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C20001

AMPERMINUTEMETER WITH REGISTER, PARTIAL CLICK METER, AMPEROMETER, TIMER AND PRODUCTION COUNTER

(rel.2 14/12/00)

HARDWARE FEATURES:

- Container:	Self extinguishing insulating material N185 NORYL. Dimensions 72x144 DIN43700
- Display:	14mm 7 section display, 6 digits; 11mm 7 section display, 6 digits.
- Keyboard:	Thermoformed keyboard with anti-scratch film applied, made of polyester insulating material. Key run 0.4mm
- Terminal board:	Extractable and polarized; provided with supervision certificate IMQ n.ED622 in conformity with standards IEC998-1(1990) and IEC 998-2-1 (1990). Operating Temperature -40^{0}C +110^{0}C, climatic category 40/11021 Sec. IEC
- Power supply:	24/110/220 Vac to be specified in the order Possible variations +/- 10% of the nominal voltage. Consumption 10 Watt
- Transformer	12VA with 3000 Volt insulation voltage manufactured in compliance with standards CEI 14-6 and VDE 0551.
-Memory	EEprom 93C46 with over 10 years data retention.
-Microprocessor	Motorola 68HC711E9
-Inputs	Optoisolated at maximum 2500Volt ON/OFF 24Vdc. Maximum frequency 20Hz (software filter)
- Outputs	Optoisolated at maximum 2500 Volt ON/OFF 40V. AC-DC. Maximum consumption 0.07Amps (500mA option available)
-EC	Declaration of conformity with standards CEI50081-1 and CEI 50082-2

SOFTWARE FEATURES:

This instrument has a 0-60mVolt analogue input which is converted into a frequency signal proportional to the input voltage. The frequency thus generated adds to the meter counters. A frequency divider is used to convert counted pulses into the measurement unit the user needs. Sensitivity of the input converter: 0,1 millivolt: 0,1 millivolt

One output continually signals the execution of the pre-set cycle and two outputs impulsively signal the actual consumption, which enables use in automatic proportioning devices by regulating the operating time. The large display shows the count UP and count DOWN partial click meter, the power supplied and the input/output diagnostics. The total click meter is visualized on the smaller display. This instrument can also be used as an analogue display with a scale range from 60mVolt to 15 Volt (to be specified in the order). One input converts the click meter into a programmable timer.

General instructions

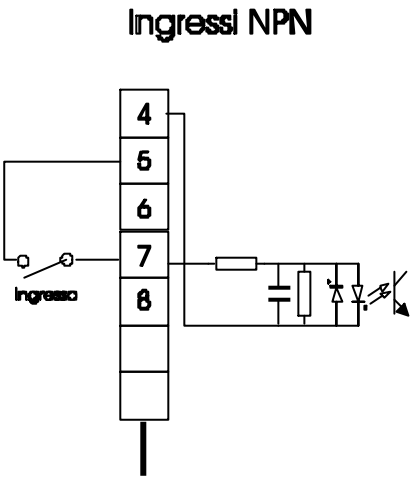
Instrument installation area.

-This meter should be assembled and installed in an area separate from the power and relay part of the system.
-The simultaneous presence of the following on the panel should be avoided: high power electromagnetic switches, contactors, relays, thyristor-based power units or, in particular, out-of-phase power units, motors, etc…
-Exposure to dust, humidity, corrosive gases and heat sources should be avoided. Notice that the working temperature of this meter ranges from 0 to 40°C.

Power supply
The mains voltage shall:
-be stable and any potential temporary instability shall not exceed +/-10% of the nominal value for more than 0.5 seconds.
-come from a fuse-protected supply disconnecting device, for safety reasons.
-supply the meter as directly as possible from the supply-disconnecting device and, additionally,:
-In case of major disturbance it is advisable that an insulating transformer be installed by connecting the screen to the ground only for meter protection. For this reason, the equipment should be fitted with an adequate grounding system, with voltage from neutral point to the ground not exceeding 1 volt and ohmic resistance not exceeding 6 ohms.
-If voltage is subject to significant variations, the meter should be supplied through a voltage stabilizer. Appropriate filters should be applied when the meter is used in the vicinity of high-frequency generators.
-In general, the supply line shall be kept separate from the meter's input and output lines.

