

PRODUCT-INFO

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Measuring - Controlling - Regulating
All from the same source

UNIVERSAL TEMPERATURE REGULATOR

MRFC-3 | MRHC-3

Graphical user interface
RS-485 Modbus interface



Programmable via
configuration software
WELBA „KONSOFT“

www.welba.de



MRFC-3

MRHC-3

- graphical colour display
- self-explanatory user interface
- up to 4 sensor inputs
- PC-parameterisable
- input 4 – 20 mA
- output 0 -10 V or 4 – 20 mA
- up to 6 digital inputs
- up to 6 relay outputs
- RS-485 Modbus interface

In connection with IO expansion module:

- additional 2 analogue inputs (4-20mA)
- additional 6 relay outputs
- additional 5 digital inputs

- Temperature sensor inputs freely activatable and configurable
 - PT100 2/3 conductor
 - PT1000
 - KTY 81-210
 - KTY 81-110
- Four independent control functions (control loops)
- Analogue input 4 – 20 mA:
 - usable as default nominal value or detector
- Analogue output 0 - 10 V or 4 - 20 mA adjustable
- Digital inputs* can be freely configured separately for each input
 - as a function or fault message input (also with self-locking)
 - Delay times
 - Display properties
 - Reset properties
- Relay outputs* can be freely configured separately for each output
 - Timer components (turn-on delay etc.)
 - Display properties
 - Standby-behaviour
- Potential-free changeover contact
- Modbus RTU for configuration via PC or for connection to higher-level machine control
- 4 independent controller units (2-point / 3-point / PID)
- Collective fault indication module
- External release function
- External setpoint switching
- Four independent temperature alarms
- Configurable customer menu
- Fault memory

Feature overview

... 2-point, ...3-point or ...PID-controlled!!!!

Relay displays
Relay-status display comprehensively parameterisable

ON- OFF- button
Function parameterisable

RESET-button
Resetting and confirmation of fault messages

Graphic display
System status can be determined at a glance.

User menu
User friendly text-based parameter settings. Multilingual.

Fault memory
Parameterisable chronological storage / display of all fault messages.

Power supply
230 V AC or 24 V UC

Timer module
For inputs and outputs versatile useable.
Saving of external time relays

Temperature alarms
4 independent temperature alarms versatile configurable

Digital inputs
Monitoring of external system components.
Error message via LED and relay output.
Internal logic operation with timer module.
Triggering of functions by external events.

Collective fault indicator
Can be linked to digital inputs or temperature alarms.

Relay outputs
for the controlling of system components, e.g. pump, compressor etc.
A potential-free changeover contact, e.g. for fault message output.

Modbus-RTU over RS-485

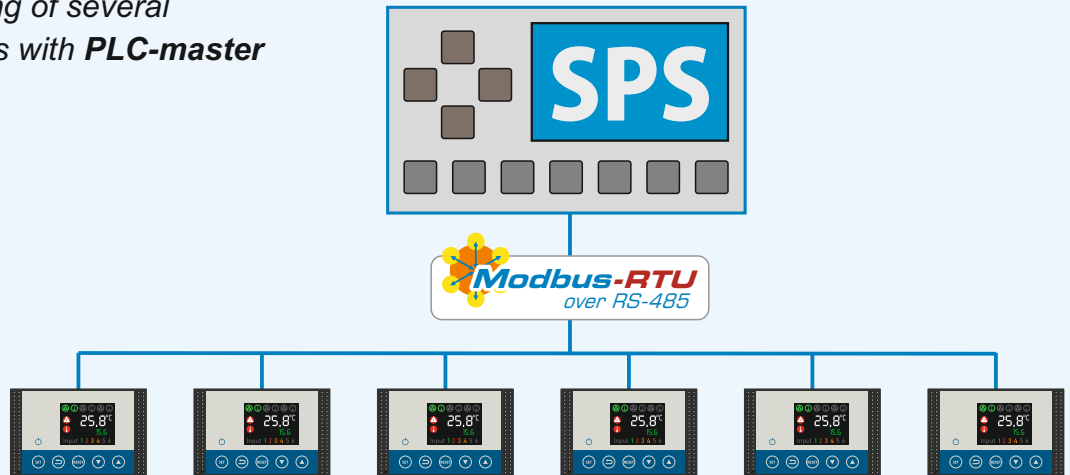
Universal sensor inputs
Inputs configurable for PT-100 2- or 3-wire, PT-1000, KTY 81-210 and KTY 81-110

