ASSEMBLY INSTRUCTION

FIBER OPTIC CONNECTORS

AVIM™

INSTALLATION

VIDEO INSPECTION

CLEANING

Part No. 1902206 - Version 01.2020

DIAMOND
the fiber meeting

CONTENTS

Updated DS may be downloaded from Diamond SA website

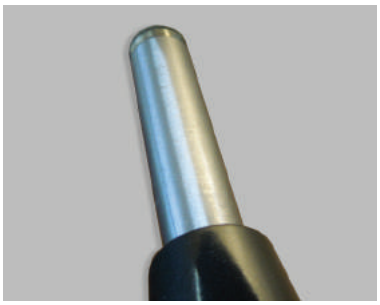
1. ADAPTER AND CONNECTOR MOUNTING USING TORQUE WRENCHES WITH SPECIFIC SETTINGS

1.1 AVIM™ MATING ADAPTER MOUNTING (HEXAGONAL FLANGE)

A) Dismantle the mating adapter.

B) Place the connector half in the "Holding Tool".

C) Place the other end of the connector half in the panel cutout.



D) On the front side hold the "Holding Tool" with connector half against the panel checking that the key adapter is on the right side. On the back side of the panel place the washer and then the nut on threaded adapter.

E) Tighten the nut using an 8mm TBIH (small break over wrench) calibrated at 1.5 Nm . When the TBIH bends over you have reached the maximum torque power permitted. Place the protection cap on.

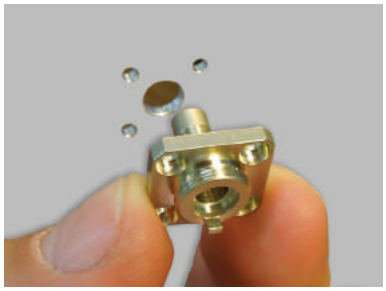
F) Place the coupling nut in position. Make sure that the alignment key fits in the in the groove.

G) Tighten the coupling nut by hand. Final tightening is done using 11mm TBIH calibrated at 1.0 Nm. When the TBIH bends over you have reached the maximum torque power permitted. Replace the protection caps back on the mating adapter.

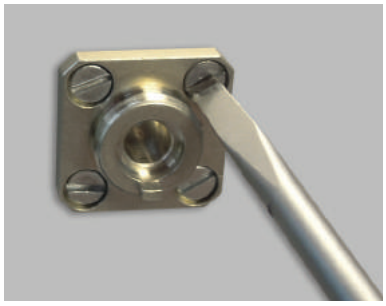
1.2 AVIM™ MATING ADAPTER MOUNTING (SQUARE FLANGE)

A) Dismantle the mating adapter.

B) Place the threaded square flange in the panel with the alignment key of the square flange facing the bottom.



C) Mount and tighten the four M2 screws. Refer to the screw torque specifications.



D) Place the coupling nut in position. Make sure that the alignment key fits in the in the groove.

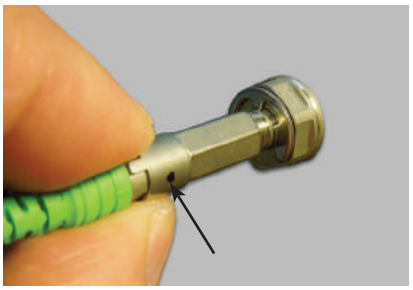
E) Tighten the coupling nut by hand. Final tightening is done using an 11mm TBIH calibrated 1.0 Nm. When the TBIH bends over you have reached the maximum torque power permitted. Place the protection cap on. Replace the protection caps back on the mating adapter.

1.3 AVIM™ CONNECTOR MOUNTING USING TORQUE WRENCH WITH SPECIFIC SETTING

A) Remove the protection cap of the connector.

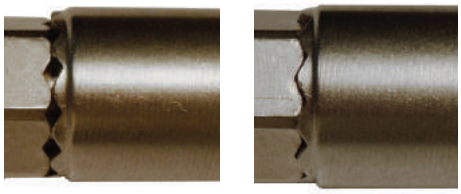
B) By holding the connector at a slight angle gently insert the connector until the sleeve has been reached. This avoids damaging/scratching the front surface of the connector. Straighten the connector along the same axis as the mating adapter.

C) Move the connector clockwise/anti clockwise until the key fits finds the keyway . It may be helpful too to mark the position of the key before inserting in the mating adapter. Turn the hexagon nut of the con nector clockwise by hand all the way down.



D) Final tightening is done using a 6mm TBIH calibrated at 0.3 Nm. When the TBIH bends over you have reached the maximum torque power permitted.

E) Make sure that the anti-rotation teeth are coupling well. If not slightly turn back the hexagon nut of the connector.



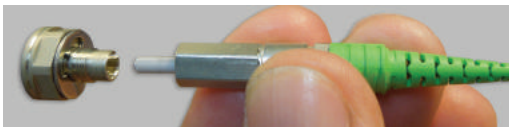
Not OK OK

2. DE-MOUNTING CONNECTOR FROM ADAPTER

2.1 DE-MOUNTING AVIM™/AVIO CONNECTOR FROM MATING ADAPTER

A) Loosen the knurled/hexagon nut of the connector. For the Avim™ case you may use the 6mm torque wrench.

