

# Portable current signal generator Current loop checker

## C-HCL-A

### Instruction Manual

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Thank you for your purchase of "Current loop checker (C-HCL-A)".

Before use this Generator, please read these "Safety notice" and use properly. These notices are intended for safe and proper use of this Generator and prevent from any injury and damage for any property.

#### 1. Safety notice

##### 1.1 Meaning of Safety symbol

On this Generator and in the manual, for safety use, following indications are displayed based on safety rating.

#### WARNING

WARNING: Wrong operation and handling will cause death or heavy injury to the user.

#### CAUTION

CAUTION: Wrong operation and handling will cause injury to the user or damage to the Generator.

#### Notice

NOTICE: Items to be understood for safe operation and good operation condition for use.

##### 1.2 Notice for use

#### WARNING

WARNING: In case of this generator connected to Utility line or High-voltage, there will be high possibility for operator's electrical shock and/or damage to this generator.

This generator is not a measurement instrument, and should not connect to Utility line and High-voltage. High-voltage: 30Vrms and 42.4Vpeak AC or the voltage exceed 60VDC.

Do not use Generator in wet condition and/or with wet hand.  
Do not use if there is a damage on Case and/or test lead.  
Do not disassemble, modify this generator.

#### CAUTION

CAUTION: There are possibility for damage of this generator or Device Under Test (here in after DUT) or injury to the operator. Will cause injury, fire, heating, leakage of battery electrolyte.

Do not make this generator wet with water or seawater.  
Do not use if there is a damage on Case and/or test lead.  
Do not connect (+)(-) of battery oppositely.  
Do not mixed use with different capacity, type, brand.  
Do not mixed use with degraded battery.  
Do not open Case except for battery cover.  
Battery exchange to be performed under power off of the generator and with disconnecting to DUT.  
Do not put heavy material on this generator or drop this generator.  
Do not apply strong impact to this generator or throw this generator.  
When install battery, follow to the notice of battery to be used.

#### CAUTION

CAUTION: There will be a possibility for disorder or damage of use to this generator after functional deterioration and degradation.

Do not store or use in the location of direct sunlight, high temperature/humidity and condensing may occur.  
This generator is not dust proof nor water proof. Refrain from using in dust or water spraying environment.  
Caution to vibration, shock, impact and drop during handling and transportation.  
Take out batteries in case of no use for long time.  
Before use Generator, confirm induced voltage is not exceeded 30V AC by external electromagnetic induction.  
Maker is not liable for the damage or failure of measurement equipment caused by the connection to Generator's monitor terminal.  
Maker is not liable for DUT's damage or failure caused by the connection of Generator to DUT.

#### 2. Configuration

Confirm before use.  
Main 1 pc  
Test lead (red, black) 1 each  
1.5VDC Manganese battery 2 pc  
Instruction Manual 1 set

#### Notice

Enclosed batteries are for test purpose, and not for normal use.

#### 3. Product summary and feature

##### Product summary

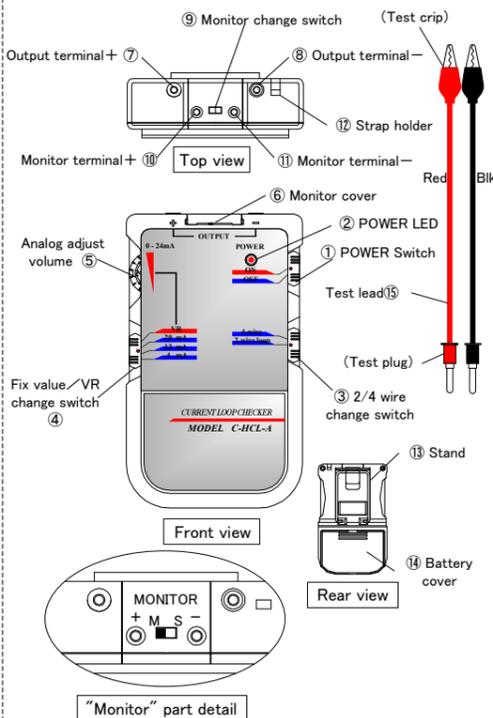
"Current loop checker(C-HCL-A)" is to loop check in maintenance, inspection and test for instrument system and plant etc. Instead of onsite transmitter, "Current loop checker" generates quasi-signal and can perform simulation by receiver side.

