High Voltage Cable Fault Location System

CFL.2000ST

Product Overview

Highly integrated and highly automated digital software cable fault location system, with the option to integrate variable frequency resonance, oscillation wave (partial discharge) and ultra- low frequency (dielectric loss) functions.

- **Surge Generator 0-32kV / 2048 Joules surge energy.**
- **TDR Time Domain Reflectometry ARC reflection method and Impulse Current Method (120 km range)**
- **Acoustic ground fault pin-pointing (with the GM. Series universal receiver and accessories set)**
- **Burndown function 60kV /**
- **DC Withstand voltage testing 0-32 kV / 0-20A**
- **Continuous output current 60mA**
- **Cable path indicator 10W / 150V**
- **Cable identification with Step Voltage.**
- **Sheath Fault Location 10kV / 200mA**
- **Cable Spiking function**
- **80kV VLF Testing function**
- **Di-electric Loss Measurement**
- **Capacitance Measurement**
- **Insulation Resistance Testing 5000V / 5mA**

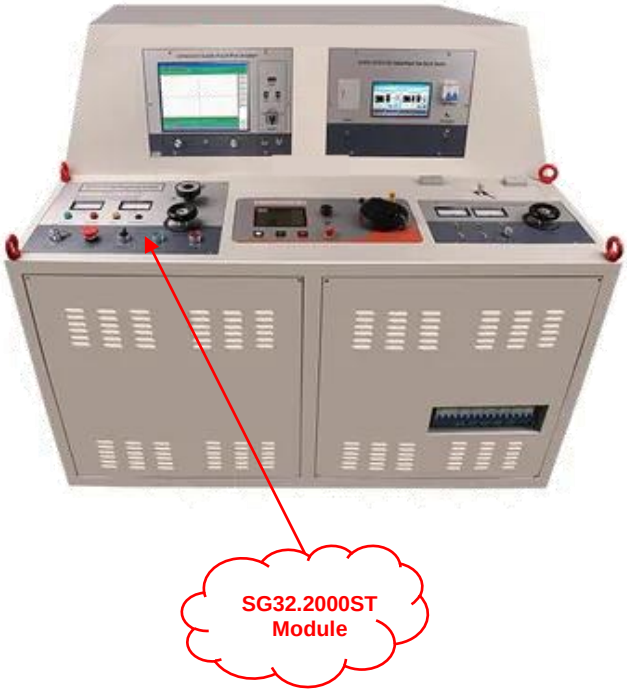
Control Interface

- Graphical interface, more intuitive and easy to operate.
- Operation Turn and click a single knob (jog dial) on the control unit
- Operating System: Windows
- Date management General database
- Data Synchronization Universal Serial Bus
- Control unit
- Display Industrial grade TFT colour panel with LED backlight
- Anti-glare feature
- Multi-touch Included
- LCD size 39.6 cm (15.6 in)
- Resolution: 1920 x 1080 Full HD
- Brightness: 150cd/m²

System Composition:

- DC or high-voltage pulse to make the cable fault point flash over and discharge
- Traveling wave reflection principle to make a rough measurement of all types of cable main insulation faults
- Acoustic and magnetic synchronization method to make a precise measurement of all types of cable main insulation faults
- Electromagnetic induction principle to accurately find the unknown cable path and depth
- Bridge method to make a rough measurement of all outer sheath faults and the main insulation (especially water ingress faults)
- Step voltage method and clamp current method to accurately locate the outer sheath fault
- Constant power principle to reduce the resistance of the ultra-high resistance fault
- Encoding method + phase method to identify multiple cables
- Remote control method to confirm the final puncture of the cable (finally, personal safety is absolutely guaranteed.
- Ultra-low frequency (0.1Hz) to perform insulation withstand voltage test and dielectric loss test on the cable
- Ohm's law to measure the quality of the cable in a coil
- Necessary tools and equipment on the cable detection test site (megohmmeter, measuring instrument, electrician tools)

High Voltage Surge Generator Module



General information:

- Trolley –Type High voltage pulse generator meet the DL/T846-2004 "High Voltage Test equipment general technical conditions" and DL/T474-2006 "field insulation test guide standards".
- Fault conditioning (burning) with current up to 76 mA @ 32kV,152mA@16kV, 304mA@8kV
- Main application is for surge discharging of cable fault testing of LV/HV Cables and used for DC voltage withstand testing of others electrical device.
- High voltage DC source and energy storage capacitor with a discharge ball discharge device and a cable fault tester. The system is convenient to use, portable, safety and reliability.
- The units adopt high precision and stability which is attributed to the high qualified HV electronic components and high frequency & voltage technology.
- The Surge generator is simple and easy to operate.
- Auto timing between pulses and manual operation for single pulse options included.
- User-friendly operation of the Trolley type DC high-voltage pulse equipment and the ideal device for power cable fault detection on networks ranging from 220V – 33kV .
- Auto Discharge, Over voltage, current & heating protection circuits built in to ensure reliability.
- Ground includes: HV ground, safety ground and continuous sampling ground for optimal safety.

