Technical Information
TI 043R/09/en
Mat.Nr. 50073427

Process display
RIA 450

Multi functional display, with integrated loop power supply, for monitoring and displaying analogue process measurements

Application areas

- The RIA 450 process display indicates 1 analogue measured value. This can also be monitored for up to 4 individual preset alarm points. A loop power supply is also available.

- The process display can be applied in:
  - Control rooms
  - Control panels
  - Stationary or mobile measurement systems
  - Manned or unmanned measurement stations.

Features and benefits

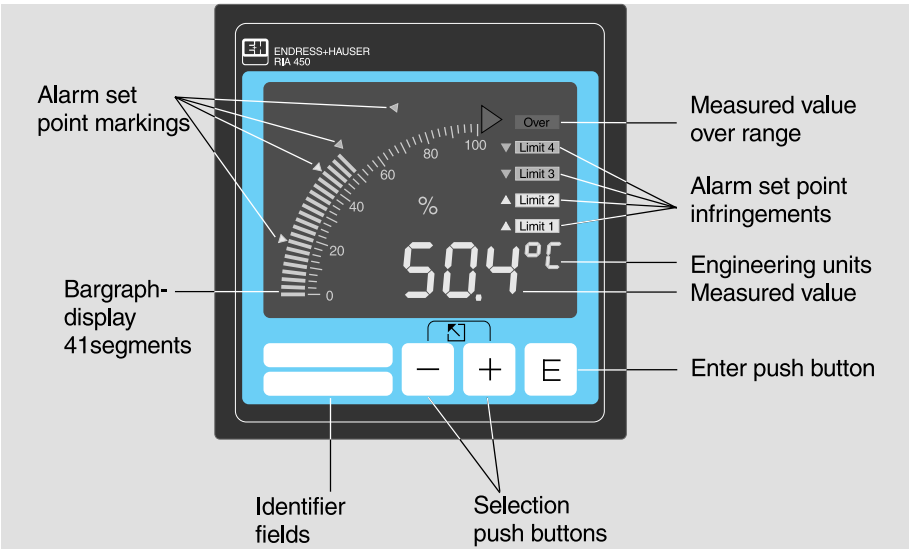
- Multi functional:
  All normal measurement signals can be directly connected (bipolar current, voltage; thermocouples; RTD).
- User friendly:
  Measurement range, engineering units and alarm set points can be easily set up using a simple interactive matrix.
- Clear display:
  Multi coloured display for a clear bargraph display, 4 digit measured value, engineering units and alarms.
- Reliable:
  Complete alarm set point monitoring function (4 alarm set points).

Endress+Hauser
Nothing beats know-how

Function

The pressettable analogue input enables direct connection of different transmitters. These can be current, voltage, RTD and TC. The three colour rear illuminated display shows both the measured value as well as the engineering units. Using the built-in loop power supply the unit can also power the connected sensors and then evaluate the signal returning from the sensor. Four presettable alarm set points monitor the input for deviation from the predefined conditions. This means that the unit can be used for a number of possibilities for direct process control. A user friendly front end interactive setting up procedure using three push buttons is also available on the unit.

Operation and display



RIA 450
Front view

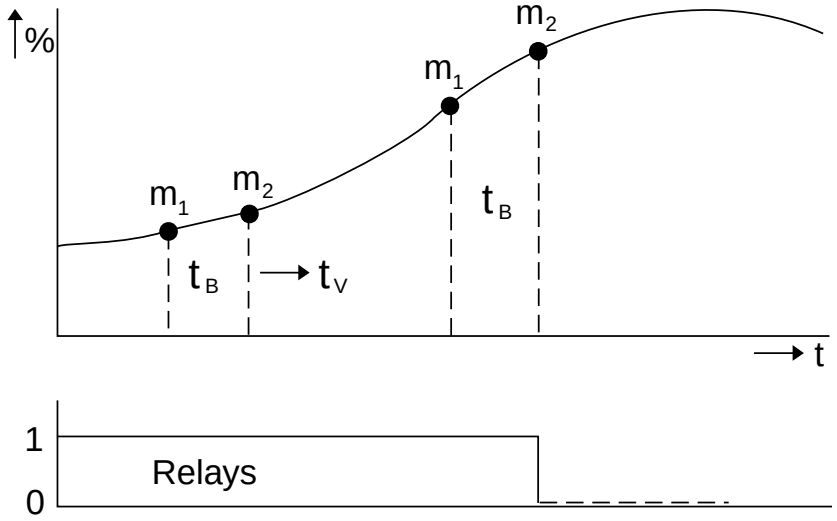
For special applications the numeric display and the bargraph can be operated inversley to the incoming measurment signal. In this function the displayed value decreases with an increase in measured signal. This means that a relationship between the measured signal e.g. 4 ... 20 mA and the display 100% ... 0% is possible.

