

5790B/5/AF

AC Measurement Standard

Addendum

General Description

The 5790B/5/AF specifications in Table 1 supersede those published in the 5790B Operator and Service Manuals. The specification differences (between the 5790B and the 5790B/5/AF) are bolded. The following notes apply to the specifications in Table 1:

- Uncertainties apply for 1 year, at $23\text{ °C} \pm 5\text{ °C}$, up to 50 % RH.
- Performance is achieved using the "Medium Filter Setting".
- Specifications are valid at the 5790B/5/AF input connectors, and may be degraded by input cables. Additional footnotes may apply. Refer to the 5790B specifications for more information.

Table 1. 5790B/5/AF Absolute AC Voltage Specifications

Voltage Range	Frequency Range	Specifications (1 year)	
		AC/DC Transfer Mode (± PPM)	Absolute Measurement Mode ± (PPM of Reading + μV)
2.2 mV	10 Hz – 20 Hz		1700 + 1.3
	20 Hz – 40 Hz		740 + 1.3
	40 Hz – 20 kHz		420 + 1.3
	20 kHz – 50 kHz		810 + 2.0
	50 kHz – 100 kHz		1200 + 2.5
	100 kHz – 300 kHz		2300 + 4.0
	300 kHz – 500 kHz		2400 + 8.0
	500 kHz – 1 MHz		3500 + 8.0
7 mV	10 Hz – 20 Hz		850 + 1.3
	20 Hz – 40 Hz		370 + 1.3
	40 Hz – 20 kHz		210 + 1.3
	20 kHz – 50 kHz		400 + 2.0
	50 kHz – 100 kHz		600 + 2.5
	100 kHz – 300 kHz		1200 + 4.0
	300 kHz – 500 kHz		1300 + 8.0
	500 kHz – 1 MHz		2300 + 8.0
22 mV	10 Hz – 20 Hz		290 + 1.3
	20 Hz – 40 Hz		190 + 1.3
	40 Hz – 20 kHz		110 + 1.3
	20 kHz – 50 kHz		210 + 2.0
	50 kHz – 100 kHz		310 + 2.5
	100 kHz – 300 kHz		810 + 4.0
	300 kHz – 500 kHz		890 + 8.0
	500 kHz – 1 MHz		1700 + 8.0
70 mV	10 Hz – 20 Hz ^[1]		240 + 1.5
	20 Hz – 40 Hz		120 + 1.5
	40 Hz – 20 kHz		65 + 1.5
	20 kHz – 50 kHz		130 + 2.0
	50 kHz – 100 kHz		260 + 2.5
	100 kHz – 300 kHz		510 + 4.0
	300 kHz – 500 kHz		670 + 8.0
	500 kHz – 1 MHz		1100 + 8.0
220 mV	10 Hz – 20 Hz ^[1]	210	210 + 1.5
	20 Hz – 40 Hz	82	85 + 1.5
	40 Hz – 20 kHz	34	38 + 1.5
	20 kHz – 50 kHz	67	69 + 2.0
	50 kHz – 100 kHz		160 + 2.5
	100 kHz – 300 kHz		250 + 4.0
	300 kHz – 500 kHz		380 + 8.0
	500 kHz – 1 MHz		600 + 0
700 mV	10 Hz – 20 Hz ^[1]	210	210 + 1.5
	20 Hz – 40 Hz	73	76 + 1.5
	40 Hz – 20 kHz	27	33 + 1.5
	20 kHz – 50 kHz	47	51 + 2.0
	50 kHz – 100 kHz		79 + 2.5
	100 kHz – 300 kHz		180 + 4.0
	300 kHz – 500 kHz		300 + 8.0
	500 kHz – 1 MHz		600 + 0

Table 1. 5790B/5/AF Absolute AC Voltage Specifications (continued)

