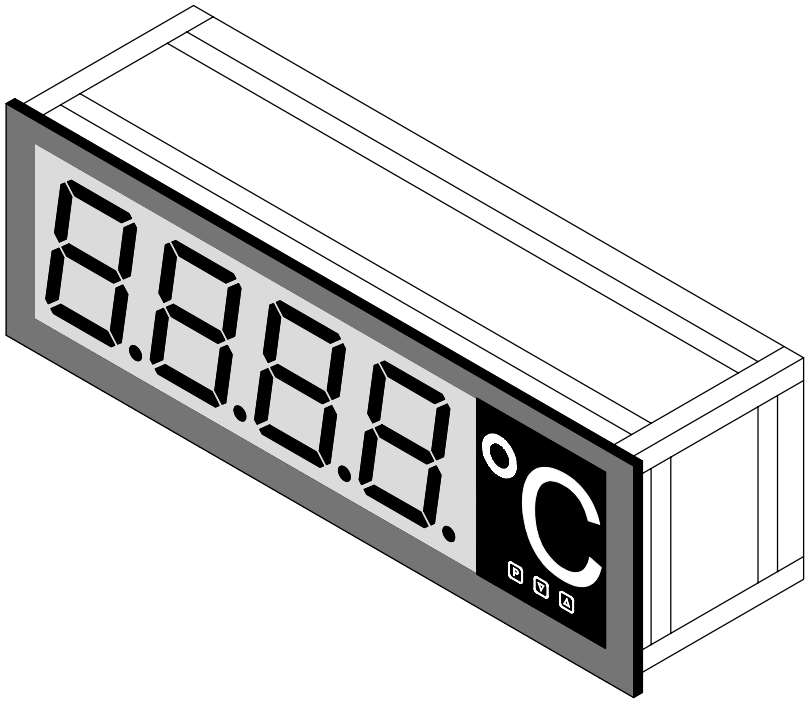
Operation manual

for

large indicators



Direct voltage, direct current

large indicator

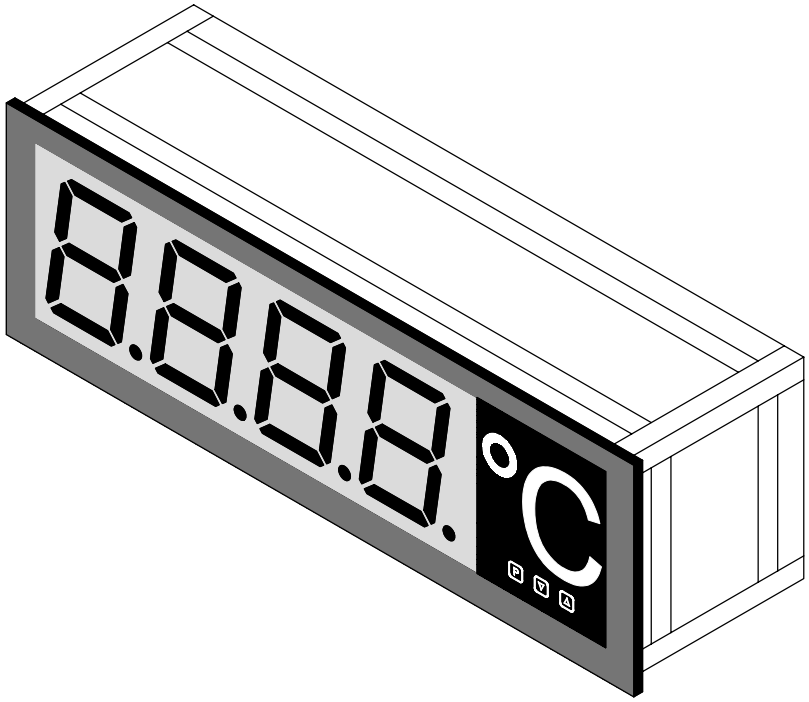
Standard: ***red indication, IP65, foil keyboard, min/max memory, plug in terminal 30 points linearization, up to 150 measurements per second adjustable***

Optional: ***character high 57mm, character high 100mm, analog output, sensor supply, relays, RS232, RS485, CANopen, without dimension***

88888

Model GBD panelmeter – including mounting hardware

(Presentation 4 digit with dimension)



Character high 57mm

			ORDER NUMBER OF TYPE
Power supply 230VAC		(4 digits with dimension)	**GBD 41.0001.510RD**
Power supply 24VDC	- **galv. insulated** -	(4 digits with dimension)	**GBD 41.0001.710RD**
Power supply 230VAC		(5 digits with dimension)	**GBD 51.0001.510RD**
Power supply 24VDC	- **galv. insulated** -	(5 digits with dimension)	**GBD 51.0001.710RD**

Character high 100mm

Power supply 230VAC		(4 digits with dimension)	**GBD 42.0001.510RD**
Power supply 24VDC	- **galv. insulated** -	(4 digits with dimension)	**GBD 42.0001.710RD**
Power supply 230VAC		(5 digits with dimension)	**GBD 52.0001.510RD**
Powrer supply 24VDC	- **galv. insulated** -	(5 digits with dimension)	**GBD 52.0001.710RD**

