MMW03-CH Multimeter



MMW03-CH - Multimeter

Designed to measure:

- > Phase-Neutral Voltage; Phase-Phase Voltage;
- > Phase Current; Neutral Current;
- > Frequency;
- Cos**(D**; Power factor;
- > Active power; Reactive power; Apparent power;
- > THDv, THDi,
- Voltage and current harmonics up to the 31St order (over Modbus)



MMW03-CH - Multimeter

Other functions:

- > Indication of phase loss and phase sequence error
- It determines and saves, in the memory, the maximum and minimum values of:
 - ✓ Voltage;
 - Current;
 - Frequency;
 - \checkmark cos and power factor;
 - ✓ THDv; THDi;
 - Active, reactive and apparent power;

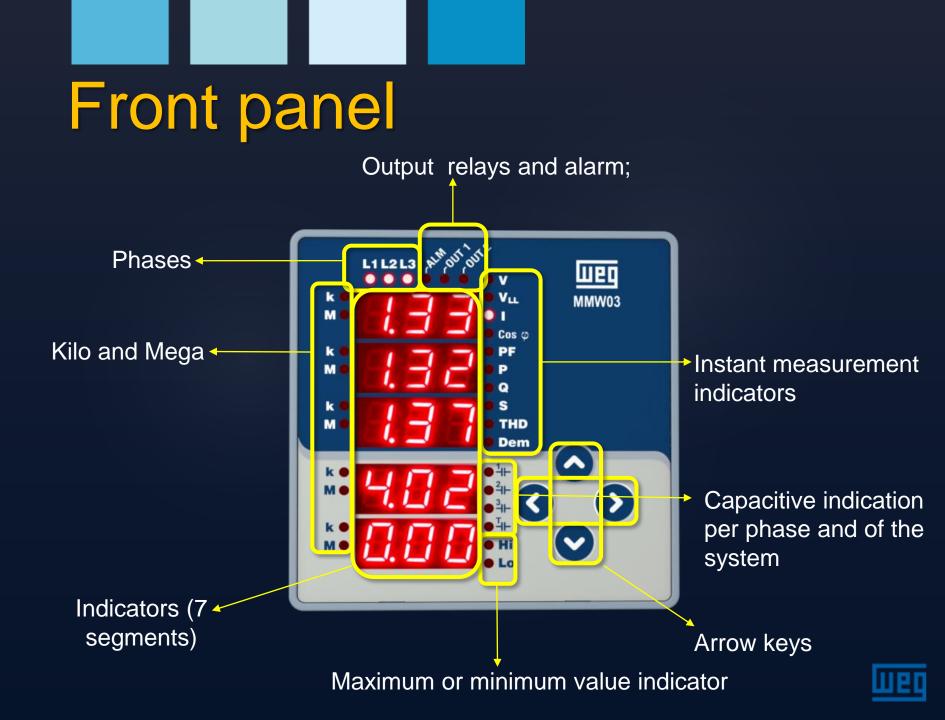


MMW03-CH - Multimeter

Other functions:

- > Current, voltage, frequency, $\cos \phi$ and power factor alarms
- Stores:
 - Hour meter;
 - Total time energized;
 - ✓ Total time de-energized;
- » RS485 communication with MODBUS RTU protocol;
- > 2 alarm output relays;
- > 4-digit password;







MMW03-CH Menus



Indicators L1, L2 and L3



1) L1, L2, L3 flashing simultaneously and very slowly (1 per second):

• Error in the phase sequence - voltage;

2) None/all of L1, L2, L3 flashing slowly (1 for 0.5 second):

