MAN01-08 – CRYO ROTARY MOTOR (CRM) USER MANUAL

CRYO & NANO PRODUCTS

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RELEVANT DOCUMENTATION

Ref	Title, Author
[1]	CNP_MAN00_Rxx_Getting-Started.pdf (JPE)
[2]	CNP_MAN02_Rxx_Software-User-Manual.pdf (JPE)
[3]	CRM_Interface-drawings.pdf (JPE)
[4]	CRM_Brochure.pdf (JPE)

DOCUMENT HISTORY

JPE	2019-06-20	R01. Creation.
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DEFINITIONS

ABBREVIATIONS

1. INTRODUCTION

Thank you for using JPE's Cryo & Nano Products!

This *User Manual* describes the handling and use of Cryo Rotary Motor (CRM), from here on described as *system*).

Please read this document carefully prior to installation and (initial) operation of the controller, (stand-alone) actuators and systems. Failure to observe the safety regulations results in a risk of mortal electric shock and/or damage to the controller(s), actuator(s) and/or system(s)!

JPE shall not be liable for damage or injury resulting from misuse of the controller system(s), actuator(s) and/or device(s) or unauthorized alterations to either of those.

All products mentioned in this manual are intended for use in a laboratory and/or scientific research environment only and may only be installed, maintained and used by higher educated, technical skilled personnel (from here on described as *operators*).

Please note that all content in this document is superseded by any new versions of this document. Visit the JPE website (www.jpe-innovations.com) to obtain the most recent version. All images in this document are for illustrative purposes only.

1.1 Prerequisites

Before continuing with this user manual, please make sure to read and understand the contents of the (latest version of the) Cryo & Nano Positioning Products Getting Started Guide (MAN00).

2. INSIDE THE BOX

2.1 Actuators without -COE

Systems will be delivered in a white-colored (membrane) polypropylene box. The system is fixed onto the inner part of the polypropylene box using fasteners and can be taken out and bend in such way that the system can be easily unpacked.

Do not cut the membrane plastic. Keep the box in case products need to be returned.

2.2 Actuators with -COE

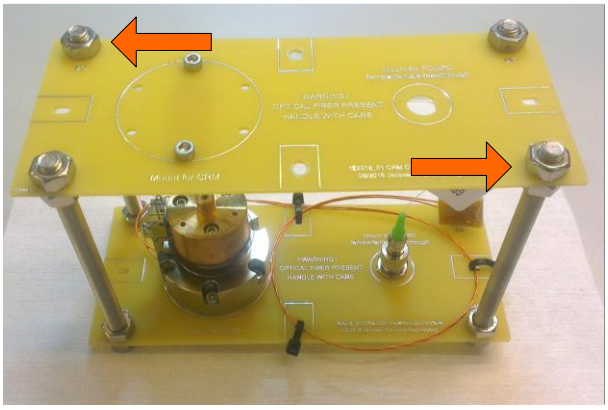
Systems equipped with a Cryo Optical Encoder (product type option –COE) are mounted in a dedicated *PCB Transport tool* to guard the encoder grid and optical fiber. The PCB Transport Tool (PCBTT) will be fixed onto the inner part of the polypropylene box using fasteners instead of being locked underneath the membrane plastic.

Unpacking these systems require a bit more attention as it is easy to damage the optical fiber and/or encoder grid.

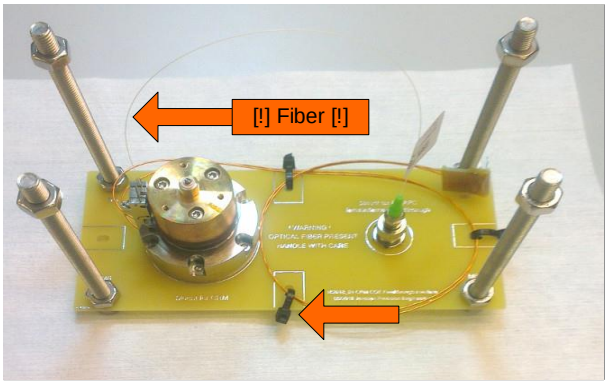
Figure 1: PCB Transport tool for CRM1-COE

