HIOKI

AC/DC CURRENT SENSOR CT7000 Series
DISPLAY UNIT CM7290

Robust support for current measurement through outstanding interoperability with Memory HiCorders and data loggers

Measurement

Extensive selection of sensors for new current measurement possibilities

Display

Immediate confirmation of measured values in the field

Output

Smooth configuration and setup

Recording

Outputting of data to Memory HiCorders and data loggers for extended recording

Analysis

Outputting of data to Memory HiCorders and data loggers for waveform observation

CE 3 years Guaranteed for 3 years DROP PROOF

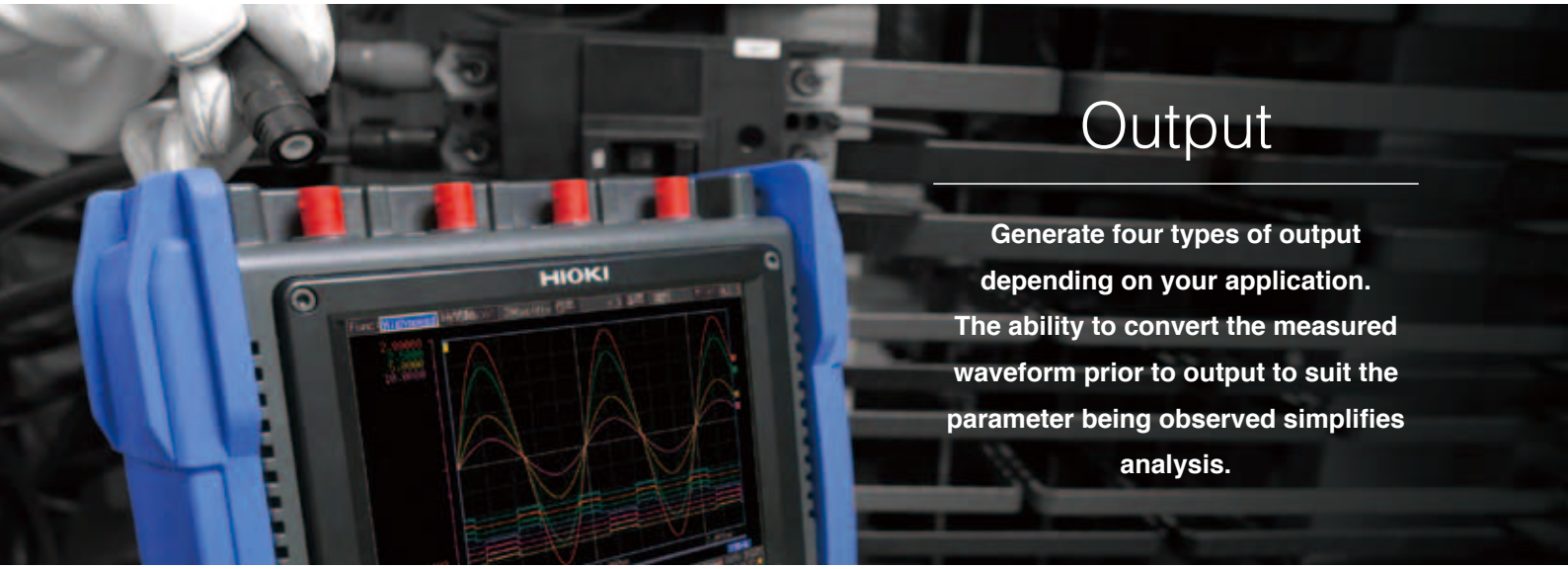
*Only the Display Unit CM7290 features a drop-proof design.

Current measurement

Observe instantaneous waveforms with an AC/DC current sensor. AC/DC auto-zero current sensors facilitate extended waveform recording.

Display

Check measured values in the field with the Display Unit. It's also easy to output data to Memory HiCorders and data loggers.



Output

Generate four types of output depending on your application. The ability to convert the measured waveform prior to output to suit the parameter being observed simplifies analysis.

