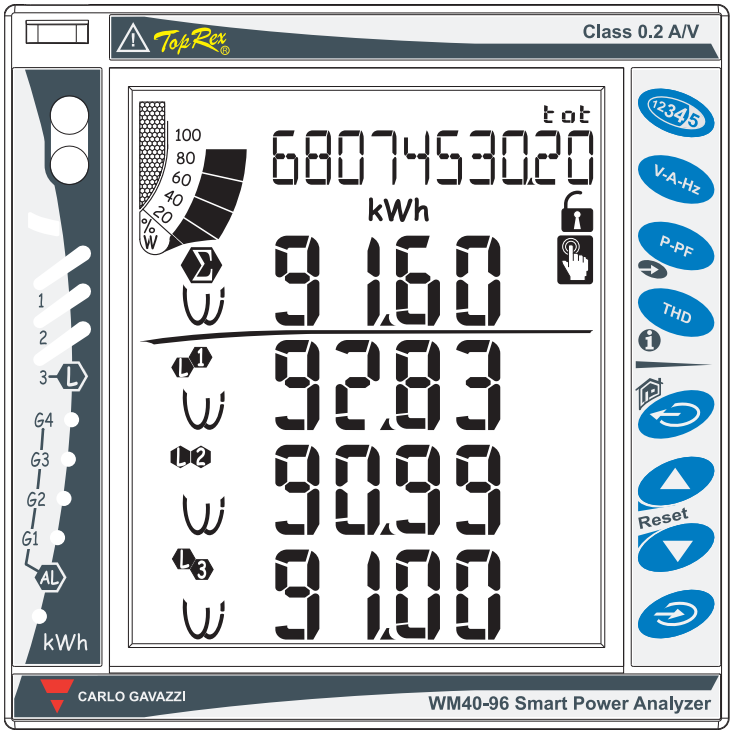
WM40-96

Instruction Manual

Display, Programming

Modular system

Class 0.2 A/V



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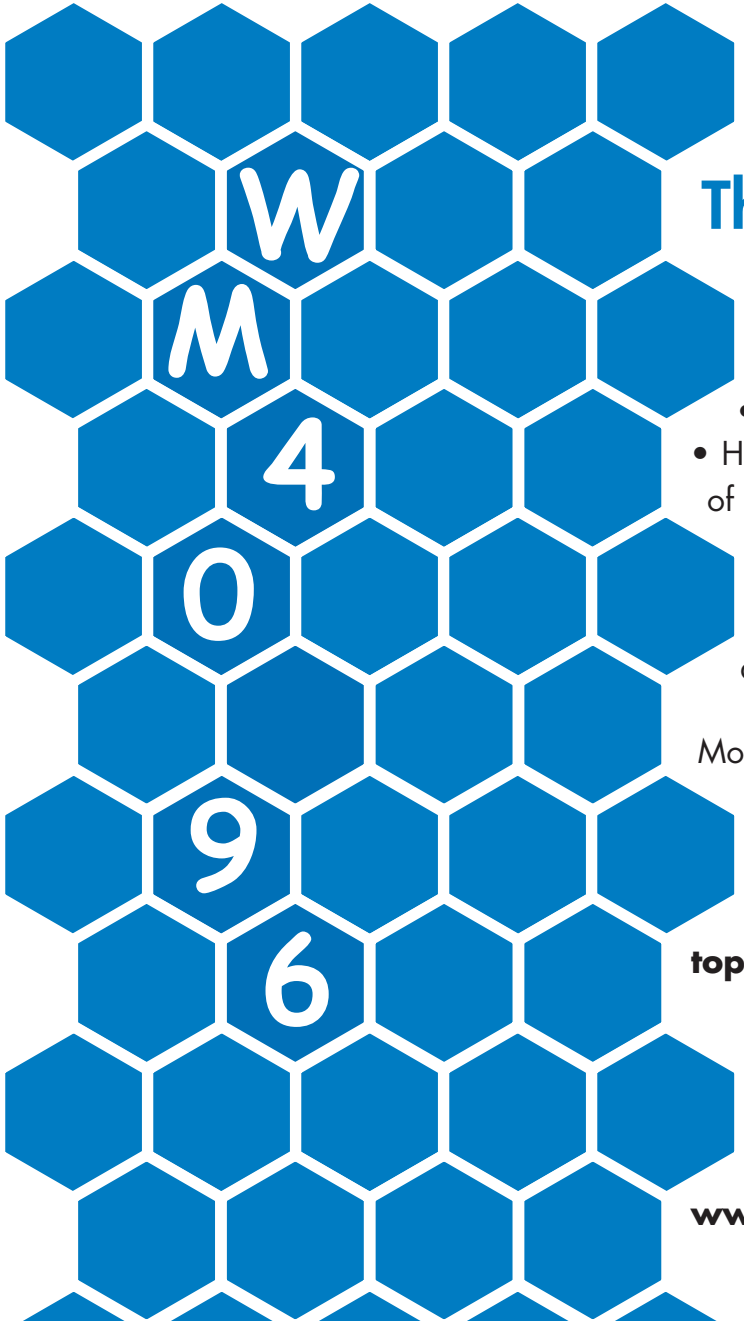

Thank you for choosing our products

WM40 96:

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

WM40-96 is the state-of-the-art tecnological 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:

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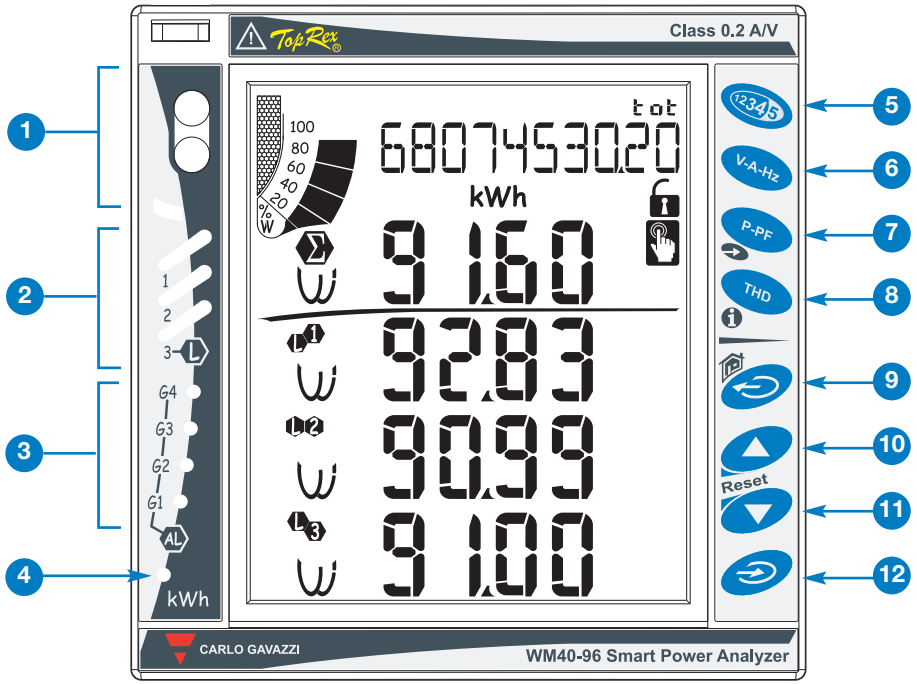


ADDITIONAL FUNCTIONS OF THE BUTTONS

The buttons featuring a double icon have two functions, to access the secondary function, hold pressed for a long time the button corresponding to the desired secondary function.

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 10, you access the reset of the MAX of the displayed variables.
Holding pressed button 11, you access the reset of the dmd's of the displayed variables.
The reset must be confirmed by button 12.

Access to the process variables (only with dedicated: M A T P, M A T P N module).

DESCRIPTION OF THE INSTRUMENT

1. Reading and programming optical port. The optical port is equipped with a detachable device for the integration of the magnetic fixing reading head.
2. Colour Bar-graf to show at a glance the status of the single phases L1-L2-L3.
3. Active virtual alarms warners.
4. 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.

5. 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).
6. Visualization of the current voltage and frequency (see the table with the measurement screens below).
7. Visualization of the instant cosφ and powers (see the table with the measurement screens below).
8. Visualization of the harmonics (see the table with the measurement screens below).

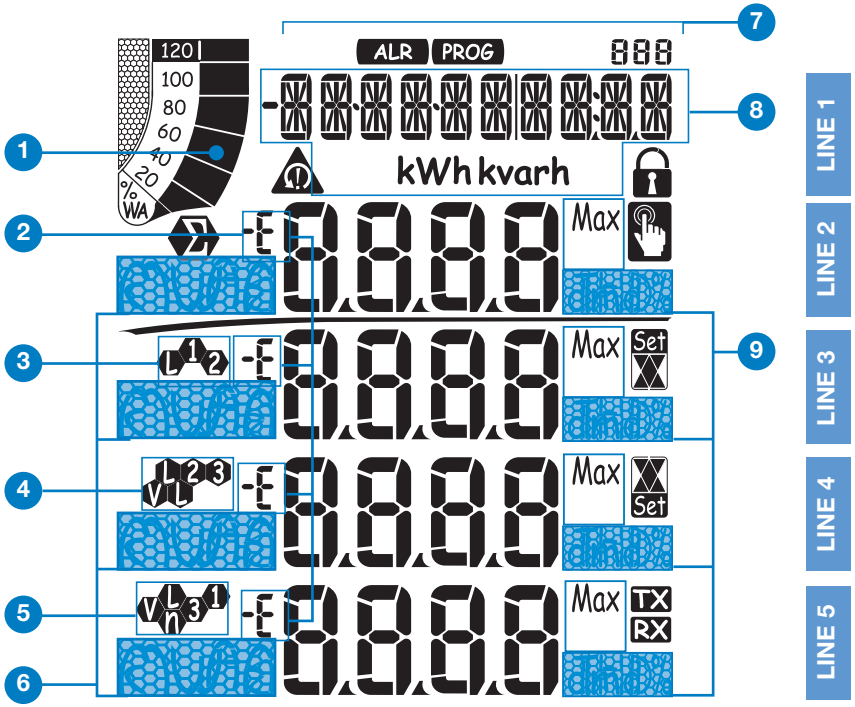
The keyboard in the bottom area is especially dedicated to instrument programming.

9. Exits the submenus, exits programming.
10. "Up" button, enables to browse the menus and to increase the values to be set.
11. "Down" button, enables to browse the menus and to decrease the values to be set.
12. 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.

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.



ICONS OF THE DISPLAY

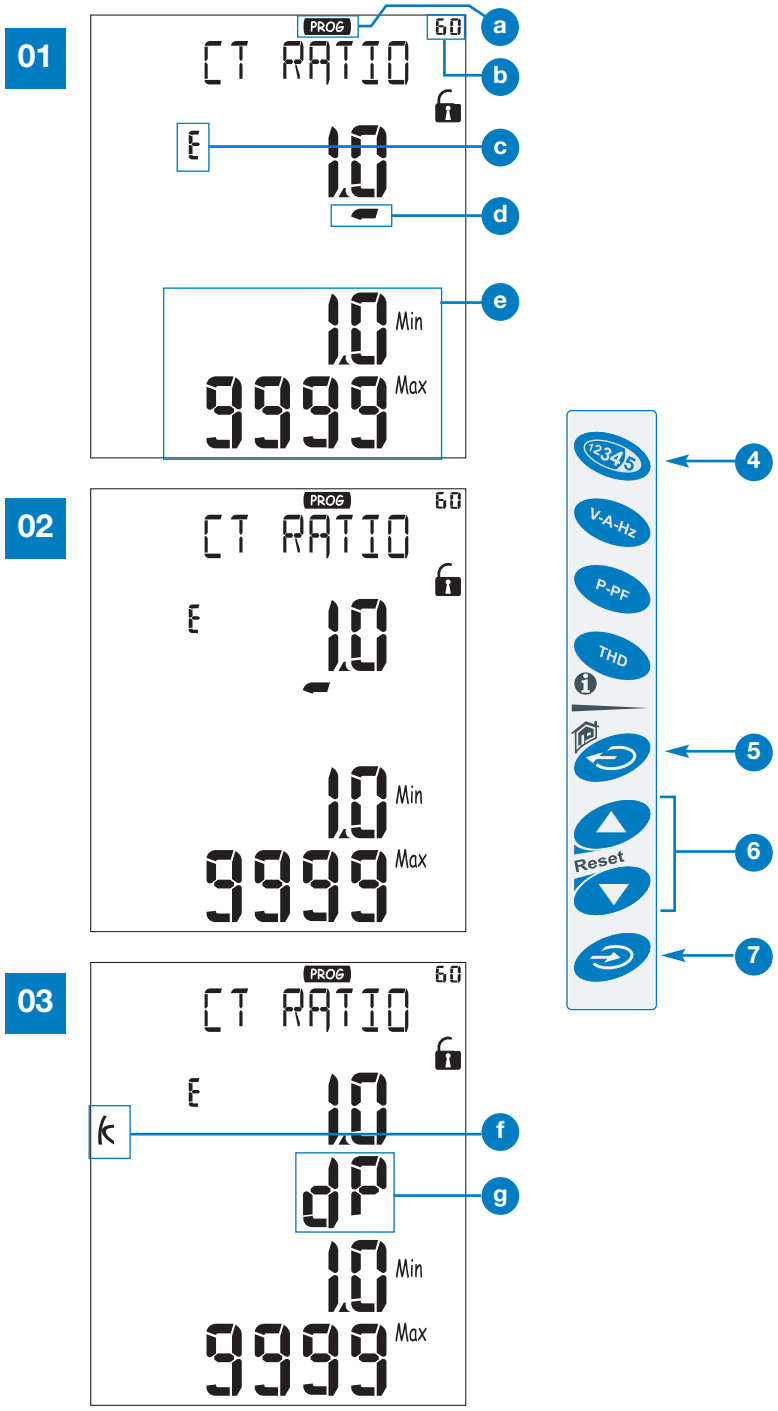
ALARM SETPOINT	
Set	Set
Up alarm.	Down alarm.

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. LOG: it is active when the LOG function is enabled. EVENT: it is active when the EVENT function is enabled.
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.
15. Gas counter (m^3).
16. Hot water counter (m^3).
16. **+ kWh**, remote heating counter.
17. Cold water counter (m^3).

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



HOW TO SET THE VALUES

With WM40 the values setting is even more simple, it is possible to increase or decrease every single digit, it is possible to easily obtain the wished value or change directly from one multiplier to another one.
Example: use of the menu relevant to the current ratio.

01 During the programming phase the instrument provides useful information:

- **a** recognition of the programming mode;
- **b** identifier number of the menu (see also the programming flow chart);
- **c** edit, identification of the line subject to set;
- **d** cursor that identifies the digit subject to set;
- **e** maximum and minimum limit of selectable variable.

02 Use the keys **6** to increase and decrease the digit detected by the cursor **(d)**. To set another digit move the cursor to match the wished digit using the key **4**, every key press corresponds to a left shifting of the cursor **(d)**.

03 When the last digit on the left is matched by the cursor **(d)**, a further press of the key **4** allows to change the decimal point and the multiplier **(f)** (k o M), the blinking “dP” (decimal point) text **(g)** identifies that the instrument is able to do this function.
To modify the decimal point position and the multiplier use the keys **6** to have the wished value.

To confirm the set value press the key **7**.
To cancel the operation in progress and come back to the starting condition press the key **5**.
To cancel the operation in progress and come back to the measuring “Home” page, press and keep pressing the key **5** at least 2 seconds.

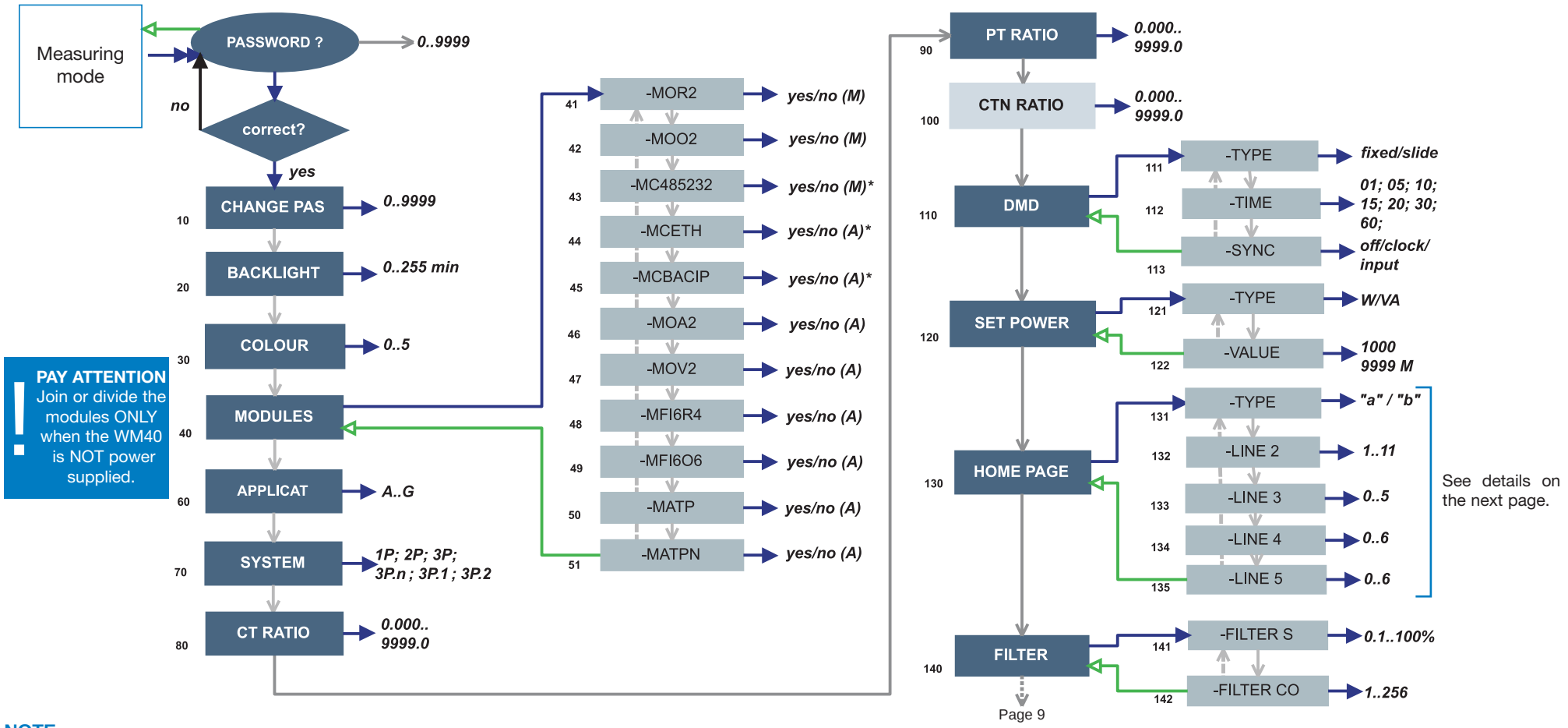
Selection	Application	Note
A	Cost allocation	Imported energy metering
B	Cost control	Imported and partial energy metering and utilities
C	Complex cost allocation	Imported/exported energy (total and partial) and utilities
D	Solar	Imported and exported energy metering with some basic power analyzer function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

NOTE

WM40-96 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.

