

Four 50 MHz channels in compact 9.6 kg construction



PHILIPS

PM 3244: 50 MHz/5 mV. Four channels



PM 3244 shown here life size.
Note well-defined 8 x 10 cm display.

Combined with logical front panel layout



Cold switching techniques give complete freedom in component and front panel layout. See rear page for more details.

PHILIPS

And a specification worth studying in detail

TECHNICAL SPECIFICATIONS

C.R.T.

Type

Philips D 14-125 rectangular meshtype tube with 10 kV acceleration potential and metal backed phosphor.

Screen type

P31 (GH) phosphor standard
P 7 (GM) phosphor optional.
Order number PM 3244G.

Useful screen area

8 x 10 div. of full centimeters.

Graticule

Internal graticule with centimeter divisions and 2 mm subdivisions along the central axes. 10% and 90% lines are indicated. Illumination continuously variable.

Y-AXES

Four identical vertical channels, each of which can be displayed individually, or in any combination up to four channels simultaneously, in alternate or chopped mode. Additionally the A + B and C + D signals can be displayed in any combination with the four channels. All channels can also be inverted.

Response

Freq. range DC :

0 Hz ... 50 MHz (-3 dB)

Freq. range AC :

10 Hz ... 50 MHz (-3 dB)

Risetime ~ 3 ns

Deflection coefficients

5 mV/div ... 2 V/div, in 1-2-5 sequence. Uncalibrated continuous control between steps 1 : > 2.5

Accuracy

± 3%

Input impedance

1 M Ω //15 pF

RC time AC coupled 22 ms

Coupling AC-0-DC

Display modes

Channel A only or

Channel B only or

Channel C only or

Channel D only or

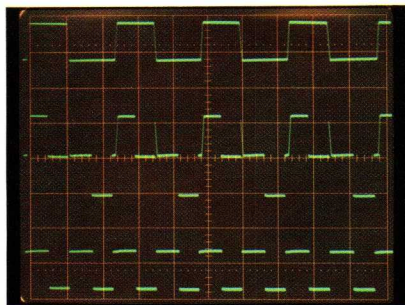
Channels A + B added or

Channels C + D added or

any of these modes in any combination, chopped or alternate. Each channel can also be inverted. Chopping frequency approx. 1 MHz.

CMRR in A-B and C-D modes

100 : 1 at 1 MHz with 8 div. of common mode signal (after adjusting one vernier for optimum rejection of common mode).



Three traces illustrating differential display facilities. In this case a simultaneous display of channel A,-B and A-B. The identical facility exists for C and D channels.

Maximum input voltage

400 V (DC + AC peak)

Maximum deflection

Undistorted deflection up to 24 div. for sinewave signals with frequencies of up to 15 MHz. Shift range 16 div.

Signal delay

≥ 20 ns

X-AXIS

Horizontal deflection can be obtained from either the main time base or the delayed time base, or a combination of the two, or from any of the signal sources selected for X-deflection. For X-Y displays Y_a, Y_b, Y_c or Y_d can be employed or the signal be applied to the external triggering input. The signal source for horizontal deflection can also be Line.

Display modes

Main time base

Main time base intensified by

delayed time base

Delayed time base

Up to four trace X-Y displays

using Y_a, Y_b, Y_c or Y_d for

horizontal deflection or external

or line.

Horizontal amplifier

Bandwidth

DC ... 1 MHz (-3 dB)

Deflection coefficient

≤ 450 mV/div. using the Ext. connector. Vertical deflection coefficients apply when Y_a, Y_b, Y_c or Y_d is used for horizontal deflection.

Measuring accuracy

± 10% using Y_a, Y_b, Y_c or Y_d input.

Phase error

< 3° at 100 kHz

Main time base

Time coefficients

0.5 s/div ... 50 ns/div in 1-2-5 sequence. Uncalibrated continuous control between steps 1 : > 2.5

Accuracy

± 3%

Delayed time base

The delayed time base starts immediately after the selected delay or can be triggered after the delay time by any of the selected delay time base trigger sources.