Extensive selection of sensors for new current measurement possibilities

CT7742	CT7736	CT7731
2000 A	600 A	100 A
ø55 mm (2.17 in)	ø33 mm (1.3 in)	ø33 mm (1.3 in)

CT7642	CT7636	CT7631
2000 A	600 A	100 A
ø55 mm (2.17 in)	ø33 mm (1.3 in)	ø33 mm (1.3 in)

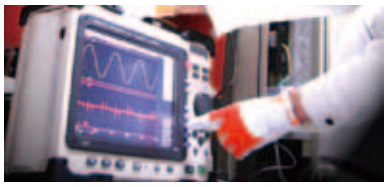
AC/DC AUTO-ZERO CURRENT SENSOR

Frequency band: DC to 5 kHz

Perform measurement without shifts in the zero-point, even during extended waveform recording or in locations where the temperature varies during measurement.

AC/DC CURRENT SENSOR

Frequency band: DC to 10 kHz
(Standard sensor)

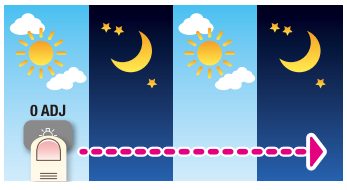


Use to observe instantaneous waveforms and make short-term measurement in locations without temperature variations.

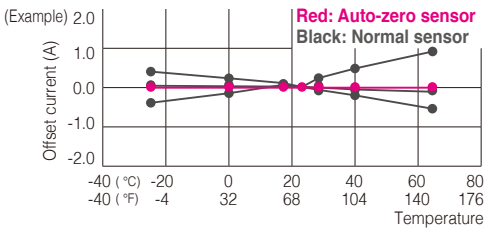
AC/DC auto-zero current sensors

Take measurements without shifts in the zero-point, even during extended recording with temperature variations

Normal sensor



New auto-zero sensor



Because measured values acquired using standard sensors exhibit shifts in the zero-point caused by temperature variations, their use in recording data over extended periods of time has required regular zero-adjustment. This issue is caused by the effects of the Hall elements used in the sensor's detection circuitry. Hioki's new auto-zero sensors feature a new, switching-based offset cancellation circuit that was developed to address this issue. This circuit minimizes shifts in the zero-point to enable extended recording without constant zero-adjustment.

Identify signal levels in the field
Intuitive output settings

Automatic sensor detection and configuration

When a sensor is connected to the connector, the display unit detects it and automatically sets the sensor type.

Efficiency in the field

The separate, backlit display is easy to read, and a magnetic strap frees up both hands to perform other work.

Retention of measurement settings

The same settings will remain in effect when the unit is turned on next, streamlining work by allowing measurement to be started immediately.

Convenient support for external power supplies for easy embedding

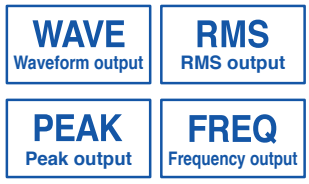
When power is supplied to the AC adapter, the unit is automatically supplied power so that it can start measurement immediately.

Battery power for convenient testing

The unit can be used with two AA alkaline batteries. This cord-free mode of operation delivers outstanding ease of use in the field.

Dual-value display for at-a-glance confirmation

The unit displays the frequency and output rate along with the measured value, simplifying the process of setting the rate when outputting measurement data.

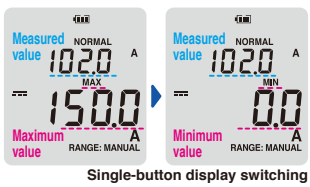


Single-button selection of output format

The unit can generate four types of output for data loggers and Memory HiCorders. The format can be switched with a single button.

Simple output connectivity

Three output cords are available for use depending on the application, making it easy to connect the unit to a data logger or Memory HiCorder.

