Westenergie AG - Eurotest

Test report

No.: **20_389-4** **Version: 1/1**

Customer	:	Hauff-Technik GmbH & Co. KG Robert-Bosch-Str. 9 89568 Hermaringen
Test object	:	Earthing wall bushing
Type	:	HEA W M12
Manufacturer	:	Hauff-Technik GmbH & Co. KG
Date of receipt	:	01.02.2021
Date of test	:	10.02.2021
Applied test regulations	:	- By prescription of the manufacturer - According to DIN EN 50522 (VDE 0101-2):2011-11, Annex D
Test carried out	:	Short circuit tests on an earthing wall bushing with 10 kA/1 s
Test result	:	The earthing wall bushing, type HEA W M12 of the manufacturer Hauff-Technik GmbH & Co. KG **passed** the short circuit tests with 10 kA/1 s by prescription of the manufacturer according to DIN EN 50522 (VDE 0101-2):2011-11, Annex D. The maximum allowed temperature of 300 °C was not reached. No damage was visible at the test object after the tests.
Specialist testers	:	Alexander Herbst; Ahmet Karakavak; Christoph Pieper

Dortmund, 12.03.2021

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Manager test laboratory

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Test engineer

Report No. 20_389-4 contains 8 pages and 3 annexes.

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Summary

The Westenergie AG, Eurotest carried out short circuit tests with 10 kA/1 s on an earthing wall bushing manufactured by Hauff-Technik GmbH & Co. KG by prescription of the manufacturer according to DIN EN 50522 (VDE 0101-2):2011-11, Annex D.

Result:

The earthing wall bushing, type HEA W M12 of the manufacturer Hauff-Technik GmbH & Co. KG **passed** the short circuit tests with 10 kA/1 s by prescription of the manufacturer according to DIN EN 50522 (VDE 0101-2):2011-11, Annex D. The maximum allowed temperature of 300 °C was not reached. No damage was visible at the test object after the tests.

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Annex:

1 Applied test regulations

By prescription of the manufacturer according to

DIN EN 50522 (VDE0101-2):2011-11

Earthing of power installations exceeding 1 kV a.c.;
German version EN 50522:2010

Prescription of the manufacturer:
- Short circuit test with 10 kA/1 s
- Maximum allowed temperature: 300 °C
- No visible damage

2 Technical data of the test object

Test object:	Earthing wall bushing
Type:	HEA W M12
Manufacturer:	Hauff-Technik GmbH & Co. KG
Concrete block:	WU – concrete C 25/30

3 Test and measuring equipment

Equip.-No.	cal.	Equipment	Type	Manufacturer
ET-811	*	Fibre Optic Isolated Digitizing Sub-system	GEN7t	HBM
ET-533		50 kA high-current test equipment	GDPN 5000/12 Sp	SIEMENS
ET-651	*	Digitizing Oscilloscope	DL750	Yokogawa
ET-556	*	Digital sampling microhmeter	DSM 200	T&R Test Equipment Limited
ET-1025	*	High current measurement system	HSM-S	RWE Eurotest GmbH

*) Measuring equipment is calibrated based on national and international reference standards. Calibration certificates can be inspected on request.

Table 1: Test and measuring equipment

The measurement uncertainty of the measuring instruments has been calculated and is archived by Eurotest. Documents can be inspected on request.

4 Tests carried out and results

The Westenergie AG, Eurotest carried out short circuit tests with 10 kA/1 s on an earthing wall bushing manufactured by Hauff-Technik GmbH & Co. KG by prescription of the manufacturer according to DIN EN 50522 (VDE 0101-2):2011-11, Annex D.

The test objects were connected with 240 mm² copper cables to the test transformer. One cable was connected to the earthing bushing, 1 cable was connected to a flat steel angle, mounted in the cross connector.

Figure 1: Test setup

The temperatures of the test objects were measured with 0,5 mm NiCr-Ni-Thermocouples (See figure 2). The measuring points were: T01 at the core material, T02 at the shrink sleeve, T03 at the loose flange and T04 at the cross connector.

