



Autocal Digital Multimeter

- 7½ Digit Resolution
- 90 Day DCV Specifications to $\pm 18\text{ppm}$
- ACV, Ω , DCI, ACI Options
- Autocal
- Comprehensive Ratio

The well established 1071 has been designed to be at the upper end of the AUTOCAL range of digital multimeters. With its key features of high accuracy and resolution, the 7½ digit 1071 is intended principally for calibration laboratory and precision system applications.

Versatile

The basic DCV instrument, with 90 day specifications to $\pm 18\text{ppm}$, can be expanded to include a large number of measurement options. These include ACV, Resistance, and both DC and AC Current. In addition, a particularly useful Ratio option can be installed which permits highly accurate automatic ratio measurements of widely differing inputs.

Programmable

With the addition of the IEEE-488 interface, the 1071 becomes a powerful systems instrument. Ideally suited for calibration systems, it is also a cost effective solution in precision ATE and data logging systems.

Self Test

Support of the 1071 is made easy through the use of AUTOCAL covers-on calibration and extensive diagnostic self test routines. Calibration is rapid and may be controlled either from the front panel keys or via the IEEE-488 interface. In addition, the self test checks all the display segments sequentially, along with the individual measurement circuits and the non-volatile calibration memory. At any stage of a self test, an error code indicates a failure to individual module level.

Averaging

The averaging facility provided as standard on the 1071 can be used to extend the performance on all measurement functions. On DCV and Resistance, for example, the selection of "Av" extends the scale length to 7½ digits on all ranges to produce a 0.05ppm FS resolution. Additionally, "Av" can smooth a noisy input signal characteristic to produce a stable reading, which is particularly useful when using LF ACV or ACI.

Two modes of "Av" are selectable: firstly, "continuous," where all subsequent readings are taken into account, and secondly, "block," where the user can select any number of readings up to 19,999 to be averaged.

Spec Readout

The complete accuracy specifications for the 1071 have been pre-programmed into its memory, so that selection of the "Spec" key will compute and display the precise limits of uncertainty for a measured value, saving both time and effort.

Computation

Compute facilities are installed as standard, including a numerical keyboard and memories which can be manipulated in a variety of ways to enhance the measurement performance of the 1071. Two of the memories are used to continuously monitor maximum and minimum readings while others can store readings, keyboard values or alarm limits, which can be applied to measured data before display.

VOLTAGE

DC Voltage

Ranges: 100 mV to 1000V in decades.
FS: 2 x Full Range, 100% Overrange. (Except 1kV range).
Resolution: 10nV, 7½ digits.
Total Uncertainty: (90 Day, 23° ±5°C, ±(ppmR +ppmFS)).
 100 mV Range: 20+2.5.
 1V Range: 15+1.5.
 10V Range: 15+1.5.
 100V Range: 20+1.5.
 1000V Range: 20+1.5.
Temperature Coefficient: (13° to 18°C and 28° to 33°C). 1/10th 90 Day Accuracy/°C ±0.3µV/°C.
CMRR: (1kΩ unbalance) >140dB at DC, >(80 dB+NMRR) at 1 Hz-60 Hz.
NMR: 66 dB at 50/60 Hz ±0.15% (Filter out), 120dB at 50/60 Hz (Filter in).
Input Impedance: >10,000MΩ from 100 mV to 10V ranges, 10MΩ ±0.1% on 100V and 1000V ranges.
Input Protection: Withstands 1kV RMS on any range.
Input Current: <50pA.
Settling Time: (To 10ppm step size) <50 ms (Filter out), <1s (Filter in).
Read Rate: 2/s.

True RMS AC Voltage

Ranges: 100 mV to 1000V in decades.
FS: 2 x Full Range, 100% Overrange. (Except 1kV range).
Resolution: 1µV, 5½ digits.
Total Uncertainty: (90 Day, 23° ±5°C, Signal >0.25%FS, ±(%R+%FS)).
100mV & 1000V Ranges
 DC+45 Hz-5 kHz: 0.08+0.02.
 DC+5 kHz-100 kHz: 0.2+0.05.
1V to 100V Ranges
 DC+45 Hz-5 kHz: 0.04+0.01.
 DC+5 kHz-100 kHz: 0.1+0.025.
Hf Accuracy: (1V and 10V ranges, typical).
 DC+100 kHz-1 MHz: ±(2%R+1%FS).
Temperature Coefficient: (13° to 18°C and 28° to 33°C). 1/10th 90 Day Accuracy/°C.
CMRR: (1kΩ unbalance) >90 dB at DC-60 Hz.
Input Impedance: >1MΩ shunted by 150pF.
Input Protection: Withstands 1kV RMS on any range.
Crest factor: 7:1 at Full Range.
Max Volt-Hertz: 2 x 10⁷.
Settling Time: (To 0.1%ppm step size) <500 ms (Filter in), <150 ms (Filter out).
Read Rate: 2/s.