B) Once the nut is loosened from the thread, pull the ferrule straight out gently without any side movement in order to avoid the ferrule front surface scratching of the front mating adapter.



3. VISUAL INSPECTION AND CLEANING PROCEDURES

3.1 GENERAL INFORMATION

Warning: Invisible laser radiation might be emitted from disconnected fibres or connectors. Do not stare into beams or view directly with optical instruments. Make sure that the lasers are turned off before you begin the inspection. It is important that every fibre connector is inspected and cleaned prior to mating. This chapter describes inspection techniques and cleaning procedures for fibre optic connections.

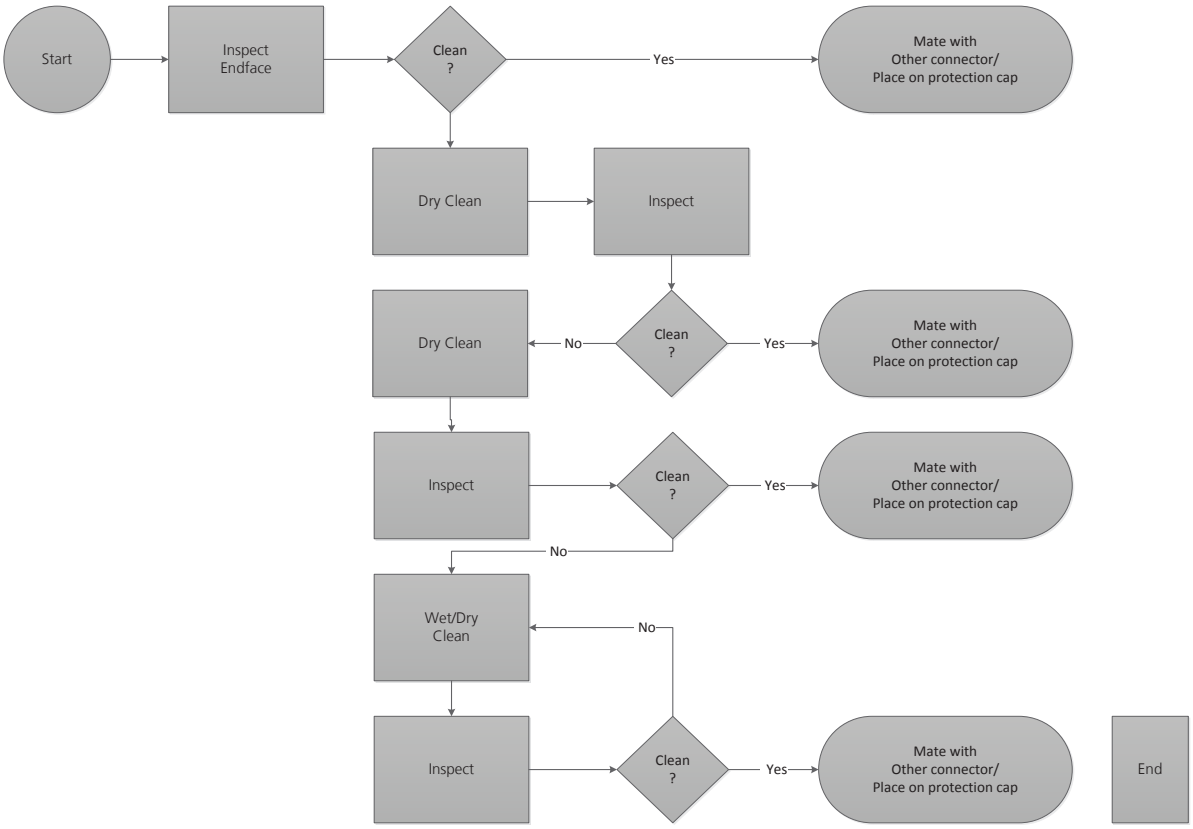
Any microscopic dust particles can cause a variety of problems for optical connections. Dust particles trapped between two fibre faces can scratch the glass surfaces. Even if a particle is only situated on the cladding or the edge of the end face, it can cause an air gap or misalignment between the fibre cores which significantly degrades the optical signal. The tolerance to dirt is near zero so always have the protection caps on adapter/connector if not in use/connected in order to avoid dust getting on the surface.

DIAMOND offers a wide range of products in order to allow a safe connector inspection and cleaning.

3.2 FIBRE OPTIC CLEANING AND TROUBLESHOOTING PROCESS FLOW

Fibre Optic Cleaning and Troubleshooting

Process Flow



If after repeated cleaning the connector still does not meet the acceptance criteria, the connector must be replaced or re-polished.

Re-polishing should only be performed by trained personnel using Diamond polishing machines and should only be performed on-site when absolutely necessary. Always keep the protective cap on the connector when not in use.

