. In this case, the 230V terminal on the AKP is permanently connected to 230V. The 0-10V signal is connected to the plug-in module.

MR12 plug-in module relay RPF
Order number: 190.15404
Order code: MR12 Steckmodul Relais RPF
RPF for controlling pumps with start-stop input. In this case, the 230V terminal on the AKP is permanently connected to 230V. The potential-free relay contact is connected to the plug-in module.

- Zero cross detection (zero crossing circuit)
The relays are switched exactly at the zero point of the sine curve. At this moment, the inrush current is smallest. This protects the relay contacts and extends the service life of the relays.

- Possibility to use ***internal wireless modules***.
(WiFi, Bluetooth or radio) For communication with end devices such as Tablet, smartphones or detection of future wireless sensors (outdoor, room sensors or radio FBR). The interface cards are installed inside the controller (no ComBasis required). This interface is shared with ComC on the COM basis. The CPU can select between ComC external and internal.

- 4.UART interface (COM-D) in the form of RS485.
Executed on the backplane with 4-pin connector (12V +/- RS485 D + / D-). For the direct connection of a digital remote control SCHNEID-FBR12/14 per heating circuit.

MR12-PLC module controller

The AKP board (BASIS board) is connected directly to the control unit. If a communication board (COM-BASIS) is available, this is also connected directly to the control unit, as well as a possible extension with an additional module for analog and digital inputs and outputs (AIN module). The COM-D is designed in the form of RS485 and is used for the direct connection of a digital SCHNEID FBR7 per heating circuit. The cables are routed in the DIN rail. The heating circuit expansion modules are connected to the AKP board.

- Optional: the MR12 can be equipped with an additional expansion connection with the following signals:
* 3 pc pulse inputs for counting applications
* 1 pc additional PT1000 sensor input
* 1 pc additional analog input 0-10V

Control unit module controller MR12:

OPERATING MODES

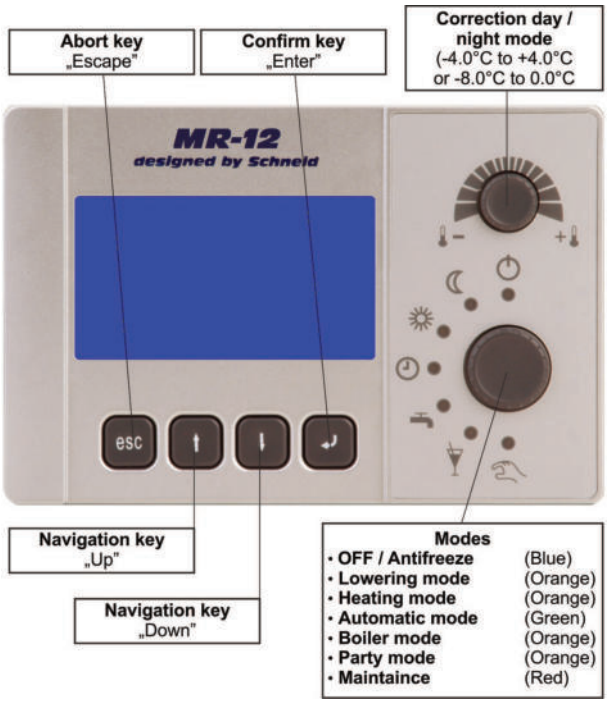
Off / frost protection
Control mode is deactivated except for the frost protection circuit. If the outside temperature falls below the frost protection temperature, the frost protection circuit is activated.

Lowering mode
The heating circuits are permanently in setback mode regardless of the time program, i.e. The target temperature is reduced according to the settings. The remote control of a heating circuit has priority.

Heating mode
The heating circuits are permanently in heating mode regardless of the time program. The remote control of a heating circuit has priority.

Automatic mode
The operating mode of the heating circuits (heating or lowering mode) depends on the time program and the remote controls.

