

Specifications

Voltage/Current/Resistance/Pulse Source Unit

Function	Range	Resolution	Source range	Accuracy (1 year) ±(% of Setting + offset)		Note
				CA500	CA550	
DC voltage	100 mV	1 µV	±110.000 mV	0.015% + 10 µV	0.015% + 5 µV	Maximum output current: 10 mA
	1–5 V	0.1 mV	0.0000 to 6.0000 V	0.015% + 0.5 mV		Maximum output current: 10 mA Value output function supporting square root computation is available
	5 V	0.1 mV	±6.0000 V	0.015% + 0.5 mV		Maximum output current: 10 mA
	30 V	1 mV	±33.000 V	0.015% + 5 mV		Maximum output current: 1 mA
DC current	20 mA	1 µA	±24.000 mA	0.015% + 3 µA	0.010% + 2 µA	Source voltage: 0 to +20 V
	4–20 mA	1 µA	0.000 to 24.000 mA	0.015% + 3 µA	0.010% + 2 µA	Source voltage: 0 to +20 V Value output function supporting square root computation is available
	20 mA SIMULATE	1 µA	0.000 to 24.000 mA	0.015% + 3 µA	0.010% + 2 µA	External power supply: +5 to +28 V
Resistance	400 Ω	10 mΩ	0.00 to 440.00 Ω	0.020% + 0.1 Ω ^{*1}	0.015% + 0.05 Ω ^{*1}	Allowable measurement current: 0.1 to 3 mA
	4000 Ω	100 mΩ	0.0 to 4400.0 Ω	0.020% + 0.5 Ω ^{*1}	0.015% + 0.2 Ω ^{*1}	Allowable measurement current: 0.05 to 0.6 mA
Frequency /pulse ^{*4}	500 Hz	0.01 Hz	1.00 to 550.00 Hz	0.005% + 0.01 Hz		Square wave, 50% Duty Cycle, +0.1 to +15 V Pulse number: Continuous 1 to 99999 cycles Maximum load current: 10 mA
	5000 Hz	0.1 Hz	1.0 to 5500.0 Hz	0.005% + 0.1 Hz		
	50 kHz	0.001 kHz	0.001 to 50.000 kHz	0.005% + 0.001 kHz		
	CPM	0.1/min	1.0 to 1100.0/min	0.5/min		

Voltage/Current/Resistance/Pulse Measurement Unit

Function	Range	Resolution	Measurement range	Accuracy (1 year) ±(% of reading + offset)		Note
				CA500	CA550	
DC voltage	100 mV	1 µV	±110.000 mV	0.015% + 10 µV	0.015% + 5 µV	Input resistance: 1 GΩ or more
	5 V	0.1 mV	±6.0000 V	0.015% + 0.5 mV		Input resistance: Approx. 1 MΩ
	50 V	1 mV	±55.000 V	0.015% + 5 mV		Input resistance: Approx. 1 MΩ
DC current	50 mA	1 µA	±60.000 mA	0.015% + 3 µA	0.010% + 2 µA	Input resistance: 10 Ω or less
Resistance	400 Ω	10 mΩ	0.00 to 440.00 Ω	0.020% + 0.1 Ω ^{*2,*3}	0.015% + 0.05 Ω ^{*2,*3}	Voltage applied current measurement method (typical 1 mA@0 Ω, 781 µA@400 Ω, 240 µA@4 kΩ)
	4000 Ω	100 mΩ	0.0 to 4400.0 Ω	0.020% + 0.5 Ω ^{*2,*3}	0.015% + 0.2 Ω ^{*2,*3}	
Pulse measurement ^{*4}	500 Hz	0.01 Hz	1.00 to 550.00 Hz	0.005% + 0.01 Hz		Measurement time: 1.0 s (Max. 10 s), 0.5 V to 30 Vpp
	5000 Hz	0.1 Hz	1.0 to 5500.0 Hz	0.005% + 0.1 Hz		
	50 kHz	0.001 kHz	0.001 to 50.000 kHz	0.005% + 0.001 kHz		
	PULSE COUNT	1	0 to 99999	2		Maximum integration time: 60 min, 0.5 V to 30 Vpp

Accuracy is guaranteed under the environmental conditions of +23°C±5°C, 20 to 80% RH. For use in the temperature range of -10 to +18°C or +28 to +50°C, add the temperature coefficient: 0.005% of Range/°C.

