Digital Clamp-On Meter Selection Guide

DC Amps
296

DC µA
270, 275

Frequency
265, 270, 275, 293, 296

Capacitance
265, 270, 275

True RMS
275, 293, 296

Non-contact Voltage
270, 275

Temperature
270, 275

% Harmonic Distortion
296

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See page 3 inside for ranges, specifications, and features.

Selecting your Digital Clamp-On Meter

1. Determine the maximum over voltage installation category (CAT I ~ CAT IV) the clamp-on will be used in and narrow your choice to those meters meeting the requirement. The Category rating for each meter is listed in the specifications table on page 3.

2. Narrow your choice by selecting meters with the features required for your intended applications. For example, if your applications require a CAT III meter with frequency and capacitance measurement capability, the TPI 265 ,TPI 270, or TPI 275 would be good choices.

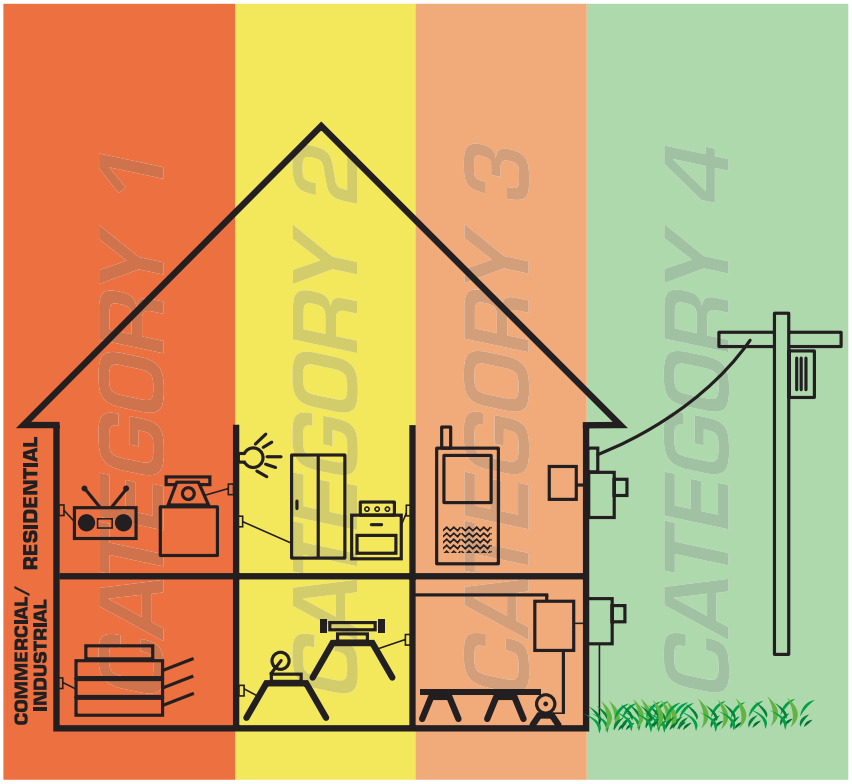
3. Finally, select a meter with enough range, accuracy, and features for the tests you will perform. For example, if you have narrowed your choice to the TPI 265, 270, and 275 and your applications require the capability to capture motor inrush amperage, the analog peak hold of the 270 and 275 make them the better choice.

APPLICATIONS

	Market			Function	255	265	270	275	291	293	296
	HVAC/R	Electrical	Electronic								
Thermocouples in furnaces and gas appliances	•			DCmV	◉	◉	◉	◉	◉	◉	◉
Heat anticipator current in thermostats	•			ACA	◉	◉	◉	◉	◉	◉	
Line voltages	•	•	•	ACV	◉	◉	◉	◉	◉	◉	◉
Control voltages	•	•	•	ACV/DCV	◉	◉	◉	◉	◉	◉	◉
Flame safety control current	•			DCuA			◉	◉			
Heating element resistance	•			Ohms	◉	◉	◉	◉	◉	◉	◉
Compressor winding resistance	•			Ohms	◉	◉	◉	◉	◉	◉	◉
Contactor and relay coil resistance	•	•		Ohms	◉	◉	◉	◉	◉	◉	◉
Motor and compressor startup current	•	•		ACA	◉	◉	◉	◉	◉	◉	◉
Motor run and start capacitors	•	•		CAP		◉	◉	◉			
Bar graph indicator of rapid fluctuations	•	•	•	All			◉	◉		◉	◉
Continuity of wiring	•	•	•	Ohms	◉	◉	◉	◉	◉	◉	◉
Measure frequency on control and line voltage	•	•	•	Hz		◉	◉	◉		◉	◉
Record minimum and maximum of measurements	•	•	•	REC	◉		◉	◉			◉
Measure temperature	•	•	•	DCV	◉*	◉*	◉	◉	◉*		
Measure True RMS of distorted or non-linear signals	•	•	•	ACV/ACA				◉		◉	◉
Measure line current	•	•		ACA	◉	◉	◉	◉	◉	◉	◉
Test continuity of circuit breakers and fuses		•	•	Ohms	◉	◉	◉	◉	◉	◉	◉
Measure voltage of direct drive DC motors		•		DCV	◉	◉	◉	◉	◉	◉	◉
Measure power supply voltage			•	ACV/DCV	◉	◉	◉	◉	◉	◉	◉
Measure power supply current			•	DCA				◉			◉
Non-Contact Voltage Detection	•	•	•	NCV			◉	◉			