Product Overview

Generates a high voltage surge and DC voltage suitable for the following methods in combination with optional devices:

- 0-32kV / 2048 Joules surge energy.
- TDR Time Domain Reflectometry ARC reflection method and Impulse Current Method.
- Acoustic ground fault pin-pointing
- (with the GM. Series universal receiver and accessories set)
- DC Withstand voltage testing up to 32 kV
- Continuous Mode included.

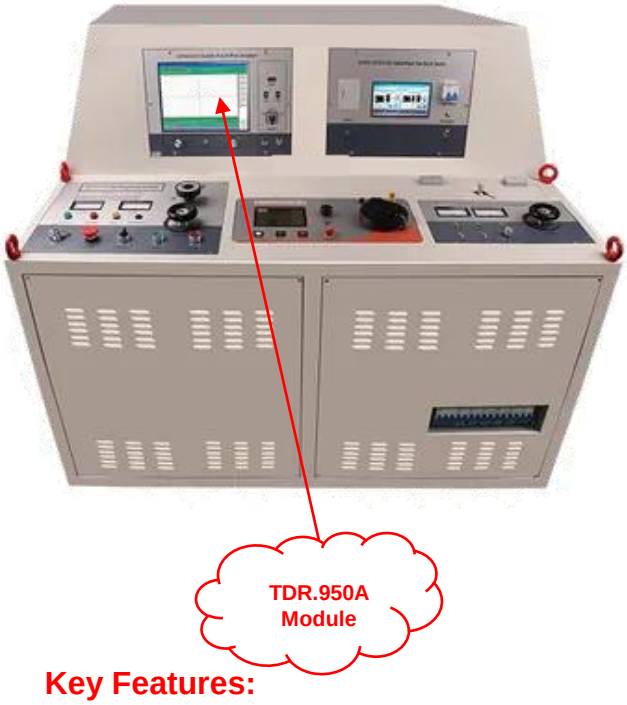
Key Features:

- High voltage pulse output is even and controllable.
- With current and voltage 1.5 pointer display, and the surge discharge process is intuitive and clear.
- High voltage side measurement is real-time and accurate.
- With zero start protection function, and potentiometer return to Zero output function, safe and reliable.
- Three voltage range and capacitors, which is easy to change the voltage as customer's requirement.
- This unique design of high voltage measurement, at stop state, it will auto discharge the capacitor electricity.
- Discharge time with 2 modes: Timing and manual.
- With DC Withstand voltage test function up to 250mA.
- Internal installation high precision test cable fault sampling waveform module.
- Over Temperature Protection up to 105°C

Technical Specifications:

- The surge HV voltage: 0 ~32kv
- High voltage divider: Voltage Accuracy 1.5 grade
- Inside capacitor :4μF/32kV、16μF/16kV、64μF/8kV
- Surge time: Auto surge ±6s, also can be control manually.
- Surge energy : 2048J
- Surge power: 1,7KVA
- Size: 750L×530W×890H
- Weight: not more than 122kg
- Power supply: AC 220V/15A + 10% 50Hz/±2Hz
- Environment temperature: -25 ~ +65 ℃

Time Domain Reflectometer (TDR.950A Module)



Key Features:

- Fully automated measurement and display of the fault distance
- Test ranges: 100m/300m/500m/1km/3km/5km/ 10km/25km/50km/100km
- High measurement resolution thanks to the 400 MHz sampling rate
- Simple, interactive menu navigation in several languages
- Touch screen and press key operation
- Touch operating screen with smart gesture operation
- Support cursor drag-drop function and double-click function, easy to locate
- Simple function menus with high performance.
- Large LED touch screen for ease of use.
- Simple function menus with high performance
- Large 10.1-inch colour touch screen for easy operation with a 1024x600 resolution
- Waveform storage and PC communication
- Software management, backup and restore in device.
- Waveform storage and communication with computer.
- Internal storage of waveform.
- Mini printer for waveform printing
- Support connection with PC or laptop
- Back light weakens if no operation in 2 min and power off in 10 min. if not operational.

