



TTK-7000 USER's MANUAL

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Chapter I.

Fusion Splicer

SAFETY REQUIREMENTS

At any stage of operation on the optical fiber fusion splicer, you must take the following general safety precautions. Not take these warnings and precautions or not comply with the warnings which described in this manual, would violate the fusion splicer design, manufacture and use of safety standards. My company does not assume any responsibility for the consequences of breaching these requirements for users caused!

● Operation environment and Power

Fusion splicer operation, storage environment and working power requirements

Operating temperature: $0\sim+40^{\circ}\text{C}$ Limit temperature: $-10^{\circ}\text{C}\sim+50^{\circ}\text{C}$
Operating humidity: 95%RH or less (no condensation) Maximum wind speed: 15m/s
Storage conditions: $-20^{\circ}\text{C}\sim+60^{\circ}\text{C}$ (no condensation)

Before turning on the power, please make sure that the power supply can match its voltage, and that all safety measures are taken.

- Do not use the fusion splicer in explosive environments
- Do not use the fusion splicer in the presence of flammable gases or fumes
- Do not attempt to disassemble any of the components of fusion splicer

In addition to the statements in this manual to allow user-replaceable parts, please do not attempt to disassemble any of the components of fusion splicer. Replacement parts and internal adjustments can only be commissioned by authorized service personnel.

WARNINGS/PRECAUTIONS

● AC/DC Adapter

The Output Characteristics Of The Power Adapter Must Meet The Following Quirements.

Voltage: 12V-14V; Current: $\geq 2\text{A}$ (output voltage of original adapter: 13.5v, output current 4.8A)

Polarity: Center Is Positive; The fiber fusion splicer will be damaged or unable to charge if uses inappropriate adapter to output voltage and current .Using Higher Voltage Will Cause Damage To The Fusion Splicer. AC /DC Power Adapter Input AC Voltage Of 100-240v, 50/60hz, If Input Voltage Exceeds This Range May Cause Permanent Damage To The Adapter!

● Internal Lithium Battery

There Is A Lithium-ion Battery Cells In The Fusion Splicer, The Use Of Other Batteries May Damage The Fusion Splicer And Jeopardize Personal Safety.

For Safety Sake, Lithium Battery Pack Can Not Be Disassembled To Prevent Short Circuits; Do Not Crash Battery, Do Not Let The Battery Close To A Fire Or An Excessive Heat To Prevent Lithium Battery Explosion. Violation of the above operation may cause lithium battery explosion, endangering the personal safety of users.

▲ **Notice:**

1. When the battery is placed for a long time, it is easy to enter into the dormancy state. At this time, the capacity is lower than the normal value, and the service time is also shortened. However, the battery can be activated and its normal capacity can be restored after only 2-3 normal charging and discharging cycles. Lithium batteries have little memory effect and can be recharged at any time.
2. Lithium batteries exist self-discharge phenomenon, a long time of unused batteries will be in the state of low voltage because of self-discharge. A long period of low voltage will damage the internal structure of the battery and shorten the battery life. Therefore, unused batteries should be charged at least once a month, pay attention to the display of 2 or 3 bars of electricity can be charged, should not be full; In daily use, try to charge in the battery display more than one grid, do not run out of power to charge
3. Do not use the machine for a long time, please take out the battery and store it separately. The temperature range of long-term storage (storage time over 6 months) of the battery is 0°C~40°C. The temperature range of short-term battery

storage (storage time less than or equal to 6 months) is: -20°C~60°C.

4. In order to ensure the safety of charging, the charging temperature range of lithium battery inside the welding machine is 0°C~40°C.

5. If the battery charging is abnormal or the battery display is abnormal, you can try to activate the battery manually. For specific operation, please see: button combination function -- three to activate the battery

● **Operation On Optical Fiber Fusion Splicer**

When Below Situation Happens On Fusion Splicer, Please Turn Off The Fusion Splicer Immediately And Unplug The Power Adapter From The Power Input. Otherwise It Will Cause The Fusion Splicer May Not Work Properly Or Can Not Be Repaired And Other Serious Consequences.

- › Liquid, foreign matter into the inside of the fiber fusion splicer. There is a protective structure inside the machine. A small amount of fiber debris will not affect the use, but please try to be careful not to fall in.
- › fiber fusion splicer is subjected to strong vibration and impact

There is no need to maintain the fiber fusion splicer internal parts, do not remove the fiber fusion splicer.