• Voltage loss in one or all connections

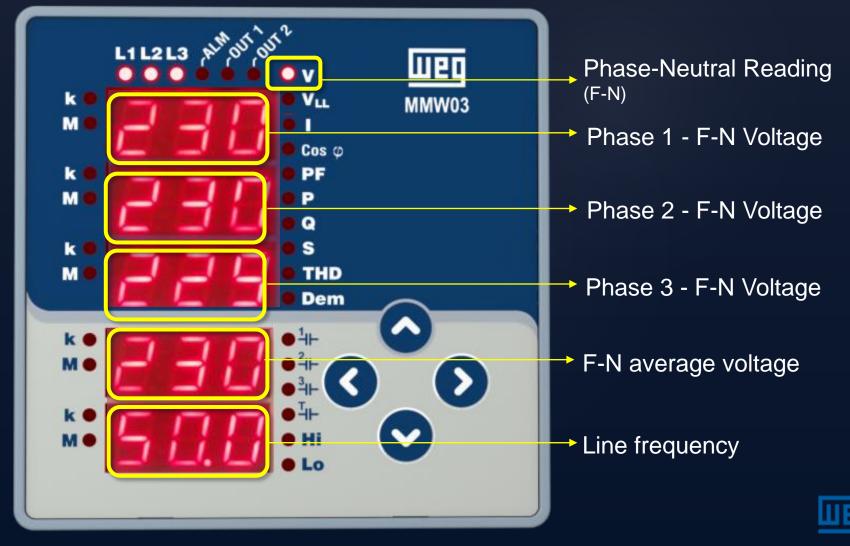
3) None/all of L1, L2, L3 flashing slowly (1 for 0.2 second):

• Current loss in one or all connections;



LED 1	LED 2	Active Menu	1st Indicator	2nd Indicator	3rd Indicator	4th Indicator	5th Indicator	
V	-	Voltage (Phase- Neutral)	Voltage L1	Voltage L2	Voltage L3	Average Voltage (Phase-Neutral)	Network Frequency	
VLL	-	Voltage (Phase- Phase)	Voltage L1-L2	Voltage L2-L3	Voltage L3-L1	Average Voltage (Phase- Phase)	Network Frequency	
I.	-	Ourrent	Current L1	Current L2	Ourrent L3	Total Current	Network Ourrent	
Cos φ	-	Cosφ	Cos φ1	Cos φ2	Cos φ3	-	-	
PF	-	Power Factor	PF1	PF2	PF3	System PF	-	
Р	-	Active Power	Active Power L1	Active Power L2	Active Power L3	Total Active Power	-	
Q	-	Reactive Power	Reactive Power L1	Reactive Power L2	Reactive Power L3	Total Reactive Power	-	
S	-	Apparent Power	Apparent Power L1	Apparent Power L2	Apparent Power L3	Total Apparent Power	-	
тно	V	Total Harmonic Distortion	THDV1	THDV2	THDV3	-	-	
	I.		THDI1	THDI2	THDI3	-	-	
1-1F	Q / Cosφ	Cosp and reactive power for the L1 phase is capacitive, otherwise is inductive.						
²⊣⊢	Q/Cosq	Cospand reactive power for the L2 phase is capacitive, otherwise is inductive.						
³ HH	Q / Cosφ	Cosp and reactive power for the L3 phase is capacitive, otherwise is inductive.						
[™] -I⊢	Q	Total reactive power is capacitive, otherwise is inductive.						

Measurement menus V F-N



Measurement menus V F-F





Measurement menus I (current)

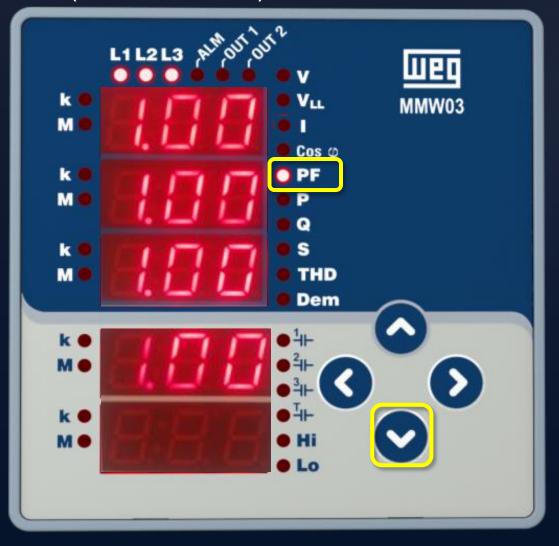








Measurement menus PF (Power factor)





