

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 ± 0.01 ... 0.1% of the span ± 1 digit (depends on the input configuration)
- Linearisation with up to 30 programmable points
- MIN/MAX memory, HOLD/TARA/totalizer function
- Up to four freely programmable switch contacts (optionally)



High-quality digital indicator for panel mounting
Model DI35

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 totalizer 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.

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 HOLD and a TARA 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 a transmitter power supply, up to four freely programmable switch contacts, an analogue output signal and a serial interface.

Display

Principle

7-segment LED, red, with 5 digits, 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

Input

Number and type

Selectable inputs

- 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, with single-channel measurement
0.04 ... 10.0 s, with dual-channel measurement

Transmitter power supply (option)

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

Analogue output (option)

Number and type

1 analogue output (galvanically isolated)

Output signal

Selectable analogue signals

- 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 $\geq 100 \text{ k}\Omega$

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)

Switching output (option)

Number and type

2 or 4 double throw 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 · 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

Selectable power supply

Standard	AC 230 V, 50/60 Hz, $\pm 10 \%$
Option	AC 115 V, 50/60 Hz, $\pm 10 \%$
Option	AC 115/230 V, 50/60 Hz, $\pm 10 \%$ switchable
Option	DC 24 V, $\pm 10 \%$

Power supply galvanically isolated

Power consumption

max. 15 VA

Electrical connection

- DI35-M: Screw terminal
Wire cross-section up to 2.5 mm²
- DI35-D: removable plug-in terminal
Wire cross-section up to 2.5 mm²

Communication (option)

Interface

Selectable interfaces

RS-232

RS-485 (only for point-to-point connection)

The interfaces are available optionally with or without galvanic isolation.

Protocol

manufacturer-specific ASCII

Baud rate

9,600 baud, no parity, 8 data bits, 1 stop bit

Lead length

RS-232: max. 3 m

RS-485: max. 1,000 m

Case

Material

PC, ABS-Blend, black

Ingress protection

Selectable ingress protections

Standard Front: IP 54; Rear: IP 00 (per IEC 60529 / EN 60529)

Option 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. 450 g

Mounting

sliding fasteners, fixed via screws, for panel thicknesses up to 50 mm

Permissible ambient conditions

Operating temperature

0 ... 60 °C

Storage temperature

-20 ... +80 °C

Relative humidity

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

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

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		
			DI35-M	DI35-D	
				Single-channel measurement	Dual-channel measurement
Current signals	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
Voltage signals	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
Thermocouples					
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	-	-
Resistance thermometer ²⁾					
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.

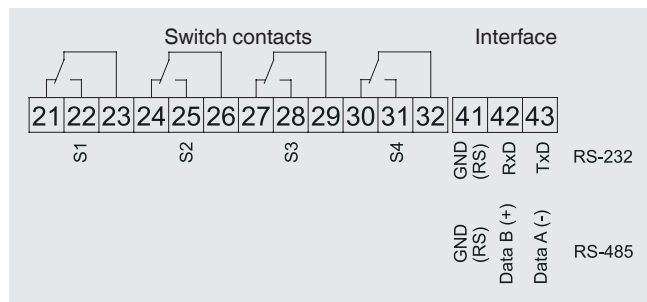
Inputs for sensor calibration

Input signals	Measuring span	Measuring error in % of the span ¹⁾	Minimum measuring time		
			D135-M	D135-D	
				Single-channel measurement	Dual-channel measurement
Current signals	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
Voltage signals	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
Resistance (2-, 3-, or 4-wire)					
	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 above

