



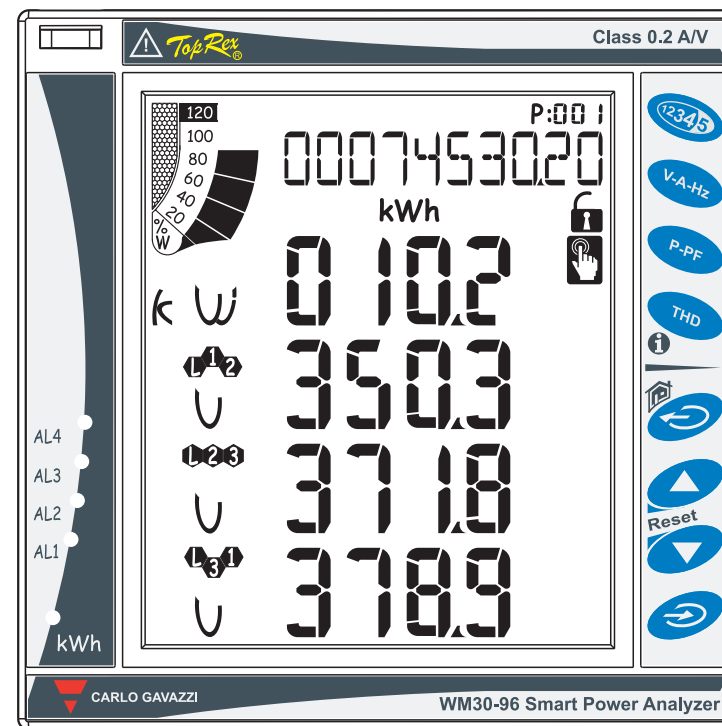
# Instruction Manual

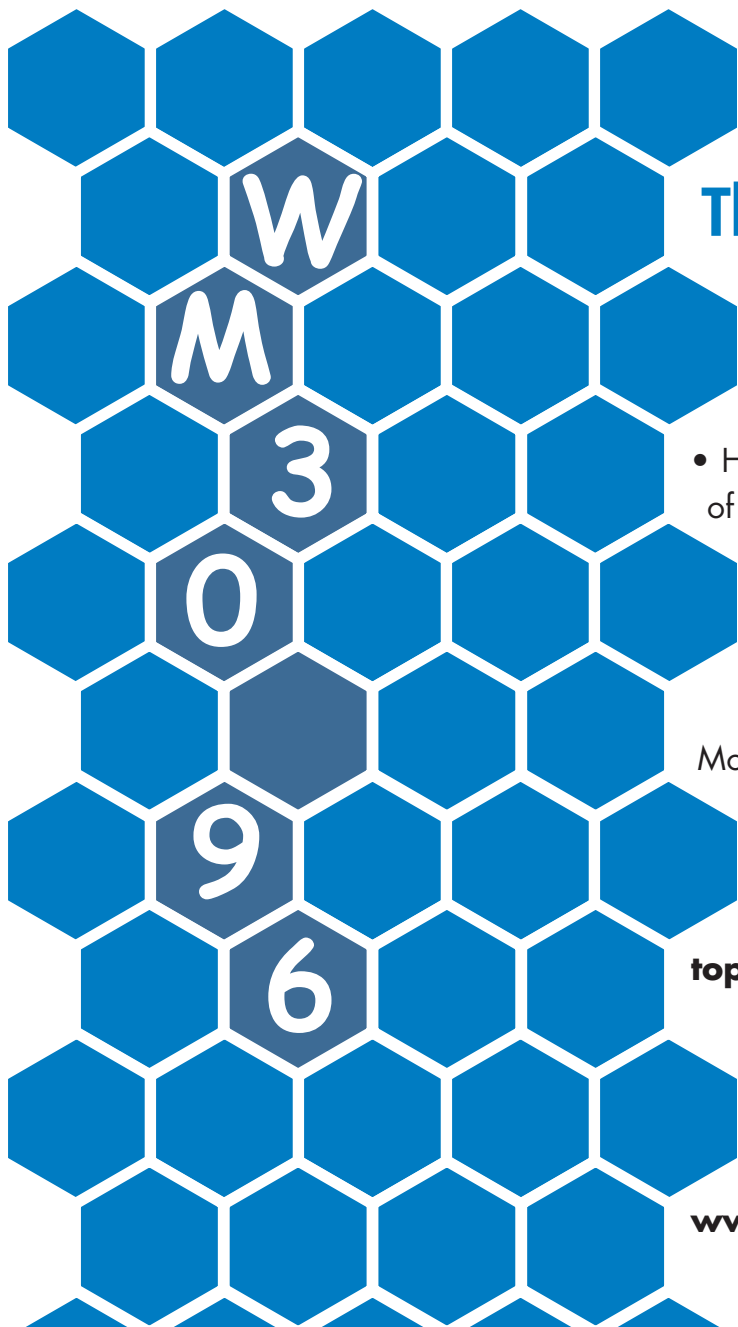


Display, Programming

Modular system

Class 0.2 A/V





## Thank you for choosing our products

WM30 96:

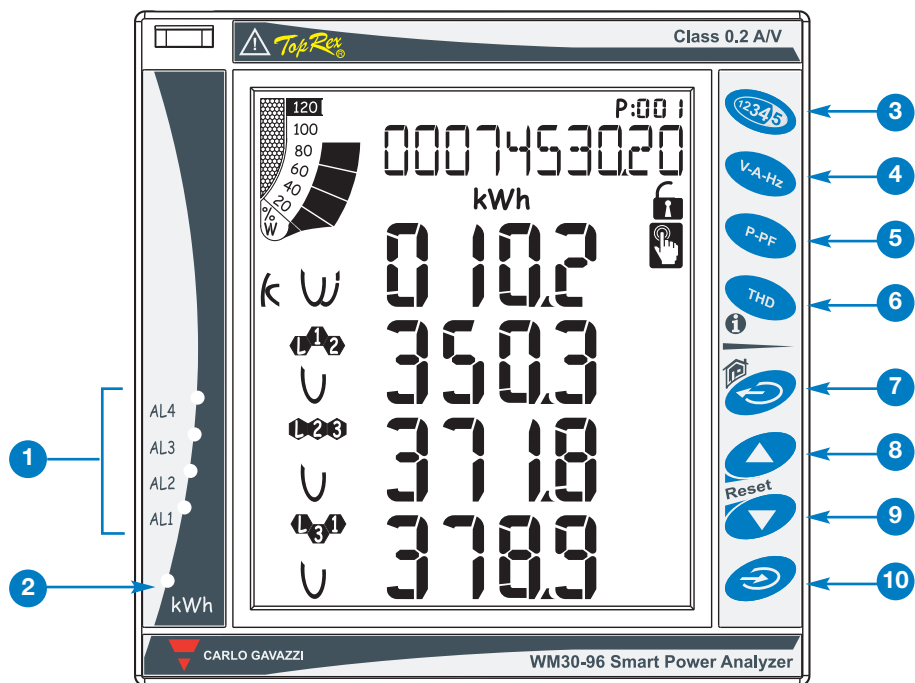
- High accuracy (class 0.2 A/V);
- High calculation performances for a fast analysis of the signal (FFT up to the 32<sup>nd</sup> harmonics);
- high connection capabilities.

WM30-96 is the state-of-the-art technological answer to your needs of power quality analysis.

Moreover, you can count on a ISO9001/VISION 2000 certified company structure, an experience of many years and a wide-spread presence both in Europe and all over the world. All this in order to guarantee the customer with a **top-quality service** and the best products.

Welcome in Carlo Gavazzi and our compliments for your choice. You can evaluate the complete range of our products on the CARLO GAVAZZI web-site:

**[www.gavazzi-automation.com](http://www.gavazzi-automation.com)**



**DESCRIPTION OF THE INSTRUMENT**

- 1 Active virtual alarms warners.
- 2 Current energy drain indicator (kWh) by means of flashing, proportional to the measured energy (the higher the flashing frequency, the higher the energy drained. Max. frequency 16Hz pursuant to standard EN5047-1).

The keyboard is divided into two areas, the top area is dedicated to the measurements with direct access to specific visualization screens.

- 3 Visualization of the counters screens: each pressure of the button corresponds to the visualization of a screen with counters related to different energies (see the table with the measurement screens below).
- 4 Visualization of the current voltage and frequency (see the table with the measurement screens below).
- 5 Visualization of the instant  $\cos\phi$  and powers (see the table with the measurement screens below).
- 6 Visualization of the harmonics (see the table with the measurement screens below).

The keyboard in the bottom area is especially dedicated to instrument programming.

- 7 Exits the submenus, exits programming.
- 8 “Up” button, enables to browse the menus and to increase the values to be set.
- 9 “Down” button, enables to browse the menus and to decrease the values to be set.
- 10 Access to the programming menu: **hold pressed for at least 2 seconds to access the programming menu.**

**In measurement mode, buttons 8 and 9 enable to display the MAX and dmd values of the displayed variables.**

Access to the instrument information screens: reference standards, firmware version, year of manufacturing.

“Home” button: from any measurement screen, from any menu, returns to the main measurement screen (customizable by the user). **If you are in the programming menu, any data entered is lost.**



Holding pressed the button 8, you access the reset of the MAX of the displayed variables.

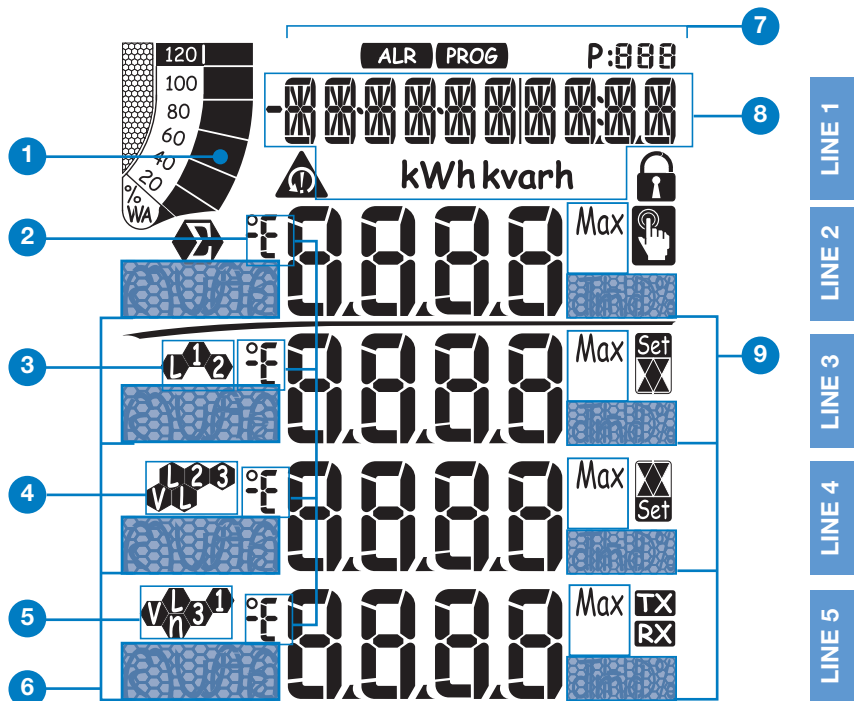
Holding pressed button 9, you access the reset of the dmd's of the displayed variables.

The reset must be confirmed by button 10.



The buttons are enhanced touch buttons. To check their actual engagement, a specific icon on the display turns on each time a button is pressed.

