Operating instructions

Digital indicator, model DI35-D

EN

Digital indicator for panel mounting

WIKA

Part of your business

Prior to starting any work, read the operating instructions!
Keep for later use!

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Declarations of conformity can be found online at www.wika.com.

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1. General information

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- The digital indicator described in these operating instructions has been designed and manufactured using state-of-the-art technology. All components are subject to stringent quality and environmental criteria during production. Our management systems are certified to ISO 9001 and ISO 14001.
- These operating instructions contain important information on handling the instrument. Working safely requires that all safety instructions and work instructions are observed.
- Observe the relevant local accident prevention regulations and general safety regulations for the instrument's range of use.
- The operating instructions are part of the product and must be kept in the immediate vicinity of the instrument and readily accessible to skilled personnel at any time. Pass the operating instructions on to the next operator or owner of the instrument.
- Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.
- The general terms and conditions contained in the sales documentation shall apply.
- Subject to technical modifications.
- Further information:
  - Internet address: www.wika.de / www.wika.com
  - Relevant data sheet: AC 80.03
  - Application consultant: Tel.: +49 9372 132-0
    Fax: +49 9372 132-406
    info@wika.de

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2. Design and function

2.1 Overview, version for panel mounting

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Designation		Description
①	Key [☼]	Programming mode is accessed Changes to a deeper parameter level
②	Key [▼]	MIN memory is accessed Changes lower limit values Changes between parameters Changes parameter values
③	Key [▲]	MAX memory is accessed Changes lower limit values Changes between parameters Changes parameter values
④	Key [O]	Multi-function key
⑤	Switch point display	Displays the status of the switching outputs
⑥	Mounting element with clamping screw	Used for fixing
⑦	7-segment display	Displays measured values, program numbers or parameters
⑧	Product label	Contains product information

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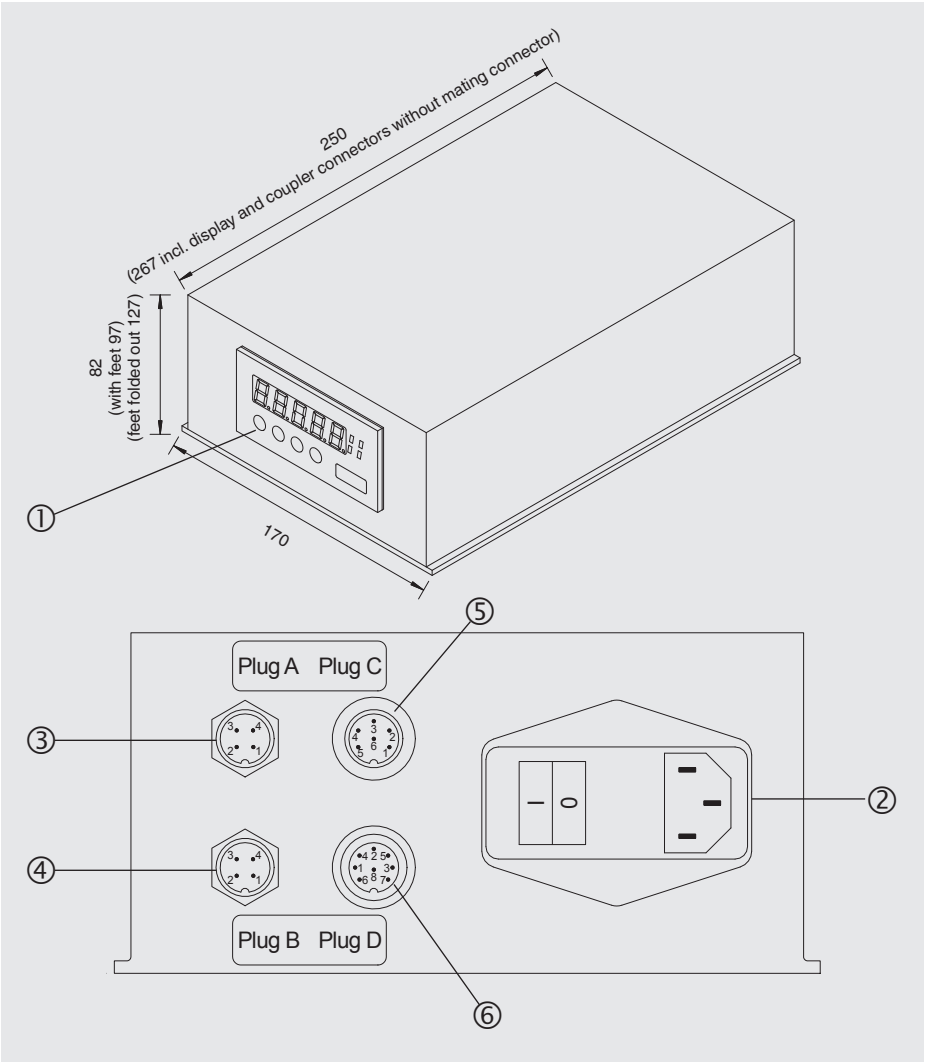
2.2 Overview, version in desktop case



Designation	
①	Digital indicator (→ for description see chapter 2.1)
②	Mains plug with switch
③	Plug A (measuring input 1)
④	Plug B (measuring input 2)
⑤	Plug C (switching outputs)
⑥	Plug D (transmitter power supply, analogue output, serial interface)

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2.3 Description

The model DI35 digital indicator is a multi-function and very accurate instrument for a wide variety of measuring tasks.

The DI35-D is equipped with two inputs for standard signals (0/4 … 20 mA and DC 0 … 10 V) that can be used in any combination. The display can show one of the two input signals or a calculated value. Calculations can be made by means of the four basic arithmetic operations (+ - * /) and an additional constant multiplier.

In addition, both versions offer the possibility to calibrate sensors and linearise using up to 30 points. This allows further adaptation of the displayed values to different sensor signals and application requirements. The standard features are completed by a transmitter power supply, a HOLD function and a TARE function for the correction of offset shifts and sensor drifts. The sampling rate and display time can be configured and the display can be dimmed. Unauthorised alteration of the set instrument parameters can be prevented via different user levels, in conjunction with a freely selectable access code.

Optionally available are up to four freely configurable switch contacts, an analogue output signal and a serial interface.

Functions

- Calculation function (4 basic calculation types, constant multiplier)
- Analogue output
- Retrieval of the MIN/MAX value
- HOLD and TARE function
- Linearisation of the measuring input
- Semiconductor switching outputs (option)
- Switch point display (option)
- Adjustable switch points (option)

2.4 Scope of delivery

Version for panel mounting

- Digital indicator
- Sealing
- 2 mounting elements
- Operating instructions
- Unit characters

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Version in desktop case

- Digital indicator
- Mains connection cable with connector per CEE 7/4
- Operating instructions
- Unit characters
- Mating connector connections

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In place of the mains connection cable supplied, other mains connection cables can be used so long as they fulfil the following characteristics:

- Connector per IEC 60320 C13 for connection to the instrument
- Protective conductor available
- Cable is certified and approved by a recognised notified body for the country of operation

Cross-check scope of delivery with delivery note.

3. Safety

3.1 Explanation of symbols

DANGER!
... identifies hazards caused by electrical power. Should the safety instructions not be observed, there is a risk of serious or fatal injury.

WARNING!
... indicates a potentially dangerous situation that can result in serious injury or death, if not avoided.

CAUTION!
... indicates a potentially dangerous situation that can result in light injuries or damage to equipment or the environment, if not avoided.

Information
... points out useful tips, recommendations and information for efficient and trouble-free operation.

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3.2 Intended use

The DI35 digital indicator is designed for the evaluation and display of sensor signals. With the switching outputs, it is possible to realise simple control functions.

The digital indicator is suitable only for indoor applications with pollution degree 2 and overvoltage category II.

This is a class B instrument for emissions and is intended for use in industrial environments. In other environments, e.g. residential or commercial installations, it can interfere with other equipment under certain conditions. In such circumstances the operator is expected to take the appropriate measures.

Only use the digital indicator in applications that lie within its technical performance limits (e.g. max. ambient temperature).

→ For performance limits see chapter 11 “Specifications”.

The instrument has been designed and built solely for the intended use described here, and may only be used accordingly.

The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use.

3.3 Improper use

WARNING!
Injuries through improper use
Improper use of the instrument can lead to hazardous situations and injuries.

- ► Refrain from unauthorised modifications to the instrument.
- ► Do not open the instrument.
- ► Do not use the instrument within hazardous areas.

Any use beyond or different to the intended use is considered as improper use.

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3.4 Personnel qualification

WARNING!
Risk of injury should qualification be insufficient
Improper handling can result in considerable injury and damage to equipment.

- The activities described in these operating instructions may only be carried out by personnel who have the qualifications described below.

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Skilled electrical personnel
Skilled electrical personnel are understood to be personnel who, based on their technical training, know-how and experience as well as their knowledge of country-specific regulations, current standards and directives, are capable of carrying out work on electrical systems and independently recognising and avoiding potential hazards. The skilled electrical personnel have been specifically trained for the work environment they are working in and know the relevant standards and regulations. The skilled electrical personnel must comply with current legal accident prevention regulations.

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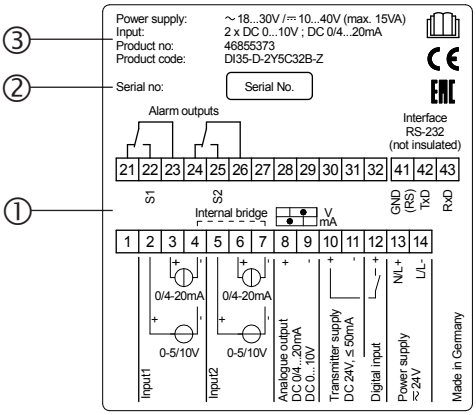
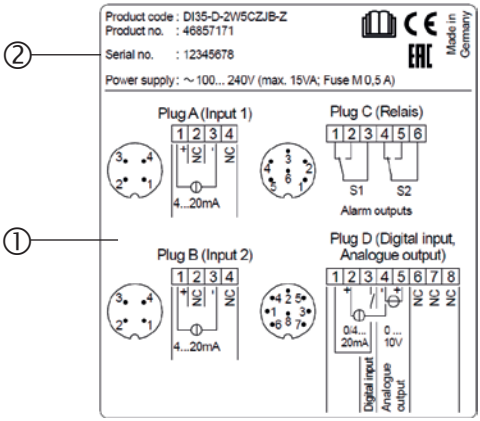
3.5 Labelling, safety marks

Product label, panel mounting



① Pin assignment
② Serial number
③ Specifications

Product label, desktop case



① Pin assignment
② Serial number

Symbols

Before mounting and commissioning the instrument, ensure you read the operating instructions!