Options

- 1 digit additional 57mm (max. 8 digit)
- 1 digit additional 100mm (max. 6 digit)
- LED green
- Sensor supply 24VDC/50mA *(the sensor supply is galv. insulated from the measuring input)*
- Sensor supply 10VDC/50mA *(the sensor supply is galv. insulated from the measuring input)*
- Analog output 0-10VDC (12bit) *(galv. insulated)*
- Analog output 0-20mA (12bit) *(galv. insulated)*
- Analog output 4-20mA (12bit) *(galv. insulated)*
- Interface RS232 *(galv. insulated)*
- Interface RS485 *(galv. insulated)*
- Interface CANopen *(galv. insulated)*
- 2 relay outputs
- Fastening set for panelmeter or base mounted housing as spare
- Terminal for signals
- Terminal for power supply
- Other power supplies on demand
- Other sensor supplies on demand
- Without dimension

Direct voltage, direct current

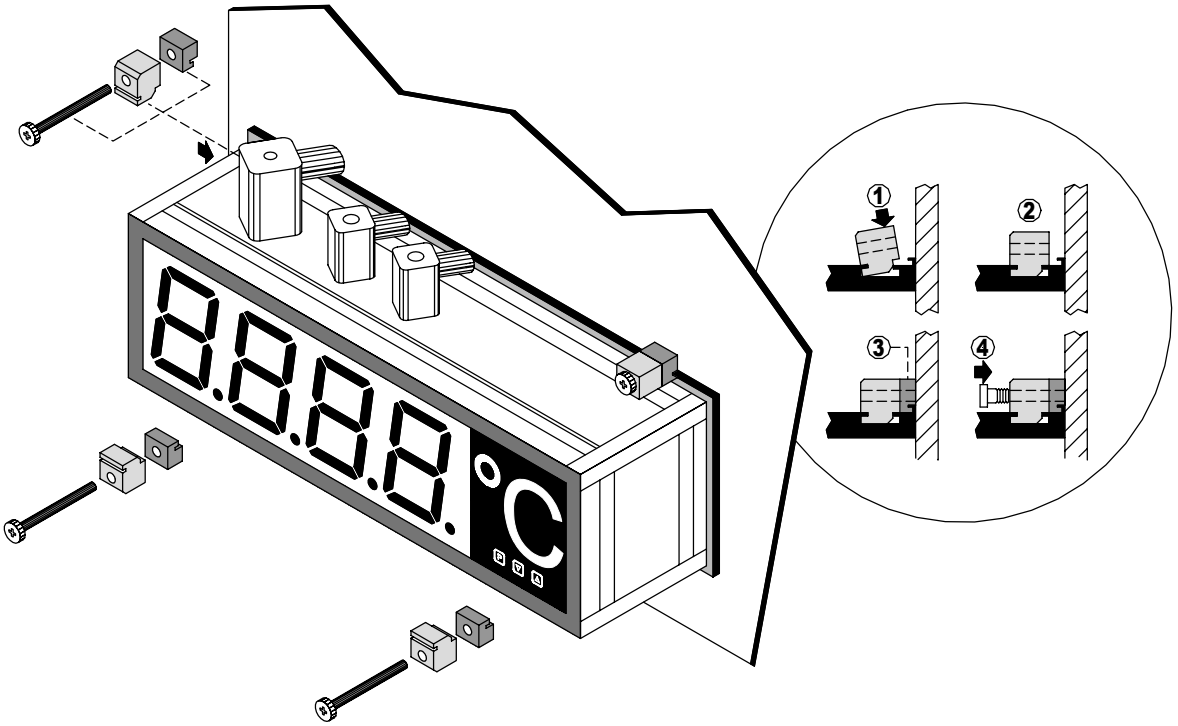
large indicator

Standard: ***red indication, IP65, foil keyboard, min/max memory, plug in terminal 30 points linearization, up to 150 measurements per second adjustable***

Optional: ***character high 57mm, character high 100mm, analog output, sensor supply, relays, RS232, RS485, CANopen, without dimension***

