

## Function Generator with Frequency Counter 1003588

### Instruction sheet

03/14 ALF



### 1. Safety instructions

The device conforms to the safety regulations for electrical measuring, control, monitoring and laboratory equipment, as specified under DIN EN 61010, section 1, and is designed to be classified as protection class I equipment. It is intended for operation in a dry environment as this is suitable for the operation of electrical equipment and systems.

Safe operation of the equipment is guaranteed, provided it is used correctly. However, there is no guarantee of safety if the equipment is used in an improper or careless manner.

If it is deemed that the equipment can no longer be operated without risk (e.g. visible damage has occurred), the equipment should be switched off immediately and secured against any unintended use.

In schools and other educational institutions, the operation of the function generator must be supervised by qualified personnel.

- Before putting the function generator into operation, confirm that the specifications printed on the rear side of the housing are

compatible with the local mains voltage.

- Before putting the function generator into operation, check the housing for any damage. In the event of any malfunction/operational defect or visible damage, switch off the unit immediately and secure it from unintentional use.
- The instrument may only be connected to the mains via a socket that has an earth connection.
- Before making any connections, check the experiment leads for damaged insulation and exposed wires.
- Replace a faulty fuse only with one matching the specifications stated at the rear of the housing.
- Disconnect the equipment from the mains before replacing a fuse.
- Never short the fuse or the fuse holder.
- The equipment may only be opened/repared by qualified and trained personnel.

## 2. Description

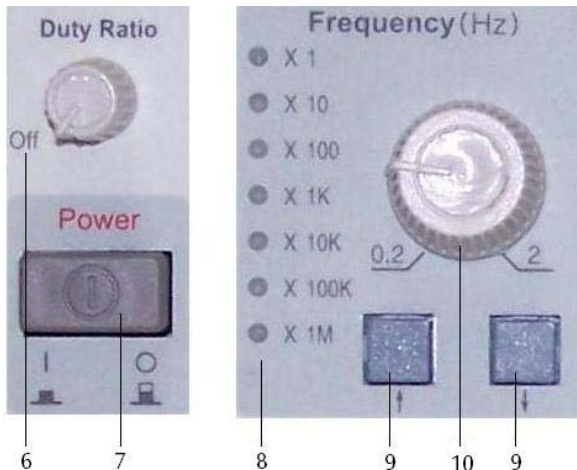
This high-power function generator is intended for conducting experiments on the topics of harmonic oscillation, acoustics, ultrasonics and magnetic induction, concentrating mainly on the low-frequency range. Frequency can be adjusted over seven decades ranging from 0.2 Hz to 2 MHz.

The device can be used as a function generator, a power amplifier, a sweep generator or a frequency counter.

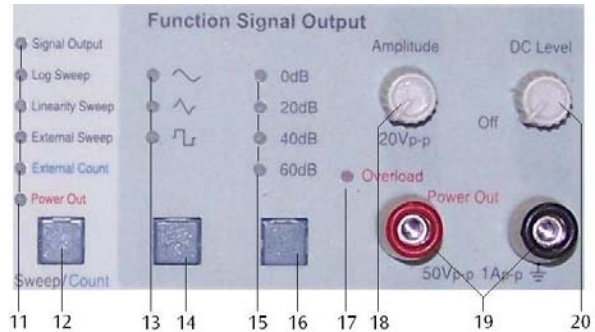
## 3. Operational controls



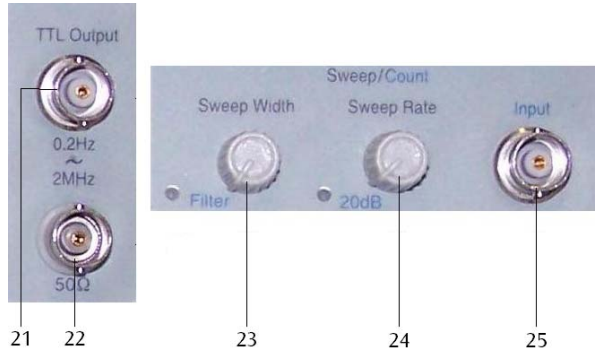
- 1 LED for gate time
- 2 Display for output frequency or measured signal frequency
- 3 LEDs indicating the frequency unit in Hz or kHz
- 4 Display for the output voltage
- 5 LEDs indicating the unit of the output voltage in  $mV_{PP}$  or  $V_{PP}$



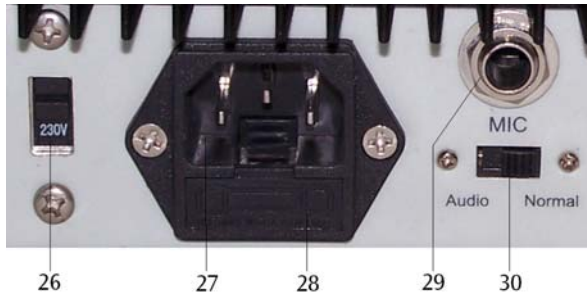
- 6 Adjustment knob for duty ratio. In "OFF"-position the signal is symmetrical
- 7 Mains switch
- 8 LEDs indicating the frequency range
- 9 Up/down preselector switches for frequency range
- 10 Frequency adjustment knob (multi turn)



