

# High-quality digital indicator for panel mounting

## Model DI35-M, with multi-function input

## Model DI35-D, with two inputs for standard signals

WIKA data sheet AC 80.03

### Applications

- Machine building and plant construction
- Test benches
- Level measurement
- General industrial applications

### Special features

- Multi-function input (29 calibrated input configurations) or double input (0/4 ... 20 mA, DC 0 ... 10 V) with calculation function
- Accuracy  $\pm 0.01$  ... 0.1% of the span  $\pm 1$  digit (depends on the input configuration)
- Transmitter power supply, MIN/MAX memory, HOLD/TARE/Totaliser function
- Linearization with up to 30 programmable points possible
- Up to four freely programmable switch contacts (optional)

### Description

The model DI35 digital indicator is a multi-function and very accurate instrument for a wide variety of measuring tasks. It is available in two different versions:

#### ■ DI35-M

The version has a multi-function input with 29 different calibrated input configurations that can be selected via terminal connections and the input signal in the instrument configuration. The display can permanently show the MIN or MAX value. Moreover, a totaliser function is integrated.

#### ■ DI35-D

The version 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.



High-quality digital indicator for panel mounting  
Model DI35

In addition, both versions offer the possibility to calibrate sensors and linearize 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 programmable switch contacts, an analogue output signal and a serial interface.

## Display

### Principle

7-segment LED, red, 5-digit, brightness adjustable in 10 gradations

### Character size

.55 in (14 mm)

### Indication range

-9999 ... 99999

### Display rate

0.1 ... 10.0 seconds

### Memory

EEPROM (parameter memory), data preservation > 100 years

## Input

### Number and type

#### Selectable versions

1 x multi-function input (for model DI35-M)

2 x input for standard signals (for model DI35-D)

### Input signal

- DI35-M: see tables "Accuracy/measuring errors of the input signals", page 4 + 5
- DI35-D: 0 ... 20 mA,  $R_I \approx 50 \Omega$   
4 ... 20 mA,  $R_I \approx 50 \Omega$   
DC 0 ... 10 V,  $R_I \approx 150 \text{ k}\Omega$

### Input configuration

Selectable via terminal connections and menu-driven programming

### Accuracy

see tables "Accuracy/measuring errors of the input signals", page 4 + 5

### Temperature error

50 ppm/K, at ambient temperature  $T_U < 20 \text{ }^\circ\text{C}$  or  $T_U > 40 \text{ }^\circ\text{C}$

### Measuring principle

Sigma/delta

### Resolution

24 bit (with 1 second measuring time)

### Measuring time

- DI35-M: 0.02 ... 10.0 s
- DI35-D: 0.02 ... 10.0 s, for single-channel measurement  
0.04 ... 10.0 s, for two-channel measurement

### Transmitter power supply

DC 24 V, max. 50 mA, galvanically isolated incl. one digital input

## Analog output (option)

### Number and type

1 analog output (galvanically isolated)

### Output signal

4 ... 20 mA (12-bit), load  $\leq 500 \Omega$

0 ... 20 mA (12-bit), load  $\leq 500 \Omega$

DC 0 ... 10 V (12-bit), load  $\geq 100 \text{ k}\Omega$

Switchable via programming or via DIP switches on rear of instrument.

### Error

0.1 % in the range 68 ... 104 °F (20 ... 40 °C)

50 ppm/K outside temperature error

### Internal resistance

100  $\Omega$  (with measuring input DC 0 ... 10 V)

## Switching output (option)

### Number and type

2 or 4 switch contacts (relays), freely programmable

### Load

AC 230 V, 5 A (resistive load)

DC 30 V, 5 A (resistive load)

### Number of switching operations

$0.5 \cdot 10^5$  at max. contact load

$5 \cdot 10^6$  mechanical

Isolation in accordance with DIN EN 50178

Parameters in accordance with DIN EN 60255

## Voltage supply

### Power supply

#### Selectable versions

Standard	AC 100 ... 240 V, 50/60 Hz
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Option	DC 10...40 V, AC 18...30 V, 50/60 Hz
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Power supply galvanically isolated

### Power consumption

max. 15 VA

### Electrical connection

- DI35-M: Removable plug-in terminal  
Wire cross-section up to 2.5 mm<sup>2</sup>
- DI35-D: Removable plug-in terminal  
Wire cross-section up to 2.5 mm<sup>2</sup>

