

MEC090A
Universal Calibrator

Operators Manual

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1. USE AND CHARACTER

MODEL MECO90A universal calibrator may output standard AC voltage, DC voltage, AC current or DC current. Keys or knobs adjust magnitude of the output signals. Wide range, high accuracy, good stabilization, easy operation and portable. The calibrator applies to test amperemeter and voltmeter below 0.2 class.

2. MAIN FUNCTIONS

2.1 $5\frac{1}{2}$ bits LED digital display. Can display actual value or percentage of FS(RANGE).

2.2 Keys or knobs used for adjusting magnitude of the output signals.

2.3 DC Voltage from 200mV to 1000V.

AC voltage from 200mV to 1000V.

DC current from 100uA to 20A.

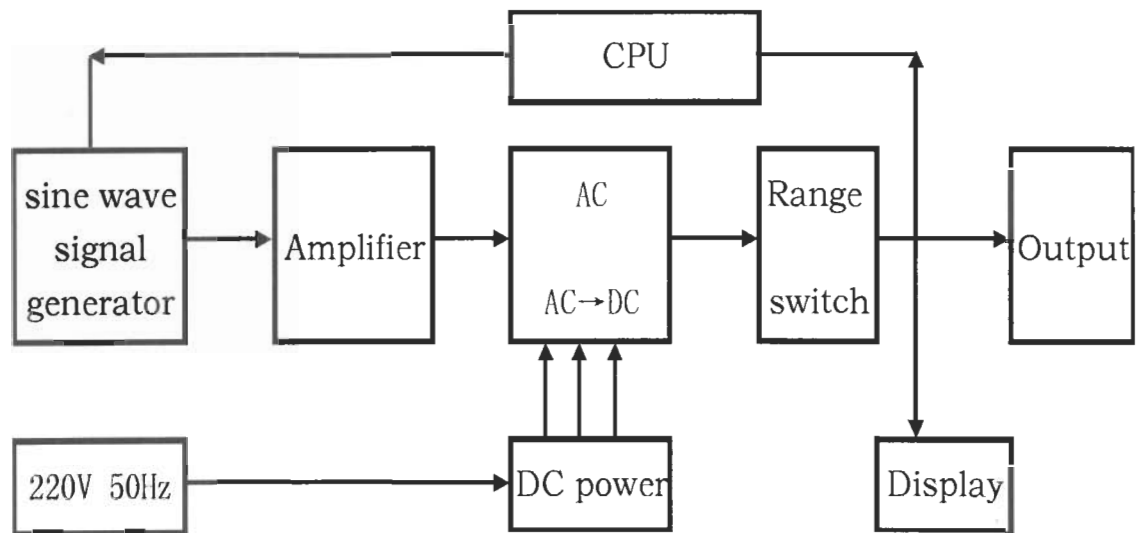
AC current from 2mA to 20A.

2.4 Can select the frequencies: 50Hz、60Hz and 400Hz.

2.5 If output overload, calibrator will protect itself automatically, and restart by pressing the key RESET.

(FS = full scale)

3. BLOCK DIAGRAM



4. TECHNICAL SPECIFICATION

4.1 Stabilization: AC < 0.03%FS/2min

DC < 0.01%FS/2min

4.2 Distortion: <0.5%

4.3 Ripple: <0.1%

4.4 Accuracy of frequency: <0.1%

Accuracy of Measurements index see table 1 (temperature $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, output must be higher than 10%FS)

Item	Measurement Range	Rated Burden	Max Burden	Accuracy
voltage	0~200mV	10mA	30mA	Basic Error: DC: $\pm (0.03\%RD + 0.02\%FS)$ AC: $\pm (0.05\%RD + 0.03\%FS)$
	0~1V~2V	20mA	60mA	
	0~5V~10V~20V	40mA	100mA	
	0~50V~100V~200V	20mA	60mA	
	0~500V~1000V (AC 750V)	DC20mA AC40mA	DC40mA AC60mA	
current	0~1A		DC:2V (AC:6V)	ACI \leq 2mA Not consult (RD---read FS---full scale)
	0~20A		2V	
standard resistance	10、24、50、100、 240、500 (Ω) 1、2.4、5、10、 24 ($k\Omega$) and 10x1k、 24x1k、50x1k、100x1k 240x1k、500x1k、1kx1k 2.4kx1k、5kx1k、10x1k 24kx1k	0.25W		$\pm 0.2\% + 20m\Omega$
Notice: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.				