Alarm set point

The switchable alarm set point function monitors the input signal twice per second to check that the preset parameters have been adhered to. The four set points can be allocated to operate in min./max. safety, trend analysis. The lower and upper set points and hysteresis as well as a time delay can also be defined.
Set point infringement is identified by two arrows and the respective relay is also activated.

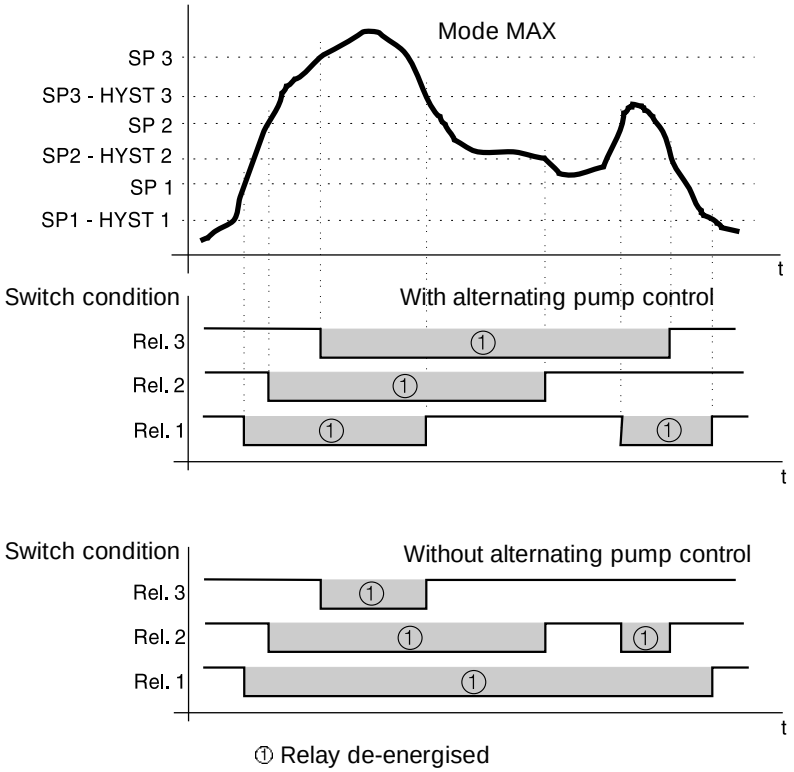
Trend analysis

This function enables the unit to monitor and analyse the change in the measured value within a preset time cycle. For this the values m_2-m_1 are compared with each other after a predefined time cycle t_B (10 s, 1 min, 10 min). If the evaluated value is larger than the preset maximum allowable change then the relay is switched. This measured value calculation is repeated every t_V=0,4 s (floating time base).