4. Transport, packaging and storage

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4.1 Transport

Check the digital indicator for any damage that may have been caused by transport. Obvious damage must be reported immediately.

CAUTION!
Damage through improper transport
With improper transport, damage to property can occur.

- ► When unloading packed goods upon delivery as well as during internal transport, proceed carefully and observe the symbols on the packaging.
- ► With internal transport, observe the instructions in chapter 4.2 “Packaging and storage”.

4.2 Packaging and storage

Do not remove packaging until just before mounting.
Keep the packaging as it will provide optimum protection during transport (e.g. change in installation site, sending for repair).

Permissible conditions at the place of storage:

- Storage temperature: -20 ... +80 °C
- Humidity: 0 ... 75 % relative humidity (no condensation)

Avoid exposure to the following factors:

- Direct sunlight or proximity to hot objects
- Mechanical vibration, mechanical shock (putting it down hard)
- Soot, vapour, dust and corrosive gases

Store the digital indicator in its original packaging in a location that fulfils the conditions listed above. If the original packaging is not available, pack and store the instrument as described below:

1. Wrap the instrument in a plastic film.
2. Place the instrument, along with shock-absorbent material, in the packaging.

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5. Commissioning

If the instrument is transported from a cold into a warm environment, the formation of condensation may result in instrument malfunction. Before putting it into operation, wait for the instrument temperature and the room temperature to equalise.

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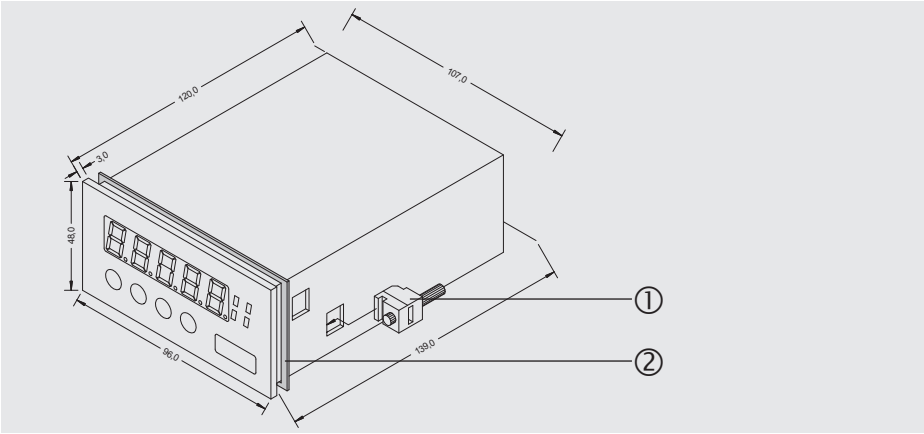
5.1 Requirements for the installation location

- In the vicinity there should be no magnetic or electrical fields, e.g. from transformers, radio-telephones or electrostatic discharges.
- In the vicinity there should be no strong heat sources. The permissible operating temperature must not be exceeded (max. 50 °C).
- The installation location must conform to pollution degree 2.
- No direct sunlight or proximity to hot objects
- No mechanical vibration, mechanical shock (putting it down hard)
- No soot, vapour, dust and corrosive gases

5.2 Mounting, version for panel mounting



① Mounting element with clamping screw
② Sealing

Cutting out the control panel

- Control panel thickness max. 15 mm
- Panel cutout $92.0^{+0.6}$ x $45.0^{+0.3}$ mm

Recommended mounting grid: 120 mm horizontal, 96 mm vertical

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Installing the digital indicator

1. As required, slide the unit characters into the window provided via the lateral channel.
2. Remove the mounting elements.
3. Slide the seal over the digital indicator.
4. Slide the digital indicator into the control panel from the front.
   Check the seal is properly seated.
5. Lock the mounting elements into place and tighten the clamping screws (max. 0.1 Nm).

5.3 Mounting, version in desktop case

► Connect the digital indicator to the socket using the mains connection lead.

5.4 Electrical connection

5.4.1 Notes on installation

- The voltage supply must comply with overvoltage category II.
- With the panel mounting version, protect the voltage supply with a slow fuse of max. 0.5 A. With the desktop case version, the fuse is integrated.
- For the panel-mounting version, a suitable isolation device must be provided.
- Route the signal input lines and signal output lines separately.
- Route outward and return lines side-by-side.
- Galvanically isolated potentials must be connected to a suitable point (e.g. earth or plant ground).
- For high-accuracy requirements and small measuring signals, the sensor wires must be shielded and twisted. The shield should be connected at one end only to a suitable equipotential bonding (e.g. measurement ground).
- Avoid electrostatic discharges in the area of the terminals.

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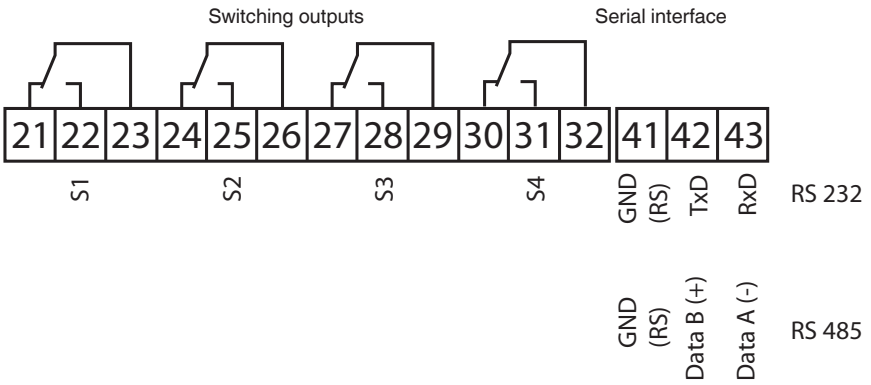
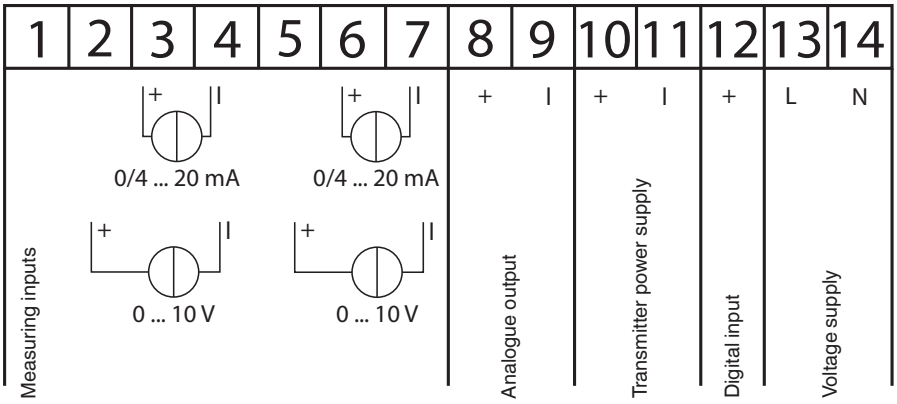
5.4.2 Pin assignment, version for panel mounting

Terminal assignment (upper terminal block)



For further information see chapter 11 “Specifications”

Terminal assignment (lower terminal block)



For further information see chapter 11 “Specifications”

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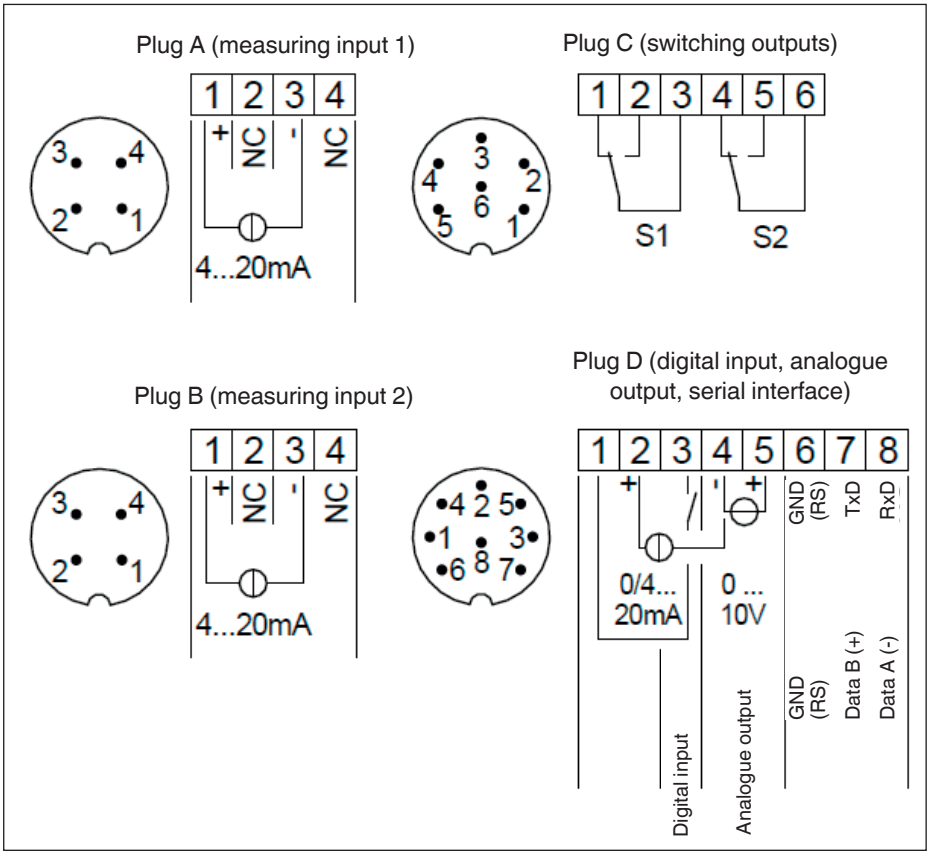
5.4.3 Pin assignment, version in desktop case



Suitable mating connectors are included in the delivery.