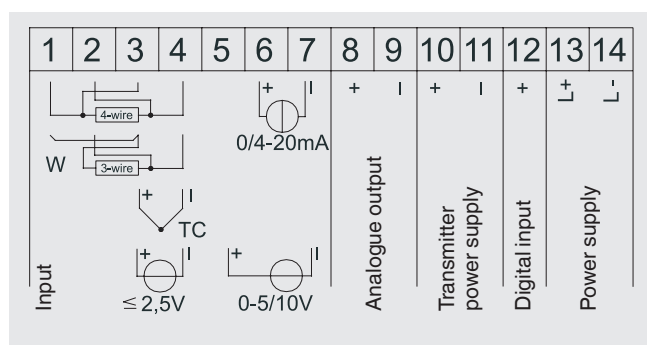


Terminal connections above

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

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

Terminal strip below for DI35-M

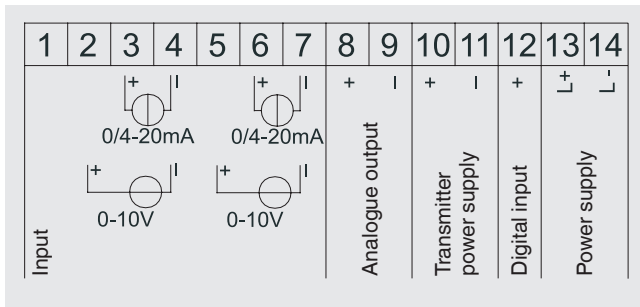


Terminal connections below for DI35-M

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

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

Terminal strip below for DI35-D

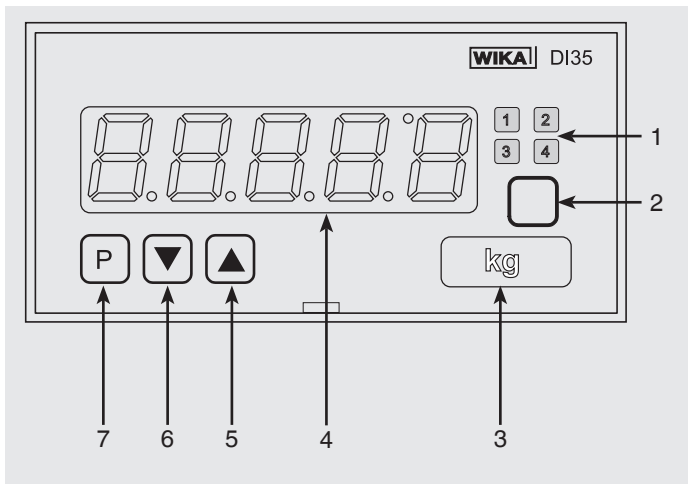


Terminal connections below for DI35-D

Terminal	Case labelling	Significance
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	+	Voltage measuring signal
9	-	Current measuring signal
10	-	{Analogue output}
11	+	{Transmitter power supply}
12	-	
13	+	Digital input
14	-	
	L+	Power supply
	L-	

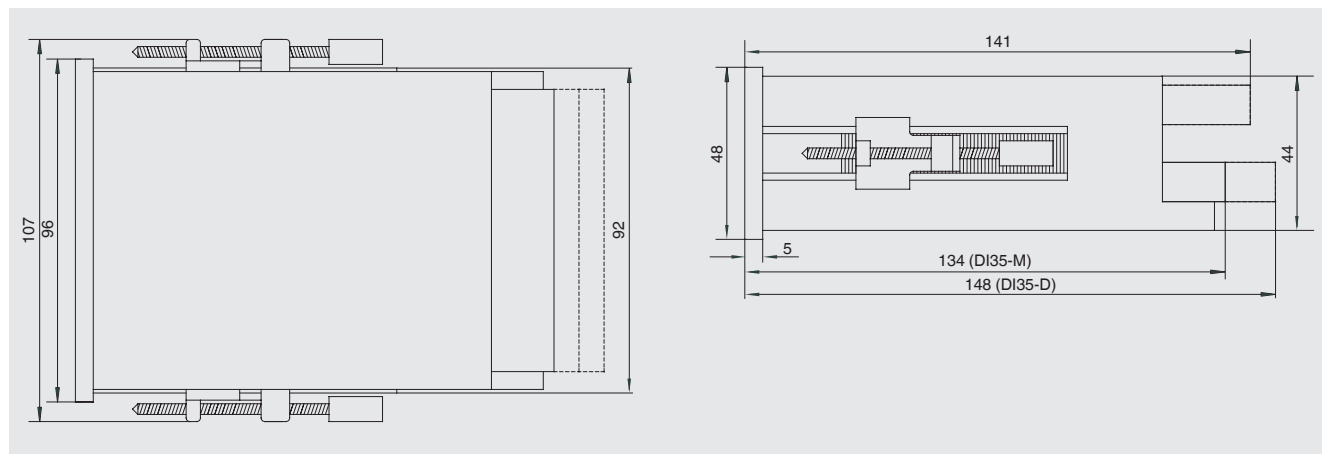
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Display and control element

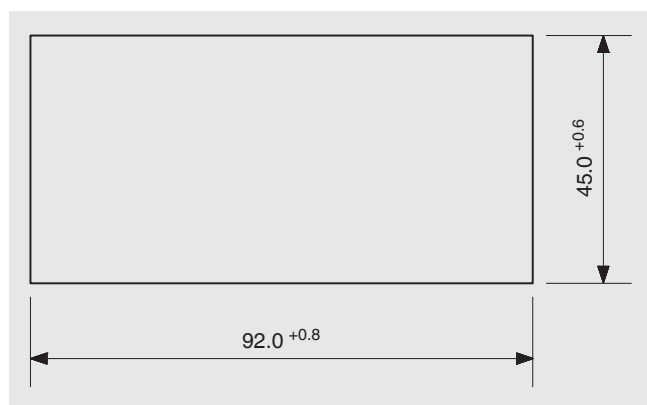


- 1 Switching-point LEDs
- 2 Multi-function key
- 3 Gap for unit label
- 4 7-segment display
- 5 Up key [UP]
- 6 Down key [DOWN]
- 7 Program key [P]

Dimensions in mm



Panel cutout in mm



Scope of delivery

- Digital indicator model DI35
- Sealing
- Mounting screws
- Operating instructions
- Punched paper with 28 unit labels for selection

Ordering information

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

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