In the electrode discharge process of fiber fusion splicer, the voltage between the two electrode rod is up to several dry volts, do not touch the electrode, otherwise will cause the fiber fusion splicer damage or personal injury and other serious consequences.

▲ **Notice:**

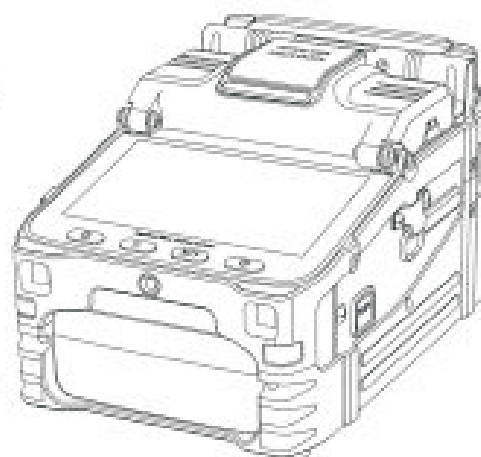
1. Optical fiber fusion splicer is used for welding quartz glass fiber, please do not use this instrument for other purposes. Please read this manual carefully before use.
2. Pay attention to clean the V groove and lens in the process of use (to clean V groove, you can use an art knife to draw back and forth along the fiber groove, and then brush with a brush); Clean dust after use.
3. When the optical fiber fusion splicer moves from the low temperature environment to the high temperature environment, try to take the gradual heating mode, otherwise the instrument will produce condensation, which has an adverse impact on the instrument.
4. Optical fiber fusion splicer is a calibrated precision instrument, please try to avoid strong vibration and impact. Special carry case should be used for storage, and suitable cushioning case should be added outside the carry case for long-distance transportation.

● **LCD display screen**

1. The LCD screen of fiber fusion splicer is not touch screen. Do not use sharp objects to click on the LCD, do not force the LCD.
2. Do not drop organic solvents or dirty sundries on the LCD screen, such as acetone, oil, antifreeze, ointment, etc., otherwise it may lead to abnormal LCD display.
3. Can use silken cloth or soft fabric to wipe clean liquid crystal screen.
4. There may be noise on the screen when the fusing machine windproof cover is opened or not put in the optical fiber. These are not LCD fault, is a normal phenomenon

● Introduction of operation keys and parts

The fusion splicer machine is mainly used for permanent splicing fiber, the machine can continue to splice ordinary rubber insulated fiber cable, jumper wire and a cladding diameter of 80um-150um, single mode, multimode and other quartz-based dispersion shifted fiber. The operation process should be taken to keep clean free subjected to strong vibration or shock



🔄 RESET

Press the reset key to reset the propulsion motor, adjustable motor, and focusing motor to their original. When the Reset button light is on, it indicates the reset is in process. If it turns off within 5 seconds automatically that means the reset is successful, otherwise the reset is failed.

▶ CONTINUE

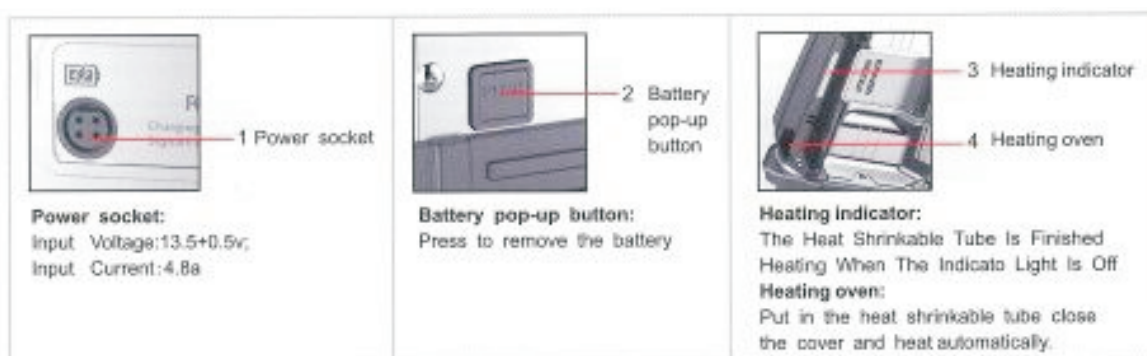
When the pause function is on, please press the Contkey to continue the next operation

