

2 CHARACTERISTICS

A. Performance Characteristics

- Properties expressed in numerical values with tolerances, ranges, or limits stated, are guaranteed by the manufacturer.
- Properties expressed in numerical values without tolerances, ranges, or limits stated, represent the characteristics of an average instrument.
- This specification is valid if the temperature has not changed more than + or - 5 °C since the last AUTO CAL, the probe is of the same type as delivered with the instrument, and if the average factor is 8.
- For definitions of terms, reference is made to IEC Publication 351-1, 359.

B. Safety Characteristics

This instrument has been designed and tested in accordance with IEC Publication 348, Safety Requirements for Electronic Measuring Apparatus, and has been supplied in a safe condition. This manual contains information and warnings which must be followed by the user to ensure safe operation and to keep the instrument in safe condition. The instrument has been designed for indoor use. It may occasionally be subjected to temperatures between +5 °C and 10 °C without degradation of its safety.

C. General Characteristics

- Overall dimensions:
- Height (without feet) : 139 mm (5.5 in)
- Width (without handle) : 341 mm (13.5 in)
- Length (without handle and front cover): 481 mm (19 in)

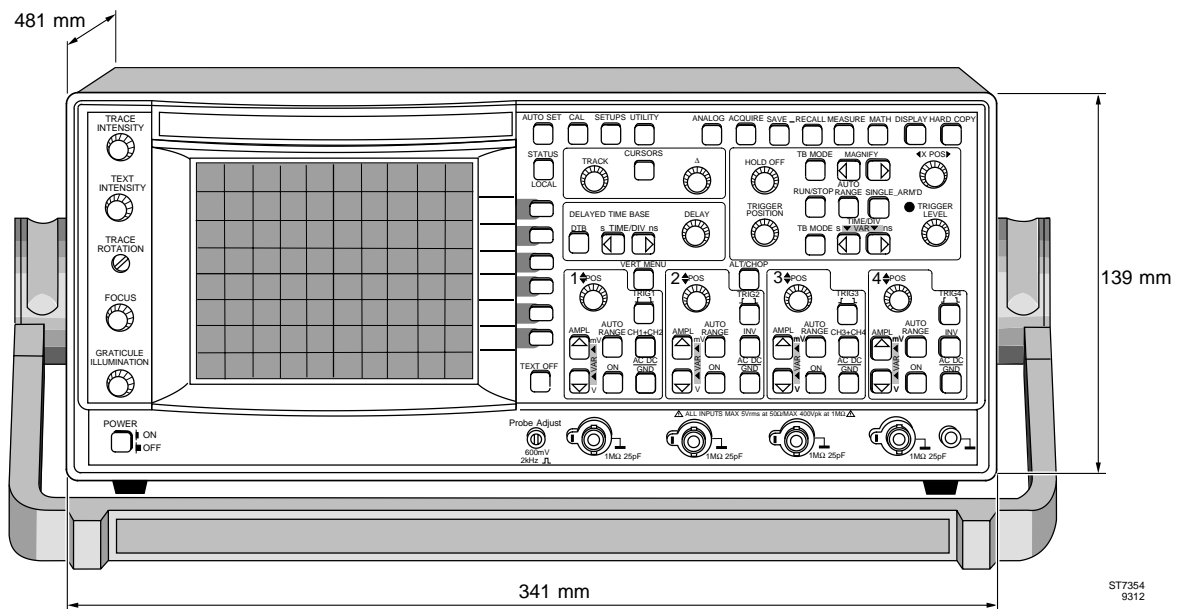


Figure 2.1 Dimensions

Weight 9.5 kg (19.7 lb)

Operating positions:

- a) Horizontally on bottom feet
- b) Vertically on rear feet
- c) On the carrying handle in three sloping positions

Note: All items that refer specifically to only one mode (analog or digital) are identified in the leftmost column with an 'A' or a 'D'.

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2.1 VERTICAL

2.1.1 Channels

CHANNELS	CH1; CH2; CH3; CH4	Form a channel set Form a channel set See Note 1
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Note 1: CH1 and CH2 for PM3370B, PM3380B and PM3390B.

2.1.2 Deflection Modes (Analog Only)

MODES	CH1, CH2, CH3, CH4	See Note 1 CH2 and CH4 can be inverted to allow -CH2 or -CH4
	CH1 + CH2	CH2 can be inverted to allow CH1 - CH2
	CH3 + CH4	CH4 can be inverted to allow CH3 - CH4
Automode: Auto attenuator	CH1, CH2 CH3, CH4	All models PM3384B/94B
Windows ON	CH1, CH2 CH3, CH4	See Note 2 All models PM3384B/94B
	Alternate Chopped	
Chopped mode: Chopped freq.	1 MHz	

Note 1: CH1 and CH2 for PM3370B, PM3380B and PM3390B.

Note 2: If more than one channel ON.

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2.1.3 Bandwidth

FREQUENCY RESPONSE		At BNC
Lower transition point of bandwidth input coupling in AC pos	<10 Hz	
PM3394B/90B		
Upper transition point of bandwidth (Ambient 5 to 40 °C)	>200 MHz	See Note 1
(Ambient 0 to 50 °C)	>175 MHz	See Note 1
PM3384B/80B		
Upper transition point of bandwidth (Ambient 5 to 40 °C)	>100 MHz	With external 50Ω
(Ambient 0 to 50 °C)	>90 MHz	With external 50Ω
PM3370B		
Upper transition point of bandwidth (Ambient 5 to 40 °C)	>60 MHz	With external 50Ω
(Ambient 0 to 50 °C)	>55 MHz	With external 50Ω
BANDWIDTH LIMITER		
Upper transition point of bandwidth	20 MHz	

*Note 1: PM3394B CH1 through CH4 in 50Ω position at BNC.
PM3390B CH1 and CH2 in 50Ω position at BNC.*

2.1.4 Attenuator

PM3394B/PM3384B CH1 to CH4 steps	2 mV/div to 5V/div	In 1-2-5 sequence
PM3390B/PM3380B/PM3370B CH1 and CH2 steps EXT TRIG steps	2 mV/div to 5V/div 0.1V/div and 1V/div	In 1-2-5 sequence
Variable gain mode	2 mV/div to 12.5V/div	Continuously variable
Auto Attenuator	2<div<6.4	1-2-5 steps precision (min. 50 mV/div)
Auto Attenuator (Windows ON)	1<div<3.2	1-2-5 steps precision (min. 50 mV/div)

