CDYS Series

Impulse Voltage Test System, S Structure, 200-1000kV

CDYS series Impulse Voltage Test System is design as S structure, it can be used to generate impulse voltage what simulate lightning strokes (LI: 1.2/50us) and switching surges (SI: 250/2500us). The total charging voltage range is from 200kV-1000kV with stage energy of 5 or 10kJ.

Applications covered include testing according to IEC, ANSI/IEEE/GB as well as other national standards.

CDYS series Impulse Voltage Test System allow to be modified for carrying out a variety of special tests such as on transformer, impulse current testing of surge arrestors and even components of wind generators or air craft as well as EMP testing of electrical equipment.

CDYS series Impulse Voltage Test System is designed to be a modular system enables a very variable application in industries as well as in laboratories for research and education.

Applications:

- Shunt reactors
- Power transformers
- Distribution transformer
- Instrument transformers
- Cables (type tests)
- Bushings
- Arresters (impulse current tests)
- Insulators
- GIS and air-insulated breakers
- R&D

Testing Waveform Parameter:

- Lightning Impulse (1.2/50us)
- Switching Impulse (250/2500us)
- Lightning Current Impulse (8/20us)
- Lightning Chopping

Main Feature:

- Total charging voltage from 200kV to 1000kV;
- Energy per stage from 5kJ to 10kJ;
- Computerized and microprocessor base control system;
- 12bit or 14bit, 100Ms/s Digital impulse analyzer system are available;
- Air pressure variable gap is be used, extend satiability and trigger range;
- Compact and flexible design;
- Unique system grounding device together with first stage traditional grounding device;
- Glaninger circuit and overshoot compensation device are available;
- Liquid insulation in the capacitors is made of castor oil make sense ecologically, life cycle is more than 100000 time full voltage fire;
- Top quality material used, more than 90% component use stain steel;
● Use electrostatic coating instead of traditional printing, get better durability;
● Short reconfiguration times by utilizing handy plug in or out resistors and connections;
● Double contact surface than original, guarantee better contact and more stable T₁ and T₂;
● 2.5-1500V Input range ensure a very good noise ratio;

Benefit and Advantage:

Top quality ensured:
● 304 stainless steel make components is over 95% of whole system;
● Choose most well known impulse capacitor supplier, life cycle is more than 10000 time full voltage fire;
- Increase 50% capacity safety margin of the impulse resistor, pass strict performance test;

- Base use electrostatic coating instead of traditional printing, outlook is more beauty, better durability as well as decrease the pollution for our world;

- Fiber optic isolation is be used for control desk, no grounding require for control desk, fully isolate any unsafe possibility for user;

**Unique Design:**
- 3 different types of impulse control and measuring system desk are available as options;

**Safety is our first polarity:**
- A new unique system grounding system is be used together with first stage grounding system, both grounding system is operating by air pressure, ensure grounding all stage within 2 seconds;
Air pressure variable sphere gap is available to select as a option, it can completely eradicate influence from humidity and dust. Meanwhile minimum output voltage is further decrease to 5%-100%. Traditional gap moveable design is never possible to reach such low value;

Theory:
The circuit of the impulse generators is a Marx multiplier circuit. The impulse capacitors, arranged in the stages of the generator are charged with DC voltages up to 100 kV against earth potential and in order to generate impulses, connected in series by spark gaps. For the adjustment of the front time and time to half value of the test impulse, the generator stages comprise front resistors and tail resistors. A short discharge loop guarantees low internal inductances and smooth voltage shape.

Components of the S Structure Impulse Test System:
- Impulse Generator
- DC Charging Device
- Weak Damped Voltage Divider
- Digital Impulse Control System
- Digital Impulse Measuring & Analyzer System

Options:
- Air Pressure Variable Gaps
- External Overshoot Compensation Device
- Glaninger Circuit
- Chopping Gaps
- Isolation Transformer
- Additional Circuits for Impulse Current Generation
- Measuring Sphere Gap
- Resistive Divider
- Rogowski Winding / Shunt
Impulse Generator

CDYS Series Impulse Generator is the main part of the impulse voltage test system. Four epoxy glass support hangs on one capacitor each stage, constituting a stable components structure for the whole impulse voltage generator. The impulse generator has 2-10 stages, constituting a tower form structure, each stage is a cascade connection, disassembly and maintenance are convenient, and the whole structure is stable.

Spark gaps are be install in the encapsulated epoxy glass tube. The enclosure protects the spark gap from dust and dirt. It also damps the impulse noise and protects the close environment and the operating personnel of the impulse generator from light flashes and ultra-violet radiation.

