

### TECHNICAL DATA



### Features

- Rugged design stands up to field use
- Measures/Sources volts, mA, RTDs, thermocouples, frequency, and ohms
- 0.02% output and measurement accuracy
- Easy-to-read measure/source screen lets you view input and output simultaneously
- Perform fast linearity tests with auto step and auto ramp features
- Powers transmitters during the test using a loop supply with simultaneous mA measurement
- Measures and outputs 10 types of RTDs and 12 types of TC signals
- Rechargeable Ni-MH battery
- Adjustable brightness provides better visibility in poor light
- Store frequently-used test setups for later use
- Low battery indicator and auto shut-off
- Includes test leads, test clips, type K thermocouple wire probe, USB cable, power adapter, carrying case

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### Specifications

#### Measure Function

| Function     | Range                                                     | Resolution                  | Accuracy                                                                                                                                   |
|--------------|-----------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| DC Voltage   | 50, 500mV,<br>30V (upper display),<br>50V (lower display) | 0.001, 0.01, 1mV,<br>0.001V | 50mV: $\pm(0.02\% +10)$<br>500mV: $\pm(0.02\% +5)$<br>30V (upper display):<br>$\pm(0.02\% +2)$<br>50V (lower display):<br>$\pm(0.02\% +2)$ |
| DC Current   | 20mA at 0 to 24mA                                         | 0.001mA                     | $\pm(0.02\% +2)$                                                                                                                           |
| Loop Current | 20mA (loop) at 0 to 24mA                                  |                             |                                                                                                                                            |
| Resistance   | 500, 5000 $\Omega$                                        | 0.01, 0.1 $\Omega$          | $\pm(0.05\% +10)$                                                                                                                          |
| Frequency    | 100Hz, 1, 10, 100kHz                                      | 0.01, 0.1, 1Hz              | $\pm(0.01\% +1)$                                                                                                                           |

#### Thermocouples

| Thermocouple | Range                             | Resolution | Accuracy                                                                                                                                                                                                                                                                      |
|--------------|-----------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type R       | 32 to 3212.6°F (0 to 1767°C)      | 1°F/°C     | 32 to 932°F (0 to 500°C):<br>$\pm 3.24^\circ\text{F}$ ( $\pm 1.8^\circ\text{C}$ )                                                                                                                                                                                             |
| Type S       |                                   |            | 932 to 3212.6°F (500 to 1767°C):<br>$\pm 2.7^\circ\text{F}$ ( $\pm 1.5^\circ\text{C}$ )                                                                                                                                                                                       |
| Type B       | 1112 to 3308°F (600 to 1820°C)    | 1°F/°C     | 1112 to 1472°F (600 to 800°C):<br>$\pm 3.96^\circ\text{F}$ ( $\pm 2.2^\circ\text{C}$ )<br>1472 to 1832°F (800 to 1000°C):<br>$\pm 3.24^\circ\text{F}$ ( $\pm 1.8^\circ\text{C}$ )<br>1832 to 3308°F (1000 to 1820°C):<br>$\pm 2.52^\circ\text{F}$ ( $\pm 1.4^\circ\text{C}$ ) |
| Type E       | -58 to 1832°F (-50 to 1000°C)     | 0.1°F/°C   | -58 to 32°F (-50 to 0°C):<br>$\pm 1.62^\circ\text{F}$ ( $\pm 0.9^\circ\text{C}$ )<br>32 to 1832°F (0 to 1000°C):<br>$\pm 2.7^\circ\text{F}$ ( $\pm 1.5^\circ\text{C}$ )                                                                                                       |
| Type K       | -148 to 2501.6°F (-100 to 1372°C) | 0.1°F/°C   | -148 to 32°F (-100 to 0°C):<br>$\pm 2.16^\circ\text{F}$ ( $\pm 1.2^\circ\text{C}$ )<br>32 to 2501.6°F (0 to 1372°C):<br>$\pm 1.44^\circ\text{F}$ ( $\pm 0.8^\circ\text{C}$ )                                                                                                  |
| Type J       | -76 to 2192°F (-60 to 1200°C)     |            | -76 to 32°F (-60 to 0°C):<br>$\pm 1.8^\circ\text{F}$ ( $\pm 1^\circ\text{C}$ )<br>32 to 2192°F (0 to 1200°C):<br>$\pm 1.26^\circ\text{F}$ ( $\pm 0.7^\circ\text{C}$ )                                                                                                         |
| Type T       | -148 to 752°F (-100 to 400°C)     | 0.1°F/°C   | -148 to 32°F (-100 to 0°C):<br>$\pm 1.8^\circ\text{F}$ ( $\pm 1^\circ\text{C}$ )<br>32 to 752°F (0 to 400°C):<br>$\pm 1.26^\circ\text{F}$ ( $\pm 0.7^\circ\text{C}$ )                                                                                                         |
| Type N       | -328 to 2372°F (-200 to 1300°C)   |            | -328 to 32°F (-200 to 0°C):<br>$\pm 2.7^\circ\text{F}$ ( $\pm 1.5^\circ\text{C}$ )<br>32 to 2372°F (0 to 1300°C):<br>$\pm 1.62^\circ\text{F}$ ( $\pm 0.9^\circ\text{C}$ )                                                                                                     |
| Type L       | -328 to 1652°F (-200 to 900°C)    | 0.1°F/°C   | -328 to 32°F (-200 to 0°C):<br>$\pm 1.53^\circ\text{F}$ ( $\pm 0.85^\circ\text{C}$ )<br>32 to 1652°F (0 to 900°C):<br>$\pm 1.26^\circ\text{F}$ ( $\pm 0.7^\circ\text{C}$ )                                                                                                    |
| Type U       | -328 to 752°F (-200 to 400°C)     | 0.1°F/°C   | -328 to 32°F (-200 to 0°C):<br>$\pm 1.98^\circ\text{F}$ ( $\pm 1.1^\circ\text{C}$ )<br>32 to 752°F (0 to 400°C):<br>$\pm 1.35^\circ\text{F}$ ( $\pm 0.75^\circ\text{C}$ )                                                                                                     |
| Type XK      | -328 to 1472°F (-200 to 800°C)    |            | -328 to -148°F (-200 to -100°C):<br>$\pm 0.9^\circ\text{F}$ ( $\pm 0.5^\circ\text{C}$ )<br>-148 to 1472°F (-100 to 800°C):<br>$\pm 1.08^\circ\text{F}$ ( $\pm 0.6^\circ\text{C}$ )                                                                                            |
| Type BP      | 32 to 4532°F (0 to 2500°C)        | 0.1°F/°C   | 32 to 1472°F (0 to 800°C):<br>$\pm 2.16^\circ\text{F}$ ( $\pm 1.2^\circ\text{C}$ )<br>1472 to 4532°F (800 to 2500°C):<br>$\pm 4.5^\circ\text{F}$ ( $\pm 2.5^\circ\text{C}$ )                                                                                                  |

