



Inženýrsko-výrobní elektrotechnický podnik, a.s.  
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CZECH TESTING LABORATORIES ASSOCIATION – SDRUŽENÍ ČESKÝCH ZKUŠEBEN A LABORATOŘÍ



ČLEN ASOCIACE ZKUŠEBEN VYSOKÉHO NAPĚTÍ – MEMBER OF ASSOCIATION OF MV TEST LABORATORIES

**TEST REPORT No.:**

**88-0196**

**Current Instrument Transformer of Outdoor Design**



Ing. Jaromír Mudra, CSc.

Brno, on: May 04, 1999

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Test Report No.: 88-0196

Page No.: 1

Tested Device: Current Instrument Transformer of Outdoor Design

No. of pages: 5

Type designation:  
CTSO 38

Kind of test:

Partial test

Rated values (nameplate data):

Rated current ratio

Sample No. 399: 10/5/5 A

Sample No. 400: 200/1/1 A

Sample No.: 1250/5/5 A

Testing carried out in accordance with the following standards and regulations:

ČSN 35 1301 and IEC 44-1  
(test of short circuit capacity)

Test required by:

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

Order No.:

KPB 199/0297 as of Nov. 01, 1999

Tested sample registration number:  
reg. No. 399 – 401/99

Atmospheric conditions:

Air temperature: 18.0° C  
Air pressure:  
Air humidity:

Manufacturer of the tested products:

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

The test report does include:

No. of text pages: 5

Charts:

Diagrammes:

Oscilloscopes: 5

Drawings:

Pictures:

Appendices:

Distribution list:

KPB 2x  
IVEP ŘZ 1x  
IVEP archives 1x

The specimens to be tested were delivered on:

Nov. 17, 1999 (work shift No. 99-046)

Test result:

All the current instrument transformers of outdoor design and subjected to testing  
have passed  
the test of short circuit capacity as defined by the ČSN 35 1301 and IEC 44-1 standards, when  
connected in power testing circuits described in chapters 1 and 7.

Date of test:

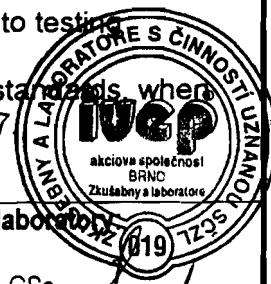
Nov. 17 to 18, 1999

Testing engineer:

Ing. Petr Kalus

Manager of the test laboratory:

Ing. Jaromir Mudra, CSc.





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**1 Tests and the corresponding parameters required**

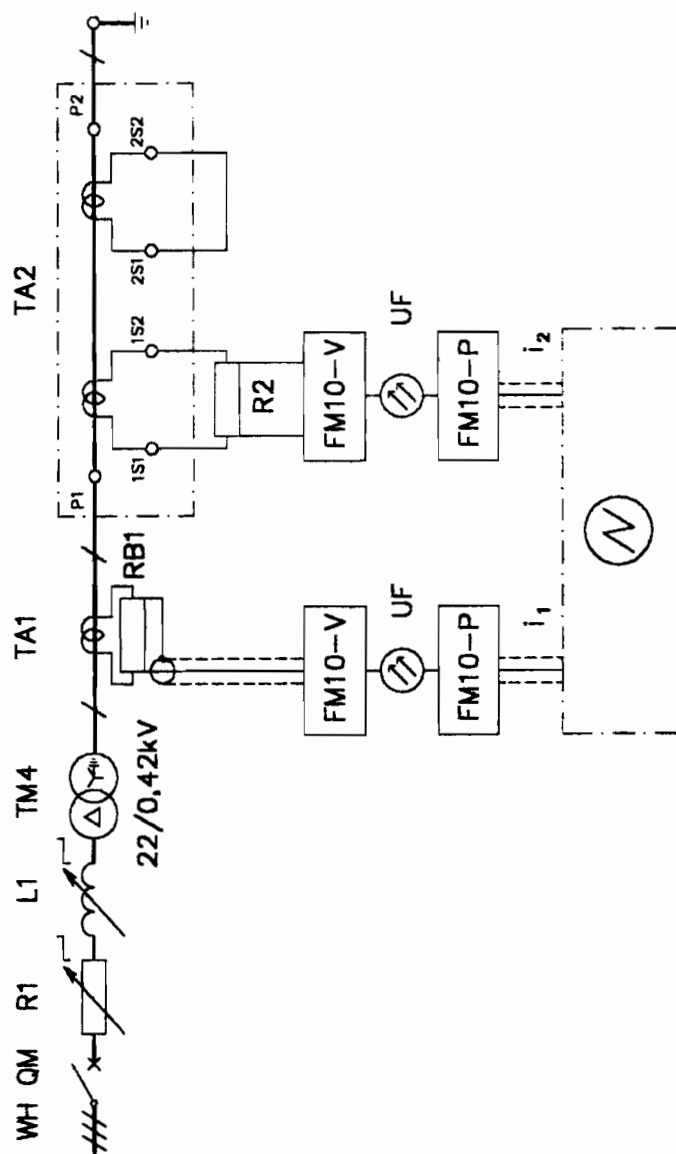
Specimen No.	Test	$I_{tm}$ [kA]	$I_1$ [1]	$t_k$ [s]
399/99	Temperature dynamic test	- 16	6.3 -	1000 50
400/99	Temperature dynamic test	- 63	25.0 -	1000 50
401/99	Temperature dynamic test	- 66 1)	31.5 -	1000 50

