# CombiScope® PM 3370B/80B/84B/90B/94B Specifications

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## Analog Mode Specifications

| Vertical Deflection | **Input Channels:**<br>(PM 3370B): 2 Channels + Ext Trig View<br>(PM 3380B/90B): 2 Channels + Ext Trig View<br>(PM 3384B/94B): 4 Channels<br><br>**Frequency Response:**<br>(PM 3370B): 60 MHz<br>(PM 3380B/84B): 100 MHz<br>(PM 3390B/94B): 200 MHz<br><br>**Deflection Coefficient:**<br>Ch1 & Ch2 (all models): 2 mV/div . 5 V/div in a 1-2-5 sequence or 2 mV/div to 12.5 V/div calibrated continuously variable<br>Ch3 & Ch4 (PM 3384B/94B): 2 mV/div . 5 V/div in a 1-2-5 sequence or 2 mV/div to 12.5 V/div calibrated continuously variable<br><br>**Rise Time (Calculated):**<br>(PM 3370B): 5.8 ns<br>(PM 3380B/84B): 3.5 ns<br>(PM 3390B/94B): 1.75 ns<br><br>**Error Limit:**<br>1.3% (Measured over center 6 divisions)<br><br>**Input Impedance:**<br>(all models, all channels) 1 MΩ ±1% // 25 pf ±2 pf<br>(PM 3390B/94B): user selectable 50Ω ±1%<br><br>**Max. Rated input voltage:**<br>In 1 MΩ position: 150 Vrms CAT II<br>In 50Ω position: 5 Vrms; 50V ac peak ( max of 50 mJ during any 100 ms interval. |
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| **Horizontal (Main & Delayed Timebases)** | **Display Modes:**<br>Main Timebase (MTB), Delayed Timebase (DTB), Alternate Timebase ( MTB & DTB), X-Y Mode.<br><br>**Time Coefficients:**<br>(PM 3370B/80B/84B): 0.5 s/div to 50 ns/div in a 1-2-5 sequence or calibrated variable control, 1.25 s/div to 50 ns/div.<br>(PM 3390B/94B): 0.5 s/div to 20 ns/div in a 1-2-5 sequence or calibrated variable control, 1.25 s/div to 20 ns/div.<br><br>**Fastest Sweep (Magn 10X):**<br>(PM 3370B/80B/84B) 5 ns/div<br>(PM 3390B/94B) 2 ns/div<br><br>**Error Limit (Magn 10X):**<br>±1.3% of reading + 0.5% of 8 divisions) |
| **Triggering (Main & Delayed Timebase)** | **Trigger modes:**<br>Auto free run, Triggered, Single, Edge Triggering, TV Triggering |
| **Edge Triggering** | **MTB Trigger Source:**<br>(PM 3370B/80B/90B): Ch1, Ch2, Ext<br>(PM 3384B/94B): Any input channel or Line (mains); Optional rear mounted External Trigger input replacing line Triggering.<br><br>**DTB Trigger Source:**<br>Starts after delay or triggered on any input channel.<br><br>**Slope:** Positive or Negative<br><br>**Coupling:**<br>DC, AC (> 10 Hz), LF-Rej (30 kHz), HF-Rej (30 kHz)<br><br>**Level Range:**<br>¤8 div or level within signal peak to peak range.<br><br>**Level Indication:**<br>On screen level indicators and numeric readout.<br><br>**Trigger Sensitivity:**<br>(PM 3370B): 0.6 div up to 30 MHz, 1.2 div up to 60 MHz, 2.0 div up to 150 MHz.<br>(PM 3380B/84B): 0.6 div up to 50 MHz, 1.2 div up to 100 MHz, 2.0 div up to 200 MHz<br>(PM 3390B/94B): 0.6 div up to 100 MHz, 1.2 div up to 200 MHz, 2.0 div up to 300 MHz |
| **TV Triggering** | **Video Standard:**<br>HDTV, NTSC, PAL, SECAM standards<br><br>**MTB Trigger Source:**<br>CH1 to CH4, Field1, Field2, TV-Lines<br><br>**Signal Polarity:** Positive or Negative<br><br>**Sensitivity:** 0.7 div (Sync Pulse) |
| **Cursor Measurements** | **Cursor Modes:** Horizontal, Vertical, Both<br><br>**Readout:**<br>Vertical: dV, V1 to gnd, V2 to gnd, Ratio<br>Horizontal: dt, 1/dt (in Hz), Ratio, Phase<br><br>**Accuracy (magn 1X):**<br>1% of full scale within the central 8 horizontal and 6 vertical divisions. |

