



# Test Report

Project designation	<b>Addition to test reports SGP-07532/SL2/CB SGP-07532/SL3/CB</b>		
	<b>Performance of impulse withstand voltage test across the open contacts according to IEC 60947-3 in conjunction with IEC 60947-1</b>		
Product description	<b>Low-voltage fuse-switch-disconnectors type SL2 1P/... and SL2 3P/... (single pole and three pole operated) SL3 1P/... and SL3 3P/... (single pole and three pole operated)</b>		
Client	ETI Elektroelement d.d. 1411 Izlake Obrezija 5 Slovenia		
Order from / No.	11/2017 / ---		
Project number	SGP-07532/SL2+SL3/ETI/Impulse withstand voltage test		
Date of issue	22.11.2017	Test engineer	H. Raheb, MSc
Total number of issues / No.	1 / 1		
Number of pages	10		
Annex: Number of pages	---		

The results relate exclusively to the items tested.

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## Test item

### Identification:

Low-voltage fuse-switch-disconnector type **SL2 1P/...**, **SL2 3P/...** and **SL3 1P/...**, **SL3 3P/...**

Manufacturer: Jean Müller GmbH  
Trademark: **ETI**  
Sizes: 2 / 3  
Number of poles: 3; 1-pole operated / 3-pole operated  
Busbar system: 185mm  
Rated voltages: 400V a.c. up to 690V a.c.  
Rated currents: 400A / 630A  
Rated frequency: 50/60Hz

### Pictures of test item:

See page 4

## Testing location, Period of testing

### Testing location:

AIT Austrian Institute of Technology GmbH  
Business Unit Electric Energy Systems  
Giefinggasse 2  
1210 Vienna  
Austria

### Period of testing:

11/2017

## Test(s)

### Test(s) performed:

Impulse withstand voltage test across open contacts with test  $U_{imp} = 20kV$

### Test standard(s):

IEC 60947-1:2014 (Edition 5.2)

IEC 60947-3:2015 (Edition 3.2)

### Possible test case verdicts:

Test object meets the requirement: P (Pass)

Test case does not apply to the test object: N/A (Not applicable)

## Test description

See page 5

## Test performance, Test values

See pages 6 to 9

## Result

The low-voltage fuse-switch-disconnectors type **SL2 1P/...**, **SL2 3P/...** and **SL3 1P/...**, **SL3 3P/...** have passed the test mentioned above successfully.



Seal

Test engineer

  
.....  
Hanna Raheb, MSc

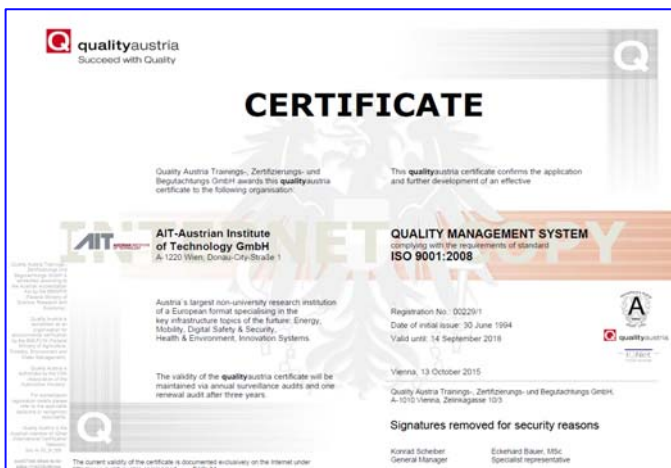
Responsible for the content

  
.....  
Ing. Johann Ainetter

# Testing laboratory



**ACCREDITED**  
 according to  
**EN ISO/IEC 17025**  
 confirmed by  
**BMWFW**  
 with GZ 92714/237-IV/9/00



**CERTIFIED**  
 according to  
**ISO 9001**  
 confirmed by  
**Quality Austria**  
 with Reg. No. 00229/1



**RECOGNIZED CB TESTING LABORATORY**  
 confirmed by  
**International Electrotechnical Commission**  
 under the responsibility of  
**OVE**  
 as the National Certification Body

**Pictures of test item**



## Test description

The test equipment has been calibrated to produce a 1,2/50  $\mu$ s waveform as defined in IEC 61180. The output was then connected to the equipment to be tested and the impulses applied **15 times (acc. to the manufacturer's requirement)** for each polarity at minimum intervals of 1s. The influence of the equipment under test on the wave-shape, if any, has been ignored.

For equipment suitable for isolation, across the poles of the main circuit, the line terminals have been connected together and the load terminals have been connected together.

**The test voltage has been applied between the line and load terminals of the equipment with the contacts in the open position.**

The test Uimp was 20kV according to the manufacturer's requirement.