X/Y X, Y DISPLAY TOGGLE KEY

X, Y display toggle

🔘 Power Meter And Optical Modules Switch

Turn On/off Power Meter And Optical Modules



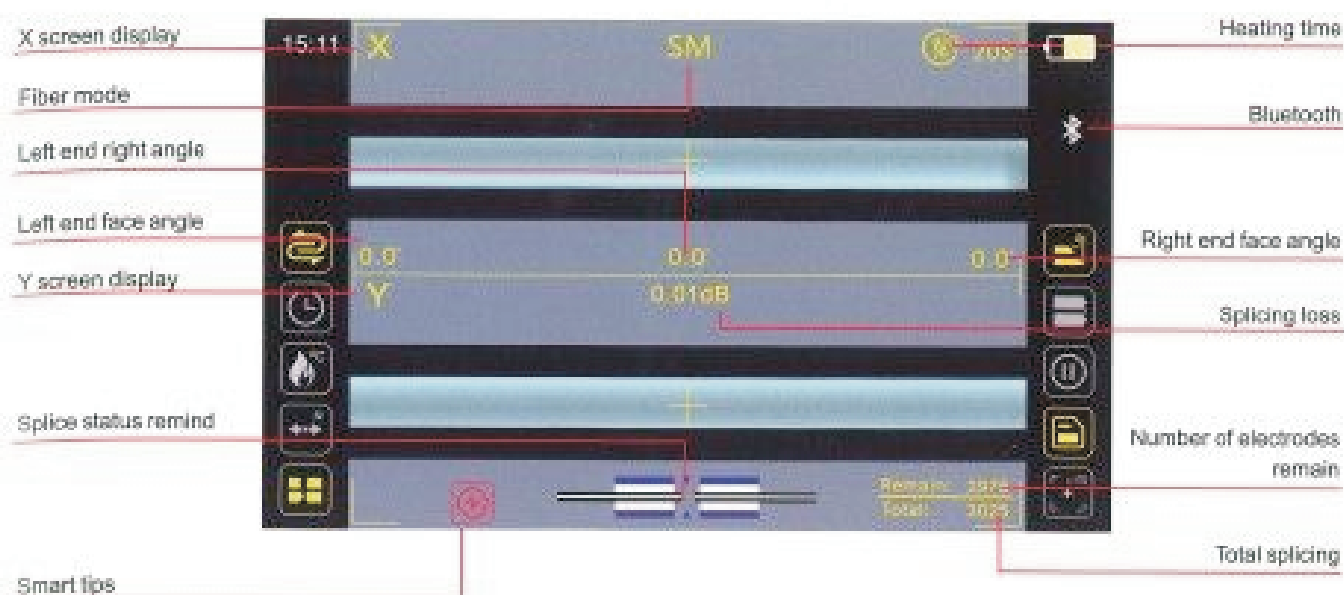
▶ DISPLAY MENU INTRODUCTION



ICON	NAME	FUNCTION
	Normal mode	Normal Splicing Mode For The Machine
	ARC calibration	According to the altitude, temperature, humidity and other conditions of the user, match the most suitable arc discharge value to minimize the splicing IOSS.(See chapter 4, discharge correction)
	Timing Power Off	machine will automatically shut down when it continues to exceed the set time.

	Pre heating	When the function is turned on, and for each time once the splicing is successful, the heater will automatically start for 6 seconds from the time of opening the windshield cover.
	Tensile test	When the function is turned on, the tensile test is performed after each successful splicing.
	Core alignment	Fiber splicing is based on core alignment
	Cladding alignment	Fiber splicing is based on cladding alignment
	Angle detection	When the function is turned on, if the fiber cleaving angle is greater than the upper limit value (upper limit value can be set in the "Splicing settings" menu "Cleave angle upper limit"), the splicing machine will pause and report the error.
	Cleave face detection	If the cleaving end face quality of the fiber does not meet the set parameters (end face quality requirements can be set in the "Splicing settings" menu "End face quality"), the splicing machine will pause and report the error.
	Splicing process pause	When the function is on, the splicing machine will stop the final splicing process after in the completion of the fiber focus, and face detection and fiber alignment. Please then press the "▶" Continue button to perform the arc discharge and the subsequent splicing process. If the cleave face detection is not passed, it will pause and report the error, then please press the "continue" key to ignore the error and continue the follow-up process
	Save the image	When the function is turned on, it will save the splicing image when the splicing failed. It will not save the splicing image when the splicing is successful or this function is closed.
	Auto focus	When the function is turned on, for each time splicing it will adjust the camera focal length to the set target value automatically (target value in the "Splicing settings" menu set "focus target value")

