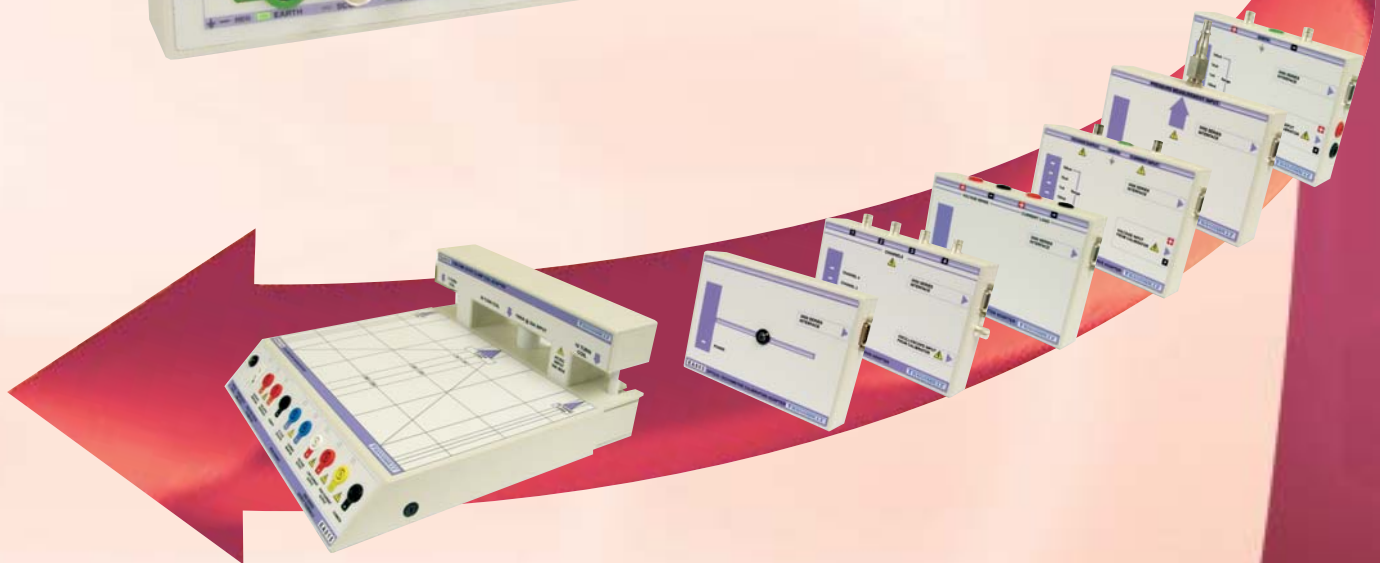
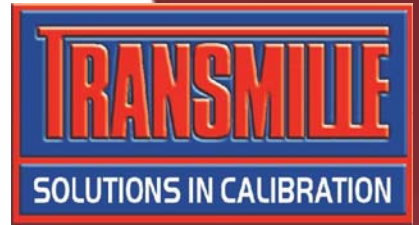


# MODEL 3010

## EXTENDED SPECIFICATIONS



**8ppm LABORATORY REFERENCE**

|                              |  |   |
|------------------------------|--|---|
| Warm Up Time                 | Double the time since last used up to 20 minutes maximum   |   |
| Standard Interfaces          | RS232  |   |
| Optional Interfaces          | GPIB (IEEE-488) : USB (Universal Serial Bus)   |   |
| Temperature Performance      | Storage : -5°C to +60°C<br>Operation : 0°C to +50°C  |   |
| Relative Humidity            | Operation : <80% to 30°C, <70% to 40°C, <40% to 50°C<br>Storage : <95%, non-condensing   |   |
| Altitude                     | Operation : 3000m (10,000ft) Maximum<br>Transit : 12000m (40,000ft) Maximum  |   |
| EMC & Safety                 | The calibrator line input plug must be earthed<br>See D.O.C for full details   |   |
| Line Power                   | Line Voltage Selectable : 110V / 230V<br>Line Frequency : 50Hz to 60Hz<br>Line Voltage Variation : -6% +10%  |   |
| Power Consumption            | 28 Watts (Standby)   | 200 Watts (Maximum)                                 |
| Low Analogue Isolation       | 100V   |   |
| Connections                  | Voltage / 2 Wire Resistance  | 1x Black : 1x White 4mm Safety sockets              |
|                              | Low Current (<=2A)   | 1x Black : 1x Red 4mm Safety sockets                |
|                              | High current (>2A)   | 1x Blue : 1x Yellow 4mm Safety sockets              |
|                              | Earth Connection   | 1x Green 4mm Safety Socket                          |
|                              | Oscilloscope Functions   | 2x BNC terminal                                     |
|                              | Feature (Ext. Pod)   | 1x Female 'D' type socket                           |
|                              | RS232 Interface  | 1x Female 'D' type socket                           |
| RS232 Settings               | Baud Rate  | 9600  |
|                              | Parity   | None  |
|                              | Data Bits  | 8   |
|                              | Stop Bits  | 1   |
| Display Information          | Type   | Backlit Black on white film STN type                |
|                              | Viewing Area   | 124.3mm * 34mm                                      |
|                              | Resolution   | 256 * 94 dots                                       |
|                              | Backlight Type   | Cold fluorescent lamp                               |
|                              | Brightness   | 70 to 90 cd/m <sup>2</sup>                          |
| Indicators                   | Voltage / Current / High Current   | Red LED (between terminals)                         |
|                              | Negative to ground   | Green LED (left of Earth terminal)                  |
|                              | Oscilloscope   | Green LED (right of BNC Connector)                  |
|                              | Feature Connector (Ext. Pod)   | Green LED (right of 'D' type connector)             |
| Keyboard                     | Rubber key   |   |
| Fuses                        | Mains Inlet  | 3.15A A/S (240 Volt)<br>5A A/S (110 Volt operation) |
| Isolation                    | Outputs are opto-isolated from mains earth and the RS-232 interface<br>Maximum common mode voltage between earth and the low terminals 30 Volts ac/dc. |   |
| Dimensions & Weights         | Calibrator Only  | 14cm x 43cm x 46cm : 12.5kgs                        |
|                              | Calibrator in Shipping Box   | 58cm x 56cm x 37cm : 15kgs                          |
|                              | Calibrator in Soft Carry Case  | 49cm x 50cm x 19cm : 13.5kgs                        |
|                              | Calibrator in Hard Transit case  | 55cm x 56cm x 26cm : 22kgs                          |
| Warranty Period              | 3 Years (Parts & Labour)   |   |
| Recommended Service Interval | 1 Year   |   |
| Supplied Connections         | 1x Serial Interface Connection   | 1x Mains Lead                                       |
|                              | 1x Adaptor Connection Lead (if at least one adaptor ordered)   |   |
| Optional Lead Set Kit        | 1x Voltage connection leadset<br>1x Low Current connection leadset<br>1x High current connection leadset<br>1x AC connection leadset                   |   |
| Mounting Kit (optional)      | 3U rack mount kit  |   |
| Case Colour                  | Cream (RAL 9002)   |   |

**1 year Total Accuracy Specifications at Tcal ±5°C & Range Parameters**

| Range     | Resolution | Max. Burden Current | Typical Output Resistance <sup>1</sup> | Overload Protection | 1 Year Total ppm set | uV     |
|-----------|------------|---------------------|--|---------------------|----------------------|--------|
| 0-202mV   | 0.01uV     | 1mA <sup>2</sup>    | 50 Ohms                                | 20 V                | 15                   | + 2    |
| 0.2-2.02V | 0.1uV      | 50mA                | 0.2 Ohms                               | 150V                | 9                    | + 2.5  |
| 2-20.2V   | 1uV        | 50mA                | 0.2 Ohms                               | 150V                | 8                    | + 24   |
| 20-202V   | 10uV       | 20mA <sup>3</sup>   | 0.5 Ohms                               | 1200V               | 12                   | + 240  |
| 200-1025V | 100uV      | 20mA <sup>3</sup>   | 0.7 Ohms                               | 1200V               | 12                   | + 2400 |

