



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

REPORT OF PERFORMANCE No: 82-0619

INSTRUMENT VOLTAGE TRANSFORMERS TYPE VTS 12

A handwritten signature in black ink, appearing to read 'Jaromír Mudra'.

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Jaromír Mudra, Phd

Brno, Feb. 25 1998

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TEST REPORT No 82 - 0619
Tested VTS 12 Instrument Voltage
subject: Transformer

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TYPE:

VTS 12

KIND OF TEST: partial test

TESTING ACC. TO:

IEC 186
ČSN 35 1360

RATED VALUES:

Rated primary voltage
11/√3 kV; 10/√3 kV; 6/√3 kV
Rated secondary voltage:
100/√3 V; 100/3 V

TEST REQUEST ISSUED BY:

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

ORDER NUMBER:

KPB-Z-98003 of Feb. 17, 1998

TESTED SPECIMEN REG. NUMBER:

Reg. No. 075-077/98
Prod. No. 1200003-1200005

ENVIRONMENTAL CONDITIONS:

TEMPERATURE:
ATMOSPHERIC PRESSURE:
AIR HUMIDITY:

PRODUCT MANUFACTURER

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

THIS TEST REPORT
INCLUDES:

TEXT PAGES: 6
TABLES:
OSCILLOGRAMMES:
DIAGRAMMES:
DRAWINGS:
PHOTOS:

DISTRIBUTION
LIST:

IVEP ŘZ 2x
Client 1x

TESTED SPECIMENS DELIVERED ON:

Feb. 23, 1998

TEST RESULT:

The VTS 12 instrument voltage transformer, manufactured by the company KPB Intra, s.r.o; for rated primary voltages of 6/√3 kV; 10/√3 kV; 11/√3 kV

c o m p l i e s

with the insulation test requirements to ČSN 35 1360 and IEC 186 standards

DATE OF TEST:

Feb. 24 and 25,
1998

TEST PERFORMED BY

Jaromír Mudra, Ph.D.

MANAGER OF TEST LAB.





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Tested VTS 12 Instrument
Subject: Voltage Transformers

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On the days of February 24 and 25, 1998, and based on the order No. KPB-Z-98003 KPB Intra, s.r.o., insulation tests by impulse and AC testing voltage was conducted on three pieces of instrument voltage transformers of VTS 12 type, with $U_N = 11/\sqrt{3}$ kV, $U_N = 10/\sqrt{3}$ kV, $U_N = 6/\sqrt{3}$ kV rated voltages to the ČSN 35 1360 and IEC 186 standards, at the testing laboratory of IVEP Brno s.s.

Testing equipment

Impulse generator 1.2 MV, manufactured by Haefely; 1.2/50 μ s;
30 kJ, arranged for 200 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 μ 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. In the course of the test the transformers were mounted horizontally to a metallic earthed platform.

List of tested instrument transformers:

Specimen registration number 075/98: type VTS 12,
manufacturer KPB Intra,
prod. No. 1200005, prod. year 1998,
11000/ $\sqrt{3}$ /100/ $\sqrt{3}$ V; 12/28/75 kV, 400 VA
test performed to ČSN 35 1360

Specimen registration number 076/98, type VTS 12,
manufacturer KPB Intra,
prod. No. 1200004, prod. year 1997,
10000/ $\sqrt{3}$ /100/ $\sqrt{3}$ /100/3V; 12/28/75 kV,
400 VA, test performed to ČSN 35 1360

Specimen registration number 07/98, type VTS 12
manufacturer KPB Intra,
prod. No. 1200003, prod. year 1997
6000/ $\sqrt{3}$ /100/ $\sqrt{3}$ V/100/3 V
7.2/22/60 kV, 500 VA, test performed
to ČSN 35 1360

Test results

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

$\sim U$ - rated short-time AC withstand voltage (rms value)

1. Insulation tests to ČSN 35 1360

- impulse test (to ČSN 35 1360, Art. 123)
- power frequency withstand test (to ČSN 35 1360, Art. 124)
- interturn test (to ČSN 35 1360, Art. 125)

1.1 Instrument voltage transformer, VTS 12 type, $U_N=11/\sqrt{3}kV$
prod. No. 1200005, prod. year 1998, reg. No. 075/98

1.1.1. Impulse test

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

1.1.2. Power frequency withstand test

- insulation test between the primary and secondary windings
 $\sim U = 2.0 \text{ kV}/50 \text{ Hz}/1 \text{ min.}$ - test passed
- insulation test between the primary and the secondary windings, and between the secondary winding and the earthed parts
 $\sim U = 2.0 \text{ kV}/50 \text{ Hz}/1 \text{ min.}$ - test passed

