



TINPENG



RAILWAY MEASURING INSTRUMENT

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OVERVIEW

TPJC-2 Portable Railway Catenary System Geometrical Parameters Measuring Device is a multifunctional precise measuring instrument. The device consists of laser ranging module, grating angular measuring module, track gauge measuring sensor, and horizontal super elevation measuring modules.

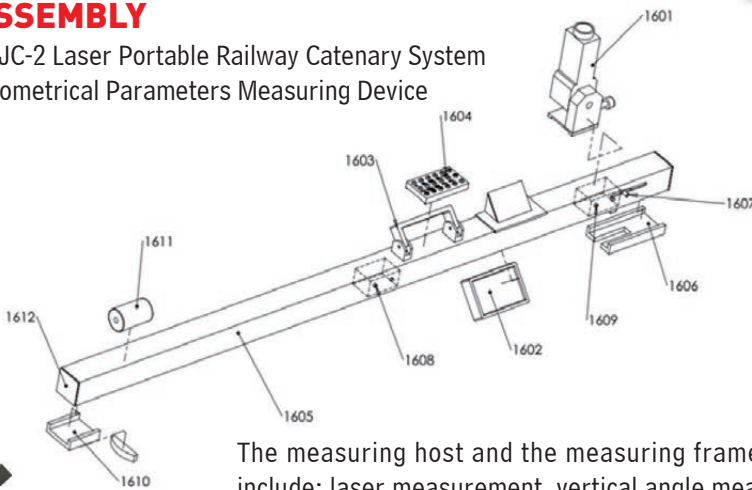
This device integrates laser non-contact detection ranging technology, rating angular technology, two-dimensional coordinate measuring system and sensor information fusion technology. Use Windows CE operating system to design user interface framework. It provides a perfect solution for the measuring catenary system geometrical parameters.

The unit is lightweight(4.7kg) and is provided with a protective box for easy transportation to and from site. All data is displayed on a colour screen. The files can be opened and viewed in TXT file.



ASSEMBLY

TPJC-2 Laser Portable Railway Catenary System Geometrical Parameters Measuring Device



- 1601. Laser ranging module
- 1602. Illuminated LCD touch screen
- 1603. Handle
- 1604. Keyboard controller
- 1605. 1435mm measuring beam, (imperial sizing optional)
- 1606. Sprung foot block
- 1607. Sprung jig
- 1608. Super elevation measuring module
- 1609. Track gauge measuring module
- 1610. Fixed foot block
- 1611. Lithium battery
- 1612. Plastic seal cap

The measuring host and the measuring frame are integrated into TPJC-2. The host functions include: laser measurement, vertical angle measurement; the measurement frame is a horizontal beam placed horizontally between the rails, mainly supporting the measurement host, measuring the track gauge, the horizontal tilt angle and so on.



MAIN TECHNICAL PARAMETERS

MECHANICAL PARAMETERS

Weight	4.7Kg
Dimension	1620(L)x160(W)x175(H)mm

WORKING CONDITION

Working temperature	-20~+50 C
Related humidity	≤90%RH
Altitude	≤2500m
Classification of waterproof	IP65

TECHNICAL SPECIFICATION

		Range	Accuracy
Cable Height		5100~6500mm	±3mm
Cable stagger		±600mm	±5mm
Gross center	Height	5100~6500mm	±3mm
	Deviation Value	±600mm	±5mm
Elevation difference at 500mm			±4mm
Track gauge		1410~1470mm	±0.5mm
Super-Elevation(horizontal)		±185mm	±1mm
Red Line			±4mm
Mast gauge		2400~6500mm	±5mm
Dropper Space			±5mm
Overlap section	Horizontal distance		±7.5mm
	Vertical distance		±5mm
Distance between railway transmission lines and contact wire			±4mm
Free measurement	Horizontal distance		±4mm
	Vertical distance		±3mm
Mast span on both sides of the track		35000mm	±5mm
Registration arm slope		1:n(n accurate to 0.1)	

