Manual Supplement

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This supplement contains information necessary to ensure the accuracy of the above manual. This manual is distributed as an electronic manual on the following CD-ROM:

CD Title:	525B
CD Rev. & Date:	10/2007
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Change #1

Replace page 6-6 with the following:

Testing DC Current Output

Use the 8508A and the precision shunt to measure the 525B output as shown in Figure 6-2. Take the Voltage reading from the 8508A and divide it by the 742A-1 actual value to determine the current output. Verify the measurements listed in Table 6-4.

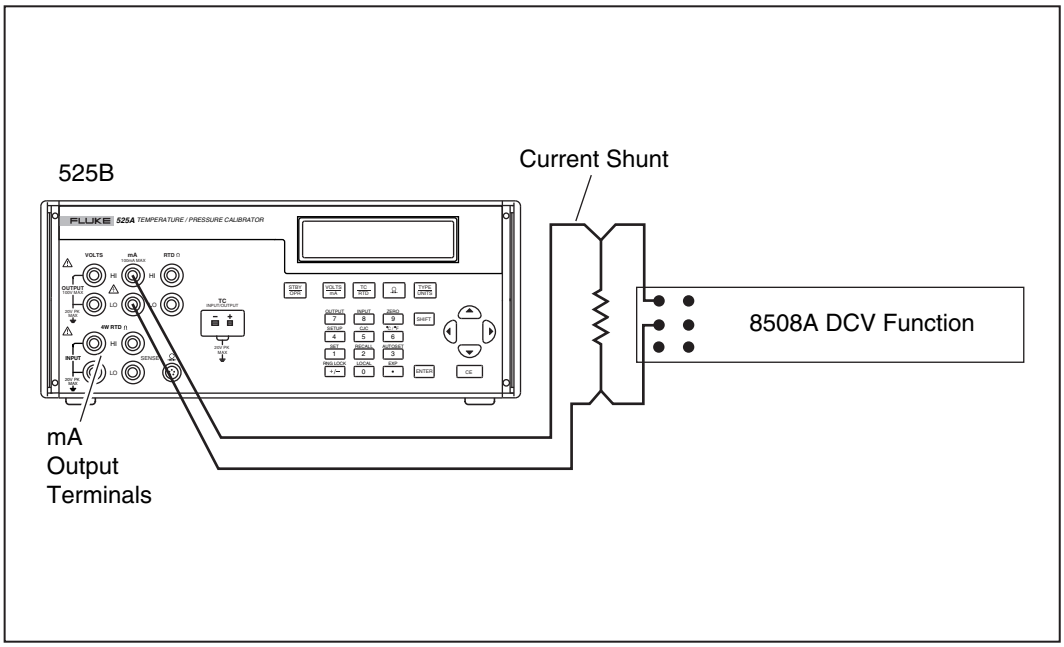

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Figure 6-2. Output DC Current

Table 6-4. Measuring DC Current

100 mA Output (mA)	Volt	Current (I=E/R)	742A-1 Shunt Value	90 Day (µA) Spec	1 Year (µA) Spec
0.000			Direct into 8508A Current Input, Autorange	1.0	1.0
25.000				2.0	2.25
75.000				4.0	4.75
100.000				5.0	6.00

Change #2

On page 6-5, Table 6-3, under **Range** 10.0 V, **Nominal Value (V)**:

Change: 25

To: 2.5

On page 6-10, replace Table 6-6 with the following:

Table 6-6. Ohms Output Ranges

Range (Ω)	Output (Ω)	90 Day Limits (Ω)	1 Year Limits (Ω)
400	5	0.025	0.15
	100	0.025	0.15
	200	0.025	0.15
	300	0.025	0.15
	400	0.025	0.15
4000	5	0.025	0.3
	1000	0.025	0.3
	2000	0.025	0.3
	3000	0.025	0.3
	4000	0.025	0.3

On page 6-12, replace Table 6-7 with the following:

Table 6-7. Ohms Ratio

Range (Ω)	742A Actual Value (Ω)	Ratio	5520A Actual Value (Ω)	525B Reading	90-Day Spec.	1-Year Spec.
400						
10					0.004	0.004
100					0.007	0.006
200					0.008	0.008
300					0.014	0.010
400					0.012	0.012
4000						
10					0.04	0.04
1000					0.06	0.06
2000					0.08	0.08
3000					0.10	0.10
4000					0.12	0.12

Change #3, 51061, 51464, 54684

On pages 7-1 through 7-8 replace the entire ***Specifications*** section with the following:

General Specifications

Warm up time ..... Twice the time since last warmed up, to a maximum of 30 minutes.
Settling time ..... Less than 5 seconds for all functions and ranges except as noted.
Standard interface ..... RS-232, IEEE-488 (GPIB)
Temperature performance
Operating ..... 0 °C to 50 °C
Calibration (tcal) ..... 18 °C to 28 °C
Storage ..... -20 °C to 70 °C
Electromagnetic compatibility ..... CE: Conforms to EN61326
Temperature coefficient ..... Temperature coefficient for temperatures outside tcal ± 5 °C is 10 % of the 90 day specification (or 1 year if applicable) per °C
Relative humidity
Operating ..... < 80 % to 30 °C, < 70 % to 40 °C, < 40 % to 50 °C
Storage ..... < 95 % noncondensing
Altitude
Operating ..... 3,050 m (10,000 ft) maximum
Nonoperating ..... 12,200 m (40,000 ft) maximum
Safety ..... EN 61010 Second, ANSI/ISA-S82.01-1994, CAN/CSA-C22.2 No. 1010.1-92, NRTL
Pollution Degree 2
Analog low isolation ..... 20 V
Line power
Line Voltage (selectable) ..... 100 V/120 V or 220 V/240 V
Line Frequency ..... 47 to 63 Hz
Line Voltage Variation ..... ± 10 % about line voltage setting
Power consumption ..... 15 VA maximum
Dimensions
Height ..... 13.3 cm (5.25 in) plus 1.5 cm (0.6 in) four feet on bottom
Width ..... ¾ standard rack width
Depth ..... 47.3 cm (18.6 in) overall
Weight (without options) ..... 4 kg (9 lb)

Electrical Specifications

DC Voltage Specifications, Output

Ranges[1]	Absolute Uncertainty, tcal ± 5 °C ± (ppm of output + µV)				Stability	Resolution	Maximum Burden[2]
	90 days		1 year		24 hours, ± 1 °C ± (ppm of output + µV)		
0 to 100.000 mV	25	3	30	3	5 + 2	1 µV	10 mA
0 to 1.00000 V	25	10	30	10	4 + 10	10 µV	10 mA
0 to 10.0000 V	25	100	30	100	4 + 100	100 µV	10 mA
0 to 100.000 V	25	1 mV	30	1 mV	5 + 1 mV	1 mV	1 mA
TC Output							
-10 to 75.000 mV	25	3	30	3	5 + 2	1 µV	10 Ω

Notes:
[1] All outputs are positive only.
[2] Remote sensing is not provided. Output resistance is < 1Ω.

Ranges	Noise	
	Bandwidth 0.1 to 10 Hz ± (ppm of output + μV p-p)	Bandwidth 10 Hz to 10 kHz (μV rms)
0 to 100.000 mV	1 μV	6 μV
0 to 1.00000 V	10 μV	60 μV
0 to 10.0000 V	100 μV	600 μV
0 to 100.000 V	10 ppm+1 mV	20 mV

DC Current Specifications, Output

Ranges[1]	Absolute Uncertainty tcal ± 5 °C ± (ppm of output + μA)				Resolution	Maximum Compliance Voltage	Maximum Inductive Load
	90 days		1 year				
0 to 100.000 mA	40	1	50	1	1 μA	12 V	100 mH

Note:

[1] All outputs are positive only.