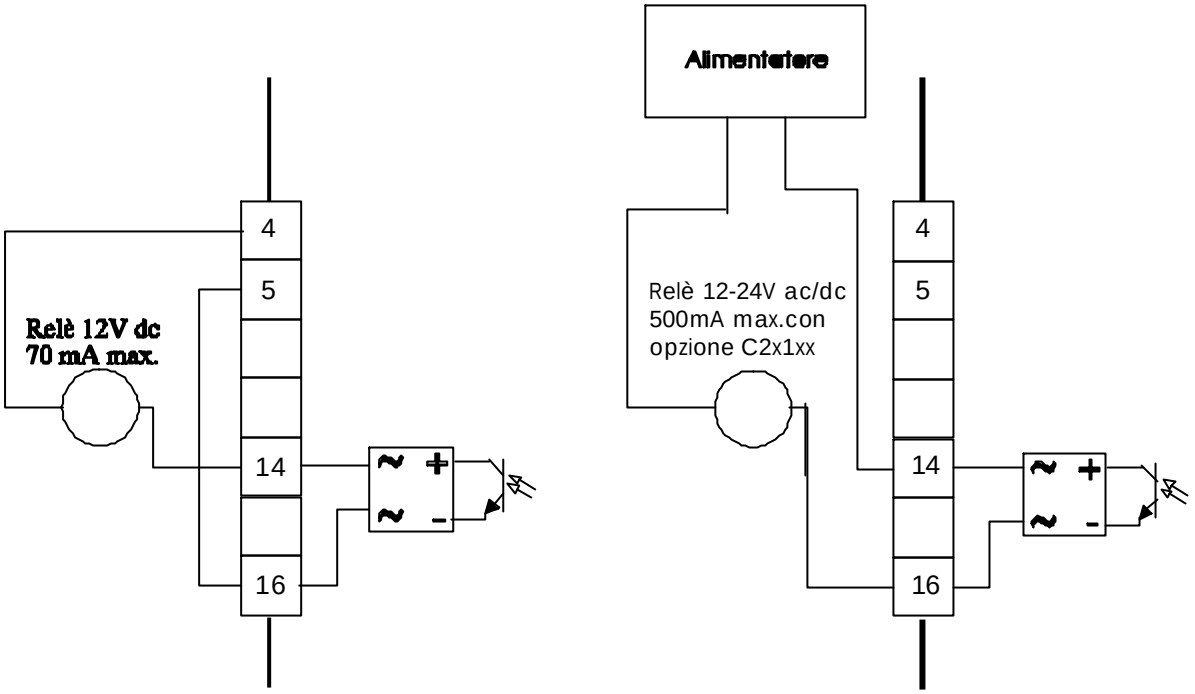
CONNECTIONS

ON-OFF Inputs:



NPN type inputs are provided.
Electrical features:
Maximum voltage: 24Vcc
Impedance: 1k2 ohm
Maximum frequency: 20Hz with a 50 msec input filter in the software.

OUTPUTS:



Electrical features:
Maximum voltage: 40Vac or dc
Maximum current: 300mA

Keyboard description

Keys	**Keys' functional description**
	If pressed together with the ENTER + PASSWORD keys, it gives access to the SET-UP parameters and production counter RESET. During data input, it moves figure selection rightwards. If pressed together with the *Arrow UP* key for at least 1 second, it enables the scheduling of U2 (**U 2**) and U1 with **A t** =2 . If enabled, it clears the register when pressed for 1 second.
	During data input, it increases the selected digit (flashing digit) impulsively or continually. If pressed during normal mode of operation, it visualizes the windows on the display. If pressed together with the RIGHT arrow key for at least one second, it enables the scheduling of U2 (**U 2**) and U1 with **A t** =2. If pressed for 2 seconds, it displays the status of inputs and outputs.
	During data input, it clears the data item displayed. If pressed impulsively, it clears the partial meter, starts the U1 output and enables the partial meter for counting.
	If pressed together with the RIGHT arrow key + PASSWORD, it gives access to the SET-UP parameters and production counter RESET. It confirms data input. When pressed, it enables programming of partial meter pre-selection.

SET-UP

To get access to the set-up, press the 

key and the  key together ; 2 seconds later, the message **P A S S** will appear on the large display. Enter value 201 in the smaller display by using the Right Arrow key and the Arrow Up key and pres 

to confirm.