**Stability (Accuracy relative to calibration Standards)**

| Range     | 24 Hour Stability |        | Noise <sup>4</sup><br>uV | 90 day Rel |        | 180 Day Rel |        | 1 year Rel |        | 2 year Rel |        |
|-----------|-------------------|--------|--------------------------|------------|--------|-------------|--------|------------|--------|------------|--------|
|           | ppm Set           | uV     |                          | ppm Set    | uV     | ppm Set     | uV     | ppm Set    | uV     | ppm Set    | uV     |
| 0-202mV   | 2                 | + 1    | 0.3                      | 9.6        | + 2    | 10.8        | + 2    | 12         | + 2    | 16.8       | + 2.8  |
| 0.2-2.02V | 2                 | + 1.2  | 0.4                      | 5.6        | + 2.5  | 6.3         | + 2.5  | 7          | + 2.5  | 9.8        | + 3.5  |
| 2-20.2V   | 2                 | + 9    | 3                        | 4.8        | + 24   | 5.4         | + 24   | 6          | + 24   | 8.4        | + 33.6 |
| 20-202V   | 3.5               | + 120  | 40                       | 8          | + 240  | 9           | + 240  | 10         | + 240  | 14         | + 336  |
| 200-1020V | 5                 | + 1100 | 363                      | 8          | + 2400 | 9           | + 2400 | 10         | + 2400 | 14         | + 3360 |

**Notes**

Note 1: Allowance must be made for output resistance when driving into a load.

Note 2: Limited by 50 Ohm output impedance.

Note 3: Internally adjustable from 2mA to 30mA - Factory set to 20mA as standard.

For safety the trip is controlled by a fail-safe circuit independent of the processor which shuts the high voltage output off in the event of an overload.

Note 4: Typical RMS noise figures at 50% of full scale, bandwidth 1Hz to 10Hz.

**High Voltage Safety**

High voltage output is ramped to allow instrument under test to auto range.

Standby is automatically activated when setting voltages greater than 20V or 200V from a lower voltage.

Standby is automatically selected for high voltage (>20V) after 20 minutes on the same setting.

High voltage (> 20V) output is indicated to user through an audible warning beep.

An external high voltage output/standby control switch is available as an option.

2 Wire output / Remote sensing not available.

Isolation : Floating or grounded selection available as standard.

Maximum floating voltage : 100V

Specifications apply at TCal ± 5°C

Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.

### 1 year Total Accuracy Specifications at TCal $\pm 5^{\circ}\text{C}$ & Range Parameters

| Range      | Resolution | Max. Inductive Load | Compliance Voltage | Overload Protection | 1 Year Total % set | uA   |
|------------|------------|---------------------|--------------------|---------------------|--------------------|------|
| 0-202uA    | 10pA       | 10mH                | 4.2 Volts          | 150V                | 0.01 +             | 0.01 |
| 0.2-2.02mA | 100pA      | 10mH                | 4.2 Volts          | 150V                | 0.005 +            | 0.03 |
| 2-20.2mA   | 1nA        | 10mH                | 4.2 Volts          | 150V                | 0.005 +            | 0.2  |
| 20-202mA   | 10nA       | 10mH                | 4.2 Volts          | 150V                | 0.005 +            | 2    |
| 0.2-2.02A  | 100nA      | 10mH                | 4.2 Volts          | 150V                | 0.013 +            | 30   |
| 2-20.2A    | 1uA        | 10mH                | 3.9 Volts          | 150V                | 0.03 +             | 300  |
| 20.2-30A   | 10uA       | 10mH                | 3.9 Volts          | 150V                | 0.05 +             | 450  |

### Stability (Accuracy relative to calibration Standards)

| Range                 | Noise <sup>1</sup><br>0.1-1Hz | 90 Day Rel<br>%Set | uA   | 180 Day Rel<br>%Set | uA   | 1 Year Rel<br>%Set | uA   | 2 Year Rel<br>%Set | uA    |
|-----------------------|-------------------------------|--------------------|------|---------------------|------|--------------------|------|--------------------|-------|
| 0-202uA               | 180pA                         | 0.006 +            | 0.01 | 0.007 +             | 0.01 | 0.008 +            | 0.01 | 0.011 +            | 0.014 |
| 0.2-2.02mA            | 500pA                         | 0.0032 +           | 0.03 | 0.0036 +            | 0.03 | 0.004 +            | 0.03 | 0.006 +            | 0.042 |
| 2-20.2mA              | 4nA                           | 0.0032 +           | 0.2  | 0.0036 +            | 0.2  | 0.004 +            | 0.2  | 0.006 +            | 0.28  |
| 20-202mA              | 40nA                          | 0.0032 +           | 2    | 0.0036 +            | 2    | 0.004 +            | 2    | 0.006 +            | 2.8   |
| 0.2-2.02A             | 1uA                           | 0.0056 +           | 30   | 0.006 +             | 30   | 0.007 +            | 30   | 0.01 +             | 42    |
| 2-20.2A <sup>2</sup>  | 20uA                          | 0.016 +            | 300  | 0.018 +             | 300  | 0.02 +             | 300  | 0.028 +            | 420   |
| 20.2-30A <sup>2</sup> | 20uA                          | 0.024 +            | 450  | 0.027 +             | 450  | 0.03 +             | 450  | 0.042 +            | 630   |

#### Notes

Note 1 : Typical RMS noise figures at 50% of full scale.

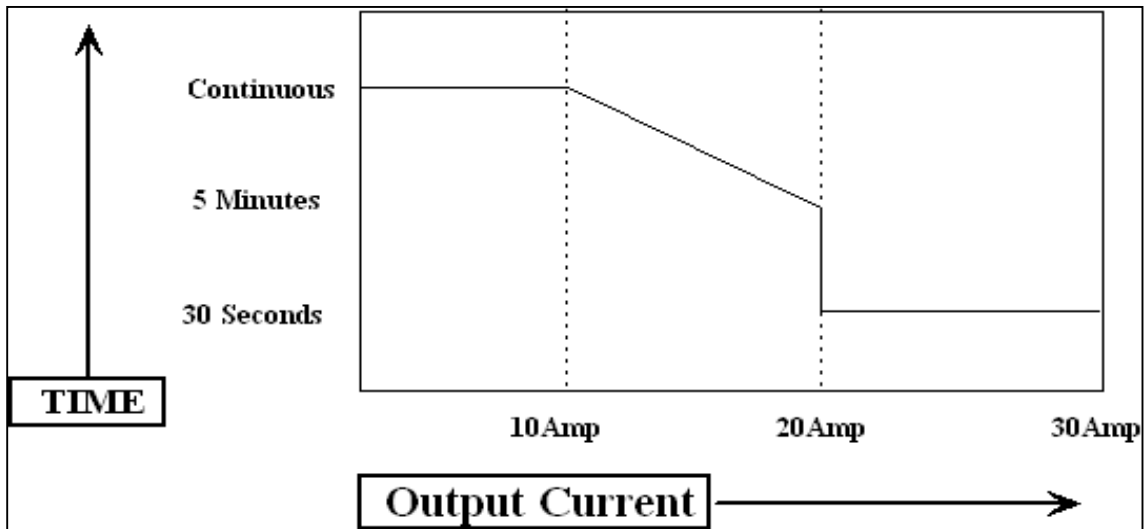
Note 2 : Power & temperature sensor on 30A range - microprocessor monitors & protects from overheating.  
Higher resistance loads allow a longer ON period. See graphs 1 and 2 for details.

Note 3 : Specifications apply to loads of less than 10% of the maximum burden voltage.

Note 4: Zero or floor allowance.

Specifications apply at TCal  $\pm 5^{\circ}\text{C}$

Outside this range an allowance of 0.18 x 1 Year Spec. per  $^{\circ}\text{C}$  should be added.



Graph 1\* : Operating time on 30A range with current into a short circuit at 20°C  
 Continuous current in available up to 10A output.

\* Note            Timing is started after a minimum period of 7 minutes at zero output.  
                       Shorter periods will reduce the output time available.