Ranges	Noise	
	Bandwidth 0.1 to 10 Hz p-p	Bandwidth 10 Hz to 10 kHz rms
0 to 100.000 mA	2000 nA	20 μA

Resistance Specifications, Output

Ranges[1]	Absolute Uncertainty tcal ± 5°C, ± Ω		Resolution	Allowable Current[2]
	90 days	1 year		
5 to 400.00 Ω	0.012	0.015	0.001 Ω	1 to 3 mA
5 to 4.0000 kΩ	0.25	0.3	0.01 Ω	100 μA to 1 mA

Notes:

[1] Continuously variable from 0 to 4 kΩ.

[2] For currents lower than shown, the floor adder increases by Floor(new) = Floor(old) x Imin/Iactual.
For example, a 500 μA stimulus measuring 100 Ω has a floor uncertainty of 0.015 Ω x 1 mA/500 μA = 0.03 Ω.

Resistance Specifications, Input

Ranges[1]	Absolute Uncertainty tcal ± 5°C, ± (ppm of output + Ω)				Resolution	Stimulus Current
	90 days		1 year			
0 to 400.00 Ω	20	0.0035	20	0.004	0.001 Ω	1 mA
0 to 4.00000 kΩ	20	0.035	20	0.04	0.01 Ω	0.1 mA

Note:

[1] 4-wire mode.

Thermocouple Specification, Output and Input

TC Type	Range (°C)		Absolute Uncertainty tcal ± 5 °C, ± (°C)[1]	
			Output/Input	
	Minimum	Maximum	90 days	1 year
B	600 °C 800 °C 1550 °C	800 °C 1550 °C 1820 °C	0.42 °C 0.40 °C 0.44 °C	0.46 °C 0.40 °C 0.45 °C
C	0 °C 150 °C 650 °C 1000 °C 1800 °C	150 °C 650 °C 1000 °C 1800 °C 2316 °C	0.25 °C 0.21 °C 0.23 °C 0.38 °C 0.63 °C	0.30 °C 0.26 °C 0.31 °C 0.50 °C 0.84 °C
E	-270 °C -100 °C -25 °C 650 °C	-100 °C -25 °C 650 °C 1820 °C	0.38 °C 0.16 °C 0.14 °C 0.16 °C	0.50 °C 0.18 °C 0.16 °C 0.21 °C
J	-210 °C -100 °C -30 °C 760 °C	-100 °C -30 °C 760 °C 1200 °C	0.20 °C 0.18 °C 0.14 °C 0.18 °C	0.27 °C 0.20 °C 0.17 °C 0.23 °C
K	-270 °C -100 °C -25 °C 120 °C 1000 °C	-100 °C -25 °C 120 °C 1000 °C 1372 °C	0.25 °C 0.19 °C 0.14 °C 0.19 °C 0.30 °C	0.33 °C 0.22 °C 0.16 °C 0.26 °C 0.40 °C
L	-200 °C -100 °C 800 °C	-100 °C 800 °C 900 °C	0.37 °C 0.26 °C 0.17 °C	0.37 °C 0.26 °C 0.17 °C
N	-270 °C -100 °C -25 °C 410 °C	-100 °C -25 °C 410 °C 1300 °C	0.33 °C 0.20 °C 0.16 °C 0.21 °C	0.40 °C 0.24 °C 0.19 °C 0.27 °C
R	-50 °C 250 °C 400 °C 1000 °C	250 °C 400 °C 1000 °C 1767 °C	0.58 °C 0.34 °C 0.31 °C 0.30 °C	0.58 °C 0.35 °C 0.33 °C 0.40 °C
S	-50 °C 250 °C 1000 °C 1400 °C	250 °C 1000 °C 1400 °C 1767 °C	0.56 °C 0.36 °C 0.30 °C 0.35 °C	0.56 °C 0.36 °C 0.37 °C 0.46 °C
T	-270 °C -150 °C 0 °C	-150 °C 0 °C 400 °C	0.51 °C 0.18 °C 0.13 °C	0.63 °C 0.24 °C 0.16 °C
U	-200 °C 0 °C	0 °C 600 °C	0.56 °C 0.27 °C	0.56 °C 0.27 °C
XK	-200 °C -100 °C 300 °C	-100 °C 300 °C 800 °C	0.22 °C 0.12 °C 0.19 °C	0.22 °C 0.13 °C 0.20 °C
BP	0 °C 200 °C 600 °C 800 °C 1600 °C 2000 °C	200 °C 600 °C 800 °C 1600 °C 2000 °C 2500 °C	0.42 °C 0.32 °C 0.39 °C 0.45 °C 0.57 °C 0.67 °C	0.42 °C 0.32 °C 0.40 °C 0.46 °C 0.58 °C 0.80 °C

Note:

[1] Does not include thermocouple wire error.

