

MECO 90P
AC Multifunctional Calibrator

Operators Manual

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1. USE AND CHARACTER

MECO90P AC multifunctional calibrator can output standard AC voltage and AC current. It may measure AC voltage, AC current, power, phase, power factor and frequency(40Hz~70Hz).

Wide output range of current and voltage;

High reliability and low wave distortion

2. MAIN FUNCTIONS

2.1 $5^{1/2}$ bits VFD digital display. May display V、I、P、F、PF (power factor) and Φ (phase).

V、I and P may display output actual value or percent of FS.

2.2 Keys or knobs adjust magnitude of the output signals.

2.3 Voltage from 1V to 1000V. (11 ranges, min resolution 0.02mV)

Current from 10mA to 100A. (11 ranges, min resolution 0.2uA)

2.4 Frequency from 40Hz to 70Hz .

2.5 Power from 0 to 100kW.

2.6 Power factor from -1 to +1.

2.7 Phase from 0 to 359.99°

2.8 Output of every Range can reach 110%FS.

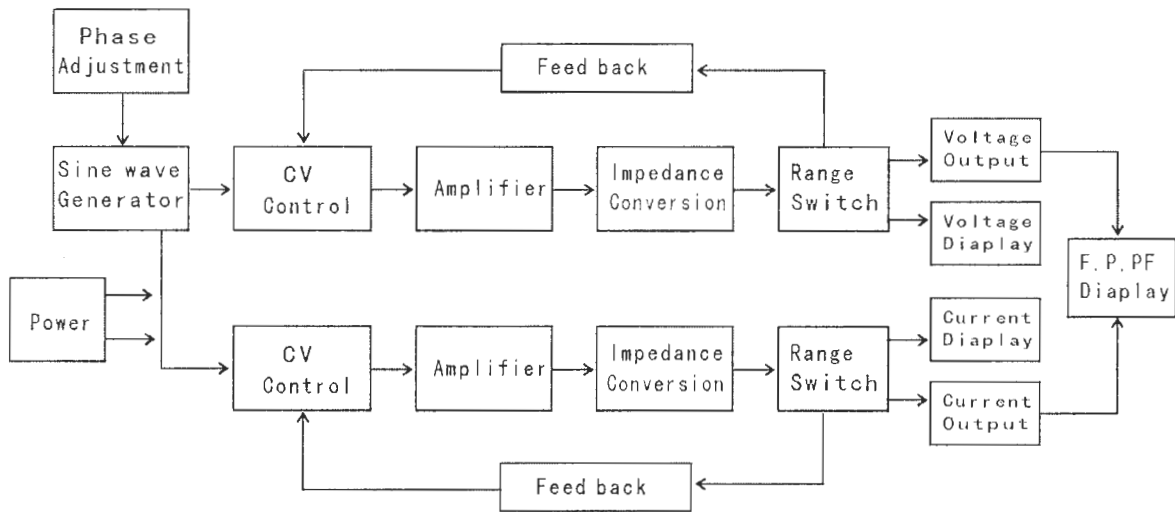
2.9 When output overload, calibrator may protect itself automatically, and then restart by pressing RESET key.

2.10 Use standard coil , may measure clamp meter from 0A to 1000A.

Accuracy reach $\pm 0.3\%$.

(FS = full scale)

3. BLOCK DIAGRAM



4. TECHNICAL SPECIFICATION

4.1 Stabilization: $V, I < 0.01\%FS/2min$

$$P < 0.02\%FS/2min$$

Additional error 0.005%

4.2 Distortion: $<0.5\%$

4.3 Accuracy of frequency: $\pm 0.02Hz$

4.4 Phase: $\pm 0.05^\circ$ (after verify zero)

4.5 Measure accuracy index see table 1 (temperature $23^\circ C \pm 5^\circ C$, output must be higher than 10%FS)

Item	Measurement Range	Rated Burden	Max Burden	Accuracy
voltage	0~1V~2V~5V~10V	200mA	500mA	Basic Error: V、I: $\pm(0.03\%RD + 0.02\%FS)$ P: $\pm(0.07\%RD + 0.03\%FS)$
	0~20V~50V	200mA	500mA	
	0~75V~150V	100mA	200mA	
	0~300V~600V	50mA	80mA	
	0~1000V	20mA	40mA	
current	0~10~20~50~200mA	12V	30V	PF: ± 0.001 (PF 0~ ± 0.8) ± 0.0005 (PF -0.8~-1 +0.8~+1) ± 0.0001 (PF ± 0.1) (RD---read FS---full scale)
	0~1A	10V	20V	
	0~2A	7V	15V	
	0~5~10A	5V	10V	
	0~25A	2V	2.5V	
	0~50~100A		1V	
Notice:1 When temperature is above or below $23^{\circ}C \pm 5^{\circ}C$, every change of temperature below $10^{\circ}C$, additional error is below basic error. 2 When range of current is below 200mA, phase and powerfactor do not account the accuray. 3 Between ± 0.5 and ± 1 , powerfactor account the accuray.				