### TECHNICAL DATA

#### RTDs

| RTD                          | Range                                                                                                   | Resolution | Accuracy          |
|------------------------------|---------------------------------------------------------------------------------------------------------|------------|-------------------|
| Pt100<br>(2-wire/3-wire)     | -328 to 1562°F<br>(-200 to 850°C)                                                                       | 0.1°F/°C   | ±0.72°F (±0.4°C)  |
| Pt100 (4-wire)               |                                                                                                         |            | ±0.54°F (±0.3°C)  |
| Pt200<br>(2-wire/3-wire)     | -328 to 482°F (-200 to 250°C):<br>±0.54°F (±0.3°C)<br>482 to 1166°F (250 to 630°C):<br>±2.88°F (±1.6°C) |            |                   |
| Pt200 (4-wire)               | -328 to 482°F (-200 to 250°C):<br>±0.36°F (±0.2°C)<br>482 to 1166°F (250 to 630°C):<br>±1.44°F (±0.8°C) |            |                   |
| Pt500<br>(2-wire/3-wire)     | -328 to 932°F (-200 to 500°C):<br>±1.08°F (±0.6°C)<br>932 to 1166°F (500 to 630°C):<br>±1.62°F (±0.9°C) |            |                   |
| Pt500 (4-wire)               | -328 to 932°F (-200 to 500°C):<br>±0.54°F (±0.3°C)<br>932 to 1166°F (500 to 630°C):<br>±0.72°F (±0.4°C) |            |                   |
| Pt1000<br>(2-wire/3-wire)    | -328 to 1202°F<br>(-200 to 650°C)                                                                       |            | ±0.54°F (±0.3°C)  |
| Pt1000 (4-wire)              |                                                                                                         |            | ±0.27°F (±0.15°C) |
| Cu10                         | -148 to 500°F (-100 to 260°C)                                                                           |            | ±3.24°F (±1.8°C)  |
| Cu50 (2-wire/3-wire)         | -58 to 302°F (-50 to 150°C)                                                                             |            | ±1.44°F (±0.8°C)  |
| Cu50 (4-wire)                |                                                                                                         |            | ±0.9°F (±0.5°C)   |
| Cu100<br>(2-wire/3-wire)     |                                                                                                         |            | ±0.72°F (±0.4°C)  |
| Cu100 (4-wire)               |                                                                                                         |            | ±0.45°F (±0.25°C) |
| Pt100-392<br>(2-wire/3-wire) | -328 to 1166°F<br>(-200 to 630°C)                                                                       |            | ±0.9°F (±0.5°C)   |
| Pt100-392 (4-wire)           | -328 to 1166°F<br>(-200 to 630°C)                                                                       |            | ±0.54°F (±0.3°C)  |
| Pt100-JIS<br>(2-wire/3-wire) |                                                                                                         |            | ±0.9°F (±0.5°C)   |
| Pt100-JIS (4-wire)           |                                                                                                         |            | ±0.54°F (±0.3°C)  |
| Ni120 (2-wire/3-wire)        |                                                                                                         |            | ±0.54°F (±0.3°C)  |
| Ni120 (4-wire)               | -112 to 500°F (-80 to 260°C)                                                                            |            | ±0.36°F (±0.2°C)  |

