

# Compact Multifunction Calibrator

CA71  
\$1450



- Simultaneously Source and Measure
- Voltage, Pulse, Current, Resistance, Thermocouple, RTD, Frequency Signals
- Autostep, Sweep, and Memory Functions

The CA71 Calibrator is a small, lightweight, multifunction calibrator that can simultaneously source and measure voltage, current, resistance, TC, RTD, frequency, and pulse signals.

The Calibrator incorporates rotary switches for simple handling. Just open the carrying case cover and connect the cables, and you're ready to take measurements.

A wide array of useful functions are offered, including source (output can be set in steps): power; transmitter; divided (n/m), eliminating need for calculations for percentage output); autostep (changes can be sourced every 10% or 25%); online communication (RS232); sweep (linearly changes output over 16 or 32 seconds); memory (50 sets); and temperature monitor function.

## Specifications

### Parameter

#### Signal Generating Unit

**Response Time:** Approx 1 second

#### Signal Generating Unit

**Voltage Limiter:** Approx 32 V

#### Signal Generating Unit

**Current Limiter:** Approx 25 mA

#### Divided Output (n/m) Function:

Output = setting x (n/m)

where n = 0 to m; m = 1 to 19; n x m

#### Auto-Step Output Function:

n value sent automatically when

n/m function selection is selected

(approx. 2.5 or 5 seconds/step)

#### Sweep Function:

Sweep time (approx

16 or 32 seconds)

#### Memory Function:

50 value sets (generated and measured values)



CA71, \$1450, shown smaller than actual size.

### Measuring Unit Maximum Input:

**Voltage Terminal:** 300 Vac

**Current Terminal:** 120 mA DC

**Current Input:** Fuses: 125 mA/250 V

### Measuring Unit Ground Voltage:

Maximum 300 Vac

### Measurement Display Updating Rate:

Approx 1 second

### Serial Interface:

Enabled via CA71-RS cable

### Display:

Segmented LCD (approximately 76 x 48 mm)

### Backlight:

LED backlight; auto-off

### Power Supply:

4 "AA" alkaline batteries (included)

### Battery Life:

Approx 20-hr for measurement and voltage output

(12-hr for current)

### Consumed Power:

Approx 7 VA (using 120 Vac adapter)

### Auto Power-Off Function:

Approx 10 minutes (can be disabled)

### Applicable Standards:

IEC61010-1, IEC61010-2-31;

EN61326-1: 1997 + A1: 1998;

EN55011: 1998, Class B, Group 1

### Insulation Resistance:

500 Vdc, 50 M or greater

### Withstand Voltage:

3.7 kVac, for 1 minute

### Operating Temperature and Humidity

Ranges: 0 to 50°C,

20 to 80% RH (no condensation)

### Storage Temperature and Humidity

Ranges: -20 to 50°C, 90% RH or less

(no condensation)

### External Dimensions (WHD):

Approx 190 x 120 x 55 mm

(7.5 x 4.7 x 2.2")

### Weight:

Approx 730 g (1.6 lb)

(including batteries)

### Measurement Unit (Temperature)

### Accuracy: ±(Reading Percentage + °C)

Function	Reference	Range	Accuracy (23±5°C per year)	Resolution
T/C *7	K	-200.0 to 1372.0°C	±(0.05% + 1.5°C) (-100°C or greater) ±(0.05% + 2°C) (-100°C or less)	0.1°C
	E	-200.0 to 1000.0°C		
	J	-200.0 to 1200.0°C		
	T	-200.0 to 400.0°C		
	N	-200.0 to 1300.0°C		
	L	-200.0 to 900.0°C		
	U	-200.0 to 400.0°C		
	R	0 to 1768°C	±(0.05% + 2°C) (100°C or greater) ±(0.05% + 3°C) (100°C or less)	1°C
	S	0 to 1768°C		
	B	600 to 1800°C		
RTD	Pt100*6	-200.0 to 850.0°C	±(0.05% + 0.6°C) (3-wire)	0.1°C
	JPt100	-200.0 to 500.0°C		

Temperature coefficient: accuracy shown above x (1/5)/°C.

\* 6: As per JIS C 1604-1997 (ITS-90). IPTS-68 may be selected through internal settings (DIP switch).

