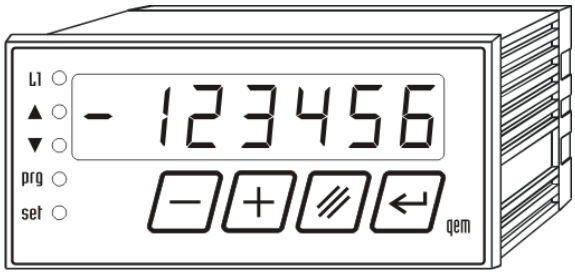
MUI

MC135.01

Quotes multi-function visualizer

User manual and installation



MUIMC13501_EN03 - 10/24/2016

1. General information's

Thanks for buying this QEM instruments. We'll be glad to receive at our e-mail address info@qem it all your suggestions referred to this instruments end to the user manual.
Finally we suggest you to preserve this manual for future consultations.

1.1 Graphic Symbol Meaning


Not reading the message will be dangerous for the instruments integrity and/or for the success of the operation.


Note: Important information for the correct use of the instruments.


For more information's see the user manual indicated in the message.


For more information's see the pages indicated.

1.2 Specification

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without any notice. QEM doesn't have any responsibility on this document.
Trade Marks:
- QEM® is a trade mark.

1.3 Limited Warranty

For two (2) years from the original acquisition, QEM will repair or replace for free controls and devices
that QEM thinks be imperfect in materials or quality. This warranty is not valid if the object has been tampered by not authorized persons or used in an inappropriate way.
This warranty replaces all other warranties either expressed or implicit.
QEM doesn't hold personally responsible for all charges (installation or uninstalling included), drawback,
or damage caused by our products, made or sold. In any case, QEM total duty, always will not exceed the control total price.
Claims for refunds of selling price, reparations, or replacements must be referred to QEM with all pertinent data (damage, purchase date, developed work and problem).
It is not provided any duty for batteries and fusible cut-out consumption.
The product must be returned only with a written notification, included the Number of Restitution Authorization
QEM and must be paid all forwarding charges.

1.4 Validity

The present document is fully valid excepted mistakes or omissions.

M: Manual;
S: Instrument.

Instrument Release	Description	Date
0	M New manual.	06/15/07
1	S Added new functions (Clear and Enter keys time function, counter enable)	07/06/07
2	M Modify the CX1 input description in NPN and simplify the text..	05/03/16
3	M Add new CX5 version.	10/24/16

1.5 Purpose

This manual could give information's for the instrument using.

1.6 Indication

We suggest to guard all instruments Programming parameters (Set-up) for an easy service ore replace.

1.7 User Manuals

The documentation referred to the QEM instrumentation in divided in many issues that allows an easy utilization.

	**MUI: User and installation manual** Instrument hardware and software information's.
	**MIMAT: Maintenance, service and installation manual.** Information's on: wiring, right calibration, parameters insertion and breakdown individuation.

It is possible to download manuals from *www.qem.it*

1.8 Norm references

Protection rate	IP20 (Conformed a EN 60-5-29)
Vibration resistance	Conformed a IEC 68-2-6
Bump resistance	Conformed a IEC 68-2-27
Jamming immunity	Conformed a EN 50082-2
Emission level	Conformed a EN 50081-2
Container	DIN43700

2. Description

MC135.01 is an instrument made for visualize an incremental bidirectional encoder count.

General features

– Bidirectional count ;
– Resolution multiplier;
– Loading preset quota;
– Programmable input;
– Not volatile storage;
– Unscratchable keyboard with tactile feeling-con;
– Incorporated encoder power supply;
– Absolute/incremental counter visualization;;
– Extractable polarized junction-box;

New functions

– Angular visualization in sexagesimal degrees;
– Display not significative zero turning off;
– Programmable philter anti-glitch on inputs;

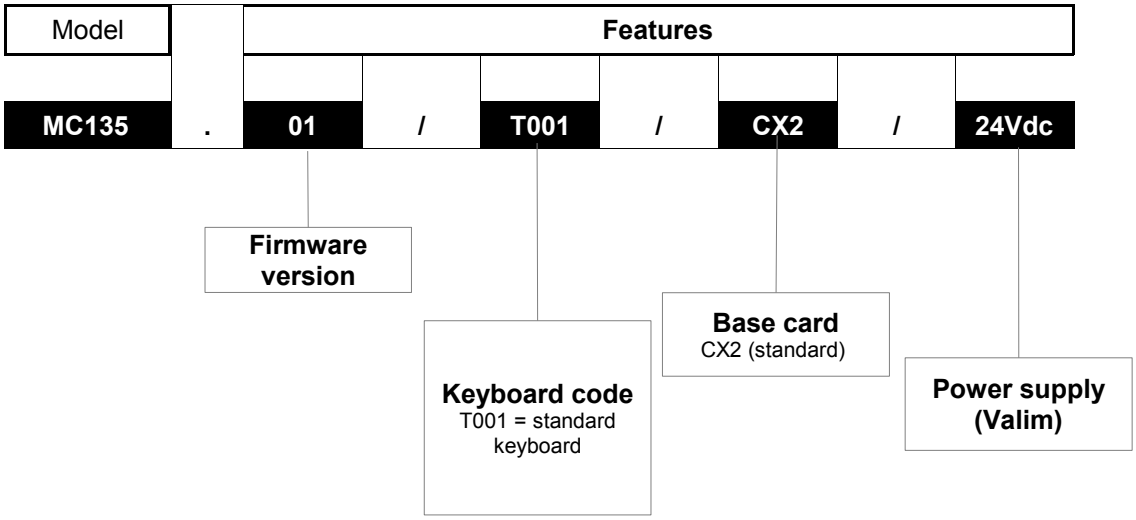
Opinion

- Personalized panel;
- Dedicated power supply voltage;
- Superior encoder counter frequencies;
- Specialization on customer specifications;

2.1 Technical features

Weight (max. hardware composition)	100 gr.
Container material	Auto-put out noryl plastic Noryl (UL 94 V-O)
Display	7 digits h = 9,2mm
Buttons	4 mechanical buttons with tactile feeling
Led	5
Working temperature	0 / 50 °C
Relative humidity	90% without condensation
Altitude	0 / 2000 m s.l.m.
Atmosphere	Not corrosive gasses
Transport and stocking temperature	-25 / +70 °C