*Requires A301 or A312 adapter

TPI DIGITAL CLAMP-ON METER TERMINOLOGY



CATEGORY RATINGS

>> Category I: Usually electronic equipment or equipment where measures have been taken to limit transient over voltages.

>> Category II: Single phase loads like appliance personal computers, television sets, and other household loads. Outlets located more than 30 feet from a CAT III source or more than 60 feet from a CAT IV source.

>> Category III: Distribution level fixed installations like distribution panel devices, short branch and feeder circuits, three phase loads, and single phase commercial lighting.

>> Category IV: Equipment and lines located on the power line side of a service panel or where a low voltage connection is made to utility power

Terminology

>> Agency Approval: Test equipment with the CE or UL mark have passed through tests and are designed with operators safety in mind.

>> Auto Range: Meter automatically selects the appropriate range after the function has been selected.

>> Trim Mode: A feature that stabilizes the display when measuring unstable or fast moving signals.

>> Basic DC Accuracy: Important specification affecting the overall accuracy of all functions on a DMM.

>> Resolution: A measurement of how small of a signal a meter can display. This specification must be taken into account with accuracy to determine the overall capability of a DMM.

>> True RMS: Allows accurate measurement of non-sinusoidal AC voltage and current found in many control and switching power supply circuits.

>> Analog Bar Graph: Provides the ability to see rapidly changing signals too fast for the digital display to see.

>> Min/ Max/ Peak: Record and display the minimum and maximum readings measured. Also dispplay the peak voltage or current reading. This feature is useful when looking for trends over a long period of time or when measuring in rush current.

>> Sleep/Auto Off: Automatically powers instrument down after 30 minutes of inactivity to preserve battery life. Meters with sleep mode will still acquire data during this time

>> Data Hold: Freezes the reading on the display. This feature is useful when recording readings on paper or when in hard to see locations. Triple display meters can hold two readings on the display at the same time.

>> Peak Hold: Measure and freeze on the display the maximum voltage or current reading. This feature is useful when measuring in rush current.

>> Relative Mode: Displays measured value as a percentage of the stored value. This feature is useful for component checking.

>> Audible Continuity: Audible beep indicating a complete circuit connnection

>> Non-Contact Voltage Detection: Meters with this capability have a sensor that detects the presense of voltage when the meter is held next to a voltage source.

>> % Harmonic Distortion: Indicates if the signal under test is clean or distorted

