

Universal Counter UZ 9648

Counting - length measurement - metering - positioning

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
- Max. 4 preset outputs, SPDT relay or transistor
- Display conversion programmable
- Isolated analog output 0/4 ... 20mA and 0/2 ... 10V DC
- Serial interface CANopen-bus
- Front protection IP65



DIN 96x48mm

General

The universal counter UZ 9648 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 $\pm 10\%$; 115V AC $\pm 10\%$; 24V AC $\pm 10\%$ or 24V DC $\pm 15\%$
Power consumption	: max. 3.5VA, with analog output 5VA, with CAN-Bus 6VA
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

pn-p input	: $R_i = 6.3k\Omega$ switching level: < 4V low; > 8.5V high; hysteresis > 2.5V, max. 35V DC
Namur input	: R_i appr. $1k\Omega$ (<4mA) switching level: < 1mA low; >2.2mA high; hysteresis > 0.5mA max. 35V DC
Counting frequency max.	: Input A or B = 15kHz, A and B together = 6kHz, switch contact = 30Hz debounced, 2-channel rotary pulse generator = 8kHz;
Counting delay	: 100 μ s when reset; 20ms when programming another preselection
Min. pulse width	: electronic pulse 50 μ s, switch contact 5ms
External reset	: min. pulse width 10ms
Transmitter-supply	: 8V DC controlled (Namur), 24V DC (pn-p), R_i abt. 150 Ω , max. 50mA (25mA with 4 relay outputs)

Display

Indicating range	: -99999 ... 999999 digit with leading zero suppression
Additional display	: LED 2-digit red, 7mm (parameter - and output indicator)

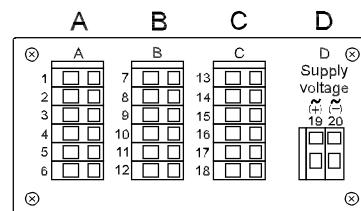
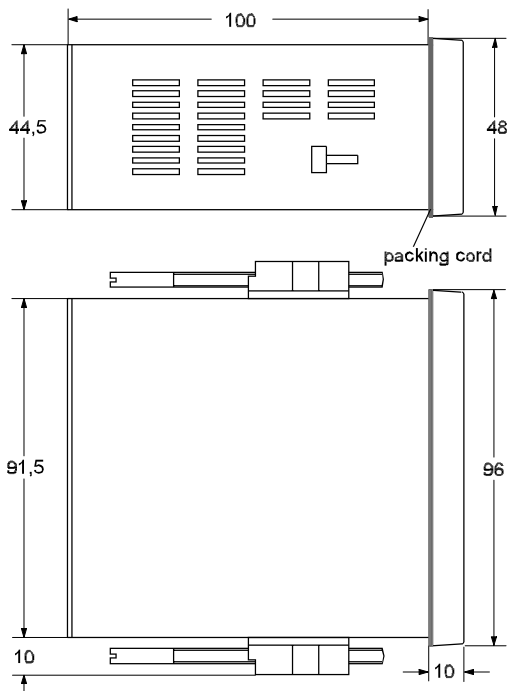
Output

Relay	: SPDT <250V AC<250VA<2A, <300V DC<50W<2A
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
CAN-bus	: CANopen, standard

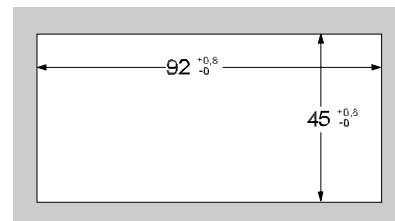
Panel case

Dimensions	: DIN 96x48mm, material PA6-GF; UL94V-0
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 43700-96x48mm

