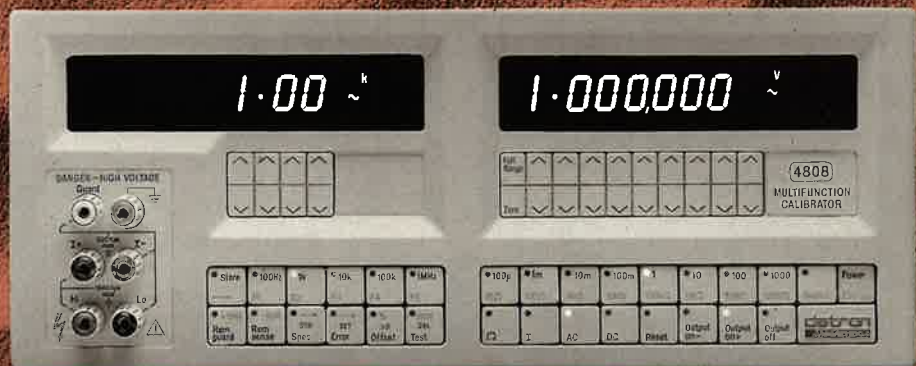


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WAVETEK

4808, 4800 & 4805

THE DATRON INSTRUMENTS
RANGE OF MULTIFUNCTION
CALIBRATORS





Datron Instruments is the technological leader in the design and manufacture of precision electronic measurement equipment. Offering a range of precision DMMs, programmable DMM calibrators and calibration standards, Datron is renowned worldwide for providing innovative solutions to today's high accuracy measurement problems.

4808, 4800 & 4805

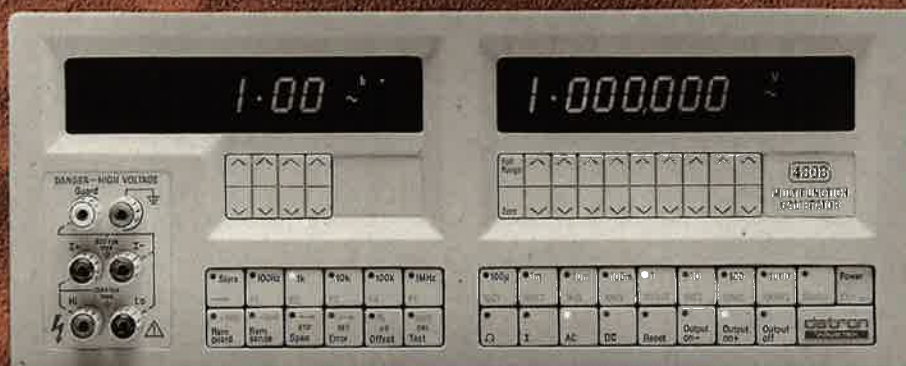
THE DATRON INSTRUMENTS RANGE OF MULTIFUNCTION CALIBRATORS

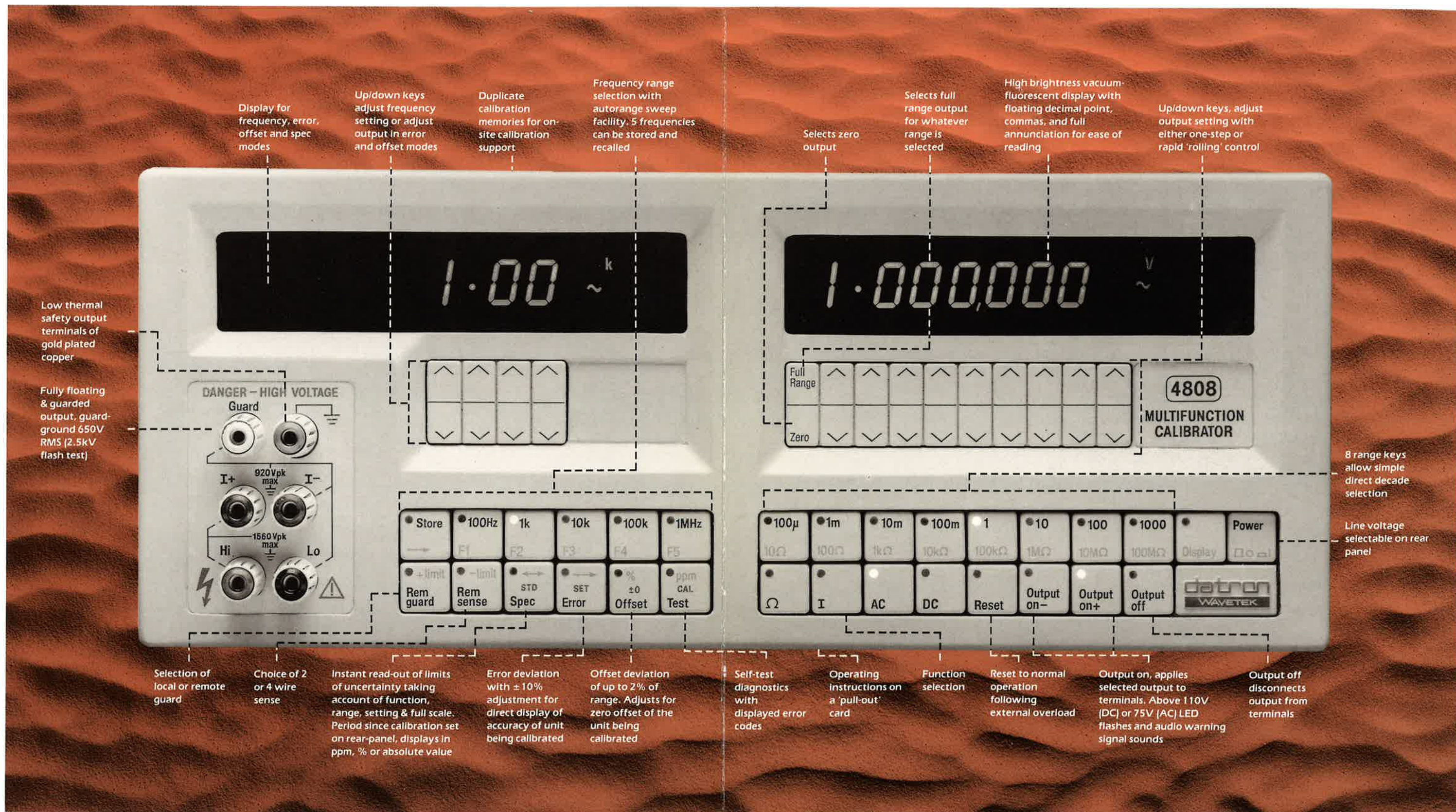
- **4808 gives the ultimate in Standards Laboratory performance**
- **4800 for meter calibration up to 7½ digit accuracy**
- **4805 for meter calibration up to 5½ digit accuracy**

Each model offers programmable DC and AC Voltage, DC and AC Current and Resistance outputs at a level of precision suitable for calibration of DMMs and other DC/AC instrumentation. A summary of their capabilities is shown below.