2.2 Product code



2.3 Electric features

			Models				
			CX1	**CX2**	**CX3**	**CX4**	**CX5**
PHA / PHB: Encoder phases	*Frequency*		15 Khz		100 Khz		
	Encoder input type		NPN				TTL 5V (PNP)*
	Nominal voltage level		24 V				2 / 3,5 V
	0 logic state voltage		< 3 V				< 1,5 V
	1 logic state voltage		> 10,5 V				> 2 V
	Input resistance		2,7 KΩ				150 Ω
	Internal voltage drop		1,2 Volt				
I1 / I2: Digital inputs	*Frequency*		10 Khz				
	Input type		PNP	NPN	PNP	NPN	PNP
	Nominal voltage level		24 V				
	0 logic state voltage		< 3V	> (V alim – 3V)	< 3V	> (V alim – 3V)	< 3V
	1 logic state voltage		> 18V	< 2V	> 18V	< 2V	> 18V
	Input resistance		3,3 KΩ				
	Internal voltage drop		1,2 V				
	I1 minimum time of acquisition **C** *: continuous* **I** *: impulsive*	*C*	50 msec.				
		I	10 μsec.				
	I2 minimum time of acquisition		50 msec.				
V out ext	*Power supplied from the instrument*		V alim – 1,1V				

**It's possible to connect a Line-Driver 5V encoder, connecting the two positive phases of the encoder. N.B.: This type of connection lowers noise immunity.*

2.4 Power supply

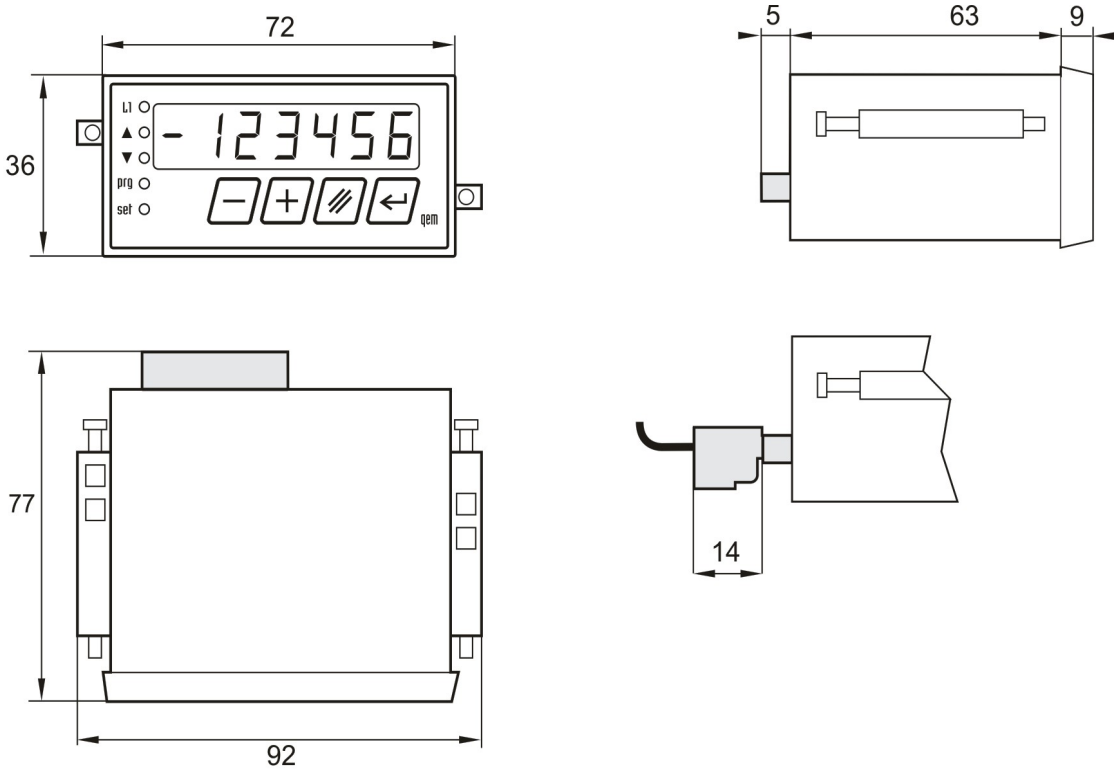
*Nominal power supply**	24 V dc
Range	20 / 30 V
Absorption	2 W (without V out load)
External V out	V alim – 1,1V
External current.	150 mA max. (not protected)

**** Note: install a 0.63A slow fuse.***

3. Installation

3.1 Mechanical dimensions

*Measure in **mm**.*



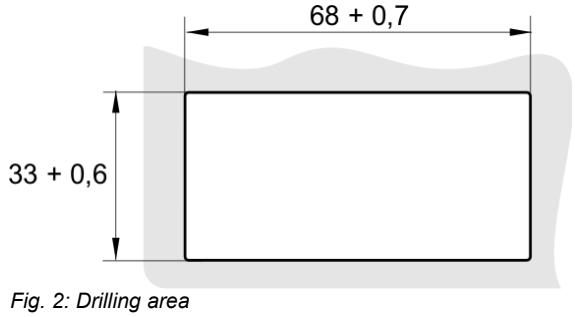
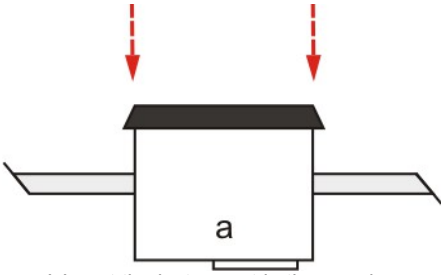
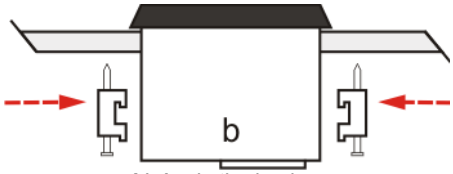


