

# frequency calibrator

## CMF 654



CMF 654 frequency calibrator generates and measures frequency signals from very low values (1 cpH) to 250 kHz, for on site calibration of frequency counters, tachometers, turbine flowmeters, vortex shedders and other frequency devices in the plant or field.

Easy to use

From 1 count per hour to 250 kHz

0.001% accuracy

Three output waveforms



### functions

#### Source mode

The CMF 654 generates zero based or zero crossing square wave or sine waves. The user can adjust frequency and level.

Frequency range .....

- Zero based and zero crossing square waves

Range		Resolution
20 000	cpH	1 cpH
2 000.0	cpm	0.1 cpm
999.99	Hz	0.01 Hz
9 999.9	Hz	0.1 Hz
99.999	kHz	0.001 kHz
250	kHz	0.01 kHz

cpH = count per hour  
cpm = count per minute

- Sine waves

Range	Resolution
999.99 Hz	0.01 Hz
9 999.9 Hz	0.1 Hz

Accuracy  $\pm$  (0.001% of reading + 1).  
Stability better than 10 ppm/year ( $10^{-5}$ /year).

Level .....

Adjustable from

- 50 mV to 12 V peak to peak with zero crossing square wave or sine wave,
- 25 mV to 6 V peak with zero based square wave,
- 500 mV to 12 V peak to peak with sine wave.

Output current: 8 mA max.

Protection .....

Outputs protected up to 240 V.

#### Measurement

(read mode)

In read mode two main functions are selected by keypad: frequencymeter and periodmeter and three secondary functions are selected by menu: timer, counter and rotation indicator. In main functions scaling allows to read in the real unit (e.g. in %, revolution per minute, meter per second, km/h ...).

The input accepts a voltage level between 20 mV and 400 V peak (50 mV to 400 V on 250 kHz range).

The use is simplified by a special push button that automatically chooses the best range, input level, trigger level and hysteresis.

## Main functions.....

Functions	Range	Resolution
Frequency	20 000 cpH	1 cpH
	2 000.0 cpm	0.1 cpm
	999.99 Hz	0.01 Hz
	9 999.9 Hz	0.1 Hz
	99.999 kHz	1 Hz
	250.00 kHz	10 Hz
Period	999.99 ms	0.01 ms
	9.9999 s	0.0001 s
	99.999 s	0.001 s
	999.99 s	0.01 s

Frequency accuracy:  $\pm 0.001\%$  of reading.  
 Sensitivity:  $\pm 20$  mV.  
 Measurement time: 1 period with a minimum time of 0.2 s on 250 kHz range and of 0.4 s for the other ranges.  
 Maximum input voltage: 400 V peak.  
 Minimum pulse width: 2  $\mu$ s.  
 Input resistance  $\approx 1$  M $\Omega$ .

## Input voltage level and trigger level.....

The CMF 654 has 4 voltage ranges and 4 trigger levels in each range. For each range an hysteresis has been fixed. In automatic mode the instrument selects itself the best range and the best trigger level. Manually, user chooses a range and a trigger level.

Range	Input voltage
500 mV peak	20 mV to 500 mV
5 V peak	100 mV to 5 V
50 V peak	1 V to 50 V
400 V peak	13 V to 400 V

In each range user can choose between 4 trigger levels: 0% of the range, 9%, 22% or 49%. Hysteresis is fixed to  $\pm 1\%$  of the range.

## Secondary functions.....

User can select these functions by the menu.

- Timer  
The CMF 654 measures the time in seconds between two pulses by pressing twice on a push button or in triggering by two pulses).
- Counter  
The instrument can count pulses using the main input and an auxiliary input. Counting maximum frequency: 1 kHz. Maximum capacity: 99,999.
- Rotation indicator (e.g. of a motor)  
With 2 proximity sensors connected on the two inputs the CMF 654 indicates the sense of rotation of a system eg a motor (positive or negative).

## additional functions .....

- Hold: memorise a measurement on the display.
- Memory: the instrument can store 20 measurements values. The user can read

these values on the display.

- Scaling  
In frequency meter and periodmeter the user can program a special scaling. This

feature allows displays in engineering units (% , mHz, Hz, kHz, MHz, k/mi, cpH, km/h, m/h, m/m, m/s, rpm, V, mV, kV, rpm).

## general specifications .....

### Display .....

5 digits (100,000 counts) LCD.  
 Height: 10 mm, backlit.  
 Display indicates the status of CMF 654 (in/out, memory, hold, waveform, unit, scaling), in emission waveform and unit, in measurement function, unit, scaling.

### Operating conditions .....

Nominal operating temperature and humidity: 0 to + 50°C, 20 to 75% RH.

Maximum operating temperature and humidity: - 10 to + 55°C, 10 to 80% RH.  
 Maximum storage and transport temperature: - 30 to + 60°C.

### Safety.....

CEI1010-1 CAT. II Pol .2, 300 V.

### Power supply .....

9 V alkaline battery (type 6KR61 or LF22) giving > 20 hours useful life. Optional

rechargeable battery kit with external charger plug (> 10 hours useful life).

### Presentation.....

Packaging: ABS antistatic moulded case.  
 Dimensions: 182 mm long, 75 mm wide, 43 mm thick.  
 Weight: 250 grams approx. according to battery and probe fitted.

## accessories .....

- Kit 9 V batteries/charger including two accumulators and a charger
- Carrying case for pocket thermometer-

calibrator and accessories

- Protective holder.

## ordering instructions .....

Frequency calibrator CMF 654

### Accessories .....

Kit 9 V batteries/charger AC 6907  
 Carrying case AC 6906  
 Protective holder AC 6908  
 Set of two crocodile clamps ACL 9309



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