ALL THREE MODELS OFFER :

- **Unique price/performance levels**
- **Integral high power 1000V DC and AC amplifier for widest workload coverage**
- **Shadow calibration memories for on-site calibration support**
- **Portocal automated calibration system compatibility**
- **Ease of use**





Display for frequency, error, offset and spec modes

Up/down keys adjust frequency setting or adjust output in error and offset modes

Duplicate calibration memories for on-site calibration support

Frequency range selection with autorange sweep facility. 5 frequencies can be stored and recalled

Selects zero output

Selects full range output for whatever range is selected

High brightness vacuum-fluorescent display with floating decimal point, commas, and full annunciation for ease of reading

Up/down keys, adjust output setting with either one-step or rapid 'rolling' control

Low thermal safety output terminals of gold plated copper

Fully floating & guarded output, guard-ground 650V RMS (2.5kV flash test)

DANGER - HIGH VOLTAGE

Guard

I+ 920Vpk max I-

Hi 1560Vpk max Lo

Selection of local or remote guard

Choice of 2 or 4 wire sense

Instant read-out of limits of uncertainty taking account of function, range, setting & full scale. Period since calibration set on rear-panel, displays in ppm, % or absolute value

Error deviation with ±10% adjustment for direct display of accuracy of unit being calibrated

Offset deviation of up to 2% of range. Adjusts for zero offset of the unit being calibrated

Self-test diagnostics with displayed error codes

Operating instructions on a 'pull-out' card

Function selection

Reset to normal operation following external overload

Output on, applies selected output to terminals. Above 110V (DC) or 75V (AC) LED flashes and audio warning signal sounds

Output off disconnects output from terminals

8 range keys allow simple direct decade selection

Line voltage selectable on rear panel

4808
MULTIFUNCTION CALIBRATOR

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4808, 4800 & 4805

THE DATRON INSTRUMENTS RANGE OF MULTIFUNCTION CALIBRATORS

Bench Operation

When used as a standalone bench operated calibrator, each 4808, 4800 and 4805 offers ease of use, high reliability, high performance and unique functionality. All three models share the same easy-to-use front panel interface that uses high brightness seven segment vacuum fluorescent displays and ergonomically designed keyboard using pushbuttons designed to give a high level of tactile feedback. Designed with operator safety in mind, specially designed safety terminals guard against contact with live parts. Selection of potentially lethal output voltages requires a fixed sequence of keystrokes, and is accompanied by a continuous, audible alarm for as long as dangerous voltages are present at the output terminals.

Used either as a component in an automated calibration system or as a standalone bench instrument, the Datron range of Multifunction calibrators offers the most cost-effective solution to today's calibration problems. Initial purchase costs are reduced by the inclusion of a full capability 1000V DC and AC power amplifier in the calibrator chassis, enabling a single unit to cover the widest possible calibration workload. The options available on the 4808 and 4800 allow an instrument to be configured as DCV only, ACV only or multifunction, enabling configuration of a calibrator that meets today's requirements while retaining the flexibility to upgrade capabilities as requirements change.

Calibration Support

The 4808, 4800 and 4805 offer an innovative solution to the problems of calibration support. Routine re-calibration may be carried out in the traditional way, i.e. transporting the unit to a standards laboratory equipped with suitable measurement standards, but this approach leads to substantial calibrator downtime and physical transportation can compromise the integrity of the calibration. The 4808, 4800 and 4805 were designed with two in-

dependent calibration memories, so they can be calibrated in-situ by comparison with portable transfer standards. At the start of the re-calibration process, a front panel keypress sequence or IEEE-488 bus command copies the calibration data for each range of each function to 'shadow', or duplicate calibration memory. The re-calibration is performed, which updates the main calibration memory, but the original calibration constants held in 'shadow' memory are used until the transfer standard is returned to the standards laboratory to close the measurement loop. When loop closure confirms that the re-calibration was successful, operation is switched to the newly-generated calibration data. This technique avoids subjecting the calibrator to the rigours of transportation while avoiding the inconvenience of calibrator downtime associated with the traditional approach. The integrity of the calibration is ensured since all ranges of all functions are measured at the instrument's terminals and compared directly with calibration standards.

	4808 with Options 10.20.30.40.50 and 60 (4600 Transconductance Amplifier)	4800 with Options 10.20.30.40.50 and 60 (4600 Transconductance Amplifier)	4805 with Option 60 (4600 Transconductance Amplifier)
DCV Ranges 1 Year Total Accuracy	100µV to 1100V 4.6ppm	100µV to 1100V 8.5ppm	100µV to 1100V 45ppm
ACV Ranges Frequency Range 1 Year Total Accuracy	1mV to 1100V 10Hz to 1MHz Spot Frequency Calibration 40ppm	1mV to 1100V 10Hz to 1MHz 130ppm	1mV to 1100V 10Hz to 100kHz 450ppm
Ω Ranges 1 Year Total Accuracy	10Ω to 100MΩ 13ppm	10Ω to 100MΩ 19ppm	10Ω to 100MΩ 29ppm
DCI Ranges 1 Year Total Accuracy	100µA to 11A 55ppm	100µA to 11A 85ppm	100µA to 11A 170ppm
ACI Ranges Frequency Range 1 Year Total Accuracy	100µA to 11A 10Hz to 5kHz (20kHz on 10A Range) Spot Frequency Calibration 190ppm	100µA to 11A 10Hz to 5kHz (20kHz on 10A Range) 250ppm	100µA to 11A 10Hz to 5kHz (20kHz on 10A Range) 700ppm

System Operation

The 4808, 4800 and 4805 are also ideally suited to use in a computer controlled automated system. Featuring a wide operating temperature range and very low temperature coefficient, they can be mounted in a standard ATE rack with minimal degradation in accuracy. Rapid response to programming commands over the standard IEEE-488 interface and fast settling increase system throughput. All internal signal, guard and ground connections are programmable over the bus, eliminating the need for complex switching arrangements external to the calibrator. Automation of the calibration process improves the reliability and repeatability of measurement while freeing skilled calibration engineers from tedious and repetitive tasks. In addition, automation of tasks such as inventory management, data reduction and

analysis, calibration cycle management etc. are simplified. In short, it enables the calibration department to use statistical process control (SPC) techniques to more effectively manage the calibration environment. This approach can improve the quality and traceability of the measurement process while substantially reducing the operating and support costs of the system.

