

Technical Note

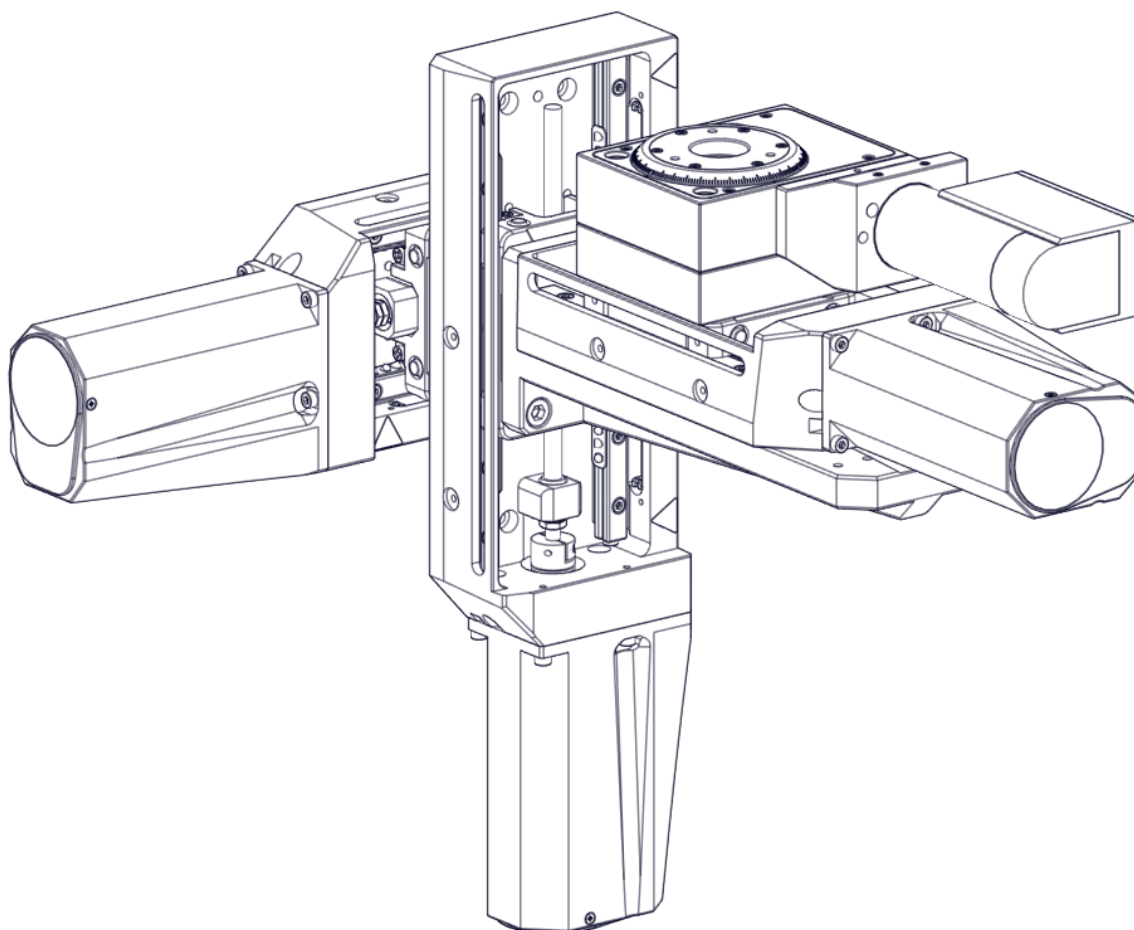
M900T0055, applies to M-900K276

MMa, 27-FEB-2019

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M-900K276

XYZ θ z-microscope positioner combination
incl. three L-509-type and one M-060-type positioners



Schematic product view

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Features

This product features positioning in 4 axes (X, Y, Z, θ_z). For operation, several PI controllers for DC motors are applicable (separate order).

It includes 3 linear stages, 1 rotation stage, required mounting adapters and screw sets, packed separately.

Mounting of the assembly is described below.

Other Applicable Documents

Product	Document
Positioners with electric motors	MP146EK Short Instructions
L-509 linear stage	MP141E User Manual
M-060 rotation stage	MP54E User Manual

*Further documents (PDF files) included in the controller CD-ROM.

