8140

FUNCTION GENERATOR

Operation Manual

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8140 FUNCTION GENERATOR

Table of Contents

1. **Overview** 1
   - 1.1 Introduction 1
   - 1.2 Unpacking and Checking 2
2. **Front and Rear Panels** 2
3. **Operation** 6
   - 3.1 Instrument Turn-on 6
   - 3.2 Main Generator 6
   - 3.3 Voltage Control Frequency 7
4. **Operation Cautions** 7
5. **Maintenance** 8
   - 5.1 Cleanness 8
   - 5.2 Changing the Fuse 8
   - 5.3 Changing the Voltage 9
   - 5.4 Environment 9
6. **Specifications** 10

Safety Instruction

- Before operating this product, please read carefully the safety symbols and definitions described here.
- This product complies with class I safety specifications.
- Installation category (over voltage category) : Class II
- Before operating this product, please check the voltage requirements and specifications as described in this operating manual.
- Proper grounding refers to the proper connection from the grounding point of the power source to the grounding terminal of this product.

Safety Symbols

⏚ Earth (Ground) Terminal

⏚ Protective Conductor Terminal

I ON(SUPPLY)

O OFF(SUPPLY)

Warning

- Any grounding terminal or earth terminal can generate electrical conductivity that may harm or endanger the user.
- When operating this product, please place it in a well-ventilated environment.
- Do not place this product in an area that is directly exposed to sunlight or under high humidity.
- When you need to clean the outer surface of the product, use a clean and dry cloth.

8140 FUNCTION GENERATOR

1. Overview

The **8140** is a portable, bench type function generator capable of producing 5 different waveforms. These are sine, square, triangle, pulse and ramp.

1.1 Introduction

The **8140** function generator with the following features:

- Short circuit and external input protection
- Ramp and pulse outputs can be continuously adjusted between 20% and 80% , and the output frequency is unchanged.
- Meets IEC —1010—1 (EN 61010-1) safety requirements.

Output frequency is adjustable from .1 Hz to 10 MHz in 8 ranges. The DC offset of all wave forms can be adjusted between +10 and -10 volts by a front panel adjustment. The duty cycle of the ramp and pulse outputs can be continuously adjusted between 20% and 80% , and the output frequency is unchanged.

8140 has a voltage controlled frequency input (VCF in) that allows the frequency to be adjusted or swept by an external source.

1.2 Unpacking and checking

Your **8140** is packed in polyfoam to protect it during shipment. You should keep this material, as well as the shipping box, in case the unit must be moved or shipped again.

The box should include the following items:

Model **8140** Function Generator

Removable AC line cord

BNC to Alligator clip cable

Operation manual

Please check to see that all of the above items are included. You should contact your sales if anything is missing.

2. Front and Rear Panels

The following is an explanation of the function of each of the front and rear panel controls and connectors. You should refer to Figure 1 for the location of each control / connector.