ELECTRICAL PARAMETERS

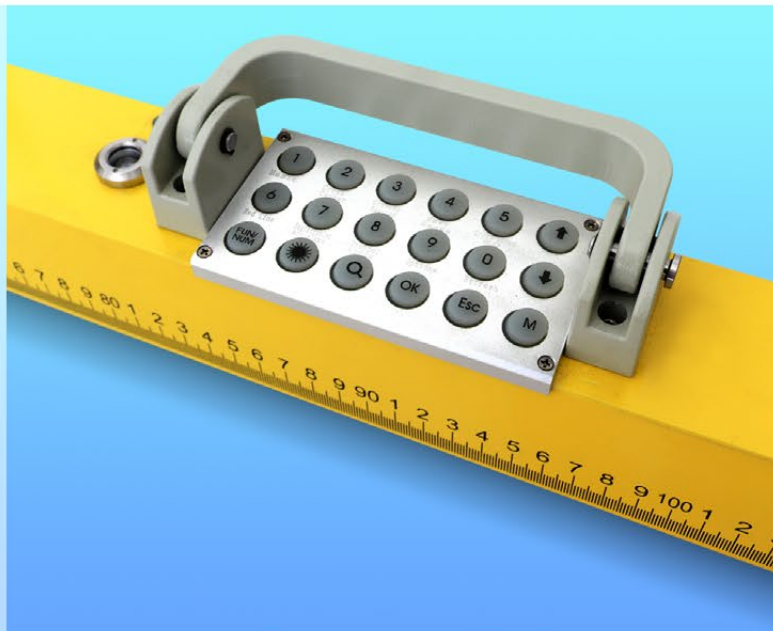
Voltage	12V
Electric current	500mA
Continuous working time	no less than 12 hours
Laser wavelength	650nm
Test data can be exported to TXT file via USB	
GPS function should be ordered separately	
Operating system	Windows Embedded CE 6.0
Software interface and logo can be customized	

FUNCTIONS

- Track gauge measurement
- Super elevation measurement
- Cable height measurement
- Cable stagger measurement
- Cross center measurement
- Overlap section measurement
- Mast gauge measurement
- Elevation difference measurement at 500mm
- Red line measurement
- Registration arm slope measurement
- Dropper space measurement
- Mast perpendicularity measurement
- Data storage and export TXT file to computer
- GPS(optional)

KEYBOARD

There are 18 buttons in this keyboard among which the following 10 buttons: 1,2,3,4,5,6,7,8,9,0 have two functions. Switch by pressing the "Func/Num" button to input the number or enter corresponding function interface. Detailed introduction will be showed in the following part.



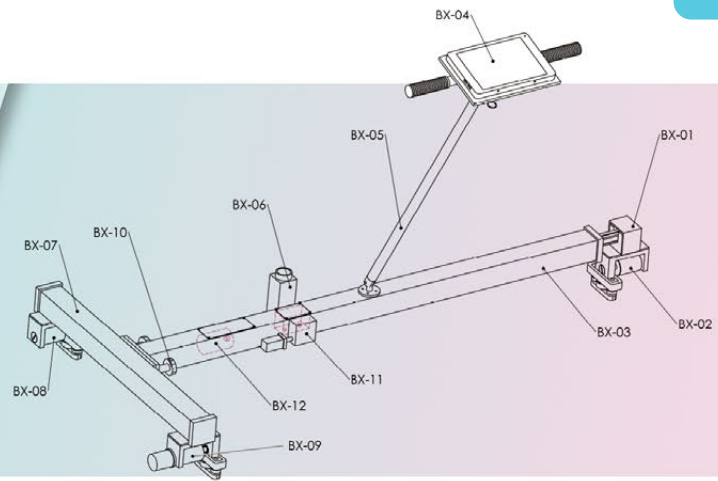
"Options" button is designed for special geometrical parameter measuring function:(a) mast perpendicularity measuring, definition:Schematic diagram M;(b) span measuring, definition: schematic diagram N; (c) tunnel section measuring, definition: schematic diagram O; default options function is to measure mast perpendicularity(a).

Turn on the power switch(The power switch is on one side of the LCD screen.), boot time is about 4-5 seconds, the basic function interface showing in LCD screen first.



ASSEMBLY

TPJC-XC Portable Trolley for Overhead Line Catenary and Tunnel Section Geometry Measurement is mainly composed of a measurement host part and a measurement trolley. The measurement host part includes industrial computer, measuring trolley, motor, three insulation rollers, automatic tracking laser measuring system, camera and other sensors.