Depending on the version, not all connections are available (instruments without switch points do not feature a plug C, instruments without analogue output and serial interface do not feature plug D).

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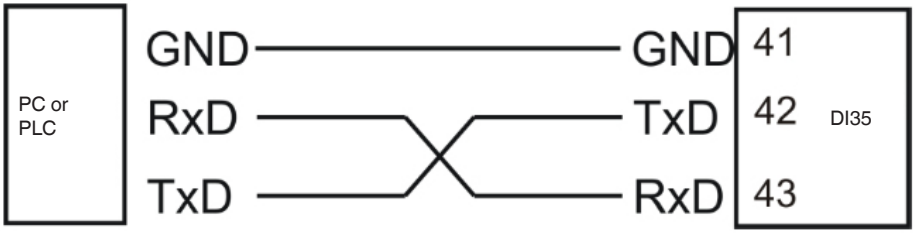
5.5 Interface connector

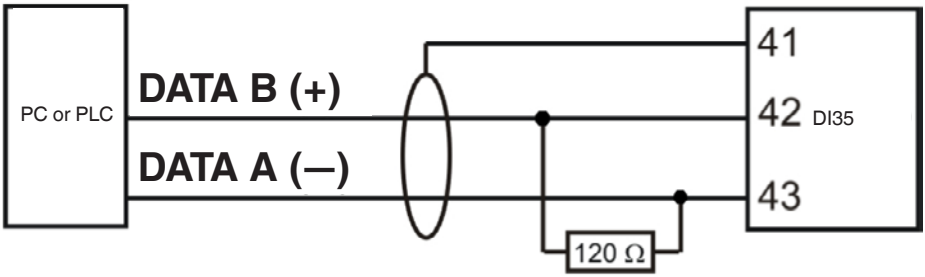
RS-232

The RS-232 interface cables must be connected 1:1 (TxD to TxD and RxD to RxD).



RS-485

The RS-485 interface is connected via a shielded data cable with twisted pairs. At each end of the bus segment, a termination of the bus lines must be connected. This is needed in order to ensure safe data transfer over the bus. For this, a resistor (120 Ω) is inserted between data B (+) and data A (-).



Where interfaces are not galvanically isolated, the potential reference between the interface and the measuring input can lead to a compensating current. This compensating current can influence the measuring signals.

5.6 Switching on the digital indicator

► Connect the power supply.

⇒ Segment test is carried out. Check the correct operation of all LEDs

⇒ Software type and software version are displayed.

⇒ Digital indicator is ready for operation.

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5.7 Connection examples, version for panel mounting

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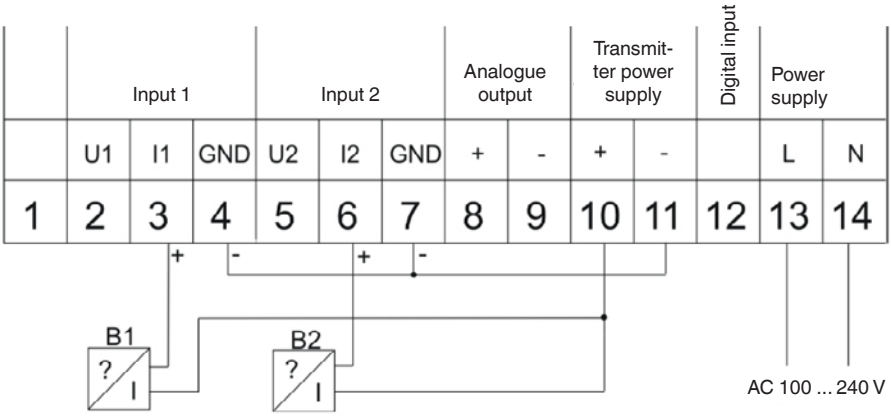
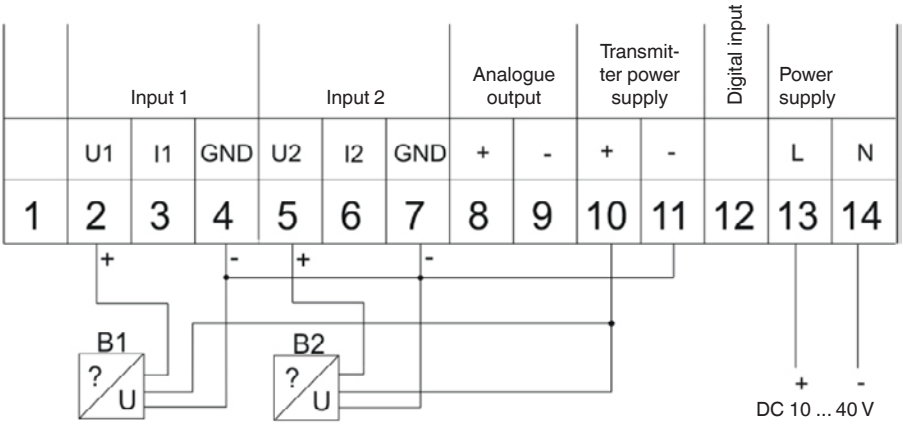
2-channel measurement with current signals, 2-wire transmitter, AC 100 ... 240 V supply



2-channel measurement with voltage signals, 3-wire transmitter, DC 10 ... 40 V supply



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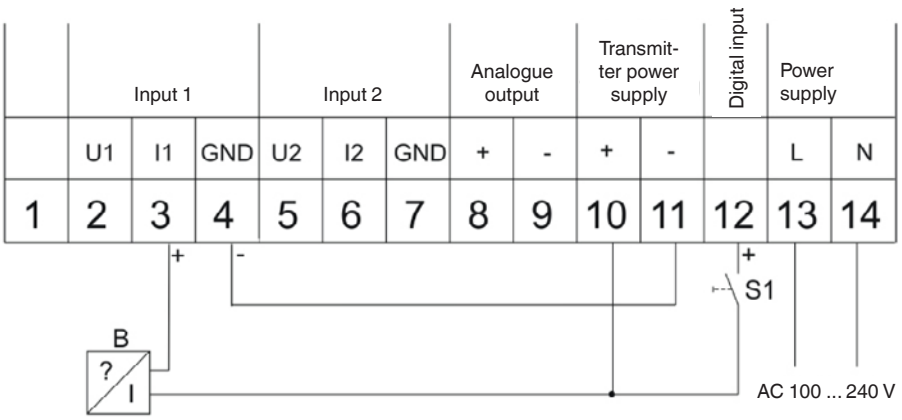
1-channel measurement with current signal in conjunction with digital signal and transmitter power supply, 2-wire transmitter, DC 100 ... 240 V supply



6. Operation

6.1 Key functions

Key	Function
Key [☼]	Programming mode is accessed Pressing < 1 s: Changes the cursor position Pressing > 1 s: Saves all parameters
Key [☼] + [▼] [▲]	Scrolls through the program numbers (PN) Pressing > 1 s: Automatically starts cycle
Key [▼]	Pressing < 1 s: Selects or changes parameter Pressing > 1 s: Switches the input channel display
Key [▲]	Pressing < 1 s: Selects or changes parameter Pressing > 1 s: Switches the input channel display
Key [○]	Multi-function key Selects functions (e.g. HOLD or TARE)

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6.2 Accessing and exiting programming mode

Accessing programming mode

► Press [☼].

⇒ Digital indicator is in programming mode

⇒ Lowest available program number is displayed.

→ Available program numbers are dependent upon the authorisation level, see chapter 7.6.1 “Authorisation levels”.

Exiting the programming mode

If no keys are pressed within 7 seconds, the digital indicator switches back to display mode.

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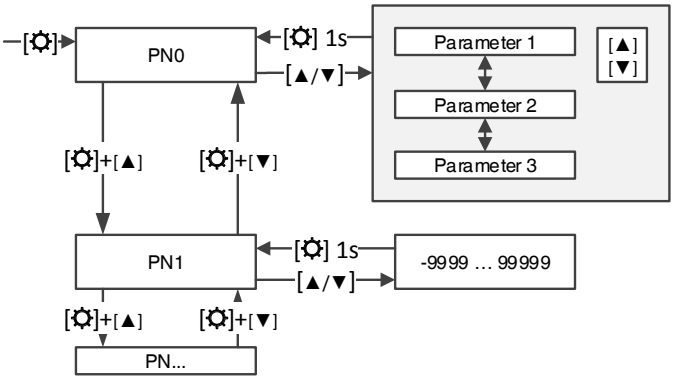
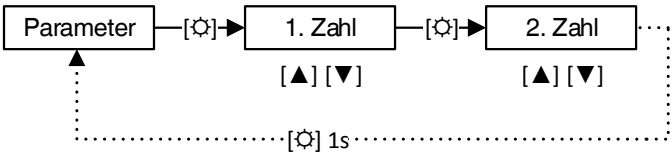
6.3 Navigating in the menu



6.4 Changing numerical values



6.5 Accessing or clearing MIN/MAX values

Accessing MIN value

► Press [▼].

⇒ MIN value is displayed 7 s.

Accessing MAX value

► Press [▲].

⇒ MAX value is displayed 7 s.

Clearing MIN/MAX values

► Press [▼] + [▲].

⇒ Horizontal bars are displayed.

⇒ MIN/MAX values are cleared.

The MIN/MAX values are lost when the instrument is switched off.

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6.6 Switching the display between measuring inputs

The switching of measuring inputs changes between the display values of the measuring inputs and the display value of the arithmetic calculation. The display value of the arithmetic calculation is only displayed when this has been configured.

