SCHNEID

SCHNEID MR-12
Heating Regulator

Modern Life - Modern Solutions

Wi Fi

MR-12
designed by Schneid

```
Mo 12:00      AT:  -9°C
Fernwärme    LBG   25kw
Speicher 1   MIN   43°C
Zirkulation  EIN   37°C
Heizkreis 0  AUS   43°C
Heizkreis 1  ABS   29°C
Heizkreis 2  EIN   32°C
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esc

14:03
23.5 °C
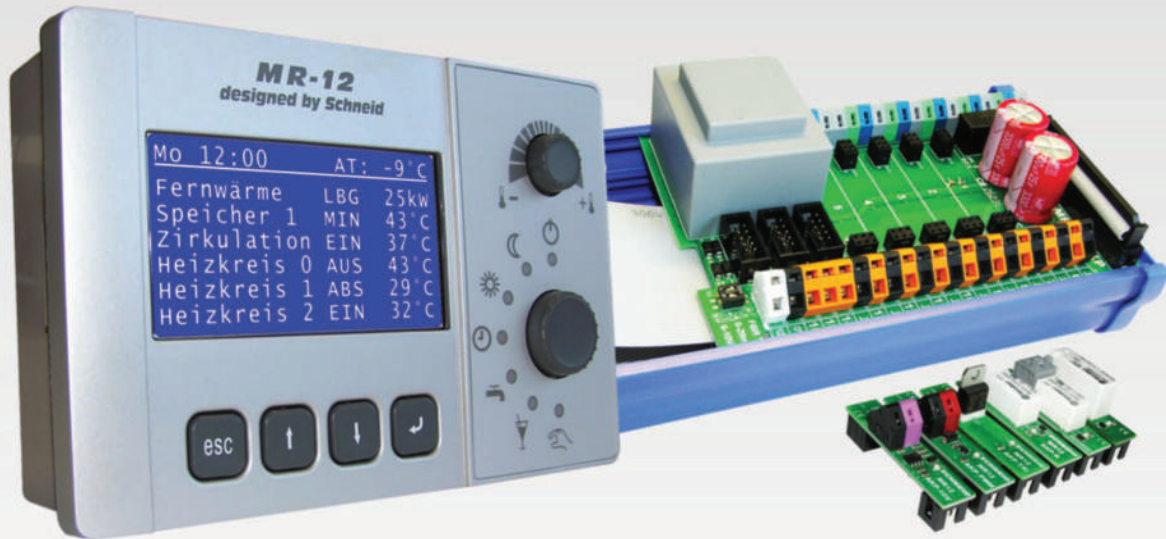
Universally useable, modulary structured heating regulator with basis on a freely programmable micro-controller with extensive possibilities for Bus-Connections, system display, remote maintenance and web-connection.

SCHNEID

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

MR12 Module-controller-base with Base-board AKP xxx
and control panel in DIN rail

Order number:	190.xxxxx
Order code :	MR12 Basismodulregler mit Basisplatine AKP xxx

Overview:

The SCHNEID MR12 module regulator is a microprocessor-controlled device for regulating the district-heating transmission stations with the option for the modular extension for three further mixer circuits, as well as the additional recording of heat-meter data and forwarding of all data to a superior network optimizing calculator in the heating chamber, consisting of:

1. Heating controller

- Three-point ouput for primary valve
- Two-point output for a heating circuit
- Two-point output for boiler 1
- Two-point output for boiler 2
  (circulating circuit)

Optionally, the first heating circuit can be configured as loading module circuit for the boiler as well.

Features of regulator:

- Heating-curve depending on the external temperature	- Limitation to the return flow depending on the external temperature
- Three heating periods for each day and heating circuit	- Heating times can be configured as lowering times as well
- The third period can be configured as the blocking time	- Room-temperature depending switch-off of the pump
- Pump switch-off function depending on the external temperature	- Ascertainment of the external temperature up to nine hours
- Building coefficient (= building storage capacity)	- Priority circuit of boiler/parallel operation of boiler

- Boiler module charging/boiler with switch valve	- Criteria for charging the boiler:
	  a) Two adjustable boiler-loading periods
	  b) Falling below the required minimum boiler value
	  c) Manual pre-selection through pre-selecting control

- Criteria for switching off the boiler:
  a) Reaching the required value of the boiler
  b) Reaching the lower required value of the boiler sensor
  c) End of boiler charging time
	- Charge-blocking of the boiler:
	  a) If the boiler's preliminary loading temperature is too low
	  b) When not reaching the required boiler temperature

MR12 module controller base

The base module regulator is provided with connectors for connecting three further heating-circuit modules and an I/O module. The SCHNEID-heating-circuit-module-HK06 STANDARD or the SCHNEID-heating-circuit-module-HK12 with three plug-in-modules relay-standard (or other plug-in-modules) enables to extend the base module regulator by further three mixer heating circuits.

