

Data Sheet no. 5.57/3

Impulse Peak Voltmeter MU27 and MU28



Application

The impulse peak voltmeters MU27 and MU28 are used for measuring high peak voltages in HV impulse testing systems in connection with HV dividers according to the relevant international standards, especially the IEC publications 60060-2 and 601083-1. The measured values can be displayed directly and recorded immediately.

Any impulse voltage of a duration between 2 μ s and 100 ms and of aperiodic or oscillating waveform, as full or chopped pulse, is evaluated on its peak value for each polarity. The peak voltmeter MU27 displays directly the measured values, in regard to the selected divider ratio of the external voltage divider. Impulse voltages with peak values up to ± 1000 V can be measured directly without any voltage divider. An internal testing procedure provides self-testing for accuracy of the device.

Two serial interfaces provide the possibility of connection to automatic control and evaluation systems. On one hand, a PROFIBUS-DP interface for time-critical communication especially with HIGHVOLT control systems and a V.24 interface for conventional connections are available.

Survey of measurement quantities and features

Peak + ; Peak -	Peak values of both polarities
Measurement storage	positive and negative peak are stored internally
Interfaces	V.24 (RS232)
	PROFIBUS-DP (RS485)

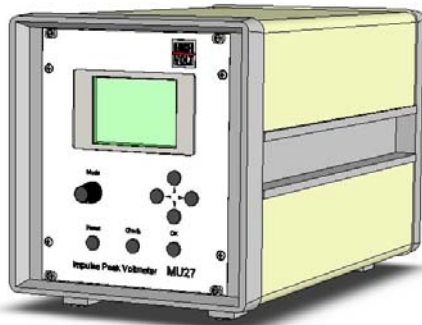
Design

Type MU27

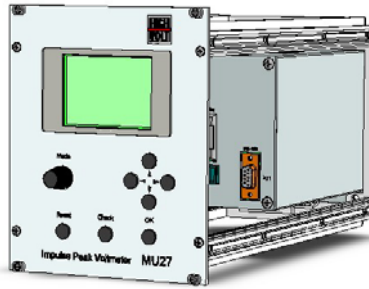
is designed as 1/3 plug-in unit in the 19" system, it can be supplied either as stand-alone (MU27G) or plug-in device (MU27E). Communication via the two serial interfaces is also possible.

Type MU28

is the metal-encapsulated measuring device for rail mounting, without display and operating panel, but connection by one of the two interfaces to the operator device or a controlling industrial PC for measuring and handling data and display.



MU27G



MU27E



MU28

Operation

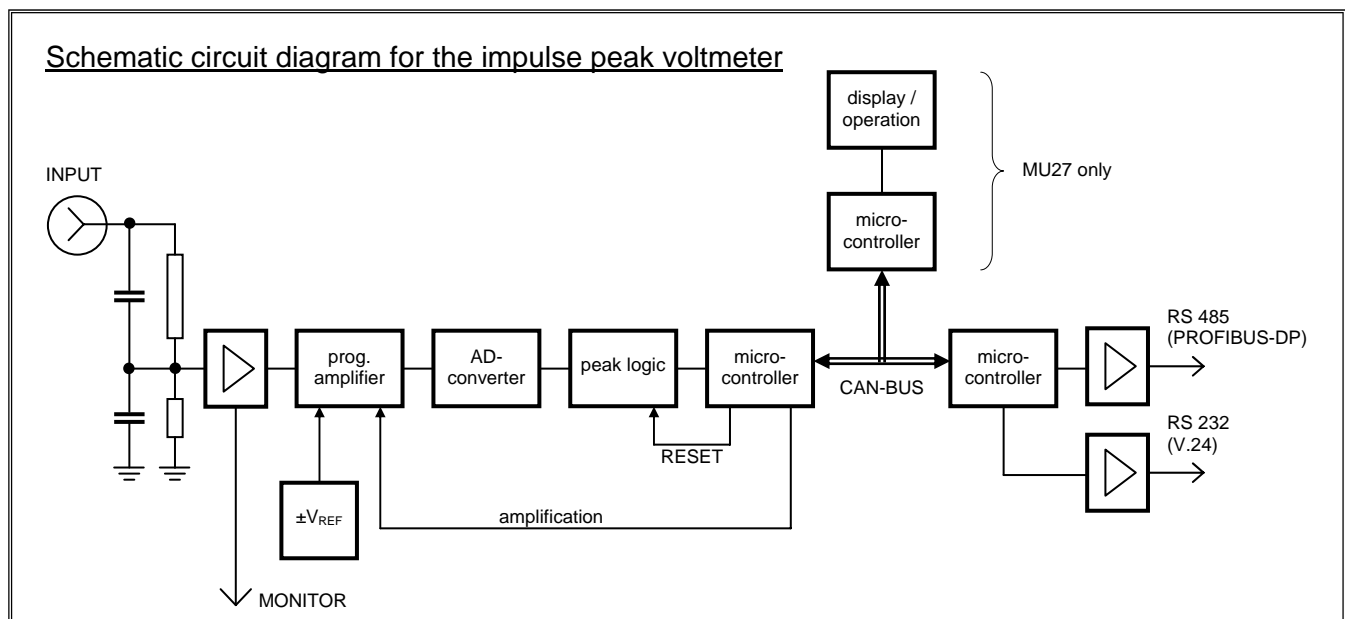
The operation is explained by the circuit diagram below.

