

Process Multimeter

CA450

Loop Power and 4 to 20 mA Output function in a DMM

From daily inspection to troubleshooting of measurement instruments—all in a single unit!

Features

■ Loop check functions

- Simultaneous 24 V loop power and mA measurement
- HART/BRAIN mode setting with loop power (Adds 250 ohm resistance internally)

■ Generation functions

- · SIMULATE (SINK) function simulates transmitters
- · 4-20 mA span/step/auto-step/sweep output

■ Measurement functions

- High accuracy signal measurement: DC mA 0.05%/30.000 mA
- Handheld DMM function
- Peak Hold function for the peak voltage measurement of DCS power supply
- Dedicated sensor modes for direct reading of many sensor signal types

■ Enhanced Safety—helps eliminate electric shocks

- Current terminal shutter prevents incorrect connections
- 1 A or more of AC/DC current can be read directly using the optional clamp probe and scaling in SENSOR mode.
- · Measurement categories 600 V CAT. IV, 1000 V CAT. III

■ Linking with a PC

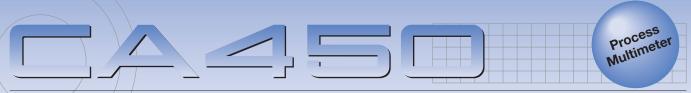
 DMM Communication Package can be used to save and manage the measurement data.

*1: AC/DC 600 mV range only



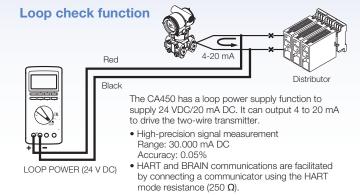


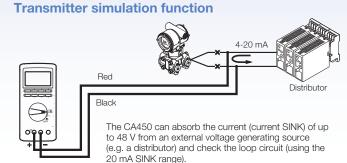
* This is a composite picture. The shutter actually opens during current measurement and generation.



The CA450 can be used in a wide range of applications, such as checking the operation of field devices and maintenance of electrical equipment.

Transmitter application





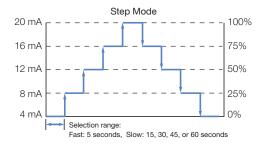
Valve/Positioner application

Span generation function

The span from 0 to 20mA or 4 to 20 mA (0 to 100%) can be switched with one touch. It is easy to adjust the span of the valve and check the operation of the valve.

Step generation function

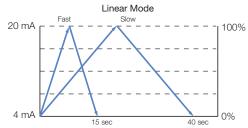
The step can be generated by increasing or decreasing the step between 0 and 20 mA or between 4 and 20 mA in increments of 25% up to 100% with one touch, or stepwise automatically (step width is selectable) to improve work efficiency. The Slow mode of Step Mode can also be used to change the step time in accordance with the performance of field devices.



Sweep generation function

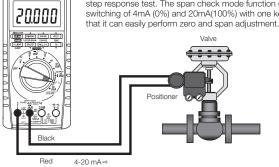
SIMULATE (SINK)

This function is used to increase or decrease the output value to the setpoint at the specified ramp rate. It is possible to switch between Fast (15 sec) and Slow (40 sec) increase or decrease.



When checking the open-close position of valve and positioner and adjusting it the CA450 supports your maintenance work efficiently

The step generation function is suitable for performing a step response test. The span check mode function enables switching of 4mA (0%) and 20mA(100%) with one key so



Electrical equipment check

AC/DC Current measurement (SENSOR mode)

The CA450 can directly read the various sensor output signals (mV DC/AC) at any scaling. The units can be changed (16 units are available).

Output signal and scaled value are simultaneously displayed.



AC/DC clamp-on probe (Model 96095) Reads maximum 60 A when used with the CA450.

Accuracy

Accuracy: ± (% of reading + digits) at 23°C ± 5°C, 80% RH or less

●DC Voltage Measurement === V,

| 0 2 0 101145 | -, | | | | | |
|--------------|------------|----------|---------------------|--------------------------|--|--|
| Range | Resolution | Accuracy | Input Resistance | Maximum Input Voltage | | |
| 600 mV | 0.1 mV | 0.09%+2 | 10 MΩ or more | | | |
| 6 V | 0.001 V | | Approx. 11 MΩ | 1000 V DC | | |
| 60 V | 0.01 V | 0.09%+1 | | | | |
| 600 V | 0.1 V | | Approx. 10 MΩ | 1000 Vrms AC | | |
| 1000 V | 1 V | 0.1%+1 | 1 | | | |

