ivep®

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

REPORT OF PERFORMANCE No: 88-0158

INSTRUMENT VOLTAGE TRANSFOMERS TYPE VTS 12

Jaromír Mudra,Phd

Brno, July 9 1998

ivep®	**TEST REPORT** No: 88 - 0158 Tested subject: Instrument Voltage Transformers	Page No.:2 Number of pages: 7

TYPE:
VTS 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

$10/\sqrt{3}//0.1/\sqrt{3}//0.1/3$ kV

$6/\sqrt{3}//\ 0.1/\sqrt{3}$V $//0.1/3$ kV

TEST REQUEST ISSUED BY:
KBP INTRA s.r.o.
Fučíkova 860
685 01 Bučovice

ORDER NUMBER:
Z-98002 of Feb. 17, 1998

TESTED SPECIMEN REG. NUMBER:
076/98 and 184/98

ENVIRONMENTAL CONDITIONS:

TEMPERATURE: 23°C
ATMOSPHERIC PRESSURE:
AIR HUMIDITY:

PRODUCT MANUFACTURER

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

TESTED SPECIMENS DELIVERED ON:
Feb. 10, 1998

THIS TEST REPORT INCLUDES:

TEXT PAGES: 7
TABLES:
OSCILLOGRAMMES: 4
DIAGRAMMES:
DRAWINGS:
PHOTOS:

DISTRIBUTION LIST:

Client 2x
IVEP Brno
Archives 1x
ŘZ 1x
ŘT 1x

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:	TEST PERFORMED BY:	MANAGER OF TEST LAB.
June 8 to 9, 1998	Mr. Petr Kalus	Jaromil Mudra, PhD.

1 Tests required and the respective parameters

Type	Test	U_z [kV]	cos [1]	t_k [s]	winding
VTS 12	Short-circuit withstand capability	6.4	0.9	1	a- n da-dn
VTS 12	Short-circuit withstand capability	3.7	0.9	1	a- n da-dn

2 Tested specimen identification

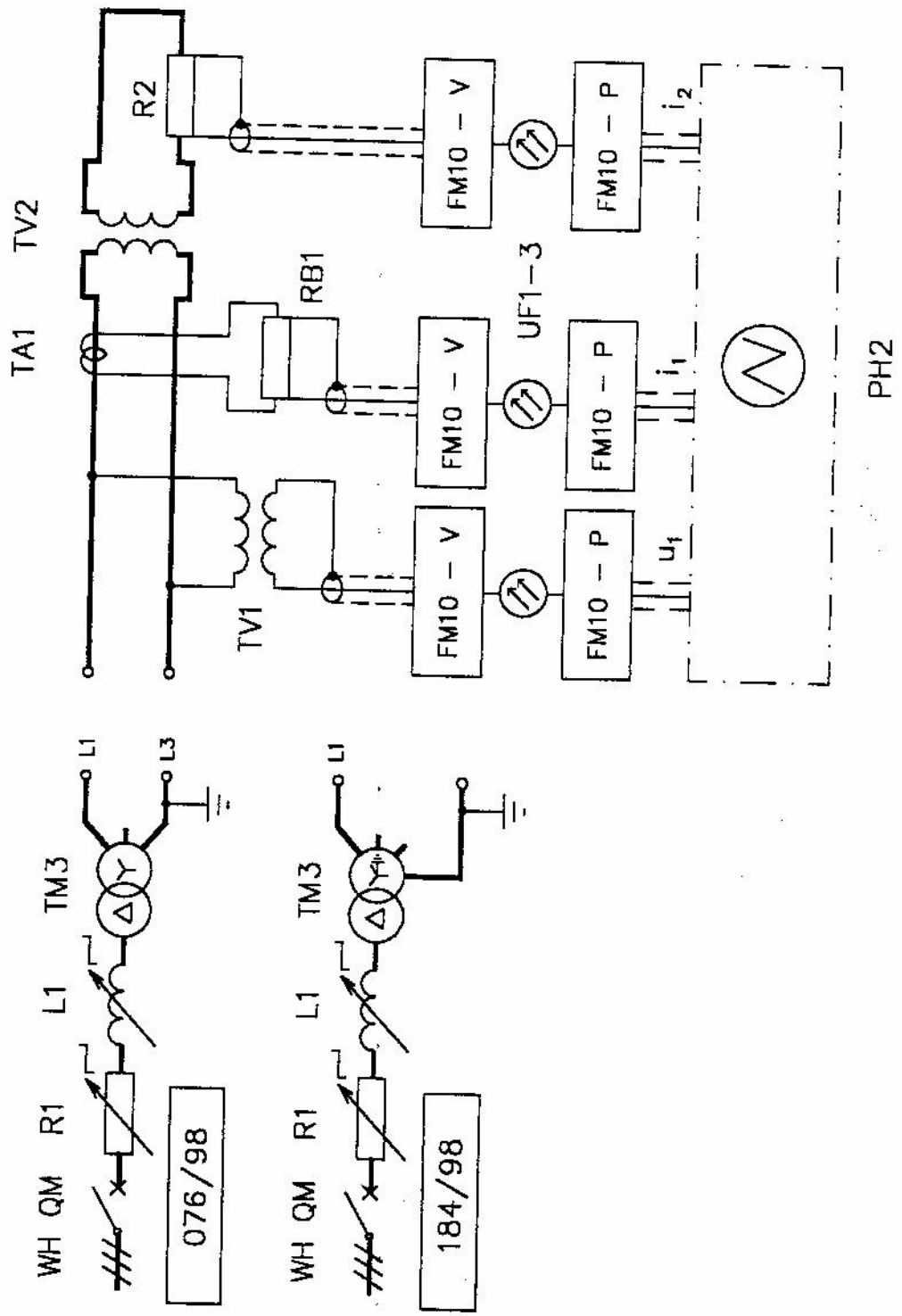
a) Instrument voltage transformer, reg. No. 076/98 :