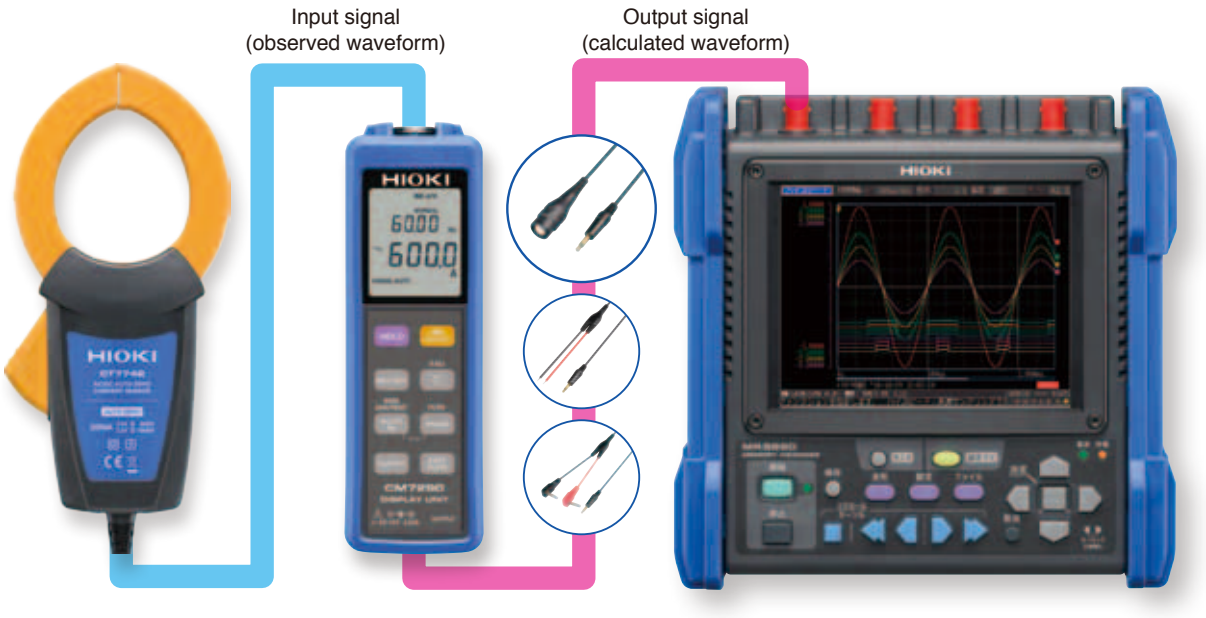


Single-button display switching

Analysis display with maximum, minimum, and average values

When the analysis display is activated, the unit displays the maximum, minimum, and average values as well as the maximum and minimum crest values since the start of measurement.

Four types of application-specific output for Memory HiCorders and data loggers



WAVE: Waveform output

Output the waveform without modification.

RMS: RMS output

Convert input for output as a series of RMS values.

FAST: 45 Hz or greater
NORMAL: 10 Hz or greater
SLOW: 3 Hz or greater

PEAK: Peak output

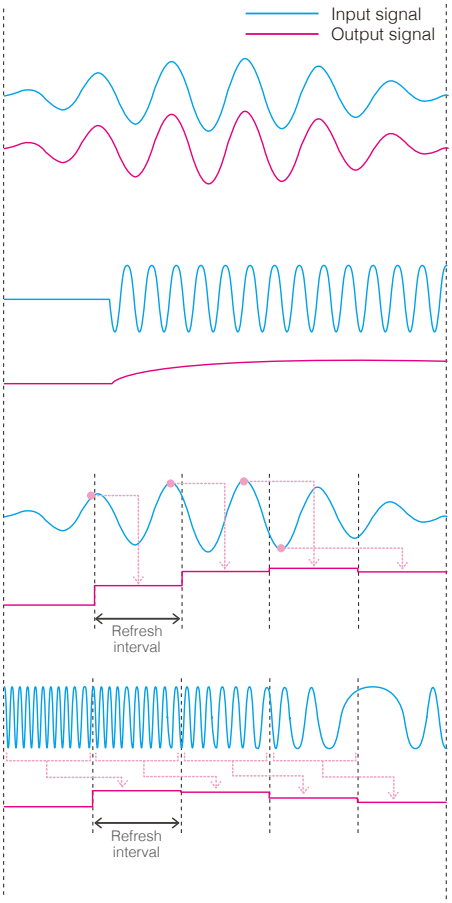
Sample the waveform at the rate of 2 kS/s and output the peak value for each interval as an absolute value.

Refresh intervals
FAST: 50 updates per sec. (0.02 sec.)
NORMAL: 5 updates per sec. (0.2 sec.)
SLOW: 1 update every sec. (1 sec.)

FREQ: Frequency output

Count the frequency and output it for each interval.

Refresh intervals
FAST: 5 updates per sec. (0.2 sec.)
NORMAL: 5 updates per sec. (0.2 sec.)
SLOW: 1 update every 3 sec.