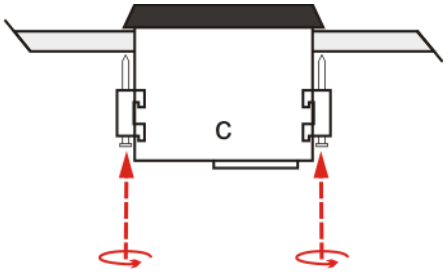
Fig. 2: Drilling area



a) *Insert the instrument in the opening;*



b) *Apply the hooks;*



c) To fix the instruments screw down*.*

4. Wiring

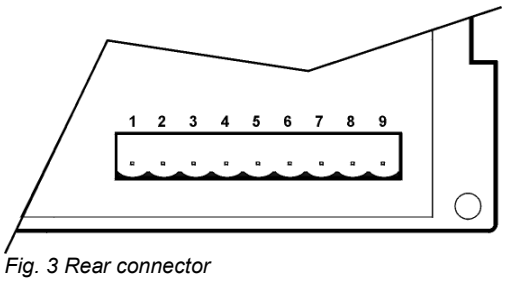


Fig. 3 Rear connector

Terminal	Name	Logic activation state	Way of activation	Description
1	Vout	-		**Volt ext.**
2	0 V			
3	I1 / PH Z	On	C / I	**Digital input I1 / Zero encoder phase (see set-up)**
4	I2 *	On	C	**Digital inputs I2.** Zero setting counter, or charging permission.
5	PH A	On	I	**Encoder phases**
6	PH B			
7	0 Volt	-		**Power supply voltage**
8	+ Vdc			
9	GND	-		Connect a conductor with 2mm$_2$ section to the PE bar.

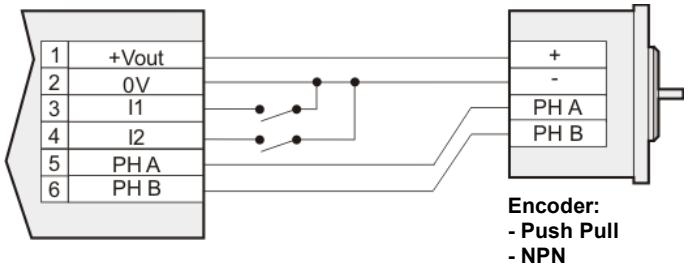
C: continuous I: impulsive

* F = 1, 3, 4, 5, 6 the I2 input reset continuously the count

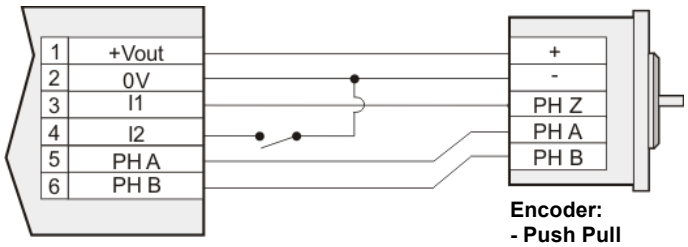
.

4.1 Wiring example

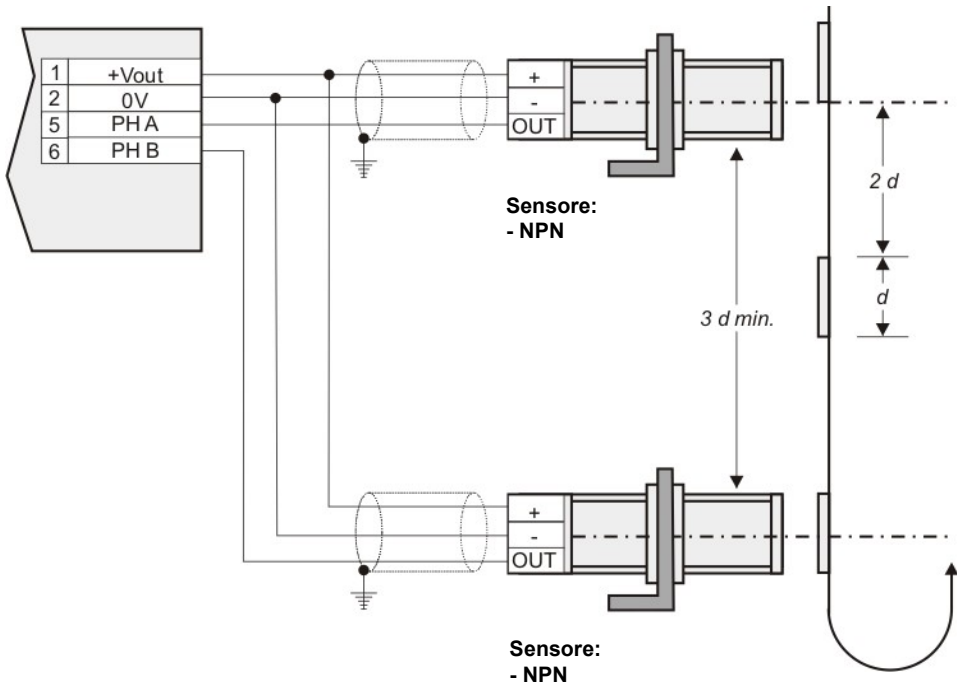
4.1.1 CX2 model



Encoder:
- Push Pull
- NPN



Encoder:
- Push Pull
- NPN



Sensore:
- NPN

Sensore:
- NPN

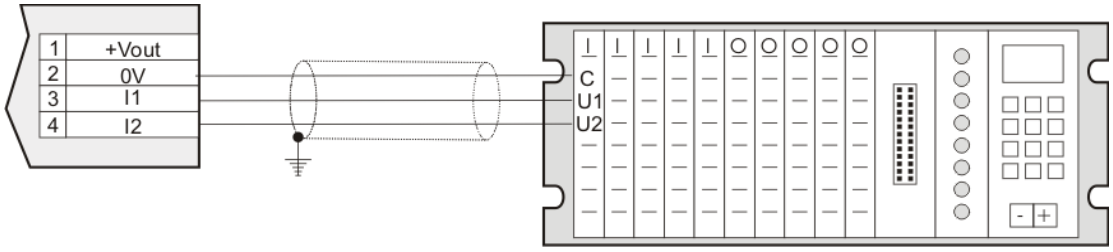


Fig. 4 Digital inputs connected to the PLC with NPN outputs.