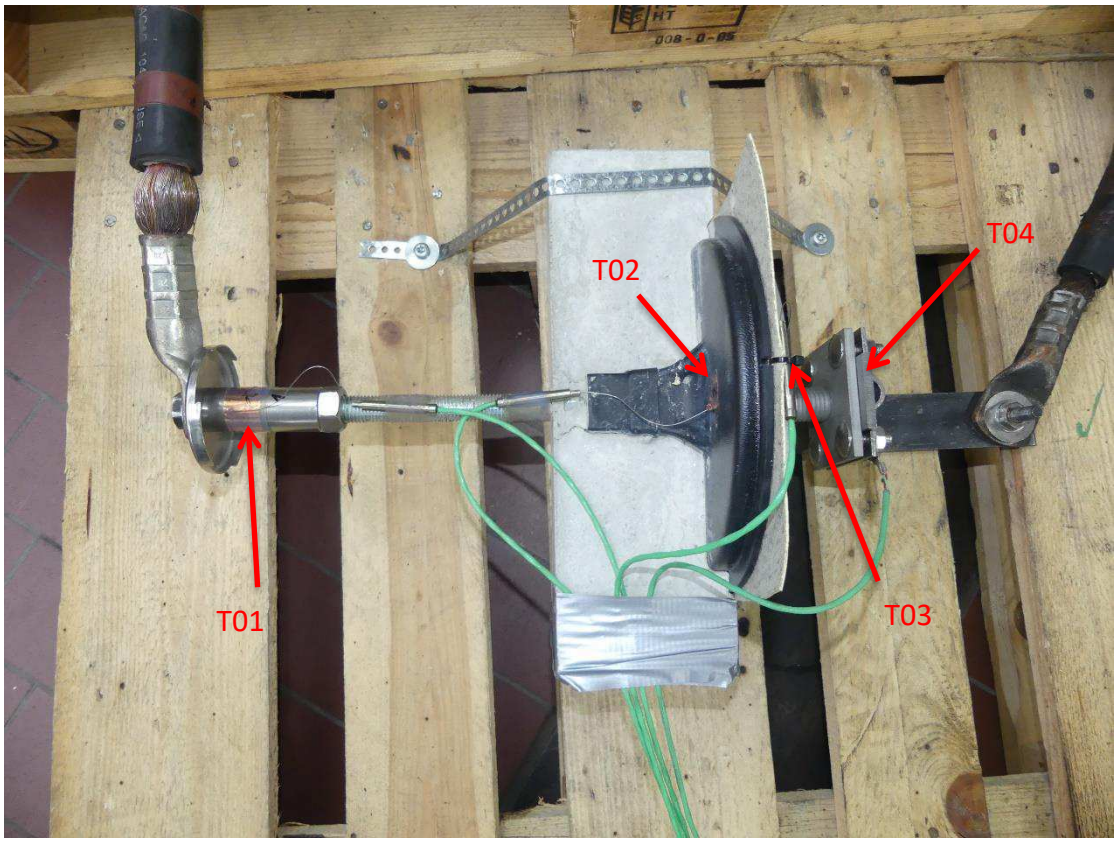


Figure 2: Positions of the thermocouples

The results of the short circuit tests are given in table 3.

Test	I_{RMS} [kA]	t [s]	I^2t [MA²s]	Maximum measured temperatures [°C]			
1	10.35	1.005	107.6	T01: 142.8	T02: 26.3	T03: 14.9	T04: 44.3
2	10.33	1.004	107.1	T01: 161.6	T02: 34.3	T03: 22.5	T04: 55.1

