

193A True-RMS Auto Ranging Automotive DMM

LCD Display

40000 count with 42 segment bar graph.

REC (Record Mode)

Store minimum, maximum, and average readings over a measurement period.

RANGE

Manually select the appropriate range

AC/DC

Manually select AC or DC measurement functin.

FUNCTION

Toggle between functions on Ohm, TEMP, and IG modes

Hz (Frequency)

Measure the frequency of sensors and signals.

Ω (Ohms, Resistance)

Measure the resistance of spark plug wires, coils, sensors, and continuity of wiring.

ACmV and DCmV Ranges

Additional 40 millivolt DC range with 0.01mV resolution for improved accuracy when performing low voltage measurements.

DCV, ACV (DC Volts, AC Volts)

Measure the voltage of circuits and sensors. Measure the voltage of ABS wheel sensors.

REL (Relative Mode)

Factor out lead resistance for improved low ohm measurements or compare readings to a known standard. Can also be used for differential measurements.

CYL (Cylinder)

Selects the number of cylinders in IG mode.

HOLD

Lock the reading on the display for hard to read locations or future reference.

PEAK-H (Peak Hold)

Capture signals spikes as fast as 1mS to diagnose intermittant events.

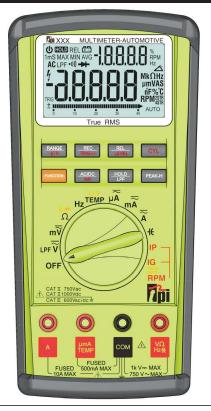
TEMP (Temperature)

Measure temperature with included temperature probe.

AC/DC Current Functions

Measure the parasitic draw from the battery.

True-RMS Auto Ranging Automotive DMM



46 (Capacitance)

Measure the capacitance of condensors or capacitors found in today's hybrid automobiles.

IP, IG (Automotive Functions)

Measure RPM, Duty, Dwell, mS pulse width, Frequency.

Built in Tilt Stand

The tilt stand in built into the instrument housing adding strength and integrity to the design.

Quickly Test Condition of Internal Fuses

You can determine the status of the internal fuses before you open the battery/fuse compartment. Simply set the instrument to the diode test function, plug the black test lead into the "V Ω " input jack and touch the prod end of the black lead to the metal inside the "A" or "UAmA" input lack. If the meter reads "OL, the fuse is blown. If there is a reading on the LCD besides "OL", the fuse is good.

Separate Fuse/Battery Compartment

Easily replace fuses and batteries in this separate compartment. Fuses are clearly labeled with replacement part number.



CAT II-1000V, CAT III-600V POLLUTION DEGREE 2

Safety! cULus 61010-1 Listed Meets CE and IEC61010-1 safety standards.