Analogue input
as current input (4-20 mA)

Analogue output
as voltage output (0-10V) or as current output (4-20 mA)

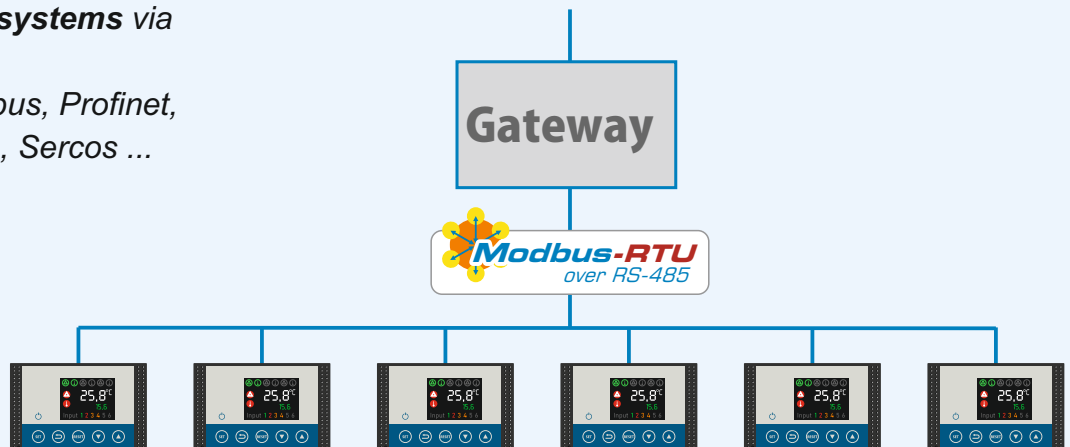
PC-parameterisable

Networking of several controllers with **PLC-master**



Integration in various **fieldbus-systems** via gateway, e.g. Profibus, Profinet, CANopen, Sercos ...

Feldbus system



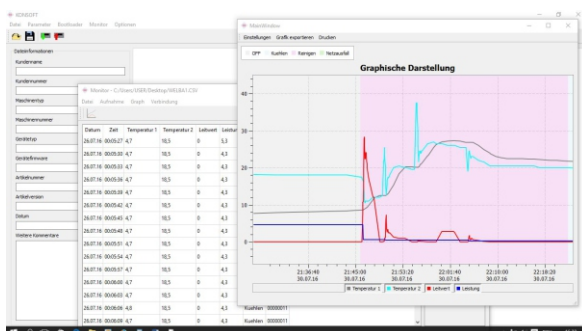
via connection to **Welba internet modem ESIPM-001** or **Welba GSM modem ESGSM-001**

- sending of fault messages
- remote configuration
- remote diagnosis





Configuration Parameterisation Visualisation Storing Updating



With the configuration software "KONSOF", the controllers can be conveniently configured and the measurement and control values can be clearly visualized.

Parameterisation

All setting parameters can be entered and stored on your PC in a clear operating mask (at the relevant level). A 'description text' is stored here for each parameter.

Once all parameters have been entered, the complete configuration can be transferred to the controller.

Visualisation

Measured values and status or fault messages can be read out from the controller and displayed and stored graphically or in tabular form on the screen. This allows a quick analysis in the case of a fault.

Bootloader function

Controller can be updated to the latest operating software by button press and thus kept up to date.