RTD and Thermistor Specification, Output

RTD Type	Range (°C)		Absolute Uncertainty tcal ± 5 °C, ± (°C)[1]	
	Minimum	Maximum	90 days	1 year
Pt 385, 100 Ω	-200 °C	800 °C	0.04 °C	0.05 °C
Pt 3926, 100 Ω	-200 °C	630 °C	0.04 °C	0.05 °C
Pt 3916, 100 Ω	-200 °C	630 °C	0.04 °C	0.05 °C
Pt 385, 200 Ω	-200 °C 400 °C	400 °C 630 °C	0.35 °C 0.42 °C	0.40 °C 0.50 °C
Pt 385, 500 Ω	-200 °C	630 °C	0.15 °C	0.17 °C
Pt 385, 1000 Ω	-200 °C	630 °C	0.07 °C	0.09 °C
Ni 120, 120 Ω	-80 ° C	260 °C	0.02 °C	0.02 °C
Cu 427, 10 Ω[2]	-100 °C	260 °C	0.30 °C	0.38 °C
YSI 400	15 °C	50 °C	0.005 °C	0.007 °C

Notes:

[1] 2-wire output.

[2] Based on MINCO Application Aid No. 18.

RTD and Thermistor Specification, Input

RTD Type	Range (°C)		Absolute Uncertainty tcal ± 5 °C, ± (°C)[1]	
	Minimum	Maximum	90 days	1 year
Pt 385, 100 Ω	-200 °C -80 °C 100 °C 300 °C 400 °C 630 °C	-80 °C 100 °C 300 °C 400 °C 630 °C 800 °C	0.012 °C 0.018 °C 0.022 °C 0.025 °C 0.031 °C 0.037 °C	0.013 °C 0.020 °C 0.024 °C 0.026 °C 0.033 °C 0.038 °C
Pt 3926, 100 Ω	-200 °C -80 °C 0 °C 100 °C 300 °C 400 °C	-80 °C 0 °C 100 °C 300 °C 400 °C 630 °C	0.012 °C 0.014 °C 0.016 °C 0.021 °C 0.024 °C 0.030 °C	0.013 °C 0.015 °C 0.017 °C 0.022 °C 0.026 °C 0.032 °C
Pt 3916, 100 Ω	-200 °C -190 °C -80 °C 0 °C 100 °C 300 °C 400 °C 600 °C	-190 °C -80 °C 0 °C 100 °C 300 °C 400 °C 600 °C 630 °C	0.009 °C 0.012 °C 0.014 °C 0.016 °C 0.021 °C 0.024 °C 0.030 °C 0.031 °C	0.013 °C 0.015 °C 0.015 °C 0.017 °C 0.022 °C 0.026 °C 0.031 °C 0.033 °C
Pt 385, 200 Ω	-200 °C -80 °C 0 °C 100 °C 260 °C 300 °C 400 °C	-80 °C 0 °C 100 °C 260 °C 300 °C 400 °C 630 °C	0.047 °C 0.050 °C 0.053 °C 0.054 °C 0.062 °C 0.064 °C 0.079 °C	0.053 °C 0.056 °C 0.060 °C 0.060 °C 0.069 °C 0.071 °C 0.088 °C
Pt 385, 500 Ω	-200 °C 0 °C 100 °C 300 °C 400 °C	0 °C 100 °C 300 °C 400 °C 630 °C	0.023 °C 0.026 °C 0.031 °C 0.035 °C 0.041 °C	0.025 °C 0.028 °C 0.034 °C 0.038 °C 0.045 °C

