

FeelTech FY6300 60M

FeelTech FY6300 Function Arbitrary Waveform Signal Generator User Manual

Model: FY6300 60M

1. INTRODUCTION

The FeelTech FY6300 series is a dual-channel function arbitrary waveform signal generator designed for various electronic testing and measurement applications. This device offers a maximum output frequency of 60MHz for sine waves and 25MHz for square waves, featuring a real-time sampling rate of 250MSa/s and 14-bit vertical resolution. It supports multiple modulation functions including AM, FM, PM, FSK, PSK, and VCO. This manual provides essential information for the safe and effective operation of your FY6300 signal generator.

2. SAFETY INFORMATION

2.1. Safety Notes

- Before using this instrument, verify that the power supply is within the specified range to ensure normal operation and personal safety.
- This instrument must be operated within its technical index range.
- Do not modify the instrument's internal circuitry arbitrarily, as this may cause damage to the equipment or endanger safety.

2.2. Warning and Personal Injury

Do not use this product in safety protection devices, emergency stop systems, or any other applications where product failure could lead to personal injury or property damage. The manufacturer is not responsible for any injury or property damage resulting from improper use. The manufacturer disclaims responsibility for any claims, including costs, expenses, and attorney fees, that may arise from such use.

3. PACKAGE CONTENTS

Upon unpacking, please verify that all items listed below are present and in good condition. If any items are missing or damaged, contact your supplier immediately.

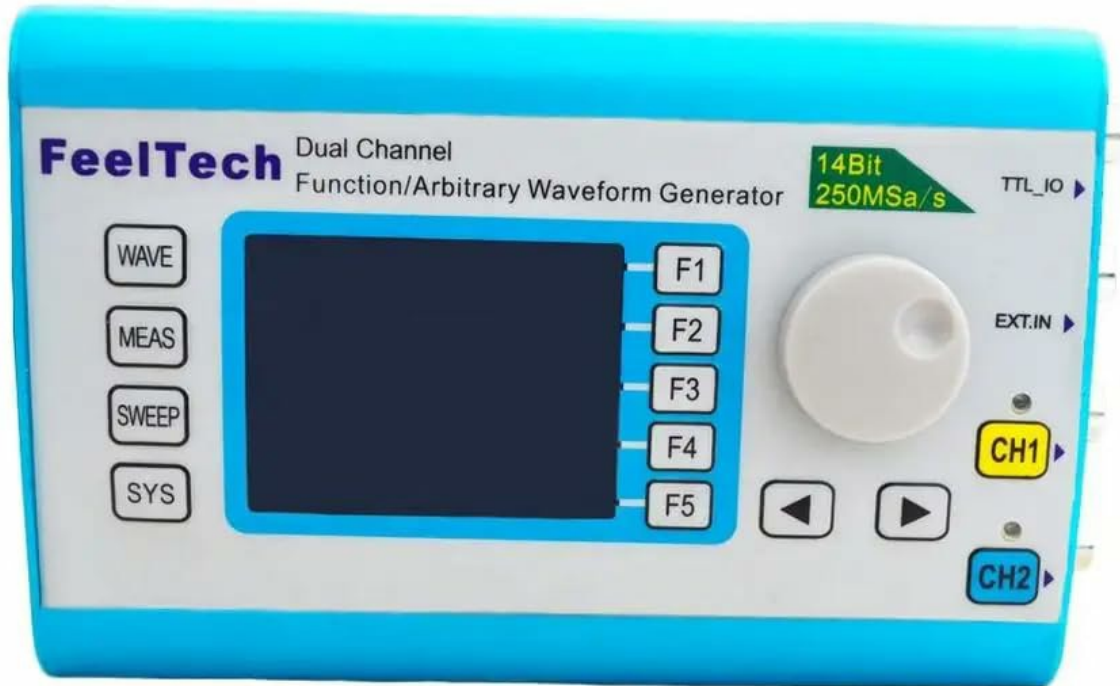


Image: FeelTech FY6300 Signal Generator with included accessories, including power cord, Q9 clip lines, USB data line, certificate, and data CD.