\* 7: As per JIS C 1602-1995 (ITS-90) (L and U are DIN specs). K, E, J, T, N, R, S, and B may be switched to IPTS-68 through internal settings (DIP switch) (L and U are not switched).

## Measurement Unit Range and Accuracy

Accuracy:  $\pm$ [reading percentage plus  $\mu$ V, mV,  $\mu$ A,  $\Omega$  or dgt (digit)]

Function	Reference	Range	Accuracy (23 $\pm$ 5°C per year)	Resolution	Remarks
DC Voltage	100 mV	0 to $\pm$ 110.00 mV	$\pm$ (0.025% + 20 $\mu$ V)	10 $\mu$ V	Input resistance: 10 M or greater
	1 V	0 to $\pm$ 1.1000 V	$\pm$ (0.025% + 0.2 mV)	0.1 mV	
	10 V	0 to $\pm$ 11.000 V	$\pm$ (0.025% + 2 mV)	1 mV	Input resistance: Approximately 1 M
	100 V	0 to $\pm$ 110.00 V	$\pm$ (0.05% + 20 mV)	0.01 V	
DC Current	20 mA	0 to $\pm$ 24.000 mA	$\pm$ (0.025% + 4 $\mu$ A)	1 $\mu$ A	Input resistance: Approximately 14 $\Omega$
	100 mA	0 to $\pm$ 100.00 mA	$\pm$ (0.04% + 30 $\mu$ A)	10 $\mu$ A	
Resistance	400 $\Omega$	0 to 400.00 $\Omega$	$\pm$ (0.05% + 0.1 $\Omega$ )	0.01 $\Omega$	Accuracy during 3-wire measurement
AC Voltage	1 V	0 to 1.100 V	$\pm$ (0.5% + 5 dgt)	1 mV	Input resistance: Approximately 10 $\Omega$ /10 pF Input frequency: 45–65 Hz Input voltage range: 10%–100% method: Average Measurement
	10 V	0 to 11.00 V		0.01 V	
	100 V	0 to 110.0 V	0.1 V		
	300 V	0 to 300 V	$\pm$ (0.5% + 2 dgt)	1 V	
Frequency, Pulse	100 Hz	1.00 to 100.00 Hz	$\pm$ 2 dgt	0.01 Hz	Maximum input: 30 V peak Input resistance: 200 k or greater Sensitivity: 0.5 V peak or greater Contact input: Maximum 100 Hz Notes CPM: Counts per minute CPH: Counts per hour
	1000 Hz	1.0 to 1000.0 Hz		0.1 Hz	
	10 kHz	0.001 to 11.000 kHz		0.001 kHz	
	CPM	0 to 99,999 CPM		1 CPM	
	CPH	0 to 99,999 CPH		1 CPH	

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## Signal Sourcing Unit Range and Accuracy