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2.1.5 Input Characteristics		
INPUT CONNECTOR	BNC	See Note 1
INPUT IMPEDANCE (in 1 M Ω pos.)		Measured at freq. <1MHz
R parallel-value	1 M Ω	
- tolerance	± 1 %	
C parallel-value	25 pF	
- tolerance	± 2 pF	
INPUT INPEDANCE (in 50 Ω pos.)		PM3390B on CH1 and CH2 PM3394B all channels
R parallel value	50 Ω	
- tolerance	± 1 %	
VSWR (typical)	1.5:1	See Note 2
<i>Note 1: BNC with Probe Readout pin which causes the instrument to change V/div indication, input impedance, and attenuator setting according to the probe (when equipped with a probe indicator).</i>		
<i>Note 2: Measured up to 200 MHz input frequency; in dc and ac coupling of input.</i>		
2.1.6 Coupling		
COUPLING	dc, ac, ground	See Note 1
<i>Note 1: In GND position: channel disconnected from input, and connected to ground, BNC open (when not in 50Ω position). The GND coupling is available for all channels except EXTTRIG.</i>		
2.1.7 Dynamic Range		
PM3390B/PM3394B		
Up to 50 MHz	± 12 div	Symmetrical
Up to 200 MHz	± 4 div	Symmetrical
PM3380B/PM3384B		
Up to 25 MHz	± 12 div	Symmetrical
Up to 100 MHz	± 4 div	Symmetrical
PM3370B		
Up to 15 MHz	± 12 div	Symmetrical
Up to 60 MHz	± 4 div	Symmetrical
2.1.8 Position Range		
POSITION RANGE	+ or - ≥ 8 div	Symmetrical
2.1.9 Trace Separation		
TRACE SEPARATION		MTB and DTB
Min. range	+ or - ≥ 4 div	MTB fixed, DTB shifts

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2.1.10 Input Voltage Limits

INPUT VOLTAGE LIMITS



In high Z position
(dc + ac peak)
In 50Ω position
dc
ac rms
ac peak

± 400V

± 5V
5V
± 50V

See Note 1
See Note 2

See Note 3
See Note 3

Note 1: The instrument should be properly grounded through the protective ground conductor of the power cord.

Note 2: Up to 10 KHz; >10 kHz see figure 1.1

Note 3: Maximum of 50 mJ during any 100 ms interval.

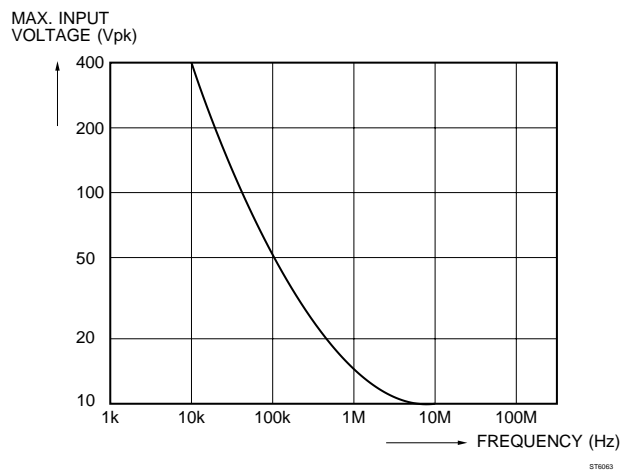


Figure 2.2 Max. input voltage versus frequency

2.1.11 Step Response

5 Divisions Pulse In 50Ω Input Impedance

STEP RESPONSE See Note 1

Note 1: Calculated from the formula: Rise time = 0.35 / Bandwidth and is measured over the central 5 divisions (vertical)

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2.1.12 Signal Delay

A: VISUAL SIGNAL DELAY	15 ns 13 ns	PM3390B94B PM3370B/80B/84B
DELAY BETWEEN CHANNELS		
CH1 and CH2	<250 ps	PM3370B/80B/90B
CH1.... CH4	<250 ps	PM3384B/94B

2.1.13 Vertical Accuracies

ACCURACY		
deflection factor		
A: Gain error (dc)	±1.3 %	Over central 6 divisions See Note 1
D: Additional gain error (dc)	±0.7%	
Gain error TrigView	±3 %	
A: Nonlinearity	≤2 %	See Note 2
D: Digital non linearity	≤4.5 %	See Note 2
MAX. BASELINE INSTABILITY		
Jump (all between steps, var, and N/I)	0.2 div or 1 mV	Whichever is greater (after autocal)
Drift	0.1 div/h	
Temperature coefficient	0.03 div/K	
CHANNEL ISOLATION		
Of deselected channels at 10 MHz	100:1	See Note 3
Of deselected channels at upper transition point	50:1	See Note 4
Between selected channels	50:1	See Note 5
CMRR		See Note 6
at 2 MHz	100:1	
at 50 MHz	25:1	

Note 1: Add 1.5% for variable gain mode.

Note 2: 2 division center screen signal with a frequency of 50 kHz, shifted within central 6 divisions.

Note 3: At 10 MHz; input to deselected channel equivalent to 8 divisions or less.

Note 4: Channels with equal V/div; input to deselected channels equivalent to 6 divisions.

Note 5: Channels with equal V/division settings; input to either channel 6 div. PM3390B/94B; max. input amplitude 3Vpp

Note 6: Between any two input channels at same attenuator setting; VAR of V/div setting adjusted for best CMRR; measured with max. 8 div.

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2.2 TIMEBASE

2.2.1 Timebase (modes)

TIMEBASE MODES	MTB only MTB and DTB DTB only Variable TB Auto TB	MTB= Main Timebase Alternating TB-mode DTB = Delayed Timebase
MTB trigger modes	AUTO TRIGGERED SINGLE SHOT SINGLE SCAN	Free run after 100 ms
DTB trigger modes	DTB starts DTB triggered	Starts after delay time Starts on first trigger after delay time

2.2.2 Timebase Settings (Analog Mode Only)

MTB PM3390B/PM3394B Settings	0.5s/div to 20 ns/div	See Note 1
Variable Time/div range	1.25s/div to 20 ns/div	MTB continuously variable
MTB PM3370B/PM3380B/PM3384B Settings	0.5s/div to 50 ns/div	See Note 1
Variable Time/div range	1.25s/div to 50 ns/div	MTB continuously variable
DTB PM3390B/PM3394B Settings	0.5s/div to 20 ns/div	See Note 1, See Note 3
DTB PM3370B/PM3380B/PM3384B Settings	0.5s/div to 50 ns/div	See Note 1, See Note 3
TIMEBASE MAGNIFICATION	10x	See Note 2

Note 1: In a 1-2-5 sequence. By means of the timebase magnifier (x10) the range is extended to 2 ns/div (PM3390B/94B) or 5ns/div (PM3370B/80B/84B).

Note 2: Expands the normal time/div by 10 times (MTB and DTB)

Note 3: The DTB sweep speed is higher or equal to MTB time/div setting.

