INTRODUCTION

This multifunction process calibrator (the calibrator in the following) is a handheld, battery-operated instrument that measures and sources electrical and physical parameters. (See Table 1)

Table 1 Source and Measurement Function

Source Function \ Measurement Function		DCV	DCI		OHM	FREQ	TC	RTD	PRESSURE	SWITCH	CONT.
			LOOP OFF	LOOP ON							
DCV		●	●	●	●	●	●	●	●	●	●
DCI	RAMP ON	×	×	×	×	×	×	×	×	×	×
	RAMP OFF	●	●	●	●	●	●	●	●	●	●
OHM		●	●	●	●	●	●	●	●	●	●
FREQ		●	●	●	●	×	●	●	×	●	●
PULSE		●	●	●	●	×	●	●	×	●	●
SWITCH		●	●	●	●	×	●	●	×	●	●
TC		●	●	●	●	●	×	×	●	●	●
RTD		●	●	●	●	●	×	×	●	●	●
PRESSURE		●	●	●	●	×	●	●	×	●	●

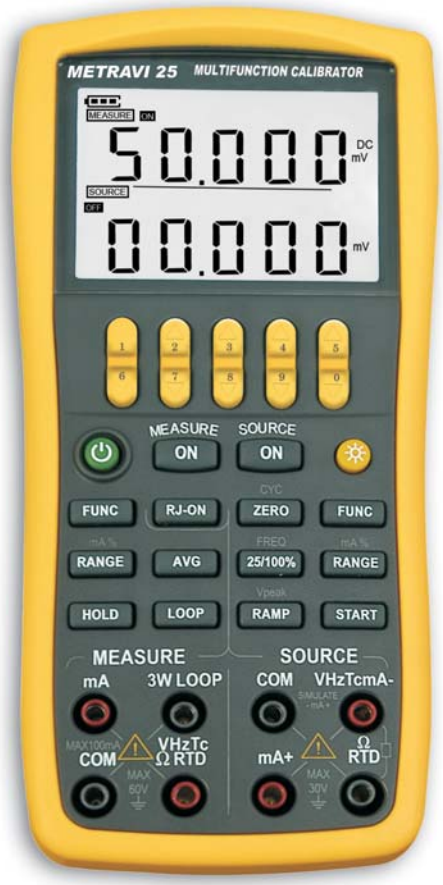
Note: ● indicating simultaneous use is allowed
× indicating simultaneous use is not allowed

Except the functions listed in Table 1, the calibrator has the following features as well:

- You can operate the measurement and source function simultaneously. The LCD screen is divided into two separate sections, whose upper part displays measurement information and lower part displays source information.
- TC measurement/source terminals and built-in lead connector of same temperature (RJ compensation with auto-reference joint point)
- Manual step source and auto -step and sweeping -step source
- Room temperature monitoring under any operation
- Measurement/source temperature monitoring function
- Measurement/source mA% display
- Measurement wave-filter function
- Measurement manual-holding function
- Pressure source auto-holding function

Standard Accessories

- Two set of Industrial testing Lead
- A set of Testing Lead
- A set of Alligator clip
- A quick reference guide
- A User's Manual
- One Fuse 50mA/250V
- One Fuse 63mA/250V



GENERAL SPECIFICATION

These specifications assume:

- A 1-year calibration cycle
- An operating temperature of 18º to 28º
- Relative humidity of 35% to 70% (non_condensing)

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GENERAL SPECIFICATION FOR MEASURE

Accuracy is expressed as ± (percentage of reading + percentage of range).