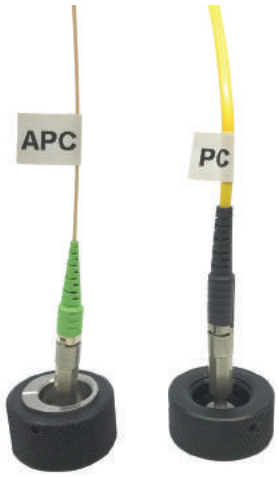
3.3 COMPLETE INSPECTION & CLEANING KIT

INSPECTION PROBE CONNECTED TO PC/LAPTOP

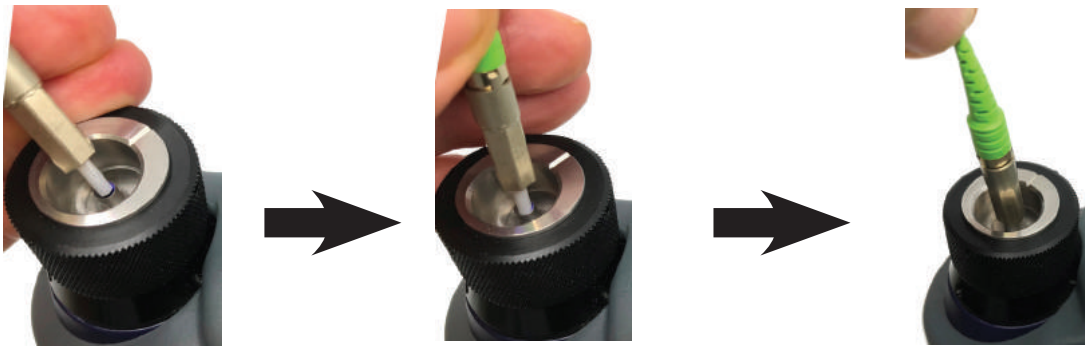
VIAVI OLP-82P MICROSCOPE

There is no danger of eye injury due that the monitor is optically separated from the connector.

3.4 VISUAL INSPECTION OF APC/PC UNMATED CONNECTOR USING THE VIAVI OLP-82P MICROSCOPE



Ø2.5mm adapter PC for unmated simplex connectors	1070134	
Ø2.5mm adapter APC for inspecting unmated simplex connectors	1083929	



A) B) C)

A) By holding the connector at a slight angle gently lean it in the adapter ø2.5mm hole. This avoids damaging/ scratching of the connector front surface.

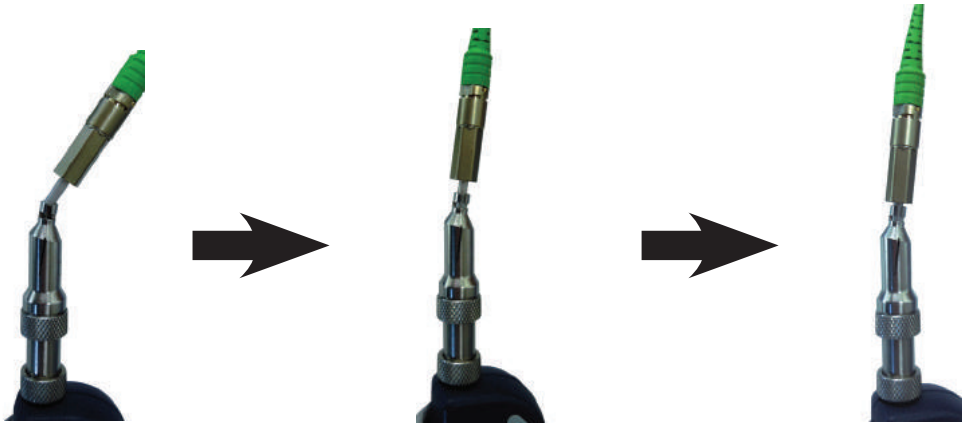
B) Straighten the connector with the same axis as the adapter.

C) Insert the ferrule as far as it will go and inspect.

D) For APC version rotate the ferrule until you have a clear image.

3.5 VISUAL INSPECTION OF APC/PC UNMATED CONNECTOR (FREE CONNECTOR) USING THE P5000I

The probe may either be connected to the microscope or to a laptop.



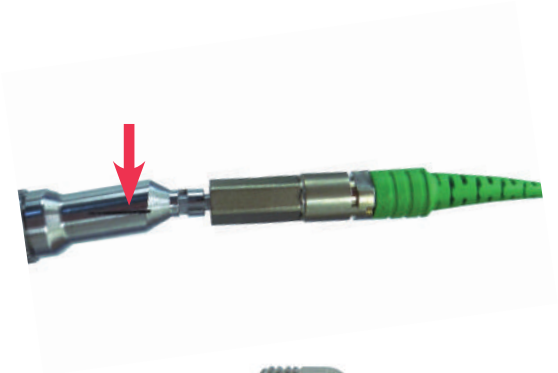
A) B) C)

A) By holding the connector at a slight angle gently lean it in the adapter tip ø2.5mm hole. This avoids damaging/scratching of the connector front surface.

B) Straighten the connector along the same axis as the adapter.

C) Insert the ferrule as far as it will go and inspect.

To capture the image more quickly, align the internal key of the connector with the mark on the adapter tip.



