



Advanced Test Equipment Rentals
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TEK User's Reference
Manual

Part No. 070-5791-01
Product Group 47

11401 and 11402

Digitizing Oscilloscopes

User's Reference Manual

PLEASE CHECK FOR *CHANGE INFORMATION* at the rear of this manual.

Instrument Options

Your instrument may be equipped with one or more instrument options. A brief description of each available option is given in the following discussion. Refer to Table 5-1 and the Contents for the location of option information. For further information and prices of instrument options, see your Tektronix Products catalog or contact your Tektronix Field Office

WARNING

To avoid electric shock hazard, operating personnel must not remove the protective instrument covers. Component replacement and internal adjustments must be made by qualified service personnel only.

List of Options

- | | |
|------------------|---|
| Option 1C | Option 1C adds eight bnc connectors to the front- and rear-panels so that signals may be internally routed directly between the two panels. This is especially useful for rackmounted applications. This option can be added at any time. |
| Option 1R | Option 1R adds slide rails and rackmounting hardware to convert the benchtop instrument to a standard 19-inch rackmount version. This option can be added at any time. |
| Option 2D | Option 2D expands total waveform memory from 44K to 100K points for storage of waveform records. This option can be added at any time. |
| Option 4D | Option 4D increases GPIB transfer speed as much as ten times. Improves the overall throughput of the oscilloscope system, especially the transmission of waveform and measurement data. This option can be added any time. |
| Option A1 | Replaces the standard power cord with the Universal European 220 V type power cord. |
| Option A2 | Replaces the standard power cord with the United Kingdom 240 V type power cord. |
| Option A3 | Replaces the standard power cord with the Australian 240 V type power cord. |
| Option A4 | Replaces the standard power cord with the North American 250 V type power cord. |
| Option A5 | Replaces the standard power cord with the Switzerland 240 V type power cord. |

TABLE 4-2
Electrical Specifications

Characteristic	Performance Requirement
SAMPLER AND DIGITIZER	
A/D Converter	
Linearity	Measured with Signal Averaging enabled. Compression or expansion of a center screen 2-division signal positioned anywhere vertically within the graticule ≤ 2 LSBs. (2 LSBs of 200 LSBs=1%)
TIME BASE	
Sample Rate Accuracy	100 ps+0.002% of measurement interval.
TRIGGER	
Trigger Coupling and Sensitivity	
DC Coupled	0.50 division from dc to 50 MHz, increasing to 1.5 division at 500 MHz.
Noise-Reject Coupled	1.2 divisions or less from dc to 50 MHz, increasing to 3 divisions at 500 MHz.
AC Coupled	0.5 divisions from 60 Hz to 50 MHz increasing to 1.5 division at 500 Mhz.
HF REJ Coupled	0.65 divisions from dc to 30 kHz
LF Rej Coupled	0.65 divisions from 80 kHz to 50 MHz, increas- ing to 1.5 division at 500 MHz.
Windowed Record Positioning	
Window Position Accuracy	100 ps +0.002% of position
Maxium Event Frequency	150 MHz.
Precision Time Measurement	
Single-Trigger Precision	200 ps (10 ps with 1000 averages)
Accuracy	250 ps +0.002% of measurement interval when > 6 div signal, < 3 ns risetime, and measured at the 50% signal point.

TABLE 4-2 (cont)
Electrical Specifications

Characteristic	Performance Requirement
POWER	
AC Line Power	
Ranges	90 to 132 V rms 180 to 250 V rms.
Line Frequency	48 Hz to 440 Hz.
Power Consumption	320 W maximum.
Line Current (Max)	4.6 A rms at 50 Hz, 90 V line, with 5% clipping.

Environmental and Physical Characteristics

TABLE 4-8
Environmental Characteristics

Characteristics	Information
Temperature (External Ambient)	
Operating	0° to +50° C.
Nonoperating	-40° to +75° C.
Operating and Nonoperating	Meets MIL-T-28800C, Type III, Class 5, tested per paragraph 4.5.5.1.3. and 4.5.5.1.4. NOTE <i>Loss of non-volatile memory and clock information may occur if temperature goes below 40° C.</i>
Humidity	
Operating and Nonoperating	Up to 95% Relative Humidity, at up to +50° C. Exceeds MIL-T-28800C, Type III, Class 5, tested per paragraph 4.5.5.1.2.2. (5 days humidity with temperature cycling.)
Altitude	
Operating	To 4.5 km (15,000 ft).
Nonoperating	To 15 km (50,000 ft).
Operating and Nonoperating	Meets MIL-T-28800C, Type III, Class 5.
Vibration	
Operating, Plug-ins not installed in Mainframe	0.015 inches total displacement from 10 Hz to 55 Hz, 75 minutes total. Meets MIL-T-28800C, Sec. 4.5.5.3.1, Type III, Class 5.