Included Accessories

Item	Description	Quantity
Main Unit	FY6300 DDS Signal Generator	1
Standard Accessory	Power Cable	1
Standard Accessory	BNC-Q9 Cable	2
Standard Accessory	BNC-BNC Cable	1
Standard Accessory	Warranty Card	1
Optional Accessory	FYA1000 Series Amplifier	Optional

Item	Description	Quantity
Optional Accessory	FYA2000 Series Amplifier	Optional

Note: Optional accessories can be ordered from local FeelTech distributors.

4. PRODUCT OVERVIEW

The FeelTech FY6300 is a compact and versatile signal generator. It features a clear display and intuitive controls for easy operation.

4.1. Front Panel



Image: Front view of the FeelTech FY6300 Signal Generator, showing the display, control buttons (WAVE, MEAS, SWEEP, SYS, F1-F5), rotary encoder, and output channels CH1 and CH2.

The front panel includes the main display, function buttons (WAVE, MEAS, SWEEP, SYS), five soft keys (F1-F5), a rotary encoder for parameter adjustment, and output connectors for Channel 1 (CH1) and Channel 2 (CH2).

4.2. Rear Panel



Image: Close-up of the rear panel connections of the FeelTech FY6300 Signal Generator, showing CH2, CH1, EXT.IN, and TTL_IO ports.

The rear panel provides additional input/output ports, including EXT.IN for external modulation or synchronization, and TTL_IO for TTL level signals.

4.3. Dimensions

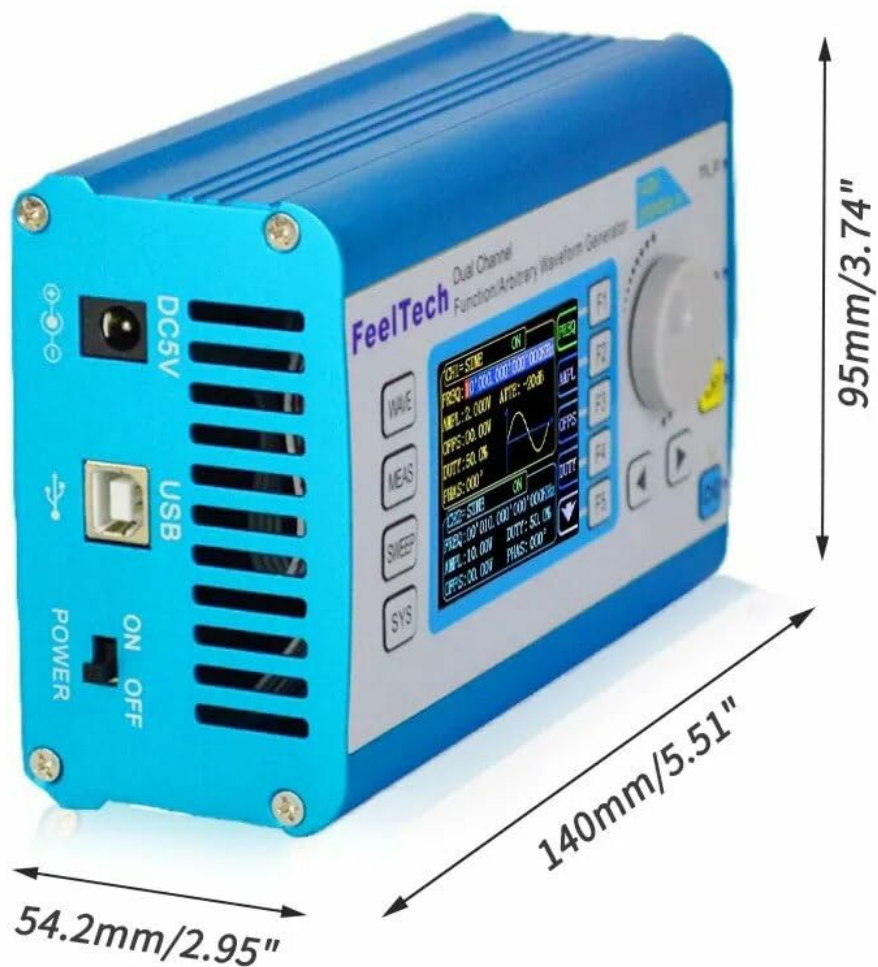


Image: Diagram showing the dimensions of the FeelTech FY6300 Signal Generator: approximately 140mm (5.51in) length, 95mm (3.74in) width, and 54.2mm (2.95in) height.

