

**VOLTAGE/CURRENT
CALIBRATOR
ISO-TECH ILC-421**

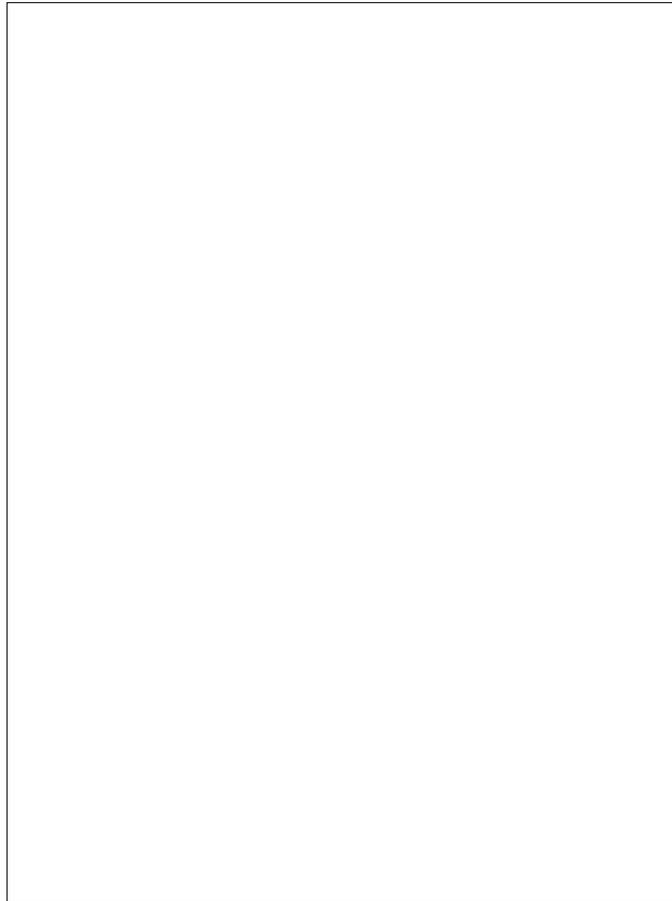


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1. FEATURES

- * 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 can power as well as measure a two-wire current loop, useful for testing 4-20mA loop devices (for example pressure transmitters).
- * Four functions include: 1) Precision current source
2) Measurement of current signal 3) Simultaneous powering and measurement of a 2-wire current loop 4) Precision DC mV source,

2. SPECIFICATIONS

2-1 General Specifications

Display	LCD display, max. display count 1999. 13 mm (0.5") digit height.
Function Range & Resolution	<i>1) Current source :</i> 2 ranges : 0 - 19.99 mA x 0.01 mA 0 - 24 mA x 0.1 mA
	<i>2) Current measurement :</i> 2 ranges : 0 - 19.99 mA x 0.01 mA 0 - 24 mA x 0.1 mA
	<i>3) Power and current measurement of two wire loop :</i> 0 - 19.99 mA x 0.01 mA 0 - 24 mA x 0.1 mA
	<i>4) DC mV source :</i> - 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 °C to 50 °C (32 °F to 122 °F).
Operating Humidity	Less than 80% RH.
Power Supply	006P DC 9V, MN1604/PP3 battery or equivalent. <i>Alkaline type or heavy duty type.</i>
Power Consumption	<i>Current measurement :</i> Approx. DC 12 mA
	<i>Power and current measurement :</i> Approx. DC 12 mA
	<i>Current source (under 10 mA signal out put) :</i> Approx. DC 33 mA
	<i>DC mV source (under 100 mV signal out put) :</i> 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 (including battery).
Accessories Included	Operational manual..... 1 PC. Cable with the alligator pairs (red & black), LN-TL421..... 1 PC.

2-2 Electrical Specifications (23 5 °C)

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	$\pm (0.25 \% \text{ FS} + 1 \text{ d})$
0 - 24 mA	0.1 mA	$\pm (0.5 \% \text{ FS} + 1 \text{ d})$
* <i>FS : full scale</i>		

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

DC mV source		
Range	Display Resolution	Accuracy
- 199.9 mV to + 199.9 mV	0.1 mV	$\pm (0.25 \% \text{ FS} + 1 \text{ d})$
* <i>Output measured load impedance should > 1 K ohms.</i>		
* <i>FS : full scale</i>		

Remark :

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

3. FRONT PANEL DESCRIPTION

Fig. 1

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

<i>Symbol</i> 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 Self-powered two-wire current loop measurement

meter equivalent block diagram

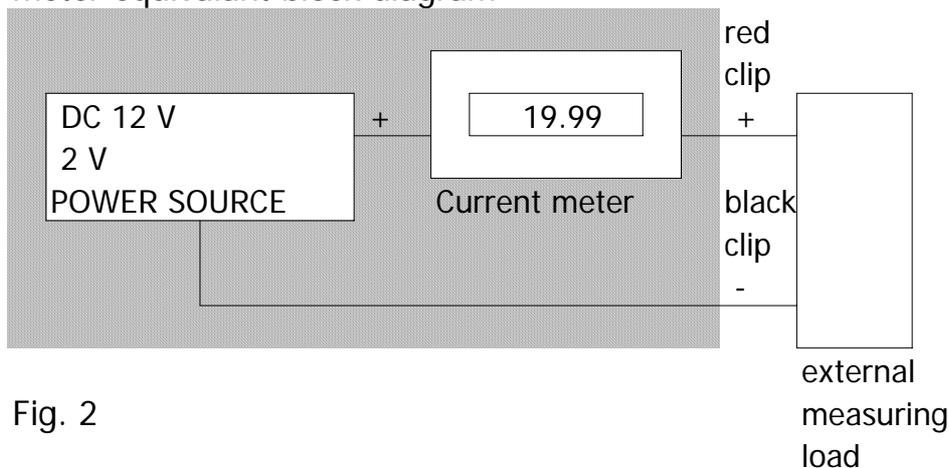


Fig. 2

- 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 to 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 the same as those in 4-2 Current measurement except the fact that the 12V DC power source is derived from the calibrator rather than from an external voltage source*

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.

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