

S122A/S122M4 Hand-Held Fusion Splicer

1. GENERAL DESCRIPTION

Furukawa Electric introduced the S122, next generation of ultra-compact fusion splicers in March, 2006. The S122 inherits the compact size, light weight and convenience of its predecessor the S121, the industry leader in compact fusion splicers since its introduction in January 2003. Integrating the functions of multi-fiber ribbon splicers used in splicing trunk lines, the S122 offers two-direction optical fiber observation and is applicable to SMF, MMF, NZDSF, and DSF fibers. The S122 Series includes the S122A for single fiber splicing and the S122M4 for single-to-four fiber ribbon splicing.

2. FEATURES

2.1 Compact, Slim Body

The dimensions of the S122, shown in Photo 1, are 140W x 189D x 73H mm excluding projections. The main unit weighs 850 g, a 75% reduction in volume and 70% reduction in weight compared to Furukawa's S199M multi-fiber ribbon splicer. Encased in an extremely slim body, 47 mm at the operation switch portion, the S122 splicer has adopted two-direction fiber observation and high-precision image processing to enable precise fiber splicing. The number of parts has been reduced through simplification of the driving mechanism, and the area of the controlling circuit board has been decreased through the adoption of highly-integrated parts and small package parts, thereby realizing significant reduction in the equipment profile. Since the head portion of the body has been reduced in thickness, the equipment can be easily insert-



Photo 1 Appearance of S122M4.

ed into an enclosure to carry out splicing with short excess fiber lengths. A light weight, high-strength magnesium alloy is used for the top surface, and corner pads are provided at the bottom portions, making the body structure rugged enough to assure easy use in any work environment. In addition, the display panel is a high-resolution, 3.5-in translucent LCD monitor capable of displaying operation conditions and clear fiber images even outdoors.

2.2 Portability and Ease of Operation

Compact and light weight, the S122M4 has detachable batteries making it easy for the splicer to be brought into a variety of splicing environments. The S122M4 is slim and low, ensuring excellent mechanical stability, both in hand and on the working table. A soft carrying case accommodates work tools such as a cleaver and stripper. The dual-purpose carrying case can be used as a work table for operating the splicer when worn around the waist. See Photo 2. The available carrying belt with a hinged working table offers an innovative style of hands free splicing and ease of use in tight spots or on an electric pole. See Photo 3.



Photo 2 High portability with a soft carrying case.



Photo 3 High portability with a foldable hinged working table.

2.3 Operation and Useful Functions

Available for the first time in fusion splicing the S122M4 has a GUI providing an operational feel much like that of a cellular phone. See Photo 4. A number of useful functions have been installed including; fiber image display with a maximum magnification ratio of 120 by means of zooming; memory function for fiber image storage; a helpful counter for maintenance of accessory tools (cleaver and stripper); alarm function which warns when it is time to replace the cleaver blade; and photo illustrations of the maintenance guide.



Photo 4 Main menu of GUI.

2.4 High Speed and Enhanced Functions

High-speed operation of splicing and testing takes 13 sec for the S122A and 15 sec for the S122M4, the quickest of two-direction observation type splicers. Heat-shrinking of a reinforcing sleeve after splicing takes 45 sec (40-mm single fiber sleeve). The installation of a self-diagnosis function permits automatic diagnosis of the equipment. Moreover, like high-quality conventional splicers, high-precision splicing has been realized by simultaneously displaying optical fiber images taken from two directions. See Photo 5. Use of a heavy-duty external battery delivers 180 splicing and reinforcing operations.



Photo 5 Fiber image display.

Table 1 Specifications of S122A and S122M4.

Item	Specification
Applicable fiber type	SM, MM, DS, NZDS
Applicable fiber count	S122A : Single S122M4 : Single to four
Splicing loss	SM : 0.05 dB or less avg. (Figure 1) MM : 0.03 dB or less avg. DS : 0.08 dB or less avg. NZDS : 0.08 dB or less avg.
Screening force	1.96 N
Fusion splicing time	S122A : 13 sec for SM fiber S122M4 : 15 sec for SM fiber
Heat-reinforcing time	45 sec for S924 sleeve
Splicing loss data	1,500 items
Number of programs	Splicing : 150 Heat-reinforcing : 12
Outer dimensions	140W x 189D x 73H mm excluding projections
Weight	Main unit : 850 g Battery : 170 g
Capacity of standard battery	Fusion splicing : 90 times Fusion splicing plus heat-reinforcing : 50 times
Applicable sleeve	40 mm and 60 mm in length

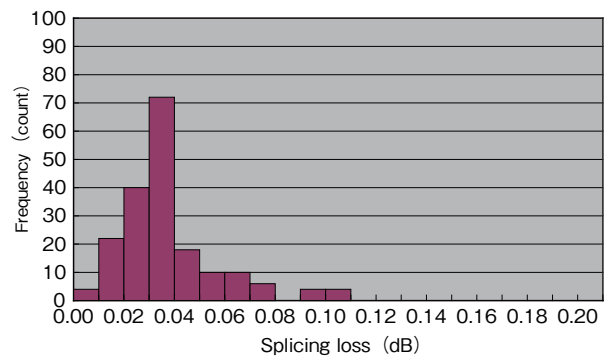


Figure 1 Histogram of splicing loss of single-mode fibers.

3. PRODUCT SPECIFICATIONS

The main specifications are shown in Table 1.

The S122 is applicable to splicing not only SM, MM and DS fibers but also NZDS fibers. The S122 can store data of splicing loss estimation up to 6,000 fibers, i.e. 1,500 times x 4 fibers, at maximum. Also, the splicer can code and memorize as many as 150 programs of fusion splicing.

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