Table 1

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

4.6 Power consumption: below 180VA.

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: $140 \times 480 \times 420mm^3$

4.10 Total weight: 16kgs

5. HOW TO OPERATE

5.1 Calibrator must be placed where there is well-ventilated,

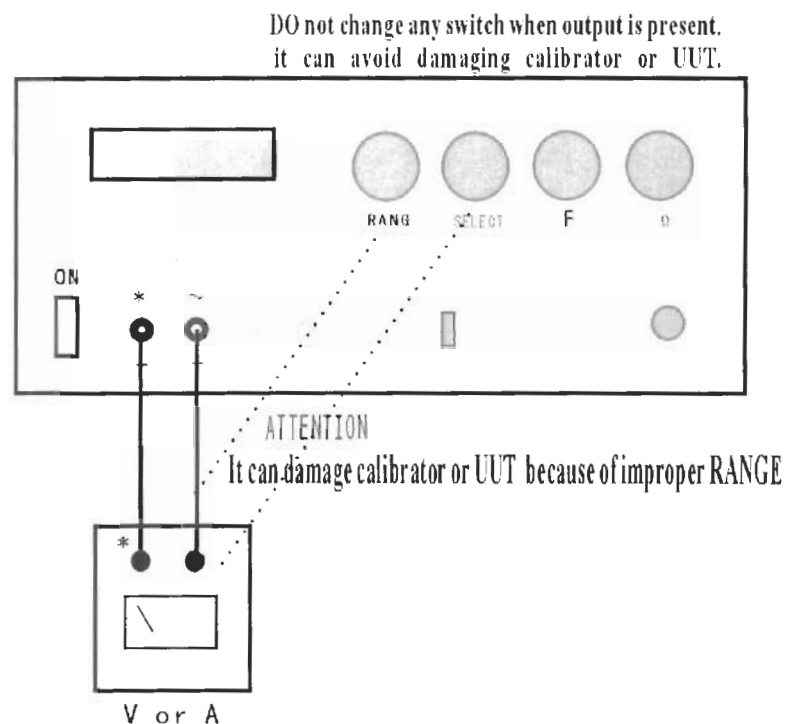
without sun, dry and clean. To avoid electric shock, make sure calibrator is safely grounded.

5.2 Before turning on POWER, SELECT switch located "O" place.

Adjustor connect with calibrator, 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 Turn on POWER, LED display is lit. Display are "-----". "V. mV. A. mA. uA" indicators and OVERLOAD indicators are not lit. OUTPUT indicator is lit.

5.4 After turning on the calibrator, allow a warm-up period of at least five minutes for the internal components to keep stabilize. If you don't use it a long time or at big relative humidity, a warm-up period must be longer. Then you may select proper range in accord with UUT.



5.5 If keys adjust magnitude of the output signals, step adjustment of output signals can select 10% of FS, 1% of FS, 0.1% of FS and 0.05% of FS. Output of every Range can reach 110% of FS. But 1000V Range only can reach 105% of FS.

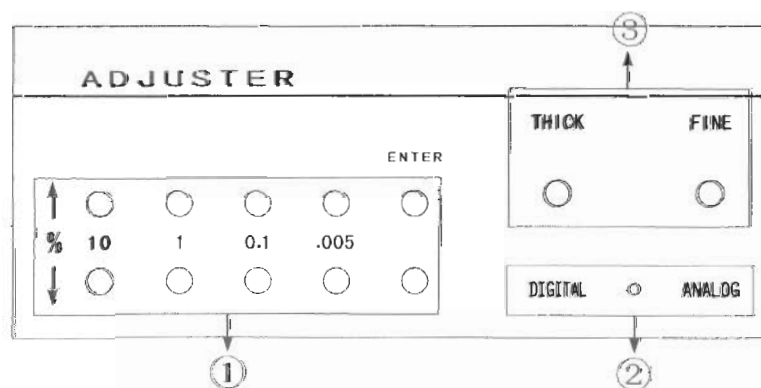
5.6 If knobs adjust magnitude of the output signals, output is increased when knob is rotated clockwise. On the contrary, it becomes decreasing.

