Technical information
TI 060R/09/en
SAP No. 51000120

Process display
RIA 250

Multifunctional 1 channel display with universal input, loop power supply, limit monitor and analogue output

Application areas

- Plant and machine construction
- Control panels
- Laboratory fittings
- Temperature display and monitoring
- Process display, monitoring
- Process control
- Signal match and transforming

Advantages

- Multi functional:
  All normal measurement signals can be directly connected (bipolar voltage and current, thermo-couple, RTD)
- Visual:
  Active numeric measured value display with bar graph
- Alarm:
  Flexible set point monitor with 2 changeover contacts
- Active:
  Scaleable current or voltage analogue output
- Power:
  Integrated loop power supply for connected sensors
- Communicative:
  RS232 interface for setting up and measured value output

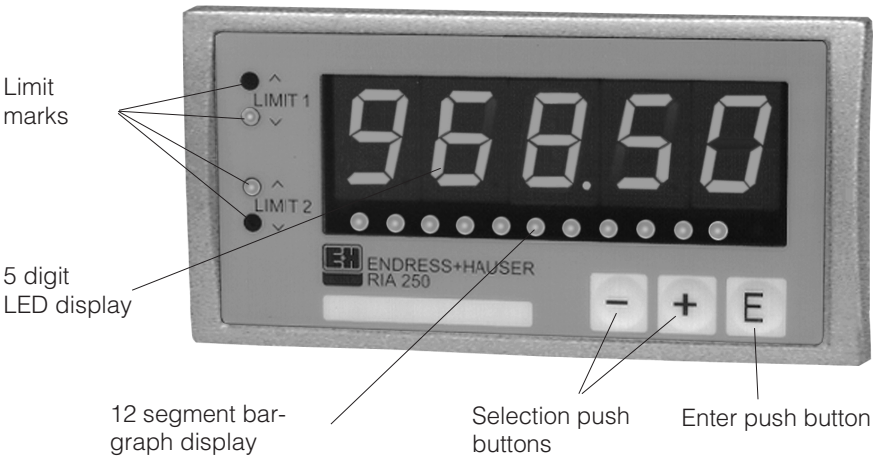
Endress+Hauser
The Power of Know How

Function

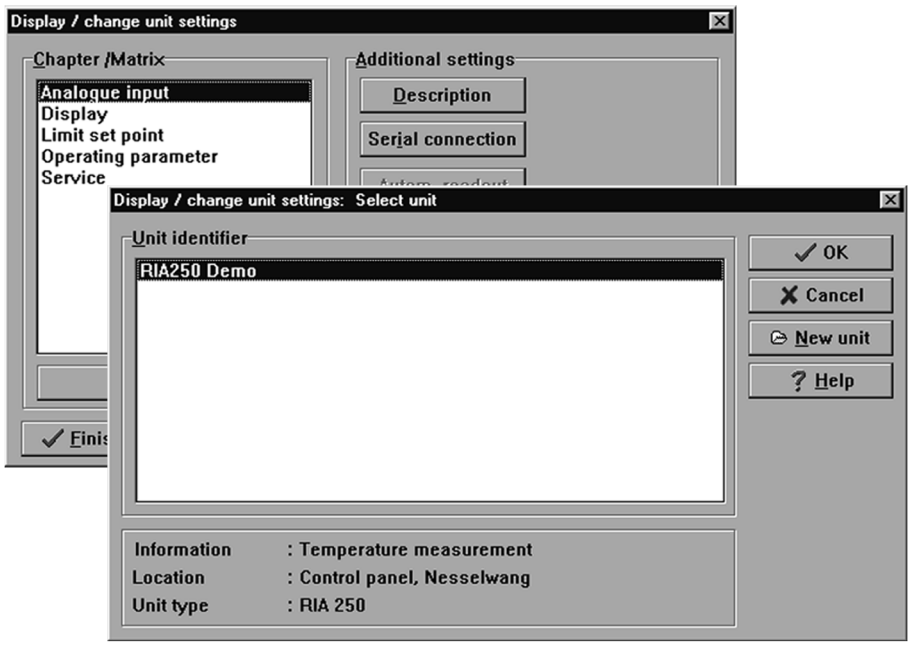
The presettable universal input enables direct connection of various sensors, whether current, voltage, RTD or thermo-couple. Using the built-in loop power supply the unit can also power the connected sensors and then evaluate the signal returning from the sensor to the input of the unit. Two presettable set points monitor the measured value for any deviation from the preset conditions.

