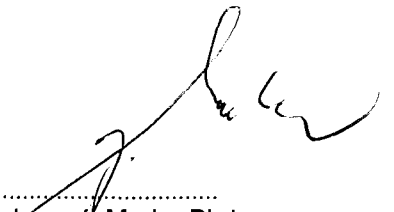
ivep®

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

REPORT OF PERFORMANCE No: 80-12951

INDOOR INSTRUMENT VOLTAGE TRANSFOMERS TYPE VTD 12



.....
Jaromír Mudra,Phd

Brno, July 20, 1998

ivep®	**TEST REPORT** No: 80 - 12951 Tested subject: Instrument Voltage Transformers	Page No.:1 Number of pages: 5

TYPE: VTD 12	KIND OF TEST: type test TESTING ACC. TO: ČSN 35 1360, IEC 186
RATED VALUES: Rated primary voltage 6 kV 10 kV 11 kV Rated burden 50VA 50VA 30VA Accuracy class 0.5 0.5 0.2 Highest system voltage 7.2kV 12 kV 12 kV Limit burden 400VA 400VA 400VA Rated secondary voltage 100V 100V 100V Rated frequency 50 Hz	TEST REQUEST ISSUED BY: KPB INTRA, s.r.o. Fučíkova 860 685 01 Bučovice ORDER NUMBER: KPB INTRA Z-98005 TESTED SPECIMEN REG. NUMBER: Reg. No. 212 to 214/98 Prod. No. KPB 001615 to 001617 drawing No. KPB-T-0801 ENVIRONMENTAL CONDITIONS: TEMPERATURE: ATMOSPHERIC PRESSURE: AIR HUMIDITY:
PRODUCT MANUFACTURER KPB Intra, s.r.o. Fučíkova 860 685 01 Bučovice TESTED SPECIMENS DELIVERED ON: July 20, 1998	THIS TEST REPORT INCLUDES: TEXT PAGES: 5 TABLES: 1 OSCILLOGRAMMES: DIAGRAMMES: DRAWINGS: PHOTOS:
	DISTRIBUTION LIST: KPB INTRA 2x IVEP ŘT 2x Archives 1x

TEST RESULT:

The instrument voltage transformers of VTD 12 type, manufactured by KPB INTRA, s.r.o, designed for 6 kV, 10 kV and 11 kV

c o m p l y

with the type test requirements according to the ČSN 35 1360 and IEC 186.

DATE OF TEST:	TEST PERFORMED BY:	MANAGER OF TEST LAB.
Aug. 10, 1998	Jaromír Mudra, PhD. Vlastimil Rada	Jaromír Mudra, PhD.

ZKUŠEBNA EVIDOVANÁ VE SDRUŽENÍ ČESKÝCH ZKUŠEBEN ivep dílová způsobilost BRNO Zkušebny a laboratoře 019

Based on the Order No. KPB INTRA Z-98005, the type test of 3 pieces of instrument voltage transformers of VTD 12 type series (7.2 kV to 12 kV) to the ČSN 35 1360 and IEC 186 standards was carried out.
The subject deals with double-pole, insulated, inductive instrument voltage transformers with rated transformer ratios of 6000//100 V; 10000//100 V and 11000//100 V, intended to be used for the powering of measuring and protective instruments in power networks with the highest voltage for equipment of 7.2kV and 12 kV.

During the test the following rating plate data was verified:

VTD 12 instrument voltage transformer - rated primary voltage of 6000 V

Prod. No. 001615
rated burden,accuracy class - 50 VA, 0.5
insulation level - 7.2/27/22/60 kV
limit power load - 400VA
temperature insulation class - E

VTD 12 instrument voltage transformer - rated primary voltage of 10000 V and 11000V

Prod. No. 001616
rated burden,accuracy class - 50 VA, 0.5
insulation level - 12/35/28/75 kV
limit power load - 400VA
temperature insulation class - E

Prod. No. 001617
rated burden,accuracy class - 30 VA, 0.2
insulation level - 12/35/28/75 kV

The type test was performed to the ČSN 35 1360 and IEC 186 requirements, in the scope, as follows:

1. Verification of proper marking of transformer terminals

2. Accuracy measurement

3. Interturn voltage test

4. Impulse test

5. Power frequency withstand test

6. Temperature rise test

7. Partial discharge measurement

8. Short-circuit capability test

1. Verification of proper marking of transformer terminals

The polarity check was carried through during the accuracy measurement by using the polarity indication instrument. The transformer is compatible with the ČSN 35 1360, Art. 120 and the IEC 186 requirements.

