

8110

FUNCTION GENERATOR

Operation Manual

8110 FUNCTION GENERATOR

Copyright

Copyright © 1996 by this company. All rights reserved. No part of this publication may be reproduced in any form or by any means without the written permission of this company.

Disclaimer

This company makes no representations or warranties, either expressed or implied, with respect to the contents hereof and specifically disclaims any warranties, merchant ability or fitness for any particular purpose. Further, this company reserves the right to revise this publication and to make changes from time to time in the contents hereof without obligation of this company to notify any person of such revision or changes.

8110 FUNCTION GENERATOR

Table of Contents

1. Overview	1
1.1 Introduction	1
1.2 Unpacking and Checking	2
2. Front and Rear Panels	3
2.1 Front Panel.....	4
2.2 Rear Panel	5
3. Operation	9
3.1 Instrument Turn-on	9
3.2 Main Generator	9
3.3 Voltage Control Frequency	10
4. Operation Cautions.....	11
5. Maintenance.....	12
5.1 Cleanness	12
5.2 Changing the Fuse.....	12
5.3 Changing the Voltage	13
5.4 Environment.....	14
6. Specifications	15

Safety Instruction

8110 FUNCTION GENERATOR

- Before operating this product, please read carefully the safety symbols and definitions described here.
- This product complies with class I safety specifications.
- Installation category (overvoltage 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

8110 FUNCTION GENERATOR

 Earth (Ground) Terminal

 Protective Conductor Terminal

| ON(SUPPLY)

○ 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.

8110 FUNCTION GENERATOR

1. Overview

The **8110** 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 **8110** has the following features:

- Frequency adjustable from 0.1Hz to 2MHz in 7 ranges.
- Output variable from 5mVp-p to 20Vp-p.
- Duty of ramp wave and pulse wave can be continuously variable between 20% and 80% with 50:50 calibrated switch. The frequency remains unchanged.
- DC offset from -10V to +10V can be added to all output waveforms.
- With V.C.F. (voltage control frequency) that allows the frequency to be controlled by an external voltage.

8110 FUNCTION GENERATOR

- Output with short circuit and external input protection.
- Passes EMC test (CE marked).
- Meets IEC-1010-1 (EN61010-1) safety requirements.

1.2 Unpacking and Checking

Your **8110** 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 **8110** Function Generator

Removable AC line cord

BNC to Alligator clip cable

Operation manual

8110 FUNCTION GENERATOR

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 & Figure 2 for the location of each control / connector.