## Communication (option)

### Interface

Selectable versions	
Option 1	RS-232 (not galvanically isolated)
Option 2	RS-232 (galvanically isolated)
Option 3	RS-485 (not galvanically isolated, only for point-to-point connection)
Option 4	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

### Lead length

RS-232: max. 9.8 ft (3 m)

RS-485: max. 3,280 ft (1,000 m)

## Case

### Material

Glass-fibre reinforced polycarbonate, black

### Ingress protection

Front: IP 65, rear: IP 00 (per IEC 60529 / EN 60529)

### Dimensions

see "Dimensions in mm", page 8

### Recommended mounting grid

120 mm horizontal, 96 mm vertical

### Weight

approx. 1 lbs (450 g)

### Mounting

sliding fasteners, fixed via screws, for panel thicknesses up to 1.97 in (50 mm)

## Table-top case

The table-top case is available as an option for the model DI35-D.

### Input signal

Only available with 4 ... 20 mA

### Switching outputs

Only available with 2 switching outputs

### Material

- Front, rear, side plates: aluminium, black, powder-coated
- Cover, base plate: hard paper, black (Pertinax)

### Ingress protection

IP 40

### Dimensions

see "Dimensions in mm", page 8

### Weight

approx. 3.5 lbs (1.6 kg)

## Operating conditions

### Permissible ambient temperatures

Operation: 32 ... 140 °F (0 ... 60 °C)

Storage: -4 ... 176 °F (-20 ... +80 °C)

### Humidity

0 ... 75 % r. h. annual mean, without condensation

# Accuracy/measuring errors of the input signals

## Inputs with factory calibration

Input signals	Measuring span	Measuring error in % of the Minimum measuring time measuring span <sup>1)</sup>	Minimum measuring time		
			DI35-M	DI35-D	
				Single-channel measurement	Dual-channel measurement
<b>Current signals</b>	0 ... 20 mA	±0.02 % ±1 digit	0.02 s	0.02 s	0.04 s
	4 ... 20 mA	±0.02 % ±1 digit	0.02 s	0.02 s	0.04 s
<b>Voltage signals</b>	DC 0 ... 18 mV	±0.06 % ±1 digit	0.02 s	-	-
	DC 0 ... 35 mV	±0.06 % ±1 digit	0.02 s	-	-
	DC 0 ... 75 mV	±0.04 % ±1 digit	0.02 s	-	-
	DC 0 ... 150 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC 0 ... 300 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC 0 ... 600 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC 0 ... 1,250 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC 0 ... 2,500 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC 0 ... 5 V	±0.02 % ±1 digit	0.02 s	-	-
	DC 0 ... 10 V	±0.01 % ±1 digit	0.02 s	0.02 s	0.04 s
<b>Thermocouples</b>					
Type B, PtRh-PtRh	-100 ... +1,810 °C	±0.10 % ±1 digit	0.04 s	-	-
Type E, NiCr-CuNi	-260 ... +1,000 °C	±0.06 % ±1 digit	0.04 s	-	-
Type J, Fe-CuNi	-210 ... +1,200 °C	±0.05 % ±1 digit	0.04 s	-	-
Type K, NiCr-Ni	-250 ... +1,271 °C	±0.05 % ±1 digit	0.04 s	-	-
Type L, Fe-CuNi	-200 ... +900 °C	±0.06 % ±1 digit	0.04 s	-	-
Type N, NiCrSi-NiSi	-250 ... +1,300 °C	±0.06 % ±1 digit	0.04 s	-	-
Type R, PtRh-Pt	0 ... 1,760 °C	±0.07 % ±1 digit	0.04 s	-	-
Type S, PtRh-Pt	0 ... 1,760 °C	±0.06 % ±1 digit	0.04 s	-	-
Type T, Cu-CuNi	-240 ... +400 °C	±0.07 % ±1 digit	0.04 s	-	-
<b>Resistance thermometer <sup>2)</sup></b>					
Pt100 (2-/4-wire)	-200 ... +850 °C	±0.04 % ±1 digit	0.04 s	-	-
Pt100 (3-wire)	-200 ... +850 °C	±0.04 % ±1 digit	0.06 s	-	-
Pt200 (2-/4-wire)	-200 ... +850 °C	±0.04 % ±1 digit	0.04 s	-	-
Pt200 (3-wire)	-200 ... +850 °C	±0.04 % ±1 digit	0.06 s	-	-
Pt500 (2-/4-wire)	-200 ... +850 °C	±0.04 % ±1 digit	0.04 s	-	-
Pt500 (3-wire)	-200 ... +850 °C	±0.04 % ±1 digit	0.06 s	-	-
Pt1000 (2-/4-wire)	-200 ... +850 °C	±0.04 % ±1 digit	0.06 s	-	-
Pt1000 (3-wire)	-200 ... +850 °C	±0.04 % ±1 digit	0.04 s	-	-