Product Overview

TDR Low current impulse method: apply to the locating of the low resistance fault. Short circuit fault, open circuit fault. It also can be used in the measurement of the cable length, the intermediate joints, T joints, and cable termination joint.

ICM/Decay Impulse current method: apply to the high resistance fault, breakdown fault. Use the current coupler to gather signal from the earth wire, it allows the user to be a safe distance from the high voltage source.

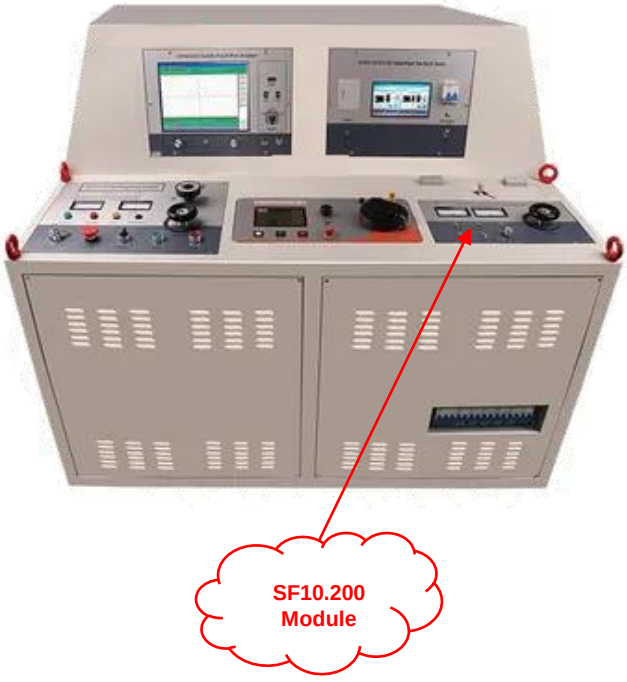
ARM Arc reflection method complete with coupler

- Light, compact and easy to operate
- Main unit for the tried-and-tested pre-location method
- Compliant with the following standards GB/T 18268,1, DL/T849,1-2019 & JJF1042-2020.

Technical specification:

Pulse voltage	0-300V±15%
Pulse width Range	0,15uS – 10us
Voltage-proof up to	400V CAT IV, 50/60 Hz
Output impedance	0 – 50 Ohm
Input signal gain	0 – 75 dB
Measurement range	0 - 120 km
Accuracy	0.1%
Sampling rate	400 MHz
Resolution	0.07 m (at v/2 = 80 m/μs)
Velocity of propagation	(v/2),adjustable 50 – 220 m/μs
Storage capacity	8000 LV pulses 250 Flashover waveforms
Communication interface	USB
Display	10,1” TFT, Colour Touch Screen
Battery type	L-ion battery rechargeable batteries,7.4 V)
Battery life	Approx. 6h contiguous use
Charger	110 – 240 VAC, 50/60 Hz
Operating Temperature	-20℃ – +65℃
Humidity	5-90％RH
Elevation	<4500m (750±30mmHg)
Dimensions (W x H x D)	Approx. 284×168×358mm
Weight Approx.	4,7 kg
Degree of protection	IP65 Case

Cable Sheath Fault Locator Module



Product Overview

- The Sheath Tester SF10 is mainly designed for voltage testing of cable sheaths made of PE or PVC as well as for the location of sheath faults on shielded plastic-insulated cables and the detection of earth-leakage faults in plastic-sheathed cables. In combination with the Sheath Fault Pre-location Device, sheath faults can be pre-located.
- Sheath fault pre-location on shielded medium-high voltage cables.
- Pre-location of line-to-earth faults on plastic-insulated low-voltage cables.
- Pin-Pointing is carried out by means of the Line-to-Earth Fault Locating Device SF10 by measuring the step voltage.
- Due to the excellent burndown effect achieved by the full-wave rectification, this device is very well suited for converting high-resistance cable faults in low-voltage power cables into low-resistance ones.

SF10 HV unit:

Application: to offer signal source for the HV cable sheath fault step-voltage pinpointing.

