

Oscilloscopes

PM 3050/3052/3055/3057 60 MHz Analog Oscilloscopes
PM 3065/3067/3070/3072 100 MHz Analog Oscilloscopes

AUTOSET for Automatic Amplitude, Time, and Trigger Setting

LCD Panel Displays Status and Settings

16 kV CRT Acceleration Voltage

Fast Action Up/down Controls and Cold Switching

Single Time Base, Dual Time Base and Cursor Versions

High Reliability: 3 Year Warranty, 5 Year CRT Warranty

1997/8
Catalog

Section
2



PM 3070

The 60/100 MHz Standards

The PM 3050 to PM 3070 series consists of four models which are all optionally available in rack mount versions for systems use. These are:

- PM 3050 60 MHz 2 channel, single time base (rackmount version: PM 3052)
- PM 3055 60 MHz 2+1 channel, dual time base (rackmount version: PM 3057)
- PM 3065 100 MHz 2+1 channel, dual time base (rackmount version: PM 3067)
- PM 3070 100 MHz 2+1 channel, dual time base with smart cursors (rackmount version: PM 3072)

Each unit represents a significant step forward in scope technology through their use of microcomputer control to both speed up and simplify the task of signal measurements.

Standard features in all models include AUTOSET for single pushbutton set up; a large backlit LCD showing all instrument settings; fast up/down rocker keys and cold switching for high reliability.

Measurements in Seconds

Just press the green AUTOSET button and automatic setting of channel amplitude, time base sweep speed and triggering takes place, for any signal. If only one channel is connected only one channel is displayed but if both channels are being used then both are automatically scaled and displayed. Triggering takes place on the lower frequency channel to give a clear jitter free display. AUTOSET eliminates time consuming manual range finding and adjustment to give fast accurate results at the touch of one button.

Clean and Simple Operation

With up/down rocker keys for amplitude and time base speed selection and push-buttons for display mode and trigger source selection the operation of this series of oscilloscopes is kept clean and simple. Upon each user action the backlit LCD display is immediately updated

making at a glance review of the scopes current parameter settings possible rather than having to search the complete front panel to determine the operating conditions.

The internal microcomputer prevents illegal setups like incorrect main and delayed time base settings and clearly identifies on the display non-calibrated amplitude settings or grounded inputs. This avoids incorrect measurements, wasted time and frustration.

To speed up accurate measurements when using the delayed time base, the LCD gives a digital readout of the delay time, thus avoiding the need for any user calculations. For infrequent scope users the MENU key functions as a "help" key showing the facilities offered by each key on the scope and quickly acquainting the user with its operation.

High Reliability and Easy Service

Behind the pushbutton operation all input signals are switched by hermetically sealed long life reed relays. These keep out damp and dirt from the active signal paths and ensure long life and long term measurement stability. In the unlikely event that a failure should occur the modular construction enables easy access to the suspect board without major disassembly.

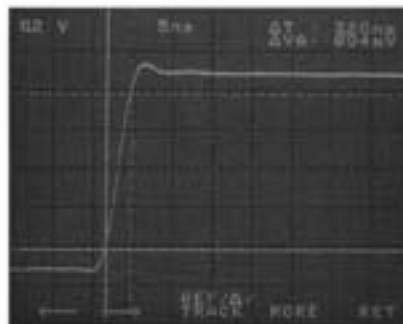
Advanced CRT

With 16 kV acceleration and advanced electron optics the CRT display has exceptional brilliance combined with a small spot size making it ideal for measurements on high speed or low repetition rate signals. The effective screen area is a full 8 x 10 cm. An internally etched graticule is provided for accurate and parallax-free measurements. Graticule illumination is standard on all models.

Clever Cursors

The PM 3070 offers full cursor measurement capabilities in both time and amplitude axes. Control of all cursor functions is by five keys in the bezel of the CRT which also are used to independently control the intensity of the alphanumerics and the cursors. Accurate measurements of peak to peak values, voltage ratios, rise times, phase relationships and time ratios are possible with direct numerical display on the CRT.

A special facility called the ZOOM function enables the signal between the cursors to be expanded to fill the full width of the screen by automatically adjusting the delay time and delay time base speed. This makes it easy to zoom in on a particular point of interest without having to consider how to set up the delay time section. In addition to the measured data both channel and time base status is displayed on screen and user text or messages can also be specified.



