



ZX020

Miniature Low Cost Counter for Input Frequencies up to 60 kHz

Product Features:

- Miniature panel housing
- Bright LED display with 6 digits
- Add-on frame for clip or screw mounting
- Counting frequency 15 to 60 kHz (depends on counting mode)
- Selectable filter for use with mechanical inputs
- Adjustable scaling factor and divider
- Protection class IP65 (front side)
- Diverse counting modes (e. g. event, difference, summing or position)
- Easy to set up by menu support
- 10 to 30 VDC power supply

Version:	Description:
Zx02001b/K/hk/Jan02	valid for models before august, 2006
Zx02002a/K/hk/Dec06	60 kHz, Divider, (x4), summing mode
ZX02002b/hk/Aug07	modification of temperature range
Zx02002c/ag/March15	- power down memory removed from the features on page 1 - new design, techn. specifications and safety instructions
Zx020_02d/ag/July15	- "Chapter 2." updated (setup procedure has been changed) - "Legal Notices" supplemented
Zx020_02e/ag	Correction of the temperature range

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1. Safety Instructions and Responsibility

1.1. General Safety Instructions

This operation manual is a significant component of the unit and includes important rules and hints about the installation, function and usage. Non-observance can result in damage and/or impairment of the functions to the unit or the machine or even in injury to persons using the equipment!

Please read the following instructions carefully before operating the device and observe all safety and warning instructions! Keep the manual for later use.

A pertinent qualification of the respective staff is a fundamental requirement in order to use these manual. The unit must be installed, connected and put into operation by a qualified electrician.

Liability exclusion: The manufacturer is not liable for personal injury and/or damage to property and for consequential damage, due to incorrect handling, installation and operation. Further claims, due to errors in the operation manual as well as misinterpretations are excluded from liability.

In addition the manufacturer reserve the right to modify the hardware, software or operation manual at any time and without prior notice. Therefore, there might be minor differences between the unit and the descriptions in operation manual.

The raiser respectively positioner is exclusively responsible for the safety of the system and equipment where the unit will be integrated.

During installation or maintenance all general and also all country- and application-specific safety rules and standards must be observed.

If the device is used in processes, where a failure or faulty operation could damage the system or injure persons, appropriate precautions to avoid such consequences must be taken.

1.2. Use according to the intended purpose

The unit is intended exclusively for use in industrial machines, constructions and systems. Non-conforming usage does not correspond to the provisions and lies within the sole responsibility of the user. The manufacturer is not liable for damages which has arisen through unsuitable and improper use.

Please note that device may only be installed in proper form and used in a technically perfect condition in accordance to the "Technical Specifications" (see chapter [6](#)).

The device is not suitable for operation in explosion-proof areas or areas which are excluded by the EN 61010-1 standard.

1.3. Installation

The device is only allowed to be installed and operated within the permissible temperature range. Please ensure an adequate ventilation and avoid all direct contact between the device and hot or aggressive gases and liquids.

Before installation or maintenance, the unit must be disconnected from all voltage-sources. Further it must be ensured that no danger can arise by touching the disconnected voltage-sources.

Devices which are supplied by AC-voltages, must be connected exclusively by switches, respectively circuit-breakers with the low voltage network. The switch or circuit-breaker must be placed as near as possible to the device and further indicated as separator.

Incoming as well as outgoing wires and wires for extra low voltages (ELV) must be separated from dangerous electrical cables (SELV circuits) by using a double resp. increased isolation.

All selected wires and isolations must be conform to the provided voltage- and temperature-ranges. Further all country- and application-specific standards, which are relevant for structure, form and quality of the wires, must be ensured. Indications about the permissible wire cross-sections for wiring are described in the "Technical Specifications" (see chapter 6).

Before first start-up it must be ensured that all connections and wires are firmly seated and secured in the screw terminals. All (inclusively unused) terminals must be fastened by turning the relevant screws clockwise up to the stop.

