

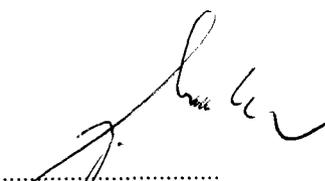


**Electrotechnical Engineering and Production, joint-stock company**  
619 00 BRNO, Vídeňská 117

REPORT OF PERFORMANCE No: 82-0640

INDOOR INSTRUMENT VOLTAGE TRANSFORMERS  
DOUBLE POLE INSULATED TYPE VTD 12



  
Jaromír Mudra, Phd

Brno, July 24 1998

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**TEST REPORT** No 82 - 0640  
Tested Indoor Instrument Voltage  
subject:Transformer Double Pole  
Insulated

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TYPE:  
VTD 12

KIND OF TEST: partial test

TESTING ACC. TO:  
IEC 186  
ČSN 35 1360

RATED VALUES:  
Rated transformer ratio  
6 000/100 V  
10 000/100 V  
11 000/100 V

TEST REQUEST ISSUED BY:  
KPB Intra, s.r.o.  
Fučíkova 860  
685 01 Bučovice

ORDER NUMBER:  
Z-98007 of Feb. 24, 1998

TESTED SPECIMEN REG. NUMBER:  
Reg. No.212-214/98  
Prod. No. KPB 001615 to 001617  
Draw. No. KPB-T-0801

ENVIRONMENTAL CONDITIONS:  
TEMPERATURE: 27°C  
ATMOSPHERIC PRESSURE: 1020.8 hPa  
AIR HUMIDITY: 46%

PRODUCT MANUFACTURER  
KPB Intra, s.r.o.  
Fučíkova 860  
685 01 Bučovice

THIS TEST REPORT  
INCLUDES:  
TEXT PAGES: 5  
TABLES:  
OSCILLOGRAMMES:  
DIAGRAMMES:  
DRAWINGS:  
PHOTOS:

DISTRIBUTION  
LIST:  
IVEP ŘZ 2x  
Client 1x

TESTED SPECIMENS DELIVERED ON:  
July 20, 1998

TEST RESULT:  
The VTD 12 indoor instrument voltage transformer,  
manufactured by the company KPB Intra, s.r.o,  
for transformer ratios of 6000/100 V; 10 000/100 V; 11000/100 V

**c o m p l i e s**

with the insulation test requirements to lightning impulse and  
power-frequency withstand to ČSN 35 1360 and IEC 186 standards

DATE OF TEST:  
Feb. 24 and 25,  
1998

TEST PERFORMED BY:  
Jaromír Mudra, PhD.  
Ladislav Dvořák

MANAGER OF TEST LAB.  
Jaromír Mudra, PhD.





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Tested VTD 12 Indoor Instrument Voltage  
Subject: Transformers Double Pole Insulated

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On the days of July from 21 to 23, 1998, and based on the order No. KPB-Z-98007 KPB Intra, s.r.o., insulation tests by impulse and AC testing voltage was conducted on three pieces of indoor instrument voltage transformers double pole insulated of VTD 12 type, for transformer ratio of 6000/100 V; 10 000/100 V and 11000/100 V at the testing laboratory of IVEP Brno s.c.

#### Testing equipment

Impulse generator 1.2 MV, manufactured by Haefely; 1.2/50  $\mu$ s;  
30 kJ, arranged for 400 kV  
Two-beam impulse oscilloscope, Haefely, 72 E type  
Impulse, peak oscilloscope, Haefely, 64 M type  
Transformer cascade, 500 kV, 150 kVA, manufactured by  
Siemens  
Capacitive voltage divider, 600 kV, Haefely, with  
Trüb-Taüber peak voltmeters

#### Test procedures and scope of the testing

Conformably to the ČSN 35 1360 and the IEC 186 standards the transformer was subjected to the 1.2/50 s lightning impulse test, with both polarities, by using a short-time AC 200/50 Hz voltage, during a time period of 30 sec./1 minute, respectively, with insulation test voltages applied across the windings.