This opens up a number of possibilities for direct process control. The scaleable analogue output offers an instrument from which a matched signal for further analysis equipment can be obtained. Simple setting up using an interface and PC programme as well as manual on site setting up are available.

Display



Interface/ ReadWin PC software



The RIA250 can be set up extremely easily using the built-in RS232 serial interface and the ReadWin®2000 PC software. Safe and secure setting up is made possible via on-line help text. ReadWin®2000 software package and interface cable are available as accessories.

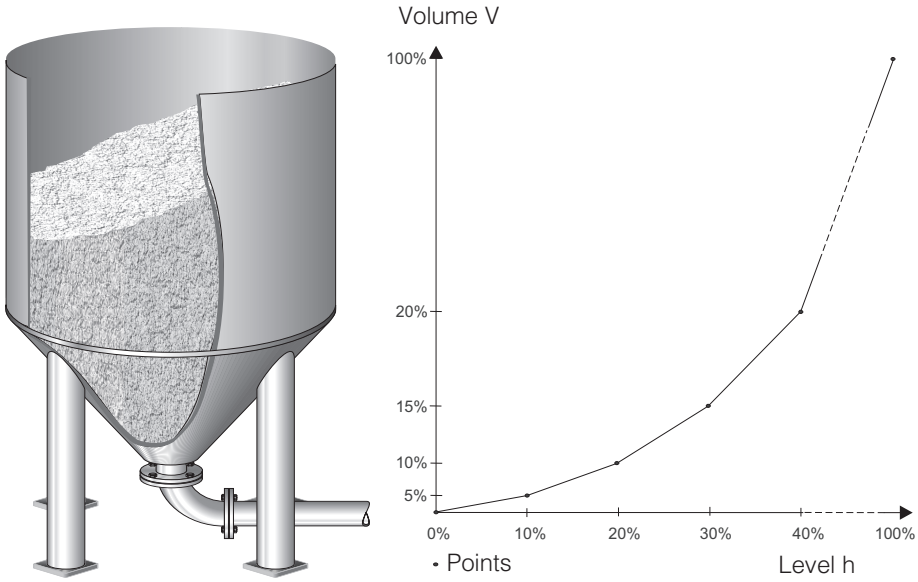
Special features:

- Uniform Windows 95/98/ME/NT4.0/ 2000/XP operating system.
- Storage of unit settings in a data bank
- Instantaneous value display
- Printout of unit settings

Linearisation

The RIA 250 display has a built in linearisation function. It is possible for the user to set up a connection between the input signal and the value to be displayed on the unit. These points can be set up at the front using the 3 front mounted push buttons or they can be comfortably defined and transmitted using the ReadWin operator software.

Example:
Linearisation of a vessel signal that describes the relationship between the filling height and the vessel volume.



Analogue output

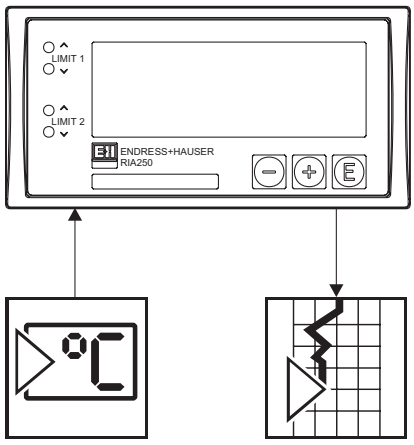
The RIA 250 display can be fitted with an analogue output (option). The output signal is proportional to the displayed measured value, the bargraph displays the input signal position.

Special features:
- Current/voltage output
- Galvanic isolation
- Infinite scaling within the display range
- Presettable fault operation to NAMUR recommendation NE43
- Invertable measurement signal output

Transmitter

Using the linearisation function and the analogue output the RIA 250 process display can also be applied as an easy to use amplifier. The large number of already stored temperature linearisation tables as well as a square root function can be easily selected from the setting up menu.

