

Digital remote display for Flow Meter DM / DE

Productive metering instrument PR

Indication of the actual flow rate in m³/h

Merkmale

- LED-Display 14,2mm red
- Display range ± 99999 digit
- 0 ... 3 decimal points programmable
- 2 digital inputs for summation, difference, ratio and product measurement
- Hold-input
- Integrated transmitter-supply 24 / 8V DC
- Max. 4 outputs, SPDT relay or transistor
- Display conversion programmable
- Isolated analog output, 0/4 ... 20mA and 0/2 ... 10V DC
- Front protection IP65



DIN 96x48mm

General

The Productivity Panelmeter PR9648 analyses impulse rates, representing a speed, flow, passing time or revolutions per time. The displayed values therefore always refer to a determined time unit and represent productivity. There are extensive functions programmable (see page 6). Since impulses and unit of a displayed value can take any relation, the device offers extensive conversion possibilities.

Short information

Programming	Parameters are programmed via front-side membrane keypad
Transmitter-supply	The integrated transmitter supply allows direct connection of pnp initiators, light barriers, mechanical switch contacts, proximity switches, rotary encoder (24V DC) and Namur initiators (8V DC).
Input prescaler	An input prescaler has separate programming function for input A and B.
Display conversion	A separate programmable divisor and factor makes the display adaptable as required.
Alarm outputs	Switching performance of the alarm outputs is programmable as minimum or maximum function.
Analog output	Proportional to the display value an isolated analog output signal 0 ... 20mA / 0 ... 10V DC or 4 ... 20mA / 2 ... 10V DC can be generated. Start value and end value are programmable. Output changed automatically from current signal to voltage signal, depending on burden.
Hold-function	Display freezes by control input level 24V DC or voltage free contact (see page 3).

Technical Data

Power supply

Supply voltage	: 230V AC $\pm 10\%$; 115V AC $\pm 10\%$; 24V AC $\pm 10\%$ or 24V DC $\pm 15\%$
Power consumption	: max. 3.5VA, with analog output 5VA
Operating temperature	: -10 ... +55°C
Rated voltage	: 250V~ acc. to VDE 0110 between input / output / supply voltage Degree of pollution 2, over-voltage category III
Test voltage	: 4kV-, between input / output / supply voltage
CE - conformity	: EN55022, EN60555, IEC1000-4-3/4/5/11/13

Input

pnp input	: $R_i = 6.3k\Omega$ level: < 4V low; > 8.5V high; Hysteresis > 2.5V, max. 35V DC
Namur input	: R_i appr. $1k\Omega$ (<4mA) level: < 1mA low; >2.2mA high; Hysteresis > 0.5mA max. 35V DC
Impulse frequency	: Input A or B = 0.1Hz ... 15kHz, A and B together = 0.1Hz ... 8kHz, switch contact = 0.1Hz ... 30Hz, 2-channel rotary encoder = 0.1Hz ... 10kHz;
Min. Impulse width	: Electronic impulse 50 μ s, switch contact 5ms
Time base	: Seconds, minutes or hours
Accuracy	: $\leq 0.003\% \pm 1$ Digit
Transmitter supply	: 8V DC (Namur), 24V DC (pnp), R_i appr. 150Ω , max. 50mA (max. 25mA with 4 relay outputs)

Display

Display range	: -99999 ... 99999 digit with leading zero suppression
Parameter display	: LED 2-digit red, 7mm (parameter - and output indicator)

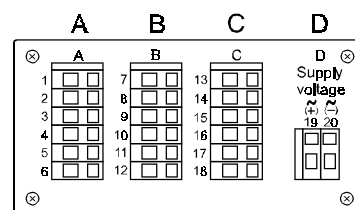
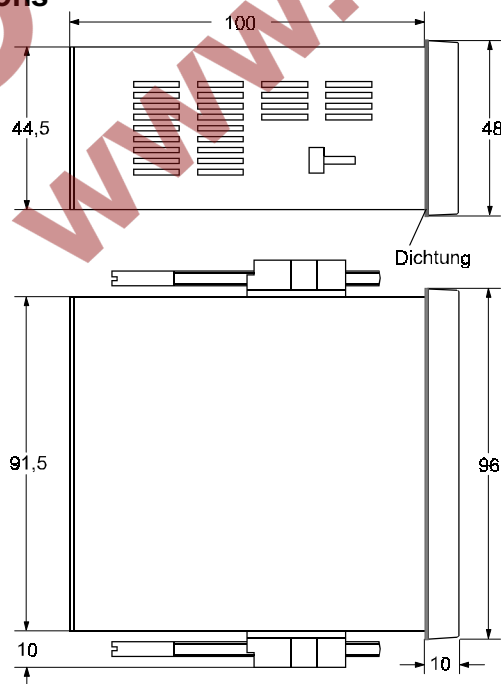
Output