4.1.2 CX1 model

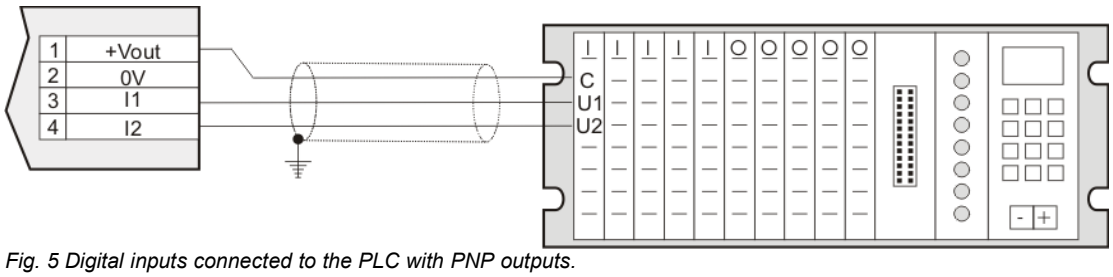


Fig. 5 Digital inputs connected to the PLC with PNP outputs.

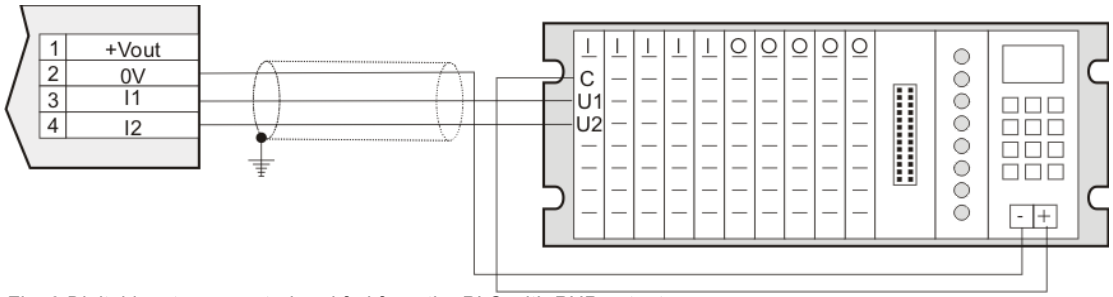
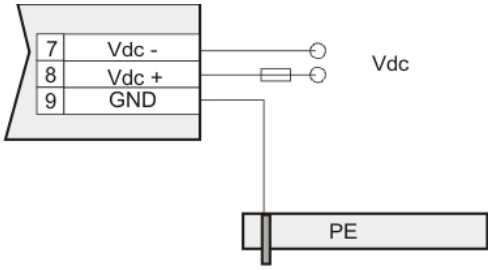


Fig. 6 Digital inputs connected and fed from the PLC with PNP outputs.

4.1.3 Power supply



4.1.3.1 Wiring types

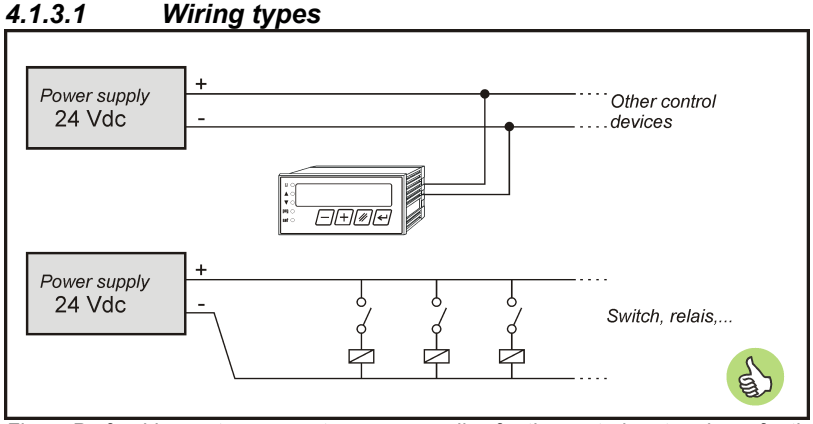


Fig. 7: Preferably use two separate power supplies for the control part and one for the power part

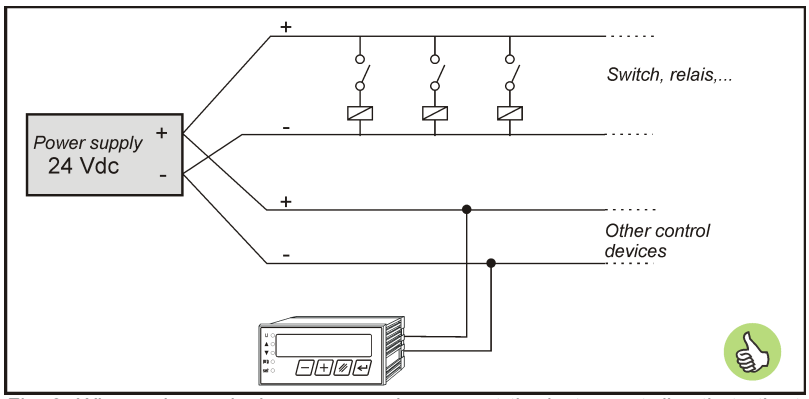
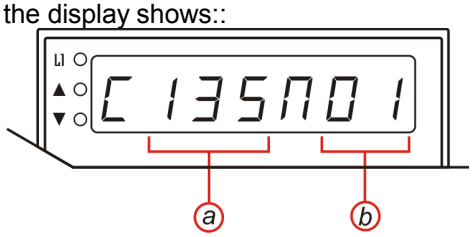


Fig. 8: When using a single power supply, connect the instrument directly to the terminals of the power supply

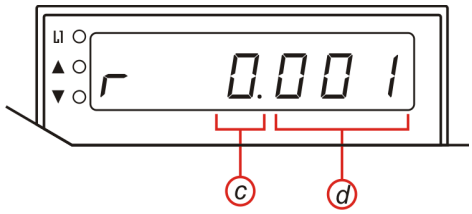
5. Functioning

5.1 Release firmware message

At the turning on the display shows::



1°: a) Instrument family;
b) Firmware version



2°: c) Release;
b) Granting.