XC-01. Linear guide rail

XC-03. 1435mm measuring beam(imperial sizing optional)

XC-05. T-handle push rod

XC-07. Vertical beam

XC-09. Zirconia Counter wheel

XC-11. Laser head rotating mechanism

XC-02. Zirconia Road wheel(right)

XC-04. Pad measurement controller

XC-06. Laser ranging module

XC-08. Zirconia Road wheel(left)

XC-10. Lock screw

XC-12. Lithium battery



MAIN TECHNICAL PARAMETERS

WORKING CONDITION

Working temperature	-20~+50℃
Related humidity	≤90%RH
Altitude	≤2500m
Classification of waterproof	IP65

ELECTRICAL PARAMETERS

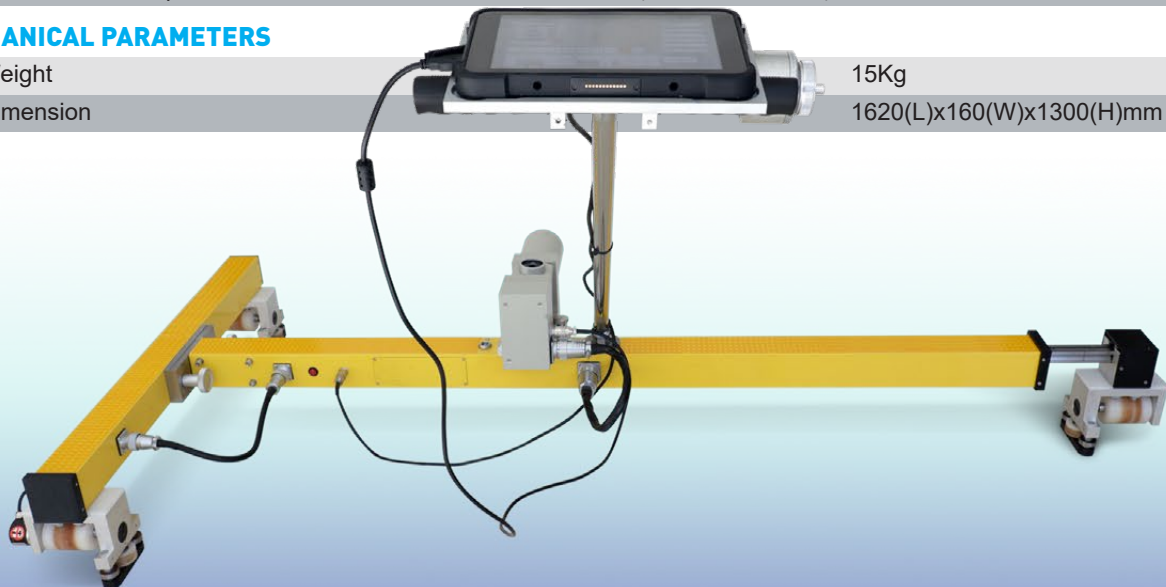
Voltage	16.8V
Electric current	390mA
Continuous working time	no less than 15 hours
Laser wavelength	650nm
laser safety grade	class 2

TECHNICAL SPECIFICATION

	Range	Accuracy
Cable Height	5100~6500mm	±3mm
Cable stagger	±600mm	±5mm
Gross center	Height	5100~6500mm
	Deviation Value	±600mm
Elevation difference at 500mm		±4mm
Track gauge	1410~1470mm	±0.5mm
Super-Elevation(horizontal)	±185mm	±1mm
Red Line		±4mm
Mast gauge	2400~6500mm	±5mm
Dropper Space		±5mm
Overlap section	Horizontal distance	±7.5mm
	Vertical distance	±5mm
Distance between railway transmission lines and contact wire		±4mm
Free measurement	Horizontal distance	±4mm
	Vertical distance	±3mm
Mast span on both sides of the track	35000mm	±5mm
Tunnel section Parameter	Measuring radius	0.05-100m any point 1mm
	Azimuth coverage	0-180°
Operation system	Windows 10	
Registration arm slope	1:n(n accurate to 0.1)	

MECHANICAL PARAMETERS

Weight	15Kg
Dimension	1620(L)x160(W)x1300(H)mm



BASIC PARAMETER MEASUREMENT

After booting, the device will automatically enter the “basic parameter measurement” interface and display 4 basic parameters columns. A red cross-line will be in the center of the left part of the LCD screen. By moving the measuring beam frame position back and forth and rotating the laser heads left and right, till the cross-line center and the target object to be measured are completely coincident aimed and all clear showing in the screen.