AC Voits (45Hz to 2KHz) Function DC Amps AC Amps	40mV 400mV 4V 40V 400V 1000V 400mV 4V 400V 750V Range 400uA 400uA 400mA 4A 10A 400uA	0.001V 0.01mV 0.001V 0.001V 0.01V 1V 0.001W 0.001V 0.001V 1V Resolution 0.1uA 0.001mA 0.001mA 0.001A 0.001A	±(0.1% + 5 digits) ±(0.75% + 40 digit) Accuracy ±(0.3% + 10 digits) ±(0.75% + 10 digits)	10M ohm 10M ohm Overload Protection Fuse*(fast blow) F600V, .5A, 31CM Fuse*(fast blow)
AC Volts (45Hz to 2KHz) Function DC Amps AC Amps	4V 40V 400V 1000V 400mV 4V 40V 400V 750V Range 400uA 4000uA 4000uA 400mA 400mA 400uA 400uA 400uA 400uA 400uA 400uA	0.0001V 0.001V 1V 0.01mV 0.001V 0.001V 0.001V 1V Resolution 0.01uA 0.001mA 0.001mA 0.001A 0.001A	±(0.75% + 40 digit) Accuracy ±(0.3% + 10 digits)	Overload Protection Fuse*(fast blow) F600V, .5A, 31CM
AC Volts 45Hz to 2KHz) Function DC Amps AC Amps	40V 400V 1000V 400mV 4V 40V 400V 750V Range 400uA 400uA 400mA 400mA 40 10A 400uA 400uA 400uA	0.001V 0.01V 1V 0.01mV 0.0001V 0.001V 1V Resolution 0.01uA 0.001mA 0.001mA 0.001hA 0.001A	±(0.75% + 40 digit) Accuracy ±(0.3% + 10 digits)	Overload Protection Fuse*(fast blow) F600V, .5A, 31CM
AC Volts 45Hz to 2KHz) Function DC Amps AC Amps	400V 1000V 400mV 4V 40V 400V 750V Range 4000A 4000A 400MA 400MA 40 10A 400UA 400MA 400MA 400MA	0.01V 1V 0.01mV 0.0001V 0.001V 1V Resolution 0.01uA 0.1uA 0.001mA 0.001mA 0.001A 0.001A	Accuracy ±(0.3% + 10 digits)	Overload Protection Fuse*(fast blow) F600V, .5A, 31CM
AC Volts 45Hz to 2KHz) Function OC Amps AC Amps	1000V 400mV 4V 40V 400V 750V Range 4000A 4000A 400MA 400MA 40 400MA 400MA 400MA 400MA 400MA 400MA	1V 0.01mV 0.0001V 0.001V 0.01V 1V Resolution 0.01uA 0.1uA 0.001mA 0.001mA 0.001A 0.001A	Accuracy ±(0.3% + 10 digits)	Overload Protection Fuse*(fast blow) F600V, .5A, 31CM
AC Volts 45Hz to 2KHz) Function DC Amps AC Amps	400mV 4V 40V 400V 750V Range 400uA 400uA 400mA 400mA 4A 10A 400uA 400uA 400uA	0.01mV 0.0001V 0.001V 0.01V 1V Resolution 0.01uA 0.001mA 0.001mA 0.0001A 0.001A	Accuracy ±(0.3% + 10 digits)	Overload Protection Fuse*(fast blow) F600V, .5A, 31CM
45Hz to 2KHz) Function DC Amps AC Amps	4V 40V 400V 750V Range 400uA 4000uA 400mA 400mA 4A 10A 400uA 400uA 400uA 400uA	0.0001V 0.001V 0.01V 1V Resolution 0.01uA 0.001mA 0.001mA 0.0001A 0.001A	Accuracy ±(0.3% + 10 digits)	Overload Protection Fuse*(fast blow) F600V, .5A, 31CM
	40V 400V 750V Range 400uA 4000uA 400mA 400mA 4A 10A 400uA 400uA 400uA 400uA	0.001V 0.01V 1V Resolution 0.01uA 0.1uA 0.001mA 0.001mA 0.0001A 0.001A	Accuracy ±(0.3% + 10 digits)	Overload Protection Fuse*(fast blow) F600V, .5A, 31CM
Function DC Amps AC Amps DHM	400V 750V Range 400uA 4000uA 400mA 400mA 4A 100 400uA 400uA 4000uA 4000uA	0.01V 1V Resolution 0.01uA 0.1uA 0.001mA 0.001mA 0.0001A 0.001A	Accuracy ±(0.3% + 10 digits)	Fuse*(fast blow) F600V, .5A, 31CM
Function DC Amps AC Amps DHM	750V Range 400uA 4000uA 400mA 400mA 4A 100A 400uA 400uA 400uA 400uA 400uA	1V Resolution 0.01uA 0.1uA 0.001mA 0.001mA 0.0001A 0.001A 0.001uA	±(0.3% + 10 digits)	Fuse*(fast blow) F600V, .5A, 31CM