2.1 Front Panel

8110 FUNCTION GENERATOR

2.1 Front Panel

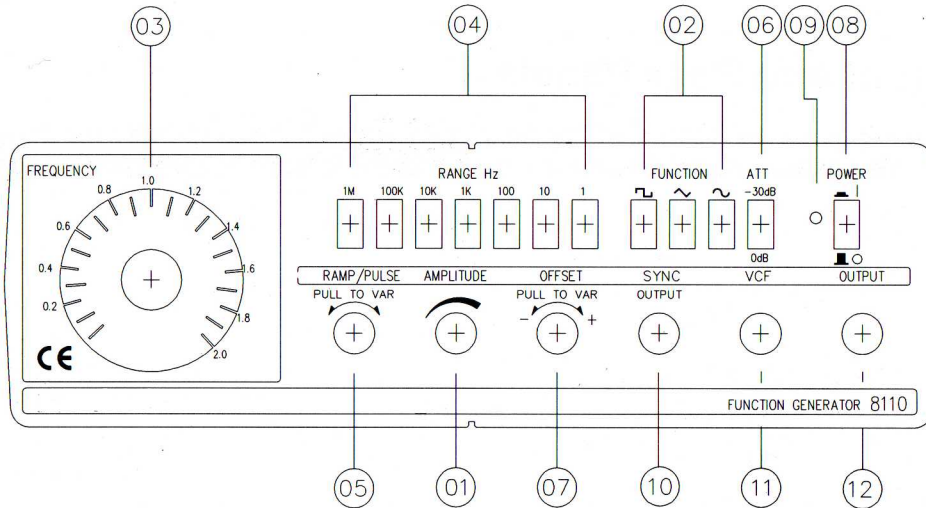


Figure 1 Front Panel

8110 FUNCTION GENERATOR

2.2 Rear Panel

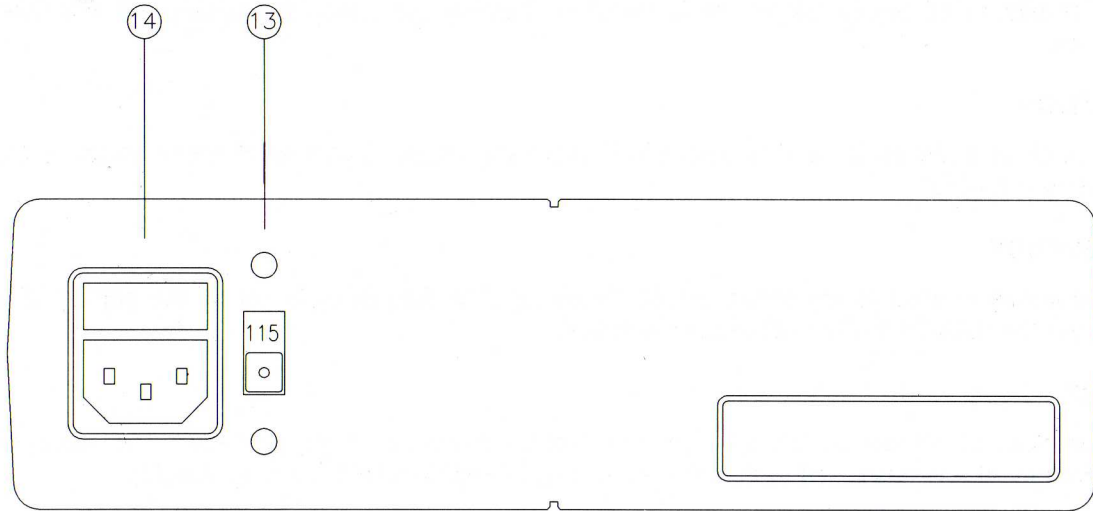


Figure 2 Rear Panel

8110 FUNCTION GENERATOR

1. AMPLITUDE

The amplitude of output waveform is variable. Turning the knob 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

These knobs is used to adjust the output frequency. The frequency is set by the setting of these knobs 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 control dial (3)**.

5. RAMP / PULSE

8110 FUNCTION GENERATOR

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 -30dB.

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.

8110 FUNCTION GENERATOR

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. V.C.F. IN

An external voltage from 0V DC to +5V DC can be input to control the output frequency up to 1000:1.

12. OUTPUT

This BNC connector provides the output signal for all waveforms.

13. POWER VOLTAGE SETTING SWITCH

There are two power voltages 115V and 230V can be selected. Before applying power to your **8110**, make sure that this switch is correctly set for your power source.

14. POWER SOCKET WITH FUSE HOLDER

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

8110 FUNCTION GENERATOR

3. Operation

3.1 Instrument Turn-on

WARNING

Before applying power to your **8110**, make sure that the **POWER VOLTAGE SETTING SWITCH (13)** is correctly set for your power source.

3.2 Main Generator

- A. Connect the **8110** to an AC power source and press the **POWER ON (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 knob (3)** and the **RANGE switch (4)**.

8110 FUNCTION GENERATOR

The actual output frequency will be:

$$F(\text{out}) = \text{Dial Indication} \times \text{Range Setting}$$

- D. Adjust the output amplitude with the **AMPLITUDE control (1)** to the desired level. If a very small signal is required, the **ATTENUATION switch (6)** can be depressed.
- E. Set DC offset voltage with the **DC OFFSET control (7)**.
- F. If a TTL compatible signal is required, use the **SYNC output terminal (10)**.

3.3 Voltage Controlled Frequency

Supply a trim voltage between 0V DC and +5V DC to **V.C.F. IN terminal (11)**. The output frequency will be varied up to 1000:1.

8110 FUNCTION GENERATOR

4. Operation Cautions

Please observe the following when operating your **8110** 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 10 Volts (DC+AC peak) into:

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

SYNC terminal (10)

V.C.F. IN terminal (11)

8110 FUNCTION GENERATOR

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 **POWER SOCKET WITH FUSE HOLDER (14)** (refer to Figure 2). 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.

8110 FUNCTION GENERATOR

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

Model	Fuse	
	Time-Delay Type	5x20mm
	115V	230V
8110	T125mA/250V	T80mA/250V

Table 1 Fuse Specification

8110 FUNCTION GENERATOR

5.4 Environment

Operating temperature	:	+5°C ~ +40°C
Operating moisture	:	80% (+5°C ~ +31°C), 50% (+31°C ~ +40°C)
Storage temperature	:	-20°C ~ +70°C
Storage moisture	:	under 80%

We here declare the functional specification for EMS Verification (IEC 801-3) of our **8110** signal generator.

It should be considered insignificant and acceptable that some disturbance of frequency shift, less than 5% or crosstalk may happen, but self-recoverable. That means such a situation is within our specification and should be considered as normal performance within the specification limit.

8110 FUNCTION GENERATOR

6. Specifications

ITEM	8110
MAIN OUTPUT	
Frequency Range	0.1Hz to 2MHz in 7 Ranges
Waveforms	Sine, Square, Triangle, Ramp, Pulse
Amplitude	20Vp-p, Open; [Output protected up to 30V (DC+AC)]
Attenuator	0dB, -30dB
Output Impedance	50Ω ± 10%
DC Offset	+10V ~ -10V (Open)
Duty Control	80:20 to 20:80 Continuously Variable with 50:50 calibrated switch (Frequency unchanged)
Frequency Accuracy	+ 5% of full scale
Distortion	<1%, 10Hz ~ 100KHz
Rise / Fall Time	<100nS
V.C.F.	0 to +5V Control frequency to 1000:1

8110 FUNCTION GENERATOR

Safety Requirements	Meets IEC-1010-1 (EN 61010-1)
EMC Requirements	Yes
SYNC OUTPUT	
Rise Time	<25nS
Level	>3Vp-p (Open), 20 TTL Load
POWER	ACV 115 / 230, + 10% , 60 / 50Hz
DIMENSION	
Machine (mm)	262(W)x85(H)x260(D)
Package (mm)	387(W)x192(H)x347(D)
Gross Weight	2.65Kg
Net Weight	1.8Kg
Accessories	ACS-003 BNC to alligator clip cable x 1, Operation manual x 1