- Output mode: Min:0.2Hz,Max:5Hz(range adjustable
- Output value: 0-10kV,0-200mA,1kW（max）
- Volume :471×234×318mm, weight: 15kg
- Power : AC220V

HV bridge/cable sheath fault locator

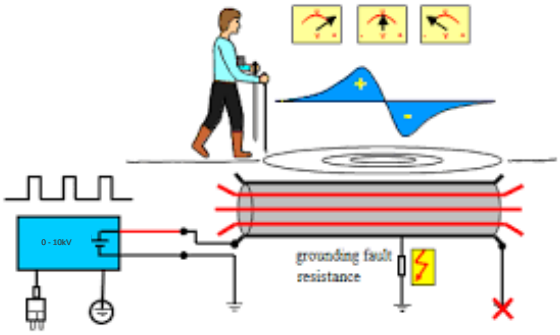
- HV bridge function for power cable main insulation fault pre-location
- Single core fault sheath pre-location
- Signal source of single-core cable sheath fault step-voltage pinpointing
- Power resistance ratio method to pre-locate and no need to do balance adjustment
- Overcome the cable connection resistance influence and high accuracy
- All digital auto testing and no need do manual intervention
- High accuracy digital process and high-resolution colour LCD which clear under the sunshine
- Grounding shutting and HV zero position start to make it safe
- Output:0-10kV，0-100mA，1kW（max）
- Volume :500×280×450mm

SF10 Receiver:

Application: HV single-core cable sheath fault pinpointing.

Work Mode:

- step-voltage: probe input and arrow indicate the fault point direction
- current coupling section: current sensor input and to test the resistive current in the cable to do fault subsect.
- High accuracy and wide responding zone.
- Easy operation and well protect with loop and HV isolation, no HV leakage.
- Easy to read zero center meter for directional indication
- Power supply: Battery operated
- Volume: 226x120x55mm
- Weight: 0.9kgs



Withstand Voltage Burn Down Cable Test Module

Product Overview

- Applicable to DC withstand voltage test for HV electrical equipment, especially in burn through for power cable high resistance fault point to reduce the resistance of fault point, also using in withstand voltage test of cables.
- DC withstand test: 0~60kV DC voltage, constant and adjustable, using in DC withstand test of HV cable and HV electrical equipment.
- High resistance fault burn through: burn through voltage up to 60kV, burn through current up to 600mA, will burn through the fault swiftly.

Key Features:

- The BDT.500 is a very powerful, portable, high voltage unit which is primarily used for locating faults in power cables of the low and medium voltage, mains, as well as in control cables.
- The high output power and short circuit of the unit make it possible in many cases to convert high impedance and intermittent cable faults into low impedance shunts up to dead short circuits without difficulty or to dry wet cable sections.
- The shockproof enclosure of all high voltage parts of the unit and automatic discharging of the test object after shutdown / power failure guarantee maximum protection for the operator and the equipment.
- The unit acts as a current source for locating faults in power and control cables. It is primarily used for burning down high impedance and intermittent cable faults in low and medium voltage power supply networks.

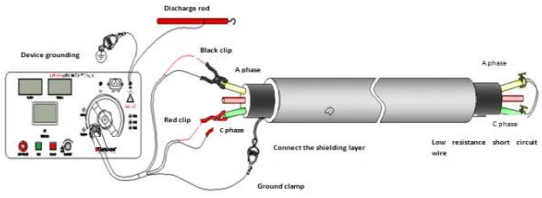
Technical Specification:

Work mode	Continuous
Burn through power	2000W
Output voltage	0 - 60KV Adjustable
Max current	600mA
Test accuracy of voltage and current	1.5%
Power supply voltage	Power Frequency
220V±15%	
Environment temperature	-15℃~55℃
Size	30cm×46cm×50cm
Weight	29kg

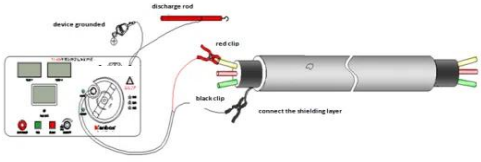
Standard Accessories:

1	Cable fault location intelligent bridge body	1 set
2	Bridge test box	1
3	Spare fuse (10a, 5 × 20)	5
4	Accessory Package	1
5	Accessories	
5.1	Bridge positioning test line	1 piece
5.2	Burn-down source output line	1 piece
5.3	Bridge positioning low resistance short route	1 piece
5.4	Special short wire for bridge positioning	1 piece
5.5	Special grounding wire	1 piece
5.6	Discharge rod grounding wire	1 piece
5.7	power cord	1 piece
5.8	Discharge rod	1 piece
	Options	1 set
	10m low resistance short line (can be used for 110kV ~ 220kV cable)	1 set
	Cable fault connection kit	1

Burn-through test:



Bridge method or section method positioning:



VLF (Very Low Frequency Tester) with Tan Delta Modules

VLF.Series

Product Overview

- The VLF sine wave test series is a compact, robust and portable VLF sine wave test system for medium and High voltage cables.
- Due to the air cooling, the VLF sine wave test series can be used without interruption and is therefore ideal for all users who will be testing with 0.1 Hz sine wave voltages.
- The VLF testing system is easy to use thanks to its single-button operation and clear simply structured menu and large LCD display.
- VLF Series ultra-low frequency AC withstand voltage testers are suitable for many application such as insulation withstand voltage on-site testing of Polyethylene, crosslinked polyethylene plastic cable and other high voltage electrical equipment for power department, industrial and mining company.
- Compared with DC voltage withstand test, this device is deemed as a non-destructive test and is a great alternative to AC frequency voltage withstand testing
- DC withstand test function available with Model S units.

Key Features:

- Data of current and voltage are obtained directly through the sampling of high-pressure side.
- Over-voltage protection: shut down protection operates within 20ms when the output voltage exceeds limits.
- Over-current protection: dual protection of high and low voltage, downtime protection can be accurately set on high-pressure side and shut down protection operates within 20ms when the current of the low-voltage side exceeds current limits.
- High-voltage output protection resistor is integrated in the HV booster which eliminates the need for an additional outside resistor.
- The settings allow you to regulate the frequency which can be adjusted to the following output frequency to 0.1,0.05 and 0.02HZ
- Closed-loop negative feedback control circuit of high and low voltage.
- Measurement accuracy: 3%
- Positive and negative voltage peak errors: ≤ 3%
- Voltage wave form distortion: ≤ 5%
- Operating Temperature (indoor and outdoor): -10℃~+40℃
- Humidity: ≤ 85%RH
- Power: AC50Hz, 220V ±5%

AC Ultra-low frequency testing

Model	Rated Voltage	Load Carrying Capacity	Product structure, weight, application range
VLF30/40kV	30/40kV （Peak）	Automatic frequency change：0.1Hz-0.01Hz On-load capacity：≦10μF	Controller: 4kg Booster: 25kg Used for voltage test of cables and motors within 11KV(30kV model) 22kV(40kV model)
VLF50kV	50kV （Peak）	Automatic change frequency: 0.1Hz-0.01Hz Load capacity: ≦10μF	Controller: 4kg Booster: 25kg Used for voltage test of cables and motors within 22KV
VLF60kV	60kV (Peak)	Automatic change frequency: 0.1Hz-0.01Hz Load capacity: ≦5μF	Controller: 4kg Booster: 25kg Used for voltage test of cables and motors within 33KV
VLF80/90kV	80/90kV (Peak）	Automatic change frequency: 0.1Hz-0.01Hz Carrying capacity: ≦10μF(within 50kV), ≦4μF(above 50kV)	Controller: 4kg Primary booster (40kV) : 25kg Two stage booster (40/50kV) : 45kg Used for voltage resistance test of cables and motors greater than 35KV

DC Withstand voltage test

Main technical indicators

1.Output rated voltage: 0-30/50/60/80/90kV
2.Voltage accuracy: 3%
3.DC leakage current range: 0-20mA
4.DC leakage current resolution: 1μA
5. DC leakage current accuracy: 3%

Operation method

The operation method is the same as the ultra-low frequency AC test operation, and the connection method is the same. Enter the parameter setting interface below and set the test voltage and test time first, then click DC Test; to start boosting the voltage. It will stop automatically when the timer is full. Click the stop button to stop immediately. After shutdown, the instrument cannot discharge automatically and must be discharged manually.

Please not that Models S will need to be ordered should the DC Withstand Voltage function be required. **(eg VLF50kV S)** and the ST version for the Tan Delta module inclusion **(eg VLF60KV ST)**

Tan Delta Option: Technical Specifications

Dielectric loss test voltage range	1kV-90kV (low test voltage affects test accuracy)
Dielectric loss test frequency:	0.1Hz
Dielectric loss measurement range	0.01 × 10 -3- 655.35 × 10-3 for sizes greater than 655.35 × The value of 10 -3 will be greater than 655.35 × 10 -3 Reminder
Dielectric loss measurement accuracy:	1%
Dielectric loss resolution:	1x10 -5
Capacitance measurement range:	0.001 μ F–10 μ F
Electrical capacity resolution:	0.001 μ F
Capacitance measurement accuracy	3%
Insulation resistance measurement range:	1MΩ -65535MΩ. For values greater than 65535MΩ, a prompt of>65535MΩ will be given (these data are located in the qualified area of the cable).
Insulation resistance resolution:	1M Ω
Insulation resistance measurement accuracy	3%
Voltage accuracy:	3%
AC current range:	0-59mA
AC current resolution:	0.1mA
AC current accuracy:	3%
DC current range:	0-20mA
DC current resolution:	1 μ A
DC current accuracy:	3%
RS232 (or USB) communication interface	

