Current loop display (flush-type)

Safety warnings

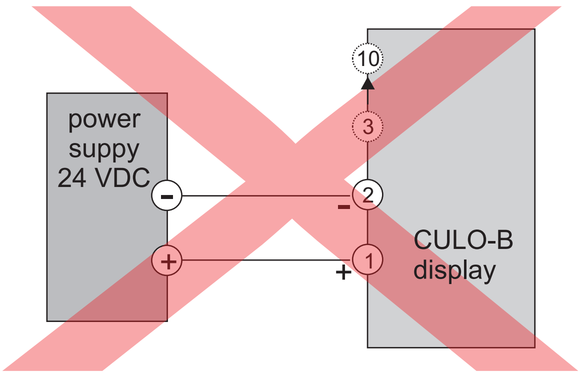
When mounting, initiating and operating this indicator the safety precautions and regulations have to be observed. Only staff with a corresponding qualification should work with the indicator. A non-observance of the safety regulations may cause serious injuries and/or damages.Check before initial operation the suitability of the indicator for this area of application. The technical data of this manual have to be followed. **Never connect the analogue input directly to a voltage supply (eg 24 VDC), that will destroy the indicator.**

Characteristics

Input: 4...20 mA (current loop)
Option: 4...20 mA / 0...20 mA / 0...10 V (external supply)
Supply: current loop Option: 230 VAC / 115 VAC / 24 VDC
Limit contacts: 2 open collectors (36 VDC, 150 mA)
2 relays: maximum 5 A (125 VDC / 250 VAC)
Display range maximum: -999...9999
Adjustment: with 3 keys / Memory: minimum/maximum
Unit: dimension strip (fixed under front foil)
Option: 4th digit programmable as unit (°C/°F)
Enclosure: 96x48 flush-type (installation depth: approx. 55 mm)
Protection: IP 65 (front) / IP20 (back)

Dimensions

Note for running a current loop display

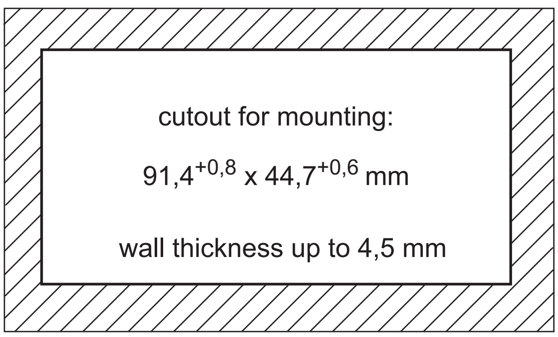


The input 0(4)...20 mA has to be operated with a mA-signal only. A direct connection to a voltage supply (eg 24 VDC) will destroy the indicator and the guarantee does not cover this.

For an operational test the display has to be supplied out of a power source for mA (eg mA source / calibration instrument).

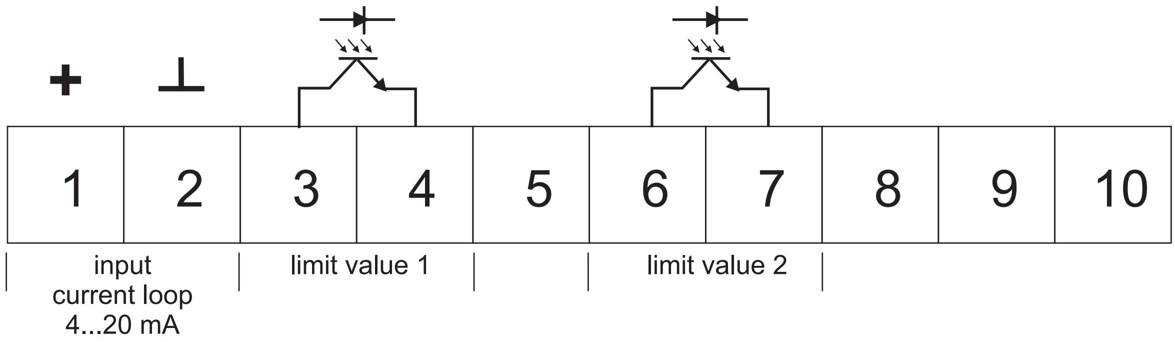
In normal operation the display is connected in series with a transmitter (4...20 mA) or is connected to a 4...20 mA analogue output of a device.