Adapter FBPT U25M for PC 2.5mm free connector inspection — PN: 1074969

Adapter FBPT U25MA for APC free connector inspection — PN: 1074971

3.6 VISUAL INSPECTION OF AVIM™ APC/PC MATED CONNECTORS (IN-ADAPTER INSPECTION)

THERE ARE TWO METHODS TO BE ABLE TO INSPECT THE FRONT SURFACE OF A MATED AVIM™ APC/PC CONNECTOR

3.61 METHOD 1

(This method does not require to dismantle the front flange of the mating adapter.)

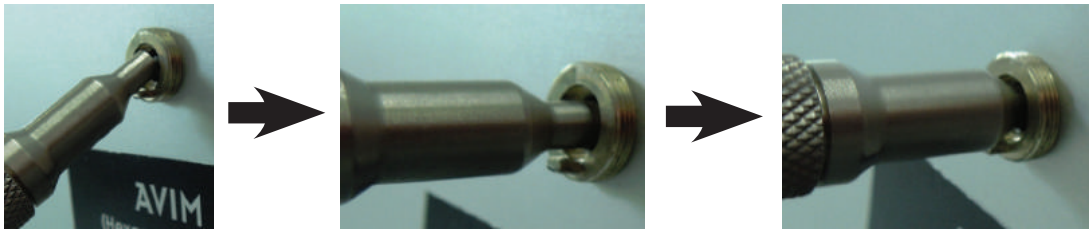
A) Fasten the screw of the special adapter tip (4°) on the extended barrel. Fasten the assembly on the P5000i probe.

B) Place the assembled tip over the AVIM™ mating adapter. To capture the image more quickly, align the adapter key of the connector with the red mark on the adapter tip. However, it needs a bit of patience to centre the image on the display because of the length of the extended barrel. The image on the display is slightly reduced.

3.61 METHOD 2

A)

B) To be able to inspect the front surface an AVIM™ APC/PC the front flange has to be removed.

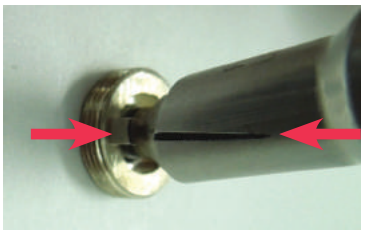


A) By holding the adapter tip ø2.5mm at a slight angle gently lean it in the mating adapter. This avoids damaging / scratching of the connector front surface.

B) Straighten the adapter tip along the same axis as the ferrule.

C) Insert the adapter tip as far as it will go and inspect.

To capture the image of an APC ferrule front face more quickly, align the internal key of the connector with the mark on the adapter tip.



Adapter FBPT U25M for PC 2.5mm free connector inspection — PN: 1074969

Adapter FBPT U25MA for APC free connector inspection — PN: 1074971

4 ACCEPTANCE CRITERIA FOR DIAMOND FERRULES (CU-NI OR TITANIUM).

Do refer to the official document "Acceptance Criteria for Installed Connectors". The document refers to the surface control and acceptance criteria of ferrule end face quality for DIAMOND standard ferrules installed in the field. (Pay attention: This document is not for nonstandard ferrules.)

Document No. 1950852

Extranet: No. 720

DISCLAIMER

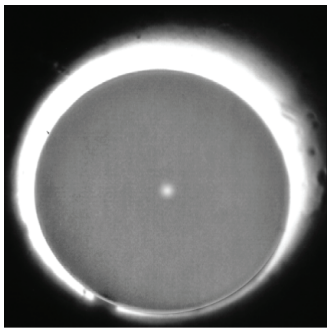
Diamond provides connectors respecting the criteria below, but with mating and de-mating the optical surface will degrade visually while the optical performance (IL, RL) remain normally intact. Visual Inspection is NOT a valid return criteria.

The reliable assessment of the power transmission and/or the reflection performances in an optical link between two fibers should be performed through direct measurements of IL and RL since those are the values that the end user will actually observe once the system is deployed.

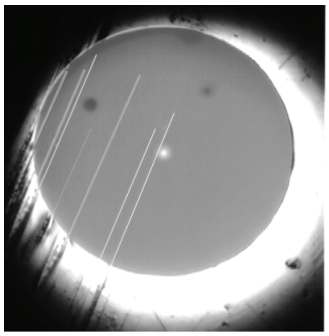
Visual inspection for surface imperfections is an acceptable back-up solution in case direct measurements cannot be performed. However, it can only indicate the suitability of a connection for use but cannot guarantee that IL and RL specifications are going to be met. In this context, visual inspection should be considered only as a qualitative assessment of the connector's performance.