Record the amount of current generated by solar panels in 1 week

Example devices used
- Display Unit CM7290
- AC/DC Auto-zero Current Sensor CT7731
- Output Cord L9095
- Memory HiCorder MR8870

Record and monitor RMS current values at a manufacturing plant

Example devices used
- Display Unit CM7290
- AC/DC Auto-zero Current Sensor CT7742
- Output Cord L9095
- Memory HiCorder MR8880

Measure and monitor the maximum power supply rating for a piece of equipment

Example devices used
- Display Unit CM7290
- AC/DC Auto-zero Current Sensor CT7736
- Output Cord L9096
- Memory HiLogger LR8431

Check the frequency of a compressor and motor

Example devices used
- Display Unit CM7290
- AC/DC Current Sensor CT7631
- Output Cord L9096
- Memory HiLogger LR8431

Display Unit Specifications CM7290 (Guaranteed accuracy period: 3 years; post-adjustment guaranteed accuracy period: 3 years)

Input/output and measurement specifications

Measured parameters	DC, AC, DC+AC, frequency (Hz)
Measurement method	True RMS measurement
Output methods	WAVE, RMS, PEAK, Hz
Output impedance	50 Ω (±5%)
Input connector	HIOKI PL14
Display refresh times	FAST: 0.2 sec. / NORMAL: 0.2 sec. / SLOW: 1.0 sec. (when using the Hz output method, SLOW: 3 sec.)
Output refresh times	**PEAK---**FAST: 0.02 sec. / NORMAL: 0.2 sec. / SLOW: 1 sec. **FREQ---**FAST: 0.2 sec. / NORMAL: 0.2 sec. / SLOW: 3.0 sec. (WAVE and RMS use analog output.)
Peak detection interval	2 ms or greater (with PEAK MAX, PEAK MIN, or PEAK output)
Zero display range	29 count or less for AC and DC+AC RMS values
Crest factor	3 at 5000 count or 2.5 at 6000 count for AC and AC+DC
Typical accuracy (display)	**DC**: ±0.3% rdg. ±8 dgt. / **AC**: ±0.3% rdg. ±8 dgt. (RMS) / **DC+AC**: ±0.3% rdg. ±12 dgt. (RMS) / **Frequency**: ±0.1% rdg. ±0.01 Hz
Typical accuracy (output)	**DC**: ±0.5% rdg. ±0.8 mV / **Current**: ±0.5% rdg. ±0.8 mV / **DC+AC**: ±0.5% rdg. ±1.2 mV / **Frequency**: ±0.3% rdg. ±2.2 mV

General specifications

Operating and storage temperature and humidity range	-25 °C to 65 °C (-13 °F to 149 °F) , 80% RH (non-condensing, with batteries removed)
Dust and water resistance	IP54 (with sensor connected and caps fitted to AC adapter and power connector)
Standard compliance	Safety: EN61010 EMC: EN61326, EN61000
Power supply	AA alkaline battery (LR6) × 2 / 5 V to 15 V external power supply
Maximum rated output	2.5 VA
Continuous operating time	Max. approx. 16 hours (with backlight off using WAVE or RMS output and CT7631, CT7636, or CT7642 sensor)
External dimensions and mass	Approx. 52 mm (2 in) W × 163 mm (6.4 in) H × 37 mm (1.5 in) D, approx. 220 g (7.76 oz)(with protector and batteries)
Accessories	AA alkaline battery (LR6) × 2, protector (attach to unit), instruction manual

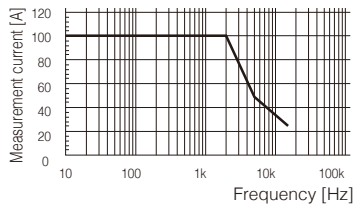
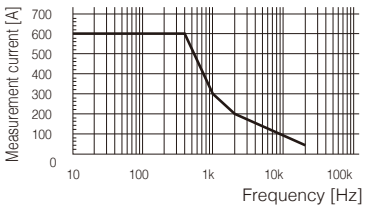
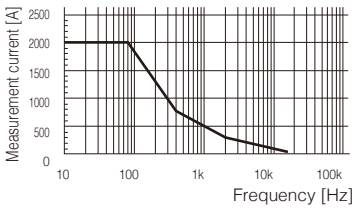
Functions

Auto-range function	Automatic configuration of optimal range (can also be set manually)
Zero-adjustment at power-on	Automatic zero-adjustment when powered on
Analysis display	Display of maximum, minimum, and average values as well as maximum and minimum crest values since activation of analysis display
Filter	180 Hz low-pass filter, on/off pass band setting
Output amplification	Output at ×10 normal level

