




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

REPORT OF PERFORMANCE No: 88-0162

INDOOR INSTRUMENT VOLTAGE TRANSFORMERS TYPE VTD 12



  
Jaromír Mudra, Phd

Brno, July 28, 1998

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**TEST REPORT** No: 88 - 0162  
Tested Instrument Voltage  
subject: Transformers

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Number of  
pages: 6

**TYPE:**

VTD 12                      2 pieces

**KIND OF TEST:** partial test

**TESTING ACC. TO:**

IEC 186, Clause 12  
(Short-circuit withstand  
capability test)

**RATED VALUES:**

Rated transformer ratio

10// 0.1 kV

6// 0.1 kV

**TEST REQUEST ISSUED BY:**

KBP INTRA s.r.o.  
Fučíkova 860  
685 01 Bučovice

**ORDER NUMBER:**

Z-98005 of Feb. 23, 1998

**TESTED SPECIMEN REG. NUMBER:**

213/98 and 214/98

**ENVIRONMENTAL CONDITIONS:**

TEMPERATURE:                      23°C  
ATMOSPHERIC PRESSURE:  
AIR HUMIDITY:

**PRODUCT MANUFACTURER**

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

**THIS TEST REPORT  
INCLUDES:**

TEXT PAGES:                      6  
TABLES:                              2  
OSCILLOGRAMMES:              2  
DIAGRAMMES:  
DRAWINGS:  
PHOTOS:

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**TESTED SPECIMENS DELIVERED ON:**

July 27, 1998

**TEST RESULT:**

All the instrument voltage transformers under test did

**c o m p l y**

with the short-circuit withstand capability requirements to  
IEC 186, Art. 12.

**DATE OF TEST:**

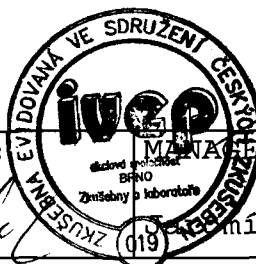
July 27 to 28,  
1998


**TEST PERFORMED BY:**

Mr. Petr Kalus

**MANAGER OF TEST LAB.**

Tomáš Mudra, PhD.



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## 1 Tests required and the respective parameters

T y p e	T e s t	$U_z$ [kV]	$\cos \varphi$ [1]	$t_k$ [s]	winding
VTD 12	Short-circuit with-stand capability	10	0.9	1	a- b
VTD 12	Short-circuit with-stand capability	6	0.9	1	a- b

## 2 Tested specimen identification

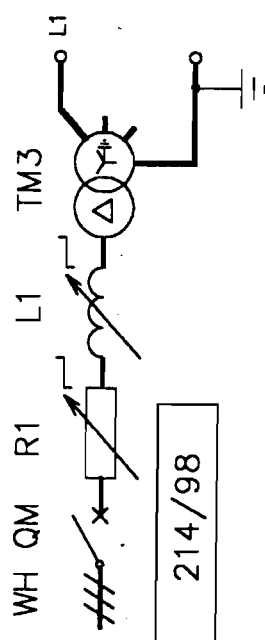
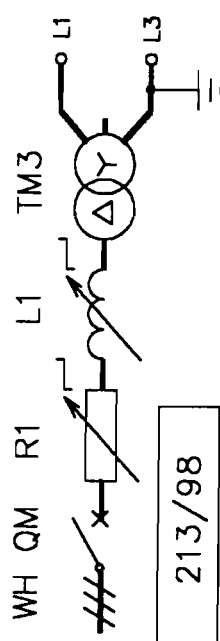
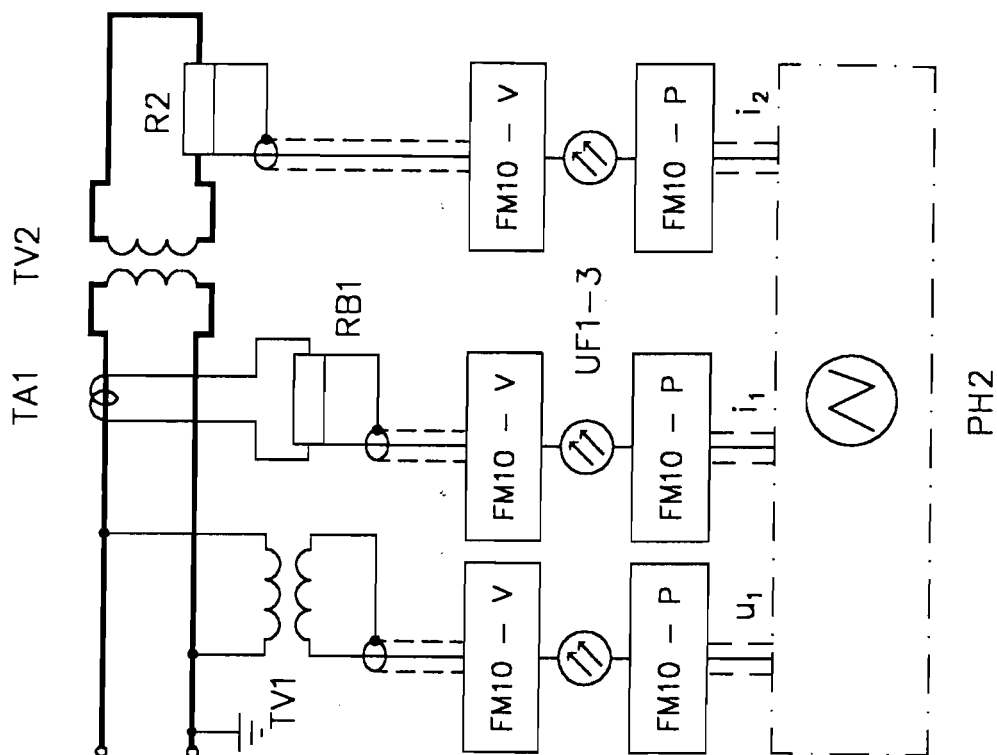
### a) Instrument voltage transformer, reg. No. 213/98 :


