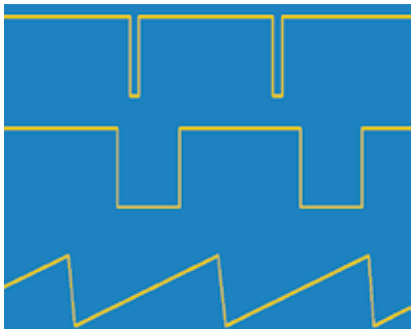
Function generators, 5 MHz with integral feedback voltage protection

TOE 7402
TOE 7404

TOE 7404

The TOE 7402 and TOE 7404 function generators are compact, rugged and low-cost signal sources designed to meet everyday practical requirements.
The outstanding feature of these instruments is the frequency counter with LED for measuring both internal and external signal frequencies. The high output voltage of max. V_{pp} = 30 V will satisfy the requirements of most general-purpose laboratory or service tasks as well as the needs of applications in production plants or educational institutions. All inputs and outputs are absolutely no-load and short-circuit proof. The output amplifiers are guarded against dangerous feedback by an integral external voltage protection feature.
These generators have a frequency range of 0.5 Hz to 5 MHz and generate the following output functions: sine, triangle, square, pulse, amplifier and bipolar DC voltage. When in amplifier mode, the instruments perform as a broadband amplifier from DC up to approx. 5 MHz. All front panel input and output sockets are floating.
The TOE 7404 function generator corresponds to the standard TOE 7402 unit. In addition, it has an extended frequency range down to 50 mHz and a variable symmetry adjustment. The latter facility allows the generation of positive and negative pulses as well as rising or falling sawtooth functions in addition to the fundamental sine, triangle and square functions.



Variable symmetry with triangle and square

Technical specifications

Functions and operating modes

Functions	Sine, triangle, square, pulse, amplifier, DC, variable symmetry (TOE 7404)
Operating modes	Free-running, external sweep-frequency control, amplifier mode, frequency counter

Frequency characteristics

Frequency range	TOE 7402 0.5 Hz to 5 MHz TOE 7404 0.05 Hz to 5 MHz in 6 decadic subranges
Frequency offset	± 2 %
Frequency error	± 2 digits. < 5 % of full-scale value when using the scale
Drift	1 x 10^{-3}/K up to 500 kHz 3 x 10^{-3}/K to 5 MHz 5 x 10^{-3} in 8 hours, in each case following 30 min warm-up time

Function output

Output amplitude	V_{pp} = 10 mV to 30 V, 15 V in pulse mode
Output impedance	50 Ohm. The output is no-load and short-circuit proof
Feedback voltage protection	Up to ≤ 120 V
DC offset	0 to ± 10 V
Output attenuator	30 dB continuously adjustable plus 20 or 40 dB steps, frequency response (sine, triangle): 0.03 dB, or 0.5 dB above 1 MHz

Function specification

at max. output voltage and 50 Ohm load

Sine	
Distortion factor	< 0.5 % up to 100 kHz < 5 % up to 5 MHz
Triangle	
Linearity error	< 1 % to 100 kHz
Symmetry error	< 1 % to 100 kHz
Square	
Transition time	< 35 ns
Overshoots	< 5 %
Pulse	See square
Symmetry variation f_{max}	10 % to 90 % 500 kHz (TOE 7404)
Amplifier	Approx. 17 dB gain, DC up to approx. 5 MHz
Distortion factor	< 0.2 % up to 100 kHz, R_i = 10 kOhm

Other signal inputs and outputs

Synchronizing signal output	TTL-compatible, source impedance: 50 Ohm, 5 fan out
VCO modulation input	Approx. 5 V for a frequency variation ratio of 1000:1
OCV output	0 to 5 V output voltage for a frequency change 1:1000
EXT IN	Amplifier input, max. input voltage 15 V_{rms}, frequency counter input

Frequency counter mode

Frequency range	< 1 Hz to 30 MHz
Resolution	4 or 5 digits with autoranging
Accuracy	± 2 digits
Sensitivity	150 mV_{rms} < 10 MHz 250 mV_{rms} > 10 MHz
Input impedance	1 MOhm II 120 pF
Input protection	Up to 15 V_{rms}

General data

Line voltage	115 V/230 V ± 10 % 47 Hz to 63 Hz
Power consumption	30 VA
Operating temperature	0 °C to 50 °C
Dimensions (W x H x D)	265 x 147 x 280 mm
Weight	Approx. 3.5 kg
Housing	Aluminium

Options

TOE 9008	Carrying handle
TOE 9501	19" adapter, 3 HU
TOE 9503	19" rack module, 4 HU

Ordering data

Function generator	TOE 7402
Function generator	TOE 7404