The four cursors of the PM 3070 enable accurate rise time measurements on fast pulses to be made quickly.

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PM 3050 60 MHz 2 Channels, Single Time Base

With all the standard facilities of the smart scope series this basic instrument provides comprehensive trigger facilities like TV line, TV frame, Auto Peak-Peak leveling and dc coupling in addition to trigger hold off. Time base speeds to 5 nsec per division are standard as well as x1 and x10 probe identification. X deflection via either channel is possible.

PM 3055 60 MHz 2 + 1 Channels, Dual Time Base

The external trigger input of this scope doubles as a third input channel with a fixed attenuation. The Delayed Time Base (DTB) facility can be directly triggered from the main time base or from either input channel. Display of MTB intensified and DTB is possible at the same time or independently.

PM 3065 100 MHz 2 + 1 Channels, Dual Time Base

Triggering to 150 MHz plus the high intensity CRT makes this unit the ideal general purpose workhorse. The fast 3.5 ns rise time and good pulse response characteristics make the PM 3065 the ultimate 100 MHz oscilloscope.

PM 3070 100 MHz 2 + 1 Channels, Dual Time Base, Clever Cursors

The clever cursors provide both amplitude and time measurement capabilities. In the amplitude mode peak to peak, ratio and 10% and 90% levels (for rise times measurements) can be read directly from the display. In the time mode, rise times, ratio and phase measurements can be made and read from the display. In addition the ZOOM facility enables fast pinpointing and expansion of a specific section of the measured signal.

Specifications

Technical Specifications

AUTOSET: Autoset selects proper channel or channels, sets vertical deflection, time base speed and triggering for easy-to-read display of input signals.

Vertical Deflection

Display Modes: Ch A, Ch B, -Ch B, Ch A + Ch B, Ch A - Ch B, X vs Y; Alternate or chopped

Trigger View: In any combination, chopped or alternate (not PM 3050)

Frequency Response

PM 3065/70:

- dc to > 100 MHz at -3 dB
(20 mV/div to 10 V/div);
- dc to > 75 MHz at -3 dB
(2 mV/div to 10 mV/div)

PM 3050/55:

- dc to > 60 MHz at -3 dB
(20 mV/div to 10 V/div);
- dc to > 35 MHz at -3 dB
(2 mV/div to 10 mV/div)
- ac coupled: lower -3 dB point is < 10 Hz

Rise Time

PM 3065/70:

- < 3.5 ns (20 mV/div to 10 V/div);
- < 4.9 ns (2 mV/div to 10 mV/div)

PM 3050/55:

- < 6 ns (20 mV/div to 10 V/div);
- < 10 ns (2 mV/div to 10 mV/div)

Deflection Coefficient: 2 mV/div to 10 V/div ($\pm 3\%$) in steps of 1, 2, 5 sequence. Continuous control ratio between steps 1 to > 2.5

Input Impedance: 1 M Ω $\pm 2\%$ // 20 pF ± 2 pF

Max. Rated Input Voltage: 400V (dc + ac peak)

Dynamic Range: > 24 div at 10 MHz

CMRR: 100:1 at 1 MHz

Input: BNC with automatic probe recognition

Trigger View

Frequency Response

PM 3065/70: DC to > 100 MHz at -3 dB (via ext); dc to > 75 MHz at -3 dB (Ch A or Ch B)

PM 3050/3055: DC to > 50 MHz at -3 dB

Deflection Coefficient: 100 mV/div via Ext Input, 2 mV/div to 10 V/div via Ch A or Ch B

Horizontal Display Modes

PM 3055/65/70: MTB, MTBL, Alt TB, DTB, X-deflection (X vs Y)

PM 3050: Timebase or X-deflection (X vs Y)

Main Time Base

Time Coefficients: 0.5 s/div to 50 ns/div ($\pm 3\%$) in steps of 1, 2, 5 sequence. Continuous control ratio between steps 1 to > 2.5

Magnifier: x10, fastest sweep speed 5 ns/div. Error limit in x10: $\pm 4\%$

Hold-Off: Continuously adjustable up to 10x minimum value

Delayed Time Base (DTB) (not in PM 3050)

Time Coefficient: 1 ms/div to 50 ns/div ($\pm 3\%$) in steps of 1, 2, 5 sequence

Magnifier: x10, fastest sweep speed 5 ns/div

Error Limit Magnifier Sweep: $\pm 4\%$
Trace Separation: $> \pm 4$ div DTB shift

Delay Time Base Multiplier (DTM) (not in PM 3050)