Type : VTD 12  
 $U_{n1}$  : 10 kV  
 $U_{n2}$  : 100 V  
 $f_n$  : 50 Hz  
accuracy class : 0.5 - 50 VA  
quantity : 1 pc  
production number : 001626

### b) Instrument voltage transformer, reg. No. 214/98 :

Type : VTD 12  
 $U_{n1}$  : 6 kV  
 $U_{n2}$  : 100 V  
 $f_n$  : 50 Hz  
accuracy class : 0.5 - 50 VA  
quantity : 1 pc  
production number : 001625

### 3 Testing circuit wiring diagram



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#### 4 Measuring instruments and symbols used

WH	- Outdoor, power supply line No. 165; 22 kV;
QM	- Protective SF6 circuit-breaker; VF 251225; 25 kV; 1 250 A; p=0.5 MPa; EJP Brno;
TM3	- KobU 825/20 Testing transformer; 1.25 MVA; 22//12.7/11/7.34/6.35/3.67 kV; D//y/d; $u_k=1,8/2.31\%$ ; BEZ Bratislava;
R1, L1	- Medium voltage burdens at the short-circuit station;
R2	- $0.01\Omega$ burden of tested transformer;
TV1	- Instrument voltage transformer; D225; 22000/100 V; EJP;
TA1	- Instrument current transformer; PE225; 200/5 A; EJP;
TV2	- Tested instrument voltage transformer;
RB1	- Shunt 3.344 A/V; IVEP Brno;
UF1-3	- FM 10 Analogous, opto-electronic measuring system; (V=transmitter, P=receiver); VUSE Běchovice;
PH2	- PCL 818 Data recording card;
KO	- Cathode oscillogram;
ZO	- Testing operation;
T	- Test by temperature current;
$u_1$	- Instantaneous value on transformer primary terminals
$u_k$	- Transformer short-circuit voltage, in percent;
$U_{n1}$	- Transformer rated primary voltage;
$U_{n2}$	- Transformer rated secondary voltage;
$U_1$	- Rms voltage value on transformer primary terminals;
$U_2$	- Rms current value of line testing voltage;
$i_1$	- Instantaneous value of current through the primary winding;
$i_2$	- Instantaneous value of current through the secondary winding;
$I_1$	- Rms value of current flowing through the primary winding;
$I_2$	- Rms value of current flowing through the secondary winding;
$t_k$	- Short-circuit time period; time period of current pass-through;
$\cos \varphi$	- Testing circuit power factor;

#### 5 Sequence and progress of the test

The sequence of tests carried through results from the table shown in chapter 6. Power into the instrument voltage transformers was fed into the primary winding, with always one secondary winding connected to a burden of  $0.01\Omega$  for monitoring the waveform of secondary current. The short-circuit time period was 1 second. In all the testing operations the waveforms of primary and secondary currents was picked-up by the PCL 818 data registration card.

All the registered cathode oscillogrammes, being a part of this test report, are documented and archived.

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## 6 Table of measured values

$$\cos \varphi = 0.9$$

Specimen	ZO	KO	short-circuited winding (terminals)	$U_1$ [kV]	$I_1$ [A]	$I_2$ [A]	$t_k$ [s]	Note
214/98	T	982703	a - b	6.8	1.9	131	1.03	
213/98	T	982704	a - b	10.3	1.1	114	1.03	

## 7 Test results

### 7.1 Short-circuit withstand capability test on the specimen No. 213/98 :

The tested instrument voltage transformer did c o m p l y with the testing requirements to IEC 186, Clause 9.7 and 12, when connected in a power testing circuit with the following parameters:

$$U_z = 10.3 \text{ kV}; I_1 = 1.1 \text{ A}; I_2 = 114 \text{ A}; \cos \varphi = 0.9; t_k = 1.03 \text{ s}.$$

### 7.2 Short-circuit withstand capability test on the specimen No. 214/98 :

The tested instrument voltage transformer did c o m p l y with the testing requirements to IEC 186, Clause 9.7 and 12, in a power testing circuit with the following parameters:

$$U_z = 6.8 \text{ kV}; I_1 = 1.9 \text{ A}; I_2 = 131 \text{ A}; \cos \varphi = 0.9; t_k = 1.03 \text{ s}.$$

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

## 8 Persons taking part in the test

IVEP Brno, a. s.:

Mr. Petr Kalus  
Zdeněk Svoboda