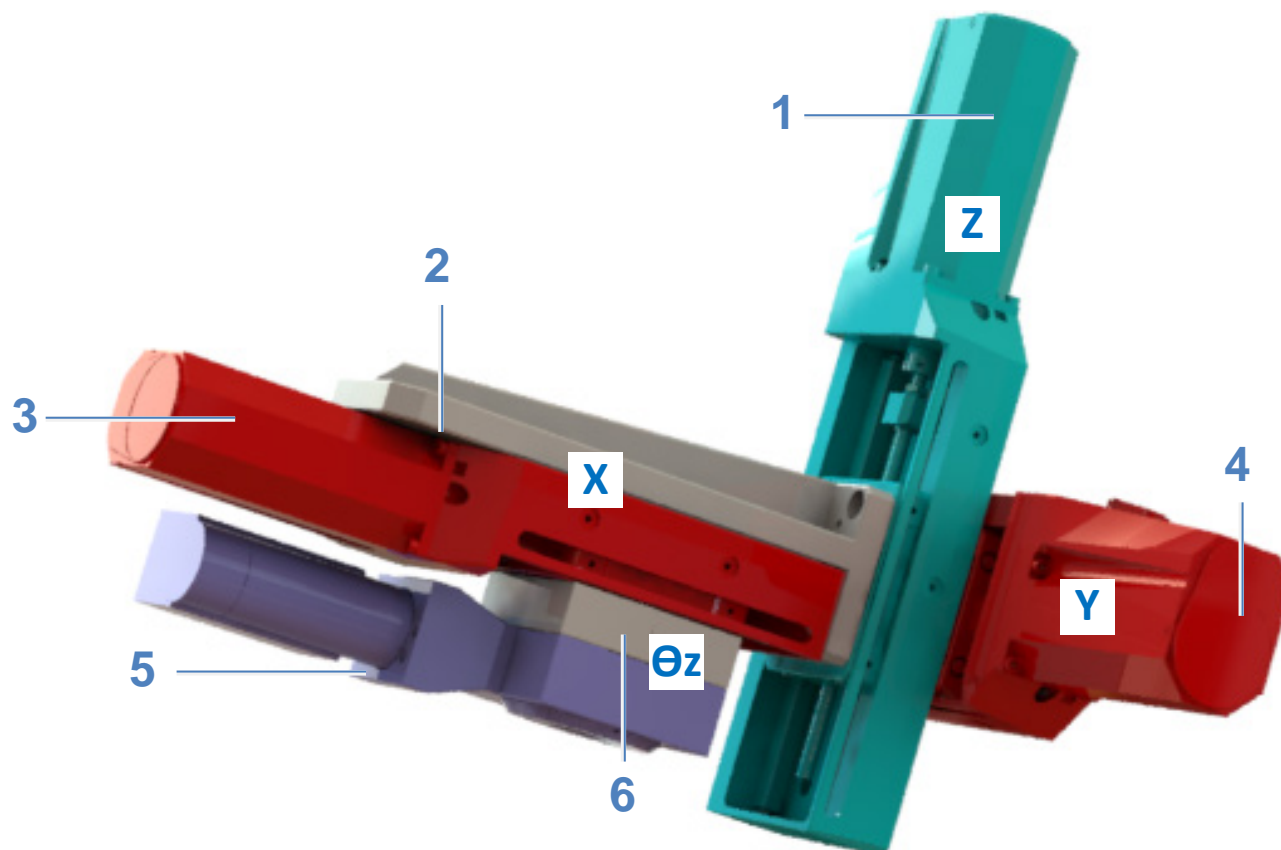
You can download user manuals for standard products from our web site www.pi.ws.

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Component Designations / Scope of Delivery (Hardware)



Ref.	Qty.	Product code	Item	Abbreviation
1	1	L-509.40DG10	Precision linear positioner, 52 mm travel range	Z stage
2	1	L-500.AV3	Mounting adapter for L-5xx positioners	X adapter
3	2	L-509.20DG10	Precision linear positioner, 102 mm travel range	X stage
4				Y stage
5	1	M-060.DG	Precision rotation stage	Θz stage
6	1	M-060K044	Adapter plate for combining L-509/M-060-type positioners	Θz adapter
	4		Screw ISO 4762 M6x12	
	4		Screw ISO 4762 M4x20	
	8		Screw ISO 4762 M4x14	
	8		Screw ISO 8734 M4x12	Grub screw
	1	C-815.38	Motor cable 3 m with connectors D-Sub 15 (male/female)	
	1	C-815.LDM1	Motor cable 3 m with connectors D-Sub 15 (male) / HD D-Sub 26 (female)	

Mounting the Stage Combination

INFORMATION

We recommend mounting the complete stage combination onto a surface with threaded holes. The dimensions and distance of these holes must match the corresponding mounting holes in the lower L-509.20DG10 positioner.

- Provide a suitable surface for a stable connection with the stage combination.

INFORMATION

For mounting the stage combination onto a surface, four additional screws (ISO 4762) M4 are required with lengths according to the threaded holes in the surface.

INFORMATION

The required tools for affixing the screws are included in the delivery:

- For the M6 (ISO 4762) screws, use the hex key AF 5
 - For the M4 (ISO 4762 and ISO 8734) screws, use the hex key AF 3
- or compliant tools

INFORMATION

Before starting the mounting procedure:

- Identify the required tools (see above), components and screws (see below), remove them from the bags and place them ready.

INFORMATION

For identification of abbreviated component designations (X/Y/Z stage etc.):

- See the table above (p. 3).