88888

Model GAD base mounted housing *(presentation 4 digit with dimension)*

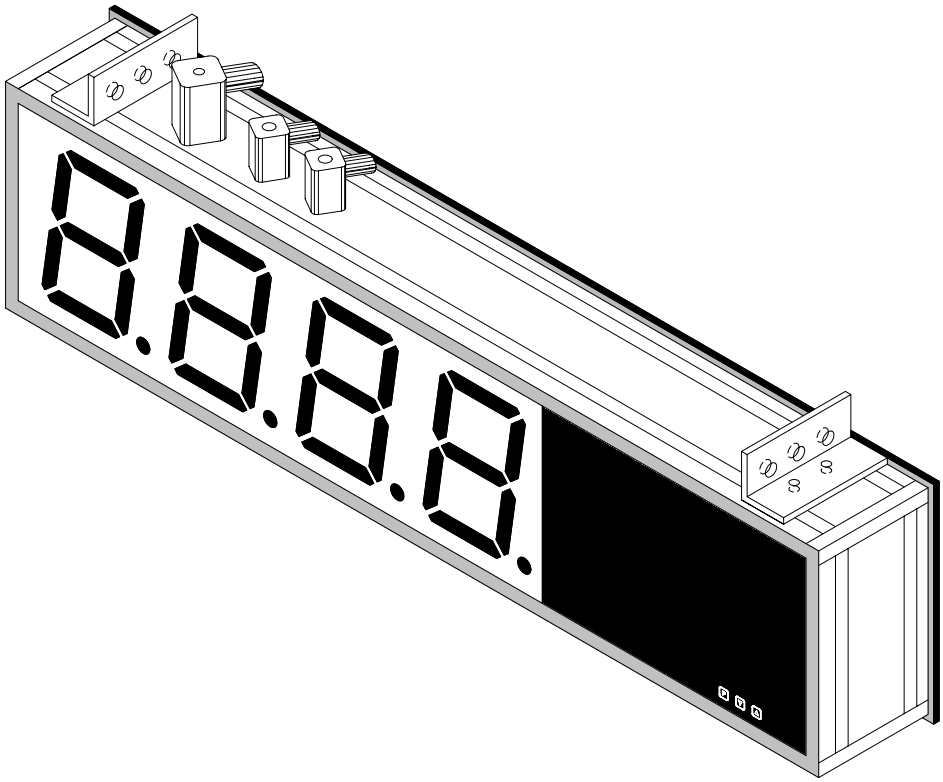


			ORDER NUMBER OF TYPE
Character high 57mm			
Power supply 230VAC		(4 digits with dimension)	**GAD 41.0001.510RD**
Power supply 24VDC	- **galv. insulated** -	(4 digits with dimension)	**GAD 41.0001.710RD**
Power supply 230VAC		(5 digits with dimension)	**GAD 51.0001.510RD**
Power supply 24VDC	- **galv. insulated** -	(5 digits with dimension)	**GAD 51.0001.710RD**
Character high 100mm			
Power supply 230VAC		(4 digits with dimension)	**GAD 42.0001.510RD**
Power supply 24VDC	- **galv. insulated** -	(4 digits with dimension)	**GAD 42.0001.710RD**
Power supply 230VAC		(5 digits with dimension)	**GAD 52.0001.510RD**
Power supply 24VDC	- **galv. insulated** -	(5 digits with dimension)	**GAD 52.0001.710RD**

Options

- 1 digit additional 57mm (max. 8 digit)
- 1 digit additional 100mm (max. 6 digit)
- LED green
- Sensor supply 24VDC/50mA *(the sensor supply is galv. insulated from the measuring input)*
- Sensor supply 10VDC/50mA *(the sensor supply is galv. insulated from the measuring input)*
- Analog output 0-10VDC (12bit) *(galv. insulated)*
- Analog output 0-20mA (12bit) *(galv. insulated)*
- Analog output 4-20mA (12bit) *(galv. insulated)*
- Interface RS232 *(galv. insulated)*
- Interface RS485 *(galv. insulated)*
- Interface CANopen *(galv. insulated)*
- 2 relay outputs
- Fastening set for base mounted housing GAD (1 angle, case throats, screws....)
- Terminal for signals
- Terminal for power supply
- Other power supplies on demand
- Other sensor supplies on demand
- Without dimension

Model GAD as douple indicator *(presentation 4 digit with dimension)*



			TYP-BESTELLNUMMER
Character high 57mm			
Power supply 230VAC		(4 digits with dimension)	**GDD 41.0001.510RD**
24VDC	- **galv. insulated** -	(4 digits with dimension)	**GDD 41.0001.710RD**
Character high 100mm			
Power supply 230VAC		(4 digits with dimension)	**GDD 42.0001.510RD**
Power supply 24VDC	- **galv. insulated** -	(4 digits with dimension)	**GDD 42.0001.710RD**

Options

- 1 digit additional 57mm (max. 8 digit)
- 1 digit additional 100mm (max. 6 digit)
- LED green
- Sensor supply 24VDC/50mA *(the sensor supply is galv. insulated from the measuring input)*
- Sensor supply 10VDC/50mA *(the sensor supply is galv. insulated from the measuring input)*
- Analog output 0-10VDC (12bit) *(galv. insulated)*
- Analog output 0-20mA (12bit) *(galv. insulated)*
- Analog output 4-20mA (12bit) *(galv. insulated)*
- Interface RS232 *(galv. insulated)*
- Interface RS485 *(galv. insulated)*
- Interface CANopen *(galv. insulated)*
- 2 relay outputs
- Fastenings set for douple indicator (2 flat steel connectors, case throats, screws....)
- Terminal for signals
- Terminal for power supply
- Other power supplies on demand
- Other sensor supplies on demand
- Without dimension

Programming, explanations

Setting (see also programming example next page)

1. Connect the instrument according to the wiring diagram.
2. Switch power on. This is followed by an initialisation and a segment test with subsequent switching to the operation mode.
3. Connect the desired measuring value to the measuring input.
4. Pressing the [**P**] key . Indication of program number **P 0.**
5. Change the programme number by simultaneous pressing of [**P**] & [▲] keys or [**P**] & [▼] keys.
6. With the desired programme number being chosen, go to the allocated value by pressing the [▼] **or** [▲] key.
7. Short pressing of **[P]** results in a change of digit. The chosen digit is changed by means of the [▼] or [▲] key.
8. Storing of the new setting is effected by pressing the [**P**] key for approx. 1 sec. This procedure is acknowledged by transversal bars in the display.
9. 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 value of the **MIN** or **MAX** memory shown in the display.

Explanations

Error messages
After connection of the supply voltage, the unit effects an initialisation including a segment test. Any disturbance during this procedure will be indicated by **"HELP"** in the display. If this indication is being displayed, a reset to the factory setting is required.