Type	:	VTS 12
U_{n1}	:	$10/\sqrt{3}$ kV
U_{n2}	:	$100/\sqrt{3}$ // 100/3 V
f_n	:	50 Hz
accuracy class	:	0.5 - 50 VA 3 P - 100 VA
quantity	:	1 pc
production number	:	1200004

b) Instrument voltage transformer, reg. No. 184/98 :

Type	:	VTS 12
U_{n1}	:	$6/\sqrt{3}$ kV
U_{n2}	:	$100/\sqrt{3}$ // 100/3 V
f_n	:	50 Hz
accuracy class	:	0.5 - 50 VA 6 P - 100 VA
quantity	:	1 pc
production number	:	1200002

3 Testing circuit wiring diagram



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; EJF 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 Ω burden of tested transformer;
TV1	- Instrument voltage transformer; D225; 22000/100 V; EJF;
TA1	- Instrument current transformer; PE225; 200/5 A; EJF;
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); VÚSE 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_z	- 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 φ	- 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 0.01Ω 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.

6 Table of measured values

$\cos \varphi = 0.9$

Speci-men	ZO	KO	short-circui-ted winding (terminals)	U_1 [kV]	I_1 [A]	I_2 [A]	t_k [s]	Note
076/98	T	**982301**	a - n	6.4	1.2	124	1.01	
	T	**982302**	da - dn	6.4	0.6	133	1.01	
184/98	T	**982303**	a - n	3.7	1.4	147	1.01	
	T	**982304**	da - dn	3.7	0.4	68	1.01	

7 Test results

7.1 Short-circuit withstand capability test on the specimen No. 076/98 :

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:

a) short-circuited "a - n" windindg

U_Z = 6.4 kV; I_1 = 1.2 A; I_2 = 124 A; cos = 0.9; t_k = 1.01 s.

b) short-circuited "da - dn" winding

U_Z = 6.4 kV; I_1 = 0.6 A; I_2 = 133 A; cos = 0.9; t_k = 1.01 s.