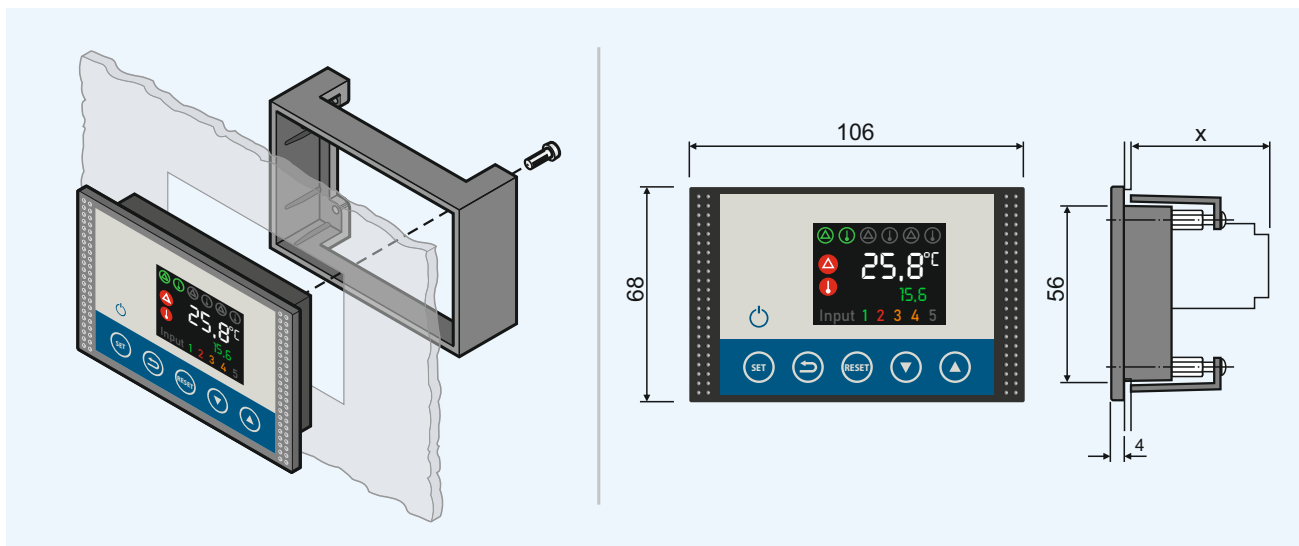
Level	Parameter	Level	Level	description	comment	value	default
1	1	Signal configuration	cooling mode detection			2	2
2	2	Milk inlet	recognition			5	5
4	3	Signal configuration	cleaning mode detection			2	2
5	4	Maximum	cleaning time			30	30
6	5	Trigger time	Cleaning signal			15	15
10	10	Activate level	monitoring at the end of cleaning			5	5
11	11	Activate monitoring	motor protection switch			5	5
17	17	Warning time 1	if no cooling start after milk inlet			30	30
18	18	Warning time 2	if no cooling start after milk inlet			45	45
19	19	Warning time 3	if no cooling start after milk inlet			60	60
20	20	Target temperature	1st milling			6.0	6.0
21	21	Max. time to reach	target temperature			180	180
22	22	Max. overtemperature	for a time			180	180
23	23	Max. time of overtemp.				180	180
24	24	Max. overtemperature	with direct alarm triggering			25.0	25.0
25	25	Min. undertemperature	for a time			2.0	2.0
27	27	Max. time of undertemp.				120	120
28	28	Min. undertemperature	with direct alarm triggering			5.5	5.5
29	29	Max. cooling	interruption			60	60
31	31	Max. time in off	mode after cleaning			600	600
32	32	Minimum	cleaning cycle			78	78
33	33	Detergent	monitoring alkaline via float switch			0	0
35	35	Detergent	monitoring acid via float switch			0	0
36	36	Max. temperature	difference monitoring sensor during cooling mode			2.0	2.0
90	90	Selection period	of the recording data (Konsoft)			90	90
91	91	Logging intervals	cleaning mode			1	1
92	92	Logging intervals	OFF and cooling mode			15	15



