

D13-480

**PHILIPS**



TEST AND MEASURING INSTRUMENTS

## Dual-trace 10 MHz oscilloscope PM 3110



Fully automatic triggering, including TV line and frame

Large 8 x 10 cm screen

10 MHz: 50 mV, 5 MHz: 5 mV

Overload protected

Excellent ergonomic styling

Light-weight construction

PM 3110 is a dual-trace, 10 MHz instrument with an excellent price/performance ratio plus a number of unusual and unique features.

It is not often that an oscilloscope can genuinely claim to be both ideal for education and service applications, but careful overall design of the PM 3110 has achieved this objective.

Triggering, for example, is fully automatic. There are no confusing level and stability controls, and in the absence of a signal the time base is free running, and thus showing at all times a clearly-visible trace.

The time base switch is linked to the chopped/alternate function, so that change-over for optimum display is completely

automatic. And once the special TV triggering position is selected, the time base control also gives fully automatic derivation of line or frame displays. For such applications (or similar) the basic 50 mV sensitivity can be increased to 5 mV through the AC x 10 switch.

Waveforms are displayed on a large 8 x 10 cm screen, and the design of the front panel is extremely simple and elegant.

With the PM 3110 traces are easily found, triggered and displayed. Measurements can be taken simply and accurately, in a highly professional manner, whilst at the same time the oscilloscope is extremely easy to operate. This unique combination of features thus makes the PM 3110 ideal for both education-

al and TV service and production applications.

### Technical specification

C.R.T.

Type D 13 - 480 GH

Diameter 13 cm

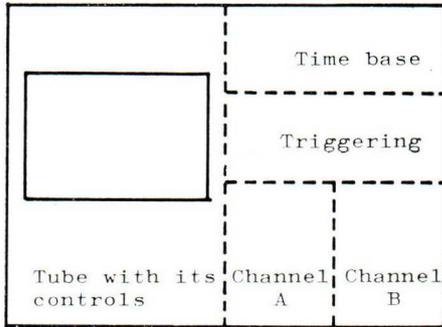
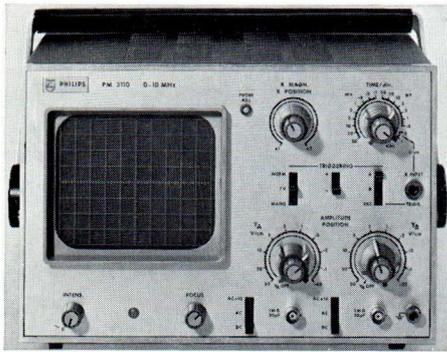
Display area 8 x 10 cm<sup>2</sup>

Acceleration voltage 2 kV

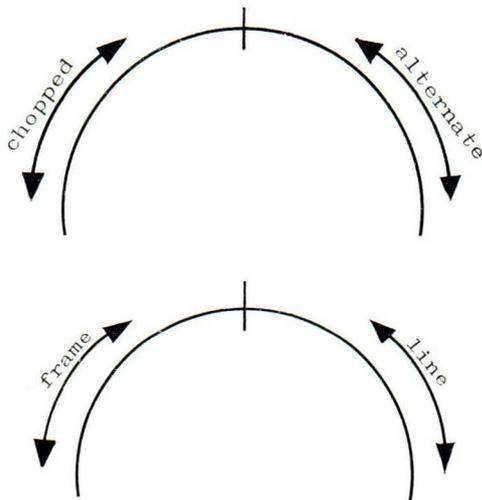
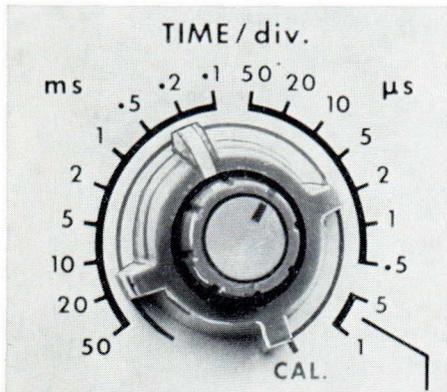
Controls Focus and luminance

### VERTICAL AMPLIFIER

Channels A and B are equal



The front panel controls of the PM 3110 are logically grouped and easy to understand and use. The tube and its controls occupy the left half of the panel. The time base controls are on the top right, with the triggering knobs underneath and finally the channel A and B controls, which are split left and right to avoid any possible confusion.