Boiler operation
The heating circuits are out of order, with the exception of frost protection. Only the boiler is loaded. (Summer operation).



Party mode
The heating circuits are switched to heating mode for a certain period (adjustable). After the time has elapsed, the controller jumps back to the last selected operating mode.

MAINTENANCE
All outputs are switched off, there is no control function.
ATTENTION: No frost protection! The maintenance function is not used to carry out electrical engineering and / or work on actuators (pumps, valves)! (Risk of injury!).

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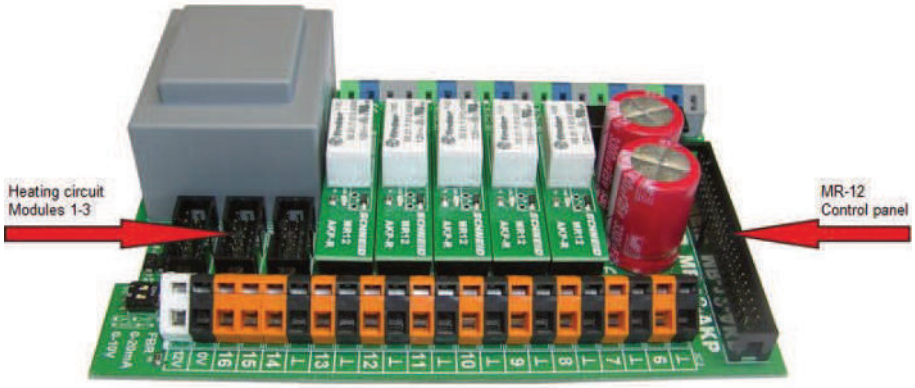
MR12-PLC module controller

Terminal board (AKP) module controller MR12:

The SCHNEID MR-12 is an electronic control device for flush mounting. The AKP of the module controller MR-12 is compatible with the components of the module controller MR-08.

The AKP board (BASIS board) is connected directly to the control unit.
If a communication board (COM-BASIS) is available, this is also connected directly to the control unit, as well as a possible extension with an additional module for analog and digital inputs and outputs (AIN module). The cables are routed in the DIN rail.
The heating circuit expansion modules 1-3 are connected to the AKP board.



Terminal plan:

Supply 230 VAC L
Supply 230 VAC N
Protective conductor PE

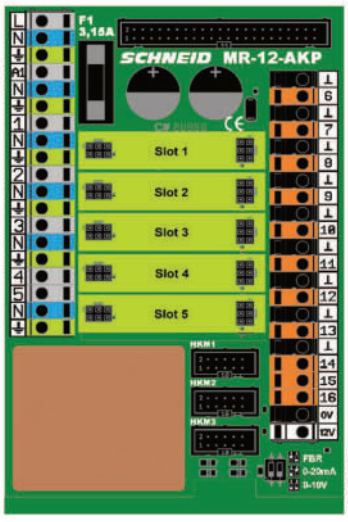
230 VAC output for heating circuit modules L
230 VAC output for heating circuit modules N
Protective conductor PE

P1 heating circuit 0 pump L
P1 heating circuit 0 pump N

P2 boiler 1 pump L
P2 boiler 1 pump N

P3 boiler 2 pump L
P3 boiler 2 pump N

M45 district heating valve OPEN L
M45 district heating valve CLOSED L
M45 district heating valve N



Temperatures PT1000
(2-pole shielded)

GND
Terminal 6: T6 outside temperature
GND
Terminal 7: T7 return temperature primary
GND
Terminal 8: T8 secondary flow temperature
GND
Terminal 9: T9 boiler 1 temperature above
GND
Terminal 10: T10 boiler 1 temperature below
GND
Terminal 11: T11 return temperature secondary
GND
Terminal 12: T12 boiler 2 temperature above
GND
Terminal 13: T13 Boiler 2 temperature below
GND room remote control circuit 0
Terminal 14: FBT room temperature circuit 0
Terminal 15: FBS remote control signal
Terminal 16: VCC remote control supply