Time coefficients

1 ms/div ... 50 ns/div in

1-2-5 sequence. Uncalibrated

continuous control between

steps 1 : > 2.5

Accuracy

± 3%

Time base magnifier

Magnification : x5

Highest effective sweep

speed : 10 ns/div

Additional tolerance : ± 2%

Main time base triggering

Trigger source

Internal, $Y_a, Y_b, Y_c, Y_d,$

Composite, Line, External.

Coupling

DC ... 50 MHz

Modes

Auto : 10 Hz ... 50 MHz

Level : DC ... 50 MHz

Single : DC ... 50 MHz

Slope

+ or -

Sensitivity

Internal : 0.5 div.
External : 150 mV.

Level range

24 div. for internal sources.
From - 5 to + 5 V for external sources.

Input impedance

1 M Ω /15 pF

Maximum input voltage

400 V (DC + AC peak)

Delayed time base triggering

Trigger specifications are the same as those of the main time base with the following exception

Trigger source

Internal, Y_a, Y_b, Y_c, Y_d,
Composite.

Sweep delay

In steps and continuously variable between 50 ns and 5 s after the start of the main time base sweep.

Incremental delay time accuracy

0.5 %

Delay time jitter

1 : > 20.000

CALIBRATION**Calibrated voltage**

3 V_{p-p} \pm 1% square wave

Calibrated current

6 mA_{p-p} \pm 1%

Frequency

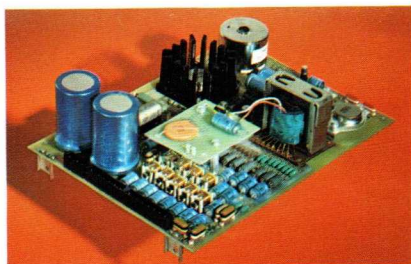
2 kHz \pm 2 %

POWER SUPPLY

Accepts any voltage between 90 and 270 V and any frequency between 46 and 440 Hz in one range without switching.

DC power source

Accepts any DC voltage between 100 V and 200 V.



Direct conversion power supply as used on PM 3244.

Power consumption

29 W

ENVIRONMENTAL CAPABILITIES

N.B. The following environmental data are only valid if the instrument is checked in accordance with the official procedures. Details of these procedures and failure criteria are available on request from your nearest Philips office or N.V. Philips Gloeilampenfabrieken, Test and Measuring Department, Eindhoven, Holland.

Ambient temperatures

+ 5°C ... + 40°C rated range of use
- 10°C ... + 55°C operating
- 40°C ... + 70°C storage and transport

Altitude

To 5,000 m operating
To 15,000 m not operating

Humidity

Meets IEC 68 dB requirements

Shock

1000 bumps of 10 g, 1/2 sine, 6 ms duration in each of 3 axes

Vibration

30 minutes in each of 3 axes at 10 ... 150 Hz, 0.7 mm_{p-p} and 5 g max. acceleration.

Electromagnetic interference

Meets VDE, Störgrad K

Recovery time

Operates within 15 minutes coming from - 10°C soak and going into 60 % relative humidity at + 20°C room conditions.

DIMENSIONS AND WEIGHT

Height : 154 mm
Width : 316 mm
Depth : 410 mm
Weight : 9.6 kg (21 lb) approx.

INSTRUMENT OPTIONS

The following are available as service modifications. Contact your local Philips office for details.

- Main time base sweep output
- Main time base gate output

- Delayed time base sweep output
- Delayed time base gate output

INSTRUMENT VERSIONS

PM 3244 is the standard version
PM 3244G has the long persistence type phosphor (P7).

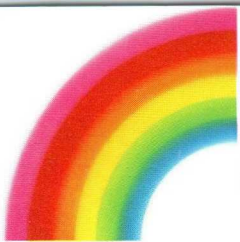
STANDARD ACCESSORIES

Contrast filter
Front cover
Collapsible viewing hood
PM 9366
BNC-banana adaptor PM 9051
Cal. terminal to BNC adaptor
Operating and service manual