VISUAL INSPECTION EXAMPLES OF DIFFERENT FIBRE DIAMETERS

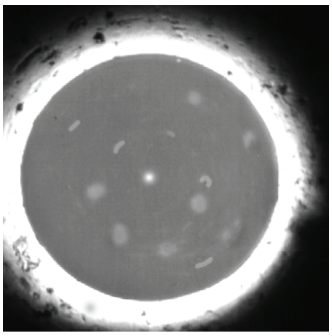
4.1 VISUAL INSPECTION EXAMPLES OF FIBRE APC/PC SM 8/125 µm



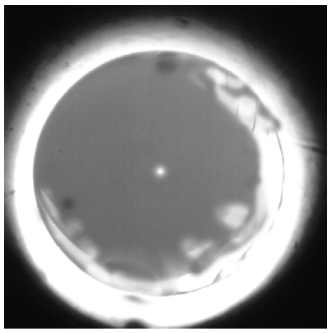
Accepted



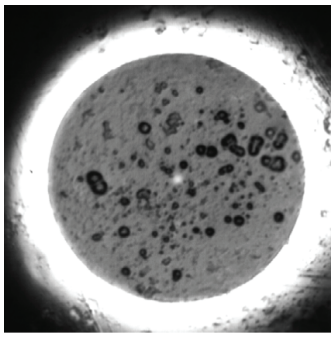
Rejected
Scratches on the fibre



Rejected
Dirt on the fibre

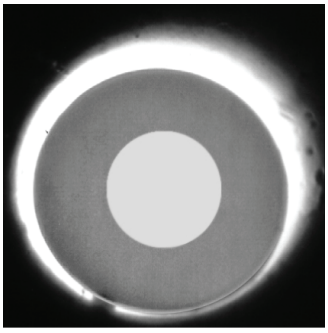


Rejected
Damaged fibre

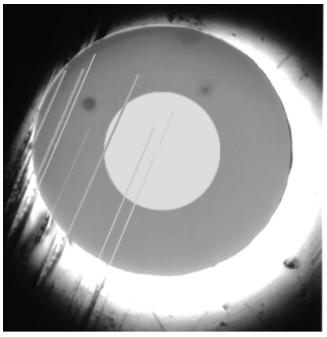


Rejected
Dirt on the fibre

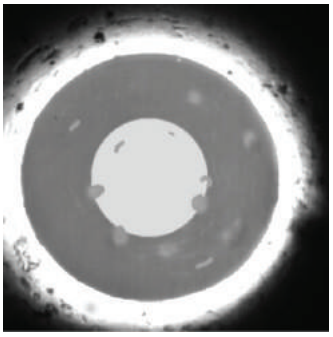
4.2 VISUAL INSPECTION EXAMPLES OF FIBRE APC/PC MM 50/62.5/125 µm



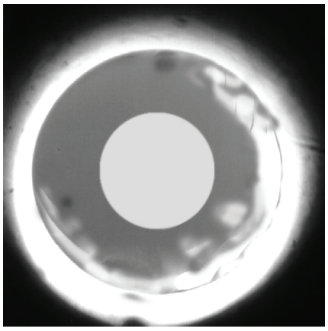
Accepted



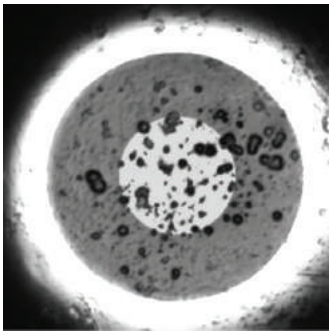
Rejected
Scratches on the fibre



Rejected
Dirt on the fibre

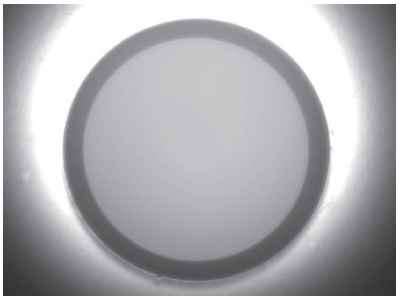


Rejected
Damaged fibre

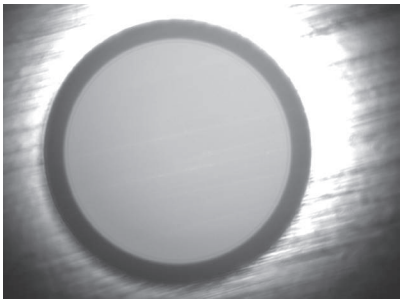


Rejected
Dirt on the fibre

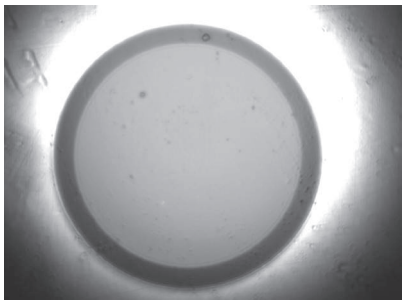
4.3 VISUAL INSPECTION EXAMPLES OF APC/PC MM 105/125 µm