| X-Y Mode | **X Deflection Source:** Any input channel or line |
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| | **X Deflection Coefficient:** Same as for vertical deflection |
| | **Dynamic range:** 20 div up to 100 kHz, > 10 div up to 2 MHz. |
| | **Frequency Response:** 32 MHz at -3 dB |
| | **Error Limit:** 5% measured over central 6 divisions. |
| | **Phase Shift:** < 3o up to 100 kHz |

# Digital Mode Specifications

| Acquisition | **Repetitive Sample Rate:** Random sampling gives an equivalent sample rate of up to; (PM 3370B/80B/84B): 10 GS/s (PM 3390B/94B): 25 GS/s |
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| | **Single Shot Sample Rate:** Up to 200 MS/s |
| | **Vertical resolution:** ADC resolution: 8 bit Memory resolution: 16 bit |
| | **Memory:** (PM 3370B/80B/90B): Standard Memory: 8 k, max trace storage, 27 traces (PM 3370B/80B/90B): Extended Memory option: 32 k, max trace storage, 153 traces (PM 3384B/94B): Standard Memory: 32 k, max trace storage, 204 traces |
| | **Average:** 2,4,8 to 4096, giving a resolution of up to 14 bits |
| | **Peak Detection:** Captures glitches up to 5 ns |
| | **Envelope Mode:** For continuous tracking of changing waveforms |
| Vertical | **Auto Ranging vertical deflection:** Automatically and continuously adapts the instrument's vertical settings to have 2 to 6 divisions' display of input signal. |
| | **Bandwidth:** See above analog mode specification |
| | **Magnification:** Up to x32 magnification for higher deflection sensitivity. |
| | **Display modes:** Ch1, ± Ch2, Ch3, ± Ch4, calculated add and subtract |
| | **Window Mode:** 2 or 4 windows to display two or four traces above each other while using the full dynamic range of the ADC |

| Horizontal | **Autoranging timebase:**<br>Continuously adapts timebase sweep speed to the frequency of the trigger signal in order to keep 2 to 6 cycles on screen.<br><br>**Acquisition modes:**<br>Recurrent (Auto and triggered), Single Shot, Multiple Single Shot, Roll, Triggered Roll<br><br>**X-Y Mode:**<br>Any trace in memory or any of the input channels can be used as a X source. |
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| **Timebase** | **Single Shot Sampling:**<br>200 s/div to 500 ns/div in a 1-2-5 sequence<br><br>**Variable Timebase:**<br>Continuously variable sweep speed; 1us/div to 500 us/div in 1 us increments. 500 us/div to 200 s/div with 0.2% or smaller increments.<br><br>**Recurrent:**<br>(PM 3370B/80B/84B): 200 ns/div to 5 ns/div<br>(PM 3390B/94B): 200 ns/div to 2 ns/div<br><br>**Roll Mode:**<br>200 s/div to 200 ms/div, triggered or free roll mode, in a 1-2-5 sequence or continuously variable<br><br>**Display Resolution:**<br>Horizontal resolution for 1x magnification: 500 samples = 10 divisions = 1 screen width.<br><br>**Magnification:**<br>x2, x4 to x32 to zoom in onto parts of waveform<br><br>**Interpolation:** Dots, Sine or Linear |
| **Triggering** | **Trigger Coupling:** Same as analog mode<br><br>**Edge Triggering:**<br>Same as analog mode plus; dual slope triggering available when in single shot, real time mode.<br><br>**TV Triggering:** Same as analog mode<br><br>**Logic trigger modes:**<br>(PM 3370B/80B/90B): Glitch (time qualified pulse)<br>(PM 3384B/94B): State (4 bit), Pattern (4 bit), Glitch (time qualified pulse) |
| **Delay** | **Time Delay:**<br>0 to 1,000 div continuously adjustable<br><br>**Pre trigger view:**<br>Up to a complete record can be filled with pre-trigger information. (160 div for 8 k, 640 division for 32 k)<br><br>**Event Delay:**<br>1 to 16,384 events, max count rate 50 MHz<br><br>**Delay Modes:**<br>Starts after time delay or wait for trigger after time delay. |
| **Cursor Measurements** | **Cursor Modes:**<br>Horizontal, Vertical, Both: Free or locked to trace<br><br>**Readout:**<br>Vertical: dv, V1 to gnd, V2 to gnd, Ratio<br>Horizontal: dt, 1/dt (in Hz), Ratio, Phase (cycle is automatically referenced to trigger signal) |