NMRR: 60 dB or more, 50/60 Hz \pm 0.1% CMRR: 120 dB or more, 50/60 Hz (Rs = 1 k Ω) Response time: Within 1 second

ullet AC Voltage Measurement \sim V, \sim mV

AC coupling, rms value detection: sine wave

| | | | Accuracy | | Input | Maximum Input |
|--------|------------|--------------|--------------------|--------------------|---------------------------|---------------|
| Range | Resolution | 50/ 60 Hz | 40 Hz to 500 Hz | 500 Hz to 1 kHz | Resistance | Voltage |
| 600 mV | 0.1 mV | | | | 10 MΩ or more, <200 pF | |
| 6 V | 0.001 V | 0.5%+5 | 1%+5 | 1.5%+5 | Approx. 11 MΩ, <50 pF | 1000 V DC |
| 60 V | 0.01 V | 0.570+5 | 170+0 | | | 1000 Vrms AC |
| 600 V | 0.1 V | | | | Approx. 10 MΩ, <50 pF | |
| 1000 V | 1 V | | | | 123 61 | |

For a range of 5 to 100%, the accuracy for the 1000 V range is 200 V to 1000 V

CMRR: 60 dB or more, DC to 60 Hz (Rs = 1 kg)

For nonsinusoidal waveforms whose crest factor is less than 3, add ±(2% of reading + 2% of range) to the accuracy. For the 1000 V range, the peak voltage is 1500 V or less

Response time: Within 2 seconds

DC Current Measurement mA

| Range | Resolution | Accuracy | Voltage Drop |
|----------|------------|----------|--------------|
| 30 mA | 0.001 mA | 0.05%+2 | <0.3 V |
| 100 mA*1 | 0.01 mA | 0.05%+2 | <0.8 V |

Only the 30 mA range can be used during LOOP POWER output. Response time: Within 1 second

■Resistance Measurement Ω

| Range | Resolution | Accuracy | Maximum Measuring Current | Open-Loop Voltage | Input Protective Voltage |
|--------|------------|----------|------------------------------|----------------------|-----------------------------|
| 600 Ω | 0.1 Ω | 0.2%+2 | <1.2 mA | <3.5 V | |
| 6 kΩ | 0.001 kΩ | | <110 μΑ | | |
| 60 kΩ | 0.01 kΩ | 0.2%+1*1 | <13 µA | | 1000 Vrms |
| 600 kΩ | 0.1 kΩ | | <1.3 µA | <1.3 V | 1000 VIIIIS |
| 6 MΩ | 0.001 MΩ | 0.35%+3 | <130 nA | | |
| 60 MΩ | 0.01 MΩ | 1%+2*2 | < 130 HA | | |

● Continuity Check •1)

| Range | Resolution | Operating Range | Measuring Current | Open-Loop Voltage | Input Protective Voltage |
|-------|------------|-----------------------------------------------------|----------------------|----------------------|-----------------------------|
| 600 Ω | 0.1 Ω | The buzzer sounds at resistances lower than 50±30 Ω | <1.2 mA | <3.5 V | 1000 Vrms |

● Diode Test + 人

| Range | Resolution | Accuracy | Measuring Current (Vf=0.6 V) | Open-Loop Voltage | Input Protective Voltage |
|-------|------------|----------|---------------------------------|----------------------|-----------------------------|
| 2 V | 0.001 V | 1%+2 | Approx. 0.5 mA | <3.5 V | 1000 Vrms |

Frequency Measurement in Hz

AC Coupling

| Range | Resolution | Accuracy | Input Voltage Range |
|-------------------------|------------|----------|---------------------|
| 10.00 Hz to 199.99 Hz | 0.01 Hz | | 0.3 to 600 Vrms |
| 90.0 Hz to 1999.9 Hz | 0.1 Hz | 0.005%+1 | 0.3 10 600 VIIIS |
| 0.900 kHz to 19.999 kHz | 0.001 kHz | | 0.4 to 600 Vrms |

●Peak Hold (P•H)

| Measurement Function | Accuracy | Minimum Detection Width |
|----------------------|-------------|-------------------------|
| DCV | ±100 digits | >6 ms |

●DC Output ♦ mA

| Range | Resolution | Accuracy | Load Condition |
|-------|------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 20 mA | 0.001 mA | 0.05% of range | SOURCE 0 to 20 mA Compliance voltage 28 V SIMULATE (SINK) 0 to 20 mA External power supply 15 to 48 V overrange up to 25 mA |

●24 V Loop Power Supply (LOOP POWER)

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Range | Load Condition |
| 24 V | 24 VDC (typ.), load current 20 mA |

General Specifications

Measurement functions: DC voltage, AC voltage, DC current, resistance,

frequency, continuity check, diode test

Additional functions: Data hold (D•H); auto hold (A•H); peak hold (P•H);

auto range (Auto);range hold (Range Hold); maximum, minimum, and average value recording and measurement; zero adjustment (Ω); relative measured value display (REL Δ , REL%); 24 V loop power supply; internal resistor on/off for HART

communication

20 mA DC current for current output SOURCE and Output functions:

current output SIMULATE(SINK) Additional functions: Current span switching and current sweep output

Operation methods: Measurement: $\Delta\Sigma$ modulation Output: Multiplicative DA

Display:5-digit LCD (7 segment)

Numeric display

| Measurement | Output |
|-------------------|-------------------|
| DC current: 33000 | DC current: 25000 |
| Frequency: 19999 | CT RELIANS Hz |
| Other: 6600 | TT/ov |

Subdisplay Displays supplemental information for various

functions

Polarity indicator Automatic display. Only the minus sign "-"

appears. "OL"

Over range indicator

Low-battery indicator === appears when the battery voltage is

below the operating voltage.

