Compact, Accurate, Multifunction Calibrator

CA100

$1500

3 YEAR WARRANTY

CE

OMEGACARE Extended Warranty Program

CA100, $1500, shown smaller than actual size.

The CA100, a new type of general-purpose measuring instrument, features all the latest OMEGA® technologies for generating and measuring voltages and currents

- **Compact and Lightweight**
  The CA100 is a lightweight portable instrument that is ideal for on-site use in process industries, for diagnosing factory equipment, and for research and development.
- **Multiple Source and Measure Functions**
  A single CA100 unit can generate a DC voltage, DC current, resistance, temperature (thermocouple and RTD), and frequency; provide a 24 Vdc power supply for calibrating transmitters; and measure DC voltage, DC current, and resistance. This multifunction capability makes it ideal for maintaining various equipment used in process industries, such as standard generators, decade resistance boxes, and digital multimeters; for diagnosing factory equipment; and for research and development work.
- **High Accuracy of 0.02%**
  The CA100 can calibrate transmitters and converters to 0.1% accuracy, which is becoming the de facto standard.
- **24 Vdc Power Supply to Transmitter**
  A 24 Vdc power supply provides a handy power source to facilitate on-site calibration and maintenance of transmitters and converters.
- **General and RTD Resistance Generation**
  The CA100 can generate a general resistance or a resistance appropriate for the RTD temperature being measured. It can also generate general DC voltages and currents, or DC voltages to suit the thermocouple temperature being measured. Unlike previous models, no decade resistance box is needed.
- **RS232C Interface**
  The CA100 comes with an RS232C interface so that the user can upload data to a PC, as well as configure functions or ranges from the computer or output data to a dedicated printer.
- **Runs on "AA" Batteries, Ni-Cad Battery Pack, or AC Power**
  An optional built-in Ni-Cad battery pack allows the CA100 to be used in all sorts of workplaces. Alternatively, the CA100 can run on "AA" batteries, or from an AC power source (with an optional dedicated AC adaptor for any commercial AC power supply voltage).
- **Easy to Use**
  The keypad of the CA100 is well designed, featuring separate pushbuttons for source and measure functions. On the left side of the center up/down keys are the SOURCE function keys, and on the right side are the MEASURE function keys. Two separate pairs of function selection and range setting keys are provided for generation and measurement individually.
- **Simultaneous Display of Generation Value and Measurement Value**
  Because the generation and measurement functions are separate, the generation value and measurement value can be displayed simultaneously on the large LCD.
- **Large LCD and Backlight**
  The large, segment-type LCD of the CA100 makes it easy to read the numerical values, and the backlight produces a clear screen even in the dark.
- **Simple and Safe Terminal Shape**
  The simple shape of the terminals makes it quick and easy to use the instrument at the work site, and the safe construction prevents the metal parts from being accidentally touched. With the separate terminals for both generation and measurement, the user can perform measurement while generating a signal.

SPECIFICATIONS

Power Supply: 8 “AA” batteries (included), dedicated Ni-Cad battery pack or dedicated AC adaptor

Alkaline Battery Life: 5 Vdc (10 mA load current) generation with active measurement function: 10 hours; 20 mA DC generation with active measurement function, active 24 Vdc power supply to transmitter, and lit backlight: 2 hours

Ni-Cad Battery Pack:
1200 mAh, 9.6 V battery pack for repeated use with service life of approximately 2 years (depending on usage conditions).
Approximate service life assuming continuous
use: 5 Vdc (10 mA load current) generation with active measurement function: 7.5 hours. 20 mA DC
generation with active measurement
function, active 24 Vdc power supply to transmitter, and lit backlight: 2.5 hours. Charging: timer-operated charging using the main unit (10 hours of charging, requiring AC adaptor).

AC Adaptor:

Input: 100 to 120 Vac or 220 to 240 Vac, 50/60 Hz, 40 to 55 VA

Maximum Range of Input Voltage:
90 to 264 Vac

Maximum Range of Input Frequency: 48 to 62 Hz

Auto Power-Off: 30 minutes without key input or data exchange

Communications: RS232C (9-pin D-Sub connector).