The following methods are supported:

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Method	Description
Static	A preset display value is shown for the duration of the trigger signal.
Triggered	With each trigger pulse, the measuring input is switched further (series Ch1, Ch2, Ar).
Cyclic	The change is made cyclically over a preset time interval (series Ch1, Ch2, Ar).

For the trigger signal, the multi-function button or the digital input can be used (for programming, see chapter 7.6 “Switching of measuring inputs”)

Before each change, the description of the measuring input is displayed.

- Measuring input 1 = Ch1
- Measuring input 2 = Ch2
- Arithmetic calculation = Ar

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7. Description of program numbers

For an overview of the program numbers see appendix 1 “Overview of program numbers”

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7.1 Setting measuring inputs

7.1.1 Input signal

The digital indicator features two measuring inputs. Each measuring input can be set for a different input signal.

PN	Function	Parameter
0	Input signal, measuring input 1	Factory calibration 1 = DC 0 ... 10 V 2 = 0 ... 20 mA 3 = 4 ... 20 mA
5	Input signal, measuring input 2	Sensor calibration 4 = DC 0 ... 10 V 5 = 0 ... 20 mA 6 = 4 ... 20 mA

Parameters 1 ... 3 Used for standardised input signals. There must be no signal applied to the measuring input. The corresponding display values can be manually assigned.

→ For assigning display values, see chapter 7.1.2 “Start and end value”

Parameters 4 ... 6 Used for non-standardised input signals. The signal must be applied to the measuring input and the corresponding display value manually assigned.

→ For assigning display values, see chapter 7.1.2 “Start and end value”

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7.1.2 Start and end value

With this value pair, the measuring signal is assigned the desired indication value.

PN	Function	Parameter
1	End value (end of measuring range) Measuring input 1	-9999 ... 99999
2	Start value (start of measuring range) Measuring input 1	-9999 ... 99999
6	End value (end of measuring range) Measuring input 2	-9999 ... 99999
7	Start value (start of measuring range) Measuring input 2	-9999 ... 99999

Procedure for standard signals

► Set the corresponding display values.

Procedure for non-standard input signals

1. Apply the end value of the input signal to the measuring input.
2. Select PN 1/PN 6.
3. Set the display value.
4. Press [☼].
   ⇒ Input signal is associated with display value.
5. Apply the start value of the input signal to the measuring input.
6. Select PN 2/PN 7.
7. Set the display value.
8. Press [☼].
   ⇒ Input signal is associated with display value.
   ⇒ Display values are assigned.

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7.1.3 Number of decimal places

Specifies the number of decimal places that are displayed on the screen. This parameter has no influence on the scaling of the indication value.

PN	Function	Parameter
3	Number of decimal places, measuring input 1	00000 ... 0.0000
8	Number of decimal places, measuring input 2	00000 ... 0.0000

7.1.4 Offset adjustment

The input signal is shifted in parallel by the offset value.

PN	Function	Parameter
4	Offset value, measuring input 1	-9999 ... 99999
9	Offset value, measuring input 2	-9999 ... 99999

This parameter can be altered directly by making a tare if this was triggered through the multi-function button or the digital input.

7.2 General settings

7.2.1 Default display

Defines the measuring input which should be displayed as standard.

PN	Function	Parameter
10	Default display	1 = Measuring input 1
		2 = Measuring input 2
		3 = Arithmetic function

→ For arithmetic function see chapter 7.3 “Arithmetic function”.

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7.2.2 Switching of measuring inputs

The switching of measuring inputs changes between the display values of the measuring inputs and the display value of the arithmetic calculation. The display value of the arithmetic calculation is only displayed when this has been configured.

The following methods are supported:

EN

Method	Description
Static	A preset display value is shown for the duration of the trigger signal.
Triggered	With each trigger pulse, the measuring input is switched further (series Ch1, Ch2, Ar).
Cyclic	The change is made cyclically over a preset time interval (series Ch1, Ch2, Ar).

For the trigger signal, the multi-function button or the digital input can be used (see chapter 7.7 “Setting special inputs”, PN 53/PN 54)

Before each change, the description of the measuring input is displayed.

- Measuring input 1 = Ch1
- Measuring input 2 = Ch2
- Arithmetic calculation = Ar

PN	Function	Parameter
11	Switching of measuring inputs	0 = Key [▼] [▲] (triggered)
		1 = Measuring input 1 (static)
		2 = Measuring input 2 (static)
		3 = Arithmetic function (static)
		4 = Multi-function key (triggered)
		5 = Cyclic (5 s)
		6 = Cyclic (10 s)
		7 = Cyclic (20 s)

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7.2.3 Refresh rate

The refresh rate determines how often the display values are updated. With strongly fluctuating input signals, it is recommended that the refresh rate is adjusted (refresh rate > 1s).

The refresh rate acts only on the presentation of the display values. Switching outputs and other functions are not affected.

PN	Function	Parameter
13	Refresh rate	0.1 ... 10.0 s (default 1 s)

7.2.4 Measuring time

PN	Function	Parameter
14	Measuring time	0.04 ... 10.0 s (two measuring inputs) 0.02 ... 10.0 s (one measuring input)

7.2.5 Display brightness

PN	Function	Parameter
19	Display brightness	0 ... 9 (0 = bright, 9 = dark)

7.3 Arithmetic function

Calculation type	Formula
Addition	(Measuring input 1 + measuring input 2) · constant
Subtraction	(Measuring input 1 + measuring input 2) · constant
Multiplication	(Measuring input 1 · measuring input 2) · constant
Ratio	(Measuring input 1 / measuring input 2) · constant
Percent	(Measuring input 1 · 100) / measuring input 2

Calculation type	Example applications
Addition	Inflow and outflow quantities, weighing technology
Subtraction	Differential measurement (e.g. differential pressure)
Multiplication	Power and energy measurement
Ratio	Mixing ratios
Percent	Percentage ratios

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PN	Function	Parameter
15	Calculation type	1 = Measuring input 1 · constant
		2 = Measuring input 2 · constant
		3 = Addition
		4 = Subtraction
		5 = Multiplication
		6 = Ratio
		7 = Percent
16	Constant	-9999 ... 99999
17	Number of decimal places of constants	00000 ... 0.0000
18	Number of decimal places of calculation	00000 ... 0.0000

With the calculation of the arithmetic function, all set decimal points are included (PN 3, PN 8, PN 17, PN 18)

7.4 Setting the analogue output (option)

The analogue output gives the measured values of the digital indicator as a standard signal (DC 0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA).

7.4.1 Start and end value

The analogue output can be assigned any measuring input. The output signal is updated simultaneously with the measuring input. The refresh rate is determined by the configured measuring time. The start and end value for the analogue signal can be assigned user-defined measured values.

The start and end value defines at which display value the minimum and maximum output signal will be given. The display value is dependent upon the setting of the input signal (see chapter 7.1.1 “Input signal”)

PN	Function	Parameter
20	Full scale	-9999 ... 99999
21	Start value	-9999 ... 99999

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7.4.2 Reference value

The reference value is the value which is given via the analogue output.

PN	Function	Parameter
22	Reference value	0 = Analogue output deactivated
		1 = Measuring input 1
		2 = Measuring input 2
		3 = Arithmetic function

7.4.3 Output signal

PN	Function	Parameter
23	Output signal	0 = DC 0 ... 10 V
		1 = 0 ... 20 mA
		2 = 4 ... 20 mA

In addition, the output signal must be set via the DIP switch on the rear of the instrument.
DC 0 ... 10 V = Switch set to the right
0/4 ... 20 mA = Switch set to the left

With the desktop case, the output signal is determined via the assignment of plug D (see pin assignment).

7.4.4 Example

A rotational speed of 0 ... 3,000 min-1 should be transmitted to a control room via 4 ... 20 mA. The rotational speed sensor is connected to measuring input 1.

1. Set the end value to 3,000.
2. Set the start value to 0.
3. Set the reference value to 1.
4. Set the output signal to 2.
5. Set the DIP switch.
   ⇒ Analogue output is set.

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7.5 Setting the serial interface (option)

PN	Function	Parameter
34	Interface properties	0 = Standard mode
		1 = Sending mode

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Interface properties	Description
Standard mode (= Configuration mode)	In this mode, the digital indicator can be configured. Responses will only be transmitted on request. The current measured value can be queried via “A↵”.
Sending mode	Measured values are sent cyclically. The cycle corresponds to the set measuring time.

Cancel sending mode
The sending mode is cancelled on receipt of “> ↵” and the instrument returns to standard mode.

Activate sending mode
Restart the digital indicator or transmit the command “S ↵”.

Protocol structure
Display values are transmitted in ASCII format. Minus signs and decimal points can be displayed directly on a terminal display or processed by a PLC. Leading spaces are disabled with transmission. With an over- or underrange, hyphens are transmitted “- - - - - ↵”.

Example: “0.00 ↵”; “-9.99 ↵” ; “999.99 ↵”; “-123.45”; “ - - - - - ↵”; “Lbr ↵”

The display values can be processed or stored on a PC via a terminal program.

Settings
- Point-to-point connection
- Transmission rate 9,600 baud
- 8 data bits
- without parity
- 1 stop bit

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7.6 Setting user authorisations

7.6.1 Authorisation levels

Via the user authorisation, it is possible to limit which settings can be made by the operator. The authorisations can be allocated in different authorisation levels.

Function	PN	Authorisation level							
		1	2	3	4	5	6	7	8
Changing the display brightness	19	✓	✓	✓	✓	✓	✓	✓	✓
Allocating the locking code	50	✓	✓	✓	✓	✓	✓	✓	✓
Reading the serial number	200	✓	✓	✓	✓	✓	✓	✓	✓
Changing switch points	61, 71, 81, 91	✓	✓	✓	✓	✓	✓	✓	-
Setting the switching output	59 ... 95	✓	✓	✓	✓	✓	✓	-	-
Setting the interface	32 ... 34	✓	✓	✓	✓	-	-	-	-
Setting the analogue output	20 ... 22	✓	✓	✓	✓	-	-	-	-
Setting measuring inputs	0 ... 18	✓	✓	✓	-	-	-	-	-
Carrying out a linearisation	100 ... 170	✓	✓	✓	-	-	-	-	-
Inputting a release code	51	✓	-	-	-	-	-	-	-
Changing the authorisation level	52	-	-	-	-	-	-	-	-

The authorisation levels can only be changed if the release code corresponds to the locking code (password protection). On delivery, both parameters are set to the value 0000, whereby the programming lockout is deactivated.

