

CA51 and CA71 Specifications

●Signal sourcing unit range and accuracy (for both CA51 and CA71)

±(setting percentage plus μV, mV, mA, Ω or °C)

Parameter	Reference	Range	Accuracy (23.5°C per year)	Resolution	Remarks
DC voltage	100 mV	-10.00~110.00 mV	±(0.02% + 15 μV)	10 μV	
	1 V	0~1.1000 V	±(0.02% + 0.1 mV)	0.1 mV	Maximum output: 5 mA
	10 V	0~11.000 V	±(0.02% + 1 mV)	1 mV	Maximum output: 10 mA
	30 V	0~30.00 V	±(0.02% + 10 mV)	10 mV	Maximum output: 10 mA **
DC current	20 mA	0~24.000 mA	±(0.025% + 3 μA)	1 μA	Maximum load: 12 V
	4~20 mA	4/8/12/16/20 mA		4 mA	
mA SINK	20 mA	0.1~24.000 mA	±(0.05% + 3 μA)	1 μA	External power supply: 5~28 V
Resistance	400 Ω	0~400.00 Ω	±(0.025% + 0.1 Ω)	0.01 Ω	Excitation current: 0.5~5 mA *3 If 0.1 mA, add 0.25 Ω or 0.6°C. Subject device input capacitance: 0.1 μF or less
RTD	PT100 *2	-200.0~850.0°C	±(0.025% + 0.3°C)	0.1°C	TC source accuracy does not include RJ sensor accuracy. RJ sensor specs Measurement range: -10~50°C Accuracy (when combined with main unit) 18~28°C: ±0.5°C Other than the above: ±1°C
	JPT100	-200.0~500.0°C			
	K	-200.0~1372.0°C	±(0.02% + 0.5°C)		
	E	-200.0~1000.0°C	(-100°C or greater)		
	J	-200.0~1200.0°C	±(0.02% + 1°C)		
	T	-200.0~1200.0°C	(-100°C or less)		
	N	-200.0~400.0°C	±(0.02% + 0.5°C)		
	L	-200.0~1300.0°C	(0°C or greater)		
	U	-200.0~900.0°C	±(0.02% + 1°C)		
	S	-200.0~400.0°C	(0°C or less)		
	R		±(0.02% + 2.5°C)		
		0~1768°C	(100°C or less)		
	TC *4	S			
			(100°C or greater)		
B		600~1800°C	±(0.02% + 2°C)		
			(1000°C or less)		
			±(0.02% + 1.5°C)		
		(1000°C or greater)			
Frequency, pulse	500 Hz	1.0~500.0 Hz	±0.2 Hz	0.1 Hz	Output voltage: +0.1~15 V (zero base waveform) Amplitude accuracy: ±(5% + 0.1 V)
	1000 Hz	90~1100 Hz	±1 Hz	1 Hz	Maximum load current: 10 mA
	10 kHz	0.9 kHz~11.0 kHz	±0.1 kHz	0.1 kHz	Contact output (with 0.0 V amplitude setting, FET switch ON/OFF)
	Pulse cycle *5	1~99,999 cycles	-	1 cycle	Maximum open/close voltage/current: +28 V/50 mA

Temperature coefficient: Accuracy shown above × (1/5)°C

*1: Output up to 24 V/22 mA is possible when using the AC adapter.

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

*3: Excitation current: If less than 0.1 mA to 0.5 mA, then add [0.025% (mA)] Ω or [0.061% (mA)]°C.

*4: As per JIS C 1602-1995 (ITS-90) (L and U are DIN specs).

*5: Frequency (interval between one pulse and another) and amplitude during pulse cycle generation may have the same range as during frequency generation.

●General specifications (for both CA51 and CA71)

Parameter	Specification
Signal generating unit response time	Approximately 1 second (time between start of voltage change and when voltage enters accuracy range)
Signal generating unit voltage limiter	Approximately 32 V
Signal generating unit current limiter	Approximately 25 mA
Divided output (n/m) function	Output = setting × (n/m) n = 0~m, m = 1~19; n ≤ m
Auto-step output function	n value sent automatically when n/m function selection is selected (two options: approximately 2.5 seconds/step or approximately 5 seconds/step)
Sweep function	Sweep time (two options: approximately 16 seconds or approximately 32 seconds)
Memory function	50 value sets (generated and measured values are stored as value sets with the same address (up to 50 value sets can be stored))
Measuring unit maximum input	Voltage terminal: 300 V AC Current terminal: 120 mA DC
Current terminal input protection	Fuses: 125 mA/250 V
Measuring unit ground voltage	Maximum 300 V AC
Measurement display updating rate	Approximately once per second
Serial interface	Enabled when communication cable (RS232) is connected; sold separately as optional accessory (CA71 only)
Display	Segmented LCD (approximately 76 mm × 48 mm)
Backlight	LED backlight; auto-off after one minute (from when LIGHT key is turned on)
Power supply	Four AA alkaline batteries, or special AC adapter (sold separately)
Battery life	Measurement off, output 5 V DC/10 kΩ or greater: Approximately 40 hours
	Simultaneous signal generation/measurement, output 5 V DC/10 kΩ or greater: Approximately 20 hours
Consumed power	Simultaneous signal generation/measurement, output 20 mA/5 V: Approximately 12 hours (using alkaline batteries, with backlight off)
	Approximately 7 VA (using 100 V AC adapter)
Auto-power-off function	Approximately 10 minutes (auto-power-off can be disabled through a DIP switch setting)
Applicable standards	IEC61010-1, IEC61010-2-31 EN61326-1: 1997 + A1: 1998 EN55011: 1998, Class B, Group 1
Insulation resistance	Across input terminal and output terminal, 500 V DC, 50 MΩ or greater

