TEST PROTOCOL No. 1VLRO16194

Issued by the Technical Laboratory in accordance with CSN EN 45001

Tested object: Instrument current transformer

Type : **CTS 38**

Rated values:

Production number:		013136/2003
Rated primary current	A	300
Rated secondary current	A	5/5
Rated sec. winding output	VA	15/30
Accuracy class		0.5/5P
Highest voltage for equipment	kV	38,5
Test volt. of avg. frequency	[kV]	80
Test volt. - atm. impulse	[kV]	180
Rated frequency	Hz	50
Rated short circuit thermal current	[kA]	31.5
Rated dynamic current	[kA]	80
FS / ALF		<10/ 10

Producer: KPB Intra s.r.o., BUCOVICE

Performed tests: Dielectric tests according to customer's specification:
Test of primary winding by impulse voltage
Insulation tests of primary winding by alternate voltage
Measuring of partial discharges

Test specifications: CSN EN 60044-1 (2001), CSN 351301 (10/1997)
I EC 60044-1 (1997)

Test result : The instrument transformer of current of type **CTS 38,** production number 013136/2002 **passed** the dielectric tests pursuant to CSN EN 60044 - 1 (2001), CSN 351301 (10/1997), and IEC 60044 - 1(1997).

Test date: 15 March 2003

Issued on: 19 March 2003

Test engineer

Laboratory manager

ABB s.r.o. Org. unit EJF : Technical laboratory Videnska 117 CZ61900 Brno Fax: +420 547152302 Tel: +420547152365

Company headquarters:
ABB s.r.o.
Sokolovska 84-86
18600 Prague 8
Czech Republic

Postal address
ABB s.r.o.
Org. unit EJF Tel. : + 420 5 4715 2469
Videnska 117 Fax.: + 420 5 4715 2960
619 00 Brno
Czech Republic

At the instrument transformer of current of type CTS 38, prod. no. 013136 / 2003, the following tests and measurements were performed:

List of performed tests:

1.	**Check of terminal marking correctness**	CSN EN 60044-1, Art. 8.1 IEC 60044-1, Art. 8.1 CSN 351301, Art. 16
2.	**Test of primary winding by impulse voltage**	CSN EN 60044-1, Art. 7.3 IEC 60044-1, Art. 7.3 CSN 351301, Art. 14
3.	**Insulating tests of primary winding by alternate voltage**	CSN EN 60044-1, Art. 8.2 IEC 60044-1, Art. 8.2 CSN 351301, Art. 17
4.	**Measuring of partial discharges**	CSN EN 60044-1, Art. 8.2 IEC 60044-1, Art. 8.2 CSN 351301, Art. 17

Test results are stated for transformer CTS 38:

Test tests and measurements were performed in the Technical Laboratory ABB s.r.o. EJF, Brno

Customer presence during the test:

Ing. Hana Maskova, IVEP Brno
Ing. Vlastimil Rada, IVEP Brno

Used Instruments and Equipment:

Alternate voltage source up to 100 kV, No. 93425
Measuring system and detector p. No. TETTEX, type 9124, No. 136810
Impulse generator TUR Dresden No. 94272
Digital system for measuring of impulse voltage TR-AS 26-8, Dr. Strauss

Used signs and symbols:

I_n, I_p	Rated primary current	[A]
I_s	Rated secondary current	[A]
P	Rated output of sec. winding	[VA]
U_m	Highest voltage for equipment	[kV]
f	Rated frequency	[Hz]
I_{th}	Rated short circuit thermal current	[kA]
I_{dyn}	Rated dynamic current	[kA]
U_{zk}	Test voltage	[kV]
q	Level of partial discharges	[pC]

Standard: CSN EN 60044 - 1 (2001), CSN 351301 (10/1997), I EC 60044-1 (1997)					
Transformer type: **CTS 38**				**Production No.:**	013136/2003
Transformer parameters:					
I_p[A]	300	I_s [A]	5/5	**P** [VA]	15/30
Accuracy	0 .5/5P	FS	<10	**ALF**	10
U_i [kV]	38.5 /80/180	f [Hz]	50	I_{th} / I_{dyn} [kA]	31.5/80

1. Terminal marking correctness check: CSN EN 60044-1, Art. 8.1, IEC 60044-1, Art. 8.1
CSN 351301, Art. 16

- It has been verified that the terminal marking corresponds with the drawing documentation.

2. Primary winding test by impulse voltage: CSN EN 60044-1, Art. 7.3, IEC 60044-1, Art. 7.3
CSN 351301, Art. 14

- Test voltage attached between the shorted terminals of primary winding and earth, the shorted terminals of secondary windings connected with the skeleton and earth.
- The course of the impulse voltage was in accordance with IEC 60060-1, see amendment 1.

Test voltage	Number of impulses	Number of breakdowns	Result:
+ 180 kV	15	0	passed
- 180 kV	15	0	passed

3. Insulation tests of primary winding by alternate voltage: CSN EN 60044-1, Art. 8.2, IEC 60044-1, Art. 8.2, CSN 351301, Art. 17

- Test voltage applied between the shorted terminals of primary winding and earth, shorted terminals of secondary windings connected with the skeleton and earth.

Test voltage:	Frequency	Test duration:	Result:
80 kV	50 Hz	60 s	Passed

4. Measuring of partial discharges: CSN EN 60044-1, Art. 8.2, IEC 60044-1, Art. 8.2, CSN 351301, Art. 17

- Test voltage applied between the shorted terminals of primary winding and ground, the shorted terminals of secondary windings connected with the skeleton and earth.

Test voltage:	**Value of partial discharge amplitude**	Note
U_{zk} = 1.2 U_m - 46.2 kV	q = 12 pC	Passed
U_{zk} = 1,2 U_m/V3- 26.67 kV	q = 0.5 pC	Passed