Connection diagrams

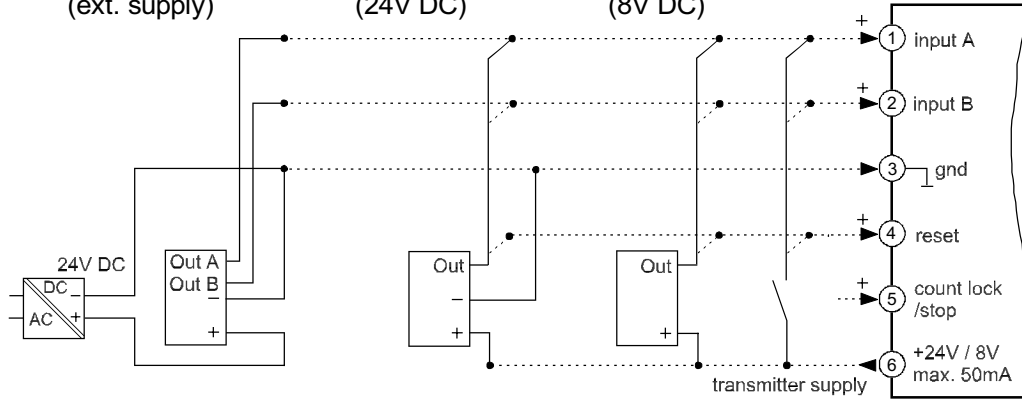
Terminal strip A

2-channel
rotary encoder
(ext. supply)

PNP-initiator,
rotary encoder
(24V DC)

Namur-
initiator
(8V DC)

switch-
contact

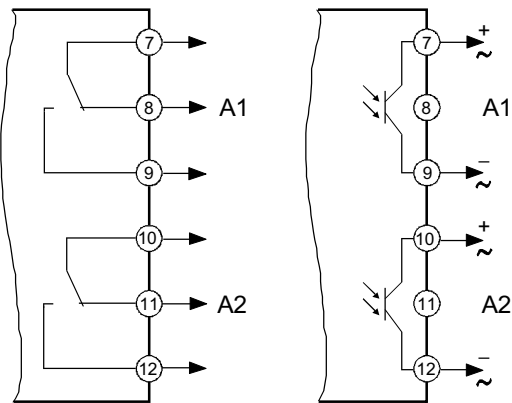


Terminal strip B (varies with version)

2 preselect (alarm) outputs

Relays

Transistor



Terminal strip C (varies with version)