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

2) The indications for Pt100 3-/4-wire apply at a max. lead resistance of 10 Ω.

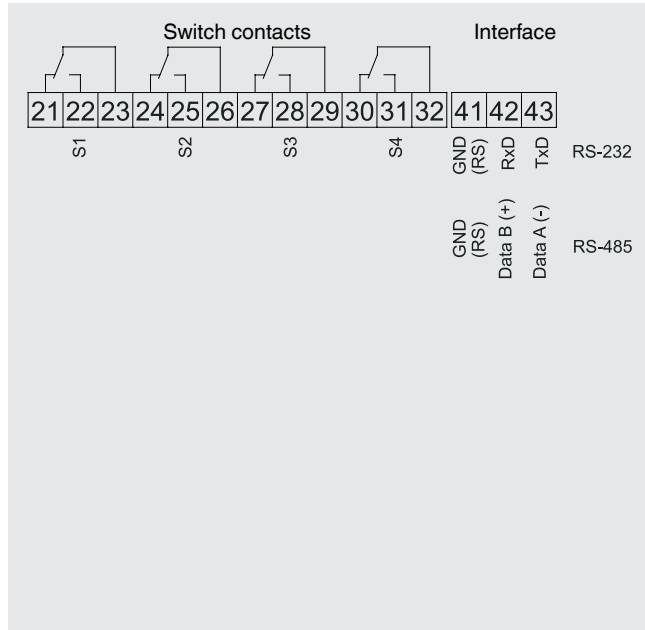
## Inputs for sensor calibration

Input signals	Measuring span	Measuring error in % of the measuring span <sup>1)</sup>	Minimum measuring time		
			D135-M	D135-D	
				Single-channel measurement	Dual-channel measurement
<b>Current signals</b>	0 ... 2 mA	±0.02 % ±1 digit	0.02 s	-	-
	0 ... 5 mA	±0.02 % ±1 digit	0.02 s	-	-
	0 ... 20 mA	±0.02 % ±1 digit	0.02 s	0.02 s	0.04 s
	4 ... 20 mA	±0.02 % ±1 digit	0.02 s	0.02 s	0.04 s
<b>Voltage signals</b>	DC -18 ... +18 mV	±0.06 % ±1 digit	0.02 s	-	-
	DC -35 ... +35 mV	±0.06 % ±1 digit	0.02 s	-	-
	DC -75 ... +75 mV	±0.04 % ±1 digit	0.02 s	-	-
	DC -150 ... +150 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC -300 ... +300 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC -500 ... +600 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC -500 ... +1,250 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC -500 ... +2,500 mV	±0.03 % ±1 digit	0.02 s	-	-
	DC -1 ... +5 V	±0.02 % ±1 digit	0.02 s	-	-
	DC -1 ... +10 V	±0.01 % ±1 digit	0.02 s	0.02 s	0.04 s
<b>Resistance (2-, 3-, or 4-wire)</b>					
	0 Ω ... 100 Ω	±0.04 % ±1 digit	0.04 s	-	-
	0 Ω ... 1 kΩ	±0.04 % ±1 digit	0.04 s	-	-
	0 Ω ... 10 kΩ	±0.04 % ±1 digit	0.04 s	-	-