1 Open the box and take out the PCBTT **with CRM1-COE** and place the tool upright.

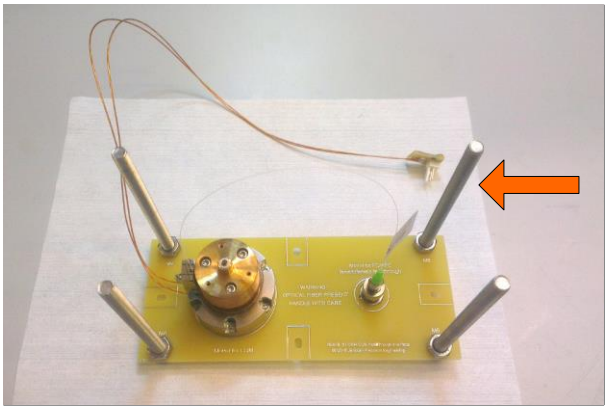
2 Remove the **top** Transport PCB by unscrewing the nuts on top. Notice the fiber underneath this PCB! Lift the PCB carefully.



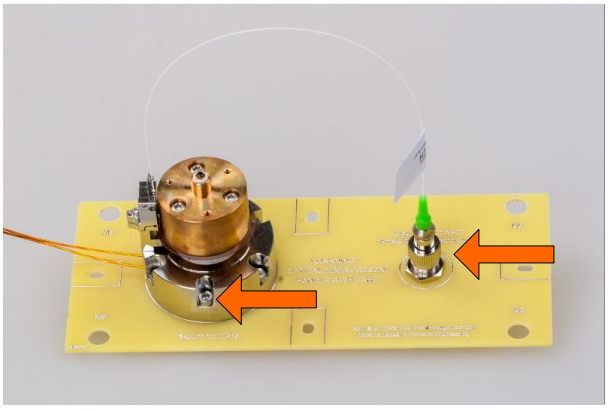
3 *(if present)* Cut the tie-wraps to free the Kapton wires (or remove the Kapton tape if the wires have been fixed with tape).



4 Remove the **4 threaded bars**. Again, take care not to damage the fiber while using handtools to remove the bars.



5 *(When installing system in customer setup)* Unscrew the **optical fiber connector** from the **feedthrough**. Unscrew the fasteners that keep the CRM fixed to the PCB. Remove the feedthrough PBC from the CLD.



6 Always put (metal) caps to cover fiber outputs and feedthroughs when not in use. Keep the PCBTT for actuator storage.

3. MOUNTING INSTRUCTIONS

View the Interface Drawing for detailed dimensions and mounting interfaces.

If the system is equipped with a Cryo Optical Encoder (product type option –COE) make sure that the optical fiber does not get damaged or stuck in the setup when mounting the actuator. Take great care not to damage the encoder grid. Use the *unpacking instructions* (see chapter 2.2) as a guide / reference.

4. ELECTRICAL CONNECTIONS

All systems are assembled with ~150[mm] Kapton coated wire and a Connector Interface PCB at the end with a 2-pin 2.54mm pitch header mounted (*Molex KK 22-05-7028*). There are two mounting holes available for M2 bolts.

The default Ambient Cable (ACL) can be connected directly to the Connector Interface PCB. If any custom cabling is required, please consult the Getting Started Guide (MAN00).

Pin configuration		
Pin	Name	Note
1	(Piezo) Signal	Routes to the pad labeled "S" or "SIG" on the actuator
2	(Piezo) REF	Routes to the pad labeled "R" or "REF" on the actuator