Other functions after extension with respective modules:

- Optimization of the on/off times by means of the room sensor	- Optional regulating via room sensor
- Regulation via adjustable volumetric influences	- Room regulation via thermostat function
- Remote controll for each heating circuit	- Four remote controls can be connected
- Eight external 0-10V (4-20mA) inputs, e.g. for specifications of the required value via additional print	

2.OPERATING UNIT:

The SCHNEID MR12 module regulator is provided with an analog operating console for the simple operation of the most important functions. A graphic display with 128x64 pixels is used as indicator.
A six-stage switch is available for setting the heating program. A setting potentiometer for the normal operation or lowering operation, respectively, is available for the precision adjustment.
All other operation and setting of the regulator is executed digitally over the display by means of a further six-staged switch and three enter keys.

3. REGULATOR COMMUNICATION

The SCHNEID MR12 module regulator is provided with a connector for a communication module.
The communication board enables to equip the base module regulator with up to three bus interfaces:
1 Standard bus for regulator network and system display via SCHNEID WinMiocs 70 or SinVIS
2 Bus interface for recording the consumer data (e.g. counter)
3 Internal regulating bus for network (SubCOM) in terms of controlling technique

Depending on the purpose of use, a relevant bus module can be equipped for each one of the four bus interfaces.

-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 for network:
COM-A: All data of the regulator and of the heat meter are transmitted to the optimizing calculator via the special interface SCHNEID-FSS (see WINMIOCS and FW MANAGEMENT)

COM-B: Selection of measurement data of the heat meter, current meter and other external devices by means of the M-bus interface (M-bus acc. to CEN TCI176 WG4 and IEC1107).
Recorded data on the example of heat counter: quantity of heat, quantity of flow, initial and return temperature, spreading, performance, flow, etc.

COM-C: Over the internal data bus, various SCHNEID regulators can be linked up with one another on their sides of the regulator. In order to enable an optimized regulating, the respective required values as well as the centrally measured outside temperature are exchanged among the regulators.

Mechanic design:
The regulator is splitted and delivered. The control desk is provided with a plastic cover on its backside, which may engage in a standard cutout. The control desk is connected to the other regulating unit via a flat cable, whereas this regulating unit is integrated in a plastic tray for the assembly of the cap rail. The length of the connection cable is approximately 50cm.

MR12 module controller base

Innovations compared to the basic module controller MR08:

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

Lamp options:

**MR12 basic module controller with base board AKP
and control panel in DIN rail, without plug-in modules**
Order number: 190.15518
Order code: MR12 Basismodulregler mit Basisplatine AKP

**MR12 base module controller with AKP + 5 plug-in-modules
and control panel in DIN rail, 5 plug-in modules relay standard**
Order number: 190.15204
Order code: MR12 Basismodulregler mit AKP + 5 Steckmodule

MR12 plug-in module relay standard for MR12 & HK12
Order number: 190.15206
Order code: MR12 Steckmodul Relais Standard

MR12 plug-in module relay R16 for MR12 & HK12
Order number: 190.16614
Order code: MR12 Steckmodul Relais R16

MR12 plug-in module PWM for MR12 & HK12
Order number: 190.15209
Order code: MR12 Steckmodul PWM
PWM for controlling pumps with PWM signal. The 230V terminal on the AKP is connected in this case fixed with 230V. The PWM signal is connected to the plug-in module.

MR12 plug-in module for MR12 & HK12
Order number: 190.15210
Order code: MR12 Steckmodul TRIAC
TRIAC module for controlling drives with a very high number of starts (primary valves).

MR12 plug-in module analog signal for MR12 & HK12
Order number: 190.15300
Order code: MR12 Steckmodul Analogsignal
0-10V for controlling pumps with 0-10V signal. The 230V terminal on the AKP is connected in this case fixed with 230V. The 0-10V signal is connected to the plug-in module.

MR12 plug-in module relay RPF for MR12 & HK12
Order number: 190.15404
Order code: MR12 Steckmodul Relais RPF
RPF for controlling pumps with start-stop input. The 230V terminal on the AKP is connected in this case fixed with 230V. The potential-free relay contact is connected to the plug-in module.

