Digital remote display for Flow Meter DM /DE

Universal meter UZ

Indication of the quantity consumed in m³

Features

- LED-Display 14.2mm red
- Indicating range -99999 ... 999999
- 0 ... 3 Decimal points programmable
- Up- and down counter function
- 2 digital inputs for summation and subtraction
- Integrated transmitter-supply 24 / 8V DC
- Auto-reset or external reset
- 2 preset outputs SPDT relay (optional),
- Display conversion programmable
- Isolated analog output
- 0/4 ... 20mA and 0/2 ... 10V DC (optional)
- Front protection IP65

General

The universal meter UZ has been designed for process engineering and automation environments. All parameters can be programmed. The counter can be used wherever quantities or processes must be measured, displayed and controlled or regulated.

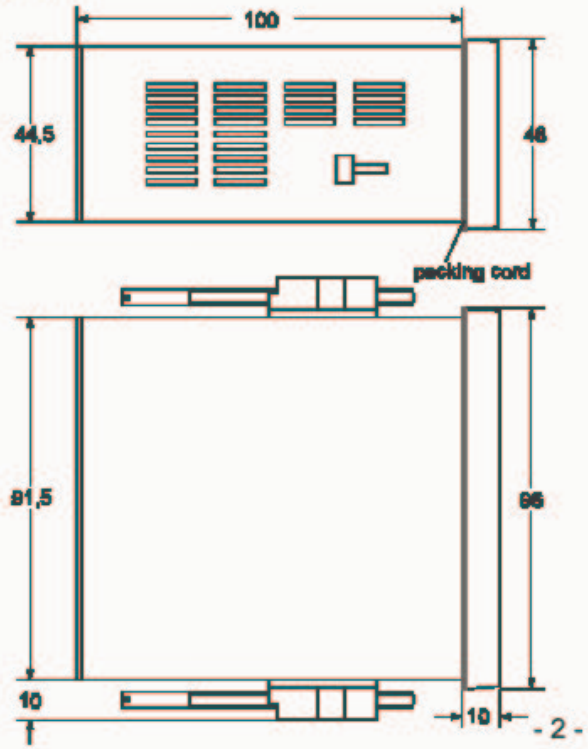
Short information

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.
Preset outputs	Preset outputs can be programmed as continuous contact or pulse contact. Switching performance is programmable as minimum or maximum function.
Analog output	Proportional to input pulses 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.

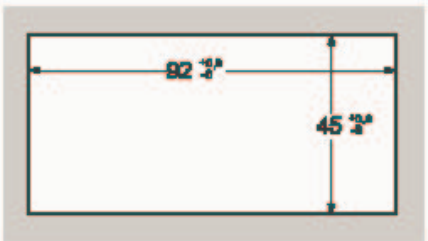
Technical Data

Power supply		
Supply voltage	:	230V AC ±10%;
Power consumption	:	max. 3,5VA, with analog output 5VA
Operating temperature	:	-10 ... +55°C
Rated voltage	:	250V~ acc. to VDE 0110 Degree of pollution 2, over-voltage category III
Test voltage	:	4kV-, between input / output / supply voltage
CE - Konformität	:	EN55022, EN60555, IEC1000-3/4/5/11/13
Input		
pnp-input	:	Ri = 6,3kΩ switching level: < 4V low; > 8,5V high; hysteresis > 2,5V, max. 35V DC
Namur input	:	Ri ca 1kΩ (<4mA) switching level: < 1mA low; >2,2mA high; hysteresis > 0,5mA max. 35V DC
Counting frequence max.:		Input A or B = 15kHz, A and B together = 6kHz, switch contact = 30Hz, 2-channel rotary pulse generator = 8kHz
Counting delay	:	100µs when reset; 20ms when programming another preselection
Min. pulse width	:	electronic pulse 50µs, switch contact 5ms
Transmitter-supply	:	8V DC controlled (Namur), 24V DC (pnp), Ri abt. 150Ω,
Display	:	LED red, 14,2mm
Indicating range	:	-99999 ... 999999 Digit with leading zero suppression
Additional display	:	LED 2- digit red, 7mm (parameter - and output indicator)
Output		
Relay:		SPDT <250V AC<250VA<2A, <300V DC<50W<2A
Analog output	:	0/4 ... 20mA burden ≤ 500□; 0/2 ... 10V burden >500Ω, isolated
	:	Automatic output changing (burden dependent)
Accuracy	:	0,1%; TK 0,01%/K
Panel case		DIN 96x48mm, material PA6-GF; UL94V-0
Dimensions	:	Front 96x48mm, mounting depth 100mm
Weight	:	max. 390g
Electrical connection	:	Clamp terminals, 2mm² single wire, 1mm² flexible wire, AWG14
Protection	:	Front IP65, terminals IP20, finger safe acc. BGV A2 (oldVBG4)