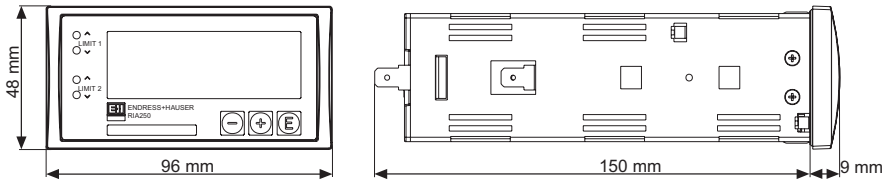
Example:
The signal from a temperature sensor is connected to the input of the unit, linearised and displayed as a temperature value.
The analogue output is made available to further instrumentation e.g. data loggers or recorders as a current or voltage signal proportional to the displayed value.

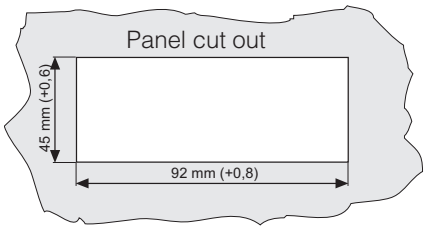


Limit function

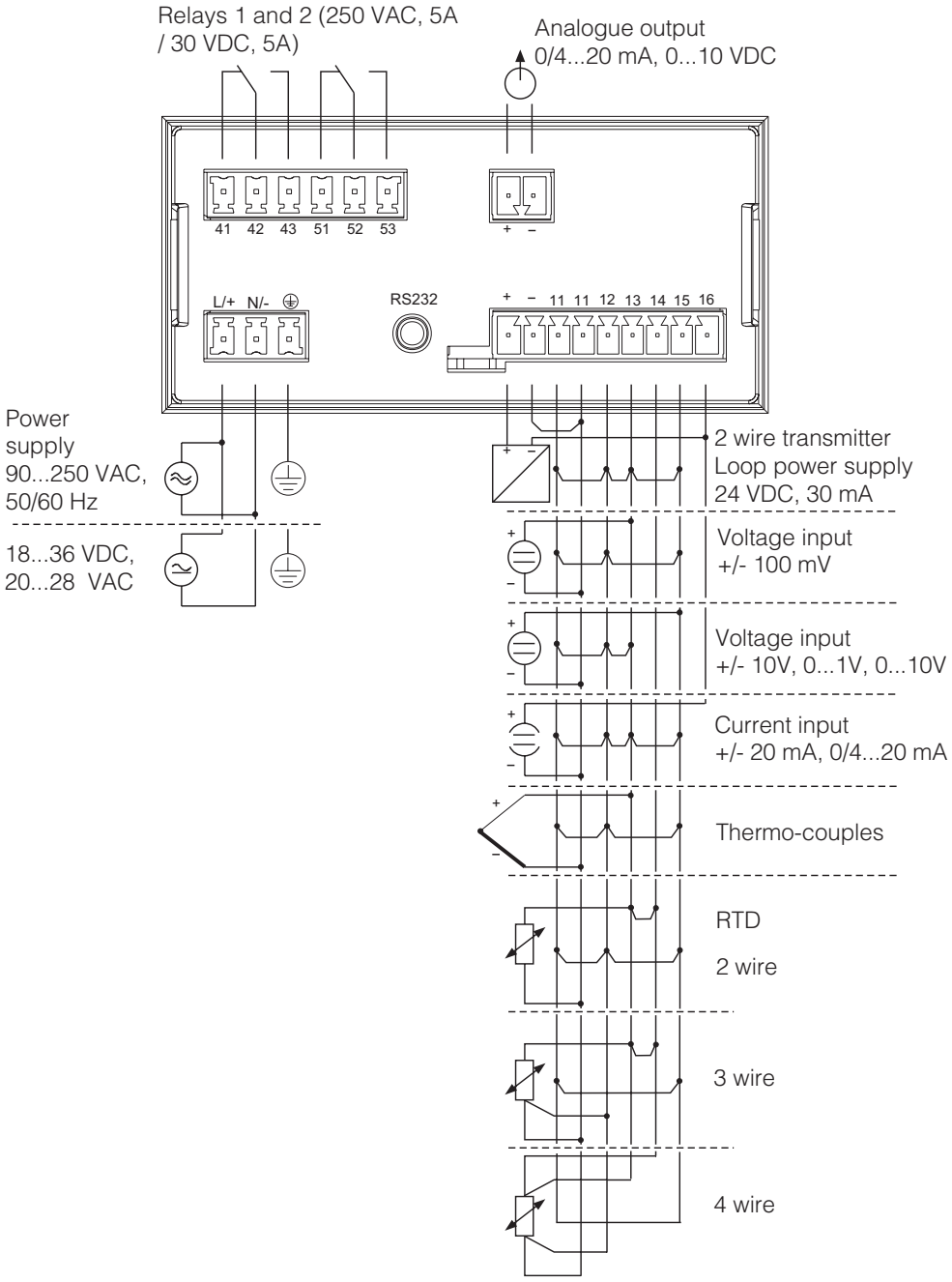
The additional limit function monitors the measured signal once per second in order to see that the preset parameters have been adhered to. Both limits can be individually set up for minimum or maximum security, as a high or low limit with presettable hysteresis as well as being able to define a switch time delay. The set point infringement is indicated using 2 LEDs, as an option, an output relay can be activated.