Surge Wave Fault Pin-pointer

IP65

touch

Colour Display

GM.2000

Product Overview

- The cable fault locator uses the principles of vibration pickup and electromagnetic induction to determine the specific location of the cable fault point.
- A high-voltage pulse generator is used to cause flash over discharge at the fault point. Physical phenomena such as vibration waves, sound waves, and electromagnetic waves generated by the flash over discharge at the fault point are picked up by a special probe of the pointing instrument, amplified, processed, displayed, and output by the cable fault pointing instrument.
- The precise location of the fault point is determined by the tester's hearing and vision. That is, the task of accurately locating the cable fault point "directly above the cable and within the range of rough measurement" is completed.
- This fixed-point instrument is suitable for low-resistance, short-circuit, open-circuit and disconnection faults of power cables, high-frequency coaxial cables, street light cables, and buried wires made of various materials with different cross-sections and media, as well as high-resistance leakage and high-resistance flash over fault.

Operating Methods:

1. Acoustic-magnetic synchronization method:
Acoustic-magnetic synchronization method is a very accurate and unique method for precise fault location. Its principle is based on the traditional acoustic point determination method and adds the detection and application of electromagnetic signals.
When the high-voltage generator performs impact discharge on the faulty cable, the sound generated by the discharge at the fault point is transmitted to the ground. The sound signal is picked up by a highly sensitive probe. After amplification, a "pop" sound can be heard by listening with headphones. The built-in probe of the probe receives the magnetic field signal in real time and uses the principle that the propagation speed of the magnetic field is much higher than the propagation speed of sound to determine the distance of the fault point by detecting the time difference between the electromagnetic signal and the sound signal. Keep moving the sensor position to find the point with the smallest acoustic-magnetic time difference, then the exact location of the fault point will be below it.
Traditional acoustic measurement legal point instruments generally only use earphones to monitor or are supplemented by the swing of the meter pointer to identify the discharge sound at the fault point. Since the discharge sound disappears in a blink of an eye and is not much different from the ambient noise, it often brings great difficulties to operators who are not very experienced. The acoustic-magnetic synchronization method effectively avoids the above problems of the traditional acoustic measurement method.

2. Pure sound method:
The pure sound method consists of an acoustic vibration sensor, a signal amplifier, a filter circuit, a sampling unit, a processor, a display unit, a power amplifier unit, headphones, etc. The pure sound method is mainly used to measure high resistance and flashover faults. Its main principle is to use a high-voltage source to apply impulse voltage to the fault cable to cause discharge breakdown at the fault point, and then use the sound generated during the discharge to accurately locate the fault. The acoustic vibration sensor converts the acoustic signal into an electrical signal, which is amplified and filtered by a signal amplifier and filter circuit. Finally, it is restored to sound through headphones, or the intensity of the sound is displayed. The place with the greatest sound intensity is the fault point.

3. Pure magnetic method:
The pure magnetic method can determine the cable path and the precise location of the cable fault point. Its main principle is to use a high-voltage source to apply impulse voltage to the faulty cable, use an induction coil to pick up the pulse signal, and judge whether it deviates from the cable through the characteristics of the pulse signal. When the characteristics of the picked-up pulse signals deviate, it is determined as a fault point.

4. A-frame method:
If a ground fault occurs in a buried cable, we can use the potential difference method to find the fault point. The method is to add a test voltage between the test point of the faulty cable and the ground, then a distributed electric field concentric with the entry point will be formed around the entry point of the cable. There is no potential difference between any points with the same radius in this electric field, but there is a potential difference between any two points with different radii (points A and B in the figure), and when the distance between the two points is fixed, the distance between the two points is The closer the object is, the stronger the potential difference is. Using this feature, we can move points A and B gradually closer to the center point. When the fault point is exactly between points A and B, the potential difference becomes zero. If it continues to move beyond the fault point, the polarity of the potential difference will be reversed, so that the grounding point can be accurately determined by moving back and forth

ID.550

Product Overview

Live cable identification instrument, also known as cable identification instrument, multi-function cable identification instrument, and intelligent cable identification instrument, is designed for power cable engineers and cable workers to solve the technical problems of cable identification.