Dimensions



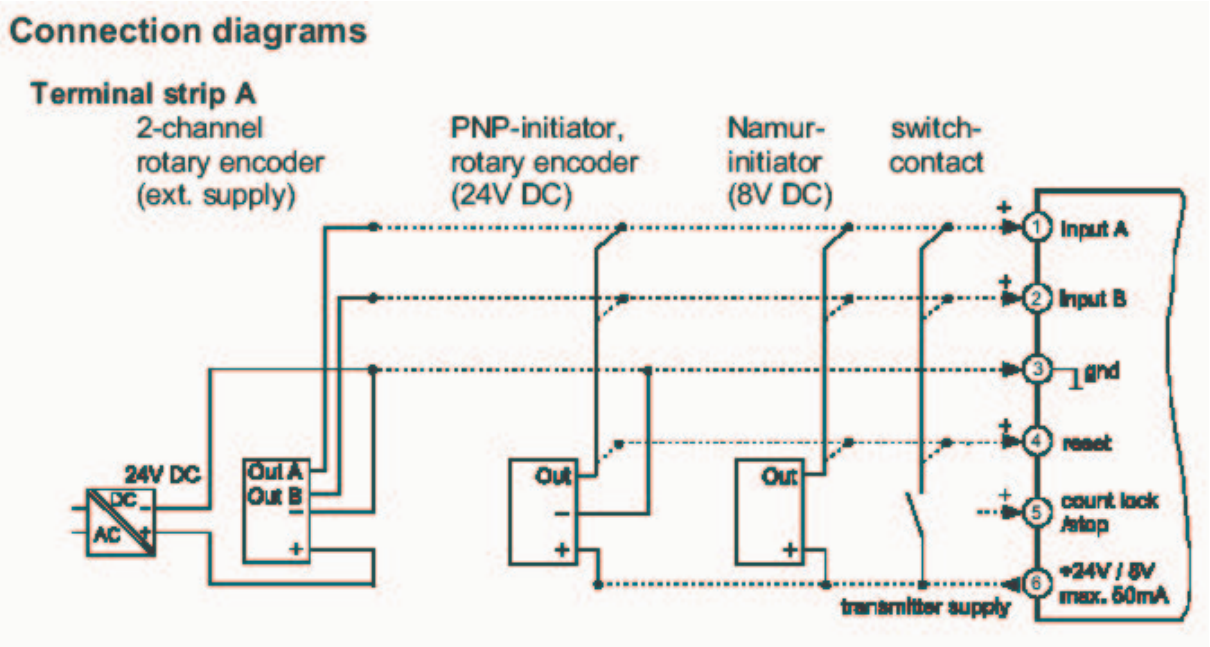
Position terminal strips



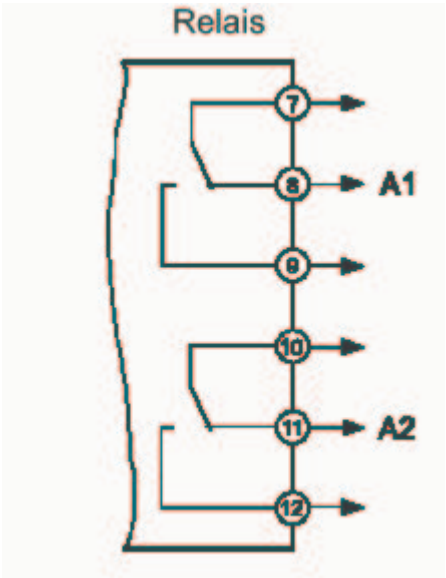
Panel cut-out
acc. to DIN 43700-96x48mm

Connection diagrams

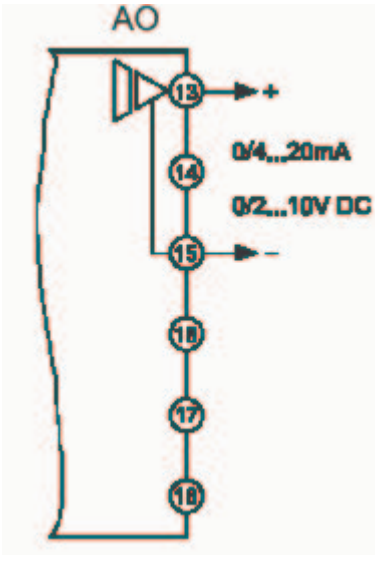
Terminal strip A



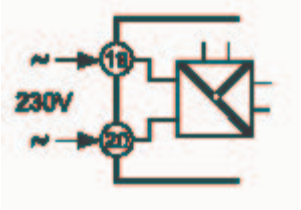
Terminal strip B **(varies with version)**
2 preselect (alarm) outputs



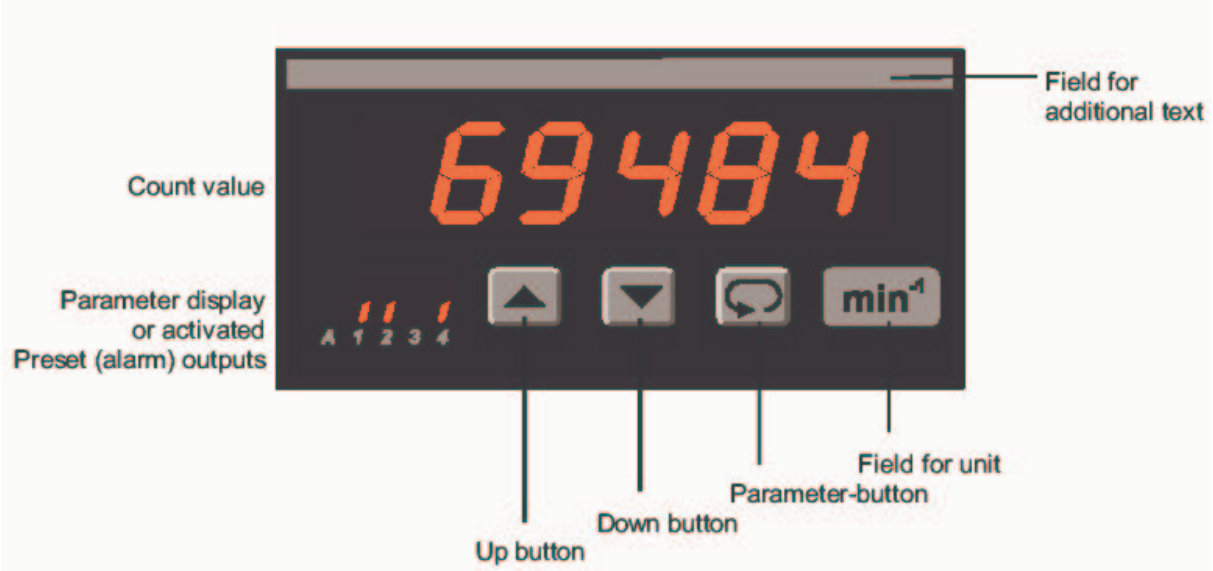
Terminal strip C **(varies with version)**
Analog output



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 preset 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 counter can be programmed. These maybe the measuring input, input configuration, conversion of the displayed value, switching performance of preset 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:

P E	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 counter is running with factory settings. Configuration and function of the counter must be checked. If error occurs again, please ship the counter to factory for repair service.
Loc	Programming lock active ⇒ see configuration page 9
of	Overflow ⇒ also see page 11

Start-up note:
Before the device can be used, it must be configured for the intended use.
⇒ see page 6