When aiming, you can use the laser head to make coarse adjustments by hand, and then fine-turn the fine-tuning knob as needed, until object aim at the target.

Click the “M” button and wait for the “Cable

Click “Lock Contact Network” to lock the current. After aiming at the target, you can press measure and display the measuring target, the screen shows “Retry to enter the dead zone or misaligned target, please measure again.”

When measuring the stagger, the stagger value is positive when the wire is deflected toward the measuring beam fixed foot block direction; the stagger value is 0 when the measured target is in the center of the rail. When the wire is toward to the beam sprung foot block direction, the stagger value is negative.

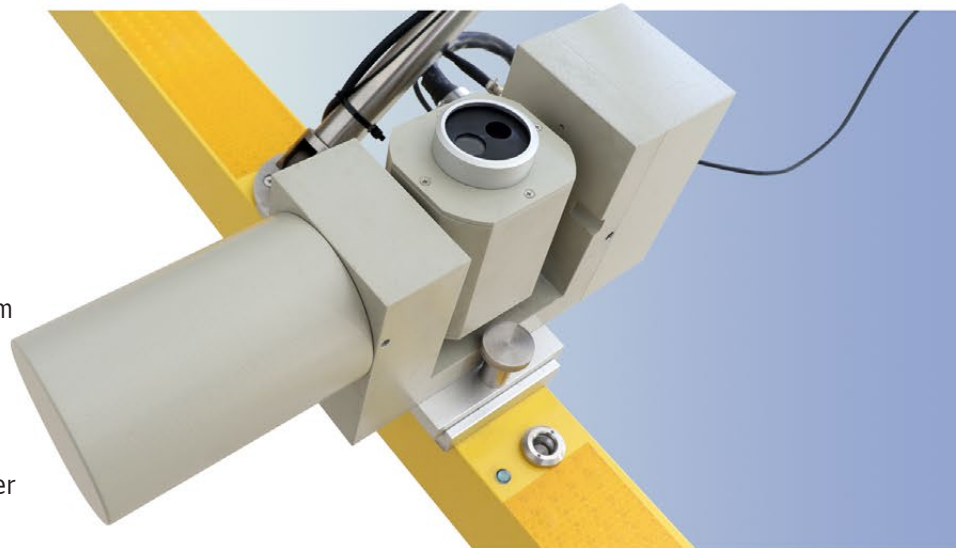
Height” and “Cable Stagger” to display normally. rent contact network.

the corresponding function button to ment result; if there is no the prompt message