Transmission: Asynchronous

Transmission Rate: 150, 300, 600, 1200, 2400, 4800 or 9600 baud

Modes: Allows selection between talk-only and normal modes and selection
of handshaking mode and data format

Printer Using ESC/P Command: Yes

Display: Segmented LCD with built-in backlight; 5 digits for generated value and 4.5 digits for measured value

Warm-Up Time: 5 min

Power Consumption: 55 VA max

Insulation Resistance: 20 MΩ or greater at 500 Vdc for 1 minute applied between respective terminals and between each terminal and the power line of the AC adaptor

Withstanding Voltage: 350 Vac, 1 minute (between respective terminals); 1500 Vac, 1 minute (between each terminal and the power line of the AC adaptor)

Operating Temperature and Humidity: 5 to 40°C (41 to 104°F), 20 to 80% RH (non-condensing), during generation and/or measurement (in normal operation) or while charging when neither generation nor measurement is taking place

Storage Temperature and Humidity:
-20 to 45°C (-4 to 113°F), 90% RH maximum (non-condensing)

Maximum Allowable Voltage:
42 Vp maximum between respective terminals and between each terminal and the ground

Dimensions:
Approx. 237 W x 137 H x 63 mm D (9.3 x 5.4 x 2.5")

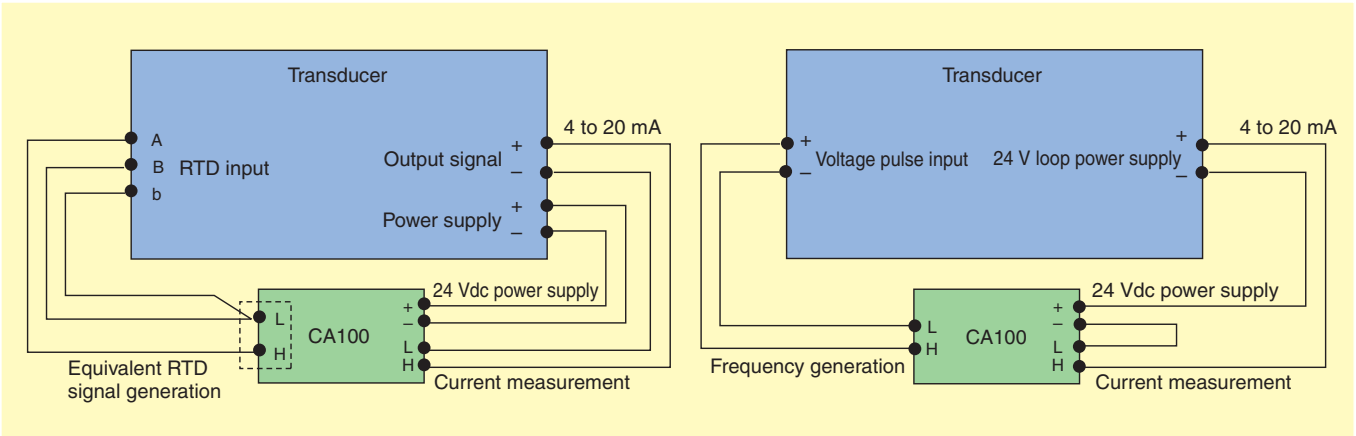
Weight: Approx. 1.2 kg (2.64 lb)

Broad Range of Applications

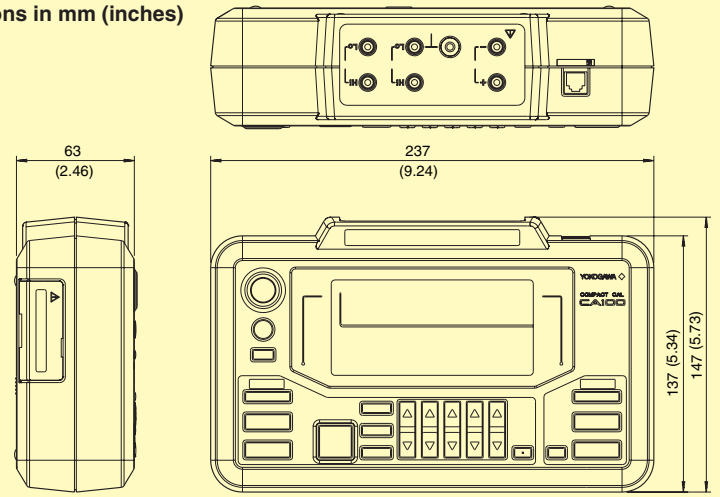
For Maintenance Work in Process Industries