**We recommend using your forefinger to activate the touch buttons.**



**DESCRIPTION OF THE DISPLAY**

- 1** Graphic bar which displays the active and the apparent power drained with relation to the installed power.
- 2** Indications of inductive phase displacement L, -L, or capacitive phase displacement C, -C.
- 3** Indication of the measurement phase-neutral L1 or phase-phase L12.
- 4** Indication of the measurement phase-neutral L2 or phase-phase L23 or of the asymmetry phase-phase VLL.
- 5** Indication of the measurement phase-neutral L3 or phase-phase L31 or of the asymmetry phase-neutral VLn.
- 6** Indication of the engineering unit and of the multiplier: k, M, V, W, A, var (VAr), PF (Pf), Hz, An.
- 7** ALR: the alarm display function is active. PROG: the programming function is active.
- 8** Area dedicated to the visualization of counters, text messages, date and time (format: dd.mm.yy/hh:mm). Energy counters (see table on the following screen).
- 9** Indication of: dmd, THD% or Max.
- 10** Indicates that all the instant values displayed are system values.
- 11** Phase sequence error alarm.
- 12** Instrument programming enabled.
- 13** Instrument programming disabled.
- 14** Data transmission (TX) and reception (RX), via network communication, in progress.

**ICONS OF THE DISPLAY**



ALARM SETPOINT	
Up alarm.	Down alarm.

Notes: the display is backlit with lighting time programmable from 0 minutes (always on) to 255 minutes.

Selection	Application	Note
<b>A</b>	Cost allocation	Imported energy metering
<b>B</b>	Cost control	Imported and partial energy metering
<b>C</b>	Complex cost allocation	Imported/exported energy (total and partial)
<b>D</b>	Solar	Imported and exported energy metering with some basic power analyzer function
<b>E</b>	Complex cost and power analysis	Imported/exported energy (total and partial) and power analysis
<b>F</b>	Cost and power quality analysis	Imported energy and power quality analysis
<b>G</b>	Advanced energy and power analysis for power generation	Complete energy metering and power quality analysis

### NOTE

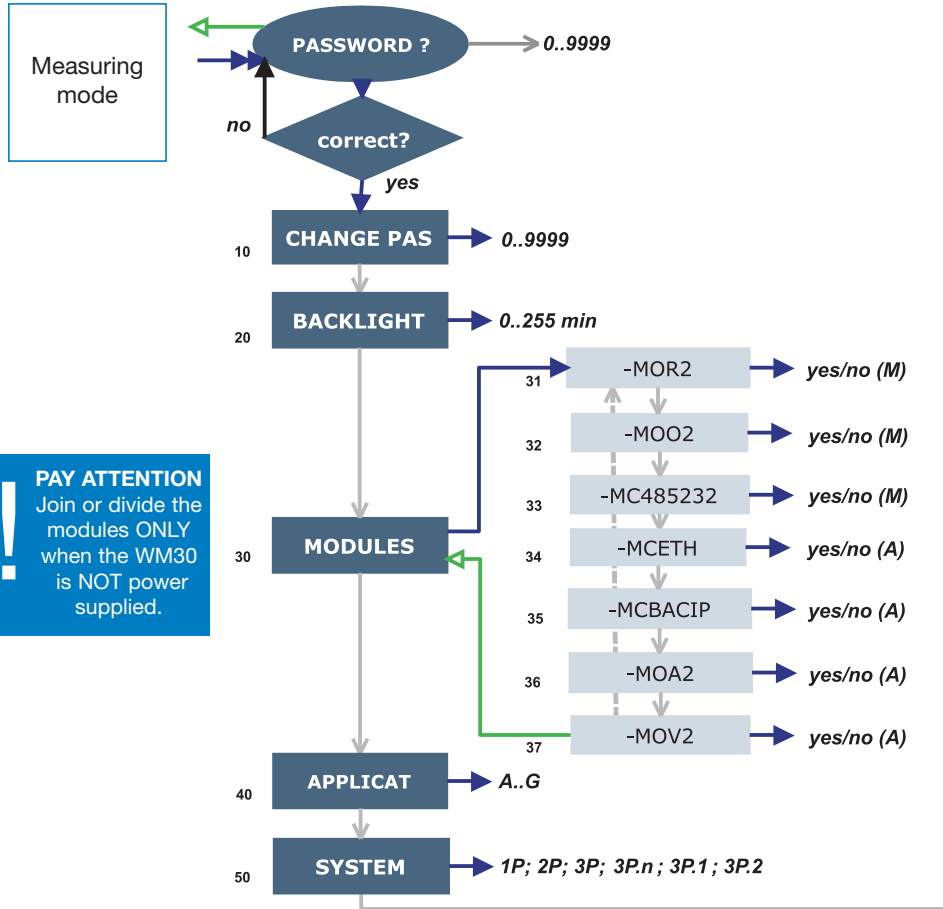
WM30-96 is provided with the "Easy-prog" function which enables a simple, quick, clear and immediate visualization of the instrument measurements, making available only specific variables depending on the application of the instrument. The available applications are described above.

To leverage all the capacities of the instrument, select the application G which enables a complete and detailed analysis of the electric energy.

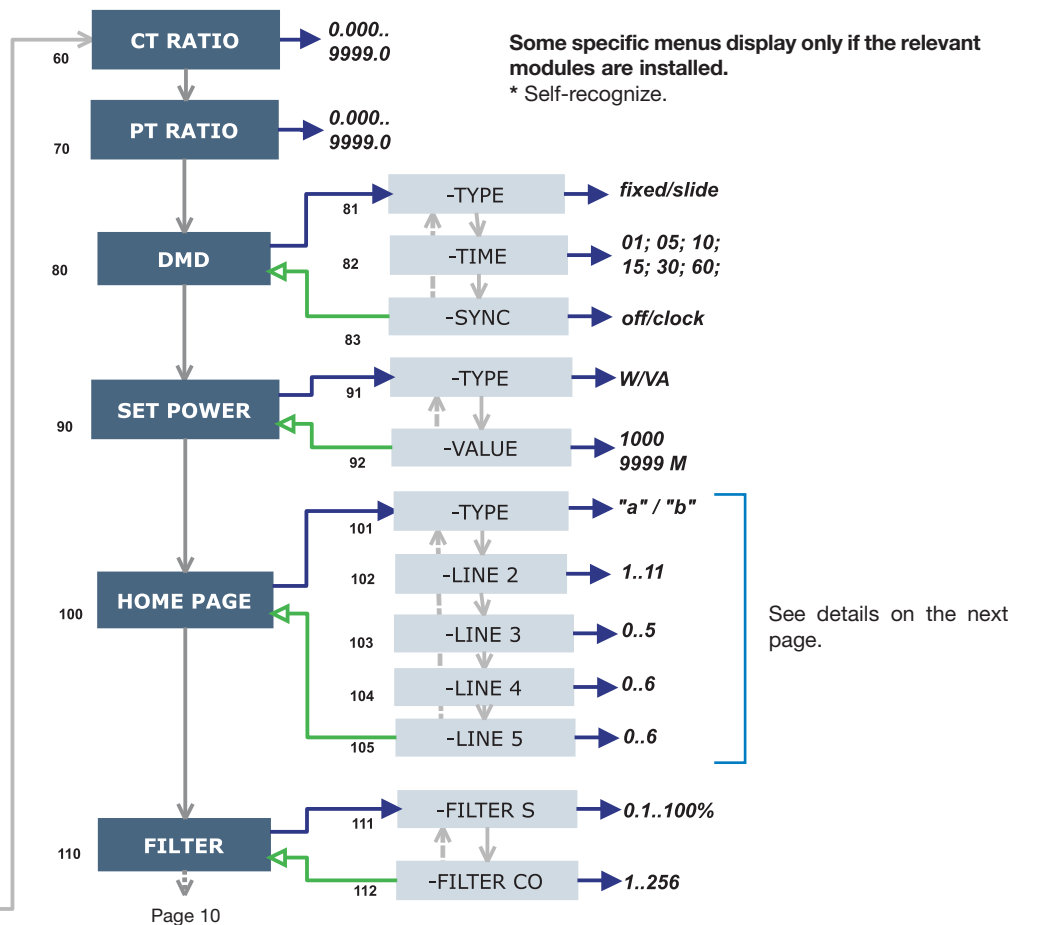
	No	Line 1	Line 2	Line 3	Line 4	Line 5	Note	Application						
								A	B	C	D	E	F	G
	0	Home page	Programmable					x	x	x	x	x	x	x
	1	Total kW (+)	Depending on the last displayed page of instantaneous variables.					x	x	x	x	x	x	x
	2	Total kvarh (+)						x	x	x	x	x		
	3	Total kWh (-)							x	x	x		x	
	4	Total kvarh (-)							x	x	x		x	
	5	kWh (+) part.							x	x		x	x	x
	6	kvarh (+) part.							x	x		x	x	x
	7	kWh (-) part.							x		x		x	
	8	kvarh (-) part.							x		x		x	
	9	Run Hours (99999999.99)							x	x	x	x	x	
	10	Phase seq.	VLN $\Sigma$	VL1	VL2	VL3				x	x	x	x	
	11	Phase seq.	VLN $\Sigma$	VL1-2	VL2-3	VL3-1				x	x	x	x	
	12	Phase seq.	An	AL1	AL2	AL3				x	x	x	x	
	13	Phase seq.	Hz	"ASY"	VLL sys (% asy)	VLL sys (% asy)				x	x	x	x	
	14	Phase seq.	VA $\Sigma$	VA L1	VA L2	VA L3					x	x	x	
	15	Phase seq.	var $\Sigma$	var L1	var L2	var L3						x	x	x
	16	Phase seq.	W $\Sigma$	WL1	WL2	WL3					x	x	x	x
	17	Phase seq.	PF $\Sigma$	PF L1	PF L2	PF L3						x	x	x
	18	Phase seq.		THD V1	THD V2	THD V3							x	x
	19	Phase seq.		THD V12	THD V23	THD V31							x	x
	20	Phase seq.		THD A1	THD A2	THD A3							x	x

No	Line 1	Line 2	Line 3	Line 4	Line 5	Note	Applications						
							A	B	C	D	E	F	G
1	Lot n. xxxx	Yr. xx	rEL	A.01	1...60 (min) "dmd"		x	x	x	x	x	x	x
2	Conn. xxx.x (3ph.n/3ph/3ph./3ph.2/1ph/2ph)	CT.rA	1.0 ... 99.99k	Pt.rA	1.0...9999		x	x	x	x	x	x	x
3	LED PULSE kWh	0.001 to 1000 kWh per pulse					x	x	x	x	x	x	x
4	PULSE OUT1 kWh/kvarh	0.001 to 1000 kWh/kvarh per pulse	+/- tot/PAr				x	x	x	x	x	x	x
5	PULSE OUT2 kWh/kvarh	xxxx kWh/kvarh per pulse	+/- tot/PAr				x	x	x	x	x	x	x
6	Remote out	out1	on/oFF	Out2	on/oFF		x	x	x	x	x	x	x
7	AL1	variable	Set 1	Set 2	(measurement)				x	x	x	x	
8	AL2	variable	Set 1	Set 2	(measurement)				x	x	x	x	
9	AL3	variable	Set 1	Set 2	(measurement)				x	x	x	x	
10	AL4	variable	Set 1	Set 2	(measurement)				x	x	x	x	
11	ANALOGUE 1	Hi.E	0.0 ... 9999k	Hi.A	0.0 ... 100.0%				x	x	x	x	
12	ANALOGUE 2	Hi.E	0.0 ... 9999k	Hi.A	0.0 ... 100.0%				x	x	x	x	
13	COM port	Add XXX	1...247	bdr	9.6/19.2/ 38.4/115.2		x	x	x	x	x	x	x
14	IP ADDRESS	XXX	XXX	XXX	XXX		x	x	x	x	x	x	x
15	XX•XX•XXIXX:XX	dAtE	tiME				x	x	x	x	x	x	x





**PAY ATTENTION**  
Join or divide the modules **ONLY** when the WM30 is **NOT** power supplied.



Some specific menus display only if the relevant modules are installed.  
\* Self-recognize.