Setting ex works
The unit allows to be reset to the factory setting by the user. With this reset, the default values are loaded.
The factory setting is loaded by pressing the [P] key *(minimum holding time = 2 sec.)* and, simultaneously, connecting the supply voltage.

Input measuring range

The admissible input value may be within the range of –10....+110% of the respecting final value of the measuring range.

Analog output

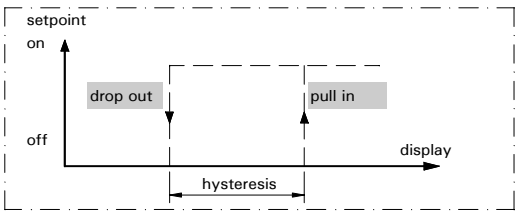
The parameters of the analog output refer to the values set under P1 and P2.

Relays

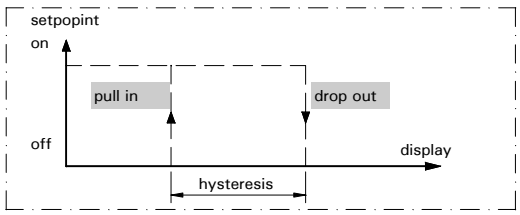
The following diagram shows the switching behaviour of the relays. The parameters for each relay are freely programmable. In the operating current mode, the respecting relay actuates when the switching threshold has been reached. In the quiescent current mode, the respecting relay is released when the switching threshold has been reached. This way, failure of the supply voltage can be indicated as an alarm. The switching delay can be used to reduce the response time of the relays in a defined way in order to suppress short-term fluctuations of the measuring value.

Definition: *The hysteresis is the width of the window between the two threshold values of a switching point.*

Example: operating current



Example: quiescent current



Measuring time/indication time
The measuring time can be chosen freely between 0.01 sec .... 1.00 sec. With measuring periods longer than 0.01 sec, the unit computes the arithmetic mean value, thus having a stabilising effect on the value to be displayed. Response time of the analog output and of the relays directly depends on the measuring time. With the measuring time set to 0.0 sec., the maximum measuring range of 150 measurements/sec. is achieved.
The display time determines the display actualisation cylce, with the last value measured during the measuring time being displayed.

Calibration
The unit disposes of different calibration modi to be preselected by P 0. With regard to the sensor calibration, a correspondingly high input signal must be applied with programming of P1 and P2 (e.g. 10 V with P1 and 0 V with P2). When the factory calibrations are used, only re-scaling of the start and end value has to be effected. The pertaining input signal values are taken over from the memorized factory settings. In this case, it is not necessary to feed an input signal. Programming of the calibration points (P 101 – P 130) only works with sensor calibration, and independently of the adjusted P 0 !

Program table, example for programming

Program table 1

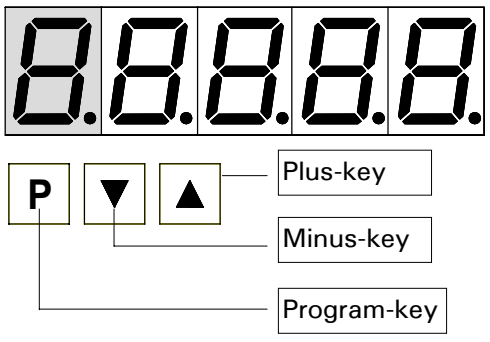
Program number	Function	Remark	Display 4-digits Display (5-digits)	Setting ex works
0	Calibration mode	0 = sensor calibration 1 = 0....10V – factory calibration 2 = 4....20mA – factory calibration	0 to 2	0
1	Input of the desired value	With sensor calibration, feed measuring value (acknowledge with P for 1 sec) e.g. 10V measuring input = final value 3500	-999 to 9999 (-9999 to 32500)	10000
2	Input of offset for indication value	With sensor calibration, feed measuring value (acknowledge with P for 1 sec.) e.g. 4 mA measuring input = initial value 0	-999 to 9999 (-9999 to 32500)	0
3	Setting of decimal point	Set digit point with ▲ or ▼		no decimalp.
13	Input of display time	Refresh of display	0.1 to 10.0 s	1.0 s
14	Input of measuring time	Measuring time 0.00 sec corresponds to max. measuring rate. With measuring times longer than 0.00 sec, arithmetic mean values are computed.	0.00 to 1.00 s	0.00 s
20	Input of final value for analog output	Option	-999 to 9999 (-9999 to 32500)	10000
21	Input of offset for analog output	Option	-999 to 9999 (-9999 to 32500)	0
50	Locking of programming	Activating/deactivating locking function for programming	0000 to 9999	0
51	Releasing code	Definition of release code for the programming locking function under PN50	0000 to 9999	0
52	User level	Restriction of programming possibilities for users (0 = weakly secured; 4 = strongly secured)	0 to 4	1
100	Number of calibration points	Calibration points for sensor calibration only (calibration points reduce the measuring rate)	0 to 30	0
101...130	Calibration points		-999 to 9999 (-9999 to 32500)	x
200	Serial number of device	cannot be changed by users		x

Program table 2 *(setpoints)*

S1	S2	Function	Display 4-digits Display (5-digits)	Setting ex works
P	P			
60	65	Setpoint	-999 to 9999 (-9999 to 32500)	1000/2000
61	66	Hysteresis	1 to (PN1-PN2)	1
62	67	Quiescent current/operation current	0/1	1
63	68	Switching delay	0.0 to 10 s	0.0
64	69	Type of delay (0 = none), (1 = switch-in), (2 = switch-off), (3 = both)	0/1/2/3	0