PN	Function	Parameter
50	Locking code	0000 ... 9999
51	Release code	0000 ... 9999
52	Authorisation level	0 ... 8

7.6.2 Cancelling the password protection

The password protection is cancelled when the release code corresponds to the locking code.

If the locking code is lost, the instrument can be reset by the manufacturer.

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7.7 Setting special functions

7.7.1 Function of the digital input

PN	Function	Parameter
53	Function of the digital input	0 = Deactivated
		1 = Switching the measuring input
		2 = HOLD
		3 = TARE

EN

7.7.2 Function of the multi-function key

PN	Function	Parameter
54	Function of the multi-function key	0 = Deactivated
		1 = Switching the measuring input
		2 = HOLD
		3 = TARE

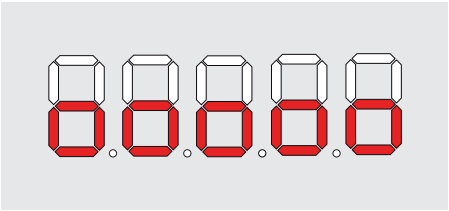
7.7.3 TARE function

The TARE function sets the display value of the stored measuring input to zero. The difference between zero and the display value is stored as an offset value.

The TARE function overrides a previously programmed offset shift of the measuring inputs (PN 4/9). Should the TARE function be used during a measurement, the offset shift has to be reprogrammed.

The TARE function can be activated through the multi-function key or the digital input (→ see chapter 7.7 “Setting special functions”). The key must be activated for at least 3 seconds.

The tare operation is represented as follows:



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PN	Function	Parameter
55	TARE function	0 = Deactivated
		1 = Measuring input 1
		2 = Measuring input 2
		3 = Measuring input 1 + 2

7.7.4 HOLD function

The HOLD function freezes the current display value. This is signalled via a flashing display.

The HOLD function can be activated through the multi-function key or the digital input (→ see chapter 7.7 “Setting special functions”).

The HOLD function can be switched statically or triggered.

Method	Description
Static	A display value is frozen for the duration of the trigger signal.
Triggered	The display value is frozen as soon the trigger is activated for a short time. The function is reset when the trigger is activated again.

PN	Function	Parameter
56	HOLD function	0 = Deactivated
		1 = Triggered
		2 = Static

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7.8 Setting the switching outputs

The switching outputs can be configured independently. Each switching output can be assigned a separate measuring input. The switching outputs react to the measuring input at any time, regardless of which measuring input is shown on the digital display.

7.8.1 Flashing display on reaching the switch points

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A switch point being exceeded can be signalled via a simultaneous flashing of the 7-segment display and switch point display.

PN	Function	Parameter
59	Flashing display	0 = not flashing
		1 = at switch point 1
		2 = at switch point 2
		3 = at switch point 3
		4 = at switch point 4
		5 = at switch point 1 + 2
		6 = at switch point 3 + 4
		7 = at switch point 1 + 2 + 3 + 4

Reading the switching status

The switching status of the switching outputs can be read from the switch point display.

7.8.2 Reference value

The reference value is the value to which the switching output reacts.

PN	Function	Parameter
60	Reference value, switching output 1	0 = Deactivated 1 = Measuring input 1 2 = Measuring input 2 3 = Arithmetic function
70	Reference value, switching output 2	
80	Reference value, switching output 3	
90	Reference value, switching output 4	

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7.8.3 Switch points

PN	Function	Parameter
61	Switch point, switching output 1	-9999 ... 99999
71	Switch point, switching output 2	-9999 ... 99999
81	Switch point, switching output 3	-9999 ... 99999
91	Switch point, switching output 4	-9999 ... 99999

7.8.4 Switch behaviour

PN	Function	Parameter
62	Hysteresis, switching output 1	1 ... 99999
72	Hysteresis, switching output 2	
82	Hysteresis, switching output 3	
92	Hysteresis, switching output 4	
63	Switching function, switching output 1	0 = Normally closed 1 = Normally open
73	Switching function, switching output 2	
83	Switching function, switching output 3	
93	Switching function, switching output 4	
64	Switching delay, switching output 1	0 ... 10 seconds
74	Switching delay, switching output 2	
84	Switching delay, switching output 3	
94	Switching delay, switching output 4	
65	Delay type, switching output 1	0 = none 1 = Switch-on delay 2 = Switch-off delay 3 = Switch-on and switch-off delay
75	Delay type, switching output 2	
85	Delay type, switching output 3	
95	Delay type, switching output 4	

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Normally open
Below the switch point, the switching output is switched off. On reaching the switch point, the switching output is switched on.

The switching output is switched off only when the switch point, less the hysteresis, is reached.

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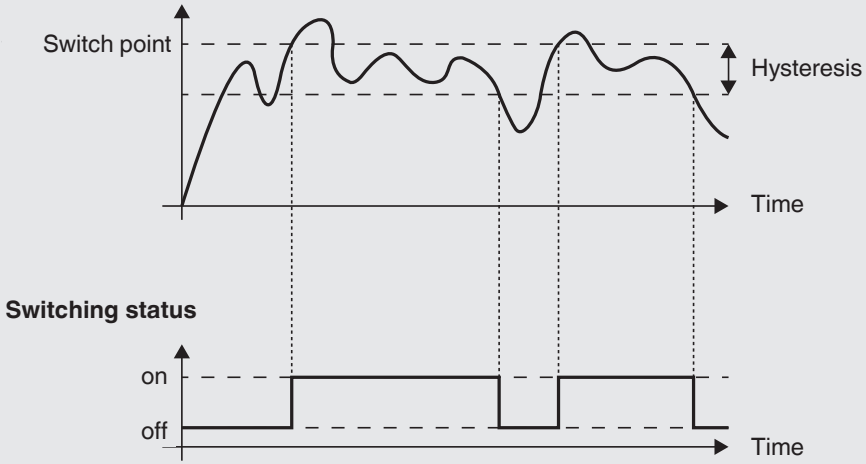

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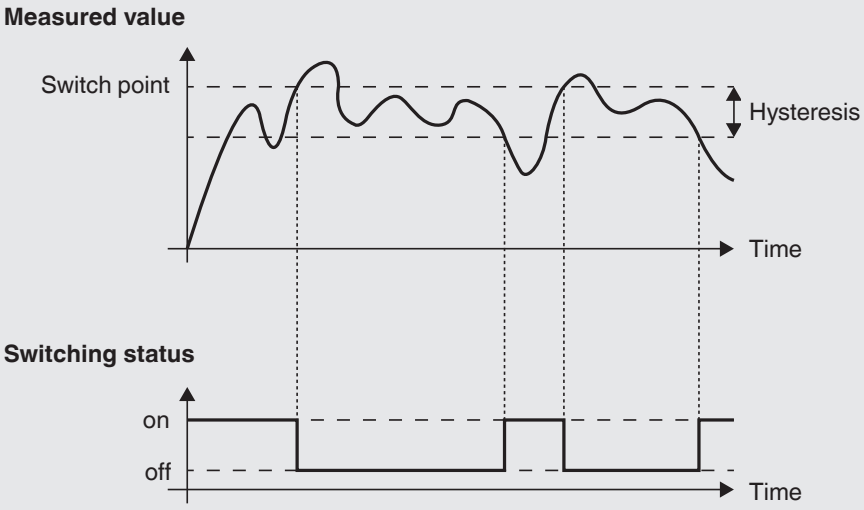
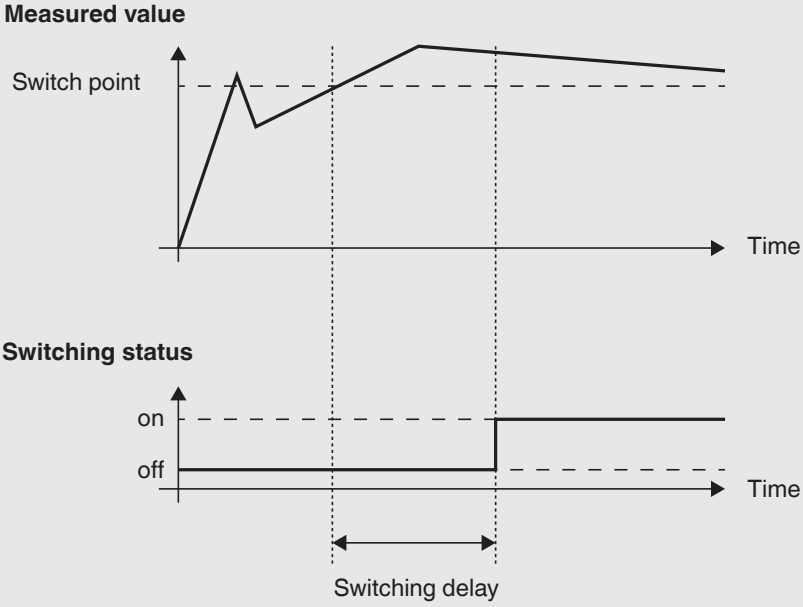
Normally closed
Below the switch point, the switching output is switched on. On reaching the switch point, the switching output is switched off.

The switching output is switched on only when the switch point, less the hysteresis, is reached.



Switch-on delay
The switching output is switched on only when the input signal remains above the switch point for at least the set switching delay.
This function prevents an unwanted switching of the switching output as a result of a short-term fluctuation of the input signal.