Model | Voltage kV | Stage No. | Stage Voltage kV | Stage Capacitance μF | Main Capacitance μF | Total energy kJ | Dimension L(mm) | W(mm) | H(mm) | LI Safety distance (mm)
---|---|---|---|---|---|---|---|---|---|---
CDY-200/10 | 200 | 2 | 1 | 0.5 | 10 | 2390 | 1540 | 1400 | 500
CDY-200/20 | 200 | 2 | 2 | 1 | 20 | 2390 | 1540 | 1400 | 500
CDY-300/15 | 300 | 3 | 1 | 0.33 | 15 | 2390 | 1540 | 2100 | 800
CDY-300/30 | 300 | 3 | 2 | 0.66 | 30 | 2390 | 1540 | 2100 | 800
CDY-400/20 | 400 | 4 | 1 | 0.25 | 20 | 2390 | 1540 | 3000 | 1000
CDY-400/40 | 400 | 4 | 2 | 0.5 | 40 | 2390 | 1540 | 3000 | 1000
CDY-600/30 | 600 | 6 | 1 | 0.166 | 30 | 2390 | 1540 | 3900 | 1500
CDY-600/60 | 600 | 6 | 2 | 0.332 | 60 | 2390 | 1540 | 3900 | 1500
CDY-800/40 | 800 | 8 | 1 | 0.125 | 40 | 2390 | 1540 | 4800 | 2000
CDY-800/80 | 800 | 8 | 2 | 0.25 | 80 | 2390 | 1540 | 4800 | 2000
CDY-1000/50 | 1000 | 10 | 1 | 0.1 | 50 | 2390 | 1540 | 5700 | 2500
CDY-1000/100 | 1000 | 10 | 2 | 0.2 | 100 | 2390 | 1540 | 5700 | 2500
DC Charging Device

**ZD-120 Series DC Charging Device** use to charge impulse capacitor for impulse generator, charging method is unilateral doubler rectifier type, maximum output voltage is 120kV (DC), output current is 20mA. DC charging device use the dry type charging transformer, primary voltage is 0.22kV, secondary voltage is 50kV (AC), rated capacity 5kVA; Use the dry type insulation transformer, primary voltage 0.22kV, secondary voltage 0.22kV, rated capacity 5kVA.

Two units 2DL-300kV/500mA high voltage diodes are be used, reverse withstanding ≥300kV, average current ≥ 0.5A, the high voltage rectifier is installed inside the PC tube motorized / air operated charging voltage polarity. The control panel has the polarity switch converting key.

One unit DC resistance voltage divider, high voltage arm use 120kV, 200MΩ, the dry type metalized film resistor. The low voltage arm resistance is installed on the bottom flange of the voltage divider, the low voltage arm voltage of the low voltage arm signals use the shielding measuring cable into the control panel;

Weak Damped Voltage Divider

**DF Series Weak Damped Voltage Divider** is a major part of high voltage surge measurement. It converts the high voltage surge to low voltage surge what can be measure by OSC.

Weak damped capacitance voltage divider is constituted by a block of impulse serial capacitor model no MWF200, the damped resistance uses a multi stage distributor, the capacitor has a non inductive structure, the low voltage arm is constitute by a non inductive monolithic capacitor connection. The divider has mobile type structure (the wheels are made with polyurethane and have grounding proprieties); the top is equipped with a shielding device. Low damping capacitance divider’s square wave response characteristics meets GB/T311.1 and IEC60060-2 standard requirements.

Low voltage arm is made by low inductance mica capacitor, 1500V rating, it can guarantee prefect temperature coefficient, voltage coefficient, lowest self inductance.

Digital Impulse Control System
IMS-2001 is made for high voltage testing laboratory operating environment, especially considering the impulse test characteristics used as high magnetic interference design, the technology performances indexes meet IEC61083 and IEEE1122、GB/T16896.1-1997/200X 、IEC61000 standards requirements.

The operating system is written under Labview environment, based on Windows 7 operating system with 23.5' TFT screen, in order to insure the system compatibility and universality. Simple visual interface, easy operation.

Digital Impulse Measuring & Analyzer System

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. It is commonly used for routine testing of transformer, bushings or other high voltage equipment.

SG3004-12(14) Digital Impulse Measuring & Analyzer System 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.

SG3004-12(14) equips 12bit or 14bit, 100Ms/S sampling rating A/D card inside and user friendly software and powerful curve analyzing tools along with the report generating.

Measurement evaluation and analysis of impulse voltages and currents can be performed according to IEC 61083, IEC 60060, IEC 60076, IEC 60099 and IEC 60230, automatic evaluation of the impulse of the impulse shapes specified in the above standards.
SG3004-12(14) is controlled by the host computer, using the USB or Ethernet interface. SG3004-12(14) is complete system to be integrated with impulse voltage test system.

Options:

- Air Pressure Variable Gaps
- Glaninger Circuit
- External Overshoot Compensation Device
- Chopping Gap
Isolation Transformer

Additional Circuits for Impulse Current Generation

Measuring Sphere Gap

Resistive Divider

Rogowski Winding / Shunt
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