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

# Terminal configuration

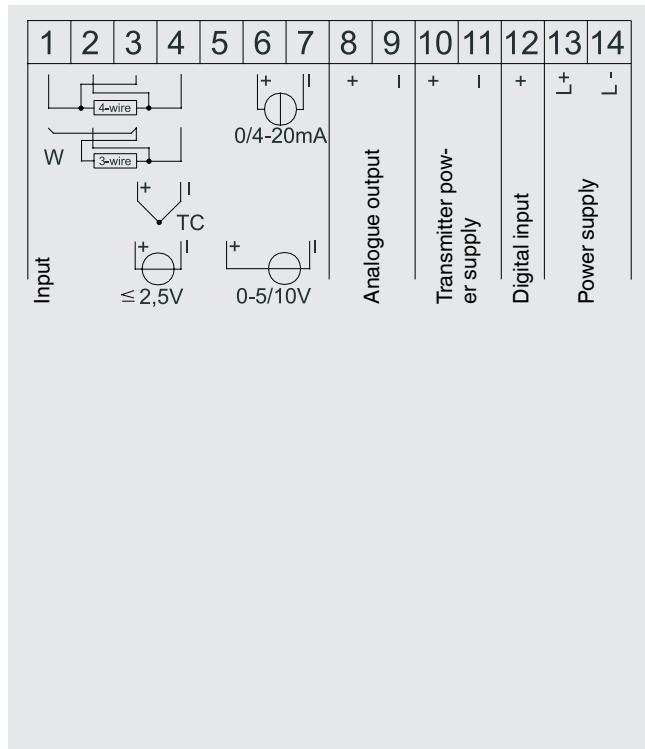
## Terminal strip at the top



Terminal	Case labelling	Meaning
21		Normally closed
22	S1	{Switch contact 1}
23		Normally open
24		COM
25	S2	{Switch contact 2}
26		Normally closed
27		Normally open
28	S3	{Switch contact 3}
29		COM
30		Normally closed
31	S4	{Switch contact 4}
32		Normally open
		COM
41	GND	{Serial interface RS232}
		{Serial interface RS485}
42	RxD	{Serial interface RS232}
	Data B(+)	{Serial interface RS485}
43	TxD	{Serial interface RS232}
	Data A(-)	{Serial interface RS485}

{ } Items in curved brackets are optional extras for an additional price.

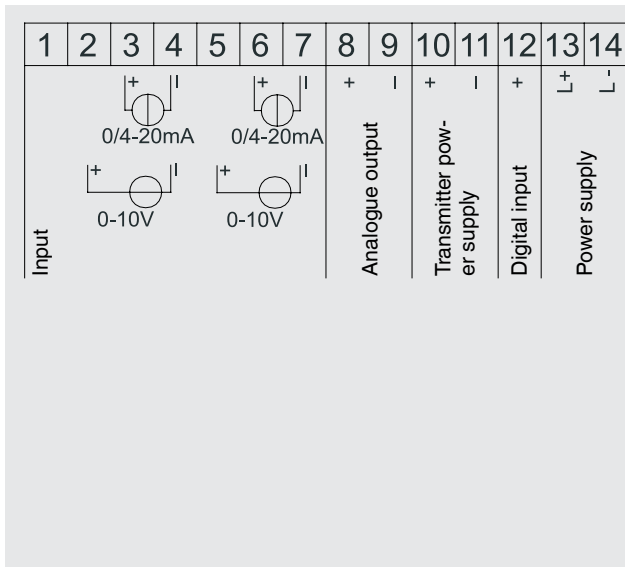
## Terminal strip below for DI35-M



Terminal	Case labelling	Meaning
1		Measuring input Resistance thermometer
2		Measuring input Resistance thermometer
3		Measuring input Resistance thermometer
	+	Voltage measuring signal ≤ 2.5 V
	+	Thermocouple measuring signal
4		Measuring input Resistance thermometer
	-	Voltage measuring signal ≤ 2.5 V
	-	Thermocouple measuring signal
5	+	Voltage measuring signal
6	+	Current measuring signal
7	-	Voltage measuring signal
	-	Current measuring signal
8	+	{Analogue output}
9	-	
10	+	{Transmitter power supply}
11	-	
12	+	Digital input
13	L+	Power supply
14	L-	

{ } Items in curved brackets are optional extras for an additional price.