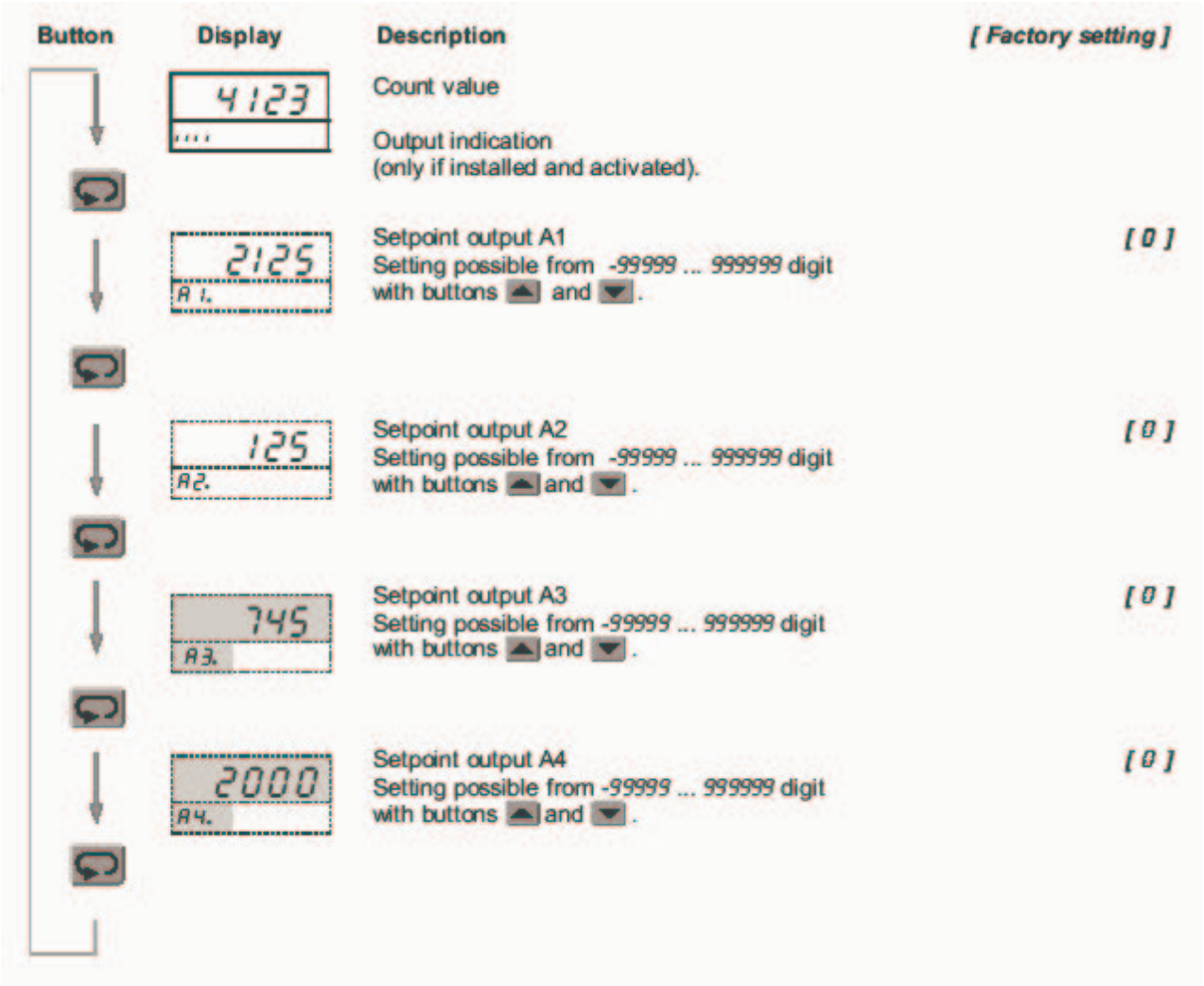
Notes to representation

Parameter only shown when configurated

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



Configuration Level

Button	Display	Description	[Factory setting]
press 2 seconds	4123	Operating level	
	A-b / FU	Function: input configuration A and B; count direction A-b = A up, B down A-b db = A up, B down, for switching contacts A u. b = A up, B up A u. b db = A up, B up, for switching contacts 90° id = rotary encoder Selection with buttons ▲ and ▼.	[A-b]
	1 / dA	Prescaler input A Setting possible from 1...9999 digit with buttons ▲ and ▼. (Only every n[th] pulse is counted)	[1]
	1 / db	Prescaler input B Setting possible from 1...9999 digit with buttons ▲ and ▼. (Only every n[th] pulse is counted)	[1]
	U=24 / In	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) tEStE = only for factory settings. Selection with buttons ▲ and ▼.	[U=24]
	rESEt / Po	Count value for power-on rESEt = load start value (StE) (see page 7) rESto r = count value is stored if power fails Selection with buttons ▲ and ▼.	[rESEt]
	0 / dP	Decimal point position .000 .00 .0 0. Selection with buttons ▲ and ▼.	[0.]