Display value hold function	YES
Backlight	YES
Auto-power off	YES
Configuration save function	YES
Key lock function	YES

Sensor specifications CT7600, CT7700 series (Guaranteed accuracy period: 3 years; post-adjustment guaranteed accuracy period: 3 years)

Input/output and measurement specifications

		CT7631/CT7731	CT7636/CT7736	CT7642/CT7742
Frequency band		**CT7631, CT7636, CT7642**: DC to 10 kHz (-3 dB) / **CT7731, CT7736, CT7742**: DC to 5 kHz (-3 dB)		
Rated measurement current		100 A AC/DC	600 A AC/DC	2000 A AC/DC
Output rate		1 mV/A		0.1 mV/A
Measurable conductor diameter		ø33 mm (1.3 in) or less		ø55 (2.17 in) mm or less
Ranges[*1]		100.0 A / 60.00 A	600.0 A / 60.00 A	2000 A / 600.0 A
Output connector		HIOKI PL14		
Maximum measurement current	**Frequency derating**			
	Peak value	150 A peak	900 A peak	2840 A peak
Sampling frequency		36.5 kHz ±0.2 Hz (CT7731, CT7736, CT7742)		
Output resistance		150 Ω or less		
Typical accuracy (continuous input)		±1.0% rdg. ±0.5% f.s. (DC, 45 to 66 Hz) ±2.0% rdg. ±0.5% f.s. (66 Hz to 500 Hz)	±2.0% rdg. ±0.5% f.s. (DC, 45 to 66 Hz) ±3.0% rdg. ±0.5% f.s. (66 Hz to 1 kHz)	±1.5% rdg. ±0.5% f.s. (DC, 45 to 66 Hz) ±2.5% rdg. ±1.0% f.s. (66 Hz to 1 kHz)
Typical accuracy (phase)		±1.8 deg. (up to 66 Hz)	±1.8 deg. (up to 66 Hz)	±2.3 deg. (up to 66 Hz)

*1: When used with CM7290

General specifications

	CT7631/CT7731	CT7636/CT7736	CT7642/CT7742
Operating and storage temperature and humidity range	-25°C to 65°C (-13 °F to 149 °F) , 80% RH (non-condensing)		
Dust and water resistance	IP40	Jaws and barriers: IP50 / Grip: IP54 (when measuring insulated conductors only) (Do not use when wet.)	
Standard compliance	Safety: EN61010 EMC: EN61326		
Maximum rated input-to-ground voltage[*2]	600 V AC/DC (CAT IV)	1000 V AC/DC (CAT III) / 600 V AC/DC (CAT IV)	
External dimensions and mass[*3]	Approx. 58 mm (2.3 in) W x 132 mm (5.2 in) H x 18 mm (0.7 in) D approx. 250 g (8.8 oz)	Approx. 64 mm (2.5 in) W x 160 mm (6.3 in) H x 34 mm (1.3 in) D approx. 320 g (11 oz)	Approx. 64 mm (2.5 in) W x 95 mm (7.7 in) H x 34 mm (1.3 in) D approx. 510 g (18 oz)
Jaw dimensions	Approx. 66 mm (2.6 in) W × 13 mm (0.5 in) D	Approx. 69 mm (2.7 in) W × 14 mm (0.6 in) D	Approx. 92 mm (3.6 in) W × 18 mm (0.7 in) D
Cable length	Approx. 2.5 m (8.2 ft) (extensible to max. of 100 m (328 ft) with optional products; subject to limits imposed by connected device)		

*2: Anticipated transient overvoltage: 8000 V
*3: Not including dimensions of protruding parts, lever, or jaws.