5.2 Keyboard functions

*Some function buttons depends by the **Set-up page.** 16.*

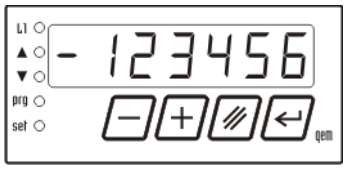
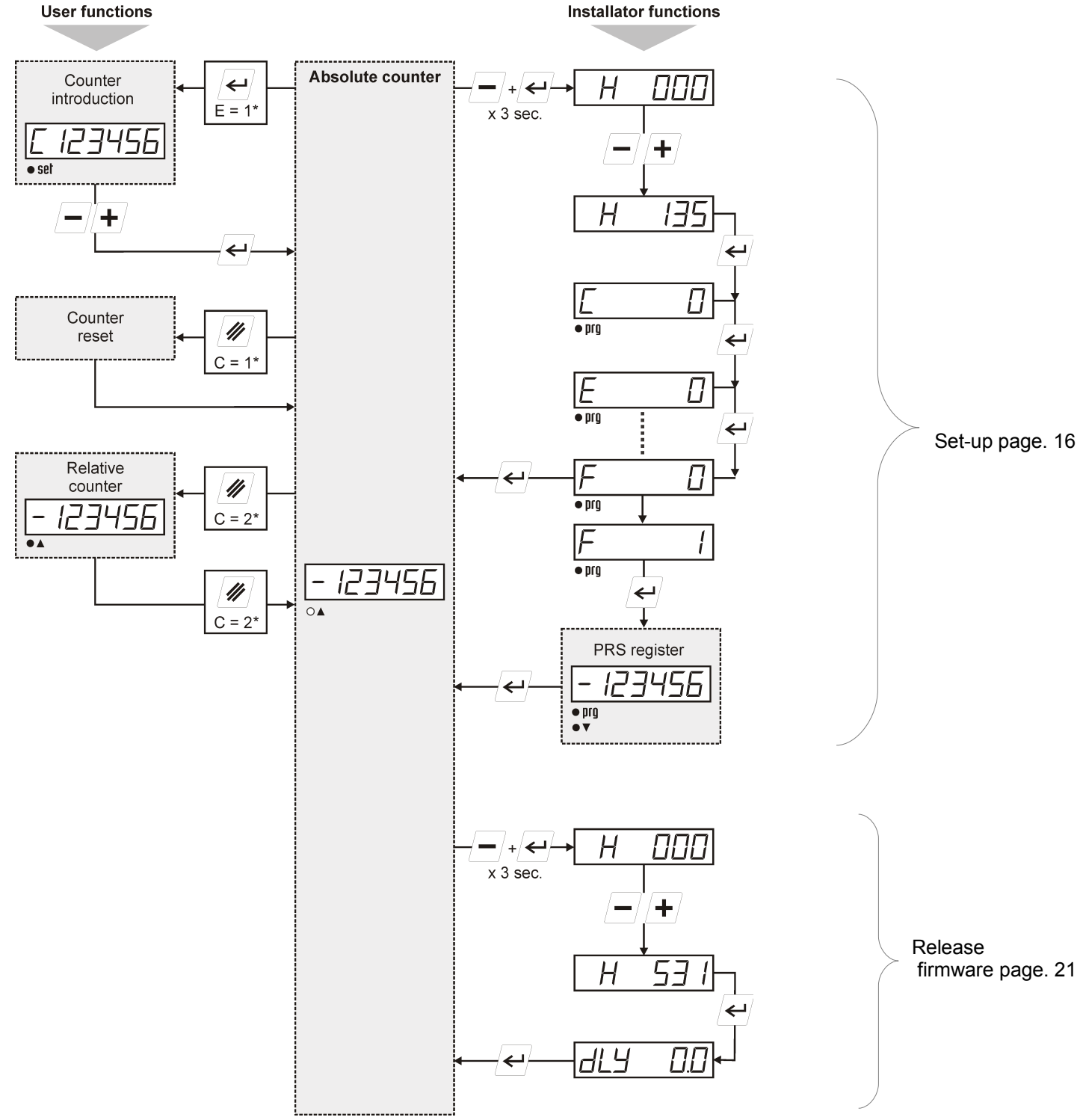


Fig. 9 Keyboard

↵	Enter	**Data insertions:** It confirms the data introduction. **Normal working:** allows a value introduction in the counter (E = 1)
///	Clear	**Data insertions:** giving the past value. **Normal working:** counter reset (C = 1) allows / not allows relative counter (C = 2)
+	-	It increases the selected number.
—	-	It selects the number with a shift from left to right.
prg ○	-	**Led.** ON = gives the parameters introduction state (set-up)
set ○	-	**Led.** ON = introduction state of a value on the counter (E = 1)
▼ ○	-	**Led.** ON = access to the storage register “PRS”
▲ ○	-	**Led.** ON = relative counter state. OFF = absolute counter state.
L1 ○ 0 00	-	**a) Led. Data insertion:** insertion sign state (direction). Normal **function:** input I1 state. **b)** first display from left - differentiation of visualized data - informs negative counter (A = 1)
↵ + —	-	Press simultaneously to access the password-protected functions

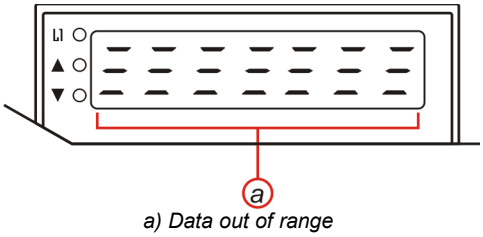
5.3 Navigation



○ ***Led** = Off.*
● ***Led** = On.*

5.4 “Data out of range” visualization

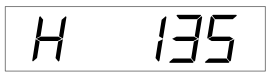
If introduced data are out of range, the display visualizes:

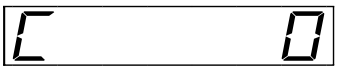


a) Data out of range

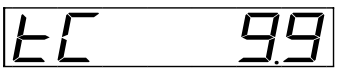
6. Introducing parameters

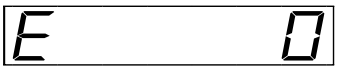
6.1 Set-up

Description	Keyboard	Visualization
Access	 x 3 sec.	
Introduce "**135**" – press **ENTER**.		