The compact design of the FY6300 allows for easy integration into various test environments.

5. SETUP

Follow these steps to set up your FeelTech FY6300 Signal Generator:

1. **Power Connection:** Connect the provided power cable to the DC5V input port on the side of the unit and then to a suitable power outlet.
2. **Power On:** Flip the ON/OFF switch to the 'ON' position. The display should illuminate.
3. **Output Connection:** Connect your test equipment (e.g., oscilloscope, circuit under test) to the CH1 or CH2 output ports using the appropriate BNC cables.
4. **USB Connection (Optional):** For PC control or firmware updates, connect the USB cable from the unit to your computer.

6. OPERATING INSTRUCTIONS

The FY6300 offers a wide range of waveform generation and modulation capabilities.

6.1. Basic Waveform Generation

FY6300 20/30/40/50/60 2-CH DDS FUNCTION ARBITRARY WAVEFORM SIGNAL GENERATOR

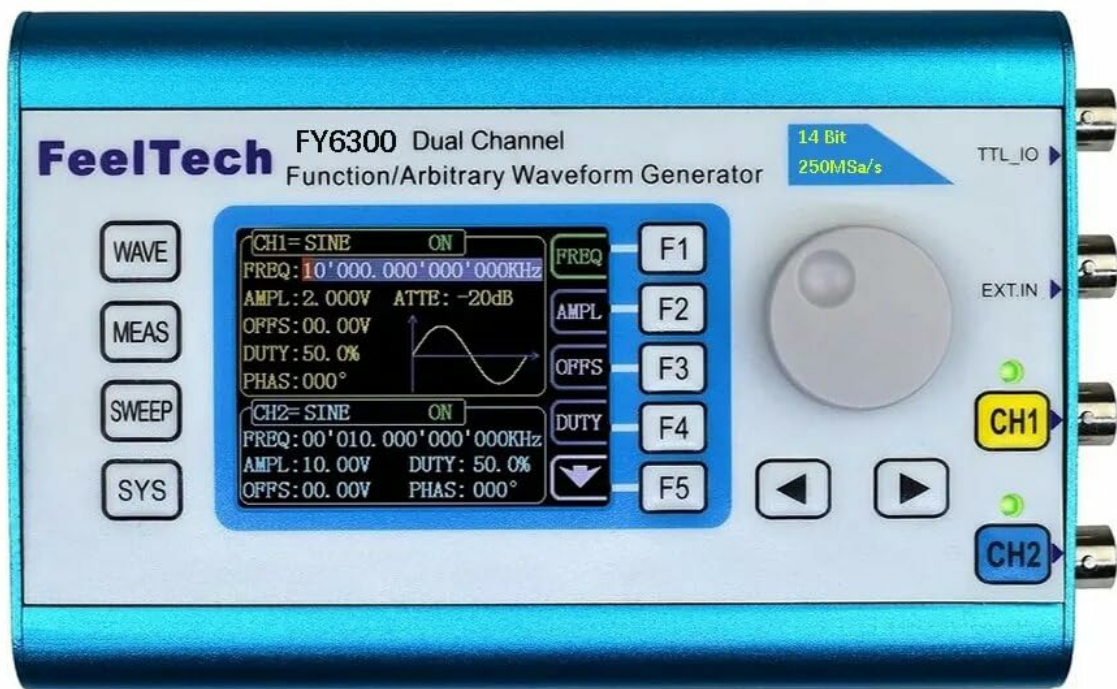


Image: The screen of the FeelTech FY6300 Signal Generator showing parameters for CH1 (Sine wave, 10.000MHz, 2.000V amplitude) and CH2 (Sine wave, 10.000MHz, 10.00V amplitude).