EN



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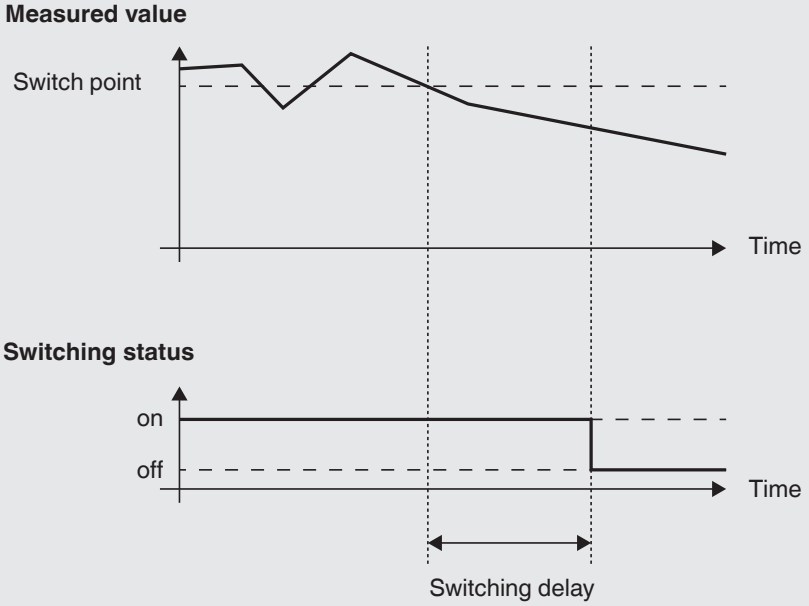
Switch-off delay
The switching output is switched off only when the input signal remains under the switch point for at least the set switching delay.
This function prevents an unwanted switching of the switching output as a result of a short-term fluctuation of the input signal.



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7.9 Linearising sensors

Non-linear sensors can be linearised with up to 30 interpolation points per measuring input.
At each interpolation point, the input signal is assigned a new display value manually.
The analogue output is also linearised since it is proportional to the display values.

EN

Each interpolation point must have a higher input signal than the previous. The corresponding display values can be freely assigned.

PN	Function	Parameter
100	Number of interpolation points, measuring input 1	0 ... 30
101 ... 130	Display value for interpolation point, measuring input 1	-9999 ... 99999
140	Number of interpolation points, measuring input 2	0 ... 30
141 ... 170	Display value for interpolation point, measuring input 2	-9999 ... 99999

Procedure

1. Set the number of interpolation points under PN 100/PN 140.
2. Apply the input signal for the first interpolation point, PN 101/PN 141, at the measuring input.
3. Set the desired display value under PN 101/PN 141.
   ⇒ Input signal is associated with display value.
4. Repeat steps 2 + 3 for all interpolation points.
   ⇒ Input signal is linearised.

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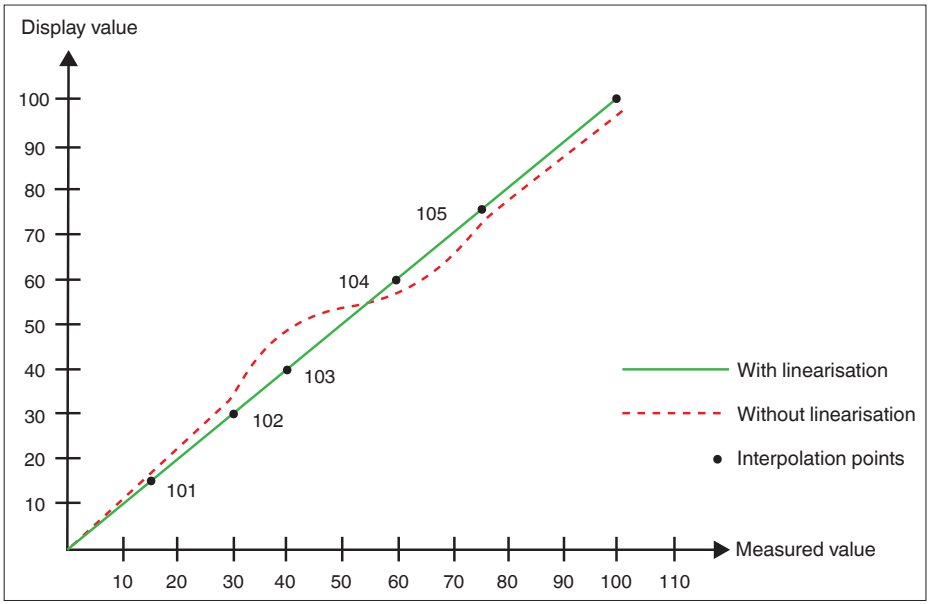
Example

Linearisation of a pressure sensor for 0 ... 100 mbar with an output signal of 0 ... 20 mA.

- Programming with 5 interpolation points.
- Non-linear range 0 ... 75 mbar.

Interpolation point	Pressure [mbar]	Transmitter output signal [mA]	Display value [mbar]	
			before linearisation	after linearisation
PN 2	0	0.5	2.5	0.0
PN 101	15	3.3	16.5	15.0
PN 102	30	6.2	31.0	30.0
PN 103	40	9.2	46	40.0
PN 104	60	11.4	57	60.0
PN 105	75	14.7	73.5	75.0
PN 1	100	20	100.0	100.0

For PN 101 this means:
With a pressure of 15 mbar, the transmitter delivers an output signal of 3.3 mA instead of 3.0 mA. Therefore, before correction, the display shows 16.5 mbar. This value is adjusted to 15.0 mbar using the interpolation point.



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7.10 Reading the serial number

PN	Function	Parameter
200	Serial number	0 ... 99999

EN

7.11 Restore factory settings

The factory settings can only be restored if the programming lock PN 50 allows access to all PNs or HELP is displayed. All application-specific data will be lost.

1. Switch off the power supply.
2. Press the multi-function key.
3. Apply power supply and hold the multi-function key for 2 s.
   ⇒ Factory settings are restored.

8. Faults

CAUTION!
Physical injuries and damage to property and the environment
If faults cannot be eliminated by means of the measures listed above, the instrument must be taken out of service immediately.

- ► Ensure that pressure or signal is no longer present and protect against accidental commissioning.
- ► Contact the manufacturer.
- ► If a return is needed, follow the instructions given in chapter 10.2 “Returns”.

Faults	Causes	Measures
Instrument shows permanent overrange	One of the measuring inputs has a very high measured value	Check measuring path
	With a measuring input with a small voltage signal, this is only connected on one side or the input is open	
	Not all activated interpolation points are parameterised	Check relevant parameter
	The arithmetic result gives an overrange	

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8. Faults

Faults	Causes	Measures
Instrument shows a permanent underrange	One of the measuring inputs has a very small measured value	Check measuring path
	With a measuring input with a small voltage signal, this is only connected on one side or the input is open	
	Not all activated interpolation points are parameterised	Check relevant parameter
	The arithmetic result gives an underrange	
Instrument displays “HELP”	Error in the configuration memory	Restore factory settings and re-enter the settings
Display values are changing in very large jumps	With a division, the measured value of the divisor is very small small	Check measuring path
Program numbers are not available	Access through user authorisation denied	
	Set sensor type is preventing the desired program number from being parameterised	
	The analogue output is an option. If this is not implemented, then the program numbers are hidden	
Instrument displays “Err1”		Contact the manufacturer
Digital input does not react		Measure input current of digital input. It should lie between 1 ... 3 mA.

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Overrange and underrange display

Each over- or underrange of a measuring input relates to a defined display. This definition ensures that the appropriate switch points go to a defined state.

Calculation type	Channel 1	Channel 2	Results
Addition	Overrange	OK or overrange	Overrange
	Underrange	OK or underrange	Underrange
	OK or overrange	Overrange	Overrange
	OK or underrange	Underrange	Underrange
	Overrange	Underrange	Overrange
Subtraction	Overrange	OK or overrange	Overrange
	Underrange	OK or underrange	Underrange
	OK or overrange	Overrange	Overrange
	OK or underrange	Underrange	Underrange
	Overrange	Underrange	Overrange
Multiplication	Overrange	OK or overrange	Overrange
	Underrange	OK or underrange	Underrange
	OK or overrange	Overrange	Overrange
	OK or underrange	Underrange	Underrange
	Overrange	Underrange	Overrange
Division	Overrange	as required	Overrange
	Underrange	as required	Underrange
	OK	Overrange	Underrange
	OK	Underrange	Underrange
Percent	Overrange	as required	Overrange
	Underrange	as required	Underrange
	OK	Overrange	Underrange
	OK	Underrange	Underrange

Illustration of overrange

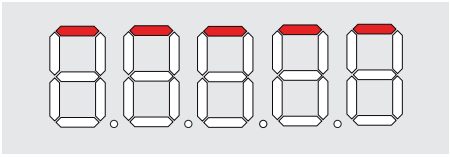
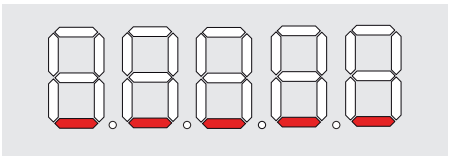


Illustration of underrange



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9. Maintenance and cleaning

9.1 Maintenance

This digital indicator is maintenance-free.
Repairs must only be carried out by the manufacturer.

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9.2 Cleaning

DANGER!
Danger to life caused by electric current
Upon contact with live parts, there is a direct danger to life.
► Only clean the case and contacts when the current is disconnected.

CAUTION!
Unsuitable cleaning agents
Cleaning with unsuitable cleaning agents may damage the instrument and the product label.
► Do not use any aggressive cleaning agents.
► Do not use any hard or pointed objects.
► Do not use any abrasive cloths or sponges.

1. Disconnect the digital indicator from the supply.
2. Wipe the instrument surface using a soft, damp cloth.

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10. Dismounting, return and disposal

10.1 Dismounting, version for control panel

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1. Disconnect the digital indicator from the supply.
2. Disconnect the electrical connection.
3. Remove the mounting elements.
4. Pull the digital indicator out of the control panel.

