Digital indicator for panel mounting
Model DI35

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
- MAX/MIN memory, HOLD/TARA/totalizer function
- Up to four freely programmable switch contacts (optionally)

Digital indicator model DI35

Description

The digital indicator DI35 is a multi-functional and very accurate digital indicator for a wide range of measuring requirements. It is available in two different basic types:

- 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. Switching channels can be performed time controlled, by pressing a key or via digital input.

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, 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.

All configuration and programming can be carried out through the front-panel keys.

Specifications

Digital indicator	DI35-M	DI35-D
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	1 multi-function input	2 standard signal inputs
Input signal	*see the following table*	0 ... 20 mA, R_I = ~50 Ω 4 ... 20 mA, R_I = ~50 Ω DC 0 ... 10 V, R_I = ~150 kΩ
Input configuration	Selectable via terminal connections and menu-driven programming	
Accuracy	*see the following table*	
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 seconds	0.02 ... 10.0 seconds with single-channel measurement 0.04 ... 10.0 seconds with dual-channel measurement
{Transmitter power supply}	DC 24 V, max. 50 mA, galvanically isolated incl. one digital input	
{Analogue output}		
Number and type	1 analogue output (galvanically isolated)	
Output signal	4 ... 20 mA (12-bit), load ≤ 500 Ω or 0 ... 20 mA (12-bit), load ≤ 500 Ω or DC 0 ... 10 V (12-bit), load ≥ 100 kΩ	
Errors	0.1 % in the range 20 °C ≤ T_U ≤ 40 °C, outside temperature error 50 ppm/K	
Internal resistance	100 Ω (for DC 0 ... 10 V measuring input)	
{Switch contacts}		
Number and type	2 or 4 double throw contacts (relays), freely programmable	
Load	AC 230 V, 5 A (resistive load) or DC 30 V, 2 A (resistive load)	
Number of switching operations	0.5 * 10^5 at max. contact load 5 * 10^6 mechanical Isolation in accordance with DIN EN 50178, parameters in accordance with DIN EN 60255	
Voltage supply		
Power supply	AC 230 V, 50/60 Hz, ±10 % or {AC 115 V, 50/60 Hz, ±10 %} or {AC 115/230 V, 50/60 Hz, ±10 % switchable} or {DC 24 V, ±10 %} Power supply galvanically isolated	
Power consumption	max. 15 VA	
Electrical connection	Screw terminal Wire cross-section up to 2.5 mm²	removable plug-in terminal Wire cross-section up to 2.5 mm²

Digital indicator	DI35-M	DI35-D
{Communication}		
Interface	RS-232, optionally with or without galvanic isolation or RS-485 (only for point-to-point connection), optionally with or without galvanic isolation	
Protocol	manufacturer-specific ASCII	
Baud rate	9600 baud, no parity, 8 data bits, 1 stop bit	
Lead length	RS-232: max. 3 m RS-485: max. 1,000 m	

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

Case	DI35-M	DI35-D
Material	PC, ABS-Blend, black	
Ingress protection	Front: IP 54; Rear: IP 00 (per IEC 60529 / EN 60529) {Front: IP 65; Rear: IP 00} (per IEC 60529 / EN 60529)	
Dimensions	96 x 48 x 134 mm (W x H x D) including terminal	96 x 48 x 148 mm (W x H x D) including terminal
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, non-condensing

Approvals and certificates

CE conformity	
EMC directive	2004/108/EC, interference emission and interference immunity in accordance with EN 61326-1, emission (group 1, class B) and interference immunity (industrial application)
Low voltage directive	2006/95/EC, EN 61010-1

For further certificates and approvals, see local website.

Accuracy/measuring errors of the input signals

Inputs with factory calibration

Input signals	Measuring span	Measuring error in % of the 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-NiSl	-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.

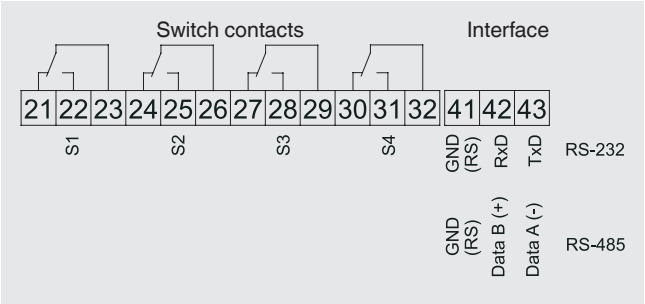
Inputs for sensor calibration

Input signals	Measuring span	Measuring error in % of the span [1]	Minimum measuring time DI35-M	DI35-D	
				Singel-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

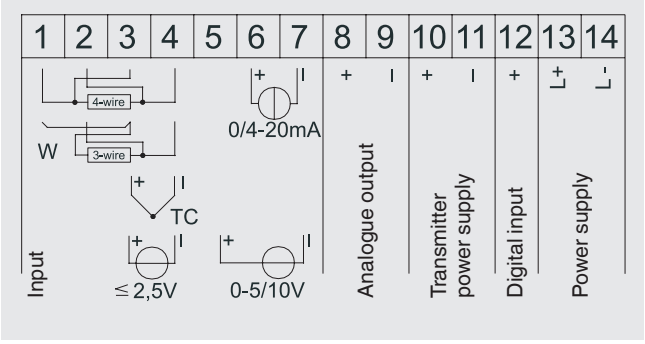


Terminal connections above

Terminal	Case labelling	Significance	
21	S1	{Switch contact 1}	Normally closed
22			Normally open
23			Basic
24	S2	{Switch contact 2}	Normally closed
25			Normally open
26			Basic
27	S3	{Switch contact 3}	Normally closed
28			Normally open
29			Basic
30	S4	{Switch contact 4}	Normally closed
31			Normally open
32			Basic
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 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	+	{Analogue output}
9	-	
10	+	{Transmitter power supply}
11	-	
12	+	Digital input
13	L+	Power supply
14	L-	