Reliability and Support

The 4808, 4800 and 4805 have been designed and built to the most exacting quality standards. To optimise serviceability, internal self diagnostic routines continuously monitor instrument status. These indicate a wide range of failure conditions — from

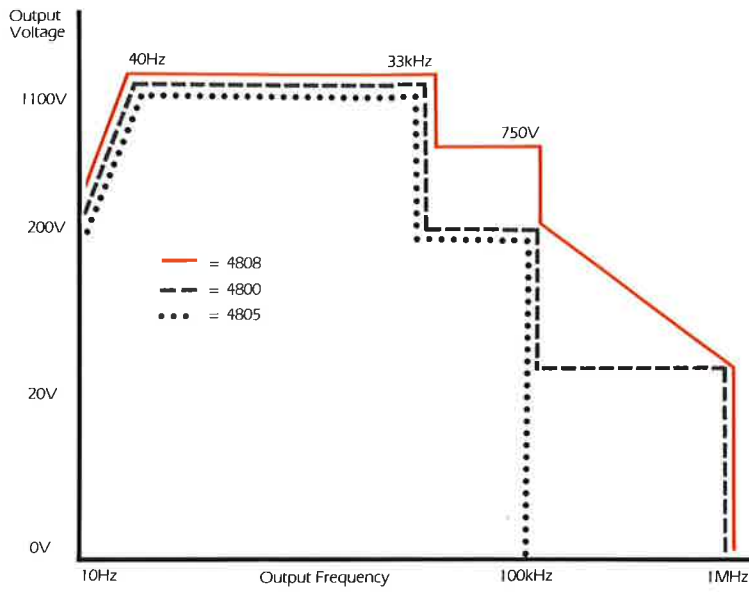
output overloads to power supply failures and over-temperature. In addition, a selftest routine can be selected at any time to provide rigorous operational checks, and if service does become necessary, simple access is provided and all major circuits are on plug-in cards.

All three models carry the comprehensive Datron warranty. This, together with the complete backup support and excellent recalibration facilities provided in our service centers worldwide, means that customers receive the high level of service they have come to expect from Datron Instruments.





4808, 4800 and 4805 Volts/Hertz Capabilities



4808, 4800 & 4805

THE DATRON INSTRUMENTS
RANGE OF MULTIFUNCTION
CALIBRATORS

4808 and 4800 Configuration Guide

Option Mix	DCV 0 to 200V	ACV 0 to 200V 10Hz-1MHz	DCV 0 to 1100V	ACV 0 to 1100V 10Hz-1MHz	DCI 0 to 2A	ACI 0 to 2A	Ω 0 to 100 M Ω	DCI 0 to 11A	ACI 0 to 11A
10	•								
20		•							
10.20	•	•							
10.30			•						
10.40	•				•				
10.50	•						•		
20.30				•					
20.40		•				•			
20.50		•					•		
10.20.30			•	•					
10.20.40	•	•		•	•	•			
10.20.50	•	•					•		
10.30.40									
10.30.50			•		•				
10.40.50	•				•		•		
10.40.60	•						•		
20.30.40				•		•		•	
20.30.50				•			•		
20.40.50		•				•	•		
20.40.60		•					•		•
10.20.30.40			•	•	•	•	•		
10.20.30.50			•	•		•	•		
10.20.40.50	•	•			•	•	•		
10.20.40.60	•	•					•	•	•
10.30.40.50			•		•		•		
10.30.40.60			•				•	•	
10.40.50.60	•						•	•	•
20.30.40.50				•		•	•		•
20.30.40.60				•			•		•
20.40.50.60		•					•	•	•
10.20.30.40.50			•	•	•	•	•		
10.20.30.40.60			•	•			•	•	
10.20.40.50.60	•	•					•	•	•
10.30.40.50.60			•				•	•	•
20.30.40.50.60				•			•		•
10.20.30.40.50.60			•	•			•	•	•

4805 Configuration Guide

Option Mix	DCV 0 to 1100V	ACV 0 to 1100V 10Hz-100kHz	DCI 0 to 2A	ACI 0 to 2A	Ω 0 to 100 M Ω	DCI 0 to 11A	ACI 0 to 11A	—	—
—	•	•	•	•	•				
60	•	•			•	•	•		

Performance Specifications

The 4808, 4800 and 4805 Total Uncertainty specifications listed below describe their guaranteed performance under the line, temperature, calibration

cycle and load conditions described, and include the uncertainty of the factory calibration traceable to National Standards.