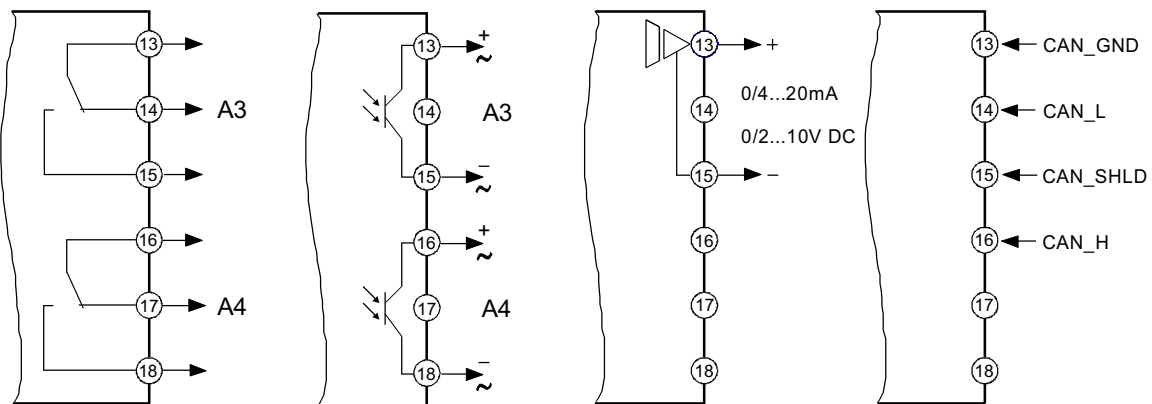
2 preselect (alarm) outputs

Relays

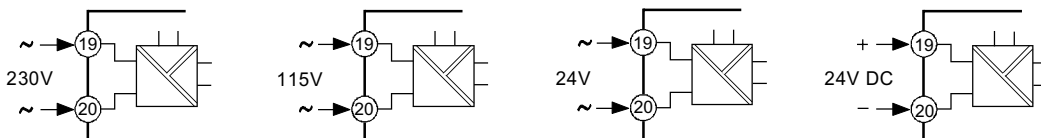
Transistor

Analog output
AO

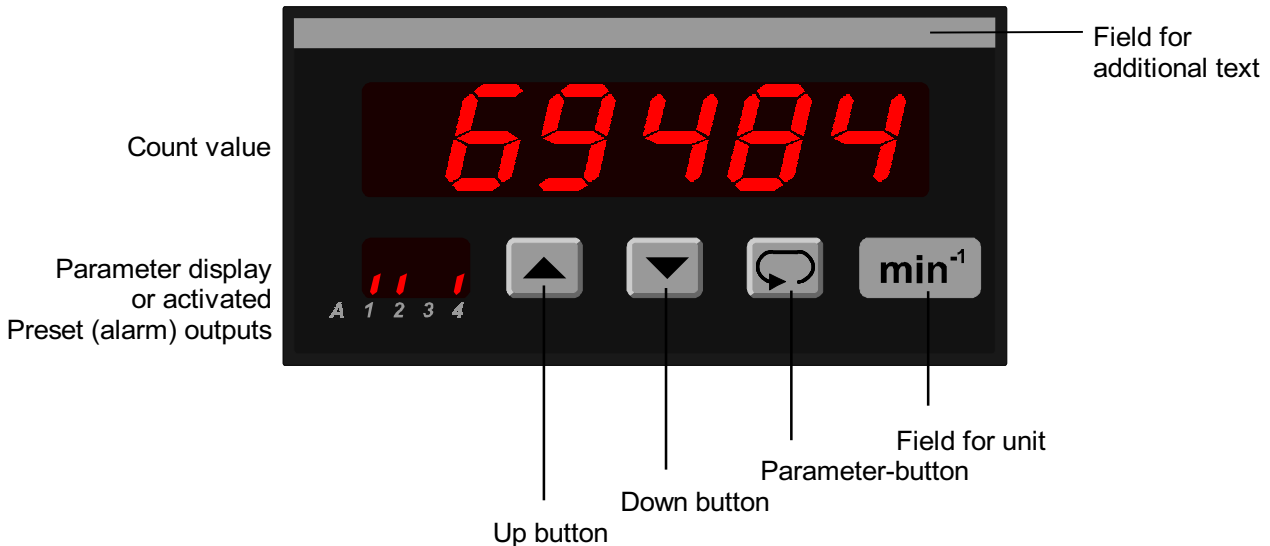
Serial interface
CAN-Bus



Terminal strip D Supply voltage (varies with version)



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:

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 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.

Lo c Programming lock active ⇒ see configuration page 9

o F 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 configured




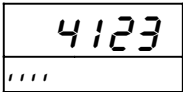

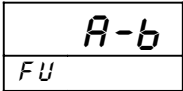



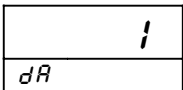







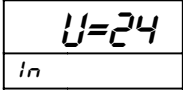



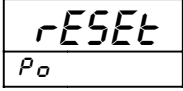



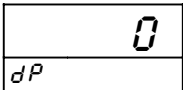


Parameter is only shown when installed in the device (see order code)

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 [0].

Working level

Button	Display	Description	[Factory setting]
		Count value	
		Output indication (only if installed and activated).	
		Setpoint output A1 Setting possible from -99999 ... 999999 digit with buttons and .	[0]
		Setpoint output A2 Setting possible from -99999 ... 999999 digit with buttons and .	[0]
		Setpoint output A3 Setting possible from -99999 ... 999999 digit with buttons and .	[0]
		Setpoint output A4 Setting possible from -99999 ... 999999 digit with buttons and .	[0]

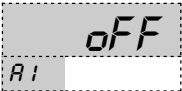
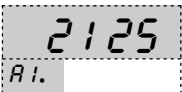


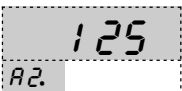
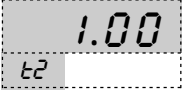
Configuration Level

Button	Display	Description	[Factory setting]
 press 2 seconds		Operating level	
		Function: input configuration A and B; count direction <i>A - b</i> = A up, B down <i>A - b db</i> = A up, B down, for switching contacts <i>A u. b</i> = A up, B up <i>A u. b db</i> = A up, B up, for switching contacts <i>g 0 0 1 d</i> = rotary encoder Selection with buttons  and  .	[<i>A - b</i>]
		Prescaler input A Setting possible from <i>1...9999</i> digit with buttons  and  . (Only every <i>n</i> th pulse is counted)	[<i>1</i>]
		Prescaler input B Setting possible from <i>1...9999</i> digit with buttons  and  . (Only every <i>n</i> th pulse is counted)	[<i>1</i>]
		Transmitter supply / input level <i>U = 24</i> = 24V DC for pnp-initiators <i>U = 8</i> = 8V DC for Namur-initiators* (*with ext. 5V supply also suitable for TTL signals) <i>t E 5 t</i> = only for factory settings. Selection with buttons  and  .	[<i>U = 24</i>]
		Count value for power-on <i>r E S E t</i> = load start value (<i>5 t</i>) (see page 7) <i>r E S t o r</i> = count value is stored if power fails Selection with buttons  and  .	[<i>r E S E t</i>]
		Decimal point position <i>. 0 0 0</i> <i>. 0 0</i> <i>. 0</i> <i>0 .</i> Selection with buttons  and  .	[<i>0 .</i>]