Note:

- 1) Highest achievable dynamic current shock at the IVEP short-circuit test shop:

Transformer type	CTSO 38	CTSO 38	CTSO 38
Rated primary current	10 A	200 A	1250 A
Rated secondary current	5A; 5 A	1 A; 1 A	5 A; 5 A
Production number	003668	003669	003670
IVEP registration number	399/99	400/99	401/99

### 3 Test circuit wiring diagram





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#### **4 Symbols and instruments used for testing**

WH	- power supply line No. 165; 22 kV;
QM	- protective SF6 circuit breaker; VF 251225; 25 kV; 1 250 A;
R1, L1	- MV burden elements at the short circuit shop;
TM4	- KobU 825/20 testing transformer; 1.25 MVA; 2 000//550/418 V; $u_{k\%}=2.02/1.98$ %; Dy 1; BEZ;
TA1	- current instrument transformer 10000/5 A; EJF Brno;
TA2	- tested current instrument transformer;
RB1	- shunt 3.344 A/V; IVEP Brno;
R2	- resistive burden of 0.01 $\Omega$ for the transformer subjected to testing;
UF	- analogous optoelectronic measuring system of FM 10 type (V = transmitter; P = receiver); manufactured by the company VÚSE Běchovice;
PH2	- the PCL 818 type data registration card;
KO	- cathode oscillogram;
ZO	- testing operation;
D	- dynamic current test;
T	- temperature current test;
$u_k$	- short-circuit voltage of the transformer in per cent;
$I_{1n}$	- rated primary current of the transformer;
$I_{2n}$	- rated secondary current of the transformer;
$U_z$	- rms value of the phase-to-zero testing voltage;
$i_1$	- instantaneous value of current flowing through the primary winding;
$I_1$	- rms value of current flowing through the primary winding;
$I_{1m}$	- highest value of current flowing through the primary winding;
$i_2$	- instantaneous value of current flowing through the secondary winding;
$I_2$	- rms value of current flowing through the secondary winding;
$t_k$	- period of the short circuit duration; period of current passage;

#### **5 The sequence and the progress of the tests**

Primary windings of the current instrument transformers of outdoor design were connected to the power. The first of the secondary windings (the 1S1 and 1S2 terminals) were short circuited via the 0.01  $\Omega$  resistance, the second secondary winding (the 2S1 and 2S2 terminals) were short circuited straight on the terminals. During all the testing operations the currents flowing through both the primary and secondary windings were registered and stored on the PCL 818 registration card.

**6 Chart of values measured**

Specimen No.	ZO	KO	$U_z$ [kV]	$I_1$ [kA]	$I_{1m}$ [kA]	$I_2$ [kA]	$t_k$ [s]
399/99	T+D	994602	0.24	6.3	17.3	0.29	1.02
400/99	T	994604	0.15	25.2	52.1	0.08	1.08
	D	994605	0.24	29.3	66.1	-	0.07
401/99	D	994606	0.24	28.9	66.6	-	0.07
	T	994608	0.15	32.8	54.5	0.19	1.08

**7 Test results**

Based on the oscillographic records of both the primary and secondary current, and pursuant to the repeated tests required, the test results of all the CTSO 38 type current instrument transformers, of outdoor design, subjected to the testing of short-circuit capacity to ČSN 35 1301 and IEC 44-1f can be considered as **appropriate and satisfactory**, with the following results:

a) specimen No. 399/99 (10/5/5 A)

- temperature and dynamic testing of specimen connected in power test circuit of the following parameters:

$I_1 = 6.3 \text{ kA}$ ;  $I_{1m} = 17.3 \text{ kA}$ ;  $t_k = 1 \text{ sec}$ .

b) specimen No. 400/99 (200/1/1 A)

- temperature testing of specimen connected in power test circuit of the following parameters:

$I_1 = 25.2 \text{ kA}$ ;  $I_{1m} = 52.1 \text{ kA}$ ;  $t_k = 1 \text{ s}$ .

- dynamic testing of specimen connected in power test circuit of the following parameters:

$I_1 = 29.3 \text{ kA}$ ;  $I_{1m} = 66.1 \text{ kA}$ ;  $t_k = 0.07 \text{ sec}$ .

c) specimen No. 401/99 (1250/5/5 A)

- tepelná zkouška ve výkonovém zkušebním obvodu s parametry:

$I_1 = 32.8 \text{ kA}$ ;  $I_{1m} = 54.5 \text{ kA}$ ;  $t_k = 1 \text{ s}$ .

- dynamic testing of specimen connected in power test circuit of the following parameters:

$I_1 = 28.9 \text{ kA}$ ;  $I_{1m} = 66.6 \text{ kA}$ ;  $t_k = 0.07 \text{ sec}$ .

**8 Personal attendance at the tests**

IVEP Brno, a. s.:

Ing. Petr Kalus

Ing. Vlastimil Rada – the Client's representative with responsibility