

Fluke 712B and 714B Temperature Calibrators

Accuracy and Simplicity

For the temperature calibration professional that wants a highly accurate, easy-to-use, single function temperature calibrator the 712B and 714B are ideal test tools.



Technical Data

Product Highlights

- The 712B can measure and simulate (13) different RTD types and resistance
- The 714B can measure and simulate (17) different thermocouple types and millivolts
- Measure 4 to 20 mA signals while simultaneously sourcing a temperature signal
- Hanging tool designed in and included with every unit
- Configurable 0% and 100% source settings for quick 25% linearity checks
- Linear ramp and 25% step auto ramp based on 0% and 100% settings
- Dual inputs and backlit display for easy interpretation of measurements
- Power down settings remembered at power up for easy restart of tests
- 1-year and 2-year specifications and traceable certificate of calibration

Specifications

Specifications are based on a one year calibration cycle and apply from +18 °C to +28 °C unless stated otherwise. All specifications assume a 5-minute warmup period.

General specifications

Maximum voltage applied between any terminal and earth ground or between any two terminals:	30 V
Operating temperature	-10 °C to 50 °C
Storage temperature	- 30 °C to 60 °C
Operating altitude	2,000 meters
Storage altitude	12,000 meters
Relative humidity (% RH operating without condensation)	Non condensing 90 % (10 °C to 30 °C) 75 % (30 °C to 40 °C) 45 % (40 °C to 50 °C) (Without condensation)
Vibration requirements	MIL-T-28800E, Class 2
Drop test requirements	1 meter
IP Rating	IEC 60529: IP52
Electromagnetic environment	IEC 61326-1, Portable
Safety	IEC 61010-1, Max 30 V to earth, Pollution Degree 2
Power supply	4 AA NEDA 1.5A IEC LR6 batteries
Size (H x W x L)	52.5 mm x 84 mm x 188.5 mm
Weight	515 g

DC mA measurement

Resolution	Range	Accuracy (% of reading + counts)
0-24 mA	0.001 mA	0.010 % + 2 µA
Temperature coefficient: ± (0.002 % of reading + 0.002 % of range) /°C (<18 °C or >28 °C)		

Ohms measurement (Fluke 712B)

Ohms range	Accuracy (% of reading + counts)
0.00 Ω to 400.00 Ω	0.015 % + 0.05 Ω
400.0 Ω to 4000.0 Ω	0.015 % + 0.5 Ω
Note: Read accuracy is based on 4-wire input. For 3-wire ohm measurements, assuming all three leads are matched, add 0.05 Ω (0.00 Ω~400.00 Ω), 0.2 Ω (400.0 Ω~4000.0 Ω) to the specifications. Temperature coefficient: ± (0.002 % of reading + 0.002 % of range) /°C (<18 °C or >28 °C)	

Millivolt measurement and source (Fluke 714B)

Resolution	Range	Accuracy (% of reading + counts)
-10 mV to 75 mV	0.01 mV	0.015 % + 10 µA
Temperature coefficient: ± (0.002 % of reading + 0.002 % of range) /°C (<18 °C or >28 °C)		

Ohms source (Fluke 712B)

Ohms range	Excitation current from measurement device	Accuracy (% of reading + counts)
1.0 Ω to 400.0 Ω	0.1 mA to 0.5 mA	0.015 % + 0.1 Ω
1.00 Ω to 400.00 Ω	0.5 mA to 3 mA	0.015 % + 0.05 Ω
400.0 Ω to 1500.0 Ω	0.05 mA to 0.8 mA	0.015 % + 0.5 Ω
1500.0 Ω to 4000.0 Ω	0.05 mA to 0.4 mA	0.015 % + 0.5 Ω
Resolution		
0.00 Ω to 400.00 Ω	0.01 Ω	
400.0 Ω to 4000.0 Ω	0.1 Ω	
Temperature coefficient: ± (0.002 % of reading + 0.002 % of range) /°C (<18 °C or >28 °C) Supports pulsed transmitters and PLCs with pulse times as short as 5 ms		

RTD input and output (Fluke 712B)

