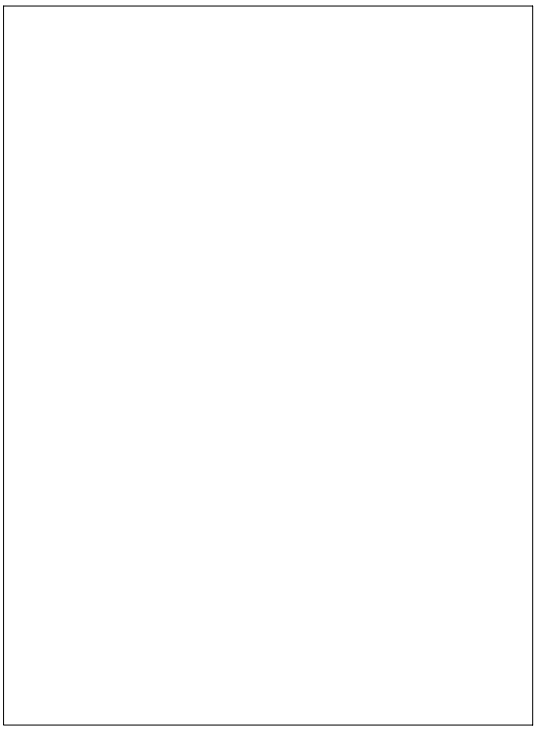
VOLTAGE/CURRENT CALIBRATOR

Model : CC-421



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1. FEATURES

* Portable instrument for calibrating process devices and measuring process signals.
* Adjustable 0-24 mA current source.
* Adjustable -199.9 mV to +199.9 mV DCV source.
* Current calibrator drives loads up to 500 ohms.
* The instruments Powers or Measure a two-wire current loop.
* Four function provide the quality and accuracy of handheld calibrator : 1) Precision current source, 2) Measurement of a current signal, 3) Power and measurement of two wire loop, 4) Precision DC mV source,

2. SPECIFICATIONS

2-1 General Specifications

Display	LCD display, max. display counnts 1999. 13 mm (0.5") digit size.
Function Range & Resolution	*1) Current source :* 2 ranges : 0 - 19.99 mA x 0.01 mA 0 - 24 mA x 0.1 mA
	2) Current measurement : 2 ranges : 0 - 19.99 mA x 0.01 mA 0 - 24 mA x 0.1 mA
	3) Power and current measurement of two wire loop : 0 - 19.99 mA x 0.01 mA 0 - 24 mA x 0.1 mA
	4) DC mV source : - 199.9 mV to + 199.9 mV x 0.1 mV

Sampling Time	Approx. 0.4 second.
Over input Indication	Indication of " 1 ".
Operating Temperature	0 蚓 to 50 蚓 (32 蚌 to 122 蚌).
Operating Humidity	Less than 80% RH.
Power Supply	006P DC 9V, MN1604/PP3 battery or equivalent. *Alkaline type or heavy duty type.*
Power Consumption	*Current measurement :* Approx. DC 12 mA
	Power and current measurement : Approx. DC 12 mA
	Current source (under 10 mA signal out put) : Approx. DC 33 mA
	DC mV source (under 100 mV signal out put) : Approx. DC 33 mA
Dimension	185 x 78 x 38 mm (7.3 x 3.0 x 1.5 inch).
Weight	265 g/0.58 LB (incluing battery).
Accessories Included	Operational manual..... 1 PC. Cable with the alligator pairs (red & black), LN-TL421..... 1 PC.

2-2 Electrical Specifications (23 5 蚓)

Current source		
Range	Display Resolution	Accuracy
0 - 19.99 mA	0.01 mA	(0.25 % FS + 1 d)
0 - 24 mA	0.1 mA	(0.5 % FS + 1 d)
** Output 0 to 24 mA current for loads up to 500 ohms.* *Output > 20 mA current for loads up to 400 ohms.* ** FS : full scale*		

Current measurement		
Range	Display Resolution	Accuracy
0 - 19.99 mA	0.01 mA	(0.25 % FS + 1 d)
0 - 24 mA	0.1 mA	(0.5 % FS + 1 d)
** FS : full scale*		

Power and current measurement of two wire loop		
Range	Display Resolution	Accuracy
0 - 19.99 mA	0.01 mA	(0.25 % FS + 1 d)
0 - 24 mA	0.1 mA	(0.5 % FS + 1 d)
** Provides power DC 12V 2 V to the loop and measures current.* ** FS : full scale*		

DC mV source		
Range	Display Resolution	Accuracy
- 199.9 mV to *+ 199.9 mV*	0.1 mV	(0.25 % FS + 1 d)
** Output measured load impedance should > 1 K ohms.* ** FS : full scale*		

Remark :

The above specification are tested under the environment RF Field Strength less than 3 V/M & frequency less than the 30 MHz only.