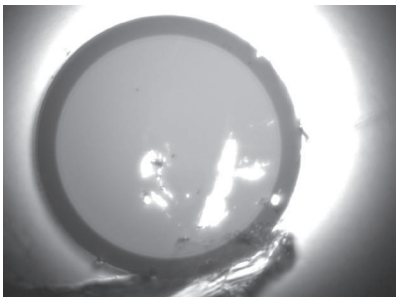
Accepted



Rejected
Scratches on the fibre

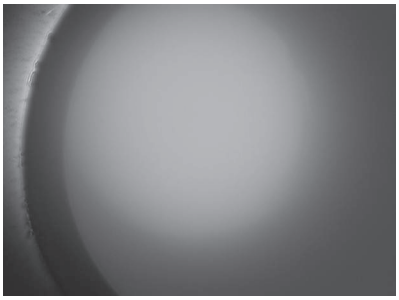


Rejected
Dirt on the fibre



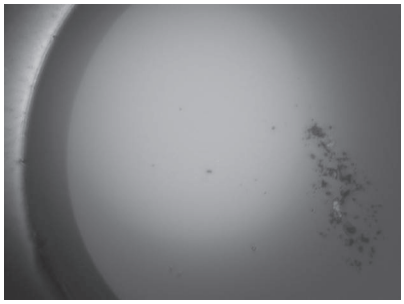
Rejected
Damaged fibre

4.4 VISUAL INSPECTION EXAMPLES OF PC MM 200/230 µm

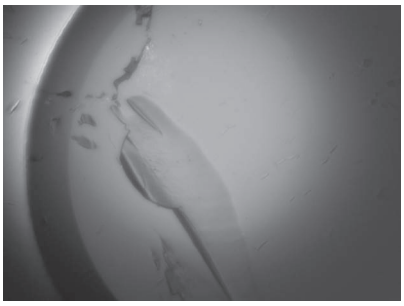


Accepted

Rejected
Scratches on the fibre



Rejected
Dirt on the front face



Rejected
Damaged fibre

5. CONNECTOR END FACE CLEANING

5.1 FERRULE END FACE DRY CLEANING PROCEDURE FOR UNMATED CONNECTORS

A) When the lever is pushed down, the metal protection cover automatically slides back and a new section of micro fibre tape appears, ready for use.

B) Keep the lever down, hold the ferrule front face onto the tape and slide along the entire tape in the indicated direction .

C) Attention: the same part of the tape may be used only once.

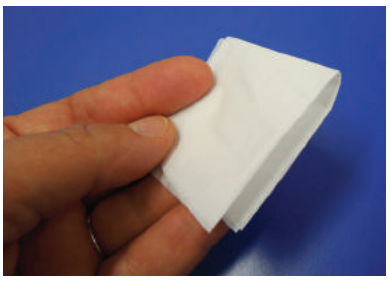
D) Close the metal protection cover by releasing the lever.

E) Inspect the connector referring to the "Acceptance Criteria" document. If the connector face is not clean repeat the procedure.

F) If the result is not positive even after repeated cleaning, try with the wet procedure.

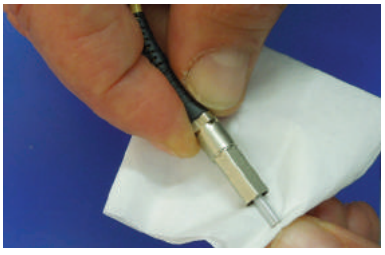
5.2 FERRULE END FACE WET CLEANING PROCEDURE FOR UNMATED CONNECTORS

A) Fold a new a lint-free, disposable wipe three times to obtain a cleaning surface cushioned with more layers of folded material.



B) Moisten a small area of the cleaning surface with some 99% isopropyl alcohol, ensuring that a small area of the surface remains dry.

C) Moisten the connector with the tissue and leave it to act briefly. Rotate the ferrule on the moistened tissue with an axial movement several times applying a slight pressure.



E) Rotate the ferrule on dry zone of the tissue with an axial movement several times applying a very slight pressure.

F) Inspect the connector referring to the according "Acceptance Criteria" document. If the connector face is not clean repeat the procedure.

G) If the result is not positive even after repeated cleaning, we recommend re-polishing or replacing the connector.

5.3 FERRULE END FACE CLEANING PROCEDURE IN BULKHEAD

End face of the ferrule may be cleaned by using the IBC-M250 for in adapter cleaning PN:1070125.

Gently place the tip of the cleaner all the way down in the mating adapter.

Press the cleaner forward 2-3 times

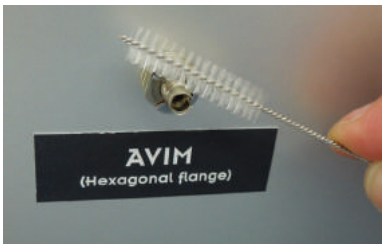
Be careful not to slant the panel cleaner while inserting it into the adapter. With the panel cleaners 90% of cases is carried out without problems, there is a 20% of cases where cleaning won't meet the criteria. If so try to pull out the connector from the mating adapter and clean it with isopropyl alcohol as described previously.

Sometimes it might be better to leave an optical port alone unless signal effecting contamination is observed blocking the core. Contaminants can be pushed onto the end face during cleaning.

IBC-M250 for in adapter cleaning PN: 107015

5.4 MATING ADAPTER SCREW THREAD CLEANING

A) Use a nylon brush to brush away any visible dirt from the threads. Follow the thread all the way round.



B) With clean air blow away any remaining dirt.

C) Clean the internal sleeve, see below.

5.5 MATING ADAPTER SLEEVE CLEANING

A) The mating adapter sleeve can only be cleaned if no connector is inserted.

B) Clean the mating sleeve with a new cleaning stick by pushing it in and out and simultaneously rotating it. Never reuse a cleaning stick.

C) If the mating adapter is not going to be used immediately, protect it with the appropriate protection caps.

D) Very dirty or damaged mating adapters must be replaced.