1. **Select Channel:** Use the CH1 or CH2 buttons to select the desired output channel.
2. **Select Waveform:** Press the **WAVE** button to cycle through available waveform types (Sine, Square, Triangle, Pulse, Arbitrary, etc.).
3. **Adjust Frequency:** Use the rotary encoder to adjust the frequency. Press the **F1** soft key (labeled **FREQ**) to enter frequency adjustment mode.
4. **Adjust Amplitude:** Press the **F2** soft key (labeled **AMPL**) to adjust the amplitude. Use the rotary encoder to change the value.
5. **Adjust Offset:** Press the **F3** soft key (labeled **OFFS**) to adjust the DC offset.

6. **Adjust Duty Cycle (Square Wave):** For square waves, press the **F4** soft key (labeled DUTY) to adjust the duty cycle. The duty cycle adjustment accuracy can reach 0.01%. You can also switch between duty cycle and rising/falling edge time settings by pressing F4 again.
7. **Adjust Phase:** Press the **F5** soft key (labeled PHAS) to adjust the phase. The phase resolution can reach 0.01°.

6.2. Modulation Functions

The FY6300 series supports various modulation types including AM, FM, PM, FSK, PSK, and VCO. Refer to the detailed user manual for specific instructions on configuring each modulation type.

6.3. Connecting to an Oscilloscope

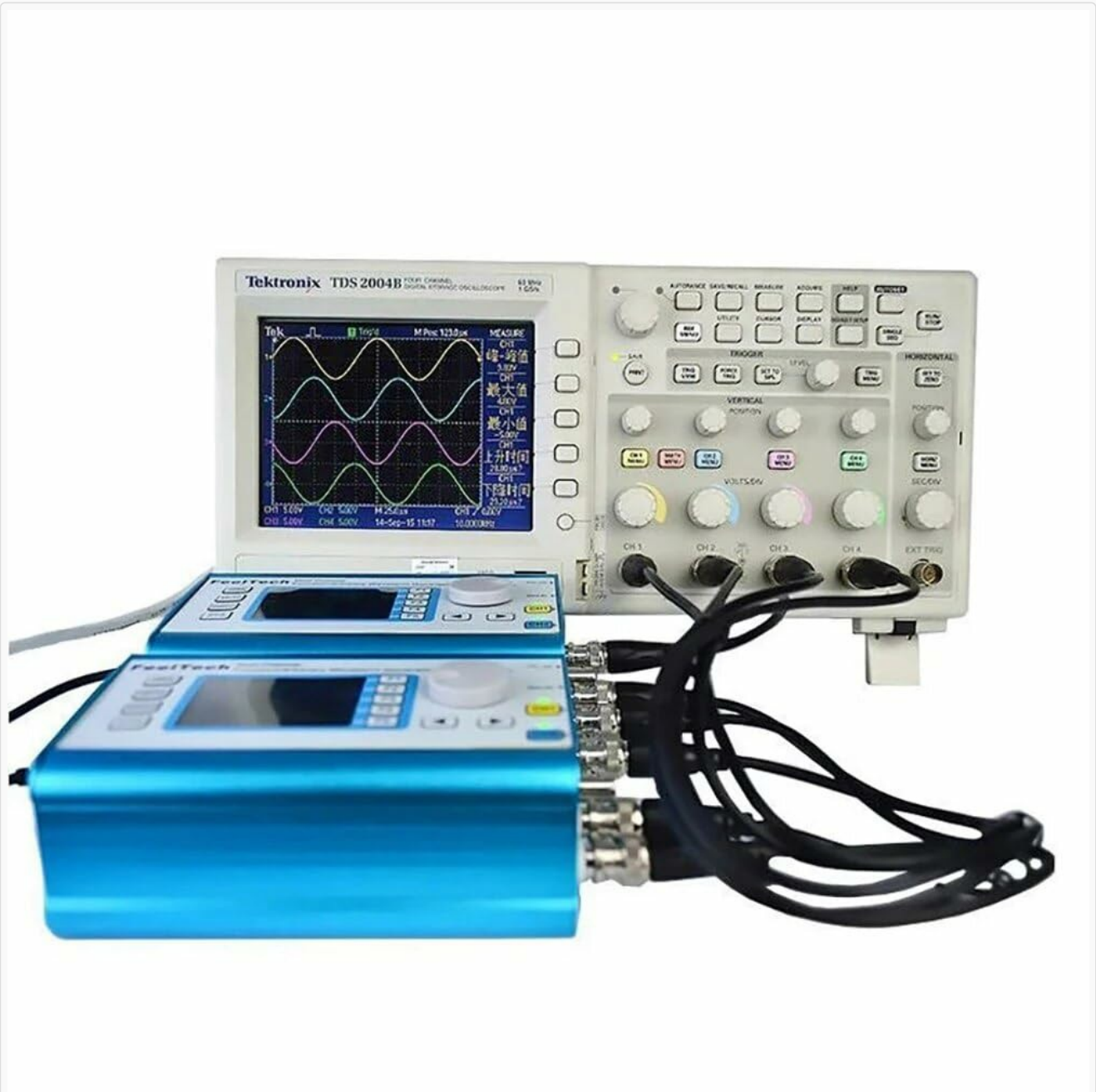


Image: The FeelTech FY6300 Signal Generator connected to a Tektronix TDS 2004B oscilloscope, demonstrating the output of waveforms.

To visualize the generated waveforms, connect the output of the FY6300 to the input of an oscilloscope using a BNC cable. Adjust the oscilloscope settings (e.g., vertical scale, time base) to properly display the waveform.

6.4. Product Video Overview

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Video: An overview of the FeelTech DDS Signal Generator, showcasing its design, features, and basic operation. This video highlights the high waveform accuracy and low distortion capabilities.