Example for programming

Measuring input: 0/4-20mA
Measuring value: 4-20mA
Display: 1.00 - 200.00
Displ. refr. time: 2.5 s
Setpoints: S1 = = > 4.00 = display and operation current
relay pull in = 3.80 ⇒ hysteresis 0.2
and switch-in/switch-off delay of 2 sec.
S2 = = > 10.00 = display, operation current
relay pull in = 9.40 ⇒ hysteresis 0.6
and switch-off delay of 1.3 sec
Analog output: 0V output = = > display 1.00 = = > measuring value 4mA
10V output = = > display 200.00 = = > measuring value 20mA



The basis for this programming example are the factory settings.

Programming

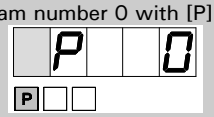
Switch power on !

Lamp test

Standard mode

Example for programming

To program number 0 with [P]

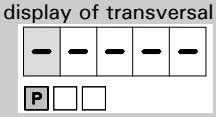


Connect 20mA! To program number 1 (Fullscale) with [P] and ▲.

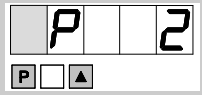
To memorized value with ▲ or ▼.

Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.

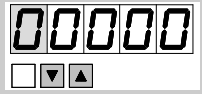
Press [P] 1 second for storage. Take over by display of transversal bars.



Connect 4mA ! To program number 2 (offset) with [P] and ▲.

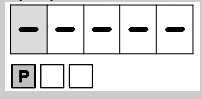


To memorized value with ▲ or ▼.



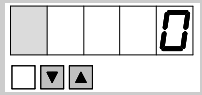
Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.

Press [P] 1 second for storage. Take over by display of transversal bars.

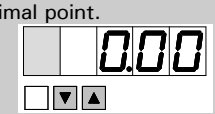


To program number 3 (decimal point) with [P] and ▲.

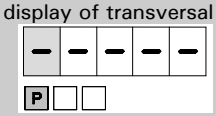
To memorized value with ▲ or ▼.



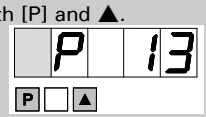
Set decimal point.



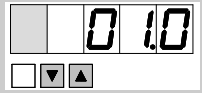
Press [P] 1 second for storage. Take over by display of transversal bars.



To program number 13 (refreshing time) with [P] and ▲.

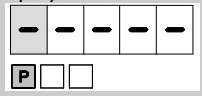


To memorized value with ▲ or ▼.



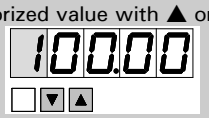
Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.

Press [P] 1 second for storage. Take over by display of transversal bars.



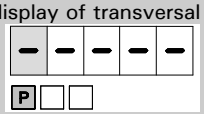
To program number 20 (full scale analog output) with [P] and ▲.

To memorized value with ▲ or ▼.

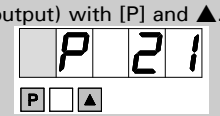


Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.

Press [P] 1 second for storage. Take over by display of transversal bars.



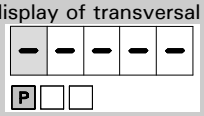
To program number 21 (offset analog output) with [P] and ▲.



To memorized value with ▲ or ▼.

Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.

Press [P] 1 second for storage. Take over by display of transversal bars.



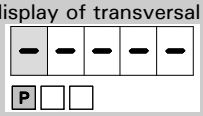
To program number 60 (setpoint 1) with [P] and ▲.

To memorized value with ▲ or ▼.

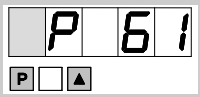
Example for programming

Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.

Press [P] 1 second for storage. Take over by display of transversal bars.

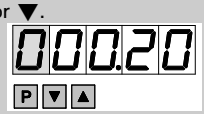


To program number 61 (hysteresis setpoint 1) with [P] and ▲.

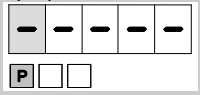


To memorized value with ▲ or ▼.

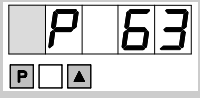
Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.



Press [P] 1 second for storage. Take over by display of transversal bars.

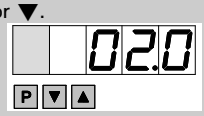


To program number 63 (time delay setpoint 1) mit [P] und ▲.

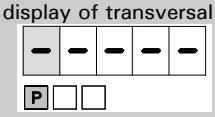


To program number 69 (kind of delay) with [P] and ▲.

Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.

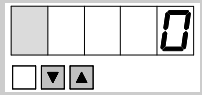


Press [P] 1 second for storage. Take over by display of transversal bars.

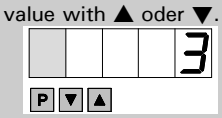


To program number 64 (kind of delay) with [P] and ▲.

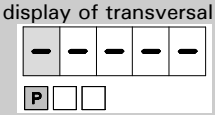
To memorized value with ▲ or ▼.



Modify value with ▲ oder ▼.



Press [P] 1 second for storage. Take over by display of transversal bars.