### ***Acceptance criteria:***

***No unintentional disruptive discharge during the tests***

## Test performance, Test values

IEC 60947-1 / IEC 60947-3			
Clause	Requirement / Test	Result / Remark	Verdict
8.3.3.2	Test of dielectric properties across the open contacts only		P
<b>Type SL2 1P/...</b>			
	Rated impulse withstand voltage (kV) .....	12	—
	- test U <sub>imp</sub> across open main contacts (equipment suitable for isolation) (kV) .....	20 (acc. to manufacturer's requirement)	P
	Results	Positive polarity: 1: 20,54kV 2: 20,26kV 3: 20,42kV 4: 20,43kV 5: 20,43kV 6: 20,38kV 7: 20,35kV 8: 20,35kV 9: 20,45kV 10: 20,33kV 11: 20,53kV 12: 20,41kV 13: 20,55kV 14: 20,34kV 15: 20,57kV  Negative polarity: 1: 20,53kV 2: 20,55kV 3: 20,54kV 4: 20,53kV 5: 20,46kV 6: 20,39kV 7: 20,51kV 8: 20,45kV 9: 20,53kV 10: 20,42kV 11: 20,37kV 12: 20,52kV 13: 20,51kV 14: 20,38kV 15: 20,23kV	P

IEC 60947-1 / IEC 60947-3			
Clause	Requirement / Test	Result / Remark	Verdict
8.3.3.2	Test of dielectric properties across the open contacts only		P
<b>Type SL2 3P/...</b>			
	Rated impulse withstand voltage (kV) .....	12	—
	- test Uimp across open main contacts (equipment suitable for isolation) (kV) .....	20 (acc. to manufacturer's requirement)	P
	Results	Positive polarity: 1: 20,45kV 2: 20,42kV 3: 20,38kV 4: 20,43kV 5: 20,37kV 6: 20,51kV 7: 20,42kV 8: 20,50kV 9: 20,56kV 10: 20,38kV 11: 20,46kV 12: 20,35kV 13: 20,42kV 14: 20,55kV 15: 20,38kV  Negative polarity: 1: 20,39kV 2: 20,47kV 3: 20,48kV 4: 20,45kV 5: 20,42kV 6: 20,35kV 7: 20,39kV 8: 20,52kV 9: 20,41kV 10: 20,58kV 11: 20,43kV 12: 20,55kV 13: 20,51kV 14: 20,42kV 15: 20,36kV	P

IEC 60947-1 / IEC 60947-3			
Clause	Requirement / Test	Result / Remark	Verdict
8.3.3.2	Test of dielectric properties across the open contacts only		P
<b>Type SL3 1P/...</b>			
	Rated impulse withstand voltage (kV) .....	12	—
	- test Uimp across open main contacts (equipment suitable for isolation) (kV) .....	20 (acc. to manufacturer's requirement)	P
	Results	Positive polarity: 1: 20,53kV 2: 20,49kV 3: 20,58kV 4: 20,31kV 5: 20,44kV 6: 20,46kV 7: 20,49kV 8: 20,45kV 9: 20,34kV 10: 20,57kV 11: 20,41kV 12: 20,49kV 13: 20,44kV 14: 20,45kV 15: 20,53kV  Negative polarity: 1: 20,47kV 2: 20,41kV 3: 20,43kV 4: 20,48kV 5: 20,51kV 6: 20,42kV 7: 20,50kV 8: 20,54kV 9: 20,53kV 10: 20,48kV 11: 20,51kV 12: 20,43kV 13: 20,49kV 14: 20,53kV 15: 20,46kV	P



IEC 60947-1 / IEC 60947-3			
Clause	Requirement / Test	Result / Remark	Verdict
8.3.3.2	Test of dielectric properties across the open contacts only		P
<b>Type SL3 3P/...</b>			
	Rated impulse withstand voltage (kV) .....	12	—
	- test Uimp across open main contacts (equipment suitable for isolation) (kV) .....	20 (acc. to manufacturer's requirement)	P
	Results	Positive polarity: 1: 20,26kV 2: 20,35kV 3: 20,48kV 4: 20,34kV 5: 20,41kV 6: 20,45kV 7: 20,37kV 8: 20,44kV 9: 20,51kV 10: 20,47kV 11: 20,45kV 12: 20,35kV 13: 20,34kV 14: 20,55kV 15: 20,42kV  Negative polarity: 1: 20,53kV 2: 20,51kV 3: 20,45kV 4: 20,42kV 5: 20,37kV 6: 20,43kV 7: 20,39kV 8: 20,50kV 9: 20,56kV 10: 20,44kV 11: 20,42kV 12: 20,54kV 13: 20,47kV 14: 20,43kV 15: 20,35kV	P

### List of Test equipment used:

Measured quantity	Device	Manufacturer	Code
Dielectric properties	Impulse tester 35	Haefely	G304
	Impulse voltmeter SV 642	Haefely	G503
	Oscilloscope HDO 4024	Le Croy	G807