

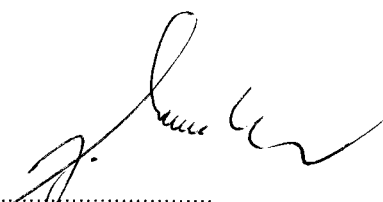


**Electrotechnical Engineering and Production**, joint-stock company  
619 00 BRNO, Vídeňská 117

REPORT OF PERFORMANCE No: 80-12952

INDOOR INSTRUMENT VOLTAGE TRANSFORMERS DOUBLE POLE  
INSULATED TYPE VTD 25



  
Jaromír Mudra, Phd

Brno, December 14, 1998

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TEST REPORT No: 80 - 12952  
Tested Instrument Voltage  
subject: Transformers

Page No.:1

Number of  
pages: 4

TYPE:

VTD 25

KIND OF TEST: type test

TESTING ACC. TO:

ČSN 35 1360

RATED VALUES:

Rated primary voltage 22 kV  
Rated burden 50 VA;150 VA

Accuracy class 0.2; 0.5  
Highest system voltage 25 kV  
Limit burden 500 VA  
Rated secondary voltage 100 V  
Rated frequency 50 Hz

TEST REQUEST ISSUED BY:

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

ORDER NUMBER:

KPB INTRA Z - 980076

TESTED SPEC.REG.NUMBER :

Reg. No. 268 to 269/98  
Prod. No. 002498-00249  
drawing No.:KPB-0206001

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: 4  
TABLES: 1  
OSCILLOGRAMMES:  
DIAGRAMMES:  
DRAWINGS:

DISTRIBUTION  
LIST:

KPB INTRA - 2x  
IVEP ŘT - 2x  
IVEP archiv - 1x

TESTED SPEC.DELIVERED ON:

November 17 1998

TEST RESULT:

The instrument voltage transformers of VTD 25 type,  
manufactured by KPB INTRA, s.r.o, designed for 22 kV

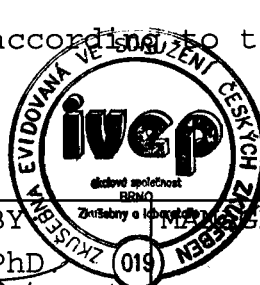
c o m p l y

with the type test requirements according to the ČSN 35 1360.

DATE OF TEST:  
November 23, 1998

TEST PERFORMED BY: MANAGER OF TEST LAB.

Jaromír Mudra, PhD  
Vlastimil Rada  
Ing.Jaromír Mudra, PhD.



**TEST REPORT** No: 80-12952

Tested Indoor Instrument Voltage Transformers  
Subject: Double Pole Insulated  
VTD 25

Page No.: 2

Number of  
pages: 4

Based on the Order No. Z-980076, the type test of 2 pieces of instrument voltage transformers of VTD 25 type series to the ČSN 35 1360 was carried out. The subject deals with double-pole, insulated, inductive instrument voltage transformers with rated transformer ratio of 22000//100 V, intended to be used for the powering of measuring and protective instruments in power networks with the highest voltage for equipment of 25 kV.

During the test the following rating plate data was verified:

Instrument voltage transformer VTD 25:

Prod. No. 002498

accuracy class - 50 VA, 0.5  
insulation level - 25/55/125 kV

Prod. No. 002499

accuracy class -150 VA, Cl. 0.5  
insulation level - 25/55/125 kV  
limit power load - 500VA  
temperature insulation class - E

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 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/451/94
- 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 prod.No.		80% $U_N$	100% $U_N$	120% $U_N$	$P_N$ VA a-b
002498	[%]	-0.02	-0.03	-0.05	12.5
	[']	+1.15	+1.70	+2.80	
	[%]	-0.21	-0.21	-0.23	50
	[']	+0.90	+1.30	+2.45	
002499	[%]	+0.06	+0.05	+0.02	15
	[']	+1.70	+2.30	+3.70	
	[%]	-0.60	-0.61	-0.64	150
	[']	+0.50	+1.20	+2.50	

After correction of turns the ratio of instrument transformers of VTD 25 type corresponds with the requirements for 0.2 accuracy class and rated burden 50 VA and for 0.5 accuracy class and rated burden 150 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. 002498 to 002499 for a time period of 30 seconds - see test report No. 82-0650. 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. 002498 and 002499 with the 1.2/50 $\mu$ s lightning-impulse see test report IVEP Brno No. 82-0650. The transformers did comply with the ČSN 35 1360, Art.123



**TEST REPORT** No: 80-12952

Tested Indoor Instrument Voltage Transformers  
Subject: Double Pole Insulated  
VTD 25

Page No.: 4

Number of  
pages: 4

### 5. Power frequency withstand test

This test was performed with AC testing voltage, as defined by the ČSN 35 1360 Art.124 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 82-0650.
- b) between the secondary windings and earthed frame by applying AC voltage 2 kV and 50 Hz.

The transformers prod. No. 002498 to 002499 did comply with the ČSN 35 1360 Art.124 requirements.

### 6. Temperature rise test

This test was performed with transformer prod. No. 002499 conformably the ČSN 35 1360 requirements Art.126

- a) Test with 500 VA limit power load,  $\cos\beta = 1$  and increased voltage level  $1.2 U_N$ .

Measured temperature rise:

"A-B" primary winding	27.0°C
"a-b" measuring winding	19.5°C

Ambient temperature  $t = 19^\circ\text{C}$

- b) Test with increased voltage level of  $1.2 U_N$  and with rated secondary burden 150 VA.

Measured temperature rise:

"A-B" primary winding	19.4°C
"a-b" measuring winding	10.5°C

Ambient temperature  $t = 19^\circ\text{C}$

### 7. Summary:

All the tested instrument transformers of VTD 25 type, manufactured by KPB Intra, have passed the type test to ČSN 35 1360 standards.