INTRODUCTION TO SPLICE INTERFACE



II fiber state prompt

The optical fiber symbol in the middle below the LCD, two blue and white bars represent V groove, the small triangle in the middle represents electrode tip, and the black bar flashing on the blue and white bars represents optical fiber. The distance from the optical fiber mark to the middle small triangle (electrode tip) is different, representing different states of optical fiber. The length of bare optical fiber placement should be as close as possible to the electrode tip, but it should not exceed the tip, and the shortest length should be more than 1mm beyond the V groove. The distance between the end faces of both sides of optical fiber should be between 2-4mm, and it should be placed flat in the groove.

● Placing optical fiber

The front end of the optical fiber identification is located in the middle of the v-groove identification and the electrode tip identification, indicating that the machine is ready and waiting for the optical fiber to be put in. If the optical fiber is normally placed and there is no response after the switch of the cover, please restart the machine, and repeatedly switch the cover on and off several times (without pressing any keys and connecting the phone) in the QR code interface of the machine. If the QR code interface cannot automatically skip, then there may be something wrong with the cover closing induction. Check whether the magnet on the left side of the windproof cover falls off or has debris attached, and whether the inner hexangular screw corresponding to the lower bottom cover is installed correctly.

● Fiber is too long

The front end of the optical fiber marker is close to the electrode tip marker in the middle, indicating that the optical fiber is placed too long. If the optical fiber exceeds the electrode tip, it needs to be placed again. If the optical fiber is placed normally and this tip appears without placing fiber, this may be caused by debris or fog in the objective lens. Clean the objective lens, wipe the objective lens with a clean cotton swab, and the fog can be eliminated with a hair dryer. After cleaning, debris image if there is no change, it may be in the lens inside, you can pick up the welding machine to pat a few times, see whether the debris out of the screen.

● Fiber is too short

The front end of the optical fiber identification is returned to the v-groove identification, indicating that the optical fiber is placed too short and should be placed beyond the v-groove. The closer it is to the electrode tip, the better.

Placed the tail fiber, attention should be paid to this error, because the tail fibers stretch the core when the cladding is removed, inner core on fixture may occur retraction, the solution is: inner core can be slightly longer, stretch the whole fibre first before you placed it on fixture, fixture linking piece on the front end of pressure hammer to pin the white rubber inner core.

Note: When tail fiber welding with the leather fiber, as the inner core of tail fiber is too long, the heat-shrinkable tube cannot be wrapped to the outer rubber, so it is recommended that the white rubber is 2-3mm longer than the outer film. However, the white inner core should be retained longer to facilitate the dishing of fibers when splicing tail fiber and bare fiber.

● The end face is not acceptable

There is a red fork in the front end of the optical fiber identification, which indicates that the end face of the optical fiber is unqualified, which affects the welding quality, so it is necessary to cut the fiber again. There are two standards for end face detection, cutting Angle (the degree displayed at both ends of the screen divider line, qualified within 3° by default) and end face quality (not shown on the screen). The test standard can be customized by zhuoshizhangzhongbao+user-defined

If the fiber is repeatedly cut, and the image of the fiber is indeed uneven or defective, the cleaver may need to be adjusted (please refer to the cleaver adjustment for specific operation).

If the cut surface is flat, but errors are frequently reported, please pay attention to whether the Angle of the cut surface becomes round when dusting, which may be because the dust removal voltage is too high. You can dust reduction voltage value in zhuoshizhangzhongbao + by welding setting and parameter settings, it is best to do a new discharge correction.