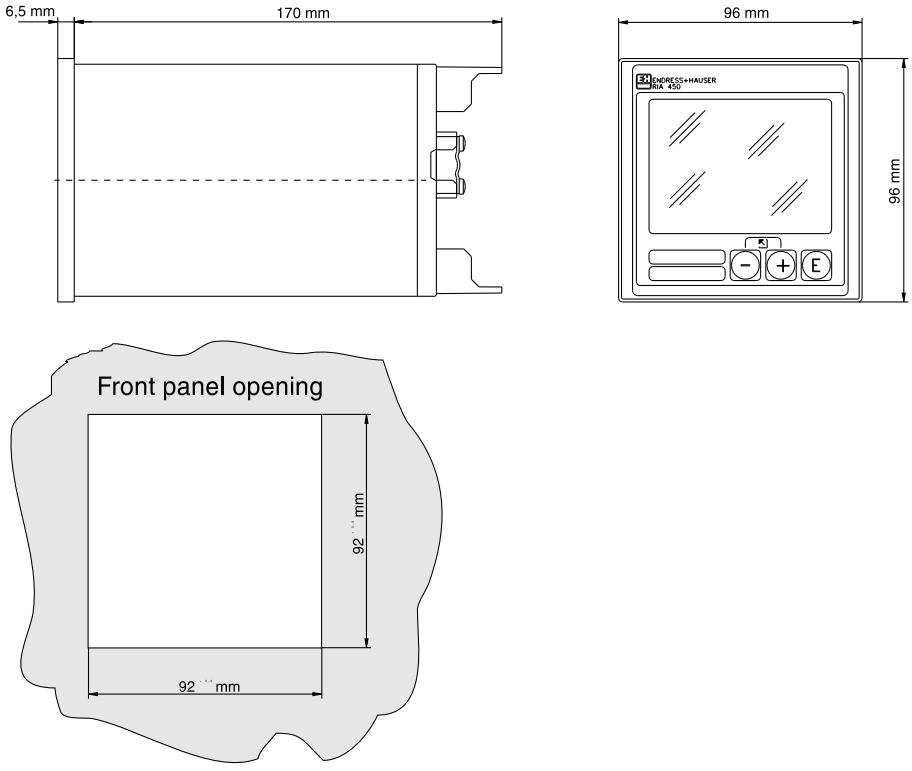
Alternating relay control

Equal use of more than one pump in level applications is done by alternately switching individual pumps.
It is no longer conditional to reach a preset switch point before switching the pump on. It is now more a case of which pump has been inoperative for the longest time.
The same condition is valid for switching the pump off:
If the switch off point is reached then the pump with the longest operation time is switched off.