FUNCTION	RANGE	FREQUENCY [HZ]	4808 Total Uncertainty ± (ppm OUTPUT + Floor)				4800 Total Uncertainty ± (ppm OUTPUT + Floor)		4805 Total Uncertainty ± (ppm OUTPUT + Floor)	
			90 DAY TCERT ^[1] ±1°C		1 YEAR TCERT ^[1] ±5°C		90 DAY TCERT ^[1] ±1°C	1 YEAR TCERT ^[1] ±5°C	90 DAY TCERT ^[1] ±1°C	1 YEAR TCERT ^[1] ±10°C
DCV	100µV-100mV		7 + 0.4µV		11 + 0.5µV		9 + 1µV	14 + 1µV	24 + 2µV	44 + 6µV
	1V		4 + 0.8µV		7 + 1µV		6 + 2µV	10 + 2µV	21 + 2µV	41 + 10µV
	10V		2.5 + 3µV		4.5 + 3µV		4.5 + 10µV	8 + 10µV	20 + 20µV	40 + 100µV
	100V		4 + 50µV		7 + 50µV		6 + 200µV	10 + 200µV	22 + 200µV	42 + 1mV
	1000V		5 + 500µV		9 + 500µV		7 + 2mV	12 + 2mV	25 + 2mV	45 + 10mV
ACV	1mV-10mV	10-31	SPOT FREQ.	BROADBAND	SPOT FREQ.	BROADBAND	280 + 8µV	370 + 8µV	380 + 23µV	480 + 23µV
		32-330	120 + 6µV	140 + 6µV	130 + 6µV	150 + 6µV	230 + 8µV	250 + 8µV	480 + 21µV	530 + 21µV
		300-10K	70 + 6µV	90 + 6µV	80 + 6µV	100 + 6µV	180 + 6µV	200 + 6µV	480 + 21µV	530 + 21µV
		10K-33K	60 + 6µV	80 + 6µV	70 + 6µV	90 + 6µV	330 + 8µV	350 + 8µV	480 + 21µV	530 + 21µV
		30K-100K	210 + 6µV	230 + 6µV	220 + 6µV	240 + 6µV	900 + 11µV	900 + 11µV	0.13% + 23µV	0.15% + 23µV
		100K-330K	410 + 6µV	600 + 6µV	430 + 6µV	650 + 6µV	0.16% + 23µV	0.2% + 23µV	-	-
	300K-1M	730 + 6µV	0.12% + 12µV	800 + 6µV	0.14% + 12µV	0.16% + 23µV	0.2% + 23µV	-	-	
			0.13% + 6µV	0.2% + 31µV	0.15% + 6µV	0.25% + 31µV	0.28% + 41µV	0.35% + 41µV	-	-
	100mV	10-31	120 + 6µV	140 + 10µV	130 + 6µV	150 + 10µV	280 + 14µV	370 + 14µV	380 + 34µV	480 + 34µV
		32-330	70 + 6µV	90 + 10µV	80 + 6µV	100 + 10µV	230 + 14µV	250 + 14µV	480 + 32µV	530 + 32µV
		300-10K	60 + 6µV	80 + 10µV	70 + 6µV	90 + 10µV	180 + 10µV	200 + 10µV	480 + 32µV	530 + 32µV
		10K-33K	210 + 6µV	230 + 10µV	220 + 6µV	240 + 10µV	330 + 14µV	350 + 14µV	480 + 32µV	530 + 32µV
		30K-100K	410 + 6µV	600 + 10µV	430 + 6µV	650 + 10µV	830 + 18µV	900 + 18µV	0.13% + 37µV	0.15% + 37µV
		100K-330K	730 + 6µV	0.12% + 21µV	800 + 6µV	0.14% + 21µV	0.16% + 41µV	0.2% + 41µV	-	-
	300K-1M	0.13% + 6µV	0.2% + 120µV	0.15% + 6µV	0.25% + 120µV	0.28% + 220µV	0.35% + 220µV	-	-	
	1V	10-31	90	100 + 30µV	100	110 + 30µV	230 + 100µV	250 + 100µV	430 + 120µV	530 + 120µV
		32-330	40	60 + 20µV	50	70 + 20µV	160 + 60µV	180 + 60µV	350 + 100µV	400 + 100µV
		300-33K	35	50 + 10µV	40	60 + 10µV	100 + 40µV	110 + 40µV	350 + 100µV	400 + 100µV
		30K-100K	85	110 + 20µV	100	130 + 20µV	180 + 40µV	200 + 40µV	440 + 160µV	640 + 160µV
		100K-330K	220	280 + 100µV	250	350 + 100µV	420 + 120µV	500 + 120µV	-	-
		300K-1M	0.11%	0.14% + 400µV	0.13%	0.18% + 400µV	0.23% + 1mV	0.3% + 1mV	-	-
	10V	10-31	95	100 + 300µV	100	110 + 300µV	230 + 1mV	250 + 1mV	430 + 1.2mV	530 + 1.2mV
		32-330	45	60 + 200µV	50	70 + 200µV	160 + 600µV	180 + 600µV	350 + 1mV	400 + 1mV
		300-33K	40	50 + 100µV	45	60 + 100µV	100 + 400µV	110 + 400µV	350 + 1mV	400 + 1mV
30K-100K		85	110 + 200µV	100	130 + 200µV	180 + 400µV	200 + 400µV	440 + 1.6mV	640 + 1.6mV	
100K-330K		220	280 + 1mV	250	350 + 1mV	420 + 1.2mV	500 + 1.2mV	-	-	
300K-1M		0.11%	0.14% + 4mV	0.13%	0.18% + 4mV	0.23% + 10mV	0.3% + 10mV	-	-	
100V	10-31	95	110 + 3mV	100	120 + 3mV	230 + 10mV	250 + 10mV	430 + 12mV	530 + 12mV	
	32-330	45	70 + 2mV	50	80 + 2mV	160 + 6mV	180 + 6mV	360 + 10mV	410 + 10mV	
	300-10K	45	60 + 1mV	50	70 + 1mV	100 + 4mV	110 + 4mV	360 + 10mV	410 + 10mV	
	10K-33K	55	70 + 2mV	60	80 + 2mV	100 + 4mV	110 + 4mV	360 + 10mV	410 + 10mV	
	30K-100K	95	140 + 3mV	110	170 + 3mV	300 + 8mV	350 + 8mV	470 + 16mV	670 + 16mV	
	100K-330K	430	730 + 30mV ^[2]	600	900 + 30mV ^[2]	-	-	-	-	
300K-1M	0.6%	0.8% + 120mV	0.75%	1% + 120mV	-	-	-	-		
1000V	10-330	150	160 + 20mV	160	170 + 20mV	240 + 60mV	250 + 60mV	470 + 120mV	570 + 120mV	
	300-10K	110	120 + 20mV	120	130 + 20mV	190 + 40mV	210 + 40mV	390 + 100mV	440 + 100mV	
	10K-33K	170	180 + 20mV	180	190 + 20mV	250 + 40mV	260 + 40mV	480 + 160mV	680 + 160mV	
	30K-100K	220	800 + 40mV	250	0.1% + 40mV	-	-	-	-	
(to 750V max)										
DCI	100µA		60 + 2nA		110 + 2nA		60 + 2nA	110 + 2nA	85 + 3nA	150 + 4nA
	1mA		30 + 10nA		50 + 10nA		45 + 20nA	75 + 20nA	85 + 30nA	150 + 40nA
	10mA		30 + 100nA		50 + 100nA		45 + 200nA	75 + 200nA	85 + 300nA	150 + 400nA
	100mA		30 + 1µA		50 + 1µA		45 + 2µA	75 + 2µA	85 + 3µA	150 + 4µA
	1A		75 + 20µA		125 + 20µA		85 + 30µA	150 + 30µA	190 + 40µA	325 + 60µA
	10A		80 + 500µA		180 + 500µA		100 + 500µA	190 + 500µA	250 + 500µA	400 + 600µA
ACI	100µA	10-1K	SPOT FREQ.	BROADBAND	SPOT FREQ.	BROADBAND	220 + 6nA	250 + 10nA	800 + 16nA	900 + 20nA
		1K-5K	200	220 + 6nA	230	250 + 10nA	350 + 8nA	400 + 14nA	0.15% + 20nA	0.16% + 32nA
	1mA	10-1K	160	170 + 60nA	190	200 + 100nA	170 + 60nA	200 + 100nA	475 + 160nA	600 + 200nA
		1K-5K	200	220 + 60nA	260	300 + 100nA	220 + 60nA	300 + 100nA	600 + 160nA	700 + 200nA
	10mA	10-1K	160	170 + 600nA	190	200 + 1µA	170 + 600nA	200 + 1µA	475 + 1.6µA	600 + 2µA
		1K-5K	200	220 + 600nA	260	300 + 1µA	220 + 600nA	300 + 1µA	600 + 1.6µA	700 + 2µA
	100mA	10-1K	160	170 + 6µA	190	200 + 10µA	170 + 6µA	200 + 10µA	475 + 16µA	600 + 20µA
		1K-5K	200	220 + 6µA	260	300 + 10µA	220 + 6µA	300 + 10µA	600 + 16µA	700 + 20µA
	1A	10-1K	270	350 + 60µA	300	400 + 100µA	350 + 60µA	400 + 100µA	700 + 160µA	800 + 200µA
		1K-5K	370	500 + 80µA	420	550 + 140µA	500 + 80µA	550 + 140µA	0.1% + 200µA	0.11% + 320µA
	10A	10-1K	320	410 + 1.2mA	380	510 + 1.3mA	410 + 2mA	510 + 2mA	800 + 2mA	900 + 2mA
		1K-5K	410	860 + 1.5mA	590	960 + 1.6mA	860 + 2mA	0.1% + 2mA	0.15% + 2mA	0.17% + 2mA
5K-10K		0.11%	0.16% + 6mA	0.15%	0.23% + 6mA	0.16% + 6mA	0.23% + 6mA	0.25% + 6mA	0.3% + 6mA	
10K-20K	0.42%	0.57% + 32mA	0.52%	0.75% + 32mA	0.57% + 32mA	0.75% + 32mA	0.7% + 40mA	1.1% + 40mA		
Ω	10Ω		20		35		25	45	55	100
	100Ω		8		14		11	20	16	30
	1KΩ		8		14		11	20	16	30
	10KΩ		7		13		10	19	15	29
	100KΩ		9		16		13	25	24	43
	1MΩ		22		37		28	50	62	97
	10MΩ		39		67		57	95	160	260
	100MΩ		80		120		130	200	325	700