7.2 Short-circuit withstand capability test on the specimen No. 184/98 :

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:

a) short-circuited "a - n" winding

U_Z = 3.7 kV; I_1 = 1.4 A; I_2 = 147 A; cos = 0.9; t_k = 1.01 s.

b) short-circuited "da - dn" winding

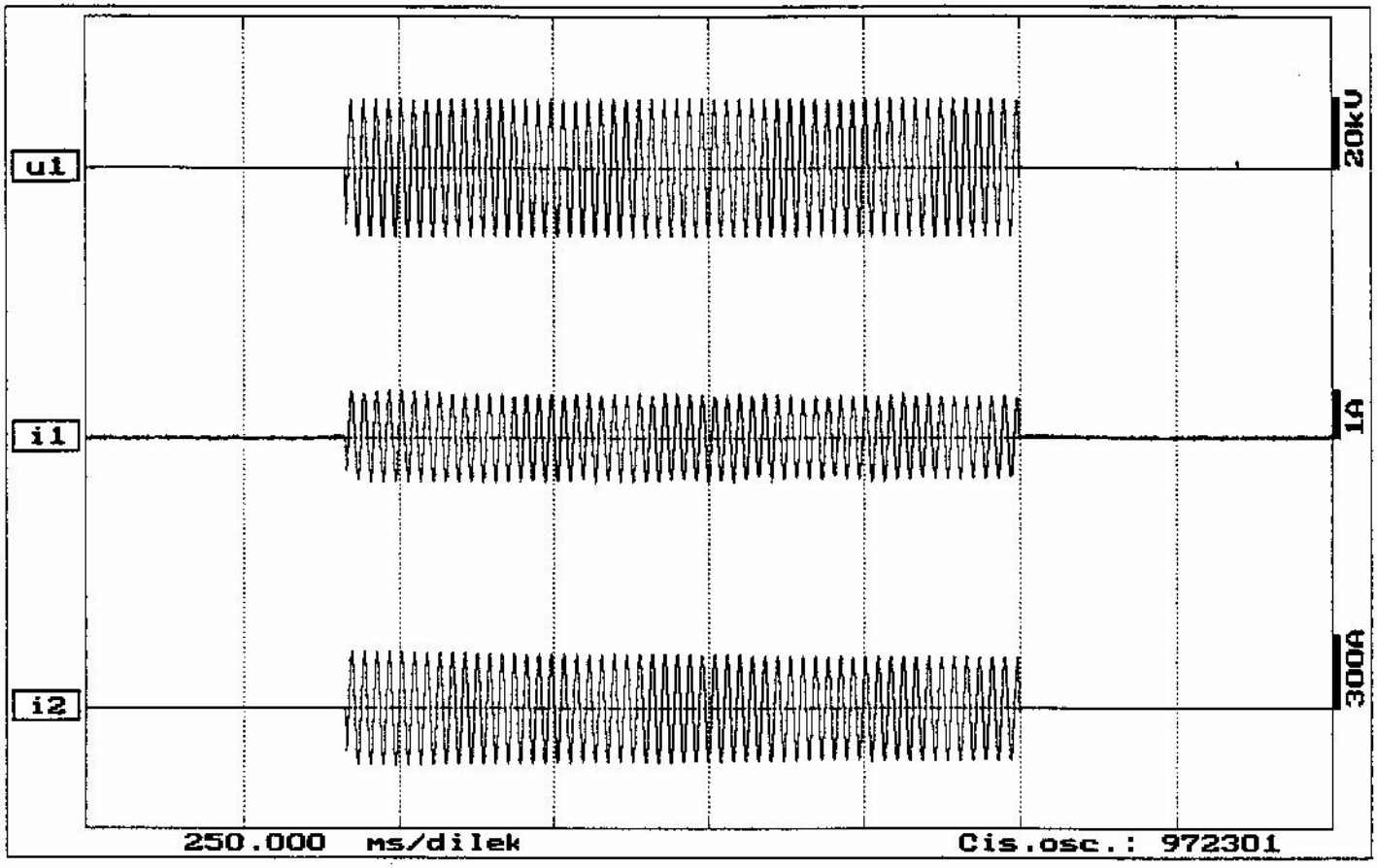
U_Z = 3.7 kV; I_1 = 0.4 A; I_2 = 68 A; cos = 0.9; t_k = 1.01 s.

