

HCTS Series

Cable Heat Cycle Test System



220kV 7000A Cable Heat Cycle Test System

The **HCTS Series Cable Heat Cycle Test System** is designed to raise and control the temperature of conductor or other low impedance electrical loop to simulate the current loading conditions found in the electrical circuits up to 10000A.

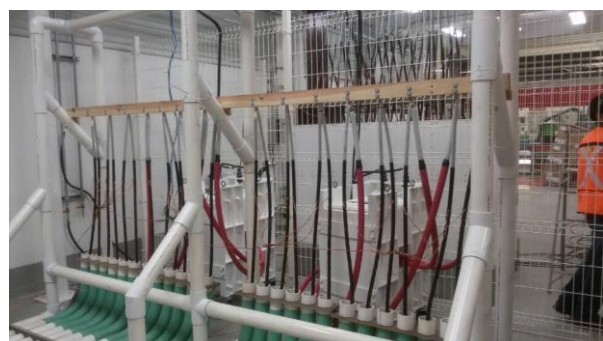
The **HCTS Series Cable Heat Cycle Test System** is mainly used to heat the cable sample conductor cores, the heating temperature can reach to 150°C. Its working principle is to use the open-type wear heart transformer, make the cable test object to be the secondary coil of the transformer, then depends the short-circuit high-current caused by test object itself to get the required temperature from the conductor cores. You can control the current go though the conductor cores to control test temperature of the control cable or other low impedance conductor. Measurement of the loop temperature is made by direct contact of a K-type thermocouple probe with conductor of the test loop.

Our system includes the low voltage analogue loop and high voltage test loop. The low voltage analogue test system utilizes one loop of conductor passing through the desired a number of open-type wear heart transformer to

each the necessary current rating according to the temperature setting. For the high voltage test system also utilizes one loop of conductor passing through the desired a number of open-type wear heart transformer to reach the necessary current rating, and current is following the low voltage analogue loop current. In the same time, the high voltage test cable also need to apply withstand the AC high voltage according the IEC standards.



220kV 5000A Cable Heat Cycle Test System



35kV 1000A Cable Heat Cycle Test System

Applications:

- ◆ 750kV and Below Voltage Level XLPE Power Cable
- ◆ 35kV and Below Plastic or Other Insulation Type LV Power Cable
- ◆ Other Low Impedance Conductor

Safety and Design Feature:

- ◆ Robust user friendly PLC based controls
- ◆ Temperature set from 40-150°C
- ◆ Integrated chart recorder
- ◆ Optically isolated type K thermocouples
- ◆ Safety interlocks
- ◆ Running time up to 1year
- ◆ Zero start interlock
- ◆ Over current protection
- ◆ Thermal overload protection
- ◆ Mobile open-type wear heart transformer, easy and fast install the test object
- ◆ Mobile CT with castors
- ◆ Capacitive compensation
- ◆ Insulation switchgear and circuit breaker
- ◆ Heavy duty
- ◆ Automatic or Manual Operation



All International Brand Electronics Used Switchgear Cabinet

Sizing of The System:

The actual rating and design appropriate for a particular application depends on a number of factors.

- ◆ Conductor type and cross-section
- ◆ Insulation type and thickness
- ◆ Length of cable to be tested
- ◆ Ambient and test temperatures

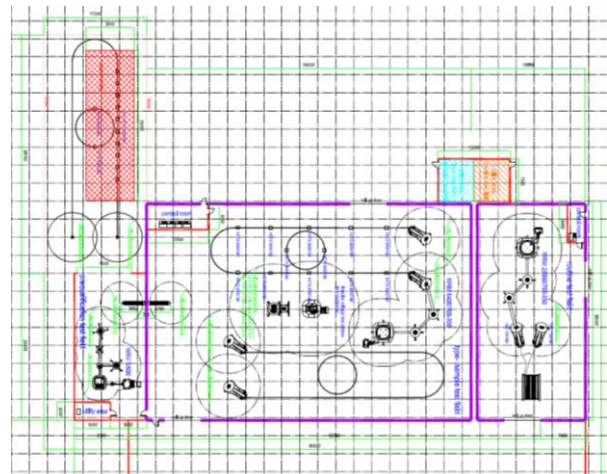
- ◆ Time allowed to reach test temperature

HCTS includes Following Main Components:

- ◆ Variable Voltage Regulators
- ◆ SCR Electronic Regulator (Option)
- ◆ Open-type Wear Heart Transformer
- ◆ Switchgear Cabinet
- ◆ Compensating Capacitors
- ◆ CTs
- ◆ Temperature Sensors
- ◆ Automatic/ Manual Control and Measuring System
- ◆ Control, Measuring, Power Cable and etc

Typical System Drawings for 500kV Class

XLPE Power Cable:



Temperature Regulation:

During a heat cycling test, voltage is applied in conjunction with high current to simulate operating conditions. A thermocouple is used for measurement of the conductor temperature. There are three testing options.