Dimensions





Electrical connection



Technical data

General	Manufacturer	Endress+Hauser
	Description	RIA 250
	Application	Process display for panel mounting
Application	Process display, transmitter	The display receives an analogue signal and shows the corresponding value on the display. The analogue output transmits this displayed value either as a current or voltage. Two presettable limit values monitor the measured value for any infringement of the preset conditions and control the two output relays. Transmitters connected are directly powered by the unit.
Operation and system construction	Principle	The analogue signal connected is digitalise, analoysed and indicated in the display. A digital analogue convertor makes a proportional current or voltage signal available for additional peripheral equipment at the output terminals.
	Mesurement system	Microcontroller controlled display with LED Display, analogue input, analogue output, limit relays and loop power supply.
Input	Input types	Voltage, current, resistive thermometer (RTD), Thermo-couple (TC)
	Measurement range	Voltage: +/-100mV; max. +/-5V +/-10V; max. +/-50V Ri: 1 MOhm
		Current: 0/4...20mA; max. 200mA Ri: 5 Ohm
		RTD: Pt100: -200°...+850°C (DIN EN60751) Ni100: -60°...+180°C (DIN 43760) Sensor current: approx. 250 µA, pulsed Connection: 2-, 3-, 4- wire Cable compensation: 40 Ohm
		T/C: Type T: -270...+400°C Type B: 0...+1820°C Type J: -210...+1200°C Type N: -270...+1300°C Type K: -200...+1372°C Type U: -200...+600°C Type R: -50...+1800°C Type L: -200...+900°C Type S: 0...+1800°C Type W3: 0...+2315°C Type W5: 0...+2315°C Type T, J, K, R, S, B, N to DIN EN60584; Type U, L to DIN 43710; Type W3, W5 to ASTME988-96
	Linearisation	Possible using a max. 32 points
	Integration time	1s
Output (loop power supply)	Output signal	24V +/-20%, 30mA
	Number of outputs	1
	Galvanic isolation	To all other current circuits
Output (analogue)	Output signal	0/4...20mA, 20...4/0mA or 0...10V, over range +10%
	Voltage	Output current max. 20 mA
	Current	Load max. 500 Ohm
	Fault message	Presettable 3.6 mA or 21mA Actions to NAMUR recommendation NE43
	D/A resolutiong	Current: 13 bit, Voltage: 15 bit
	Number of outputs	1
	Galvanic isolation	To all other current circuits

Output (relays)

Output signal	Binary, switches when set point is reached
Number of relays	2
Contact type	1 potential free changeover contact
Contact load	<= 250 VAC, 5 A / 30 VDC, 5 A

Accuracy

Voltage	Accuracy 0.05% of end value Temperature drift: 0.01% / 10K ambient temperature			
Current	Accuracy 0.05% of end value Temperature drift: 0.01% / 10K ambient temperature			
RTD	Accuracy: 2 wire: +/-0.8 °C 3 wire: +/-0.5 °C 4 wire: +/-0.3 °C Temperature drift: 0.01% / 10K ambient temperature			
T/C	Type T:	+/- 0.2 °C T< -150 °C +/-1.0 °C	Type N	+/- 1.0 °C
	Type J:	+/- 0.2 °C T< -150 °C +/-1.0 °C	Type U	+/- 0.5 °C
	Type K	+/- 1.0 °C	Type L	+/- 0.5 °C
	Type R	+/- 1.0 °C	Type W3	+/- 1.0 °C
	Type S	+/- 1.0 °C	Type W5	+/- 1.0 °C
	Type B:	T > 400 °C +/- 1.0 °C		
	Temperature drift: 0.01% / 10K ambient temperature			
Analogue output	Accuracy 0.04% of end value Temperature drift: 0.05% / 10K ambient temperature			
T/C cold junction	Accuracy: +/-0.5 °C; Resolution: 0.1 °C;			