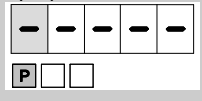


To program number 65 (setpoint 2) with [P] and ▲.

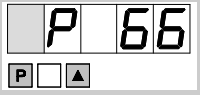
To memorized value with ▲ or ▼.

Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.

Press [P] 1 second for storage. Take over by display of transversal bars.



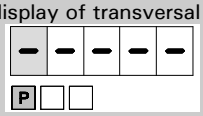
To program nummer 66 (hysteresis) with [P] and ▲.



To memorized value with ▲ or ▼.

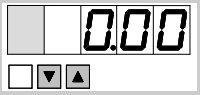
Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.

Press [P] 1 second for storage. Take over by display of transversal bars.

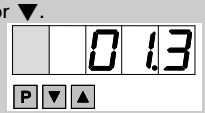


To program number 68 (time delay setpoint 2) mit [P] und ▲.

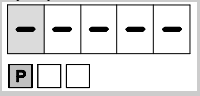
To memorized value with ▲ or ▼.



Changing of digit with [P].
Modify value of the individual digit with ▲ or ▼.



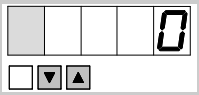
Press [P] 1 second for storage. Take over by display of transversal bars.



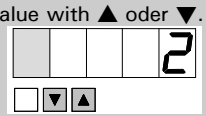
To program number 69 (kind of delay) with [P] and ▲.

Example for programming, technical data

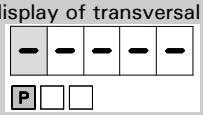
To program number 69 (kind of delay) with [P] and ▲.



Modify value with ▲ oder ▼.



Press [P] 1 second for storage. Take over by display of transversal bars.



Programming finished !

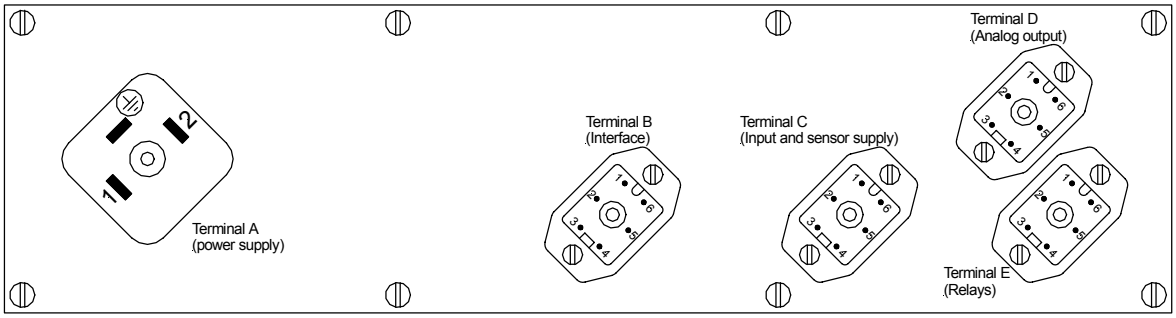
Technical data

Dimensions	57mm display	L 288 mm x H 96 mm x T 82 mm (length of the douple indicator +48mm)
without plug adapter	100mm display	L 498 mm x H 148 mm x T 82 mm (length of the douple indicator +90mm)
	150mm display	appr. L 744 mm x H 213 mm x T 82 mm
	200mm display	appr. L 963 mm x H 291 mm x T 82 mm
	250mm display	appr. L 1195mm x H 357 mm x T 82 mm
	300mm display	appr. L 1457mm x H 498 mm x T 82 mm
with plug adapter	GBD	T 125 mm
	GAD, GDD	Height + 41mm
	Assembly cut out	only GBD instruments
	57mm display	L $282.0^{-0.5}$ x B $90.0^{-0.5}$ mm (length in the case of douple indicator +48mm)
	100mm display	L $492.0^{-0.5}$ x B $142.0^{-0.5}$ mm (length in the case of douple indicator +90mm)
	150mm display	On demand
	200mm display	On demand
	250mm display	On demand
	300mm display	On demand
	Fastening	Displays to 100mm in accordance with illustration Displays via 100mm can be positioned with specific fixing (see accessory)
	Housing material	Aluminium black, with powder coating
	Protective system	IP65
	Weight	
	57mm display	appr. 2,2 kg
	100mm display	appr. 4,0 kg
	150mm display	appr. 6,5 kg
	200mm display	appr. 9,8 kg
	250mm display	appr. 13,5 kg
	300mm display	appr. 20,4 kg
	Connection	3 channel multipole connector for voltage supply in execution IP65, for conductor diameter 5,5 – 10mm. 6 channnel multiple connector for inputs and outputs in executionIP65, for conductor diameter 4 – 7,5mm.
Input	Measuring range	0...10V, 0/4...20mA, all ranges are selectable via connection terminal
	Measuring cycle	Max. 150 measurements per second With active linearisation, the measuring rate decreases
	Input resistance	Measuring range 0....10V = 110kΩ 0/4....20mA = 50Ω
Output	Sensor supply	24VDC/50mA 10VDC/50mA (Other sensor supplies on demand) *The **sensor supply** is separated from measuring input by **galvanic insulation !***
	Relay outputs	2 or 4 change over contacts Load 230VAC/5A – 30VDC/2A Separation as per DIN EN 50178 Ratings as per DIN EN 60255 Switching delay 0....10 sec
	Analog output	0-10VDC (12 bit) – max. 20mA 0-20mA (12 bit) – max. load 500 Ohm 4-20mA (12 bit) – max. load 500 Ohm *The **analog output** is separated from measuring input by **galvanic insulation !***