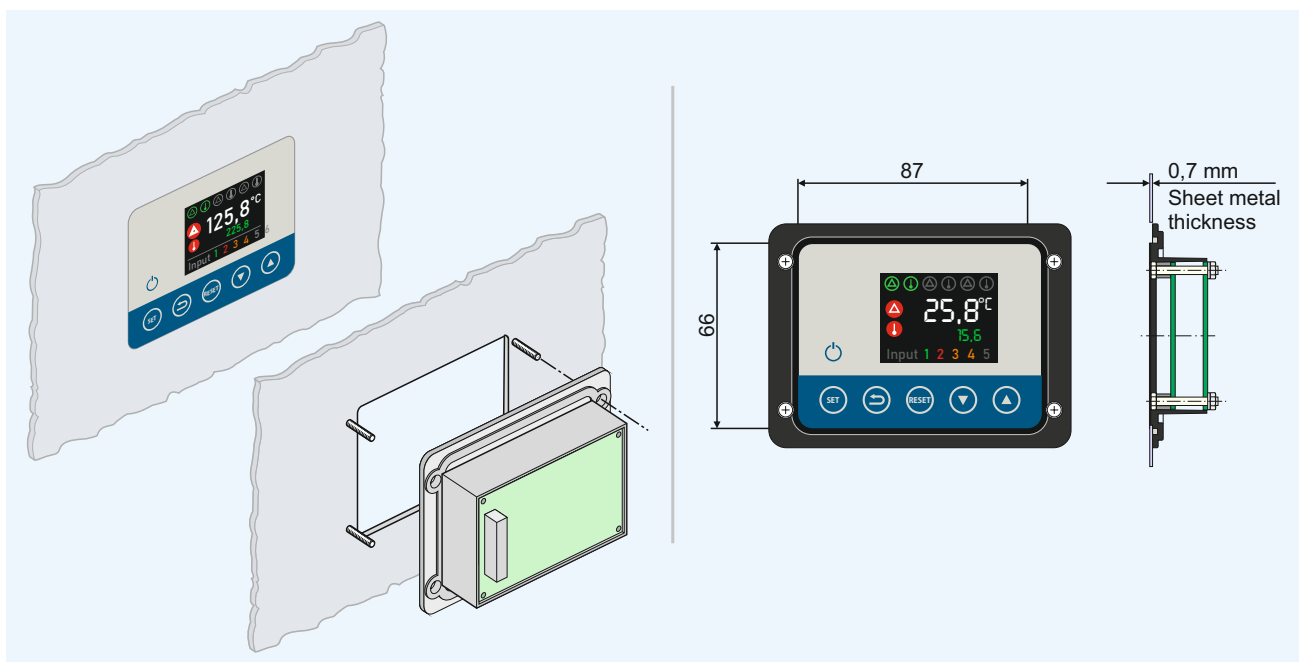
Operating voltage	230 V AC or 24 V UC +/-10%, 50/60 Hz
Relay contacts	see connection diagrams
max. switching current	up to max. 5 AAC1 depending on version
max. switching voltage	up to max. 250 V depending on version
Display	240 x 320 Pixel Full Color TFT Display - 2,0 inch
Active display area:	ca. 30,6 x 40,8 mm
Number of sensor inputs	up to 3
Useable sensors	PT 100 (2- or 3- wires) PT 1000 KTY 81-210 KTY 81-110
Measure range	
- PT 100	-50° to +400°C
- PT 1000	-50° to +400°C
- KTY 81-210	-50° to +150°C
- KTY 81-110	-50° to +150°C
Interface RS-485	WE-Bus / Modbus
Digital inputs	up to 6
Analog input	4-20 mA
Analog output	0-10 V or 4-20 mA, switchable
Temperature alarms	4 (independently)
Control mode	two step control / three step control / PID
Housing MRFC-3 (<i>Front panel mounting</i>)	- Front size 106 x 68 mm - Front panel cut 87 x 56 mm
Housing MRHC-3 (<i>Rear wall mounting</i>)	- Front size 106 x 68 mm - Front panel cut 87 x 66 mm
Installation conditions	build-in-appliance - installation depth 45 mm
Protection class	
- Housing front	IP 64
- Rear	IP 00
Electrical safety	Overvoltage category III up to 250 V
- pollution degree	2
- rated impulse voltage	1500 V
Connection	Plug-in screw connections for cables up to 2,5 mm ² / 1,5 mm ²
Environment specifications:	
- Operation temperature	0° .. +50°C
- Storage temperature	-20° .. +70°C
- max. humidity	75% (no dew)