Parameter	Display	Description	Limits
Click meter decimal digits and pre-selection	**S E t c** **0**	Indicates the number of decimal digits the user wants to be displayed after the decimal point.	0-3
Maximum frequency	**S E t F** **9 9 9 9**	Maximum frequency which converter A/F sends out when 60mV is supplied to input I1. It is also the maximum frequency for the value of set-up parameter 4 to be displayed.	1-9999
Visualization of decimal digits	**S E t A** **0**	Is the number of digits the user wants to be displayed after the decimal point.	0-3
Maximum visualization (ampere)	**S E t n** **9 9 9 9 9**	Indicates the ampere value displayed by the meter at the maximum frequency. If zero is entered, the visualization is not enabled.	0-99999
Read-outs average for ampere visualization	**S E t i A** **9 9**	Indicates the read-outs interval needed for calculating the value to be displayed (speedometer). The more read-outs, the slower the value updating time.	0-99
Clipping frequency	**S E t G** **9 9 9 9**	Is the clipping frequency of the clock input, beyond which no signal is recorded. This value must be higher than or equal to the maximum frequency (usually 5% higher).	0-9999
Enabling the partial click meter	**S E t A t** **0**	0= Partial click meter disabled. Always appears with **I 1**=3 1= Partial click meter enabled (it can be cleared with I1=ON or with the CLEAR key impulsively)	0-1
Initial timer	**S E t t n** **9 9.9 9**	Indicates the time, in seconds, for stopping the pulse meter at instrument start-up. When the timer is on, U1 is OFF and the CLEAR key is disabled for read-out.	0-99.99
Register increase	**S E t i t** **0**	0= The result register is always enabled for counting 1= The result register is only enabled for counting when U1=ON 2= The result register is disabled	0-2
Enabling register reset with Right Arrow Key	**S E t c t** **0**	0= The right arrow key is enabled 1= The right arrow key is disabled 2= The right arrow kew press for 2 seconds + pass 102 reset the register	0-1
Enabling partial click meter in countdown mode	**S E t c S** **0**	0= The partial click meter in countdown mode is disabled 1= The partial click meter in countdown mode is enabled	0-1
Configuration I1	**S E t I 1** **0**	0= Input I1 is not used 1= Input I1 is configured as amperminutemeter enabling connection 2= Input I1 is configured as Right Arrow key enabling connection (it clears the result register) 3= Input I1 is used to configure the partial click meter as a TIMER. The partial click meter does not confine itself to pre-selection and pre-selection is not accessible in TIMER mode. 4= Equal to parameter 3, with partial click meter programming option. In this case, the partial click meter is limited to pre-selection and has no influence on the outputs. 5= Equal to parameter 4, whit U3 conditioning partial clik meter 6=Input I1 is used to configure the partial clik meter **C** as a TIMER. If I1=OFF the timer is replace to **C** partial clik meter 7= I1 enable automatic count clik meter. If I1=OFF equal to parameter 6	0-3
Partial click meter operation	**S E t r P** **0**	0= when switching on, the partial click meter gets cleared (it is placed at zero) 1= when switching on, the partial click meter displays the value stored at switching off; to start it up again, press CLEAR.	0-2

		2= when switching on, the partial click meter displays the value stored at switching off and is always enabled. 3= Equal **r P** =2 wit zero automatic partial clik meter 4= With parameter **I I** =6 at shutdown the value's timer or clik meter are equal zero (as **r P** =0)	
Enabling production counter	**S E t P r 1.0**	If register receives pulses, this function sets the production counter incremental time interval in seconds. When zero is entered, the production counter is not displayed.	0-9.0
Display mode	**S E t M u 1.0**	0= The large display shows all enabled parameters except the register, which is visualized on the smaller display. 1= The large display shows the register, whereas the small display shows all other parameters.	0-1
Pulse divider	**S E t d 9 9 9 9 9 9**	Sets the input frequency divider (See section "How to calculate pulse division").	1-99999

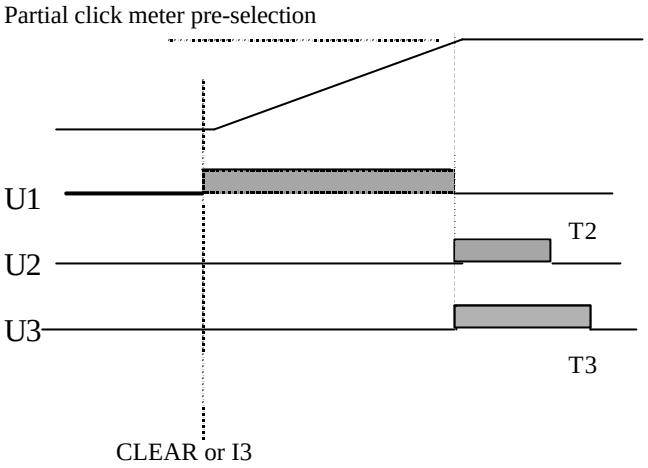
INPUTS

Terminal number	Input	Functional description
6	I1	Enables the amperminutemeter (ON). Upon switching it off (OFF), click meter is stopped but visualization is maintained (if enabled), U1 is disabled and the CLEAR key is disabled for read-out. Input I3 is enabled for read-out. The functioning of this input can be excluded from set-up parameter **I 1** =0. With **I 1** =2, input I1 works as RIGHT Arrow key. With **I 1** =3 and I1=ON, the partial click meter turns into a TIMER (1 second time base)
7	I2	Click meter reset. If connected impulsively, it clears the partial click meter and starts up output U1.
8	I3	Reset timer.
18-19	SCH1-2	60mV.Analogue input 0-60mV to be connected to the shunt using a screened cable.