7. SPECIFICATIONS

The following table details the technical specifications of the FeelTech FY6300 series, specifically the 60M model.

Parameters

Frequency				
Model	FY6300-15M	FY6300-20M	FY6300-30M	FY6300-60M
Sine	0~15MHz	0~20MHz	0~30MHz	0~60MHz
Square	0~15MHz	0~20MHz	0~25MHz	0~25MHz
Ramp, Triangle	0~10MHz	0~10MHz	0~20MHz	0~20MHz
Pulse	0~10MHz	0~10MHz	0~20MHz	0~20MHz
TTL/CMOS	0~10MHz	0~10MHz	0~40MHz	0~60MHz
Arbitrary Waveform	0~10MHz	0~10MHz	0~20MHz	0~20MHz
Resolution	1 μ Hz (0.000001Hz)			
Accuracy	$\pm 5 \times 10^{-6}$			
Stability	$\pm 1 \times 10^{-6}$ / 3Hours			
Impedance	50 $\Omega \pm 10\%$ (Typical)			
Phase Range	0~359.9 $^{\circ}$			
Phase Resolution	0.1 $^{\circ}$			
Waveform Characteristics				
Waveforms	Sine, Square, Triangle(Ramp), Arbitrary, Rise Sawtooth, Fall Sawtooth, Lorenz Pulse, Multitone, Noise, Cardiogram, Rapedoidal Pulse, Sinc Pulse, Narrow Pulse, Gauss White Noise, AM, FM, Step			
Waveform Length	8192 points			
Sampling Rate	250MSa/s			
Vertical Resolution	14 bits			
Sine	Harmonic Suppression	$\geq 45\text{dBc} (< 1\text{MHz}); \geq 40\text{dBc} (1\text{MHz} \sim 60\text{MHz});$		
	Total Harmonic Distortion	$< 0.8\% (20\text{Hz} \sim 20\text{kHz}, 0\text{dBm})$		
Square	Rise/Fall Time	$\leq 10\text{ns} (V_{pp} < 5\text{V})$		
	Overshoot	$\leq 7.5\%$		
	Duty Cycle	0.1%~99.9%		
Sawtooth wave	Linearity	$> 98\% (0.01\text{Hz} \sim 10\text{kHz})$		

Image: A table detailing the frequency ranges for various waveforms (Sine, Square, Ramp, Pulse, TTL/CMOS, Arbitrary) across different FY6300 models (15M, 20M, 30M, 60M), along with resolution, accuracy, stability, impedance, phase range, phase resolution, waveform length, sampling rate, vertical resolution, harmonic suppression, total harmonic distortion, rise/fall time, overshoot, duty cycle, and linearity.