Dimensions

MRFC-3 for front panel installation



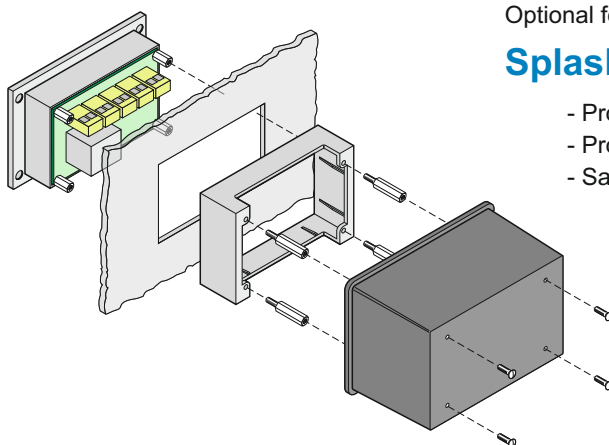
MRHC-3 for front-flush assembly



Optional for both housing versions:

Splash guard cover

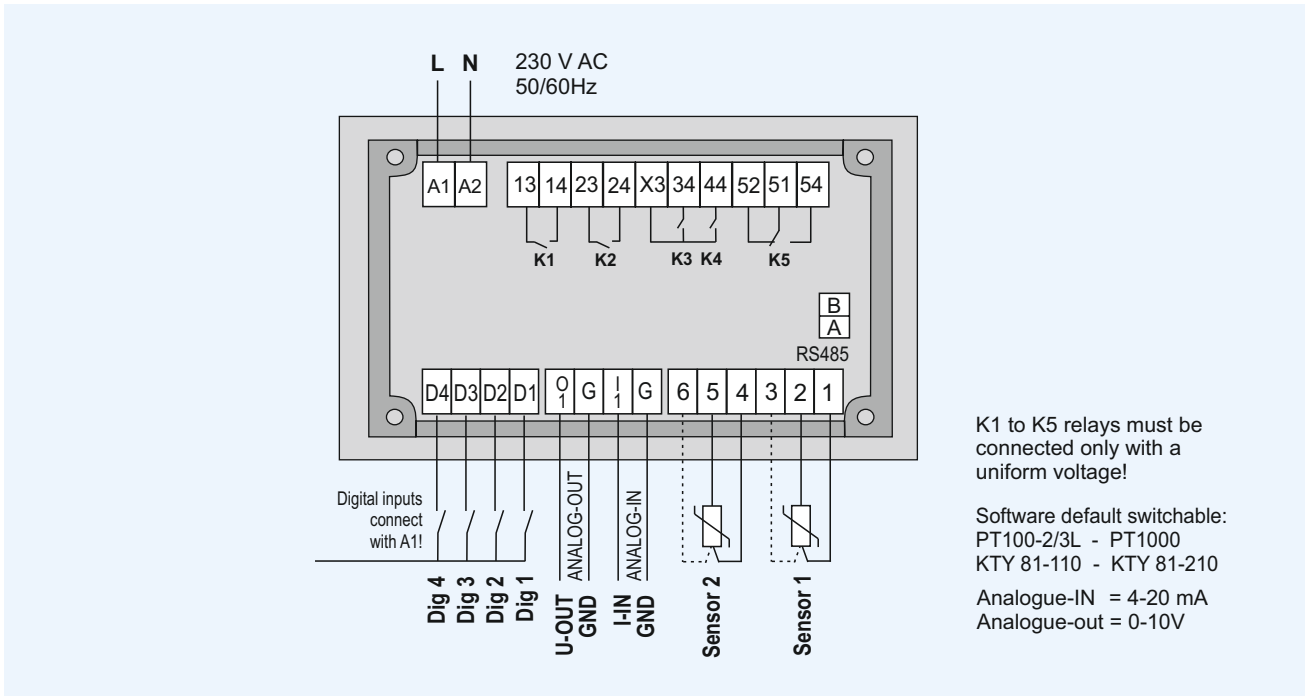
- Protection against splashing water
- Protection against pollution
- Saving of a separate switch box



