

THE 5 AXES MANIPULATOR WITH X, Y, Z, R1, R2 AXES MOTORIZED

Description

The 5 Axes Manipulator with X, Y, Z, R1, R2 Axes Motorized is a high precision, high rigidity, UHV specimen manipulator of modular construction, suitable for a range of X, Y, Z, R1 and R2 motions. The modular construction means that the specification can be upgraded or modified by the addition or replacement of well defined modules. All axes of the manipulator are motorized by stepper motors. The X, Y and Z axes may also be operated manually by as required. The standard mounting flange is DN 100CF or DN 160CF. The 5 Axes Manipulator is a combination of XY Stage, Z Slide and Rotation Stages (see chapters **XY Stages** and **Z Slides**).

Application

The 5 Axes Manipulators are used for manipulating sample holders and scientific tools with respect to a sample's position. These manipulators, when combined with sample holders, allow precise placement and manipulation of samples in UHV environments. The manipulators themselves move the sample in three orthogonal axes, X, Y, and Z while the rotary drives provide rotation R1 and R2 around the Z and Y axes. They can work in any orientation.

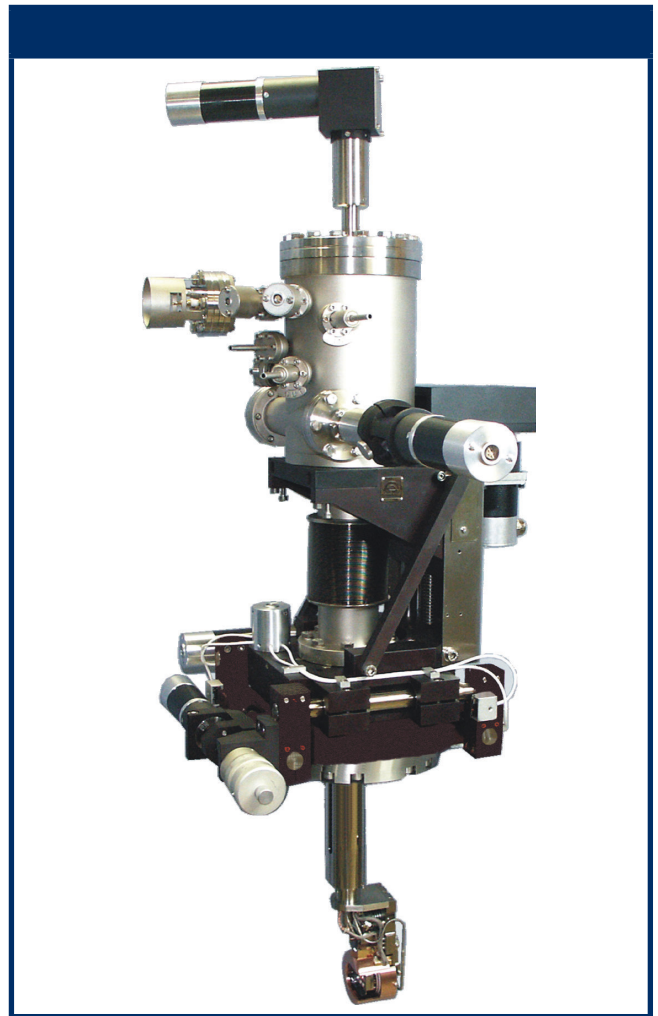
Additional information

The 5 Axes Manipulators are configured with a Sample Receiving Station that accepts one of our 'PTS' range of sample holders. The station is equipped with 6 electrical contacts (2 x thermocouple type K, C or E; 2 x sample bias up to 1000V, 2 x heating current up to 20A) and sapphire ball cooling contact for liquid nitrogen cooling. The manipulator includes all of the necessary electrical, gas and mechanical feedthroughs together with stepper motor and stepper motor driver for the XY, Z, R1 and R2 axes.