Basic Technique: Aligning Holes and Mounting Parts with Screws

Generally, the following sequence applies for mounting two parts with the dedicated screws:

1. Align the two parts with the illustrated holes overlapping (holes assigned the same letter must overlap).
2. Insert one mounting screw per overlapping hole pair.
3. Tighten the mounting screws completely with an according hexagon key.
For screws M4, do **not** exceed a tightening torque of **2 Nm**.
For screws M6, do **not** exceed a tightening torque of **3 Nm**.
4. Check for backlash of the connection (zero-backlash required!)

If the instruction reads e. g.: "Mount part 1 onto part 2 using the holes a and b and mounting screws M4x14", the complete sequence described above applies correspondingly.

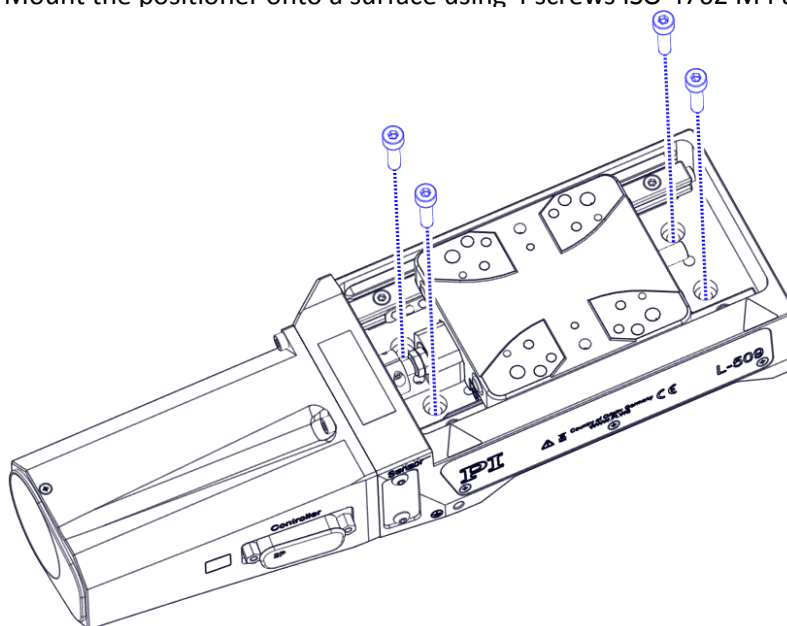
Fixing the Y Stage (Lower L-509.40DG10 Positioner) to a Surface

INFORMATION

This step can be done either before or after assembling the stage combination.

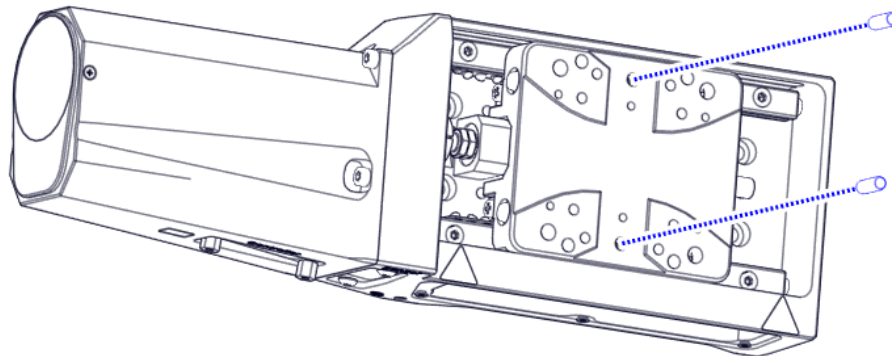
We recommend mounting the positioner using the mounting holes as shown below.

1. Ensure that a surface is available which includes 4 mounting holes M4 with a depth matching the screws used. The pattern must match the corresponding mounting hole pattern of the positioner.
2. Mount the positioner onto a surface using 4 screws ISO 4762 M4 and a hex key AF 3.

