

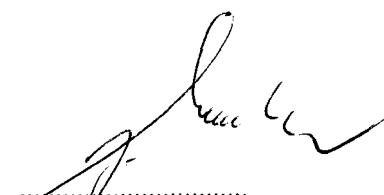


Electrotechnical Engineering and Production, joint-stock company
619 00 BRNO, Vídeňská 117

REPORT OF PERFORMANCE No: 80-12950

OUTDOOR INSTRUMENT VOLTAGE TRANSFORMERS DOUBLE POLE
INSULATED TYPE VTDO 25




Jaromír Mudra, Phd

Brno, September 10, 1998

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TEST REPORT No: 80 - 12950
Tested Instrument Voltage
subject: Transformers

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TYPE:

VTDO 25

KIND OF TEST: type test

TESTING ACC. TO:

ČSN 35 1360

RATED VALUES:

Rated primary voltage 22 kV
Rated burden 50 VA

Accuracy class 0.2; 0.5
Highest system voltage 25 kV
Limit burden 400 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. 010 to 011/98
Prod. No. 250002-250003
drow. No.: KPB-T-01 VTDO25

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:

February 5, 1998

TEST RESULT:

The outdoor instrument voltage transformers of VTDO 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:

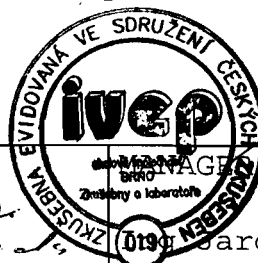
July 15, 1998

TEST PERFORMED BY:

Jaromír Mudra, PhD.
Vlastimil Rada

TEST LAB.

Jaromír Mudra, PhD.



**TEST REPORT** No: 80-12950

Tested Outdoor Instrument Voltage
Subject: Transformers Double Pole Insulated
VTDO 25

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Based on the Order No. Z-980031, the type test of 2 pieces of outdoor instrument voltage transformers of VTDO 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 VTDO 25:

Prod. No. 250002

accuracy class - 50 VA, 0.2
insulation level - 25/55/125 kV
temperature insulation class - E

Prod. No. 220002

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


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 Harman & 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

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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
250002	[%]	+0.90	+0.85	+0.80	12.5
	[']	+3.70	+5.20	+7.50	
	[%]	+0.62	+0.59	+0.54	50
	[']	+3.0	+4.40	+6.65	
250003	[%]	+0.25	+0.23	+0.20	12.5
	[']	+0.15	+0.40	+1.20	
	[%]	-0.01	-0.02	-0.04	50
	[']	-0.50	-0.30	+0.40	

After correction of turns the ratio of instrument transformers of VTDO 25 type corresponds with the requirements for 0.5 accuracy class and rated burden 50 VA and for 0.2 accuracy class and rated burden 50 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. 250002 and 250003 for a time period of 30 seconds - see test report No. IVEP Brno 82-0650.

The transformers correspond with the ČSN 35 1360, Art. 125.

4. Impulse test

This test was performed with transformers prod. No. 250002 and 250003 with the 1.2/50 μ s lightning-impulse see test report IVEP Brno No. 82-0609. The transformers did comply with the ČSN 35 1360, Art.123



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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 as dry and wet test by applying AC voltage 50 Hz, see test report IVEP 82-0609.
- b) between the secondary windings and earthed frame by applying AC voltage 2 kV and 50 Hz.

The transformers prod. No. 250002 to 250003 did comply with the ČSN 35 1360 Art.124 requirements.

6. Temperature rise test

This test was performed with transformer prod. No. 250002 conformably the ČSN 35 1360 requirements Art.126

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

Measured temperature rise:

"A-B" primary winding	31.0°C
"a-b" measuring winding	25.0°C

Ambient temperature $t = 20^\circ\text{C}$

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

Measured temperature rise:

"A-B" primary winding	15.0°C
"a-b" measuring winding	13.0°C

Ambient temperature $t = 20^\circ\text{C}$

Measured values comply with the ČSN 35 1360 Art.126 requirements for thermal class of insulation E.

7. Summary:

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