6. INSPECTION

The ML3S Visual Fault Locator is a hand-held, lightweight, visible laser light source used to identify tight bends or crimps, damaged components, bad splices fiber breaks and also to isolate high losses and faults in fibers cables. By emitting a bright beam of red light into a fiber, breaks can be seen as a glowing red light. The ML3S can be used with either singlemode or multimode cable sections. Model ML3S is recommended for applications in cable length up to 6-8 km.

Characteristics:

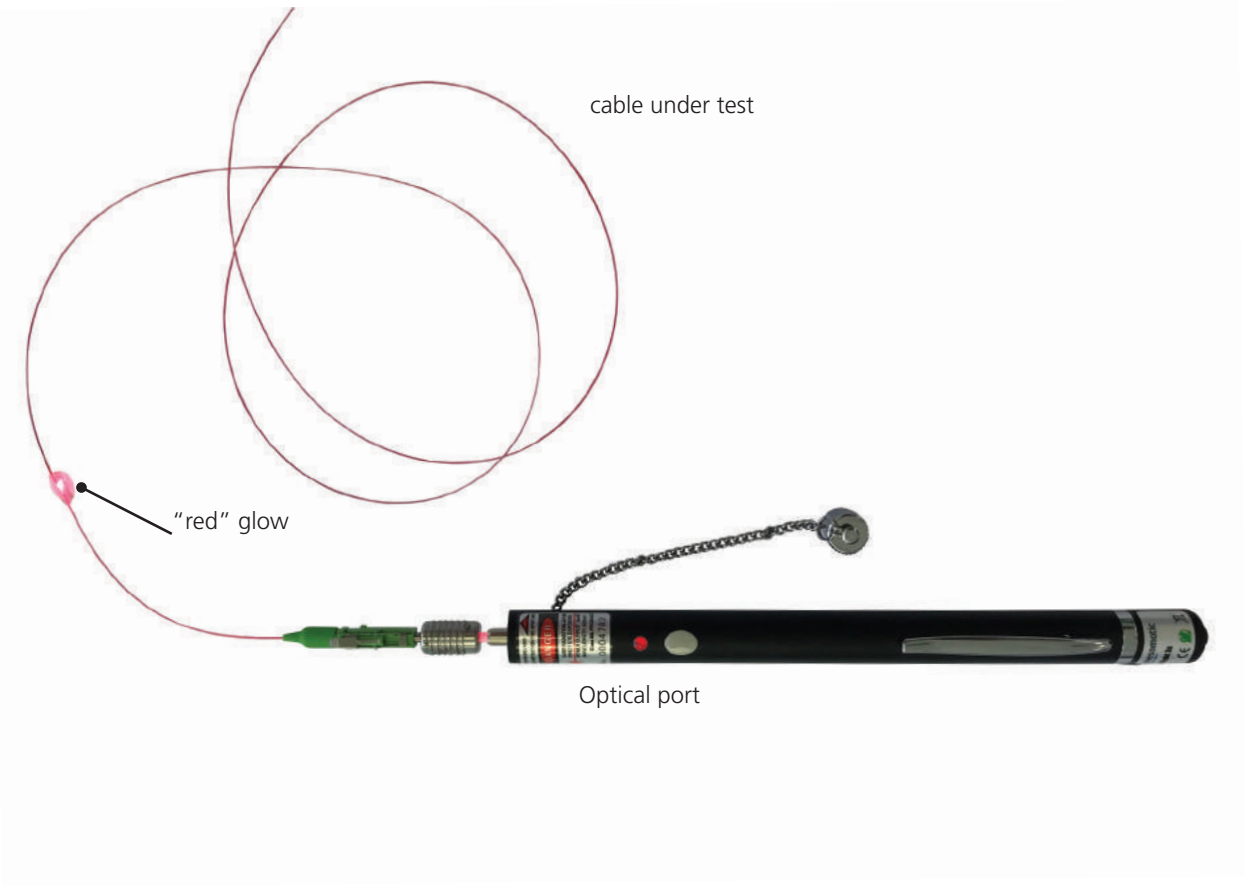
- For Singlemode and Multi-Mode Fiber
- Small and easily manageable, robust
- Universal style optical port connector 2,5 mm.
- Universal 1.25mm Adapter as option
- Operating Distance: approximately 8 km

Technical Characteristics:

- Output power: 3 mW; -9 dBm in the SM 9/125µ Fiber
- Emittertype Laser: (FDA and IEC Class III)
- Wavelength: 650 nm (visible)
- Port connector: 2,5 mm Universal fix or 1,25mm Adapter optional
- Modulation: 2 Hz or continuous
- Weight: 60 g without batteries
- Dimension: 170x15 mm
- Electric power supply: 2 AA Battery for approx. 5 hours operating
- Operating temperature: -10° to +50° C
- Storage Temperature: -20° to +80°C
- Humidity: 0 to 95% (non-condensing)