2. Accuracy measurement

The accuracy measurement was carried out by using the compensation method and by means of the Harmann & Braun measuring bridge of the "Keller" system, MEWK type, prod. No. 640 6857, verification sheet NO. LPM /451/93. Additionally, the following other measuring instruments were used:

voltage standard: instrument voltage transformer, manufactured by Messwandler - Gallspach, NUZG 35 type, production number:72/454315 verification sheet No. CM 10/115/48/94

voltage burden of measuring winding:

a) manufacturer Hartmann & Braun AG, NBKa type, prod. No. 3154032, verification sheet No. LPM/451/93
b) Tettex 3683/KS, prod. No. 136626, verification sheet No. CM 114/1/083/95

Values of voltage and phase displacement errors, for 80, 100 and 120 percent of U_N, are given in the table

Table

Transformer ratio		80%U_N	100%U_N	120%U_N	P_N VA a-b
6000/100 V prod. No. 001615	[%]	+0.07	+0.05	0	12.5
	[´]	+2.0	+2.90	+5.40	
	[%]	-0.26	-0.28	-0.35	50
	[´]	+2.15	+3.20	+6.20	
10000/100 V prod. No. 001616	[%]	+0.40	+0.39	+0.35	12.5
	[´]	+1.95	+2.70	+5.30	
	[%]	+0.05	+0.04	0	50
	[´]	+3.10	+3.95	+6.60	
11000/100 V prod. No. 001617	[%]	+0.05	+0.04	0	7.5
	[´]	+2.60	+3.70	+6.20	
	[%]	-0.14	-0.15	-0.20	30
	[´]	+3.0	+3.90	+6.20	

Measuring winding with the 6 000//100 V and 10 000//100 V transformer ratio corresponds with the requirements for 0.5 accuracy class and reted burden 50 VA.
Measuring winding with the 11 000//100 V transformer ratio corresponds with the requirements for 0.2 accuracy class and rated buden 30 VA.

3. Interturn voltage test

This test was performed with AC voltage of 200 Hz, applied to the transformer primary side of transformers prod. No. 001615 to 001617 for a time period of 30 seconds - see test report No. 82-0640.
The transformers correspond with the ČSN 35 1360, Art. 125 and IEC 186, Art. 9.2.2. and Art. 16 requirements.

4. Impulse test

This test was performed with transformers prod. No. 001615 to 001617 with the 1.2/50 s lightning-impulse, with 15 impulses of positive and negative polarity - see test report No. 82-0640.
The transformers did comply with the ČSN 35 1360, Art. 123 and IEC 186, Art. 13 requirements.

5. Power frequency withstand test

This test was performed with AC testing voltage, as defined by the ČSN 35 1360 Art.124 standard and with 3 kV AC testing voltage, as defined by the IEC 186 Art. 9.2.2. standard, by applying the voltage between the following transformer parts:

a) between the primary and the secondary winding by applying AC voltage 50 Hz, see test report IVEP 82-0640.
b) between the secondary windings and earthed frame by applying AC voltage 3 kV and 50 Hz.

The transformers prod. No. 001615 to 001617 did comply with the ČSN 35 1360 and IEC 186 requirements.

6. Temperature rise test

This test was performed with transformer prod. No. 001615 to 001616 conformably the ČSN 35 1360 requirements, Art. 126 and IEC 186 requirements, Art.11.

a) Test with 400 VA limit power load, cos = 1 and increased voltage level 1.2 U_N.

Measured temperature rise:

prod. No	001615	001616
"A-B" primary winding	38.0°C	41.0°C
"a-b" measuring winding	43.0°C	49.0°C

Ambient temperature t = 25°C

b) Test with increased voltage level of 1.2 U_N and with rated secondary burden 50 VA.

Measured temperature rise:

prod. No	001615	001616
"A-B" primary winding	26.0°C	12.0°C
"a-b" measuring winding	18.0°C	14.5°C

Ambient temperature t = 25°C

The measured temperature rise values comply with the ČSN 35 1360 requirements, Art. 126 and IEC 186 requirements, Art.11 for the "E" class of insulation.

7. Partial discharge measurement

This kind of measurement was performed with transformers prod.No.001615 to 001617 conformably to the Appendix No. 2 of IEC-1995-09 Publication, for both network earthing modes methode "B".

The following partial discharge values were measured:

Transformer prod.No.	(prim. voltage)	$1,2U_m$
001615	(6kV)	20 pC
001617	(11 kV)	20 pC

The values of partial discharges, measured on the instrument voltage transformers of VTD 12 type, comply with the prescribed values for the highest operated voltages of U_m = 7.2 and 12 kV to the IEC 186 standard.

8.Short-circuit withstand capability test

The test was performed to IEC 186 standard, Art.12 see test report No. 88-0162.

After finishing the test the tested transformers did not exhibit any visual damage and complied with all the repeated testing requirements.

9. Summary:
All the tested instrument transformers of VTD 12 type, manufactured by KPB Intra, have passed the type test to ČSN 35 1360 and IEC 186 standards.