Specification
CMi210
Insulation Clamp Meter

All specified accuracies are at 23°C ± 5°C, <75% RH for 1 year.
Temperature Coefficient: < 0.1 x (specified accuracy) per °C. (0°C to 18°C, 28°C to 50°C).

All accuracies below are expressed as ± (percentage of reading + digits)

DC Voltage

Range	Resolution	Input Impedance	Accuracy
600mV	0.1mV	>100MΩ	0.5% + 2
6V	0.001V	10MΩ	
60V	0.01V	9.1MΩ	
600V	0.1V		
1000V	1V		

Overload protection: 1000 V DC or 750V AC rms

AC Voltage (true RMS)

Range	Resolution	Input Impe-dance	Accuracy		
			HFR1 selected (50 to 60Hz)	HFR2 selected	
				(50 to 100Hz)	(100 to 400Hz)
600mV	0.1mV	>100MΩ	2.0% + 10	1.5% + 8	Not specified
6V	0.001V	10MΩ			2.0% + 8
60V	0.01V	9.1MΩ			
600V	0.1V				
750V	1V				

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True rms AC voltage accuracy is specified from 1% of range to 100% of range.
Crest factor: ≤ 3
Frequency measurement accuracy (50Hz to 1kHz): 0.1% + 5
Frequency sensitivity >500 dgts
Overload protection: 1000V DC or 750V AC rms

AC Current using clamp (true RMS)

Range	Resolution	Accuracy		
		HFR1 selected (50 to 60Hz)	HFR2 selected	
			(50 to 60Hz)	(60 to 400Hz)
600A	0.1A	2.5% + 10	2.0% + 10	3.0% + 10
1500A	1A	2.5% + 10 (≤1000A)	2.5% + 10 (≤1000A)	3.5% + 10 (≤1000A)
		5.0% + 10 (>1000A)	5.0% + 10 (>1000A)	Not specified

True rms AC current accuracy is specified from 1 % of range to 100 % of range.
Crest factor: ≤ 3
Frequency measurement accuracy (50Hz to 1kHz): 0.1% + 5
Frequency sensitivity > 500 dgts
Overload protection: 1500A AC rms for 60 seconds maximum

DC Current using clamp

Range	Resolution	Accuracy
600A	0.1A	2.0% + 5
2000A	1A	3.0% + 5 (≤1000A) 5.0% + 5 (>1000A)

Overload protection: 2000 A DC for 60 seconds maximum

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AC Current (True RMS)

Range	Resolution	Voltage burden	Accuracy
600µA	0.1µA	500mV	1.5 % + 10
6000µA	1µA	2V	
60mA	0.01mA	500mV	
400mA	0.1mA	2V	2.0% + 10

Input protection: 0.5 A/1000V fast blow ceramic fuse

DC Current

Range	Resolution	Voltage burden	Accuracy
600µA	0.1µA	500mV	1.0% + 4
6000µA	1µA	2V	
60mA	0.01mA	500mV	
400mA	0.1mA	2V	1.5% + 4

Input protection: 0.5 A/1000V fast blow ceramic fuse

Resistance

Range	Resolution	Open circuit voltage	Accuracy
600Ω	0.1Ω	-3.0Vdc	1.0% + 5
6kΩ	0.001kΩ	-1.2V dc typical	
60kΩ	0.01kΩ		
600kΩ	0.1kΩ		
6MΩ	0.001MΩ		2.0% + 5
60MΩ	0.01MΩ		3.5% + 5

Overload protection: 600V DC or AC rms

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Capacitance

Range	Resolution	Accuracy
6µF	0.001µF	3.0% + 10
60µF	0.01µF	
600µF	0.1µF	
6mF	0.001mF	5.0% + 10

Overload Protection: 600V DC or AC rms

Frequency

Range	Resolution	Accuracy
60Hz	0.01Hz	0.1% + 5
600Hz	0.1Hz	
6kHz	0.001kHz	
60kHz	0.01kHz	
600kHz	0.1kHz	
6MHz	0.001MHz	
10MHz	0.01MHz	

Sensitivity (10Hz to 1 MHz): >3.5V AC rms
(1MHz to 10MHz): >3.5V, <5V AC rms
Minimum pulse width: >100 ns.
Duty cycle limits: >30% and <70%
Overload protection: 600V DC or AC rms

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Duty Cycle

Range	Frequency range	Resolution	Pulse width	Accuracy (5V logic)
5% to 95%	40Hz to 1kHz	0.1%	> 10µs	2.0% + 10
10% to 90%	1kHz to 10kHz			
20% to 80%	10kHz to 20kHz			

Overload protection: 600V DC or AC rms

Temperature (Type K Thermocouple)

Range	Resolution	Accuracy
0°C to 400°C	1°C	1.0% + 2
-50°C to 0°C, 400°C to 1300°C		2.0% + 3
32°F to 750°F	1°F	1.0% + 4
-58°F to 32°F, 750°F to 2372°F		2.0% + 6

Overload protection: 30V DC or AC rms

Continuity

Range	Resolution	Response time	Open circuit voltage	Audible indication
600Ω	0.1Ω	100ms	-3.0V dc	<40Ω