TABLE 4-8 (cont)
Environmental Characteristics

Characteristics	Information
Shock Nonoperating, Plug-ins not installed in Mainframe.	30 g's, half sine, 11 ms duration, 18 shocks total. Meets MIL-T-28800C, Sec. 4.5.5.4.1, Type III, Class 5, Equipment not operating.
Bench Handling Operating, Plug-ins installed or not installed	Drop from 10 cm (4 inch) tilt, or 45°, whichever is less. (Tilt not to exceed balance point.) Meets MIL-T-28800C, Sec. 4.5.5.4.3, Type III, Class 5.
Packaged Product Vibration and Shock Vibration and Bounce of Packaged Product, Plug-ins not installed.	Meets ASTM D999-75, Method A, Para. 3.1, (NSTA Proj. 1A-B-1).
Drop of Packaged Product, Plug-ins not installed.	Meets ASTM D775-61, Method 1, Para 5. (NSTA Proj. 1A-B-2).
Electromagnetic Compatibility (Plug-ins or optional blank panels installed in all plug-in compartments). United States	Meets the following requirements of MIL-STD- 461B: CE-03 Part 4, Curve 1, CS-01 Part 7, CS-02 Part 4, CS-06 Part 5, RE-02 Part 7, RS-01 Part 4, RS-02 Part 5, RS-03 Part 7, (limited to 1 GHz) Meets FCC Part 15, subpart J, Class A.
Germany	Meets VDE 0871/6.78, Class B.

TABLE 4-9
Physical Characteristics

Characteristics	Information
Weight (instrument without plug-ins)	20 kg (44 lbs).
Overall Dimensions	
Benchtop	See Figure 4-1.
Rackmount	See Figure 4-2.
Ventilation	Safe operation temperature maintained by forced air circulation. Automatic resetting thermal cutout protects instrument from over-heating.
Finish	Blue-vinyl painted pebblegrain material on aluminum cabinet.