**1 year Total Accuracy Specifications at TCal ±5°C & Range Parameters**

| Range                  | Frequency         | Resolution | Max. Burden Current | Typical Output Resistance | Overload Protection | 1 Year Accuracy % set | uV    |
|------------------------|-------------------|------------|---------------------|---------------------------|---------------------|-----------------------|-------|
| 0-202mV                | 10 to 44Hz        | 1uV        | 1mA <sup>1</sup>    | 50 Ohms                   | 20 V                | 0.0800 +              | 15    |
|                        | 45 to 999Hz       | 1uV        | 1mA <sup>1</sup>    | 50 Ohms                   | 20 V                | 0.0160 +              | 15    |
|                        | 1 to 19.999kHz    | 1uV        | 1mA <sup>1</sup>    | 50 Ohms                   | 20 V                | 0.0200 +              | 28    |
|                        | 20 to 99.999kHz   | 1uV        | 1mA <sup>1</sup>    | 50 Ohms                   | 20 V                | 0.1000 +              | 40    |
|                        | 100 to 500kHz     | 1uV        | 1mA <sup>1</sup>    | 50 Ohms                   | 20 V                | 0.4000 +              | 100   |
| 0.2-2.02V              | 10 to 44Hz        | 10uV       | 50mA                | 0.2 Ohms                  | 1200V               | 0.0500 +              | 180   |
|                        | 45 to 999Hz       | 10uV       | 50mA                | 0.2 Ohms                  | 1200V               | 0.0160 +              | 120   |
|                        | 1 to 19.999kHz    | 10uV       | 50mA                | 0.2 Ohms                  | 1200V               | 0.0210 +              | 180   |
|                        | 20 to 99.999kHz   | 10uV       | 50mA                | 0.2 Ohms                  | 1200V               | 0.0650 +              | 300   |
|                        | 100 to 500kHz     | 10uV       | 50mA                | 0.2 Ohms                  | 1200V               | 0.3000 +              | 450   |
| 2-20.2V                | 10 to 44Hz        | 100uV      | 50mA                | 0.2 Ohms                  | 1200V               | 0.0500 +              | 1600  |
|                        | 45 to 999Hz       | 100uV      | 50mA                | 0.2 Ohms                  | 1200V               | 0.0160 +              | 1000  |
|                        | 1 to 19.999kHz    | 100uV      | 50mA                | 0.2 Ohms                  | 1200V               | 0.0210 +              | 1600  |
|                        | 20 to 100kHz      | 100uV      | 50mA                | 0.2 Ohms                  | 1200V               | 0.0600 +              | 3000  |
| 20-202V                | 30Hz to 44Hz      | 1mV        | 20mA <sup>2</sup>   | 0.5 Ohms                  | 1200V               | 0.0500 +              | 20mV  |
|                        | 45Hz to 99.999kHz | 1mV        | 15mA <sup>2</sup>   | 0.5 Ohms                  | 1200V               | 0.0150 +              | 12mV  |
|                        | 1 to 9.999kHz     | 1mV        | 15mA <sup>2</sup>   | 0.5 Ohms                  | 1200V               | 0.0200 +              | 16mV  |
|                        | 10 to 40kHz       | 1mV        | 2mA <sup>2</sup>    | 0.5 Ohms                  | 1200V               | 0.0300 +              | 30mV  |
| 200-1020V <sup>3</sup> | 30 to 44Hz        | 10mV       | 20mA <sup>2</sup>   | 0.7 Ohms                  | 1200V               | 0.0550 +              | 200mV |
|                        | 45 to 999Hz       | 10mV       | 15mA <sup>2</sup>   | 0.7 Ohms                  | 1200V               | 0.0200 +              | 60mV  |
|                        | 1kHz to 10kHz     | 10mV       | 2mA <sup>2</sup>    | 0.7 Ohms                  | 1200V               | 0.0250 +              | 120mV |

**Stability (Accuracy relative to calibration Standards)**

| Range                  | Frequency       | Frequency Resolution | 90 day Rel |       | 180 Day Rel |       | 1 year Rel |       | 2 year Rel |       |
|------------------------|-----------------|----------------------|------------|-------|-------------|-------|------------|-------|------------|-------|
|                        |                 |                      | %Set       | uV    | %Set        | uV    | %Set       | uV    | %Set       | uV    |
| 0-202mV                | 10 to 44Hz      | 1Hz                  | 0.0480 +   | 12    | 0.0540 +    | 13.5  | 0.0600 +   | 15    | 0.0840 +   | 21    |
|                        | 45 to 999Hz     | 1Hz                  | 0.0080 +   | 12    | 0.0090 +    | 15    | 0.0100 +   | 15    | 0.0140 +   | 21    |
|                        | 1 to 19.999kHz  | 1Hz                  | 0.0096 +   | 22.4  | 0.0108 +    | 28    | 0.0120 +   | 28    | 0.0168 +   | 39    |
|                        | 20 to 99.999kHz | 1Hz                  | 0.0720 +   | 32    | 0.0810 +    | 40    | 0.0900 +   | 40    | 0.1260 +   | 56    |
|                        | 100 to 500kHz   | 1Hz                  | 0.2400 +   | 80    | 0.2700 +    | 100   | 0.3000 +   | 100   | 0.4200 +   | 140   |
| 0.2-2.02V              | 10 to 44Hz      | 1Hz                  | 0.0360 +   | 144   | 0.0405 +    | 180   | 0.0450 +   | 180   | 0.0630 +   | 252   |
|                        | 45 to 999Hz     | 1Hz                  | 0.0112 +   | 96    | 0.0126 +    | 120   | 0.0140 +   | 120   | 0.0196 +   | 168   |
|                        | 1 to 19.999kHz  | 1Hz                  | 0.0128 +   | 144   | 0.0144 +    | 180   | 0.0160 +   | 180   | 0.0224 +   | 252   |
|                        | 20 to 99.999kHz | 1Hz                  | 0.0464 +   | 240   | 0.0522 +    | 300   | 0.0580 +   | 300   | 0.0812 +   | 420   |
|                        | 100 to 500kHz   | 1Hz                  | 0.2000 +   | 360   | 0.2250 +    | 450   | 0.2500 +   | 450   | 0.3500 +   | 630   |
| 2-20.2V                | 10 to 44Hz      | 1Hz                  | 0.0344 +   | 1280  | 0.0387 +    | 1600  | 0.0430 +   | 1600  | 0.0602 +   | 2240  |
|                        | 45 to 999Hz     | 1Hz                  | 0.0104 +   | 800   | 0.0117 +    | 1000  | 0.0130 +   | 1000  | 0.0182 +   | 1400  |
|                        | 1 to 19.999kHz  | 1Hz                  | 0.0128 +   | 1280  | 0.0144 +    | 1600  | 0.0160 +   | 1600  | 0.0224 +   | 2240  |
|                        | 20 to 100kHz    | 1Hz                  | 0.0416 +   | 2400  | 0.0468 +    | 3000  | 0.0520 +   | 3000  | 0.0728 +   | 4200  |
| 20-202V                | 30Hz to 44Hz    | 1Hz                  | 0.0344 +   | 20mV  | 0.0387 +    | 20mV  | 0.0430 +   | 20mV  | 0.0602 +   | 28mV  |
|                        | 45Hz to 999Hz   | 1Hz                  | 0.0104 +   | 12mV  | 0.0117 +    | 12mV  | 0.0130 +   | 12mV  | 0.0182 +   | 16mV  |
|                        | 1 to 9.999kHz   | 1Hz                  | 0.0128 +   | 16mV  | 0.0144 +    | 16mV  | 0.0160 +   | 16mV  | 0.0224 +   | 22mV  |
|                        | 10 to 40kHz     | 1Hz                  | 0.0192 +   | 30mV  | 0.0216 +    | 30mV  | 0.0240 +   | 30mV  | 0.0336 +   | 56mV  |
| 200-1020V <sup>3</sup> | 30 to 44Hz      | 1Hz                  | 0.0400 +   | 200mV | 0.0450 +    | 200mV | 0.0500 +   | 200mV | 0.0700 +   | 280mV |
|                        | 45 to 999Hz     | 1Hz                  | 0.0120 +   | 60mV  | 0.0135 +    | 60mV  | 0.0150 +   | 60mV  | 0.0210 +   | 105mV |
|                        | 1kHz to 10kHz   | 1Hz                  | 0.0160 +   | 120mV | 0.0180 +    | 120mV | 0.0200 +   | 120mV | 0.0280 +   | 180mV |