Relay	: SPDT <250V AC<250VA<2A, <300V DC<50W<2A
Transistor	: max. 35V AC/DC / 100mA, with short circuit protection
Analog output	: 0/4 ... 20mA burden $\leq 500\Omega$; 0/2 ... 10V burden $> 500\Omega$, isolated Automatic output changing (burden dependent)
-Accuracy	: 0.1%; TK 0.01%/K

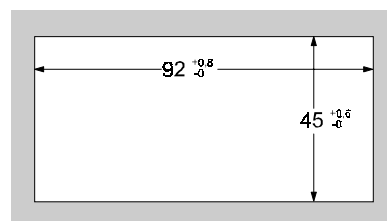
Panel case

Panel case	: DIN96x48mm Material PA6-GF; UL94V-0
Dimensions	: Front 96x48mm, mounting depth 100mm,
Weight	: max. 390g
Electrical connection	: Clamp terminals, 2mm ² single wire, 1mm ² flexible wire, AWG14
Protection	: Front IP65, terminals IP20, finger safe acc. BGV A2 (old VBG4)

Dimensions



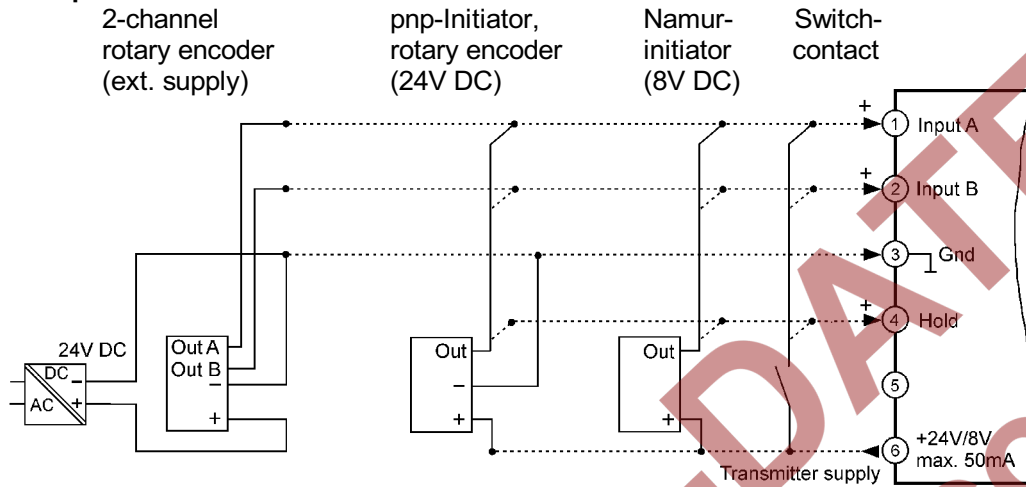
position terminal strips



Panel cut-out
acc. to DIN 43700-96x48

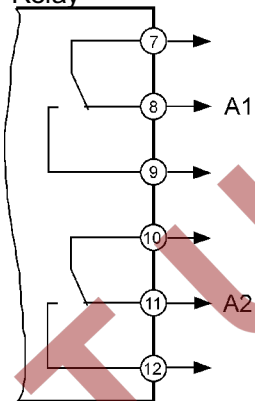
Connection diagrams

Terminal strip A



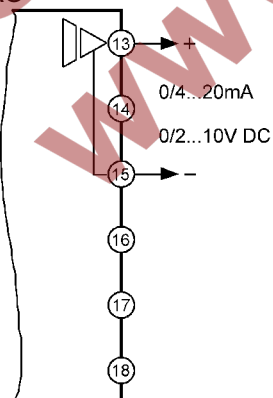
Terminal strip B

2 preselect (alarm) outputs
Relay

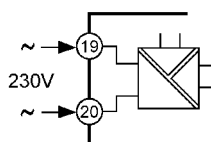


Terminal strip C

Analog output
AO



Terminal strip D supply voltage



Controls and indicators



Description

Operation of the device is arranged in 2 levels. The requested parameter can be called by  button. Selection within a parameter or entering data, use buttons  and . Parameters are stored zero-voltage safe in the EEPROM.

Button combinations:

-  +  one parameter back.
-  +  setting parameter to zero or minimum value.

After turn on the supply voltage, the device is working in the **Working level**. Set points of preselect (alarm) outputs can be selected.