See details on the next page.

**Key-pad**



**NOTE**

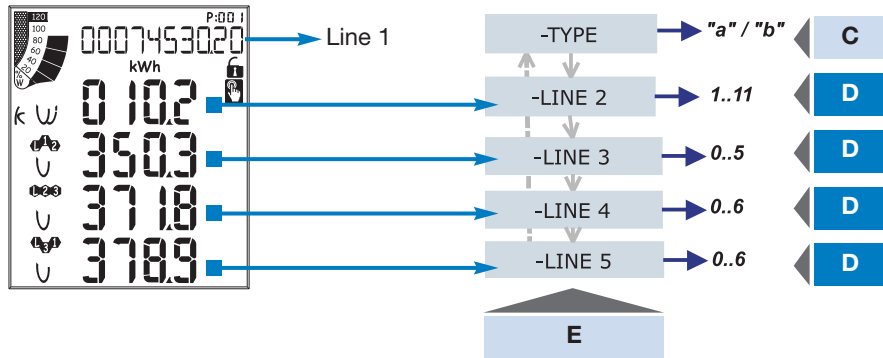
**10 CHANGE PAS:** this function allows the user to modify the PASS value with a new value (from 0 to 9999).  
**20 BACKLIGHT:** backlight time from 0 (always on) to 255 minutes.  
**30 MODULES:** the WM30 96 supports either automatic (A) or manual (M) acknowledgment of the installed modules depending on the kind of module.  
**40 APPLICAT:** this function which enables a simple, quick, clear and immediate visualization of the instrument measurements, making available only specific variables (page 4/5) depending on the application of the instrument.  
**50 SYSTEM:** this function allows the user to select the type of electrical system.  
**60 CT RATIO:** this function allows the user to select the value of the CT ratio (primary/secondary ratio of the current transformer being used). Example: if the CT primary (current transformer) has a current of 300A and the secondary a current of 5A, the CT ratio corresponds to 60 (obtained using the following calculation: 300/5).  
**70 PT RATIO:** this function allows you to select the value of the VT-PT ratio (primary/secondary ratio of the voltage transformer being used). Example:

if the primary of the connected VT (voltage transformer/potential transformer) is 20kV and the secondary is 100V, then the VT-PT ratio corresponds to 200 (obtained carrying out the following calculation: 20000/100).  
**80 DMD:** This function allows the user to select the calculation method of the DMD/AVG value of the selected variable. 81 TYPE: select the type of calculation mode to be used for the DMD/AVG calculation FIXED: if, for example, a time interval of 15 minutes has been selected, the instrument will calculate the AVG/DMD value of the measured variable and updates its value every 15 minutes, after that resets and starts a new calculation. SLIDE: if for example a time interval of 15 minutes has been selected, the instrument calculates the AVG/DMD value and updates its value at the beginning after the first 15 values and then after every minute, thus generating a window whose width is of 15 minutes and that moves forward every minute. 82 TIME: select the time interval for the DMD/AVG calculation 83 SYNC: select the synchronization mode, that is the method that controls the calculation method of the average/demand according to the selected time.

**90 SET POWER:** This menu allows you to set a power value (installed power) that, in the measuring phase, will represent 100% of the graph indicator.  
**100 HOME PAGE:** This function allows the user to select the variables to be displayed on first page (home page). 101 TYPE: A, you can select the variable for each row. B, you can select a preset combination of variables (see relevant chapter to next page).  
**110 FILTER:** with the digital filter it's possible to stabilize the measurements which are too instable when displaying the relevant values. 111 FILTER S: set the operating range (span) of the digital filter. The value is expressed as a % (filter to 0.0 means filter excluded). 112 FILTER CO: set the filtering coefficient of the instantaneous measures. By increasing the value, also the stability and the settling time of the measures are increased.

**Some specific menus display only if the relevant modules are installed.**





**How to customize the home page of WM30-96**

Menu "101 TYPE":

"a", you can select a "system" variable for each line.

"b", you can select a preset combination of variables which is split in line 2 (a system variable) and line 3 to 5 (single phase variables) .

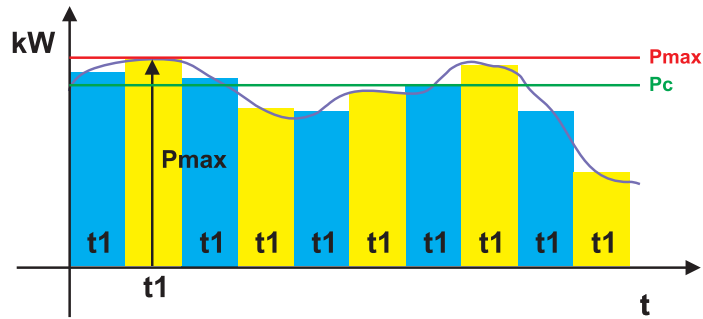
Moreover, the selectable variables depend on the selected electric system, if 1P (one phase) system is selected, the available variables are different.

**Note:** when the B type is selected all the A selections on line 3, 4 and 5 are irrelevant.

E	C	D											
	Type Selection	0	1	2	3	4	5	6	7	8	9	10	11
Line 2	Type "a"	An	WΣ	varΣ	VAΣ	PFΣ	Hz	An	An	An	An	An	An
	Type "a" with System 1P	V	A	W	var	VA	PF	Hz	V	V	V	V	V
	Type "b"	Select one of the preset combination of variables											
	Type "b" with System 1P	Select one of the preset combination of variables											
Line 3	Type "a"	An	WΣ	varΣ	VAΣ	PFΣ	Hz	An	An	An	An	An	An
	Type "a" with System 1P	V	A	W	var	VA	PF	-	-	-	-	-	-
Line 4	Type "a"	VL-LΣ	An	WΣ	varΣ	VAΣ	PFΣ	Hz	-	-	-	-	-
	Type "a" with System 1P	V	A	W	var	VA	PF	Hz	-	-	-	-	-
Line 5	Type "a"	VL-LΣ	An	WΣ	varΣ	VAΣ	PFΣ	Hz	-	-	-	-	-
	Type a with System 1P	V	A	W	var	VA	PF	Hz	-	-	-	-	-

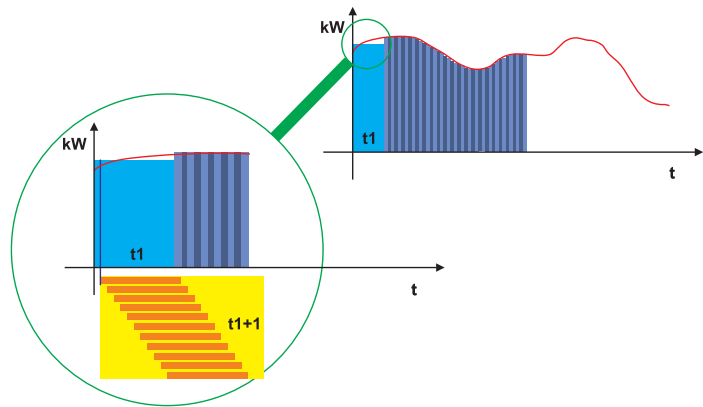
E	D											
	0	1	2	3	4	5	6	7	8	9	10	11
Line 2	-	V LN Σ	V LN Σ	An	Hz	VA Σ	var Σ	W Σ	PF Σ	-	-	-
Line 3	-	V L1	V L1-2	A L1	"ASY"	VA L1	var L1	W L1	PF L1	THD V1	THD V12	THD A1
Line 4	-	V L2	V L2-3	A L2	VLL sys (% asy)	VA L2	var L2	W L2	PF L2	THD V2	THD V23	THD A2
Line 5	-	V L3	V L3-1	A L3	VLL sys (% asy)	VA L3	var L3	W L3	PF L3	THD V3	THD V31	THD A3

E	D											
	0	1	2	3	4	5	6	7	8	9	10	11
Line 2			V				VA				THD_V	
Line 3			A				VAR				THD_A	
Line 4			Hz				W				-	
Line 5			-				PF				-	

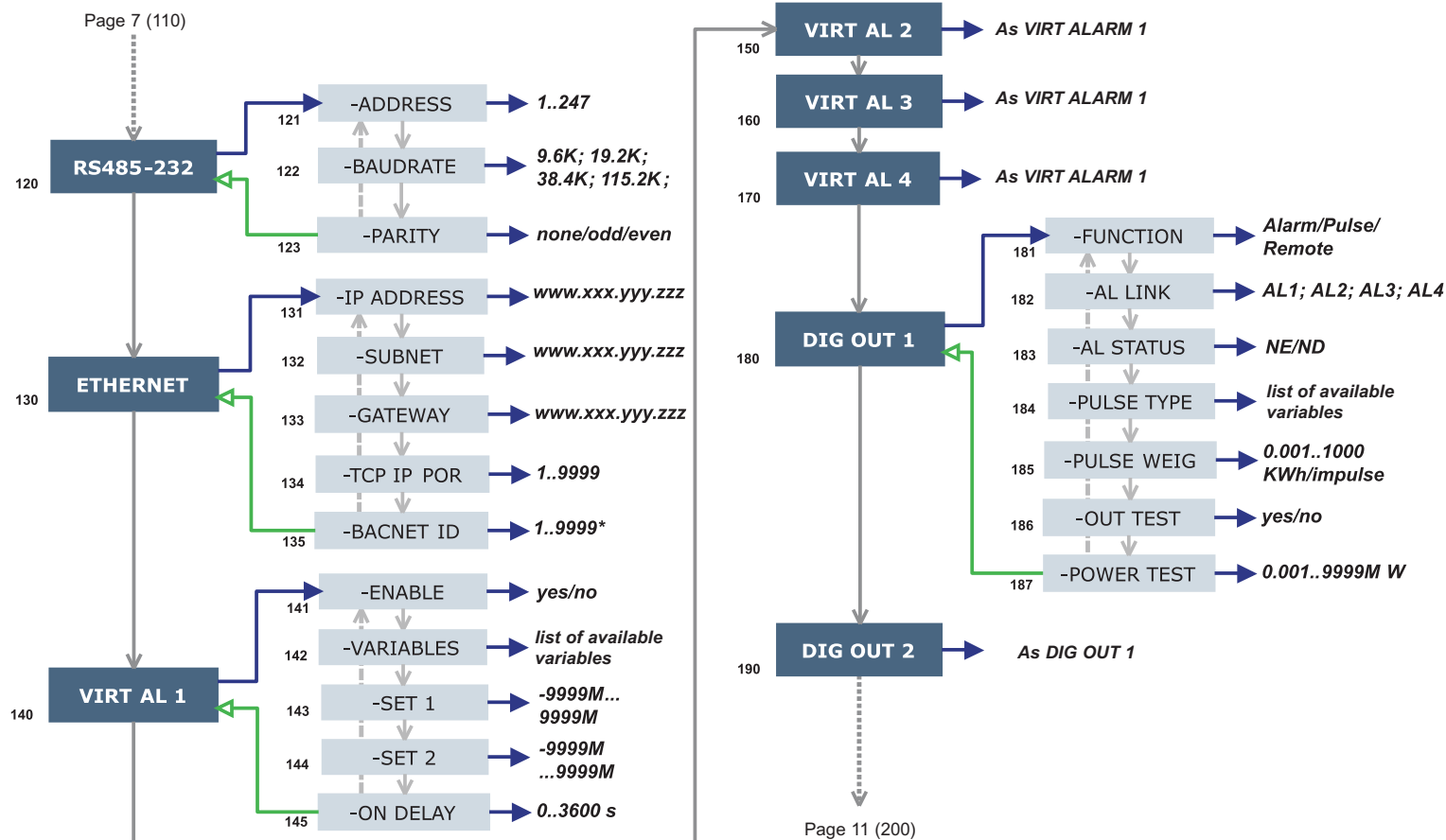


Where:  
**Pmax** is the maximum power,  
**Pc** is the contractual power,  
**t1** is the selected time period for the calculation of the AVG/DMD value.