Table 1

4.5 Operating supply voltage :AC230V, 50 (60) Hz.

4.6 Power consumption: below 300VA.

4.7 Working circumstance: temperature $5^{\circ}C \sim 35^{\circ}C$, relative humidity $\leq 80\%$, no causticity gas.

4.8 Working time : continuous

4.9 Overall dimension: $180 \times 480 \times 480mm^3$

4.10 Total weight: 25kgs

5. HOW TO OPERATE

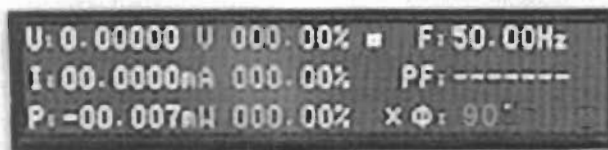
5.1 Calibrator must be placed where there is well-ventilated, without sun, dry and clean. To avoid electric shock, make sure calibrator is safely grounded.

5.2 Before turning on POWER, knobs are rotated till zero

widdershins. To avoid damaging UUT because of improper range, output terminals do not connect with UUT until you check it right.

5.3 Turning on POWER, VFD display is lit. Allow a warm-up period of at least five minutes for the internal components to keep stabilizes. If you don't use it a long time or at big relative humidity, a warm-up period must be longer.

5.4 Power-On State:



Symbol ■ indicated that it is available. Symbol ■ can be moved by pressing **V** **I** **F** **Φ** key.

Default V is available.

5.5 If “OFLO” appears on display. Calibrator is protected automatically. You can restart by pressing the key RESET. If the key does not work, it indicates that calibrator or operation is wrong. After checking reason, you can use it.

* Reason it does not work was that V short circuit or current open circuit.

5.6 Measurement of power:

Voltage: 75V, 150V, 300V, 600V.

Current: 1A, 2A, 5A, 10A. Frequency: 50Hz.

Other Ranges don't account the accuracy.