Pt 385, 1000 Ω	-200 °C 0 °C 100 °C 300 °C 400 °C	0 °C 100 °C 300 °C 400 °C 630 °C	0.014 °C 0.017 °C 0.022 °C 0.024 °C 0.031 °C	0.015 °C 0.018 °C 0.024 °C 0.026 °C 0.033 °C
PtNi 385, 120 Ω (Ni120)	-80 °C	260 °C	0.008 °C	0.009 °C
Cu 427, 10 Ω [2]	-100 °C	260 °C	0.097 °C	0.110 °C
YSI 400	15 °C	50 °C	0.005 °C	0.007 °C
SPRT	-200 °C	660 °C	0.05 °C	0.06 °C

Notes:

[1] 4-wire mode. Uncertainties listed do not include probe uncertainties.

[2] Based on MINCO Application Aid No. 18.

Pressure Measurement

The Calibrator can accept either the Fluke 700 or 525A-P series pressure modules. Pressure modules plug directly into the front panel Lemo connector with the Calibrator firmware autodetecting the type and value of the module you are attaching.

Range .....Determined by pressure module

Accuracy/Resolution .....Determined by pressure module

Units

PSI .....pounds per square inch

inH2O4°C.....inches of water at 4 degrees Celsius

inH2O20°C.....inches of water at 20 degrees Celsius

cmH2O4°C.....centimeters of water at 4 degrees Celsius

cmH2O20°C.....centimeters of water at 20 degrees Celsius

BAR.....bars

mBAR.....millibars

KPAL.....kilopascals

inHG 0°C.....inches of mercury at 0 degrees Celsius

mmHG 0°C.....millimeters of mercury at 0 degrees Celsius

Kg/cm2.....kilograms per square centimeter

Change #4

On page 6-9, replace **Figure 6-5** with the following:

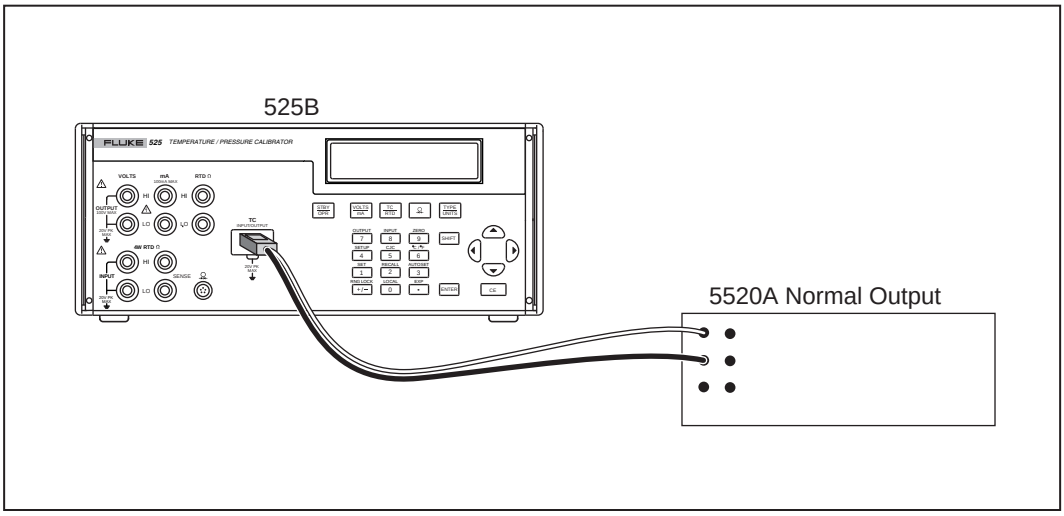

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Figure 6-5. Connections for Measuring TC Input

On page 6-12, in the first paragraph, replace the last sentence with the following:

Use the formula (742A Actual Value Ω/ratio indication = actual 5520A Actual Value Ω).

Under **To test ohm input**, replace Steps 2 and 3 with the following:

2. Set the 525B to 400 ohm range. Select SHIFT, then 9 to Zero.
3. Set the 525B to the 4000 ohm range. Select SHIFT, then 9 to Zero.