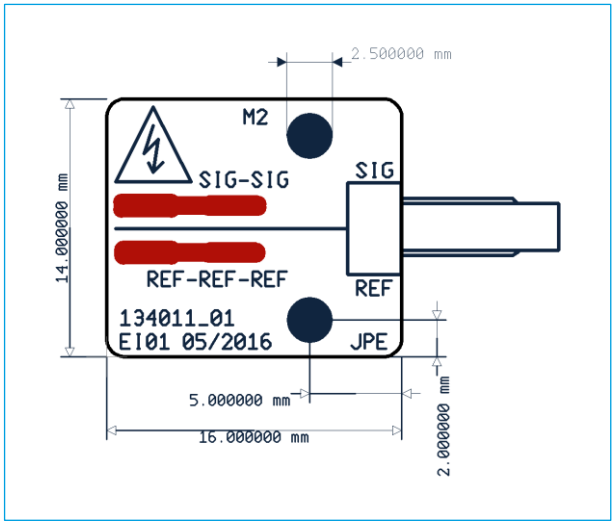


Figure 2: CLA Connector Interface PCB (top view)

Make sure that there is no force applied to the Kapton coated wires connected to the actuator!

Please note that (Piezo) REF is NOT the same as (system) GND or PE, so do not connect these to each other and do not use standard oscilloscope probes!

Because of design constraints, open voltage contacts are present!

5. OPTICAL CONNECTIONS

If the system is equipped with a Cryo Optical Encoder (product type option –COE) an optical fiber with a length of ~200[mm] is fixed to the encoder bracket. On the end of the fiber is an *FC/APC narrow key (male)* connector.

The fiber cable and COE are delicate components that need to be handled very carefully. Take great care not to damage the encoder grid. Make sure that no force is applied to the fiber and fixate the FC/APC connector. Please read the Unpacking Instructions manual (see above) as a guide / reference

The default Ambient Fiber (AF5) cable can be connected to the FC/APC narrow key (male) connector only by using the supplied *FC/APC female/female adapter (Molex 106152-3000)*. If not in use, always keep metal screw-on cap on connector and/or adapter.

If any custom cabling is required, please consult the Getting Started Guide (MAN00).

Figure 3: FC/APC female/female adapter

6. CONNECTING TO CONTROLLER

Controller with Plug-in Modules [1]	
CRM1	CADM2 Output
CRM1-COE	CADM2 Output OEM2 Input A

[1] For available Modules see CNP MAN01-09 (CPSC).

7. SENSOR CALIBRATION

If the system is equipped with a Cryo Optical Encoder (product type option –COE), the device will be delivered pre-calibrated. This calibration is done to determine the correct optical signal levels for the encoder.

Calibration is done in cooperation with the Optical Encoder Module (OEM2). This means that the calibration settings for a specific COE will be stored for a specific input channel of the OEM2.

For that reason, or for a re-calibration, it is also possible to do a (manual) calibration. For this the actuator must be able to move freely. Re-calibration can be done with the user software, please read the *Software User Manual (MAN02)* on how to do this.

8. DECLARATION OF CONFORMITY CRM

Manufacturer	:	JPE B.V.
Address	:	Aziëlaan 12 6199 AG Maastricht-Airport The Netherlands

The manufacturer hereby declares that the product:

Product Name	:	**Cryo Rotary Motor (CRM)**
Product Description	:	**High torque rotational drive for cryogenic applications.**
Product Number	:	**C181050**

Complies with the following European directives:

2014/35/EU	**Low Voltage Directive**
2014/30/EU	**EMC Directive**
2011/65/EU	**RoHS**

A copy of the Technical file for this equipment is available at JPE.

Maastricht-Airport, 29 June 2018

Ir. H. Janssen
Founder & CEO
JPE B.V.
The Netherlands

9. DECLARATION OF CONFORMITY COE

Manufacturer	:	JPE B.V.
Address	:	Aziëlaan 12 6199 AG Maastricht-Airport The Netherlands

The manufacturer hereby declares that the product:

Product Name	:	**Cryo Optical Encoder (COE)**
Product Description	:	**Cryogenic Optical Encoder for the CLA.**
Product Number	:	**C181045**

Complies with the following European directives:

2006/25/EC	**Artificial Optical Radiation**
2011/65/EU	**RoHS**

A copy of the Technical file for this equipment is available at JPE.

Maastricht-Airport, 29 June 2018

Ir. H. Janssen
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