P45.10

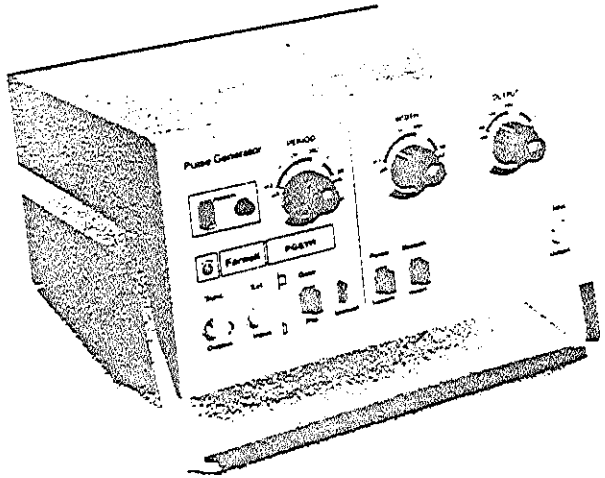
INTRODUCTION

G5111 and PG5112 are models from the Farnell PG5000 series of ow cost 5MHz pulse generators.

oth models have single channel outputs with pulse period and idth continuously variable over 6 decades by means of switched anges and fine potentiometer controls. Output is adjustable in similar manner over 5 ranges to a maximum e.m.f. of 20 volts. G5111 output is positive only. Model PG5112 features an extra ush-button control to permit selection of positive or negative utput.

ront panel push-button controls allow the following modes of peration:- internally triggered, gated, externally triggered r single shot manually triggered. A further push-button control elects variable (pulse) or fixed (square) mark/space operation, he latter ensuring that a waveform is always generated, whilst nother control enables either the normal waveform or its omplement to be generated.

he instrument is normally supplied set for operation from an .c. mains supply of 190 to 260 volts but can be supplied or djusted for 95 to 130 volts operation.



SPECIFICATION

PERIOD	
Coarse switched ranges	Adjustable 200nS (5MHz) to 200mS (5Hz) in 6 decades
Fine control	Provides continuous adjustment within ranges
WIDTH	
Coarse switched ranges	Adjustable 100nS to 100mS in 6 decades
Fine control	Provides continuous adjustment within ranges
Duty cycle	Approaching 100% using invert pulse. Greater than 60% in normal mode.
OUTPUT	
Coarse switched ranges	Adjustable 30mV to 10V into 50Ω in 5 ranges each of 10dB
Fine control	Provides continuous adjustment within ranges
Maximum output e.m.f.	20V
Source impedance	50Ω
Rise and fall time	10nS, typical into 50Ω Not greater than 15nS
Polarity	PG5111 Positive only. Normal or invert PG5112 Positive or negative. Normal or invert *
Protection	Protected against short circuit or open circuit output.
SQUARE WAVE OPERATION	
	Output not symmetrical about zero
P.R.F.	Set by 'PERIOD' controls

GATED OPERATION	
Inhibit signal	+5V nominal to 'EXT. INPUT' socket inhibits period generator. If signal absent, period generator free runs
Inhibit signal range	2.5V to 20V
TRIGGERED OPERATION	
Trigger signal	+5V nominal to 'EXT. INPUT' socket triggers width function
Trigger signal range	2.5V to 20V
SINGLE SHOT	
Manual operation only	Depression of white push button triggers width function
SYNC. OUT	
Pulse amplitude	4V nominal into open circuit (min. 2.4V) 700mV nominal into 50Ω
Pulse width	50nS typical
OPERATING TEMPERATURE RANGE	0°C to 40°C
MAINS SUPPLY	A.C. mains 190 to 260V, 50-60Hz or 95 to 130V a.c., 50-60Hz by internal link changes
DISSIPATION	Max. 55 watts
DIMENSIONS	Height 130 mm Width 236 mm Depth 245 mm

OPERATING INSTRUCTIONS

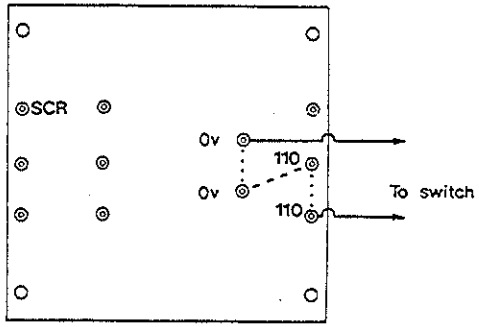
Installation

Check that the voltage range of the instrument supplied is suitable for the local mains supply

Both the PG5111 and PG5112 are set for 190 to 260V operation as standard. Units set for 95 to 130V operation bear an additional label to indicate this. The label may be found on the rear panel near the cable entry.

The alternative 95 to 130V supply setting is achieved by connecting the two primaries in parallel. See Fig. 1

Fig.1 Mains tappings



....Links for 110v operation
- - -Link for 240v operation

The three core mains lead should be connected as follows:-

Brown	-	Mains Live
Blue	-	Mains Neutral
Green/Yellow	-	Earth.

First time operation

All the push-buttons except 'MANUAL' (single-shot) have two functions. The legends above the buttons indicate the functions obtained when the push buttons are out, as indicated by symbol (⊐). The legends below the knobs indicate the alternative function obtained when the push buttons are pressed in, as shown by symbol (⊐).

Ensure all the push buttons are out and all the rotary controls are set fully anti-clockwise.

Connect an oscilloscope terminated in 50Ω to the 'OUTPUT' socket of the pulse generator. Connect the instrument to the mains supply and depress the push button switch marked 'POWER'. The neon indicator will light as the unit is switched on.