Method 1, the thermocouple is bonded to the outer insulation of the cable. With this method the conductor temperature is previously calculated or established by testing without applied high voltage.

Method 2 involves using an optional fiber optic

temperature probe. With this probe, a hole is cut into the cable insulation and physical contact is made with the center conductor. The hole is filled with a compound to re-establish the dielectric strength of the insulation. The fiber optic probe may also be used during impulse testing.

Method 3 utilizes two separate cable loops. A control loop, which is typically shorter, is used to connect the thermocouple to the conductor. No high voltage is applied to the control loop. A second test loop, which is typically longer, has high voltage applied. The control loop is used to exactly monitor conductor temperature while the LVTS control system maintains the same current in each loop, thus ensuring that the conductor temperature stays within prescribed limits.

Variable Voltage Regulator Controlled Systems:

Variable voltage regulator systems utilize a column auto transformer to control the output voltage. This system produces a true sine wave over the full output range and operates at very low impedance (typical less than 8%). A master-slave setup can be implemented to expand testing capabilities for multiple units. Add capacitive compensation at regulator output side, it can reduce the regulator size more than 50%. Compare to SCR electronic regulator, it will not create any background partial discharge signal to interference the partial discharge measurement.

SCR Electronic Regulator Controlled Systems:

SCR electronic regulator systems utilize a solid state regulator which offers faster rise time and instantaneous return to zero. The compact design allows the SCR to be maneuvered more easily. The SCR controlled system is proven to be a reliable and economical choice for many testing applications. SCR regulator is typically used on smaller systems, because the SCR regulator is not compactable with capacitive compensation which is often used to reduce mains service requirements. Compare to

the variable voltage regulator controlled system, it has more easier logic control by ON/OFF.



Capacitor Compensation

Open-type Wear Heart Transformer:

The Open-type Wear Heart Transformer is constructed out the high quality grain oriented laminated core steel. The primary windings utilize cooper conductor and it is protected by barriers form the cable under test. The carts are designed to cooling by natural air (AN).

Heating transformer is be design to open and wear heart, it increase convenience for install the test object. The size of Wear heart hole is no less than 0.25mX0.25m, width is no more than 0.85m Small size heating transformer we supply handle to pull the core out and back, and big size heating transformer, we supply hydraulic handle to pull the core our and back.



Open-type Wear Heart Transformer

Automatic/ Manual Control and Measuring System



Software Interface



HCTS Desk Type Control Cabinet



Software Interface on testing



HCTS Control Cabinet + AC Apply Voltage Control Cabinet with

Laptop Type

Computerized controls, which consist of an industrial computer and PLC, and a communications port implement all metering, timing and set point functionality. Computerized controls allow programming of complex custom sequences, allow for data acquisition and report generation.

It uses the PLC to control, it can show the test cable current/ analogue cable current, current ,regulator input/output voltage, regulator current after capacitance compensation, temperature setting. It has manual, automatic operation mode and test current fine adjustment function.

The system is equipped with 4 or more channel digital recorder; it can record the test cable current/ analogue cable current, analogue cable conductor temperature, ambient temperature, regulator output voltage. The input signal can select the type of temperature signal, such as PT.K.J.S.R, etc. DC voltage (2.20V) and to receive the output signal of the loop current signal converter. All the data is stored in the SD card, it is easy to read and data analysis, data processing and print.

- ◆ Current Measurement Accuracy: $\pm 1\%$
- ◆ Temperature Measurement Accuracy: $\pm 1^{\circ}\text{C}$;
- ◆ Analogue cable loop is equipped a set of K-type

thermal couple(0.75 level, diameter is 1.5-2mm, length 200m.including the compensation wire 5m and quick

connector) and K-type extend compensation wire 100m. The compensation wire has plastic sheath to protect the plain conductor keep dry.

Heating time, cooling time can be set in 10-9999 min, cycle times can be set in 1-9999 times , it has over-voltage, over-current protection function;

Under automatic operating mode, after setup test temperature, cycle time, cycle times, the system will do the heating test and data recording automatically.

Company Profile:

Over 20 years professional supplier in the high voltage test equipment business make the high voltage test department become most important branch of SAMGOR group, SAMGOR has a reputation for quality and reliability based on extensive products and vast experience. SAMGOR provides test, measurement and diagnostic equipments for a wide range of electrical applications. Test systems for laboratory, factory and field use are available.

Welcome to send us your spec and test object details, our professional engineers will provide you the most suitable test solution.

For further information please contact:

Samgor Technology

Add: No.500 Renmintang Rd. Pudong, Shanghai, 201209, China

Tel: 86-21-58999552 58999556

Fax: 86-21-68482953 50323350

E-mail: info@samgor.com

Http:// www.samgor.com