AC Amps	Range 400uA 4000uA 40mA 400mA 4A 10A 400uA 4000uA 4000uA	Resolution 0.01uA 0.1uA 0.001mA 0.001mA 0.0001A 0.001A 0.001A	±(0.3% + 10 digits)	Fuse*(fast blow) F600V, .5A, 31CM
AC Amps	400uA 4000uA 40mA 400mA 4A 10A 400uA 4000uA 4000uA 40mA	0.01uA 0.1uA 0.001mA 0.001mA 0.0001A 0.001A 0.001uA	±(0.3% + 10 digits)	Fuse*(fast blow) F600V, .5A, 31CM
AC Amps	4000uA 40mA 400mA 4A 10A 400uA 400uA 4000uA 40mA	0.1uA 0.001mA 0.01mA 0.0001A 0.001A 0.01uA		F600V, .5A, 31CM
AC Amps	40mA 400mA 4A 10A 400uA 400uA 4000uA 40mA	0.001mA 0.01mA 0.0001A 0.001A 0.01uA		F600V, .5A, 31CM
AC Amps	400mA 4A 10A 400uA 400uA 400uA	0.01mA 0.0001A 0.001A 0.01uA		F600V, .5A, 31CM
AC Amps	4A 10A 400uA 400uA 40mA	0.0001A 0.001A 0.01uA	±(0.75% + 10 digits)	
AC Amps	10A 400uA 4000uA 40mA	0.001A 0.01uA	±(0.75% + 10 digits)	
AC Amps	400uA 4000uA 40mA	0.001A 0.01uA		
DHM	4000uA 40mA			F600V, 10A, 31CM
DHM	40mA			
DHM		0.1uA	±(0.75% + 10 digits)	
DHM	400mA	0.001mA		Fuse*(fast blow)
DHM		0.01mA	1	F600V, .5A, 31CM
DHM .	4A	0.0001A	±(1.5% + 10 digits)	Fuse*(fast blow)
	10A	0.001A		F600V, 10A, 31CM
	400	0.01		600V DC or AC Peak
	4k	0.0001k	1	
	40k	0.001k	±(0.1% + 5 digits)	
	400k	0.01k	_(
	4M	0.0001M	1	
	40M	0.001M	±(0.75% + 15 digits)	_
	40nF	0.01nF	=(en sys + re aigne)	
	400nF	0.1nF	1	
	4uF	0.001uF	±(3.0% + 10 digits)	
	40μF	0.01µF	L(0.070) To digital	600V DC or Peak AC
	400μF	0.1μF	ł	Took Bo of Fountino
	4mF	0.001mF	l	
	10mF	0.01mF	±(5.0% + 10 digits)	_
	40Hz	0.001Hz	±(0.070 + 10 digits)	
requency	400Hz	0.001Hz	1	
	4kHz	0.0001kHz	±(0.05% + 2 digits)	
-	40kHz	0.0001kHz	±(0.00 /0 + 2 digits)	600V DC or Peak AC
	400kHz	0.001kHz		OUGV DO OFFERN AC
_	4MHz	0.00001MHz	1	
_	10MHz	0.0000 HVIHZ		
	-40° to 2,462°F	1°F	±(3°F +1 digit) (-4° to 572°F)	+3% of reading reet of range
	-40° to 1,350°C	1°C	±(1.5°C +1 digit) (-20 to 300°C)	
	3V Test Voltage	12 1321	A Max Test Current	600 V DC or Peak AC
	3V Test Voltage	< 70 ohms	With foot ourroll	600 V DC or Peak AC
Zontinuity	ov root voltage	< 10 UIIII0		1 000 A DO OLLEWY WO
G	l			
	60 to 12,000	1 RPM	±2 RPM	
	0.0 to 99.9%	0.1%	±2% per kHz, +0.1% (pulse	width > 0.5mc\
	0.0 to 356.4°	0.1% 0.1°	pulse width > 0.5mS	wiutii >0.3iii3)
		0.1	puise wiutii > 0.5iii5	
	(30 to 19999 RPM)	0.1mC	.00/ por kHz 0.40/ 4 -11-	it (nulse width 00)
Pulse Width	0.2 to 199.9mS	0.1mS	±2% per kHz, ±0.1% ±1 dig	nt (puise wiath>2µS)
	(30 to 19999 RPM)	0.111-	0.050/ of mo-dia 0.11.11	
Frequency	1Hz to 1999.9Hz	0.1Hz	±0.05% of reading, ±2 digit	S
IP				
RPM		1 RPM	I	

General Specifications				
1000V				
0.5Amp/600VAC; 10Amp/600VAC				
40,000 Count, 4x per second update 2x41 segments, 20x per sec. update				
-0° to 45°C (32° to 113°F)				
-40° to 60°C (-40° to 140°F)				
(0° - 35°C/32° - 95°F)				
(35° - 55°C/95° - 131°F)				
0.1 x (Specified Accuracy) per °C for temperature <18°C to >28°C				
9 Volt Battery				
100 hrs. Alkaline				
61mm x 97mm x 203mm (2.4in x 3.8in x 8.0in)				
680g (24oz)				