The impulse voltage to be measured is transferred from the INPUT via the internal divider to an input amplifier. The following programmable amplifier is set for the chosen measuring range and feeds the AD converter.

The converter scans the input signal with a high frequency. The digital values provided by the AD converter are being scanned immediately by a peak

logic for the absolute maximum value in each polarity. A microcontroller stores the two peak values and computes the data to be transferred via CAN-Bus. For special controlling modes the output voltage of the internal divider is provided at the output MONITOR.

Another microcontroller controls the entire data exchange across the PROFIBUS-DP and V.24 interfaces. With the device MU28, operation and data output is only possible across these interfaces.



Technical data

Values of connection

Input voltage range	0 ... \pm 1000 V
Input signal	all voltages of the lightning and switching impulse range with aperiodic or oscillating (unipolar or bipolar) wave form
Shortest standard input pulse (full wave)	0.84/50 μ s
Shortest input pulse width (top or tail chopped aperiodic impulse)	2 μ s
Longest input pulse width (time of half-value)	100 ms
Minimum pulse interval	5 s (shorter on request)
Frequency range of oscillating pulses	50 Hz ... 500 kHz
Input impedance	$R \geq 1 \text{ M}\Omega$; $C \leq 40 \text{ pF}$ $Z = 50 \Omega$ (termination adapter, optional)
Input Connector	coaxial, Type N

Input signal evaluation

The peak value of the input signal is evaluated for both polarities with an internal trigger.

Measurement uncertainty

The measurement uncertainty is related to the measured value and is valid for the optimum preselected measuring range with an input signal of \pm (50 V ... 1000) V under reference operation conditions.

Deviation	max. \pm 1 %
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Data input and output

Divider ratio range	typical 1 ... 100 000; possible 1 ... $9.999 \cdot 10^9$
Input of divider ratio	4 digits with exponent
Measuring range	1000 V / 500 V / 250 V / 125 V (related to the value of the input signal), selection manually or externally through interface
Output of measured values	4 digits with unit of measurement
Analog output voltages	0 ... \pm 2 V (MONITOR) ; connector type BNC
Digital interfaces	V.24 (RS 232) PROFIBUS-DP (RS 485)

Testing mode

Internal test voltage	+1.250 V and -1.250 V
Test output impedance	$Z = 100 \Omega$

Mains supply

MU27	230 V (\pm 10 %) 50/60 Hz approx. 20 VA
MU28	24 V (12 V ... 32 V) DC approx. 300 mA

Dimensions and weight

MU27G stand-alone device (w x h x d)	186 x 205 x 330 mm / approx. 5.5 kg
MU27E plug-in device (w x h x d)	142(=28TE) x 173(=4HE) x 300 mm / approx. 3 kg
MU28 (w x h x d)	65 x 126 x 160 mm / approx. 1 kg

Conditions for application

Reference operating conditions	ambient temperature 23 °C ± 5 K relative humidity 10 ... 65 %
Normal conditions	ambient temperature +5 °C ... +40 °C relative humidity 10 ... 80 %
Application	indoor
Conditions for storage/transport	ambient temperature -40 °C ... +70 °C relative humidity ≤ 95 % (with max. 30 °C)

Scope of delivery

MU27G stand-alone device	19" casing plug-in unit MU27 power supply cable, 1.5 m adapter N ↔ BNC set of fuses set of plugs
MU27E plug-in device	plug-in unit MU27 power supply cable, 1.5 m adapter N ↔ BNC set of fuses set of plugs
MU28 measuring module	metal-encapsulated measuring device without display
Termination adapter	Z = 50 Ω

MU27 and MU28 fulfil all requirements of IEC 60060-2 and IEC 61083-1.

For further information please contact:

or our local representative:

HIGHVOLT Prüftechnik Dresden GmbH
Marie-Curie-Straße 10

D-01139 Dresden / Germany
Tel. +49 351 8425 648
Fax +49 351 8425 679
e-mail dresden@highvolt.de
website <http://www.highvolt.de>