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Button	Display	Description	[Factory settings]
↓	1 d	Divisor for display Setting possible from *1* ... *9999* digit, with buttons ▲ and ▼. ⇒ also see page 11	[1]
↻			
↓	1 F	Factor for display Setting possible from *1* ... *9999* digit, with buttons ▲ and ▼. ⇒ also see page 11	[1]
↻			
↓	34 St	Start value Count value after reset. Setting possible from *-99999* ... *999999* digit, with buttons ▲ and ▼.	[0]
↻			
↓	oFF En	End value *oFF*: the counter operates as totalizing counter in the full range range. When reaching the value *-99999* or *999999* the counter stops. In the case of overflow the display flashes. *on*: the counter operates as ring counter between start value *St* and end value *En* (see following parameter) Selection with buttons ▲ and ▼.	[oFF]
↻			
↓	3420 En.	Count value for internal reset Setting possible from *-99999* ... *999999* digit with buttons ▲ and ▼. **Note:** Parameter is only displayed if *En* = *On* and occupied setpoint preset of output A1.	[999999]
↻			

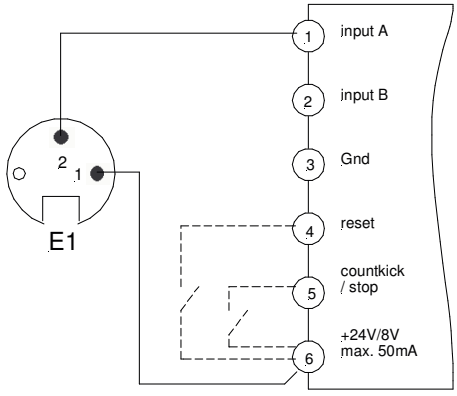
continue page 8

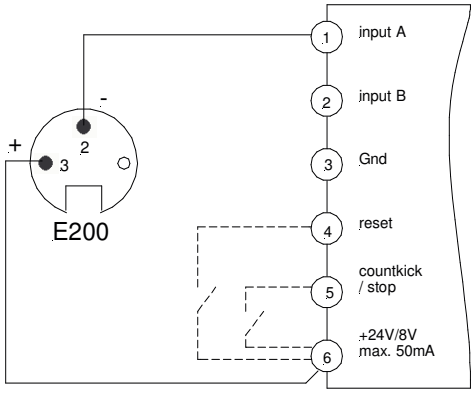
Button	Display	Description	[Factory settings]
↓	oFF A1	Switching performance preselect (alarm) output A1 oFF = no output on L (min) = continuous contact: on-off on J (max) = continuous contact: off-on on n (max) = pulse contact: off-on-off on u (min) = pulse contact: on-off-on Selection with buttons ▲ and ▼.	[oFF]
↻			
↓	2125 A1.	Setpoint output A1 Setting possible from -99999 ... 999999 digit, with buttons ▲ and ▼.	[0]
↻			
↓	1.00 t1	Switching time output A1 [sec]. Setting possible from 0.01 ... 99.99 s, with buttons ▲ and ▼.	[1.00]
↻			
↓	oFF A2	Switching performance of preselect (alarm) output A2 oFF = no output on L (min) = continuous contact: on-off on J (max; = continuous contact: off-on on n (max) = pulse contact: off-on-off on u (min) = pulse contact: on-off-on Selection with buttons ▲ and ▼.	[oFF]
↻			
↓	125 A2.	Setpoint output A2 Setting possible from -99999 ... 999999 digit, with buttons ▲ and ▼.	[0]
↻			
↓	1.00 t2	Switching time output A2 in sec. Setting possible from 0.01 ... 99.99 s, with buttons ▲ and ▼. **Note:** Switching performance, setpoint and switching time of the preselect outputs A1 to A4 are identical.	[1.00]
↻			