	N°	Line 1	Line 2	Line 3	Line 4	Line 5	Note	Application A	B	C	D	E	F	G
	0	Total kWh (+)	Depending on the last displayed page of instantaneous variables.					x	x	x	x	x	x	x
	1	Total kvarh (+)						x	x	x		x	x	x
	2	Total kWh (-)								x	x	x		x
	3	Total kvarh (-)								x		x		x
	4	kWh (+) partial							x	x		x	x	x
	5	kvarh (+) part.							x	x		x	x	x
	6	kWh (-) partial								x		x		x
	7	kvarh (-) part.								x		x		x
	8	Run Hours (99999999.99)								x	x	x	x	x
	9	kWh (+) t1								x		x		x
	10	kvarh (+) t1								x		x		x
	11	kWh (-) t1								x		x		x
	12	kvarh (-) t1								x		x		x
	13	kWh (+) t2								x		x		x
	14	kvarh (+) t2								x		x		x
	15	kWh (-) t2								x		x		x
	16	kvarh (-) t2								x		x		x
12345	17	kWh (+) t3								x		x		x
	18	kvarh (+) t3								x		x		x
	19	kWh (-) t3								x		x		x
	20	kvarh (-) t3								x		x		x
	21	kWh (+) t4								x		x		x
	22	kvarh (+) t4								x		x		x
	23	kWh (-) t4								x		x		x
	24	kvarh (-) t4								x		x		x
	25	kWh (+) t5								x		x		x
	26	kvarh (+) t5								x		x		x
	27	kWh (-) t5								x		x		x
	28	kvarh (-) t5								x		x		x
	29	kWh (+) t6								x		x		x
	30	kvarh (+) t6								x		x		x
	31	kWh (-) t6								x		x		x
	32	kvarh (-) t6								x		x		x
	33	C1							x	x		x		x
	34	C2							x	x		x		x
	35	C3							x	x		x		x
	36		VLN Σ	VL1	VL2	VL3					x	x	x	x
V-A-Hz	37		VLL Σ	VL1-2	VL2-3	VL3-1					x	x	x	x
	38		An	AL1	AL2	AL3					x	x	x	x
	39		Hz	“ASY”	VLL sys (% asy)	VLN sys (% asy)					x	x	x	x
	40		W Σ	WL1	WL2	WL3					x	x	x	x
P-PF	41		var Σ	var L1	var L2	var L3						x	x	x
	42		PF Σ	PF L1	PF L2	PF L3						x	x	x
	43		VA Σ	VA L1	VA L2	VA L3						x	x	x
	44				Process sig.	Temperature	Max, dmd						x	x
	45			THD V1	THD V2	THD V3							x	x
	46			THD V12	THD V23	THD V31							x	x
	47			THD A1	THD A2	THD A3							x	x
	48			THD V1 odd	THD V2 odd	THD V3 odd							x	x
	49			THD V12 odd	THD V23 odd	THD V31 odd							x	x
THD	50			THD A1 odd	THD A2 odd	THD A3 odd							x	x
	51			THD V1 even	THD V2 even	THD V3 even							x	x
	52			THD V12 even	THD V23 even	THD V31 even							x	x
	53			THD A1 even	THD A2 even	THD A3 even							x	x
	54			TDD A1	TDD A2	TDD A3							x	x
	55			K-FACT L1	K-FACT L2	K-FACT L3					x	x	x	x

	N°	Line 1	Line 2	Line 3	Line 4	Line 5	Applications						
							A	B	C	D	E	F	G
	1	Lot n. xxxx	Yr. xx	rEL	X.xx	1...60 (min) “dmd”	x	x	x	x	x	x	x
	2	Conn. xxx.x (3ph.n/3ph/3ph.1/ 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	xxxx kWh per pulse				x	x	x	x	x	x	x
	4	PULSE out1 kWh/kvarh	xxxx kWh/kvarh per pulse	+/- tot/PAr/tAr 1-2-3-4			x	x	x	x	x	x	x
	5	PULSE out2 kWh/kvarh	xxxx kWh/kvarh per pulse	+/- tot/PAr/tAr 1-2-3-4			x	x	x	x	x	x	x
	6	PULSE out3 kWh/kvarh	xxxx kWh/kvarh per pulse	+/- tot/PAr/tAr 1-2-3-4			x	x	x	x	x	x	x
	7	PULSE out4 kWh/kvarh	xxxx kWh/kvarh per pulse	+/- tot/PAr/tAr 1-2-3-4			x	x	x	x	x	x	x
	8	PULSE out5 kWh/kvarh	xxxx kWh/kvarh per pulse	+/- tot/PAr/tAr 1-2-3-4			x	x	x	x	x	x	x
	9	PULSE out6 kWh/kvarh	xxxx kWh/kvarh per pulse	+/- tot/PAr/tAr 1-2-3-4			x	x	x	x	x	x	x
	10	PULSE out7 kWh/kvarh	xxxx kWh/kvarh per pulse	+/- tot/PAr/tAr 1-2-3-4			x	x	x	x	x	x	x
	11	PULSE out8 kWh/kvarh	xxxx kWh/kvarh per pulse	+/- tot/PAr/tAr 1-2-3-4			x	x	x	x	x	x	x
	12	Remote output	Output 1	on/oFF	Output 2	on/oFF	x	x	x	x	x	x	x
	13	Remote output	Output 3	on/oFF	Output 4	on/oFF	x	x	x	x	x	x	x
	14	Remote output	Output 5	on/oFF	Output 6	on/oFF	x	x	x	x	x	x	x
	15	Remote output	Output 7	on/oFF	Output 8	on/oFF	x	x	x	x	x	x	x
	16	AL1 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	17	AL2 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	18	AL3 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	19	AL4 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	20	AL5 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	21	AL6 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	22	AL7 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	23	AL8 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	24	AL9 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	25	AL10 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	26	AL11 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	27	AL12 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	28	AL13 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	29	AL14 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	30	AL15 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	31	AL16 OUTx NE/ND	Variable L 1/2/3	Set 1	Set 2	(Measurement)				x	x	x	x
	32	Analogue 1	Hi:E	0.0 ... 9999	Hi.A	0.0 ... 100.0%				x	x	x	x
	33	Analogue 2	Hi:E	0.0 ... 9999	Hi.A	0.0 ... 100.0%				x	x	x	x
	34	Analogue 3	Hi:E	0.0 ... 9999	Hi.A	0.0 ... 100.0%				x	x	x	x
	35	Analogue 4	Hi:E	0.0 ... 9999	Hi.A	0.0 ... 100.0%				x	x	x	x
	36	Optical	bdr (text)	9.6/19.2/38.4/115.2			x	x	x	x	x	x	x
	37	COM port	Add	xxx (address)	bdr	9.6/19.2/38.4/115.2	x	x	x	x	x	x	x
	38	Indirizzo IP	XXX	XXX	XXX	XXX	x	x	x	x	x	x	x
	39	xx.xx.xx xx:xx	Date	Time			x	x	x	x	x	x	x
	40	Event, Data, Ora								x	x	x	x



PAY ATTENTION
Join or divide the modules ONLY when the WM40 is NOT power supplied.

See details on the next page.

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 COLOUR: this function allows the user to select the backlight colour and the working logic. 0: no timer and backlight off. 1: timer and white backlight. 2: timer and blue backlight. 3: no timer and backlight off, when an alarm occurs it flashes from white to blue. 4: timer, white backlight, when an alarm occurs it flashes from white to blue. 5: timer, white backlight, when an alarm occurs it flashes from blue to white.
40 MODULES: the WM40 96 supports either automatic (A) or manual (M) acknowledgment of the installed modules depending on the kind of module.
60 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. **70 SYSTEM:** this function allows the user to select the type of electrical system (see relevant chapter to next page). **80 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.
90 PT RATIO: this function allows 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).
100 CTN RATIO: this function allows to select the value of neutral current AT ratio (primary/secondary ratio of the used current transformer).
110 DMD: This function allows the user to select the calculation method of the DMD/AVG value of the selected variable (see the box on page 10).
120 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.
130 HOME PAGE: This function allows the user to select the variables to be displayed on first page (home page). 131 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).
140 FILTER: with the digital filter it's possible to stabilize the measurements which are too instable when displaying the relevant values. 141 FILTER S: set the operating range (span) of the digital filter. The value is expressed as a % (filter to 0.0 means filter excluded). 142 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.

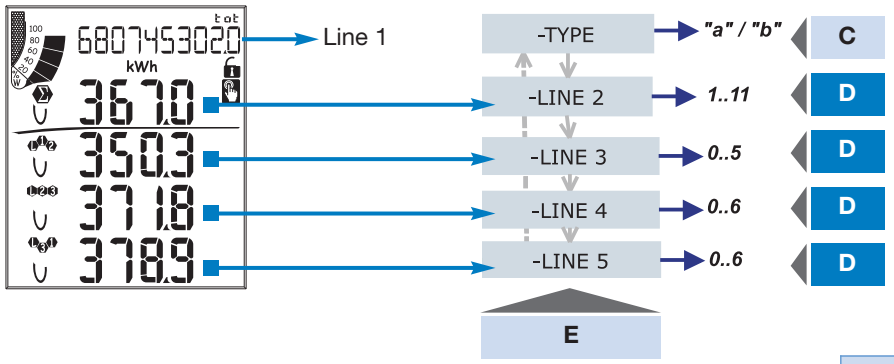
Some specific menus display only if the relevant modules are installed.

SYSTEM menu and selection of the electrical system

System type Selection	1P	2P	3P.1	3P.2	3P	3P.n
Variable	1-ph. sys	2-ph. sys	3-ph. 3/4-wire balanced sys	3-ph. 2-wire balanced sys	3-ph. 3-wire unbal. sys	3-ph. 4-wire unbal. sys
VL-N sys	○	●	●	●	○	●
VL1	●	●	●	●	○	●
VL2	○	●	1	1	○	●
VL3	○	○	1	1	○	●
VL-L sys	○	●	●	●	●	●
VL1-2	○	●	●	2	●	●
VL2-3	○	○	●	2	●	●
VL3-1	○	○	●	2	●	●
AL1	●	●	●	●	●	●
AL2	○	●	3	3	●	●
AL3	○	○	3	3	●	●
VA sys	○	●	●	●	○	●
VA L1	●	●	●	●	○	●
VA L2	○	●	●	●	○	●
VA L3	○	○	●	●	○	●
var sys	○	●	●	●	○	●
var L1	●	●	●	●	○	●
var L2	○	●	●	●	○	●
var L3	○	○	●	●	○	●
W sys	○	●	●	●	●	●
WL1	●	●	●	●	○	●
WL2	○	●	4	4	○	●
WL3	○	○	4	4	○	●
PF sys	○	●	●	●	○	●
PF L1	●	●	●	●	○	●
PF L2	○	●	5	5	○	●
PF L3	○	○	5	5	○	●
Hz	●	●	●	●	●	●
Phase seq.	○	○	●	○	●	●

System type Selection	1P	2P	3P.1	3P.2	3P	3P.n
Variable	1-ph. sys	2-ph. sys	3-ph. 3/4-wire balanced sys	3-ph. 2-wire balanced sys	3-ph. 3-wire unbal. sys	3-ph. 4-wire unbal. sys
Asy VLL	●	●	●	○	●	●
Asy VLN	○	○	○	○	○	●
Run Hours	●	●	●	●	●	●
kWh (+)	●	●	●	●	●	●
kvarh (+)	●	●	●	●	○	●
kWh (+)	●	●	●	●	●	●
kvarh (+)	●	●	●	●	○	●
kWh (-)	●	●	●	●	●	●
kvarh (-)	●	●	●	●	○	●
kWh (-)	●	●	●	●	●	●
kvarh (-)	●	●	●	●	○	●
C1	●	●	●	●	●	●
C2	●	●	●	●	●	●
C3	●	●	●	●	●	●
A L1 THD	●	●	●	●	●	●
A L2 THD	○	●	6	6	●	●
A L3 THD	○	○	6	6	●	●
V L1 THD	●	●	●	●	○	●
V L2 THD	○	●	●	7	○	●
V L3 THD	○	○	●	7	○	●
V L1-2 THD	○	●	●	○	●	●
V L2-3 THD	○	○	●	○	●	●
V L3-1 THD	○	○	●	○	●	●
A L1 TDD	●	●	●	●	●	●
A L2 TDD	○	●	●	●	●	●
A L3 TDD	○	○	●	●	●	●
K-Factor L1	○	○	●	●	●	●
K-Factor L2	○	○	●	●	●	●
K-Factor L3	○	○	●	●	●	●

●= available; ○= variable not available on the display
1= the variable is available. The variable is calculated (it is not really measured) and corresponds to VL1
2= the variable is available. The variable is calculated (it is not really measured) and corresponds to VL1*1.73
3= the variable is available. The variable is calculated (it is not really measured) and corresponds to AL1
4= the variable is available. The variable is calculated (it is not really measured) and corresponds to WL1
5= the variable is available. The variable is calculated (it is not really measured) and corresponds to PFL1
6= the variable is available. The variable is calculated (it is not really measured) and corresponds to AL1THD
7= the variable is available. The variable is calculated (it is not really measured) and corresponds to VL1THD



How to customize the home page of WM40-96

Menu “131 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.

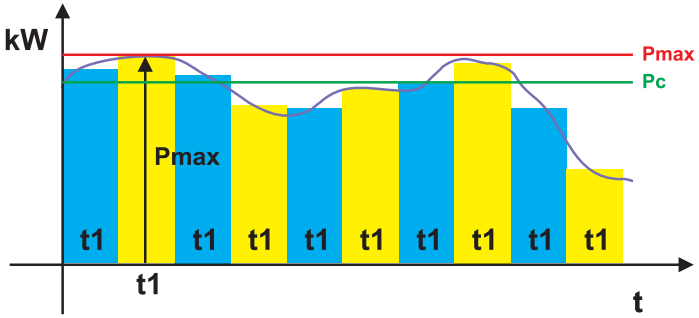
Note: when the B type is selected all the A selections on line 3, 4 and 5 are irrilevant.

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	12	13	14	15	16	17	18	19	20
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	THD V1 even	THD V12 even	THD A1 even	THD V1 odd	THD V12 odd	THD A1 odd	k factor	TDD A1	Tempe rature
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	THD V2 even	THD V23 even	THD A2 even	THD V2 odd	THD V23 odd	THD A2 odd	k factor	TDD A2	Proc Segn
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	THD V3 even	THD V31 even	THD A3 even	THD V3 odd	THD V31 odd	THD A3 odd	k factor	TDD A3	-

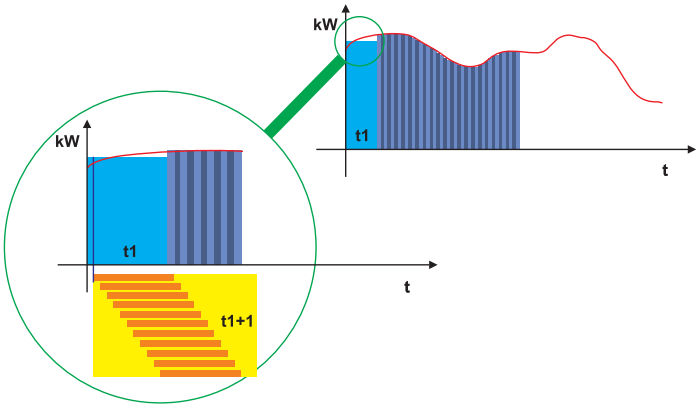
E	D																				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Line 2	Hz					W				-			-			-			-	-	-
Line 3	V					VAR				THD_V			THD_V even			THD_V odd			k-Factor	TDD A	Temperature
Line 4	A					VA				THD_A			THD_A even			THD_A odd			-	-	Analogue signal input
Line 5	-					PF				-			-			-			-	-	-

SELECTION OF DMD CALCULATION: 111 TYPE: 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. 112 TIME: select the time interval for the DMD/AVG calculation 113 SYNC: select the synchronization mode, that is the method that controls the calculation method of the average/demand according to the selected time.

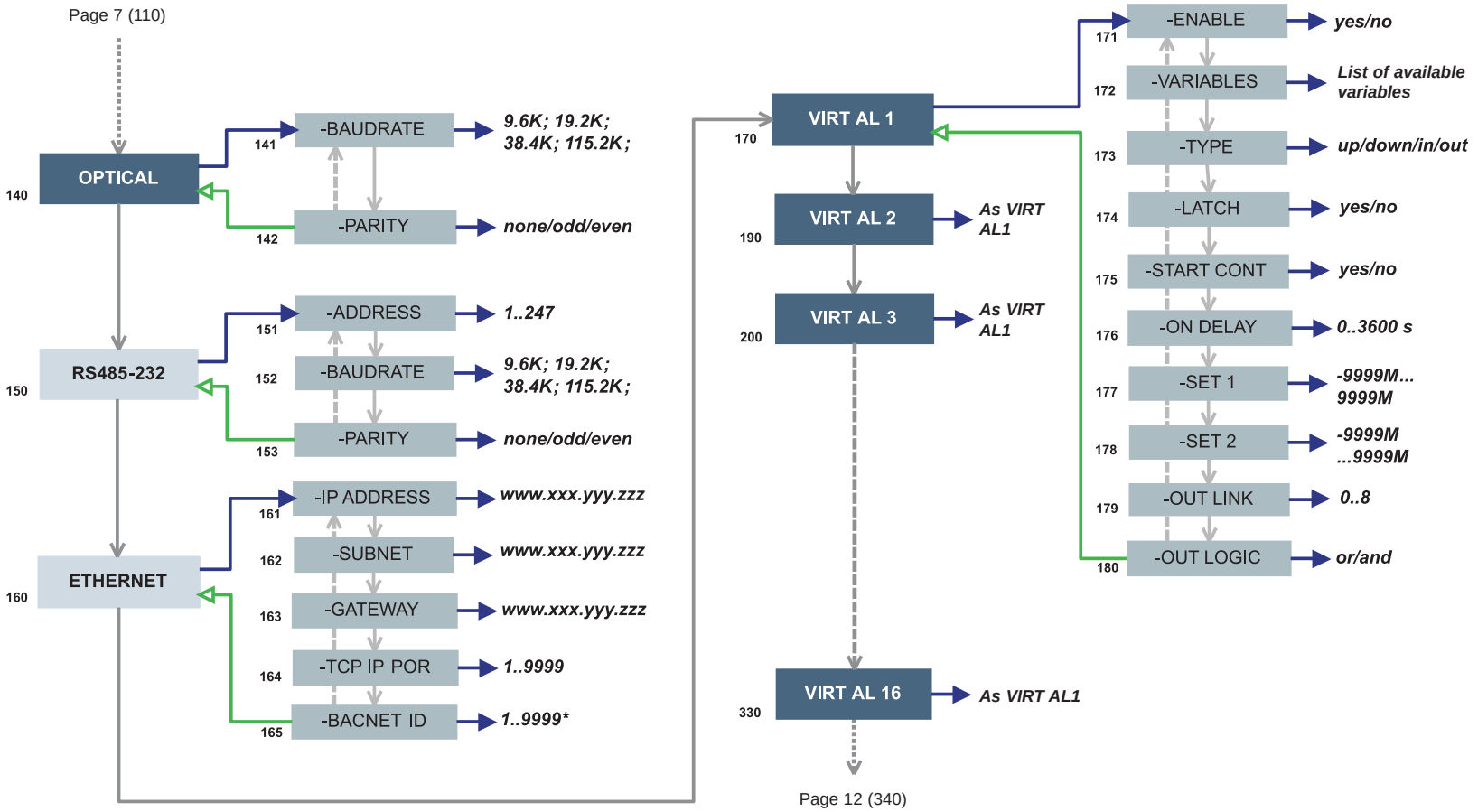


Where:
Pmax is the maximum power,
Pc is the contractual power,
t1 is the selected time period for the calculation of the AVG/DMD value.

