1.2. CHARACTERISTICS

This instrument has been designed and tested according to IEC Publication 348 first edition for Class I instruments and UL 1244 and has been supplied in a safe condition. The present Operating Manual contains information and warnings which shall be followed by the purchaser to ensure safe operation and to retain the instrument in a safe condition.

- This specification is valid after the instrument has warmed up for 30 minutes (reference temperature 23°C).
- Properties expressed in numerical values with tolerance stated, are guaranteed by the manufacturer.
- Numerical values without tolerances are typical and represent the characteristics of an average instrument.
- Inaccuracies (absolute or in %) relate to the indicated reference value.

	Designation	*Specification*	*Additional Information*
1.2.1	**C.R.T.**		
	Type	D14-125 GH/117	Rectangular tube face, mesh type, post accelerator, metal backed phosphor.
	Measuring area	8 x 10 divisions	1 div. equals 1 cm
	Screen type	P31 (GH)	P7 (GM) optional
	Total acceleration	10 kV	
	Graticule	Internal	Cont. variable illumination
1.2.2	**Vertical or Y-axis**		
	Display modes	Channel A only Channel B only A and B chopped A and B alternating A and B added	
	Channel B polarity	Normal or inverted	
	Response:		
	Frequency range	DC: 0 .... 50MHz (-3dB) AC: 2 Hz .... 50MHz (-3dB)	
	Rise time	$\leqslant$ 7ns	
	Pulse aberrations	$\leqslant$ ± 3% ($\leqslant$ 5% pp)	Measured at 6 div. amplitude and applied rise time of $\geqslant$ 1 ns.
	Deflection coefficients	2 mV/DIV .... 10 V/DIV	1-2-5 sequence
	Continuous control range	1 : $\geqslant$ 2,5	
	Deflection accuracy	± 3 %	
	Input impedance	1 MΩ/20 pF	
	Input RC time	0,1 s	Coupling switch to AC
	⚠ Maximum safe input voltage	400V, dc + ac peak	
	Chopping frequency	≈ 500 kHz	
	Vertical positioning range	16 divisions	
	Dynamic range	24 divisions	For frequencies $\leqslant$ 10MHz
	Visible signal delay	$\geqslant$ 2 divisions	At 10ns

C.M.R.R. in A-B mode	⩾ 40 dB at 1 MHz	After adjustment at d.c. or low frequencies
Cross talk between channels	-40 dB or better at 10 MHz	Both attenuators in the same setting
Instability of the spot position:		
Temperature drift	⩽ 0,3 div/hour	

1.2.3 Horizontal or 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 the signal source selected for X-deflection. In this case X-Y diagrams can be displayed using A, B, the Ext input connector, or Line as a signal source for horizontal deflection.

Display modes	– Main time base – Main time base intensified by delayed time base – Main time base and delayed time base alternately displayed – Delayed time base – XY or XY/Y operation	X deflection by: – Channel A signal – Channel B signal – Signal applied to EXT connector of main time base – Line frequency

1.2.4 Main time base

Operation	Automatic	Possibility of automatic free-running in the absence of triggering signals
	Triggered	
Time coefficients	0,5 s/DIV ... 0,1 µs/DIV	1-2-5 sequence
Continuous control range	1 : ⩾ 2,5	
Coefficient error	± 3%	± 5% including x10 magnifier
Magnification	10x	
Max. effective time coefficient	10 ns/DIV	

1.2.5 Delayed time base

Operation	Delayed time base either starts immediately after delay time or is triggerable after the delay time, by the selected delayed time base trigger source	
Time coefficients	1 ms/DIV – 0,1 µs/DIV	1-2-5 sequence
Continuous control range	1 : ⩾ 2,5	
Coefficient error	± 3%	
Delay time	In steps variable with main time base. Continuously variable with 10-turn potentiometer between 0 x and 10 x the time coefficient of the main time base	
Incremental delay time accuracy	0,5%	
Delay time jitter	1 : ⩾ 20.000	

Designation	*Specification*	*Additional information*
X Deflection		
Source	A, B, EXT, EXT ÷ 10 or LINE	As selected by trigger source switch, if push-button X DEFL. is depressed
Deflection coefficients	A or B: As selected by AMPL/DIV EXTERNAL : 0,2 DIV EXT ÷ 10 : 2V/DIV LINE 8 divisions at nominal line voltage.	
Deflection accuracy	± 10%	
Frequency range	DC: 0 .... 1 MHz (-3 dB) over 6 divisions	
Phase shift	⩽ 3° at 100 kHz	
Dynamic range	24 divisions	For frequencies ⩽ 100 kHz
Triggering of the main time base		
Source	Ch. A, Ch. B, Composite, External ÷ 10 and line	
Trigger mode	Automatic, normal AC normal DC, TV-line and TV frame	
Trigger sensitivity	Internal: 0,5 div (DC ..... 5 MHz) 1 div (5 MHz ..... 50 MHz) External : 150 mV (DC ..... 5MHz) 200 mV (5 MHz ..... 50 MHz) Ext. ÷ 10 : 1,5V (DC ..... 5MHz) 2V (5 MHz ..... 50 MHz)	
Triggering frequency range	AUTO: 20 Hz..... ⩾ 50 MHz AC: 5 Hz..... ⩾ 50 MHz DC: 0 Hz..... ⩾ 50 MHz	
Level range	AUTO: Proportional to peak-to-peak value of trigger signal.	
	AC DC: 8 div. at Internal trigg., 1,6V at external trigg., and 16V at ext. ÷ 10	+ or – 4 div. and + or – 0,8 V referenced to centre of screen + or – 8 V referenced to centre of screen
Triggering slope	Positive or negative going	
Input impedance	1 MΩ//20 pF	
Maximum safe input voltage	400V, dc + ac peak	
Hold-off time	variable	
Triggering of the delayed time base		
Source	chA, chB, Composite, External, MTB.	
Trigger sensitivity	Internal: 2 div. (DC .... 50MHz)	External: 400 mV (DC .... 50 MHz)

Other trigger specifications are identical to "triggering of the main time base" with the exception of the trigger modes EXT. ÷ 10, TV and AUTO.