RTD Type (α)	Range (°C)	Measure (°C)			Source (°C)	
		1-year	2-year	Source current	1-year	2-year
10Ω Pt(385)	-200 to 100 °C	1.5 °C	3 °C	1 mA	1.5 °C	3 °C
	100 to 800 °C	1.8 °C	3.6 °C	1 mA	1.8 °C	3.6 °C
50Ω Pt(385)	-200 to 100 °C	0.4 °C	0.7 °C	1 mA	0.4 °C	0.7 °C
	100 to 800 °C	0.5 °C	0.8 °C	1 mA	0.5 °C	0.8 °C
100 Ω Pt(385)	-200 to 100 °C	0.2 °C	0.4 °C	1 mA	0.2 °C	0.4 °C
	100 to 800 °C	0.015 %+0.18 °C	0.03 %+0.36 °C		0.015 %+0.18 °C	0.03 %+0.36 °C
200 Ω Pt(385)	-200 to 100 °C	0.2 °C	0.4 °C	500 μA	0.2 °C	0.4 °C
	100 to 630 °C	0.015 %+0.18 °C	0.03 %+0.36 °C		0.015 %+0.18 °C	0.03 %+0.36 °C
500 Ω Pt(385)	-200 to 100 °C	0.3 °C	0.6 °C	250 μA	0.3 °C	0.6 °C
	100 to 630 °C	0.015 %+0.28 °C	0.03 %+0.56 °C		0.015 %+0.28 °C	0.03 %+0.56 °C
1000 Ω Pt(385)	-200 to 100 °C	0.2 °C	0.4 °C	250 μA	0.2 °C	0.4 °C
	100 to 630 °C	0.015 %+0.18 °C	0.03 %+0.36 °C		0.015 %+0.18 °C	0.03 %+0.36 °C
100 Ω Pt(3916)	-200 to 100 °C	0.2 °C	0.4 °C	1 mA	0.2 °C	0.4 °C
	100 to 630 °C	0.015 %+0.18 °C	0.03 %+0.36 °C		0.015 %+0.18 °C	0.03 %+0.36 °C
100 Ω Pt(3926)	-200 to 100 °C	0.2 °C	0.4 °C	1 mA	0.2 °C	0.4 °C
	100 to 630 °C	0.015 %+0.18 °C	0.03 %+0.36 °C		0.015 %+0.18 °C	0.03 %+0.36 °C
10 Ω Cu(427)	-100 to 260 °C	1.5 °C	3 °C	1 mA	1.5 °C	3 °C
120 Ω Ni(672)	-80 to 260 °C	0.15 °C	0.3 °C	1 mA	0.15 °C	0.3 °C
50 Ω Cu(427)	-180 to 200 °C	0.4 °C	0.7 °C	1 mA	0.4 °C	0.7 °C
100 Ω Cu(427)	-180 to 200 °C	0.2 °C	0.4 °C	1 mA	0.2 °C	0.4 °C
YSI400	15 to 50 °C	0.2 °C	0.4 °C	250 μA	0.2 °C	0.4 °C

1. Sensor inaccuracies not included.
 2. Resolution: 0.1 °C.
 3. Read accuracy is based on 4-wire input. For 3-wire RTD measurements, assuming all three RTD leads are matched, add 1.0 °C (Pt10 and Cu10), 0.6 °C (Pt50 and Cu50), 0.4 °C (Other RTD types) to the specifications.
 4. Source Accuracy in source mode is based on 0.5 mA~3 mA (1.00 Ω~400.00 Ω), 0.05 mA~0.8 mA (400.0 Ω~1500.0 Ω), 0.05 mA~0.4 mA (1500.0 Ω~4000.0 Ω), excitation current (0.25 mA for Pt1000 range).
 5. Temperature Coefficient: ±0.05 °C /°C for measure, ± 0.05 °C /°C (<18 °C or >28 °C) for source.
 6. Supports pulsed transmitters and PLCs with pulse times as short as 5 ms.