*1 When using the included binding post (99045)

*2 Above accuracy is defined for 4 wire measuring.

*3 Accuracy for 3 wire measuring: 0.05Ω to 400 Ω range; 0.2 Ω to 4000 Ω range is added, on condition the resistance of all cables are the same.

*4 Accuracy for 2 wire measuring: Same with 3 wire measuring on condition the resistance of cables are excluded.

*4 Dry contact compatible

24 V Loop Power Supply

Supply voltage	Note
24 V±2 V	Communication resistance: OFF Maximum load current: 24 mA

Thermocouple (TC) Source/Measure (Terminal TC-A: TC plug terminal)

Accuracy of Source/Meas (Common to CA500/CA550)

t: Temperature of Source/Meas.

TC	Source/Meas Temperature Range	Source Accuracy [°C] (1 year) (\pm %)	Meas. Accuracy [°C] (1 year) (\pm %)	Standard or Regulation
K	$-200.0 \leq t < 0.0^{\circ}\text{C}$	$0.5 + t \times 0.30\%$	$0.5 + t \times 0.30\%$	IEC60584-1 ^{*1, *2}
	$0.0 \leq t < +500.0^{\circ}\text{C}$	0.5	0.5	
	$+500.0 \leq t \leq +1372.0^{\circ}\text{C}$	$0.5 + (t - 500.0) \times 0.03\%$	$0.5 + (t - 500.0) \times 0.02\%$	
E	$-250.0 \leq t < -200.0^{\circ}\text{C}$	$1.1 + (t - 200.0) \times 2.00\%$	$1.1 + (t - 200.0) \times 2.00\%$	IEC60584-1 ^{*1, *2}
	$-200.0 \leq t < 0.0^{\circ}\text{C}$	$0.5 + t \times 0.30\%$	$0.5 + t \times 0.30\%$	
	$0.0 \leq t < +500.0^{\circ}\text{C}$	0.5	0.5	
	$+500.0 \leq t \leq +1000.0^{\circ}\text{C}$	$0.5 + (t - 500.0) \times 0.02\%$	$0.5 + (t - 500.0) \times 0.02\%$	
J	$-210.0 \leq t < 0.0^{\circ}\text{C}$	$0.5 + t \times 0.30\%$	$0.5 + t \times 0.30\%$	IEC60584-1 ^{*1, *2}
	$0.0 \leq t \leq +1200.0^{\circ}\text{C}$	$0.5 + t \times 0.02\%$	$0.5 + t \times 0.02\%$	
T	$-250.0 \leq t < -200.0^{\circ}\text{C}$	$1.1 + (t - 200.0) \times 2.50\%$	$1.1 + (t - 200.0) \times 2.50\%$	IEC60584-1 ^{*1}
	$-200.0 \leq t < 0.0^{\circ}\text{C}$	$0.5 + t \times 0.30\%$	$0.5 + t \times 0.30\%$	
	$0.0 \leq t \leq +400.0^{\circ}\text{C}$	0.5	0.5	
N	$-200.0 \leq t < 0.0^{\circ}\text{C}$	$0.6 + t \times 0.40\%$	$0.6 + t \times 0.30\%$	IEC60584-1 ^{*1}
	$0.0 \leq t \leq +1300.0^{\circ}\text{C}$	0.6	0.6	
L	$-200.0 \leq t < 0.0^{\circ}\text{C}$	$0.5 + t \times 0.15\%$	$0.5 + t \times 0.15\%$	DIN 43710 1985
	$0.0 \leq t \leq +900.0^{\circ}\text{C}$	0.5	0.5	
