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Data Sheet 5.23/3

High-Ohmic Resistive Reference Voltage Divider, Type GMR ... ref

Application

The High-Ohmic Resistive Reference Voltage Dividers are designed for the measurement of the mean value of Direct Voltages (DC). They are the basic components of Direct Voltage Reference Measuring Systems for calibration purposes according to IEC 60060-2 and they also can be used as measuring divider of a high voltage test system.

Design

The divider consists of low-inductive high-power resistors with a low temperature coefficient of $25 \cdot 10^{-6}\,K^{-1}$. The resistors are arranged inside an insulating tube. The low-voltage part of the divider is formed by a tap of the lowest resistor. Therefore under operating conditions the low-voltage part and the high-voltage part have a similar temperature level. The resistors are cooled by the ambient air which can circulate through the insulating tube in which the resistors are arranged.
The dividers are equipped with a PD free top electrode and a base frame with rollers. Type of socket is N-type.

Instruments

Beside the High-Ohmic Resistive Reference Voltage Divider the instrument for the Reference Measuring System – the AC/DC peak voltmeter MU 17 (see Data Sheet 5.56) – can be delivered, too.

Option

For the application of the divider and the instrument for on-site calibrations special transportation boxes can be delivered on request.

Table 1: Operating conditions

Temperature range		
Reference working condition	°C	15 … 30
Operating working condition	°C	5 … 40
Relative humidity		
Reference working condition	%	≤ 55 (no condensation)
Operating working condition	%	≤ 80 (no condensation)
Height above sea level	m	≤ 1000
Installation		Indoor to keep the temperature range

Table 2: Measuring uncertainty

Measuring uncertainty of voltage: Measurement for a probability level of 95 %: (under reference working conditions)	%	≤ 0.7 % Direct voltage (average and scale factor)

Table 3: Reference atmospheric conditions

Temperature	°C	20
Absolute pressure	hPa	1013
Absolute humidity	g/m^3	11

Table 4: Technical Parameters

Type	High-voltage resistance R	DC voltage (peak)	DC duration	Divider ratio
	MΩ	kV	min	
GMR 250/135 ref	250	135	30	200
GMR 500/270 ref	500	270	30	400
GMR 600/300 ref	600	300	30	500
GMR 800/400 ref	800	400	30	1000
GMR 1600/800 ref	1600	800	30	2000

Table 5: Metrological characteristics

Type	Voltage-dependent non-linearity	Short-term instability at DC rated voltage and operating time 30 min	Long-term instability over 1 year	Temperature coefficient of scale factor
	%	%	%	%/K
GMR 250/135 ref	≤ 0.3	≤ 0.2	≤ 0.5	≤ 0.01
GMR 500/270 ref	≤ 0.3	≤ 0.2	≤ 0.5	≤ 0.01
GMR 600/300 ref	≤ 0.3	≤ 0.2	≤ 0.5	≤ 0.01
GMR 800/400 ref	≤ 0.3	≤ 0.2	≤ 0.5	≤ 0.01
GMR 1600/800 ref	≤ 0.3	≤ 0.2	≤ 0.5	≤ 0.01

Accessories (included in the scope of delivery):

- measuring cable (wave resistance 50 Ohm or 75 Ohm, length 25 m, single screened)
- documentation (Record of Performance according to IEC 60060-2:2010)

Table 6: Dimensions and weight (approx.)

Type	Height (H)	Footprint (A x A)	Weight
	mm	mm	kg
GMR 250/135 ref	1050	440 x 440	30
GMR 500/270 ref	1830	644 x 644	34
GMR 600/300 ref	2300	1000 x 1000	42
GMR 800/400 ref	2881	1508 x 1508	52
GMR 1600/800 ref	5765	2680 x 2680	261

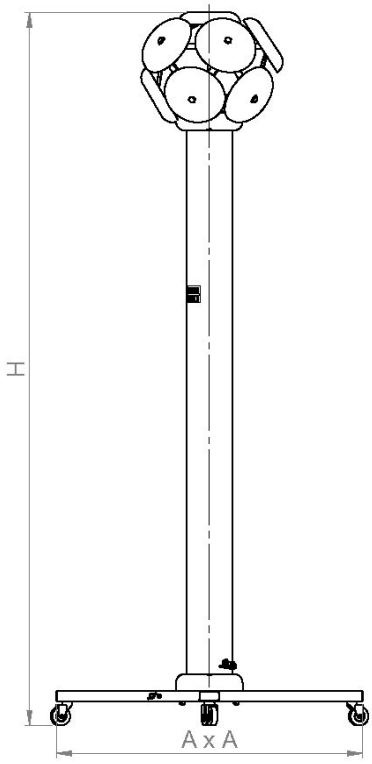

Figure 1: Dimensional drawing

Figure 2: GMR 800/400 ref

Calibration

High-Ohmic Resistive Reference Voltage Dividers are calibrated by the HIGHVOLT calibration laboratory D-K-19153-01-00. The calibration is documented by a DAkkS-calibration certificate. This calibration certificate documents the traceability to national standards, which realize the units of measurements according to the International System of Units (SI).
Germany's Accreditation Body DAkkS is signatory to the multilateral agreements of the European co-operation for Accreditation (EA) and of the International Laboratory Accreditation Cooperation (ILAC) for the mutual recognition of calibration certificates.
If the application task demands a calibration at a National Institute for Metrology, on request, the High-Ohmic Resistive Reference Voltage Dividers would be calibrated at the Physikalisch-Technische Bundesanstalt (PTB).
It is recommended to calibrate the High-Ohmic Resistive Reference Voltage Dividers together with the instruments which will be used together with the divider.

Type designation

GMR x/y ref

x = high-voltage resistance in MΩ
y = DC voltage (peak) in kV
ref = reference divider