Voltage Range	Frequency Range	Specifications (1 year)	
		AC/DC Transfer Mode (± PPM)	Absolute Measurement Mode ± (PPM of Reading + μV)
2.2 V	10 Hz – 20 Hz ^[2]	200	200
	20 Hz – 40 Hz	63	66
	40 Hz – 20 kHz	18	24
	20 kHz – 50 kHz	43	46
	50 kHz – 100 kHz		71
	100 kHz – 300 kHz		160
	300 kHz – 500 kHz		260
	500 kHz – 1 MHz		600
7 V	10 Hz – 20 Hz ^[2]	200	200
	20 Hz – 40 Hz	63	67
	40 Hz – 20 kHz	18	24
	20 kHz – 50 kHz	44	48
	50 kHz – 100 kHz		81
	100 kHz – 300 kHz		190
	300 kHz – 500 kHz		400
	500 kHz – 1 MHz		600
22 V	10 Hz – 20 Hz ^[2]	200	200
	20 Hz – 40 Hz	63	67
	40 Hz – 20 kHz	21	27
	20 kHz – 50 kHz	44	48
	50 kHz – 100 kHz		81
	100 kHz – 300 kHz		190
	300 kHz – 500 kHz		400
	500 kHz – 1 MHz		600
70 V ^[3]	10 Hz – 20 Hz ^[2]	200	200
	20 Hz – 40 Hz	63	68
	40 Hz – 20 kHz	25	32
	20 kHz – 50 kHz	55	57
	50 kHz – 100 kHz		94
	100 kHz – 300 kHz		200
	300 kHz – 500 kHz		410
	500 kHz – 1 MHz		600
220 V ^[3]	10 Hz – 20 Hz	200	200
	20 Hz – 40 Hz	63	68
	40 Hz – 20 kHz	23	31
	20 kHz – 50 kHz	63	69
	50 kHz – 100 kHz		98
	100 kHz – 300 kHz		210
	300 kHz – 500 kHz		500
700 V	10 Hz – 20 Hz ^[4]	200	200
	20 Hz – 40 Hz	92	99
	40 Hz – 20 kHz	36	41
	20 kHz – 50 kHz		130
	50 kHz – 100 kHz		500
1000 V	10 Hz – 20 Hz ^[4]	200	200
	20 Hz – 40 Hz	92	99
	40 Hz – 20 kHz	33	38
	20 kHz – 50 kHz ^[5]		130
	50 kHz – 100 kHz ^[5]		500

[1] For 9.5 Hz to 10 Hz, the specifications is ±(1000 ppm of reading + 1.5 μV)

[2] For 9.5 Hz to 10 Hz, the specifications is ±(1000 ppm of reading)

[3] Inputs >100 kHz and with a V*Hz product >2.2E7 are typical.

[4] Typical specification, as determined by sourcing with the Fluke 5205A Precision Power Amplifier.

[5] Inputs >30 kHz and >750 V are typical, as determined by sourcing with the Fluke 5205A Precision Power Amplifier.

Note: The Product is to be used in controlled environments. For disturbances on the mains power supply of >0.5 Vrms from 10 MHz to 40 MHz, add 5 ppm to the 2.2 V range.

Calibration Requirements

Full Calibration as described in Chapter 3 of the 5790B Service Manual must be performed before the expiration of the specified calibration interval to guarantee 5790B/5/AF specifications listed in this addendum. Replace Table 3-14 in the 5790B Service Manual with the following Table 3. Table 3 reflects the Performance Specification differences shown in Table 1. The specification differences (between the 5790B and the 5790B/5/AF) are bolded.