FUNCTIONS

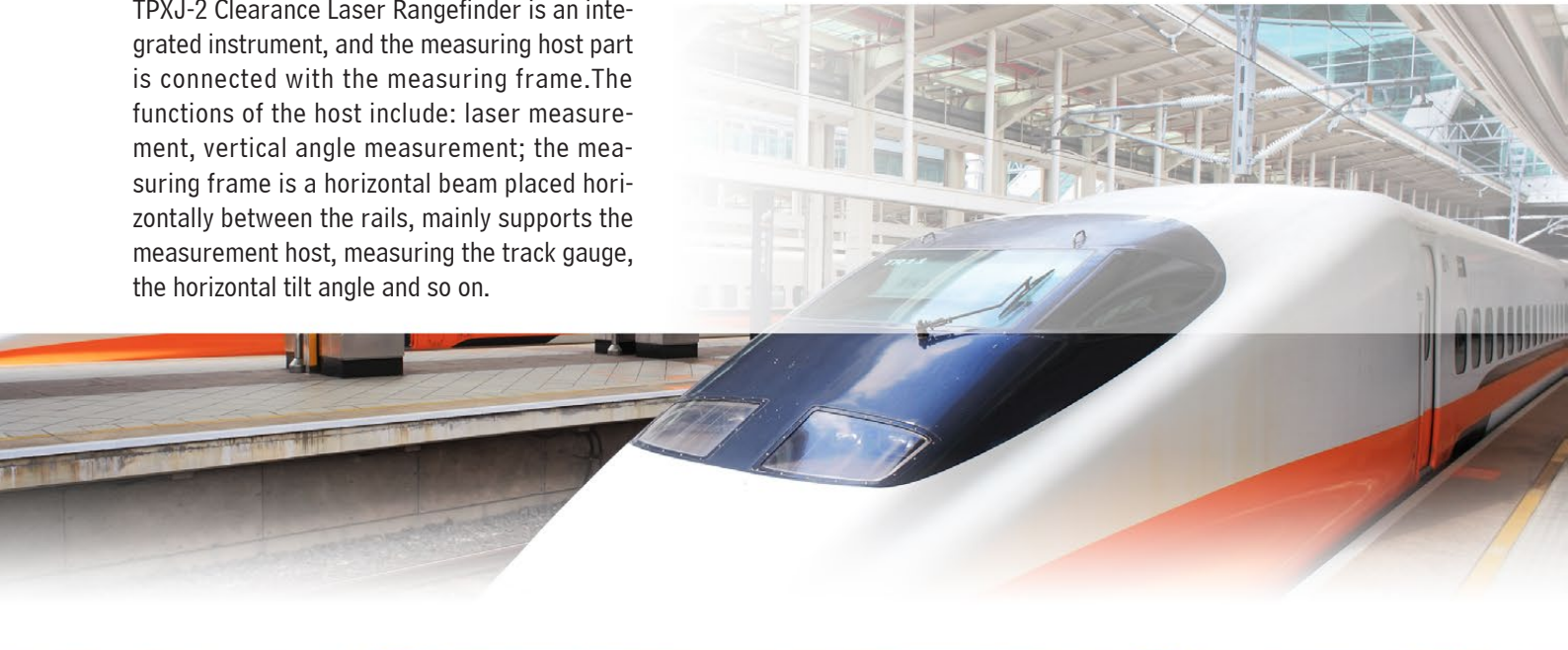
- ⊙ Track gauge measurement
- ⊙ Super elevation measurement
- ⊙ Cable height measurement
- ⊙ Cable stagger measurement
- ⊙ Cross center measurement
- ⊙ Overlap section measurement
- ⊙ Mast gauge measurement
- ⊙ Elevation difference measurement at 500mm
- ⊙ Red line measurement
- ⊙ Registration arm slope measurement
- ⊙ Dropper space measurement
- ⊙ Mast perpendicularity measurement
- ⊙ Data storage and export TXT file to computer
- ⊙ GPS(optional)



OVERVIEW

TPXJ-2 Clearance Laser Rangefinder is an intelligent catenary ranging instrument. The system consists of laser ranging, grating angular and track gauge measuring module and horizontal measuring module. This device integrates laser non-cooperative target ranging technology, two-dimensional coordinate measuring system of grating angle measurement technology and sensor information fusion technology etc. It provides a perfect solution for the construction of digital management platform of catenary parameters, the erection and "Condition Based Maintenance" of catenary of electrified railway.

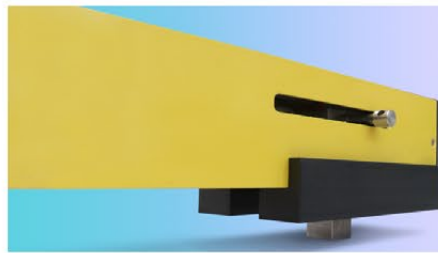
TPXJ-2 Clearance Laser Rangefinder is an integrated instrument, and the measuring host part is connected with the measuring frame. The functions of the host include: laser measurement, vertical angle measurement; the measuring frame is a horizontal beam placed horizontally between the rails, mainly supports the measurement host, measuring the track gauge, the horizontal tilt angle and so on.



MAIN TECHNICAL PARAMETERS

WORKING CONDITION

Working temperature	-20~+50 C
Related humidity	≤90%RH
Altitude	≤2500m



TECHNICAL SPECIFICATION

	Range	Accuracy
Track gauge	1410~1470mm	2mm
Super-Elevation(horizontal)	-200~+200mm	3mm
Horizontal distance of the measured point from the center of the track (clearance)	240~10000mm	±1mm
Height of the measured point relative to the rail plane (cable height)	0~10000mm	±1mm
The vertical height of the measured point from the center of the track	0~10000mm	±1mm

ELECTRICAL PARAMETERS

Voltage	12V
Electric current	500mA
Continuous working time	no less than 12 hours
Laser wavelength	650nm

MECHANICAL PARAMETERS

Weight	4.5Kg
Dimension	1620(L)x160(W)x175(H)mm



Rail straightness directly influences the running speed of the train and the comfort of passengers, even the running safety. Portable Laser Straightness Gauge is a user-friendly and simple to use instrument designed to measure without contact the rail geometry.