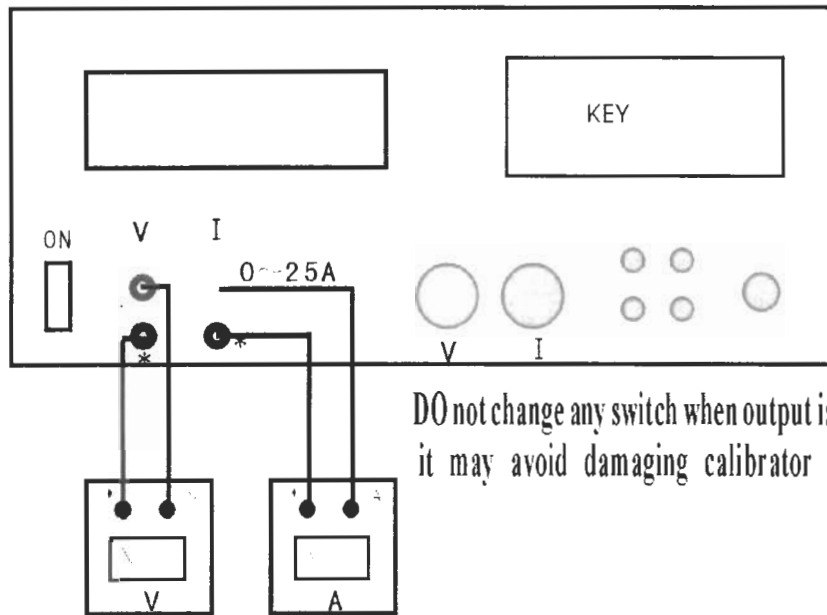


Figure1.Measurement OF V(I) connection

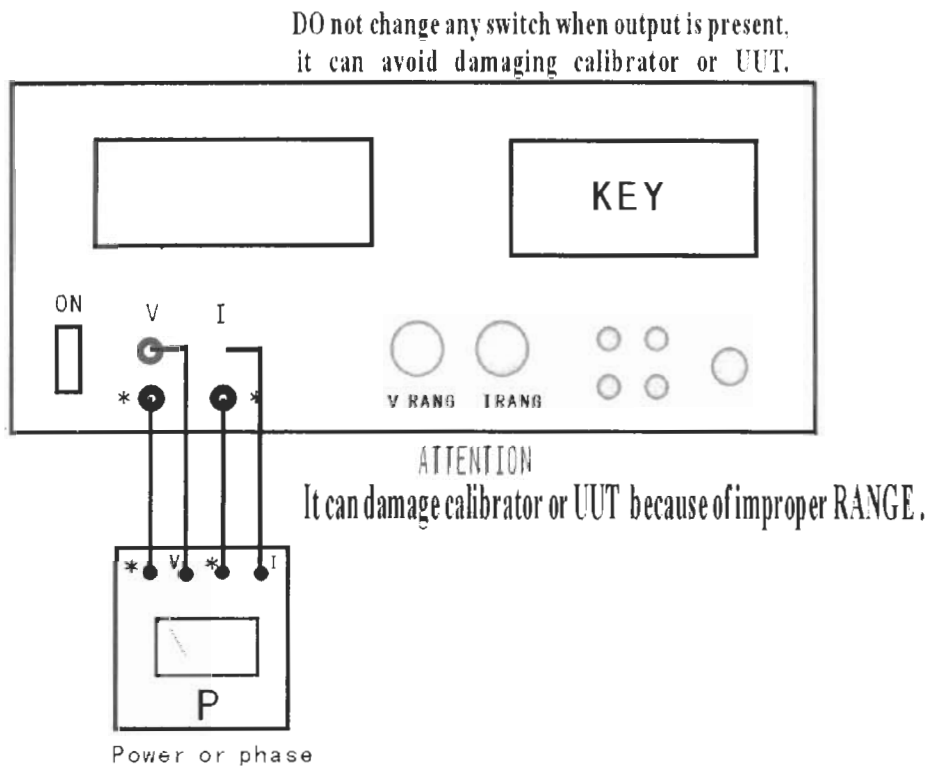
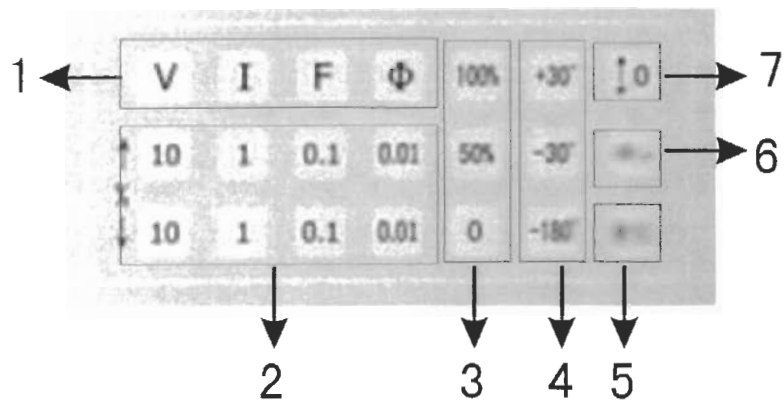


Figure2.Measurement OF P connection

(UUT--- unit under test)

6. KEY FEATURES



- ① Function keys: Symbol **■** appears on VFD display.
- ② These keys provided step adjustment of the output signals.

If you select V or I, press **10 ↑** key once, output value will become 10% of FS. Twice, 20% of FS. You can reach 110% of FS by pressing the key. On the contrarily, output value is decreasing.

(75V,150V,300V Range, press **10 ↑** key once ,it becomes 1/15 of FS. 600V Range, 1/12 of FS)

If frequency was selected, they are 10Hz, 1Hz, 0.1Hz and 0.01Hz.

If phase was selected, they are 10°, 1°, 0.1° and 0.01°.

- ③ If you select V or I V or I, press the key **100%**, output value will become 100% of FS.Press the key **50%**, 50% of FS. Press the key **0**, output become zero.

If frequency was selected, press the key **0** , it is 50Hz.

If frequency was selected, press the key **0** , it is 0°. press the key **50%** , it is 60°.

- ④ Only phase (Φ) is available.

⑤ RESET

If OFLO appear on display, you may press it.