P Active power



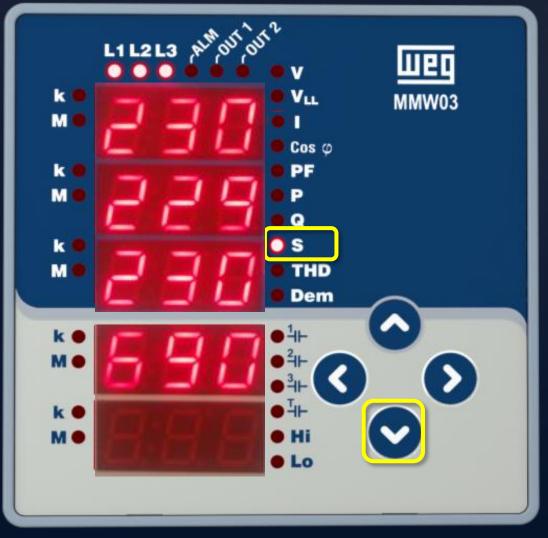


Q Reactive power



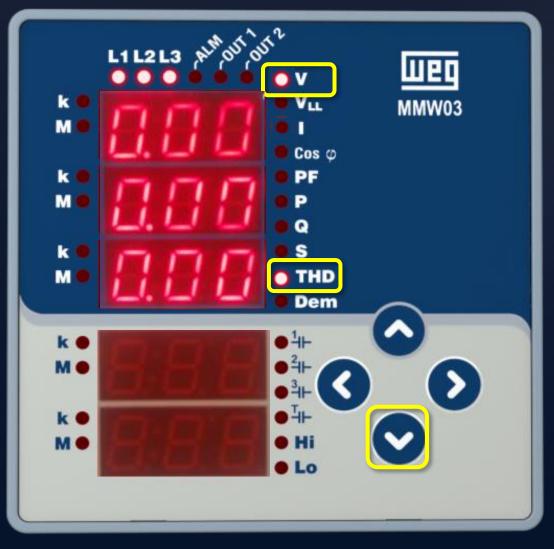


S Apparent power





THDv









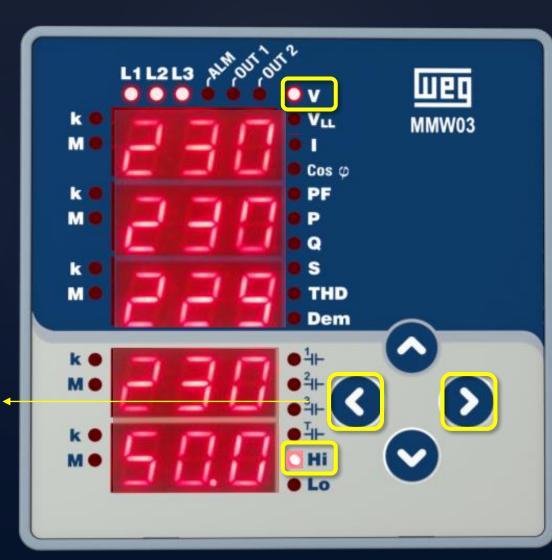
Measurement menus – V (L-N)

Maximum and minimum menus

The maximum and minimum values are calculated and stored in non-volatile memory for the following parameters

- Voltage (F-N and F-F)
- Neutral current
- Frequency
- Cosφ
- Power factor
- ➤ THDV
- > THDI

To view max. and min menus, use the left and right arrow keys.