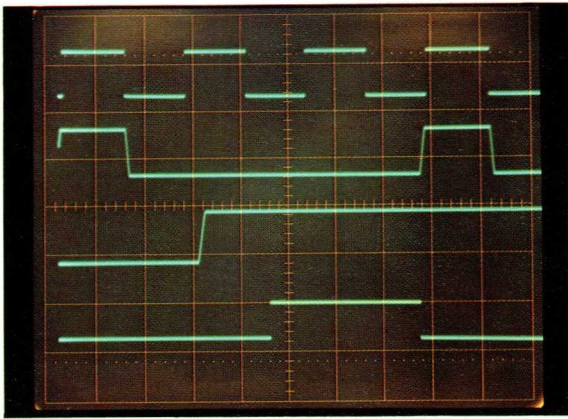
OPTIONAL ACCESSORIES

PM 9335 Passive probe set
1 : 1 (1.5 m)
PM 9335L Passive probe set
1 : 1 (2.5 m)
PM 9350 Passive probe set
10 : 1 11 pF (1.5 m)
PM 9350L Passive probe set
10 : 1 14 pF (2.5 m)
PM 9358 Passive probe set
100 : 1; max. voltage
5600 V; 2 pF (1.5 m)
PM 9333 Set of eagle clips
(wire wrap etc.)
PM 9347 Active TV triggering
probe 10 : 1 11 pF
(1.5 m)
PM 9352 Micro miniature probe
10 : 1 6 pF (2.5 m)
PM 9353 Active FET probe
1 : 1; 10 : 1; 100 : 1,
3.5 pF (1.5 m)
PM 9355 Current probe;
1 mA/div. ... 1 A/div.;
12 Hz... 70 MHz
PM 9346 Power supply for
active probes
PM 8960 19 inch rack mount
adaptor
PM 8992 Accessory pouch
PM 9380 Oscilloscope camera
PM 8971 Adaptor for oscil-
loscope camera
PM 8910 Polaroid anti-glare
filter
PM 8980 Long type viewing
hood
PM 8901 Battery pack 24 V dc
and 140 V dc
PM 8991 Oscilloscope trolley

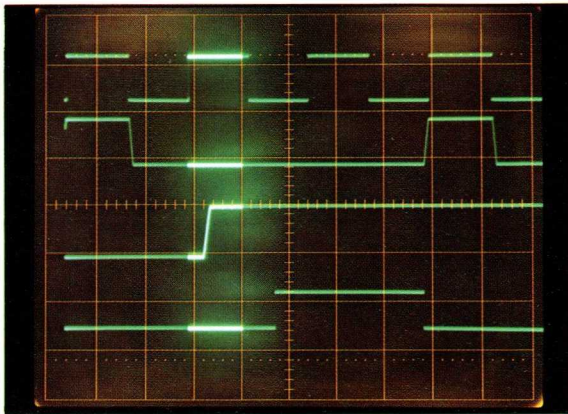
Steinheil Oscillophot® system :
Oscilloscope camera's M3, M4
and M5 can be mounted on
oscilloscope using Steinheil
adaptor 1820/50.



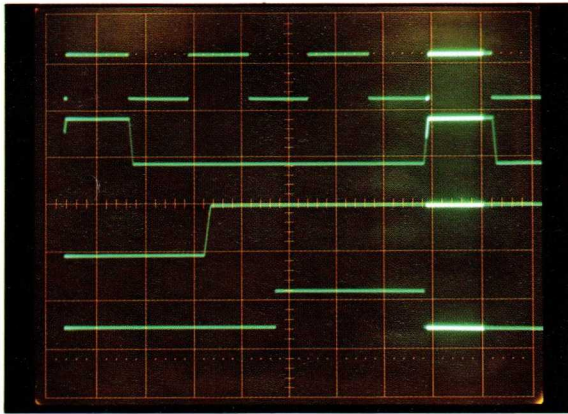
Plus widest display spectrum



As illustrated, triggering is fully independent and multi-sourced. Main and delayed time bases can be triggered from any of the four signals plus Composite. The main time base can also be triggered on External and Line.



In this example the main time base is triggered on channel B and the delayed on channel A. It is therefore possible to magnify any delayed section of a signal in a stable manner even when it is not directly related to the main time reference.



Here the main time base has been changed to channel B and the delayed to channel B. The two differentials can also be shown or displayed separately. Dual X-Y displays are yet another example of the PM 3244's remarkable display versatility.