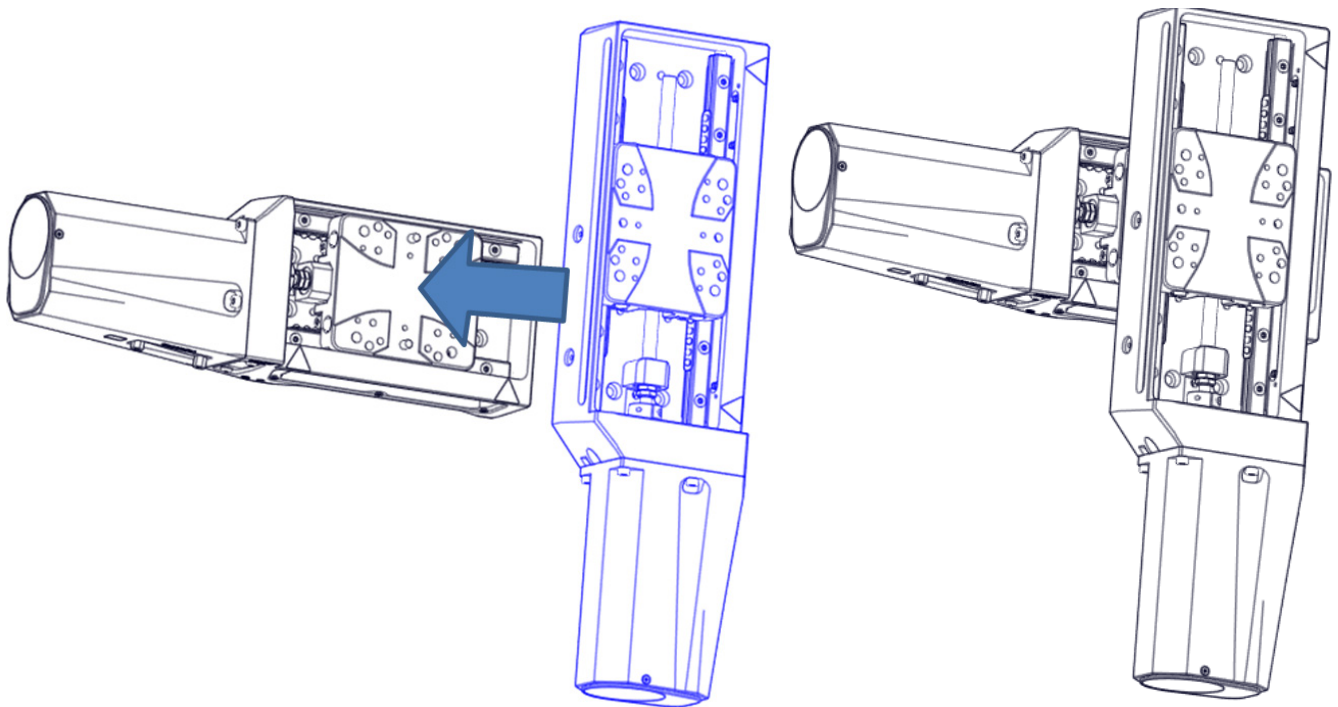


Assembling the Stage Combination

1. Using a hex key AF3, mount 2 grub screws onto the platform of the Y stage, as shown below.



2. Position the Z stage onto the Y stage. Note that the protruding grub screws on the Y stage's platform should insert in the corresponding holes of the Z stage's casing.



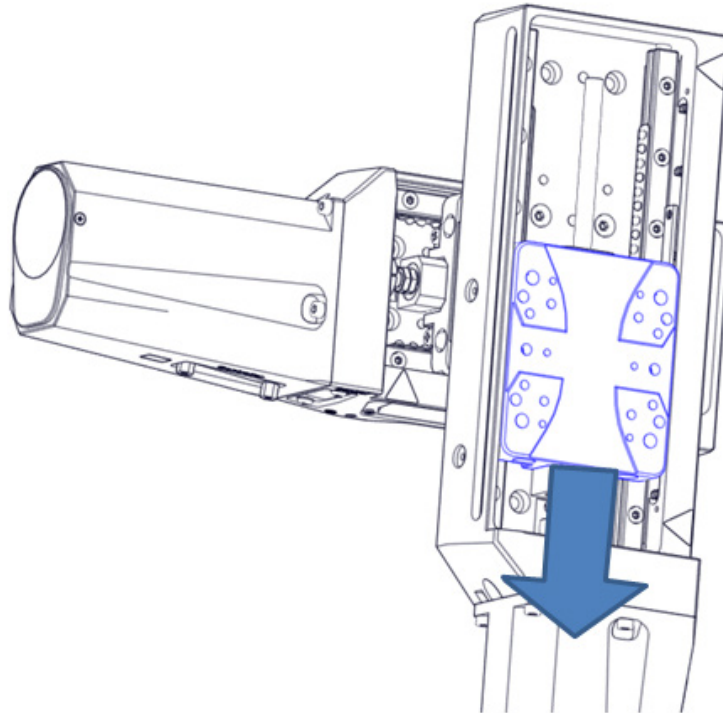
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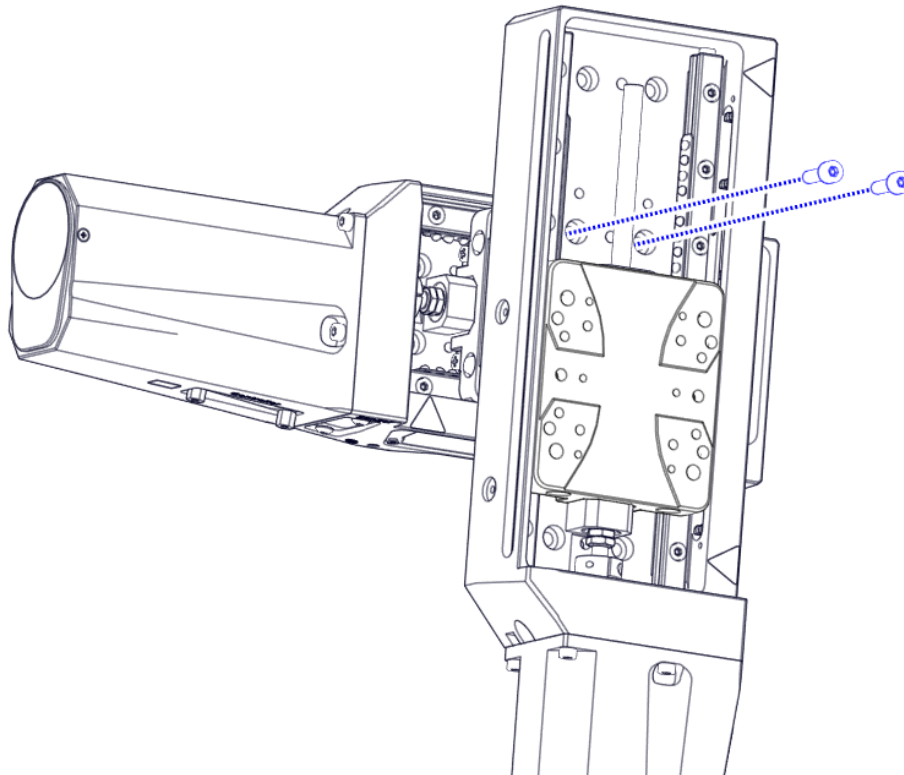
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3. For providing access to the Z stage's mounting holes: Move the platform of the stage either manually or using the corresponding controller and motion control software (see the user manual MP141E).