##### Feature of product

Compact and lightweight  
Handy size and fit in a pocket.  
Ultimate for onsite work.  
Easy operation and use.  
Simplified operation procedure.  
Function is focused on the usage and work.  
Signal system is correspond to 2/4 wire system.  
Low price  
Superior cost per performance  
Realize low cost with dedicated function by the concept of personal use.

#### 4. Component identification and function

##### Component identification



#### Notice

This Generator has a stable constant current output function, but is not suitable for precision instrument calibration. For calibration and adjustment, please select instrument fit for usage and purpose.

#### Functional description

- POWER switch: Power ON/OFF
- POWER LED: Red light Indication for power ON
- 2/4 wire change switch: Change current output between 2-wire loop system (sink) and 4-wire system (source)
- Fix/VR output change switch: By setting 4 · 12 · 20mA, each setting fixed value will output. Set to VR, fixed output is released and output is controlled by analog adjust volume.
- Analog adjust volume: Set ④ to VR to make successive output 0-24mA.
- Monitor cover: Take off when monitor function is used.

#### CAUTION

When monitor terminal is not used, make sure to put monitor cover on "monitor" location.

- Output terminal ±: Connect red test lead to + side and black test lead to - side.
- Monitor change switch: When monitor function is used, switch from S to M side.

#### CAUTION

Always switch to S side when monitor function is not used.

- Monitor terminal ±: When monitor current value, red test lead to be connected to + side, and black test lead to be connected to - side.
- Strap holder: When hang to use this Generator, top of strap to be threaded to the hole of this Generator.

#### CAUTION

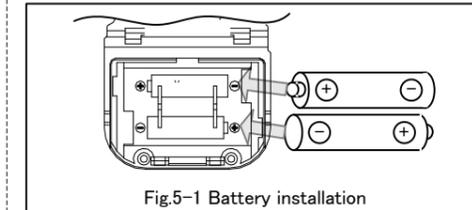
When customer purchase Strap, it should be no metal exposure type.

- Stand: Pull bar this side to use in standing position.
- Battery cover: Take off to change battery.
- Test lead: Insert red test lead to + side of output terminal, and black lead to - side.

#### 5. Directions

##### 5.1 Before use

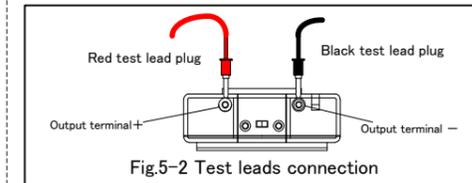
- Battery installation  
Remove rear battery cover.  
Install 1.5VDC Manganese battery 2 pcs as indicated in Fig. 5-1.
- Attach rear battery cover.



#### CAUTION

Do not mixed use with different capacity, type and brand.  
Do not install battery in opposit polarity.

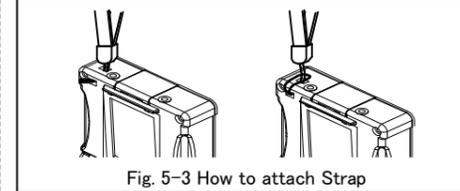
- Test lead connection  
Fully insert red test lead plug to "output terminal+" and black test lead plug to "output terminal-".



#### CAUTION

Do not use test leads other than attached test leads.

##### ③ How to attach Strap

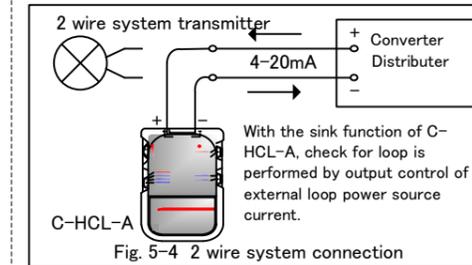


#### CAUTION

Strap is to be prepared by customer. When customer purchase Strap, it should be no metal exposure type.