Notes: [1] Tcert = temperature at certification. Factory certification temperature = 23°C
 [2] Valid over load range 0-50mA rms. Above 50mA, add $\frac{F[\text{kHz}] \times I[\text{mA}]-50}{750}$ mV



Other Specifications:	
DC Voltage Scale Length:	0 to $\pm 200\%$ of range (100 μ V to 100V ranges) 0 to $\pm 110\%$ of range (1000V range)
Settling Time: Setting Resolution:	< 1s to 10ppm of step size 0.1ppm or 10nV (4808 and 4800) 1ppm or 100nV (4805)
Maximum Load:	25mA on 1V to 1000V ranges Output Impedance: 100 Ω on 100 μ V to 100mV ranges
AC Voltage Scale Length:	9% to 200% of range (1mV to 100V ranges) 9% to 110% of range (1000V range)
Settling Time:	To 100ppm of step size: < 10s 10Hz-32Hz < 3s 33Hz-330Hz < 1s > 330Hz Double these figures for range changes
Frequency Accuracy: Max Resistive Load:	< ± 100 ppm for life Output Impedance 300 Ω on 1mV to 100mV ranges 50mA rms on 1V range 60mA rms on 10V range 120mA rms on 100V range 15mA rms on 1000V range, < 3kHz 65mA rms on 1000V range, > 3kHz
Max Capacitive Load: Setting Resolution:	1000pF (1V to 100V ranges) 300pF (1000V range) 1ppm or 100nV (4808, 4800) 10ppm or 1 μ V (4805)
DC Current Scale Length:	0 to $\pm 200\%$ of range (100 μ A to 1A ranges) 0 to $\pm 100\%$ of range (10A range)
Settling Time:	< 1s to full specification (100 μ A to 1A ranges) < 1s to 40ppm of step size (10A range)
Setting Resolution: Compliance Voltage:	1ppm (4808, 4800), 10ppm (4805) 3V on 100 μ A to 1A ranges, 2V on 10A range
AC Current Scale Length:	9% to 200% of range (100 μ A to 1A ranges) 9% to 110% of range (10A range) As AC Voltage
Settling Time: Frequency Accuracy: Max Reactive Load: Setting Resolution: Compliance Voltage:	As AC Voltage 10nF, 1mH (time constant < 1 μ s) 1ppm (4808, 4800), 10ppm (4805) 3V rms on 100 μ A to 1A ranges, 2V rms on 10A range
Resistance Display Resolution: Connections: Fuse Protection:	0.1ppm (4808, 4800), 1ppm (4805) Programmable 2-wire/4-wire sense Programmable remote/local guard To 120V rms

Ordering Information

Models 4808/4800 Multifunction Calibrators:

Option 10 DCV function to 200V.
Option 20 ACV function to 200V.
Option 30 Integral 1000V amplifier for ACV and/or DCV functions. Requires either Option 10, Option 20 or both.

Option 40 Current Converter for DCI and ACI functions. DCI capability requires Option 10, ACI capability requires Option 20.

Option 50 Resistance function.
Option 60 Range Extender to 11A DCI and ACI. Includes 4600 Transconductance Amplifier and all necessary cabling. Requires Option 40.

Option 90 Rack Mount Kit.

Model 4805 Multifunction Calibrator:

Option 60 Range Extender to 11A DCI and ACI. Includes 4600 Transconductance Amplifier and all necessary cabling.

Option 90 Rack Mount Kit.

Model 4600 Transconductance Amplifier:

Option 90 Rack Mount Kit.
440151 Slave Model Lead Kit.
440154 Current Output Lead Kit.

4808, 4800 & 4805

THE DATRON INSTRUMENTS RANGE OF MULTIFUNCTION CALIBRATORS

General Specifications

Line Supply:

110/120/220/240V $\pm 10\%$, 48Hz to 62Hz

Power Consumption:

370VA normal, 660VA full power

Operating Temperature:

0°C to +50°C

Storage Temperature:

-40°C to +70°C

Dimensions (H x W x D):

178mm (7") x 455mm (17.9") x 563mm (22.2")

Weight:

36kg (80lbs)

Safety:

Designed to UL1244, IEC348, IEC1010, BS4743

Warranty:

1 year

Due to a process of continuous refinement and improvement, Datron Instruments reserves the right to change materials, components and specifications without notice.