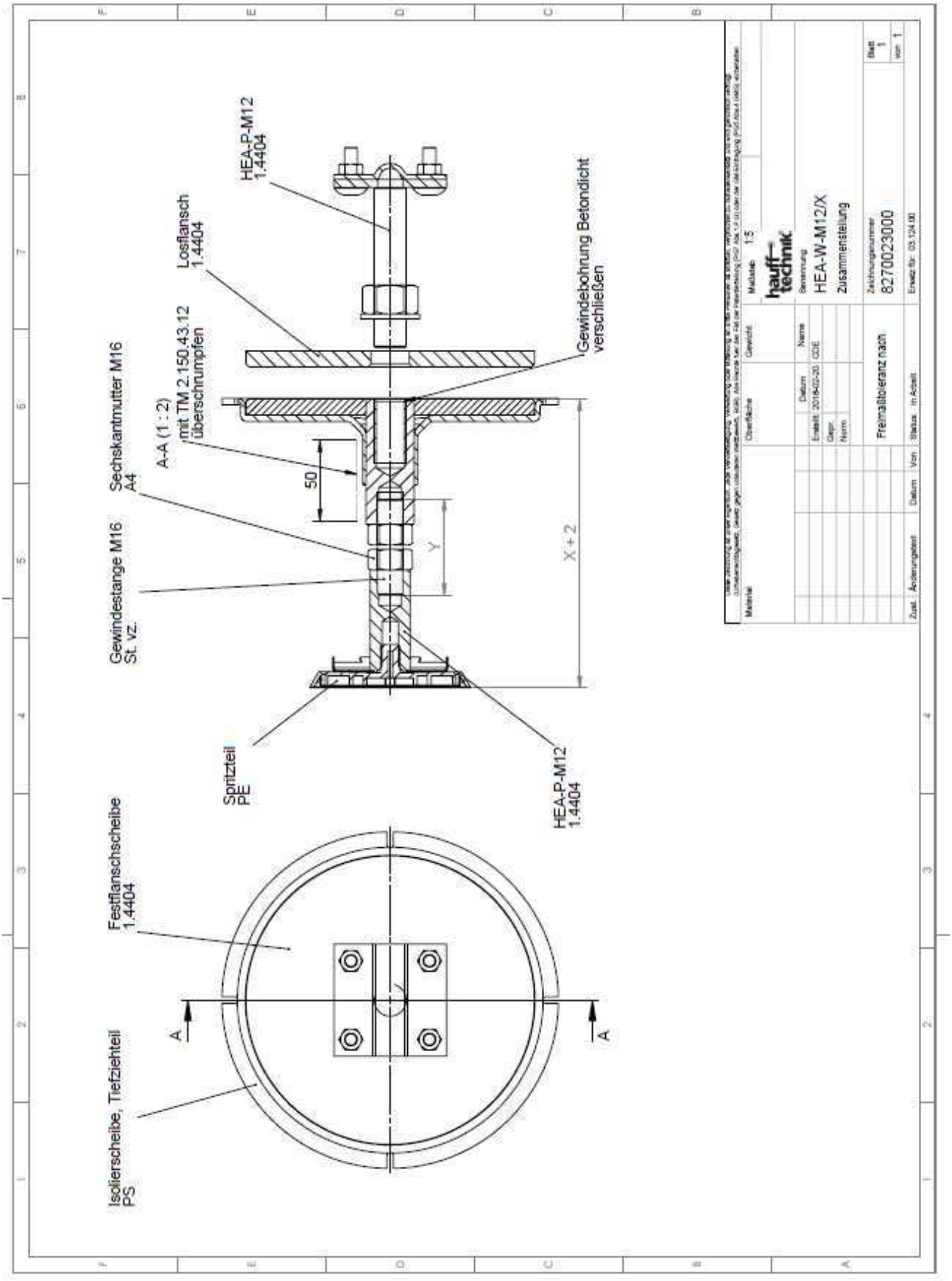
Table 3: Results of the tests

The maximum allowed temperature of 300 °C was not reached during the short circuit tests.

5 Overall result

The earthing wall bushing, type HEA W M12 of the manufacturer Hauff-Technik GmbH & Co. KG **passed** the short circuit tests with 10 kA/1 s by prescription of the manufacturer according to DIN EN 50522 (VDE 0101-2):2011-11, Annex D. The maximum allowed temperature of 300 °C was not reached. No damage was visible at the test object after the tests.

