



**ELECTROTECHNICAL TESTING INSTITUTE**  
**Pod Lisem 129**  
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No. of the Test Report: 802532-02/01

Issued:24.03.2009



## TEST REPORT

**Name of product:** Surge voltage protector  
**Type of product:** Series P III M  
**Ratings:**  $U_N$ :280 V/50 Hz,  $U_c$ :320 V/50 Hz,  $I_{max}$ :40 kA  
(8/20),  $I_n$ :20 kA (8/20)  
**Serial number:** ---  
**Manufacturer:** HAKEL spol. s r. o., Bratří Štefanů 980, 500 03  
Hradec Králové, Slezské Předměstí,  
Czech Republic  
**Production site:** HAKEL spol. s r. o., Bratří Štefanů 980, 500 03  
Hradec Králové, Slezské Předměstí,  
Czech Republic  
**EZÚ product coding system:** 020499 – other  
**Ordering firm:** HAKEL spol. s r. o., Bratří Štefanů 980, 500 03  
Hradec Králové, Slezské Předměstí,  
Czech Republic  
**Number of tested samples:** 3  
**Samples submitted on:** 17.6.2008  
**Location of testing:** EZÚ  
**Tested from** 20.11.2008 through 24.03.2009  
**Other data:** Test report EZÚ No.701127-01/01, Test report EZÚ  
No.1070299,  
Test report HAKEL spol. s r.o. No.07-1101  
**The product was tested according to:** EN 61643-11:02+A11:07  
(ident. ČSN EN 61643-11:03+A11:07)  
cl.6.1.2,7.2,7.2.2,7.3.2.2,6.5.1,7.4,7.5.2,7.9.2,  
7.9.3.1, 7.9.3.2,7.9.4,7.9.5.2,7.9.6,7.7.3,7.7.6

The test results contained in this report refer to the tested items only. The values presented in this report were measured with the accuracy specified in the testing regulations. All measuring instruments used are properly traceable.  
This Report shall not be reproduced except as a whole.

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Tested according to EN 61643-11:02+A11:07 (ident. ČSN EN 61643-11:03+A11:07).

For certification were used the test results stated in:

- test record EZÚ No.701127-01/01 dated 11/04/2007;
- an EZÚ certificate No.1070299 dated 17/04/2007, valid until 30/04/2010 was issued;
- test report HAKEL spol. s. r.o. No. 07-1101 dated 01/11/2007.

The aforementioned test reports include the following tests:

ČSN EN 61643-11:2003+A11:2007

Cl.:6.1.2,7.2,7.3.2.2,6.5.1,7.4,7.5.2,7.9.2,7.9.3.1,7.9.3.2,7.9.4,7.9.5.2,7.9.6,7.7.3,7.7.6.

Additional tests were carried out:

**Cl. 7.2 Identification and marking**

Carried out in accordance with requirements in Cl.6.1.1 and 6.1.2.

Manufacturer provided the following information:

a) Manufacturer's name or trade mark, type *	*	Hakel, PIIM
b) Location category		inner
c) Number of electrodes		2
d) Method of assembly		on bar DIN 35 mm
e) Highest permanent operating voltage U <sub>c</sub> and r. frequency *	*	480 V AC/50 Hz
f) SPD type and discharge parameters	*	II(T2) ; I <sub>max</sub> :40 kA (8/20)
g) Rated discharge current I <sub>n</sub>	*	15 kA (8/20)
h) Voltage protection level U <sub>p</sub>	*	< 2 kV
i) Rated load current I <sub>L</sub>		----
j) Protection degree IP (if IP > 20)	*	IP 20
k) Short-circuit withstand capability		At max. pre-protection 60 kAef
l) Max. recommended level of overcurrent protection	*	100 A, 160 A AgL/gG
m) Effect indication of the disconnecter		Yes (green disk-operation, red disk-failure)
n) Position when normally used, if significant		----
o) Marking of leads (if necessary)	*	----
p) Installation instructions		Stated in documentation
q) Type of current	*	AC
r) Specific energy W/R		----
s) Temperature limit		-40°C to +80°C
t) Interrupt level of the follow-on current		----
u) Any requirements on external SPD disconnecter		----
v) Residual current (optional)		----
w) Temporary overvoltage characteristics		----

**Passed**

**Cl. 6.1.2 Marking**

\*) marking is compulsory to be stated on the body of SPD or to be stuck to the body of SPD.