4. Mount 2 screws M4x14, using a hex key AF 3 (see below).

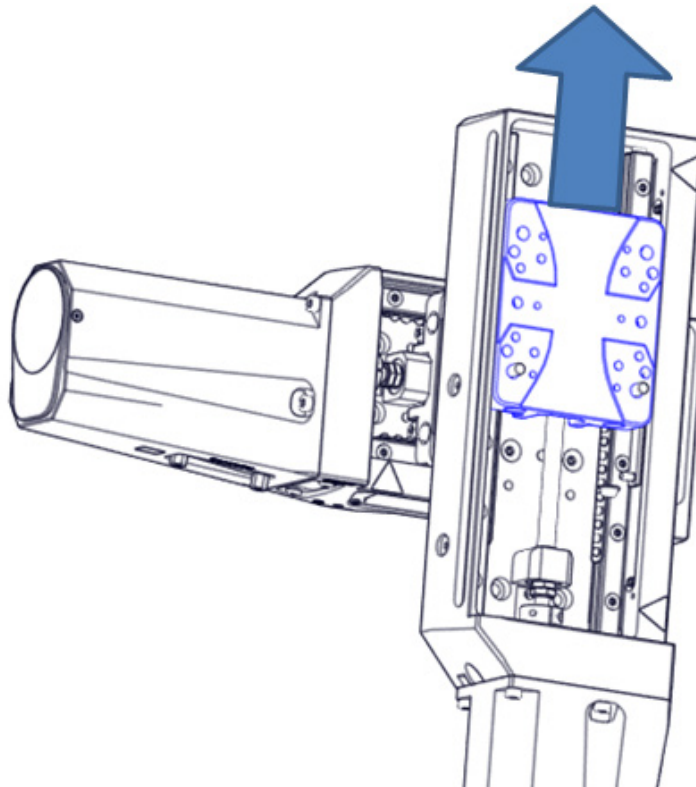


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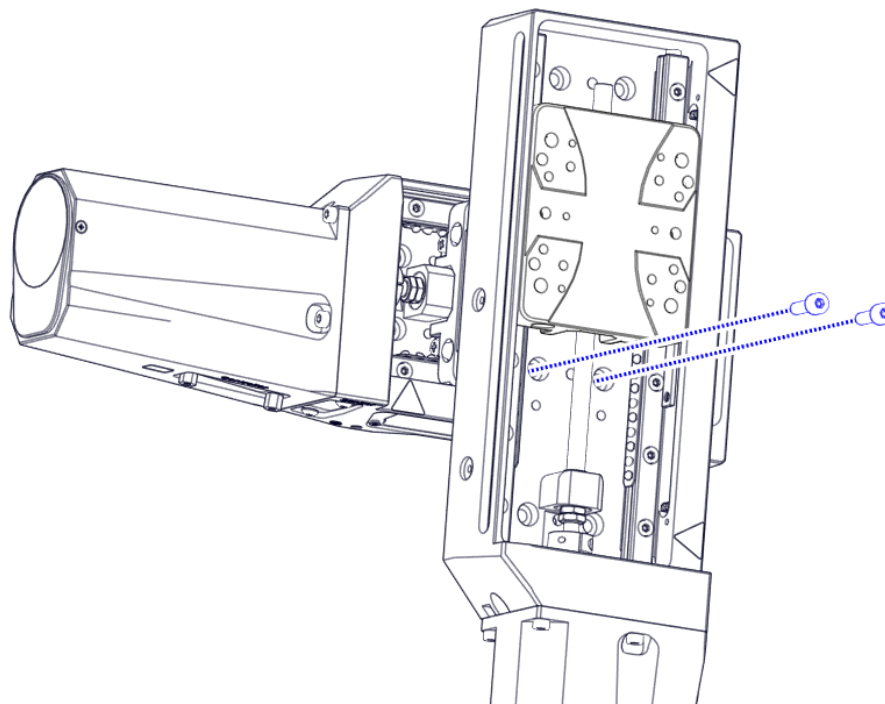
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5. For providing access to the Z stage's remaining mounting holes: Move the platform of the Z stage either manually or using the corresponding controller and motion control software (see the user manual MP141E).



