

FLUKE®

5790A/AF

AC Measurement Standard

Addendum

General Description

The 5790A/AF is similar to the standard 5790A AC Measurement Standard except for different performance specifications and added accessories as noted below. The serial number has an AF prefix that identifies the instrument as a 5790A/AF.

Performance Specification Differences

The 5790A/AF specifications in Table 1 supersede those published in the 5790A Operator and Service Manuals. The specification differences [between the 5790A and the 5790A/AF] are bolded. The following notes apply to the specifications in Table 1:

- Uncertainties apply for 1 year, at $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$, up to 50 % RH.
- The maximum input voltage x frequency is 2×10^7 .
- Performance is achieved using the "Medium Filter Setting".
- Specifications are valid at the 5790A/AF input connectors, and may be degraded by input cables.

Table 1. 5790A/AF Absolute Uncertainty Specifications

Voltage Range	Frequency Range	Absolute Uncertainty (1 year)	
		AC/DC Transfer Mode (± PPM)	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		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	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	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. 5790A/AF Absolute Uncertainty Specifications (continued)

Voltage Range	Frequency Range	Absolute Uncertainty (1 year)	
		AC/DC Transfer Mode (± PPM)	Measurement Mode ± (PPM of Reading)
2.2 V	10 Hz – 20 Hz	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	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	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	10 Hz – 20 Hz	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	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
700 V	300 kHz – 500 kHz		500
	10 Hz – 20 Hz	200	200
	20 Hz – 40 Hz	92	99
	40 Hz – 20 kHz	36	41
	20 kHz – 50 kHz		130
1000 V	50 kHz – 100 kHz		500
	10 Hz – 20 Hz	200	200
	20 Hz – 40 Hz	92	99
	40 Hz – 20 kHz	33	38
	20 kHz – 50 kHz		130
	50 kHz – 100 kHz		500

Accessories Included with the 5790A/AF

Instruction sheets are packed with the 5790A-7001 Current Shunt Adapter and Cable, and Y5737 Rack Mount Kit. The Type "N" to banana cable listed in Table 2 is for connecting sources to INPUT 1.

Table 2. Accessories Included with the 5790A/AF

Model	Description	Fluke Part Number
5790A-7001	Current Shunt Adapter and Cable	893185
Y5737	Rack mount Kit	827105
5790A-8026	12-in. cable with 50 Ω Type "N" female connector to dual banana plugs	900394

Calibration Requirements

Service Calibration as described in Section 3 of the 5790A Service Manual must be performed before the expiration of the specified calibration interval to guarantee 5790A/AF specifications listed in this addendum. The simpler Periodic Calibration in Section 3 of the 5790A Service Manual procedure does not guarantee the 5790A/AF specifications. Replace Table 3-13 in the 5790A Service Manual with the following Table 3. Table 3 reflects the Performance Specification differences shown in Table 1. The specification differences [between the 5790A and the 5790A/AF] are bolded.