Function	Reference	Range	Resolution	Accuracy	Remark
DCV	50mV	-5.000mV ~ 55.000mV	1μV	0.02 + 0.02	Input Resistance: 100MΩ
	500mV	-50.00mV ~ 550.00mV	10μV	0.02 + 0.01	
	5V	-0.5000V ~ 5.5000V	0.1mV	0.02 + 0.01	Input Resistance: 1MΩ
	50V	-5.000V ~ 55.000V	1mV	0.03 + 0.01	
DCmA	50mA	-5.000mA ~ 55.000mA	1μA	0.02 + 0.01	Shunt Resistance:10Ω
OHM	500Ω Test Current: Approximately 1mA	0.00Ω ~ 550.00Ω	0.01Ω	0.05 + 0.02	Open Circuit Voltage:about 2.5V; Does not include lead resistance;
	5KΩ Test Current Approximately 0.1mA	0.0000 KΩ~5.5000KΩ	0.1Ω	0.05 + 0.02	
FREQ	500Hz	3Hz~500.00Hz	0.01Hz	± 2digit	Input Impedance:100 kΩ at least; Sensitivity: 3Vp-p minimum;Duty Cycle: 50%.
	5KHz	3Hz~5.0000KHz	0.1Hz		
	50KHz	3Hz~50.000KHz	1Hz		
TC	R	0°C~1767°C	1°C	0 ~ 500ºC : 1.8 ºC 500 ~ 1767 : 1.5	By using ITS-90 temperature scale; The accuracy does not include the error of internal temperature compensation caused by a sensor;
	S	0°C~1767°C			
	K	-100.0°~1372.0°C	0.1°C	-100.0 ~ 0ºC : 1.2ºC, 0 ~ 1372.0 ºC : 0.8	
	E	-50.0°C~1000.0°C		-50.0ºC ~ 0ºC : 0.9ºC, 0 ~ 1000.0ºC: 1.5ºC	
	J	-60.0°C~1200.0°C		-60.0 ~ 0ºC : 1.0ºC, 0 ~ 1200.0ºC : 0.7ºC	
	T	-100.0°C~400.0°C		-100.0 ~ 0ºC : 1.0ºC, 0 ~ 400.0ºC : 0.7ºC	
	N	-200.0°~1300.0°C		-200.0 ~ 0ºC : 1.5ºC, 0 ~ 1300.0ºC : 0.9ºC	
	B	600°C~1820°C	1°C	600 ~ 800ºC : 2.2ºC, 800 ~ 1000ºC : 1.8ºC, 1000 ~ 1820ºC: 1.4ºC	
RTD	Pt100-385	-200.0°C~800.0°C	0.1°C	-200.0 ~ 0ºC : 0.5ºC 0 ~ 400.0ºC : 0.7ºC 400.0 ~ 800.0ºC : 0.8ºC	By using Pt100-385 Does not include lead resistance.
	Pt1000-385	-200.0°C~630.0°C		-200.0 ~ 100.0ºC: 0.3ºC,100.0 ~ 300.0ºC : 0.5ºC, 300.0ºC ~ 630.0ºC : 0.7ºC	
	Pt200-385	-200.0°C~630.0°C		-200.0 ~ 100.0ºC: 0.8ºC, 100.0 ~ 300.0ºC : 0.9ºC, 300.0 ~ 630.0ºC : 1.0ºC	
	Pt500-385	-200.0°C~630.0°C		-200.0 ~ 100.0ºC: 0.4ºC, 100.0 ~ 300.0ºC : 0.5ºC, 300.0 ~ 630.0ºC : 0.7ºC	
	Cu10	-100.0°C~260.0°C		1.8ºC	
	Cu50	-50.0°C~150.0°C		0.7ºC	
SWITCH		CLOSE / OPEN			Approximately 1mA Test Curren Short circuit display : CLOSE, Open circuit display: OPEN; Threshold value about 200~300O
CONT.	500Ω	=50Ω sound			Approximately 1mA Test Current

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OTHER FEATURE

Measurement function	Rate
DCV, DCI, OHM, TC	2 Readings per Second about
RTD	1 Readings per Second about
FREQ	0.5 Readings per Second about
CONT.	4 Readings per Second about
PRESSURE	1.5 Readings per Second about

- DCV

Normal Mode Rejection Ratio (NMRR) ≥ 60dB (at 50Hz or 60Hz)

Common Mode Rejection Ratio (CMRR) ≥140dB (at 50Hz or 60Hz)

- Temperature Coefficient: 0.1 times the applicable accuracy specification per degree C for 5°C to 18°C and 28°C to 40°C
- The range of the internal temperature compensation sensor is from -10ºC to 50ºC, compensation error = 0.5°C
- Maximum voltage between VΩHz terminal and COM terminal: 60 Vp-p
- Maximum Input current: 60mA.
- Protected with a 63mA, 250V fast blow fuse

GENERAL SPECIFICATIONS FOR SOURCE

These specifications assume:

A 1-year calibration cycle

An operating temperature of 18°C to 28°C (64.4°F ~ 82.4°F)

Relative humidity of 35% to 70% (non_condensing)

Accuracy is expressed as ± (percentage of set value + percentage of range)

