

CERTIFICATE OF MEASUREMENT

For testing of electrical

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equipment by accredited experts

Certificate no.: 2548849.2

<p>Customer BTC Biotecpro Consulting Schwaighofstr. 62 D-83684 Tegernsee</p> <p>Steho Energy AG 95, Avenue de la Liberation L - 3850 Schifflage</p>	<p>Address of the measurement Steho Energy AG Zettachring 10a – 70567 Stuttgart</p> <p>Person assigned: Developer Inspector:: Torsten Beutinger Accompanying person: ./. Date of testing: 19.03.2013 Duration: 0:05h</p>
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Kind of Equipment: Transformer

Is frequency controlled equipment (e.g. engines) provided for? yes no

Are there any protective measures to be identified by the producer? yes no

If yes, which:

Grounding of the transformer

Identification of the Equipment:

Data of the type label

Producer: Bückle+Schöck Device: UTK80103 Serial number: 137422

Measurement result

- No results found
 The results found are specified in **Attachment A**

This certificate of measurement has 6 pages including the attachment.
 The electrical apparatus was measured to the best of my knowledge and belief.



Neuhausen, 20.03.2013

(Signature)
 Torsten Beutinger
 state cert. E-Technician (TC)

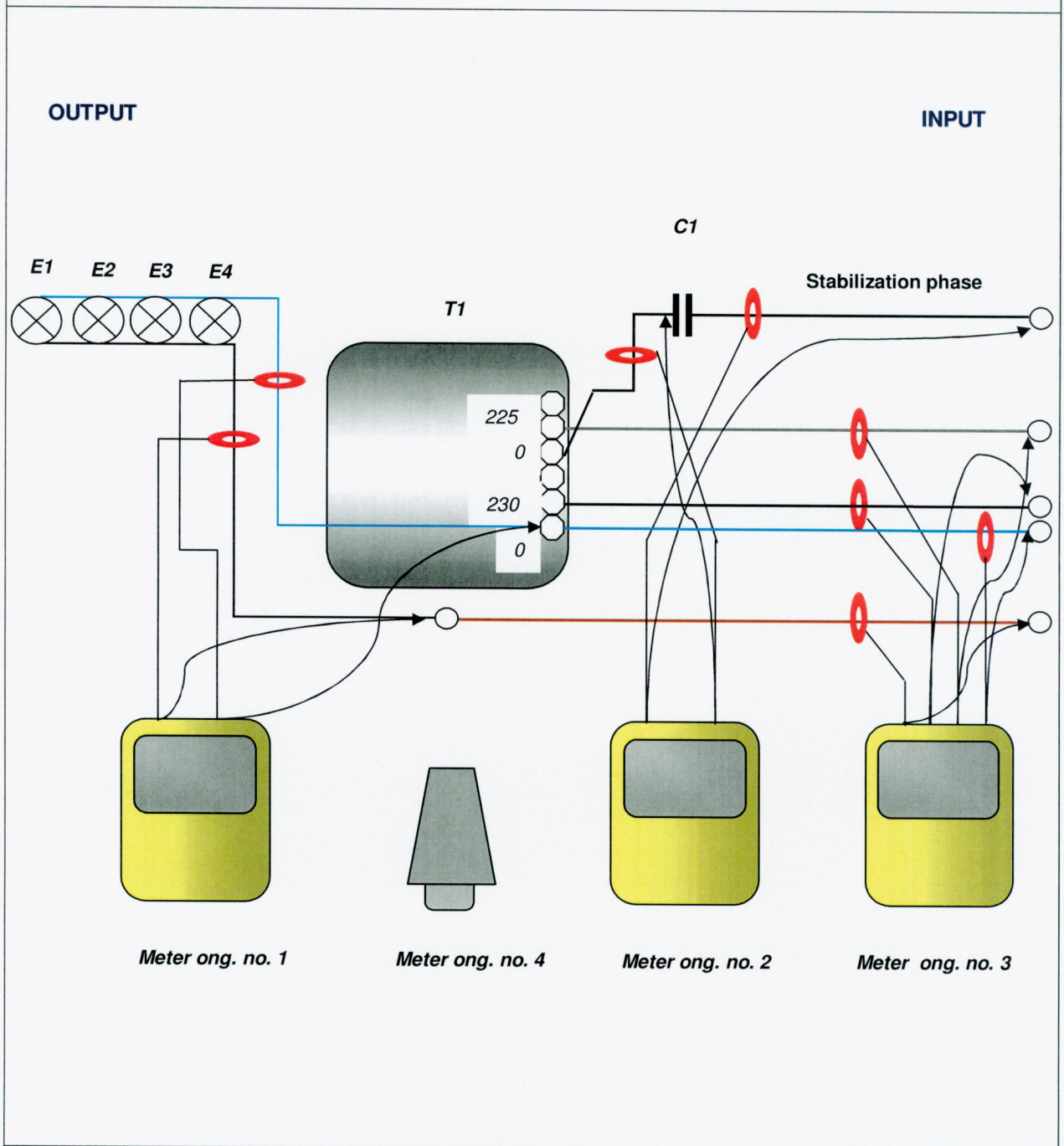
This is a translation of the measurement certificate in German language.

Valid is the German certificate!