MAIN PURPOSE

Detecting short-wave irregularities

Detecting the quality of rail welded joints

Guide the repair of welded joints according to the waveform diagram

MEASUREMENT PRINCIPLE

- ▶ Rail top surface measurement adopts laser sensor to measure the middle line of rail top with sampling interval of 1mm.
- ▶ The principle of rail side measurement is similar to that of rail top surface measurement. The difference is that the rail top surface measurement is carried out in the vertical plane, while the rail side measurement is carried out in the horizontal plane. The measurement point is 16mm below the rail top surface.

ASSEMBLY

Rail straightness measuring instrument is mainly composed of two parts: frame and PDA. The laser sensor, signal processing interface board, power supply module and other integrated devices are installed on the rack. The rack and the PDA are connected by wireless communication.

FRAME

The frame is fixed on the top.

SENSOR

Laser displacement sensor with high accuracy to measure the short-wave irregularity on the top and inner working side of the rail.

SIGNAL PROCESSING INTERFACE BOARD

The weak signal of the sensor is amplified and filtered for digital conversion, and provides an interface to the computer.

POWER MODULE

Provide long-term and stable power for laser sensor and signal processing interface board.

DIAGNOSTOR

It processes and stores digital signals, displays measurement data in real time.



MAIN FEATURES

The precision guide rail is adopted as the measurement baseline, which can accurately reflect the real value and eliminate the principle defects in the original measurement method of steel plate ruler and feeler gauge. At the same time, many new technologies are applied, such as using high-precision laser displacement sensor to measure the chord height, and using special collector or laptop to collect and process data.

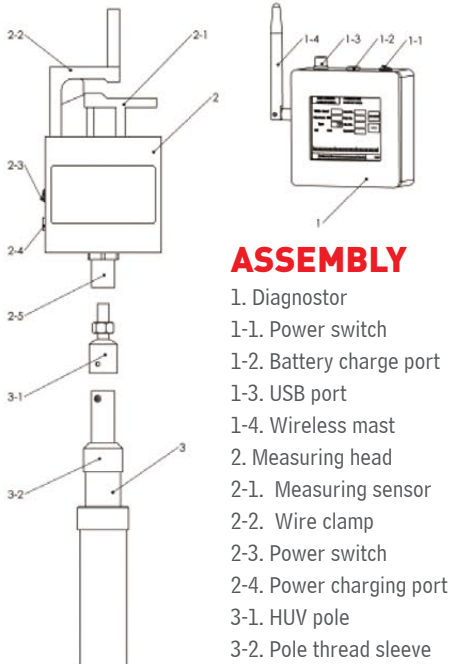


Ambient temperature	-30 ~ +50 °C
Rail temperature	-20~ +60 °C
Related humidity	≤90%RH
Protection class	IP54
Rails which can be measured	UIC54, UIC 60...
Measuring basic length	1.0 m (customizable)
Horizontal resolution	1000 measuring points
Vertical resolution	0.01 mm
Measuring accuracy	0.02mm
Measuring range	-2~ +1mm
Measuring time	7s
Measuring principle	Laser measurement photoelectric image principle
Laser wavelength	650nm
Memory capacity	10000 welding profiles
Electric current	3500 mAh
Charging time	approx. 10 hrs
Connection interfaces	USB or Bluetooth
Battery power	> 1000 times measurement
Standard requirements	EN 61000-4-2 EN 55022
Weight	5 kg
Dimensions (W×D×H)	1230 × 165 × 110 mm



FUNCTIONS

The wear measurement device can measure the overhead catenary system contact line. The measuring head adopts the high-precision sensor as the image acquisition key measuring part, the measuring head, wireless data receiver and one pc Ultrahigh voltage insulating rod assemble one full set measuring device. Worker holds UHV voltage insulating rod to push the measuring head touches each measurement point, full system uses Zigbee technology data to transmit measuring values wirelessly, wireless diagnostor collect the measuring data and to do data analysis and storage. The wireless diagnostor uses touch screen computer technology, operator may input working area marks like area No./Line No./Pole No. The Wear Measurement Device uses a special software to statistically analyze the contact line wear area data, and can connect PC to exchange data and print out the specified report specifications via USB port.