**FIXED SELECTION:** if, for example, a time interval of 15 minutes has been selected, the instrument will calculate the AVG/DMD value of the measured variable and updates its value every 15 minutes.



**SLIDING SELECTION:** if for example a time interval of 15 minutes has been selected, the instrument calculates the AVG/DMD value and updates its value at the beginning after the first 15 values and then after every minute, thus generating a window whose width is of 15 minutes and that moves forward every minute.



**Key-pad**



**NOTE**

**120 RS232-458:** This function allows the user to set the RS232 and RS485 serial communication ports.

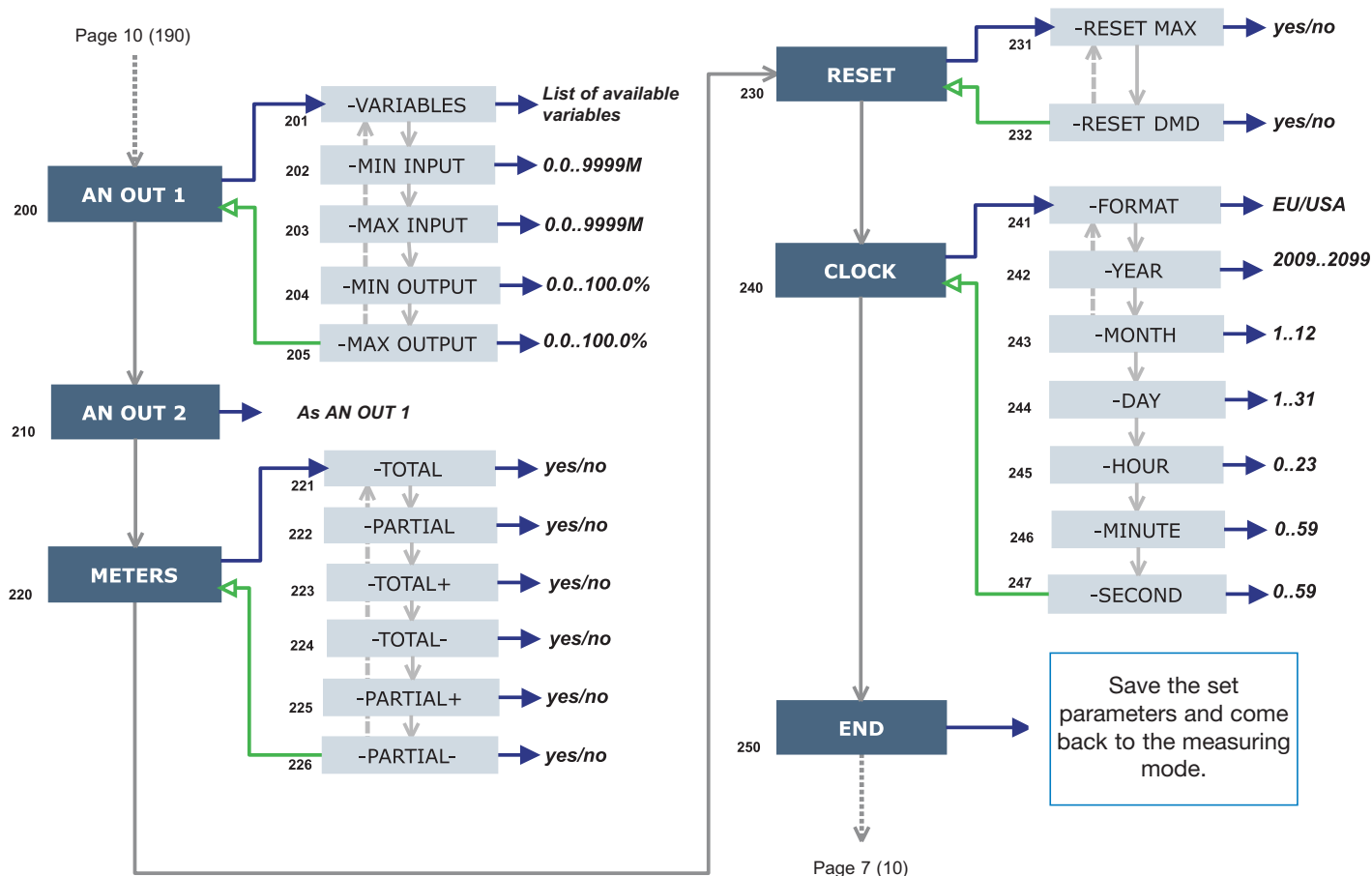
**130 ETHERNET:** This function allows the user to set the Ethernet communication port.

**140 VIRT AL 1:** This function allows you to set the alarm parameters. 141 ENABLE: enable (YES) or disable (NO) the alarm. 142 VARIABLES: set the variable to be linked to the alarm. 143 SET 1: set the on alarm set point of the variable. 144 SET 2: set the off alarm set point of the variable. 145 ON DELAY: set a delay on activation of the alarm.

**180 DIG OUT 1:** This function allows to link a virtual alarm to the digital output and to its working parameters. 181 FUNCTION: *Alarm*, the digital output is enabled only if the expected alarm status occurs. *Pulse*, the measured energy is retransmitted by the digital output by means of pul-

ses. *Remote*, the digital output can be enabled through a command sent by means of serial communication port. 182 AL LINK: select the virtual alarm to which it has to be linked. 183 AL STATUS: "ND" (normally de-energized relay) or "NE" (normally energized relay) 185 PULSE WEIG: selects the pulse weight (kWh per pulse). 186 OUT TEST: enables the TEST (YES), disables the TEST (NO). 187 POWER TEST: sets the simulated power value (kW) to which a proportional pulse sequence according to "PULSE WEIG" corresponds. The function is active until you remain within the menu and it is used when the output is connected to a PLC.

**Some specific menus display only if the relevant modules are installed.**



**Key-pad**



**NOTE**

**200 AN OUT 1:** this submenu allows the programming of the analogue outputs (0-20mA, 0-10V). **201 VARIABLES:** select the variable to be retransmitted by means of the analog output. **202 MIN INPUT:** minimum value of the variable input range to which the "MIN OUTPUT" value, retransmitted by the analogue output, will be linked. **203 MAX INPUT:** maximum value of the variable input range to which the "MAX OUTPUT" value, retransmitted by the analogue output, will be linked. **204 MIN OUTPUT:** set the value expressed as % of the output range (0-20mA, 0-10V) to be linked to the minimum measured value. **205 MAX OUTPUT:** select the value expressed as % of the output range (0-20mA, 0-10V) to be linked to the maximum measured value.

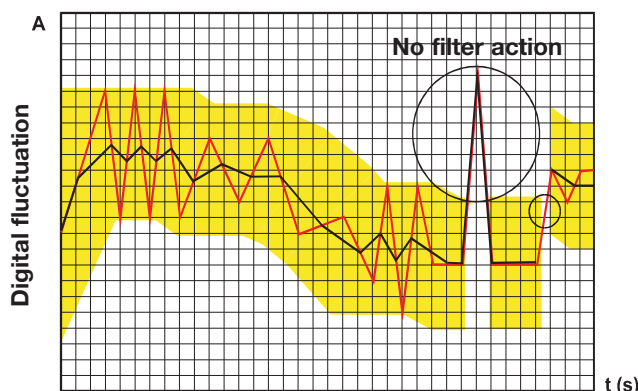
**220 METERS:** reset the ENERGY METERS choosing among: TOTAL, PARTIAL: resets all energy meters, both total and partial. TOTAL +: resets the total meters of imported energy. TOTAL -: resets the total meters of exported energy. PARTIAL +: resets the partial meters of imported energy.

PARTIAL -: resets the partial meters of exported energy.

**230 RESET:** carry out the reset of the MAX or dmd stored values.

**240 CLOCK,** 241 **FORMAT:** UE, set the European time format as 24h (00:00) or the USA set the American time format as 12h (12:00 AM/PM). 242 **YEAR:** set the current year. 243 **MONTH:** set the current month. 244 **DAY:** set the current day. 245 **HOUR:** set the current hour. 246 **minute:** set the current minute. 247 **SECOND:** set the current second.

**Some specific menus display only if the relevant modules are installed.**



### WHAT IS THE ACTION OF THE DIGITAL FILTER PARAMETERS ON THE MEASURE?

The first filter parameter is **FILTER S** and defines the operating range of the filter. This operating range is represented as a yellow band in figure on left side (each small square is one digit). Until the measured value (red curve in figure) is within this band, the filter is active; as soon as the value is external, the filter is deactivated and a new band will be active around the new value.

The range of the fluctuation (in digit) is a good starting value for such parameters.

The suggestion to set this parameter is to look at the size of the fluctuation (in digit) and use this value.

The second parameter is **FILTER CO** and represents the filtering coefficient. The higher is **FILTER CO**, the smoother is the curve of the displayed values (black in figure). There is not a theoretical rule to define this parameter, it is to be set on the field: however a rough suggestion is to start with the same value of the **FILTER S** coefficient and then increase it until the desired stability is reached.

The digital filter affects the values retransmitted both via serial communication and analogue output.

### DIGITAL FILTER PROGRAMMING EXAMPLES

#### Example 1

**How to stabilize the value of the VL-N variable displayed on the display, fluctuating from 222V and 228V.**

The parameters of the digital filter have to be programmed as follows:

**FILTER S:** the variable has fluctuations within the mean value whose amplitude is equal to  $\pm 0,75\%$  of the full scale rated value of the variable itself (obtained by the following calculation:  $(228-222)/2 = \pm 3V$ , then  $\pm 3 \cdot 100/400V = \pm 0,75\%$  where 400V is the phase-neutral rated value of an AV5 input). The "range" parameter, representing the action range of the digital filter, is to be programmed to a value which must be slightly higher than the percentage amplitude of the fluctuation: ex. 1.0%.

**FILTER CO:** if the new value measured by the instrument is within the action range of the filter, the new displayed value is obtained by adding algebraically the previous value to the variation divided by the filtering coefficient. As a consequence, a value higher than this coefficient implies a longer settling time and therefore a better stability. You generally obtain the best result by setting the filtering coefficient to a value equal to at least 10 times the range parameter value.

In the following example:  $1,0 \cdot 10 = 10$ , the stability of the filtering coefficient can be improved by increasing the filtering coefficient, the allowed values are included within 1 and 255.

#### Example 2

**How to stabilize the value of the displayed System Active Power ( $W\Sigma$ ), fluctuating between 300kW and 320kW (the load is connected to the instrument by means of a 300/5A CT and a direct measure of the voltage).**

The parameters of the digital filter must be programmed as follows:

**FILTER S:** the variable has fluctuations within the mean value whose amplitude is equal to  $\pm 2,78\%$  of the full scale rated value of this variable. This value is obtained by the following calculation:  $(320-300)/2 = \pm 10kW$ , then  $\pm 10 \cdot 100/360kW = \pm 2,78\%$ , where 360kW is the rated value of the System Active Power of an AV5 input, at the above mentioned CT and VT ratios and obtained by means of the following formula:  $(320-300)/2 = \pm 10kW$ , then  $\pm 10 \cdot 100/360kW = \pm 2,78\%$ , where 360kW is the rated value of the System Active Power of an AV5 input at the above mentioned CT and VT ratios and obtained by means of the following formula: " $VLN \cdot VT \cdot IN \cdot CT \cdot 3$ " where  $VLN$  = rated input voltage (400V for the AV5 input),  $VT$  = primary/secondary ratio of the voltage transformer being used,  $IN$  = rated current (5A for the AV5 type input),  $CT$  = primary/secondary ratio of the voltage transformer being used (in this example " $400 \cdot 1 \cdot 5 \cdot 60 \cdot 3 = 360kW$ ").