12VDC output (for e.g. SCHNEID radio modules)
maximum load: 500mA

Supply 115 VAC L
Supply 115 VAC N
Protective conductor PE

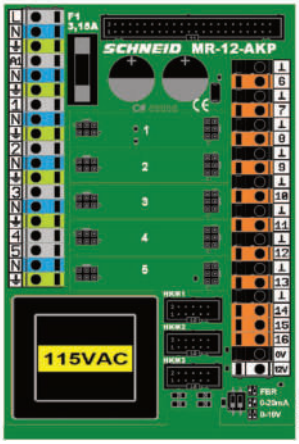
115 VAC output for heating circuit modules L
115 VAC output for heating circuit modules N
Protective conductor PE

P1 heating circuit 0 pump L
P1 heating circuit 0 pump N

P2 boiler 1 pump L
P2 boiler 1 pump N

P3 boiler 2 pump L
P3 boiler 2 pump N

M45 district heating valve OPEN L
M45 district heating valve CLOSED L
M45 district heating valve N



Temperatures PT1000
(2-pole shielded)

GND
Terminal 6: T6 outside temperature
GND
Terminal 7: T7 return temperature primary
GND
Terminal 8: T8 secondary flow temperature
GND
Terminal 9: T9 boiler 1 temperature above
GND
Terminal 10: T10 boiler 1 temperature below
GND
Terminal 11: T11 return temperature secondary
GND
Terminal 12: T12 boiler 2 temperature above
GND
Terminal 13: T13 Boiler 2 temperature below
GND room remote control circuit 0
Terminal 14: FBT room temperature circuit 0
Terminal 15: FBS remote control signal
Terminal 16: VCC remote control supply

12VDC output (for e.g. SCHNEID radio modules)
maximum load: 500mA

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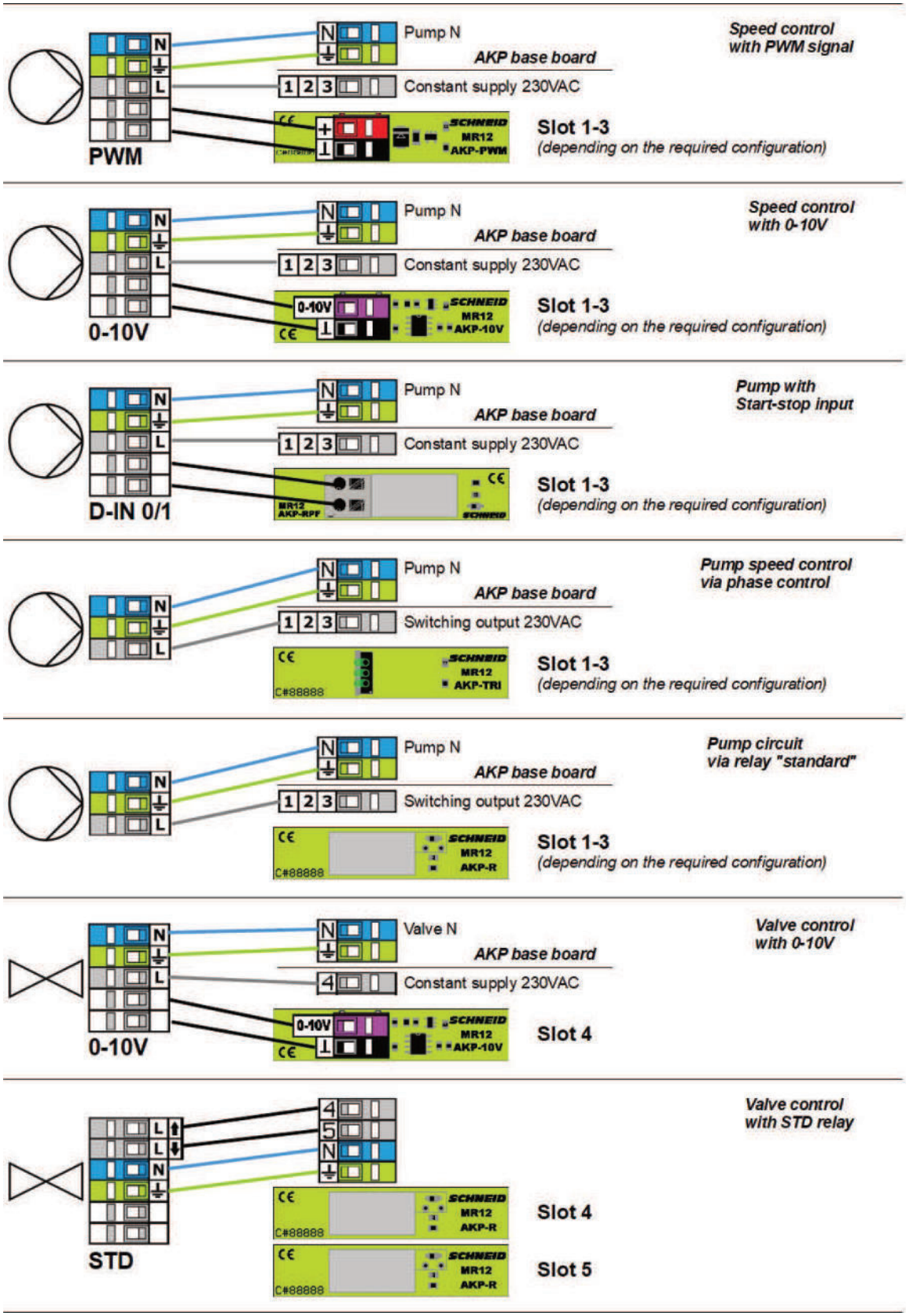
Terminal plan:



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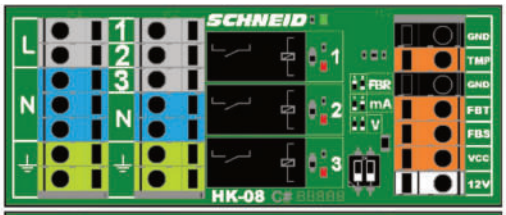
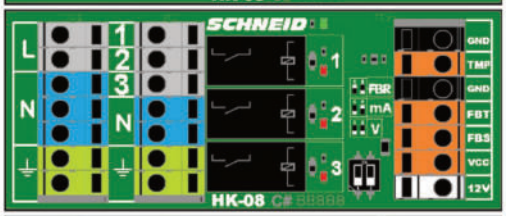
MR12-PLC module controller

Outputs 230VAC
1P1 pump heating circuit 1 1
1M1 mixing valve circuit 1 OPEN 2
1M1 mixing valve circuit 1 CLOSED 3
FBR
0-20mA
0-10V



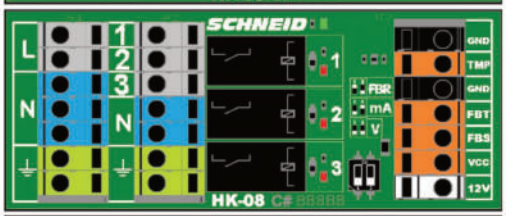
Heating circuit module circuit 1
GND
TMP 1T1 flow temperature circuit 1
GND room remote control circuit 1
FBT remote control room temperature
FBS remote control signal
VCC remote control supply
12VDC output (max. 100mA load)

Outputs 230VAC
2P1 pump heating circuit 2 1
2M1 mixing valve circuit 2 OPEN 2
2M1 mixing valve circuit 2 CLOSED 3
FBR
0-20mA
0-10V