Calibrating Transducers

A single CA100 unit can supply signals and power to the input and power supply terminals of a transducer for an RTD sensor or a pulse output sensor while measuring the output of the transducer at the same time. The user can also calibrate and check transducers using the thermocouple, DC voltage, and DC current generation functions of the CA100.



Dimensions in mm (inches)



If not specified, tolerance is ±3%. However, where less than 10 mm, tolerance is ±0.3%.

Specifications of Generation Functions

DC Voltage/Current and Resistance Generation

Function	Range	Range with Guaranteed Accuracy	Setting Resolution	Setting Range	Accuracy ±(% of setting + % of range) % of setting	Accuracy ±(% of setting + % of range) % of range	Temp Coefficient ±(% of setting + % of range)/°C % of setting/°C	Temp Coefficient ±(% of setting + % of range)/°C % of range/°C	Remarks
DC Voltage Generation	100 mV	0 to 100 mV	1 µV	-10 to 110 mV	0.02	0.01	0.003	0.002	Output resistance approx. 6.5 Ω
Resistance	1 V	0 to 1 V	10 µV	-0.1 to 1.1 V	0.02	0.005	0.002	0.001	Max output: 10 mA
	10 V	0 to 10 V	100 µV	-1 to 11 V	0.02	0.005	0.002	0.001	Approx. 30 MΩ Max output: 10 mA Output resistance approx 30 mΩ
DC Current Generation	20 mA	0 to 20 mA	1 µA	0 to 22 mA	0.025	0.015	0.003	0.003	Max output: 24 V
	-20 mA*2	0 to -20 mA	1 µA	0 to -22 mA	0.025	0.03	0.003	0.003	Max output: 28 V
Resistance Generation*3	500 Ω	0 to 500Ω	10 MΩ	0 to 550 Ω	0.02 *4	0.02 *4	0.002	0.01	*5
	5 kΩ	0 to 5 kΩ	100 MΩ	0 to 5.5 kΩ	0.05 *4	0.03 *4	0.002	0.01	*6
	50 kΩ	0 to 50 kΩ	1 Ω	0 to 55 kΩ	0.1 *4	0.1 *4	0.002	0.03	*7

**1) Temperature conditions of temperature coefficient: 5°C or greater but less than 18°C and greater than 28°C but no greater than 40°C*

**2) DC-mA sink: a function that draws a current of the specified intensity in the direction from an external voltage generation source to the positive terminal.*

**3) Resistance is generated by generating an equivalent resistance based on detection of the resistance-measuring current and generation of a voltage drop. The specifications are valid over the ranges of measuring current and output voltage shown in the "Remarks" column*