Resolution: 1:10,000

Error Limit Total: 4% (in x10 magnifier)

Delay Time Jitter: 1 in > 20,000

Triggering (MTB or TB)

Trigger Modes: Auto (free run), normal (triggered), Single sweep

Trigger Sources: Ch A, Ch B Composite (Ch A/Ch B), Ext. (dc or ac), Line

Trigger Coupling: Auto Peak to peak (p-p), dc, TVL, TVF

Triggering (DTB) (not in PM 3050)

Starts or triggered by Ch A, Ch B, Composite (Ch A/Ch B), ext TVL (only if MTB TV selected)

Trigger Sensitivity

PM 3050 & PM 3055	Internal	External
10 MHz	1.0 div	100 mV
50 MHz	1.0 div	150 mV
100 MHz	3.0 div	500 mV
TVF/TVL	0.7 div sync	70 mV sync
Level Range	± 8 div	± 800 mV

PM 3065 & PM 3070	Internal	External
10 MHz	1.0 div	100 mV
100 MHz	1.2 div	150 mV
150 MHz	2 div	500 mV
TVL/TVF	0.7 div sync	70 mV sync
Level Range	± 8 div	± 800 mV

Slope positive or negative; TVF or TVL, positive or negative

X-Deflection

Deflection Coefficient: Via Ch A or Ch B, 2 mV/div to 10 V/div; via external input 100 mV/div

Frequency Response: DC to 2 MHz

Error Limit: $\pm 5\%$

Phase Shift: $< 3^\circ$ up to 100 kHz

External Input

Impedance: 1 M Ω $\pm 2\%$ // 20 pF ± 2 pF
Maximum Input Voltage: 400V (dc + ac peak)

Cursor (PM 3070 only)

Intensity control independent of trace intensity

Measurements: V, t, 1/t, Ratio, Phase, Rise Time (4 way cursors), Zoom

Settings: User text, Settings readout.

Output Options

Y Signal out from Channel A

Deflection Coefficient: 100 mV/div into 10 k Ω load

Output Impedance: 75 Ω

Frequency Response

PM 3065/70: > 75 MHz at -3 dB

PM 3050/55: > 60 MHz at -3 dB

MTB Sweep Out: Output voltage 0.5V/div; load 1 M Ω

MTB Gate Out: High when MTB sweep running (> 2.4 V); otherwise low (< 0.4 V).

DTB Gate Out: High when DTB sweep running (> 2.4 V); otherwise low (< 0.4 V).

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1997/8
Catalog

Section
2

General Specifications

Display: Screen CRT 8 × 10 cm viewing area, P31 phosphor, 16 kV acceleration voltage. Parallax-free graticule with continuously variable illumination. Separate constantly illuminated LCD for display of menus, settings, status indications, etc.

Power Requirements

Safety requirements meet following specifications: IEC 348 Class I, UL 1244, CSA Certified (CSA 556B), VDE 0411. **Line Voltage:** 100V to 240V ±10% in one range

Line Frequency: 50 Hz to 400 Hz ±10% in one range

DC Nominal Voltage: 145V to 335V

Power Consumption (AC Source):

PM 3050/55: 50W

PM 3065/70: 60W

Miscellaneous

Calibration Output: 1.2V ±1%

Frequency: 2 kHz typ.

Z-modulation Input: TTL-compatible, >2.0V blanks display; <0.8 max intensity, analog control possible between 2.0V and 0.8V

Environmental Data

Temperature

Rated Range of Use: +10°C to +40°C

Limited Range of Operation: 0°C to +30°C

Storage: -40°C to +75°C

Altitude Operating: 15,000 ft (4,500m)

Non-Operating: 40,000 ft (12,000m)

Humidity: 95% RH

EMI: Meets requirements of MIL-STD-461 Class B, VDE 0871 and VDE 0875

Grenzwert-klasse B

Shock Operating and Non-Operating:

30g, ½ sine wave, 11 ms duration, 5 shocks in each direction (3 each face), for a total of 18 shocks

Vibration: 5 Hz to 55 Hz, 15 minutes along each of three axes, with a maximum acceleration of 3g. Resonance dwell of 10 minutes at each frequency where resonance occurs, or at 33 Hz when no resonance found.