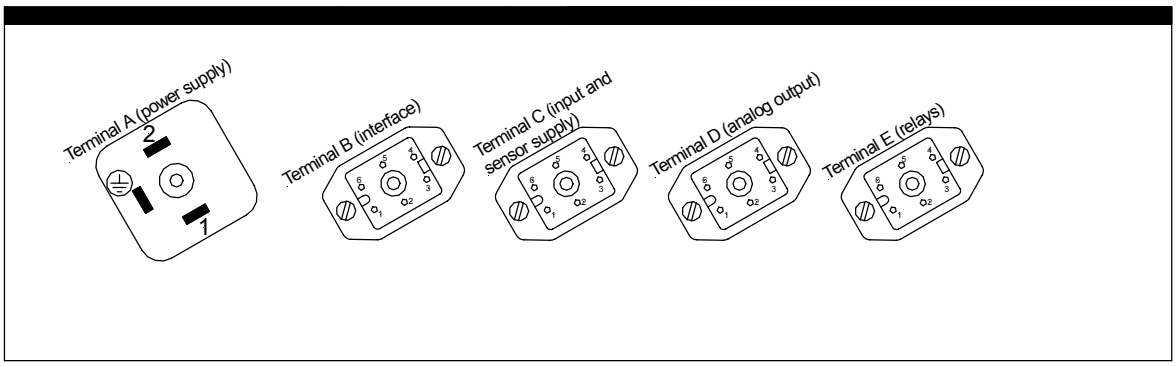
Technical data, connection diagrams

Interface	RS232	9600 Baud, no parity, 8 data bits, 1 stop bit *This **interface** isn't separated from measuring input by **galvanic insulation !***
	RS485	9600 Baud, no parity, 8 data bits, 1 stop bit *This **interface** is separated from measuring input by **galvanic insulation !***
	CANopen	Baud rates: 10k bit; 20k bit; 50k bit; 125k bit; 250k bit; 500k bit; 800k bit; 1M bit Protocol CANopen DSP-404 *This **interface** is separated from measuring input by **galvanic insulation !***
Accuracy	Resolution	12 bit
	Measuring fault	+/-0,1% of final value, +/- 1 digit
	Temp. drift.	130 ppm/K
	Measuring principle	Successive approximation
Power unit	Supply voltage	230VAC ± 10% (50-60Hz), 24VDC ±20% galv. insulated
	Power consumption	max. 10VA
Indication	Display	LED with 7 segments, 14mm high, red 5 digit = indication –9999 up to 32500
	Measuring time	Adjustable from 0.1-10 sec.
	Overflow	Indication of 5 transversal bars
Ambient conditions	Working temperature	0 up to + 50 °C
	Storing temperature	-20 up to + 80°C

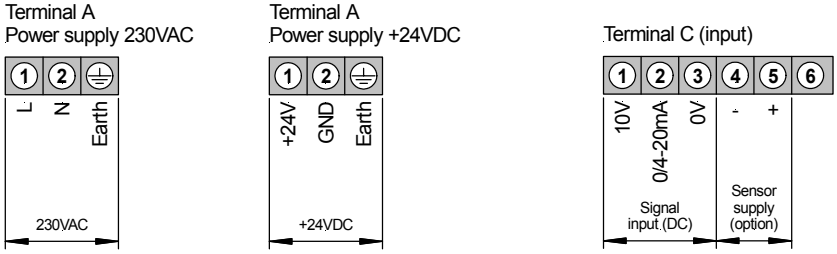
Rear of the housing (GBD)



Top of the housing (GAD)



• Power supply

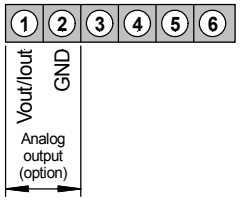


Installation drawing

Options

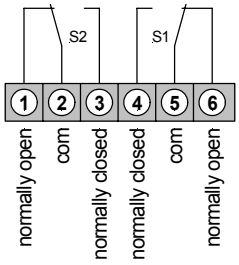
- **Analog output**

Interface D (analog output)



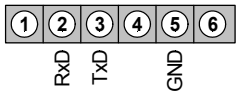
- **Setpoints**

Terminal E (relays)

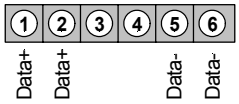


- **Interfaces**

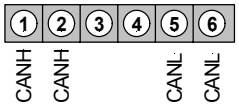
Terminal B (RS232)