- End of report -


HEA-P-M12
1.4404
Losflansch
1.4404
Gewindebohrung Betondicht
verschließen
A-A (1 : 2)
mit TM 2.150.43.12
überschrumpfen
Sechskantmutter M16
A4
Gewindestange M16
St. vz.
50
Y
X + 2
Spritzteil
PE
HEA-P-M12
1.4404
Festflanschscheibe
1.4404
Isolierscheibe, Tiefziehteil
PS
A
A
hauff-technik
HEA-W-M12/X
Zusammenstellung
82700023000
Freimaßtoleranz nach

Current-/time-diagrams

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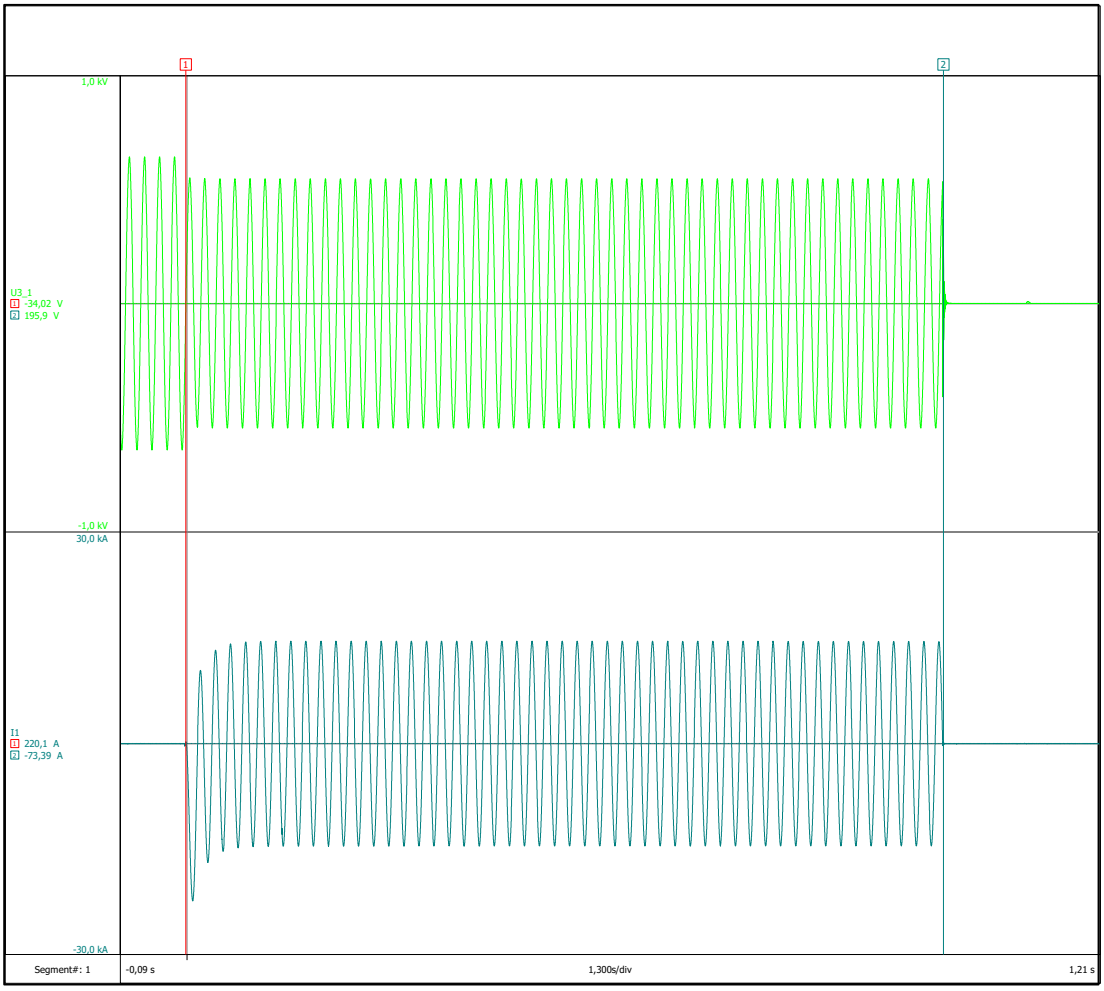