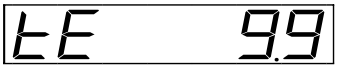
Function	Display	Description
CLEAR key		**0** = operation blocked **1** = reset counter **2** = enable / disable relative counter

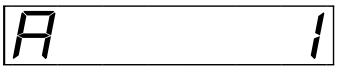
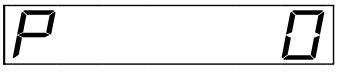
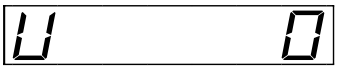
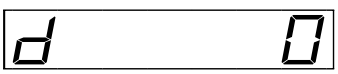
If the parameter "Button CLEAR" is different from 0 will be showed also the follow visualization:

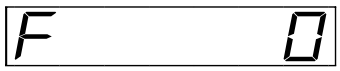
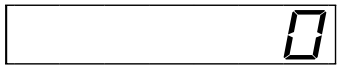
CLEAR key time		Is the time of access to the selected function in the parameter *"CLEAR key"* Max 9,9 sec.

ENTER key		**0** = operation blocked **1** = counter introduction

If the parameter "Button ENTER" is different from 0 will be showed also the follow visualization:

ENTER key time		Is the time of access to the select function in the parameter *"ENTER key"* Max 9,9 sec.

Sign of the counter		**0 =** 999999 / 0 / 999999 **1 =** -999999 / 0 / 999999	
Digit after the point Max. 3		P 1, 2 o 3 = Position of the point	d = 0, 1 o 2
		0 = display in degrees **1** = display in degrees and earlies	d = 3 o 4
-		U = 0	
Transducer resolution		Multiplier of pulses/Rev encoder *(Range: 0.00200 / 4.00000)*	
Visualization mode		**0** = standard visualization. **1** = HDR type 1 system visualization. **2** = HDR type 2 system visualization. **3** = Sexagesimal single turn visualization. **4** = Sexagesimal multi turn visualization.	

Function	Display	Description
I1 Input function		**0** = no one function **1** = continuous load PRS storage register on the counter **2** = impulsive load PRS storage register on the counter (enabled on the active front of input I1 con I2 = ON) ***Counter preset*** *pag. 20* **3** = adds PRS storage register to the counter **4** = subtracs the PRS storage register to the counter **5** = prevents access to the setup **6** = visualization block *F = 0, 1, 3, 4, 5, 6 minimum time = 50 milliseconds*
PRS storage register		prg O = ON. Value of the register.
After programming, the instrument returns to the normal display.		

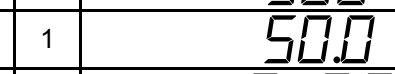
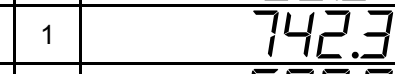
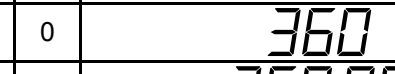
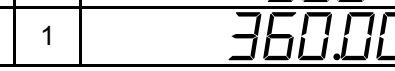
6.2 Transducer resolution calculation

Mode A

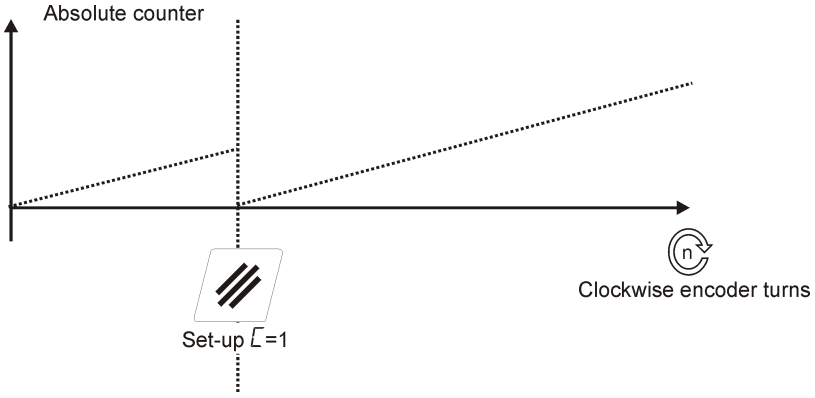
- Set “Transducer resolution” L = 1.00000.
- Reset the counter.
- Move the axes (S).
- Execute the calculation S / displayed value.
- The value of the calculation should be into the L parameter

Mode B

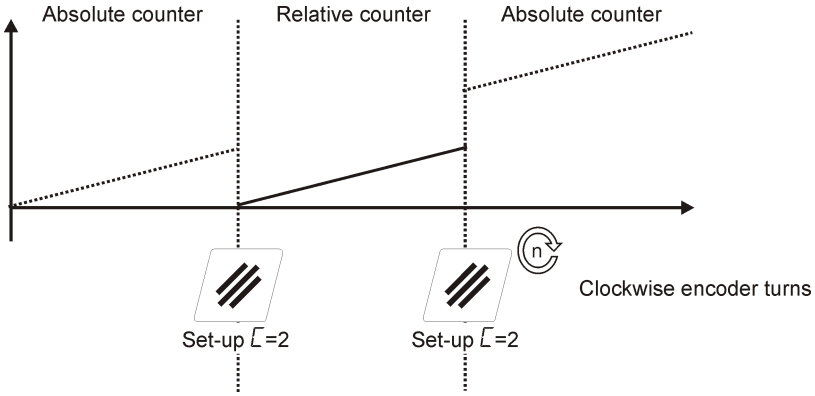
- Space covered with an encoder / label encoder pulses
- The value of the calculation should be into the L parameter