All specifications apply from 10% of full scale.<sup>5</sup>

**AC Frequency Accuracy : 30ppm**

| Notes    |  |
|----------|--|
| Note 1 : | Current limited by 50 ohms output resistance.  |
| Note 2 : | Internally adjustable from 2mA to 30mA - Factory set to 20mA as standard<br>For safety the trip is controlled by a fail-safe circuit independent of the processor which shuts the high voltage output off in the event of an overload. |
| Note 3 : | Frequency and voltage combinations are limited.  |
| Note 4 : | Specifications apply up to 10% of maximum load current. Above this level, allowance must be made for output resistance   |
| Note 5 : | Zero or floor allowance.   |

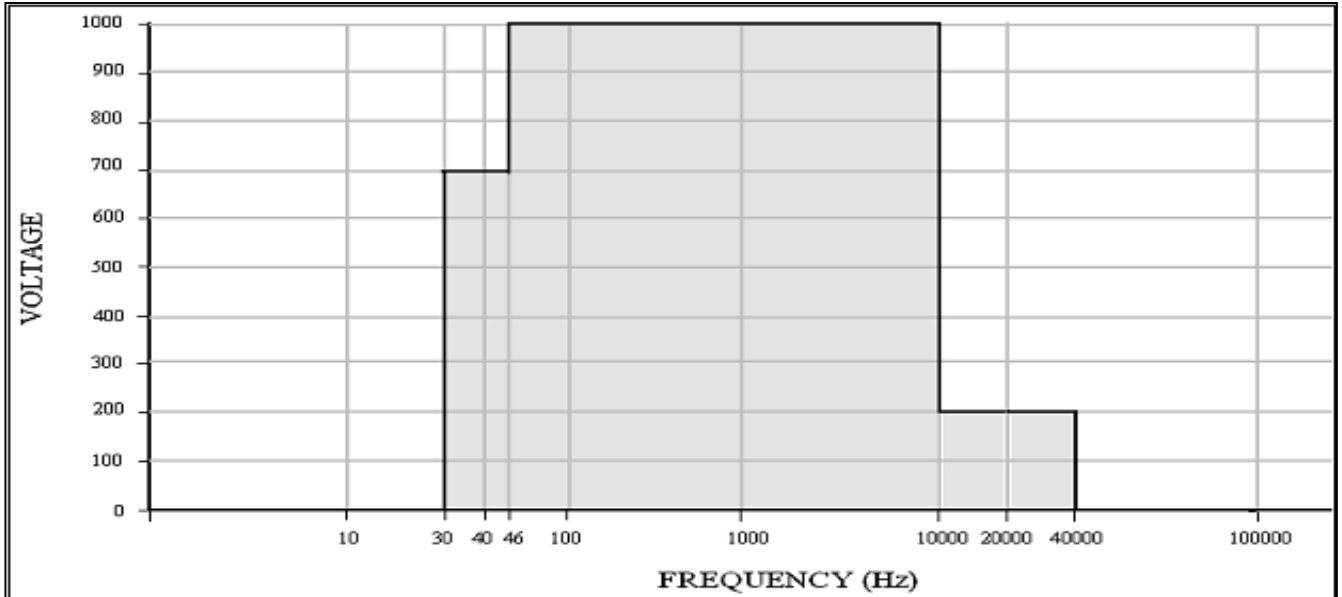
2 Wire output / Remote sensing not available. Maximum floating voltage : 100V.

Isolation : Floating or grounded selection available as standard.

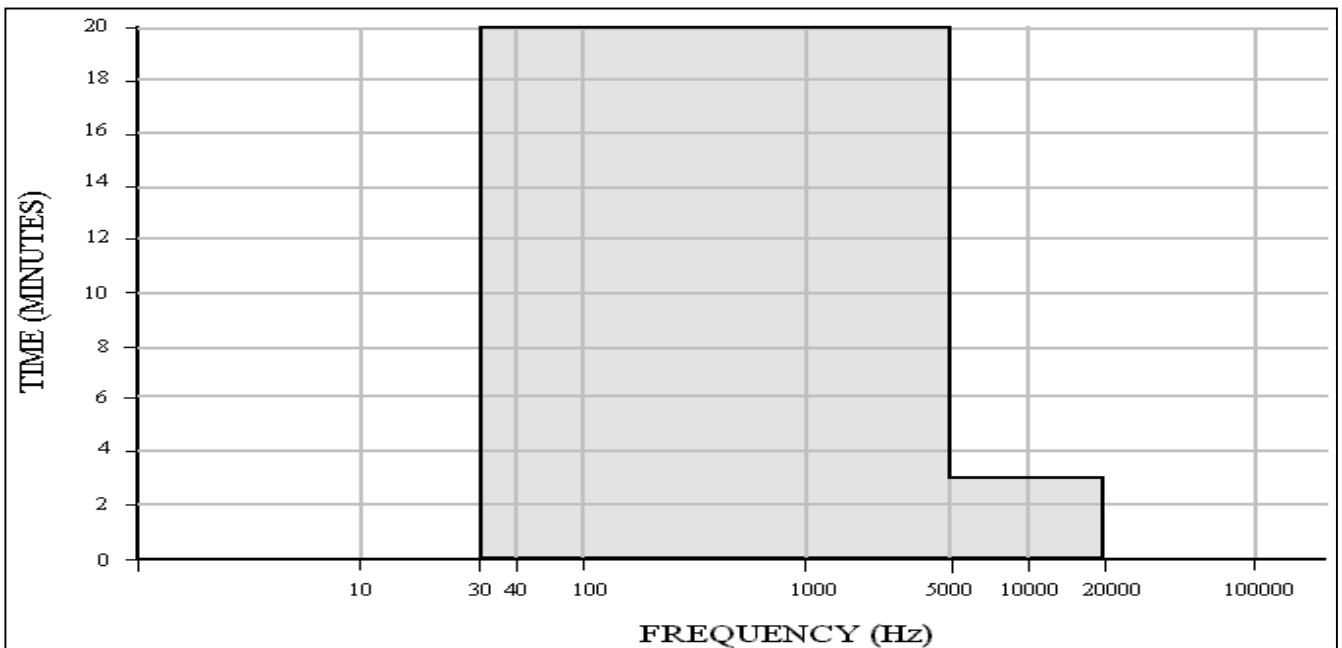
Specifications apply at TCal ± 5°C. Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.

**High Voltage Safety**

High voltage output is ramped to allow instruments under test to auto-range  
 Standby is automatically activated when setting voltages greater than 20V or 200V from a lower voltage  
 Standby is automatically selected for high voltage (>20V) after 20 minutes on the same setting for frequencies up to 5kHz or 3 mins for frequencies above 5kHz. See graph 4.  
 High voltage (> 20V) output is indicated to user through an audible warning beep  
 An external high voltage output/standby control switch is available as an option