Table		
U3_1_eff	383,1	V
I1_eff	10,35 k	A
I1²t	107,6 M	A²s
I1_max	-22,42 k	A
Time	1,005	s

Settings of the high current plant		
	L1	L3
U [V]	449	449
R_{slide} [mΩ]	0	0
R_{fixed} [mΩ]	0	0
X_L	i	i
Phi	0°	0°

Ambient temperature:	20 °C
Humidity:	12 %

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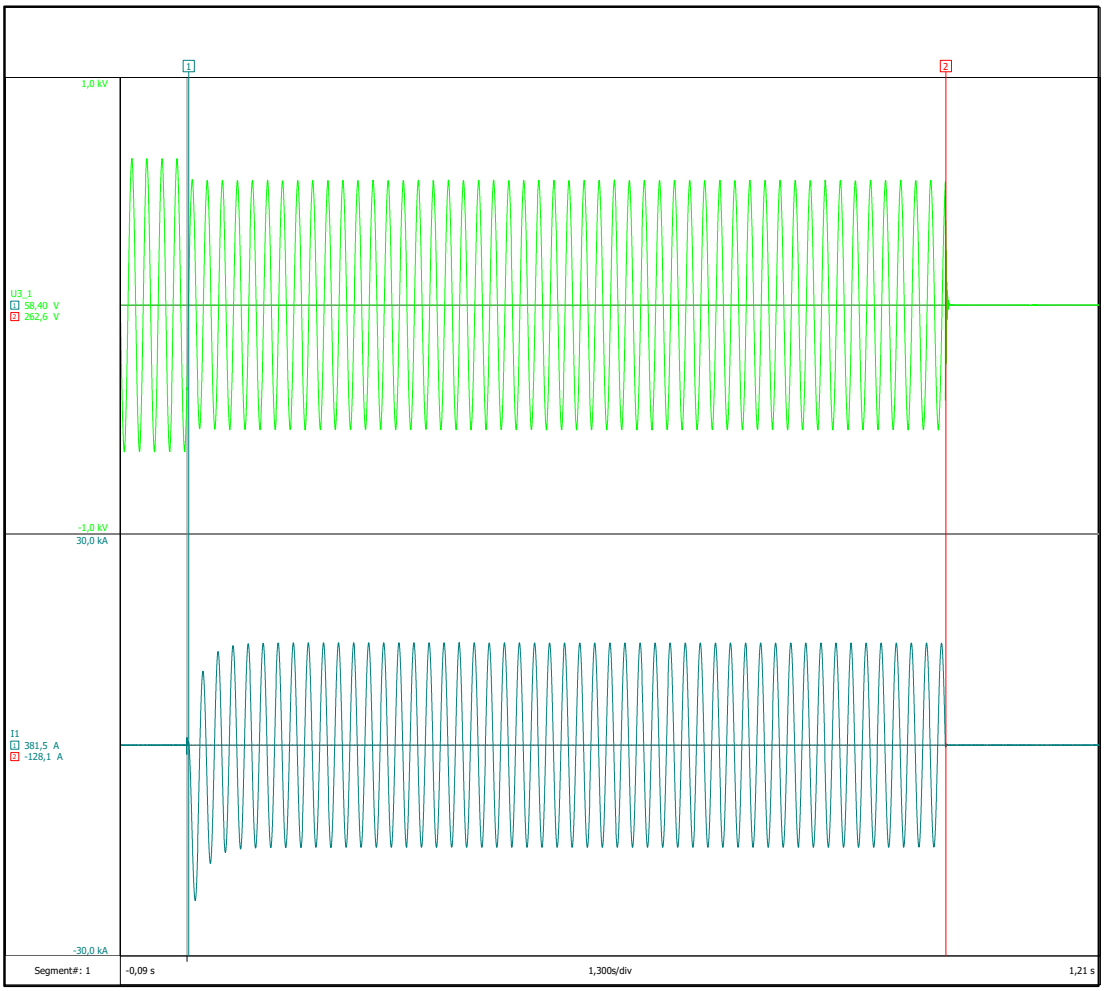


