

TESTER TYPE TWS-6000 & TWS-3000 OF HIGH SPEED DC CIRCUIT BREAKERS

TWS tester is designed to test high speed DC circuit breakers (HSBs) installed at the traction substations for current up to 6000 A. The test is performed on site eliminating the need for breakers transport to laboratory.

TWS tester allow:

- shaping the pulse test current up to 6000/3000 A for current adjustment measurement
- closing on capability measurements of the breaker for currents up to 100% of its current adjustment
- HSB switch-off time measurement for currents up to 120% of its current adjustment
- measurement of resistance from 1 $\mu\Omega$ to about 250 $\mu\Omega$
- self diagnosing of possible damage in the current shaping module

The electronic tester TWS is a portable power electronic device capable to generate current pulses of maximum value up to 6000 or 3000 A used to examine the HSB current adjustments and to measure very low resistances e. g. contact resistance.

Depending on the type of undergoing tests the current pulse duration changes from a few hundred milliseconds up to two seconds. Shaping the current in the tested circuit is realised by sequential switching of resistors. The energy source is a charged high-capacity supercapacitor block.



Parameters of HSB tester TWS-6000 / TWS-3000:

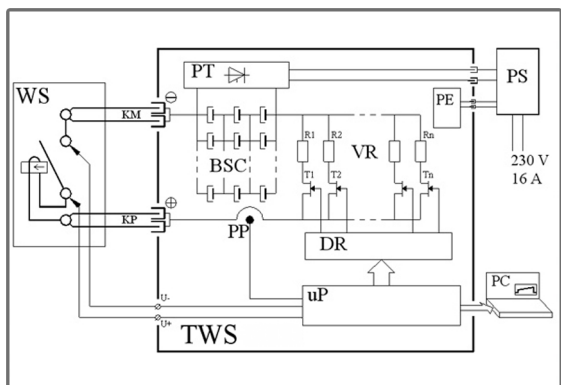
Supply voltage	230 V \pm 10% / 50 Hz
Maximal capacitor's bank voltage	8 VDC
Maximal scaling current of HSB	6000 A / 3000 A
Degree of protection	IP 20
Range of service duty temperature	+5°C \div +40°C
Maximal power consumption	2 kVA
Current measurement accuracy	2,5%

TWS tester designed for:

- companies operating high-speed circuit breakers for testing their performance after repair or maintenance adjustment
- producers of high-speed circuit breakers for testing the parameters of finished products at the end of the technology line

Patent PL 206036





Block diagram of HSB tester TWS:

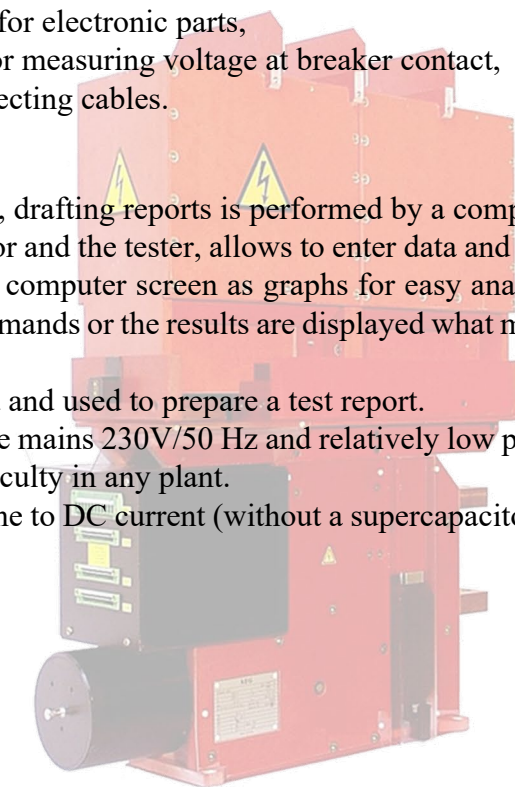
PS – power supply, PC – computer,
WS – HSB under test, BSC – battery of capacitors,
PT – rectifier, VR – variable resistor,
PP – current conversion block, uP – microcontroller,
DR – driver of transistors for variable resistor,
T1, T2, ... Tn – transistor switches,
PE – power supply for electronic parts,
U-, U+ - contacts for measuring voltage at breaker contact,
KP and KM – connecting cables.

Adminstrating of power generation functions, registration of data, drafting reports is performed by a computer. Specialized software provides communication between the operator and the tester, allows to enter data and track progress and test results. Currents during tests are presented on a computer screen as graphs for easy analysis. When it is important or necessary, additional comments to the commands or the results are displayed what makes operating the tester easy.

Results of tests are stored in computer memory and can be printed and used to prepare a test report.

One of the main advantages of TWS is its supply from single-phase mains 230V/50 Hz and relatively low power consumption (2 kVA). It enables the use of the tester without difficulty in any plant.

To compare, a converter directly powered from the 230V/50 Hz line to DC current (without a supercapacitor) of 6000/3000 A requires about 60/30 kVA power supply box.



Dimensions:

- battery of capacitors with variable resistor - box size 770 x 525 x 370, weight around 52 / 48 kg
- power supply - suitcase size 415 x 315 x 200, weight about 15 kg
- suitcase to transport cables - suitcase size 415 x 315 x 220; weight with a set of cables about 15 kg

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