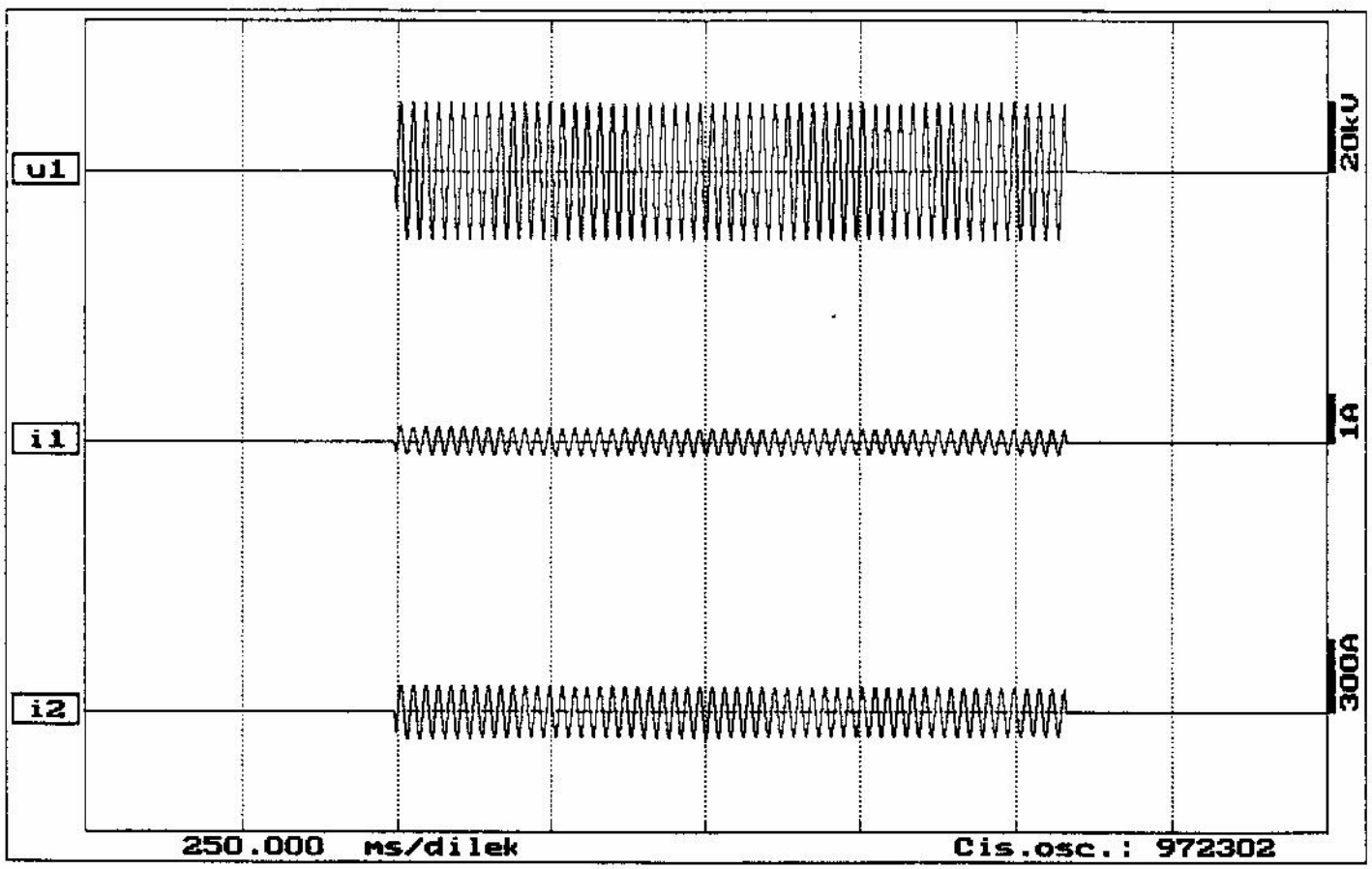
After finishing the test the tested transformers did not exhibit any visual damage and complied with all the repeated testing requirements.