Graph 3 : Volt-Hertz profile for 1000V AC range



Graph 4 : Time-Hertz profile for voltages above 20V

**1 year Total Accuracy Specifications at TCal ±5°C & Range Parameters**

| Range      | Frequency     | Resolution | Max. Burden Voltage (peak) | Overload Protection | 1 year Accuracy |        |
|------------|---------------|------------|----------------------------|---------------------|-----------------|--------|
|            |               |            |                            |                     | %Set            | uA     |
| 20-202uA   | 10Hz to 44Hz  | 1nA        | 3 Volts                    | 150V                | 0.20            | + 0.25 |
|            | 45Hz to 999Hz |            |                            |                     | 0.10            | + 0.15 |
|            | 1kHz to 10kHz |            |                            |                     | 0.80            | + 0.25 |
| 0.2-2.02mA | 10Hz to 44Hz  | 10nA       | 3 Volts                    | 150V                | 0.20            | + 0.25 |
|            | 45Hz to 999Hz |            |                            |                     | 0.09            | + 0.2  |
|            | 1kHz to 10kHz |            |                            |                     | 0.50            | + 0.3  |
| 2-20.2mA   | 10Hz to 44Hz  | 100nA      | 3 Volts                    | 150V                | 0.20            | + 3    |
|            | 45Hz to 999Hz |            |                            |                     | 0.09            | + 2    |
|            | 1kHz to 10kHz |            |                            |                     | 0.25            | + 3    |
| 20-202mA   | 10Hz to 44Hz  | 1uA        | 3 Volts                    | 150V                | 0.20            | + 30   |
|            | 45Hz to 999Hz |            |                            |                     | 0.09            | + 20   |
|            | 1kHz to 10kHz |            |                            |                     | 0.50            | + 40   |
| 0.2-2.02A  | 10Hz to 44Hz  | 10uA       | 3 Volts                    | 150V                | 0.20            | + 300  |
|            | 45Hz to 999Hz |            |                            |                     | 0.09            | + 200  |
|            | 1kHz to 5kHz  |            |                            |                     | 0.50            | + 400  |
| 2-30.0A    | 30Hz to 44Hz  | 100uA      | 2.8 Volts                  | 150V                | 0.20            | + 3000 |
|            | 45Hz to 99Hz  |            |                            |                     | 0.06            | + 2000 |
|            | 100Hz to 1kHz |            |                            |                     | 0.30            | + 4000 |

All specifications apply from 10% of full scale.

AC Frequency Accuracy : 30ppm

Settling Time: For 50% change in output: Less than 3 second from standby to within spec

Inductive Loads : Up to 1H may be connected without additional protection providing the frequency/inductance combination does not exceed the maximum burden voltage.

**Stability (Accuracy relative to calibration Standards)**

| Range                | Frequency     | Frequency Resolution | 90 Day Rel |        | 180 Day Rel |        | 1 Year Rel |        | 2 Year Rel |        |
|----------------------|---------------|----------------------|------------|--------|-------------|--------|------------|--------|------------|--------|
|                      |               |                      | %Set       | uA     | %Set        | uA     | %Set       | uA     | %Set       | uA     |
| 20-202uA             | 10Hz to 44Hz  | 1Hz                  | 0.128      | + 0.25 | 0.144       | + 0.25 | 0.160      | + 0.25 | 0.224      | + 0.35 |
|                      | 45Hz to 999Hz | 1Hz                  | 0.056      | + 0.15 | 0.063       | + 0.15 | 0.070      | + 0.15 | 0.098      | + 0.21 |
|                      | 1kHz to 10kHz | 1Hz                  | 0.640      | + 0.2  | 0.720       | + 0.2  | 0.800      | + 0.2  | 1.120      | + 0.28 |
| 0.2-2.02mA           | 10Hz to 44Hz  | 1Hz                  | 0.120      | + 0.25 | 0.135       | + 0.25 | 0.150      | + 0.25 | 0.210      | + 0.35 |
|                      | 45Hz to 999Hz | 1Hz                  | 0.048      | + 0.2  | 0.054       | + 0.2  | 0.060      | + 0.2  | 0.084      | + 0.28 |
|                      | 1kHz to 10kHz | 1Hz                  | 0.320      | + 0.3  | 0.360       | + 0.3  | 0.400      | + 0.3  | 0.560      | + 0.42 |
| 2mA-20.2mA           | 10Hz to 44Hz  | 1Hz                  | 0.120      | + 3    | 0.135       | + 3    | 0.150      | + 3    | 0.210      | + 4.2  |
|                      | 45Hz to 999Hz | 1Hz                  | 0.048      | + 2    | 0.054       | + 2    | 0.060      | + 2    | 0.084      | + 2.8  |
|                      | 1kHz to 10kHz | 1Hz                  | 0.160      | + 3    | 0.180       | + 3    | 0.200      | + 3    | 0.280      | + 4.2  |
| 20-202mA             | 10Hz to 44Hz  | 1Hz                  | 0.120      | + 30   | 0.135       | + 30   | 0.150      | + 30   | 0.210      | + 42   |
|                      | 45Hz to 999Hz | 1Hz                  | 0.048      | + 20   | 0.054       | + 20   | 0.060      | + 20   | 0.084      | + 28   |
|                      | 1kHz to 10kHz | 1Hz                  | 0.320      | + 40   | 0.360       | + 40   | 0.400      | + 40   | 0.560      | + 56   |
| 200-2.02A            | 10Hz to 44Hz  | 1Hz                  | 0.120      | + 300  | 0.135       | + 300  | 0.150      | + 300  | 0.210      | + 420  |
|                      | 45Hz to 999Hz | 1Hz                  | 0.048      | + 200  | 0.054       | + 200  | 0.060      | + 200  | 0.084      | + 280  |
|                      | 1kHz to 5kHz  | 1Hz                  | 0.320      | + 400  | 0.360       | + 400  | 0.400      | + 400  | 0.560      | + 560  |
| 2-30.0A <sup>†</sup> | 30Hz to 44Hz  | 1Hz                  | 0.120      | + 3000 | 0.135       | + 3000 | 0.150      | + 3000 | 0.210      | + 4200 |
|                      | 45Hz to 99Hz  | 1Hz                  | 0.048      | + 2000 | 0.054       | + 2000 | 0.060      | + 2000 | 0.084      | + 2800 |
|                      | 100Hz to 1kHz | 1Hz                  | 0.320      | + 4000 | 0.360       | + 4000 | 0.400      | + 4000 | 0.560      | + 5600 |

Due to continuous development specifications may be subject to change.

3010 Extended Specifications

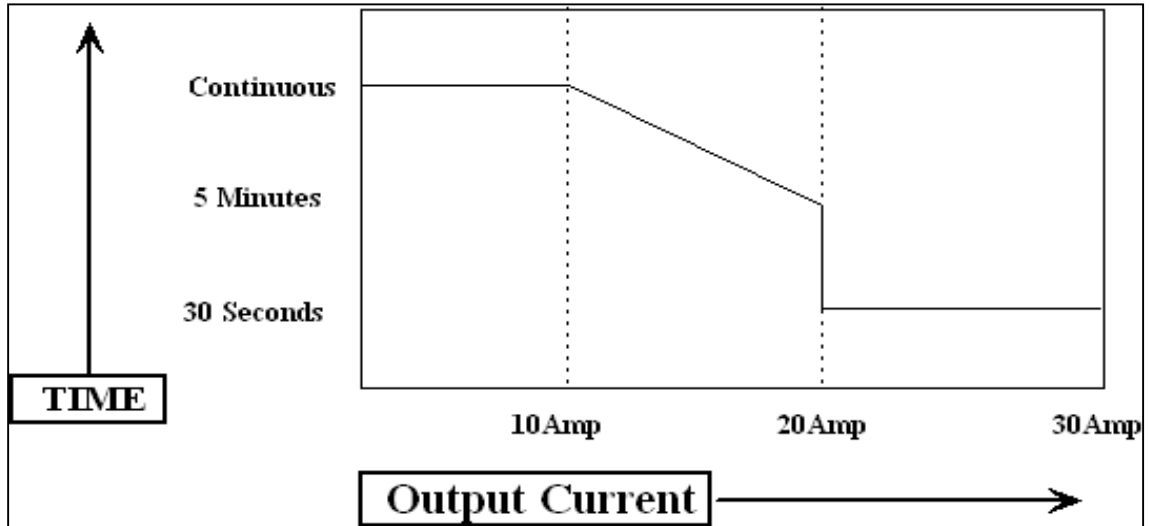
ACI Specifications : V1.35

**Notes**

Note 1 : Temperature sensor on 30A range - microprocessor monitors & protects from overheating. Higher resistance loads allow a longer ON period. See graphs 5 and 6 for details.  
 Note 2 : Specifications apply to loads of less than 10% of the maximum burden voltage.

Specifications apply at TCal ± 5°C

Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.



Graph 5\* : Operating time on 30A range with current into a short circuit at 20°C  
 Continuous current is available up to 10A output.