Mounting holes

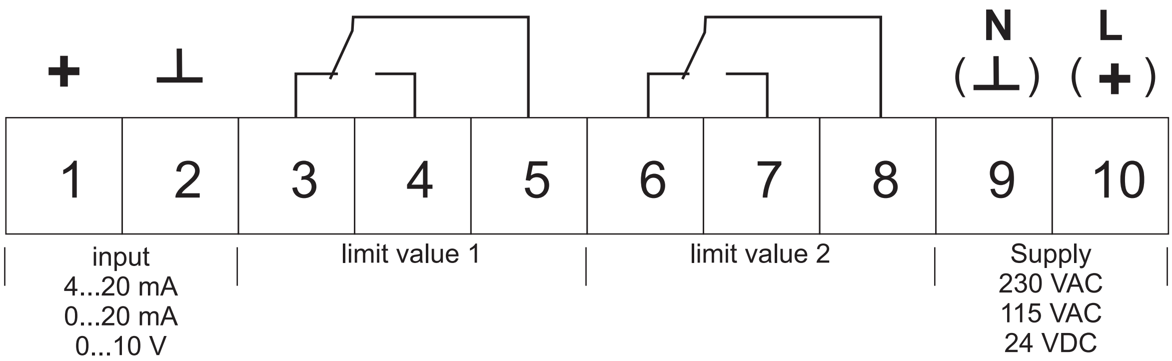


1. Cut the cutout into the control board
2. Raise the plastics clamps at the back with a screw driver and remove them
3. Put in the indicator into the cutout
4. Push in the plastic clamps and press them ahead

Connection current loop 4...20 mA



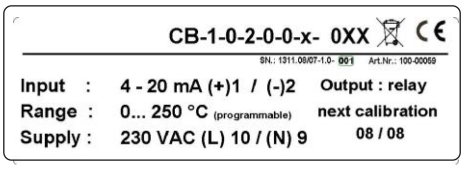
Connection with external power supply

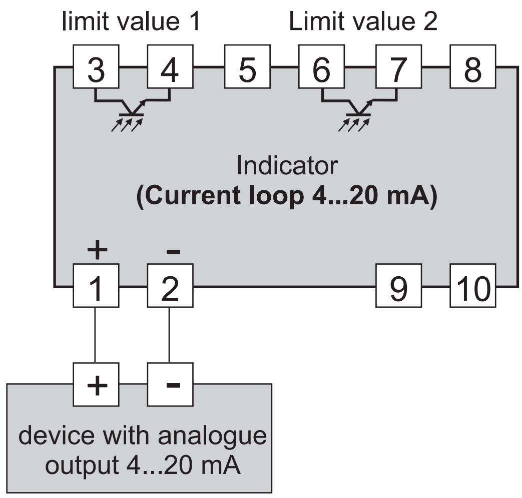


Examples for connection

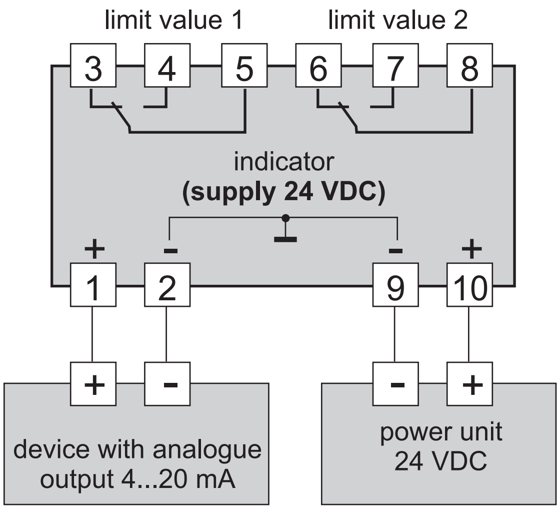
The respective data for connection are shown on the type plate.