#### Source Function

| Function        | Range                                        | Resolution                | Accuracy                                                  |
|-----------------|----------------------------------------------|---------------------------|-----------------------------------------------------------|
| DC Voltage      | 100mV, 1, 10V                                | 0.001, 0.01mV,<br>0.0001V | $\pm(0.02\% +10)$                                         |
| DC Current      | 20mA at 0 to 24mA<br>20mA (SIM) at 0 to 24mA | 0.001mA                   | $\pm(0.02\% +2)$                                          |
| Resistance      | 400, 4000 $\Omega$ , 40k $\Omega$            | 0.01, 0.1, 1 $\Omega$     | $\pm(0.02\% +8)$<br>$\pm(0.05\% +10)$<br>$\pm(0.1\% +40)$ |
| Frequency       | 200, 2000Hz, 20, 100kHz                      | 0.01, 0.1, 1, 10Hz        | $\pm(0.01\% +1)$ ( $\pm 3$ dgt.),<br>100kHz: $\pm 5$ dgt. |
| Pulse           | 100Hz, 1, 10kHz                              | 1 cyc                     | $\pm 2$ dgt.                                              |
| Switch Quantity | 100Hz, 1, 10, 100kHz                         | 0.01, 0.1, 1, 10Hz        |                                                           |

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#### Thermocouples

| Thermocouple | Range                             | Resolution | Accuracy                                             |
|--------------|-----------------------------------|------------|------------------------------------------------------|
| Type R       | 32 to 3212.6°F (0 to 1767°C)      | 1°F/°C     | 32 to 212°F (0 to 100°C):<br>±2.7°F (±1.5°C)         |
| Type S       |                                   |            | 212 to 3212.6°F (100 to 1767°C):<br>±2.16°F (±1.2°C) |
| Type B       | 1112 to 3308°F (600 to 1820°C)    | 1°F/°C     | 1112 to 1472°F (600 to 800°C):<br>±2.7°F (±1.5°C)    |
|              |                                   |            | 1472 to 3308°F (800 to 1820°C):<br>±1.98°F (±1.1°C)  |
| Type E       | -328 to 1832°F (-200 to 1000°C)   | 0.1°F/°C   | -328 to -148°F (-200 to -100°C): ±1.08°F (±0.6°C)    |
|              |                                   |            | -148 to 1112°F (-100 to 600°C): ±0.9°F (±0.5°C)      |
|              |                                   |            | 1112 to 1832°F (600 to 1000°C): ±0.72°F (±0.4°C)     |
| Type K       | -328 to 2501.6°F (-200 to 1372°C) |            | -328 to -148°F (-200 to -100°C): ±1.08°F (±0.6°C)    |
|              |                                   |            | -148 to 752°F (-100 to 400°C): ±0.9°F (±0.5°C)       |
|              |                                   |            | 752 to 2192°F (400 to 1200°C): ±1.26°F (±0.7°C)      |
|              |                                   |            | 2192 to 2501.6°F (1200 to 1372°C): ±1.62°F (±0.9°C)  |
| Type J       | -328 to 2192°F (-200 to 1200°C)   | 0.1°F/°C   | -200 to -148°F (-200 to -100°C): ±1.08°F (±0.6°C)    |
|              |                                   |            | -148 to 1472°F (-100 to 800°C): ±0.9°F (±0.5°C)      |
|              |                                   |            | 1472 to 2192°F (800 to 1200°C): ±1.26°F (±0.7°C)     |
| Type T       | -418 to 752°F (-250 to 400°C)     | 0.1°F/°C   | ±1.08°F (±0.6°C)                                     |
|              |                                   |            |                                                      |
| Type N       | -328 to 2372°F (-200 to 1300°C)   | 0.1°F/°C   | -328 to -148°F (-200 to -100°C): ±1.8°F (±1°C)       |
|              |                                   |            | -148 to 1652°F (-100 to 900°C): ±1.26°F (±0.7°C)     |
|              |                                   |            | 1652 to 2372°F (900 to 1300°C): ±1.44°F (±0.8°C)     |
| Type L       | -328 to 1652°F (-200 to 900°C)    | 0.1°F/°C   | -328 to 32°F (-200 to 0°C): ±1.53°F (±0.85°C)        |
|              |                                   |            | 32 to 1652°F (0 to 900°C): ±1.26°F (±0.7°C)          |
| Type U       | -328 to 752°F (-200 to 400°C)     | 0.1°F/°C   | -328 to 32°F (-200 to 0°C): ±1.98°F (±1.1°C)         |
|              |                                   |            | 32 to 752°F (0 to 400°C): ±1.35°F (±0.75°C)          |
| Type XK      | -328 to 1472°F (-200 to 800°C)    | 0.1°F/°C   | -328 to -148°F (-200 to -100°C): ±0.9°F (±0.5°C)     |
|              |                                   |            | -148 to 1472°F (-100 to 800°C): ±1.08°F (±0.6°C)     |
| Type BP      | 32 to 4532°F (0 to 2500°C)        | 0.1°F/°C   | 32 to 1472°F (0 to 800°C): ±2.16°F (±1.2°C)          |
|              |                                   |            | 1472 to 4532°F (800 to 2500°C): ±4.5°F (±2.5°C)      |