●Measurement unit range and accuracy (for both CA51 and CA71)

Accuracy: ±(reading percentage plus μV, mV, mA, Ω or dgt (digit))

Parameter	Reference	Range	Accuracy (23.5°C per year)	Resolution	Remarks
DC voltage	100 mV	0~±110.00 mV	±(0.025% + 20 μV)	10 μV	Input resistance: 10 MΩ or greater
	1 V	0~±1.1000 V	±(0.025% + 0.2 mV)	0.1 mV	
	10 V	0~±11.000 V	±(0.025% + 2 mV)	1 mV	Input resistance: Approximately 1 MΩ
	100 V	0~±110.00 V	±(0.05% + 20 mV)	0.01 V	
DC current	20 mA	0~±24.000 mA	±(0.025% + 4 μA)	1 μA	Input resistance: Approximately 14 Ω
	100 mA	0~±100.00 mA	±(0.04% + 30 μA)	10 μA	
Resistance	400 Ω	0~400.00 Ω	±(0.05% + 0.1 Ω)	0.01 Ω	Accuracy during 3-wire measurement
AC voltage	1 V	0~1.100 V	±(0.5% + 5 dgt)	1 mV	Input resistance: 45~55 Hz Approximately 10 MΩ/10 pF Input voltage range: 10%~100% Measurement method: Average value rectification
	10 V	0~11.00 V		0.01 V	
	100 V	0~110.0 V		0.1 V	
	300 V	0~300 V		1 V	
Frequency, pulse	100 Hz	1.00~100.00 Hz	±2 dgt	0.01 Hz	Maximum input: 30 V peak Input resistance: 200 kΩ 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	1.0~1000.0 Hz		0.1 Hz	
	10 kHz	0.001~11.000 kHz		0.001 kHz	
	CPM	0~99,999 CPM		1 CPM	
	CPH	0~99,999 CPH		1 CPH	

Temperature coefficient: Accuracy shown above × (1/5)°C

●Measurement unit (temperature; CA71 only) range and accuracy

Accuracy: ±(reading percentage + °C)

Parameter	Reference	Range	Accuracy (23.5°C per year)	Resolution	Remarks	
TC *7	K	-200.0~1372.0°C	±(0.05% + 1.5°C) (-100°C or greater)	0.1°C		
	E	-200.0~1000.0°C				
	J	-200.0~1200.0°C				
	T	-200.0~400.0°C				
	N	-200.0~1300.0°C				
	L	-200.0~900.0°C				
	U	-200.0~400.0°C				
	R	0~1768°C				
RTD	S	0~1768°C	±(0.05% + 2°C) (100°C or greater)	1°C		
	B	600~1800°C				
						±(0.05% + 3°C) (100°C or less)
RTD	PT100 *6	-200.0~850.0°C	±(0.05% + 0.6°C)	0.1°C	Accuracy during 3-wire measurement	
	JPT100	-200.0~500.0°C				

Temperature coefficient: Accuracy shown above × (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).

Parameter	Specification
Withstand voltage	Across input terminal and output terminal, 3.7 kVAC, for one minute
Operating temperature and humidity ranges	0~50°C, 20~80% RH (no condensation)
Storage temperature and humidity ranges	-20~50°C, 90% RH or less (no condensation)
External dimensions (WHD)	Approximately 190 × 120 × 55 mm
Weight	Approximately 730 g (including batteries)
Standard accessories	All of the following are included: Signal generating lead cables (one red, two black): 98020 Measurement lead cables (one red, one black): RD031 Carrying case: 93016 Terminal adapter for CA71: 99021 User's manual: IM CA71-E Fuse: A1501EF (for current terminal input protection) Four AA alkaline batteries: A1070EB × 4
Optional accessories (sold separately)	AC adapter: A1020UP (100 V AC power supply) AC adapter: A1022UP (120 V AC power supply) AC adapter: B9108WB (220~240 V AC power supply) RJ sensor: B9108VA (For reference junction compensation) Accessory carrying case: B9108XA Communication cable: 91017
Spare parts	Signal generating lead cables (one red, two black): 98020 Measurement lead cables (one red, one black): RD031 Carrying case: 93016 Terminal adapter: 99021 Fuse: A1501EF (for current terminal input protection)