Bench Handling: MIL-STD-810, method 516, procedure V. The PM 3050/55/65/70 are designed to meet the requirements of MIL-T-28800 D, Type III, Class 5, Style D. CE: Compliant

Mechanical Data

Width: 387 mm (15.2 in) incl. handle;

350 mm (13.8 in) excl. handle

Length: 518 mm (20.4 in) incl. handle;

456 mm (17.9 in) excl. handle; incl. knobs

Height: 146.5 mm (5.8 in) incl. feet;

134.5 mm (5.3 in) excl. feet

Weight: Approx 7.5 kg (16.5 lb) excl. accessories.

Ordering Information

Models

PM 3050 and PM 3052 60 MHz Analog Oscilloscope, single timebase

PM 3055 and PM 3057 60 MHz Oscilloscope with dual timebase

PM 3065 and PM 3067 100 MHz Oscilloscope with dual timebase

PM 3070 and PM 3072 100 MHz Oscilloscope with dual timebase and clever cursors

PM 3052, PM 3057, PM 3067 and PM 3072 Instrument in rackmount version.

Included with Instrument

Three-year product warranty, five-year CRT warranty; line cord; two 100 MHz 10:1 probes, model PM 8926/591 or equivalent, with 1.5m (5 ft) cable and scale factor readout; blue CRT contrast filter (on CRT); Operator and reference manual. Service manual is available upon return of reply card included with each instrument; and Certificate of Calibration Practices.

Optional Configurations

When ordering, select basic "PM" model number, and add the configuration option number listed below as a suffix.

/00n Standard Version

/11n CRT with P7 Long Persistence Phosphor

/76n Y Signal Output (bandwidth 75 MHz or 60 MHz), plus MTB Gate + DTB Gate Outputs (on PM 3050 and PM 3052 MTB Gate only)

/77n P7 Phosphor + Aux Outputs (options /76n + /11n.)

The **n** indicates the required line cord. To select your line cord substitute the **n** by:

1 Universal Euro 220V/16A, 50 Hz

3 Standard North American 120V/15A, 60 Hz

4 UK 240V/13A, 50 Hz

5 Switzerland 220V/16A, 50 Hz

8 Australia 240V/10A, 50 Hz

Options are not retrofittable. All required options must be included when order is placed.

Example, Ordering Configuration

To order a 100 MHz Oscilloscope with cursors in rack mountable configuration, with CRT option, and U.S. line cord select:

	Model	
Basic Oscilloscope	PM 3072	
P7 Phosphor		/11n
US power cord, n=3		/xx3
Complete Model Number	PM 3072/113	

Accessories

Passive Probes

PM 9001/001 Modular 1:1 Probe, 1.5m (5 ft) Cable

PM 9011/001 Switchable 1:1 or 10:1 Probe, 1.5m (5 ft) Cable, useful BW: 100 MHz (in 10:1 mode), 10 MHz (in 1:1 mode)

PM 9001/201 Modular 1:1 Probe, 2.5m (8 ft) Cable

PM 9100/101 Modular 200 MHz 100:1 Probe, 1.5m (5 ft) Cable

PM 9100/191 Modular 200 MHz 100:1 Probe, 1.5m (5 ft) Cable, Range Indicator

PM 8918/301 Low-Pass filter probe, bandwidth 4 kHz

PM 8926/591 100 MHz, 10:1 Probe; 1.5m (5 ft) Cable, with Range Indicator

Other Accessories

PM 8969/001 Retrofittable Rackmount Kit

PM 8988/001 Protective Front Panel Cover

PM 8989/001 Traveller Carrying Case

PM 8989A/031 Traveller Carrying Case with accessory storage compartments

PM 8991/041 Oscilloscope Cart

PM 8992/801 Accessory Pouch

PM 8998/001 Memory back-up for analog oscilloscopes

PM 9051/001 BNC male to 4 mm Banana Jack/Binding Posts

PM 9074/001 50Ω coaxial cable 1m (3 ft)

PM 9075/001 75Ω coaxial cable 1m (3 ft)

PM 9585/011 50Ω feedthrough termination, 1W

PM 9381/001 Oscilloscope Camera System

80i-110s AC/DC Current Probe for Oscilloscopes

80i-500s AC Current Probe for Oscilloscopes

80i-1000s AC Current Probe for Oscilloscopes

TC100 Instrument Cart

Customer Support Services

Factory Warranty

Three-year product warranty. Five-year CRT warranty.

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<http://www.fluke.com>