continue
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Button	Display	Description	[Factory setting]
↓		Divisor for display Setting possible from 1 ... 9999 digit, with buttons ▲ and ▼ . ⇒ also see page 11	[1]
↻			
↓		Factor for display Setting possible from 1 ... 9999 digit, with buttons ▲ and ▼ . ⇒ also see page 11	[1]
↻			
↓		Start value Count value after reset. Setting possible from -99999 ... 999999 digit, with buttons ▲ and ▼ .	[0]
↻			
↓		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]
↻			
↓		Count value for internal reset Setting possible from -99999 ... 999999 digit with buttons ▲ and ▼ .	[999999]
↻		Note: Parameter is only displayed if En = On and occupied setpoint preset of output A1.	

continue
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Button	Display	Description	[Factory setting]
↓		Switching performance preselect (alarm) output A1 <i>oFF</i> = no output <i>o n L</i> (min) = continuous contact: on-off <i>o n J</i> (max) = continuous contact: off-on <i>o n n</i> (max) = pulse contact: off-on-off <i>o n v</i> (min) = pulse contact: on-off-on Selection with buttons ▲ and ▼ .	[<i>oFF</i>]
↺			
↓		Setpoint output A1 Setting possible from -99999 ... 999999 digit, with buttons ▲ and ▼ .	[0]
↺			
↓		Switching time output A1 [sec]. Setting possible from 0.01 ... 99.99 s, with buttons ▲ and ▼ .	[1.00]
↺			
↓		Switching performance of preselect (alarm) output A2 <i>oFF</i> = no output <i>o n L</i> (min) = continuous contact: on-off <i>o n J</i> (max) = continuous contact: off-on <i>o n n</i> (max) = pulse contact: off-on-off <i>o n v</i> (min) = pulse contact: on-off-on Selection with buttons ▲ and ▼ .	[<i>oFF</i>]
↺			
↓		Setpoint output A2 Setting possible from -99999 ... 999999 digit, with buttons ▲ and ▼ .	[0]
↺			
↓		Switching time output A2 in sec. Setting possible from 0.01 ... 99.99 s, with buttons ▲ and ▼ .	[1.00]
↺			

Note: Switching performance, setpoint and switching time of the preselect outputs A1 to A4 are identical.

continue
page 9

Button	Display	Description	[Factory settings]
↓		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]
↺			
↓		Start value for the analog output Setting possible from -99999 ... 999999 digit, with buttons ▲ and ▼ .	[0]
↺			
↓		End value for the analog output Setting possible from -99999 ... 999999 digit, with buttons ▲ and ▼ . If the Start value A5 > AE the output works with a decreasing characteristic.	[0]
↺			
↓		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]
↺			
		Return to the working level (count value)	

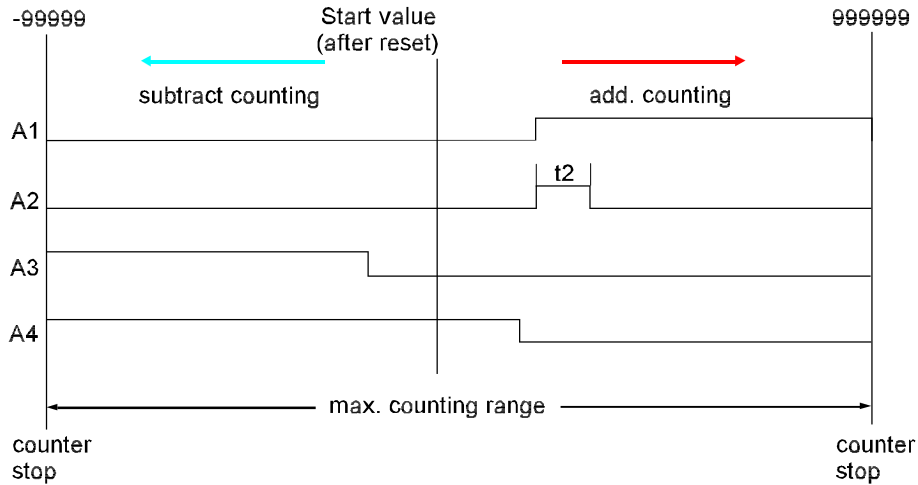
Configuration CAN-Bus

Please ask for separate instruction manual

Linear counter

This counter can operate in the full range from -99999 up to 999999. Counting can start from any start value. Depending on up or down counter function count value will increase or decrease. Maximum 4 presel-ect outputs can be activated either as maintained or pulse contact. Reset to start value only with external reset.