TPI DIGITAL CLAMP-ON METER SPECIFICATIONS

	255	265	270	275	291	293	296
Range Selection							
Manual					•		
Auto/Manual	•	•	•	•		•	•
Display Specifications							
4,000 Count	•	•	•		•	•	•
11,000 Count				•			
Analog Bar Graph			•			•	•
Basic Features							
AC Volts	•	•	•	•	•	•	•
DC Volts	•	•	•	•	•	•	•
AC Amps	•	•	•	•	•	•	•
DC Amps				•			•
DC Microamps*			•	•			
Resistance	•	•	•	•	•	•	•
Diode Test		•	•	•		•	•
Audible Continuity	•	•	•	•	•	•	•
Additional Features							
True RMS				•		•	•
Frequency		•	•	•		•	•
Capacitance		•	•	•			
Temperature			•	•			
% Harmonic Distortion							•
Non-Contact Voltage Detection			•	•			
Trim Mode						•	
Data Hold	•	•	•	•	•	•	•
Relative Mode			•	•			
Min / Max / Peak	•		•	•			•
Peak Hold			•	•	•	•	
Sleep Mode / Auto Off	•	•	•	•		•	•
Range & Resolution							
Basic DC Accuracy	0.3%	0.3%	0.5%	0.5%	0.75%	0.75%	0.75%
DC Voltage (maximum)	600V	600V	600V	600V	600V	750V	600V
Resolution (maximum)	0.001V	0.1mV	0.1mV	0.01mV	0.001V	0.01V	0.01V
AC Voltage (maximum)	600V	600V	600V	600V	600V	750V	600V
Resolution (maximum)	0.001V	0.1mV	0.1mV	0.01mV	0.001V	0.01V	0.01V
DC Amps (maximum)	-	-	-	400A	-	-	700A
Resolution (maximum)	-	-	-	0.01A	-	-	0.01A
DC Microamps (maximum)*	-	-	400µA*	1,100µA*			
Resolution(maximum	-	-	0.1µA	0.01µA			
AC Amps (maximum)	400A	400A	400A	400A	700A	700A	700A
Resolution (maximum)	0.01A	0.01A	0.01A	0.01A	0.01A	0.01A	0.01A
Resistance (maximum)	40MΩ	40MΩ	40MΩ	110MΩ	4KΩ	40KΩ	40KΩ
Resolution (maximum)	0.1Ω	0.1Ω	0.1Ω	0.01Ω	1Ω	0.1Ω	0.1Ω
Frequency (maximum)	-	40MHz	400MHz	110MHz	-	10KHz	10KHz
Resolution (maximum)	-	1Hz	0.001KHz	0.01Hz	-	0.1Hz	0.1Hz
Capacitance (maximum)	-	4,000µF	40,000µF	110,000µF	-	-	-
Resolution (maximum)	-	0.001nF	0.001nF	0.001nF	-	-	-
Temperature (maximum)	-	-	1,000°F	1,000°F	-	-	-
Resolution (maximum)	-	-	0.1°F	0.1°F	-	-	-
Agency Approval							
CE IEC 1010	CAT III 600V	CAT III 600V	CAT III 600V	CAT III 600V	CAT III 600V	CAT III 600V	CAT III 600V
cULus 3111	•	•	•	Pending		•	•

Controls / Functions / International Symbols

TPI offers a complete line of…

- CO, Combustibles & Combustion (CEA)
- Refrigerant Leak Detectors
- Digital Manometers
- Temperature Contact & IR Instruments
- IAQ: Air Flow / Humidity
- Handheld Oscilloscopes
- Digital Multimeters & Clamp-on Meters
- Accessories & Kits

Controls and Functions

Push Buttons

REC	Activates the Min/Max/Record mode
NCV	Activates non-contact voltage detection mode
REL	Activates the REL% mode
RANGE, R-H	Activates manual ranging
FUNC	Toggles between AC and DC volts, and or functions
PEAK HOLD, P-H	Activates peak capture mode
HOLD, D-H	Holds the reading on the display until the button is pushed a second time
TRIM	Activates TRIM, PEAK, and HDR functions (except on frequency range)

Rotary Switch

V⎓	Used to measure DC volts
V~	Used to measure AC volts
A⎓	Used to measure AC and DC amps
A~	Used to measure AC amps
OFF	Turns the clamp-on completely off
V~⎓	Used to measure AC and DC volts
TEMP	Used to measure temperature
µA⎓	Used to measure DC microamps with test leads

Rotary Switch cont'd

⊣◁	Used to measure diodes
Ω	Used to measure resistance and use continuity buzzer
⊣⊢	Used to measure capacitance
Hz	Used to measure frequency of current through jaws

Input Jacks

COM	Black test lead connection for all functions
V/Ω	Red test lead connection for all ACV, DCV, Continuity Buzzer, and Diode Test functions

International Symbols

CAUTION: RISK OF ELECTRICAL SHOCK	GROUND
AC (ALTERNATION CURRENT)	DOUBLE INSULATION
DC (DIRECT CURRENT)	EITHER DC OR AC
REFER TO INSTRUCTION MANUAL	

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DCM FAQ

1. How does the non-contact voltage feature of the TPI 270 and 275 benefit me?
The non-contact feature of the TPI 270 and 275 allows you to detect live circuits without using the test leads, which enables faster checks for the presence of voltage.

2. Which of the TPI clamp-on meters will measure temperature?
The 270 and 275 have this feature built in and the 255, 265, and 291 can measure temperature by using the optional A301 or a A312 K-type thermocouple adapters.

3. Which TPI clamp-ons can measure DC microamps?
The TPI 270 and 275 has the capability to measure DC microamps by using the test leads. This is very useful for making flame safety control current measurements. The 265 can measure DC microamps with the optional A213 adapter.

4. Does a clamp-on meter measure anything besides amps?
All TPI clamp-on meters measure AC/DC volts and resistance. Models are available with temperature, frequency, capacitance, and non-contact voltage detection capability as well as many other features. Various adapters including temperature (A301 or A312), carbon monoxide (A771), and pressure (A620/630) are available. Contact TPI for additional information.

5. Is it possible to measure AC amps on a device that uses a power cord?
Yes, to accomplish this you can use the TPI line splitter (A202). AC amps must be measured by isolating a single wire and the A202 line splitter does this without damaging the power cord.