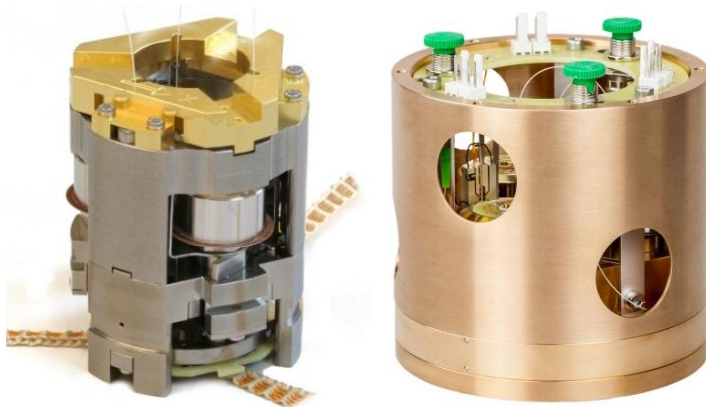


## CRYO POSITIONING STAGE HIGH RESONANCE (CPSHR)



### Features

- Parallel kinematics, high stiffness design
- High internal resonances, up to 4kHz
- Coarse motion using Cryo Linear Actuators
- Choice of 3 types with unique features
- CPSHR<sub>1</sub>: compact, high resonances, titanium
- CPSHR<sub>2</sub>: large stroke, lower resonances, higher thermal conductivity, phosphor bronze
- CPSHR<sub>3</sub>: large stroke, high resonances, optimal thermal conductivity, aluminium
- Scanner option "S"
- Cryo Optical Encoder option "COE"

### Description / Applications

The Cryo Positioning Stage High Resonance (CPSHR) is a XYZ positioning stage developed for use in a cryo-vacuum environment. Parallel kinematics result in a light and stiff stage with very high internal resonance frequencies, making it less sensitive to floor vibrations. The CPSHR<sub>1</sub> is the most compact design with small stroke and high resonances. The CPSHR<sub>2</sub> has large stroke and improved thermal conductivity but lower resonances. The CPSHR<sub>3</sub> combines the best of both worlds with large stroke, further optimized thermal conductivity and high resonances.

### Specifications

specs	unit	CPSHR <sub>1</sub> -S	CPSHR <sub>2</sub>	CPSHR <sub>2</sub> -S	CPSHR <sub>2</sub> -COE	CPSHR <sub>2</sub> -S-COE	CPSHR <sub>3</sub>	CPSHR <sub>3</sub> -S	CPSHR <sub>3</sub> -COE	CPSHR <sub>3</sub> -S-COE
<b>SYSTEM SPECIFICATIONS</b>										
Active axes	-	3								
Type of motion	-	x, y, z with parasitic RxRy								
System Range *	mm <sup>3</sup>	approx. 1x1x1	approx. 10x10x4				approx. 8x8x4			
System scan range @4K	μm <sup>3</sup>	approx. 1x1x0.5	N/A	approx. 10x10x1.6	N/A	approx. 10x10x1.6	N/A	approx. 8x8x1.6	N/A	approx. 8x8x1.6
Parasitic angle from xy stroke	mrاد/mm	20	14				17			
Coarse actuator	-	CLA2201	CLA2601							
Scanning actuator	-	Piezo ceramic	N/A	Piezo ceramic	N/A	Piezo ceramic	N/A	Piezo ceramic	N/A	Piezo ceramic
Endstops **	-	at z -3mm and z +3mm								
Main construction material	-	Titanium	Phosphor Bronze (improved thermal conductivity, lower resonances)				Aluminium (optimal thermal conductivity, high resonances)			
1st natural frequency	kHz	xy: 1.5 / z: 4.0	xy: 1.2 / z: 2.2	xy: 0.55 / z: 2.2	xy: 1.2 / z: 2.2	xy: 0.55 / z: 2.2	xy: 2 / z: 3.7	xy: 1.5 / z: 3.7	xy: 2 / z: 3.7	xy: 1.5 / z: 3.7
<b>ACTUATOR SPECIFICATIONS</b>										
Specifications are given for individual actuators unless otherwise mentioned. See interface drawing for transformation matrix from actuator outputs to system motion										
Coarse range	mm	±0.5	±3							
Scan range @ 293 K	μm	2.5	N/A	8	N/A	8	N/A	8	N/A	8
Scan range @ 4 K	μm	0.5	N/A	1.6	N/A	1.6	N/A	1.6	N/A	1.6
Coarse step size @ 293 K	nm	5-25								
Coarse step size @ 4 K	nm	1-5								
Scanner sensitivity @ 293 K	nm/V	25	N/A	66	N/A	66	N/A	66	N/A	66
Scanner sensitivity @ 4 K	nm/V	5	N/A	13	N/A	13	N/A	13	N/A	13
Load capacity	grams	200								
Operating temperature	K	0.8-375	0.02-375				1.5-375			
Mass	grams	300	1230		1450		510		570	
Coarse actuator spindle pitch	mm/turn	0.25								
Coarse actuator encoder resolution ***	PPR	N/A	N/A		850		N/A		850	
<b>DRIVE ELECTRONICS</b>										
Controller/driver	-	CAB-230(115), CADM(2), MCM								
Encoder readout	-	N/A	N/A		OEM <sub>2</sub>		N/A		OEM <sub>2</sub>	
Scanner module	-	PSM, PSMIL	N/A	PSM, PSMIL	N/A	PSM, PSMIL	N/A	PSM, PSMIL	N/A	PSM, PSMIL
* Typical volume for positioning. Due to the parallel kinematics the indicated max values are not necessarily simultaneously achievable. On the other hand max values can be bigger when strokes along other axes are limited.										
** Endstops are placed close to, but not coincident with each actuator motion axis. Together they define a system z-position, with x and y being 0. Touching multiple endstops in an uncontrolled manner with x and y not being 0 can cause the system to jam and could require manual action to free it.										
*** Linear resolution can be found by dividing the spindle pitch by PPR (pulses per revolution)										

### Mechanical and electrical information

Download 3D-Step files, interface drawings and user manuals from:  
[www.jpe.nl/cryo-nano-positioning/](http://www.jpe.nl/cryo-nano-positioning/)

### Contact

For quotations, orders, customization or specials, please contact us at:  
[www.jpe.nl/contact](http://www.jpe.nl/contact)

## Ordering Information

CPSHR1-S	CPSHR1 incl. Scanner
CPSHR2	CPSHR2
CPSHR2-S	CPSHR2 incl. Scanner
CPSHR2-COE	CPSHR2 incl. Cryo Optical Encoder
CPSHR2-S-COE	CPSHR2 incl. Scanner and Cryo Optical Encoder
CPSHR3	CPSHR3
CPSHR3-S	CPSHR3 incl. Scanner
CPSHR3-COE	CPSHR3 incl. Cryo Optical Encoder
CPSHR3-S-COE	CPSHR3 incl. Scanner and Cryo Optical Encoder