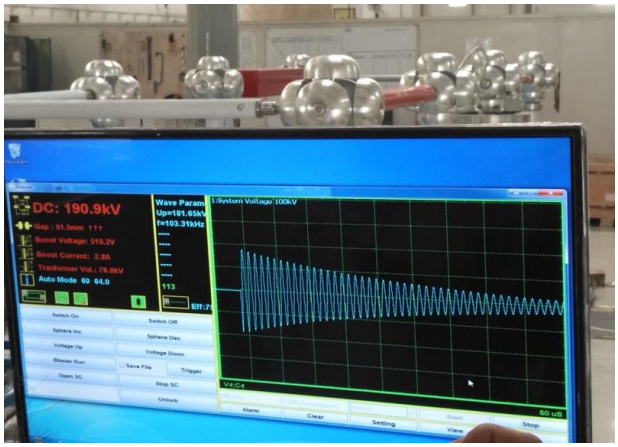
# CDS Series

## Turn To Turn Overvoltage Test System For Dry Reactor




**CDS Series turn-to-turn overvoltage test system** is performed by repeatedly charging a capacitor and discharging it, through sphere gaps, into the reactor windings. The type of overvoltage that the reactor is subjected to is similar to a switching impulse with an exponentially decaying sinusoidal wave shape.

**CDS Series turn-to-turn overvoltage test system** can maximum generate 200kV impulse oscillator voltage to dry type air core reactors, by changing difference capacitors from 1nF to 2uF, the oscillation frequency can be adjust accordingly, it is around 100kHz.

### Applications:

- Dry Type Air Core Reactor
- Research & Development

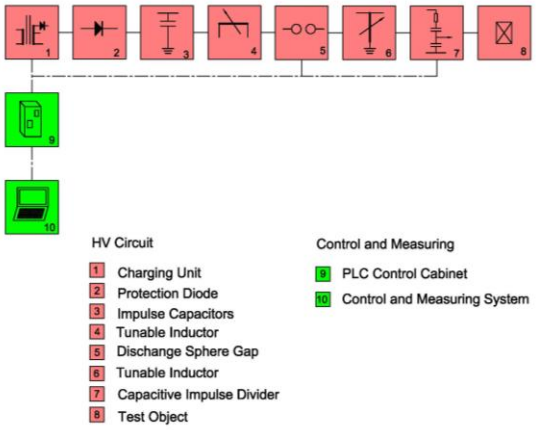
### Testing Applications:

- Turn to Turn Overvoltage Test (200kV)
- AC Apply Voltage Test (100kV)
- DC Apply Voltage Test (200kV)
- Impulse Voltage Test (LI/SI)

### Benefit and Advantage:

- Modular design allows future expansions;
- Very Compact design;
- Efficient space usage by combining AC/DC/impulse voltages and turn to turn overvoltage test in one test system;
- Suitable to test large inductance range reactor;
- Fast rearrangement without special skills;
- Semi or automatic control and measuring system;
- Fast assemble and disassemble the components by quick coupling connector;
- Meet IEC60076-6 and GB1094-6;

## System Diagram:




## Main Components:

◆ **Single Phase AC Test Transformer (TT)**

Test transformer which can be used for AC, DC and impulse voltage generation. The output power can be extended by cascading the transformers. ($SF_6$ filled and Oil filled available)

| | |
|---|---|
| Rated power: | 50kVA |
| Input voltage: | 380V |
| Input current: | 131.5A |
| Output voltage: | 100kV |
| Output current: | 500mA |
| Impedance voltage: | 5% |
| Frequency: | 50/60Hz |
| Duty cycle: | 1 Hour |

◆ **Voltage Regulator (VR)**

Voltage regulator is used to regulate the input voltage for test transformer; the output voltage from test transformer will follow to change.

| | |
|---|---|
| Rated power: | 50kVA |
| Rated input voltage: | 0.38kV |
| Rated input current: | 131.5A |
| Rated output voltage: | 0-0.42kV |
| Rated output current: | 125A |
| Impedance voltage: | <12% |
| Cooling method: | AN |
| Frequency: | 50/60Hz |
| Duty cycle: | 1 Hour |

◆ **Damped Resistor (DR)**

Damped resistor is used to limit the output current of test transformer when flashover happened.

| | |
|---|---|
| Rated voltage: | 100kV |
| Rated resistance: | 2kohm |
| Temperature rise: | <55k |
| Frequency: | 50/60Hz |
| Duty cycle: | 1 Hour |

◆ **Coupling Capacitor & Divider ( CC)**

Coupling capacitor & divider consist of one high voltage capacitor and one secondary capacitor. It can used to measure the partial discharge, the same time it also can used to be a high voltage divider to measuring the AC high voltage. The voltage level can be extended by cascading the capacitor.