8140 FUNCTION GENERATOR

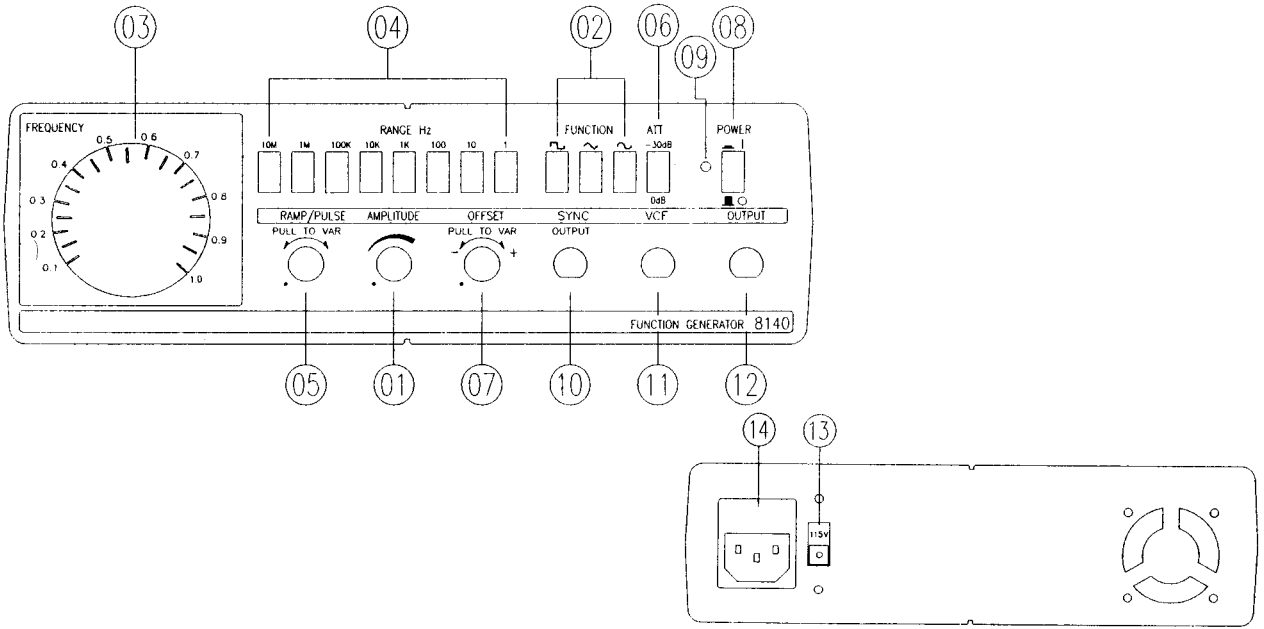


Figure 1 Front and Rear Panels

1. AMPLITUDE

This adjustment sets the signal level of the output. Turning the control clockwise will increase the amplitude.

2. FUNCTION

This bank of switches is used to select the output waveform. Only one of these switches can be depressed at a time.

3. FREQUENCY

This knob is used to adjust the output frequency. The frequency is dependent on the setting of this knob and the **RANGE switch (4)** explained below.

4. RANGE

This bank of interlocked switches is used to select the frequency range produced. The actual output is the product of the depressed switch and the setting of **FREQUENCY dial (3)**.

5. RAMP/PULSE

This combination switch/adjustment is used to adjust the duty cycle of the square/pulse and triangle/ramp waveforms. When the knob is pushed in, the duty cycle is fixed at 50%. When pulled out, the duty cycle is adjustable between 20% and 80% , and the output frequency is unchanged

6. ATTENUATION

When this push button is out, the signal is passed to the output unchanged. If the switch is depressed, the output signal is attenuated by 30 dB.

7. DC OFFSET

This knob allows a variable DC voltage between -10V to +10V to be added to the output signal. Note that the knob has to be pulled out for the offset to affect the signal. When the knob is pushed in, no offset voltage is added.

8. POWER ON

This is the main power switch. It is a push on/push off type.

9. POWER INDICATOR LED

This LED is on when the **POWER ON switch (8)** is depressed.

10. SYNC

This connector supplies a TTL compatible signal. The output is unaffected by either the **FUNCTION select (2)** or **AMPLITUDE (1)** controls. The output frequency is the same as that provided on the **OUTPUT connector (12)** and will not be affected by the **RAMP/PULSE adjustment (5)**.

11. VCF IN

This input is used to modulate the frequency with an external source.

12. OUTPUT

This BNC connector provides the output signal for all waveforms.

13. AC INPUT VOLTAGE SETTING SWITCH

There are two input voltages 115V and 230V can be selected. Before applying power to your **8140**, make sure that this switch is correctly set for your power source.

14. AC SOCKET WITH FUSE HOLDER

There are two fuses put inside the **FUSE HOLDER**. One of them is for spare use.

3. Operation

3.1. Instrument Turn-on

WARNING

Before applying power to your **8140** , make sure that the **AC input voltage setting switch (13)** is correctly set for your power source.