The user can accurately identify one of the target cables from the multiple cables through the instrument, so as to avoid accidentally sawing the live cables and causing serious accidents. The cable identification starts from the operation at both ends of the cable.

The double numbering at both ends of the cable must be ensured to be accurate. This instrument is designed with PSK technology combined with precise algorithms. No matter how reliable the memory of on-site staff is, it cannot replace the recognition of professional instruments.

This product also has the functions of live cable identification, power failure cable identification, AC current test, and AC voltage test. It is composed of a transmitter, a transmitting current clamp, a receiver, and a receiving flexible current clamp.

Measuring Function:

- **Transmitter:** It transmits signals to the target cable during the identification of live cables and power-off cables. Built-in high-performance rechargeable lithium battery, automatic impedance matching, and automatic protection. The transmitter adopts an integrated special toolbox design, uses polypropylene plastic as raw material, and adds new composite fillers for one-time injection molding. It has low density, strength, rigidity, hardness, wear resistance, heat resistance, and insulation performance. The cabinet can withstand a pressure of about 200kg, the host's large LCD displays the remaining battery power in real time, white backlight, and dynamic indication of the emission signal, which is clear at a glance.

- **Transmitting clamp:** When the live cable is identified, the transmitting clamp couples the signal from the transmitter to the target cable. The jaw size is Φ120mm. The transmitting clamp has directivity. The transmitting signal flows in from the direction indicated by the arrow on the transmitting clamp.

- **During live identification:** use calipers to couple output pulse currents, emit four frequencies: 625Hz, 1562Hz, 2500Hz, 10kHz, couple to the target cable (target cable is a three-core armored cable) through the transmitter, and inject composite pulses into the cable core Current signal, the pulse current generates an electromagnetic field around the target cable for the receiver and flexible current clamp to detect and identify; because the pulse current is directional, the detection is also directional.

- **When power failure identification:** Directly connected output pulse current is used to inject pulse encoding current signal into the cable core. This current generates an electromagnetic field around the target cable for the receiver and flexible current clamp to detect, decode, and identify; because the current has directivity, so Detection is also directional.

- **Receiver:** It is a handheld device, 3.5-inch color LCD screen, built-in high-speed microprocessor, combined with precise algorithms, to identify and decode the pulse code current signal of the transmitter, and has a signal strength calibration function to display signal strength and detection results. Exquisite and intuitive; dynamic display of color scale bars, clear at a glance, successful cable identification check mark, non-target cable check mark, can quickly and automatically identify the target cable. At the same time, the testable voltage range is AC 0.00V~600V (50Hz/60Hz), the measurable AC current range is AC 0.00A~5000A (50Hz/60Hz), and the measurable current frequency is 45Hz~70Hz.

- **Flexible current clamp:** It is a Rockwell coil with excellent transient tracking ability, can quickly identify the pulse code current generated by the transmitter, and is suitable for thick cables or irregularly shaped conductors. The inner diameter of the jaw is about 200mm, and it can clamp cables below Φ200mm, without disconnecting the tested circuit, non-contact measurement, safe and fast.

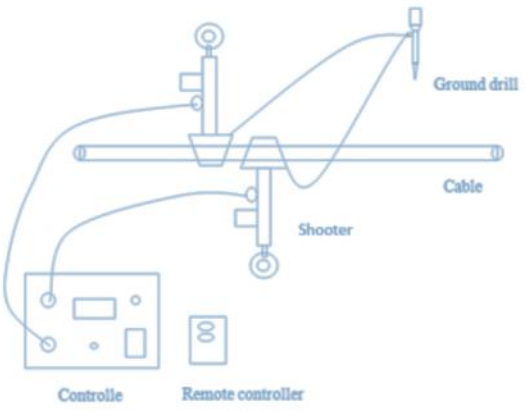
- **Special note:** This cable identification instrument has both live cable identification and De-energised cable identification functions. When power failure cable identification, it is strictly forbidden to connect to the live cable. Live cable identification is only applicable to three-core armored cables. When identifying, the transmitting clamp and receiving clamp cannot be mixed, and the direction of the input signal must be consistent.