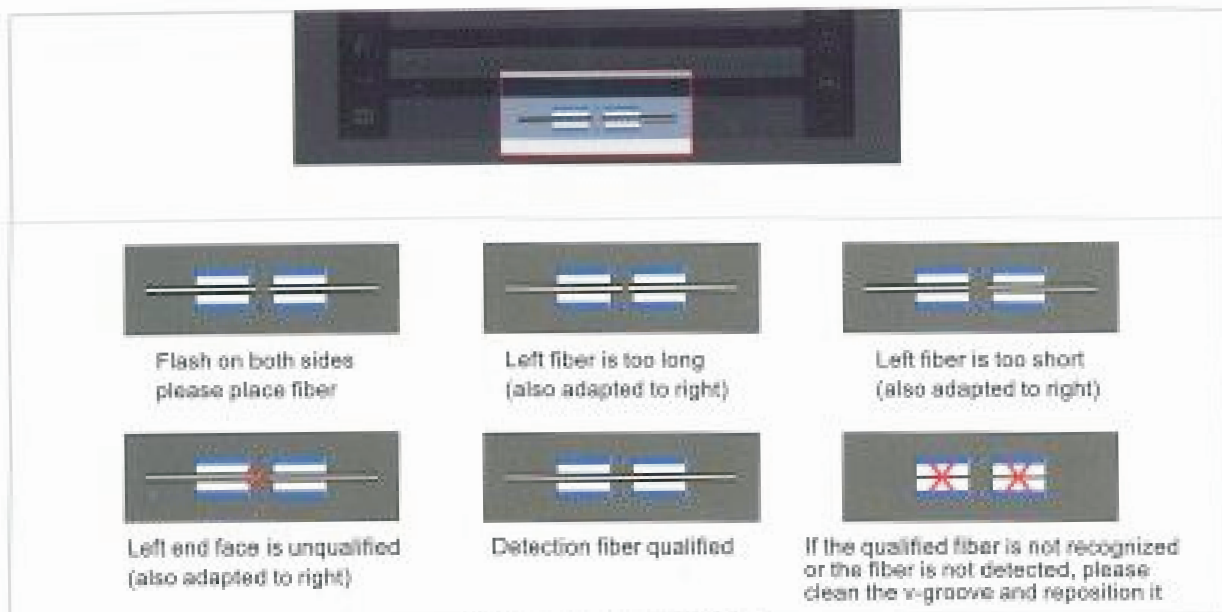
Blurry fiber images can also cause errors, clear V slot and objective lens, press reset key; In addition, the reasons for the unclear fiber image include wrong focal length and lighting problems. Please refer to daily maintenance for details.

Intelligent prompt and fiber state prompt solution

I Intelligent prompt

The red symbol displayed at the bottom left of the LCD.

- **Camera fault:** first clean the objective lens, and then upgrade the welding machine firmware to the latest version. If the fault still exists, please conduct self-inspection of the welding machine to confirm whether the camera fails (please refer to daily maintenance for specific operation).
- **Core failure:** first exclude the fiber treatment unqualified factors, such as the coating layer is not clean, too bad cutting surface, too many burrs; Then clean up the V slot and objective lens and press the reset key.
Note: dust in the lens may also cause failure of core alignment, so dust should be cleaned (please refer to daily maintenance for specific operation).
- **Focus failure:** this tip only appears when autofocus is turned on, usually because the fiber image is too blurry for the range of autofocus. Solution: first eliminate the fiber treatment unqualified factors, such as the coating layer is not clean, too bad cutting surface, too many burrs; Then clean the V slot and objective lens, press the reset key; Autofocus can also be turned off and adjusted manually (see daily maintenance for details). If the fault continues, enter the welding machine self-check mode to check whether items 5 and 6 are wrong.
Note: dust in the lens may also cause failure of core alignment, so dust should be cleaned (please refer to daily maintenance for specific operation).
- **Discharge correction failure:** First clean the tip of the electrode and remove debris; Restore the factory Settings in the device's fusion setting. Restart welding machine and zhuoshizhangzhongbao +, re-discharge correction. If the fault continues, enter the welding machine self-check mode to check whether item 11 is wrong.
- **The left and right optical fibers do not match:** the specifications or types of optical fibers on both sides are different, and they need to be replaced with the same specifications or types. This error, can press continue to ignore the key error, mandatory welding.
Note: according to the construction specifications of welding machine, different specifications and types of fiber cannot be fused, if forced welding, welding quality may be affected.
- **Fog or foreign matter interference in the lens:** firstly exclude the unqualified factors of the optical fiber treatment, such as not scraping the coating layer, too bad cutting surface, too many burrs, and so on, and then clean the objective lens; In addition, if the red light on the electrode fails, it may report an error. Please check it (Open the electrode cover, and the indicator is on all the time. If not, it is broken and needs to be replaced.).