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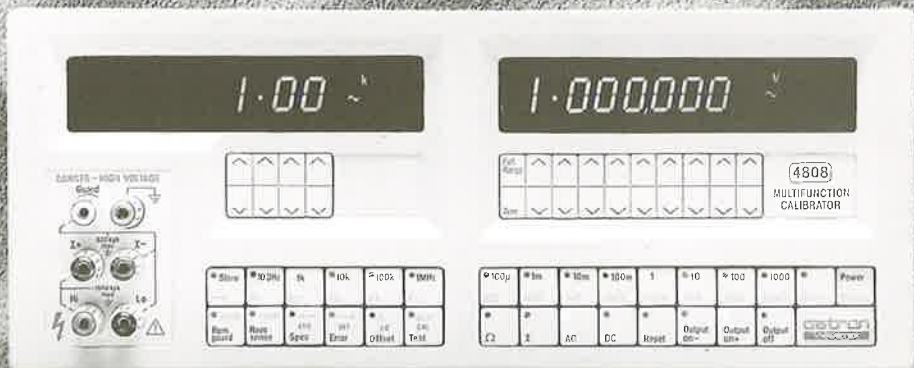
YOUR LOCAL AGENT/REPRESENTATIVE

datron
WAVETEK

**4808, 4800
& 4805**

THE DATRON INSTRUMENTS
RANGE OF MULTIFUNCTION
CALIBRATORS

**EXPANDED
PERFORMANCE
SPECIFICATIONS**



The Total Uncertainty specifications listed for the 4808, 4800 and 4805 specify the traceable accuracy of each range of each function available at the calibrator's output terminals and include the traceability of Datron's factory calibration system. These specifications are valid for new units, or units re-calibrated at the factory. If calibration is performed using standards with different traceable uncertainties, the Total Uncertainty specifications listed will no longer ap-

ply. Therefore, the specification tables following detail the performance of the 4808, 4800 and 4805 separately from the traceability of the Datron factory calibration system. When different calibration standards are used, simply substitute their uncertainties in place of the column headed 'Calibration Uncertainty' and combine them with the listed calibrator 'Accuracy Relative to Calibration Standards' specifications.

FUNCTION	RANGE	FREQUENCY (Hz)	4808 Accuracy Relative to Calibration Standards ± [ppm OUTPUT + ppmFS] ^[1]				Calibration Uncertainty (ppm Output)	Temperature Coefficient (ppm/°C)				
			24 Hour Stability ^[2]	90 Days Tcrt ^[3] ± 1°C		1 Year Tcrt ^[3] ± 5°C						
DCV	100µV-100mV 1V 10V 100V 1000V		0.4+0.3µV	3+0.4µV		7+0.5µV		4	1			
			0.3+0.25 0.3+0.05 0.5+0.1 0.5+0.1	2+0.4 1+0.15 2+0.25 3+0.25		5+0.5 3+0.15 5+0.25 7+0.25		2 1.5 2 2	0.5 0.15 0.5 0.5			
ACV	1mV-100mV	10-31 32-330 300-10k 10k-33k 30k-100k 100k-330k 300k-1M	60+5+5µV	90+5µV	110+20+5µV	100+5µV	120+20+5µV	30+1µV	5			
			30+5+5µV	40+5µV	60+20+5µV	50+5µV	70+20+5µV	30+1µV	5			
			20+5+5µV	30+5µV	50+20+5µV	40+5µV	60+20+5µV	30+1µV	5			
			20+5+5µV	40+5µV	60+20+5µV	50+5µV	70+20+5µV	170+1µV	5			
			30+5+5µV	60+5µV	250+20+5µV	80+5µV	300+20+5µV	350+1µV	5			
			80+10+5µV	280+5µV	750+50+10µV	350+5µV	0.1%+50+10µV	450+1µV	20			
			130+10+5µV	850+5µV	0.15%+500+20µV	0.1%+5µV	0.2%+500+20µV	450+1µV	50			
			30+10	70	80+15	80	90+15	20	1.5			
			10+5	20	40+10	30	50+10	20	1.5			
			7+2	15	30+5	20	40+5	20	1.5			
15+5	35	60+10	50	80+10	50	1.5						
30+10	120	180+50	150	250+50	100	10						
100+10	800	0.11%+200	0.1%	0.15%+200	300	50						
10V	10-31 32-330 300-33k 30k-100k 100k-330k 300k-1M	10-31 32-330 300-33k 30k-100k 100k-330k 300k-1M	30+10	75	80+15	80	90+15	20	1.5			
			10+5	25	40+10	30	50+10	20	1.5			
			7+2	20	30+5	25	40+5	20	1.5			
			15+5	35	60+10	50	80+10	50	1.5			
			30+10	120	180+50	150	250+50	100	10			
			100+10	800	0.11%+200	0.1%	0.15%+200	300	50			
			100V	10-31 32-330 300-10k 10k-33k 30k-100k 100k-330k 300k-1M	10-31 32-330 300-10k 10k-33k 30k-100k 100k-330k 300k-1M	30+10	75	90+15	80	100+15	20	3
						10+5	25	50+10	30	60+10	20	3
						10+2	25	40+5	30	50+5	20	3
						10+2	35	50+10	40	60+10	20	3
15+5	45	90+15				60	120+15	50	5			
160+20	230	530+150 ^[4]				400	700+150 ^[4]	200	30			
600+75	0.57%	0.77%+600 ^[4]				0.72%	0.95%+600 ^[4]	300	90			
1000V	10-330 300-3.3k 3k-10k 10k-33k 30k-100k	10-330 300-3.3k 3k-10k 10k-33k 30k-100k				20+5	120	130+10	130	140+10	30	5
						20+2	80	90+10	90	100+10	30	5
						20+2	80	90+10	90	100+10	30	5
			30+2	120	130+10	130	140+10	50	5			
			50+10	170	750+20	200	0.1%+20	50	7			
			DCI	100µA 1mA 10mA 100mA 1A 10A		7+10	50+10		100+10		10	15
						3+4	20+5		40+5		10	6
						3+4	20+5		40+5		10	6
						3+4	20+5		40+5		10	6
						7+10	50+10		100+10		25	15
15+10	50+25					150+25		30	15			
ACI	100µA	10-1k 1k-5k				50+20	SPOT FREQ	BROADBAND	SPOT FREQ	BROADBAND	100	10
						70+30	100	120+30	130	150+50	100	20
							180	250+40	220	300+70		
	1mA-100mA	10-1k 1k-5k	10-1k 1k-5k	30+10	60	70+30	90	100+50	100	10		
				40+10	100	120+30	160	200+50	100	10		
1A	10-1k 1k-5k	10-1k 1k-5k	50+20	170	250+30	200	300+50	100	20			
			70+30	270	400+40	320	450+70	100	25			
10A	10-1k 1k-5k 5k-10k 10k-20k	10-1k 1k-5k 5k-10k 10k-20k	40+20	210	300+60	270	400+65	110	13			
			75+30	300	750+75	480	850+80	110	13			
			400+60	0.11%	0.15%+300	0.14%	0.22%+300	130	28			
			0.2%+150	0.4%	0.54%+0.16%	0.5%	0.72%+0.16%	250	50			
Ω	10Ω 100Ω 1kΩ 10kΩ 100kΩ 1MΩ 10MΩ 100MΩ		2	10		25		10	6			
			1	3		9		5	2			
			1	3		9		5	2			
			1	3		9		4	2			
			1	3		10		6	2			
			2	10		25		12	6			
			2	25		50		17	10			
			3	30		70		50	20			