CST.200

Product Overview

- The cable spiking gun is divided into two parts: the firing head (Gun Body) and the controller: the firing head of the cable spiking gun is a low-speed piston-type special device designed for piercing the cable.
- Its structure is light weight is very simple to install on the cable for operation.
- The cable spiking gun is designed to operate remotely from a safe distance, causing a short circuit on a live cable which will cause a flash and discharge.
- A single gun body can only produce one short circuit point on the cable at a time, and a double gun body can produce two short circuit points on the cable at a time.
- Since the three-phase cable is usually in the shape of a multi core cable, if a single gun has pierced the cable, it is possible to be in the gap of a multi core Cable (that is, the gap between the two phases) this is why 2 spiking gun bodies are supplied so the operator can use spiking head A and B simultaneously which in turn will ensure a short circuit is created.

Operation Diagram:



Specifications:

- Shooter: 2 spiking bodies;
- Remote control distance: more than 10 meters, you can remote control through the wall;
- Control line length: 5 meters;
- Fixture diameter: φ30-150mm;
- Working power supply: charging AC 220V/50Hz, the built-in battery can work continuously for more than 10 hours;
- Controller: 270×230×120mm 2.5kg;
- Whole set： 470×380×210mm 15.5kg (Double tools 506S)
- S1 red rounds (Level 5)

Optional Inverter / Battery System Power Supply

FT-Series

Model	FT-102	FT-152	FT-202	FT-302	FT-402	FT-502	FT-602
Rated power	1KW	1.5KW	2KW	3KW	4KW	5KW	6KW
Surge power	3KW	4.5KW	6KW	9KW	12KW	15KW	18KW
AC Input & Output							
Voltage	220VAC						
Selectable Voltage Range	165-275VAC (220VAC)						
Frequency Range	50Hz/60Hz automatic recognition						
AC Voltage Regulation (BATT. Mode)	(DC Batt.mode)220vac±3%						
Transfer Time	≤4ms						
Wave Form	Pure Sine Wave						
Transformer type	Toroidal						
Transfer efficiency	≥85%						
Battery							
Battery Voltage	12V/24V		12V/24V/48V		24V/48V		
Type	Gel/SLA/AGM/Water/Lithium(lifepo4) Battery						
DC Charge Voltage	12~16VDC(12V)/20~32VDC(24V)/40~64VDC(48V)						
Overcharge Protection	Battery voltage ≧16VDC (12V) ≧32VDC (24V) ≧64VDC (48V), stop charging after 60s alarm						
AC Charger							
Maximum Ac Charge Current	35A (adjustable)						
Working mode							
01 mode	AC mains priority mode						
02 mode	ECO mode						
03 mode	DC battery priority mode						
04 mode	Generator mode						
05 mode	Unattended mode						
Communication Port							
Type	RS485, available for wifi box & external control screen						
Physical							
Dimension, D*W*H(MM)	600*380*170				780*380*280		
G.W.(KGS)	15	17	19	21	31	33	35
Environment							
Humidity	0~95%（NO CONDESNSATION)						
Operating Temperature	0~60℃						
Storage Temperature	0~60℃						

Battery System Specifications (Lithium Ion Batteries)

Weight: 12kg
Dimensions: 70cm (L) x 39cm (W) x 28cm (H)

Weight 24.78 kg X 4
Dimensions 21.6 × 32.8 × 17.2 cm (Per unit)

Technical Information:

Electrical Characteristics	Nominal Voltage	12.8V
	Nominal Capacity	100Ah@0.2C
	Energy	1280Wh
	Internal Resistance	≤50mΩ
	Cycle Life	6000 Cycles @ 0.2C Charging/Discharging ,Until 70% Capacity
	Self Discharge	≤3.5% per month at 25℃
Standard Charging	Max.Charging Voltage	14.0~14.6V
	Charging Mode	At 0℃~45℃ temperature, charged to 14.6V at a constant current of 0.2C, and then, changed continuously with constant voltage of 14.6V until the current was not more than 0.02C
	Charging Current	20A
	Max.Charging Current	50A
Standard Discharging	Discharging Current	50A
	Max. Continuous Current	80A
	Max.Pulse Current	200A(<3S)
	Discharging Cut-off Voltage	10.0
Operating Condition	Charge Temperature	0℃ to 45℃(32℉ to 113℉) @60±25% Relative Humidity
	Discharge Temperature	-20℃ to 60℃(-4℉ to 140℉) @60±25% Relative Humidity
	Storage Temperature	0℃ to 45℃(32℉ to 113℉) @60±25% Relative Humidity
	Water Dust Resistance	IP55
Structure	Cell & Format	IFR32700 N65,4S17P
	Casing	Plastic
	Dimension(L*W*H*TH)	328*172*216*216
	Weight	Approx. 13Kg
	Terminal	M8