U	$-200.0 \leq t < 0.0^{\circ}\text{C}$	$0.5 + t \times 0.20\%$	$0.5 + t \times 0.20\%$	DIN 43710 1985
	$0.0 \leq t \leq +600.0^{\circ}\text{C}$	0.5	0.5	
R	$-20.0 \leq t < 0.0^{\circ}\text{C}$	2.0	2.0	IEC60584-1 ^{*1, *2}
	$0.0 \leq t < +100.0^{\circ}\text{C}$	2.0	1.4	
	$+100.0 \leq t \leq +1767.0^{\circ}\text{C}$	1.4	1.4	
S	$-20.0 \leq t < 0.0^{\circ}\text{C}$	2.0	2.0	IEC60584-1 ^{*1, *2}
	$0.0 \leq t < +100.0^{\circ}\text{C}$	2.0	1.4	
	$+100.0 \leq t \leq +1768.0^{\circ}\text{C}$	1.4	1.4	
B	$+600.0 \leq t < +800.0^{\circ}\text{C}$	1.2	1.5	IEC60584-1 ^{*1, *2}
	$+800.0 \leq t < +1000.0^{\circ}\text{C}$	1.0	1.2	
	$+1000.0 \leq t \leq +1820.0^{\circ}\text{C}$	1.0	1.1	
C	$0.0 \leq t < +1000.0^{\circ}\text{C}$	0.8	0.8	IEC60584-1 ^{*1}
	$+1000.0 \leq t \leq +2315.0^{\circ}\text{C}$	$0.8 + (t - 1000.0) \times 0.06\%$	$0.8 + (t - 1000.0) \times 0.06\%$	
XK	$-200.0 \leq t < 0.0^{\circ}\text{C}$	$0.4 + t \times 0.20\%$	$0.4 + t \times 0.20\%$	GOST R 8.585-2001
	$0.0 \leq t < +300.0^{\circ}\text{C}$	0.4	0.4	
	$+300.0 \leq t \leq +800.0^{\circ}\text{C}$	0.5	0.5	
A	$0.0 \leq t < +1000.0^{\circ}\text{C}$	1.0	1.0	IEC60584-1
	$+1000.0 \leq t \leq +2500.0^{\circ}\text{C}$	$1.0 + (t - 1000.0) \times 0.06\%$	$1.0 + (t - 1000.0) \times 0.06\%$	
D (W3Re/W25Re)	$0.0 \leq t < +300.0^{\circ}\text{C}$	1.4	1.8	ASTM E1751/E1751M
	$+300.0 \leq t < +1500.0^{\circ}\text{C}$	1.2	1.2	
	$+1500.0 \leq t \leq +2315.0^{\circ}\text{C}$	1.8	2.2	
G (W/W26Re)	$+100.0 \leq t < +300.0^{\circ}\text{C}$	1.4	1.8	ASTM E1751/E1751M
	$+300.0 \leq t < +1500.0^{\circ}\text{C}$	1.2	1.2	
	$+1500.0 \leq t \leq +2315.0^{\circ}\text{C}$	1.8	2.2	
PLATINELII	$0.0 \leq t < +100.0^{\circ}\text{C}$	0.6	1.8	ASTM E1751/E1751M
	$+100.0 \leq t < +1000.0^{\circ}\text{C}$	0.8	1.8	
	$+1000.0 \leq t \leq +1395.0^{\circ}\text{C}$	1.0	2.2	
PR20-40	$0.0 \leq t < +500.0^{\circ}\text{C}$	10.0	11.0	ASTM E1751
	$+500.0 \leq t < +1000.0^{\circ}\text{C}$	3.0	4.0	
	$+1000.0 \leq t \leq +1888.0^{\circ}\text{C}$	2.0	2.0	

Using internal reference junction compensation

Accuracy is guaranteed under the environmental conditions of 23°C±5°C, 20 to 80% RH. For use in the temperature range of -10 to +18°C or 28 to 50°C, add the temperature coefficient: 0.05°C/C. Errors of TC are not included.