10.2 Return

Strictly observe the following when shipping the instrument:
All instruments delivered to WIKA must be free from any kind of hazardous substances (acids, bases, solutions, etc.) and must therefore be cleaned before being returned.

When returning the instrument, use the original packaging or a suitable transport packaging.

Information on returns can be found under the heading “Service” on our local website.

10.3 Disposal

Incorrect disposal can put the environment at risk.
Dispose of instrument components and packaging materials in an environmentally compatible way and in accordance with the country-specific waste disposal regulations.

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11. Specifications

Specifications	
Digital indicator	
Principle	7-segment LED, red, 5-digit, brightness adjustable in 10 gradations
Character size	14 mm
Indication range	-9999 ... 99999
Display rate	0.1 ... 10.0 seconds
Memory	EEPROM (parameter memory), data preservation > 100 years
Inputs	
Inputs	2 x input for standard signals
Digital input	< 2.4 V off, >10 V on, max. DC 30 V, Ri ≈ 5 kΩ
Input signals, version for panel mounting	0 ... 20 mA, R_i ≈ 50 Ω 4 ... 20 mA, R_i ≈ 50 Ω DC 0 ... 10 V, R_i ≈ 150 kΩ
Input signals, version in desktop case	4 ... 20 mA, R_i ≈ 50 Ω
Input configuration	Selectable via terminal connections and menu-driven programming
Accuracy	See the following tables “Accuracy/measuring errors of the input signals”
Temperature error	50 ppm/K, at ambient temperature T_U < 20 °C or T_U > 40 °C
Measuring principle	Sigma/delta
Resolution	24 bit (with 1 second measuring time)
Measuring time	0.02 ... 10.0 s, with 1-channel measurement 0.04 ... 10.0 s, with 2-channel measurement
Transmitter power supply	DC 24 V, max. 50 mA, galvanically isolated
Analogue output (option)	
Number and type	1 analogue output (galvanically isolated)
Output signal	4 ... 20 mA (12-bit), load ≤ 500 Ω 0 ... 20 mA (12-bit), load ≤ 500 Ω DC 0 ... 10 V (12-bit), load ≥ 100 kΩ
Error	0.1 % in the range 20 ... 40 °C 50 ppm/K outside temperature error
Internal resistance	100 Ω (with measuring input DC 0 ... 10 V)

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11. Specifications

EN

Specifications	
Switching output (option)	
Number and type	2 or 4 switch contacts (relays), freely programmable
Load capacity	AC 250 V, 5 A (resistive load) DC 30 V, 5 A (resistive load)
Number of switching operations	0.5 · 105 at max. contact load 5 · 106 mechanical Isolation in accordance with DIN EN 50178 Parameters in accordance with DIN EN 60255
Voltage supply	
Power supply	See product label Power supply galvanically isolated AC 100 ... 240 V, 50/60 Hz, DC 100 ... 240 V DC 10...40 V, AC 18 ... 30 V, 50/60 Hz Overvoltage category II
Power consumption	Max. 15 VA
Electrical connection	Removable plug-in terminal Wire cross-section up to 2.5 mm²
Serial interface (option)	
Interface	See product label ■ RS-232 (not galvanically isolated) ■ RS-232 (galvanically isolated) ■ RS-485 (not galvanically isolated, only for point-to-point connection) ■ RS-485 (galvanically isolated, only for point-to-point connection)
Protocol	Manufacturer-specific ASCII
Baud rate	9,600 baud, no parity, 8 data bits, 1 stop bit
Cable length	RS-232: max. 3 m RS-485: max. 1,000 m
Case, panel mounting	
Material	Glass-fibre reinforced polycarbonate, black
Ingress protection	Front: IP65, rear: IP00 (per IEC 60529)
Weight	approx. 350 g
Recommended mounting grid	120 mm horizontal, 96 mm vertical
Mounting	Sliding mounting elements, fixed via screws, for wall thicknesses up to 15 mm

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Specifications	
Case, desktop case	
Material	Front, rear, side plates: aluminium, black, powder-coated Cover, base plate: hard paper, black (Pertinax)
Ingress protection	IP40 (per IEC 60529)
Weight	approx. 1.6 kg
Fuse	Integrated fuse 0.5 A medium-acting (not to be changed by operator)
Operating conditions	
Permissible ambient temperatures	Operation: 0 ... 50 °C Storage: -20 ... +80 °C
Humidity	0 ... 75 % r. h. annual mean, without condensation
Requirements for the installation location	■ Pollution degree 2 ■ No direct sunlight or proximity to hot objects ■ No mechanical vibration, mechanical shock (putting it down hard) ■ No soot, vapour, dust or corrosive gases ■ This is a class B instrument for emissions and is intended for use in industrial environments. In other environments, e.g. residential or commercial installations, it can interfere with other equipment under certain conditions. In such circumstances the operator is expected to take the appropriate measures.

Accuracy/measuring errors of the input signals

Inputs with factory calibration

Input signals	Measuring span	Measuring error in % of the measuring span [1)]	Minimum measuring time	
			1-channel measurement	2-channel measurement
Current signals	0 ... 20 mA	≤ ±0.02 % ±1 digit	0.02 s	0.04 s
	4 ... 20 mA	≤ ±0.02 % ±1 digit	0.02 s	0.04 s

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11. Specifications

Input signals	Measuring span	Measuring error in % of the measuring span [1]	Minimum measuring time	
			1-channel measurement	2-channel measurement
Voltage signals	DC 0 ... 18 mV	≤ ±0.06 % ±1 digit	-	-
	DC 0 ... 35 mV	≤ ±0.06 % ±1 digit	-	-
	DC 0 ... 75 mV	≤ ±0.04 % ±1 digit	-	-
	DC 0 ... 150 mV	≤ ±0.03 % ±1 digit	-	-
	DC 0 ... 300 mV	≤ ±0.03 % ±1 digit	-	-
	DC 0 ... 600 mV	≤ ±0.03 % ±1 digit	-	-
	DC 0 ... 1,250 mV	≤ ±0.03 % ±1 digit	-	-
	DC 0 ... 2,500 mV	≤ ±0.03 % ±1 digit	-	-
	DC 0 ... 5 V	≤ ±0.02 % ±1 digit	-	-
	DC 0 ... 10 V	≤ ±0.01 % ±1 digit	0.02 s	0.04 s
Thermocouples				
Type B, PtRh-PtRh	-100 ... +1,810 °C	≤ ±0.10 % ±1 digit	-	-
Type E, NiCr-CuNi	-260 ... +1,000 °C	≤ ±0.06 % ±1 digit	-	-
Type J, Fe-CuNi	-210 ... +1,200 °C	≤ ±0.05 % ±1 digit	-	-
Type K, NiCr-Ni	-250 ... +1,271 °C	≤ ±0.05 % ±1 digit	-	-
Type L, Fe-CuNi	-200 ... +900 °C	≤ ±0.06 % ±1 digit	-	-
Type N, NiCrSi-NiSI	-250 ... +1,300 °C	≤ ±0.06 % ±1 digit	-	-
Type R, PtRh-Pt	0 ... 1,760 °C	≤ ±0.07 % ±1 digit	-	-
Type S, PtRh-Pt	0 ... 1,760 °C	≤ ±0.06 % ±1 digit	-	-
Type T, Cu-CuNi	-240 ... +400 °C	≤ ±0.07 % ±1 digit	-	-
Resistance thermometer 2)				
Pt100 (2-/4-wire)	-200 ... +850 °C	≤ ±0.04 % ±1 digit	-	-
Pt100 (3-wire)	-200 ... +850 °C	≤ ±0.04 % ±1 digit	-	-
Pt200 (2-/4-wire)	-200 ... +850 °C	≤ ±0.04 % ±1 digit	-	-
Pt200 (3-wire)	-200 ... +850 °C	≤ ±0.04 % ±1 digit	-	-
Pt500 (2-/4-wire)	-200 ... +850 °C	≤ ±0.04 % ±1 digit	-	-
Pt500 (3-wire)	-200 ... +850 °C	≤ ±0.04 % ±1 digit	-	-
Pt1000 (2-/4-wire)	-200 ... +850 °C	≤ ±0.04 % ±1 digit	-	-
Pt1000 (3-wire)	-200 ... +850 °C	≤ ±0.04 % ±1 digit	-	-

1) The indication of the measuring error applies to ambient temperatures of 20 ... 40 °C and the measuring time of 1 s.
2) The indications for Pt100 3-/4-wire apply at a max. lead resistance of 10 Ω.

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Inputs for sensor calibration

Input signals	Measuring span	Measuring error in % of the measuring span [1]	Minimum measuring time	
			1-channel measurement	2-channel measurement
Current signals	0 ... 2 mA	≤ ±0.02 % ±1 digit	-	-
	0 ... 5 mA	≤ ±0.02 % ±1 digit	-	-
	0 ... 20 mA	≤ ±0.02 % ±1 digit	0.02 s	0.04 s
	4 ... 20 mA	≤ ±0.02 % ±1 digit	0.02 s	0.04 s
Voltage signals	DC -18 ... +18 mV	≤ ±0.06 % ±1 digit	-	-
	DC -35 ... +35 mV	≤ ±0.06 % ±1 digit	-	-
	DC -75 ... +75 mV	≤ ±0.04 % ±1 digit	-	-
	DC -150 ... +150 mV	≤ ±0.03 % ±1 digit	-	-
	DC -300 ... +300 mV	≤ ±0.03 % ±1 digit	-	-
	DC -500 ... +600 mV	≤ ±0.03 % ±1 digit	-	-
	DC -500 ... +1,250 mV	≤ ±0.03 % ±1 digit	-	-
	DC -500 ... +2,500 mV	≤ ±0.03 % ±1 digit	-	-
	DC -1 ... +5 V	≤ ±0.02 % ±1 digit	-	-
	DC -1 ... +10 V	≤ ±0.01 % ±1 digit	0.02 s	0.04 s
Resistance (2-, 3-, or 4-wire)	0 Ω ... 100 Ω	≤ ±0.04 % ±1 digit	-	-
	0 Ω ... 1 kΩ	≤ ±0.04 % ±1 digit	-	-
	0 Ω ... 10 kΩ	≤ ±0.04 % ±1 digit	-	-

1) The indication of the measuring error applies to ambient temperatures of 20 ... 40 °C and the measuring time of 1 s.