Marking is inefaceable, tested in accordance with Cl. 7.2.2. with the passing result.

**Passed**

**Cl. 7.2.2 Inefaceability test of the marking**

Tested by manual abrasion for the period of 15 sec with a piece of cotton cloth damped in water and subsequently for 15 sec with a piece of cotton cloth damped in petrol.

Marking remained legible after the test.

**Passed**

**Cl. 7.4 Protection against direct contact test**

**Cl. 7.4.1 Insulated parts**

Manufacturer states in the documentation the protection degree of IP20.

The terminals were connected with a Cu conductor with the smallest size of 6 mm<sup>2</sup> (stated in the documentation). It is not possible to touch the live parts with a test finger. Protection degree of IP20 corresponds with what the manufacturer states.

**Passed**

**Cl. 7.9.2 Mechanical strength**

- 7.9.2.1 Tested with beater in height 150 mm (taken as the built-in version). The total number of 5 impacts were applied.

After the test, there was no damage or breach of the desired protection degree.

**Passed**

**Cl. Cl.7.9.3 Thermal resistance**

-7.9.3.1 Tested in the heat box under temperature of  $(100 \pm 2) ^\circ\text{C}$

No change to the sample after the test.

**Passed**

-7.9.3.2

Tested part	set temperature ( $^\circ\text{C}$ )	diameter of. impression (mm)
terminal board	$125 \pm 2$	0,8 passed

prescribed: diameter of the impression cannot be smaller than 2 mm.

**Passed**

**Cl. Cl.7.9.4 Resistance to abnormal heat and fire**

Tested part	set temperature ( $^\circ\text{C}$ )	result
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terminal board (yellow)	$850 \pm 15$	burns, melts, trickles, does not ignite the paper, after removal burning stops in 1 s.
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**Passed**

**Cl. 7.9.5 Creepage distances and clearances check**

**-7.9.5.2 SPD for interior use**

Check carried out according to the table 15 (up to 200-450 V)

**-7.9.5.2.1 Test: Measuring**

Clearances (mm):

Measured between	Prescribed	Measured
Live parts of different polarity	3	29 (measured between blades of the surge voltage protector)

2) live parts and

- screws for fixation of the cover, which must be removed during installation of SPD

3

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--attachment surfaces (note 2)	6 (3)		3 (measured between the head of the screw connect. terminal and cover plate of the switchboard with connect. conductor of 6 mm <sup>2</sup> )
- with screws or other means mounting of SPD (note 2)	6 (3)		insul. partition (measured between the DIN bar and the socket contacts)
--with bodies (note 1 and 2) exterior		3	3.22 (measured between the input terminal and the of the casing)
3) metal parts of the mechanism of the disconnecter and -bodies ( note 1 )		3	---
- screws or other means of attachment of SPD ( note 1 )		3	---

**Passed**

Creepage distances (mm):

<u>Measured between</u>	<u>Prescribed</u>	<u>Measured</u>
4) live parts of various polarity	3	29 (measured between the blades of the surge voltage protector)
5) live parts and -screws and other means of attachment of the covers, which must be removed during the assembly of SSPD	3	---
-screws or other means of attachment of SPD (note 2)	6 (3)	3,2 (measured between the DIN bar and the socket contacts)
--bodies (note 1)	3	3.22 (measured between the input terminal and exterior of the casing)

Note 1:for definitions see Cl. 7.9.7.2.

Note 2: If the creepage distances and clearances between the live parts of the device and the metal shielding and the surface on which the SPD is attached are dependent only on the construction of SPD, they cannot be reduced in case the SPD is attached in the most favourable position (in the metal case), the values on lines 1 and 4 are satisfactory.

**Passed**



sample

**Apparatus used:**

Slide gauge                      No. DHM 20264  
Test beater                        No. DKP 3317

Tested by: J.Klípa                24<sup>th</sup> March 2009.

A handwritten signature in blue ink, appearing to read 'J. Klípa', written over the date.