2.2.3 DTB Delay (Analog Mode Only)

DELAY TIME	2 ns to 4.9s
Position range	0.1 div to 9.9 div
Resolution	1: 40000

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2.2.4 Timebase Settings (Digital Mode Only)

MTB Settings		
REAL TIME SAMPLING	200s/div to 250 ns/div	See Note 1 and 4
ROLL	200s/div to 200 ms/div	See Note 2
RANDOM SAMPLING		
PM3390B/94B	200 ns/div to 2 ns/div	See Note 2
PM3370B/80B/84B	200 ns/div to 5 ns/div	See Note 2
Variable Timebase	2 nsec ... 1 μ sec/div 1 μ sec ... 500 μ sec/div 500 μ sec ... 200 sec/div	1-2-5 sequence steps 1 μ sec step size equals analog step size
Auto Timebase		
Capture Range	DC up to full bandwidth	
Dynamic Range	2 nsec ... 200 msec/div	
DTB Settings (STARTS/TRIGGERED)		See Note 5
REAL TIME SAMPLING	0.5 ms/div to 250 ns/div or 0.5 ms/div to 0.001x MTB setting	Whichever is greater See Note 1 and 3
RANDOM SAMPLING	200 ns/div to 20 ns/div or 200 μ s/div to 2 ns/div	Whichever is greater 200 ns/div to
only for MTB	0.001x MTB setting	See Note 2 and 3

Note 1: In a 1-2-5 sequence and 250 ns.

Note 2: In a 1-2-5 sequence.

Note 3: The DTB sweep speed is higher or equal to MTB time/div. setting.

Note 4: When DTB is on: 500 ms/div to

Note 5: DTB is only possible with normal acquisition length. Triggered DTB is not possible in combination with tv, logic or event delay trigger mode.

2.2.5 Timebase Delay (Digital Mode Only)

TIME DELAY		
TRIGGER POSITION		
Acquisition length		
normal	-10 to 0 div	pretrigger
Acquisition length max.		
PM3384B/94B	-640 to 0 div	pretrigger
PM3370B/80B/90B	-160 to 0 div	pretrigger, note 1
DELAY		
Resolution	0 to 1000 div steps of 0.02 div	posttrigger sample distance
EVENTS DELAY		
Range	1 to 16384	See event counter

Note 1: When extended memory option is installed Time delay of trigger position at max. acquisition length is -640 to 0 div. pretrigger.

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2.2.6 DTB Delay (Digital Mode Only)

TRIGGERED		
DELAY TIME	2 ns to 4.9 s	
Position range	0.1 div to 9.9 div	
Resolution	1 : 40000	
STARTS		
DELAY TIME	0 to 10 div of MTB setting	
Position range	0 div to 10 div	
Resolution	1 : 40000	

2.2.7 Analog Timebase Accuracies

Unmagnified:	\pm (1.3% of reading +0.5% of central 8 div)	See Note 1
Magnified:		See Note 2
Up to 10 ns div	\pm (1.3% of reading +1.0% of central 8 div)	See Note 1
In 5ns/div and 2ns/div	\pm (1.8% of reading +1.5% of central 8 div)	See Note 1

Note 1: Add 1% of reading in variable mode.

Note 2: Valid over central unmagnified 8 divisions.

2.2.8 Delaytime Accuracy (Analog Mode)

MTB in 20 μ s/div	\pm (0.8% of reading	See Note 1
DTB in 2 μ s/div	+0.3% of central 8 div + Tf)	
PM3390B/94B	Tf = 4 ns	
PM3370B/80B/84B	Tf = 5 ns	

Note 1: add 1% of reading in variable mode.

2.2.9 DTB Jitter In Starts (Analog Mode)

Jitter	1 part of 25000
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2.2.10 Timebase Accuraries (Digital Mode)

MTB, DTB	
Real Time Mode	\pm 0.010%
Equivalent Time Mode	\pm 0.5%

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2.2.11 DTB Jitter In Starts (Digital Mode)

Jitter	120 ps	
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2.2.12 External Horizontal Deflection

This paragraph is valid only for the analog mode. In the digital mode X versus Y is defined as a display mode.

DEFLECTION SOURCES

PM3384B/94B	Line and CH1 to CH4	
PM3370B/80B/90B	Line, CH1, CH2, EXT TRIG	

LINE DEFLECTION

Deflection amplitude	6 ± 1.7 div	Between 49 and 61 Hz at 220 volts
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CHANNEL DEFLECTION

Error limit	$\pm 5\%$	Refer to VERTICAL Over central 6 divisions See Note 1
Linearity error limit	$\pm 2\%$	
Dynamic range up to 100 kHz	20 div	
up to 2 MHz	10 div	

POSITION RANGE	± 5 div	
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FREQUENCY RESPONSE

Upper transition point	2 MHz	
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MAX. PHASE

DIFFERENCE Between horizontal and vertical	3°	Up to 100 kHz
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Note 1: 2 div/50kHz center screen signal shifted within central 8 divisions.

2.2.13 Horizontal Display Accuracy

Display Accuracy	$\pm(0.8\% \text{ of reading} + 0.5\% \text{ of central 8 divisions})$	
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CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
2.3 TRIGGERING		
2.3.1 Source		
MTB trigger sources PM3384B/94B PM3370B/80B/90B	CH1 to CH4, Line CH1, CH2, Line, EXT TRIG	
DTB trigger sources PM3384B/94B PM3370B/80B/90B	CH1 to CH4 CH1, CH2	
2.3.2 Modes		
MODES MTB triggering PM3384B/94B	EDGE, TV, D:PATTERN, D:STATE, D:GLITCH	Enter/exit pattern plus timed pattern.
PM3370B/80B/90B	EDGE, TV, D:GLITCH	
MODES DTB triggering	EDGE	
2.3.3 TV Systems		
TV systems	TV HDTV	See Note 1 See Note 1
TV Line	1 to n	See Note 1 and 2
<i>Note 1: Line selection possible in field1 and field2. In digital mode, triggered DTB not possible in combination with TV line.</i>		
<i>Note 2: n is equal to maximum lines of TV system.</i>		

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.3.4 Coupling

BANDWIDTH EDGE TRIGGER MTB Vertical coupling in DC

Lower transition point of BW

BW = Bandwidth

Trigger coupling:

DC	dc
AC	10 Hz
LF-reject	30 kHz
HF-reject	dc

Upper transition point of BW

BW = Bandwidth

Trigger coupling:

DC)
AC)See sensitivity
LF-reject)
HF-reject	30 kHz

BANDWIDTH EDGE TRIGGER DTB

Vertical coupling in DC

Lower transition point of BW

BW = bandwidth

Trigger coupling:

DC	dc
AC	10 Hz
LF-reject	30 kHz
HF-reject	dc

Upper transition point of BW

BW = bandwidth

Trigger coupling:

DC)
AC)See sensitivity
LF-reject)
HF-reject	30 kHz

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2.3.5 Sensitivity

EDGE TRIGGER SENSITIVITY MTB and DTB of: PM3390B/94B		See Notes 1, 3, 4
dc to 100 MHz	0.6 div	
dc to 200 MHz	1.2 div	
dc to 300 MHz	2.0 div	See Note 2
PM3380B/84B		
dc to 50 MHz	0.6 div	
dc to 100 MHz	1.2 div	
dc to 200 MHz	2.0 div	See Note 2
PM3370B		
dc to 30 MHz	0.6 div	
dc to 60 MHz	1.2 div	
dc to 150 MHz	2.0 div	See Note 2
TV TRIGGER SENSITIVITY (ampl. of sync. pulse)	0.7 div	See Note 1
TRIGGER SENSITIVITY D: PATTERN/STATE PM3394B		
Rectangle pulses		
t ≥ 10 ns	1.0 div	See Note 5
t ≥ 2 ns	2.0 div	
PM3384B		
Rectangle pulses		
t ≥ 20 ns	1.0 div	See Note 5
t ≥ 4 ns	2.0 div	

Note 1: All figures are valid for an ambient temperature range of 5 to 40 °C, add 20% for ambient 0 to 50 °C.