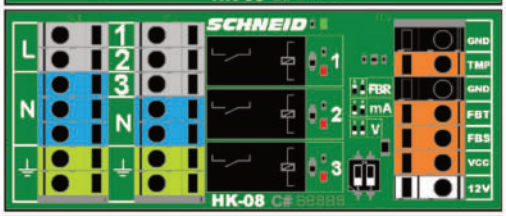
Heating circuit module circuit 2
GND
TMP 2T1 flow temperature circuit 2
GND room remote control circuit 2
FBT remote control room temperature
FBS remote control signal
VCC remote control supply
12VDC output (max. 100mA load)

Outputs 230VAC
3P1 pump heating circuit 3 1
3M1 mixing valve circuit 3 OPEN 2
3M1 mixing valve circuit 3 CLOSED 3
FBR
0-20mA
0-10V



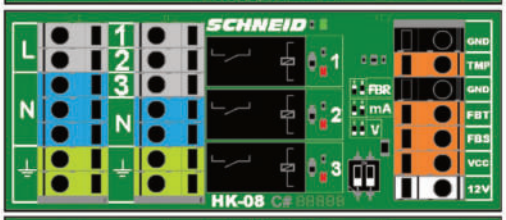
Heating circuit module circuit 3
GND
TMP 3T1 flow temperature circuit 3
GND room remote control circuit 3
FBT remote control room temperature
FBS remote control signal
VCC remote control supply
12VDC output (max. 100mA load)

Outputs 230VAC
4P1 pump heating circuit 4 1
4M1 mixing valve circuit 4 OPEN 2
4M1 mixing valve circuit 4 CLOSED 3
FBR
0-20mA
0-10V



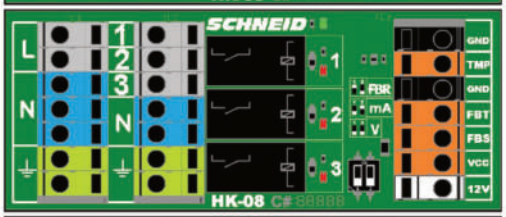
Heating circuit module circuit 4
GND
TMP 4T1 flow temperature circuit 4
GND room remote control circuit 4
FBT remote control room temperature
FBS remote control signal
VCC remote control supply
12VDC output (max. 100mA load)

Outputs 230VAC
1P1 pump heating circuit 1 1
1M1 mixing valve circuit 1 OPEN 2
1M1 mixing valve circuit 1 CLOSED 3
FBR
0-20mA
0-10V



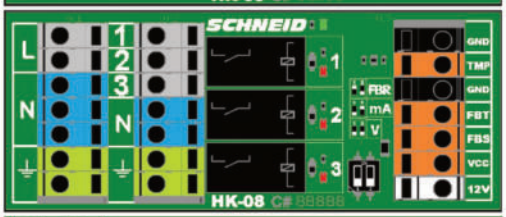
Heating circuit module circuit 1
GND
TMP 1T1 flow temperature circuit 1
GND room remote control circuit 1
FBT remote control room temperature
FBS remote control signal
VCC remote control supply
12VDC output (max. 100mA load)

Outputs 230VAC
2P1 pump heating circuit 2 1
2M1 mixing valve circuit 2 OPEN 2
2M1 mixing valve circuit 2 CLOSED 3
FBR
0-20mA
0-10V



Heating circuit module circuit 2
GND
TMP 2T1 flow temperature circuit 2
GND room remote control circuit 2
FBT remote control room temperature
FBS remote control signal
VCC remote control supply
12VDC output (max. 100mA load)

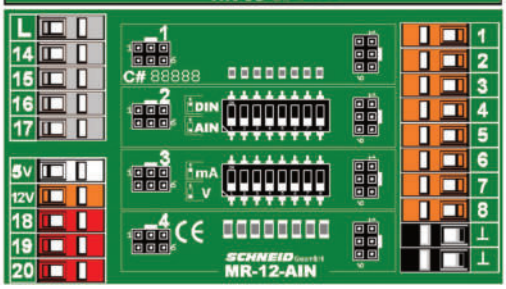
Outputs 230VAC
3P1 pump heating circuit 3 1
3M1 mixing valve circuit 3 OPEN 2
3M1 mixing valve circuit 3 CLOSED 3
FBR
0-20mA
0-10V