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.



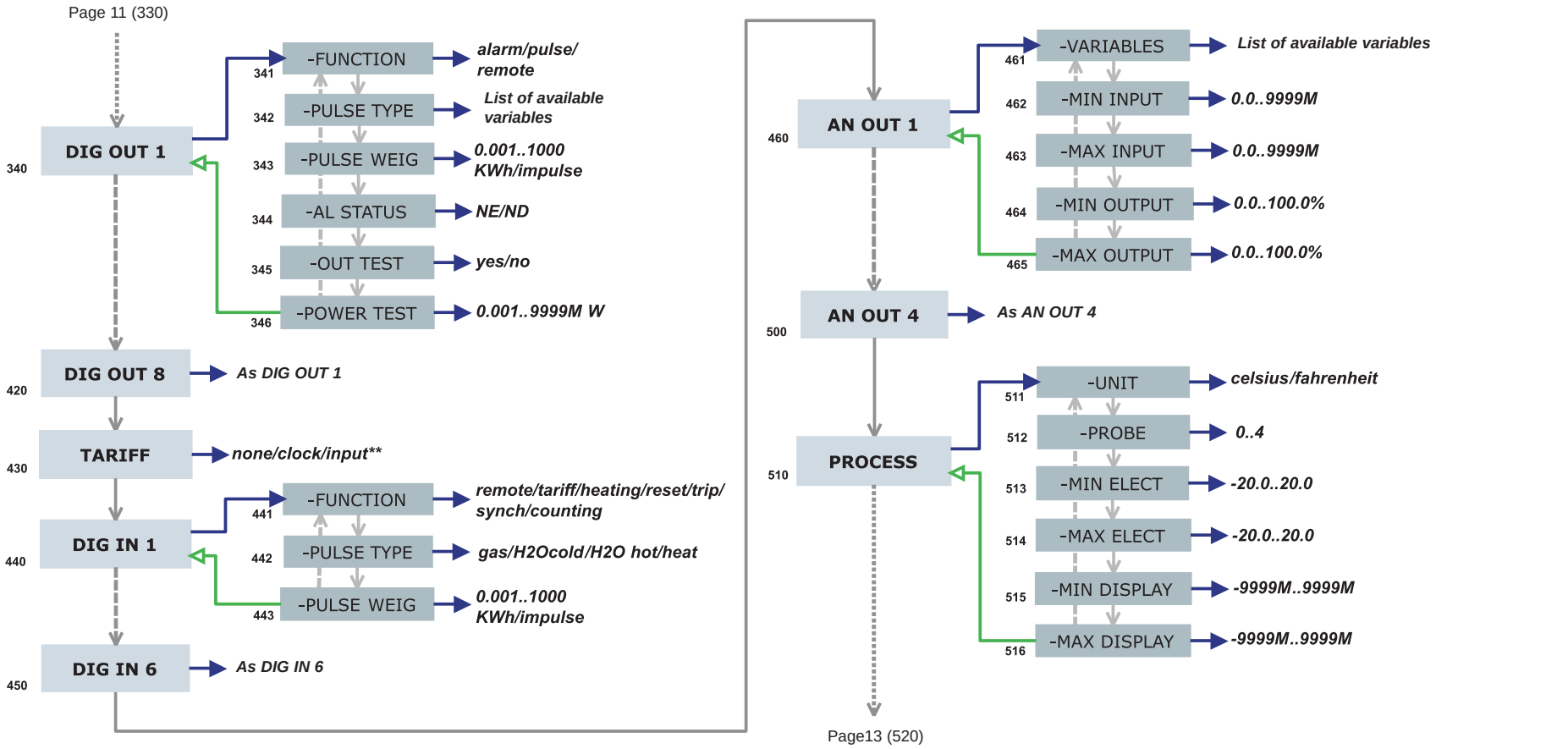
SLIDING SELECTION: if for example a time interval of 15 minutes has been selected, the instrument calculates the AVG/DMD value and updates its value at the beginning after the first 15 values and then after every minute, thus generating a window whose width is of 15 minutes and that moves forward every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



NOTE

140 OPTICAL: this function allows the user to set the communication mode of the front optical port.
150 RS232-458: This function allows the user to set the RS232 and RS485 serial communication ports.
160 ETHERNET: This function allows the user to set the Ethernet communication port.
170 VIRT AL 1: This function allows you to set the alarm parameters. 171 ENABLE: enable (YES) or disable (NO) the alarm. 172 VARIABLES: set the variable to be linked to the alarm. 173 SET 1:set the on alarm set point of the variable. 174 SET 2: set the off alarm set point of the variable. 175 ON DELAY: set a delay on activation of the alarm.

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



NOTE

340 DIG OUT 1: This function allows to link a virtual alarm to the digital output and to its working parameters. 341 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 pulses. *Remote*, the digital output can be enabled through a command sent by means of serial communication port. 342 AL LINK: select the virtual alarm to which it has to be linked. 343 AL STATUS: "ND" (normally de-energized relay) or "NE" (normally energized relay) 345 PULSE WEIG: selects the pulse weight (kWh per pulse). 346 OUT TEST: enables the TEST (YES), disables the TEST (NO). 347 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.

430 TARIFF: it allows to select the tariffs mode.

440 DIG IN 1: it allows to set the digital inputs parametres. 441 FUNCTION: function type selection. 442 PULSE TYPE: it allows to set the pulse type.

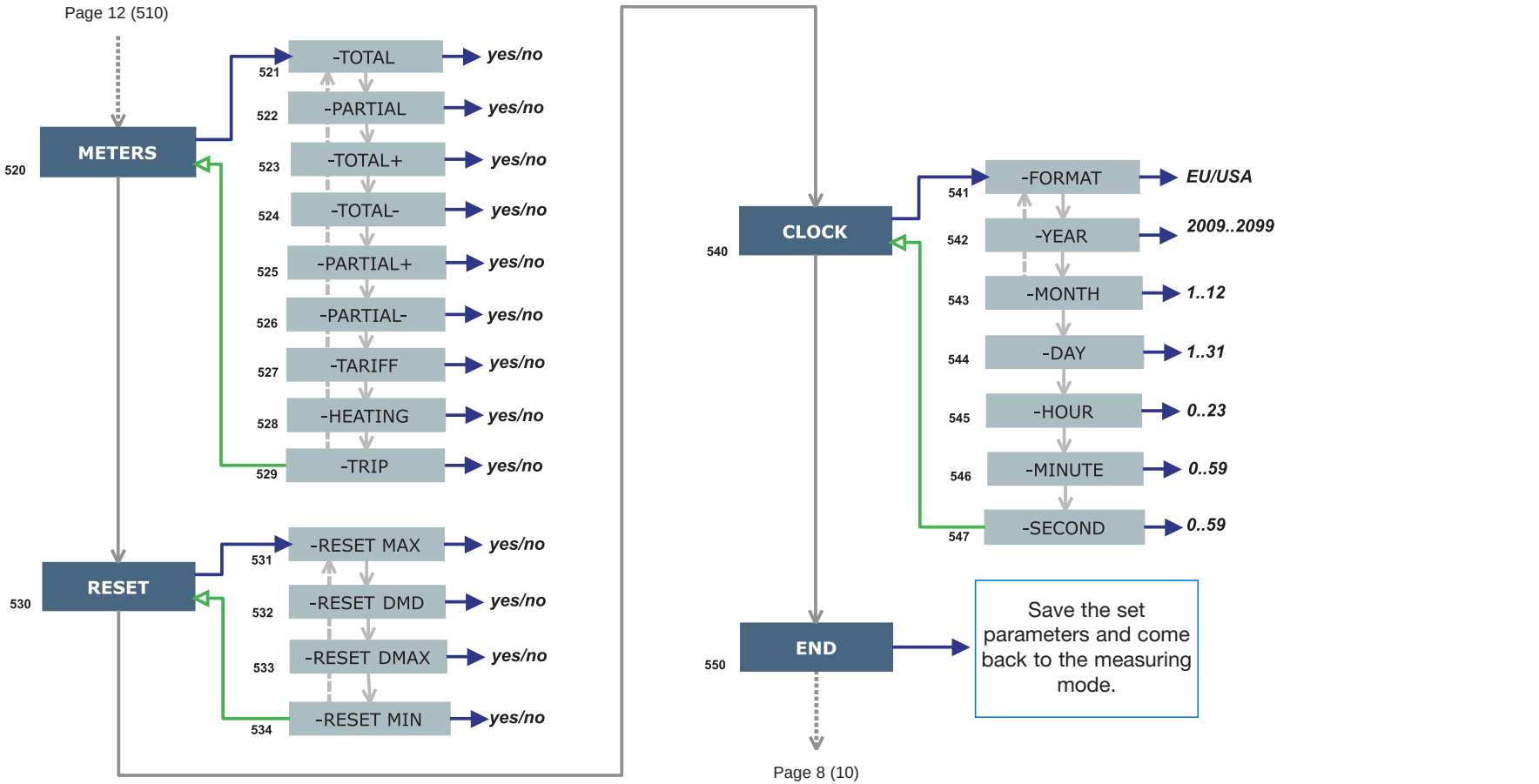
443 PULSE WEIG: it allows to set the pulse weight.

460 AN OUT 1: this submenu allows the programming of the analogue outputs (0-20mA, 0-10V). 461 VARIABLES: select the variable to be retransmitted by means of the analog output. 462 MIN INPUT: minimum value of the variable input range to which the "MIN OUTPUT" value, retransmitted by the analogue output, will be linked. 463 MAX INPUT: maximum value of the variable input range to which the "MAX OUTPUT" value, retransmitted by the analogue output, will be linked. 464 MIN OUTPUT: set the value expressed as % of the output range (0-20mA, 0-10V) to be linked to the minimum measured value. 465 MAX OUTPUT: select the value expressed as % of the output range (0-20mA, 0-10V) to be linked to the maximum measured value.

510 PROCESS: it allows to set the process signal parameters. 511 UNIT: engineering unit selection (°C or °F). 512 PROBE: probe selection. 513 MIN ELECT: selection of electrical scale minimum value. 514 MAX ELECT: selection of electrical scale maximum value

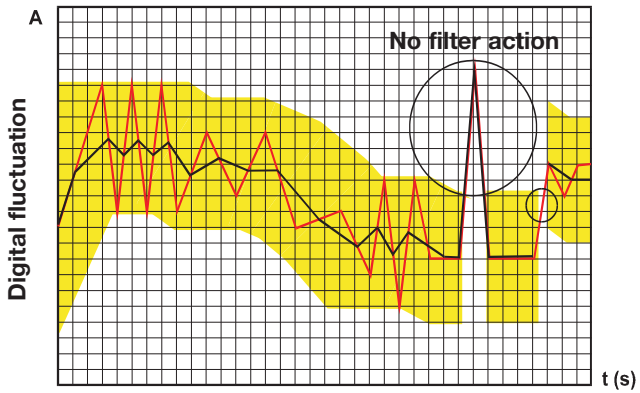
515 MIN DISPLAY: selection of the displayed minimum value. 516 MAX DISPLAY: selection of the displayed maximum value.

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



NOTE

520 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.
TARIFF: tariffs counter reset. HEATING: remote heating counter reset. TRIP: errors counter reset.
530 RESET: carry out the reset of the MAX or dmd stored values.
540 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).



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 ±0,75% of the full scale rated value of the variable itself (obtained by the following calculation: (228-222)/ 2= ±3V, then ±3*100/400V= ±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 algebrically 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*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 (WΣ), 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 ±2,78% of the full scale rated value of this variable. This value is obtained by the following calculation: (320-300)/ 2= ±10kW, then ±10*100/360kW= ±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 * VT * IN * CT * 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*1*5*60*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 algebrically 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*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 ±1,60% of the full scale rated value of this variable (obtained by means of the calculation: (486-470)/ 2= ±8A, then ±8*100/500A= ±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 algebrically 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*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:

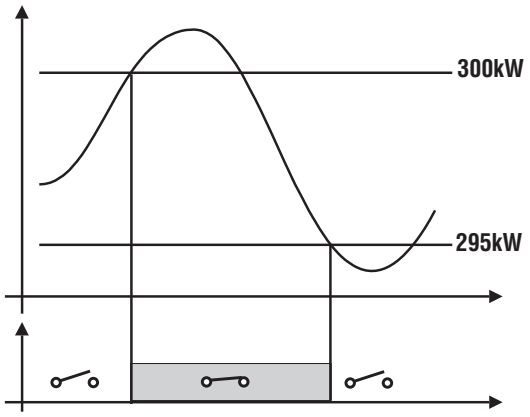
VARIABLE: W∑ (system active power).
MIN OUT: 20.0% means 4 mA. The calculation to be carried out is the following: (100*minimum output) / fullscale output =100*4mA/ 20mA=20%.
MAX OUT: 100.0% means 20mA. The calculation to be carried out is: (100*maximum output) / fullscale output = 100*20mA/20mA= 100.
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∑).
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 swifting 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 (WΣ)
SET POINT 1: 300kW
SET POINT 2: 295kW
ON DELAY: set the desired number of seconds: “5 seconds”.

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WM4096 IM ML 270510 BASE cod. 8021030

Instruction Manual
Base Instrument

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.

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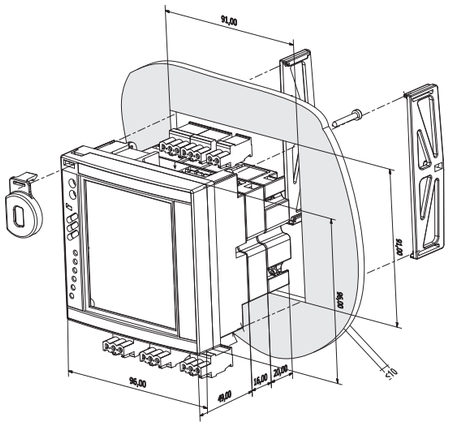

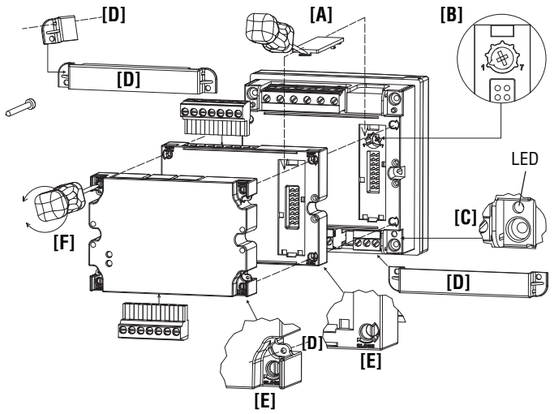

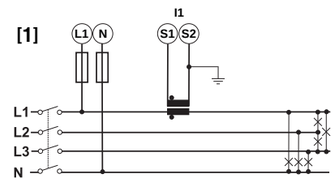

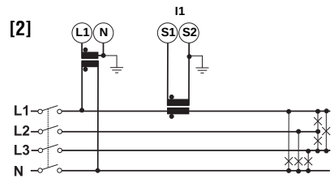

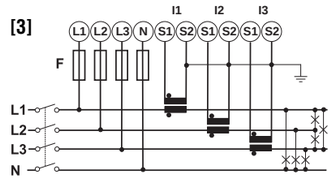

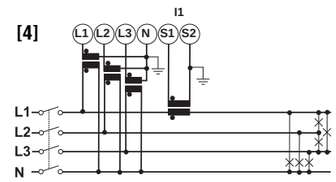

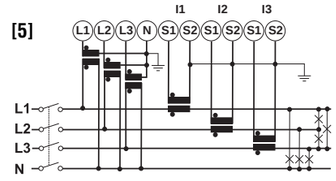

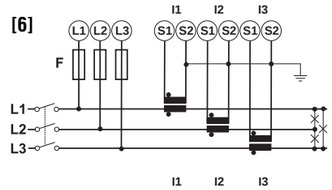

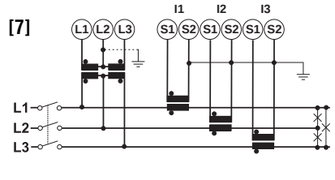

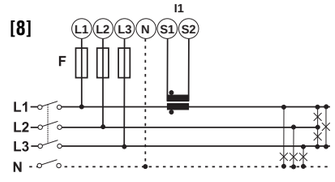

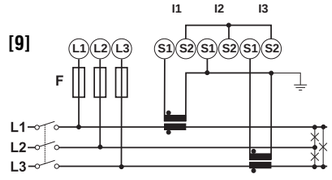

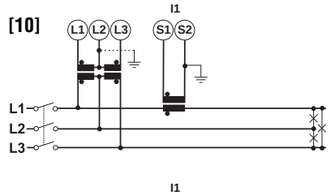

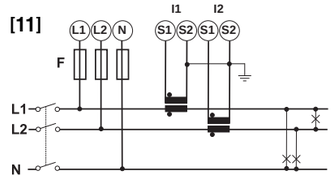

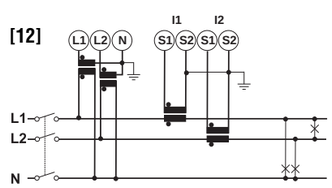

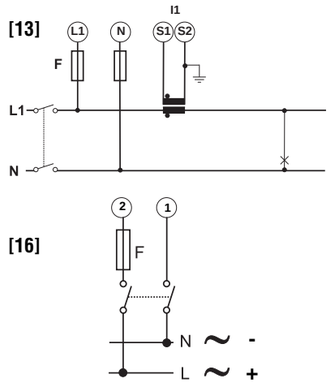

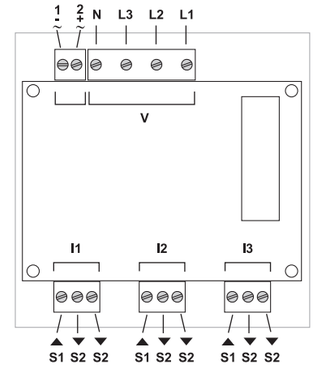

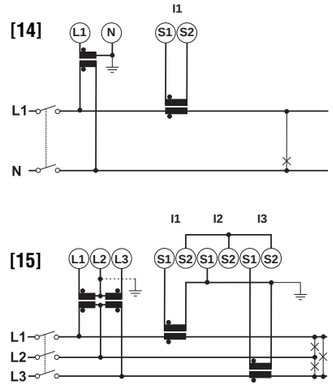

ENGLISH

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 supplayed.