Activating the  button for more than 2 seconds, the program is jumping into the **Configuration level**. Now all parameters, defining the function of the device can be programmed. These maybe the measuring input, input configuration, conversion of the displayed value, switching performance of alarm outputs and the analog output signal.

After finishing the configuration or when longer than 2 minutes no button was pushed, the program jumps back to the working level. Leaving the configuration level is possible at any time when pushing the button  for 2 seconds.

Error messages:

PE Reading this message in the parameter display, parameter failure has been occurred. The display flashes. When pushing one of the buttons the error code will be deleted and the device is running with factory settings. Configuration and function of the device must be checked. If error occurs again, please ship the device to factory for repair service.

Lo c Programming lock active ⇒ see configuration page 9

o F Overflow

Notes to representation



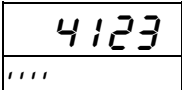
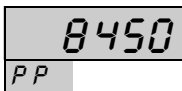
Parameter only shown when configured



Parameter is only shown when installed in the device (see order code)

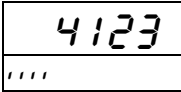
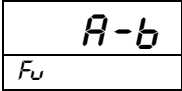
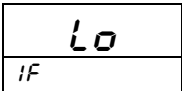
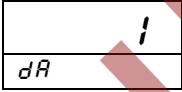
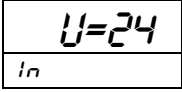
Note: All parameters can be called if they are not blocked by other programmed parameters and if they are available. Factory settings are shown in [].

Working level

Button	Display	Description	[Factory settings]
		Actual value Output indication (only if installed and activated).	
			
		Display peak reading Reset with the buttons  or  , or at every power off.	
			
		Display valley reading Reset with buttons  or  , or at every power off.	
			
		Setpoint output A1 Setting possible from -99999 ... 99999 digit with buttons  and  .	[0]
			
		Setpoint output A2 Setting possible from -99999 ... 99999 digit with buttons  and  .	[0]
			

Note: Setpoint of the alarm outputs A1 to A4 are identical.

Configuration level

Button	Display	Description	[Factory settings]
 press 2 sec.		Working level	
		Function: input configuration $A-b$ = A up, B down $A \cup b$ = A up, B up $g \circ \circ \circ \circ$ = rotary encoder $b \circ A$ = ratio or passing time $A-b \circ b$ = proportional deviation (A-B) / Bx100 $b-A \circ b$ = proportional deviation (B-A) / Bx100 Selection with buttons  and  .	[A - b]
		Input frequency $L o$ ≤ 30 Hz, for switch contacts $H i$ ≤ 15 kHz, for electronic outputs Selection with buttons  and  .	[Lo]
		Prescaler input A Setting possible from 1 ... 9999 digit with buttons  and  . (only every n th impulse is counted)	[1]
		Prescaler input B Setting possible from 1 ... 9999 digit with buttons  and  . (only every n th impulse is counted)	[1]
		Constant input B $o F F$ = no function $-99999 \dots o F F \dots 99999$ Setting possible from -99999 ... 99999 digit with buttons  and  . Input B is deactivated. Input signal will be replaced by Constant $\circ b$ This constant enables to measure e.g. the slippage of a motor, the deviation from a reference value or the passing time in a continuous heater.	[o F F]
		Transmitter supply / Input level $U = 24$ = 24V DC for pnp-initiators $U = 8$ = 8V DC for Namur-initiators (* with ext. 5V supply also suitable for TTL-signals) $t E 5 t$ only for factory settings Selection with buttons  and  .	[U = 24]
			

↓

Time base [SEC]

$h r$ = hour (h^{-1})
 $m i n$ = minutes (min^{-1})
 $s e c$ = seconds (s^{-1})
 Selection with buttons  and  .

↓

Refresh time (displayed time) [1.0]

Setting possible from 0.1 ... 9.9 sec. with buttons  and  .

Maximum display accuracy with will be reached :

$t \geq (\text{max. display time in digit}) \times 0.000024 \text{ s}$

Example: max. display value 1200.0
 $t = 12000 \times 0.000024 = 0.288 \text{ s} \Rightarrow t \geq 0.3 \text{ s}$

Note: At minimum 2 impulses must run the input within one refresh cycle (refresh time)

↓

Decimal point position [0.]

Auto (floating point)

$.000$
 $.00$
 $.0$
 $0.$
 0
 Selection with buttons  and  .

↓

Digital filter [OFF]

$o f f$
 $o n$
 Selection with buttons  and  .

↓

Divisor for display [1]

Setting possible from 1 ... 9999 digit with buttons  and  .