6. Mount 2 screws M4x14, using a hex key AF 3 (see below).



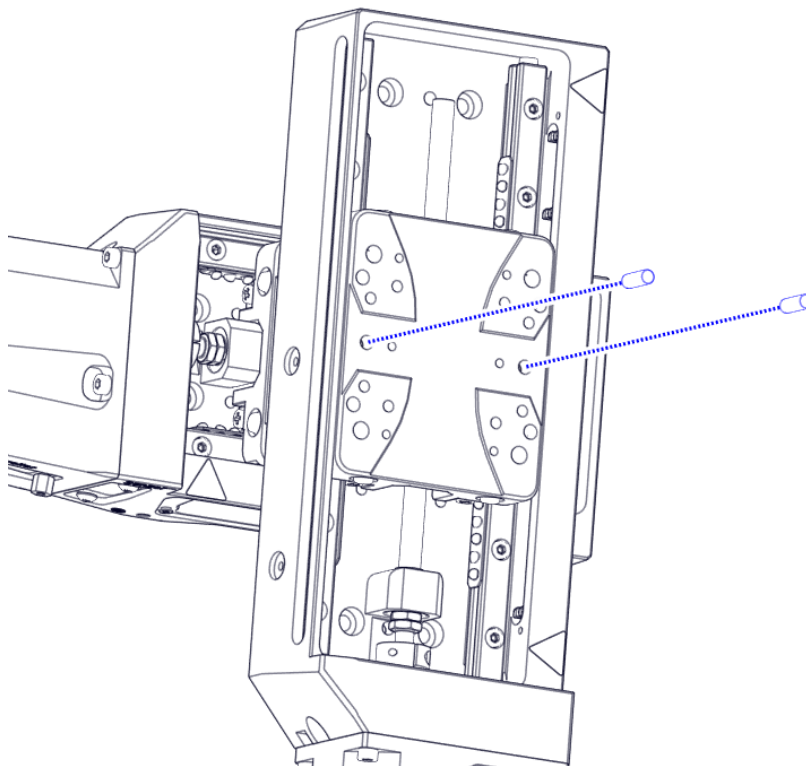
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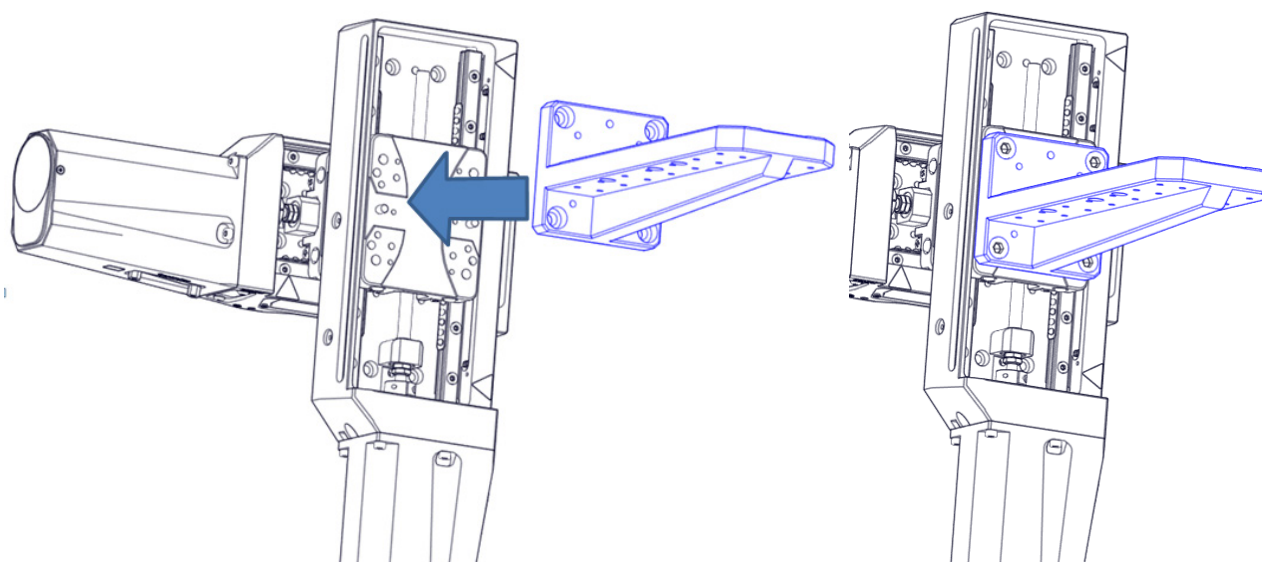
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7. Using a hex key AF 3, mount 2 grub screws onto the Z stage's platform as shown below.