Application conditions

Installation conditions	
Installation angle	No limit
Ambient conditions	
Ambient temperature	- 10 °C..+ 50 °C
Storage temperature	- 30 °C..+ 70 °C
Climatic class	To IEC 60654-1 Class B2
Ingress protection	Front: IP 65 Terminals: IP 20
EMC/immunity	
RF protection	To EN 55011 Group 1, Class A
Safety	
Norm	To IEC 61010-1 protection class 1, Overvoltage catagory II, Installation over current protection ≤ 10 A
Interferance safety	
ESD	To IEC 61000-4-2, 6 kV/8 kV
Electromagnetic fields	To IEC 61000-4-3, 10 V/m

Environmental conditions (continued)	Burst (supply)	To IEC 61000-4-4, 4 kV
	Burst (signal)	To IEC 61000-4-4, 4 kV
	Surge (AC supply)	To IEC 61000-4-5, sym. 1 kV, unsym. 2 kV
	Surge (DC supply)	To IEC 61000-4-5, sym. 0,5 kV, unsym. 1 kV
	Surge (Signal)	To IEC 61000-4-5, unsym. 1 kV
	Cable high frequency	To EN 61000-4-6, 10 V
	Common mode noise rejection	80 dB at 60 V 50/60 Hz
	Normal mode noise rejection	60 dB at input range 1/10, 50/60 Hz
Mechanical construction	Dimensions	W: 48 mm, H: 96 mm, D: 150 mm
	Weight	600g
	Materials used	Housing front: Die cast aluminium Housing casing: Galvanised sheet steel Housing rear panel: ABS plastic
	Electrical connection	Plug on screw terminals, Size 1.5 mm^2 solid, 1.0 mm^2 multi with ferrule
Display and operation level	Display	LED display, 2 colour Numeric display: 5 x 7 segment (red or green, 13 mm) Bargraph display: 12 element (yellow) Limit infringement: 4 x 1 segment (yellow)
	Range	- 19999 to + 99999
	Operation	3 push button operation (+/-/E) and/or software
	Interface	RS 232, on the unit rear panel, 3,5 mm stereo connection
Limit function	Operation mode	Off, minimum, maximum safety, alarm
	Number of limits	2
	Display	2 LED per limit
	Scan rate	1s
Power supply	Power supply	90...250 VAC, 50/60 Hz (operating altitude < 2000 m above sea level)
		18...36 VDC, 20...28 VAC 50/60 Hz
	Power sonsumption	11,5 VA (90...250 VAC); 5,5 VA (18...36 VDC, 20...28 VAC)
Certification	CE mark	89/336/EWG and 73/23/EWG guide lines
	GL-Marine approval	Germanischer Lloyd / marine approval
Order information	Order structure	See section “How to order”

How to order

RIA 250 process display

Certification
A Version for use in no EX areas

Power supply
1 90...250 VAC, 50/60 Hz
2 18...36 VDC, 20...28 VAC 50/60 Hz

Signal input
1 0/4...20 mA, 0...1/10 V, +/-100 mV, +/-10 V, thermocouple and Pt100, Ni100

Display
R Red numeric display, 5 digit
G Green numeric display, 5 digit

Analogue output/limit relays
1 Analogue output and limit relays not required
2 2 limit relays, each with one changeover contact (250 VAC, 5 A)
3 Analogue output 0/4...20 mA / 0...10 V and 2 limit relays, each with one changeover contact (250 VAC, 5 A)

Model
1 Panel mounting 48x96 mm, depth 150 mm
2 Panel mounting 48x96 mm, depth 150 mm with works calibration certificate
3 Field housing, IP65, 204x155x215 mm
4 Field housing, IP65, 204x155x215 mm with works calibration certificate

RIA250-							←Order code

Accessories

PC software ReadWin®2000 for unit setting up with connection cable (approx. 1 m long), 9 pin Sub. D connector and 3.5 mm stereo plug.

Order No. RIA250A-VK

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