\* Note      Timing is started after a minimum period of 7 minutes at zero output.  
 Shorter periods will reduce the output time available.

**Total Accuracy - Standard Accuracy**

| Range  | 90 day ppm | 180 Day ppm | 1 year ppm | 2 year ppm |
|--------|------------|-------------|------------|------------|
| 1Hz    | 16         | 18          | 20         | 28         |
| 10Hz   | 16         | 18          | 20         | 28         |
| 100Hz  | 16         | 18          | 20         | 28         |
| 1kHz   | 16         | 18          | 20         | 28         |
| 10kHz  | 16         | 18          | 20         | 28         |
| 100kHz | 16         | 18          | 20         | 28         |
| 1MHz   | 16         | 18          | 20         | 28         |
| 10MHz  | 16         | 18          | 20         | 28         |

**Total Accuracy - High Accuracy (Option)**

| Range  | 90 day ppm | 180 Day ppm | 1 year ppm | 2 year ppm |
|--------|------------|-------------|------------|------------|
| 1Hz    | 0.8        | 0.9         | 1          | 1.4        |
| 10Hz   | 0.8        | 0.9         | 1          | 1.4        |
| 100Hz  | 0.8        | 0.9         | 1          | 1.4        |
| 1kHz   | 0.8        | 0.9         | 1          | 1.4        |
| 10kHz  | 0.8        | 0.9         | 1          | 1.4        |
| 100kHz | 0.8        | 0.9         | 1          | 1.4        |
| 1MHz   | 0.8        | 0.9         | 1          | 1.4        |
| 10MHz  | 0.8        | 0.9         | 1          | 1.4        |

Specifications apply at TCal ± 5°C

Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.

| FREQUENCY - TTL | Standard Spec. | Optional Spec. |
|-----------------|----------------|----------------|
| 10Hz to 10MHz   | 12ppm          | 1ppm           |

| PWM (%)   |                    |
|-----------|--------------------|
| 5% to 95% | Better than 0.001% |

*For the highest possible accuracy and dependability of the measured value, regardless of the measurement technique used, the 3000 Series calibrators use passive standard resistors, the calibrated value of which is displayed when selected.*

**1 year Total Accuracy Specifications at TCal ±5°C & Range Parameters**

| Range   | Maximum Current | Maximum Voltage | Display Resolution | 1 Year Total Accuracy |       |
|---------|-----------------|-----------------|--------------------|-----------------------|-------|
|         |                 |                 |                    | % set                 | Ohms  |
| 0Ω      | 0.5A            | -               | 1uΩ                |                       | 0.005 |
| 0.1Ω    | 0.5A            | -               | 1uΩ                | 0.015 +               | 0.005 |
| 1Ω      | 0.4A            | -               | 1uΩ                | 0.01 +                | 0.005 |
| 10Ω     | 0.3A            | -               | 1uΩ                | 0.01 +                | 0.005 |
| 100Ω    | 0.1A            | -               | 10uΩ               | 0.005 +               | 0.005 |
| 1kΩ     | -               | 10V             | 100uΩ              | 0.004 +               | 0.04  |
| 10kΩ    | -               | 50V             | 1mΩ                | 0.004 +               | 0.4   |
| 100kΩ   | -               | 100V            | 10mΩ               | 0.004 +               | 4     |
| 1MΩ*    | -               | 100V            | 100mΩ              | 0.01 +                | 40    |
| 10MΩ*   | -               | 100V            | 1Ω                 | 0.035 +               | 400   |
| 100MΩ*  | -               | 100V            | 1kΩ                | 0.5 +                 | 4000  |
| 1000MΩ* | -               | 100V            | 10kΩ               | 1 +                   | 40000 |

\* 2-Wire only

**Stability (Accuracy relative to calibration Standards)**

| Range  | 90 Day Rel |       | 180 Day Rel |       | 1 Year Rel |       | 2 Year Rel |       |
|--------|------------|-------|-------------|-------|------------|-------|------------|-------|
|        | %          | Ohms  | %           | Ohms  | %          | Ohms  | %          | Ohms  |
| 0Ω     | -          | 0.005 | -           | 0.005 | -          | 0.005 | -          | 0.005 |
| 0.1Ω   | 0.0112 +   | 0.005 | 0.0126 +    | 0.005 | 0.014 +    | 0.005 | 0.0196 +   | 0.005 |
| 1Ω     | 0.0072 +   | 0.005 | 0.0081 +    | 0.005 | 0.009 +    | 0.005 | 0.0126 +   | 0.005 |
| 10Ω    | 0.0072 +   | 0.005 | 0.0081 +    | 0.005 | 0.009 +    | 0.005 | 0.0126 +   | 0.005 |
| 100Ω   | 0.0036 +   | 0.005 | 0.00405 +   | 0.005 | 0.0045 +   | 0.005 | 0.0063 +   | 0.005 |
| 1kΩ    | 0.0028 +   | 0.04  | 0.00315 +   | 0.04  | 0.0035 +   | 0.04  | 0.0049 +   | 0.04  |
| 10kΩ   | 0.0028 +   | 0.4   | 0.00315 +   | 0.4   | 0.0035 +   | 0.4   | 0.0049 +   | 0.4   |
| 100kΩ  | 0.0024 +   | 4     | 0.0027 +    | 4     | 0.003 +    | 4     | 0.0042 +   | 4     |
| 1MΩ    | 0.0072 +   | 40    | 0.0081 +    | 40    | 0.009 +    | 40    | 0.0126 +   | 40    |
| 10MΩ   | 0.024 +    | 400   | 0.027 +     | 400   | 0.03 +     | 400   | 0.042 +    | 400   |
| 100MΩ  | 0.32 +     | 4000  | 0.36 +      | 4000  | 0.4 +      | 4000  | 0.56 +     | 4000  |
| 1000MΩ | 0.72 +     | 40000 | 0.81 +      | 40000 | 0.9 +      | 40000 | 1.26 +     | 40000 |

**For 2-Wire connection allow 35mΩ on all resistance specifications.**

The 2 and 4 Wire value for each resistor is calibrated. The 2-Wire value is measured at the terminals

The 4-Wire values are taken using the zero position to NULL the measuring system.

Specifications apply at TCal ± 5°C.

Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.

**For the highest possible accuracy and dependability of the measured value, regardless of the measurement technique used, the 3000 Series calibrators use passive standard capacitors, the calibrated value of which is displayed when selected.**

### General Specifications

| Range | Maximum Voltage | Display Resolution | D     | R <sub>s</sub> |
|-------|-----------------|--------------------|-------|----------------|
| 1nF   | 50V             | 0.1pF              | 0.006 | N/A            |
| 10nF  | 50V             | 0.1pF              | 0.006 | N/A            |
| 20nF  | 50V             | 0.1pF              | 0.006 | N/A            |
| 50nF  | 50V             | 1pF                | 0.006 | N/A            |
| 100nF | 50V             | 10pF               | 0.006 | N/A            |
| 1uF   | 30V             | 100pF              | 0.002 | N/A            |
| 10uF  | 20V             | 1nF                | 0.014 | 0.2Ω           |

**Specifications apply at 1kHz. Allow 20pF for lead effects.  
No appreciable variation is noticeable at frequencies below 1kHz.**

### Total Accuracy

| Range | 90 day % | 180 Day % | 1 year % | 2 year % |
|-------|----------|-----------|----------|----------|
| 1nF   | 0.2      | 0.225     | 0.25     | 0.35     |
| 10nF  | 0.2      | 0.225     | 0.25     | 0.35     |
| 20nF  | 0.2      | 0.225     | 0.25     | 0.35     |
| 50nF  | 0.2      | 0.225     | 0.25     | 0.35     |
| 100nF | 0.2      | 0.225     | 0.25     | 0.35     |
| 1uF   | 0.32     | 0.36      | 0.4      | 0.56     |
| 10uF  | 0.48     | 0.54      | 0.6      | 0.84     |

#### Measurement methods

C<sub>p</sub> up to 1uF  
C<sub>s</sub> above 1uF

Capacitance is calibrated as value at the terminals  
ie. displayed value incorporates capacitance of circuit up to and including the terminals

Specifications apply at TCal ±5°C.  
Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.