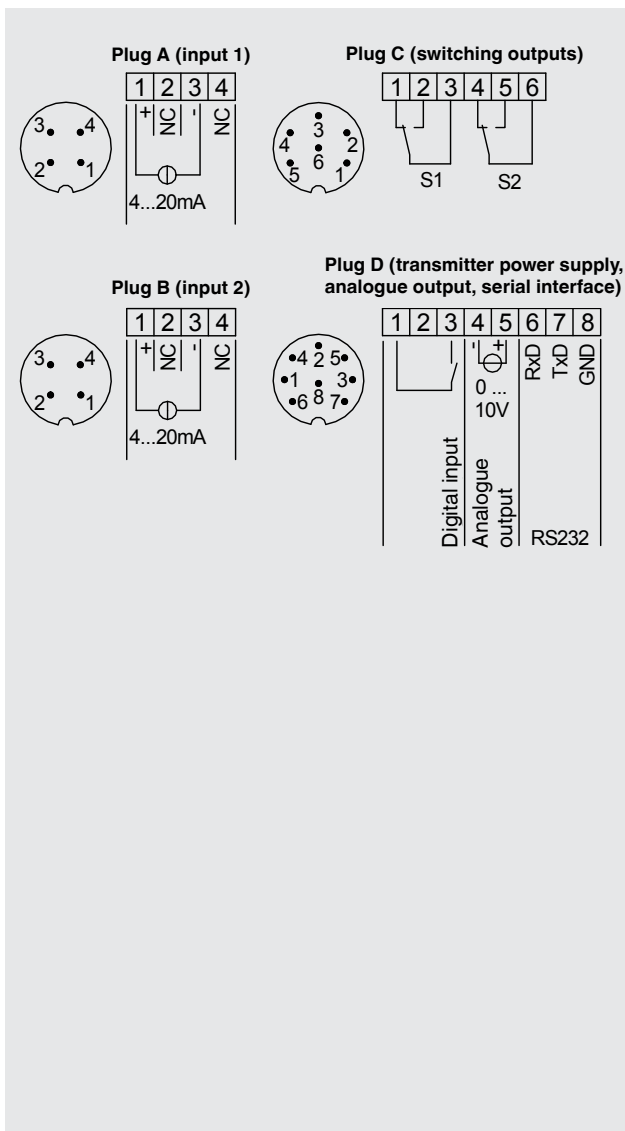
## Terminal strip below for DI35-D



Terminal	Case labelling	Meaning
1		Not connected
2	+	Voltage measuring signal
3	+	Voltage measuring signal
4	-	Voltage measuring signal
5	-	Current measuring signal
6	+	Voltage measuring signal
7	+	Current measuring signal
8		{Analogue output}
9		
10	+	{Transmitter power supply}
11	-	
12	+	Digital input
13	L+	Power supply
14	L-	

{ } Items in curved brackets are optional extras for an additional price.

## Pin assignment for DI35-D in table-top case



Plug A (input 1)		
Terminal	Case labelling	Meaning
1	+	Current measuring signal
2	NC	Not connected
3	-	Current measuring signal
4	NC	Not connected

Plug B (input 2)		
Terminal	Case labelling	Meaning
1	+	Current measuring signal
2	NC	Not connected
3	-	Current measuring signal
4	NC	Not connected

Plug C (switching outputs)		
Terminal	Case labelling	Meaning
1		Normally closed
2	S1	Normally open
3		COM
4		Normally closed
5	S2	Normally open
6		COM