1.1.3. Interturn test

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

1.2. Instrument voltage transformer, VTS 12 type, $U_N=10/\sqrt{3}kV$
prod. No. 1200004, prod. year 1997, reg. No. 076/98

1.2.1. Impulse test

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

1.2.2. Power frequency withstand test

- insulation test between the primary and all the secondary windings
 $\sim U = 2.0 \text{ kV}/50 \text{ Hz}/1 \text{ min}$ - test passed



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- insulation test between the measuring and the residual voltage winding
~ U = 2,0 kV/50 Hz/1min - test passed

- insulation test between all the secondary windings and the primary winding, and between the secondary windings and the earthed parts
~ U = 2.0 kV/50 Hz/1 min - test passed

1.2.3. Interturn test

- ~ U = 28 kV/200 Hz/30 s - test passed

1.3 Instrument voltage transformer, VTS 12 type, $U_N=6/\sqrt{3}$ kV, prod. No. 1200003, prod. year 1997, reg. No. 077/98

1.3.1. Impulse test

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

1.3.2. Power frequency withstand test

- insulation test between the primary and all the secondary windings
~U = 2.0 kV/50 Hz/1 min - test passed
- insulation test between the measuring and the residual voltage winding
~ U = 2.0 kV/50 Hz/1min - test passed
- insulation test between all the secondary windings and the primary winding, and between the secondary windings and the earthed parts
~ U = 2.0 kV/50 Hz/1 min - test passed

1.3.3. Interturn test

- ~ U = 22 kV/200 Hz/30 s - test passed

2. Insulation tests to IEC 186

- impulse test (to IEC 186, Art. 13)
- power frequency withstand voltage test on the primary winding (to IEC 186, Art. 9.2.2. and Art. 16)
- power frequency withstand voltage test on the secondary winding (to IEC 186, Art. 17).

2.1 Instrument voltage transformer, VTS 12 type, $U_N=11/\sqrt{3}$ kV, prod. No. 1200005, prod. year 1998, reg. No. 075/98



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Tested

VTS 12 Instrument

subject:

Voltage Transformers

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2.1.1. Impulse test

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

2.1.2. Power frequency withstand test

- insulation test of that primary winding terminal which is earthed during the transformer operation.

$\sim U = 3.0 \text{ kV/50 Hz/1 min.}$ - test passed

- primary winding insulation test

$\sim U = 28 \text{ kV/200 H}_z/30 \text{ s}$ - test passed

2.1.3 Power frequency withstand test on the secondary winding

- test of insulation between the primary and secondary windings

$\sim U = 3.0 \text{ kV/50 H}_z/1 \text{ min}$ - test passed

- test of insulation between the secondary windings and the earthed frame

$\sim U = 3.0 \text{ kV/50 H}_z/1 \text{ min}$ - test passed

2.2. Instrument voltage transformer, VTS 12 type, $U_N = 10/\sqrt{3} \text{ kV}$, prod. No.1200004, prod. year 1997, reg. No. 076/98

2.2.1. Impulse test

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

2.2.2. Power frequency withstand test on the primary winding

- test of that primary winding terminal which is earthed during the transformer operation

$\sim U = 3.0 \text{ kV/50 H}_z/1 \text{ min}$ - test passed

- primary winding test


$\sim U = 28 \text{ kV/200 H}_z/30 \text{ s}$ - test passed

2.2.3. Power frequency withstand test of the secondary windings

- test of insulation between the primary and all the secondary windings.

$\sim U = 3.0 \text{ kV/50 H}_z/1 \text{ min}$ - test passed

- insulation test between the measuring and the residual voltage winding

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~ U = 3.0 kV/50 H_z/1 min - test passed

- insulation test of secondary windings against the earthed frame

~ U = 3.0 kV/50 H_z/1 min - test passed

2.3. Instrument voltage transformer, VTS 12 type.

U_N=6/√3kV, prod. No. 1200003, prod. year 1997,
 registration number 077/98

2.3.1. Impulse test

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

2.3.2. Power frequency withstand test on the primary winding

- test of that primary winding terminal which is earthed during the transformer operation

~ U = 3.0 kV/50 H_z/1 min - test passed

- primary winding test
 ~ U = 20 kV/200 H_z/30 s - test passed

2.3.3. Power frequency insulation test of the secondary windings

- test of the insulation between the primary and all the secondary windings.

~ U = 3.0 kV/50 H_z/1 min - test passed

- insulation test between the measuring and the residual voltage winding

~ U = 3.0 kV/50 H_z/1 min - test passed

- insulation test of secondary windings against the earthed frame

~ U = 3.0 kV/50 H_z/1 min - test passed

Summary:

All the instrument transformers of VTS 12 type, manufactured by KPB Intra, have passed the insulation tests to ČSN 35 1360 and IEC 186 standards.