Heating circuit module circuit 3
GND
TMP 3T1 flow temperature circuit 3
GND room remote control circuit 3
FBT remote control room temperature
FBS remote control signal
VCC remote control supply
12VDC output (max. 100mA load)

GND Signalground
Terminal 14: **AOUT 1** District heating valve
Terminal 15: **AOUT 2** Base C / Circuit 1
Terminal 16: **AOUT 3** Base D / Circuit 2
Terminal 17: **AOUT 4** Circuit 3

VCC +5V: Supply 5V
VCC +12V: Supply 12V
Terminal 18: **DOUT 1** Leak warning
Terminal 19: **DOUT 2** RESET
Terminal 20: **DOUT 3** Reserve



Terminal1: **AIN 1** 0-10V Circuit1
Terminal 2: **AIN 2** 0-10V Circuit 2
Terminal 3: **AIN 3** 0-10V Circuit 3
Terminal 4: **IN 4**
Terminal 5: **IN 5**
Terminal 6: **IN 6**
Terminal 7: **IN 7**
Terminal 8: **IN 8**

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MR12-PLC module controller

Individual components: MR12-PLC module controller with AKP base board

MR12 control unit PLC
Order number: 190.15635
Order code: MR12 Bedienteil SPS

MR12 basic terminal board AKP without plug-in modules (with connection cable)
Order number: 190.15231
Order code: MR12 Basis-Anklemmplatine AKP ohne Steckmodule

MR12 plug-in module relay standard - 5 pieces
Order number: 190.15206
Order code: MR12 Steckmodul Relais Standard

DIN rail 395mm for MR07 / MR08 / MR12
Order number: 400.13546
Order code: DINRail-Schiene 395mm für MR07/MR08/MR12

DIN rail cover for MR07 / MR08 / MR12 - 2 pieces
Order number: 400.13542
Order code: DINRail-Cover für MR07/MR08/MR12

DIN rail clip - 2 pieces
Order number: 400.13544
Order code: DINRail-Clip

Technical data MR12-PLC module controller

Intrastat Number:	8537.10.91.90
Country of origin	EU/AT
Height, width, depth (in mm)	Control unit: 96x144x57 AKP with 5 plug-in module relay standard: 100x145x36 DIN rail (with 2 x covers and 2 x clips): 102x405x50
Weight (in kg)	1,163
Degree of protection	IP-20
Ambient temperature	0°C....+40°C
Operating voltage	230VAC
Power consumption	Max. 10VA
Max. Rated current "A1"	3,15A
Max. Total nominal current	3,15A
Max. Nominal current per output	2A continuous current // max. 15A inrush current
Relay output life	50.10^3 switching cycles
Connection type	Fixed wiring terminals
Connection technology	Spring clamp
Cable cross section	Max. 2.5mm²
Mounting type	DIN-RAIL TS35
Operating time	Continuous operation
Degree of pollution	2
Rated impulse voltage	1kV
Sensor type temperature sensor	PT1000

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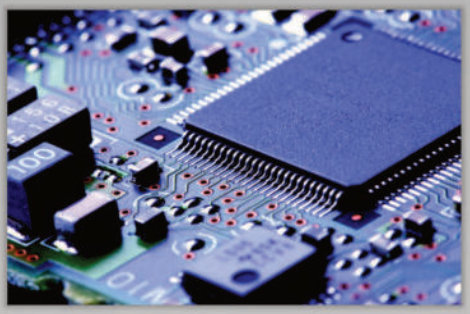
Our services in summary



Hardware
Development at first hand

Project management
Supervise and achieve your goals

Software
Solve custom demands and requirements

SCHNEID

Monitoring system
The entire system at a glance

Quality management
Safeguards a first-class quality

Support
Your concern is our request

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