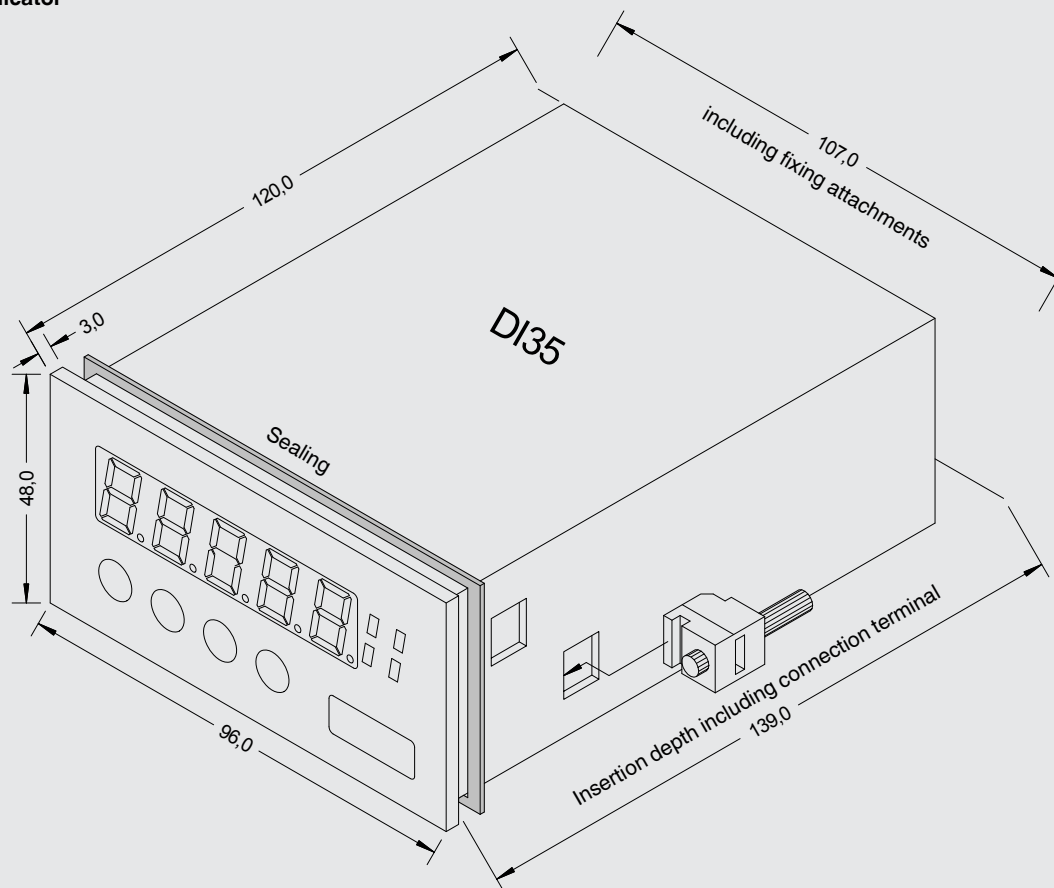
only with digital indicator with switch points

Plug D (transmitter power supply, analogue output, serial interface)		
Terminal	Case labelling	Meaning
1		
2		Digital input
3		
4	-	Analogue output
5	+	
6	RxD	
7	TxD	RS-232 interface
8	GND	

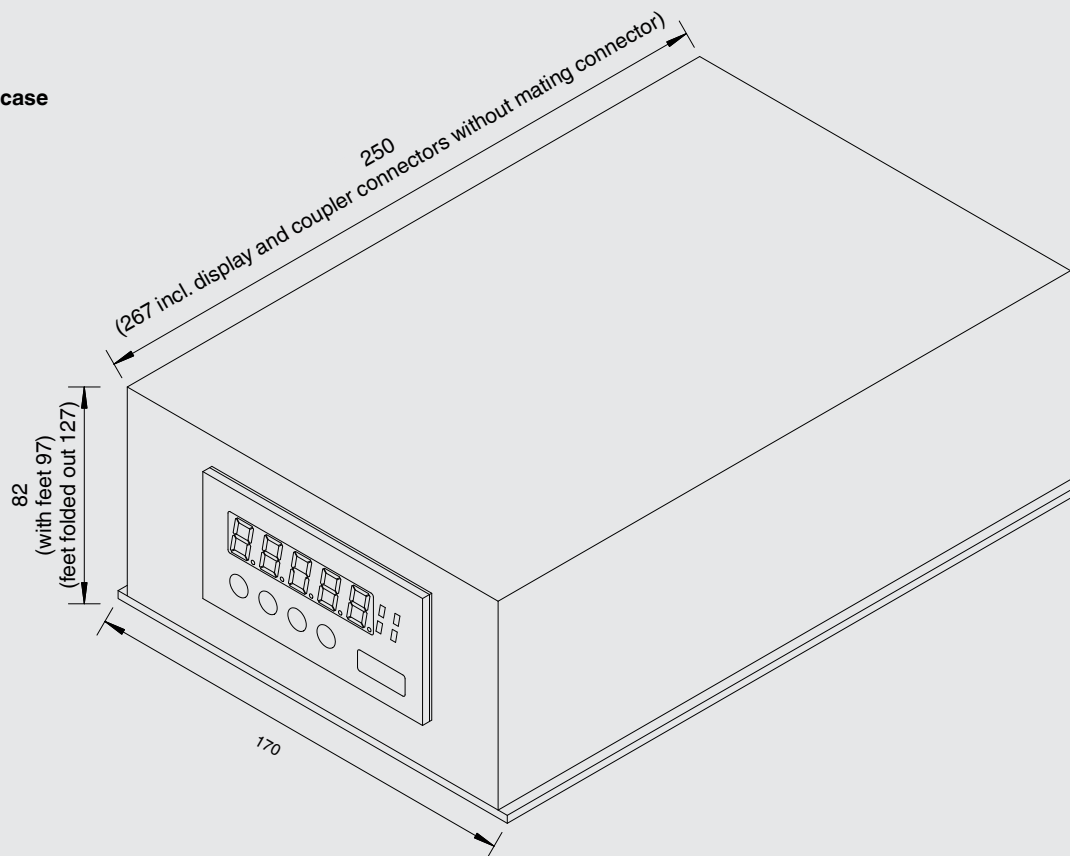
only with digital indicators with analogue output or interface