Connection

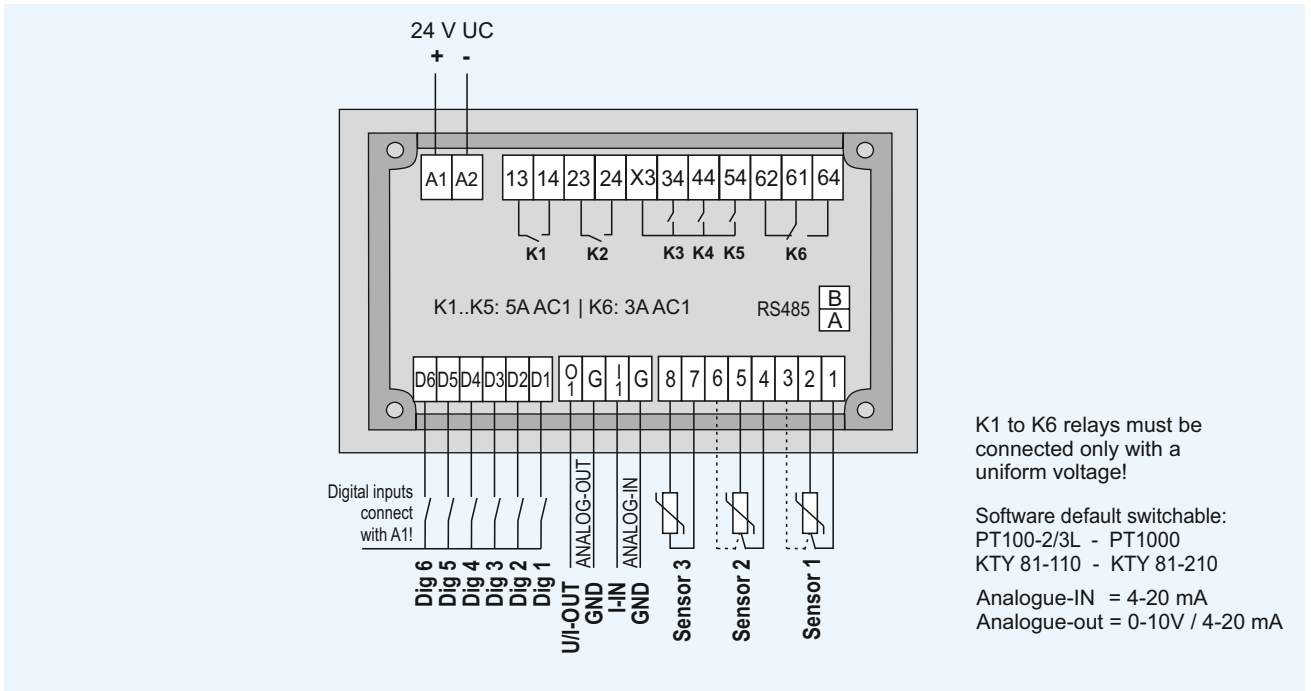
MRFC-3-001-A
MRHC-3-001-A

230 V



MRFC-3-003-F
MRHC-3-003-F

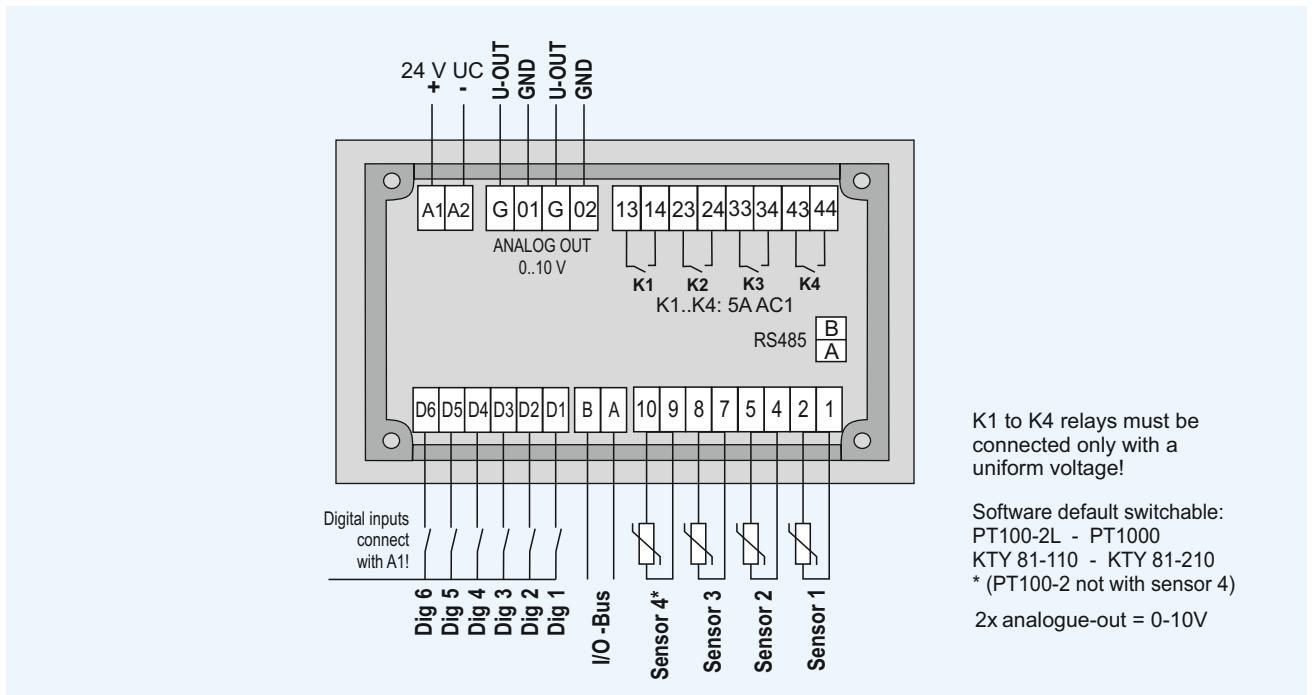
24 V



Connection

MRFC-3-005-F
MRHC-3-005-F

24 V



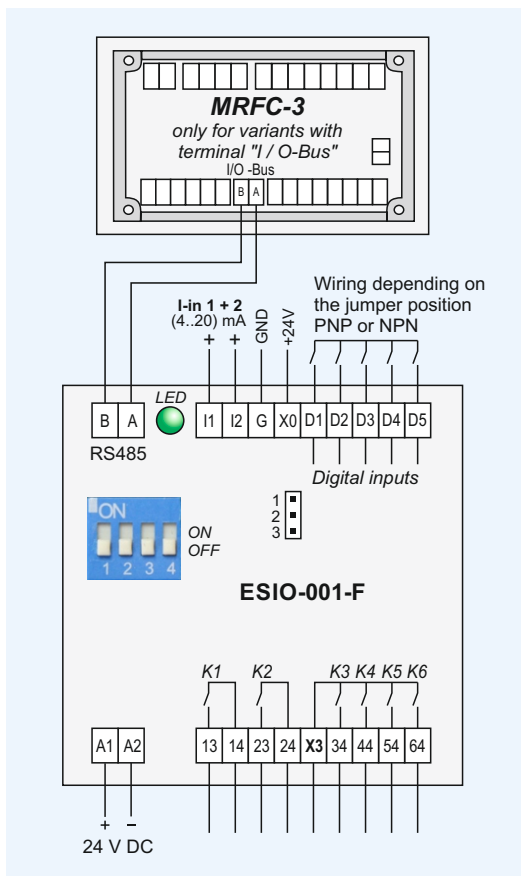
I/O Expansion module (optionally)



With an I/O extension module, the MRFC-3 / MRHC-3 (in the -005 version) can be extended by additional digital and analog inputs and outputs.

- 6 output relays
- 5 digital inputs
- 2 current inputs 4..20 mA

Connection example



Technical data ESIO-001-F

Operating voltage	24 V DC
Relay contacts	2 make contacts independently, 4 make contacts with common contact
max. switching current	5AAC1 (K1 and K2), 5AAC1 (sum of K3 - K6)
Digital inputs	D1..D5 via opto coupler, (configurable via jumpers as NPN or PNP input)
Analog input	I1 and I2; 4..20 mA; $R_i < 100 \text{ ohm}$
DIN rail housing	100 x 71 x 40 mm for 35 mm top-hat rail
Protection housing	IP 20
Electrical safety voltage	Overvoltage category II to 500V Rated impulse voltage: 2500V Degree of pollution 2, protection class I
Screw connections	for cables up to 2,5 mm ²
Environment specifications	
- Operation temperature	0° .. +50°C
- Storage temperature	-20° .. +70°C
- max. humidity	75% (no dew)

Example of application

Standard compressor regulation (with or without hotgas-Bypass)