Table 3. Main Input Verification Test Record

Step No.	5790B Range	Test Voltage (V)	Frequency	1 Yr. Absolute AC Error Spec. (±ppm)	Measured Absolute AC Error (PPM)	2 Yr AC-DC Error Spec. (±ppm)	Measured AC-DC Error (PPM)
1	0.0022	0.002	10 Hz	2350		No spec	
2	0.0022	0.002	20 Hz	1390		No spec	
3	0.0022	0.002	40 Hz	1070		No spec	
4	0.0022	0.002	1 kHz	1070		No spec	
5	0.0022	0.002	20 kHz	1070		No spec	
6	0.0022	0.002	50 kHz	1810		No spec	
7	0.0022	0.002	100 kHz	2450		No spec	
8	0.0022	0.002	300 kHz	4300		No spec	
9	0.0022	0.002	500 kHz	6400		No spec	
10	0.0022	0.002	1 MHz	7500		No spec	
11	0.0022	0.0006	1 kHz	2587		No spec	
12	0.007	0.006	10 Hz	1070		No spec	
13	0.007	0.006	20 Hz	587		No spec	
14	0.007	0.006	40 Hz	427		No spec	
15	0.007	0.006	1 kHz	427		No spec	
16	0.007	0.006	20 kHz	427		No spec	
17	0.007	0.006	50 kHz	733		No spec	
18	0.007	0.006	100 kHz	1020		No spec	
19	0.007	0.006	300 kHz	1870		No spec	
20	0.007	0.006	500 kHz	2600		No spec	
21	0.007	0.006	1 MHz	3600		No spec	
22	0.022	0.02	10 Hz	355		No spec	
23	0.022	0.02	20 Hz	245		No spec	
24	0.022	0.02	40 Hz	175		No spec	
25	0.022	0.02	1 kHz	175		No spec	
26	0.022	0.02	20 kHz	175		No spec	

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Step No.	5790B Range	Test Voltage (V)	Frequency	1 Yr. Absolute AC Error Spec. (\pm ppm)	Measured Absolute AC Error (PPM)	2 Yr AC-DC Error Spec. (\pm ppm)	Measured AC-DC Error (PPM)
28	0.022	0.02	50 kHz	310		No spec	
29	0.022	0.02	100 kHz	435		No spec	
30	0.022	0.02	300 kHz	1010		No spec	
31	0.022	0.02	500 kHz	1290		No spec	
32	0.022	0.02	1 MHz	2100		No spec	
33	0.07	0.06	10 Hz	265		No spec	
34	0.07	0.06	20 Hz	145		No spec	
35	0.07	0.06	40 Hz	90		No spec	
36	0.07	0.06	1 kHz	90		No spec	
37	0.07	0.06	20 kHz	90		No spec	
39	0.07	0.06	50 kHz	163		No spec	
40	0.07	0.06	100 kHz	302		No spec	
41	0.07	0.06	300 kHz	577		No spec	
42	0.07	0.06	500 kHz	803		No spec	
43	0.07	0.06	1 MHz	1230		No spec	
44	0.22	0.06	1 kHz	63		34	
45	0.22	0.06	1 MHz	600		No spec	
46	0.22	0.2	10 Hz	218		210	
47	0.22	0.2	20 Hz	93		82	
48	0.22	0.2	40 Hz	46		34	
50	0.22	0.2	1 kHz	46		34	
51	0.22	0.2	20 kHz	46		34	
52	0.22	0.2	50 kHz	79		67	
53	0.22	0.2	100 kHz	173		No spec	
54	0.22	0.2	300 kHz	270		No spec	
55	0.22	0.2	500 kHz	420		No spec	
56	0.22	0.2	1 MHz	600		No spec	
57	0.7	0.6	10 Hz	213		210	
58	0.7	0.6	20 Hz	79		73	
60	0.7	0.6	40 Hz	36		27	
61	0.7	0.6	1 kHz	36		27	
62	0.7	0.6	20 kHz	36		27	

Step No.	5790B Range	Test Voltage (V)	Frequency	1 Yr. Absolute AC Error Spec. (\pm ppm)	Measured Absolute AC Error (PPM)	2 Yr AC-DC Error Spec. (\pm ppm)	Measured AC-DC Error (PPM)
63	0.7	0.6	50 kHz	54		47	
64	0.7	0.6	100 kHz	83		No spec	
65	0.7	0.6	300 kHz	187		No spec	
66	0.7	0.6	500 kHz	313		No spec	
67	0.7	0.6	1 MHz	600		No spec	
68	2.2	0.6	10 Hz	200		200	
69	2.2	0.6	20 Hz	66		63	
71	2.2	0.6	40 Hz	24		18	
72	2.2	0.6	1 kHz	24		18	
73	2.2	0.6	20 kHz	24		18	
74	2.2	0.6	50 kHz	46		43	
75	2.2	0.6	100 kHz	71		No spec	
76	2.2	0.6	300 kHz	160		No spec	
77	2.2	0.6	500 kHz	260		No spec	
78	2.2	0.6	1 MHz	600		No spec	
79	2.2	1.0	10 Hz	200		200	
80	2.2	1.0	20 Hz	66		63	
82	2.2	1.0	40 Hz	24		18	
83	2.2	1.0	1 kHz	24		18	
84	2.2	1.0	20 kHz	24		18	
85	2.2	1.0	50 kHz	46		43	
86	2.2	1.0	100 kHz	71		No spec	
87	2.2	1.0	300 kHz	160		No spec	
88	2.2	1.0	500 kHz	260		No spec	
89	2.2	1.0	1 MHz	600		No spec	
90	2.2	2.0	10 Hz	200		200	
91	2.2	2.0	20 Hz	66		63	
93	2.2	2.0	40 Hz	24		18	
94	2.2	2.0	1 kHz	24		18	
95	2.2	2.0	20 kHz	24		18	
96	2.2	2.0	50 kHz	46		43	
97	2.2	2.0	100 kHz	71		No spec	