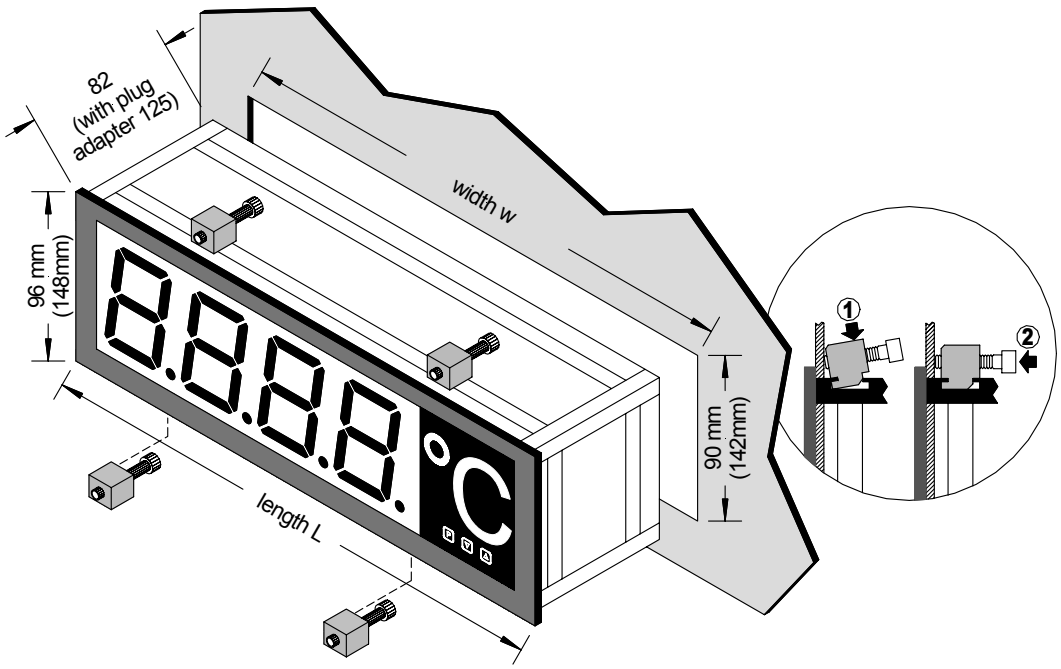
Terminal B (RS485)



Terminal B (CANopen)



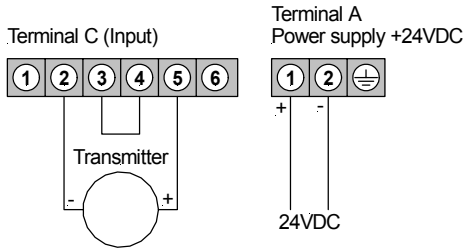
Panelmeter GBD



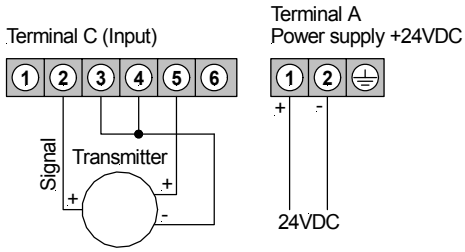
Connection diagrams

Terminal holding for transmitter connections

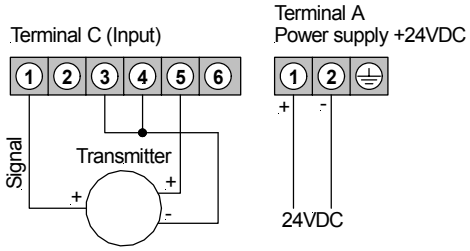
2-wire: 4-20mA



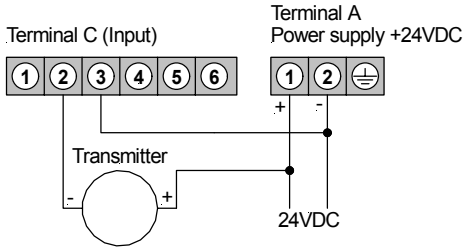
3-wire: 0-20mA



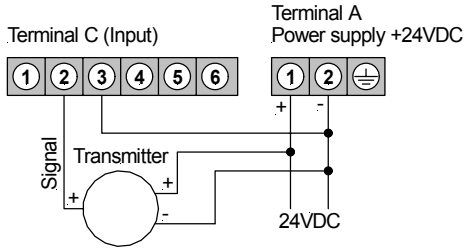
3-wire: 0-10V/0-5V/0-1V/1-6V



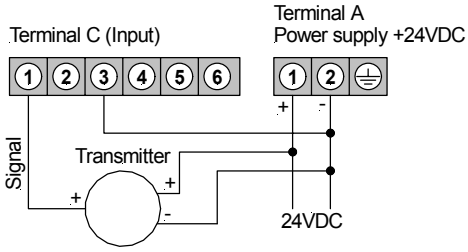
2-wire 4-20mA



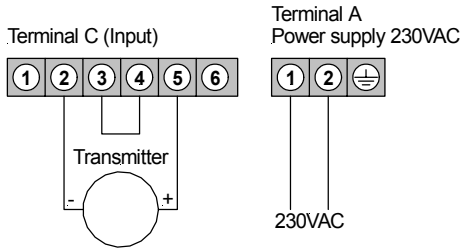
3-wire: 0-20mA



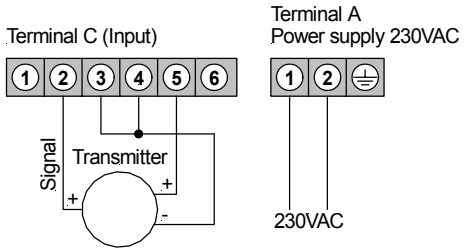
3-wire: 0-10V/0-5V/0-1V/1-6V



2-wire: 4-20mA



3-wire: 0-20mA



3-wire: 0-10V/0-5V/0-1V/1-6V