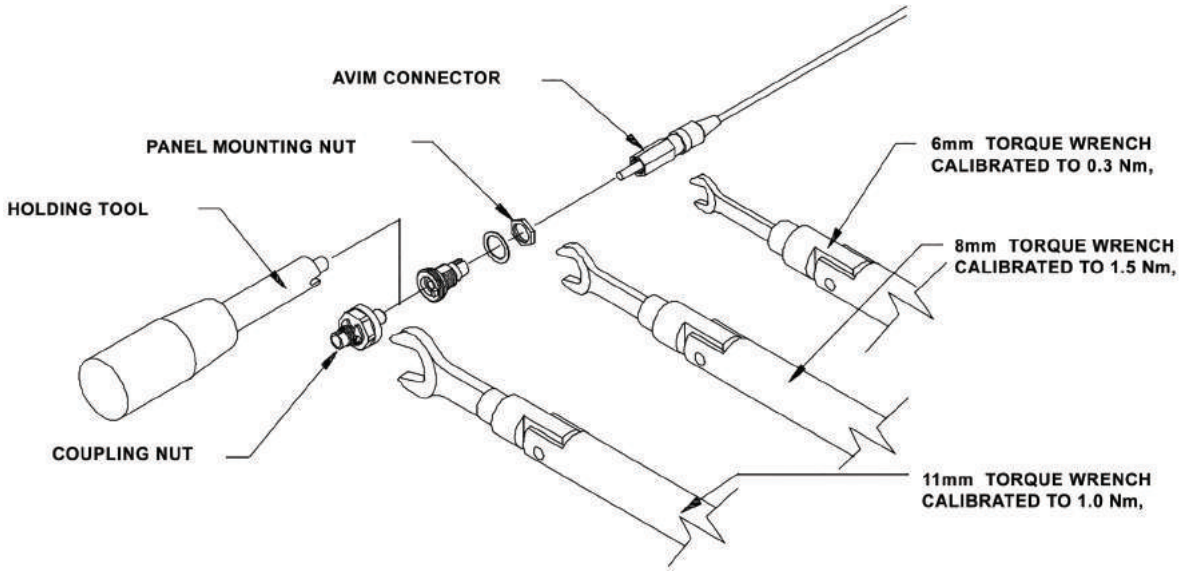
Use the following procedure for fault locate detection:

1. Remove the dust cap covering the unit's OPTICAL PORT.
2. Connect a cable to the OPTICAL PORT connector.
3. Push the switch to the to the desired function:
   Turns the LASER off.
   Turns the LASER on with a continuous laser output. The red Laser Active LED remains on.
   Turns the LASER on with a pulsing laser output. (The red Laser Active LED pulses at a 2 Hz rate).
4. Visually examine the fiber components, locating the faults by a red glow (see Figure 1).
5. Turn unit off.
6. Remove cable from port and replace cap.



7. INTERCONNECTION MOUNTING TOOLS WITH P.N

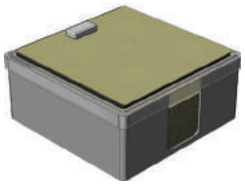
7.1 AVIM™ INTERCONNECTION MOUNTING/DE-MOUNTING TOOLS



P.N AVIM™ INTERCONNECTION TOOLS	
Holding tool for DIN adapter while mounting	1030366
Torque Wrench calibrated to 0.3Nm S=6mm Used for fastening the AVIM™ connector	1027834
Torque Wrench calibrated to 1.5Nm S=8mm(Std Open Head) Used for fastening the panel mounting nut on the D-0626D only	1027835
Torque Wrench calibrated to 1.0Nm S=11mm (Std Open Head) Used for fastening D-062X insert coupling nut.	1027836
Torque Wrench calibrated to 1.5Nm S=8mm (Socket Version) Used for fastening the bulkhead nut.	AUR
Torque Wrench calibrated to 1.0Nm S=11mm (Socket Version) Used for fastening the coupling nut.	AUR

8. PART LIST – INSPECTION KITS, ACCESSORIES AND CONSUMABLES

DESCRIPTION	PN	PHOTO
Digital video inspection microsope kit	1081582	
P5000i Digital inspection probe, including universal 2.5mm (PC) tip for free connector inspection. Further tips maybe ordered. Laptop is excluded	1074601	
Adapter FBPT U25M for PC 2.5mm free connector inspection	1074969	
Adapter FBPT U25MA for APC 2.5mm free connector inspection	1074971	
Set for Avim in-adapter APC/PC inspection. (bulkhead) Barrel & adapter	1080864	
Adapter Ø2.5mm for inspection microscope FMD-200	1070134	

DESCRIPTION	PN	PHOTO
IBC-M250 for in adapter cleaning	107015	
Cletop cleaning sticks L=150mm ø2.5 5pz	1065369	
Doser alcohol 150ml (without alcohol)	1070135	
Spender box with fibre optic lint-free wipes 10x10 cm 100pcs	1070137	
Fibre optic lint-free wipes to refill spender box 100pcs	1070130	
Cletop Cassette Cleaner Type B	1038981	
Replacement reel for Cletop Cassette Cleaner Type B	1038970	
SticklersTM cleaner. The product fulfills flight regulations (non-flammable)	1073654	

DESCRIPTION	PN	PHOTO
30ml sealed alcohol. (can be transported by plane)	1074474	
Visual fault locator ML3	1071628	
Nylon brush	1020702	
Magnifying eye lens	1020640