

MAN01-04 – CRYO STAGE 02 (CS02) USER MANUAL

CRYO & NANO POSITIONING PRODUCTS

JPE



+31 (0) 43 3585 777

www.jpe.nl

Aziëlaan 12

6199 AG Maastricht-Airport
The Netherlands

Property of: JPE

Author: JPE

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RELEVANT DOCUMENTATION

Ref	Title, Author
[1]	CNP-Products_MAN00_Rxx_Getting-Started.pdf (JPE)
[2]	CNP-Products_MAN02_Rxx_Software-User-Manual.pdf (JPE)
[3]	CS02_Interface-drawings.pdf (JPE)
[4]	CS02_Brochure.pdf (JPE)
[5]	

DOCUMENT HISTORY

JPE	2019-06-20	Ro1. Creation.

DEFINITIONS

ABBREVIATIONS

1. INTRODUCTION

Thank you for using JPE's Cryo & Nano Positioning products!

This *User Manual* describes the handling and use of Cryo Stage 02 (CS02), 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Please note that all content in this document is superseded by any new versions of this document.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.nl) to obtain the most recent version¹. 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).

¹ This *User Manual* is intended for products ordered and delivered from **June 2019 onwards**. For products ordered and delivered prior to this date, please refer to the previous User Manual(s).

2. INSIDE THE BOX

Actuators will be delivered in a white-colored (membrane) polypropylene box (one system per box). The inner part of the polypropylene box can be taken out and bend in such way that the actuators and/or systems can be easily unpacked.

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

3. MOUNTING INSTRUCTIONS

View the Interface Drawing for detailed dimensions and mounting interfaces.

Make sure the wiring to the Connector Interface PCB and/or Resistive Linear Sensor (product type option -RLS) does not get damaged or stuck in the setup when mounting the system. The Connector Interface PCB must be mounted properly prior to driving the CS02 electrically!

An optional reference frame (I1-CS021) is also available. If ordered, this reference frame will be delivered already mounted on the CS02.

4. ELECTRICAL CONNECTIONS

4.1 Drive Signal

Each actuator in the system is 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

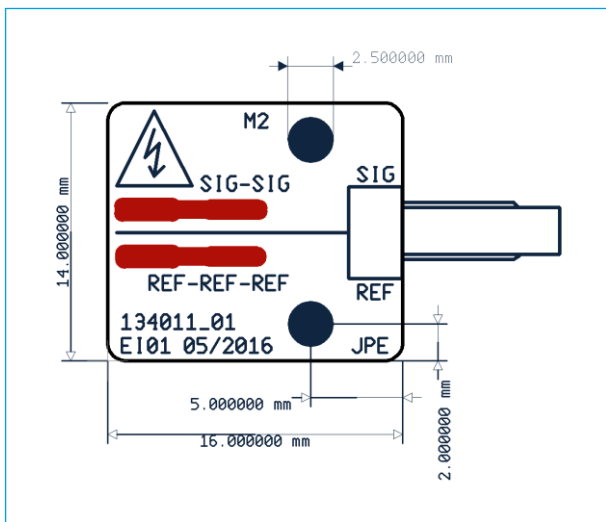


Figure 1: CLA Connector Interface PCB (top view)

Make sure that there is no force applied to the 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!

4.2 Sensor signal

If the system is equipped with a Resistive Linear Sensor (product type option –RLS), the system is assembled with ~300[mm] AWG30 Kapton coated wires terminated to a 15p female PEEK UHV D-Sub with screw locks (*LewVac D15-PCONF with DPINF-25-S crimp contacts*). This D-Sub can be connected directly to industry standard (vacuum) D-Sub (male) feedthroughs.

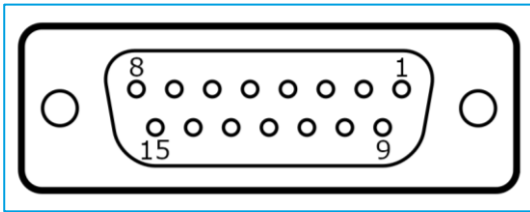


Figure 2: 15p female PEEK UHV D-Sub (front view)

15p female PEEK UHV D-Sub		
Pin #	RLS #	Signal
8	X	Excitation Negative
7	X	Wiper Positive
6		n/c
5	Y	Wiper Negative
4	Y	Excitation Positive
3		n/c
2	Z	Wiper Negative
1	Z	Excitation Positive
15	X	Wiper Negative
14	X	Excitation Positive
13	Y	Excitation Negative
12	Y	Wiper Positive
11		n/c
10	Z	Excitation Negative
9	Z	Wiper Positive

Note that most (D-Sub) vacuum feedthroughs are "male-male" type. This means that the pinning will be mirrored from one side to the other. The pinning of the 15p female PEEK UHV D-Sub is defined such that it works correctly by default with the I1-RSM and a male-male feedthrough (!).

Make sure that there is no force applied to the wires connected to the sensor!

This connector works best in combination with the Ambient Connector Kit for the RSM (I1-RSM). With this a complete (electrical) connection from RLS to RSM can be constructed without the need for any additional wiring.

5. CONNECTING TO CONTROLLER

Controller with Plug-in Modules ²		
	Module	Slot #
CS02 (X)	CADM2 Output	1
CS02 (Y)	CADM2 Output	2
CS02 (Z)	CADM2 Output	3
CS02-RLS (X)	CADM2 Output	1
CS02-RLS (Y)	CADM2 Output	2
CS02-RLS (Z)	CADM2 Output	3
CS02-RLS (X)	RSM Input A	4
CS02-RLS (Y)	RSM Input B	
CS02-RLS (Z)	RSM Input C	
CS02(-RLS) (Z scanning)	PSM Output A	5

² For available Modules see CNP-Products MAN01-09 (CPSC).

6. SENSOR CALIBRATION

If the system is equipped with a Resistive Linear Sensor (product type option –RLS), the device will be delivered pre-calibrated. This calibration is done to determine the (maximum) stroke the sensor can measure as well as the center (nominal) position.

Calibration is done in cooperation with the Resistive Sensor Module (RSM). This means that the calibration settings for a specific RLS will be stored for a specific input channel of the RSM.

For that reason, or for a re-calibration, it is also possible to do a manual calibration. This involves moving the actuator through its range (free movement required) and storing measurement calibration values. This can all be done with the user software, please read the *Software User Manual (MANo2)* on how to do this.

7. DECLARATION OF CONFORMITY

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

The manufacturer hereby declares that the product:

Product Name : **Cryo Stage 02 (CS02)**
Product Description : **Orthogonal xyz positioning with high load capacity, fitting a 50mm bore.**
Product Number : **C181103**

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, 20 June 2019



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