



**Czech Metrology Institute**

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**Calibration laboratory No. 2202 accredited by the Czech Accreditation Institute according to ISO/IEC 17025:2017**

**Laboratory:** Regional Inspectorate Praha, Radiová 1136/3, 102 00 Praha 10  
Department of primary metrology of RF electrical quantities, tel. +420 266 020 174,  
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## CERTIFICATE OF CALIBRATION

**1013-KL-80076-24**

**Date of issue:** December 13<sup>th</sup>, 2024

Page 1 of 3

**User:** State Unitary Enterprise  
Uzbek Center of Scientific Testing and Quality Control (STE UzTest)  
St. Farabi 333A  
100169 Tashkent city - Alzamar District

**Measuring instrument:** ESD generator

**Manufacturer:** EM Test

**Type:** Dito

**Serial number:** P2022241206

**Accessories:** Contact-discharge tip  
Air-discharge tip  
Discharge module 150 pF / 330  $\Omega$ , DM1, nr. 100867, s/n: P1943233879

The results of the calibration have been obtained following the procedures reported in this Certificate and are related only to the calibrated measuring instrument, the date, place and conditions of the calibration.

**Date of calibration:** December 12<sup>th</sup>, 2024

**Calibrated by:**

**Head of the Department:**

Tomáš Pavlíček



Martin Hudlička



**Metrological traceability:**

The measurements are metrologically traceable to national/international standards.

Oscilloscope DPO 7354C, TEKTRONIX, ser. no. C130911,  
calibrated at ČMI, calibration certificate 1011-KL-50018-24

Current target ESD1, RAO, ser. no. 001,  
calibrated at ČMI, calibration certificate 1013-KL-70032-23

Kilovoltmeter ES105, ESDEMC TECHNOLOGY, ser. no. 20180904-01,  
calibrated at ČMI, calibration certificate 1011-KL-20178-24

**Calibration procedure:**

Calibration was performed in accordance with the standard EN 61000-4-2 ed. 2. Time interval measurement was carried out in accordance with the internal document 113-MP-C007, measurement of current parameters ( $I_P$ ,  $I_{30}$  and  $I_{60}$ ) and the open circuit voltage check was carried out in accordance with the internal document 113-MP-C017.

The instrument was operated in connection with a grounding cable of circular cross-section with a length of approximately 200 cm.

**Place of calibration:**

Czech Metrology Institute, Regional Inspectorate Praha,  
Radiová 1136/3, 102 00 Praha 10

**Ambient conditions:**

Ambient temperature  $(23 \pm 2) ^\circ\text{C}$   
Relative humidity  $(25 \pm 10) \%$

**Results of calibration:**

For measurement results see following tables.

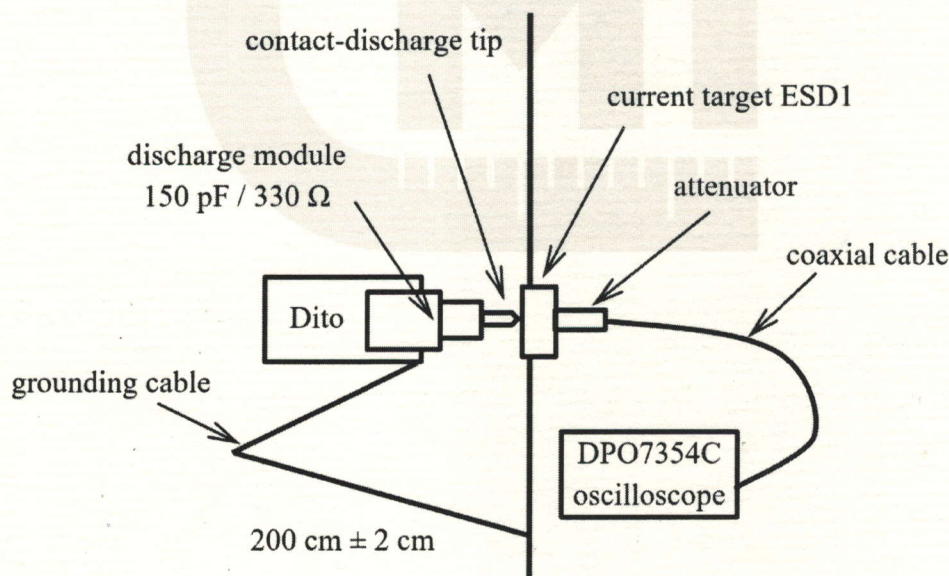


Figure 1: Measurement configuration

The tables contain following symbols:

$V_{SET}$	generator voltage setting
$I_P$	measured peak current value
$I_{30}$	current value measured 30 ns after the first 10 % $I_P$ point (during the impulse rising edge)
$I_{60}$	current value measured 60 ns after the first 10 % $I_P$ point (during the impulse rising edge)
$t_R$	impulse rise time (10 % – 90 %)
$V_0$	measured value of open circuit voltage (air discharge)



*Contact discharge (CD), Trigger: Single*

V <sub>SET</sub> (kV)	t <sub>r</sub> (ns)	Uncertainty (ns)	I <sub>p</sub> (A)	Uncertainty (A)	I <sub>30</sub> (A)	Uncertainty (A)	I <sub>60</sub> (A)	Uncertainty (A)
2.0	0.877	0.055	6.90	0.36	4.43	0.25	1.60	0.12
4.0	0.883	0.054	14.32	0.74	9.88	0.53	3.39	0.25
6.0	0.885	0.054	21.0	1.1	14.92	0.80	5.03	0.37
8.0	0.889	0.055	27.5	1.4	19.9	1.1	6.79	0.56
-2.0	0.883	0.055	-7.00	0.36	-4.53	0.25	-1.68	0.13
-4.0	0.887	0.054	-14.33	0.74	-10.02	0.53	-3.49	0.25
-6.0	0.892	0.054	-20.9	1.1	-15.08	0.82	-5.29	0.38
-8.0	0.894	0.055	-27.5	1.4	-20.5	1.1	-6.99	0.57

Table 1: Output current impulse parameters (current into ~ 2 Ω load)

*Air discharge (AD), Trigger: Cont*

V <sub>SET</sub> (kV)	V <sub>0</sub> (kV)	Rel. error (%)	Uncertainty (%)
2.0	2.040	2.0	2.3
4.0	4.105	2.6	2.2
6.0	6.052	0.9	2.1
8.0	8.011	0.1	2.1
15.0	15.01	0.1	2.1
-2.0	-2.026	1.3	2.3
-4.0	-4.086	2.2	2.2
-6.0	-6.012	0.2	2.1
-8.0	-8.020	0.2	2.1
-15.0	-14.95	-0.3	2.1

Table 2: Open circuit voltage check

The standard uncertainty of measurement has been determined in accordance with EA-4/02 M:2022 document. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k$  corresponding to a coverage probability of approximately 95 %, which for normal distribution corresponds to a coverage factor  $k = 2$ .

End of calibration certificate.

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