Fiber status prompt description

- **The test is fiber passing**

Fiber passing means screen display is a complete fiber, take out fiber can be normal.

Sometimes errors may be reported due to dirty lens or fog, and the lens can be restored after cleaning (see daily maintenance for specific operations).

- **Failed to identify qualified optical fiber or no optical fiber detected**

A Red Cross is displayed on the v-slot mark to indicate that no fiber has been identified or no fiber has been laid.

If the optical fiber has been placed, and the error is still reported, firstly exclude the unqualified factors of the optical fiber treatment, such as the coating layer is not clean, the cutting surface is too bad, too many burrs, etc.; Then clean up the V groove and objective lens, and press the reset key (see daily maintenance for specific operations).

Blurry fiber images can also cause errors, clear V slot and objective lens, press reset key; In addition, the reasons for the unclear fiber image include wrong focal length and lighting problems. (Please refer to daily maintenance for details.)

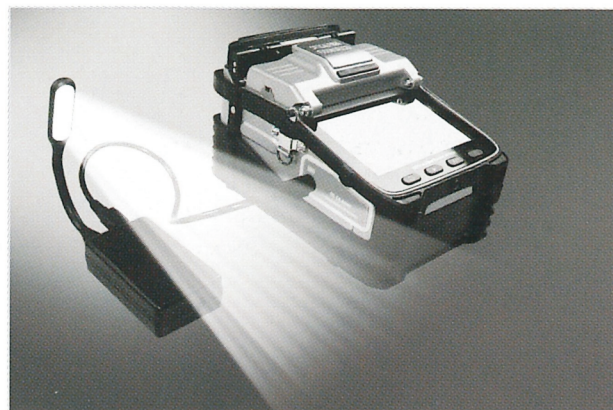
In rare cases, there is a signal or light source in the fiber optic line, which may affect the image detection of welding machine and cause error reporting. Turn off the signal or light source in the circuit.

LIGHTING AND POWER SUPPLY

Lighting: night lighting is convenient for construction work Mobile phone charging: the device can reverse the power supply to the mobile phone



Mobile phone charging diagram



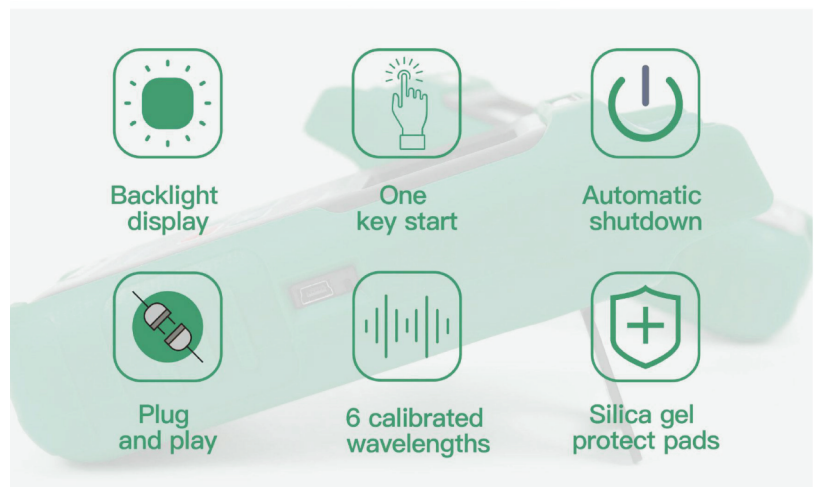
Lighting use diagram

Chapter II.

Optical Power Meter + Light Source

▼ Key Features

- High Precision
- Highly accurate unit offering 6 calibrated wavelengths
- Interchangeable connectors
- Easy-to-use interface for error-free testing
- Rubber armor protection



PRODUCT FEATURES



Anti fall



Mini



Bracket



Split design

OPTICAL POWER METER



Interface accessories



SC



FC



ST

Wavelength(nm)	800~1700nm
Measurement Range	-70~3dBm / -50~+26dBm
Optical Connector	FC.SC.LC
Power Supply	Alkaline Battery (3 x AA 1.5V batteries)
Display Units	dB / dBm / w
Resolution (dB)	0.01
Dimensions / Weight	185 x 83 x 48 mm / 272g
Working temperature(°C)	-20(°C)~+70(°C)