Combined accuracy CT7600/CT7700 series + CM7290

CM7290 + CT7631/CT7731

(AC: 45 Hz ≤ f ≤ 66 Hz)

Range	Amplitude [A]			DC output	AC output		
	WAVE	RMS	PEAK	WAVE	WAVE	RMS	PEAK
60.00 A	$I \leq 60$	$3 \leq I \leq 60$	$\|Ipeak\| \leq 150$	±1.5% rdg. ±5.8 mV	±1.5% rdg. ±5.8 mV, ±2.0 deg.	±1.8% rdg. ±5.8 mV	±3.5% rdg. ±27.0 mV
100.0 A	$I \leq 80$	$30 \leq I \leq 100$		±1.5% rdg. ±1.3 mV	±1.5% rdg. ±1.3 mV, ±2.0 deg	±1.8% rdg. ±1.3 mV	±3.5% rdg. ±9.0 mV
	$80 \leq I \leq 100$				±1.5% rdg. ±1.5 mV, ±2.0 deg		

Range	Amplitude [A]			AC + DC output					
				WAVE		RMS		PEAK	
	WAVE	RMS	PEAK	DC	AC	DC	AC	DC	AC
60.00 A	$I \leq 60$	$3 \leq I \leq 60$	$\|Ipeak\| \leq 150$	±2.5% rdg. ±6.2 mV	±1.5% rdg. ±6.2 mV, ±2.0 deg	±2.7% rdg. ±6.2 mV	±1.8% rdg. ±6.2 mV	±3.5% rdg. ±27.0 mV	±3.5% rdg. ±27.0 mV
100.0 A	$I \leq 80$	$30 \leq I \leq 100$		±2.5% rdg. ±1.7 mV	±1.5% rdg. ±1.7 mV, ±2.0 deg	±2.7% rdg. ±1.7 mV	±1.8% rdg. ±1.7 mV	±3.5% rdg. ±9.0 mV	±3.5% rdg. ±9.0 mV
	$80 \leq I \leq 100$								

Range	Amplitude [A]			Display				
				DC mode	AC mode	AC+DC mode		AC peak mode
	DC	AC/AC+DC	PEAK	DC	AC	DC	AC	AC
60.00 A	$I \leq 60$	$3 \leq I \leq 60$	$\|Ipeak\| \leq 110$	±1.3% rdg. ±0.58 A	±1.3% rdg. ±0.58 A	±2.5% rdg. ±0.57 A	±1.3% rdg. ±0.62 A	±3.5% rdg. ±2.7 A
60.00 A			$110 < \|Ipeak\| \leq 150$					
100.0 A	$I \leq 80$	$30 \leq I \leq 80$	-	±1.3% rdg. ±1.3 A	±1.3% rdg. ±1.3 A	±2.5% rdg. ±2.0 A	±1.3% rdg. ±1.7 A	±3.5% rdg. ±2.7 A
100.0 A	$80 \leq I \leq 100$	$80 < I \leq 100$						

CM7290 + CT7636/CT7736

(AC: 45 Hz ≤ f ≤ 66 Hz)

Range	Amplitude [A]			DC output	AC output		
	WAVE	RMS	PEAK	WAVE	WAVE	RMS	PEAK
60.00 A	$I \leq 60$	$3 \leq I \leq 60$	$\|Ipeak\| \leq 150$	±2.5% rdg. ±30.8 mV	±2.5% rdg. ±30.8 mV, ±2.0 deg	±2.8% rdg. ±30.8 mV	±4.5% rdg. ±49.0 mV
600.0 A	$I \leq 600$	$30 \leq I \leq 600$	$\|Ipeak\| \leq 600$	±2.5% rdg. ±3.8 mV	±2.5% rdg. ±3.8 mV, ±2.0 deg	±2.8% rdg. ±3.8 mV	±4.5% rdg. ±11.2 mV
			$600 < \|Ipeak\| \leq 900$				±6.5% rdg. ±11.2 mV

Range	Amplitude [A]			AC+DC output					
				WAVE		RMS		PEAK	
	WAVE	RMS	PEAK	DC	AC	DC	AC	DC	AC
60.00 A	$I \leq 60$	$3 \leq I \leq 60$	$\|Ipeak\| \leq 150$	±3.5% rdg. ±31.2 mV	±2.5% rdg. ±31.2 mV, ±2.0 deg	±3.7% rdg. ±31.2 mV	±2.8% rdg. ±31.2 mV	±4.5% rdg. ±49.0 mV	±4.5% rdg. ±49.0 mV
600.0 A	$I \leq 600$	$30 \leq I \leq 600$	$\|Ipeak\| \leq 600$	±3.5% rdg. ±4.2 mV	±2.5% rdg. ±4.2 mV, ±2.0 deg	±3.7% rdg. ±4.2 mV	±2.8% rdg. ±4.2 mV	±4.5% rdg. ±11.2 mV	±4.5% rdg. ±11.2 mV
			$600 < \|Ipeak\| \leq 900$					±6.5% rdg. ±11.2 mV	±6.5% rdg. ±11.2 mV