The RANGE parameter, representing the digital filtering coefficient action range, is to be programmed to a value which must be slightly higher than the percentage of the fluctuation: eg. 3.0%.

**FILTER CO:** if the new value acquired by the instrument is within the filtering action range, the new displayed value is obtained by adding algebraically the previous value to the variation divided by the filtering coefficient. As a consequence, a value higher than this coefficient implies an higher settling time and therefore a better stability. Generally speaking the best result is obtained setting the filtering coefficient to a value equal to at least 10 times the value of the range parameters. In the example:  $3,0 \cdot 10 = 30$ . In order to improve the stability you can increase the filtering coefficient, the admitted values are included within 1 and 255.

#### Example 3.

**It's necessary to stabilize the value of the displayed variable AL 1 (phase current 1), fluctuating within 470V and 486V.**

To be able to manage the alarm function and activation and deactivation of the relay, this value is not to be subject to continuous fluctuations. In this example we have considered using a 500/5A CT. The parameters of the digital filter is to be programmed as follows:

**FILTER S:** the variable has fluctuations within the mean value whose amplitude is equal to  $\pm 1,60\%$  of the full scale rated value of this variable (obtained by means of the calculation:  $(486-470)/2 = \pm 8A$ , then  $\pm 8 \cdot 100/500A = \pm 1,60\%$  where 500A is the value referred to the primary of the transformer being used). The "range" parameter, which represents the action range of the digital filter, is to be programmed to a value slightly higher than the pourcentage amplitude of the fluctuation: for example 2.0%.

**FILTER CO:** if the new value acquired by the instrument is within the filtering action range, the new displayed value is calculated algebraically adding to the previous value the variation divided by the filtering coefficient. As a consequence, a higher value of this coefficient implies a higher settling time and therefore a better stability. Generally speaking, the best result is obtained setting the filtering coefficient at a value equal to at least 10 times the value of the range parameter. In the example:  $2,0 \cdot 10 = 20$ . To improve the stability you can increase the filtering coefficient, the admitted values are within 1 and 255.

**PROGRAMMING EXAMPLES OF THE ANALOGUE OUTPUTS****Power retransmission by means of a 0-20mA analogue output.**

It's necessary to measure a consumed power up to 100kW and retransmit this value by means of a signal from 4 to 20 mA: the module to be used is MOV2 (2x from 0 to 20mA), the instrument is to be programmed as follows:

**VARIABLE:**  $W\Sigma$  (system active power).

**MIN OUT:** 20.0% means 4 mA. The calculation to be carried out is the following:  $(100 \cdot \text{minimum output}) / \text{fullscale output} = 100 \cdot 4\text{mA} / 20\text{mA} = 20\%$ .

**MAX OUT:** 100.0% means 20mA. The calculation to be carried out is:  $(100 \cdot \text{maximum output}) / \text{fullscale output} = 100 \cdot 20\text{mA} / 20\text{mA} = 100$ .

**MIN INPUT:** 0,0k; the multiple k, M, G can be selected on the instrument according to the chosen VT and CT values.

**MAX INPUT:** 100.0k; the k, M, G multiples can be selected on the instrument according to the selected VT and CT values.

**Retransmission of the POWER FACTOR (PF) by means of the 0-20mA analog output.**

It's necessary to retransmit the whole range of the allowed values for the PF with a signal from 0 to 20mA. Particular attention must be paid to the value of the PF variable which may vary from C0,001 and L0,000 (for each phase): these values will be retransmitted and will then correspond to 0 and 20 mA. When the PF will have a value equal to 1, being in the middle between C0,001 and L0,000, the value of the output will correspond to the middle of the scale, that is 10mA. As a consequence, the instrument will have to be programmed as follows:

**VARIABLE:** PF L1 (or L2 or L3 or  $PF\Sigma$ ).

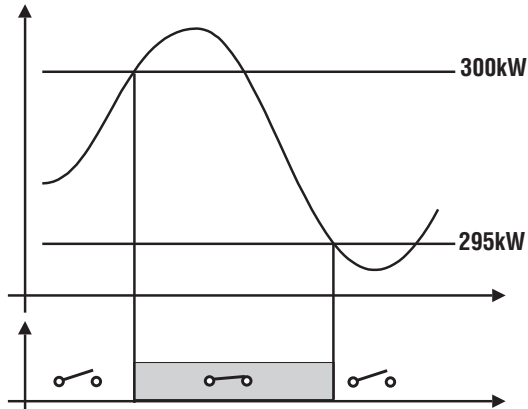
**MIN OUT:** 0,0%.

**MAX OUT:** 100,0%.

**MIN INPUT:** C0,001 (the C symbol shows a CAPACITIVE value).

**MAX INPUT:** L0,001 (the L symbol shows an INDUCTIVE value). L0,001 has been chosen as minimum value to be set in order to avoid any undesirable swifiting of the repeated outputs.

**EXAMPLE OF ALARM PARAMETERS PROGRAMMING**



It is required the disconnection of a load when a set value of absorbed power occurs. For example when 300kW are exceeded, the alarm occurs and the set load is disconnected.

An "UP" alarm is selected, below you'll find the recommended programming:

**ENABLE:** YES

**VARIABLES:** W system ( $W\Sigma$ )

**SET POINT 1:** 300kW

**SET POINT 2:** 295kW

**ON DELAY:** set the desired number of seconds: "5 seconds".



**CARLO GAVAZZI**

W

M

3

0

9

6

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**Control**



## Instruction Manual Base Instrument

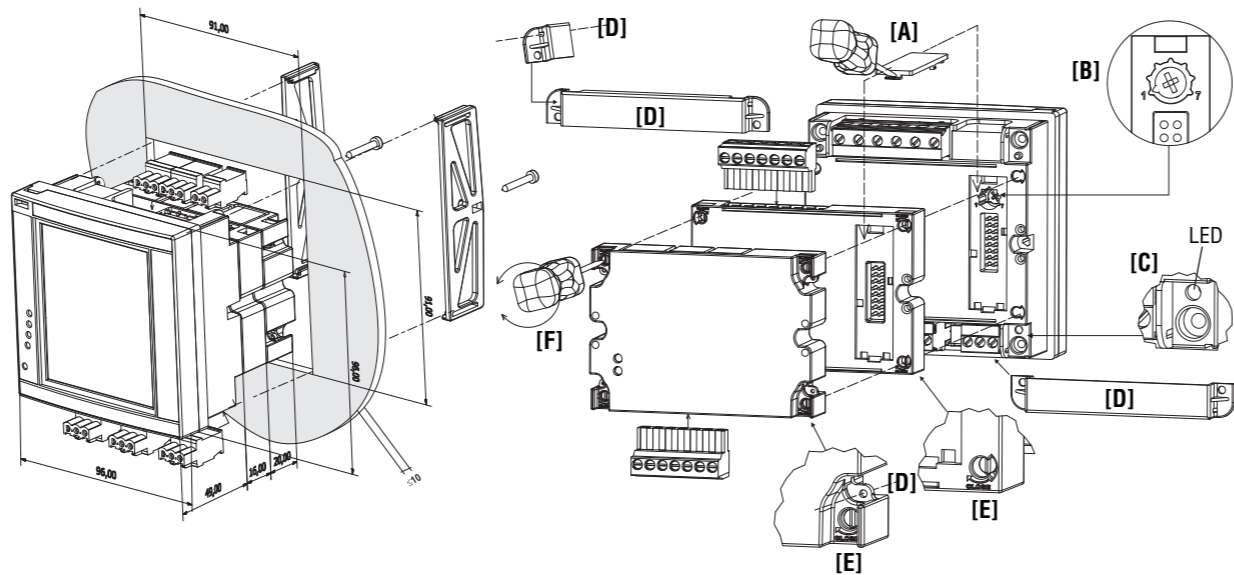
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**Grazie**  
per aver scelto i nostri prodotti.

**Wir danken**  
Ihnen dafür, dass Sie unsere  
Produkte gewählt haben.

**Gracias**  
por elegir nuestros productos.

**Merci**  
d'avoir choisi nos produits.



### ENGLISH

**Read carefully the instruction manual.** If the instrument is used in a manner not specified by the producer, the protection provided by the instrument may be impaired. **Maintenance:** make sure that the connections are correctly carried out in order to avoid any malfunctioning or damage to the instrument. To keep the instrument clean, use a slightly damp cloth; do not use any abrasives or solvents. We recommend to disconnect the instrument before cleaning it.

**WARNING:** to make sure that the screw tightening torque is 0.5Nm. ALL THE MOUNTING AND DISASSEMBLY OPERATIONS OF THE INSTRUMENT AND MODULES HAVE TO OCCUR WHEN POWER SUPPLY AND THE LOADS ARE NOT CONNECTED.

**Preliminary operations:** if necessary remove the protection cover of the contacts **[A]**, using a properly screwdriver.

**Lock the programming and LED of power supply on:** to lock the acces to the programming of the instrument turning (clockwise) the rotary switch **[B]** to position 7. To unlock the programming come-back the rotary switch to the position 1. The green LED **[C]** on warns that the instrument is power supplied.

**The instrument and modules sealing:** to lock the modules turning (clockwise) the properly fixing elements on the corners **[E]**, using a properly screwdriver **[F]**. To seal the instrument use the dedicated covers and holes **[D]**.

### WIRING DIAGRAMS

- [1] 3-ph, 2-wire, balanced load, 1-CT connection.
- [2] 3-ph, 2-wire, balanced load, 1-CT and 1-VT/PT connections
- [3] 3-ph, 4-wire, unbalanced load, 3-CT connection
- [4] 3-ph, 4-wire, unbalanced load, 3-CT and 3-VT/PT connections
- [5] 3-ph, 3-wire, unbalanced load, 3-CT connection
- [6] 3-ph, 3-wire unbalanced load, 3-CT and 2-VT/PT connections
- [7] 3-ph, 3-wire, unbalanced load, 2-CT connections (ARON)
- [8] 3-ph, 3-wire, unbalanced load, 2-CT and 2-VT/PT connections ARON
- [9] 3-ph, 3-wire, balanced load, 1-CT connections
- [10] 3-ph, 3-wire, balanced load, 1-CT and 3-VT/PT connections
- [11] 3-ph, 3-wire, balanced load, 1-CT and 2-VT/PT connections
- [12] 2-ph, 3-wire, 2-CT connection
- [13] 2-ph, 3-wire, 2-CT and 2-VT/PT connections
- [14] 1-ph, 2-wire, 1-CT connection
- [15] 1-ph, 2-wire, 1-CT and 1-VT connections
- [16] Power supply 90 to 260VAC/DC. F=250V [T] 630mA.  
Power supply 18 to 60VAC/DC. F=250V [T] 3.15A.

### ITALIANO

**Leggere attentamente il manuale di istruzioni.** Qualora l'apparecchio venisse adoperato in un modo non specificato dal costruttore, la protezione prevista dall'apparecchio potrebbe essere compromessa. **Manutenzione:** Per mantenere pulito lo strumento usare un panno inumidito; non usare abrasivi o solventi. Si consiglia di scollegare lo strumento prima di eseguire la pulizia.

**ATTENZIONE:** assicurarsi che la coppia di serraggio applicata alle viti dei morsetti sia di: 0,5Nm. TUTTE LE OPERAZIONI DI MONTAGGIO E SMONTAGGIO DELLO STRUMENTO E DEI MODULI VANNO ESEGUITE CON ALIMENTAZIONE E CARICO SCOLLEGATI.