- Zero-Cross-Detection:
The relays are switched exactly at the zero point of the sinusoid. At this moment in the inrush current smallest. This protects the relay contacts and extends the life of the relays.

- Possibility to use internal wireless modules.
(WiFi, Bluetooth or radio) For communication with terminals such as e.g. Tablet, smartphones or acquisition of future wireless sensor technology (outdoor, room sensor or wireless FBR). The interface cards are installed inside the controller (no ComBasis necessary). 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-pole plug (12V +/- RS485 D + / D-). For direct connection of a digital remote control SCHNEID-FBR12/14 per heating circuit.

The AKP-Board (BASE-Board) is connected directly to the control unit. If a communication board (COM-BASE) is present, it is also directly connected to the control unit, as well as a possible extension with an additional module for analog and digital in- and outputs (AIN module). Cables are routed in the DIN-Rail track. The heating circuit expansion modules are connected to the AKP-Board.

- Optional: the MR12 can be equipped with an additional expansion connector with the following signals:
* 3 pcs. Impulse inputs for counting applications
* 1 pc additional PT1000 sensor input
* 1 pc additional analogue input 0-10V

Control panel module controller MR12:

MODE OF OPERATIONS

OFF / frost protection
Normal operation is deactivated except for frost protection. If the outside temperature falls below the frost protection temperature, the frost protection circuit is activated.

Setback
The heating circuits are permanently in the lowering mode, irrespective of the time program, i. The setpoint temperature is reduced according to the settings. The remote control of a heating circuit, however, has priority.

Heating
The heating circuits are permanently in heating mode regardless of the time program. The remote control of a heating circuit, however, 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 operation except frost protection. There is only the boiler load. (Summer)

Party-Mode
The heating circuits are put into heating mode for a certain duration (adjustable). After the time has elapsed, the controller returns to the last mode selected.

MAINTENANCE
Shutdown of all outputs, there is no control function.
ATTENTION: No frost protection!
The maintenance function is not intended to carry out electrotechnical and / or work on actuators (pumps, valves)! (Risk of injury!).
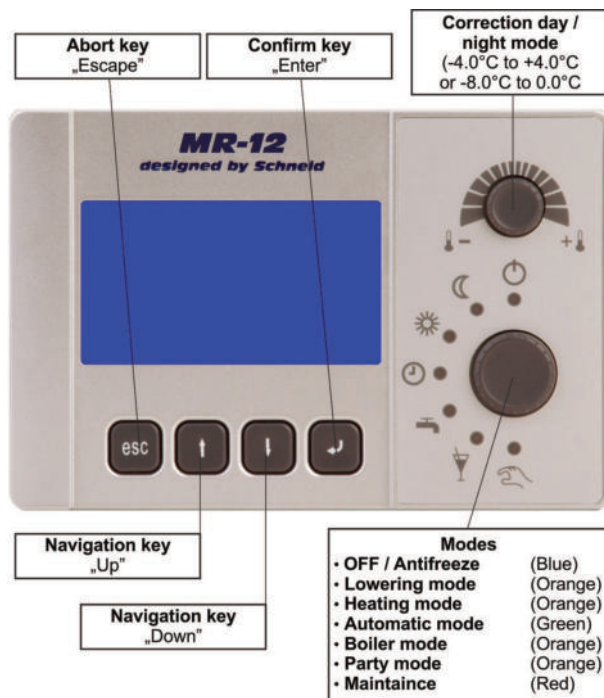
Terminal board (AKP) module regulator MR12:

The SCHNEID MR-12 is an electronic control unit for installation mounting. The AKP of the module regulator MR-12 is compatible with the components of the module regulator MR-08.

The AKP board (terminal board) is connected directly to the control unit.
If a communication board (COM-BASE) is available, it will also be 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 cable routing takes place in the DIN rail rail.
The heating circuit expansion modules 1-3 are connected to the AKP board.