Note 2: Measured with a 2 divisions center screen signal.

Note 3: In noise trigger multiply stated value by 2.

Note 4: In 2 ... 5 mV/div multiply stated value by 2.

Note 5: Duty cycle 50%.

2.3.6 Slope

Slope selection edge	+ or -	MTB and DTB See Note 1
D:Dual slope	Up to full vertical bandwidth	See note 2

Note 1: In TV-triggering positive/negative video.

Note 2: Only in single shot, real time mode.

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2.3.7 Level

LEVEL CONTROL RANGE MTB EDGE	$\geq \pm 8$ div	
Unless: In level p(eak)p(eak) TV	Fixed	See Note 1
D: PATTERN, STATE and GLITCH	± 5 div	PM3370B/80B/90B: glitch mode only
LEVEL CONTROL RANGE DTB EDGE	$\geq \pm 8$ div	

Note 1: The control range of the trigger level is related to the peak-peak value and duty cycle of the trigger signal.

2.3.8 Logic Triggering Timing (Digital Mode Only)

PATTERN/GLITCH DETECTION		PM3370B/80B/90B: glitch detection only
Max. pattern rate	150 MHz	
Min. present time		
PM3390B/94B	2 ns	Pulse amplitude >2 div
PM3380B/84B	4 ns	Pulse amplitude >2 div
PM3370B	6 ns	Pulse amplitude >2 div
range t_1	20 ns, 30 ns, 40 ns, 50 ns to 0.16s	See note 1
range t_2	20 ns, 40 ns, 50 ns, 60 ns to 0.16s	See note 1
accuracy $t_1 t_2$	± 5 ns	
STATE DETECTION		Not in PM3370B/80B/90B
Max. state rate	150 MHz	
Min. setup time	2.5 ns	Pattern to clock
Min. hold time	2.5 ns	Pattern to clock

Note 1: Timing behavior around t_1 and t_2 .

Pattern valid time:

-----|*****|TTTTTTTTTTTTTTTTTTTT|*****|-----

$t_1 t_1 + 10 \text{ ns } t_2 - 10 \text{ ns } t_2$

- : not triggered
- * : undefined
- T: triggered

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.3.9 Trigger Accuracies

TRIGGER LEVEL		
Accuracy edge	≤0.2 div	At 1 MHz input signal
D: Accuracy logic	≤0.4 div	At 1 MHz input signal
Trigger gap edge	0.4 div	At 1 MHz input signal in noise trigger multiply by 2
FALSE TRIGGERS	1:100 000	See Note 1

Note 1: These values are not tested in production and are based on theoretical estimates and laboratory tests.

2.4 EVENT COUNTER

EVENT delay		
PM3384B/94B		In trigger modes EDGE and LOGIC.
PM3370B/80B/90B		In trigger modes EDGE and GLITCH
Event count	1 to 16384	See Note 1
Event source		
PM3384B/94B	CH1 to CH4	
PM3370B/80B/90B	CH1, CH2, EXT TRIG	
Event slope selection	+ or -	
Event clock sensitivity		
DC to 50 MHz	0.5 div	
Event level	8 div	
Max. count frequency	50 MHz	typical value

Note 1: In digital mode, triggered DTB in combination with Event is not possible

2.5 HOLD-OFF

HOLD OFF SETTING		
A: Minimum	2 μs or 3 divisions of MTB setting	Whichever is greater
A: Maximum	2s or 20 divisions of MTB setting	Whichever is smaller
D: Minimum	4 ms	See Note 1
D: Maximum	20 divisions of MTB setting	

Note 1: For total hold off time, the process time must be included. See also ACQUISITION TIME.

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2.6 PROCESSING

2.6.1 Preprocessing

PREPROCESSING FUNCTIONS		See Note 1
	Invert	CH2; CH4
	Add	CH1+CH2; CH3+CH4; See Note 2
	Subtract	CH1-CH2; CH3-CH4; See Note 2
D:	Peak detection	Real time only
D:	Average	See Note 3
D:	Envelope	

Note 1: These functions are performed before the acquisition data is stored in the acquisition registers. PM3370B/80B/90B; offer two channels, CH1 and CH2.

Note 2: Dynamic range in digital mode ± 5 div.

Note 3: Average factor 2 to 4096 in power of 2 sequence.

2.6.2 Register Processing (Digital Mode)

REGISTER PROCESSING FUNCTION		See Note 1
	Add	See Note 2
	Sub	See Note 2
	Mul	See Note 2
	Filter	LF filter with adjustable -3dB point

Note 1: There may be run two processes simultaneously. The acquisition registers can also be used as source registers. The result from process one will be stored in memory one. The result from process two will be stored in memory two.

Note 2: The source can be any trace from any register except the result register. The result can be scaled.

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2.7 TRACE MEASUREMENTS (DIGITAL MODE)

TRACE MEASUREMENTS FUNCTIONS

Horizontal	Frequency Period Pulse width Rise / fall	See Note 1 PM3370B/80B/90B: CH1, CH2
Vertical (with or without offset)	Mean RMS Maximum Minimum Peak/peak Low High Overshoot Preshoot Duty cycle Delay	PM3370B/80B/90B: CH1, CH2 See Note 2

Note 1: These measurements can be performed on traces stored in the acquisition and memory registers.

Note 2: In PM3370B/80B/90B also available for EXT trigger source and external trigger memory.

2.8 CURSORS

2.8.1 Cursor Control

NUMBER OF CURSORS	4	
CURSOR RELATION D:	Screen Trace	Free Follows the trace
CURSOR MODES	Time Amplitude Both	Only screen cursor
Amplitude cursor modes	Absolute Ratio	See Note 1
Time cursor modes	Absolute Ratio	See Note 1
Phase cursor Modes	Absolute Ratio	See Note 1

Note 1: The ratio range is 0% to 999% where 100% corresponds to the value in the cursor read out at the moment that the "ΔT=100%" button is pressed.