##### 5.2 Current (sink) output with 2 wire system

- Power OFF this Generator and connect test leads to output terminal (2 wire system connection; see Fig. 5-4)
- Set 2/4 wire system change switch to "2-wire loop".
- To output fixed value, set desirable fixed value and connect test leads to DUT (device under test).
- Power ON this Generator and confirm LED is lightened, and then switch the value for adjustment sequentially for the test. (It is possible to shift to VR continuously).
- After test done, make sure power OFF, and disconnect test leads confirming DUT's safety.



#### WARNING

Do not connect to Utility line and high-voltage.

#### CAUTION

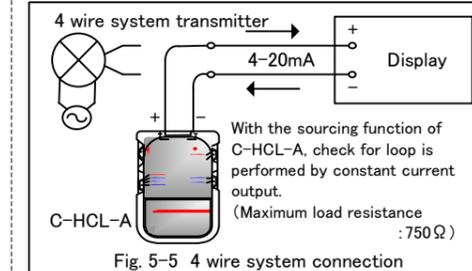
When use Generator in 2 wire system, input to Generator should be equal or less than 28V DC.

#### Notice

When use in 2 wire system, output adjustment to be performed after confirm internal power supply voltage and internal resistance of DUT. If internal resistance is large and internal power supply voltage is low, maximum output current (24mA) can not be attained.

##### 5.3 Current (source) output with 4 wire system

- With same procedure with 5.2, set 2/4 wire system change switch to "4-wire", and then follow to 5.2 procedure.



#### WARNING

Do not connect to Utility line and high-voltage.

#### WARNING

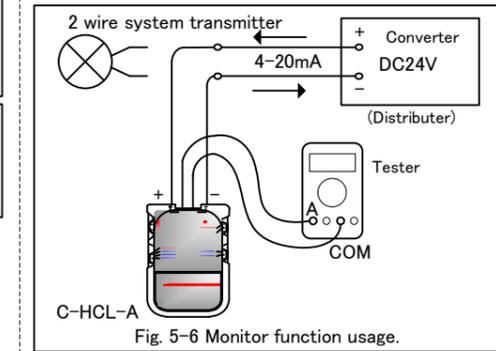
Do not leave Generator in output terminal short condition to avoid possible heat up of Generator.

#### Notice

**2 wire (sink) system and 4 wire (source) system**  
2 wire system: When there is no power supply in the signal transmitter and connect power supply, cable and output terminal of signal transmitter in series circuit, this system is that current value in the circuit represent signal. In this Generator, loop check is performed by output control (sink function) of the current with external loop power supply (maximum 28V DC).  
4 wire system: It has power supply in the signal transmitter, and require totally 4 wire including 2 wire for power supply and 2 wire for analog signal output. In this Generator, constant current signal will be output (source function) as supply signal of receiver side.

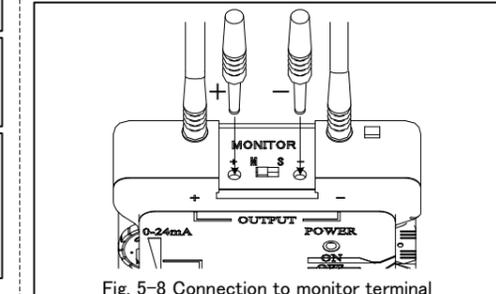
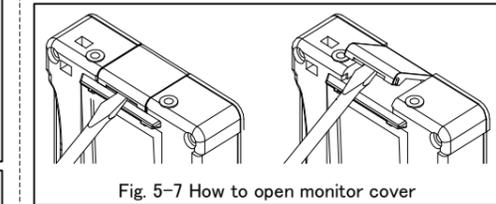
##### 5.4 When use monitor function

- Power OFF Generator, and then change monitor change switch from S to M.
- Connect measurement equipment for monitoring to + side (red) and - side (black) of monitor terminal.
- Test to be performed following 5.2 or 5.3 procedure.