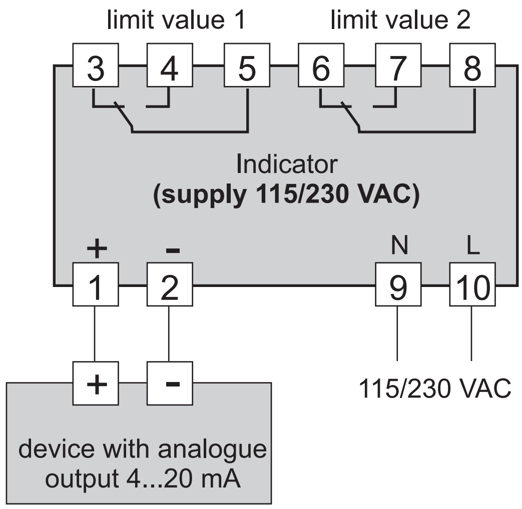
sample type plate





The analogue input of the indicator and the voltage supply are not galvanically insulated.





Program table for programming the indicator

PN	Description	Range	Delivered state[1)]
0	Calibration mode 0 = sensor calibration (with applied signal, factory configuration) 1 = programming (indicated value at 4/20 mA, 0/20 mA, 0/10 V)	0/1	1
1	Final value (Programming the value at 20 mA (10 V), eg 600)	-999...9999	250
2	Initial value (Programming the value at 4 mA (0 mA, 0 V), eg 100)	-999...9999	0
3	Selection of decimal point or unit (Programming a unit the indication shifts to the left)	0 0.0 0.00 0.000 °C °F	°C
4	Time of average / refresh of display (in 1/10 seconds)	5...10	10
5[2)]	Stabilisation zero (the +/- range where 0000 is indicated)	0...100	2
9	Switch off time of average (jump of input signal of x% of adjusted range of indication	5...100	5
50[3)]	Definition PIN-code for programming interlock (value >0000))	0000...9999	0000
51	Version of program		
52	Version of program day/month		
53	Version of program year		
54	Serial number manufacterer		
55	Serial number customer		
56	Day/month of delivery		
57	Year of delivery		
100	Number of calibration setpoints (calibration points for sensor calibration only, calibration points reduce the measuring rate)	0...30	0
101...130	Calibration points (the visible number of calibration points is fixed under PN100)	-999...9999	0
150[4)]	Limit value 1: trigger value	-999...9999	110
151[4)]	Limit value 1: reset value (hysteresis value)	-999...9999	90
152	Limit value 1: delay of trigger (x100 ms)	0...9000	0
153	Limit value 1: delay of reset (x100 ms)	0...9000	10
160[4)]	Limit value 2: trigger value	-999...9999	40
161[4)]	Limit value 2: reset value (hysteresis value)	-999...9999	60
162	Limit value 2: delay of trigger (x100 ms)	0...9000	0
163	Limit value 2: delay of reset (x100 ms)	0...9000	10
200	TAG number	0000....9999	0

1) With factory configuration

2) When programming a value >1 a hysteresis of 0,1% is activated. This avoids a jumping indication.

3) Optionally (if a PIN-code is not defined, PN50 is hidden). A PIN-code can be programmed via PC-interface only during factory settings. When there is a definition for a PIN-code (indication of **Pin** during segment test), for programming (after key **P** was pressed) the defined PIN-code of PN51 has to be input. This has to be confirmed by pressing the **P**-Key for 2 seconds. If no key is used for approx. 1 minute, the programming mode is blocked again.
When PN50 is selected to change an existing PIN-code, 5 times **Pin** is indicated before the changings can be started.

4) The difference between trigger value and reset value is the hysteresis.