Thermocouple input and output (Fluke 714B)

TC Type	Range (°C)	Measure (°C)		Source (°C)	
		1 year	2 year	1 year	2 year
E	-250 to 200 °C	1.3	2.0	0.6	0.9
	-200 to -100 °C	0.5	0.8	0.3	0.4
	-100 to 600 °C	0.3	0.4	0.3	0.4
	600 to 1000 °C	0.4	0.6	0.2	0.3
N	-200 to -100 °C	1.0	1.5	0.6	0.9
	-100 to 900 °C	0.5	0.8	0.5	0.8
	900 to 1300 °C	0.6	0.9	0.3	0.4
J	-210 to -100 °C	0.6	0.9	0.3	0.4
	-100 to 800 °C	0.3	0.4	0.2	0.3
	800 to 1200 °C	0.5	0.8	0.3	0.3
K	-200 to -100 °C	0.7	1.0	0.4	0.6
	-100 to 400 °C	0.3	0.4	0.3	0.4
	400 to 1200 °C	0.5	0.8	0.3	0.4
	1200 to 1372 °C	0.7	1.0	0.3	0.4
T	-250 to -200 °C	1.7	2.5	0.9	1.4
	-200 to 0 °C	0.6	0.9	0.4	0.6
	0 to 400 °C	0.3	0.4	0.3	0.4
B	600 to 800 °C	1.3	2.0	1.0	1.5
	800 to 1000 °C	1.0	1.5	0.8	1.2
	1000 to 1820 °C	0.9	1.3	0.8	1.2
R	-20 to 0 °C	2.3	2.8	1.2	1.8
	0 to 100 °C	1.5	2.2	1.1	1.7
	100 to 1767 °C	1.0	1.5	0.9	1.4
S	-20 to 0 °C	2.3	2.8	1.2	1.8
	0 to 200 °C	1.5	2.1	1.1	1.7
	200 to 1400 °C	0.9	1.4	0.9	1.4
	1400 to 1767 °C	1.1	1.7	1.0	1.5
C	0 to 800 °C	0.6	0.9	0.6	0.9
	800 to 1200 °C	0.8	1.2	0.7	1.0
	1200 to 1800 °C	1.1	1.6	0.9	1.4
	1800 to 2316 °C	2.0	3.0	1.3	2.0
L	-200 to -100 °C	0.6	0.9	0.3	0.4
	-100 to 800 °C	0.3	0.4	0.2	0.3
	800 to 900 °C	0.5	0.8	0.2	0.3
U	-200 to 0 °C	0.6	0.9	0.4	0.6
	0 to 600 °C	0.3	0.4	0.3	0.4
BP	0 to 1000 °C	1.0	1.5	0.4	0.6
	1000 to 2000 °C	1.6	2.4	0.6	0.9
	2000 to 2500 °C	2.0	3.0	0.8	1.2
XK	-200 to 300 °C	0.2	0.3	0.2	0.5
	300 to 800 °C	0.4	0.6	0.3	0.6
G	100 to 300 °C	1.6	2.4	1.2	1.8
	300 to 1500 °C	1.0	1.5	1.0	1.5
	1500 to 2320 °C	2.0	3.0	1.6	2.4
D	0 to 300 °C	1.6	2.4	1.2	1.8
	300 to 1500 °C	1.0	1.5	1.0	1.5
	1500 to 2315 °C	2.0	3.0	1.6	2.4
P	0 to 1000 °C	1.6	2.4	0.6	0.9
	1000 to 1395 °C	2.0	3.0	0.8	1.2
M	-50 to 100 °C	1.0	1.5	0.4	0.6
	100 to 1000 °C	1.6	2.4	0.6	0.9
	1000 to 1410 °C	2.0	3.0	0.8	1.2