	Designation	*Specification*	*Additional Information*
1.2.9	**Calibration generator**		
	Output voltage	1,2 Vpp	Square wave
	Accuracy	± 1%	
	Frequency	≈ 2 kHz	
1.2.10	**Power supply**		
	AC supply:		
⚠	Nominal voltage range (on line-mains voltage adaptor)	110, 127, 220 or 240 Vac ± 10%	
	Nominal frequency range	50 ..... 400 Hz ± 10%	
	Power consumption	30 W max.	At nominal mains voltage
	Battery supply:		
	Voltage range	22-27 V dc	Battery minus (–) connected to chassis
	Current consumption	1,1 A max.	
	Capacity to earth	185 pF	Measured with rubber feet on grounded metal plate of 1 m^2
		27 pF	Measured 30 cm above grounded plate of 1 m^2

1.2.11. Environmental characteristics

The environmental data are valid only if the instrument is checked in accordance with the offical checking procedure. Details on these procedures and failure criteria are supplied on request by the PHILIPS organisation in your country, or by N.V. PHILIPS' GLOEILAMPENFABRIEKEN, TEST AND MEASURING DEPARTMENT, EINDHOVEN, THE NETHERLANDS.

Ambient temperatures:	
Rated range of use	+ 5°C ... +40°C
Operating	–10°C ... +55°C
Storage and transport	–40°C ... +70°C
Altitude:	
Operating to	5000 m (15000 ft)
Non-operating to	15000 m (45000 ft)
Humidity	21 days cyclic damp heat 25°C –40°C, R.H. 95%
Shock	30 g: half sinewave shock of 11ms duration: 3 shocks per direction for a total of 18 shocks
Vibration	Vibrations in three directions with a maximum of 15 min. per direction, 5 – 55 Hz and amplitude of 0.7mm_{pp} and 4g max. acceleration. Unit mounted on vibration table without shock absorbing material.
Electromagnetic interference	Meets VDE 0871 and VDE 0875 Grenzwertklasse B.
Safety	The isolation between the oscilloscopes and line fulfills the safety requirements of IEC 348 first edition for metal encased class I instruments.

Mechanical data

Dimensions:

Length	445 mm	Handle and controls excluded
Width	335 mm	Handle excluded
Height	137 mm	Feet excluded
Weight	8,4 kg (18,5 lb) approx.	

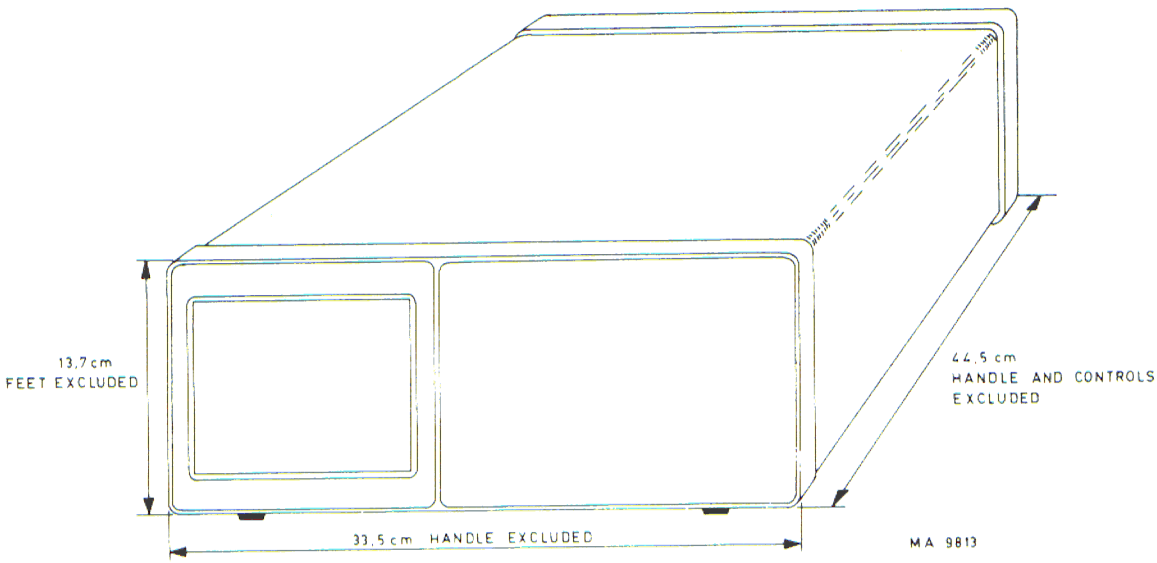

Fig. 2.

Z-mod input

DC coupled
TTL compatible
"1" is normal intensity
"0" blanks display

Min. pulse width required	20ns

ACCESSORIES

Supplied with the instrument

Front cover
2 BNC 4 mm adaptor
2 Probes
Operating manual