

**Test Object :** Current Instrument Transformer

**Type :** CTS 12

**Ratings:**

Design: cast resin insulated for indoor use			
Serial number:		026804	1200192
Rated primary current	[ A ]	200	600
Rated secondary current	[ A ]	5 / 5	5 / 5
Highest system voltage	[ kV ]	7,2	12
Power frequency withstand voltage	[ kV ]	20 (32)	28 (42)
Lightning-impulse withstand voltage	[ kV ]	60	75
Rated output	[ VA ]	15 / 15	15 / 15
Accuracy class		0,5 / 5P	0,5 / 5P
Rated short - time thermal current	[ kA ]	20	50
Rated dynamic current	[ kA ]	50	125
Rated frequency	[ Hz ]	50	50
FS / ALF		5 / 10	10 / 10

**Manufacturer:** KPB Intra s.r.o, BUČOVICE

**Test performed :** Dielectric tests according to requirements of customer:  
Lightning impulse test on primary winding  
Power - frequency withstand test on primary windings

**Test specification :** GOST 1516.3-96, GOST 7746 - 2001  
KPB Intra s.r.o, order Nr. 003000124/2007

**Test results :** The transformers CTS 12, serial number 026804 and 1200192, have been tested in accordance with GOST 1516.3-96 and GOST 7746-2001. Transformers are considered to comply with the above standards.

**Date of test :** 12. 2. 2007

12.2.2007

**Date of issue**

**Test manager**

**Laboratory manager**

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- The transformers CTS 12, serial number 026804 and 1200192 have been subjected to the dielectric tests in compliance with Standard GOST 1516.3-96, GOST 7746 – 2001 for voltage classes:
- 6 kV (Highest voltage for equipment  $U_m = 7,2$  kV) and
- 10 kV (Highest voltage for equipment  $U_m = 12$  kV)

**TEST PROGRAM:**

**Standard**

- |   |                                    |
|---|------------------------------------|
| 1. Verification of terminal markings                    | GOST 1516.3-96<br>GOST 7746 - 2001 |
| 2. Lightning impulse test                               | GOST 1516.3-96<br>GOST 7746 - 2001 |
| 3. Power - frequency withstand test on primary windings | GOST 1516.3-96<br>GOST 7746 - 2001 |
| 4. Partial discharge measurement                        | GOST 1516.3-96<br>GOST 7746 - 2001 |

**Results of tests performed on transformer CTS 12:**

Serial No.: 026804

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Serial No.: 1200192

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All tests and measurements have been performed in Technical laboratory ABB s.r.o , Brno.

**Ambient air conditions during tests:**

Temperature:	20,2° C
Rel. humidity:	39%
Pressure:	998 hPa

**Devices and equipment used:**

1. High Voltage Test System WGBS, HIGHVOLT Pruftechnik Dresden GmbH
2. Digital partial discharge measuring system LDS-6, LEMKE Diagnostic GmbH
3. Impulse voltage test system IPF 20/400L, Nr 522423
4. Digital Impulse Voltage Measuring System TR – AS 25-8 , Dr.STRAUSS

**List of symbols used::**

$I_p$	Rated primary current	[ A ]
$I_s$	Rated secondary current	[ A ]
$P$	Rated output	[ VA ]
$U_m$	Highest system voltage	[ kV ]
$f$	Rated frequency	[ Hz ]
$I_{th}$	Rated short - time thermal current	[ kA ]
$I_{dyn}$	Rated dynamic current	[ kA ]
$U_{zk}$	Test voltage	[ kV ]



<b>Standard:</b> GOST 1516.3-96, GOST 7746 - 2001					
<b>TYPE :</b> CTS 12			<b>Serial No. :</b> 026804		
<b>RATINGS :</b>					
<b>I<sub>p</sub> [ A ]</b>	200	<b>I<sub>s</sub> [ A ]</b>	5 / 5	<b>P [ VA ]</b>	15 / 15
<b>Accuracy</b>	0,5 / 5P	<b>FS</b>	5	<b>ALF</b>	10
<b>U<sub>m</sub> / U<sub>zk</sub> [ kV ]</b>	7,2 / 20(32) / 60	<b>f [ Hz ]</b>	50	<b>I<sub>th</sub> / I<sub>dvn</sub> [ kA ]</b>	20 / 50

#### 1. Verification of terminal markings: GOST 1516.3-96, GOST 7746 - 2001

- It was verified that the terminal markings are correct and in accordance with drawings.