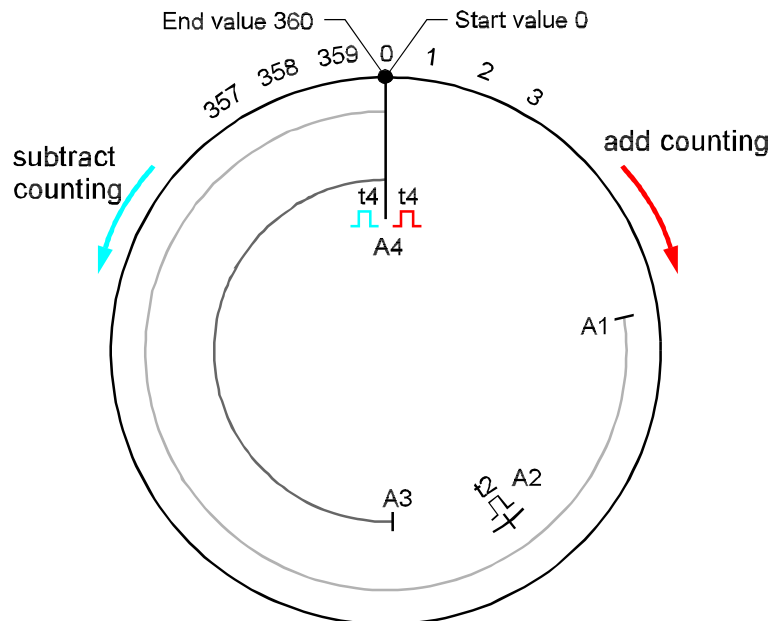
Example



Ring counter

This counter operate in the range between start (S_t) and end value (E_n) or via versa. The procedure repeats regularly unless the counting direction is reversed. Depending on the counting mode, the count value goes back from end value to start value or from start value to end value. Like 0° and 360° are identical in a circle, the start value and the end value coincide in the ring count.

Example



Conversion of display value

With certain settings of a divisor (d) and factor (F) it is possible that the counter does not work in the full range (0...999999). The relationship is as follows:

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

Example:

In a measurement equipment, the flow rate shall be counted in m^3 and displayed without decimal digits. The sensor generates every 0.084m^3 one pulse.

For programming the conversion of the display value, the sensor constant is converted to a fraction first. Hence:

$$\text{Sensor constant} = \frac{\text{factor } (F) = 84}{\text{divisor } (d) = 1000}$$

Please set for factor $F = 84$ and for divisor $d = 1000$. The check of the maximum display range shows:

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

This means, the counter can display maximum up to 672000 digits, when the counting stops. If this is insufficient, part of the divisors can be applied to prescaler dA or dB respectively. In this example if divisor d was reduced to 500, the maximum display range is > 999999 and full capacity of the counter will be reached.

The procedure is as follows:

Set divisor d to 500 prescaler dA and dB respectively (depending on which input is used) to 2.

Check of maximum display range shows:

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

This provides an optimum configuration for the current example.

Order code

UZ9648 - 1. - 2. - 3. - 4. - 5. - 6. - 7.

1. Terminal strip A

1 2 configurable counting inputs,
extensive counting functions,
integrated transmitter-supply,
programmable display conversion,
2 additional control inputs

2. Terminal strip B

00 not installed
2R 2 preselect (alarm) outputs relay
2T 2 preselect (alarm) outputs transistor

3. Terminal strip C

00 not installed
2R 2 preselect (alarm) outputs relay
2T 2 preselect (alarm) outputs transistor
AO analog output 0/4...20mA and 0/2...10V DC, isolated
CA CANopen standard

4. Terminal strip D, supply voltage

0 230V 50/60Hz ±10%
1 115V 50/60Hz ±10%
4 24V 50/60Hz ±10%
5 24V DC ±15%

5. Option

00 without option

6. Unit (appears on the field unit)

7. Additional text (appears on the face plate in the field additional text, maximum 3 x 90mm WxH)

Ihr kompetenter Ansprechpartner / Your competent contact partner :

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