Progamming

1. Connect the instrument according to the wiring diagram.
2. Switch power of the current loop (current between 4...20 mA) or the external power supply on. This is followed by an initalisation and a segment test. Then **CULO** is indicated and afterwards the version of firmware (eg **F1.16**). Subsequent current loop display is switching to the operation mode.
3. Press the **P** key. Indication of program number **P 0** .
4. Change the program number by simultaneous pressing of **P** & ▲ keys or **P** &▼ keys.
5. With the desired program number being chosen, go to the stored value by pressing the **P** key.
6. Short pressing of **P** results in a change of digit. The value of the chosen digit is changed by pressing the ▼ or ▲ key.
7. Storing of the new settings is effected by pressing the **P** for approx. 2 sec. This procedure is acknowledged by transversal bars in the display.
8. If no other key is actuated, the unit switches to its operation mode after seven seconds.

Additional key functions in standard mode for indication of min/max values

The ▲ key serves for indicating the value of the Max memory in the display for some seconds

The ▼ key serves for indicating the value of the Min memory in the display for some seconds

Simultaneous pressing of the ▲ and ▼ keys erases the values of the memory (minimum / maximum)

Underflow/overflow

standard input range: 4,00...20 mA
displayed standard input range: 3,90...20,10 mA
usable input range: 3,60...21,50 mA
warning underflow: 3,60...<3,9 mA
warning overflow: >20,10...21,50 mA
indication underflow: <3,60 mA
indication overflow: >21,50 mA
On warning the indicator flashes
(normal indication is changing with bars).
Values below 3,60 mA: a bar is changing with indication **undr**.
Values above 21,50 mA: a bar is changing with indication **over**.

Technical data

Input

Current loop:	4...20 mA
Input resistance:	R_i : approx. 450 ohms (U = 9 V)
	R_i : approx. 850 ohms (U = 17 V)
Voltage across adjustable with jumper	
With external supply:	
4...20 mA	R_i : approx. 10 ohms
0...20 mA	R_i : approx. 10 ohms
0...10 V	R_i : approx. 100 kohms

Accuracy

Resolution:	-999...+9999 digit
Measuring fault:	±0,2% of measuring range, ±1 digit
Temperature drift:	100 ppm/K
Measuring principle:	ramp conversion

Indication

Display:	7 segments, 14 mm high, red, 4 digits
Overflow/Underflow:	to HI / to LO
Time of indication:	0,1 s - 1 s - 10 s (adjustable)
Memory:	minimum / maximum values

Limit contacts

Electronically:	2 open collectors (36 VDC, 150 mA)
leakage current:	approx. 0,1 mA
Mechanically:	2 relays (changeover contact)
switching voltage:	minimum: 10 V AC/DC
	maximum: 125 VDC / 250 VAC
switching current:	VA: 0,1...1250 / W: 0,1...120
continuous current:	5 A
Indication:	limit value reached: LED red
	limit value not reached: LED green
Adjustment:	limit value, hysteresis value and delay times with 3 keys
Fai-safe function:	voltage supply “ON” = contacts active

Ambient conditions

Operating temperature:	0...+60°C
Storing temperature:	-20...+80°C

Supply

Current loop:	4...20 mA (9 or 17 VDC voltage accross, adjustable with jumper)
Direct current:	24 VDC ±5% (maximum 50 mA) (without galvanical insulation)
Alternating current:	115/230 VAC, power consumption: 1,5 VA

Mechanics

Enclosure:	96x48x30 mm (empty)
	96x48x55 mm (with terminals)
Mounting :	with plastic clamps in panel
Material enclosure:	polycarbonate, self-extinguishing (UL94 V-0)
Color:	black
Protection:	front: IP 65 (with sealing)
	back: IP 20
Weight:	approx: 170 g (type 115/230 VAC)
Connection:	plug-in terminal strip up to 1,5 mm² interlockable

Programmable features

range of indication / time of indication / decimal point / unit (°C/°F) / stabilisation zero point / limit value 1 / hysteresis value 1 / delay times 1 / limit value 2 / hysteresis value 2 / delay times 2 / locking of programming / calibration points / TAG number

Possibilities of indication

Programming the decimal point and unit the following scope of representation is possible:
xxxx / xxx.x / xx.xx / x.xxx / xxx°C / xxx°F