5.7 When OVERLOAD indicator is lit, "OFLO" appears on value 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.

When "E-----" appears on value display, it indicates that output is excessive.

(UUT=Unit Under Test)

6. KEY FEATURES



① These keys provided step adjustment of the output signals. if you press 10 ↑ key once, output actual value will become 10% of FS. Twice, 20% of FS. Hold the key, output increase until it

become 100% of FS. On the contrary, Hold the key **10 ↓** for three or five seconds, output value will become zero.

ENTER: No function.

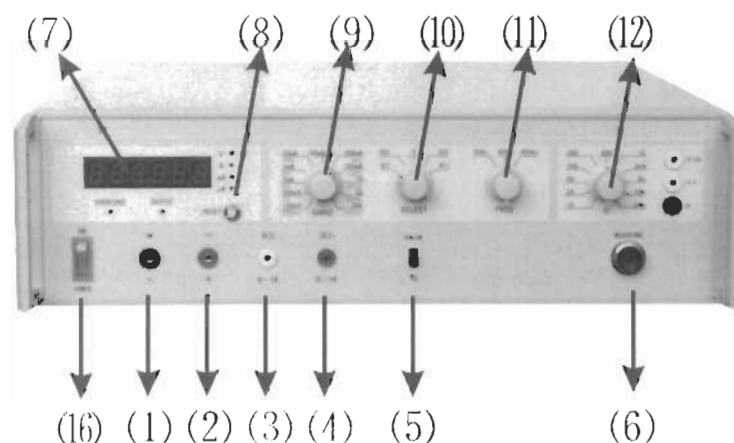
If “CHE---” appears on display, please press the key RESET.

② Knob or Key switch: Switch choose “ANALOG” position, knobs adjust magnitude of the output signals. Switch choose DIGITAL” position, keys adjust it.

③ Knobs adjustment: Adjustment of left knob is thick. Other is fine.

Output is increased when knob is rotated clockwise.

7. FRONT PANEL FEATURES



(1). (2): Can output current (0~20A) or voltage(0~1000V).

(1). (3): Can output AC current (0~1A) Max voltage 20V

(1). (4): Can output DC current (0~1A) Max voltage 20V

Above two apply to measure amperemeter of biggish inner impedance.

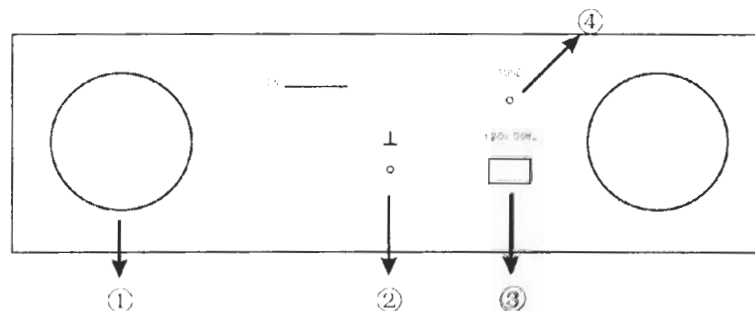
(5) Percent or actual value switch

(6) Input port of adjustor

- (7) Output display
- (8) RESET key
- (9) RANGE switch: According to requirement, you may select range manually.
- (10) SELECT switch: Can select DCV, DCI, ACV and ACI
- (11). When output is AC, you can select frequency. 50Hz, 60Hz and 400Hz.
- (12) Standard resistance switch: You may select twenty kinds of resistances.

(16). Power switch

8. REAR PANEL FEATURES



- ① Fan
- ② Chassis ground terminal
- ③ AC power input module
- ④ Fuse

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.

10. STANDARD EQUIPMENT

ITEM	NUMBER
Model XF30 Calibrator	one
Key Adjuster	one
Line Power Cord	one
Output Lead	one
Fuse (2A)	two
MECO90A Operators Manual	one

Table 2