General Specifications

Parameter	Value
Manufacturer	FeelTech/FeelElec
Model Number	GT-FY6300 60M
Item Weight	1 kg
Product Dimensions	25 x 20 x 15 cm
Power Source Type	Battery Powered (1 Lithium Metal battery included)
Wattage	15 Watt-hours
Material	Acrylonitrile Butadiene Styrene
Color	Blue
Country of Origin	China

7.1. Performance Specifications (FY6300-60M)

- **Sine Wave Frequency:** 0 ~ 60MHz
- **Square Wave Frequency:** 0 ~ 25MHz
- **Ramp/Triangle Wave Frequency:** 0 ~ 10MHz
- **Pulse Wave Frequency:** 0 ~ 10MHz
- **TTL/CMOS Frequency:** 0 ~ 60MHz
- **Arbitrary Waveform Frequency:** 0 ~ 10MHz
- **Frequency Resolution:** 1 μ Hz (0.000001Hz)
- **Frequency Accuracy:** $\pm 5 \times 10^{-6}$
- **Frequency Stability:** $\pm 1 \times 10^{-6}$ / 3 Hours
- **Output Impedance:** 50 $\Omega \pm 10\%$ (Typical)
- **Phase Range:** 0 ~ 359.9 $^\circ$
- **Phase Resolution:** 0.1 $^\circ$
- **Waveform Length:** 8192 points
- **Sampling Rate:** 250MSa/s
- **Vertical Resolution:** 14 bits
- **Sine Wave Harmonic Suppression:** ≥ 45 dBc (<1MHz); ≥ 40 dBc (1MHz~60MHz)
- **Sine Wave Total Harmonic Distortion:** <0.8% (20Hz~20KHz, 0dBm)
- **Square Wave Rise/Fall Time:** ≤ 10 ns (Vpp<5V)
- **Square Wave Overshoot:** $\leq 7.5\%$
- **Duty Cycle:** 0.1% ~ 99.9%
- **Sawtooth Wave Linearity:** >98% (0.01Hz~10KHz)

8. MAINTENANCE

To ensure the longevity and optimal performance of your FeelTech FY6300 Signal Generator, follow these maintenance guidelines:

- **Cleaning:** Use a soft, dry cloth to clean the exterior of the instrument. Avoid using abrasive cleaners or solvents that could damage the casing or display.
- **Storage:** Store the instrument in a cool, dry place away from direct sunlight, extreme temperatures, and high humidity.
- **Ventilation:** Ensure that the ventilation slots on the instrument are not obstructed to prevent overheating.
- **Power Off:** Always power off the instrument and disconnect it from the power supply when not in use for extended periods.

9. TROUBLESHOOTING

If you encounter issues with your FY6300, refer to the following common troubleshooting tips:

- **No Power:** Check the power cable connection and ensure the power switch is in the 'ON' position. Verify the power outlet is functional.
- **No Output Signal:** Ensure the output channels (CH1/CH2) are enabled on the device. Check cable connections to the test equipment. Verify frequency and amplitude settings are not set to zero.
- **Incorrect Waveform:** Confirm the correct waveform type is selected. Check all parameter settings (frequency, amplitude, offset, duty cycle) for accuracy.
- **Unstable Output:** Ensure the instrument is placed on a stable surface and away from strong electromagnetic interference. Check for proper grounding.

For persistent issues, contact FeelTech customer support.

10. WARRANTY AND SUPPORT

10.1. Warranty Information

FeelTech warrants that its products, including the mainframe and accessories, will be free from defects in materials and workmanship for a period of **1 year from the date of delivery**. If a product is found to be defective within this period, FeelTech guarantees free replacement or repair of approved defective products. This warranty does not cover damages caused by misuse, vandalism, improper maintenance, or force majeure. Any disassembly or unauthorized modification of the instrument will void the warranty.

10.2. Customer Support

For technical assistance, warranty claims, or any other inquiries, please contact FeelTech customer support through their official channels or your local distributor. Provide your product model number (FY6300 60M) and a detailed description of the issue for efficient service.