↓

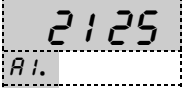
Factor for display [1]

Setting possible from 1 ... 9999 digit buttons  and  .

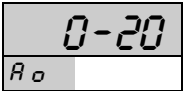
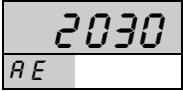
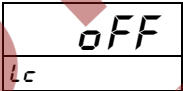
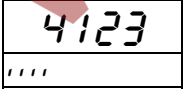
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Negative sign [OFF]

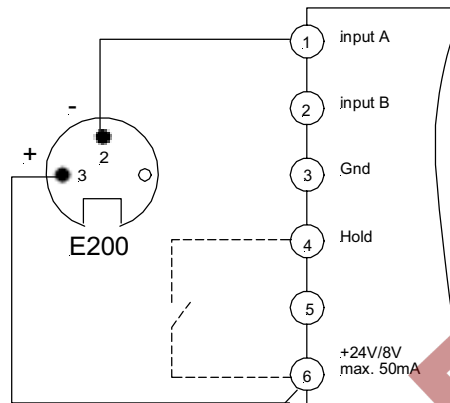
$o f f$ no sign for measuring value and parameter
 $o n$ with sign; the output activation referring belongs to the sign;
 (depending on direction of movement)
 Selection with buttons  and  .

Button	Display	Description	[Factory settings]
		Switching performance output A1 <i>oFF</i> = no action <i>o n L</i> (min) = continuous contact: on-off <i>o n J</i> (max) = continuous contact: off-on Selection with buttons  and  .	[<i>oFF</i>]
			
		Setpoint output A1 Setting possible from -99999 ... 99999 digit with buttons  and  . Decimal points only displayed if a fixed decimal point was programmed	[0]
			
		Switching performance output A2 <i>oFF</i> = no action <i>o n L</i> (min) = continuous contact: on-off <i>o n J</i> (max); = continuous contact: off-on Selection with buttons  and  .	[<i>oFF</i>]
			
		Setpoint output A2 Setting possible from -99999 ... 99999 digit with buttons  and  . Decimal points only shown if a fixed decimal point was programmed.	[0]
		Note: Switching performance and setpoint of the outputs A1 bis A4 are identical.	
		Common Hysteresis for outputs A1 ... A4. Setting possible from 1 ... 9999 digit with buttons  and  . Decimal points only shown if a fixed decimal point was programmed. Parameter only shown if at minimum 1 output is activated.	[1]
			

Continue
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Button	Display	Description	[Factory settings]
 		Analog output $0 - 20 \text{ mA}$ (0 - 10 V DC) $4 - 20 \text{ mA}$ (2 - 10 V DC). The changing from current to voltage output is load-dependent ($\leq 500\Omega$ = current output, $> 500\Omega$ = voltage output). Selection with buttons  and  .	[0 - 20]
 		Start value for analog output Setting possible from -99999 ... 99999 digit with buttons  and  . Decimal point only shown if programmed.	[0]
 		End value for analog output Setting possible from -99999 ... 99999 digit with buttons  and  . With fixed decimal point programming the difference between start- and end value must be at minimum 4000 digit to get the maximum display resolution. With floating point, R_{LB} parameter $R5$ und RE changing automatically for best resolution. If the start value $R5 > \text{end value } RE$, the output works with decreasing characteristic. Decimal points only shown if a fixed decimal point was programmed	[0]
 		Program lockout OFF = no lock $CONF$ = configuration level locked ALL = all parameters locked REL = only with analog output (only for factory settings) Selection with buttons  and  .	[OFF]
		Return to the working level	

Connection diagram for Flow Meter DM/DE



Example of programming for Flow Meter DM/DE

Connection at pulser E 200

Parameter	Designation / Display	Input
Input configuration	FU	A-b
Frequency input	IF	High
Prescaler input A	dA	1
Prescaler input B	db	1
Constant input B	Cb	off
Transmitter supply	In	U = 8
Time base	tb	hr
Refresh time	rt	3.0
Decimal point position	dp	.0
Digital filter	Fi	off
Divisor for display	d	5000 / 500 / 250 / 1875 cp-value of the flow meter
Factor for display	F	1/10
Negative sign	Si	off
Switching performance A1	AI	
Setpoint output A1	AI.	
Switching performance A2	A2	
Setpoint A2	A2.	
Common hysteresis for output A1,A2	Hy	
Analog output	Ao	
Start value for analog output	AS	
End value for analog output	AE	
Program lockout	LC	as required

We reserve the right to make technical modifications in the interest of progress

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