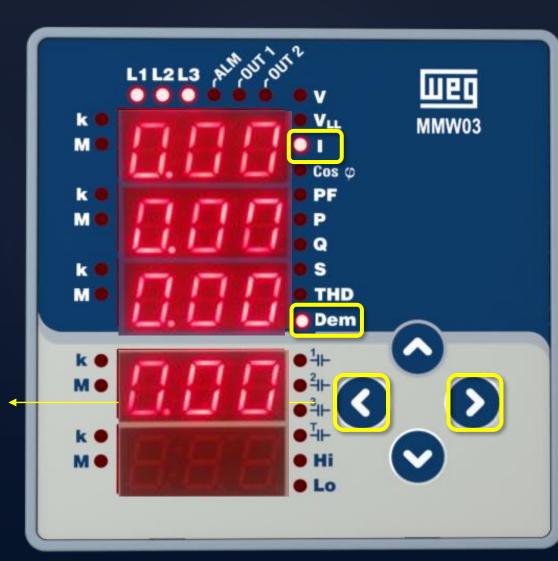


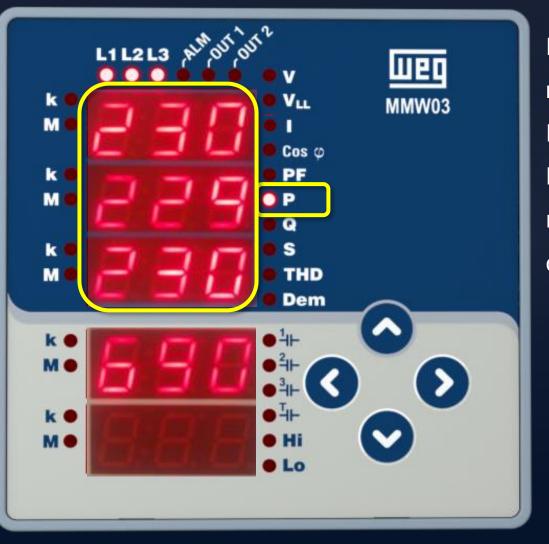
Demand Menus

The demand values are calculated and stored in nonvolatile memory for the following parameters:

- > Current
- Active power
- Reactive power
- Apparent power

To view max. and min. and demand menus, use the left and right arrow keys.



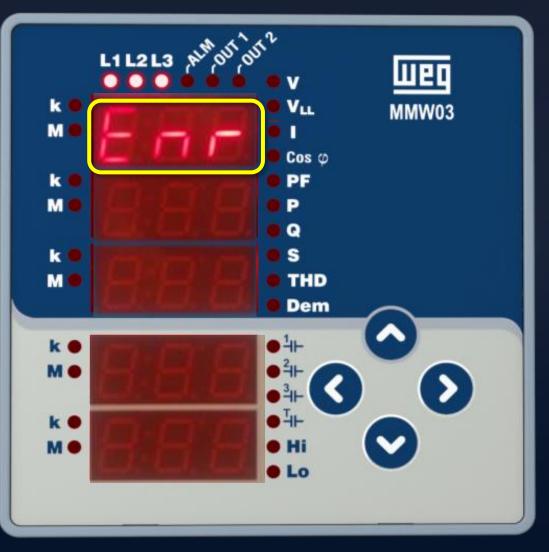


If the system consumes energy, (P) must be positive. If the active power display (P1, P2 or P3) is flashing in L-H or instant menu, reverse the input connection of the current transformer (k-I)



Energy measurement menus

To access the ENERGY menu, use the UP and DOWN arrow keys



Available energy parameters:

- Import active energy (I.Ac)
- Export active energy (E.Ac)
- Import reactive energy (I.rE)
- Export reactive energy (E.rE)



Energy measurement menus



Preset value: In any menu on the device, press for at least 2 seconds and release. The menu will start flashing. Using the right arrow key, move the indicator to the digit you want to change. Enter the desired value using the up and down arrow keys. After entering the desired value, use the left arrow key to confirm the operation. Navigate through the menus to the storage field to save the preset value.

Meters menu

To navigate to the Meters menu, use the Up and Down arrow keys



"On hour" Meter: The display shows the total hours that the equipment was energized. "Run hour" Meter: It shows the time the device performed the measurement. It is necessary that the signal inputs be fed by the three current phases and three voltage phases. "Int" Meter: It shows the number of energy interruptions on the equipment.