OUTPUTS

Terminal number	Outputs	Functional description
13	U1	**Pre-selection obtained** activates when CLEAR key or input I2 are pressed. It turns off when the partial click meter reaches pre-set selection. With U1=ON, partial click meter is enabled for counting .
14	U2	**Impulsive pre-selection obtained** activates for the pre-set time (**t 2**) when the partial click meter reaches pre-set selection. It is used in automatic proportioning devices.
15	U3	**Impulsive pre-selection obtained** activates for the pre-set time (**t 3**) when the partial click meter reaches pre-set selection. It is used in automatic proportioning devices.

Output functional diagram



PROGRAMMING PARTIAL CLICK METER PRE-SELECTION

To programme the partial click meter pre-selection, please make sure the following steps are performed:

Press the 

key. The displays will now show:

P r E S E t

P 1 2 3 4 5

Using the *right arrow* key and the *arrow up* key, the user can enter his number in the smaller display (min.1 - max.99999). When the 

key is pressed to confirm, the displays goes back to the main screen.

PROGRAMMING U2 TIME OF OPERATION

To programme U2 time of operation, please make sure the following steps are performed:

Press  and  keys together for at least 1 second. The displays will now show:

t i M E r 2

1 2 3 4.5

Using the *right arrow* key and the *arrow up* key, the user can enter his number in the smaller display (min.1 - max.99999). When the 

key is pressed to confirm, the display will show:

t i M E r 3

5 3 6.7

Using the *right arrow* key and the *arrow up* key, the user can enter his number in the smaller display (min.1 - max.99999). When the 

key is pressed to confirm, the displays goes back to the main screen.

RESETTING PRODUCTION COUNTER

To clear the production counter, press 

key and  key together. Two seconds later, the larger display will show the message **P A S S**. Enter value **3 0 4** in the smaller display using the *right arrow* key and the *arrow up* key, and press 

to confirm. The smaller display will show:

r E S E t

P r o d

By pressing 

the production counter is cleared and the display goes back to the main screen. All other keys inhibit the reset procedure.

RESETTING TOTAL COUNTER (if C t =2 set-up)

To clear the total counter, press 

key and 
key together. Two seconds later, the larger display will show the message **P A S S**. Enter value **1 0 2** in the smaller display using the *right arrow* key and the *arrow up* key, and press 

to confirm.

The total counter is cleared and the display goes back to the main screen.

PULSE DIVIDER CALCULATION

At maximum power (meter full-scale), 600 clicks a second are counted, with divider=1.
To calculate the divider to enter, the following formula shall be applied:

$$DIV = \frac{36000 \times CP}{CS \times FS}$$

where: DIV= Divider to enter
CP= Pre-set current
FS= Full Scale (maximum shunt current)
CS= click meter in 1 minute time

Example: to get 50 clicks a minute with a 200 Amp galvanic bath and a 75 Amp working power, the DIV value to enter will be:

$$\frac{36000 \times 75}{50 \times 200} = 270$$

Note: If you need to enter an hour-based value, constant 36000 shall be replaced with constant 2160000.
If you need to get one click per minute for each ampere used, please refer to the following table which provides the divider values to be entered based on the shunt installed:

SHUNT	DIVIDER	SHUNT	DIVIDER
10A	3600	400A	90
25A	1440	500A	72
50A	720	600A	60
100A	360	800A	45
150A	240	1000A	36
200A	180	1500A	24
250A	144	2000A	18
300A	120	3000A	12

DISPLAY MODES

During normal operations, the large display shows one window at a time. Using the  key, data can be scrolled through for you to stop on the desired piece of information.

P 3456	Partial click meter	Shows when **At** =1(and gets cleared by either pressing I2 impulsively, or using the CLEAR key).
A 200	Amperemeter	Shows when **n** ??zero
J 200	Production counter (seconds)	Shows when **Pr** ? zero. Maximum capacity 277 hours.
d 123	Partial click metre in count down mode	Shows when **CS**=1 (set-up)
i A12 **u 123**	Input/Output Diagnostics	Shows by pressing the  key for 2 seconds
EEEEEE	Error	If the data item to be displayed is out of scale, the display will show text character “e” in its place.