3.2. Main Generator

A. Connect the **8140** to an AC power source and press the **POWER ON switch (8)**.

B. Select the desired waveform using the **FUNCTION select switch (2)**. To generate a ramp or pulse output, pull out the **RAMP/PULSE adjust knob (5)** and set to the desired duty cycle.

C. Set the desired frequency with the **FREQUENCY CONTROL dial (3)** and the **RANGE switch (4)**.

The actual output frequency will be:

F (out) = Dial Indication x Range setting

D. If the output needs to be less than 20 volts peak to peak, it may be adjusted with the **AMPLITUDE control (1)** to the desired level. If a very small signal is required, the **ATTENUATION switch (6)** can be depressed.

E. Any required DC offset voltage can be set with the **DC OFFSET (7)** control.

F. If a TTL compatible signal is required, use the **SYNC output terminal (10)**.

3.3. Voltage Controlled Frequency

A. If minor external control of the output frequency is required, you may supply a trim voltage (< +5VDC) to the **VCF IN terminal (11)**.

4. Operation Cautions

Please observe the following when operating your **8140** Function Generator ;

1. To assure operation within the listed specifications, allow the unit to warm up and stabilize for at least 20 minutes.
2. Do not supply more than 30 volts (DC + AC peak) into:

   Output terminal (12)[Protected to 30Volts(DC+AC peak)]

Output terminal (12)[Protected to 30Volts(DC+AC peak)]

SYNC terminal (10)

VCF IN terminal (11)

5. Maintenance

5.1 Cleanness

Please clean outer casing with dry cloth and do not release the outer casing except maintenance staffs.

5.2 Changing the Fuse

The fuse is located inside the **AC SOCKET WITH FUSE HOLDER (14)** (refer to Figure 1). You need to change the fuse when:

- the fuse is blown out
- you change the input voltage

In any case, replace the fuse with one of the same rating. Refer to Table 1 for the type of fuse used for different input voltage.

NOTE : Unplug the power cord before you change the fuse.

5.3 Changing the Input Voltage

To change the voltage, follow these steps:

1. Use a flathead screwdriver to switch the **AC INPUT VOLTAGE SETTING SWITCH (13)** to meet the correct AC input voltage.
2. Refer to the correct fuse rating on Table 1. Use a flathead screwdriver to open the **cover of FUSE HOLDER (14)** and change the correct fuse.

Model	Weight		Dimension W x H x D(mm)		Fuse Time-Delay Type 5x20mm	
	Net	Gross	Machine	Package	115V	230V
8140	2.0Kg	2.3Kg	262x85x260	387x192x347	T250mA/250V	T125mA/250V

Table 1 Weight,Dimension and Fuse Specification

5.4 Environment

Operating temperature : +5℃ ~ +40℃

Operating moisture : 80% (+5℃ ~ +31℃), 50% (+31℃ ~ +40℃)

Storage temperature : -20℃ ~ +70℃

Storage moisture : under 80%

6. Specifications

ITEM	8140
MAIN OUTPUT	
Frequency Range	0.1Hz to 10MHz in 8 Ranges
Waveforms	Sine,Square,Triangle,Ramp,Pulse
Amplitude	20 Vp-p , Open;[Output protected up to 30V (DC+AC)]
Attenuator	0dB,-30dB
Output Impedance	50Ω ±10%
DC Offset	+10V ~ −10V
Duty Control	80:20 to 20:80 Continuously Variable with 50:50 calibrated switch (Frequency unchanged)
Freq. . Accuracy	±5% of full scale
Distortion	<0.5% ,10Hz ~ 100KHz
Rise/Fall Time	<25nS
V.C.F.	0 to +5V Control frequency to 1000:1
SYNC OUTPUT	
Rise Time	<25nS

8140 FUNCTION GENERATOR

Level	>1Vp-p(open)
POWER	ACV115 / 230 , 60/50 Hz
DIMENSION	262(W) x 85(H) x 260(D)
WEIGHT	2.0 Kg
ACCESSORIES	ACS-003 BNC to Clip x 1, Operation manual x 1