#### CAUTION

Do not apply any voltage between monitor terminals.  
Do not insert wire or significantly deformed terminal. to avoid possible damage to inside of this Generator.  
When monitor function is not used, monitor change switch should be set to S side, and attach monitor cover.  
Maker has no responsibility for the damage or injury of measurement equipment by connecting to monitor part.



#### CAUTION

Power OFF Generator, and then connect test lead.  
Power OFF Generator, and then change 2/4 wire system.  
Use Generator after confirm DUT's signal system (2/4 wire system).  
Connection to output terminal should be performed at the polarity met with connection condition of DUT.

#### 6. Specification

- Generation method: Sink and source generation by FET drive.
- Output: 4, 12, 20mA fixed output (accuracy ±2.5%)  
0-24mA successive VR output.
- Operation: -5 to +40°C (23 to 104°F)  
80%RH Max. (non-condensing)
- Storage: -10 to +50°C (14 to 122°F)  
80%RH Max. (non-condensing)
- Power source: 1.5VDC battery, 2 pcs.  
Acceptable battery: Alkaline UM3 battery (LR6) recommended  
Manganese UM3 battery (R6)  
Nickel hydrogen rechargeable battery (HR)
- Continuous operation: approximately 7 hours.  
(load resistance 750Ω, 12mA output, new alkaline UM3 battery)
- Maximum output current: 24mA DC  
Maximum output current is depend upon maximum voltage between output terminals and load resistance.  
750Ω is operation guaranteed value of this Generator.  
When use with the load more than 750Ω, normal operation is not guaranteed.
- Maximum input voltage (2 wire system): Nominally 24V DC (Max. 28V DC)
- Location for use: Indoor and outdoor where no direct sun light, strong wind, water dropping, high temperature and high humidity, and condensation.
- Dimensions: W60xH100xD23mm (2.36"x3.94"x0.91")
- Weight: Approximately 70g (0.154lbs)  
(Generator without battery)

#### Notice

- Continuous operation time is estimate and deviate with operation condition and battery type.
- This Generator and/or contents of instruction manual will be changed without notice for improvement of this Generator.
- Exterior and design will be changed without notice.

#### 7. Maintenance, service

##### 7.1 Battery exchange

When battery voltage decline, POWER LED will turn out. Need to change to new battery for normal operation.

- Turn OFF this Generator.
- Remove rear battery cover.
- Take out old battery, and install new battery in correct polarity.
- Attach rear battery cover.

#### CAUTION

Do not mixed use with different capacity, type and brand of the battery.  
Do not install battery in wrong polarity.

#### Notice

- Use commercially available Alkaline UM3 battery or Nickel hydrogen battery.
- Attached Manganese battery (R6) is test purpose and not meet with specified continuous operation.

##### 7.2 In case of Trouble?

Confirm following items.

Symptom	Confirmation	Measures
POWER LED does not light	• Battery are installed? • Battery are consumed?	• Insert battery fully. • Change to new battery.
No output	• POWER switch is ON? • Connection of output terminal, test lead and DUT are correct? • Connection polarity is correct? • Test lead(s) wire is (are) open? • Monitor change switch is set "S"?	• Turn POWER switch ON. • Connect output terminal, Test lead, DUT correctly. • Correct polarity. • Change test lead(s). • Set monitor change switch to "S".
Can not monitor	• Monitor change switch is set "M"? • Monitor terminal, measurement instrument connections are correct? • Connection polarity is correct?	• Set monitor change switch to "M". • Connect correctly. • Correct polarity.

##### 7.3 Service

In case of trouble?, contact with the shop you bought this Generator after confirm item 7.2. When you return concerned Generator, please wrap and pack adequately to prevent any damage during transportation, and attach the letter indicating symptom. Maker do not warrant to any damage in the transportation.

##### 7.4 Scrap

This Generator use batteries. When scrap this Generator, please remove batteries installed and scrap with proper procedure

#### WARNING

Used battery should be scrapped to reserved location based on type of battery. Also, in case of regulation for scrapping battery, please follow to the regulation.