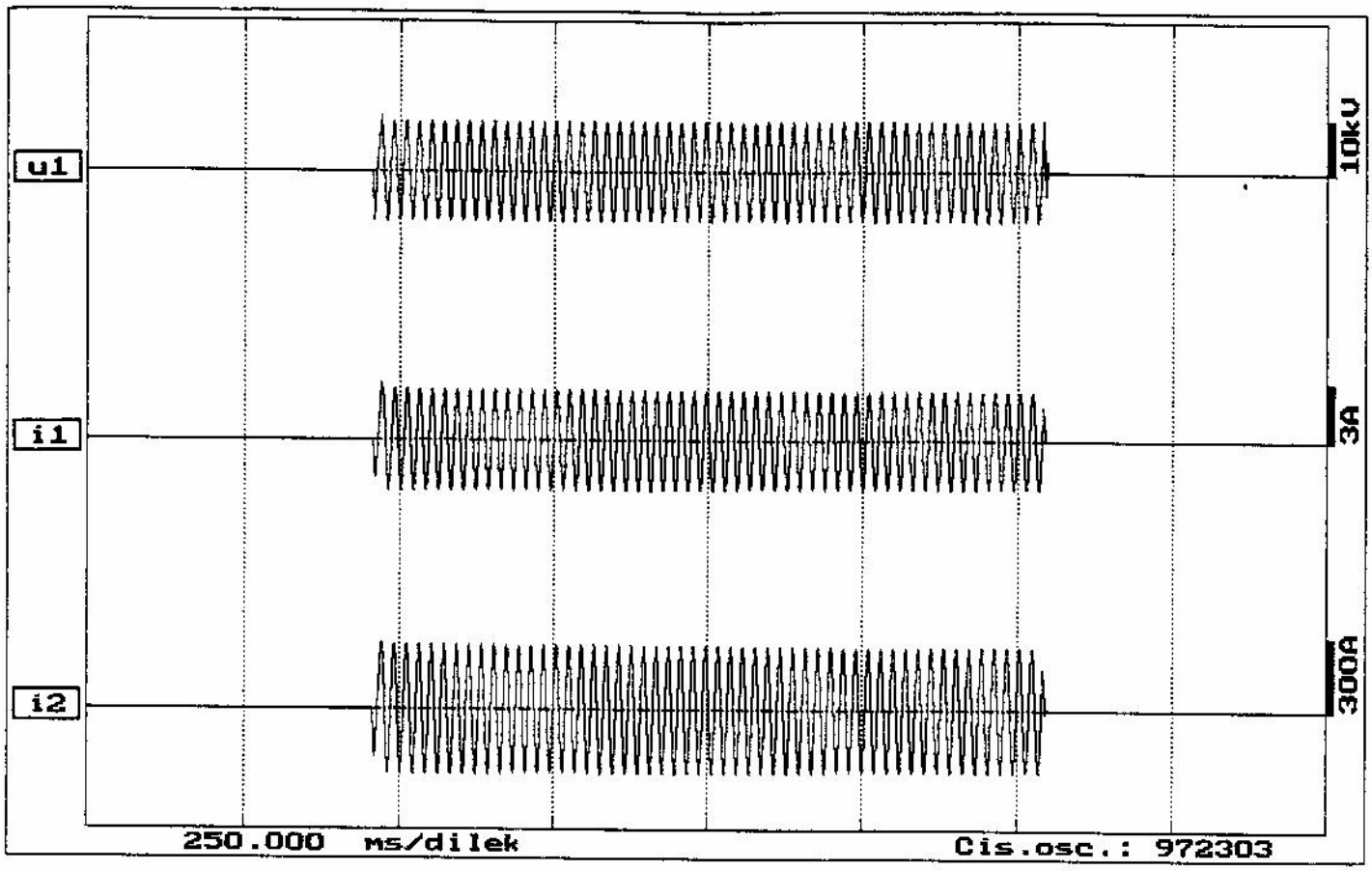
8 Persons taking part in the test

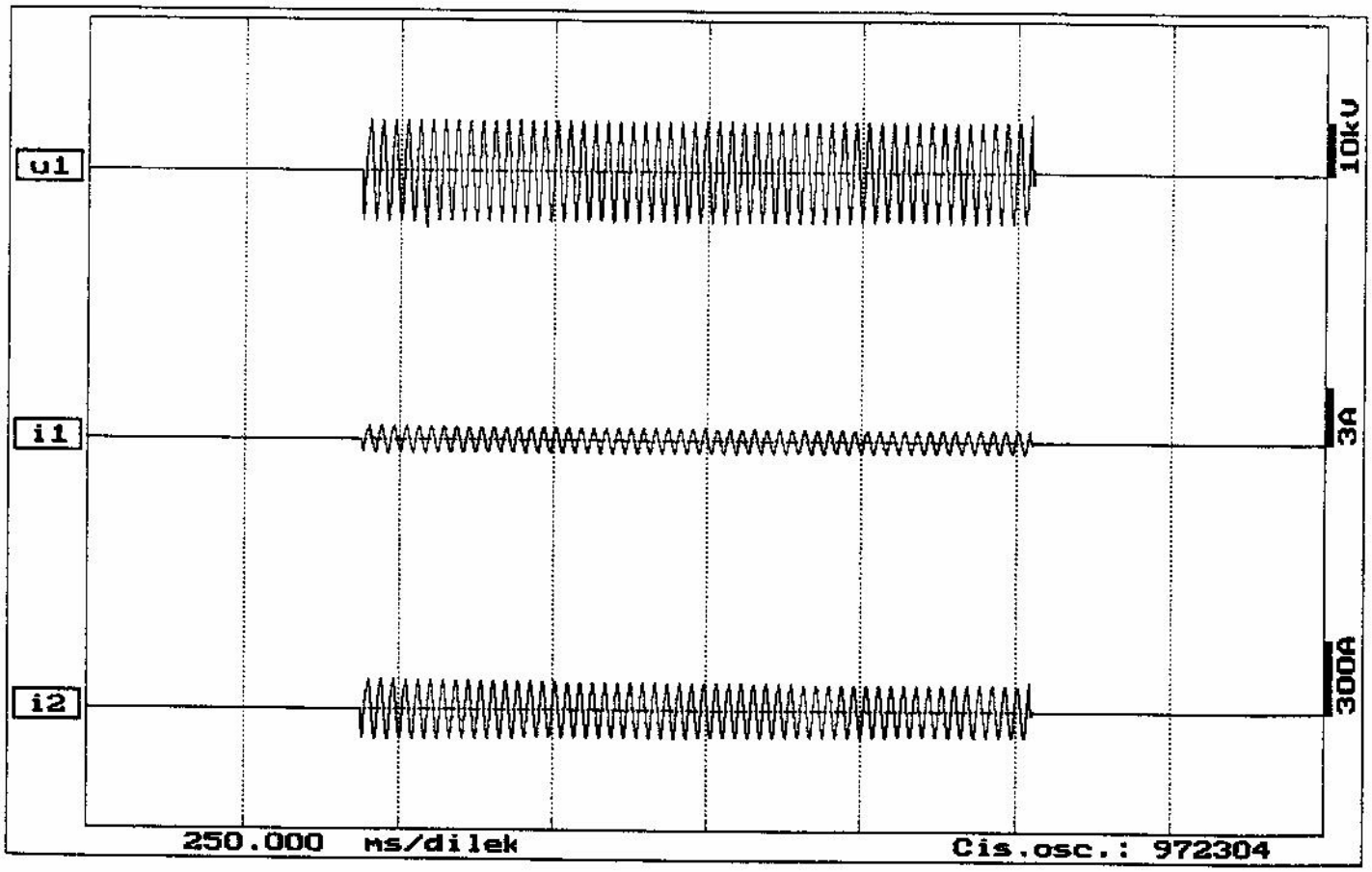
IVEP Brno, a. s.:

Mr. Petr Kalus
Mr. Vlastimil Rada


u1
i1
i2
20kU
1A
300A
250.000 ms/dilek
Cis.osc.: 972301


u1
i1
i2
20kU
1A
300A
250.000 ms/dilek
Cis.osc.: 972302


u1
i1
i2
10kV
3A
300A
250.000 ms/dilek
Cis.osc.: 972303


u1
i1
i2
10kV
3A
300A
250.000 ms/dilek
Cis.osc.: 972304