| Calculated Measurements | **Volt:**<br>DC, rms, minimum, maximum, peak to peak, Low level, High level, Overshoot (positive & negative), Pre-shoot (positive & negative)<br><br>**Time:**<br>Frequency, Period, Pulsewidth, Rise time, Fall time, Duty cycle<br><br>**Delay:** Channel to channel, rising and falling edges.<br><br>**Quick Measurements**<br>Probe operated, "Touch Hold And Measure" instantly gives calculated measurements of frequency, dc, rms, and Vp-p. |
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| Processing | Add, Subtract, Multiply, Digital Filter, Integrate, Differentiate, FFT, Histogram, Pass Fail. |

## General Specifications

| Autoset | Selects proper channel, time-base and trigger settings. Function can be customized |
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| Autocal | Automatic fine adjustment for enhanced accuracy to get optimal performance even under extreme environmental conditions |
| Interfacing | **Standard:** RS-232C, CPL protocol<br>**Options:** IEEE-488.2(GPIB), SCPI |
| Hard Copy | **Output:**<br>Printed or plotted hard copy of the screen in digital mode.<br><br>**User Text:** Two lines of on-screen text<br><br>**Interface:** RS-232C or IEEE-488.2 (GPIB)<br><br>**Printer Drivers:**<br>FX Series (9 Pin), LQ1500 (24 Pins), HP 2225 Thinkjet, HP Laserjet, (series II & III), HP 540 Deskjet, and compatibles.<br><br>**Plotters:**<br>HP 7440, HP 7550, HP 7475A, HP 7470A and compatibles, HPGL.<br><br>**Camera:**<br>Camera Kit PM 9381/001 available as optional accessory. |
| Power Supply | **Line Voltage:** 100V to 240V (±10%) CAT II<br><br>**Line Frequency:** 50 Hz to 400 Hz (±10%)<br><br>**Power Consumption:** 115W (130W with all options installed) |
| Safety | Meets requirements of EN 61010-1 CAT II Pollution Degree 2, Low Voltage Directive 73/23/EEC, UL3111, CSA C22.2 No 1010-1 |
| EMC | Meets requirements of EMC directive 89/336/EEC: emission EN50081.1, susceptibility EN50082.1.<br><br>Meets requirements of MIL-STD-461C: Part2 CEO1 (narrow band), Part4 CEO3, Part2 CSO1, Part5 CSO6, (Limited to 300V), Part5 and 6 REO1, Part2 REO2 (max. 1 GHz) |

| Miscellaneous | **Setting Memory:**<br>10 complete instrument setups, with battery backup.<br><br>**Calibrated output:**<br>600 mv p-p, 2 kHz square wave.<br><br>**Z-Modulation Input:**<br>BNC, 10 kΩ > 2.4V=blanked, < 0.5 V=unblanked<br><br>**Time Between Calibration:**<br>2000 Hrs or 1 year<br>4000 Hrs or 2 year if error limits are doubled. |
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| **Size (excluding handle & feet)** | 139 mm H x 341 mm W x 481 mm L<br>5.5" H x 13.4" W x 18.9' L |
| **Weight** | 9.5 kg<br>21 lb |
| **Warranty** | Three-year product warranty, parts and labor. Five year CRT warranty. |