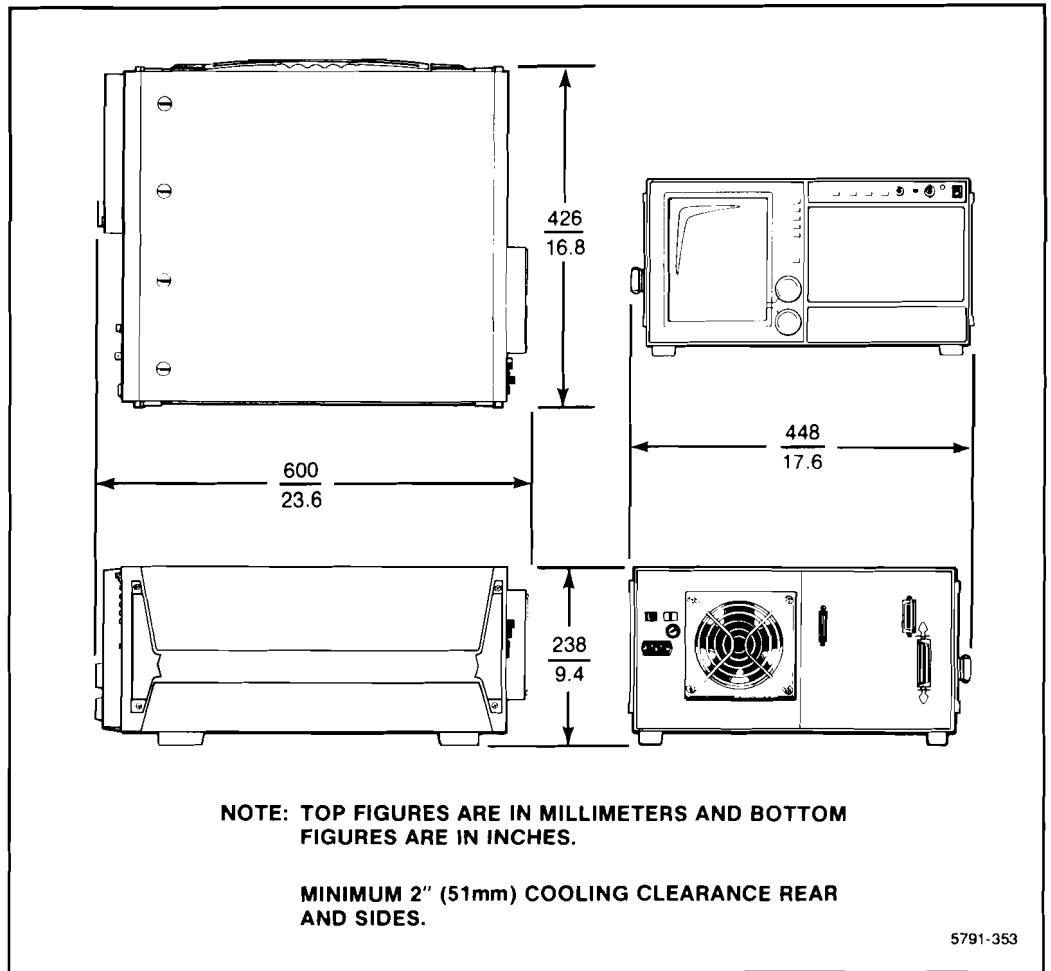


Figure 4-1. Benchtop 11401/11402 dimensional drawing.

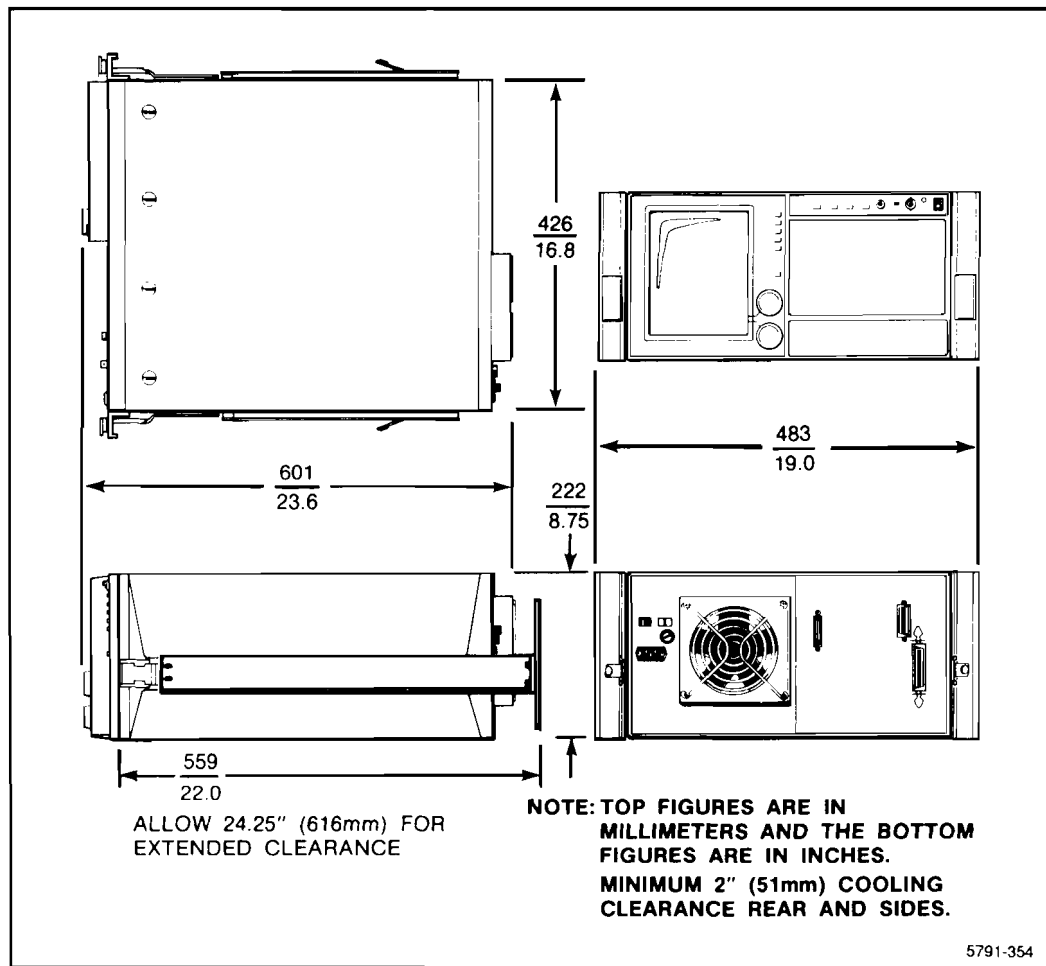


Figure 4-2. Rackmount 11401/11402 dimensional drawing.