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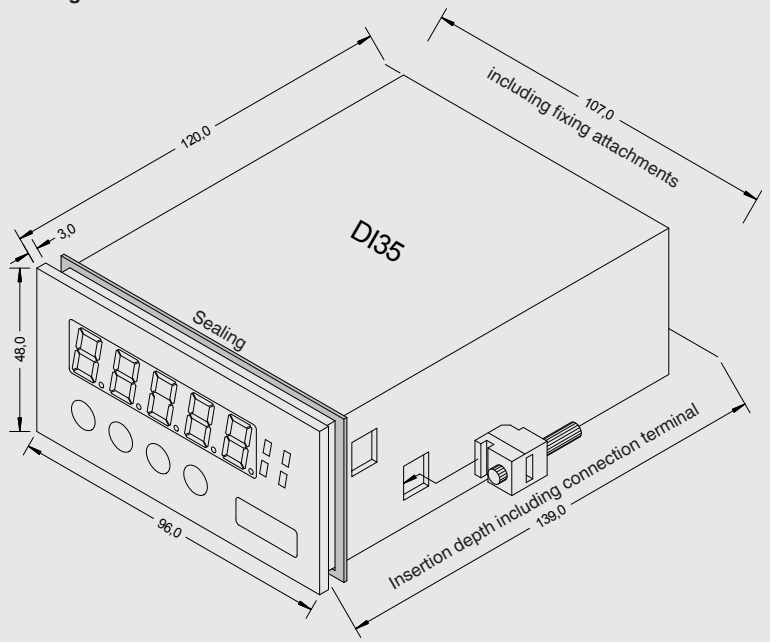
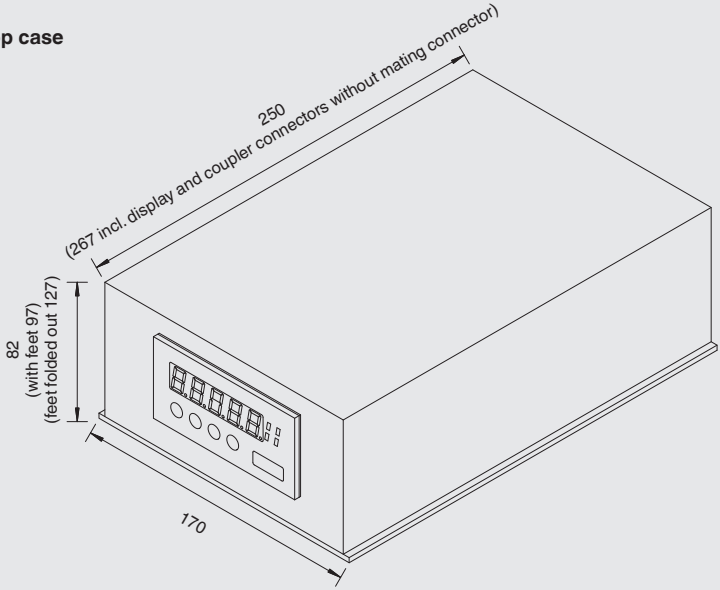
Dimensions in mm

Panel mounting



Desktop case



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Appendix 1: Overview of program numbers

PN	Function	Parameter	Factory setting	Authorisation level
Measuring input 1				
0	Measuring input	0 = N/A Factory calibration 1 = DC 0 ... 10 V 2 = 0 ... 20 mA 3 = 4 ... 20 mA Sensor calibration 4 = DC 0 ... 10 V 5 = 0 ... 20 mA 6 = 4 ... 20 mA	0	2
1	Full scale	-9999 ... 99999	10000	2
2	Start value	-9999 ... 99999	0	2
3	Decimal places	00000 ... 0.0000	00000	2
4	Offset adjustment	-9999 ... 99999	0	2
Measuring input 2				
5	Measuring input	0 = N/A Factory calibration 1 = DC 0 ... 10 V 2 = 0 ... 20 mA 3 = 4 ... 20 mA Sensor calibration 4 = DC 0 ... 10 V 5 = 0 ... 20 mA 6 = 4 ... 20 mA	0	2
6	Full scale	-9999 ... 99999	10000	2
7	Start value	-9999 ... 99999	0	2
8	Decimal places	00000 ... 0.0000	00000	2
9	Offset adjustment	-9999 ... 99999	0	2

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Appendix 1: Overview of program numbers

PN	Function	Parameter	Factory setting	Authorisation level
General settings				
10	Default display	1 = Measuring input 1 2 = Measuring input 2 3 = Arithmetic function	3	2
11	Switching of measuring inputs	0 = Key [▼] [▲] (triggered) 1 = Measuring input 1 (static) 2 = Measuring input 2 (static) 3 = Arithmetic function (static) 4 = Multi-function key (triggered) 5 = Cyclic (5 s) 6 = Cyclic (10 s) 7 = Cyclic (20 s)	0	2
13	Refresh rate	0.1 ... 10.0 s	1.0	2
14	Measuring time	0.04 ... 10.0 s (two measuring inputs) 0.02 ... 10.0 s (one measuring input)	0.2	2
19	Display brightness	0 ... 9	3	8
Arithmetic function				
15	Calculation type	1 = Measuring input 1 · constant 2 = Measuring input 2 · constant 3 = Addition 4 = Subtraction 5 = Multiplication 6 = Ratio 7 = Percent	3	2
16	Constant	-9999 ... 99999	1	2
17	Number of decimal places of constants	00000 ... 0.0000	00000	2
18	Number of decimal places of calculation	00000 ... 0.0000	00000	2

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Appendix 1: Overview of program numbers

PN	Function	Parameter	Factory setting	Authorisation level
Analogue output (option)				
20	Full scale	-9999 ... 99999	10000	2
21	Start value	-9999 ... 99999	0	2
22	Reference value	0 = Deactivated 1 = Measuring input 1 2 = Measuring input 2 3 = Arithmetic function	3	2
23	Output signal	0 = DC 0 ... 10 V 1 = 0 ... 20 mA 2 = 4 ... 20 mA	2	4
Interface				
34	Interface properties	0 = Standard mode 1 = Transmission mode	0	4
User authorisation				
50	Locking code	0000 ... 9999	0000	8
51	Release code	0000 ... 9999	0000	0
52	Authorisation level	0 ... 8	8	0
Special functions				
53	Function of the digital input	0 = Deactivated 1 = Switching the measuring input 2 = HOLD 3 = TARE	0	2
54	Function of the multifunction key	0 = Deactivated 1 = Switching the measuring input 2 = HOLD 3 = TARE	0	2
55	TARE function	0 = Deactivated 1 = Measuring input 1 2 = Measuring input 2 3 = Measuring input 1 + 2	0	2
56	HOLD function	0 = Deactivated 1 = Triggered 2 = Static	0	2

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PN	Function	Parameter	Factory setting	Authorisation level
59	Flashing display	0 = Deactivated 1 = at switch point 1 2 = at switch point 2 3 = at switch point 3 4 = at switch point 4 5 = at switch point 1 + 2 6 = at switch point 3 + 4 7 = at switch point 1 + 2 + 3 + 4	0	6
Switching output 1				
60	Reference value	0 = Deactivated 1 = Measuring input 1 2 = Measuring input 2 3 = Arithmetic function	1	6
61	Switch point	-9999 ... 99999	1000	6
62	Hysteresis	1 ... 99999	1	6
63	Switching function	0 = Normally closed 1 = Normally open	1	6
64	Switching delay	0 ... 10.0 seconds	0.0	6
65	Delay type	0 = none 1 = Switch-on delay 2 = Switch-off delay 3 = Switch-on and switch-off delay	1	6
Switching output 2				
70	Reference value	0 = Deactivated 1 = Measuring input 1 2 = Measuring input 2 3 = Arithmetic function	1	6
71	Switch point	-9999 ... 99999	1000	6
72	Hysteresis	1 ... 99999	1	6
73	Switching function	0 = Normally closed 1 = Normally open	1	6
74	Switching delay	0 ... 10.0 seconds	0.0	6
75	Delay type	0 = none 1 = Switch-on delay 2 = Switch-off delay 3 = Switch-on and switch-off delay	1	6

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Appendix 1: Overview of program numbers

PN	Function	Parameter	Factory setting	Authorisation level
Switching output 3				
80	Reference value	0 = Deactivated 1 = Measuring input 1 2 = Measuring input 2 3 = Arithmetic function	1	6
81	Switch point	-9999 ... 99999	1000	6
82	Hysteresis	1 ... 99999	1	6
83	Switching function	0 = Normally closed 1 = Normally open	1	6
84	Switching delay	0 ... 10.0 seconds	0.0	6
85	Delay type	0 = none 1 = Switch-on delay 2 = Switch-off delay 3 = Switch-on and switch-off delay	1	6
Switching output 4				
90	Reference value	0 = Deactivated 1 = Measuring input 1 2 = Measuring input 2 3 = Arithmetic function	1	6
91	Switch point	-9999 ... 99999	1000	6
92	Hysteresis	1 ... 99999	1	6
93	Switching function	0 = Normally closed 1 = Normally open	1	6
94	Switching delay	0 ... 10.0 seconds	0.0	6
95	Delay type	0 = none 1 = Switch-on delay 2 = Switch-off delay 3 = Switch-on and switch-off delay	1	6

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Appendix 1: Overview of program numbers

PN	Function	Parameter	Factory setting	Authorisation level
Linearisation				
100	Number of interpolation points Measuring input 1	0 ... 30	0	2
101 ... 130	Display value for interpolation point Measuring input 1	-9999 ... 99999		2
140	Number of interpolation points Measuring input 2	0 ... 30	0	2
141 ... 170	Display value for interpolation point Measuring input 2	-9999 ... 99999		2
Serial number				
200	Reading the serial number	0 ... 99999		8

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