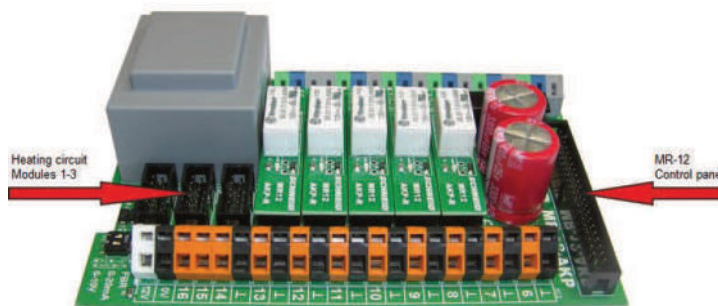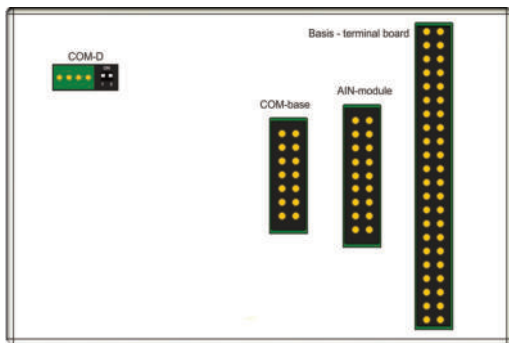
Connection diagram :

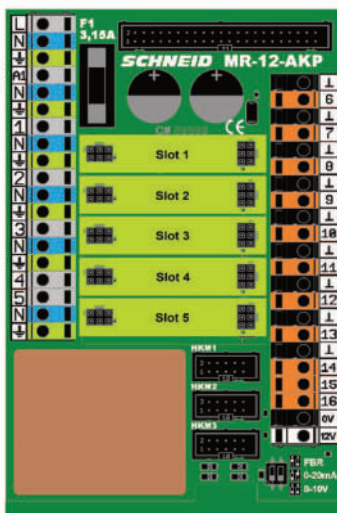Supply 230 VAC L
Supply 230 VAC N
Protective conductor PE

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

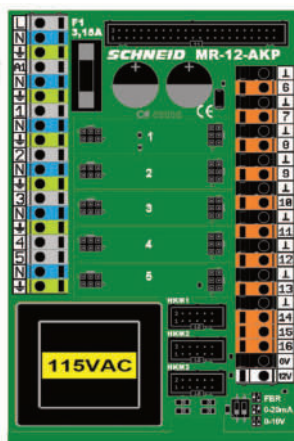115 VAC output for heating circuit modules L
115 VAC output for heating circuit modules N
Protective conductor PE

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

MR12 module controller base

Connection diagram :

PWM	Pump N — AKP base board / Constant supply 230VAC / Slot 1-3 (depending on the required configuration) — SCHNEID MR12 AKP-PWM	Speed control with PWM signal
0-10V	Pump N — AKP base board / Constant supply 230VAC / Slot 1-3 (depending on the required configuration) — SCHNEID MR12 AKP-10V	Speed control with 0-10V
D-IN 0/1	Pump N — AKP base board / Constant supply 230VAC / Slot 1-3 (depending on the required configuration) — MR12 AKP-RPF SCHNEID	Pump with Start-stop input
	Pump N — AKP base board / Switching output 230VAC / Slot 1-3 (depending on the required configuration) — SCHNEID MR12 AKP-TRI	Pump speed control via phase control
	Pump N — AKP base board / Switching output 230VAC / Slot 1-3 (depending on the required configuration) — SCHNEID MR12 AKP-R	Pump circuit via relay "standard"
0-10V	Valve N — AKP base board / Constant supply 230VAC / Slot 4 — SCHNEID MR12 AKP-10V	Valve control with 0-10V
STD	4 5 N — Slot 4 SCHNEID MR12 AKP-R / Slot 5 SCHNEID MR12 AKP-R	Valve control with STD relay

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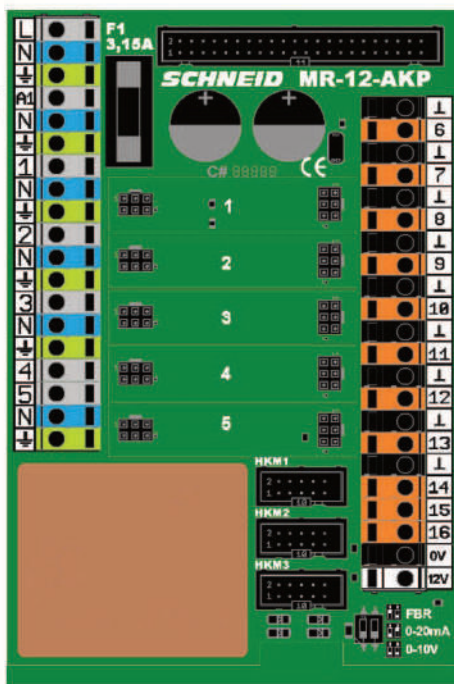