During normal operations, the smaller display will show the register. If the register is not enabled as a set-up feature, the display will show the partial click meter.

123456	Register	Shows when **It**=0 or **It**=1 (and gets cleared by pressing the Right arrow key (if enabled) for more than 1 second or by using **I2**=2). Note: The register final record is stored when switching off.

CONNECTIONS

Terminal number	Name	Description
1	VAC	Meter supply terminal
2	VAC	Meter supply terminal
3	GND	Grounding terminal
4	+12V	12 Volt 0.1 Amp Output. It can be used to give power to transducers and input wires.
5	0V	Common supply +12Volt
6	I1	Enables amperminutemeter/ TIMER
7	I2	Click meter reset
8	I3	Reset timer
9	I4	
10	I5	
11	I6	
12	I7	
13	U1	
14	U2	Impulsive pre-selection obtained (for alarms or proportioning devices)
15	U3	Impulsive pre-selection obtained (for alarms or proportioning devices)
16	CU	Output polarization common
17		
18	SCH1	Negative shunt input
19	SCH2	Positive shunt input

ORDERING CODES

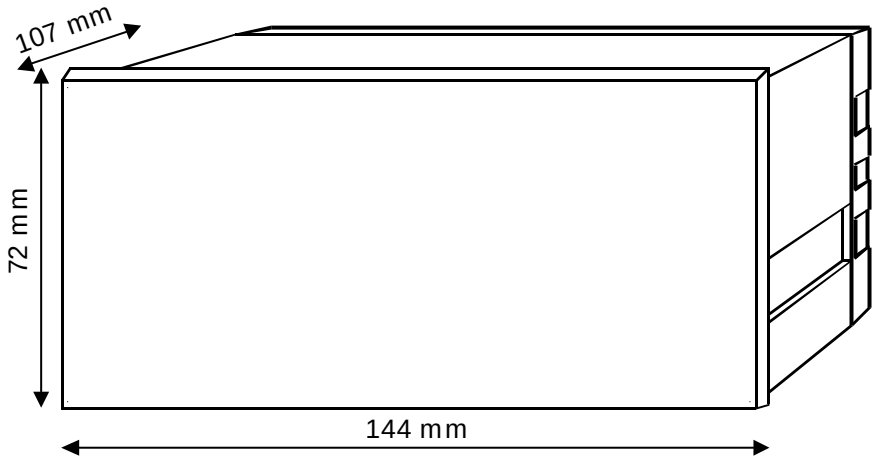
C	2	0	0	0	1

Size specification	Hardware type	Hardware code	Software code
B= 72x144 DIN 43700	2	00= 60mV 01= 10V input	01=Amperminutemeter 02=with analogue output for Ampere/Volt configuration

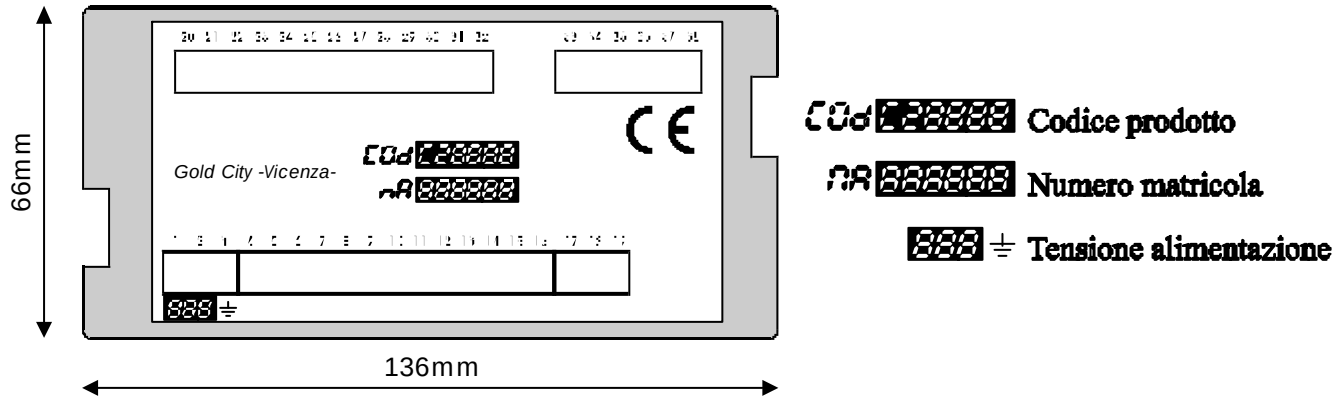
Note: When ordering, please specify meter supply voltage as it may range from 24 to110 to 220 VAC.

DIMENSIONS

Front pannel



Back pannel



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