

# SPECIFICATIONS

|                                    |      | Model 8101   | Model 8100 |
|------------------------------------|------|--|------------|
| <b>CRT</b>                         |      | 150 mm rectangular with internal graticule   |            |
| Acceleration Voltage               |      | 12 kV  |            |
| Display Area                       |      | 8 × 10 div (1 div = 10 mm)   |            |
| <b>VERTICAL AXIS (CH1 and CH2)</b> |      |  |            |
| Deflection Sensitivity             |      | 1 mV/div to 5 V/div: 1 mV to 2 mV/div ±5%, 5 mV/div to 5 V/div ±3%   |            |
| Attenuator                         |      | 12 steps, 1 mV/div to 5 V/div in 1-2-5 sequence<br>Vernier control for fully adjustable sensitivity between steps            |            |
| Input Impedance                    |      | 1 MΩ ±2%, approx. 30 pF  |            |
| Frequency Response                 | DC   | DC to 100 MHz, -3 dB (5 mV/div to 5 V/div)<br>DC to 20 MHz, -3 dB (1 mV/div to 2 mV/div)                                     |            |
|                                    | AC   | 5 Hz to 100 MHz, -3 dB (5 mV/div to 5 V/div)<br>5 Hz to 20 MHz, -3 dB (1 mV/div to 2 mV/div)                                 |            |
| Rise Time                          |      | 3.5 ns (5 mV/div to 5 V/div)<br>17.5 ns (1 mV/div & 2 mV/div)  |            |
| Signal Delay Time                  |      | Adequate to identify leading edge  |            |
| Crosstalk                          |      | -40 dB or less (at 1 kHz)  |            |
| Operating Modes                    | CH1  | CH1 single trace   |            |
|                                    | CH2  | CH2 single trace   |            |
|                                    | ALT  | Two-waveform display, alternately  |            |
|                                    | CHOP | Two-waveform display, chopped  |            |
|                                    | ADD  | CH1 + (±CH2) added display   |            |
| Chop Frequency                     |      | Approx. 300 kHz  |            |
| Channel Polarity                   |      | Normal or inverted, channel 2 only inverted  |            |
| ⚠ Maximum Input Voltage            |      | 250 Vpk  |            |
| <b>X-Y MODE</b>                    |      |  |            |
| Operating Modes                    |      | X-Y operation is selectable with HORIZ DISPLAY switch<br>CH1 : Y axis<br>CH2 : X axis  |            |
| Sensitivity                        |      | Same as vertical axis  |            |
| Input Impedance                    |      | Same as vertical axis  |            |
| X axis Frequency Response          | DC   | DC to 1 MHz, -3 dB   |            |
|                                    | AC   | 5 Hz to 1 MHz, -3 dB   |            |
| X-Y Phase Difference               |      | 3° or less at 100 kHz  |            |
| ⚠ Maximum Input Voltage            |      | Same as vertical axis  |            |
| <b>HORIZONTAL AXIS</b>             |      |  |            |
| Type                               | A    | A sweep  |            |
|                                    | ALT  | A sweep (intensified for duration of B sweep) and B sweep (delayed sweep) alternating  |            |
|                                    | B    | Delayed sweep  |            |
|                                    | X-Y  | X-Y oscilloscope operation   |            |
| Sweep Time                         | A    | 50 ns/div to 0.5 s/div ±3%, in 22 ranges, in 1-2-5 sequence<br>Vernier control for fully adjustable sweep time between steps |            |
|                                    | B    | 50 ns/div to 50 ms/div ±3%, in 19 ranges, in 1-2-5 sequence  |            |
| Sweep Magnification                |      | × 10 (ten times) ±5% (±8% in 50 ns-to-0.5 μs range)  |            |
| Linearity                          |      | ±3% (±5% for × 10 magnification)   |            |
| Holdoff                            |      | Continuously variable from NORM position in A sweep  |            |
| Trace Separation                   |      | Shifts B sweep trace continuously in vertical direction by 4 divisions or more with respect to A sweep                       |            |
| Delayed Sweep                      |      | Continuous delay (AFTER DELAY) & triggered delay (B TRIG' D: triggered by A trigger)   |            |
| Delay Time                         |      | Continuous adjustable from 50 ns/div to 0.5 s/div  |            |