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, 3-wire, balanced load, 1-CT and 3-VT/PT connections
[5] 3-ph, 4-wire, unbalanced load, 3-CT and 3-VT/PT connections
[6] 3-ph, 3-wire, unbalanced load, 3-CT connection
[7] 3-ph, 3-wire unbalanced load, 3-CT and 2-VT/PT connections
[8] 3-ph, 3-wire, balanced load, 1-CT connections
[9] 3-ph, 3-wire, unbalanced load, 2-CT connections (ARON)
[10] 3-ph, 3-wire, balanced load, 1-CT and 2-VT/PT connections
[11] 2-ph, 3-wire, 2-CT connection
[12] 2-ph, 3-wire, 2-CT and 2-VT/PT connections
[13] 1-ph, 2-wire, 1-CT connection
[14] 1-ph, 2-wire, 1-CT and 1-VT connections
[15] 3-ph, 3-wire, unbalanced load, 2-CT and 2-VT/PT connections ARON
[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 serragio 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 fissagio 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 squilibrato, connessione con 3 TA
[4] 3 fasi, 3 fili, carico equilibrato, connessione con 1 TA e 3 TV
[5] 3 fasi, 4 fili, carico squilibrato, connessione con 3 TA e 3 TV
[6] 3 fasi, 3 fili, carico squilibrato, connessione con 3 TA
[7] 3 fasi, 3 fili, carico squilibrato, connessione con 3 TA e 2 TV
[8] 3 fasi, 3 fili, carico equilibrato, connessione con 1 TA
[9] 3 fasi, 3 fili, carico squilibrato, connessione con 2 TV (ARON)
[10] 3 fasi, 3 fili, carico equilibrato, connessione con 1 TA e 2 TV
[11] 2 fasi, 3 fili, connessioni con 2 TA
[12] 2 fasi, 3 fili, connessioni con 2 TA e 2 VT
[13] 1 fase, 2 fili, connessione con 1TA
[14] 1 fase, 2 fili, connessione con 1 TA e 1 TV
[15] 3 fasi, 3 fili, carico squilibrato, connessione con 2 TA e 2 TV (ARON)
[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 Klemmenschrauben 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, unsymmetrische Last, Anschluss mit 3 TA
[4] 3 Phasen, 3 Adern, symmetrische Last, Anschluss mit 1 TA und 3 TV
[5] 3 Phasen, 4 Adern, unsymmetrische Last, Anschluss mit 3 TA und 3 TV
[6] 3 Phasen, 3 Adern, unsymmetrische Last, Anschluss mit 3 TA
[7] 3 Phasen, 3 Adern, unsymmetrische Last, Anschluss mit 3 TA und 2 TV
[8] 3 Phasen, 3 Adern, symmetrische Last, Anschluss mit 1 TA
[9] 3 Phasen, 3 Adern, unsymmetrische Last, Anschluss mit 2 TV (ARON)
[10] 3 Phasen, 3 Adern, symmetrische Last, Anschluss mit 1 TA und 2 TV
[11] 2 Phasen, 3 Adern, Anschlüsse mit 2 TA
[12] 2 Phasen, 3 Adern, Anschlüsse mit 2 TA und 2 VT
[13] 1 Phase, 2 Adern, Anschluss mit 1 TA
[14] 1 Phase, 2 Adern, Anschluss mit 1 TA und 1 TV
[15] 3 Phasen, 3 Adern, unsymmetrische Last, Anschluss mit 2 TA und 2 TV (ARON)
[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 déséquilibrée, connexion avec 3 TA
[4] 3 phases, 3 fils, charge équilibrée, connexion avec 1 TA et 3 TV
[5] 3 phases, 4 fils, charge déséquilibrée, connexion avec 3 TA et 3 TV
[6] 3 phases, 3 fils, charge déséquilibrée, connexion avec 3 TA
[7] 3 phases, 3 fils, charge déséquilibrée, connexion avec 3 TA et 2 TV
[8] 3 phases, 3 fils, charge équilibrée, connexion avec 1 TA
[9] 3 phases, 3 fils, charge déséquilibrée, connexion avec 2 TV (ARON)
[10] 3 phases, 3 fils, charge équilibrée, connexion avec 1 TA et 2 TV
[11] 2 phases, 3 fils, connexions avec 2 TA
[12] 2 phases, 3 fils, connexions avec 2 TA et 2 VT
[13] 1 phase, 2 fils, connexion avec 1TA
[14] 1 phase, 2 fils, connexion avec 1 TA et 1 TV
[15] 3 phases, 3 fils, charge déséquilibrée, connexion avec 2 TA et 2 TV (ARON)
[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.

ATENCIÓN: asegúrese de que el par de apriete aplicado a los tornillos 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 alimentación ON: para bloquear la programación del instrumento gire en el sentido de las agujas del reloj el conmutador giratorio **[B]** llevándolo a la posición 7, para desbloquear la programación llévelo a la posición 1. El LED verde encendido **[C]** indica que el instrumento está alimentado.

Sellado de los módulos y del instrumento: para bloquear los módulos gire en el sentido de las agujas del reloj los específicos elementos de fijación de los extremos de los módulos **[E]**, utilizando un adecuado destornillador de punta plana **[F]**. Para sellar el equipo use las cubiertas y orificios específicos **[D]**.

■ **CONEXIONES ELÉCTRICAS**

[1] Trifásico, 2 hilos, carga equilibrada, conexión mediante 1 CT
[2] Trifásico, 2 hilos, carga equilibrada, conexión mediante 1 CT y 1 VT/PT
[3] Trifásico, 4 hilos, carga desequilibrada, conexión mediante 3 CT
[4] Trifásico, 3 hilos, carga equilibrada, conexión mediante 1 CT y 3 VT/PT
[5] Trifásico, 4 hilos, carga desequilibrada, conexión mediante 3 CT y 3 VT/PT
[6] Trifásico, 3 hilos, carga desequilibrada, conexión mediante 3 CT
[7] Trifásico, 3 hilos, carga desequilibrada, conexión mediante 3 CT y 2 VT/PT
[8] Trifásico, 3 hilos, carga equilibrada, conexión mediante 1 CT
[9] Trifásico, 3 hilos, carga desequilibrada, conexión mediante 2 CT (ARON)
[10] Trifásico, 3 hilos, carga equilibrada, conexión mediante 1 CT y 2 VT/PT
[11] Bifásico, 3 hilos, conexiones mediante 2 CT
[12] Bifásico, 3 hilos, conexiones mediante 2 CT y 2 VT/PT
[13] Monofásico, 2 hilos, conexión mediante 1 CT
[14] Monofásico, 2 hilos, conexión mediante 1 CT y 1 VT/PT
[15] Trifásico, 3 hilos, carga desequilibrada, conexión mediante 2 CT y 2 VT/PT (ARON)
[16] Alimentación de 90 a 260VCA/CC. F=250V [T] 630mA.
Alimentación de 18 a 60VCA/CC. F=250V [T] 3.15A.

CT = Trafo de intensidad, VT = Trafo de tensión, PT = Trafo de potencia

ENGLISH

Rated inputs, system type: 1, 2 or 3-phase. Galvanic insulation by means of built-in CT's. Current range (by CT) AV5 and AV6: 5(6)A; AV4 and AV7: 1(2)A. Voltage (by direct connection or VT/PT) AV4, AV5: 400/690VLL; AV6, AV7: 100/208VLL. **Accuracy** (Display + RS485) (@25°C ±5°C, R.H. ≤60%, 48 to 62 Hz). In: see below, Un: see below AV4 model In: 1A, Imax: 2A; Un: 160 to 480VLN (277 to 830VLL). AV5 model In: 5A, Imax: 6A; Un: 160 to 480VLN (277 to 830VLL). AV6 model, In: 5A, Imax: 6A; Un: 40 to 144VLN (70 to 250VLL), AV7 model In: 1A, Imax: 2A; Un: 40 to 144VLN (70 to 250VLL). Current AV4, AV5, AV6, AV7 models from 0.01In to 0.05In: ±(0.5% RDG +2DGT). From 0.05In to Imax: ±(0.2% RDG +2DGT). Phase-neutral voltage: In the range Un: ±(0,2% RDG +1DGT). Phase-phase voltage: In the range Un: ±(0.5% RDG +1DGT). Frequency: ±0.1Hz (45 to 65Hz). Active and Apparent power: 0.01In to 0.05In, PF 1: ±(1%RDG+1DGT) From 0.05In to Imax PF 0.5L, PF1, PF0.8C: ±(0.5%RDG+1DGT). Power Factor ±[0.001+0.5%(1.000 - "PF RDG")]. Reactive power 0.1In to Imax, senφ 0.5L/C: ±(1%RDG+1DGT). 0.05In to 0.1In, senφ 0.5L/C: ±(1.5%RDG+1DGT), 0.05In to Imax, senφ 1: ±(1%RDG+1DGT) 0.02In to 0.05In, senφ 1: ±(1.5%RDG+1DGT). Active energy, class 0.5 according to EN62053-22, ANSI C12.20, class C according to EN50470-3. Reactive energy class 1 according to EN62053-23, ANSI C12.1. Start up current AV5, AV6: 5mA. Start up current AV4, AV7 1mA. **Energy additional errors:** according to EN62053-22, ANSI C12.20. Influence quantities, class B or C according to EN50470-3, EN62053-23, ANSI C12.1. **Total Harmonic Distortion (THD)** ±1% FS (FS: 100%). Phase: ±2°; Imin: 5mARMS; Imax: 15Ap; Umin: 30VRMS; Umax: 585Vp. Detection of imported and exported harmonics. **Total Demand Distortion (TDD)** ±1% FS (FS: 100%). Imin: 5mA RMS; Imax: 15Ap; Umin: 30VRMS; Umax: 585Vp. **K-Factor and factor K** ±(0.5%RDG+1DGT). **Temperature drift** ≤200ppm/°C. **Sampling rate** 3200 samples/s @ 50Hz, 3840 samples/s @ 60Hz. Method TRMS measurements of distorted wave forms. Coupling type by means of CT's. **Crest factor**, AV5, AV6: ≤3 (15A max. peak), AV4, AV7: ≤3 (3A max. peak). **Current Overloads,** continuous (AV5 and AV6) 6A, @ 50Hz/60Hz. Continuous (AV4 and AV7) 2A, @ 50Hz/60Hz. For 500ms (AV5 and AV6) 120A, @ 50Hz/60Hz. For 500ms (AV4 and AV7) 40A, @ 50Hz/60Hz. **Voltage Overloads,** continuous 1.2 Un. For 500ms 2 Un. **Input impedance,** 400VL-L (AV4 and AV5) >1.6MΩ; 208VL-L (AV6 and AV7) >1.6MΩ. 5(10)A (AV5 and AV6) <0.2VA. 1(2)A (AV4 and AV7) <0.2VA. **Frequency** 40 to 440 Hz. **Meters.** Total 4 (10 digit). Partial 4 (10 digit). **Pulse output** connectable to total and/or partial meters. **Energy meter recording,** storage of total and partial energy meters. Energy meter storage format (EEPROM) Min. -9,999,999,999.9 kWh/kvarh, Max. 9,999,999,999.9 kWh/kvarh. **Energy Meters,** total energy meters +kWh, +kvarh, -kWh, -kvarh. Partial energy meters +kWh, +kvarh, -kWh, -kvarh. **Analysis principle** FFT. **Harmonic measurement.** Current up to the 32nd harmonic. Voltage up to the 32nd harmonic. **Type of harmonics** THD (VL1 and VL1-N) THD odd (VL1 and VL1-N) THD even (VL1 and VL1-N) TDD. The same for the other phases: L2, L3. THD (AL1) THD odd (AL1) THD even (AL1). The same for the other phases: L2, L3. **Power supply:** H: 90 to 265VAC/DC; L: 19 to 60VAC (48 to 62Hz), 21.6 to 60VDC. **Auxiliary power supply according to UL:** 100 to 240VAC +10% -15% 100 to 240VDC +10% -20% 24 to 48VAC +10% -15% 24 to 48VDC +10% -20%. **Power consumption:** AC: 20 VA; DC: 10 W. **Operating temperature** -25°C to +55°C (-13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C) according to EN62053-21, EN50470-1 and EN62053-23. **Storage temperature** -30°C to +70°C (-22°F to 158°F) (R.H. < 90% non-condensing @ 40°C) according to EN62053-21, EN50470-1 and EN62053-23. **Installation category** Cat. III (IEC60664, EN60664). **Dielectric strength** 4000 VRMS for 1 minute. **Noise rejection** CMRR 100 dB, 48 to 62 Hz. **EMC** according to EN62052-11. Electrostatic discharges: 15kV air discharge. Immunity to irradiated: test with current: 10V/m from 80 to 2000MHz. Electromagnetic fields: test without any current: 30V/m from 80 to 2000MHz. Burst: on current and voltage measuring inputs circuit: 4kV. Immunity to conducted disturbances: 10V/m from 150KHz to 80MHz. Surge: on current and voltage measuring inputs circuit: 4kV; on "L" auxiliary power supply input: 1kV. Radio frequency suppression: according to CISPR 22. **Standard compliance:** safety: IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Metrology EN62053-21, EN62053-23, EN50470-3. Pulse output: DIN43864, IEC62053-31. **Approvals:** CE, cULus "Listed". **Connections:** Screw-type. Cable cross-section area: max. 2.5 mm2. Min./max. Screws tightening torque: 0.4 Nm / 0.8 Nm. Suggested: 0.5 Nm. Module holder: 96x96x50mm. "A" and "B" type modules: 89.5x63x16mm. "C" type module: 89.5x63x20mm. Max. depth behind the panel. With 3 modules (A+B+C): 81.7 mm. Material, ABS, self-extinguishing: UL 94 V-0. **Protection degree,** front: IP65, NEMA4x, NEM12. Screw terminals: IP20.

ITALIANO

Ingressi di misura. Sistema: 1, 2 o 3 fasi. Isolamento galvanico mediante TA integrati. Portata corrente (TA) AV5 e AV6: 5(6)A. AV4 e AV7: 1(2)A. Tensione (connesione diretta o TV) AV4, AV5: 400/690VLL; AV6, AV7: 100/208VLL. **Precisione** (Display + RS485) (@25°C ±5°C, R.H. ≤60%, 48 to 62 Hz) In: vedere sotto, Un: vedere sotto, Modello AV4, In: 1A, Imax: 2A; Un: da 160 a 480VLN (da 277 a 830VLL). Modello AV5, In: 5A, Imax: 6A; Un: da 160 a 480VLN (da 277 a 830VLL). Modello AV6 In: 5A, Imax: 6A; Un: da 40 a 144VLN (da 70 a 250VLL). Modello AV7 In: 1A, Imax: 2A; Un: da 40 a 144VLN (da 70 a 250VLL). Corrente, modelli AV4, AV5, AV6, AV7 Da 0,01In a 0,5In: ±(0,5% RDG +2DGT). Da 0,05In a Imax: ±(0.2% RDG +1DGT). Tensione fase-neutro, nel campo Un: ±(0,2% RDG +1DGT). Tensione fase-fase, nel campo Un: ±(0,5% RDG +1DGT). Frequenza ±0,1Hz (da 45 a 65Hz). Potenza attiva ed apparente: da 0,01In a 0,05In, cosφ 1: ±(1% RDG +1DGT), da 0,05In a Imax, cosφ 0,5L, cosφ 1, cosφ 0,8C: ±(0,5% RDG +1DGT). Fattore di potenza: ±[0.001+0.5%(1.000 - "PF RDG")]. Potenza reattiva, da 0,1In a Imax, senφ 0,5L/C: ±(1%RDG+1DGT), da 0,05In a 0.1In, senφ 0,5L/C: ±(1.5%RDG+1DGT), da 0.05In a Imax, senφ 1: ±(1%RDG+1DGT), da 0,02In a 0,05In, senφ 1: ±(1,5%RDG+1DGT). Energia attiva: Classe 0,5 secondo EN62053-22, ANSI C12.20 Classe C secondo EN50470-3. Energia reattiva Classe 1 secondo EN62053-23, ANSI C12.1. Corrente di avvio AV5, AV6 5mA. Corrente di avvio AV4, AV7 1mA. **Errori addizionali** secondo EN62053-22, ANSI C12.20. Grandezze di influenza Classe B o C secondo EN50470-3, EN62053-23, ANSI C12.1. **Distorsione armonica totale (THD):** ±1% FS (FS: 100%). Fase: ±2°; Imin: 5mA RMS; Imax: 15Ap; Umin: 30VRMS; Umax: 585Vp Rilevamento dell'armonica importata o esportata. **Distorsione del Demand (TDD):** ±1% FS (FS: 100%) Imin: 5mA RMS; Imax: 15Ap; Umin: 30VRMS; Umax: 585Vp. **K-Fattore e fattore K** ±(0,5% RDG +1DGT). **Deriva termica:** ≤200ppm/°C. **Frequenza di campionamento:** 3200 campioni/s @ 50Hz, 3840 campioni/s @ 60Hz. **Misure,** metodo TRMS misura delle forma d'onda distorte. Tipo di accoppiamento Mediante TA. **Fattore di cresta** AV5, AV6: ≤3 (15A max. picco) AV4, AV7: ≤3 (3A max. picco). **Sovraccarico corrente:** continuo (AV5 e AV6) 6A, @ 50Hz/60Hz. Continuo (AV4 e AV7) 2A, @ 50Hz/60Hz. Per 500ms (AV5 e AV6) 120A, @ 50Hz/60Hz. Per 500ms (AV4 e AV7) 40A, @ 50Hz/60Hz. **Sovraccarico:** continuo 1,2 Un. Per 500ms 2 Un. **Impedenza d'ingresso:** 400VLL (AV4 e AV5) >1,6MΩ. 208VLL (AV6 e AV7) >1,6MΩ. 5(10)A (AV5 e AV6) <0,2VA. 1(2)A (AV4 e AV7) <0,2VA. **Frequenza** da 40 a 440 Hz. **Cotatori:** totali, 4 (10 digit). Parziali, 4 (10 digit). **Uscita impulsi:** associabile ai contatori parziali e/o totali. **Registrazione dei contatori:** memorizzazione dei contatori parziali e totali. Formato dei contatori memorizzati (EEPROM) Min. -9,999,999,999.9 kWh/kvarh. Max. 9,999,999,999.9 kWh/kvarh. **Contatori di energia:** totali, +kWh, +kvarh, -kWh, -kvarh. Parziali, +kWh, +kvarh, -kWh, -kvarh. **Principio dell'analisi** FFT. **Misura dell'armonica,** corrente, fino alla 32a armonica. Tensione, fino alla 32a armonica. **Tipo di armoniche** THD (VL1 e VL1-N). Lo stesso per le altre fasi: L2, L3. THD (AL1). Lo stesso per le altre fasi: L2, L3. THD (AL1) THD dispari (AL1) THD pari (AL1). Lo stesso per le altre fasi: L2, L3. **Alimentazione:** H: da 90 a 265VCA/CC; L: da 19 a 60VCA (da 48 a 62Hz), da 21,6 a 60VCC. **Alimentazione secondo UL:** da 100 a 240VCC +10% -15% da 100 a 240VCC +10% -20% da 24 a 48VCA +10% -15% da 24 a 48VCC +10% -20%. **Autoconsumo:** CA: 20 VA; CC: 10 W. **Temperatura di funzionamento** da -25°C a +55°C (da -13°F a 131°F) (U.R. da 0 a 90% senza condensa @ 40°C) secondo EN62053-21 e EN62053-23. **Temperatura di immagazzinamento** da -30°C a +70°C (da -22°F a 140°F) (U.R. <90% senza condensa @ 40°C) secondo EN62053-21 e EN62053-23. **Categoria di installazione:** Cat. III (IEC60664, EN60664). **Isolamento (per 1 minuto)** 4000 VRMS tra ingressi di misura ed alimentazione. 4000 VRMS tra alimentazione e RS485/uscite digitali. **Rigidità dielettrica** 4000 VRMS per 1 minuto. **Reiezione** CMRR 100 dB, da 48 a 62 Hz. **EMC** secondo EN62052-11. Scariche elettrostatiche 15kV scarica in aria; Immunità campi elettromagnetici irradianti, provato con corrente applicata: 10V/m da 80 a 2000MHz; provato senza corrente applicata: 30V/m da 80 a 2000MHz. Immunità ai transitori veloci, sui circuiti degli ingressi di misura in corrente e tensione: 4kV. Immunità ai radiodisturbi condotti: 10V/m da 150KHz a 80MHz. Immunità ad impulso, sui circuiti degli ingressi di misura in corrente e tensione: 4kV; sull'alimentazione "L": 1kV. Emissioni in radiofrequenza: secondo CISPR 22. **Conformità alle norme**: sicurezza IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Metrologia: EN62053-21, EN50470-3, EN62053-23. Uscita impulsiva DIN43864, IEC62053-31. Approvazioni: CE, cULus listed. **Connessioni:** a vite. Sezione del cavo: max. 2,5 mm2. Coppia min./max serraggio: 0,4 Nm / 0,8 Nm. Consigliata: 0,5 Nm. **Custodia:** dimensioni (LxAxP) modulo base: 96x96x50mm. Moduli tipo "A" e "B": 89,5x63x16mm. Modulo tipo "C": 89,5x63x20mm. Ingombro massimo dietro il pannello Con 3 moduli (A+B+C): 81,7 mm. Materiale: nylon PA66, autoestinguenza: UL 94 V-0. Montaggio a pannello. **Grado di protezione:** frontale: IP65, NEMA4x, NEM12. Morsetti: IP20.