MAIN TECHNICAL PARAMETERS

Measuring height	1m~6.5m
Scope of application	DIN48201standard TJ10/16/25/35/50/70/95/120/150/185/240/300/400/500 DIN43138 Standard TJR16/25/35/50/70/95/120/150/185/240/300
Measurement accuracy	0.02mm
Data transmission	Zigbee technology, data wireless transmission, ground receiving terminal synchronous display
Display content	Pillar number, wire wear width, wear percentage prompt
Storage	Applause computer(added) real-time storage
Insulation performance	Suitable for power frequency, single-phase(AT27.5KV,BT25KV) contact network live working
Portable	Probe weight<1kg
Power	Probe and receiver using lithium-ion batteries
Power consumption	Can work continuously for 8 hours at room temperature
Working environment	-10℃~+50℃
Relative humidity	80%

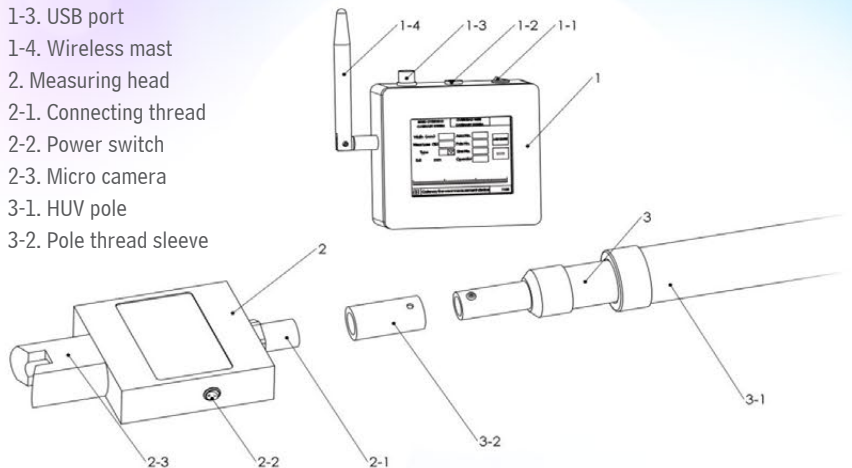


FUNCTIONS

The wear measurement device can measure the rigid catenary system contact line. The measuring head uses the wireless micro camera as the image acquisition key measuring part, the measuring head, wireless data receiver and one pc Ultrahigh voltage insulating rod assemble one full set measuring device. Worker holds UHV insulating rod to push the measuring head touches each measurement point, full system uses Zigbee technology data to transmit measuring values wirelessly, wireless diagnostor collect the measuring data and to do date analysis and storage. The wireless diagnostor uses touch screen computer technology, operator may input working area mark like area No./Line NO./Pole NO. The wear measurement device uses a special software to statistically analyze the contact line wear area data, and can connect PC to exchange data and print out the specified report specifications via USB port .

ASSEMBLY

1. Diagnostor
 - 1-1. Power switch
 - 1-2. Battery charge port
 - 1-3. USB port
 - 1-4. Wireless mast
2. Measuring head
 - 2-1. Connecting thread
 - 2-2. Power switch
 - 2-3. Micro camera
3. HUV pole
 - 3-1. HUV pole
 - 3-2. Pole thread sleeve



MAIN TECHNICAL PARAMETERS

Measuring height	1m~6.5m
Scope of application	CT85,110,120,150 or other DIN 43141/TB/T2810 wire
Measurement accuracy	0.02mm
Data transmission	Zigbee technology, data wireless transmission, ground receiving terminal synchronous display
Display content	Pillar number, wire wear width, wear percentage prompt
Storage	Applause computer(added) real-time storage
Insulation performance	Suitable for power frequency, Single-phase(AT27.5KV,BT25KV) contact network live working
Portable	Probe weight < 1kg
Power	Probe and receiver using lithium-ion batteries
Power consumption	Can work continuously for 8 hours at room temperature
Working environment	-10℃~+50℃
Relative humidity	80%