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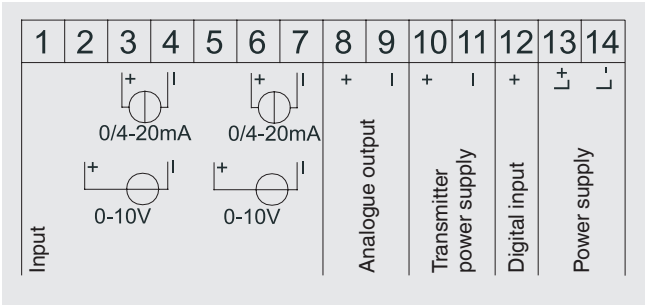
Terminal strip below for DI35-D



Terminal connections below for DI35-D

Terminal	Case labelling	Significance	
1		Not connected	
2	+	Voltage measuring signal	Channel 1
3	+	Voltage measuring signal	
4	-	Voltage measuring signal	
	-	Current measuring signal	
5	+	Voltage measuring signal	Channel 2
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-		

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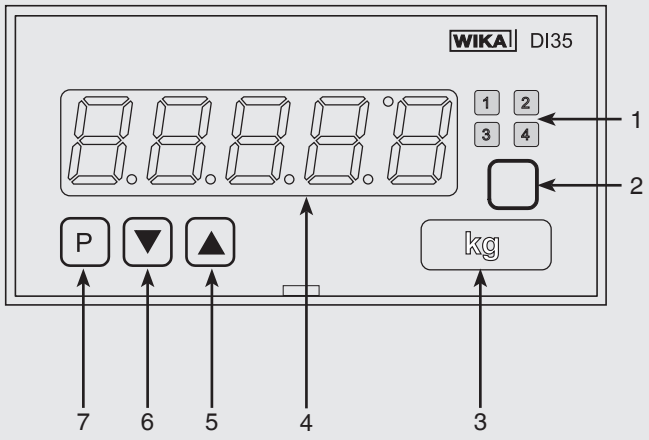
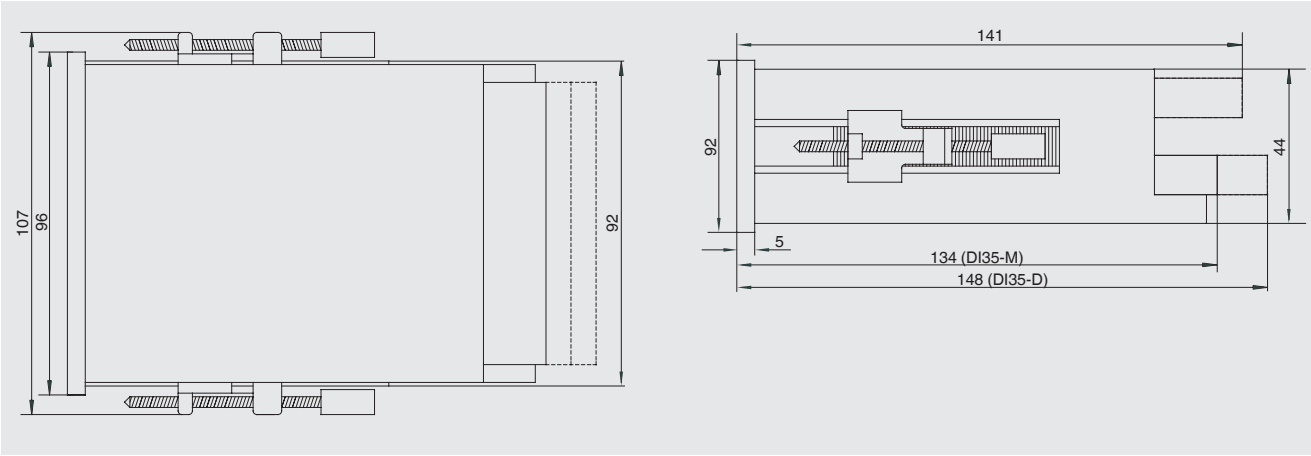
Display and operating elements

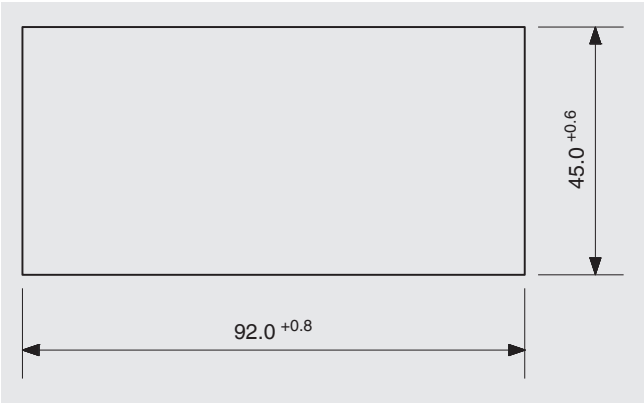


1 Switching-point LEDs
2 Multi-function key
3 Gap for unit label
4 7-segment display
5 Up key [UP]
6 Down key [DOWN]
7 Program key [P]

Dimensions in mm



Panel cutout in mm



Scope of delivery

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

Ordering information

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

WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Tel. (+49) 9372/132-0
Fax (+49) 9372/132-406
E-mail info@wika.de
www.wika.de

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