Function	Reference	Range	Resolution	Accuracy	Remark
DC voltage	100mV	-10.000mV ~ 110.000mV	1μV	0.02 + 0.01	Maximum output current: 0. 5mA
	1V	-0.10000V ~ 1.10000V	10μV	0.02 + 0.01	Maximum output current: 2mA
	10V	-1.0000V ~ 11.0000V	0.1mV	0.02 + 0.01	Maximum output current: 5mA
DC current	20mA	0.000mA ~ 22.000mA	1μA	0.02 + 0.02	External supply for simulate mA: 5V-28V Maximum load 1KΩ at 20mA
Resistance	400Ω	0.00Ω ~ 400.00Ω	0.01Ω	0.02 + 0.02	Excitation current: ± 0.5-3 mA; if ± 0.1-0.5, add 0.1Ω;Accuracy does not include lead resistance;
	4KΩ	0.0000 KΩ ~ 4.0000 KΩ	0.1Ω	0.05 + 0.025	Excitation current: ± 0.05 -0.3mA; Does not include lead resistance;
	40KΩ	0.000 KΩ ~ 40.000 KΩ	1Ω	0.1 + 0.1	Excitation current: ± 0.01mA; Does not include lead resistance;
TC	R	0°C ~ 1767°C	1°C	0 ~ 100ºC : 1.5ºC 100 ~ 1767ºC : 1.2ºC	By using ITS-90 temperature scale; The accuracy does not include the error of internal temperature compensation caused by a sensor;
	S	0°C ~ 1767°C		0 ~ 100ºC : 1.5ºC, 100 ~ 1767ºC: 1.2ºC	
	K	-200.0°C ~ 1372°C	0.1°C	-200 ~ -100ºC : 0.6ºC -100 ~ 400ºC : 0.5ºC 400 ~ 1200ºC : 0.7ºC 1200 ~ 1372ºC : 0.9ºC	
	E	-200.0°C ~ 1000°C		-200 ~ -100ºC : 0.6ºC -100 ~ 600ºC : 0.5ºC 600 ~ 1000ºC: 0.4ºC	
	J	-200.0°C ~ 1200°C		-200 ~ -100ºC : 0.6ºC -100 ~ 800ºC : 0.5ºC 800 ~ 1200ºC : 0.7ºC	
	T	-250.0°C ~ 400°C		-250 ~ 400ºC : 0.6ºC	
	N	-200.0°C ~ 1300.0°C		-200 ~ -100ºC : 1.0ºC -100 ~ 900ºC : 0.7ºC 900 ~ 1300ºC : 0.8ºC	
	B	600°C ~ 1820°C	1°C	600 ~ 800ºC : 1.5ºC 800 ~ 1820ºC : 1.1ºC	

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OTHER FEATURE

Function	Reference	Range	Resolution	Accuracy	Remark
RTD	Pt100-385	-200.0°C ~ 800.0°C	0.1°C	-200 ~ 0ºC : 0.3ºC 0 ~ 400ºC : 0.5ºC 400 ~ 850ºC : 0.8ºC	By using Pt100-385 Excitation current: ± 0.5 ~ ±3mA for Pt100, Cu10, Cu50;
	Pt200-385	-200ºC ~ 630ºC		-200-100 : 0.22ºC 100-300 : 0.3ºC 300 ~ 630 : 0.4ºC	Excitation current: ± 0.05ma ~ ± 0.3mA for PT200, PT500, PT1000; Does not include lead resistance
	Pt500-385	-200ºC ~ 630ºC		-200 ~ 100 : 0.22ºC 100-300 : 0.3ºC 300 ~ 630 : 0.4ºC	
	Pt1000-385	-200ºC ~ 630ºC		-200 ~ 100 : 0.22ºC 100 ~ 300 : 0.3ºC 300 ~ 630 : 0.4ºC	
	Cu10	-100.0ºC ~ 260.0ºC		-100 ~ 260ºC : 2ºC	
	Cu50	-50.0ºC ~ 150.0º		-50 ~ 150ºC : 0.6ºC	
FREQ	100Hz	1.00Hz ~ 110.00Hz	0.1Hz		Output voltage: +1 ~ +11 Vp-p (Zero base waveform);
	1KHz	0.100KHZ ~ 1.100KHz	0.1KHz	± 2 count	Amplitude accuracy: (± 5% + 0.5V); Maximum load: > 100KΩ; Duty Cycle: 50%
	10KHz	1.0KHz ~ 11.0KHz	2KHz		
	100KHz	1KHz ~ 110KHz	2KHz	± 5 count	
PULSE	100Hz		0.1Hz		
	1KHz		1Hz	± 2 count	
	10KHz		0.1KHz		
SWITCH	100Hz		0.1Hz		FET switch
	1KHz		1Hz	± 2 count	Maximum open/close voltage + 28V
	10KHz		0.1KHz		Maximum open/close current: 50mA
	100KHz		2KHz	± 5 count	
LOOP	24V			± 10%	Maximum current: 22mA Short circuit protected

Measurement and source pressure

	Range and Accuracy	resolution	For more detail, refer the pressure module about APM.
PRESSURE	Determined by pressure module	5 digits	

Other feature:

- Temperature Coefficient: 0.1 times the applicable accuracy specification per degree C for 5°C to 18°C and 28°C to 40°C.
- The range of the internal temperature compensation sensor is from -10ºC to 50ºC
- Maximum voltage between any output terminal and earth: 30V DC
- Maximum output current: Approximately 25mA.

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