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Step No.	5790B Range	Test Voltage (V)	Frequency	1 Yr. Absolute AC Error Spec. (\pm ppm)	Measured Absolute AC Error (PPM)	2 Yr AC-DC Error Spec. (\pm ppm)	Measured AC-DC Error (PPM)
98	2.2	2.0	300 kHz	160		No spec	
99	2.2	2.0	500 kHz	260		No spec	
100	2.2	2.0	1 MHz	600		No spec	
101	7.0	6.0	10 Hz	200		200	
102	7.0	6.0	20 Hz	67		63	
104	7.0	6.0	40 Hz	24		18	
105	7.0	6.0	1 kHz	24		18	
106	7.0	6.0	20 kHz	24		18	
107	7.0	6.0	50 kHz	48		44	
108	7.0	6.0	100 kHz	81		No spec	
109	7.0	6.0	300 kHz	190		No spec	
110	7.0	6.0	500 kHz	400		No spec	
111	7.0	6.0	1 MHz	600		No spec	
113	22	20.0	10 Hz	200		123	
114	22	20.0	20 Hz	67		123	
115	22	20.0	40 Hz	27		21	
116	22	20.0	1 kHz	27		21	
117	22	20.0	20 kHz	27		21	
119	22	20.0	50 kHz	48		44	
120	22	20.0	100 kHz	81		No spec	
121	22	20.0	300 kHz	190		No spec	
122	22	20.0	500 kHz	400		No spec	
123	22	20.0	1 MHz	600		No spec	
125	70	20.0	500 kHz	410		No spec	
126	70	20.0	1 MHz	600		No spec	
127	70	60.0	10 Hz	200		200	
128	70	60.0	20 Hz	68		63	
129	70	60.0	40 Hz	32		25	
130	70	60.0	1 kHz	32		25	
131	70	60.0	20 kHz	32		25	
132	70	60.0	50 kHz	57		55	
133	70	60.0	100 kHz	94		No spec	
134	70	60.0	300 kHz	200		No spec	
135	220	60	300 kHz	210		No spec	

Step No.	5790B Range	Test Voltage (V)	Frequency	1 Yr. Absolute AC Error Spec. (\pm ppm)	Measured Absolute AC Error (PPM)	2 Yr AC-DC Error Spec. (\pm ppm)	Measured AC-DC Error (PPM)
136	220	200.0	10 Hz	200		200	
137	220	200.0	20 Hz	68		63	
138	220	200.0	40 Hz	31		23	
139	220	200.0	1 kHz	31		23	
140	220	200.0	20 kHz	31		23	
141	220	200.0	50 kHz	69		63	
142	220	200.0	100 kHz	98		No spec	
143	700	600.0	40 Hz	41		36	
144	700	600.0	1 kHz	41		36	
145	700	600.0	20 kHz	41		36	
146	700	600.0	50 kHz	130		No spec	
147	700	600.0	100 kHz	500		No spec	
148	1000	1000.0	100 Hz	38		33	
149	1000	1000.0	1 kHz	38		33	
150	1000	1000.0	20 kHz	38		33	
151	1000	1000.0	30 kHz	130		No spec	
152	1000	600.0	40 Hz	38		33	
153	1000	600.0	50 kHz	130		No spec	
154	1000	600.0	100 kHz	500		No spec	