The time base switch covers some clever circuitry. The changeover from chopped to alternate modes is automatic, as is the changeover from frame to line derived triggering when the special TV position is selected. To avoid confusion the changeovers are not indicated and the operator need not concern himself with the problem.

#### Bandwidth

DC - 10 MHz (—3 dB)  
AC: 2 Hz - 10 MHz (—3 dB)  
AC x 10: 3 Hz - 5 MHz (—3 dB)

#### Risetime

DC and AC: 35 ns  
AC x 10: 70 ns

#### Sensitivity

DC and AC: 50 mV/cm ... 50 V/cm (1 : 2 : 5 sequence) in 10 calibrated steps.  
ACX10: 5 mV/cm ... 5 V/cm (1 : 2 : 5 sequence) in 10 calibrated steps.

Accuracy < 5 %

Input impedance 1 MΩ//30 pF

#### Maximum input voltage

500 V (DC + AC peak)  
(1000 V during approx. 30 seconds)

Input connector BNC

#### Maximum deflection

For sine waveform of frequencies up to 1 MHz vertical deflection is undistorted for a total amplitude equivalent to 24 cm

Vertical shift range > 18 cm

#### Modes of operation

Channel A only  
Channel B only  
Channel A and B chopped or alternate depending on time base switch position

Chopped time/cm: 50 ... 0.2 ms

Alternate time/cm: 0.1 ms ... 0.5 μs

Chopper frequency 200 kHz

Probe adjustment voltage available at front panel

voltage 5 Vp/p  
frequency 2 kHz

#### HORIZONTAL AMPLIFIER

Bandwidth AC 20 Hz ... 1 MHz (—3 dB)

#### Sensitivity

5 V/cm ... 1 V/cm in 2 steps and continuously to 200 mV/cm with time base magnification

Input Combined with external trigger input

Input connector BNC

Accuracy < 10 %

#### Input impedance

100 kΩ at 1 V/cm  
500 kΩ at 5 V/cm

#### Maximum input voltage

(250 V DC + AC peak)

#### TIME BASE

Sweep speeds 0.5 μs/cm ... 50 ms/cm

(1 : 2 : 5 sequence in 16 calibrated steps and continuous x 2.5)

Accuracy < 5 %

Magnifier x 5 (max. 0.1 μs/cm)

#### TRIGGERING

Source Ya, Yb, extern

Polarity + and —

#### Mode

- normal
- T.V. (line and frame triggering coupled with time base switch)  
frame: 50 ms/cm ... 0.2 ms/cm  
line: 0.1 ms/cm ... 0.5 μs/cm
- Mains (with fixed polarity)  
Top triggering on all 3 modes

#### Sensitivity

Sine internally:

- < 2 cm at 2 Hz
- < 1 cm at 100 Hz - 2 MHz
- < 4 cm at 10 MHz

Sine externally:

- < 10 V p/p at 2 Hz
- < 1.5 V p/p at 100 Hz - 2 MHz
- < 3 V p/p at 10 MHz

#### T.V. signals

Sync pulse < 1 cm

Input impedance 100 kΩ

#### Maximum input voltage

250 V (DC + AC peak)

#### Input

Combined with external X-deflection input.

Connector BNC

#### POWER SUPPLY

110 ... 220 V (+10/—15 %); 50 ... 60 Hz;  
50 W

#### TEMPERATURE RANGE

Temperature tolerance range +5 ... +35 °C

Working range —10 ... +45 °C

Storage temperature —25 ... +70 °C

#### DIMENSIONS

Height 19.5 cm

Width 30.5 cm (without carrying handle)

Depth 45.5 cm (without carrying handle)

Weight 8.5 kg

Accessories supplied with the instrument

Manual

#### Optional accessories

- PM 9326 or PM 9327 probe unit
- PM 9051 BNC to 4 mm connector
- PM 9366 viewing hood
- Application handbook