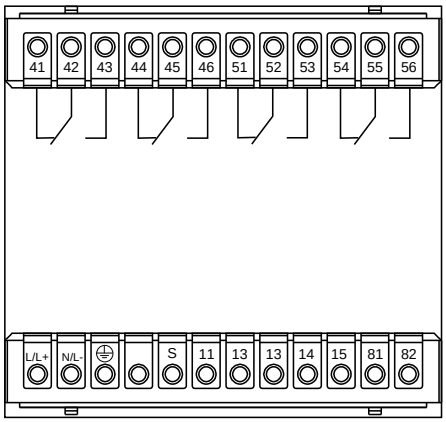


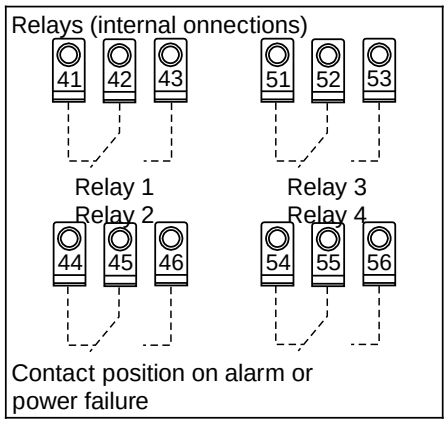
① Relay de-energised

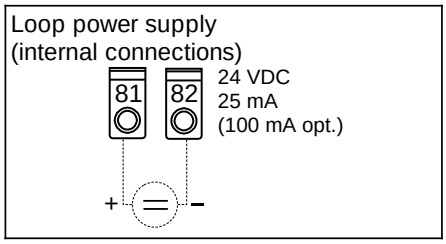
Dimensions

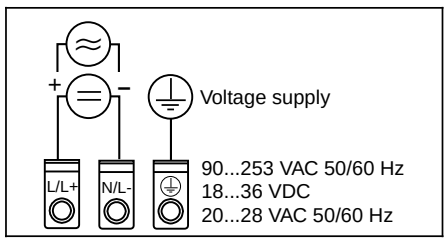


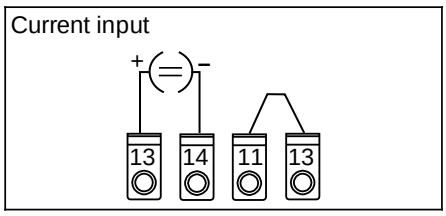
Electrical connection

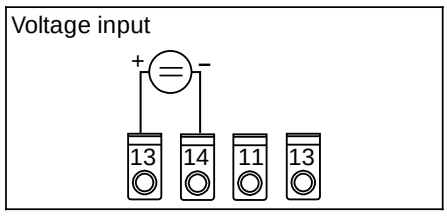


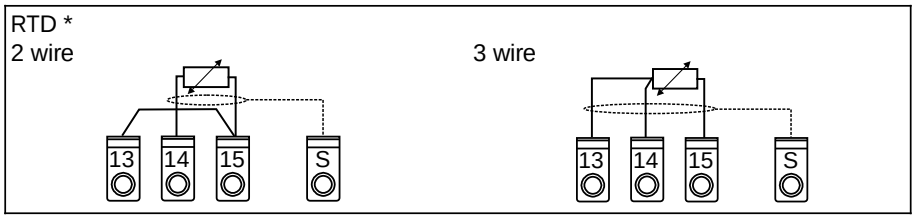


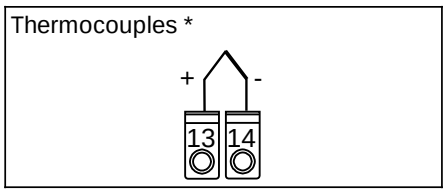






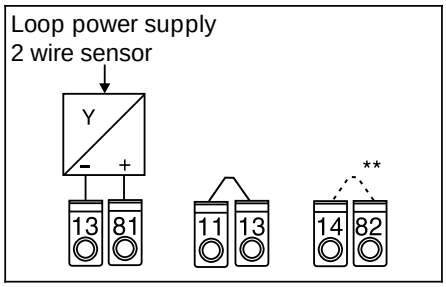






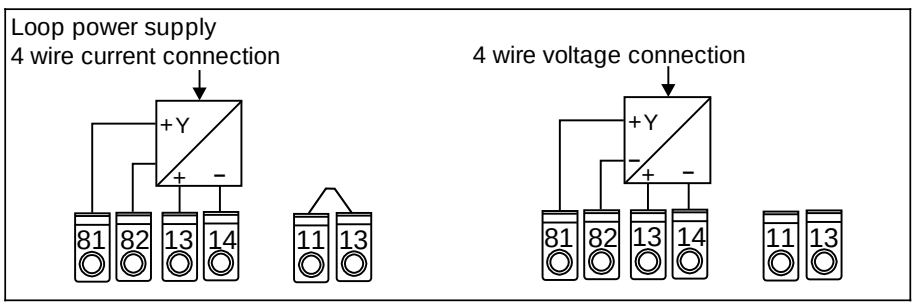
Note:

* Temperature measurement can only be made when the unit is fitted with the “universal input” option.



Note:

** If together with the option “Universal input” the current measurement and the internal loop power supply (terminals 81/82) is used then a link must be added between terminals 14 and 82.



Technical data

General information	Unit function	Process display for panel mounting.
Application	Process display, set point contactor	The display receives an analogue signal and shows the corresponding value on the display. Four presettable set points monitor the measured value for any infringement of the preset conditions and control the relays. Transmitters connected can be directly powered by the unit.
Operation and system construction	Measurement principle	The analogue signal connected is digitalised, analysed and indicated in the display.
	Measurement system	Microcontroller controlled display with LC display, analogue input, alarm set point relays and loop power supply.
Input	Input types	Voltage, current, resistive thermometer (RTD), thermocouple (TC)
	Measurement range (current/voltage input)	Voltage: 0...1/10 V; max. 50 VRi: 1 MOhm Current: 0/4...20 mA; max.100 mARi: 50 Ohm
	Measurement range (option “Universal input”)	Voltage: +/-20 mV, +/-50 mA, ±100 mV, ±200 mV, 1 V, ±2 V, ±5 V, ±10 V, 0...1 V, 0...10 V; max. ±50 V, Ri: 1 MOhm
		Current: 0/4...20 mA; max.100 mA Ri: 50 Ohm
		RTD: Pt100, Pt500, Pt1000: -100 °C ... +600 °C (DIN EN60751); Ni100: -60 °C...+180 °C (DIN 43760); Sensor current: approx. 1 mA; Connection: 2-, 3-wire; Cable compensation: Up to approx. 100 Ohm
		TC: Type T: -270...+400 °C Type J: - 210...+1200 °C Type K: -270...+1372 °C Type R: -50...+1800 °C Type S: 0...+1800 °C Type B: 200... +1820 °C Type N: -270...+1300 °C Type U: -200...+60 °C Type L: -200...+900 °C Type T, J, K, S, B, N to DIN EN60584; Type U, L to DIN 43710; With cable open circuit monitor
	Integration time	200 ms
Output (loop power supply)	Output signal	24 V +/- 10%, 25 mA (internal limit, short circuit protected) Option: 100 mA, without short circuit protection
	Number	1
Output (relays)	Output signal	Binary, switches on reaching the alarm set point
	Number	4
	Contact type	1 potential free changeover contact
	Contact load	<= 250 VAC, 3 A / 30 VDC, 3 A
Accuracy (Current/voltage input)	Voltage, current	Accuracy 0.25% of end value (FSD) Temperature drift 0.25% / 10 K ambient temperature
Acuracy (Option “Universal input”)	Current, voltage, RTD, TC	Accuracy 0.5% of end value (FSD) Temperature drift 0.25% / 10 K ambient temperature
	Cold junction TC	Accuracy ±5 K Temperature drift ±1 °C / 10 K ambient temperature