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2.8.2 Cursor Readouts

CURSOR READOUTS	dV	See Note 1
	dT	
	V to GND	See Note 1
	1/dT	
	dQ(Q1, Q2)	
T-trig	See Note 3	
READOUT RESOLUTION	3 digits	

Note 1: In the "MTB + DTB timebase" and "DTB", all waveform operations and measurements are performed on the DTB traces.

Note 2: Refer to trigger point (Q1, Q2)

Refer to start of trace (Trace in memory, Q1 and Q2).

Note 3: Gives time differences (delta) between the cursor position and the trigger point (for both cursors).

2.8.3 Cursor Accuracies (Analog Mode)

Voltage measurements Manual	$\pm 1\%$ of FULL SCALE	Note 1
Time measurements Unmagnified timebase	$\pm 1\%$ of FULL SCALE	Note 2
Magnified timebase up to 10 ns/div	$\pm 1.4\%$ of FULL SCALE	
Magnified timebase in 5 ns/div and 2 ns/div	$\pm 2.2\%$ of FULL SCALE	

Note 1: Measured with 1 kHz square wave within central 6 div.

Note 2: within central 8 div.

2.8.4 Cursor Accuracies (Digital Mode)

ERROR LIMIT VERTICAL	See vertical accuracy
ERROR LIMIT HORIZONTAL	See horizontal accuracy

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2.9 DIGITAL ACQUISITION

2.9.1 Modes

MODES Select one:	Recurrent Single shot/scan Roll	Stop on trigger continuous
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2.9.2 Sample Rate

Real time	Max. Sample rate 200MS/s	250 ns/div to 200s/div See Note 1
Equivalent time:	Random sampling	See Note 1
PM3390B/94B	Max. 25GS/s	2 ns/div to 0.2 μs/div
PM3370B/80B/84B	Max. 10GS/s	5 ns/div to 0.2 μs/div

Note 1: Sampling rate depends on time/division setting.

2.9.3 Multiplexed Channels

The 4 channel instruments have 4 channels configured as 2 + 2. This implies, that the channels CH1 and CH2 are multiplexed with the channels CH3 and CH4 to share the same dual channel digitizer. The Ext.Trig. channel (TRIG VIEW) is multiplexed the same way as CH4.

Multiplexed channels (CH1 and CH2) or (CH3 and CH4)	simultaneously	See Note 1
Any other combination for timebase settings		
200s/div to 10 μs/div	CHOPPED	See Note 2
5 μs/div to 2 ns/div	ALTERNATED	
Max. Chop freq.	5 MHz	

Note 1: At 250 ns/div each of the four channels is acquired in alternated mode.

Note 2: When peak detection is activated the multiplexing is in alternating mode.

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2.9.4 Trace Memory

PM3384B/PM3394B

This digitizer has a total acquisition memory size of 32K bytes. To apply this memory as efficiently as possible, it is shared by all channels connected to it. The following section summarizes the effects:

Record length normal 1 to 4 channels selected	512 samples/channel	
Record length 'Max' 3 or 4 channels selected	8K samples/channel	See Note 1
2 of 4 channels selected	16K samples/channel	
1 of 4 channels selected	32K samples	
Display	501 samples/trace	

PM3370B/80B/90B:

This digitizer has a total acquisition memory size of 8K bytes. To apply this memory as efficiently as possible, it is shared by all channels connected to it. The following section summarizes the effects:

Record length normal 1 and 2 channels selected	512 samples/channel	See Note 2
Record length 'Max' 2 channels selected	2K samples/channel	See Note 1 and 4
2 channels selected	4K samples/channel	See Note 2
1 of 2 channels selected	8K samples	See Note 3
Display	501 samples/trace	

Note 1: When peak detection or envelope is activated, all "max" record length figures have to be divided by 2 because samples are stored as peak/peak combinations.

Note 2: Trigger view possible.

Note 3: No trigger view possible.

Note 4: When extended memory option is installed total acquisition memory is 32K bytes, shared by both channels and external trigger. This results in the following max. record lengths:
2 channels and trig.view 8K samples/channel.
2 channels, no trig.view 16K samples/channel.
1 of 2 channels, no trig.view 32K samples/channel.

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.9.5 Acquisition Time

The process time between acquisitions depends from the selected settings and the selected processing. Therefore it is not possible to catch the process time between acquisitions in a formula. The next table gives an indication of the performance of the processing capabilities.

Process time between acquisitions 500 ns/div one channel no trigger delay acquisition length = 512	6 ms active	See Note 1 Holdoff is min and no processes or measurements are
500 ns/div two channel no trigger delay acquisition length = 512 average = 8	16 ms	Holdoff is min and no other processes or measurements are active
Equivalent time Timebase:		See Note 2
- at 2 ns/div	2s	
- at 0.2 µs/div	100 ms	

Note 1: Time required to fill the acquisition record at the sampling rate corresponding with the selected timebase setting is not included.

Note 2: After the specified time, there is a 99% probability of all sample positions being updated to the new acquisition. Trigger frequency >2 kHz. These values are not tested in production and are based on theoretical estimates and laboratory tests.

2.9.6 Resolution

ACQUISITION RESOLUTION	8 bits	over 10.24 divisions
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2.9.7 Registers

NUMBER OF REGISTERS Acquisition length: PM3384B/94B:		Including current acquisition One set contains:
- Normal	51 sets	Four traces
- Max: -4x8K	3 sets	Four traces
-2x16K		Two traces
-1x32K		One trace
WORD LENGTH	16 bits	
PM3370B/80B/90B:		Note 1
- Normal	9 sets	Two traces } + Trig.View
- Max: -2x2K	3 sets	Two traces }
-2x4K		Two traces
-1x8K		One trace
WORD LENGTH	16 bits	

Note1: When extended memory installed: number of register, equal to four channel models. One set contains max. two traces+ trig.view.

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.9.8 Register Manipulations

Clear		The contents of the selected register is set to zero
Save		The contents of the acquisition register is stored in the selected register
Copy		The contents of a selected register is stored in another selected register
Recall		The register can be made visible on the display or can be removed from the display

2.9.9 Digital Acquisition Accuracies

SAMPLING RATE ERROR	$\pm 0.01\%$	X-tal
TIME UNCERTAINTY At double sampling rate	$\pm 100\text{ps}$	

2.10 FRONT PANEL MEMORY

Memory size	10 fronts
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2.11 BLANKING OR Z-AXIS (ONLY FOR ANALOG TRACE)

Input connector	BNC	
Input impedance	10 k Ω	
Input coupling	dc	
Max input voltage	$\pm 10\text{V}$	
Input voltage unblank	0.5V or less	See Note 1
Input voltage blanked	+ 2.4 V or more	See Note 1
Response time	80 ns	Rise time 2 ns

*Note 1: Half tones are possible at input voltages between +0.8V and +2.4 V.
Blanking has only effect on the trace in analog mode.*