Overvoltages at the connections must be limited to values in accordance to the overvoltage category II.

For placement, wiring, environmental conditions as well as shielding and earthing/grounding of the supply lines the general standards of industrial automation industry and the specific shielding instructions of the manufacturer are valid.

Please find all respective hints and rules on www.motrona.com/download.html
--> "[General EMC Rules for Wiring, Screening and Earthing]".

1.4. Cleaning, Maintenance and Service Notes

To clean the front of the unit please use only a slightly damp (not wet!), soft cloth. For the rear no cleaning is necessary. For an unscheduled, individual cleaning of the rear the maintenance staff or assembler is self-responsible.

During normal operation no maintenance is necessary. In case of unexpected problems, failures or malfunctions the device must be shipped for back to the manufacturer for checking, adjustment and reparation (if necessary). Unauthorized opening and repairing can have negative effects or failures to the protection-measures of the unit.




2. Front Key Operation

2.1. Enter the Setup Mode

There are two different ways to enter the setup mode:

- a) keep both front keys pressed when powering on
- b) keep both front keys pressed for 5 seconds, if the power is already on

2.2. Parameter Settings

With an activated setup mode , the display shows:	
After <u>releasing the keys</u> , the display shows:	
In order to cancel the setup <u>hold the left key pressed and additionally press the right one</u>	
By <u>pressing the right key</u> , the display changes to:	
To jump into the first parameter , <u>hold the left key pressed and additionally press the right one</u>	
After <u>releasing the keys</u> , the display alternates between the parameter title and the setting of the parameter. After <u>pressing any key</u> , only the parameter value for setting is displayed.	
<u>Press the right key</u> , to jump into the next parameter.	
For numerical inputs <u>select the decade with the left key and change the value by the right one</u>	
To jump into the next parameter , <u>hold the left key pressed and additionally press the right one</u>	
After reaching the last menu item " Endpro ", two selections can be done: „ Yes “: will <u>store</u> all new entries, before the unit automatically switches to normal operation. „ No “: will <u>repeat</u> the setup routine. The latest values will remain without saving and can be checked or modified before they are permanently stored.	

3. Operational parameters

Please enter all of the subsequent parameters, as explained in section [2](#).

3.1. Input polarity

InPoL	InpoL	
<input type="checkbox"/> nPn	nPn	NPN: All inputs must switch to "0"
<input type="checkbox"/> PnP	PnP	PNP: All inputs must switch to "+". For Namur: Set to NPN, see chapter 4 .

3.2. Input filter

FILtEr	Filter	
<input type="checkbox"/> OFF	Off	Filter off: Counting frequency up to 60 kHz see "Technical Specifications" (chapter 6)
<input type="checkbox"/> ON	on	Filter on. Maximum counting frequency 30 Hz

3.3. Input Mode of count impulses

InPut	Input	
<input type="checkbox"/> Cnt.dir	Cnt.dir	Input A: Count input Input B: Direction select up/down
<input type="checkbox"/> UP dn	Up .dn	Differential: Input A: increments Input B: decrements
<input type="checkbox"/> UP .UP		Summing: Input A: increments Input B: increments
<input type="checkbox"/> QUAd	Quad	Quadrature up/down for signals A/B, 2 x 90° Counts rising edge of input A
<input type="checkbox"/> QUAd 2	Quad 2	Similar to "quad", but with impulse doubling. Counts rising and falling edges of input A
<input type="checkbox"/> QUAd 4	Quad 4	Similar to "quad", but with impulse quadrupling. Counts all edges of inputs A and B

3.4. Impulse scaling factor

FActor	Factor	
00.0001	00.0001	Multiplies the input pulses with the factor set.
99.9999	99.9999	Setting range 0.0001 to 99.9999. Setting "0" will not be accepted.
d. U. 50	Divider	
00.0001	00.0001	Divides the input pulses by the divider set.
99.9999	99.9999	Setting range 0.0001 to 99.9999. Setting "0" will not be accepted.