DEUTSCH

Messeingänge: Phasensystem: Systemcode: 1, 2 oder 3. Strommessung: Galvanische Isolation durch integrierte Stromwandler. Strombereich (Stromwandler) AV5 und AV6: 5(6)A. AV4 und AV7: 1(2)A. Spannung (Direktmessung oder Spannungswandler) AV4, AV5: 400/690VLL; AV6, AV7: 100/208VLL. **Genauigkeit** (Anzeige + RS485) (bei 25°C ±5°C, R.F. ≤60%, 48 bis 62 Hz) In: Nennstrom, Un: Nennspannung: Modell AV4, In: 1A, Imax: 2A; Un: 160 bis 480VLN (277 bis 830VLL). Modell AV5, In: 5A, Imax: 6A; Un: 160 bis 480VLN (277 bis 830VLL). Modell AV6, In: 5A, Imax: 6A; Un: 40 bis 144VLN (70 bis 250VLL). Modell AV7, In: 1A, Imax: 2A; Un: 40 bis 144VLN (70 bis 250VLL). Strom Modelle AV4, AV5, AV6, AV7 VON 0,01In bis 0,5In: ±(0,5% RDG +2stellig). VON 0,5In bis Imax: ±(0,2% RDG +2stellig). Spannung Phase - N Bereich Un: ±(0,2% RDG +1stellig). Spannung Phase - Phase Bereich Un: ±(0,5% RDG +1stellig). Frequenz: ±0.1Hz (45 bis 65Hz). Wirk- und Scheinleistung: 0,01In bis 0,05In, PF 1: ±(1%RDG+1stellig). VON 0,05In bis Imax. PF 0,5L, PF1, PF0,8C: ±(0,5%RDG+1stellig). Leistungsfaktor: ±[0,001+0,5%(1,000 - "PF RDG")]. Blindleistung: 0,1In bis Imax, senφ 0,5L/C: ±(1%RDG+1stellig). 0,05In bis 0,1In, senφ 0,5L/C: ±(1.5%RDG+1stellig). 0,05In bis Imax, senφ 1: ±(1%RDG+1stellig). 0,02In bis 0,05In, senφ 1: ±(1,5%RDG+1stellig). Energie: Klasse 0.5 gemäß EN62053-22, ANSI C12.20. Klasse C gemäß EN50470-3. Blindleistung: Klasse 1 gemäß EN62053-23, ANSI C12.1. Startstrom AV5, AV6 5mA. Startstrom AV4, AV7 1mA. **Zusätzlicher Energiefehler:** gemäß EN62053-22, ANSI C12.20, Bereichsüberschreitungs-abhängig: Klasse B oder C gemäß EN50470-3, EN62053-23, ANSI C12.1. **Gesamte Harmonische Verzerrung (THD):** ±1% BE (BE: 100%) Phase: ±2°; Imin: 5mARMS; Imax: 15Ap; Umin: 30VRMS; Umax: 585Vp. Identifikation der aufgenommenen und abgegebenen Harmonischen. **Gesamtverzerrungsfaktor (TDD):** ±1% BE (BE: 100%) Imin: 5mARMS; Imax: 15Ap; Umin: 30VRMS; Umax: 585Vp. **K-Faktor und Faktor K:** ±(0.5%RDG+1stellig). **Temperaturdrift:** ≤200ppm/°C. **Abtastrate** 3200 Abtastwertes/s bei 50Hz, 3840 Abtastwertes/s bei 60Hz. Messmethode TRMS-Messungen von verzerrten Wellenformen. Wandleranschluss Durch Stromwandler. **Scheitelwertfaktor:** AV5, AV6: ≤3 (15A Höchstspitze). AV4, AV7: ≤3 (3A Höchstspitze). **Überlaststrom:** Dauer (AV5 und AV6) 6A, bei 50Hz/60Hz. Dauer (AV4) 2A, bei 50Hz/60Hz. Für 500ms (AV5 und AV6) 120A, bei 50Hz/60Hz. Für 500ms (AV4 uund AV7) 40A, bei 50Hz/60Hz. **Überlastspannung:** Dauer 1,2 Un. Für 500ms 2 Un. **Eingangsimpedanz:** 400VL-L (AV4 und AV5) >1,6MΩ. 208VL-L (AV6 und AV7) >1,6MΩ. 5(10)A (AV5 und AV6) <0,2VA. 1(2)A (AV4 und AV7) <0,2VA. **Frequenz:** 40 bis 440 Hz. **Zähler:** Gesamt 4 (10 Ziffern). Partiell 4 (10 Ziffern). **Impulsausgang:** Anschließbar an Gesamtund/oder Teilzähler. **Aufzeichnung der Energiemessung:** Aufzeichnung von Gesamt- und Teilenergiemessung. Aufzeichnung der Energiemessung(EEPROM) Min. -9,999,999,999.9 kWh/kvarh. Max. 9,999,999,999.9 kWh/kvarh. **Energiezähler:** Gesamte Energiezähler +kWh, +kvarh, -kWh, -kvarh. Teilenergiezähler +kWh, +kvarh, -kWh, -kvarh. **Analyseprinzip:** FFT. **Wellenmessung:** Strom Bis zur 32. Harmonischen: Spannung Bis zur 32. Harmonischen. **Wellentypen:** THD (VL1 und VL1-N) THD ungerade (VL1 und VL1-N) THD gerade (VL1 und VL1-N) TDD. Dasselbe für andere Phasen: L2, L3. THD (AL1) THD ungerade (AL1) THD gerade (AL1). Dasselbe für andere Phasen: L2, L3. **Modelle mit Hilfsstromversorgung:** H: 90 bis 265VAC/DC; L: 19 bis 60VAC/DC (48 bis 62Hz) da 21,6 a 60VDC **Hilfsstromversorgung gemäß UL:** 100 bis 240VAC +10% -15% 100 bis 240VDC +10% -20% 24 bis 48VAC +10% -15% 24 bis 48VDC +10% -20%. **Leistungsaufnahme:** AC: 20 VA; DC: 10 W. **Betriebstemperatur** -25°C bis +55°C (-13°F bis 131°F) (R.F. von 0 bis 90% nicht kondensierend bei 40°C) gemäß EN62053-21, EN50470-1 und EN62053-23. **Lagertemperatur:** -30°C bis +70°C (-22°F bis 158°F) (R.F. < 90% nicht kondensierend bei 40°C) gemäß EN62053-21, EN50470-1 und EN62053-23. **Installationskategorie:** Kat. III (IEC60664, EN60664). **Durchschlagfestigkeit:** 4kVAC RMS für 1 Minute. **Rauschdrückungsverhältnis:** GTUV 100 dB, 48 bis 62 Hz. **EMC:** According to EN62052-11. Elektrostatische Entladungen: 15kV air discharge; Strahlungsimmunität: Test mit angelegten Strom: 10V/m von 80 bis 2000MHz; Elektromagnetfeld. Test ohne angelegten Strom: 30V/m von 80 bis 2000MHz; Ladungsimpuls: Am Strom- und Eingangsspannungsmesskreis: 4kV. Leiterstörungsimmunität: 10V/m von 150KHz bis 80MHz. Überspannungsfestigkeit: Strom- und Eingangsspannungsmesskreis: 4kV; an „L" Hilfsstromversorgungsein-gang: 1kV; Störausstrahlung Gemäß CISPR 22. **Standardkonformität:** Sicherheit: IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Messungen: EN62053-21, EN62053-23, EN50470-3. MID "Anhang MI-003". Impulsausgang: DIN43864, IEC62053-31. Zulassungen: CE, cULus "Listed". **Anschlüsse:** Schraubklemmen, Kabelquerschnitt: 2,5 mm2. Min./Max. Anzungsmoment: 0,4 Nm / 0,8 Nm. Empfohlene Anzungsmoment: 0,5 Nm. **Gehäuse DIN** Abmessungen (LxHxB): 96x96x50mm. Tiefe hinter der DIN-Schiene Mit 3 Modulen (A+B+C): 81,7 mm. Material ABS, selbstlöschend: UL 94 V-0. Montage: DIN-Schiene. **Schutzgrad**: Vorderseite, IP65, NEMA4x, NEM12. Schraubenklemmen: IP20.

FRANÇAIS

Entrées nominales. Type de réseau: 1, 2 ou 3-phases. Type de courant: Isolation galvanisée par TC incorporé. Plage de courant (par TC) AV5 et AV6: 5(6)A. AV4 et AV7: 1(2)A. Tension direct ou par TT/TP AV4, AV5: 400/690VLL; AV6, AV7: 100/208VLL. **Précision** (Afficheur + RS485) (@25°C ±5°C, H.R. ≤60%, 48 à 62 Hz) In: voir ci-dessous, Un: voir ci-dessous, Modèle AV4 In: 1A, Imax: 2A; Un: 160 à 480VLN (277 à 830VLL). Modèle AV5 In: 5A, Imax: 6A; Un: 160 à 480VLN (277 à 830VLL). Modèle AV6 In: 5A, Imax: 6A; Un: 40 à 144VLN (70 à 250VLL). Modèle AV7 In: 1A, Imax: 2A; Un: 40 à 144VLN (70 à 250VLL). Courant modèles AV4, AV5, AV6, AV7. De 0,01In à 0,5In: ±(0,5% RDG +2DGT). De 0,05In à Imax: ±(0,2% RDG +2DGT). Tension phase-neutre, Dans l'intervalle Un: ±(0,2% RDG +1DGT). Tension phase-phase, Dans l'intervalle Un: ±(0,5% RDG +1DGT). Fréquence: ±0,1Hz (45 à 65Hz). Puissance active et apparente: 0,01In à 0,05In, PF 1: ±(1%RDG+1DGT). De 0,05In à Imax, PF 0,5L, PF1, PF0,8C: ±(0,5%RDG+1DGT). Facteur de puissance: ±[0,001+0,5%(1,000 - "PF RDG")]. Puissance réactive: 0,1In à Imax, senφ 0,5L/C: ±(1%RDG+1DGT). 0,05In à 0,1In, senφ 0,5L/C: ±(1,5%RDG+1DGT). 0,05In à Imax, senφ 1: ±(1%RDG+1DGT). 0,02In à 0,05In, senφ 1: ±(1,5%RDG+1DGT). Energie active: Classe 0,5 selon EN62053-22, ANSI C12.20. Classe C selon EN50470-3. Energie réactive: Classe 1 selon EN62053-23, ANSI C12.1. Courant de démarrage AV5, AV6: 5mA. Courant de démarrage AV4, AV7: 1mA. **Erreurs additionnelles énergie:** Selon EN62053-22, ANSI C12.20. Quantités influentes: Classe B ou C selon EN50470-3, EN62053-23, ANSI C12.1. **Distorsion harmonique totale (THD):** ±1% PE (PE: 100%); Phase: ±2°; Imin: 5mA RMS; Imax: 15Ap; Umin: 30VRMS; Umax: 585Vp Détection des harmoniques importées et exportées. **Demand de distorsion total (TDD):** ±1% PE (PE: 100%). Imin: 5mA RMS; Imax: 15Ap; Umin: 30VRMS; Umax: 585Vp. **K-Facteur et Facteur K** ±(0,5%RDG+1DGT). **Dérive de température:** ≤200ppm/°C. **Taux d'échantillonnage:** 3200 échantillons/s @ 50Hz, 3840 échantillons/s @ 60Hz. **Mesures,** méthode: mesures TRMS de formes d'ondes déformées. Type de raccordement: au moyen d'un TC. **Facteur de crête:** AV5, AV6: ≤3 (15A pic max), AV4, AV7: ≤3 (3A pic max). **Surcharges de courant:** continu (AV5 et AV6) 6A, @ 50Hz/60Hz, Continu (AV4) 2A, @ 50Hz/60Hz. Pour 500ms (AV5 et AV6) 120A, @ 50Hz/60Hz. Pour 500ms (AV4 et AV7) 40A, @ 50Hz/60Hz. **Surcharges de tension,** continu 1,2 Un. Pour 500ms 2 Un. **Impédance d'entrée:** 400VL-L (AV4 et AV5) > 1,6MΩ. 208VL-L (AV6 et AV7) > 1,6MΩ. 5(10)A (AV5 et AV6) < 0,2VA. 1(2)A (AV4 et AV7) <0,2VA. **Fréquence:** 40 à 440 Hz. **Compteurs:** total 4 (10 digit). Partiel 4 (10 digit). **Sortie impulsions:** raccordement possible aux compteurs d'énergie totale et/ou partielle. **Enregistrement du comptage d'énergie:** enregistrement du comptage d'énergie totale et partielle. Enregistrement du comptage d'énergie (EEPROM). Min. -9,999,999,999.9 kWh/kvarh. Max. 9,999,999,999.9 kWh/kvarh. **Compteurs d'énergie:** compteurs d'énergie totale +kWh, +kvarh, -kWh, -kvarh. Compteurs d'énergie partielle +kWh, +kvarh, -kWh, -kvarh. **Principe d'analyse:** FFT. **Mesure des harmoniques:** courant, jusqu'à la 32ème harmonique. Tension, jusqu'à la 32ème harmonique. **Type d'harmoniques:** THD (VL1 et VL1-N) THD impaire (VL1 et VL1-N) THD paire (VL1 et VL1-N) TDD. Identique pour les autres phases: L2, L3. THD (AL1) THD impaire (AL1) THD paire (AL1). Identique pour les autres phases: L2, L3. **Version auto-alimentée:** H: 90 à 265VCA/CC; L: 19 à 60VCA (48 à 62Hz) et 21,6 à 60VCC. **Version auto-alimentée selon UL:** 100 à 240VCA +10% -15% 100 à 240VCC +10% -20% 24 à 48VCA +10% -15% 24 à 48VCC +10% -20%. **Consommation d'énergie:** CA: 20 VA; CC: 10 W. **Température de fonctionnement** -25°C à +55°C (-13°F à 131°F) (H.R. de 0 à 90% sans condensation @ 40°C) selon EN62053-21, EN50470-1 and EN62053-23. **Température de stockage** -30°C à +70°C (-22°F à 158°F) (H.R. < 90% sans condensation @ 40°C) selon EN62053-21, EN50470-1 and EN62053-23. **Catégorie d'installation** Cat. III (IEC60664, EN60664). **Tension diélectrique:** 4kVCA RMS pour 1 minute. **Émission de bruit** CMRR 100 dB, 48 à 62 Hz . **CEM:** selon EN62052-11. Décharges électrostatiques 15kV décharge atmosphérique. Immunité à l'irradiation: test avec courant: 10V/m de 80 à 2000MHz. Champs électromagnétiques: test sans aucun courant: 30V/m de 80 à 2000MHz. Transitoires: sur circuit d'entrées de mesure courant et tension: 4kV. Immunité aux bruits par conduction 10V/m de 150KHz à 80MHz. Surtension: sur circuit d'entrées de mesure courant et tension: 4kV; sur entrée d'alimentation auxiliaire « L » : 1kV; suppression fréquence radio, selon CISPR 22. **Conformité aux standards:** sécurité IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Métrologie: EN62053-21, EN62053-23, EN50470-3. MID "annexe MI-003". Sortie impulsion DIN43864, IEC62053-31. **Approbations:** CE, cULus "Listed". **Connexions:** À vis, Section de câbles max. 2,5 mm2. Min./Max. couple de serrage de vis: 0,4 Nm / 0,8 Nm. Couple de serrage de vis recommandé: 0,5Nm. **Boîtier DIN** Dimensions (LxHxD): 96x96x50mm. Profondeur max. derrière le panneau. Avec 3 modules (A+B+C): 81,7 mm Matériau ABS, autoextinguible: UL 94 V-0. Montage: montage sur panneau. **Indice de protection:** face avant IP65, NEMA4x, NEM12. Terminaisons de vis IP20.