- 11 LEDs indicating the function state
- 12 Function selector switch: signal output, log sweep, linearity sweep, external sweep, external count, power out
- 13 LEDs indicating the wave form
- 14 Selector switch for the wave form: sine, triangle, rectangle
- 15 LEDs indicating the attenuation level
- 16 Attenuation selector switch for output signal for output socket 22: 0 dB, 20 dB, 40 dB, 60 dB
- 17 LED indicating overload for power output
- 18 Adjustment knob for amplitude
- 19 Power output sockets: output range max. 50  $V_{PP}$ , max. 1  $A_{PP}$
- 20 Adjustment knob for DC level: output signal voltage is -5 V to +5 V, no off-set in "OFF" position



- 21 Output socket for standard TTL signal, impedance 600  $\Omega$
- 22 Signal output socket for the function signals
- 23 Adjustment knob for sweep width to adjust the frequency range
- 24 Adjustment knob for sweep rate to set the interior scan time
- 25 Input socket for external signal



- 26 Mains voltage selector switch
- 27 Socket for mains connection
- 28 Fuse holder
- 29 Audio input socket for microphone
- 30 Switch for microphone sensitivity (audio) and line (normal)

### 3. Technical data

#### Generator:

- Signal form: symmetrical or non symmetrical sine, triangle, rectangle wave
- Frequency range: 0.2 Hz – 2 MHz in 7 decades
- Output impedance: 50  $\Omega$
- Output voltage range: 1 mV<sub>PP</sub> – 10 V<sub>PP</sub> -3 dB (50  $\Omega$ )  
1 mV<sub>PP</sub> – 20 V<sub>PP</sub> -3 dB (1 M  $\Omega$ )
- Function output: 0 dB 1 V<sub>PP</sub> – 10 V<sub>PP</sub>  $\pm$ 10%  
20 dB 0.1 V<sub>PP</sub> – 1 V<sub>PP</sub>  $\pm$ 10%  
40 dB 10 m V<sub>PP</sub> – 100 mV<sub>PP</sub>  $\pm$ 10%  
60 dB 1 mV<sub>PP</sub> – 10 mV<sub>PP</sub>  $\pm$ 10%
- Duty ratio: 20% - 80%
- DC bias: -5 V – +5 V
- TTL output impedance: 600  $\Omega$

#### Power output:

- Output voltage: 50 V<sub>PP</sub> -3 dB
- Output current: max. 1 A<sub>PP</sub>
- Output frequency: 0.2 Hz – 100 kHz  
square wave < 30 kHz

#### Frequency counter:

- Frequency range: 0.2 Hz – 20 MHz

#### General data:

- Mains voltage: 115 or 220 V AC, 50 Hz  
see back of housing
- Power consumption: 30 W
- Dimensions: 265x215x90 mm approx.
- Weight: 2 kg approx.

## 4. Operation

### 4.1 Generator mode

- Turn on the mains via the mains switch (7).
- Set the operation mode to “Signal Output” using the switch (12).
- Select the waveform using the selector (14).
- Set the frequency to the required value using controls (9 and 10).
- Select the damping using the control (16).
- Connect BNC cable to the TTL output (21) or the signal output (22) to use the signal.

### 4.2 Power amp with external signal

- Turn on the mains via the mains switch (7).
- Connect the external signal source to the MIC input (29) at the back of the device.
- Select the sensitivity of the input (29) using the switch (30).
- Select “Power Out” using the switch (12).
- Adjust the amplitude for the output signal using the knob (18).
- Select the DC level using the knob (20).
- Use the signal which appears at power out sockets (19).

**Caution:** For excessively large input signals LED (16) will indicate an "Overload".

### 4.3 Sweep generator mode

- Turn on the mains via the mains switch (7).
- Set the operation mode to the required function using the switch (12).
- For “external sweep” connect the external function generator to input socket (25).
- For “linear sweep” and “log sweep” put the mid frequency to the required value using controls (9 and 10) and choose sweep width (23) and sweep rate (24) using the knobs.
- Connect BNC cable to the TTL output (21) or the signal output (22) to use the signal.

### 4.4 Frequency counter mode

- Connect the external device to the input socket (25).
- Turn on the mains via the mains switch (7).
- Set the operation mode to “External Count” using the switch (12).
- Read the counted frequency in the display (2).

#### **4.5 Replacing the fuse**

- Unplug the mains plug and remove the power cord from the power supply unit.
- Lift out the fuse holder (28) using a flat tool such as a screwdriver.
- Replace the fuse and reinsert the holder in its socket.
- Connect the power cord to the power supply unit.