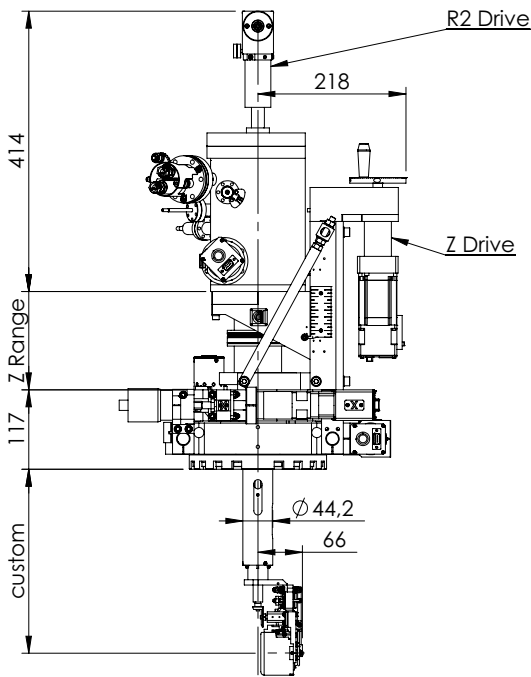
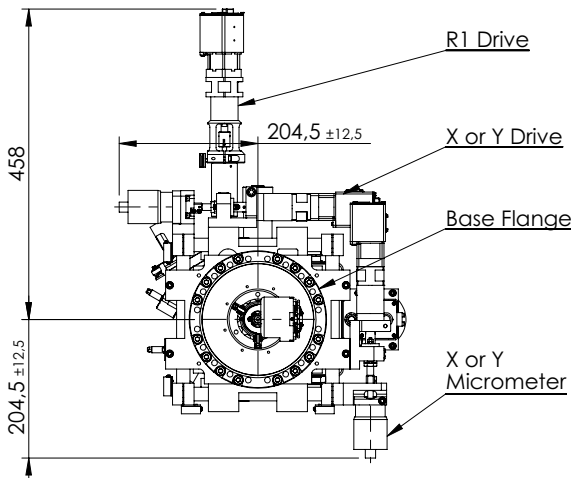
The Z Axis Stepper Motor is controlled by the stepper motor driver SMCD20 (see chapter **Stepper Motor Control Driver SMCD20**). The XY, R1 and R2 rotations are controlled by the stepper motor driver SMCD10 (see chapter **Stepper Motor Control Driver SMCD10**). All controllers are designed for easy removal prior to baking.

Note:

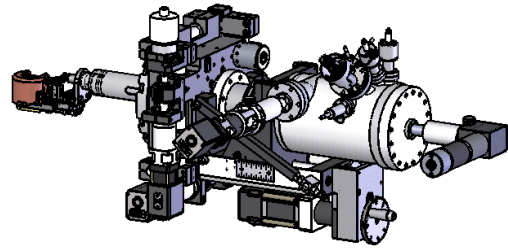
To order 5 Axes manipulators please use the Multi Axes Manipulator Configuration Table.



Basic dimensions



Over view



Specification

Positional control X, Y	Micrometer or stepper motor
Positional control Z	Handwheel or stepper motor
Position control R1	Stepper motor
Position control R2	Stepper motor
Pressure range	1 bar to 10 ⁻¹¹ mbar
Operating temperature	-25 °C to +60 °C
Bakeout temperature	150 °C
Standard base flange	DN 100CF or DN 160CF
Travelling flange	DN 40CF or DN 63CF
XY Range	± 12,5 mm
Resolution (manual)	0,5 µm
Resolution (motorized)	1 µm
Maximum speed	2 mm/s
Z Range	75-800 mm
Resolution (manual/motorized)	500 µm / 1 µm
Repeatability (motorized)	0,01 mm
R1 Range	± 180°
Resolution (motorized)	0,1°
Repeatability (motorized)	0,05°
Maximum speed	4°/s
R2 Range	± 360° continuous
Resolution (motorized)	0,1°
Repeatability (motorized)	0,05°
Maximum speed	4° /s