ESPAÑOL

Entradas de medida. Tipo de sistema: monofásico, bifásico, trifásico. Tipo de entr. de intensidad: aislamiento galvánico mediante CT incorporado. Escala de intens. (mediante CT) AV5 y AV6: 5(6)A. AV4 y AV7: 1(2)A. Tensión (conex. directa o con VT/PT) AV4, AV5: 400/690VLL; AV6, AV7: 100/208VLL. **Precisión** (Display + RS485) (a 25°C ±5°C, H.R. ≤60%, 48 a 62 Hz) In: ver abajo, Vn: ver abajo. Modelo AV4 In: 1A, Imax: 2A; Vn: 160 a 480VLN (277 a 830VLL). Modelo AV5 In: 5A, Imax: 6A; Vn: 160 a 480VLN (277 a 830VLL). Modelo AV6 In: 5A, Imax: 6A; Vn: 40 a 144VLN (70 a 250VLL). Modelo AV7 In: 1A, Imax: 2A; Vn: 40 a 144VLN (70 a 250VLL). Intensidad modelos AV4, AV5, AV6, AV7 De 0,01In a 0,05In: ±(0,5% lec. +2díg) De 0,05In a Imax: ±(0,2% lec. +2díg). Tensión fase-neutro, en la escala Vn: ±(0,2% lec. +1díg). Tensión fase-fase En la escala Vn: ±(0,5% lec. +1díg). Frecuencia: ±0,1Hz (45 a 65Hz). Potencia activa y aparente: 0,01In a 0,05In, PF 1: ±(1%lec.+1díg). De 0,05In a Imax PF 0,5L, PF1, PF0,8C: ±(0.5%lec.+1díg). Factor de potencia (PF): ±[0,001+0,5%(1,000 - "PF lec.")]. Potencia reactiva: 0,1In a Imax, senφ 0,5L/C: ±(1%lec. +1díg). 0,05In a 0.1In, senφ 0,5L/C: ±(1,5%lec. +1díg). 0,05In a Imax, senφ 1: ±(1%lec. +1díg). 0,02In a 0,05In, senφ 1: ±(1,5%lec. +1díg). Energía activa: Clase 0,5 según norma EN62053-22, ANSI C12.20. Clase C según norma EN50470-3. Energía reactiva: Clase 1 según norma EN62053-23, ANSI C12.1. Intensidad de arranque: AV5, AV6 5mA. Intensidad de arranque: AV4, AV7 1mA. **Errores adicionales de energía:** según norma EN62053-22, ANSI C12.20. Influencia: Clase B o C según norma EN50470-3, EN62053-23, ANSI C12.1. **Distorsión armónica total (THD):** ±1% f.e. (f.e.: 100%). Fase: ±2°; Imin: 5mARMS; Imax: 15Ap; Vmin: 30VRMS; Vmax: 585Vp. Detección de armónicos consumidos y generados. **Distorsión de demanda total (TDD):** ±1% f.e. (f.e.: 100%) Imin: 5mARMS; Imax: 15Ap; Vmin: 30VRMS; Vmax: 585Vp. **K-Factor y factor K:** ±(0,5%lec.+1díg). **Deriva térmica:** ≤200ppm/°C. **Frecuencia de muestreo:** 3200 lecturas/s a 50Hz, 3840 lecturas/s a 60Hz. **Medidas,** método: medida TRMS de tensión/intensidad de una onda distorsionada. Tipo de conexión: mediante CT. **Factor de cresta:** AV5, AV6: ≤3 (pico máx 15A). AV4, AV7: ≤3 (pico máx 3A). **Protec. contra sobrecargas de intensidad:** Continua (AV5 y AV6) 6A, a 50Hz/60Hz. Continua (AV4) 2A, a 50Hz/60Hz. Durante 500ms (AV5 y AV6) 120A, a 50Hz/60Hz. Durante 500ms (AV4 y AV7) 40A, a 50Hz/60Hz. **Protec. contra sobrecargas de tensión:** Continua 1,2 Vn. Durante 500ms 2 Vn. **Impedancia de entrada:** 400VL-L (AV4 y AV5) >1,6MΩ. 208VL-L (AV6 y AV7) >1,6MΩ. 5(10)A (AV5 y AV6) <0,2VA 1(2)A (AV4 y AV7) <0,2VA. **Frecuencia** 40 a 440 Hz. **Medidores.** Total 4 (10 díg.). Parcial 4 (10 díg.). **Salida de pulsos**: se puede asociar a los medidores de energía totales y parciales. **Registro del medidor:** almacenamiento del los medidores parciales y totales. Formato de almacenamiento del medidor de energía (EEPROM), Mín. -9,999,999,999.9 kWh/kvarh. Máx. 9,999,999,999.9 kWh/kvarh. **Medidores de energía:** medidores de energía total +kWh, +kvarh, -kWh, -kvarh. Medidores de energía parcial +kWh, +kvarh, -kWh, -kvarh. **Método de análisis:** FFT. **Medida de armónicos:** Intensidad Hasta armónico nº32. Tensión: Hasta armónico nº32. **Tipo de armónicos:** THD (VL1 y VL1-N) THD impar (VL1 y VL1-N) THD par (VL1 y VL1-N) TDD. Lo mismo para las otras fases: L2, L3. THD (AL1) THD impar (AL1) THD par (AL1). Lo mismo para las otras fases: L2, L3. **Alimentación auxiliar:** H: 90 a 265VCA/CC; L: 19 a 60VCA (48 a 62Hz), 21,6 a 60VCC. **Alimentación auxiliar según UL:** 100 a 240VCA +10% -15% 100 a 240VCC +10% -20% 24 a 48VCA +10% -15% 24 a 48VCC +10% -20%. **Consumo de potencia:** CA: 20 VA; CC: 10 W. **Temperatura de trabajo:** -25°C a +55°C (-13°F a 131°F) (H.R. de 0 a 90% sin condensación a 40°C) según normas EN62053-21, EN50470-1 y EN62053-23. **Temperatura almacenamiento:** -30°C a +70°C (-22°F a 158°F) (H.R. de 0 a 90% sin condensación a 40°C) según normas EN62053-21, EN50470-1 y EN62053-23. **Categoría de la instalación:** Cat. III (IEC60664, EN60664). **Resistencia dieléctrica:** 4kVCA RMS durante 1 minuto. **Rechazo al ruido** CMRR 100 dB, 48 a 62 Hz. **Compatibilidad electromag. (EMC):** según norma EN62052-11. Descargas electrostáticas: 15kV en el aire. Inmunidad a los campos electromagnéticos: prueba con corriente: 10V/m de 80 a 2000MHz. Prueba sin corriente: 30V/m de 80 a 2000MHz. Ráfagas: en el circuito de entradas de medida de intensidad y tensión: 4kV. Inmunidad a las perturbaciones conducidas: 10V/m de 150KHz a 80MHz. Irrupción: en el circuito de entradas de medida de intensidad y de tensión: 4kV; en la entrada de alimentación auxiliar "L": 1kV. Emisiones de radiofrecuencia: según norma CISPR 22. **Conformidad con las normas:** Seguridad: IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Metrología: EN62053-21, EN62053-23, EN50470-3. MID según el a"anexo MI-003". Salida de pulso: DIN43864, IEC62053-31. **Homologaciones:** CE, cULus "Listed". **Conexiones:** A tornillo. Sección del cable máx. 2,5 mm2. Par de apriete mín./máx.: 0,4 Nm / 0,8 Nm. Par de apriete recomendado: 0,5 Nm. **Caja DIN** Dimensiones (Al. x An. x P.): 96x96x50mm. Máx. profundidad tras panel Con 3 módulos (A+B+C): 81,7 mm. Material: ABS, autoextingible: UL 94 V-0. Montaje: montaje a panel. **Grado de protección:** panel frontal IP65, NEMA4x, NEM12. Conexiones: IP20.

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WM40 IM ML 270510 MODULES cod. 8021031

Instruction Manual Modules WM40

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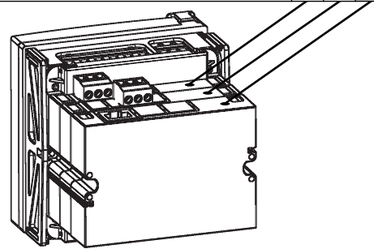
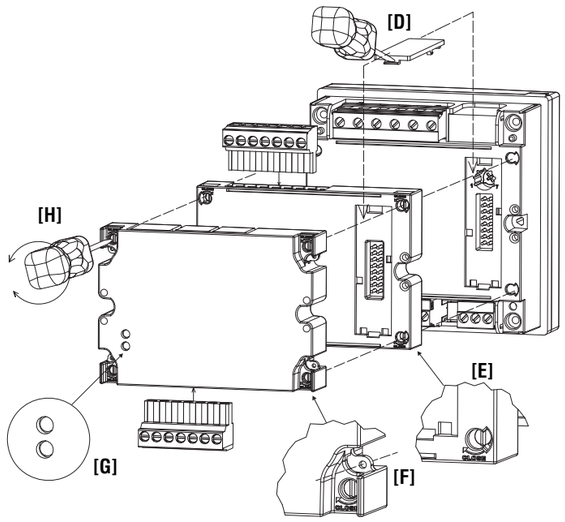
Gracias por elegir nuestros productos.

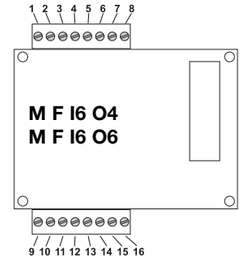
Merci d'avoir choisi nos produits.

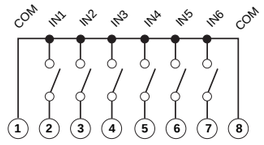
CE c UL US LISTED

Tab.1	A	B	C
M F I6 O6, [1], [2]		X	
M F I6 R4, [1], [3]		X	
M A T P, [4]		X	
M A T P N, [5]		X	
M C 485 232 M, [6], [7]			X
M C ETH M			X
M C BAC IP M			X

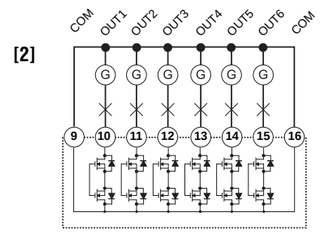








[1]



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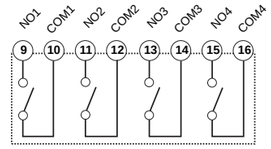
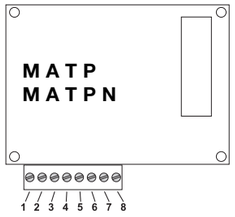
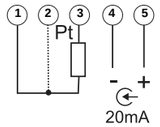
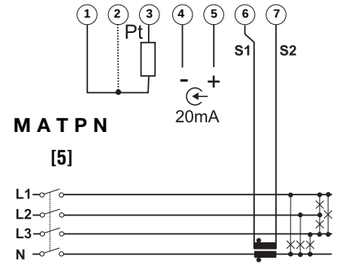


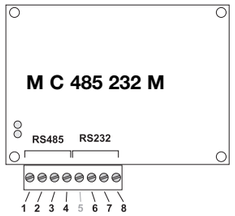
[3]

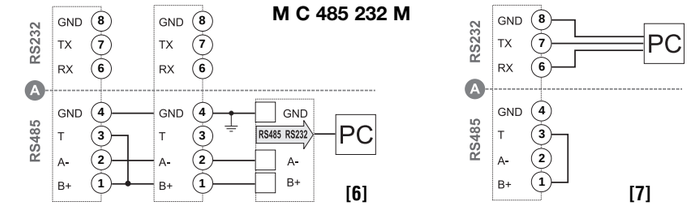




M A T P [4]







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] 6 digital inputs **[2]** 4 relay outputs **[3]** 6 opto mosfet outputs. **[4]** Pt, temperature input (2/3 wire) and 20mA DC input. **[5]** Pt, temperature input (2/3 wire), 20mA DC input with true neutral current measure input. **[6]** 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. **[7]** RS232 serial port. **IMPORTANT:** the termination must be done by means of a jumper between B+ and T.

Ⓐ: 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 o 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].**

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 serragio 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] 6 ingressi digitali. **[2]** 4 uscite relè. **[3]** 6 uscite opto mosfet. **[4]** Pt, ingresso sonda di temperatura (2/3 fili) e ingresso a 20mA CC. **[5]** Pt, ingresso sonda di temperatura (2/3 fili) e ingresso a 20mA CC, con ingresso di misura della vera corrente di neutro. **[6]** Uscita porte seriali RS485. **IMPORTANTE:** uletriori 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. **[7]** Uscita porte seriali RS232. **IMPORTANTE:** eseguire la terminazione mediante un ponticello tra i morsetti B+ e T.

Ⓐ: 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 fissagio 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 Klemmenschrauben 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] 6 Digitaleingänge. **[2]** 4 Relaisausgänge. **[3]** 6 opto mosfet Ausgänge. **[4]** Pt, und Temperatureingang (2/3 Adern) und 20mA DC Eingang. **[5]** Pt, und Temperatureingang (2/3 Adern), 20mA DC Eingang mit Neutralstrommessungeingang. **[6]** 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. **[7]** Ausgang serielle RS232-Anschlüsse. WICHTIG: Der Endverschluss muss mit einer Überbrückung zwischen den Klemmen B+ und T durchgeführt werden.

Ⓐ: 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] 6 entrées logiques. **[2]** 4 **sorties relais**. **[3]** 6 **sorties** opto mosfet. **[4]** Pt, entrée de température (2/3 câbles) et entrée 20mA CC. **[5]** Pt, entrée de température (2/3 câbles), entrée 20mA CC avec entrée de mesure de courant neutre. **[6]** 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.

[7] Sortie ports série RS232. IMPORTANT: procéder à la terminaison au moyen d'un cavalier entre les bornes B+ et T.

Ⓐ: 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.

ATENCIÓN: 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] 6 salidas digitales. **[2]** 4 salidas relé. **[3]** 6 salidas opto mosfet. **[4]** Pt, entrada de temperatura (2/3 hilos) y entrada 20mA CC. **[5]** Pt, entrada de temperatura (2/3 hilos), entrada 20mA CC con entrada de medida de intensidad neutro. **[6]** Salida de puerto serie RS485. IMPORTANTE: Instrumentos adicionales dotados de RS485 se conectan en paralelo. La terminación de la salida serie sólo debe realizarse en el último instrumento de la red mediante un puente entre B+ y T. **[7]** Salida de puerto serie RS232. IMPORTANTE: realice la terminación mediante un puente entre B+ y T.

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

Para CONECTAR los módulos con salida ethernet o BACnet-IP utilice el conector RJ45.

[G] El módulo de comunicación está dotado de LEDs que señalan el estado de comunicación RX o TX.

Operación preliminar: desmonte la ventana de protección de los contactos **[D]**, utilizando su propio destornillador de punta plana.

Bloqueo y sellado de los módulos: para bloquear los módulos gire en el sentido de las agujas del reloj los específicos elementos de fijación de los extremos de los módulos **[E]**, **[F]**, utilizando un adecuado destornillador de punta plana **[H]**. Para sellar el equipo use los orificios específicos **[F].**

Tab. 2	A	B	C	D	E	F	G
A	-	4kV	4kV	4kV	4kV	4kV	4kV
B	4kV	2kV	NA	4kV	4kV	4kV	4kV
C	4kV	NA	2kV	4kV	4kV	4kV	4kV
D	4kV	4kV	4kV	-	4kV	4kV	4kV
E	4kV	4kV	4kV	4kV	0kV	4kV	4kV
F	4kV	4kV	4kV	4kV	4kV	-	4kV
G	4kV	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= Digital inputs - Ingressi digitali - Digitaleingänge - Entrées logiques - Entradas digitales
G= Power supply - Alimentazione - Hilfsstromversorgung - Alimentation auxiliaire - Alimentación aux.

ENGLISH

M F I6 R4. Relay Outputs: physical outputs 4 (max. one module per instrument). Purpose, for either pulse output or alarm output. Type Relay, SPST type, AC 1-5A @ 250VAC; AC 15-1A @ 250VAC. Configuration, only by means of the programming software WM40Soft. In this latter case using either the serial communication port or the front optical port. **Digital inputs.** Number of inputs: 6 (voltage-free contacts). Purpose: contact status reading. "dmd" measurements synchronisation and clock synchronisation. Energy tariff selection. Utility meter counters. Trip counter. Remote input disable. Interfacing with watt-hour meters (+kWh, +kvarh, -kWh, -kvarh). Input frequency: 20Hz max, duty cycle 50%. Prescaler adjustment: from 0.1 to 999.9 m3 or kWh/pulse. Open contact voltage: ≤3,3. Contact meas. current: <1mADC. Input impedance 680Ω. Contact resistance: ≤300Ω closed contact ≥50kΩ open contact.

M F I6 O6. Static Outputs: physical outputs: 6 (max. one module per instrument). Purpose: for either pulse output or alarm output. Type of outputs Opto-Mos. Signal: VON: 2.5VDC max.100mA; VOFF: 42 VDC. Pulse type, programmable from 0.001 to 10.00 kWh/kvarh per pulse. Outputs connectable to the energy meters (kWh/kvarh). Pulse duration: ≥100ms <120msec (ON), ≥120ms (OFF), according to EN62052-31. **Digital Inputs:** as digital inputs of M F I6 R4.

M A T P (N). Temperature and Process signal inputs, In measuring. Number of inputs 1. Accuracy (@25°C ±5°C, R.H. ≤60%, 48 to 62 Hz) ±(0.5%RDG +5DGT). Temperature drift: ≤150ppm/°C. Temperature probe: Pt100, Pt1000. Number of wires: 2 or 3-wire connection. Wire compensation Up to 10Ω. Engineering unit: selectable °C or °F. Process signal. Number of inputs: 1. Accuracy (Display + RS485) ±(0.1%RDG+1DGT) 0% to 25% FS; ±(0.1%RDG+2DGT) 25% to 110% FS. Temperature drift: ≤150ppm/°C. Process signal input: -20mA to +20mADC. Signal overload continuous: 50mADC. For 1 s.: 150mADC. Input impedance: ≤22Ω(<12Ω). Min. and Max. indication: -9.999 to +9999 fully programmable scaling with decimal point positioning. Module with true neural current input (M A T P N) In: 1A. Accuracy (Display + RS485) from 0.002In to 0.2In: ±(0.2% RDG +1DGT), from 0.2In to 1,2 In: ±(0.2% RDG +1DGT). Temperature drift ≤150ppm/°C. Measuring input type: to be connected to external current transformer. Transformer ratio: up to 10kA (10,000 max). Crest factor: ≤3 (3A max. peak). Current Overloads: continuous 1,2A, @ 50Hz. For 500ms: 10A, @ 50Hz. Input impedance < 0.5Ω. Frequency: 45 to 65 Hz.

M C 485 232 M, RS485/232 port with data stamping and event recording memory. Type: multidrop, bidirectional (static and dynamic variables). Connections: 2-wire. Max. distance 1000m, termination directly on the module. Addresses: 247, selectable by means of the front key-pad. Protocol: MODBUS/JBUS (RTU). Data (bidirectional), dynamic (reading only). Static (reading and writing only) all the configuration parameters. Data format: 1 start bit, 8 data bit, no/even/odd parity,1 stop bit. Baud-rate, selectable: 9.6k, 19.2k, 38.4k, 115.2k bit/s. Driver input capability 1/5 unit load. Maximum 160 transceivers on the same bus.

RS232 port. Type: bidirectional (static and dynamic variables). Connections 3 wires. Max. distance 15m. Protocol: MODBUS RTU /JBUS. Data (bidirectional). Dynamic (reading only). Static (reading and writing only), all the configuration parameters. Data format 1 start bit, 8 data bit, no/even/odd parity,1 stop bit. Baud-rate, selectable: 9.6k, 19.2k, 38.4k, 115.2k bit/s.