Meters menu







Settings menu

The settings are done in the SEt menu. To navigate to the settings menu, use the Up and Down arrow keys

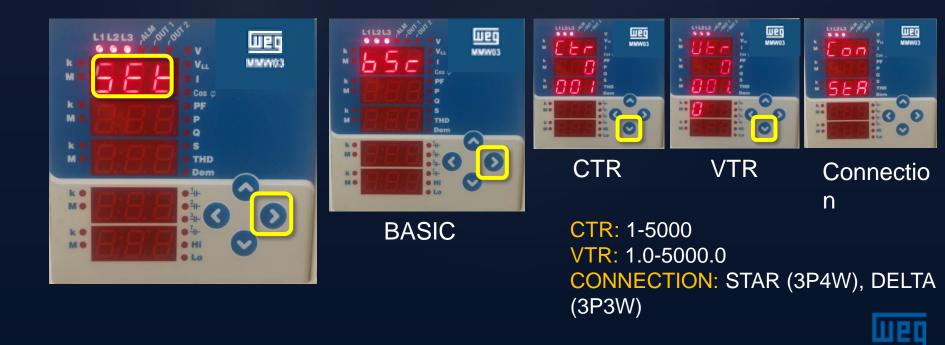




Settings menu - basic

In this menu, it is defined:

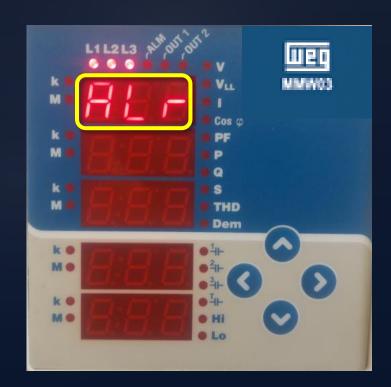
- Current transformer ratio CTR
- Voltage transformer ratio VTR
- Connection type 3P4W (star) or 3P3W (delta)



Settings menu - Alarm

In this menu, the alarm limits, hysteresis and alarm holding time are configured. ALARMS:

- U (L-N), ULL (L-L),
- I (current), In (I neutral),
- COSφ, PF,
- F





Settings menu - Alarm



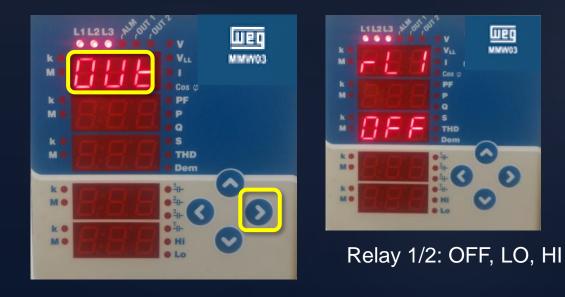


When the alarm limit is exceeded:

- "k" and "M" LEDs of the respective parameter start flashing at the same time.
- After the holding time has elapsed, the "ALM" LED turns on; if the alarm relay is programmed to operate, OUT1 and/or OUT2 LEDs turn on and the respective relay is energized.

Settings menu - Alarm

In this menu, the operating conditions of the alarm relays are defined



The alarm relays can be programmed to:

- **OFF** : Relay is not energized in an alarm condition
- LO : Relay is activated when the lower limit alarm is triggered
- HI : Relay is activated when the upper limit alarm is triggered

The relays are de-energized when the alarm condition ends.



Settings menu - Demand

In this menu, the demand time conditions are defined.

After defining the period, which may be from 1 to 60 minutes, the demand values are calculated periodically considering this time.