## Dimensions in mm

### Digital indicator

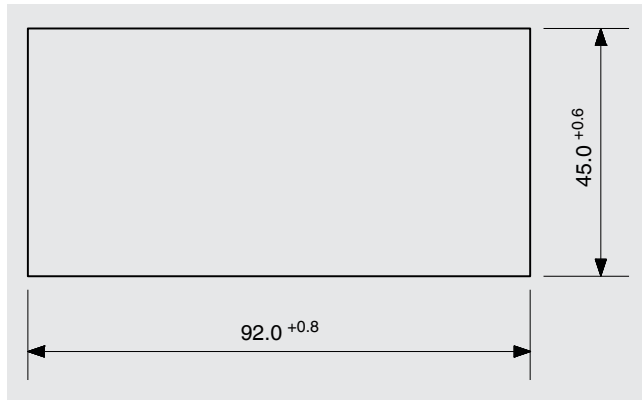


### Table-top case

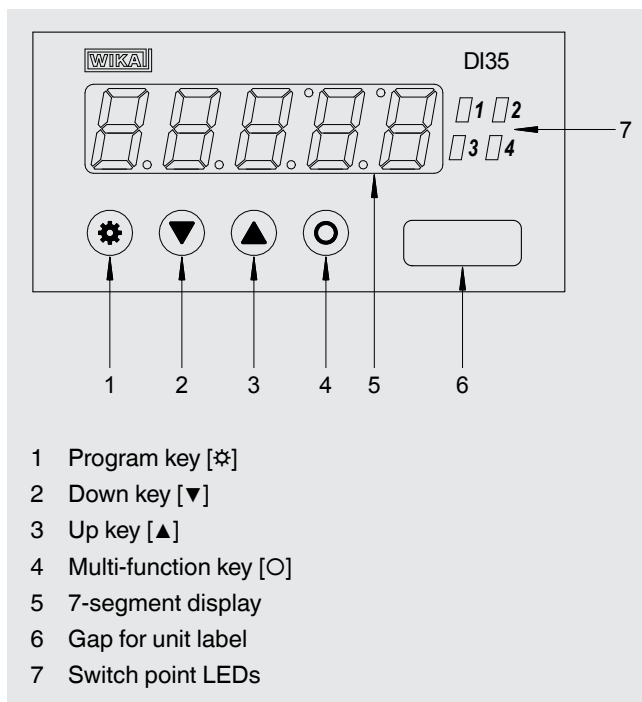




## Panel cutout in mm



## Display and control element



## CE conformity

### EMC directive

2004/108/EC, interference emission and interference immunity in accordance with EN 61326-1, emission (group 1, class B) und interference immunity (industrial application)

### Low voltage directive

2006/95/EC, EN 61010-1

## Scope of delivery

- Digital indicator model DI35
- Sealing
- Mounting screws
- Operating instructions
- Punched paper with unit labels for selection

## Ordering information

Model / Input / Switching outputs / Power supply / Transmitter power supply / Analogue output signal / Interface / Ingress protection / Instrument configuration

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