M C ETH M, Ethernet/Internet port with data stamping and event recording memory. Protocols: Modbus TCP/IP. IP configuration: Static IP / Netmask / Default gateway. Port selectable (default 502). Client connections: Max 5 simultaneously. Connections: RJ45 10/100 BaseTX. Max. distance 100m. Data (bidirectional): dynamic (reading only) system and phase variables. Static (reading and writing only): all the configuration parameters.

M C BAC IP M, BACnet-IP with data stamping and event recording memory. Protocols: BACnet-IP (for measurement reading purpose) and Modbus TCP/IP (for measurement reading purpose and for programming parameter purpose). IP configuration Static IP / Netmask / Default gateway. BACnet-IP Port. Fixed: BAC0h. Modbus Port Selectable (default 502). Client connections: modbus only: max 5 simultaneously. Connections RJ45 10/100 BaseTX Max. distance 100m. Data dynamic (reading only). System and phase variables (BACnet-IP and Modbus). Static (reading and writing only), all the configuration.

Operating temperature -25°C to +55°C (-13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C) according to EN62053-21, EN50470-1 and EN62053-23. **Storage temperature** -30°C to +70°C (-22°F to 158°F) (R.H. < 90% non-condensing @ 40°C) according to EN62053-21, EN50470-1 and EN62053-23. **Installation category** Cat. III (IEC60664, EN60664). **Dielectric strength** 4000 VRMS for 1 minute. **Noise rejection** CMRR 100 dB, 48 to 62 Hz. **EMC** according to EN62052-11. Electrostatic discharges: 15kV air discharge. Immunity to irradiated: test with current: 10V/m from 80 to 2000MHz. Electromagnetic fields: test without any current: 30V/m from 80 to 2000MHz. Burst: on current and voltage measuring inputs circuit: 4kV. Immunity to conducted disturbances: 10V/m from 150KHz to 80MHz. Surge: on current and voltage measuring inputs circuit: 4kV; on "L" auxiliary power supply input: 1kV. Radio frequency suppression: according to CISPR 22. **Standard compliance:** safety: IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Metrology EN62053-21, EN62053-23, EN50470-3. Pulse output: DIN43864, IEC62053-31. **Approvals:** CE, cULus "Listed". **Connections:** Screw-type. Cable cross-section area: max. 2.5 mm2. Min./max. Screws tightening torque: 0.4 Nm / 0.8 Nm. Suggested: 0.5 Nm. **Housing** dimension: "A" and "B" type modules: 89.5x63x16mm. "C" type module: 89.5x63x20mm. Max. depth behind the panel. With 3 modules (A+B+C): 81.7 mm. Material, ABS, self-extinguishing: UL 94 V-0. **Protection degree,** front: IP65, NEMA4x, NEM12. Screw terminals: IP20.

ITALIANO

M F I6 R4. Uscite relè: uscite fisiche: 4 (un modulo massimo per strumento) Utilizzo:uscita impulsi ed uscita allarme. Tipo: relè, tipo SPST AC 1-5A @ 250VCA; CA 15-1A @ 250VCA. Confgurazione: solo mediante il software di programmazione WM40Soft. In questo ultimo caso si utilizzano entrambe le porte di comunicazione, seriale o porta ottica.

Ingressi digitali: numero di ingressi: 6 (contatti liberi da tensione). Utilizzo: lettura stato contatti. sincronizzazione misure "dmd" e sincronizazzione dell'ora. Selezione delle tariffa dell'energia. Contatori gas ed acqua. Contatore Trip. Ingresso remoto disabilitato. Interfacciamento con i contatori watt-ora (+kWh, +kvarh, -kWh, -kvarh). Frequenza d'ingresso: 20Hz max, duty cycle 50%. Regolazione del prescaler: da 0,1 a 999,9 m^3 o kWh/pulse. Tensione contatto aperto: ≤3,3VCC. Corrente contatto chiuso: <1mACC. Impedenza d'ingresso: 680Ω. Resistenza del contatto: ≤300W contatto chiuso,≥50kW contatto aperto.

M F I6 O6. Uscite statiche. Uscite fisiche: 6 (un modulo massimo per strumento) Utilizzo: uscita impulsi ed uscita allarme. Tipo delle uscite: Opto-Mos. Segnale: V_{ON}: 2,5VCC max.100mA V_{OFF}: 42VCC max. Funzione: le uscite possono funzionare come allarmi avanzati e come uscite a controllo remoto o in qualsiasi altra combinazione. Ritrasmissione del segnale: totale: +kWh, -kWh, +kvarh, -kvarh. Parziale: +kWh, -kWh, +kvarh, -kvarh Tariffa: +kWh, -kWh, +kvarh, -kvarh. Le variabili disponibili sono associabili ad ogni uscita. Tipo d'impulso: programmabile da 0,001 a 10,00 kWh/kvarh per impulso. Uscite collegabili ai contatori di energia (kWh/kvarh). Durata impulso:≥100ms <120ms (ON), ≥120ms (OFF), secondo EN62052-31. **Ingressi digitali:** vedi uscite digitali in M F I6 R4.

M A T P (N). Ingressi di temperatura e segnale di processo, misura In. Numero di ingressi: 1. Precisione (Display + RS485): vedere tabella dedicata. Deriva termica: ≤150ppm/°C. Sonda di temperatura: Pt100, Pt1000. Numero di fili: connessione a 2 o 3 fili. Compensazione: fino a 10Ω. Unità ingegneristica: selezionabile °C o °F. Segnale di processo. Numero di ingressi: 1. Precisione (Display + RS485): ±(0,1%RDG+1DGT) da 0% a 25% FS; ±(0,1%RDG+2DGT) da 25% a 110% FS. Deriva termica: ≤150ppm/°C. Ingresso segnale di processo: da -20mA a +20mACC. Sovraccarico del segnale: continuo: 50mACC, per 1 s.: 150mACC. Impedenza d'ingresso: ≤22Ω (<12Ω). Indicazione Min. e Max.: da -9999 a +9999 completamente programmabile scaling con posizionamento del punto decimale. Modulo con ingresso per la corrente di neutro (M A T P N): In: 1A. Precisione (Display + RS485): da 0,002In a 0,2In: ±(0,2% RDG +1DGT) da 0,2In a 1,2 In: ±(0,2% RDG +1DGT). Deriva termica: ≤150ppm/°C. Tipo misura d'ingresso: mediante trasformatore di corrente. Rapporto amperometrico: fino a 10kA (10.000 max). Fattore di cresta:≤3 (3A max. picco). Sovraccarico di corrente: continuo 1,2A, @ 50Hz, per 500ms: 10A, @ 50Hz. Impedenza di ingresso: < 0.5ΩVA. Frequenza: da 45 a 65 Hz.

Porta RS485/RS422 (a richiesta). Tipo: Multidrop, bidirezionale (variabili statiche e dinamiche). Connessione 2 fili. Distanza massima 1000m, terminazione direttamente sullo strumento. Indirizzi 247, selezionabili mediante tastiera frontale. Protocollo MODBUS/JBUS (RTU). Dati (bidirezionali) dinamici (solo lettura), variabili di sistema e di fase. Statici (lettura e scrittura) tutti i parametri di configurazione. Formato dati: 1 bit di start, 8 bit di dati, nessuna parità, 1 bit di stop. Velocità di comunicazione selezionabile: 9,6k, 19,2k, 38,4k, 115,2k bit/s. Dispositivi in rete 1/5 unit load. Massimo 160 dispositivi nella stessa rete.

Porta RS232 (a richiesta). Tipo: bidirezionale (variabili statiche e dinamiche). Connessioni 3 fili. Distanza max. 15m. Protocollo MODBUS RTU /JBUS. Dati (bidirezionali) dinamici (solo lettura) variabili di sistema e di fase. Statici (lettura e scrittura) tutti i parametri di configurazione. Formato dati: 1 bit di start, 8 bit di dati, nessuna parità, 1 bit di stop. Velocità di comunicazione selezionabile: 9,6k, 19,2k, 38,4k, 115,2k bit/s. Dispositivi in rete 1/5 unit load. Massimo 160 dispositivi nella stessa rete.

Porta Ethernet/Internet (a richiesta). Protocollo Modbus TCP/IP. Configurazione IP: IP statico / Netmask / Gateway di default. Porta selezionabile (default 502). Connessioni utente Max 5 simultaneii. Connessioni RJ45 10/100 BaseTX. Distanza max 100m. Dati (bidirezionali) Dinamici (solo lettura) variabili di sistema e di fase. Statici (lettura e scrittura) tutti i parametri di configurazione.

BACnet-IP (a richiesta). Protocollo BACnet-IP (per la lettura delle misure) e Modbus TCP/IP (per la lettura delle misure e la programmazione dei parametri). Configurazione IP: IP statico / Netmask / Gateway di default: Porta BACnet-IP. Fisso: BAC0h. Porta Modbus selezionabile (default 502). Connesioni utenti, solo Modbus: max 5 simultaneii. Connessioni: RJ45 10/100 BaseTX. Distanza max 100m. Dati (bidirezionali) dinamici (solo lettura) variabili di sitema e di fase (BACnet-IP e Modbus). Statici (lettura e scrittura) tutti i parametri di configurazione.

Temperatura di funzionamento da -25°C a +55°C (da -13°F a 131°F) (U.R. da 0 a 90% senza condensa @ 40°C) secondo EN62053-21 e EN62053-23. **Temperatura di immagazzinamento** da -30°C a +70°C (da -22°F a 140°F) (U.R. < 90% senza condensa @ 40°C) secondo EN62053-21 e EN62053-23. **Categoria di installazione:** Cat. III (IEC60664, EN60664). **Isolamento (per 1 minuto)** 4000 VRMS tra ingressi di misura ed alimentazione. 4000 VRMS tra alimentazione e RS485/uscite digitali. **Rigidità dielettrica** 4000 VRMS per 1 minuto. **Reiezione** CMRR 100 dB, da 48 a 62 Hz. **EMC** secondo EN62052-11. Scariche elettrostatiche 15kV scarica in aria; Immunità campi elettromagnetici irradianti, provato con corrente applicata: 10V/m da 80 a 2000MHz; provato senza corrente applicata: 30V/m da 80 a 2000MHz. Immunità ai transitori veloci, sui circuiti degli ingressi di misura in corrente e tensione: 4kV. Immunità ai radiodisturbi condotti: 10V/m da 150KHz a 80MHz. Immunità ad impulso, sui circuiti degli ingressi di misura in corrente e tensione: 4kV; sull'alimentazione "L": 1kV. Emissioni in radiofrequenza: secondo CISPR 22. **Conformità alle norme**: sicurezza IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Metrologia: EN62053-21, EN50470-3, EN62053-23. Uscita impulsiva DIN43864, IEC62053-31. Approvazioni: CE, cULus listed. **Connessioni:** a vite. Sezione del cavo: max. 2,5 mm2. Coppia min./max serraggio: 0,4 Nm / 0,8 Nm. Consigliata: 0,5 Nm. **Custodia:** dimensioni (LxAxP). Moduli tipo "A" e "B": 89,5x63x16mm. Modulo tipo "C": 89,5x63x20mm. Ingombro massimo dietro il pannello Con 3 moduli (A+B+C): 81,7 mm. Materiale: nylon PA66, autoestinguenza: UL 94 V-0. Montaggio a pannello. **Grado di protezione:** frontale: IP65, NEMA4x, NEM12. Morsetti: IP20.

DEUTSCH

M F I6 R4. Relaisausgänge: Physisch Ausgänge: 4 (max. 1 Modul pro Netzwerk) Funktionsbereich: für Alarm oder Impulsausgang. Typ: Relais, SPDT Typ AC 1-5A bei 250VAC; AC 15-1A bei 250VAC. Konfiguration: nur mittels der Programmier-Software WM30Soft. Im letzteren Fall entweder unter Verwendung des seriellen Kommunikationsports oder des optischen optische vordere Kommunikations-Schnittstelle.

Digitale Eingänge: Anzahl der Eingänge 6 (spannungsfrei). Zweck: Kontaktstatusanzeige "dmd"-Messungen Synchronisation und Uhrsynchronisation. Tarifauswahl: Energie. Verbrauchszähler. Auslösezähler. Ferneingangsausschaltung. Schnittstelle mit Watt-Stunden-Zählern (+kWh, +kvarh, -kWh, -kvarh). Eingangsfrequenz: 20Hz max, Tastverhältnis 50% Multiplikator: von 0.1 bis 999,9 m^3 oder kWh pro Impuls. Steuerspannung: ≤3,3 VDC. Steuerstrom: <1mADC. Eingangsimpedanz: 680Ω. Kontaktwiderstande: ≤300Ω geschlossener Kontakt≥50kΩ offener Kontakt.

M F I6 O6. Statikausgang: Physisch Ausgänge: 6 (max. 1 Modul pro Netzwerk). Funktionsbereich: für Alarm- oder Impulsausgang. Ausgangstyp: Opto-Mos. Signal: V_{ON}:2.5VDC max.100mA V_{OFF}: 42 VDC. Funktion: Die Ausgänge können als Alarmausgänge benutzt werden, aber auch als Impulsausgänge, ferngesteuerte Ausgänge oder in jeder anderen beliebigen Kombination. Signalweiterübertragung: Gesamt: +kWh, -kWh, +kvarh, -kvarh. Partiell : +kWh, -kWh, +kvarh, -kvarh. Tarif: +kWh, -kWh, +kvarh, -kvarh. Die verfügbaren Messgrößen können mit einem beliebigen Ausgang verknüpft werden. Impulstyp: programmierbar von 0,001 bis 10,00 kWh/kvarh pro Impuls. Ausgänge an Energiezähler anschließbar (kWh/kvarh). Impulsdauer:≥100ms <120msec (ON), ≥120ms (OFF), gemäß EN62052-31. **Digitale Eingänge**: siehe Digitale Eingänge von M F I6 R4.

M A T P (N). Temperatur- und Prozesssignaleingänge, In-Messung: Anzahl der Eingänge: 1. Genauigkeit (Anzeige+RS485) siehe Tabelle oben. Temperaturbewegung: ≤150ppm/°C. Temperatursonde: Pt100, Pt1000. Anzahl der Leiter: 2 oder 3-Leiter Anschlus. Aderausgleich: bis zu10Ω. Technische Einheit wählbar: °C oder °F. Prozesssignal: Anzahl der Eingänge: 1. Genauigkeit : (Anzeige+RS485) ±(0.1%RDG+1DGT) 0% bis 25% FS; ±(0.1%RDG+2DGT) 25% bis 110% FS. Temperaturbewegung: ≤150ppm/°C. Prozesssignaleingang: -20mA bis +20mADC. Überlastsignal: Dauer: 50mADC Für 1 s.: 150mADC. Eingangsimpedanz: ≤22Ω (<12Ω). Max. und Min. Anzeige: -9999 bis +9999 voll skalierbar mit Dezimalstellenpositionierung. Modul mit Neutralstrom-eingang (M A T P N) In: 1A. Genauigkeit (Anzeige+RS485): von 0.002In bis 0.2In: ±(0.2% RDG +1DGT) Von 0.2In bis 1,2 In: ±(0.2% RDG +1DGT). Temperaturbewegung: ≤150ppm/°C. Eingangsmessung: müssen externe Stromwandler angeschlossen werden. Wandlerverhältnis: bis zu 10kA (10,000 max). Scheitelwertfaktor: 3 (3A Höchstspitze). Überlaststrom: Dauer 1,2A, @ 50Hz. Für 500ms: 10A, @ 50Hz. Eingangsimpedanz: < 0,5Ω. Frequenz: 45 bis 65 Hz.

M C 485 232 M, RS485/RS422 Schnittstelle mit Datenausdruck und Ereignis-Aufzeichnungspeicher: Typ: Multidrop, Bidirektional (Statik- und Dynamikgrößen). Anschlüsse: 2-Leiter. Max. Entfernung 1000m, Abschluss direkt am Modul. Adressen: 247, wählbar über die vordere Tastatur. Protokoll: MODBUS/JBUS (RTU) Datenübertragung (bidirektional) Dynamisch (nur lesen) System und Phasengrößen. Statisch (lesen und schreiben): Alle Konfigurations Parameter. Datenformat: 1-Startbit, 8-Datenbits, keine Parität/gerade Parität, ungerade Parität, 1 Stoppbit, Übertragungsgeschwindigkeit. Wählbar: 9,6k, 19,2k, 38,4k, 115,2k bit/s. Treiber Eingangsimpetanz 1/5 Leistungsaufnahme Maximal Geräte 160 am gleichen Bus. **Schnittstelle RS232:** Typ: Bidirektional (Statik- und Dynamikgrößen). Anschlüsse: 3-Leiter. Max. Entfernung 15m. Protokoll: MODBUS RTU /JBUS. Datenübertragung (bidirektional) Dynamisch (nur lesen): System und Phasengrößen. Statisch (lesen und schreiben): Alle Konfigurations Parameter. Datenformat: 1-Startbit, 8-Datenbits, keine Parität/gerade Parität, ungerade Parität, 1 Stoppbit, Übertragungsgeschwindigkeit. Wählbar: 9,6k, 19,2k, 38,4k, 115,2k bit/s.

M C ETH M, Ethernet/Internet Schnittstelle mit Datenausdruck und Ereignis-Aufzeichnungspeicher: Protokoll: Modbus TCP/IP. IP Konfiguration: Statisch IP / Netzmaske / Standard-Gateway. Schnittstelle: Wählbar (Standard 502). Client Verbindung: Max 5 gleichzeitig. Anschlüsse: RJ45 10/100 BaseTX, Max. Entfernung 100m. Daten (bidirektional). Dynamisch (nur lesen) System und Phasengrößen. Statisch (lesen und schreiben): Alle Konfigurations Parameter.

M C BAC IP M, BACnet-IP mit Datenausdruck und Ereignis-Aufzeichnungspeicher: Protokoll: BACnet-IP (für Messunganzeige) und Modbus TCP/IP (für Messunganzeige und Parameterprogrammierung). IP Konfiguration: Statisch IP / Netzmaske / Standard-Gateway. Schnittstelle: BACnet-IP. Fest: BAC0h. Modbus Schnittstelle: Wählbar (Standard 502). Client Verbindung: nur Modbus: Max 5 gleichzeitig. Anschlüsse: RJ45 10/100 BaseTX, Max. Entfernung 100m. Daten: Dynamisch (nur lesen): System und Phasengrößen (BACnet-IP und Modbus). Statisch (lesen und schreiben): Alle Konfigurations Parameter (nur Modbus).