#### Symbols used:

- +U, -U - rated withstand voltage at the 1.2/50  $\mu$ s lightning impulse test, with positive and negative wave (peak value)
- The 15/0 and 5/0 records indicate 15 or 5 impulses, without flashover
- $\sim$ Us, - rated short-time AC withstand voltage, dry test 50 Hz/200 Hz (rms value)



Test results

1. Instrument voltage transformer, VTD 12 type,  
prod. No. 001615, prod. year 1998, reg. No. 214/98,  
transformer ratio 6000/100 V, 50 Hz, 400 VA, ČSN 35 1360

a) Impulse test

to the ČSN 35 1360 art.123 and the IEC 186 standards

- a1) Testing voltage conducted to the terminal A, terminals  
B, a and PE were earthed, the terminal b was insulated

+ U = 60 kV/5/15/0                      - test passed  
- U = 60 kV/5/15/0                      - test passed

- a2) Testing voltage conducted to the terminal B, terminals  
A, b and PE were earthed, terminal a was insulated

+ U = 60 kV/5/15/0                      - test passed  
- U = 60 kV/5/15/0                      - test passed

- b) Power frequency withstand insulation test between  
the primary and secondary, to the ČSN 35 1360, Art.124  
and the IEC 186 standards, performed as dry

Testing voltage conducted to the terminals A and B  
both connected, terminals a , b and PE were earthed.

$\sim$ Us = 27 kV/50 Hz/1 min.                      - test passed

Note:

The IEC 186 standard requires test voltage

$\sim$ Us = 20 kV/50 Hz/1 min.

- c) Power frequency withstand insulation test on primary  
winding to the ČSN 35 1360, Art.125 and the IEC 186  
standards.

$\sim$ Us = 22 kV/200 Hz/30 s                      - test passed

Note:

The IEC 186 standard requires test voltage

$\sim$ Us = 20 kV/200 Hz/30s

2. Instrument voltage transformer, VTD 12 type,  
prod. No. 001616, prod. year 1998, reg. No. 213/98,  
transformer ratio 10000/100 V, 50 Hz, 400 VA, ČSN 35 1360

a) Impulse test

to the ČSN 35 1360 art.123 and the IEC 186 standards



a1) Testing voltage conducted to the terminal A, terminals B, a and PE were earthed, the terminal b was insulated

+ U = 75 kV/5/15/0 - test passed  
- U = 75 kV/5/15/0 - test passed

a2) Testing voltage conducted to the terminal B, terminals A, b and PE were earthed, terminal a was insulated

+ U = 75 kV/5/15/0 - test passed  
- U = 75 kV/5/15/0 - test passed

b) Power frequency withstand insulation test between the primary and secondary, to the ČSN 35 1360, Art.124 and the IEC 186 standards, performed as dry

Testing voltage conducted to the terminals A and B both connected, terminals a, b and PE were earthed.

$\sim U_s = 35 \text{ kV}/50 \text{ Hz}/1 \text{ min.}$  - test passed

Note:

The IEC 186 standard requires test voltage  
 $\sim U_s = 28 \text{ kV}/50 \text{ Hz}/1 \text{ min.}$

c) Power frequency withstand insulation test on primary winding to the ČSN 35 1360, Art.125 and the IEC 186 standards.

$\sim U_s = 28 \text{ kV}/200 \text{ Hz}/30 \text{ s}$  - test passed

3. Instrument voltage transformer, VTD 12 type,  
prod. No. 001617, prod. year 1998, reg. No. 212/98,  
transformer ratio 11000/100 V, 50 Hz, 400 VA, ČSN 35 1360

a) Impulse test  
to the ČSN 35 1360 art.123 and the IEC 186 standards

a1) Testing voltage conducted to the terminal A, terminals B, a and PE were earthed, the terminal b was insulated

+ U = 75 kV/5/15/0 - test passed  
- U = 75 kV/5/15/0 - test passed

a2) Testing voltage conducted to the terminal B, terminals A, b and PE were earthed, terminal a was insulated

+ U = 75 kV/5/15/0 - test passed  
- U = 75 kV/5/15/0 - test passed



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- b) Power frequency withstand insulation test between the primary and secondary, to the ČSN 35 1360, Art.124 and the IEC 186 standards, performed as dry

Testing voltage conducted to the terminals A and B both connected, terminals a , b and PE were earthed.

$\sim U_s = 35 \text{ kV}/50 \text{ Hz}/1 \text{ min.}$  - test passed

Note:

The IEC 186 standard requires test voltage

$\sim U_s = 28 \text{ kV}/50 \text{ Hz}/1 \text{ min.}$

- c) Power frequency withstand insulation test on primary winding to the ČSN 35 1360, Art.125 and the IEC 186 standards.

$\sim U_s = 28 \text{ kV}/200 \text{ Hz}/30 \text{ s}$  - test passed

**Summary:**

All the indoor instrument transformers double pole insulated of VTD 12 type, manufactured by KPB Intra, prod. No. 001615 to 001617, for the transformer ratio of 6000/100 V; 10 000/100 V; 11000/100 V and 11000/100 V have passed the insulation tests to ČSN 351360 and IEC 186 standards.