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|----------------------------------|---|--|-------------------------------------|-----------------------|
| Delay Accuracy                   |   | $\pm (3\% \text{ of set value} + 1\% \text{ of full scale}) + (0 \text{ to } 300 \text{ ns})$                | $\pm 4\% \text{ of reading on CRT}$ |                       |
| Delayed Jitter                   |   | 10000 : 1 of decoupled time axis A set value   |                                     |                       |
| <b>TRIGGERING</b>                |   |  |                                     |                       |
| Modes                            |   | AUTO, NORM, FIX, & SINGLE-RESET  |                                     |                       |
| Trigger Source                   | VERT  | Triggered by input signal selected with vertical MODE selector   |                                     |                       |
|                                  | CH1   | Triggered by CH1 vertical signal   |                                     |                       |
|                                  | CH2   | Triggered by CH2 vertical signal   |                                     |                       |
|                                  | LINE  | Triggered by line frequency  |                                     |                       |
|                                  | EXT   | Triggered by external trigger signal   |                                     |                       |
| External Trigger Input Impedance |   | 1 M $\Omega$ $\pm$ 2%, approx. 30 pF   |                                     |                       |
| $\Delta$ MAX. EXT. Input Voltage |   | 50 Vpk   |                                     |                       |
| Coupling                         |   | AC, HF-REJ, DC, TV-V & TV-H  |                                     |                       |
| Trigger Sensitivity              | COUPLING  | FREQUENCY RANGE  | INT EXT                             |                       |
|                                  | AC  | 10 Hz ~ 50 MHz<br>10 Hz ~ 100 MHz  | 1 div<br>1.5 div                    | 0.15 Vp-p<br>0.2 Vp-p |
|                                  | DC  | DC ~ 50 MHz<br>DC ~ 100 MHz  | 1 div<br>1.5 div                    | 0.15 Vp-p<br>0.2 Vp-p |
|                                  | HF-REJ  | Trigger frequency range is more than 50 kHz, and minimum amplitude (voltage) required for sync is increased. |                                     |                       |
|                                  | TV-V  | —  | 1.5 div                             | 0.2 Vp-p              |
|                                  | TV-H  | —  | 1.5 div                             | 0.2 Vp-p              |
|                                  | AUTO : Same as above specifications for above 50 Hz<br>50 Hz to 50 MHz INT : 1.5 div, EXT : 0.2 Vp-p<br>50 Hz to 100 MHz INT : 2 div, EXT : 0.25 Vp-p |  |                                     |                       |
| <b>CALIBRATION VOLTAGE</b>       |   | 1 V p-p $\pm$ 3%, square wave, positive polarity, approx. 1 kHz  |                                     |                       |
| <b>INTENSITY MODULATION</b>      |   |  |                                     |                       |
| Sensitivity                      |   | + 5 V, positive voltage decreases brightness   |                                     |                       |
| Input Impedance                  |   | Approx. 10 k $\Omega$  |                                     |                       |
| Usable Frequency Range           |   | DC to 5 MHz  |                                     |                       |
| $\Delta$ Maximum Input Voltage   |   | 50 Vpk   |                                     |                       |
| <b>CH1 OUTPUT</b>                |   |  |                                     |                       |
| Output voltage                   |   | Approx. 50 mVp-p/div (50 $\Omega$ termination)   |                                     |                       |
| Output Impedance                 |   | Approx. 50 $\Omega$  |                                     |                       |
| Frequency Response               |   | 100 Hz to 100 MHz, - 3 dB/50 $\Omega$ termination<br>(1 mV/div, 2 mV/div: 100 Hz to 20 MHz, - 3 dB)          |                                     |                       |

|   |                      | Model 8101   | Model 8100                         |
|---|----------------------|--|------------------------------------|
| <b>READOUT</b>  |                      |  |                                    |
| Set Value   |                      | CH1/CH2 scale factor (with probe detection); V-UNCAL, ADD, INVERT<br>A/B sweep scale factor (magnification conversion); SWEEP-UNCAL, AFTER DELAY, TRIG' D, X-Y |                                    |
| Cursor Mode<br>A SWEEP mode only                                | $\Delta V1$          | Voltage difference between REF and $\Delta$ cursors on a CH1 scale factor basis  |                                    |
|   | $\Delta V2$          | Voltage difference between REF and $\Delta$ cursors on a CH2 scale factor basis  |                                    |
|   | $\Delta T$           | Time difference between REF and $\Delta$ cursors on the basis of A sweep scale factor  |                                    |
|   | $1/\Delta T$         | Frequency between REF and $\Delta$ cursors on the basis of A sweep scale factor  |                                    |
|   |                      | Ratio: Voltage and time ratio between REF and $\Delta$ cursors, supposing 5-division on the CRT as 100%  |                                    |
|   |                      | Phase: Phase difference between REF and $\Delta$ cursors, supposing 5-division on the CRT as 360°  |                                    |
| NOTE: The X-Y mode allows $\Delta V1$ measurement only.         |                      |  |                                    |
| Cursor Measurement  | Resolution           | 10 bits  |                                    |
|   | Measurement accuracy | $\pm 4\%$  |                                    |
|   | Measurable range     | $\Delta V$ , Ratio: $\pm 3.6$ div or more from the CRT center<br>$\Delta T$ , $1/\Delta T$ , Ratio, Phase: $\pm 4.6$ div or more from the CRT center           |                                    |
| <b>TRACE ROTATION</b> (Electrical, adjustable from front panel) |                      |  |                                    |
| <b>POWER REQUIREMENT</b>  |                      |  |                                    |
| Line Voltage  |                      | 100 V/120 V/220 V $\pm 10\%$ , 216 V to 250 V  |                                    |
| Line Frequency  |                      | 50/60 Hz   |                                    |
| Power Consumption   |                      | Approx. 59 W   |                                    |
| <b>DIMENSIONS</b> (W x H x D)                                   |                      | 319 (341) x 132 (145) x 380 (455) mm<br>( ) dimensions include protrusion from basic outline dimensions  |                                    |
| <b>WEIGHT</b>   |                      | 9.2 kg   |                                    |
| <b>ENVIRONMENTAL</b>  |                      |  |                                    |
| Within Specifications   |                      | 10°C to 35°C, 85% max. relative humidity   |                                    |
| Full Operation  |                      | 0°C to 40°C, 85% max. relative humidity  |                                    |
| <b>ACCESSORIES SUPPLIED</b>                                     |                      |  |                                    |
| Probe   |                      | LP-103 (READOUT compatible probe) x 2  | LP-102 x 2                         |
|   | Attenuation          | 1/10   | 1/10                               |
|   | Input impedance      | 10 M $\Omega$ , 12.5 pF $\pm 10\%$   | 10 M $\Omega$ , 12.5 pF $\pm 10\%$ |
| Power supply cable  |                      | 1  |                                    |
| Replacement Fuse  |                      | 1  |                                    |
| Instruction Manual  |                      | 1  |                                    |

\* Circuit and rating are subject to change without notice due to developments in technology.