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.12 DISPLAY

2.12.1 CRT

CRT		
Deflection	Electrostatic	Vector
Dimensions (h x w)	80 mm x 100 mm	8 x 10 divisions
Phosphor Standard	Green GH (P31)	
GRATICULE	Fixed	
Y-AXIS ORTHOGONALITY	90 ° ± 0.5 °	
ACCELERATING VOLTAGE	16.5 kV	
Writing speed	>1.8cm/ns	
TRACE ROTATION		Screwdriver adjustment
Min. range	10 °	External field <0.1 mT
Min. overrange	2 °	
TRACE DISTORTION		
At center of screen	<0.3 mm	Deviation from straight line inside 6 x 8 div
Else	<1.0 mm	

2.12.2 Modes

PRESENTATION MODES	Y versus T Y versus X
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2.12.3 Vertical Display Manipulations (Digital Mode)

Linear		Linear interpolations between measured dots
Sine		Sine like interpolation between measured dots
Vertical magnify	2, 4, 8, 16, 32	
Windows	1, 2, 4	Each trace has his own place on the screen
PM3384B/94B		max. 4 traces
PM3370B/80B/90B		max. 3 traces
Recall trace		Each trace can be made visible on the screen or can be removed from the screen. Note 1
Vertical position	± 8 div	Each trace can be moved over 8 divisions
Max. displayable traces on screen	8	See Note 1

Note 1: At least one trace is visible.

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.12.4 Horizontal Display Manipulations (Digital Mode)

TIMEBASE		
MAGNIFICATION	2, 4, 8, 16, 32	See Note 1

Note 1: For acquisition depth greater than 512 byte it is possible to make the magnification factor less than one (compress mode) to display the complete trace on the screen.

2.13 EXTERNAL INTERFACES

2.13.1 Calibrator

WAVEFORM		
Shape	square wave	
INTERNAL IMPEDANCE		
Value	1200Ω	
OUTPUT VOLTAGE		
Peak-peak value	600 mV	See Note 1
Tolerance	1%	
OUTPUT CURRENT		
Peak-peak value	0.5 mA	See Note 2
FREQUENCY		
Value	2kHz	
Tolerance	±20%	

Note 1: Positive going with respect to ground; Open voltage (halves when terminated with 1200Ω).

Note 2: When output short circuited (halves when terminated with 1200Ω).

2.13.2 Standard external interface

TYPE OF INTERFACE	RS 232-C	CPL (compact programming language) See operating guide	
PINNING			
PIN	I/O	NAME	
1	-	-	Not connected
2	I	RXD	Received data
3	O	TXD	Transmitted data
4	O	DTR	Data terminal ready
5	-	GND	Signal ground
6	I	DSR	Data set ready
7	O	RTS	Request to send
8	I	CTS	Clear to send
9	-	-	Not connected
TRANSMISSION MODES	Asynchronous Full duplex		
HANDSHAKE			
Hardware	RTS/CTS and DSR/DTR	Default: not active See Note 1	
Software	XON/XOFF	Default: not active See Note 1	

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
BAUDRATE	75,110,150,300 600,1200,2000, 2400,4800,9600 19200,38400	Receiving and transmitting Default:1200 See Note 1
NUMBER OF STOP BITS PARITY	1 odd,even,or no	Default: no parity See Note 1
CHARACTER LENGTH	7 or 8	Default:8 See Note 1
ERROR RESPONSE	See CPL, Chapter 6 in Users Manual	
ELECTRICAL TXD and RXD Spacing "0" Marking "1"	$\geq +3V$ $\leq -3V$	
RTS,CTS,DSR and DTR ON OFF	$\geq +3V$ $\leq -3V$	
Current output	$\leq 10mA$	
Impedance Output Input	$300\Omega \pm 10\%$ $\geq 3 k\Omega \leq 7k\Omega$	
Voltage Output Input	$\geq -12V \leq +12V$ $\geq -25V \leq +25V$	
Connector	Shielded	9 pole RAP male connector according MIL-C-24308

Note 1: Selectable via UTILITY menu and CPL. When battery installed, same as last power-off value.

2.13.3 Optional external interfaces

IEEE	ANSI/IEEE 488.2	SCPI See section 1.20.5
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CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.13.4 Printers and plotters support

PRINTERS	HP-thinktjet LQ1500 FX80 HP-LASER HP-540
PLOTTERS	HPGL HP7440 HP7550 HP7475A HP7478A PM8277 PM8278

2.13.5 Real Time Clock

(RTC)		
Select:	Time of trigger or Time of pressing hardcopy button	Note 1 Note 2

Note1: These times may be the same when it is not possible to reconstruct the time of trigger.

*Note2: - Stamped on any hardcopy via hardcopybutton
- Time is part of delta transfer waveform.*

2.14 AUTO SET & CALIBRATION

2.14.1 Auto Set

Vertical deflection	2...5 div	Note 1
Horizontal deflection	Max. 6 periods on CRT at input signal 10 mV...25V 40 Hz...30 MHz	Note 1

Note 1: AUTO SET selects the proper channel, sets vertical deflection, timebase speed, intensity, and triggering for an easy-to-read display of input signals, or the user programmable AUTO SET items.

2.14.2 Calibration

CALIBRATION FACILITIES	Auto cal	See Note 1
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Note 1: Calibrates vertical offset and gain, horizontal offset and gain and sweep time, trigger offset and gain.

CHARACTERISTICS

SPECIFICATIONS

ADDITIONAL INFORMATION

2.15 POWER SUPPLY AND BATTERY BACKUP**2.15.1 Power Supply**

LINE VOLTAGE



ac (rms)

Operation

Tolerance

100V to 240V

±10%

LINE FREQUENCY

Nominal

50 Hz to 400 Hz

Limits of operation

45 Hz to 440 Hz

LINE WAVEFORM

Max. waveform

deviation factor

10%

Crest factor

1.27 to 1.56

At nominal source
voltage

ALLOWABLE POWER

INTERRUPTION

20 ms

See Note 1

POWER CONSUMPTION

Without options

115W

Max. power

consumption

130W

POWER CORD

Length

2.1m (82.7 in)

Power plug

Nat.version

Note 1: At the lowest allowable source voltage. After this time the oscilloscope data is saved before the instrument goes down, and an automatic power-on sequence starts after restoration of the power source voltage.

2.15.2 Battery Backup

DATA AND SETTINGS

RETENTION

See Note 1

Retention time

2 years

Batteries:

Recommended type

LR 6

See Note 2

Quantity

2

Temperature range

0..+70 °C

See Note 3

Note 1: When instrument is switched off or during power failure.

Note 2: According to IEC 285 (=Alkaline Manganese Penlight Battery).