Space in units of measure	Encoder pulses	Transducer resolution		P	Visualization
S	I				
500	2000	0,25000	0, 1, 2	0	
500	2000	0,25000	0, 1, 2	1	
7423	4096	1,81226	0, 1, 2	1	
5000	2000	2,50000	0, 1, 2	1	
360	9000	0,04000	3, 4	0	
21600 (360x60)	9000	2,40000	3, 4	1	

6.1 Counter reset (C = 1)



6.2 Visualization relative/absolute (C = 2)



6.3 Angular visualization

Units permitted:

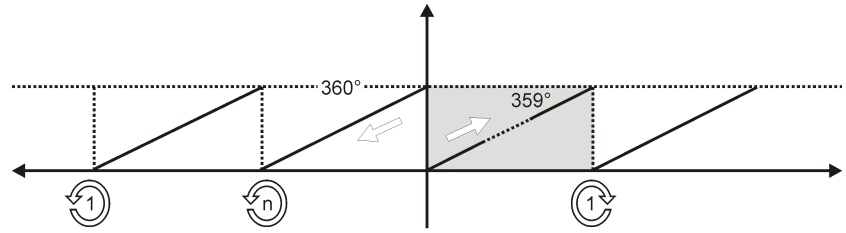
	A full circle
Radiant	2 π rad
Hundredths degree	360.00°
Sexagesimal degree	360°00’00”

The visualization can be single-turn (with 360 module) or multi-turn.
In the following table summarizes the settings:

Visualization			Parameters		
			d	P	A
Single-turn without sign	*Degrees*	0° / 360°	3	0	0
	Degrees and early	0° 00' / 360° 00'	3	1	0
Single-turn with sign	*Degrees*	360° / 360°	3	0	1
	Degrees and early	- 360° 00' / 360° 00'	3	1	1
Multi-turn without sign	*Degrees*	0° / 999999°	4	0	0
	Degrees and early	0° 00' / 9999° 99'	4	1	0
Multi-turn with sign	*Degrees*	- 999999° / 999999°	4	0	1
	Degrees and early	- 9999° 99' / 9999° 99'	4	1	1

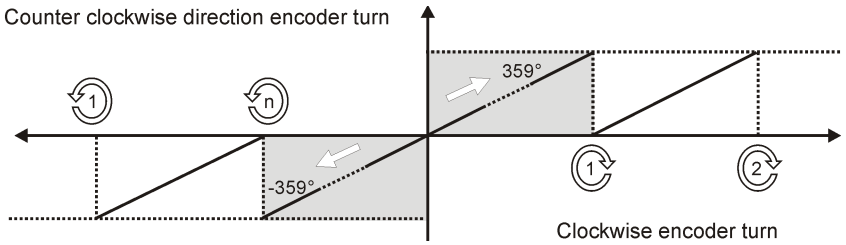
6.3.1 Single-turn counter (d = 3)

6.3.1.1 *Without sign (A = 0)*



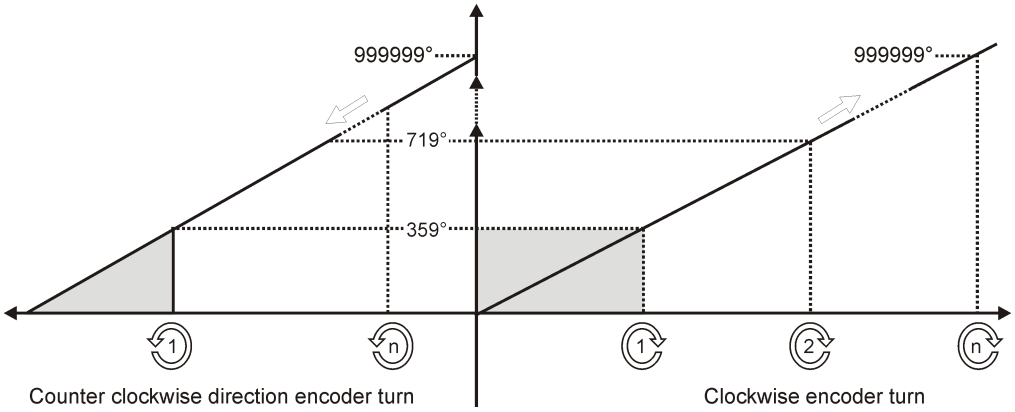
Counter clockwise direction encoder turn Clockwise encoder turn