| | |
|---|---|
| Rated voltage: | 100kV |
| Rated capacitance: | 500pF |
| Tan delta: | <0.2% |
| Divider ratio: | 1000:1 |
| Frequency: | 50/60Hz |
| Partial discharge: | <2pC |
| Duty cycle: | 1 Hour |

◆ **HV Rectifier + Protection Resistor (RE)**

Rectifier, which can be used for impulse and DC voltage configurations.

| | |
|---|---|
| Protection resistor: | 5k Ω |
| Inverse peak voltage: | 200kV |
| Rated current: | 1000mA |
| Duty cycle: | 1 Hour |

◆ **Resistive Divider (RD)**

Resistive divider is used to measure the HV DC voltage also the charging voltage of the impulse capacitor.

| | |
|---|---|
| Rated resistance: | 400M Ω |
| Rated voltage: | 200kV |

Rated current: 0.5mA
Divider ratio: 1000:1
Duty cycle: 1 Hour

◆ **Smooth Capacitor & Impulse Capacitor (SC & IC)**

Capacitor is used as energy storage capacitor for generate impulse voltage or smoothing capacitor for DC generation.

Rated capacitance: 1nF-2uF
Rated DC & IMP voltage: 200kV
Duty cycle: 1 Hour

◆ **Grounding Switch (GS)**

Remote controlled switch, which can be used to ground the high voltage construction KIT.

Rated DC & IMP voltage: 200kV
Service voltage: 24V, 50/60Hz

◆ **Sphere Gap (SG)**

Max. IMP voltage: 200kV
Sphere diameter: 250mm
Max. gap distance: 250mm

◆ **Weak Damped Capacitive Voltage Divider (DL)**

Weak damped capacitive voltage divider is used to be measure the impulse voltage, also use as a basic load of the impulse generator.

Max. IMP voltage: 200kV
Rated capacitance: 100pF
Response time: <95ns
Divider ratio: 500:1

◆ **Load Inductor (LI)**

Load inductor has multiple taps inductors. It is used to adjust the discharge frequency.

Max. IMP voltage: 200kV
Rated inductance: 10-100uH

◆ **Digital AC/DC/Impulse/Turn to Turn Overvoltage Control System (ACS-1)**

Digital AC/DC/Impulse/Turn to Turn Overvoltage control system is used to be control the switchgears, voltage regulator, impulse trigger, in the mean time, it is also used to measure the rated voltage and current in the system. Necessary protection function is included. The software is base on the Window 10 platform and Labview software.

Industry Platform: TFT 23.5' TFT Screen
Operating system: Window 10 or Window 8
I/O control: Mitsubishi PLC
A/D sampling: Mitsubishi PLC
D/A output: Mitsubishi PLC
Channel of measuring: 8
A/D accuracy: 0.5% (16bit)

◆ **Digital Impulse Voltage/ Turn to Turn Overvoltage Measuring System (SG3004)**

High voltage impulse test is used to assess the quality of any high voltage equipment. The test object is subjected to a fast voltage impulse of defined wave shape caused by the test object are used for detection of insulation strengths and/or faults.

SG3004-12(14) is an excellent and reliable tool for accurate measurement of all kinds of wave-shapes. It also manufactures complete impulse voltage test systems to meet most requirement. This impulse generation capability plus impulse measurement offers a complete solution to modern testing needs.

Industry platform: TFT 23.5' TFT Screen
Operating system: Window 10 or Window 8
Number of Channels: Two (Independent) channels
Input voltage: 1.5V-1500V
Input impedance: 2MΩ/20pF
Analog bandwidth: 50MHz for each channel
Trigger: CH1, CH2 or Ext
Resolution: 12bit
Sampling rate: 100MS/sec max.
Measuring time: 1-9999us

Accuracy: ±1% T1, T2 and Tc (12bit)

## Option:

◆ **Front/Tail Wave Resistor (RD)**

Front/Tail wave resistor, which can be used as series resistor for impulse voltage configurations, determining the front and tail wave time.

Resistance value: 10-500 Ω
Max. IMP voltage: 200kV

◆ **Digital AC/DC Measuring System (SG3005)**

The Digital Measuring Instrument SG3005 is a microprocessor controlled device for accuracy measuring AC, DC and also can be used for testing voltage waveform distortion and ripple factor.
The SG3005 has implemented a flash detector which stores and shows the last voltage measurement and its polarity before a breakdown or flashover occurs.

**AC Measurement**

Measurement modes: peak, peak/2, rms
Input Voltage range: 0 … 700 V rms
Frequency range: 16 … 1000 Hz
Accuracy: 0.2% rdg, ± 3 counts

**DC Measurement**

Measurement modes: mean value, ripple
Input voltage range: 0 … 1000 V
Accuracy: ± 0.2% rdg, ± 3 counts

◆ **Ground Foil (GF)**

Copper ground foil, which can be used to make ground connections between the individual high voltage apparatus.

Weight: 0.45kg/m

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