Function	Reference	Range	Accuracy (23 $\pm$ 5°C per year)	Resolution	Remarks
DC voltage	100 mV	-10.0 to 110.00 mV	$\pm$ (0.02% + 15 $\mu$ V)	10 $\mu$ V	
	1 V	0 to 1.1000 V	$\pm$ (0.02% + 0.1 mV)	10 $\mu$ V	Maximum output: 5 mA
	10 V	0 to 11.000 V	$\pm$ (0.02% + 1 mV)	1 mV	Maximum output: 10 mA
	30 V	0 to 30.00 V	$\pm$ (0.02% + 10 mV)	10 mV	Maximum output: 10 mA <sup>*1</sup>
DC current generation	20 mA 4 to 20 mA	0 to 24.000 mA 4/8/12/16/20	$\pm$ (0.025% + 3 $\mu$ A)	1 $\mu$ A 4 mA	Maximum load: 12 V
mA sink	20 mA	0.1 to 24.000 mA	$\pm$ (0.05% + 3 $\mu$ A)	1 $\mu$ A	External power supply: 5 to 28 V
Resistance	400 $\Omega$ Pt100 <sup>*2</sup> JPT100	0 to 400.00 $\Omega$ -200.0 to 850.0°C -200.0 to 500.0°C	$\pm$ (0.025% + 0.1 $\Omega$ ) $\pm$ (0.025% + 0.3°C)	0.01 $\Omega$ 0.1°C	Excitation current: 0.5 to 5 mA <sup>*3</sup> If 0.1 mA, add 0.25 $\Omega$ or 0.6°C. Subject device input capacitance: 0.1 $\mu$ F or less
	T/C <sup>*4</sup>	<b>K</b>	-200.0 to 1372.0°C	$\pm$ (0.02% + 0.5°C) (-100°C or greater)	0.1°C
<b>E</b>		-200.0 to 1000.0°C	$\pm$ (0.02% + 1°C) (-100°C or less)		
<b>J</b>		-200.0–1200.0°C	$\pm$ (0.02% + 0.5°C) (0°C or greater)		
<b>T</b>		-200.0 to 400.0°C	$\pm$ (0.02% + 1°C) (0°C or less)		
<b>N</b>		-200.0 to 1300.0°C	$\pm$ (0.02% + 2.5°C) (100°C or less)	1°C	
<b>L</b>		-200.0 to 900.08C	$\pm$ (0.02% + 1.5°C) (1000°C or less)		
<b>U</b>		-200.0 to 400.0°C	$\pm$ (0.02% + 2°C) (1000°C or less)		
<b>R</b>		0 to 1768°C	$\pm$ (0.02% + 1.5°C) (1000°C or greater)		
<b>S</b>					
<b>B</b>	600 to 1800°C				
Frequency Pulse	500 Hz	1.0 to 500.0 Hz	0.1 Hz	$\pm$ 0.2 Hz	Output voltage: +0.1–15 V (zero base waveform) Amplitude accuracy: $\pm$ (5% + 0.1 V) Maximum load current: 10 mA Contact output: (with 0.0 V amplitude setting, FET switch ON/OFF) Maximum open/close voltage/current: +28 V/50 mA
	1000 Hz	90 to 1100 Hz	1 Hz	$\pm$ 1 Hz	
	10 kHz	0.9 kHz to 11.0 kHz	0.1 kHz	$\pm$ 0.1 kHz	
	Pulse Cycle <sup>*5</sup>	1 to 99,999 cycles	—	1 cycle	

Temperature coefficient: Accuracy shown above x (1/4)<sup>1/3</sup>C  
<sup>\*1</sup>: Output up to 24 V/22 mA is possible when using the AC adaptor.  
<sup>\*2</sup>: As per JIS C 1604-1997 (ITS-90). IPTS-68 may be selected through internal settings (DIP switch).  
<sup>\*3</sup>: Excitation current: If less than 0.1 mA to 0.5 mA, then add [0.025/(s (mA))]  $\Omega$  or [0.06/(s (mA))]°C.  
<sup>\*4</sup>: As per JIS C 1602-1995 (ITS-90) (L and U are DIN specs).  
 K, E, J, T, N, R, S, and B may be switched to IPTS-68 through internal settings (DIP switch).  
 L and U are not switched).  
<sup>\*5</sup>: Frequency (interval between one pulse and another) and amplitude during pulse cycle generation may have the same range as during frequency generation.

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

**MOST POPULAR MODEL HIGHLIGHTED!**

To Order (Specify Model Number)		
Model No.	Price	Description
CA71	\$1450	Calibrator
CA71-NIST	1700	Calibrator with NIST calibration certificate

Comes with signal generating lead cables (1 red, 2 black), measurement lead cables (1 red, 1 black), carrying case, terminal adaptor, user's manual, fuse: A1501EF (for current terminal input protection), and 4 "AA" alkaline batteries.

Ordering Example: CA71, calibrator, and CA71-PS, power supply adaptor, \$1450 + 45 = \$1495. OCW-2, OMEGACARE<sup>SM</sup> extends standard 3-year warranty to a total of 5 years, (\$270), \$1495 + 270 = \$1765.

## Accessories

Model No.	Price	Description
CA71-PS	\$45	120 Vac adaptor
CA71-PS230	99	230 Vac adaptor
CA71-FUSE	15	Fuse, input, package of 1
CA71-RS	83	RS232 cable
CA71-RJC	175	External RJC*

\* Allows remote cold junction compensation for thermocouples instead of using the standard internal sensor.



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