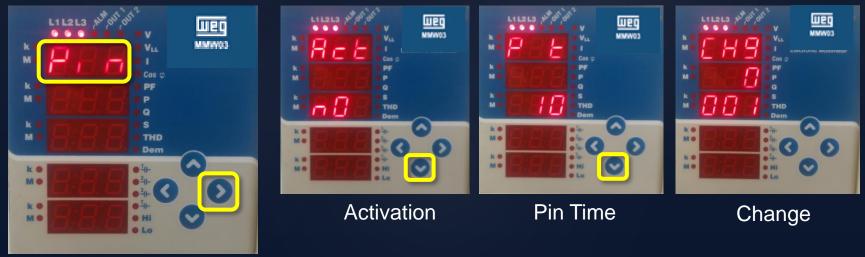




Settings menu - Password

In this menu, it is defined:

- Activate the password or not;
- Define password;
- Password activation time;



Act - Activation: Enable/Disable password protection (NO/YES) P t - Pin Time: Time to request password again. When any key is pressed after entering the password or no change is made via MODBUS, the password protection is activated after the preset time has elapsed (1-60min) CHg - Change: Change password (1 - 9999)

Settings menu - RS485

In this menu, the MODBUS RTU, RS485 communication parameters are defined:

- Baud Rate Network communication rate;
- Slave ID;
- Parity control



Baud Rate: Options of (1200/2400/4800/9600/19200/38400/57600) ID: Slave ID of (1-247) Parity: Parity check definition (None, Even, Odd)



Settings menu - Clear

In this menu, the values stored in the machine's memory are deleted and the factory values are restored.



- OFF : Disable the "clear" process
- All : Clear all stored values and restores factory settings
- Enr : Clear all power meters
- Cnt: Clear all meters
- HI : Clear the maximum values stored
- LO : Clear the minimum values stored
- dEd : Clear the demand values stored
- Set : Clear all factory parameters
- ALr : Restore the alarm parameters to the factory

parameters



Settings menu - Version

This menu shows the device firmware version







SAVE procedure

Press the left arrow key up to the "SAU" screen.

Press the key until "YES" or "NO" is shown to confirm the changes in the settings or not.

To confirm the changes:



Press the right button until "YES" flashes. Then press the left arrow key to save the changes. changes.

To discard the changes:



Press the right button until "nO" flashes. Then exit the settings menu without saving the changes.



Technical specifications

SUPPLY							
Voltage	85300 V AC/DC						
Frequency	4565Hz						
Power Consumption	< 6VA						
MEASUREMENT INPUTS							
Voltage	5300V AC (L - N)						
	10500V AC (L - L)						
Current	10mA 6A AC						
Frequency	4565Hz						
Network Connection Type	3-phase 4-wire, 3-phase 3-wire						
RELAY OUTPUT							
	AC	DC					
Maximum Switching Voltage	250V	30V					
Maximum Switching Current	10A	5A					
Maximum Switching Power	1250VA	150W					

Measurements - accuracy

Function Symbol	Function	Function Performance Class According to IEC 61557-12	Measuring Range	Other Complementary Characteristics
Р	Total active power	0,5	10 % I _b ≤ I ≤ I _{max} 0,5 Ind to 0,8 Cap	-
Q _v	Total reactive power	1	5 % I _b ≤ I ≤ I _{mer} 0,25 Ind to 0,25 Cap	-
5 ₄	Total apparent power	0,5	10 % I _b ≤ I ≤ I 0,5 Ind to 0,8 Cap	-
E	Total active energy	0,5	0 to 999999999 kWh	IEC 62053-22 Class 0.55
E	Total reactive energy	2	0 to 999999999 kVARh	IEC 62053-23 Class 2
f	Frequency	0,1	45 – 65 Hz	-
1	Phase current	0,5	20 % l _b ≤ l ≤ l _{max}	-
I _{nc}	Neutral current (calculated)	0,5	20 % l _b ≤ l ≤ l _{max}	-
U	Voltage	0,2	$U_{min} \le U \le U_{max}$	-
PFA	Powerfactor	0,5	0,5 Ind to 0,8 Cap	-
THDV	Total harmonic distortion voltage	1	0 % to 20 %	-
THDI	Total harmonic distortion current	1	0 % to 100 %	-



WEG Drives & Controls

Thank you!