#### 2. Lightning - impulse test: GOST 1516.3-96, GOST 7746 - 2001

- Test voltage was applied between short-circuited primary winding and earth. The short-circuited secondary windings and the frame were connected to earth.
- Voltage form 1,2 / 50 $\mu$ s was in accordance with GOST 1516.2 (IEC 60060-1).

Test voltage	impulses	flashovers	Result:
+ 60 kV	15	0	has passed
- 60 kV	15	0	has passed

#### 3. Power-frequency withstand test on primary windings: GOST 1516.3-96, GOST 7746 - 2001.

- Test voltage was applied between short-circuited primary winding and earth. The short-circuited secondary windings and the frame were connected to earth:

Test voltage	frequency	test duration	Result:
32 kV	50 Hz	60 sec.	has passed

#### 4. Partial discharge measurement: GOST 1516.3-96, GOST 7746 - 2001.

- Test voltages were selected with respect to customer's requirement for  $U_m = 7,2$  kV.
- Test voltage was applied between short-circuited primary winding and earth. The short-circuited secondary windings and the frame were connected to earth:

Table 1. Partial discharge values for transformer CTS 12, Serial. No.: 026804

Test voltage:	Partial discharge level:	Note:
$U_t = 1,3 U_m - 10s$ (9,4 kV)	$q = 0,2$ pC	(PD limit = 20 pC) Informative value
$U_t = 1,1 U_m / \sqrt{3} - 1$ min (4,6 kV)	$q = 0,2$ pC	Satisfactory



Standard: GOST 1516.3-96, GOST 7746 - 2001					
TYPE :		CTS 12		Serial No. : 1200192	
RATINGS :					
I <sub>p</sub> [ A ]	600	I <sub>s</sub> [ A ]	5 / 5	P [ VA ]	15 / 15
Accuracy	0,5 / 5P	FS	10	ALF	10
U <sub>m</sub> / U <sub>zk</sub> [ kV ]	12 / 28(42) / 75	f [ Hz ]	50	I <sub>th</sub> / I <sub>dvn</sub> [ kA ]	50 / 125

**1. Verification of terminal markings:** GOST 1516.3-96, GOST 7746 - 2001

- It was verified that the terminal markings are correct and in accordance with drawings.

**2. Lightning - impulse test:** GOST 1516.3-96, GOST 7746 - 2001

- Test voltage applied between short-circuited primary winding and earth. The short-circuited secondary windings and the frame connected to earth.
- Voltage form 1,2 / 50 $\mu$ s was in accordance with GOST 1516.2 (IEC 60060-1).

Test voltage	impulses	flashovers	Result:
+ 75 kV	15	0	has passed
- 75 kV	15	0	has passed

**3. Power-frequency withstand test on primary windings:** GOST 1516.3-96, GOST 7746 - 2001.

- Test voltage was applied between short-circuited primary winding and earth. The short-circuited secondary windings and the frame were connected to earth:

Test voltage	frequency	test duration	Result:
42 kV	50 Hz	60 sec.	has passed

**4. Partial discharge measurement:** GOST 1516.3-96, GOST 7746 - 2001.

- Test voltages were selected with respect to customer's requirement for  $U_m = 12$  kV.
- Test voltage was applied between short-circuited primary winding and earth. The short-circuited secondary windings and the frame were connected to earth:

Table 1. Partial discharge values for transformer CTS 12, Serial. No.: 1200192

Test voltage:	Partial discharge level:	Note: (PD limit = 20 pC)
$U_t = 1,3 U_m - 10s$ (15,6 kV)	$q = 0,5$ pC	Informative value
$U_t = 1,1 U_m / \sqrt{3} - 1$ min (7,6 kV)	$q = 0,2$ pC	Satisfactory