Measurement cycle: 2.5 to 5 times a second (however,

frequency measurement takes place

once a second)

Operating temperature and humidity: -20°C to 55°C (80% RH or less) with no

condensation

Within the range of 40°C to 55°C, the humidity must be 70% RH or less. Storage temperature and humidity: -40°C to 70°C (70% RH or less) with no

condensation

In the ranges of -20°C to 18°C and 28°C

Temperature coefficient (typ.): to 55°C, add the accuracy of 23°C ± 5°C

× 0.1/°C.

Power supply: Four AA-size alkaline batteries (1.5 V LR6) Battery life:

When using alkaline batteries

DC voltage measurement: Approx. 140 hours

DC current output (SIMULATE): Approx. 140 hours

DC current output (SOURCE) 12 mA (500 Ω load): Approx. 10 hours

Insulation resistance: 100 $M\Omega$ or greater at 1000 VDC

Withstand voltage: 6.88 kVAC for five seconds (between the input

terminals and the case)

External dimensions: Approx. 90 (W) x 192 (H) x 49 (D) mm Weight: Approx. 600 g (including the batteries)

Compliant standards:

Safety standards: EN61010-1, EN61010-2-030, EN61010-2-033,

EN61010-031

Measurement Categories:

1000 V CATIII, 600 V CATIV

For current measurement and output: 48 V max, 100 mA

Lead cables (98064): 70 VDC, 100 mA

Pollution degree 2, indoor use

Vibration: Sweep vibration frequencies 10 Hz to 5 Hz to 10 Hz

Amplitude 0.15 mm (peak value)

Duration 30 minutes

1 m drop test as defined by the safety standards Shock:

Altitude: 2000 m or less EMC standards: EN61326-1, EN61326-2-2 EN55011 Class B Group 1

Influence of radiated immunity: In RF electromagnetic fields

of 3 V/m

EN61326-1 AC voltage measurement, 600 mV range:

1.5% of range

DC voltage measurement, 600 mV range:

1% of range

DC current measurement, all ranges: 1.5% of range

DC current output: 1.5% of range

EN61326-2-2 AC voltage measurement (6 V range or

higher):

Within 5 times the accuracy

DC voltage measurement (6 V range or

4

1 set

higher):

Within 5 times the accuracy

Standard accessories: AA-size alkaline batteries

Test leads (98073)

Lead cables (98064) 1 set Fuses (inside the CA450) 440 mA/1000 V (99042) 2

User's manual

Blank cover

The accuracy after ZERO CAL For 40 M Ω to 60 M Ω , the accuracy is 2% + 2. Response time: Within 2 seconds for 600 Ω to 600 k Ω , within 10 seconds for 6 M Ω to 60 M Ω



Product Model code

| Name | Model | Suffix code | Descriptions |
|--------------------|-------|-------------|---------------------------------|
| Process Multimeter | CA450 | -E | With English Instruction manual |

Standard accessories

| Name | Model | Descriptions | |
|-------------|-------|------------------------------------------------------|--|
| Test leads | 98073 | 1000 V CAT III, 600 V CAT IV Red Black 1 set | |
| Lead cables | 98064 | Alligator clip, for control signal only (under 70 V) | |
| Fuse | 99042 | 440 mA/1000 V 10 A cut off 1 piece | |

Optional accessories

| Name | Model | Suffix code | Descriptions |
|------------------------------|-------|-------------|-------------------------------------------------------------|
| Carrying Case | 93029 | | For carrying the CA450, the test leads, and the lead cables |
| Carrying Case | 93043 | -P1 | Carrying case with hanger strap and large size case |
| Magnet hook | 99032 | | Magnet hook (Maximum weight 1.5 kg) |
| DMM Communication Package *1 | 92015 | | USB adapter, USB cable and software |
| Alligator Test leads | 99014 | | 1000 V CAT III, 600 V CAT IV Red Black 1 set |
| 1 to 5 V Adapter Set | 99031 | | 250 Ω resister, terminal adapter and leads |
| AC/DC Clamp-on Probe | 96095 | | DC180 A, AC130 A, output 10 mV/A |
| Current Clamp-on Probe | 96001 | | AC400 A, output 10 mV/A |

^{*1:} The application software can use only the measurement function, (Logging function only)

Accessories



Related Products

Magnet hook

Model:99032



magnetic body

(e.g. iron).



∧ NOTICE

• Before using the product, read the instruction manual carefully to ensure proper and safe operation.

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[Ed: 05/b]

can be hung on

piping or handrails.

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Carrying Case

Model:93043-P1

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