Note 3: At -40 to 0 °C, settings retention is uncertain. It is advised to remove batteries from instrument when it is stored during longer periods (>24 hours) below -30 °C or above 60 °C. UNDER NO CIRCUMSTANCES SHOULD BATTERIES BE LEFT IN THE INSTRUMENT AT TEMPERATURES BEYOND THE RATED RANGE OF THE BATTERY SPECIFICATION

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.16 MECHANICAL CHARACTERISTICS

PORTABLE VERSION

Dimensions:

Length	481 mm (19 in)	Handles excluded Add 5 mm (0.2 in) for cover Add 65 mm (2.5 in) for handle
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Width	341 mm (13,5 in)	Add 50 mm (2 in) for handle
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Height	139 mm (5,5 in)	Add 8 mm (0.3 in) for feet
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Weight:

Instrument	9.5 kg (19,7 lb)	
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COOLING

Regulated	No air filter
Forced air	

2.17 ENVIRONMENTAL CHARACTERISTICS

2.17.1 General

The characteristics are valid only if instrument is checked in accordance with the official checking procedure. Warm up and recovery time are in accordance with MIL-T 28800D par. 3.7.1.1.

The instrument meets the environmental requirements of MIL-T-28800D Type III Class 3, Style D, Color R (unless specified otherwise).

2.17.2 Environmental

TEMPERATURE

See Note 1

Operating:

min.low temp.	0 °C
max.high temp.	+50 °C

Nonoperating (storage):

min. low temp.	-40 °C
max. high temp.	+70 °C

MAX. HUMIDITY

See Note 1

Operating and Non operating (storage)	95%	Relative humidity noncondensing
---------------------------------------	-----	---------------------------------

MAX. ALTITUDE

See Note 2

Operating	4.6 km (15000 ft)	See Note 3
Nonoperating (storage)	12 km (39000 ft)	

VIBRATION (OPERATING)

See Note 4

Freq. ranges:

5 Hz to 15 Hz	g level at max. freq.:
16 Hz to 25 Hz	0.7 at 15 Hz
26 Hz to 55Hz	1.3 at 25 Hz
	3 at 55 Hz

At each freq.range:

Cycling time	15 min	
Resonance search	5 min	
Resonance dwell	10 min	See Note 5

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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Note 1: In accordance with MIL-T-28800D par. 3.7.2.1.1. (FIGURE 2).

Note 2: In accordance with MIL-T 28800D par. 3.7.3.

Note 3: Maximum operating temperature derated to 3 °C for each km above sea level

Note 4: In accordance with MIL-T-28800D par. 3.7.4.1.

Note 5: At each resonance frequency (or at 33 Hz if no resonance was found).

SHOCK (OPERATING)		See Note 6
Amount of shocks		
total	18	
each axis	6	3 in each direction
Shock waveform	half sinewave	
Duration	6-9 ms	
Peak acceleration	400 m/s ²	

BENCH HANDLING		See Note 7
Meets requirements of	MIL-ST-810 method 516 procedure V	

TRANSPORTATION	Drop height 0.76m	See Note 9
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SALT ATMOSPHERE		
Structural parts		See Note 8

Note 6: In accordance with MIL-T-28800 par. 3.7.5.1.

Note 7: In accordance with MIL-T-28800 par. 3.7.5.3.

Note 8: In accordance with MIL-T-28800 par. 3.7.8.1.

Note 9: Drop in shipping container on 8 corners, 12 edges, 6 surfaces.

2.17.3 EMI

2.17.3.1 *Meets MIL-T 28800D Type III Class 3 (Navy requirement, unless specified otherwise).*

Meets MIL-STD-461C as follows:

- Conducted Emissions	Part 2	CEO1	(Narrow band)
	Part 4	CEO3	
- Conducted Susceptibility	Part 2	CSO1	
	Part 5	CSO6	(Limited to 300V)
- Radiated Emissions	Part 5,6	REO1	
	Part 2	REO2	(1 GHz max)

2.17.3.2 *CE (89/336EEC)*

Meets harmonized product requirements of 89/336EEC, EN50081.1 and EN50082.1 with addition of the tables 1 to 8.

2.17.3.3 *VDE requirements*

The instrument meets the requirements of VDE 0871 Grenzwert-klasse B.

CHARACTERISTICS

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2.17.3.4 Additional EMI requirements

The instrument is tested in accordance with IEC 351-1 par. 5.1.3.1. The maximum deflection factor is 7 mm/mT (0.7 mm/gauss). This value measured with the instrument in a homogeneous field (in any direction with respect to the instrument) with a flux intensity (peak to peak value) of 1.42 mT (14.2 gauss) and of symmetrical sine wave form with a frequency of 45 Hz to 66 Hz.

The PM3370B, PM3380B and PM3384B, including standard accessories, conform with the EEC Directive 89/336 for EMI immunity, as defined by IEC 801-3, with the addition of the following tables.

Table 1.

	Susceptibility: no visible disturbance		
Frequency range: 10 kHz .. 25 MHz	E = < 0.1V/m	E = 1 V/m	E = 3 V/m
Stand alone	2 mV/div ... 5 V/div	2 mV/div ... 5 V/div	2 mV/div ... 5 V/div
With PM9010/091	2 mV/div ... 5 V/div	20 mV/div ... 5 V/div	100 mV/div ... 5 V/div

Table 2.

	Susceptibility: no visible disturbance		
Frequency range: 25 MHz ... 1 GHz	E = < 0.1V/m	E = 1 V/m	E = 3 V/m
Stand alone	2 mV/div ... 5 V/div	2 mV/div ... 5 V/div	10 mV/div ... 5 V/div
With PM9010/091	2 mV/div ... 5 V/div	100 mV/div ... 5 V/div	500 mV/div ... 5 V/div

Table 3.

	Susceptibility: disturbance less than 10 % of full scale		
Frequency range: 10 kHz .. 25 MHz	E = < 0.1V/m	E = 1V/m	E = 3 V/m
Stand alone	N/A	N/A	N/A
With PM9010/091	N/A	5 mV/div ... 10 mV/div	20 mV/div ... 50mV/div

Table 4.

	Susceptibility: disturbance less than 10 % of full scale		
Frequency range: 25 MHz ... 1 GHz	E = < 0.1V/m	E = 1V/m	E = 3 V/m
Stand alone	N/A	N/A	2 mV/div ... 5 mV/div
With PM9010/091	N/A	20 mV/div ... 50 mV/div	50 mV/div 200 mV/div

For conditions not specified in tables 1 - 4, a susceptibility effect of more than 10 % is possible.

CHARACTERISTICS

SPECIFICATIONS

ADDITIONAL INFORMATION

The PM3390B and PM3394B, including standard accessories, conform with the EEC Directive 89/336 for EMI immunity, as defined by IEC 801-3, with the addition of the following tables.

Table 5.

	Susceptibility: no visible disturbance		
Frequency range: 10 kHz .. 25 MHz	E = < 0.1V/m	E = 1 V/m	E = 3 V/m
Stand alone	2 mV/div ... 5 V/div	2 mV/div ... 5 V/div	2 mV/div ... 5 V/div
With PM9020/091	2 mV/div ... 5 V/div	20 mV/div ... 5 V/div	50 mV/div ... 5 V/div

Table 6.