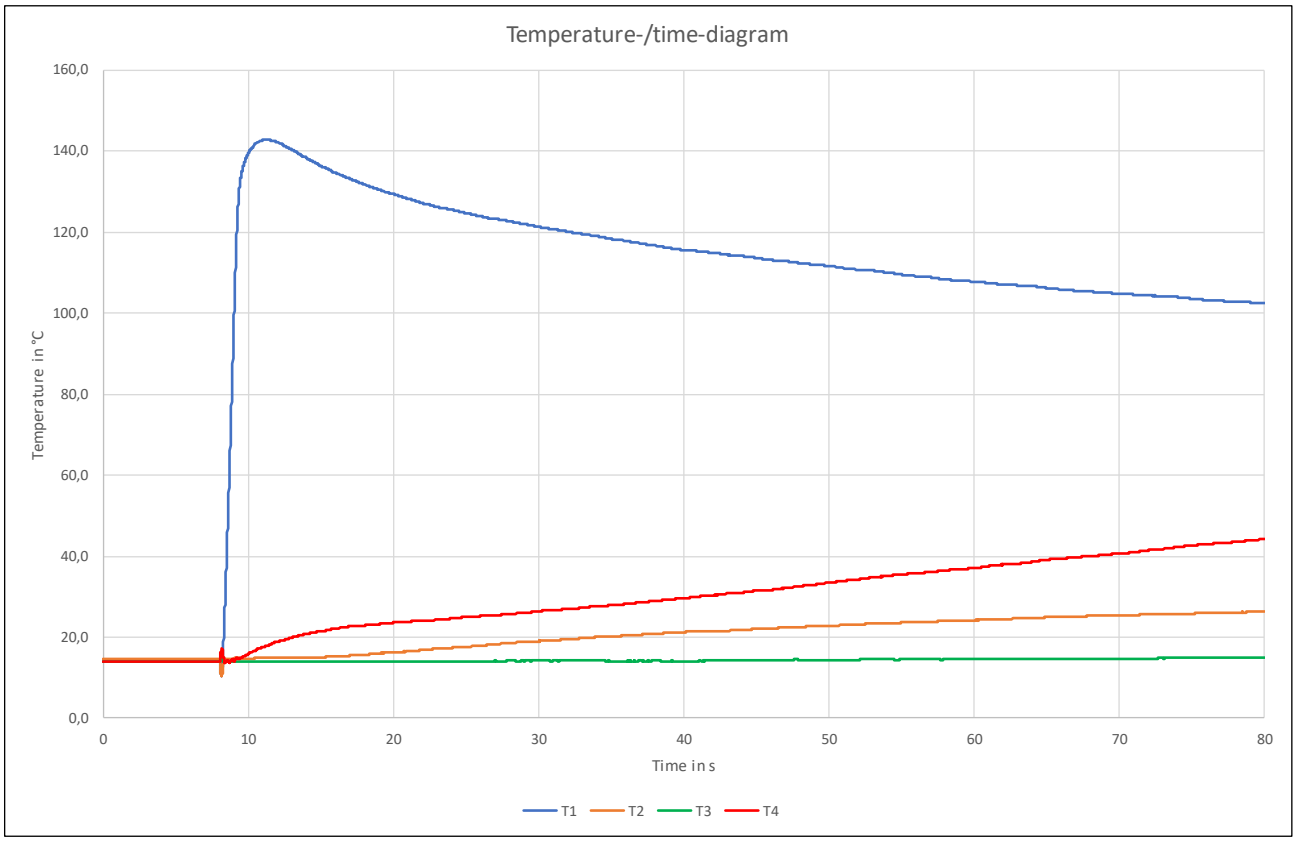
Table		
U3_1_eff	382,6	V
I1_eff	10,33 k	A
I1²t	107,1 M	A²s
I1_max	-22,15 k	A
Time	1,004	s

Settings of the high current plant		
	L1	L3
U [V]	449	449
R_{slide} [mΩ]	0	0
R_{fixed} [mΩ]	0	0
X_L	i	i
Phi	0°	0°

Ambient temperature:	20 °C
Humidity:	12 %

Temperature-/time-diagrams

Test 1



Test 2