- Notes: [1] FS = 2X Nominal Range Value (eg 20V on 10V range)
[2] For same conditions between 18°C and 28°C
[3] Tcrt = temperature at certification. Factory certification temperature = 23°C
[4] Valid over load range 0-50mA rms. Above 50mA, add $F[kHz] \times I[mA]-50$ ppmFS

FUNCTION	RANGE	FREQUENCY (Hz)	4800 Accuracy Relative to Calibration Standards ± (ppm OUTPUT + ppmFS) ^[1]			Calibration Uncertainty (ppm Output)	Temperature Coefficient (ppm/°C)
			24 Hour Stability ^[2]	90 Days Tcert ^[3] ± 1°C	1 Year Tcert ^[3] ± 5°C		
DCV	100µV-100mV		1.2+0.6µV	5+1µV	10+1µV	4	2
	1V		1+0.5	4+1	8+1	2	1
	10V		0.6+0.1	3+0.5	6.5+0.5	1.5	0.5
	100V		1+0.3	4+1	8+1	2	1
	1000V		1+0.3	5+1	10+1	2	1
ACV	1mV-100mV	10-31	120+10+7µV	250+30+7µV	340+30+7µV	30+1µV	10
		32-330	60+10+7µV	200+30+7µV	220+30+7µV	30+1µV	5
		300-10k	60+10+5µV	150+20+5µV	170+20+5µV	30+1µV	5
		10k-33k	60+10+7µV	160+30+7µV	180+30+7µV	170+1µV	5
		30k-100k	60+10+9µV	480+40+9µV	550+40+9µV	350+1µV	10
		100k-330k	160+20+20µV	0.12%+100+20µV	0.15%+100+20µV	450+1µV	20
		300k-1M	260+20+20µV	0.23%+0.1%+20µV	0.3%+0.1%+20µV	450+1µV	50
	1V	10-31	80+20	210+50	230+50	20	5
		32-330	40+10	140+30	160+30	20	5
		300-33k	40+10	80+20	90+20	20	3
		30k-100k	40+10	130+20	150+20	50	5
		100k-330k	100+20	320+60	400+60	100	15
		300k-1M	240+20	0.2%+500	0.27%+500	300	100
	10V	10-31	80+20	210+50	230+50	20	5
		32-330	40+10	140+30	160+30	20	5
		300-33k	40+10	80+20	90+20	20	3
		30k-100k	40+10	130+20	150+20	50	5
		100k-330k	100+20	320+60	400+60	100	15
		300k-1M	240+20	0.2%+500	0.27%+500	300	100
	100V	10-31	80+20	210+50	230+50	20	5
32-330		40+10	140+30	160+30	20	5	
300-10k		40+10	80+20	90+20	20	3	
10k-33k		40+10	80+20	90+20	20	3	
33k-100k		40+10	250+40	300+40	50	10	
1000V	10-330	100+20	210+30	220+30	30	5	
	300-3.3k	60+20	160+20	180+20	30	5	
	3k-10k	60+20	160+20	180+20	30	5	
	10k-33k	100+30	200+20	210+20	50	5	
DCI	100µA		7+10	50+10	100+10	10	20
	1mA		7+5	35+10	65+10	10	10
	10mA		7+5	35+10	65+10	10	10
	100mA		7+5	35+10	65+10	10	10
	1A		15+10	60+15	125+15	25	20
	10A		15+10	70+25	160+25	30	20
ACI	100µA	10-1k	50+20	120+30	150+50	100	10
		1k-5k	70+30	250+40	300+70	100	20
	1mA-100mA	10-1k	30+10	70+30	100+50	100	10
		1k-5k	40+10	120+30	200+50	100	10
	1A	10-1k	50+20	250+30	300+50	100	20
		1k-5k	70+30	400+40	450+70	100	25
	10A	10-1k	40+20	300+100	400+100	110	13
		1k-5k	75+30	750+100	900+100	110	13
5k-10k		400+60	0.15%+300	0.22%+300	130	28	
10k-20k		0.2%+150	0.55%+0.16%	0.72%+0.16%	250	50	
Ω	10Ω		6	15	35	10	6
	100Ω		2.5	6	15	5	2
	1kΩ		2.5	6	15	5	2
	10kΩ		2.5	6	15	4	2
	100kΩ		2.5	7	19	6	2
	1MΩ		6	16	38	12	6
	10MΩ		15	40	78	17	10
	100MΩ		30	80	150	50	20

Notes: [1] FS = 2X Nominal Range Value (eg 20V on 10V range)
[2] For same conditions between 18°C and 28°C
[3] Tcert = temperature at certification. Factory certification temperature = 23°C