Overload protection: 600V DC or AC rms

Diode Test

Range	Resolution	Test current	Open circuit voltage	Audible indication	Accuracy
2V	1mV	0.5mA approx.	3.0V dc typical	<0.05V	2.0% + 5

Overload protection: 600V DC or AC rms

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Insulation Resistance

Test voltage	Test current	Insulation resistance range	Resolution	Accuracy
50V	1mA at 50 kΩ	50kΩ to 300kΩ	1kΩ	3.0% + 5
		0.3MΩ to 3MΩ	0.01MΩ	
		3MΩ to 30MΩ	0.1MΩ	
		30MΩ to 300MΩ	1MΩ	
100V	1mA at 100 kΩ	100kΩ to 600kΩ	1kΩ	
		0.6MΩ to 6MΩ	0.01MΩ	
		6MΩ to 60MΩ	0.1MΩ	
		60MΩ to 600MΩ	1MΩ	
250V	1mA at 250 kΩ	0.25MΩ to 1.5MΩ	0.01MΩ	1.5% + 5
		1.5MΩ to 15MΩ	0.1MΩ	
		15MΩ to 150MΩ	1MΩ	
		0.15GΩ to 1.5GΩ	0.01GΩ	
500V	1mA at 500 kΩ	0.5MΩ to 3MΩ	0.01MΩ	
		3MΩ to 30MΩ	0.1MΩ	
		30MΩ to 300MΩ	1MΩ	
		0.3GΩ to 3GΩ	0.01GΩ	
1000V	1mA at 1 MΩ	1MΩ to 6MΩ	0.01MΩ	
		6MΩ to 60MΩ	0.1MΩ	
		60MΩ to 600MΩ	1MΩ	
		0.6GΩ to 6GΩ	0.01GΩ	10% + 5

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Insulation Resistance Operating Range to BS EN 61557-2

Test voltage	Operating range to BS EN 61557-2 (See note 1)
50V	55kΩ to 300kΩ
	0.55MΩ to 3MΩ
	5.5MΩ to 30MΩ
	55MΩ to 300MΩ
100V	100kΩ to 600kΩ
	0.6MΩ to 6MΩ
	6 MΩ to 60MΩ
	60MΩ to 600MΩ
250V	0.5MΩ to 1.5MΩ
	5MΩ to 15MΩ
	50MΩ to 150MΩ
	0.5GΩ to 1.5GΩ
500V	0.5MΩ to 3 MΩ
	5MΩ to 30MΩ
	50MΩ to 300MΩ
	0.5GΩ to 3GΩ
1000 V	1MΩ to 6MΩ
	6MΩ to 60MΩ
	60MΩ to 600MΩ
	2.5GΩ to 6GΩ

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Note 1: The operating range where the operating uncertainty does not exceed ± 30 % in accordance with BS EN 61557-2.
Operating uncertainty (B) = ± (|A| + 1,15 $\sqrt{[\ E_2^2 + E_3^2\ ]}$)
where, A is the intrinsic uncertainty at reference conditions
E_2 is the variation due to supply voltage change
E_3 is the variation due to temperature change

Test voltage accuracy: 0% to +20%
Short circuit test current: 1mA
Auto discharge: discharge time <1s for C=1µF or less
Maximum capacitive load: operable with up to 1µF load
Live circuit detection: >30V DC or AC rms, test is inhibited
Overload protection: 600V DC or AC rms

GENERAL

Display: liquid crystal display
digital, 6000 counts, updates 2/sec
polarity: Automatic, positive implied, '-' for negative polarity indication
overrange: (OL) or (-OL) is displayed
bar-graph, 60 segments, updates 20/sec
Power: 5 x 1.5V, AA alkaline batteries (IEC LR6, NEDA 15A)
Battery life: 100 hours typical with alkaline
Low battery indication: ▯ symbol and **bAtt** displayed
Auto power off: after 30 minutes
Fuse: 0.5 A/1000V 6.3x32mm fast blow ceramic fuse
Jaw opening capability: conductor diameter 57mm
bus bar 70 x 18mm
Dimensions: 326 x 108 x 53mm
Weight: 720g approx., including batteries
Includes: carrying case, set of TL45 test leads, probe set, Type K thermocouple, 5 x 1.5V AA batteries (installed), instructions

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ENVIRONMENTAL
Temperature & Humidity (Operating): 0°C to 50°C <70% R.H.
(Storage): -20°C to 60°C < 80% R.H.
Altitude: up to 2000m
Pollution degree 2, indoor use

SAFETY
Conforms to:
BS EN 61010-1, BS EN 61010-2-032, CAT IV 600V, CAT III 1000V
BS EN 61557-1, BS EN 61557-2, CAT II 600V
Class II, Double insulation

EMC
Conforms to BS EN 61326-1, BS EN 61326-2-2

SPECIFICATION FOR TL45 TEST LEADS
Maximum voltage: 1000V AC/DC
Maximum current: 10A continuous
Connector: 4mm banana plug with fixed shroud

Environmental
Temperature (Operating & Storage): 0°C to 40°C
Altitude: up to 2000m
Pollution degree 2

Safety
Conforms to BS EN 61010-031,
CAT IV 600V, CAT III 1000V, 10A (Probe tip caps fitted)
CAT II 1000V, 10A (Probe tip caps removed)
Class II, Double insulation

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