High-End Fusion Splicer S183PMⅡ/S184PM

1. OUTLINE

In addition to the increasing demands of high-functional fusion splicers used for optical parts manufacturing and research, the need for splicing equipment for LDF (Large Diameter Fiber) which has a larger diameter than optical fiber for communications, is on the rise in the industrial field. Therefore, the S183PMⅡ and the S184PM, all-round type fusion splicers, which enable not only specialty fiber splicing and polarization-maintaining (PM) fiber splicing, but also LDF splicing, have been developed.

2. FEATURES

The prime features of the S183PMⅡ and the S184PM are the basic performance which realized both various functions and usability in a higher level, and the applicability for a broad range of optical fiber clad diameters.
The S183PMⅡ is applicable from 80 μm to 500 μm in diameter and the S184PM is applicable from 80 μm to 1200 μm in diameter.

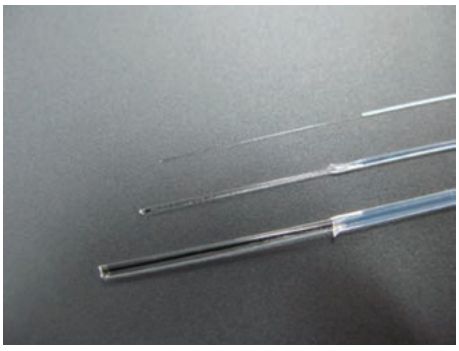

Figure 1 Appearance of large diameter fibers.

2.1 Appearance

The appearance of the fusion splicers is shown in Figure 2. As the appearance succeeds the designing of the former equipment, it factors in the usability on an assembly line in an optical parts manufacturing factory by lowering the work plane. In addition, as the display screen of the LCD monitor, which displays the status of an operation, can be turned upside-down and the equipment can be used with its front and back reversed, it provides the optimal usage environment depending on the size of an optical part or the layout of a factory, etc.

Figure 2 Appearance of S183PMⅡ.

2.2 Screen Display

Figure 3 shows various screen displays. A 6.5 inch large-screen LCD monitor is adopted, and an intuitive, easily comprehensive GUI is used. Also, a fiber image can be magnified up to 430 times on the screen by the zoom function. In addition, it is possible to output the screen image to an external monitor or a projector, etc, through a VGA connector (an analog RGB) on the side panel.

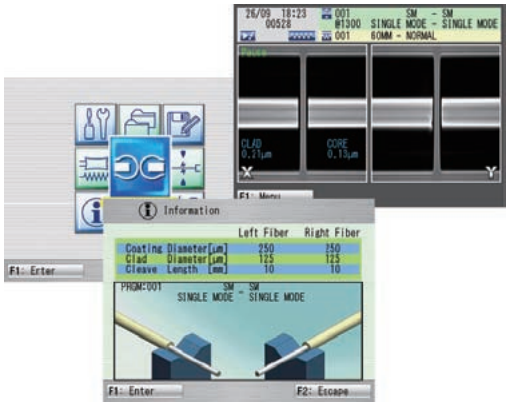

Figure 3 Screen display.

2.3 Operability

The S183PMⅡ and the S184PM adopt a fiber-holder method which makes a series of operations easy, from a preparation of fiber to its set up in the fusion splicer. As shown in the right side of Figure 4, the holder shaft rotates around in PM fiber splicing which requires rotational alignment of polarization plane. It does not damage

fiber coating, and the extra length of fiber is fixed without being entangled or caught up in the shaft. Also, LDFs which are not flexible are easily settable, as they are held in a straight line.

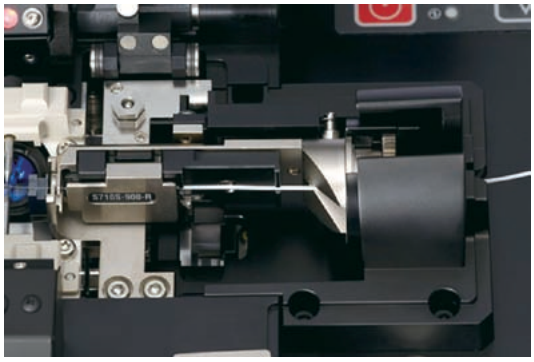

Figure 4 Mechanism of fiber rotation.

In addition, as an automatic fiber holder release structure for the fiber holder cap is used and a series of operation is automatically finished with the windshield closed, the takeout operation of a spliced fiber is extremely easy and safe.

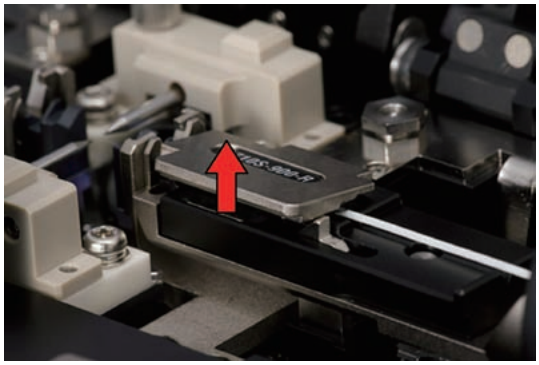

Figure 5 Automatic fiber holder release structure.