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	Certificate no.: 2548849.2
Measurement	
<ul style="list-style-type: none"> • Insulation resistance: <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <i>If insulation resistance measurements are not possible: Were alternatively before measurement protocols on insulation resistance measurements?</i> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <i>Note this: temporary test setup</i> 	
<ul style="list-style-type: none"> • Residual current protective devices (RCDs) <input type="checkbox"/> all or 0 % <i>Note this: temporary test setup, no RCD installed at the entrance</i> 	
<ul style="list-style-type: none"> • Loop resistance <input type="checkbox"/> yes, No: <input checked="" type="checkbox"/> no <i>Note this: temporary test setup</i> 	
<ul style="list-style-type: none"> • Thermographic abnormalities were found? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <i>Note this: Temperature was recorded during the measurement</i> 	
General information on the measured electrical equipment	
Supply system <input checked="" type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT <input type="checkbox"/> Ring feeding	
Power requirements of the equipment: 5 kVA	
Further explanations	
<p>The extent of the measured operating means consists essentially of:</p> <p>A transformer, which was prepared according to the specifications of a person appointed by the manufacturer of the transformer.</p>	

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				Certificate no.: 2548849.2	
ong. no.	Meters <i>Identification of all equipment used</i>			Calibration number	Calibrated to
	Designation	Serial number			
1	Power analyzer Fluke 435	11800035		X445496	14.01.2016
2	Power analyzer Fluke 435	11800034		X445497	04.02.2016
3	Power analyzer Fluke 435	11800026		X445419	04.02.2016
4	Thermometer Raytek Raynger MX	262913-0101-0016		-	-

Sketch of the measurement setup



Attachment to certificate no.: 2548849.2			
ong. no.	Observations Detailed description	Reference	Lack
3	0.5 kW / 6.2 kVA / 6.2 kVAR / 0.10 PF / 0.09 cosphi / 27 Arms / 231.18 Vrms Measured beginning 15:10h <i>Initial readings of the equipment at power</i>	L1 - N	
3	0.5 kW / 6.2 kVA / 6.2 kVAR / 0.10 PF / 0.09 cosphi / 27 Arms / 231.33 Vrms Measured ending 15:15h <i>Finish readings of the equipment</i>	L1 - N	
3	5.0 kW / 5.0 kVA / 0.0 kVAR / 1.00 PF / 1.00 cosphi / 22 Arms / 230.98 Vrms Measured beginning 15:10h <i>Initial readings of the equipment at power</i>	L2 - N	
3	5.0 kW / 5.0 kVA / 0.0 kVAR / 1.00 PF / 1.00 cosphi / 22 Arms / 230.69 Vrms Measured ending 15:15h <i>Finish readings of the equipment</i>	L2 - N	
3	-5.1 kW / 6.3 kVA / 3.6 kVAR / -0.80 PF / -0.82 cosphi / 27 Arms / 233.18 Vrms Measured beginning 15:10h <i>Initial readings of the equipment at power</i>	L3 - N	
3	-5.1 kW / 6.3 kVA / 3.6 kVAR / -0.80 PF / -0.82 cosphi / 27 Arms / 233.08 Vrms Measured ending 15:15h <i>Finish readings of the equipment</i>	L3 - N	
2	0.1 kW / 2.2 kVA / 2.2 kVAR / 0.02 PF / 0.03 cosphi / 27 Arms / 82,33 Vrms Measured beginning 15:10h <i>Initial readings of the equipment at power</i>	L1 - N	
2	0.1 kW / 2.2 kVA / 2.2 kVAR / 0.02 PF / 0.03 cosphi / 27 Arms / 82,62 Vrms Measured ending 15:15h <i>Finish readings of the equipment</i>	L1 - N	
1	4.7 kW / 4.7 kVA / 0.0 kVAR / 1.00 PF / 1.00 cosphi / 20 Arms / 229.62 Vrms Measured beginning 15:10h <i>Initial readings of the equipment at power</i>	L1 - N	
1	4.7 kW / 4.7 kVA / 0.0 kVAR / 1.00 PF / 1.00 cosphi / 20 Arms / 230.63 Vrms Measured ending 15:15h <i>Finish readings of the equipment</i>	L1 - N	
4	23.5°C Measured beginning 15:10h <i>Initial readings of the equipment at power</i>		
4	28.2°C Measured ending 15:15h <i>Steady-state temperature of the equipment</i>		

Attachment to certificate no.: 2548849.2**General observations***Making calculations are to check twice*

The measurement was carried out by an expert of SGS-TÜV Saar GmbH. Were present in addition to the Men of the SGS-TÜV Saar GmbH also the developer and a translator of the company Steho Energy AG.
The measurement setup was by default of the developer.

A measurement of the electrical equipment has not been performed, as this was not desirable. It was only recorded the performance of the electrical equipment. The measurement was performed until the electrical equipment attained an approximately constant steady-state temperature.

At the input of the transformer phases L2 and L3 were connected, phase L1 was not connected, it has been connected through to the consumer.

The steady-state temperature following measurements were taken:

At the transformer input was the real power 0.4 kW, the apparent power of 17.5 kVA and reactive power was 9.8 kVAR.

At transformer output was 4.7 kW active powers, apparent power of 4.7 kVA but there was no reactive power measured.

Efficiency

$$\eta = \frac{P_{out}}{P_{in}}$$

$$P_{in} = P_{L1} + P_{L2} + P_{L3} + P_{Stabi} = 0.5 + 5.0 + -5.1 + 0.1 \text{ kW} = 0.5 \text{ kW}$$

$$P_{out} = 4.7 \text{ kW}$$

$$\eta = \frac{4.7}{0.5} = 9.4$$