Thermocouple Probes

	Bead	HVAC	Immersion	Surface	Air	Piercing	General purpose	Industrial surface
								
	80PK-1 80PJ-1	80PK-11	80PK-22	80PK-3A	80PK-24	80PK-25 80PT-25	80PK-26	80PK-27
Lowest temperature	-40 °C	-30 °C	-40 °C	0 °C	-40 °C	K Type: -40 °C T Type: -196 °C	-40 °C	-127 °C
Highest temperature	260 °C	105 °C	1090 °C	260 °C	816 °C	350 °C	816 °C	600 °C
Probe material	Type K wire with teflon insulation	Velcro	Inconel 600	Type K sensor with teflon body	Inconel	316 Stainless Steel	304 Stainless Steel	
Probe length	1 m lead wire	48.26 cm velcro cuff	21.27 cm	9.525 cm	21.59 cm	10.16 cm	21.57 cm	20.32 cm
Cable length	1 m			1.3 m	1 m			
Connection	Molded thermocouple plug							
SureGrip handle	No	No	Yes	No	Yes	Yes	Yes	Yes
Key feature	Ideal for initial troubleshooting. Can be secured in place with a magnet.	Velcro probe allows hands free temperature measurement.	For use in liquids or in gels.	Exposed junction for direct contact with flat or slightly convex surfaces.	Perforated baffle for air and non-caustic gas measurements.	Probe material safe for use in foods. Sharp tip pierces solid surfaces.	Use for general purpose air or surface measurements.	Low conductivity stainless steel minimizes thermal shunting. Extra rugged.
Thermocouple types	K, J	K	K			K, T	K	
Typical use								
General purpose	•	•	•	•	•	•	•	•
HVAC	•	•	•	•	•	—	•	•
Food service	—	—	•	—	—	•	—	—
Industrial	•	•	—	—	—	—	—	•
Residential	•	—	—	•	•	•	—	—
Commercial	•	•	•	•	•	•	•	•

Thermocouple kits and accessories

Thermocouple Plug Kits		700TC1 A kit of ten mini-plug connectors. One each of the following: Type J (black) Type K (yellow) Type T (blue) Type E (purple) Type R/S (green) Type B or Cu (white) Type L (J-DIN) (blue) Type U (T-DIN) (brown) Type C (red) Type N (orange)	700TC2 A kit of seven mini-plug connectors. Type J (black), two Type K (yellow), two Type E (purple), one Type T (blue), one Type R/S (green), one
80PK-8, 80PK-10, Pipe Clamp Temperature Probes		• Type K thermocouples clamp securely onto pipes for fast temperature and superheat measurements • Durable ribbon sensors • 1 m lead • Measure from -29 °C to 149 °C • 80PK-8 for 6.4 mm to 34.9 mm • 80PK-10 for 32 mm to 64 mm	
80CK-M and 80CJ-M Type K and J Male Mini-Connectors		• Isothermal screw terminal for K or J wire • Suitable for up to 20 gauge thermocouple wire • Color coded to industry standards (K-yellow, J-black) • Two per package	
80PJ-EXT, 80PK-EXT, 80PT-EXT Thermocouple Wire Extension Kits		For extending and repairing type J, K or T thermocouple wires. • Kit includes 3 m of thermocouple wire and 1 pair of male/female mini-connectors • Maximum continuous exposure temperature: 260 °C • 80PK-EXT is compatible with type K thermometers; 80PJ-EXT is designed for type J thermometers, and 80PT-EXT is designed for type T thermometers	
5627A-6-J, 5627A-9-J and 5627A-12-J Industrial RTD probes		5627A-6-J, 5627A-9-J and 5627A-12-J Industrial RTD probes for Fluke-712B • 15.24 cm and 22.86 cm (6 and 9 inch) models measure to 300 °C, 30.48 cm model (12 inch) measures up to 420 °C • Accuracy to ± 0.025 °C. • NVLAP-accredited calibration included • Uses IEC standard PT-100-385 RTD curve • Each probe is individually calibrated and includes a NVLAP-accredited report of calibration • Terminated with (4) Banana plugs for 4-wire temperature measurement with the 712B • Add 2601 (22.86 cm, 9 in) or 2609 (63.5 cm, 25 in) protective case to protect the probe	

Ordering information

FLUKE-712B Temperature Calibrator

FLUKE-714B Temperature Calibrator

Included equipment

Magnetic hanging tool, batteries, manual, traceable calibration certificate, and test leads

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