Raman Amplifier Troubleshooting Guide

Models: BDRA5008, PDRA5014, DRA5000

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1. Safety Precautions

Before installing and using this product, please read the following carefully:

The signal input port of the Raman amplifier is a high-power pump laser output port. Do not look directly at the connector end face when the product is working to avoid burns to the eyes and skin.

The Raman amplifier contains precision optical devices. To avoid severe impact damage, please avoid severe vibration and collision. The pigtail is easy to break, please handle with care. Before use, please make sure to keep all input and output pigtail end faces clean.

The product contains electrostatic sensitive devices. Please handle with care and ensure proper grounding and stable power supply.

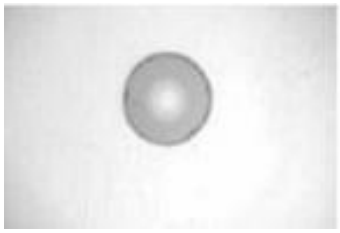
2. Safety Operation Instructions

Preparation: end face detector, cleaning tools, handheld power meter

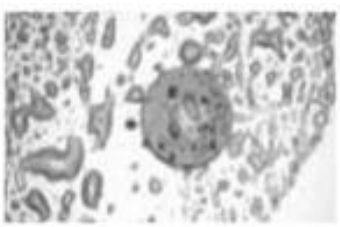
The output power of the Raman amplifier is relatively high, close to 1W of pump power, which can easily damage the optical fiber and hurt the eyes. When operating the Raman amplifier, please strictly follow the following procedures:

1. Before connecting the Raman pigtail, please turn off the power of the Raman amplifier;

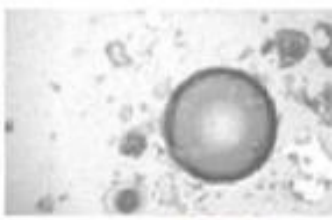
2. Before connecting the Raman pigtail, you need to ensure that the end face of the pigtail is clean. There are many inspection tools and instruments for optical fiber end faces, among which the fiber optic microscope is the most widely used professional inspection instrument. Generally, the display magnification of the fiber optic microscope used for multimode is 200 times, while the display magnification of the fiber optic microscope used for single mode is 400 times. The more advanced fiber optic microscope can not only switch freely between the two magnifications, but also display the condition of the optical fiber end face through the LCD screen, so there is no need to disconnect the product to detect the optical fiber end face, and the risk of laser damage to the eyes is avoided. The following pictures show several end face conditions observed by the instrument:



Clean



Fingerprint



Dust

You need to check the fiber end face through a microscope to confirm that it is clean before connecting it to the Raman amplifier port. If the fiber core is contaminated, you can use fiber wiping paper to clean the end face and connect it to the Raman amplifier port only after it is wiped clean; if the fiber core is damaged, you need to replace the fiber.

3. When the pigtail is connected to the ODF frame, it is also necessary to check the pigtail end face and the optical fiber end face in the ODF frame to ensure that the fiber core is clean and undamaged.

4. After all the pigtail connections from Raman to the ODF rack are completed, turn on the power of the Raman amplifier.

5. If you need to plug or unplug the Raman amplifier's pigtail, you need to turn off the power of the Raman amplifier first.

3 . Fiber Optic Line Quality Requirements

The pump output power of the Raman amplifier is relatively high. In order not to damage the optical fiber and achieve a better Raman effect, the Raman amplifier has high requirements for the optical fiber quality. Before the start of the operation, it is recommended to use OTDR to test the optical fiber line quality to check whether the optical fiber quality meets the start-up requirements.

- Single point additional loss within 0km~10km is less than 0.2dB
- Single point additional loss within 10km~20km is less than 0.4dB
- Single point additional loss within 20KM~30KM is less than 0.6dB
- Single point additional loss within 30KM~40KM is less than 1dB
- Additional loss at a single point beyond 40KM is less than 2dB

4 . Common Troubleshooting

(1) **Raman amplifier has no output**

Inspection: Inspect whether the PUMP switch of the Raman amplifier is turned on.

(2) **Signal power alarm**

Inspection: Inspect whether the optical fiber is connected properly, whether there is light input on the ODF side, and whether the optical fiber is damaged.

(3) **Light reflection alarm is too high**

Inspection: Inspect whether the input optical fiber connector is contaminated or damaged.

(4) **Raman gain does not achieve the desired effect**

Inspection: Use an OTDR to inspect the optical fiber line quality, and Inspect if an attenuator has been added at the Raman PUMP output port (IN port of counter-pumped Raman).

(5) **Pump alarm**

Inspection: Check the ambient temperature, troubleshoot for any PUMP malfunctions, and verify whether the fan is operating normally.