Table 3. Main Input Verification Test Record

Step No.	5790A Range	Test Voltage (V)	Frequency	AC Source Maximum Uncertainty (Note)	1-Year Absolute AC Error Spec. (+/- PPM)	Measured Absolute AC Error (PPM)	2-Year AC-DC Error Spec (PPM)	Measured AC-DC Error (PPM)
1	0.0022	0.002	10 Hz	1700*	2350		No spec	
2	0.0022	0.002	20 Hz	700*	1390		No spec	
3	0.0022	0.002	100 Hz	400*	1070		No spec	
4	0.0022	0.002	1 kHz	400*	1070		No spec	
5	0.0022	0.002	10 kHz	400*	1070		No spec	
6	0.0022	0.002	20 kHz	400*	1070		No spec	
7	0.0022	0.002	50 kHz	800*	1810		No spec	
8	0.0022	0.002	100 kHz	1200*	2450		No spec	
9	0.0022	0.002	300 kHz	2300*	4300		No spec	
10	0.0022	0.002	500 kHz	2300*	6400		No spec	
11	0.0022	0.002	1 MHz	2300*	7500		No spec	
12	0.007	0.006	10 Hz	840*	1070		No spec	
13	0.007	0.006	20 Hz	360*	587		No spec	
14	0.007	0.006	100 Hz	200*	427		No spec	
15	0.007	0.006	1 kHz	200*	427		No spec	
16	0.007	0.006	10 kHz	200*	427		No spec	
17	0.007	0.006	20 kHz	200*	427		No spec	
18	0.007	0.006	50 kHz	400*	733		No spec	
19	0.007	0.006	100 kHz	600*	1020		No spec	
20	0.007	0.006	300 kHz	1200*	1870		No spec	
21	0.007	0.006	500 kHz	1200*	2600		No spec	
22	0.007	0.006	1 MHz	1200*	3600		No spec	
23	0.022	0.02	10 Hz	280*	355		No spec	
24	0.022	0.02	20 Hz	180*	245		No spec	
25	0.022	0.02	100 Hz	100*	175		No spec	
26	0.022	0.02	1 kHz	100*	175		No spec	
27	0.022	0.02	10 kHz	100*	175		No spec	
28	0.022	0.02	20 kHz	100*	175		No spec	
29	0.022	0.02	50 kHz	200*	310		No spec	
30	0.022	0.02	100 kHz	300*	435		No spec	
31	0.022	0.02	300 kHz	720*	1010		No spec	

Table 3. Main Input Verification Test Record (continued)

Step No.	5790A Range	Test Voltage (V)	Frequency	AC Source Maximum Uncertainty (Note)	1-Year Absolute AC Error Spec. (+/- PPM)	Measured Absolute AC Error (PPM)	2-Year AC-DC Error Spec (PPM)	Measured AC-DC Error (PPM)
32	0.022	0.02	500 kHz	720*	1290		No spec	
33	0.022	0.02	1 MHz	720*	2100		No spec	
34	0.07	0.06	10 Hz	230	265		No spec	
35	0.07	0.06	20 Hz	120	145		No spec	
36	0.07	0.06	100 Hz	60	90		No spec	
37	0.07	0.06	1 kHz	60	90		No spec	
38	0.07	0.06	10 kHz	60	90		No spec	
39	0.07	0.06	20 kHz	60	90		No spec	
40	0.07	0.06	50 kHz	120	163		No spec	
41	0.07	0.06	100 kHz	250	302		No spec	
42	0.07	0.06	300 kHz	500	577		No spec	
43	0.07	0.06	500 kHz	600	803		No spec	
44	0.07	0.06	1 MHz	600	1230		No spec	
45	0.22	0.2	10 Hz	200	218		210	
46	0.22	0.2	20 Hz	80	93		82	
47	0.22	0.2	100 Hz	30	46		34	
48	0.22	0.2	1 kHz	30	46		34	
49	0.22	0.2	10 kHz	30	46		34	
50	0.22	0.2	20 kHz	30	46		34	
51	0.22	0.2	50 kHz	65	79		67	
52	0.22	0.2	300 kHz	220	270		No spec	
53	0.22	0.2	500 kHz	250	420		No spec	
54	0.22	0.2	1 MHz	300	600		No spec	
55	0.7	0.6	10 Hz	200	213		210	
56	0.7	0.6	20 Hz	70	79		73	
57	0.7	0.6	100 Hz	22	36		27	
58	0.7	0.6	1 kHz	22	36		27	
59	0.7	0.6	10 kHz	22	36		27	
60	0.7	0.6	20 kHz	22	36		27	
61	0.7	0.6	50 kHz	45	54		47	
62	0.7	0.6	100 kHz	60	83		No spec	

Table 3. Main Input Verification Test Record (continued)