Up to three kinds of frequently-used fusion programs are registrable in the program key and can be called up instantly. And as various functions, such as measurement of optical fiber shape, are implemented, frequently-used functions are registrable in the shortcut key and can be called up directly without going through the menu.

Figure 6 Function key panel.

2.4 Fiber Positioning Structure

Part replacement of the optical fiber chuck is unnecessary and setting of the equipment is automatically readjusted when the coating diameter and the clad diameter of a spliced fiber change. Up to 2 mm in coating diameter is applicable. Dissimilar diameter splicing is also possible.

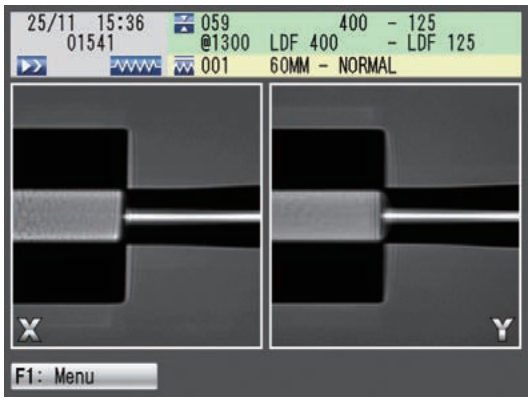

Figure 7 Dissimilar diameter splicing for 400 μm – 125 μm.

2.5 3-Electrode Arc Discharge

The S184PM has adopted the 3-electrode arc discharge method. It enables broad-area and high-output discharge heating, and splicing of LDFs more than 1000 μm in diameter is possible.

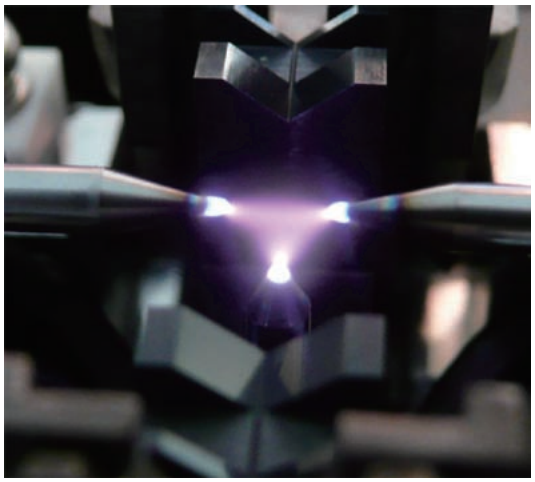

Figure 8 Appearance of 3-electrode arc discharge.

2.6 Specialty Discharge Function

The S183PMⅡ and the S184PM are provided with an arc discharge function called arc scanning. The arc scanning is a function that discharges with a fiber shifting in a longitudinal direction after splicing and heats up fiber far and wide (±2 mm).

Migration speed of fiber, round-trip distance, discharge intensity, discharge time, etc, are freely settable. Various patterns of heating treatment are possible depending on the characteristics of fibers.

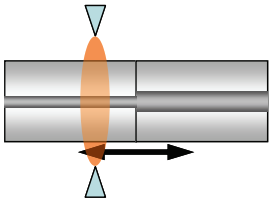

Figure 9 Conceptual image of arc discharge during arc scanning.

2.7 Specification

The main specifications are shown in Table 1. Various fusion programs, such as dissimilar fiber splicing, PM fiber splicing, axis offset splicing, and dissimilar diameter splicing, etc, are preset, and new programs can be coded and stored (up to 150 programs in total).

Table 1 Specifications of S183PM Ⅱ and S184PM

Item	S183PM Ⅱ	S184PM
Applicable fiber type	SMF, DSF, MMF, NZ-DSF, EDF, PMF, etc.	
Applicable clad diameter	80～500 μm	80～1200 μm
Applicable coating diameter	160～2000 μm	
Fiber cleave length	4 mm (coating clamping)	5 mm (coating clamping)
	10 mm (cladding clamping)	
Insertion loss	SMF：average 0.02 dB	
Extinction ratio	PANDA：average 40 dB	
Splicing time	SMF：average 15 sec PANDA：average 35 sec	SMF：average 20 sec PANDA：average 50 sec
Data output terminal	USB1.1, LAN (10BASE-T)	
Size	350W×197D×154H mm (excluding projections)	
Mass	8.5 kg	8.8 kg
Number of fusion programs	Maximum 150	

3. FUTURE PROCUCT DEVELOPMENTS

As the S183PM Ⅱ and the S184PM are applicable to LDF splicing, those are optimal products for splicing in various optical application fields, such as fiber laser.
In the future, the range of application will be extended to splicing of new kinds of specialty fibers, such as holey fiber and multi-core fiber, etc.

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