continue page 9

Button	Display	Description	[Factory settings]
↓	0-20 Ao	Analog output 0-20 mA (0 - 10 V DC) 4-20 mA (2 - 10 V DC). Changing from current to voltage output is load-dependent (≤ 500Ω = current output, > 500Ω = voltage output). Selection with buttons ▲ and ▼.	[0-20]
↻			
↓	0 AS	Start value for the analog output Setting possible from -99999 ... 999999 digit, with buttons ▲ and ▼.	[0]
↻			
↓	2030 AE	End value for the analog output Setting possible from -99999 ... 999999 digit, with buttons ▲ and ▼. If the Start value AS > AE the output works with a decreasing characteristic.	[0]
↻			
↓	oFF Lc	Program lockout. oFF = no lock Conf. = configuration level locked ALL = all parameters locked CAL = only with analog output (only for factory settings) Selection with buttons ▲ and ▼.	[oFF]
↻			
	4123	Return to the working level (count value)	

Connection diagramms for flow meter DM/DE





Example of programming for Flow Meter DM/DE

Conection on pulser E1 or E 200

Table 1

Parameter	Designation / Display	Input
Input cofiguration	FU	A-b or A u. B
Prescaler input A	dA	1
Prescaler input B	db	1
Transmitter supply	In	U = 24 V or U = 8 V for Sensor of Namur (E200)
Count value for power-on	Po	rEStor
Decimal point position	dp	.0
Divisor for display	d	1 at E1 (E200 see Table 2)
Factor for display	F	1 at E1 (E200 see Table 2)
Start value	St.	0
End value	En	off

Switching performence preselect (alarm) output A1	AI	
Setpoint output A1	AI.	
Switching performence preselect (alarm) output A2	A2	
Setpoint output A2	A2.	
Analog output	Ao	
Start value for the analog output	AS	
End value for the analog output	AE	

Program lockout	LC	as required

Differing from the above table, by connection on pulse generator E200 of the flow meter, are input following parameter:

Table 2

		cp-value of the flow meter (Imp./m³)			
Parameter	Designation / Display	5000	500	250	187,5
Prescaler input A	dA	1	1	1	1
Prescaler input B	db	1	1	1	1
Divisor for display	d	5000	500	250	1875
Factor for display	F	1	1	1	10

Display adjustment from universal meter and flow meter

Procedure:
For the configuration of the universal counter, you have to put at parameter „Start value“ (page 7) the present value of the flow meter.
If the configuration is finished, the clamps 4 and 6 on terminal strip A , are interconnected transient. Afte the reset, the input value appears on the display.

Display conversion

For some settings of the divisor (***d***) and factor (***f*** it is possible that the meter will not cover the possible display range of the unit (0-999999). The following formula relationship applies:

$$\text{Maximum display range} = \frac{8 \times 10^6 \times \text{factor (F)}}{\text{Divisor (d)}} \quad \text{should be} > 999999$$

If this check produces a value of less than 999999, the meter will only be able to count to this display value. The problem can be avoided if the scaler ***d A*** or ***d b*** is included in the configuration.

Example:
In a measuring device the flow rate is to be recorded in m³, and displayed without any decimal places. The sensor used supplies one pulse every 0.084 m³.
To program the display conversion this sensor constant must first be converted into a fraction. This is as follows:

$$\text{Sensor contact} = \frac{\text{Factor (F)} = 84}{\text{Divisor (d)} = 1000}$$

Therefore the value 84 must be entered for the factor ***F*** and 1000 for the divisor ***d***. However, if we now check the maximum display range, we obtain the following:

$$\text{Maximum display range} = \frac{8 \times 10^6 \times 84}{1000} = 672000$$

This means that the meter can only display up to a maximum value of 672000 at which point it will stop. If this is inadequate it is possible to transfer part of the divisor to the scaler ***d A*** or ***d b***. In this case, if the divisor ***d*** were to be reduced to 500 the maximum display range would be > 999999, so that the unit could be used to the full extent.

The procedure for this is as follows:

The divisor ***d*** is set to 500 and the scaler ***d A*** or ***d b*** (depending on which input is used) is set to 2.

These settings produce the following:

$$\text{Maximum display range} = \frac{8 \times 10^6 \times 84}{500} = 1344000$$

This means that the display conversion is now configured perfectly for this application.

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