**4) Does not include the resistance effects of the leads provided.*

**5) Effective for measuring-current range of 1 to 5 mA, and for output voltage of no greater than 2 V.*

**6) Effective for measuring-current range of 0.1 to 1 mA, and for output voltage of no greater than 2 V.*

**7) Effective for measuring-current range of 0.01 to 0.1 mA, and for output voltage of no greater than 2 V.*

Specifications of Measurement Function

Function	Range	Range with Guaranteed Accuracy	Reading Resolution	Reading Range	Accuracy ±(% of reading + % of range) % of reading	Accuracy ±(% of reading + % of range) % of range	Temperature Coefficient ±(% of reading + % of range)/°C (% of reading)/°C	Temperature Coefficient ±(% of reading + % of range)/°C (% of range)/°C	Remarks
DC Voltage Measurements	500 mV	-500 to 500 mV	10 µV	-599.99 to 599.99 mV	0.02	0.01	0.002	0.001	Input resistance: more than 1 GΩ
	5 V	-5 to 5 V	100 µV	-5.9999 to 5.9999 V	0.02	0.01	0.002	0.001	Input resistance: approx. 1 MΩ
	35 V	-35 to 35 V	1 mV	-41.999 to 41.999 V	0.02	0.015	0.002	0.001	
DC Current Measurements	20 mA	-20 to 20 mA	1 µA	-23.999 to 23.999 mA	0.025	0.02	0.002	0.001	Input resistance: no more than 20
	100 mA	-100 to 100 mA	10 µA	-119.99 to 119.99 mA	0.04	0.03	0.002	0.001	
Resistance Measurement	500 Ω	0 to 500 Ω	10 MΩ	0 to 599.99 Ω	0.055 *11	0.015 *11	0.005	0.02	Measurement current: approx. 1 mA
	5 kΩ	0 to 5 kΩ	100 MΩ	0 to 5.9999 kΩ	0.055 *11	0.015 *11	0.005	0.02	Measurement current approx. 100 µA
	50 kΩ	0 to 50,000 kΩ	1 Ω	0 to 59.999 kΩ	0.55 *11	0.02 *11	0.005	0.02	Measurement current approx. 10 µA

Generation of Equivalent RTD Temperature

Range	Generation Range (°C)	Setting Resolution (°C)	Accuracy*8 (°C)	Temperature Coefficient*9 (°C/°C)
PT100	-200 to 0	0.1	0.3	0.04
	0 to 400	0.1	0.5	0.04
	400 to 850	0.1	0.8	0.04

**8) The accuracy is specified for measurement currents from 1 to 5 mA, excluding the resistance effects of the leads provided.*

**9) Temperature conditions to temperature coefficient: 5°C or greater but less than 18°C, and greater than 28°C but no greater than 40°C. The specifications are compatible with both IRC 751-1983 and IEC 751-1995.*

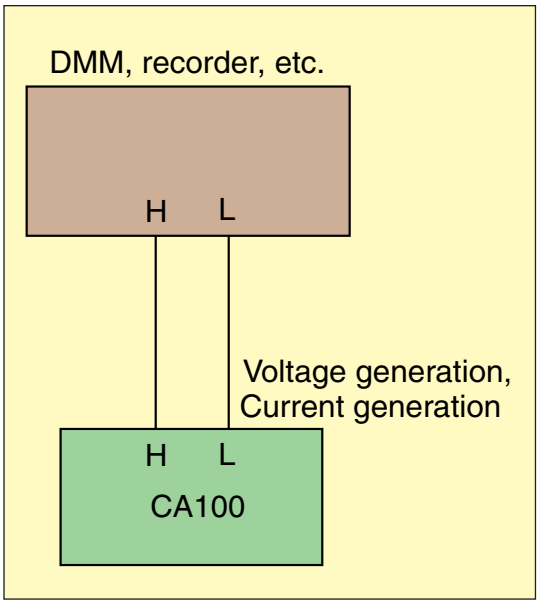
- *The equivalent RTD temperature is generated by generating an equivalent resistance based on detection of the resistance-measuring current and generation of a voltage drop.*
- *See *5)*
- *Response time of generation function: DC V generation with 1 V or 10 V range: 10 ms (time taken from when the output begins changing to when it falls within the given accuracy). Resistance generation with 500 Ω range (including RTD output): 10 ms (time taken from when the specified current is applied to when the output falls within the given accuracy). Generation functions for ranges other than noted above: 300 ms.*
- *DC V generation limiter: Active for load voltages equal to or greater than 28.5 V (recovered manually).*
- *DC A generation limiter: Active for load currents equal to or greater than 12 mA (DC voltage, frequency and pulse generation functions only; recovered manually).*
- *Temperature units: °C, °F*

For Checking and Calibrating Digital Multimeters, Recorders, Temperature Controllers, by Using the DC Voltage and Current Generation Functions of the CA100