	Susceptibility: no visible disturbance		
Frequency range: 25 MHz ... 1 GHz	E = < 0.1V/m	E = 1 V/m	E = 3 V/m
Stand alone	2 mV/div ... 5 V/div	2 mV/div ... 5 V/div	10 mV/div ... 5 V/div
With PM9020/091	2 mV/div ... 5 V/div	100 mV/div ... 5 V/div	200 mV/div ... 5 V/div

Table 7.

	Susceptibility: disturbance less than 10 % of full scale		
Frequency range: 10 kHz.. 25 MHz	E = < 0.1V/m	E = 1V/m	E = 3 V/m
Stand alone	N/A	N/A	N/A
With PM9020/091	N/A	5 mV/div ... 10 mV/div	10 mV/div ... 20 mV/div

Table 8.

	Susceptibility: disturbance less than 10 % of full scale		
Frequency range: 25 MHz ... 1 GHz	E = < 0.1V/m	E = 1V/m	E = 3 V/m
Stand alone	N/A	N/A	5 mV/div
With PM9020/091	N/A	20 mV/div ... 50 mV/div	50 mV/div ... 100 mV/div

For conditions not specified in tables 5-8,, a susceptibility effect of more than 10 % is possible.

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.18 SAFETY

MEETS
REQUIREMENTS OF

IEC 348 Class I
UL 1244
CSA C22.2 No231
VDE 0411

See Note 1
See Note 2
See Note 2
See Note 1

APPROVALS
(applied for)

CSAC22.2 No231

MAX. X-RADIATION

MIL-T-28800D
par. 3.9.3.4.a

Note 1: Except for power cord, unless shipped with universal European power cord.

Note 2: Except for power cord, unless shipped with North American power cord.

2.19 ACCESSORIES

PACKED WITH
INSTRUMENT
Signal input

2x10 M Ω 10:1 probe
Contrast filter
Front cover

With readout (1.5 m)
Blue
Can be locked on instr.

Operating guide

Reference manual

2.20 OPTIONS & OPTIONAL VERSIONS

2.20.1 Options Line cord

LINE CORD

Universal
European

In accordance with VDE

North American

In accordance with CSA, UL

United Kingdom

In accordance with BSI

Australian

In accordance with SAA

Swiss

In accordance with SAV

2.20.2 Options digital versions

EXTERNAL INTERFACES
INTERNAL EXTENSIONS

IEEE
EXTENDED
MEMORY
MATH+

Factory installed only

Factory installed only

Factory installed only

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.20.3 Options analog

EXTERNAL INTERFACES	Y-out, MTB gate, DTB-gate, ExtTrig. IEEE	See Note 1, Factory installed only Factory installed only
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Note 1: Ext trig is a standard feature in PM3370B/80B/90B. For characteristics refer to chapter 1.3.5.

2.20.4 Specification optional outputs

Y SIGNAL OUT	BNC	
Source	CH1	
Coupling	as CH1	
Voltage:		
into 1 M Ω	20mV/div \pm 10%	
into 50 Ω	10mV/div \pm 10%	
Freq. response:		Terminated with 50 Ω
PM3390B/94B	dc to 200 MHz	
PM3380B/84B	dc to 100 MHz	
PM3370B	dc to 60 MHz	
Dynamic range	\pm 10 div	At 50 MHz
MTB GATE OUT		
Connector	BNC	
Output impedance	1 k Ω	
Voltage:Timebase		
not running	0.2 \pm 0.2V	
Timebase running	3.7 \pm 1.3V	
DTB GATE OUT		
Connector	BNC	
Output impedance	1 k Ω	
Voltage:Timebase		
not running	0.2 \pm 0.2V	
Timebase running	3.7 \pm 1.3V	

CHARACTERISTICS	SPECIFICATIONS	ADDITIONAL INFORMATION
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2.20.5 Specification External trigger option


Valid for ext trig option in PM3384B/94B

(External trigger input is a standard feature in PM3370B/80B/90B)

SOURCE

SOURCE(S) MTB-triggering	CH1 ... CH4 External Line
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INPUT CHARACTERISTICS

INPUT CONNECTOR	BNC	At rear of instrument
INPUT IMPEDANCE		Measured at freq. <1MHz
R parallel - value	1 M Ω	
- tolerance	$\pm 1\%$	
C parallel - value	25 pF	
- tolerance	± 5 pF	
DYNAMIC RANGE		
Up to 10 MHz	± 2.5 V	Symmetrical
INPUT VOLTAGE LIMITS		See note 1
 (d.c. + a.c. peak)	± 400 V	See note 2

Note 1: Apparatus should be properly grounded through the protective ground conductor of the power cord.

Note 2: Up to 10 kHz; >10 kHz see figure 1.1.

SENSITIVITY

EDGE TRIGGER SENSITIVITY		See note 3
d.c. to 5 MHz	100 mV	
d.c. to 10 MHz	200 mV	

Note 3: In noise-trigger multiply stated value by 2.

TRIGGER LEVEL

TRIGGERLEVEL		
Range	± 1.45 V	See note 4
Accuracy	≤ 0.45 V	at 1 kHz input signal
triggercoupling DC		

Note 4: With Level-pp on the range is restricted to the peak-peak value of the trigger signal.

2.20.6 Specification IEEE-OPTION

TYPE OF INTERFACE	ANSI/IEEE 488.2	SCPI (see SCPI programming manual) See Note 1
INTERFACE REPERTORY		
Source handshake	SH1	Complete capability
Acceptor handshake	AH1	Complete capability
Talker	T5	Basic talker: yes Serial poll : yes Talk only : yes Unaddress if MLA: yes
Listener	L3	Basic listener: yes Listener only : yes Unaddress if MTA: yes
Service request	SR1	Complete capability
Remote local	RL1	Complete capability
Parallel poll	PP0	No capability
Device clear	DC1	Complete capability
Device trigger	DT1	Complete capability
Controller	C0	No capability
ELECTRICAL INTERFACE		
Busdrivers	E2	Three state (true=0 to 0.8V;false=2 to 5V)
Connector	Shielded	Amphenol type 57FE-20240-20SD35
Pin 1 ... 4	DIO1...DIO4	
Pin 13 ... 16	DIO5...DIO8	
Pin 18 ... 23	GND	
Pin 24	Logic GND	
Pin 5	EOI	
Pin 6	DAV	
Pin 7	NRFD	
Pin 8	NDAC	
Pin 9	IFC	
Pin 10	SRQ	
Pin 11	ATN	
Pin 12	Shield	
Pin 17	REN	
FUNCTION SELECTION	Via UTILITY-MENU	Busaddress Default: 8 See Note 2
INTERFACE STATUS INDICATOR	On screen	

Note 1: Talker/listener

Note 2: When battery installed, same as last power-off value.