6.3.1.2 *With sign (A = 1)*

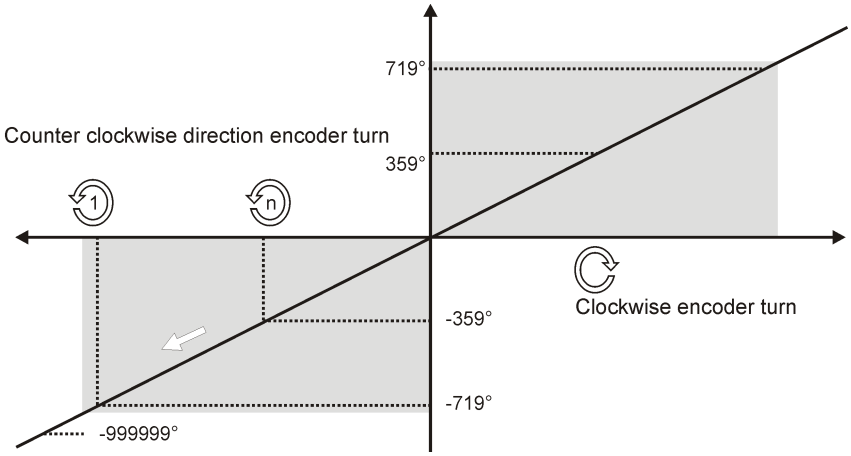


6.3.2 Single-turn counter (d = 4)

6.3.2.1 Without sign (A = 0)



6.3.2.2 With sign (A = 1)

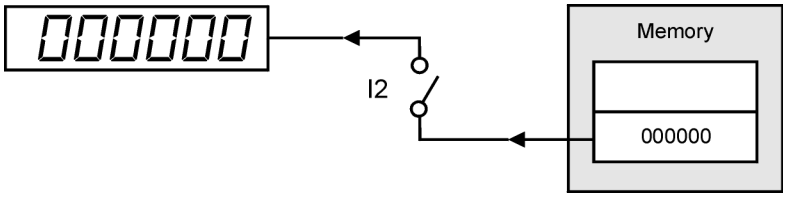


6.4 Counter preset

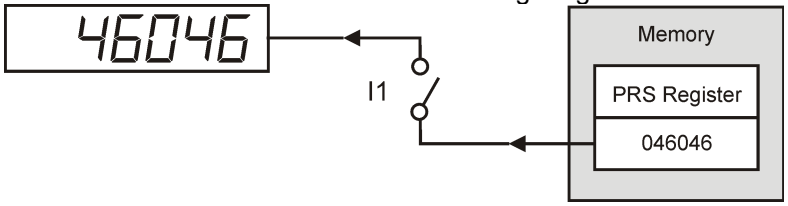
*For other information's see **Navigation** at page. 15*

6.4.1 With parameter (F = 1)

I2 = ON. Maintains zero count.

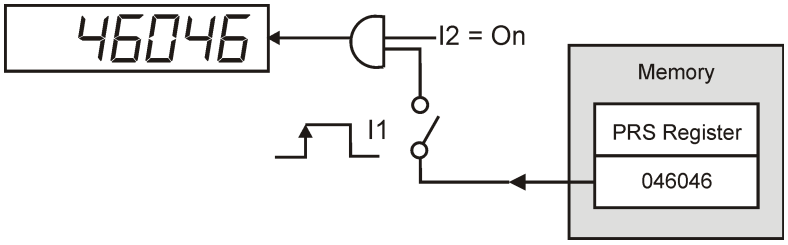


I1 = ON. Load and maintains the PRS storage register on the counter.

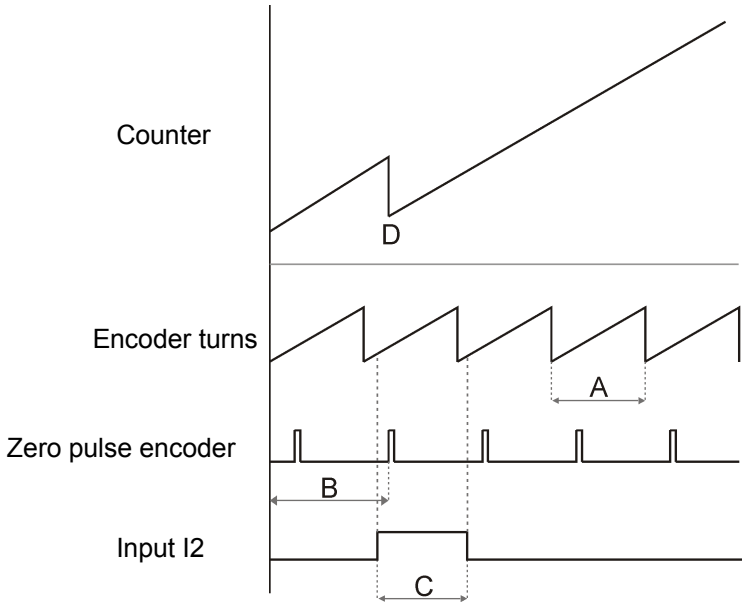


6.4.2 With parameter (F = 2)

I1 = ON. Load the PRS storage register on the counter only if I2 = ON.
The counter is not blocked.



6.4.3 Preset procedure



A = 1 encoder turn

B = space between the 0 machine and the encoder zero pulse

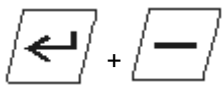
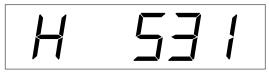
C = capture area of encoder zero pulse (input 2)

D = when the count takes the value contained in the “PRS storage register”

- Set “L”
- Set the “PRS storage register” = 00000
- Move the encoder
- In the “D” moment the instrument load a value of the “PRS storage register” on the counter
- Move the encoder until the value 0 in the count
- To measure “B” (space between the mechanical zero and the axis position)
- Insert the “B” value on the “PRS storage register”

Important: C < A

6.5 Firmware release

Description	Keyboard	Visualization
Access	 x 3 sec.	
Set "**531**" – push **ENTER**.		

Function	Display	Description
Time		Time of the release firmware visualization (at power-up)

7. Maintenance and service

7.1 Request for assistance

To provide you a faster service, at a minimum cost, we do need your help.

a)

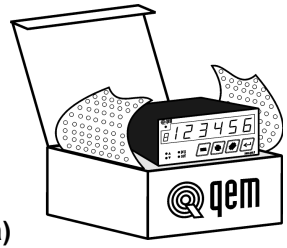
b)

a) *Follow all the information in the manual MIMAT (www.qem.it)*

b) *If the problem persists, fill out the "**Request Form for assistance**" on the page Contact at www.qem.it site.*
Our technicians will get elements essential for the understanding of your problem.

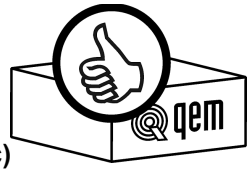
7.2 Shipment

We recommend to pack the instrument with materials that can damp eventual falls.



a)

b)



c)

a) Use the original package*: it has to protect the instrument during the transportation.*

b) Attach*:*
- An anomaly description;
- Part of the electrical sketch where the instrument is inserted
- Programming of the instrument (set up, working
quotes, parameters..).
*- **Request of a repairing estimate**; if not requested*
the cost will be calculated at the end.

c) An exhaustive description of the problem allows to find and solve your problem. An accurate package avoids further drawbacks.

QEM informs the courteous costumer that the shipped instruments unfairly packed won't be repaired, except for the cases where the costumer assumes completely the reparation cost.

Motivations
The QEM established like that because a too strong line may cause damages that could reveal in a temporal space of some months, causing doubts and shadows on the reparation done.

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e-mail: info@qem.it

CE

The CE marking of the instrument does not discharge the 'installer from the implementation and fulfillment of regulatory obligations to its reference product.