Generation of Thermocouple EMF

Range	Generation Range (°C)	Setting Resolution (°C)	Accuracy (°C)	Temp Coefficient (°C/°C)
K	-200 to -100	0.1	0.6	0.05
	-100 to 400	0.1	0.5	0.05
	400 to 1200	0.1	0.7	0.05
	1200 to 1372	0.1	0.9	0.05
E	-250 to -200	0.1	1.2	0.1
	-200 to 100	0.1	0.6	0.05
	-100 to 600	0.1	0.5	0.05
	600 to 1000	0.1	0.6	0.05
J	-210 to -100	0.1	0.6	0.05
	-100 to 800	0.1	0.5	0.05
	800 to 1200	0.1	0.7	0.05
T	-250 to -200	0.1	1.5	0.2
	-200 to 400	0.1	0.5	0.05
N	-200 to -100	0.1	1.0	0.1
	-100 to 900	0.1	0.7	0.05
	900 to 1300	0.1	0.8	0.05
B	400 to 600	1	2.0	0.2
	600 to 800	1	1.5	0.2
	800 to 1820	1	1.1	0.2
R	-40 to 100	1	1.5	0.2
	100 to 1767	1	1.2	0.2

- *The specifications are compatible with both IEC-1-1989 and IEC 584-1-1995.*
- *The internal resistance for thermocouple output is approximately 6.5 Ω.*
- *The accuracy does not include the accuracy of reference junction compensation (RJC). RJC is done by the optional RJC sensor. When performing output correction using the reference junction temperature, add the sensor accuracy. The output is corrected about every 10 seconds.*
- *Specifications of RJC sensor—measurement range: -10 to 50°C; accuracy: ±0.5°C for a range of 18 to 28°C (when combined with the main unit) ±1°C for ranges of -10 to 18°C and 28 to 50°C (when combined with the main unit)*
- *Cord length: approx. 1.5 m (5')*
- *Temperature units: °C, °F*



Specifications

General Conditions: These specifications apply to the CA100 calibrator under the following conditions: ambient temperature 23 ±5°C, auto-zeroing executed, the backlight turned off, no battery charging is in progress, and less than one year since calibrator was calibrated.

Frequency and Resistance Generation

Function	Range (Range with Guaranteed Accuracy)	Setting Resolution	Range of Generation Reading	Accuracy	Maximum Output	Remarks
Frequency Generation	1 to 100 Hz	100 Hz	1 to 110 Hz	±1 digits	10 mA	Waveform: Rectangular with approx. 50% of duty ratio
	100 to 1000 Hz	1000 Hz	90 to 1100 Hz			
	1 to 10 kHz	10 Hz	0.9 to 11 kHz			
Pulse Generation *	10 to 50 kHz	50 kHz	9 to 50 kHz	±1 digits	10 mA	Output level: 0 to 10 V Accuracy of output level ±10% 10 to 50 kHz
	1 to 100 kHz					
	100 to 1000 kHz	60,000 cycles	1 to 60,000 cycles			
	1 to 10 kHz					

** The pulse generation generates as many rectangular waves as the specified number or cycles, where the single period of a rectangular wave is defined as a cycle.*

OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARE℠ covers parts, labor and equivalent loaners.

AVAILABLE FOR FAST DELIVERY!

To Order *(Specify Model Number)*

Model No.	Price	Description
CA100	**$1500**	Compact multifunction calibrator
CA100-NIST	**1650**	CA100 with NIST calibration certificate

The CA100 is supplied with: carrying case, 8 "AA" dry cell alkaline batteries, battery holder, 2 measurement leads, 2 ferrite cores, 1 fuse and operator's manual. ***Ordering Example: CA100,*** *compact multifunction calibrator with* ***CA100-PS,*** *AC power supply, $1500 + 100 =* ***$1600.***
OCW-2, *OMEGACARE℠ extends standard 3-year warranty to a total of 5 years,* ***$250,*** *$1500 + 250 =* ***$1750.***

Accessories

Model No.	Price	Description
CA100-PS	**100**	AC power supply for CA100*
CA100-TL	**30**	Leads for 2 wire TX cal (required for transmitter calibration)
CA100-BATT	**100**	Battery pk; requires CA100-PS
CA100-ML	**23**	2 measurement leads (spare)
CA100-FC	**10**	Ferrite core, each (spare)
CA100-ITA	**25**	Input terminal adaptor
CA100-RJC	**175**	Reference junction compensation sensor

** CA100-PS is a universal auto-sensing 90 to 240 V supply. It comes with a standard power cord with 115 V plug. For other voltages/countries, the plug may be special ordered or simply replaced with a local power cord connector.*

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