Range	Amplitude [A]			Display				
				DC mode	AC mode	AC+DC mode		AC peak mode
	DC	AC/AC+DC	PEAK	DC	AC	DC	AC	AC
60.00 A	$I \leq 60$	$3 \leq I \leq 60$	$\|Ipeak\| \leq 150$	±2.3% rdg. ±3.08 A	±2.3% rdg. ±3.08 A	±3.5% rdg. ±3.07 A	±2.3% rdg. ±3.12 A	±4.5% rdg. ±4.9 A
600.0 A	$I \leq 600$	$30 \leq I \leq 600$	$\|Ipeak\| \leq 600$	±2.3% rdg. ±3.8 A	±2.3% rdg. ±3.8 A	±3.5% rdg. ±4.5 A	±2.3% rdg. ±4.2 A	±4.5% rdg. ±5 A
			$600 < \|Ipeak\| \leq 900$					±6.5% rdg. ±5 A

CM7290 + CT7642/CT7742

(AC: 45 Hz ≤ f ≤ 66 Hz)

Range	Amplitude [A]			DC output	AC output		
	WAVE	RMS	PEAK	WAVE	WAVE	RMS	PEAK
600.0 A	$I \leq 600$	$30 \leq I \leq 600$	$\|Ipeak\| \leq 1500$	±2.0% rdg. ±10.8 mV	±2.0% rdg. ±10.8 mV, ±2.5 deg	±2.3% rdg. ±10.8 mV	±4.0% rdg. ±27.0 mV
2000 A	$I \leq 1800$	$300 \leq I \leq 1800$	$\|Ipeak\| \leq 2300$	±2.0% rdg. ±1.8 mV	±2.0% rdg. ±1.8 mV, ±2.5 deg	±2.3% rdg. ±1.8 mV	±4.0% rdg. ±9.0 mV
	$1800 < I \leq 2000$	$1800 < I \leq 2000$	$2300 < \|Ipeak\| \leq 2840$	±2.0% rdg. ±1.8 mV	±2.5% rdg. ±1.8 mV, ±2.5 deg	±2.8% rdg. ±1.8 mV	±8.5% rdg. ±10.0 mV

Range	Amplitude [A]			AC+DC output					
				WAVE		RMS		PEAK	
	WAVE	RMS	PEAK	DC	AC	DC	AC	DC	AC
600.0 A	$I \leq 600$	$30 \leq I \leq 600$	$\|Ipeak\| \leq 1500$	±3.0% rdg. ±11.2 mV	±2.0% rdg. ±11.2 mV, ±2.5 deg	±3.2% rdg. ±11.2 mV	±2.3% rdg. ±11.2 mV	±4.0% rdg. ±27.0 mV	±4.0% rdg. ±27.0 mV
2000 A	$I \leq 1800$	$300 \leq I \leq 1800$	$\|Ipeak\| \leq 2300$	±3.0% rdg. ±2.2 mV	±2.0% rdg. ±2.2 mV, ±2.5 deg	±3.2% rdg. ±2.2 mV	±2.3% rdg. ±2.2 mV	±4.0% rdg. ±9.0 mV	±4.0% rdg. ±9.0 mV
	$1800 < I \leq 2000$	$1800 < I \leq 2000$	$2300 < \|Ipeak\| \leq 2840$	±3.0% rdg. ±2.2 mV	±2.5% rdg. ±2.2 mV, ±2.5 deg	±3.2% rdg. ±2.2 mV	±2.8% rdg. ±2.2 mV	±8.5% rdg. ±9.0 mV	±8.5% rdg. ±10.0 mV

