

# Data Sheet

## Test Bench<sup>®</sup>, High Performance DMM Models 388B, 389A, 390A & 391A

### High Quality, Ruggedized, Multifunction

High performance and value priced, the Test Bench<sup>®</sup> Series offers more features for the dollar than other multimeters. These meters include Component Test capabilities, Resistance, Diode Test and Capacitance, in addition to measuring Frequency, Temperature and a Logic Indicator. See the chart below for the meter that best fits your needs. Dual injection molding process allows a better grip and protection for the meters. CE marked and UL listed.



391A

390A

389A

388B

### Features and Benefits

- Resistance measurement
- Diode check
- Frequency measurement
- Audible continuity
- All current ranges fused
- Ruggedized case
- Auto power off
- Designed to meet IEC61010-1 CATIII 1000V, class 2



Features	391A	390A	389A	388B
Basic Functions				
True RMS	√			
Ranging	Manual	Auto/Manual	Auto/Manual	Manual
DCV Accuracy	0.05%	0.1%	0.25%	0.5%
AC/DC Voltage and Current	√	√	√	√
Display Digits, Count	4 1/2, 20000	3 3/4, 4000	3 3/4, 4000	3 3/4, 4000
Bar Graph (41 Segment)	√	√	√	
Capacitance Measurement		√	√	√
Transistor Test				√
Temperature Probe		√		
Logic Probe	√			√
Relative Mode		√	√	
Min/Max Hold		√	√	
Peak Hold		√	√	
Data Hold	√	√	√	
USB		√		

Specifications	391A	390A	389	388B
Volts	True RMS reading			
DC Ranges	200mV, 2V, 20V, 200V, 1,000V		400mv, 4V, 40V, 400V, 1000V	
AC Ranges	200mV, 2V, 20V, 200V, 750V		400mv, 4V, 40V, 400V, 750V	
Resolution	10μV, 100mV, 1 mV, 10mV, 100mV		100μV, 1mV, 10mV, 100mV, 1V	
DC Accuracy	±(0.05% + 3 dgt)	±(0.1% rdg + 2 dgt)	±(0.25% rdg + 2 dgt)	±(0.5% rdg + 1 dgt)
AC Accuracy	±(1% + 10 dgt.) 50Hz-500Hz ±(2% + 10 dgt.) 500Hz - 2kHz,	400mV: ±(1.2% rdg + 5 dgt)	50Hz-100Hz >10% of range at 200mV range	±(1.2% rdg + 4 dgt) 750V: ±(2% rdg + 4 dgt)
Overload Protection	500Hz on 750V range 1200VDC or AC rms 500VDC/AC rms 15 sec on 200mV range	±(1.0% rdg + 3 dgt) 50Hz-500Hz 1100VDC or AC rms		±(1.5% rdg + 3 dgt) 500Hz-1kHz 1200VDC or AC rms 500VDC/AC rms 15 sec on 200mV range
Input Impedance	10MΩ	400mV: >100MΩ, 4V: 10MΩ,	40V - 1000V: 9.1MΩ	10MΩ