Technical data

Aplication conditions

Installation conditions	
Installation angle	No limit
Ambient conditions	
Ambient temp.	0 °C...50 °C
Storage temp.	-20 °C...+70 °C
Climatic class	To EN 60654-1 Class B2
Ingress protection	Front: IP65; Terminals: IP20
EMC immunity	
RF protection	To EN 55011 Group1, Class A
Safety	
Norm	To EN 61010 -1 protection class 1; Overvoltage category II, maximum allowable interference level II; Installation excessive current protection (surge fuse) <=10 A
Interference safety	
ESD	To EN 61000-4-2, 6 kV/8 kV
Electromagnetic fields	To EN 61000-4-3, 10 V/m
Burst (supply)	To EN 61000-4-4, 2 kV
Burst (signal)	To EN 61000-4-4, 2 kV
Cable high frequency	To EN 61000-4-6, 10 kV
Surge (supply)	To EN 61000-4-5, 1 kV symmetrical, 2 kV unsymmetrical
Surge (signal)	To EN 61000-4-5, 1 kV unsymmetrical with external overvoltage protection (surge)
Common mode noise rejection	To IEC 770, 60 dB at 60 V 50/60 Hz
Normal mode noise rejection	To IEC 770, 40 dB at measurement range 1/10, 50/60 Hz

Mechanical construction

Dimensions	W: 96 mm, H: 96 mm, D: 168 mm
Weight	Approx. 670 g.
Materials	Plastic PC (Polycarbonate)
Electrical connection	Plug on screw terminals 2 x 12 pole 2,5 mm² solid core, 1,5 mm² stranded with ferrule

Display

Display	LC display three colour, rear illuminated; 41 element bargraph with 41alarm set point arrows (yellow) 4 x 7 segment, 15 mm, numeric value (orange) 4 x 14 segment, 6 mm, engineering units (orange) 4 x 1 segment alarm set point infringement (red) 4 x exceed, 4 x undercut (arrows, red)
Display range	-999 to +9999 (can be inverted to the input signal)
Offset	-999 to 9999
Operation	3 push button operation (-/+/E)

Technical data

Alarm set point function	Mode	Off, minimum, maximum safety, trend analysis, alarm
	Number	4
	Hysteresis	-999 to 9999
	Time delay	0 to 100 s
	Display	Two bargraph markings per set point, 1 signal field and 1 exceed/undercut arrow per point
	Scan rate	400 ms
Power supply	Power supply	90...253 VAC, 50/60 Hz 18...36 VDC, 20...28 VAC, 50/60 Hz
	Power consumption	8 VA
	Fuse	315 mA slow blow (90...253 VAC), 1 A slow blow (18...36 VDC)
Certification	CE mark	Directive 89/336/EWG and 73/23/EWG
Additional documentation	System information	SI 006R/09/en/
	Operating manual	BA 086R/09/

Technical alterations reserved

How to order

RIA 450 process display

Alarm set points/relays
R Version with 4 alarm contacts
S Version without 4 alarm contacts

Power supply
1 90..253 V, 50/60 Hz
2 10...36 V DC/20...28 V AC, 50/60 Hz
cannot be supplied with the option “Universal input”

Measured signal input
1 0/4..20 mA, 0..1/10 V signal input loop power supply 25 mA
2 Universal input
Current, voltage, thermocouple + Pt100
3 0/4..20 mA, 0..1/10 V signal input loop power supply 100 mA

Model
1 96x96x168 mm HxWxD panel mounting
5 IP 65 field housing

RIA450-					← Order code

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