The display resolution for source/measure is 0.1°C

Terminal TC-B (reference junction compensation: off) Source/measurement accuracy 0.3°C (typical)

*1 Also compliant with JIS C 1602

*2 IPTS-68 (JIS C 1602 1981) may be selected.

About formula of accuracy

The accuracy of source or measuring is defined by constant value or formula of linear expression.

Example) Accuracy of type K at measuring point of 1000.0°C is $\pm(0.5 + (1000.0 - 500) \times 0.02\%)^{\circ}\text{C} = \pm 0.6^{\circ}\text{C}$

RTD Source/Measure

t: Temperature of Source/Meas.

RTD	Coefficient	Temperature Range	Source/Meas. Accuracy (1 year) ($\pm^{\circ}\text{C}$)		Allowable excitation current	Standard or Regulation
			CA500	CA550		
PT100	3851	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.3	0.1	0.1 to 3 mA	IEC60751 ^{*1}
		$+100.0 \leq t \leq +800.0^{\circ}\text{C}$	$0.3 + (t-100) \times 0.033\%$	$0.1 + (t-100) \times 0.033\%$		
	3850	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.3	0.1	0.1 to 3 mA	JIS C 1604 1989 (Pt100)
		$+100.0 \leq t \leq +630.0^{\circ}\text{C}$	$0.3 + (t-100) \times 0.033\%$	$0.1 + (t-100) \times 0.033\%$		
3916	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.3	0.1	0.1 to 3 mA	JIS C 1604 1989 (JPt100)	
	$+100.0 \leq t \leq +510.0^{\circ}\text{C}$	$0.3 + (t-100) \times 0.033\%$	$0.1 + (t-100) \times 0.033\%$			
3926	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.3	0.1	0.1 to 3 mA	Minco Application Aid #18	
	$+100.0 \leq t \leq +630.0^{\circ}\text{C}$	$0.3 + (t-100) \times 0.033\%$	$0.1 + (t-100) \times 0.033\%$			
PT200	3851	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.3	0.1	0.05 to 3 mA	IEC60751 ^{*1}
		$+100.0 \leq t \leq +630.0^{\circ}\text{C}$	$0.3 + (t-100) \times 0.033\%$	$0.1 + (t-100) \times 0.033\%$		
PT500	3851	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.3	0.1	0.05 to 0.6 mA	IEC60751 ^{*1}
		$+100.0 \leq t \leq +630.0^{\circ}\text{C}$	$0.3 + (t-100) \times 0.033\%$	$0.1 + (t-100) \times 0.033\%$		
PT1000	3851	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.2	0.1	0.05 to 0.6 mA	IEC60751 ^{*1}
		$+100.0 \leq t \leq +630.0^{\circ}\text{C}$	$0.2 + (t-100) \times 0.033\%$	$0.1 + (t-100) \times 0.033\%$		
Cu10	427	$-100.0 \leq t \leq +260.0^{\circ}\text{C}$	1.5	1.2	0.1 to 3 mA	Minco Application Aid #18
Ni120	627	$-80.0 \leq t \leq +260.0^{\circ}\text{C}$	0.2	0.1	0.1 to 3 mA	Minco Application Aid #18
PT50	3851	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.4	0.2	0.1 to 3 mA	IEC60751 ^{*1}
		$+100.0 \leq t \leq +630.0^{\circ}\text{C}$	$0.4 + (t-100) \times 0.033\%$	$0.2 + (t-100) \times 0.033\%$		
PT50G	—	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.4	0.2	0.1 to 3 mA	GOST R 8.625-2006
		$+100.0 \leq t \leq +800.0^{\circ}\text{C}$	$0.4 + (t-100) \times 0.033\%$	$0.2 + (t-100) \times 0.033\%$		
PT100G	—	$-200.0 \leq t < +100.0^{\circ}\text{C}$	0.3	0.1	0.1 to 3 mA	GOST R 8.625-2006
		$+100.0 \leq t \leq +630.0^{\circ}\text{C}$	$0.3 + (t-100) \times 0.033\%$	$0.1 + (t-100) \times 0.033\%$		
Cu50M	—	$-180.0 \leq t \leq +200.0^{\circ}\text{C}$	0.4	0.2	0.1 to 3 mA	GOST R 8.625-2006
Cu100M	—	$-180.0 \leq t \leq +200.0^{\circ}\text{C}$	0.3	0.1	0.1 to 3 mA	GOST R 8.625-2006