**Test Bench, High Performance DMM**  
**Models 388B, 389A, 390A & 391A**

Specifications	391A	390A	389A	388B
<b>Current</b>				
Current	True RMS reading			
Ranges	200µA, 2mA, 20mA, 200mA, 20A*	400µA, 4mA, 40mA, 400mA, 20A*		400mA, 4mA, 40mA, 400mA, 2A, 20A*
Resolution	10nA, 100nA, 1µA, 10µA, 1mA	0.1µA, 1µA, 10µA, 100µA, 10mA		100nA, 1µA, 10µA, 100µA, 1mA, 10mA
DC Accuracy	200µA to 200mA: ±(0.5% rdg + 5 dgt.) 20A: ±(2% rdg + 10 dgt.)	400µA - 400mA: ±(1% rdg + 5 dgt.) 20A: ±(2% rdg + 3 dgt.)		±(1% rdg + 1 dgt) ±(2% rdg + 3dgt)
AC Accuracy	200µA to 200mA: ±(1.2% rdg + 10 dgt.) 20A: ±(2.5% rdg + 20 dgt.)	400µA to 400mA: ±(1.5% rdg + 4 dgt.) 20A: ±(2.5% rdg + 4 dgt.)		400µA - 400mA: ±(1.5% rdg + 1 dgt) 2A: ±(2% rdg + 4 dgt) 20A: ±(3.5% rdg + 3 dgt)
Input Protection	µA/mA input: 0.5A/500V fast blow ceramic fuse 20A input: 20A/600A fast blow ceramic fuse	µA/mA input: 0.5A/500V fast blow ceramic fuse 20A input: 20A/600A fast blow ceramic fuse		µA/mA input: 2A/600V fast blow ceramic fuse 20A input: 20A/600V fast blow ceramic fuse
Max. Burden Voltage	600mV (900mV on 20A range)	500mV (2V on 4mA, 400mA ranges)		600mV (900mV on 2A, 20A ranges)
<b>Resistance</b>				
Ranges	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 20MΩ	400Ω, 4kΩ, 40kΩ, 400kΩ, 4MΩ, 40MΩ		
Resolution	10mΩ, 100mΩ, 1Ω, 10Ω, 100Ω, 1kΩ	100mΩ, 1Ω, 10Ω, 100Ω, 1kΩ, 10kΩ		
Accuracy	200Ω, 2MΩ: ±(0.25% rdg + 10 dgt.) 2kΩ to 200kΩ: ±(0.15% rdg + 3 dgt.) 20MΩ: ±(1.0% + 10 dgt.)	400Ω to 400kΩ: ±(0.5% rdg + 4 dgt.) 4MΩ: ±(1% rdg + 5 dgt.) 40MΩ: ±(2% rdg + 5 dgt.)		400Ω: ±(1% rdg + 4 dgt.) 4kΩ to 4MΩ: ±(0.8% rdg + 4 dgt.) 40MΩ: ±(2% rdg + 5 dgt.)
Open Circuit Voltage	3.2VDC typ.	-0.45VDC typ. (-1.2VDC on 400Ω range)		0.6VDC typ. (3.2VDC on 400Ω range)
Overload Protection		500VDC or ACrms		
Diode Test	Tested at 1mA, 3.2VDC max. type. ±(1% rdg + 10 dgt.) accuracy	Tested at 1.2mA, 3.0VDC max. type. ±(1.5% rdg + 3 dgt.) accuracy		Tested at 1mA, 3.2VDC max. type. ±(1.5% rdg + 3 dgt.) accuracy
Transistor Test (hFE)	Does not apply	Does not apply		hFE range: 0 - 1000, hFE base current: 10µADC
<b>Capacitance</b>				
Ranges	Does not apply	4nF, 40nF, 400nF, 4µF, 40µF, 400µF, 4mF, 40mF		4nF, 40nF, 400nF, 4µF, 40µF
Resolution		1pF, 10pF, 100pF, 1nF, 10nF, 100nF, 1µF, 10µF		0.1pF, 1pF, 10pF, 100pF, 1nF
Accuracy		4nF: ±(3% rdg + 20 dgt.) 4nF to 40µF: ±(3% rdg + 5 dgt.) 400µF to 40mF: ±(5% rdg + 10 dgt.)		±(3% rdg + 4 dgt.)
Test Voltage		< 1V		< 3.5V
Overload Protection		500VDC or AC rms		
<b>Frequency</b>				
Ranges	2kHz, 20kHz, 200kHz	4kHz, 40kHz, 400kHz, 4MHz, 40MHz		4kHz, 40kHz, 400kHz, 4MHz
Resolution	0.1 Hz, 1Hz, 10Hz	1Hz, 10Hz, 100Hz, 10kHz, 100kHz		1Hz, 10Hz, 100Hz, 10kHz
Accuracy	±(0.1% rdg + 3 dgt.)	±(0.1% rdg + 3 dgt.)		±(0.25% + 4 Digits)
Sensitivity	50mVrms min. (@>30 & <70% duty cycle: 400mVrms min.)	1Hz - 4MHz: 1Vrms 4MHz - 40MHz: >2Vrms, <5Vrms		250mVrms min. on 10Hz to 1MHz 500mVrms min. on 1MHz to 4MHz
Minimum Pulse Width	>25ns	>25ns		>2µs
Duty Cycle Limits	>30% & <70%	>30% & <70%		
Minimum Input Range	2kHz: 10Hz: 20kHz: >60dgt; 200kHz: >60dgt			
Overload Protection	500VDC or AC rms	500VDC or AC rms		
<b>Logic Test</b>				
Logic Threshold	Hi=2.8±0.8V, 0=0.8 ± 0.5V	Does not apply		Hi=2.8±0.8V, 0=0.8 ± 0.5V
Frequency Response	20MHz			20MHz
Pulse Width	25ns			25ns
Pulse Limits	>20% and <80%			>20% and <80%
Indication	40m sec beep at logic 1 (HI)			40m sec beep at logic 1 (HI)
Overload Protection	500V DC or ACrms			500V DC or ACrms
<b>Temperature</b>				
Range, Resolution	Does not apply	-58° to +2372°F 1F°, (-50° to + 1300°C, 1C°)		Does not apply
Accuracy		±(0.8% rdg + 2°C) -50° - 400°C, ±(1% rdg + 2°C) 400° - 1300°C		
<b>Duty Cycle</b>				
Range, Resolution	0 to 90%, 0.1%	Does not apply		Does not apply
Accuracy (5V logic)	±(2.0% rdg + 10 dgt.)			
Minimum Pulse Width	10µs			
Frequency Range	40Hz to 20kHz			
Overload Protection	500VDC or AC rms			
<b>General</b>				
Display	20000 count, 4 1/2 digit LCD	4000 count, 3 3/4 digit LCD with 41 segment analog bar graph		4000 count, 3 3/4 digit LCD
Polarity		Automatic, positive implied, negative polarity indication		
Operating Temperature		32° to 122° (0° to 50°C), 0 to 70% R.H.		
Dimensions (HxWxD)		7.8 x 3.5 x 1.57" (198 x 90 x 40mm)		
Weight		11.3 oz. (320g).		
				<b>Three Year Warranty</b>
SUPPLIED ACCESSORIES: 9 Volt Battery, Test Leads, Instruction Manual, Thermocouple Probe (Model 390A), Software and USB Interface Cable (Model 390A)				
OPTIONAL ACCESSORIES: TL 2A Deluxe Test Leads, TL 3 Accessory Tip Kit (for TL 2A), PR 28A High Voltage Probe (40kVDC), TL 130A General Purpose DMM Kit, Carrying Case (not included): LC 29B				

\* 10 A continuous, 20 A for 30 seconds maximum