**Operazione preliminare:** smontare, se necessario, la finestra di protezione dei contatti **[A]**, utilizzando un apposito cacciavite a taglio.

**Blocco della programmazione e LED di presenza alimentazione:** per bloccare la programmazione dello strumento agire (ruotandolo in senso orario) sul commutatore rotante **[B]** portandolo nella posizione 7, per sbloccare la programmazione portarlo nella posizione 1. Il LED verde acceso **[C]** avvisa che lo strumento è alimentato.

**Sigillatura dei moduli e dello strumento:** per bloccare i moduli agire (ruotandoli in senso orario) sugli appositi elementi di fissaggio posti agli angoli dei moduli stessi **[E]**, utilizzando un adeguato cacciavite a taglio **[F]**. Il sigillo va apposto utilizzando i fori e i copri morsetti dedicati **[D]**.

### COLLEGAMENTI ELETTRICI

- [1] 3 fasi, 2 fili, carico equilibrato, connessione con 1 TA
- [2] 3 fasi, 2 fili, carico equilibrato, connessione con 1TA e 1 TV
- [3] 3 fasi, 4 fili, carico equilibrato, connessione con 3 TA
- [4] 3 fasi, 4 fili, carico squilibrato, connessione con 3 TA e 3 TV
- [5] 3 fasi, 3 fili, carico squilibrato, connessione con 3 TA
- [6] 3 fasi, 3 fili, carico squilibrato, connessione con 3 TA e 2 TV
- [7] 3 fasi, 3 fili, carico squilibrato, connessione con 2 TV (ARON)
- [8] 3 fasi, 3 fili, carico squilibrato, connessione con 2 TA e 2 TV (ARON)
- [9] 3 fasi, 3 fili, carico equilibrato, connessione con 1 TA
- [10] 3 fasi, 3 fili, carico equilibrato, connessione con 1 TA e 3 TV
- [11] 3 fasi, 3 fili, carico equilibrato, connessione con 1 TA e 2 TV
- [12] 2 fasi, 3 fili, connessioni con 2 TA
- [13] 2 fasi, 3 fili, connessioni con 2 TA e 2 VT
- [14] 1 fase, 2 fili, connessione con 1TA
- [15] 1 fase, 2 fili, connessione con 1 TA e 1 TV
- [16] Alimentazione da 90 a 260VCA/CC. F=250V [T] 630mA.  
Alimentazione da 18 a 60VCA/CC. F=250V [T] 3.15A.

### DEUTSCH

**Die Betriebsanleitung aufmerksam lesen.** Sollte das Gerät nicht gemäss der Herstellerangaben verwendet werden, könnte der vom Gerät vorgesehene Schutz beeinträchtigt werden. **Wartung:** Das Gerät mit einem feuchten Tuch reinigen; keine Scheuer- oder Lösemittel verwenden. Das Gerät vor der Reinigung ausschalten

**ACHTUNG:** Darauf achten, dass das Anzugsmoment der Klemmschrauben 0,5Nm beträgt. SOWOHL BEI DER MONTAGE, ALS AUCH BEIM AUSBAU DES GERÄTES UND DER MODULE MÜSSEN STROMVERSORGUNG UND STROMLAST STETS VORHER ABGETRENNT WERDEN.

**Vorbereitung:** Gegebenenfalls das Schutzfenster der Kontakte **[A]** mit einem Schlitzschraubenzieher entfernen.

**Programmierungssperre und LED Stromversorgung vorhanden:** Um die Programmierung des Gerätes zu sperren, den Drehschalter **[B]** im Uhrzeigersinn auf Position 7 drehen, für die erneute Freigabe auf Position 1. Das Leuchten der grünen LED **[C]** zeigt an, dass das Gerät mit Strom versorgt wird.

**Versiegelung der Module und des Geräts:** Die Befestigung der Module erfolgt (durch Drehen derselben im Uhrzeigersinn) über die an den Ecken vorgesehenen Befestigungselemente **[E]**, mit Hilfe eines passenden Schlitzschraubenziehers **[F]**. Das Siegel wird über die hierfür vorgesehenen Löcher und Klemmendeckel **[D]** angebracht.

### ELEKTRISCHE ANSCHLÜSSE

- [1] 3 Phasen, 2 Adern, symmetrische Last, Anschluss mit 1 TA
- [2] 3 Phasen, 2 Adern, symmetrische Last, Anschluss mit 1 TA und 1 TV
- [3] 3 Phasen, 4 Adern, symmetrische Last, Anschluss mit 3 TA
- [4] 3 Phasen, 4 Adern, unsymmetrische Last, Anschluss mit 3 TA und 3 TV
- [5] 3 Phasen, 3 Adern, unsymmetrische Last, Anschluss mit 3 TA
- [6] 3 Phasen, 3 Adern, unsymmetrische Last, Anschluss mit 3 TA und 2 TV
- [7] 3 Phasen, 3 Adern, unsymmetrische Last, Anschluss mit 2 TV (ARON)
- [8] 3 Phasen, 3 Adern, unsymmetrische Last, Anschluss mit 2 TA und 2 TV (ARON)
- [9] 3 Phasen, 3 Adern, symmetrische Last, Anschluss mit 1 TA
- [10] 3 Phasen, 3 Adern, symmetrische Last, Anschluss mit 1 TA und 3 TV
- [11] 3 Phasen, 3 Adern, symmetrische Last, Anschluss mit 1 TA und 2 TV
- [12] 2 Phasen, 3 Adern, Anschlüsse mit 2 TA
- [13] 2 Phasen, 3 Adern, Anschlüsse mit 2 TA und 2 VT
- [14] 1 Phase, 2 Adern, Anschluss mit 1 TA
- [15] 1 Phase, 2 Adern, Anschluss mit 1 TA und 1 TV
- [16] Stromversorgung von 90 bis 260 VAC/DC. F=250V [T] 630mA.  
Stromversorgung von 18 bis 60 VAC/DC. F=250V [T] 3.15A.

### FRANÇAIS

**Lire attentivement le manuel de l'utilisateur.** Si l'appareil est utilisé dans des conditions différentes de celles spécifiées par le fabricant, le niveau de protection prévu par l'instrument peut être compromis. **Entretien:** Pour nettoyer l'instrument, utiliser un chiffon humide; ne pas utiliser d'abrasifs ou de solvants. Il faut déconnecter le dispositif avant de procéder au nettoyage.

**ATTENTION:** s'assurer que le couple de serrage appliqué aux vis des bornes soit de : 0,5Nm. POUR TOUTES LES OPÉRATIONS DE MONTAGE ET DÉMONTAGE DE L'INSTRUMENT ET DES MODULES IL FAUT QUE L'ALIMENTATION ET LA CHARGE SOIENT DÉBRANCHÉES.

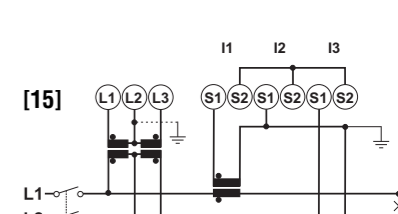
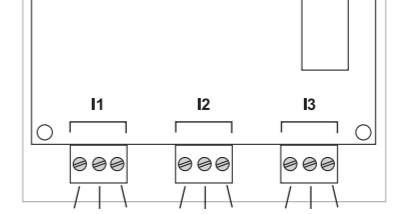
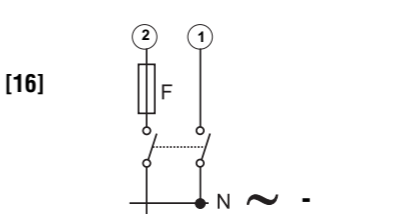
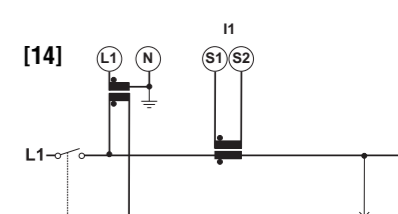
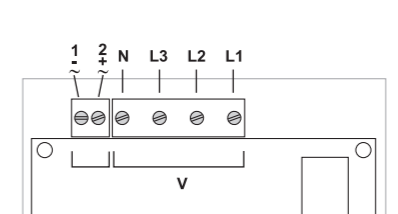
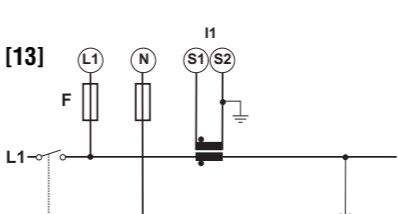
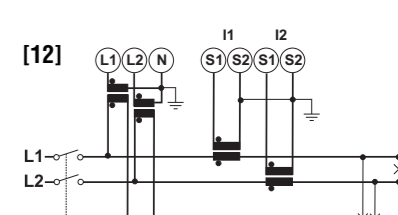
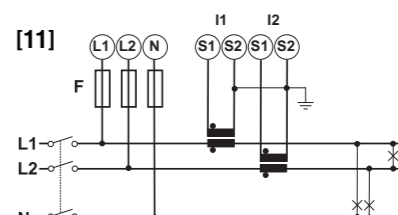
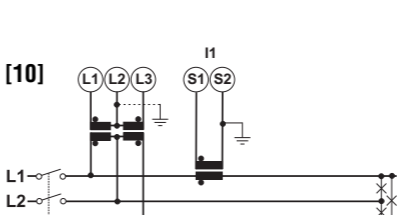
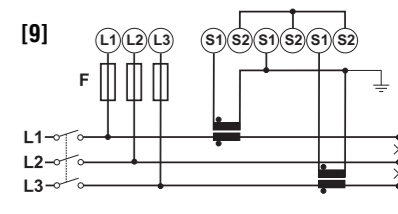
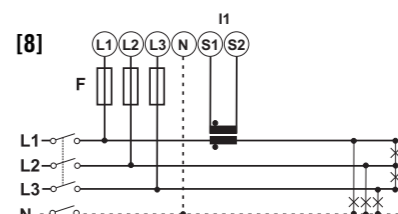
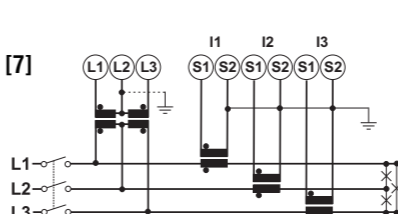
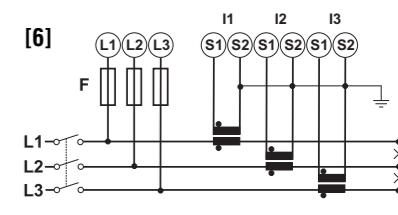
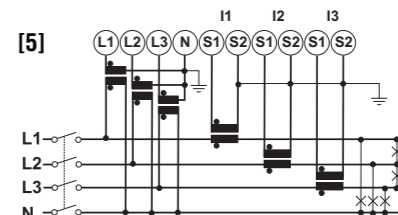
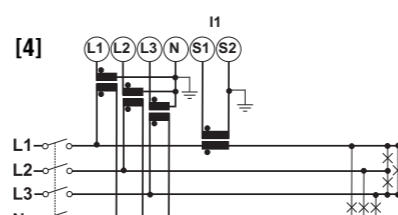
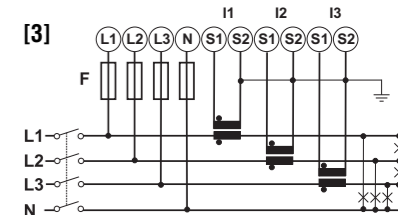
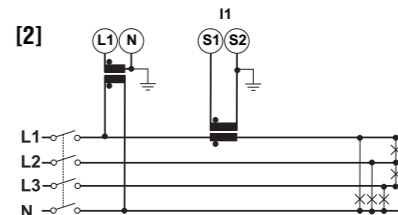
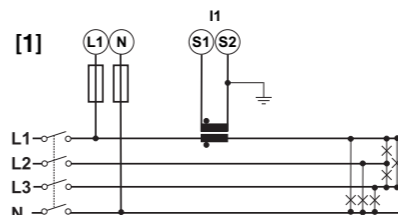
**Opération préliminaire:** démonter, si nécessaire, la fenêtre de protection des contacts **[A]**, en utilisant un tournevis plat approprié.