3.5. Decimal point

dP	dP	
0	0	Sets the decimal point of the display.
0.000	0.000	(Max. 3 decimal places)

3.6. Set/Reset mode

rESnrd	resmd	
ManEL	Man.el	Manual Set/ Reset function by the red front key and electrical Set/ Reset by the rear input.
no rES	No res	All Set/ Reset functions disabled.
EL rES	El res	Electrical Set/ Reset only by input "Reset".
Manre	Manre	Manual Set/ Reset only by the red front key.

3.7. Set point

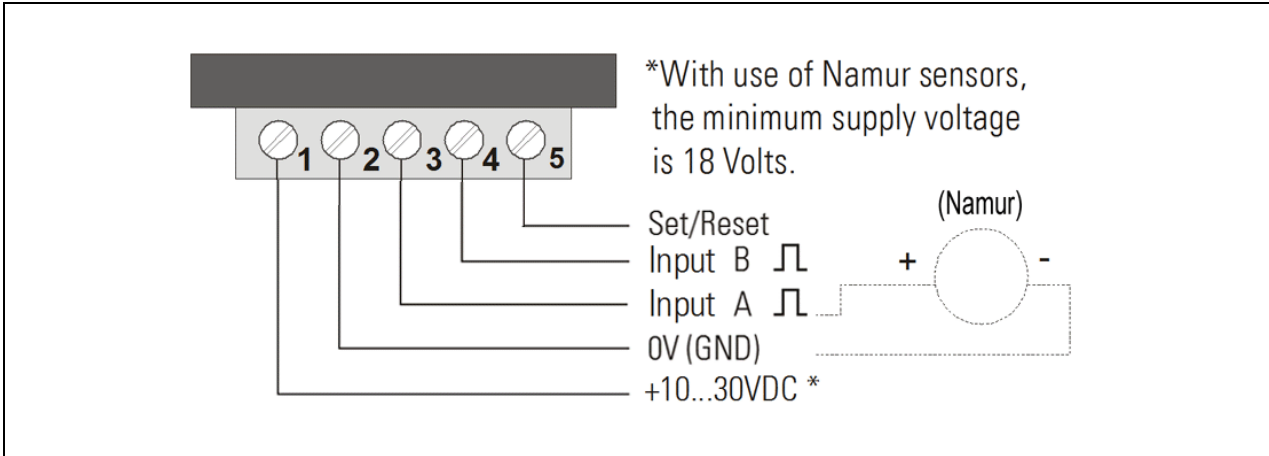
SEtPt	Setpt		
-199999	-199999	Upon a Set/ Reset command, the counter sets to the value entered here.	
999999	99.9999	Range -199 999....999 999.	

3.8. End of program

EndPro	Endpro		
no	No	Select "No" to return to the beginning of the menu for verification of settings.	
YES	Yes	Select "Yes" to store data and exit the menu.	

4. Terminal Assignments

(also printed to the top of the unit)



5. Delivery includes:

- Panel mounting clip
- Bezel for screw mounting with panel cut out 50 x 25 mm
- Bezel for clip mounting with panel cut out 50 x 25 mm
- Sealing