CAUTION

**** The protection for the input terminals (red & black alligator pairs) is AC/DC 10V.***
**** Any external voltage is prohibited to input to the meter.***
**** If input any voltage over 10 volt will harm the meter's internal circuit, supplier will without liability.***

3. FRONT PANEL DESCRIPTION

Fig. 1

3-1 Display
3-2 Function Switch
3-3 Power Switch

Symbol
1 = On 0 = Off

3-4 Range Switch
3-5 Calibration Adjust knob
3-6 Battery Compartment/Cover
3-7 Input Socket
3-8 Cable Plug
3-9 Alligator Clips

4. MEASURING PROCEDURE

4-1 Current source

1) Install the " Cable Plug " (3-8, Fig. 1) into the " Input Socket " (3-7, Fig. 1).
2) Slide the " Function Switch " (3-2, Fig. 1) to the " CURRENT SOURCE " position.
3) Slide the " Range Switch " (3-4, Fig. 1) to " 0 - 19.99 mA " position for getting the 0.01 mA display resolution (max. display is 19.99 mA). Slide the " Range Switch " (3-4, Fig. 1) to " 0 - 24.0 mA " position for getting the 0.1 mA display resolution.
4) Adjust the " Calibration Adjust knob " (3-5, Fig. 1) will generate the current output same as the display value.

Note :
The " Red Alligator clip " (3-9, Fig. 1) is for the positive current output. The " Black Alligator clip " (3-9, Fig. 1) is the " ground " for current output.

4-2 Current measurement

1) Install the " Cable Plug " (3-8, Fig. 1) into the " Input Socket " (3-7, Fig. 1).
2) Slide the " Function Switch " (3-2, Fig. 1) to the " mA MEASURE " position.
3) Slide the the " Range Switch " (3-4, Fig. 1) to " 0 - 19.99 mA " position for geeting the 0.01 mA display resolution (max. display is 19.99 mA). Slide the " Range Switch " (3-4, Fig. 1) to " 0 - 24.0 mA " position for getting the 0.1 mA display resolution.
4) Open the circuit in which current is to be measured and connect the " Alligator Clips " (3-9, Fig. 1) securely in series with the load in which the current is be measured.

Note :
The " Red Alligator clip " (3-9, Fig. 1) is for the positive current measurement input. The " Black Alligator clip " (3-9, Fig. 1) is for the negative current measurement input.

4-3 Power and current measurement of two wire loop

meter equivalant block diagram

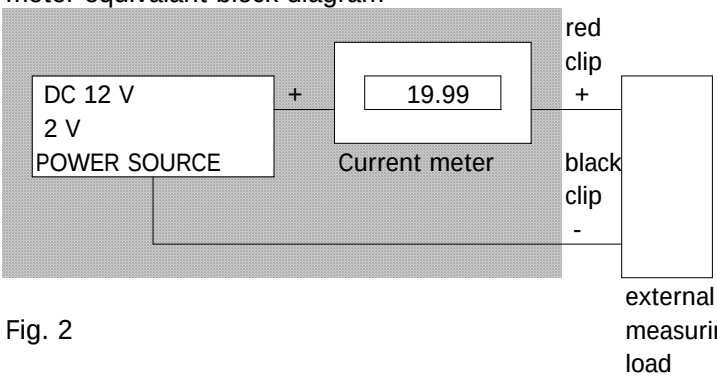

Fig. 2

1) Install the " Cable Plug " (3-8, Fig. 1) into the " Input Socket " (3-7, Fig. 1).
2) Slide the " Function Switch " (3-2, Fig. 1) to the " POWER/ mA MEASURE " position.
3) Slide the " Range Switch " (3-4, Fig. 1) to " 0 - 19.99 mA " position for getting the 0.01 mA display resolution (max. display is 19.99 mA). Slide the " Range Switch " (3-4, Fig. 1) to " 0 - 24.0 mA " position for getting the 0.1 mA display resolution.
4) Open the circuit in which current is to be measured and connect the " Alligator Clips " (3-9, Fig. 1) securely in series with the load in which the current is be measured.

Note :

a. The " Red Alligator clip " (3-9, Fig. 1) is for the positive current measurement input. The " Black Alligator clip " is for the negative current measurement input.

b. The measuring procedures & principal are same as the 4-2 Current measurement except the meter build in the DC 12 V power source in serial with the current meter, please refer Fig. 2.

4-4 DC mV source

1) Install the " Cable Plug " (3-8, Fig. 1) into the " Input Socket " (3-7, Fig. 1).
2) Slide the " Function Switch " (3-2, Fig. 1) to the " VOLTAGE SOURCE " position.
3) Adjust the " Calibration Adjust knob " (3-5, Fig. 1) will generate the voltage (mV) output same as the display value.

Note :

The " Red Alligator clip " (3-9, Fig. 1) is for the positive voltage output. The " Black Alligator clip " (3-9, Fig. 1) is for the negative voltage output.

5. REPLACEMENT OF BATTERY

1) When LCD display show the " BAT " marker,
   It is necessary to replace the battery. However,
   in-spec measurement may still be made for several
   hours after low battery indicator appears before the
   instrument become inaccurate.
2) Slide the " Battery Cover " (3-6, Fig. 1) away from the
   instrument by loss the screw and remove the battery.
3) Replace with 9V battery (Alkaline or heavy duty type)
   and reinstate the cover.
4) Make sure the battery cover is secured after change the
   battery.