**Blocage de la programmation et LED pour la présence d'alimentation:** pour bloquer la programmation de l'instrument, agir (en le tournant dans le sens des aiguilles d'une montre) sur le commutateur rotatif **[B]** en le mettant sur la position 7, pour débloquer la programmation, le mettre sur la position 1. Le LED vert allumé **[C]** signale que l'instrument est alimenté.

**Sceller les modules et l'instrument:** pour bloquer les modules, agir (en les tournant dans le sens des aiguilles d'une montre) sur les éléments de fixation prévus à cet effet, situés aux angles des modules mêmes **[E]**, en utilisant un tournevis plat adéquat **[F]**. Le sceau doit être posé en utilisant les trous et les couvre-bornes prévus pour à cet effet **[D]**.

### BRANCHEMENTS ÉLECTRIQUES

- [1] 3 phases, 2 fils, charge équilibrée, connexion avec 1 TA
- [2] 3 phases, 2 fils, charge équilibrée, connexion avec 1TA et 1 TV
- [3] 3 phases, 4 fils, charge équilibrée, connexion avec 3 TA
- [4] 3 phases, 4 fils, charge déséquilibrée, connexion avec 3 TA et 3 TV
- [5] 3 phases, 3 fils, charge déséquilibrée, connexion avec 3 TA
- [6] 3 phases, 3 fils, charge déséquilibrée, connexion avec 3 TA et 2 TV
- [7] 3 phases, 3 fils, charge déséquilibrée, connexion avec 2 TV (ARON)
- [8] 3 phases, 3 fils, charge déséquilibrée, connexion avec 2 TA et 2 TV (ARON)
- [9] 3 phases, 3 fils, charge équilibrée, connexion avec 1 TA



- [10] 3 phases, 3 fils, charge équilibrée, connexion avec 1 TA et 3 TV
- [11] 3 phases, 3 fils, charge équilibrée, connexion avec 1 TA et 2 TV
- [12] 2 phases, 3 fils, connexions avec 2 TA
- [13] 2 phases, 3 fils, connexions avec 2 TA et 2 VT
- [14] 1 phase, 2 fils, connexion avec 1TA
- [15] 1 phase, 2 fils, connexion avec 1 TA et 1 TV
- [16] Alimentation de 90 à 260VCA/CC. F=250V [T] 630mA.  
Alimentation de 18 à 60VCA/CC. F=250V [T] 3.15A.

### ESPAÑOL

**Lea atentamente el manual de instrucciones.** Si el instrumento se usa de modo distinto al indicado por el fabricante, la protección de seguridad ofrecida por el instrumento podrá resultar dañada. **Mantenimiento:** para limpiar el equipo utilizar siempre un trapo ligeramente humedecido, nunca productos abrasivos o disolventes. Se recomienda desconectar siempre el instrumento antes de limpiarlo.

**CAUIDADO:** asegúrese de que el par de apretamiento aplicado a los tornillos de los borne sea de: 0,5Nm. TODAS LAS OPERACIONES DE MONTAJE Y DESMONTAJE DEL INSTRUMENTO Y DE LOS MÓDULOS DEBE REALIZARSE CON LA ALIMENTACIÓN Y LA CARGA DESCONECTADAS.

**Operación preliminar:** desmonte, si lo necesita, la ventana de protección de los contactos **[A]**, utilizando su propio destornillador de punta plana. **Bloqueo de la programación y LED de presencia alimentación:** para bloquear la programación del instrumento actúe (girándolo en la direc-

ción de las agujas del reloj) en el conmutador giratorio **[B]** llevándolo a la posición 7, para desbloquear la programación llévelo a la posición 1. El LED verde encendido **[C]** avisa de que el instrumento está alimentado. **Sellado de los módulos y del instrumento:** para bloquear los módulos actúe (girándolos en la dirección de las agujas del reloj) en los específicos elementos de fijación ubicados en los ángulos de los mismos módulos **[E]**, utilizando un adecuado destornillador de punta plana **[F]**. El sello va aplicado utilizando los orificios y los cubre-bornes dedicados **[D]**.

### CONEXIONES ELÉCTRICAS

- [1] 3 fases, 2 hilos, carga equilibrada, conexión con 1 TA
- [2] 3 fases, 2 hilos, carga equilibrada, conexión con 1TA y 1 TV
- [3] 3 fases, 4 hilos, carga equilibrada, conexión con 3 TA
- [4] 3 fases, 4 hilos, carga desequilibrada, conexión con 3 TA y 3 TV
- [5] 3 fases, 3 hilos, carga desequilibrada, conexión con 3 TA
- [6] 3 fases, 3 hilos, carga desequilibrada, conexión con 3 TA y 2 TV
- [7] 3 fases, 3 hilos, carga desequilibrada, conexión con 2 TV (ARON)
- [8] 3 fases, 3 hilos, carga desequilibrada, conexión con 2 TA y 2 TV (ARON)
- [9] 3 fases, 3 hilos, carga equilibrada, conexión con 1 TA
- [10] 3 fases, 3 hilos, carga equilibrada, conexión con 1 TA y 3 TV
- [11] 3 fases, 3 hilos, carga equilibrada, conexión con 1 TA y 2 TV
- [12] 2 fases, 3 hilos, connexiones con 2 TA
- [13] 2 fases, 3 hilos, connexiones con 2 TA y 2 VT
- [14] 1 fase, 2 hilos, conexión con 1TA
- [15] 1 fase, 2 hilos, conexión con 1 TA y 1 TV
- [16] Alimentación de 90 a 260VCA/CC. F=250V [T] 630mA.  
Alimentación de 18 a 60VCA/CC. F=250V [T] 3.15A.





**Instruction Manual  
Modules WM30**

**Thank you**  
for choosing our products.

**Grazie**  
per aver scelto i nostri prodotti.

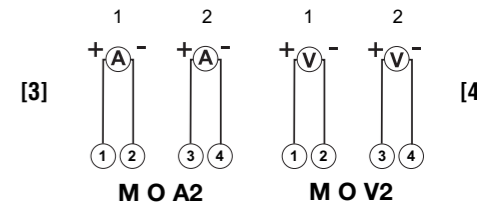
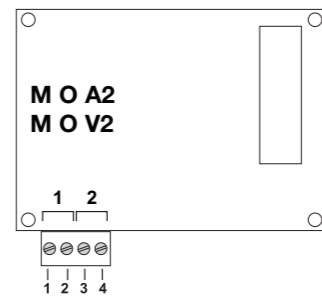
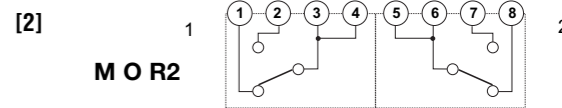
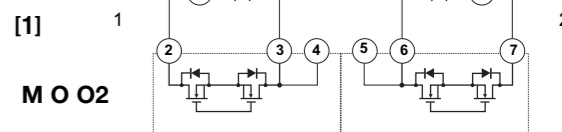
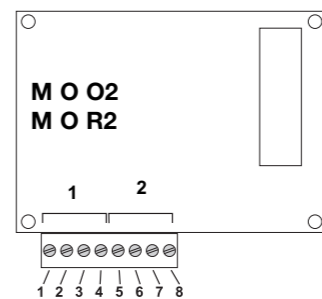
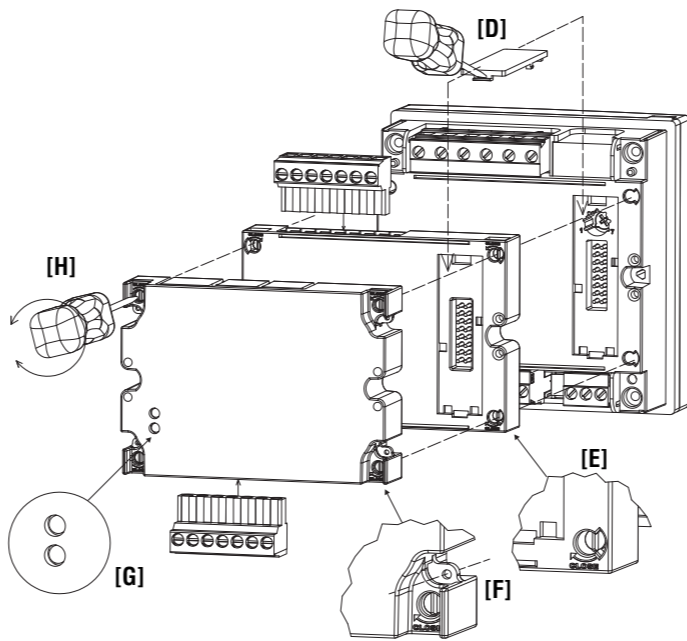
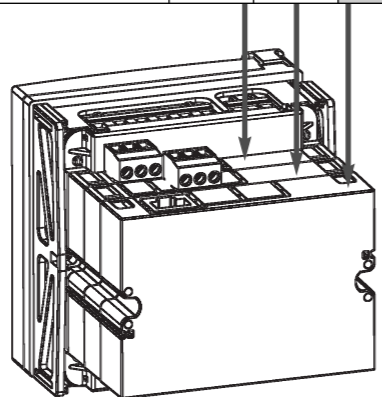
**Wir danken**  
Ihnen dafür, dass Sie unsere  
Produkte gewählt haben.

**Gracias**  
por elegir nuestros productos.

**Merci**  
d'avoir choisi nos produits.



Tab.1	A	B	C
M O R2	X		
M O O2	X		
M O A2		X	
M O V2		X	
M C 485 232			X
M C ETH			X
M C BACnet-IP			X



**ENGLISH**



**Read carefully the instruction manual.** If the instrument is used in a manner not specified by the producer, the protection provided by the instrument may be impaired. **Maintenance:** make sure that the connections are correctly carried out in order to avoid any malfunctioning or damage to the instrument. To keep the instrument clean, use a slightly damp cloth; do not use any abrasives or solvents. We recommend to disconnect the instrument before cleaning it.

**WARNING:** it allows to mount only one module per type, for a maximum of 3 modules in total. To avoid any damage respect the position of the modules as shown on table 1. To make sure that the screw tightening torque is 0.5Nm. ALL THE MOUNTING AND DISASSEMBLY OPERATIONS OF THE INSTRUMENT AND MODULES HAVE TO OCCUR WHEN POWER SUPPLY AND THE LOADS ARE NOT CONNECTED.

**WIRING DIAGRAMS**

- [1] 2 static opto-mosfet outputs.
- [2] 2 relays outputs.
- [3] 2 analogue outputs 20mA DC.
- [4] 2 analogue outputs 10V DC.
- [5] RS485 serial port. **IMPORTANT:** additional devices provided with RS485 are connected in parallel. The termination of the serial output is carried out only on the last instrument of the network, by means of a jumper between B+ and T.
- [6] RS232 serial port. **IMPORTANT:** the termination must be done by means of a jumper between B+ and T.

**A:** the communication RS232 and RS485 ports **can't be** connected and used simultaneously.

To connect the ethernet or BACnet-IP modules using the RJ45 connector. **[G]** The communication modules are provided with LED indicating the communication status RX or TX.