LIGHT SOURCE



Interface accessories



SC



FC



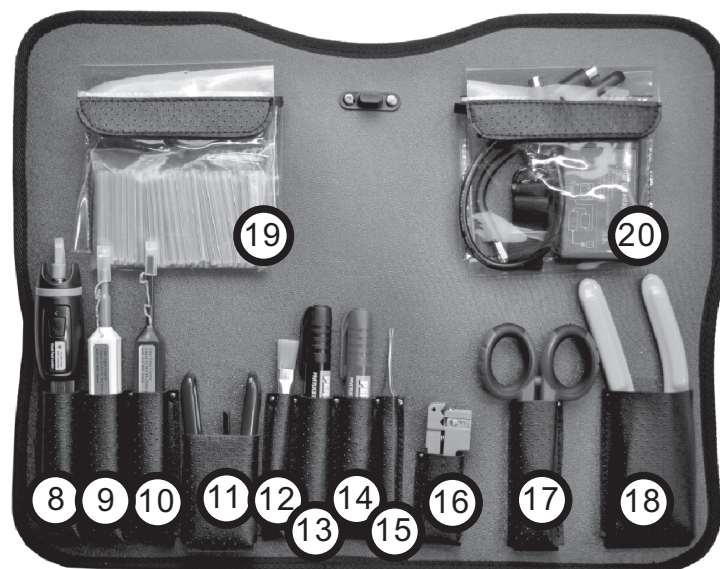
ST

Wavelength(nm)	SM 1310/1500nm
	MM 850/1300/1310/1550nm
	PON 1310/1490/1550nm
Typical Output Power	-5dB
Optical Connector	FC.SC.LC
Power Supply	Alkaline Battery (3 x AA 1.5V batteries)
Output Stability	±0.05dB/15mins; ±0.1dB/ 8hours
Modulation Frequencies	CW,270Hz,1KHz,2KHz
Dimensions / Weight	185 x 83 x 48 mm / 293g
Working temperature(°C)	-20(°C)~+70(°C)

Chapter III.

Product List

NO	Model	Product Name	Qty
1	TCT-7100	Optical Power Meter	1pcs
2	TCT-5000	Fusion Splicer	1pcs
3	TCT-5670-ms	Light Source	1pcs
4	GCL-001	Clean Wipers	1pcs
5	GCL-005	Cassette Cleaner	1pcs
6		Alcohol Bottle	1pcs
7	TTK-1406	Fiber Cleaver	1pcs
8	TCT-4200-30	Visual Fault Locator	1pcs
9	GCL-002-1.25	Fiber Clean Pen 1.25mm	1pcs
10	GCL-002-2.5	Fiber Clean Pen 2.5mm	1pcs
11	TTK-155	FTTH Drop Cable Stripper	1pcs
12	GSR-127	Brush	1pcs
13	CP-05BK	CD Marking Pen-Black	1pcs
14	CP-05RD	CD Marking Pen-RED	1pcs
15	GCP-005	Super Fine Tip Stainless Tweezer	1pcs
16	TTK-171	Buffer Tube Stripper	1pcs
17	GKN-375	5.5" Electrician Scissors	1pcs
18	TTK-164	High-Precision Stripper	1pcs
19	SPS-002	Heat Shrinkable Tube	1set
20		Recharge Cable	1pcs
		USB LED	1pcs
		Belt	1pcs
21	GPL-619	6" ALL-PURPOSE PLIERS	1pcs
22	GPL-615	6" CUTTING PLIER	1pcs
23	TTK-183	Coaxial / UTP CableStrippers and Cutters	1pcs
24	TTK-188	Round Cable sheath Cutter	1pcs
25	TOR-136	LED FLASH LIGHT	1pcs
26	GKN-113	Utility Knief with 3Blades Includes 24 Snap-Off Blades	1pcs
27	GSD-880	Ratchet Screwdriver with BIT Holder	1pcs
28	GTB-1210	Tape Measure	1pcs
29	GMG-551	PVC Electrical Insulation	1pcs
		Electrode	2pcs
		Bare Fiber	1pcs
		L Wrench	3pcs
30	GTK-956	CASE	1pcs



※Product appearance



※Product display