Betriebstemperatur -25°C bis +55°C (-13°F bis 131°F) (R.F. von 0 bis 90% nicht kondensierend bei 40°C) gemäß EN62053-21, EN50470-1 und EN62053-23. **Lagertemperatur:** -30°C bis +70°C (-22°F bis 158°F) (R.F. < 90% nicht kondensierend bei 40°C) gemäß EN62053-21, EN50470-1 und EN62053-23. **Installationskategorie:** Kat. III (IEC60664, EN60664). **Durchschlagfestigkeit:** 4kVAC RMS für 1 Minute. **Rauschdrückungsverhältnis:** GTUV 100 dB, 48 bis 62 Hz. **EMC:** According to EN62052-11. Elektrostatische Entladungen: 15kV air discharge; Strahlungsimmunität: Test mit angelegten Strom: 10V/m von 80 bis 2000MHz; Elektromagnetfeld. Test ohne angelegten Strom: 30V/m von 80 bis 2000MHz; Ladungsimpuls: Am Strom- und Eingangsspannungsmesskreis: 4kV. Leiterstörungsimmunität: 10V/m von 150KHz bis 80MHz. Überspannungsfestigkeit: Strom- und Eingangsspannungsmesskreis: 4kV; an „L" Hilfsstromversorungseingang: 1kV; Störausstrahlung Gemäß CISPR 22. **Standardkonformität:** Sicherheit: IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Messungen: EN62053-21, EN62053-23, EN50470-3. MID "Anhang MI-003". Impulsausgang: DIN43864, IEC62053-31. Zulassungen: CE, cULus "Listed". **Anschlüsse:** Schraubklemmen, Kabelquerschnitt: 2,5 mm2. Min./Max. Anzungsmoment: 0,4 Nm / 0,8 Nm. Empfohlene Anzungsmoment: 0,5 Nm. **Gehäuse DIN** Abmessungen (LxHxB): "A" und "B" Module: 89,5x63x16mm. "C" Module: 89,5x63x20mm. Max. Tiefe hinter der DIN-Schiene Mit 3 Modulen (A+B+C): 81,7 mm. Material ABS, selbstlöschend: UL 94 V-0. Montage: DIN-Schiene. **Schutzgrad**: Vorderseite, IP65, NEMA4x, NEM12. Schraubenklemmen: IP20.

FRANÇAIS

M F I6 R4. Sortie relais: Sorties physiques: 4 (max. un module par instrument). Objectif: pour sortie d'alarme ou sortie à impulsions. Type: Relais, type SPDT CA 1-5A @ 250VCA; CA 15-1A @ 250VAC. Configuration: uniquement au moyen du logiciel de programmation WM40Soft. Dans ce dernier cas en utilisant n'importe quel port de communication série ou port de communication de type optique sur la face avant.

Entrées logiques: Nombre d'entrées: 6 (exemptes de tension). Fonction: lecture de l'état des contacts. Synchronisation des mesure "dmd" et synchronisation horloge. Sélection tarif énergie. Compteurs de Services. Compteur de déclenchement. Entrée à distance désactivée. Interfaçage avec wattheuremètres (+kWh, +kvarh, -kWh, -kvarh). Fréquence d'entrée: 20Hz max, cycle de marche 50%. Réglage du poids de l'impulsion: de 0.1 à 999,9 m^3 ou kWh par impulsions. Tens. contact ouvert: ≤3,3VCC. Cour. de contact fermé: 1mACC max. Impédance d'entrée: 680Ω. Résistance de contact:≤300Ω, contact fermé, ≥50kΩ, contact ouvert.

M F I6 O6. Sortie statiques: Sorties physiques: 6 (max. un module par instrument). Objectif: pour sortie d'alarme ou sortie à impulsions. Type de sorties: Opto-Mos. Signal: V_{ON}: 2,5VCC max.100mA V_{OFF}: 42 VCC max. Fonction: les sorties peuvent aussi fonctionner en tant que sorties d'alarme, sorties d'impulsion, sorties de contrôle à distance, ou d'autres combinations. Signal de retransmission: total: +kWh, -kWh, +kvarh, -kvarh. Partiel: +kWh, -kWh, +kvarh, -kvarh Tarif: +kWh, -kWh, +kvarh, -kvarh. Les variables mentionnées ci-dessus peuvent être connectées à n'importe quelle sortie.Type d'impulsion: programmable de 0,001 à 10,00 kWh/kvarh par impulsion. Les sorties peuvent être connectées à les compteurs d'énergie (kWh/kvarh). Durée d'impulsion:≥100ms <120msec (ON), ≥120ms (OFF), selon EN62052-31. **Entrées logiques:** voir entrées logiques de M F I6 R4.

M A T P (N). Entrées température et signal Processus, mesure In.: nombre d'entrées: 1. Précision (Affichage+RS485): voir le tableau ci-dessous. Dérive de température: ≤150ppm/°C. Sonde de température: Pt100, Pt1000. Nombre de conducteurs: raccordement 2 ou 3-conducteurs. Compensation du câble: jusqu'à 10Ω. Unité technique: sélectionnable °C ou °F. Signal de processus: nombre d'entrées: 1. Précision (Affichage+RS485): ±(0.1%RDG+1DGT) 0% a 25% FS; ±(0.1%RDG+2DGT) 25% a 110% FS. Dérive de température: ≤150ppm/°C. Entrée signal de processus: -20mA a +20mACC. Surcharge signal: en continu: 50mACC Pendant 1 s.: 150mACC. Impédance d'entrée: ≤22Ω(< 12Ω). Indication Max et Min.: -9999 à +9999 échelle complètement programmable avec positionnement du point décimal. Module avec entrée courant: neutre (M A T P N) In: 1A. Précision (Affichage+RS485): de 0.002In a 0.2In: ±(0.2% RDG +1DGT) de 0.2In a 1,2 In: ±(0.2% RDG +1DGT). Dérive de température: ≤150ppm/°C. Type d'entrées de mesure: doivent obligatoirement être connectés à des transformateurs de courant externe. Ratio du transformateur: jusqu'à 10kA (max 10,000). Facteur de crête:≤3 (pic max 3A). Surcharge de courant: en continu: 1,2A, @ 50Hz. Pendant 500ms: 10A, @ 50Hz. Impédance d'entrée: < 0,5Ω. Fréquence: 45 a 65 Hz.

Port M C 485 232 M, RS485/232 avec enregistrement de données et mémoire d' enregistrement des événements. Type, circuit multipoints, bidirectionnel (variables statiques et dynamiques). Connexions: 2 câbles, Distance max 1000m, Raccordement directement sur le module. Addresses 247, à sélectionner au moyen du clavier avant. Protocole: MODBUS/JBUS (RTU). Données (bidirectionnelles). Dynamiques (lecture seule) Statique (écriture et lecture). Tous les paramètres de configuration. Format de données: 1 bit de départ, 8 bits de données,pas de parité, parité paire, parité impaire, 1 bit de stop. Baud-rate: à sélectionner: 9,6k, 19,2k, 38,4k, 115,2k bit/s. Capacité entrée driver: 1/5 unités en charge. Maximum 160 emetteurs/ récepteurs sur le même bus. **Port RS232.** Type bidirectionnel (variables statiques et dynamiques). Connexions: 3 câbles, distance max 15m. Protocole: MODBUS RTU/ JBUS. Données (bidirectionnelles), dynamiques (lecture seule). Statique (écriture et lecture), tous les paramètres de configuration. Format de données: 1 bit de départ, 8 bits de données,pas de parité, parité paire, parité impaire, 1 bit de stop. Baud-rate: à sélectionner: 9,6k, 19,2k, 38,4k, 115,2k bit/s.

M C ETH M, Port Ethernet/Internet avec enregistrement de données et mémoire d' enregistrement des événements. Protocole: Modbus TCP/IP. Configuration IP: IP statique / Netmask / Portail implicite. Port: à sélectionner (implicite 502). Connexions client Max. 5 simultanément. Connexions: RJ45 10/100 BaseTX. Distance max 100m. Données (bidirectionnelles). Dynamiques (lecture seule). Statique (écriture et lecture). Tous les paramètres de configuration.

M C BAC IP M, BACnet-IP avec enregistrement de données et mémoire d' enregistrement des événements. Protocole: BACnet-IP (pour la lecture de mesure) et Modbus TCP/IP (pour la lecture de mesure et pour paramétre de programmation). Configuration IP: IP statique / Netmask / Portail implicite Port BACnet-IP. Fixe: BAC0h. Port Modbus à sélectionner (implicite 502). Connexions client, seul. Modbus: Max. 5 simultanément. Connexions RJ45 10/100 BaseTX. Distance max.100m. Données Dynamiques (lecture seule), variables de phase et réseau (BACnet-IP and Modbus). Statique (écriture et lecture) tous les paramètres de configuration. (seul. Modbus).

Température de fonctionnement -25°C à +55°C (-13°F à 131°F) (H.R. de 0 à 90% sans condensation @ 40°C) selon EN62053-21, EN50470-1 and EN62053-23. **Température de stockage** -30°C à +70°C (-22°F à 158°F) (H.R. < 90% sans condensation @ 40°C) selon EN62053-21, EN50470-1 and EN62053-23. **Catégorie d'installation** Cat. III (IEC60664, EN60664). **Tension diélectrique:** 4kVCA RMS pour 1 minute. **Émission de bruit** CMRR 100 dB, 48 à 62 Hz . **CEM:** selon EN62052-11. Décharges électrostatiques 15kV décharge atmosphérique. Immunité à l'irradiation: test avec courant: 10V/m de 80 à 2000MHz. Champs électromagnétiques: test sans aucun courant: 30V/m de 80 à 2000MHz. Transitoires: sur circuit d'entrées de mesure courant et tension: 4kV. Immunité aux bruits par conduction 10V/m de 150KHz à 80MHz. Surtension: sur circuit d'entrées de mesure courant et tension: 4kV; sur entrée d'alimentation auxiliaire « L » : 1kV; suppression fréquence radio, selon CISPR 22. **Conformité aux standards:** sécurité IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Métrologie: EN62053-21, EN62053-23, EN50470-3. MID "annexe MI-003". Sortie impulsion DIN43864, IEC62053-31. **Approbations:** CE, cULus "Listed". **Connexions:** À vis, Section de câbles max. 2,5 mm2. Min./Max. couple de serrage de vis: 0,4 Nm / 0,8 Nm. Couple de serrage de vis recommandé: 0,5Nm. **Boîtier DIN** Dimensions (LxHxD). Modules "A" et "B": 89,5x63x16mm.Modules"C": 89,5x63x20mm. Profondeur max. derrière le panneau. Avec 3 modules (A+B+C): 81,7 mm Matériau ABS, autoextinguible: UL 94 V-0. Montage: montage sur panneau. **Indice de protection:** face avant IP65, NEMA4x, NEM12. Terminaisons de vis IP20.

ESPAÑOL

M F I6 R4. Salidas de relé: Salidas físicas: 4 (máx. un módulo por equipo). Finalidad: para salida de alarma o de pulso. Tipo: relé, tipo SPDT CA 1-5A a 250VCA; CA 15-1A a 250VCA. Configuración: solo mediante el software de programación WM40Soft. En este último caso utilizando el puerto de comunicación serie o el puerto de comunicación óptico frontal.

Entradas digitales: Número de entradas: 6 (libres de tensión). Finalidad: lectura de estado contactos. Sincroniz. de medidas "dmd"y sincronización de reloj. Selección de tarifas de energía. Contadores de la Compañía Eléctrica. Contador de disparo. Inhabilitación: remota de entradas. Interconexión con vatímetros (+kWh, +kvarh, -kWh, -kvarh). Frecuencia de entrada: 20Hz máx, ciclo de trabajo 50%. Ajuste del preescalador: de 0,1 a 999,9 m^3 o kWh por pulso. Tensión de contactos abiertos: ≤3,3VCC. Intensidad de contactos cerrados: <1mACC. Impedancia de entrada: 680Ω. Resistencia de contacto: ≤300Ω contacto cerrado≥50kΩ contacto abierto.

M F I6 O6. Salidas estáticas: Salidas físicas: 6 (máx. un módulo por equipo). Finalidad: para salida de alarma o de pulso. Tipo: Opto-Mos. Señal: V_{ON}: 2.5VCC máx.100mA V_{OFF}: 42 VCC. Función: las salidas pueden funcionar también como salidas de alarma, como salidas de pulso, como salidas de control remoto, o en cualquier otra combinación. Retransmisión de señal: total: +kWh, -kWh, +kvarh, -kvarh. Parcial: +kWh, -kWh, +kvarh, -kvarh. Tarifa: +kWh, -kWh, +kvarh, -kvarh. Las anteriores variables pueden conectarse a cualquier salida. Tipo de pulso: programable de 0,001 a 10.00 kWh/kvarh por pulso. Las salidas pueden ser vinculadas a los medidores de energía (kWh/kvarh). Duración del pulso: ≥100ms <120msec (ON), ≥120ms (OFF), según norma EN62052-31. **Entradas digitales**: ver entradas digitales de M F I6 R4.

M A T P (N). Entradas de Temperatura y Señal de proceso, medida In. Número de entradas: 1. Precisión (Display + RS485): ver tabla a continuación. Deriva térmica: ≤150ppm/°C. Sonda de temperatura: Pt100, Pt1000. Número de hilos: conexión 2 o 3 hilos. Compensación del cable: hasta 10Ω. Unidad ingenierística: seleccionable °C o °F. Señal de proceso: número de entradas: 1. Precisión (Display + RS485): ±(0.1%lec. +1díg) 0% a 25% FE; ±(0.1%lec. +2díg) 25% a 110% FE. Deriva térmica: ≤150ppm/°C. Entrada señal proceso: -20mA a +20mACC. Sobrecarga de señal: continua: 50mACC, durante 1 s.: 150mACC. Impedancia de entrada:≤22Ω(<12Ω). Indicación de máx. y mín.: -9.999 a +9999 ajuste de escala totalmente programable con posición del punto decimal. Módulo con entrada de intensidad del neutro (M A T P N): In: 1A. Precisión (Display + RS485): de 0.002In a 0.2In: ±(0.2% lec. +1díg). De 0.2In a 1,2 In: ±(0.2% lec. +1díg). Deriva térmica: ≤150ppm/°C. Entrada de medida: debe estar conectados a transformadores de intensidad externos. Relación del transformador: hasta 10kA (10,000 máx). Factor de cresta:≤3 (3A pico máx.). Protec. contra sobrecargas: intensidad, continua: 1,2A, @ 50Hz, durante 500ms: 10A, @ 50Hz. Impedancia de entrada: < 0,5Ω. Frecuencia: 45 a 65 Hz.

Puerto M C 485 232 M, RS485/232 con registro de datos y memoria registro evento. Tipo: multiterminal, bidireccional (variables estáticas y dinámicas). Conexiones: 2 hilos. Distancia máx: 1000m, terminación directamente en el módulo. Direcciones 247, seleccionable a través del teclado frontal. Protocolo: MODBUS/JBUS (RTU). Datos (bidirecccionales), Dinámicos (sólo lectura), variables del sistema y de cada fase. Estáticos (lectura y escritura): todos los parámetros de configuración. Formato de datos: 1 bit de arranque, 8 bit de datos, sin pardidad, paridad par, paridad impar,1 bit de parada. Velocidad en baudios: seleccionable: 9,6k, 19,2k, 38,4k, 115,2k bit/s. Capacidad de entrada del driver; Carga unitaria, 1/5. Máximo: 160 transceptores en el mismo bus. **Puerto RS232.** Tipo: bidireccional (variables estáticas y dinámicas). Conexiones: 3 hilos. Distancia máx 15m. Protocolo MODBUS RTU /JBUS. Datos (bidirecccionales), Dinámicos (sólo lectura): variables del sistema y de cada fase. Estáticos (lectura y escritura): todos los parámetros de configuración. Formato de datos: 1 bit de arranque, 8 bit de datos, sin pardidad, paridad par, paridad impar,1 bit de parada. Velocidad en baudios: seleccionable: 9,6k, 19,2k, 38,4k, 115,2k bit/s.

Puerto Ethernet/Internet con registro de datos y memoria registro evento. Protocolo: Modbus TCP/IP. Configuración IP: IP estático/ Máscara de red / Gateway por defecto. Puerto: seleccionable (por defecto 502). Conexiones del cliente: Máx. 5 simultáneamente. Conexiones: RJ45 10/100 BaseTX. Distancia máx. 100m. Datos (bidirectional), Dinámicos (sólo lectura): variables del sistema y de cada fase. Estáticos: (lectura y escritura): todos los parámetros de configuración .

M C BAC IP M, BACnet-IP con registro de datos y memoria registro evento. Protocolo: BACnet-IP (para lectura de medidas) y Modbus TCP/IP (para lectura de medidas y parámetros de configuración). Configuración IP: IP estático / Máscara de red / Gateway por defecto. Puerto BACnet-IP. Fijo: BAC0h. Puerto Modbus: seleccionable (por defecto 502). Conexiones del cliente, Sólo Modbus: Máx. 5 simultáneamente. Conexiones: RJ45 10/100 BaseTX. Distancia máx. 100m. Datos: Dinámicos (sólo lectura): variables del sistema y de cada fase (BACnet-IP y Modbus). Estáticos: (lectura y escritura): todos los parámetros de configuración (sólo Modbus).

Temperatura de trabajo: -25°C a +55°C (-13°F a 131°F) (H.R. de 0 a 90% sin condensación a 40°C) según normas EN62053-21, EN50470-1 y EN62053-23. **Temperatura almacenamiento:** -30°C a +70°C (-22°F a 158°F) (H.R. de 0 a 90% sin condensación a 40°C) según normas EN62053-21, EN50470-1 y EN62053-23. **Categoría de la instalación:** Cat. III (IEC60664, EN60664). **Resistencia dieléctrica:** 4kVCA RMS durante 1 minuto. **Rechazo al ruido** CMRR 100 dB, 48 a 62 Hz. **Compatibilidad electromag. (EMC):** según norma EN62052-11. Descargas electrostáticas: 15kV en el aire. Inmunidad a los campos electromagnéticos: prueba con corriente: 10V/m de 80 a 2000MHz. Prueba sin corriente: 30V/m de 80 a 2000MHz. Ráfagas: en el circuito de entradas de medida de intensidad y tensión: 4kV. Inmunidad a las perturbaciones conducidas: 10V/m de 150KHz a 80MHz. Irrupción: en el circuito de entradas de medida de intensidad y de tensión: 4kV; en la entrada de alimentación auxiliar "L": 1kV. Emisiones de radiofrecuencia Según norma CISPR 22. **Conformidad con las normas:** Seguridad: IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11. Metrología: EN62053-21, EN62053-23, EN50470-3. MID según el a"anexo MI-003". Salida de pulso: DIN43864, IEC62053-31. **Homologaciones:** CE, cULus "Listed". **Conexiones:** A tornillo. Sección del cable máx. 2,5 mm2. Par de apriete mín./máx.: 0,4 Nm / 0,8 Nm. Par de apriete recomendado: 0,5 Nm. **Caja DIN** Dimensiones (Al. x An. x P.). Módulo "A" y "B": 89,5x63x16mm. Módulo "C": 89,5x63x20mm. Máx. profundidad tras panel Con 3 módulos (A+B+C): 81,7 mm. Material: ABS, autoextinguible: UL 94 V-0. Montaje: montaje a panel. **Grado de protección:** panel frontal IP65, NEMA4x, NEM12. Conexiones: IP20.