8. Position the Z adapter onto the Z stage's platform. Note that the protruding grub screws on the Z stage's platform should insert in the corresponding holes of the adapter's casing.



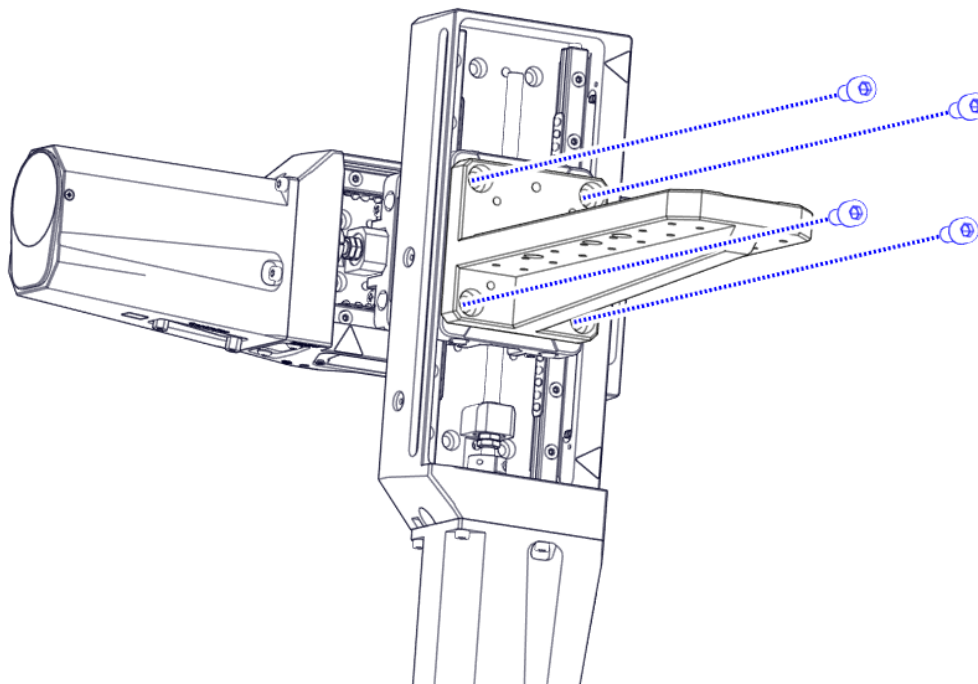
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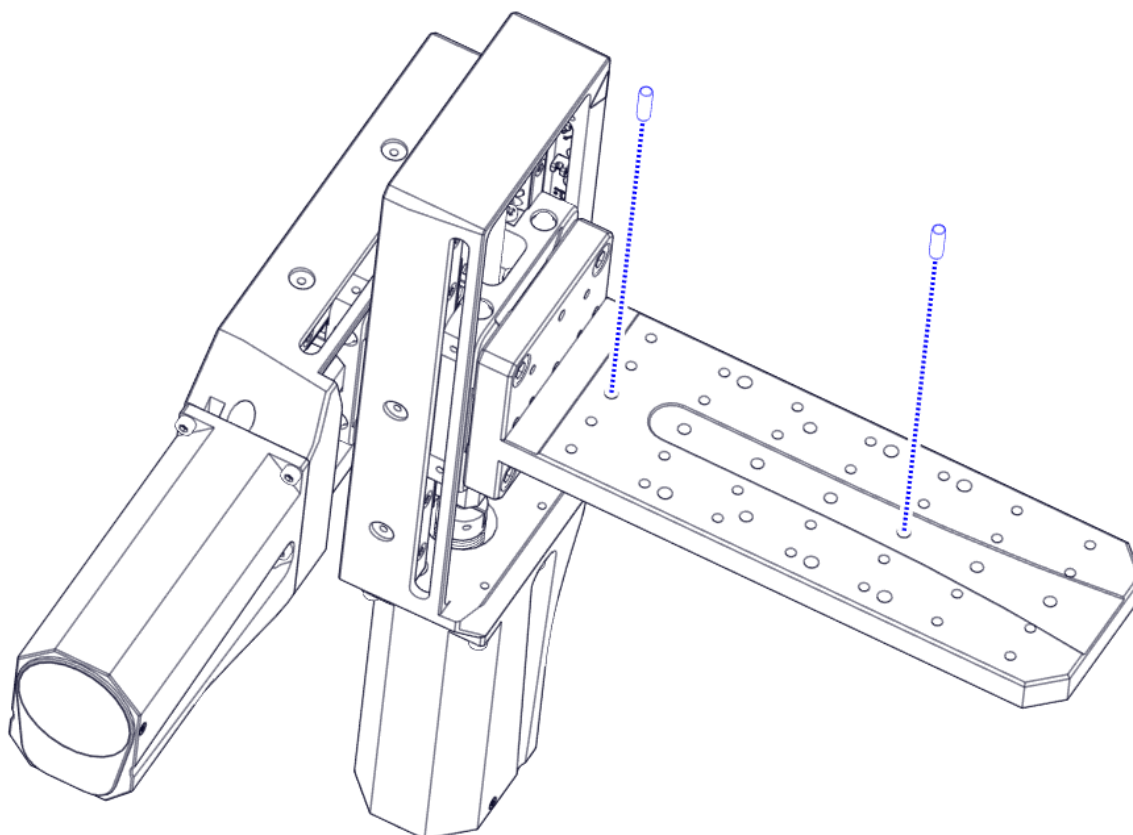
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9. Using a hex key AF5, mount 4 screws M6x12 as shown below.