4808, 4800 & 4805

EXPANDED PERFORMANCE SPECIFICATIONS

FUNCTION	RANGE	FREQUENCY (Hz)	4805 Accuracy Relative to Calibration Standards ± (ppm OUTPUT + ppmFS) ^[1]			Calibration Uncertainty (ppm Output)	Temperature Coefficient (ppm/°C)
			24 Hour Stability ^[2]	90 Days Tcert ^[3] ± 1°C	1 Year Tcert ^[3] ± 10°C		
DCV	100µV-100mV		2 + 1µV	15 + 1µV	35 + 5µV	9 + 1µV	2
	1V		2 + 0.5	15 + 1	35 + 5	6	1.5
	10V		1 + 0.5	15 + 1	35 + 5	4.5	1
	100V		2 + 0.5	15 + 1	35 + 5	7	1.5
	1000V		2 + 0.5	15 + 1	35 + 5	10	2
ACV	1mV-100mV	10-31	170 + 10 + 10µV	300 + 60 + 10µV	400 + 60 + 10µV	80 + 12µV	10
		32-330	80 + 10 + 10µV	250 + 60 + 10µV	300 + 60 + 10µV	230 + 10µV	10
		300-10k	80 + 10 + 10µV	250 + 60 + 10µV	300 + 60 + 10µV	230 + 10µV	10
		10k-33k	80 + 10 + 10µV	250 + 60 + 10µV	300 + 60 + 10µV	230 + 10µV	10
		30k-100k	80 + 10 + 10µV	800 + 80 + 10µV	0.1% + 80 + 10µV	510 + 11µV	10
	1V	10-31	150 + 20	300 + 60	400 + 60	130	6
		32-330	80 + 10	250 + 50	300 + 50	100	6
		300-33k	80 + 10	250 + 50	300 + 50	100	6
		30k-100k	80 + 10	300 + 80	500 + 80	140	6
	10V	10-31	150 + 20	300 + 60	400 + 60	130	6
		32-330	80 + 10	250 + 50	300 + 50	100	6
		300-33k	80 + 10	250 + 50	300 + 50	100	6
		30k-100k	80 + 10	300 + 80	500 + 80	140	6
	100V	10-31	150 + 20	300 + 60	400 + 60	130	6
		32-330	80 + 10	250 + 50	300 + 50	110	6
		300-10k	80 + 10	250 + 50	300 + 50	110	6
		10k-33k	80 + 10	250 + 50	300 + 50	110	6
		30k-100k	80 + 10	300 + 80	500 + 80	170	10
	1000V	10-330	150 + 20	300 + 60	400 + 60	170	10
		300-3.3k	80 + 20	250 + 50	300 + 50	140	10
3k-10k		80 + 20	250 + 50	300 + 50	140	10	
10k-33k		150 + 30	300 + 80	500 + 80	180	10	
DCI	100µA		15 + 10	50 + 15	115 + 20	34	30
	1mA		15 + 10	50 + 15	115 + 20	32	12
	10mA		15 + 10	50 + 15	115 + 20	32	12
	100mA		15 + 10	50 + 15	115 + 20	32	12
	1A		15 + 15	115 + 20	250 + 30	76	30
	10A		30 + 15	150 + 25	300 + 30	100	30
ACI	100µA	10-1k	50 + 20	400 + 80	500 + 100	400	20
		1k-5k	70 + 30	550 + 100	650 + 160	900	40
	1mA-100mA	10-1k	50 + 20	220 + 80	350 + 100	255	20
		1k-5k	50 + 20	350 + 80	450 + 100	255	20
	1A	10-1k	50 + 20	400 + 80	500 + 100	290	40
		1k-5k	70 + 30	550 + 100	650 + 160	440	40
	10A	10-1k	60 + 20	500 + 100	600 + 100	300	40
		1k-5k	80 + 30	0.1% + 100	0.12% + 100	450	40
5k-10k		500 + 80	0.2% + 300	0.25% + 300	550	70	
10k-20k		0.25% + 200	0.6% + 0.2%	1% + 0.2%	700	150	
Ω	10Ω		10	30	75	25	6
	100Ω		2.5	6	20	10	2
	1kΩ		2.5	6	20	10	2
	10kΩ		2.5	6	20	9	2
	100kΩ		2.5	6	25	18	2
	1MΩ		8	25	60	37	6
	10MΩ		30	100	200	62	10
	100MΩ		40	125	500	200	20

Notes: [1] FS = 2X Nominal Range Value (eg 20V on 10V range)
 [2] For same conditions between 18°C and 28°C
 [3] Tcert = temperature at certification, Factory certification temperature = 23°C

4808, 4800 & 4805

**EXPANDED
PERFORMANCE
SPECIFICATIONS**

Model 4805 Multifunction Calibrator:

Option 60 Range Extender to 11A DCI and ACI. Includes 4600 Transconductance Amplifier and all necessary cabling.

Option 90 Rack Mount Kit.

Model 4600 Transconductance Amplifier:

Option 90 Rack Mount Kit.
440151 Slave Model Lead Kit.
440154 Current Output Lead Kit.

General Specifications

Line Supply:

110/120/220/240V ± 10%, 48Hz to 62Hz

Power Consumption:

370VA normal, 660VA full power

Operating Temperature:

0°C to +50°C

Storage Temperature:

-40°C to +70°C

Dimensions (H × W × D):

178mm (7") × 455mm (17.9") × 563mm (22.2")

Weight:

36kg (80lbs)

Safety:

Designed to UL1244, IEC348, IEC1010, BS4743

Warranty:

1 year

Ordering Information

Models 4808/4800 Multifunction Calibrators:

Option 10 DCV function to 200V.

Option 20 ACV function to 200V.

Option 30 Integral 1000V amplifier for ACV and/or DCV functions. Requires either Option 10, Option 20 or both.

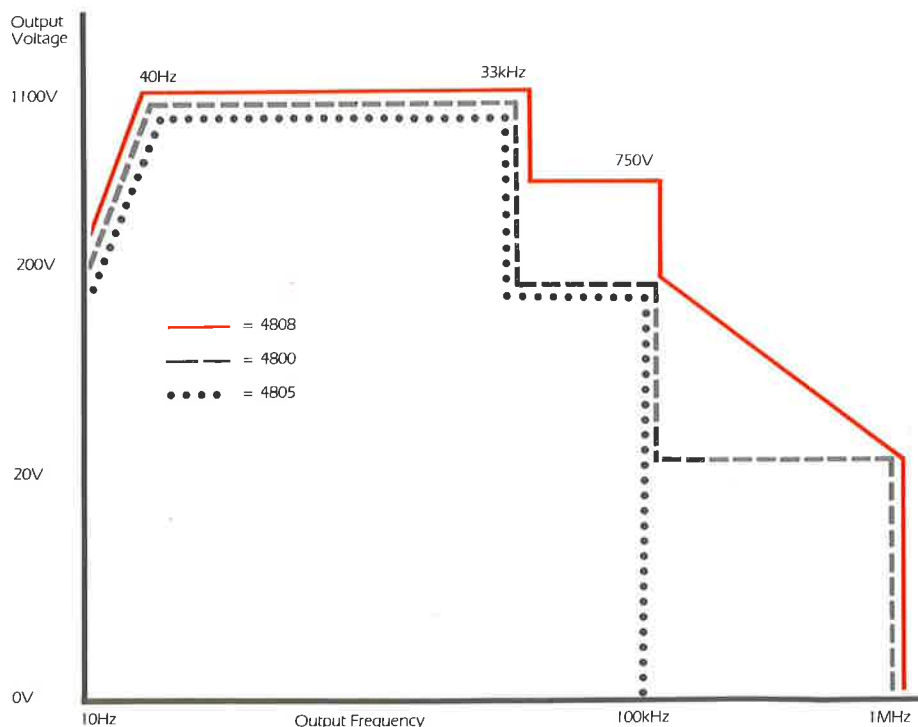
Option 40 Current Converter for DCI and ACI functions. DCI capability requires Option 10, ACI capability requires Option 20.

Option 50 Resistance function.

Option 60 Range Extender to 11A DCI and ACI. Includes 4600 Transconductance Amplifier and all necessary cabling. Requires Option 40.

Option 90 Rack Mount Kit.

4808, 4800 and 4805 Volts/Hertz Capabilities





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