6. Technical Specifications

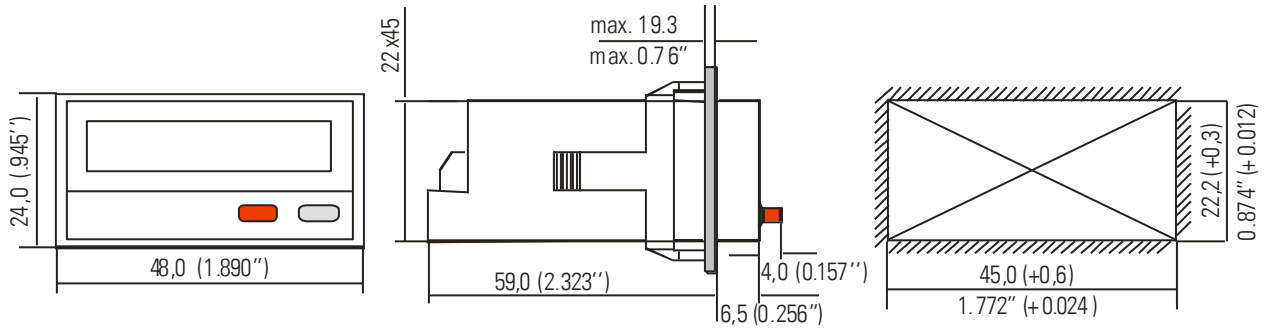
Power supply:	Input voltage: 10 ... 30 VDC Protection circuit: reverse polarity protection Consumption: max. 50 mA
Connections:	Type of connection: screw terminal, 1.5 mm ² / AWG 16
Incremental input:	Characteristic: NPN / PNP / Namur Switching levels: LOW: 0 V ... 0.2 x power supply voltage HIGH: 0.6 x power supply voltage ... 30 V Channels: A, B and Set/Reset Counting frequency: 15 ... 60 kHz (depends on selected counting mode) Pulse form: arbitrary (Schmitt-Trigger) Internal resistance: Ri ≈ 10 kOhm Pulse time (set/reset): min. 5 ms
Power down memory:	Data retention: 10 years Storage Cycles: 10 ⁶
Display:	Type: 6 digit LED, red Digit height: 8 mm / 0.3149 inch Range: -199999 ... 999999
Housing:	Material: plastic Mounting: panel Dimensions: cut out (w x h): 45 x 22 mm resp. 1.772 x 0.866 inch outer dimensions (w x h x d): 48 x 24 x 59 mm resp. 1.889 x 0.9449 x 2.323 inch Miscellaneous: additional bezels for clip or screw mounting are included in the delivery Protection class: front: IP 65 / rear: IP20 Weight: approx. 50 g
Ambient temperature:	Operation: -20°... + 55° C / -4° ... 131° F (not condensing) Storage: -25°... + 70° C / -13° ... 158° F (not condensing)
Conformity & standards:	EMC 2004/108/EC: EN 61000-6-2, EN 61000-6-3, EN 61000-6-4 RoHS 2011/65/EU: EN 50581

Maximum counting frequency with respect to operating mode and power supply:

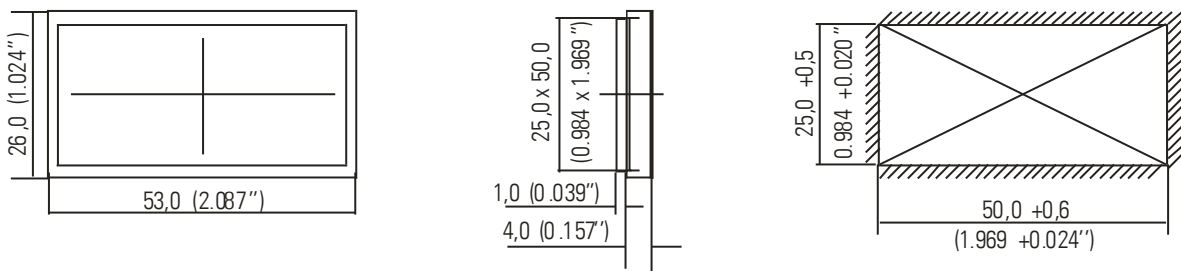
Mode	Power supply 24 VDC	Power supply 12 VDC
CntDir	60 kHz	20 kHz
Up-Down	25 kHz	15 kHz
Up-Up	25 kHz	15 kHz
Quad	25 kHz	15 kHz
Quad2	25 kHz	15 kHz
Quad4	15 kHz	15 kHz

7. Dimensions

7.1. Mounting without use of add-on frames



7.2. Bezel 50 x 25 mm (1.969 x 0.984 inches) for clip mounting



7.3. Bezel 50 x 25 mm (1.969 x 0.984 inches) for screw mounting