Square wave operation

Turn the 'PERIOD' switch to 200µS. Turn the period fine control fully clockwise. Ensure push button marked 'GATE/TRIG' is set to 'GATE' (button out). Set the push button marked 'PULSE/SQUARE' to 'SQUARE' (button in). The 'NORMAL/INVERT' switch should be in the 'NORMAL' position (button out).

Amplitude of the square wave output can be increased by rotating the coarse and fine 'OUTPUT' controls in a clockwise direction to achieve a maximum of 10 volts into 50Ω. As the width controls are inoperative when operating in the 'SQUARE' mode the oscilloscope, if suitably set, will display a positive going waveform (model PG5111). If the 'INVERT' function is selected by depressing the 'NORMAL/INVERT' push button the output waveform displayed will be negative going from a positive base line as shown in fig. 2.

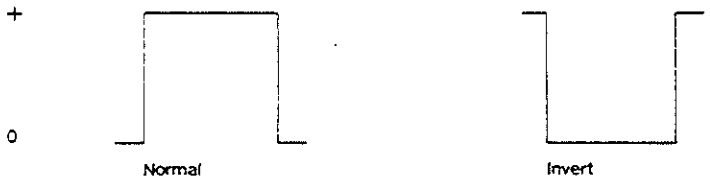


Fig.2 Normal/Invert function PG5111 & PG5112 if set to +ve output

Model PG5112 will deliver a negative pulse when the '+ve/-ve' switch is set to '-ve' (button in). This is illustrated in fig. 3. The 'NORMAL/INVERT' function will now be modified so that if 'NORMAL' (button out) is selected, the pulse will be negative going from a zero base line and in the 'INVERT' position will be positive going from a negative base line. See fig. 4.

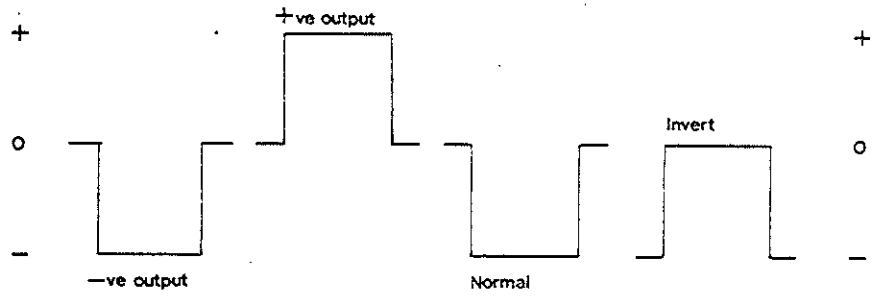


Fig.3 +ve/−ve function PG5222

Fig.4 Normal/Invert function PG5222

The displayed waveform will have a nominal unity mark/space ratio and the pulse repetition rate is determined by the setting of the period controls. Clockwise rotation of the coarse and fine controls gives increased time.

Pulse operation

Return all controls to the positions recommended in 'first time operation'.

Ensure that the push button marked 'PULSE/SQUARE' is in the 'PULSE' position (button out). Select the required repetition period using the coarse and fine 'PERIOD' controls. Select the required pulse width by means of the coarse and fine 'WIDTH' controls ensuring always that the chosen setting is less than the repetition period. Select a suitable pulse amplitude by means of the 'OUTPUT' controls.

To achieve duty cycles approaching 100% the 'INVERT' mode should be used. The maximum duty cycle is then limited by the minimum pulse width attainable.

Gated operation

The internally clocked operation used in the foregoing instructions is obtained when the 'GATE/TRIG' switch is in the 'GATE' (button out) position because in the absence of a suitable signal to the 'EXT. INPUT' socket the internal period generator free runs.

The period generator may be gated by applying a gating signal to the B.N.C. socket marked 'EXT. INPUT'. The signal should have an amplitude of +5V from a zero volts base and should have reasonably fast edges (say 20µS) in order to define the gating period. (See specification).

The gating signal inhibits the period generator waveform and reinstates it by means of its falling edge. The action is such that complete pulses are generated even though the gating signal has gone positive (inhibit) part way through a pulse. see fig. 5.

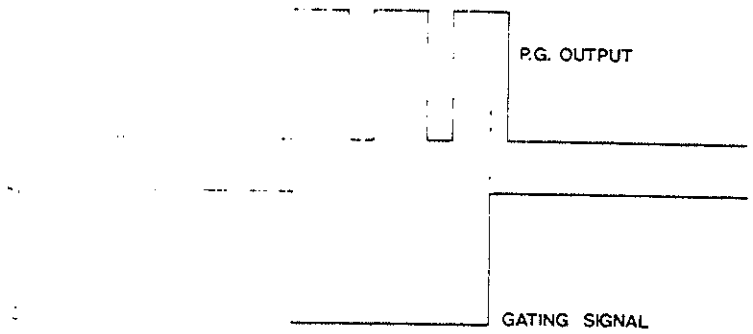


Fig. 5 Gated operation

External trigger

If the 'GATE/TRIG' button is depressed to engage the 'TRIG' function either model can be triggered by an external source.

Period range and the square facility are rendered in-operative in this mode and the external stimulus applied to the B.N.C. socket marked 'EXT. INPUT' triggers the width function. The trigger signal should have an a nominal amplitude of +5V.

Adjacent to the 'GATE/TRIG' switch is a white push button marked 'MANUAL'. When in the external trigger mode, i.e. 'TRIG' button in, depressing the 'MANUAL' button will provide a 'one-shot' pulse. Internal circuitry ensures the reliability of this pulse free from the effects of contact bounce.

Sync. output

A positive trigger pulse with a width of 50nS typically is available from the B.N.C. socket marked 'SYNC. OUTPUT'. This signal may be used to trigger other instruments such as an oscilloscope.

The sync. pulse is always available no matter how the pulse generator is triggered, be it internal period, single shot or externally triggered.