Output can not become zero by pressing this key

⑥ ENTER: Only effecting when PC connected. Press the key, data will send into PC for save.

⑦ Phase calibration.

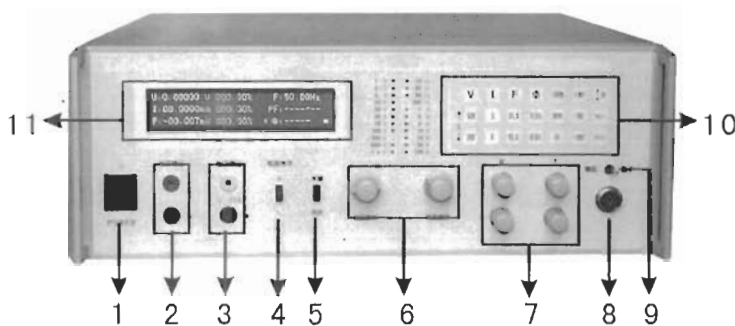
Before measuring phase meter, if Symbol \times ahead Φ , you must use it. First you need to connect UUT, and then V and I must

more than 50% of FS, press the key $\updownarrow 0$, display will flash several times, Phase calibration completed.

- If range of V and I changed, you need a new calibration.

If you use exterior key adjustor, it must be connected before turning on calibrator.

7. FRONT PANEL FEATURES



1. Power switch

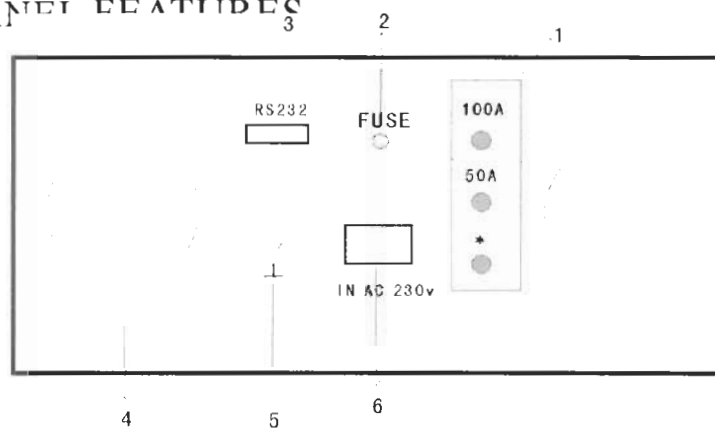
2. AC voltage output terminals, from 1V to 1000V.

3. AC Current output terminals, from 10mA to 25A.

4. Only current is available. L first. If current load is heavy, you can choose H.

5. Only frequency is available. You can choose OSC or SYNCH. Choose OSC, frequency is adjustable from 40Hz to 70Hz. Otherwise frequency is same with AC input. (IN AC230V)
6. Range switch. LED indicated range you selected.
7. Knobs adjustment: Output is increased if knob is rotated clockwise.
8. Input port of key adjustor
9. Knob or Key switch: Switch chooses "ANALOG" position, knobs adjust magnitude of the output signals. Switch chooses "DIGITAL" position, keys is available.
10. Keys.
11. VFD display.

8. FRONT PANEL FEATURES



1. 100A.* :Can output AC current(0~100A)
50A.* :Can output AC current(0~50A)
Output lead must use thick wire with fork.
- 2.Fuse(4A)
- 3.RS232
- 4.AC power input module
5. Chassis ground terminal
6. AC power input module.

9. ATTENTION

9.1 **DO not change any switch when output is present, it will avoid damaging calibrator or UUT.**

9.2 **The calibrator is capable of supplying lethal voltages. So must take care of safety. To avoid shocking hazard, do not make connections to the output terminals when any voltages is present.**

9.3 **Before turning off POWER, output must become zero.**

9.4 Lead of output must be of good insulation. It's section must be above 5 mm².

9.5 The calibrator is not fit for work at big relative humidity (>80%RH). Bad AC power sources has influencing on stabilization of output.

9.5 When you restart calibrator, zero will appears on value display at DC status. At AC status, it may display number. But it is below 0.1% of FS.

12. STANDARD EQUIPMENT

ITEM	NUMBER
Model XF30-IIa Calibrator	one
Key Adjuster	one
Line Power Cord	one
Output Lead	one
Data Cable	one
Fuse (4A)	two
Meco90P Operators Manual	one

Table 2