RESISTANCE & CURRENT

Resistance

Ranges: 10Ω to 10MΩ in decades.
FS: 2 x Full Range, 100% Overrange.
Resolution: 1µΩ, 7½ digits.
Total Uncertainty: (90 Day, 23° ±5°C, ±(ppmR+ppmFS)).
 10Ω Range: 30+4.
 100Ω Range: 20+2.
 1kΩ Range: 20+2.
 10kΩ Range: 20+2.
 100kΩ Range: 30+2.
 1MΩ Range: 80+2.
 10MΩ Range: 240+2.
Temperature Coefficient: (13° to 18°C and 28° to 33°C). 1/10th 90 Day Accuracy/°C ±100µΩ/°C.

Open Circuit Voltage: <10V.

Lead Resistance: Up to 100Ω.

Current Through Unknown

10Ω: 10 mA.
 100Ω: 10 mA.
 1kΩ: 1 mA.
 10kΩ: 100µA.
 100kΩ: 10µA.
 1MΩ: 1µA.
 10MΩ: 100 nA.
Input Protection: Withstands 250V RMS on any range.
Settling Time: Up to 10kΩ generally the same as DCV.
Read Rate: 2/s.

DC Current

Ranges: 100µA to 1A in decades.
FS: 2 x Full Range, 100% Overrange.
Resolution: 1 nA, 5½ digits.
Total Uncertainty: (90 Day, 23° ±5°C, ±(ppmR+ppmFS)).
100µA to 100mA Ranges: 100+20.
1A Range: 200+20.
Temperature Coefficient: (13° to 18°C and 28° to 33°C). 1/10th 90 Day Accuracy/°C.
Shunt Resistance
 100µA: 1kΩ.
 1 mA: 100Ω.
 10 mA: 10Ω.
 100 mA: 1Ω.
 1A: 100mΩ.
Settling Time: (To 10ppm of step size) <50 ms (Filter out), <1s (Filter in).
Read Rate: 2/s.

AC Current

Ranges: 100µA to 1A in decades.
FS: 2 x Full Range, 100% Overrange.
Resolution: 1 nA, 5½ digits.
Total Uncertainty: (90 Day, 23° to ±5°C, ±(%R+%FS)).
100µA to 1A Ranges:
 DC+45 Hz-5 kHz: 0.2+0.05.
Temperature Coefficient: (13° to 18°C and 28° to 33°C). 1/10th 90 Day Accuracy/°C.
Shunt Resistance
 100µA: 1kΩ.
 1 mA: 100Ω.
 10 mA: 10Ω.
 100 mA: 1Ω.
 1A: 100mΩ.
Settling Time: (To 0.1% of step size) <150 ms (Filter out), <500 ms (Filter in).
Read Rate: 2/s.
Ratio Accuracy: ±(net signal accuracy+net reference accuracy).

GENERAL

Calibration: Autocal from front panel or via IEEE-488 interface.
Remote Programming: IEEE-488.
Environmental
Operating Temp: 0° to +50°C.
Storage Temp: -40° to +70°C.
Dimensions: 88 mm (3.5 in.) high, 455 mm (17.9 in.) wide, 420 mm (16.5 in.) deep.
Weight: 10 kg (22 lb).
Power: 105-127V or 205-255V, 50 Hz, 60 Hz, or 400 Hz. 20 Watts approx.

CONFIGURATIONS

Model 1071: 7½ Digit AUTO CAL Digital Multi-meter (includes DCV, 5 Year Warranty).

OPTIONS

- 10: True RMS AC Converter
- 20: 2-wire and 4-wire Resistance Converter
- 30: Current Converter
- 40: Comprehensive Ratio and Rear Input
- 41: Selectable Rear Input (Included in Option 40)
- 50: IEEE-488 (1978) Standard Digital Interface
- 52: Remote Trigger (Included in Option 50)
- 70: Analog Output
- 80: 115V 60 Hz Line Operation
- 81: 115V 50 Hz Line Operation
- 82: 115V 400 Hz Line Operation
- 90: Rack Mounting Kit

ACCESSORIES

1501: DMM Lead Kit

FACTORY/FOB

Indianapolis, IN
 Norwich, England