#### RTDs

| RTD        | Range                          | Resolution | Accuracy                                        |
|------------|--------------------------------|------------|-------------------------------------------------|
| Pt100-385  | -328 to 1472°F (-200 to 800°C) | 0.1°F/°C   | ±0.6°F (±0.33°C)                                |
| Pt100-392  |                                |            | ±0.54°F (±0.3°C)                                |
| Pt200-385  |                                |            | -328 to 482°F (-200 to 250°C): ±0.36°F (±0.2°C) |
|            |                                |            | 482 to 1166°F (250 to 630°C): ±1.44°F (±0.8°C)  |
| Pt100-JIS  | -328 to 1166°F (-200 to 630°C) |            | ±0.54°F (±0.3°C)                                |
| Pt500-385  |                                |            | -328 to 932°F (-200 to 500°C): ±0.54°F (±0.3°C) |
|            |                                |            | 932 to 1166°F (500 to 630°C): ±0.72°F (±0.4°C)  |
| Pt1000-385 |                                |            | ±0.36°F (±0.2°C)                                |
| Cu10       | -148 to 500°F (-100 to 260°C)  |            | ±3.24°F (±1.8°C)                                |
| Cu50       | -58 to 302°F (-50 to 150°C)    |            | ±0.9°F (±0.5°C)                                 |
| Cu100      |                                |            | ±0.45°F (±0.25°C)                               |
| Ni120      | -112 to 500°F (-80 to 260°C)   |            | ±0.36°F (±0.2°C)                                |

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#### Function Specifications

|                      |                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------|
| Ramp Functions:      | Source functions: Voltage, Current, Resistance, Frequency, Temperature Ramps: Slow ramp, fast ramp, 25% step-ramp |
| Loop Power Function: | Voltage: 24V<br>Accuracy: 10%<br>Maximum current: 22mA, short circuit protected                                   |
| Step Functions:      | Source functions: Voltage, Current, Resistance, Frequency, Temperature Steps: 25% of range, 100% of range         |

#### General Specifications

|                           |                                       |
|---------------------------|---------------------------------------|
| Display:                  | 20,000 count<br>TFT color LCD display |
| Kick Stand:               | Yes                                   |
| Power Supply:             | 1.2V x 6 AA rechargeable batteries    |
| Auto shut-off:            | Yes                                   |
| Low Battery Indicator:    | Yes                                   |
| Replaceable Test Leads:   | Yes                                   |
| Product Certifications:   | CE, RoHS                              |
| Operating Temperature:    | 14 to 131°F (-10 to 55°C)             |
| Operating Humidity Range: | ≤95%                                  |
| Storage Temperature:      | -4 to 158°F (-20 to 70°C)             |
| Max Operating Altitude:   | 6561' (2000m)                         |
| Dimensions:               | 7.7 x 3.7 x 2.3" (195 x 95 x 58mm)    |
| Weight:                   | 22.92oz (650g)                        |

| Model             | Description                             |
|-------------------|-----------------------------------------|
| <b>R5850</b>      | Multifunction Process Calibrator        |
| <b>TP-01</b>      | Type K Beaded Wire Probe                |
| <b>R1000</b>      | Safety Test Lead Set                    |
| <b>R1020</b>      | Fused Test Lead Set                     |
| <b>R2920</b>      | Type K Surface Probe                    |
| <b>R2930</b>      | Type K Right Angle Surface Probe        |
| <b>R2940</b>      | Type K Air/Gas Probe                    |
| <b>R2950</b>      | Type K Immersion Probe                  |
| <b>R2960</b>      | Type K Needle Tip Probe                 |
| <b>R8888</b>      | Medium Hard Carrying Case               |
| <b>R1050-KIT2</b> | Deluxe Safety Test Lead Kit             |
| <b>R5850-NIST</b> | Multifunction Process Calibrator & NIST |