Accuracy is guaranteed under the environmental conditions of $+23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, 20 to 80% RH. For use in the temperature range of -10 to $+18^{\circ}\text{C}$ or $+28$ to $+50^{\circ}\text{C}$, add the temperature coefficient: $0.05^{\circ}\text{C}/^{\circ}\text{C}$. Above accuracy is defined for 4 wire measuring. Accuracy for 3 wire measuring: 1.0°C to Cu 10; 0.6°C to Pt50/Pt50G/Cu50M; 0.3°C to other RTD is each added, on condition the resistance of all cables are the same. Accuracy for 2 wire measuring: Same with 3 wire measuring on condition the resistance of cables are excluded. The accuracy of source is the one when using the included binding post (99045) *1 Also compliant with JIS C 1604.

Common Specifications

Source

Generation unit voltage limiter	Approx. -5 V to $+36$ V
Generation unit current limiter	Approx. ± 30 mA
Sweep function	Step/Linear/Program
Interval time	5 to 600 s
Generation load condition	$C \leq 10 \mu\text{F}$, $L \leq 10$ mH
Output resistance	20 m Ω or less
Output response time	DC Voltage/Current/TC: Approx. 250 ms RTD/Resistance: Approx. 1 ms

Measurement

CMRR	120 dB (50/60 Hz)
NMRR	60 dB (50/60 Hz)
Rating between terminals	H/L terminals: 50 V LOOP/mA terminals: 30 V mA/L terminals: 50 mA
Current terminal protective input	PTC protection
Maximum voltage application between measurement terminals and earth	50 V peak

General Specifications

Function	CA500	CA550
Display	Monochrome Dot Matrix LCD	
Built-in light	Selection of "Constantly ON", "Constantly OFF" or "Auto off by approx. 10 min" OFF, level dimming function	
Display refresh rate	Approx. 1 s	
Warm-up time	Approx. 5 min	
Language	English (default setting), Japanese, Chinese, Korean, Russian	
Power supply	DC 5 V $\pm 10\%$, max. 500 mA, Four alkaline AA batteries, Battery life: Approx. 16 hours (Measurement ON, 5 V output/10 k Ω or more)	
Auto power-off	Approx. 30 minutes (disabled by default)	
Ground voltage	Measurement terminal: 50 V, Source terminal: 30 V	
Insulation resistance	Between FUNCTION1-2 terminals: DC 500 V 50 M Ω or more	
Withstand voltage	Between FUNCTION1-2 terminals: 500 V AC for 10 seconds	
Dimensions	Approx. 130 (W) \times 260 (H) \times 53 (D) mm	
Weight	Approx. 900 g (including batteries)	
Safety standard	EN61010-1, Overvoltage Category I, Pollution Degree 2 EN61010-2-030, Measurement category O (other)	
Operation environment	Temperature: -10 to $+50^{\circ}\text{C}$, Humidity: 80%R.H. (40°C or less), 50%R.H. (40 to 50°C) *No condensation, Altitude: 2000 m or less	
Storage environment	Temperature: -20 to $+60^{\circ}\text{C}$, Humidity: 90%R.H. (No condensation)	
Interface	USB B communication device class	USB B communication device class, USB B mass storage class
Application	—	HART communication mode
Number of Data Records	Up to 100 results	Up to 250 CSV files
Accessories	Source lead cables, Measurement lead cables, Binding post (2 sets), USB cable (2 m, USB Type A - USB Type B), Soft case (for accessories), four AA alkaline batteries, Instruction manual (CD), Startup guide, Shoulder strap	