Range	Amplitude [A]			Display				
				DC mode	AC mode	AC+DC mode		AC peak mode
	DC	AC / AC+DC	PEAK	DC	AC	DC	AC	AC
600.0 A	$I \leq 600$	$30 \leq I \leq 600$	$\|Ipeak\| \leq 1500$	±1.8% rdg. ±10.8 A	±1.8% rdg. ±10.8 A	±3.0% rdg. ±10.7 A	±1.8% rdg. ±11.2 A	±4.0% rdg. ±27 A
2000 A	$I \leq 1800$	$300 \leq I \leq 1800$	$\|Ipeak\| \leq 2300$	±1.8% rdg. ±18 A	±1.8% rdg. ±18 A	±3.0% rdg. ±25 A	±1.8% rdg. ±22 A	±4.0% rdg. ±27 A
	$1800 < I \leq 2000$	$1800 < I \leq 2000$	$2300 < \|Ipeak\| \leq 2840$	±1.8% rdg. ±18 A	±2.3% rdg. ±18 A	±3.0% rdg. ±25 A	±2.3% rdg. ±22 A	±8.5% rdg. ±27 A

Accuracy specifications conditions and effects

	Both display unit and sensors
Accuracy guarantee conditions	Guaranteed accuracy period: 3 years; post-adjustment guaranteed accuracy period: 3 years; guaranteed accuracy temperature and humidity range: 23°C ±5°C, 80% RH or less; after zero-adjustment; jaw cycle count: 30,000 or less
Temperature coefficient	Within operating temperature range, add 0.1 × accuracy specifications per °C (at other than 23°C ±5°C).
Offset drift (from -25°C to 65°C)	CT7731: Within ±0.5% f.s. / CT7736: Within ±0.1% f.s. / CT7742: Within ±0.1% f.s.
Effect of radiative radiofrequency electromagnetic field	15% f.s. at 10 V/m
Effect of conductive radiofrequency electromagnetic field	10% f.s. at 3 V/m
AC accuracy guarantee conditions	Sine wave input

	CT7631/CT7731	CT7636/CT7736	CT7642/CT7742
Effect of conductor position (deviation from center)	Within ±1.5%	Within ±2.0%	Within ±1.0%
Effect of external magnetic field (400 A/m, DC)	Within 1.5% f.s.	Within ±0.5% f.s.	Within ±0.2% f.s.

Lineup

DISPLAY UNIT

CM7290

Accessories: AA alkaline battery (LR6) × 2, protector (attach to unit), instruction manual

AC/DC AUTO-ZERO CURRENT SENSOR

Frequency band: DC to 5 kHz (-3 dB)

CT7731
100 A AC/DC
ø33 mm
(1.3 in)

CT7736
600 A AC/DC
ø33 mm
(1.3 in)

CT7742
2000 A AC/DC
ø55 mm
(2.17 in)

AC/DC CURRENT SENSOR

Frequency band: DC to 10 kHz (-3 dB)

CT7631
100 A AC/DC
ø33 mm
(1.3 in)

CT7636
600 A AC/DC
ø33 mm
(1.3 in)

CT7642
2000 A AC/DC
ø55 mm
(2.17 in)

Use an AC/DC Auto-zero Current Sensor or AC/DC Current Sensor with the Display Unit and Output Cord to generate output for a Memory HiCorder, data logger, or other instrument.

AC FLEXIBLE CURRENT SENSOR

Frequency band: 10 Hz to 50 kHz (within ±3 dB)

CT7044
600 A/6000 A AC
ø100 mm (3.9 in)
cable diameter ø7.4 mm (0.29 in)

CT7045
600 A/6000 A AC
ø180 mm (7.0 in)
cable diameter ø7.4 mm (0.29 in)

CT7046
600 A/6000 A AC
ø254 mm (10 in)
cable diameter ø7.4 mm (0.29 in)

OUTPUT CORD

For use with the Display Unit

L9094
For use with banana terminals

L9095
For use with BNC connectors

L9096
For use with terminal blocks

PL14 EXTENSION CABLE

For extending the sensor cable to the Display Unit

L0220-01 2 m (6.6 ft)
L0220-02 5 m (16.4 ft)
L0220-03 10 m (32.8 ft)
L0220-04 20 m (65.6 ft)
L0220-05 30 m (98.4 ft)
L0220-06 50 m (164 ft)
L0220-07 100 m (328 ft)

Other options

AC ADAPTER
9445-02

CARRYING CASE
C0220

Stores one sensor, one Display Unit, an AC adapter, and an output cord.

CARRYING CASE
C0221

Stores three sensors, one Display Unit, an AC adapter, an output cord, and an extension cable of up to 30 m (98.4 ft) in length.

MAGNETIC STRAP
Z5004

HIOKI
HIOKI E. E. CORPORATION