**Preliminary operations:** remove the protection cover of the contacts **[D]**, using a properly screwdriver.

**Lock and sealing the modules:** to lock the modules turning (clockwise) the properly fixing elements on the corners **[E]**, **[F]**, using a properly screwdriver **[H]**. To seal the instrument use the dedicated holes **[F]**.

- [3] Doppia uscita analogica a 20mA CC.
- [4] Doppia uscita analogica a 10V CC.
- [5] Uscita porte seriali RS485. **IMPORTANTE:** ulteriori strumenti provvisti di RS485 sono collegati in parallelo. La terminazione dell'uscita seriale dev'essere eseguita solo sull'ultimo strumento della rete mediante un ponticello tra i morsetti B+ e T.
- [6] Uscita porte seriali RS232. **IMPORTANTE:** eseguire la terminazione mediante un ponticello tra i morsetti B+ e T.

**A:** le porte di comunicazione RS232 e RS485 **non possono** essere usate e connesse insieme.

Per COLLEGARE i moduli con uscita ethernet o BACnet-IP utilizzare l'apposito conettore RJ45.

**[G]** Il modulo di comunicazione è provvisto di appositi LED segnalanti lo stato di comunicazione RX o TX.

**Operazione preliminare:** smontare la finestra di protezione dei contatti **[D]**, utilizzando un apposito cacciavite a taglio.

**Bloccaggio e sigillatura dei moduli:** per bloccare i moduli agire sugli appositi elementi di fissaggio posti agli angoli dei moduli stessi **[F]**, **[E]**, utilizzando un adeguato cacciavite a taglio **[H]**. Il sigillo va apposto utilizzando i fori dedicati **[F]**.

**DEUTSCH**



**Die Betriebsanleitung aufmerksam lesen.** Sollte das Gerät nicht gemäss der Herstellerangaben verwendet werden, könnte der vom Gerät vorgesehene Schutz beeinträchtigt werden.

**Wartung:** Das Gerät mit einem feuchten Tuch reinigen; keine Scheuer- oder Lösemittel verwenden. Das Gerät vor der Reinigung ausschalten.

**ACHTUNG:** Pro Typ kann nur ein einziges Modul montiert werden, d.h. insgesamt maximal drei Module. Um Störungen zu vermeiden, sollte die Position der Module gemäß Tabelle 1 eingehalten werden. Außerdem ist darauf zu achten, dass das Anzugsmoment der Klemmschrauben 0,5Nm beträgt. SOWOHL BEI DER MONTAGE, ALS AUCH BEIM AUSBAU DES GERÄTES UND DER MODULE MÜSSEN STROMVERSORGUNG UND STROMLAST STETS VORHER ABGETRENNT WERDEN.

**ELEKTRISCHE ANSCHLÜSSE**

- [1] Doppelter statischer Ausgang Opto-mosfet.
- [2] Doppelter statischer Ausgang Relais.
- [3] Doppelter analoger Ausgang 20mA DC.
- [4] Doppelter analoger Ausgang 10V DC.
- [5] Ausgang serielle RS485-Anschlüsse. **WICHTIG:** Weitere mit RS485 ausgestattete Geräte sind parallel angeschlossen. Der Endverschluss des seriellen Ausgangs darf nur am letzten Gerät des Netzes mit einer Überbrückung zwischen den Klemmen B+ und T durchgeführt werden.
- [6] Ausgang serielle RS232-Anschlüsse. **WICHTIG:** Der Endverschluss muss mit einer Überbrückung zwischen den Klemmen B+ und T durchgeführt werden.

**A:** Die Kommunikationsanschlüsse RS232 und RS485 können nicht gemeinsam verwendet und angeschlossen werden. Für den ANSCHLUSS der Module an den Ethernet- oder BACnet-IP-Ausgang den dafür vorgesehenen RJ45-Stecker verwenden. **[G]** Das Kommunikationsmodul ist mit entsprechenden LED ausgestattet, die den Kommunikationsstatus RX oder TX anzeigen.

**Vorbereitung:** Das Schutzfenster der Kontakte **[D]** mit einem Schlitzschraubenzieher entfernen.

**Befestigung und Versiegelung der Module:** Die Befestigung der Module erfolgt über die an den Ecken derselben vorgesehenen Befestigungselemente **[F]**, **[E]**, mit Hilfe eines passenden Schlitzschraubenziehers **[H]**. Das Siegel wird über die hierfür vorgesehenen Löcher **[F]** angebracht.

**FRANÇAIS**



**Lire attentivement le manuel de l'utilisateur.** Si l'appareil est utilisé dans des conditions différentes de celles spécifiées par le fabricant, le niveau de protection prévu par l'instrument peut être compromis. **Entretien:** Pour nettoyer l'instrument, utiliser un chiffon humide; ne pas utiliser d'abrasifs ou de solvants. Il faut déconnecter le dispositif avant de procéder au nettoyage.

**ATTENTION:** il est possible de monter un module unique par type, avec un maximum de trois modules au total. Afin d'éviter les dysfonctionnements, respecter la position des modules comme l'indique le tableau 1. Faire attention à ce que le couple de serrage appliqué aux vis des bornes soit de : 0,5Nm. POUR TOUTES LES OPÉRATIONS DE MONTAGE ET DÉMONTAGE DE L'INSTRUMENT ET DES MODULES IL FAUT QUE L'ALIMENTATION ET LA CHARGE SOIENT DÉBRANCHÉES.

**BRANCHEMENTS ÉLECTRIQUES**

- [1] Double sortie statique à opto-mosfet.
- [2] Double sortie statique à relais.
- [3] Double sortie analogique à 20mA CC.
- [4] Double sortie analogique à 10V CC.
- [5] Sortie ports série RS485. **IMPORTANT:** d'autres instruments pourvus de RS485 sont branchés en parallèle. La terminaison de la sortie série doit se faire uniquement sur le dernier instrument du réseau au moyen d'un cavalier entre les bornes B+ et T.
- [6] Sortie ports série RS232. **IMPORTANT:** procéder à la terminaison au moyen d'un cavalier entre les bornes B+ et T.

**A:** les ports de communication RS232 et RS485 ne peuvent pas être utilisés et branchés ensemble.

Pour BRANCHER les modules avec sortie Ethernet ou BACnet-IP utiliser le connecteur RJ45 prévu à cet effet.

**[G]** Le module de communication est pourvu de LED spécifiques qui signalent l'état de communication RX ou TX.

**Opération préliminaire:** démonter la fenêtre de protection des contacts **[D]**, en utilisant un tournevis plat approprié.

**Bloquer et sceller les modules:** pour bloquer les modules, agir sur les éléments de fixation prévus à cet effet, situés aux angles des modules mêmes **[F]**, **[E]**, en utilisant un tournevis plat approprié **[H]**. Poser le sceau en utilisant les trous spécifiques prévus **[F]**.

**ESPAÑOL**



**Lea atentamente el manual de instrucciones.** Si el instrumento se usa de modo distinto al indicado por el fabricante, la protección de seguridad ofrecida por el instrumento podrá resultar dañada. **Mantenimiento:** para limpiar el equipo utilizar siempre un trapo ligeramente humedecido, nunca productos abrasivos o disolventes. Se recomienda desconectar siempre el instrumento antes de limpiarlo.

**ITALIANO**

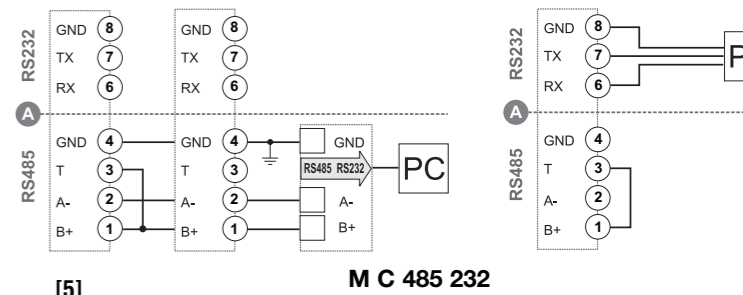
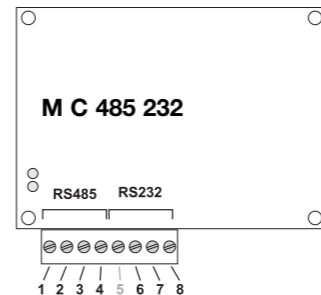


**Leggere attentamente il manuale di istruzioni.** Qualora l'apparecchio venisse adoperato in un modo non specificato dal costruttore, la protezione prevista dall'apparecchio potrebbe essere compromessa. **Manutenzione:** Per mantenere pulito lo strumento usare un panno inumidito; non usare abrasivi o solventi. Si consiglia di scollegare lo strumento prima di eseguire la pulizia.

**ATTENZIONE:** è possibile montare un unico modulo per tipo, per un massimo di tre moduli in totale. Per evitare malfunzionamenti rispettare la posizione dei moduli come indicato dalla tabella 1. Porre attenzione alla coppia di serraggio applicata alle viti dei morsetti che sia di: 0,5Nm. TUTTE LE OPERAZIONI DI MONTAGGIO E SMONTAGGIO DELLO STRUMENTO E DEI MODULI VANNO ESEGUITE CON ALIMENTAZIONE E CARICO SCOLLEGATI.

**COLLEGAMENTI ELETTRICI**

- [1] Doppia uscita statica a opto-mosfet.
- [2] Doppia uscita statica a relè.



**CUIDADO:** es posible montar un solo módulo por tipo, por un total máximo de tres módulos. Para evitar funcionamientos defectuosos respete la posición de los módulos tal como se indica en la tabla 1. Ponga cuidado en que el par de apretamiento aplicado a los tornillos de los bornes sea de: 0,5Nm. **TODAS LAS OPERACIONES DE MONTAJE Y DESMONTAJE DEL INSTRUMENTO Y DE LOS MÓDULOS DEBE REALIZARSE CON LA ALIMENTACIÓN Y LA CARGA DESCONECTADAS.**

**CONEXIONES ELÉCTRICAS**

- [1] Doble salida estática de opto-mosfet.
- [2] Doble salida estática de relé.
- [3] Doble salida analógica de 20mA CC.
- [4] Doble salida analógica de 10V CC.
- [5] Salida de puertos seriales RS485. **IMPORTANT:** Instrumentos adicionales dotados de RS485 están conectados en paralelo. La terminación de la salida serial sólo debe realizarse en el último instrumento de la red mediante un puente entre los bornes B+ y T.
- [6] Salida de puertos seriales RS232. **IMPORTANT:** realice la terminación mediante un puente entre los bornes B+ y T.

**A:** los puertos de comunicación RS232 y RS485 no pueden utilizarse y conectarse juntos.

Tab. 2	A	B	C	D	E	F
A	-	4kV	4kV	4kV	4kV	4kV
B	4kV	2kV	NA	4kV	4kV	4kV
C	4kV	NA	2kV	4kV	4kV	4kV
D	4kV	4kV	4kV	-	4kV	4kV
E	4kV	4kV	4kV	4kV	0kV	4kV
F	4kV	4kV	4kV	4kV	4kV	-

- A=** Measuring input - Ingressi di misura - Messeingänge - Entrées de mesure - Entr. de medida.
- B=** Relay outputs - Uscita relè - Relaisausgänge - Sorties à relais - Salidas de relé.
- C=** Static outputs - Uscita statica - Statische Ausgänge - Sorties statiques - Salidas estáticas.
- D=** Communication port - Porta di comunicazione - Kommunikations-Schnittstelle - Port de commun - Puerto de comunicación.
- E=** Analogue outputs - Uscite analogiche - Analoge Ausgänge - Sortie analogiques - Salidas analógicas.
- F=** Power supply - Alimentazione - Hilfsstromversorgung - Alimentation auxiliaire - Alimentación aux.