Step No.	5790A Range	Test Voltage (V)	Frequency	AC Source Maximum Uncertainty (Note)	1-Year Absolute AC Error Spec. (+/- PPM)	Measured Absolute AC Error (PPM)	2-Year AC-DC Error Spec (PPM)	Measured AC-DC Error (PPM)
63	0.7	0.6	300 kHz	130	187		No spec	
64	0.7	0.6	500 kHz	140	313		No spec	
65	0.7	0.6	1 MHz	140	600		No spec	
66	2.2	2.0	10 Hz	190	200		200	
67	2.2	2.0	20 Hz	60	66		63	
68	2.2	2.0	100 Hz	10	24		18	
69	2.2	2.0	1 kHz	10	24		18	
70	2.2	2.0	10 kHz	10	24		18	
71	2.2	2.0	20 kHz	10	24		18	
72	2.2	2.0	50 kHz	40	46		43	
73	2.2	2.0	100 kHz	50	71		No spec	
74	2.2	2.0	300 kHz	115	160		No spec	
75	2.2	2.0	500 kHz	125	260		No spec	
76	2.2	2.0	1 MHz	125	600		No spec	
77	7.0	6.0	10 Hz	190	200		200	
78	7.0	6.0	20 Hz	60	67		63	
79	7.0	6.0	100 Hz	10	24		18	
80	7.0	6.0	1 kHz	10	24		18	
81	7.0	6.0	10 kHz	10	24		18	
82	7.0	6.0	20 kHz	10	24		18	
83	7.0	6.0	50 kHz	40	48		44	
84	7.0	6.0	100 kHz	50	81		No spec	
85	7.0	6.0	300 kHz	120	190		No spec	
86	7.0	6.0	500 kHz	125	400		No spec	
87	7.0	6.0	1 MHz	125	600		No spec	
88	22	20.0	10 Hz	190	200		123	
89	22	20.0	20 Hz	60	67		123	
90	22	20.0	100 Hz	15	27		21	
91	22	20.0	1 kHz	15	27		21	
92	22	20.0	10 kHz	15	27		21	
93	22	20.0	20 kHz	15	27		21	

Table 3. Main Input Verification Test Record (continued)

Step No.	5790A Range	Test Voltage (V)	Frequency	AC Source Maximum Uncertainty (Note)	1-Year Absolute AC Error Spec. (+/- PPM)	Measured Absolute AC Error (PPM)	2-Year AC-DC Error Spec (PPM)	Measured AC-DC Error (PPM)
94	22	20.0	50 kHz	40	48		44	
95	22	20.0	100 kHz	50	81		No spec	
96	22	20.0	300 kHz	120	190		No spec	
97	22	20.0	500 kHz	125	400		No spec	
98	22	20.0	1 MHz	125	600		No spec	
99	70	60.0	10 Hz	190	200		200	
100	70	60.0	20 Hz	60	68		63	
101	70	60.0	100 Hz	20	32		25	
102	70	60.0	1 kHz	20	32		25	
103	70	60.0	10 kHz	20	32		25	
104	70	60.0	20 kHz	20	32		25	
105	70	60.0	50 kHz	50	57		55	
106	70	60.0	100 kHz	65	94		No spec	
107	70	60.0	300 kHz	130	200		No spec	
108	220	200.0	10 Hz	190	200		200	
109	220	200.0	20 Hz	60	68		63	
110	220	200.0	100 Hz	18	31		23	
111	220	200.0	1 kHz	18	31		23	
112	220	200.0	10 kHz	18	31		23	
113	220	200.0	20 kHz	18	31		23	
114	220	200.0	50 kHz	60	69		63	
115	220	200.0	100 kHz	70	98		No spec	
116	700	600.0	100 Hz	27	41		36	
117	700	600.0	1 kHz	27	41		36	
118	700	600.0	10 kHz	30	41		36	
119	700	600.0	20 kHz	30	41		36	
120	700	600.0	50 kHz	60	130		No spec	
121	700	600.0	100 kHz	70	500		No spec	
122	1000	1000.0	100 Hz	25	38		33	
123	1000	1000.0	1 kHz	25	38		33	
124	1000	1000.0	10 kHz	27	38		33	
125	1000	1000.0	20 kHz	27	38		33	
126	1000	600.0	50 kHz	60	130		No spec	
127	1000	600.0	100 kHz	70	500		No spec	