### General Specifications

| Range | Maximum Voltage | Display Resolution |
|-------|-----------------|--------------------|
| 100uF | 8V              | 10nF               |
| 1mF   | 8V              | 100nF              |
| 10mF  | 8V              | 1uF                |

### Total Accuracy

| Range | 90 day % | 180 Day % | 1 year % | 2 year % |
|-------|----------|-----------|----------|----------|
| 100uF | 0.48     | 0.54      | 0.6      | 0.84     |
| 1mF   | 0.8      | 0.9       | 1        | 1.4      |
| 10mF  | 0.8      | 0.9       | 1        | 1.4      |

Capacitance is calibrated as value at the terminals

ie. displayed value incorporates capacitance of circuit up to and including the terminals

Specifications apply at TCal  $\pm 5^{\circ}\text{C}$ .

Outside this range an allowance of 0.18 x 1 Year Spec. per  $^{\circ}\text{C}$  should be added.

Minimum terminal voltage = 80mV

Maximum terminal voltage = 8V

Maximum current input = 20mA

Performance/compatibility may be affected using other measurement methods/techniques for the simulated capacitance function in which case passive capacitance functionality may be employed.

**Total Accuracy**

| Range           | Display Resolution | Measurement Current (Max.) | 1 year  | 1 year |
|-----------------|--------------------|----------------------------|---------|--------|
|                 |                    |                            | % (Rng) | Zero   |
| 10R to 100R     | 10mΩ               | 20mA                       | 0.03    | 50mΩ   |
| 101R to 1kR     | 100mΩ              | 2mA                        | 0.03    | 50mΩ   |
| 1.01kR to 10kR  | 1Ω                 | 300uA                      | 0.03    | 50mΩ   |
| 10.1kR to 100kR | 10Ω                | 40uA                       | 0.03    | 50mΩ   |
| 101kR to 1MR    | 100Ω               | 4uA                        | 0.03    | 50mΩ   |
| 1.01MR to 10MR  | 1kΩ                | 0.4uA                      | 0.03    | 50mΩ   |

Minimum terminal voltage = 80mV

Maximum current input = 20mA

Input measurement current must be a constant DC current isolated from earth

Performance/compatibility may be affected using other measurement methods/techniques for the simulated resistance function eg. AC or pulsed, in which case passive resistance functionality may be employed.

Current must be stable for a period of 1s - it is therefore recommended the UUT range is selected manually

Specifications apply at TCal ± 5°C.

Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.

## General Specifications

| Range | Maximum Current | DC Resistance | Q   | Display Resolution |
|-------|-----------------|---------------|-----|--------------------|
| 1mH   | 30mA            | 7.8Ω          | 1   | 100mH              |
| 10mH  | 25mA            | 24Ω           | 2.8 | 1uH                |
| 19mH  | 20mA            | 33Ω           | 3.8 | 1uH                |
| 29mH  | 20mA            | 41Ω           | 4.7 | 1uH                |
| 50mH  | 20mA            | 54Ω           | 6.1 | 1uH                |
| 100mH | 20mA            | 78Ω           | 8.6 | 10uH               |
| 1H    | 10mA            | 260Ω          | 29  | 100uH              |
| 10H   | 1mA             | 950Ω          | 110 | 1mH                |

All Inductance specifications  $\pm 50\mu\text{H}$ .

## Accuracy Relative to Calibration Standards Specifications

| Range | 90 day Rel % | 180 Day Rel % | 1 year Rel % | 2 year Rel % |
|-------|--------------|---------------|--------------|--------------|
| 1mH   | 0.4          | 0.45          | 0.5          | 0.7          |
| 10mH  | 0.4          | 0.45          | 0.5          | 0.7          |
| 19mH  | 0.4          | 0.45          | 0.5          | 0.7          |
| 29mH  | 0.4          | 0.45          | 0.5          | 0.7          |
| 50mH  | 0.4          | 0.45          | 0.5          | 0.7          |
| 100mH | 0.4          | 0.45          | 0.5          | 0.7          |
| 1H    | 0.4          | 0.45          | 0.5          | 0.7          |
| 10H   | 0.4          | 0.45          | 0.5          | 0.7          |

### Measurement methods

$L_s$  up to 1H

$L_p$  from 1H to 10H

Specifications apply at TCal  $\pm 5^\circ\text{C}$ .

Outside this range an allowance of 0.18 x 1 Year Spec. per  $^\circ\text{C}$  should be added.

| General Specifications |   |
|------------------------|---|
| Voltage Range          | 1V to 1000V DC  |
| Current Range          | 0.3A to 30A DC  |
| Output Terminals       | Voltage output from top (Black & White) terminals<br>300mA to 2A current output from middle 2A (Black & Red) terminals<br>2.01A to 30A current output from bottom 30A (Blue & Yellow) terminals<br>Note : Indicator LEDs for both sets of terminals will illuminate to indicate DC Power mode |

### 1 Year Accuracy Relative to Calibration standards

| Current Range | Resolution | Setting | Zero  |
|---------------|------------|---------|-------|
| 0.3A to 2A    | 200uA      | 0.015%  | 400uA |
| 2.01A to 30A  | 2mA        | 0.04%   | 4mA   |

### 1 Year Accuracy Relative to Calibration standards

| Voltage Range | Resolution | Setting | Zero   |
|---------------|------------|---------|--------|
| 20V           | 1uV        | 0.0025% | 40uV   |
| 200V          | 10uV       | 0.0030% | 400uV  |
| 1000V         | 100uV      | 0.0030% | 4000uV |

#### High Voltage Safety

High voltage output is ramped to allow instruments to auto range  
Standby is automatically activated when setting voltages greater than 20V or 200V from a lower voltage  
Standby is automatically selected for high voltage (>20V) after 20 minutes on the same setting  
High voltage (> 20V) output is indicated to user through an audible warning beep  
An external high voltage output/standby control switch is available as an option

30A available as standard - external amplifier **not** required

Specifications apply at TCal  $\pm$  5°C.

Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.

| General Specifications |   |
|------------------------|---|
| Voltage Range          | 1V to 1000V AC  |
| Current Range          | 0.2A to 30A AC  |
| Output Terminals       | Voltage output from top (Black & White) terminals<br>200mA to 2A current output from middle 2A (Black & Red) terminals<br>2.01A to 30A current output from bottom 30A (Blue & Yellow) terminals<br>Note : Indicator LEDs for both sets of terminals will illuminate to indicate AC Power mode |

### 1 Year Accuracy Relative to Calibration standards

| Current Range | Resolution | Setting | Zero  |
|---------------|------------|---------|-------|
| 0.2A to 2A    | 200uA      | 0.1%    | 400uA |
| 2.01A to 30A  | 2mA        | 0.05%   | 4mA   |

### 1 Year Accuracy Relative to Calibration standards

| Voltage Range | Resolution | Setting | Zero  |
|---------------|------------|---------|-------|
| 20V           | 1uV        | 0.035%  | 900uV |
| 200V          | 10uV       | 0.04%   | 7.5mV |
| 1000V         | 100uV      | 0.04%   | 75mV  |

### Frequency Specifications

| Frequency |  |
|-----------|--|
| Range     | 40 to 400Hz (1V to 699V) : 46 to 400Hz (700V to 1000V) |

### Phase Specifications

| Phase Angle  | Resolution | Accuracy |
|--------------|------------|----------|
| 0° to 359.9° | 0.1°       | 0.1°+6us |

3010 calibrators **automatically correct for any errors in the phase** caused by inductive loading, for example when using the clamp coil adaptor.

### Harmonic Specifications (applies only if Power DDS Option fitted)

| Frequency |   |
|-----------|---|
| Accuracy  | 0.1% + (N x 0.08%) : Where N is the Harmonic number |

#### High Voltage Safety

High voltage output is ramped to allow instruments to auto range  
Standby is automatically activated when setting voltages greater than 20V or 200V from a lower voltage  
Standby is automatically selected for high voltage (>20V) after 20 minutes on the same setting  
High voltage (> 20V) output is indicated to user through an audible warning beep  
An external high voltage output/standby control switch is available as an option

30A available as standard - external amplifier **not** required

Specifications apply at TCal  $\pm$  5°C.

Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.

| Amplitude                   |  |                      |                     |                     |
|-----------------------------|--|----------------------|---------------------|---------------------|
| Ranges                      | 2mV/Div : 5mV/Div : 10mV/Div : 20mV/Div : 50mV/Div : 100mV/Div<br>200mV/Div : 500mV/Div : 1V/Div : 2V/Div : 5V/Div : 10V/Div : 20V/Div : 50V/Div |                      |                     |                     |
| Sequence                    | 1, 2, 5  |                      |                     |                     |
| Waveshapes                  | Square Wave (positive going from ground) : DC  |                      |                     |                     |
| Frequency                   | 1kHz   |                      |                     |                     |
| Frequency Accuracy          | 30ppm  |                      |                     |                     |
| Graticule Height            | 6 Graticules   |                      |                     |                     |
| Rise Time                   | 2us  |                      |                     |                     |
| Fall Time                   | 2us  |                      |                     |                     |
| Output Terminal             | Front BNC (Green LED indicates terminal active)  |                      |                     |                     |
|                             |  |                      |                     |                     |
| Range<br>@ 1M $\Omega$ load | 90 Day Rel.<br>% uV  | 180 Day Rel.<br>% uV | 1 Year Rel.<br>% uV | 2 Year Rel.<br>% uV |
| 2mV to 50V/Div              | 0.009 $\pm$ 20   | 0.01 $\pm$ 20        | 0.01 $\pm$ 5        | 0.014 $\pm$ 20      |

**High Voltage Safety**  
 High voltage output is ramped to allow instruments to auto range  
 Auto standby is activated when passing through 20V or 200V output values  
 High voltage (> 20V) output is indicated to user through an audible warning beep  
 An external high voltage output/standby control switch is available as an option

| Amplitude Deviation  |                          |                      |                     |                     |
|----------------------|--------------------------|----------------------|---------------------|---------------------|
| Deviation Range      | $\pm$ 10%                |                      |                     |                     |
| Deviation Resolution | 3010 : Better than 10ppm |                      |                     |                     |
| Range                | 90 Day Rel.<br>% uV      | 180 Day Rel.<br>% uV | 1 Year Rel.<br>% uV | 2 Year Rel.<br>% uV |
| -10% to +10%         | 0.008 $\pm$ 20           | 0.01 $\pm$ 20        | 0.01 $\pm$ 20       | 0.014 $\pm$ 20      |

| Timebase          |  |                     |                    |                    |
|-------------------|--|---------------------|--------------------|--------------------|
| Ranges            | 2ns/Div : 5ns/Div : 10ns/Div : 20ns/Div : 50ns/Div : 100ns/Div : 200ns/Div<br>500ns/Div : 1ms/Div : 2ms/Div : 5ms/Div : 10ms/Div : 20ms/Div : 50ms/Div<br>100ms/Div : 200ms/Div : 500ms/Div : 1s/Div : 2s/Div : 5s/Div |                     |                    |                    |
| Sequence          | 1, 2, 5  |                     |                    |                    |
| Waveshape         | Comb below 100ns<br>Sine Wave above 100ns  |                     |                    |                    |
| Oscillator        | Internal Crystal TCXO  |                     |                    |                    |
| Output Terminal   | Front BNC (Green LED indicates terminal active)  |                     |                    |                    |
| Range             | 90 Day Rel.<br>ppm   | 180 Day Rel.<br>ppm | 1 Year Rel.<br>ppm | 2 Year Rel.<br>ppm |
| 2ns/Div to 5s/Div | 4.5  | 4.75                | 5                  | 6                  |

| Timebase Deviation   |                          |                   |                  |                  |
|----------------------|--------------------------|-------------------|------------------|------------------|
| Deviation Range      | $\pm$ 10% in 0.05% Steps |                   |                  |                  |
| Deviation Resolution | Better than 0.05%        |                   |                  |                  |
| Range                | 90 Day Rel.<br>%         | 180 Day Rel.<br>% | 1 Year Rel.<br>% | 2 Year Rel.<br>% |
| -9.5% to +9.5%       | 0.01                     | 0.01              | 0.01             | 0.01             |

| Levelled Sweep  |   |                    |                   |                   |
|-----------------|---|--------------------|-------------------|-------------------|
| Sweep Range     | 5MHz to 350MHz or 5MHz to 600MHz (dependant on option fitted) |                    |                   |                   |
| Waveform        | Sine Wave   |                    |                   |                   |
| Levelled Sweep  | 600mV pk-pk into 50 Ohms                                      |                    |                   |                   |
| Reference Level | 50kHz   |                    |                   |                   |
| Output Terminal | Front BNC (Green LED indicates terminal active)               |                    |                   |                   |
| Range           | 90 Day Rel.<br>db   | 180 Day Rel.<br>db | 1 Year Rel.<br>db | 2 Year Rel.<br>db |
| 5MHz to 350MHz  | 0.8   | 0.90               | 1                 | 1.4               |
| 5MHz to 600MHz  | 0.8   | 0.90               | 1                 | 1.4               |

| Levelled Sweep     |                  |
|--------------------|------------------|
| Frequency Accuracy | See Time markers |

| 50kHz Reference    |             |              |             |             |
|--------------------|-------------|--------------|-------------|-------------|
| Accuracy           | 90 Day Rel. | 180 Day Rel. | 1 Year Rel. | 2 Year Rel. |
| Frequency Accuracy | 27 ppm      | 29 ppm       | 30 ppm      | 36 ppm      |
| Level Accuracy     | 0.4 %       | 0.45 %       | 0.5 %       | 0.7 %       |

| Fast Rise Output |               |
|------------------|---------------|
| Rise/Fall Time   | Typically 1ns |

Specifications apply at TCal  $\pm$  5°C.

Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.

## General Specifications

| Range  | Actual Value (Ohms) | Max. Power Rating (Watts) | Maximum Voltage (V) | Maximum Current (mA) | Display Resolution |
|--------|---------------------|---------------------------|---------------------|----------------------|--------------------|
| -100°C | 60.25               | 0.2                       | 3.47                | 57.62                | 1m°C               |
| 0°C    | 100.00              | 0.2                       | 4.47                | 44.72                | 1m°C               |
| +30°C  | 111.67              | 0.2                       | 4.73                | 42.32                | 1m°C               |
| +60°C  | 123.24              | 0.2                       | 4.96                | 40.28                | 1m°C               |
| +100°C | 138.50              | 0.2                       | 5.26                | 38.00                | 1m°C               |
| +200°C | 175.84              | 0.2                       | 5.93                | 33.73                | 10m°C              |
| +300°C | 247.04              | 0.2                       | 7.03                | 28.45                | 10m°C              |
| +800°C | 375.51              | 0.2                       | 8.67                | 23.08                | 10m°C              |

4-Wire connection. Allow 1mΩ on all resistance specifications.

## Accuracy Relative to Calibration Standards Specifications

| Range  | Actual Value (Ohms) | 90 day Rel % | 180 Day Rel % | 1 year Rel % | 2 year Rel % |
|--------|---------------------|--------------|---------------|--------------|--------------|
| -100°C | 60.25               | 0.008        | 0.009         | 0.01         | 0.014        |
| 0°C    | 100.00              | 0.008        | 0.009         | 0.01         | 0.014        |
| +30°C  | 111.67              | 0.008        | 0.009         | 0.01         | 0.014        |
| +60°C  | 123.24              | 0.008        | 0.009         | 0.01         | 0.014        |
| +100°C | 138.50              | 0.008        | 0.009         | 0.01         | 0.014        |
| +200°C | 175.84              | 0.008        | 0.009         | 0.01         | 0.014        |
| +300°C | 247.04              | 0.008        | 0.009         | 0.01         | 0.014        |
| +800°C | 375.51              | 0.008        | 0.009         | 0.01         | 0.014        |

Specifications apply at TCal ± 5°C.

Outside this range an allowance of 0.18 x 1 Year Spec. per °C should be added.