230 VAC output for heating circuit modules L.
230 VAC output for heating circuit modules N
Protective conductor PE

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 15: alternatively AIN
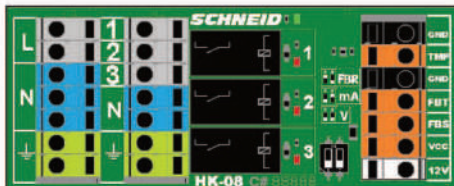Terminal 16: VCC remote control supply

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

FBR
0-20mA
0-10V

Outputs 230VAC

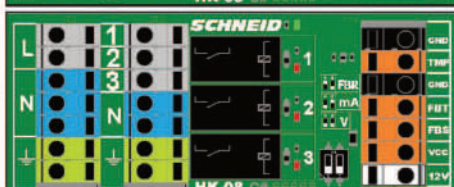|	
1P1 pump heating circuit 1	1
1M1 mixing valve circuit 1 OPEN	2
1M1 mixing valve circuit 1 CLOSED	3

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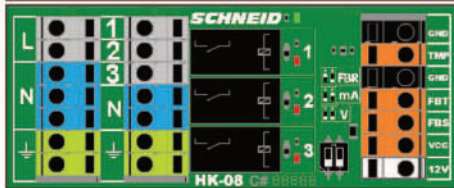
Heating circuit module circuit 3
GND
TMP   3T1 flow temperature circuit 3
GND   room remote control circuit 3
FBT   remote control room temperature
FBS   remote control signal
VCC   remote control supply
12VDC output (max. 100mA load)

GND signal ground
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
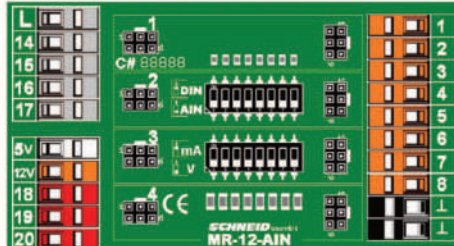
Terminal 1: AIN 1 0-10V circuit 1
Terminal 2: AIN 2 0-10V circuit 2
Terminal 3: AIN 3 0-10V circuit 3
Terminal 4: IN 4
Terminal 5: IN 5
Terminal 6: IN 6
Terminal 7: IN 7
Terminal 8: IN 8

MR12 module controller base

Delivery: MR12 base module controllerwith base board AKP + 5 Relay STD modules

MR12 control panel
Order number : 190.15205
Order code: MR12 Bedienteil

MR12 base board AKP without plug-in modules (with connection cable 500mm)
Order number : 190.15231
Order code: MR12 Basis-Anklemmplatine AKP ohne Steckmodule

MR12 plug-in modul Relay Standard – 5 pieces
Order number : 190.15206
Order code: MR12 Steckmodul Relais Standard

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

DINRail-Cover for MR07/MR08/MR12 – 2 pieces
Order number : 400.13542
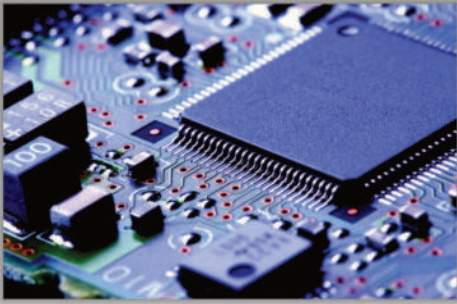*Order code: DINRail-Cover für MR07/MR08/MR12*

DINRail-Clip – 2 pieces
Order number : 400.13544
Order code: DINRail-Clip

Technical Data MR12 basic module controller with base board AKP + 5 STM

customs number	8537.10.91.90
country of origin	EU/AT
height, width, depth (in mm)	control panel : 96x144x57
	AKP with 5 plug-in modules relay standard : 100x145x36
	DIN-Rail (with 2 x Cover and 2 x Clip): 102x405x50
weight (in kg)	1,160
protection	IP-20
ambient temperature	0°C....+40°C
operating voltage	230VAC
input	max. 10VA
max. rated current "A1"	3,15A
max. rated current total	3,15A
max. rated current per output	2A continuous current // max. 15A inrush current
lifetime relay output	50×10^3 switching cycles
connection	fixed wiring terminals
connectivity technology	spring terminal
wire Gauge	max. 2.5mm²
mounting	DIN-RAIL TS35
operating time	continuous operation
pollution degree	2
rated impulse voltage	1kV
sensor type temperature sensor	PT1000

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