10. Using a hex key AF3: On the flat side of the Z adapter, mount 2 scrub screws as shown below.



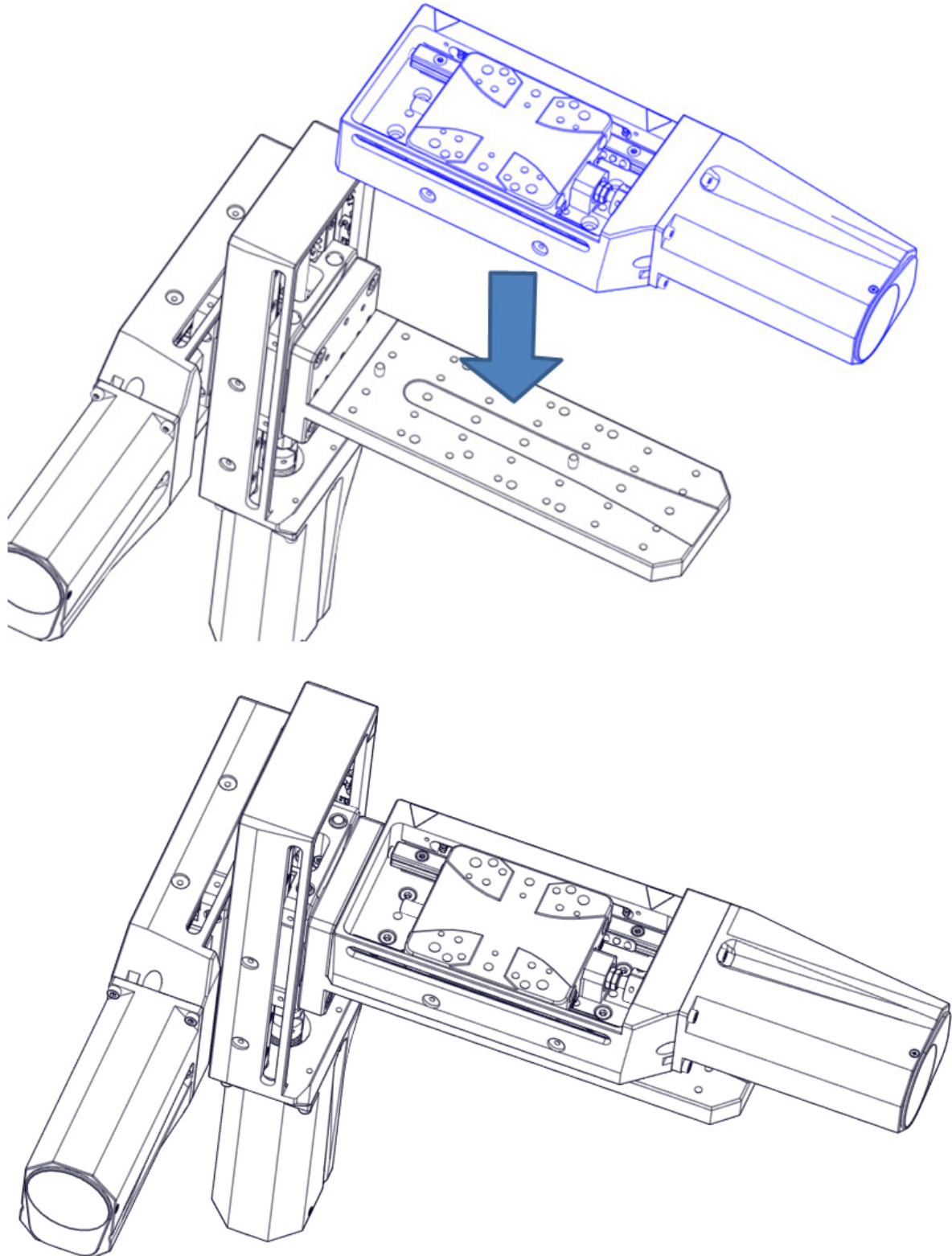
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11. Position the X stage onto the X adapter as shown below. Note that the protruding grub screws on the X adapter's flat side should insert in the corresponding holes of the X stage's casing.



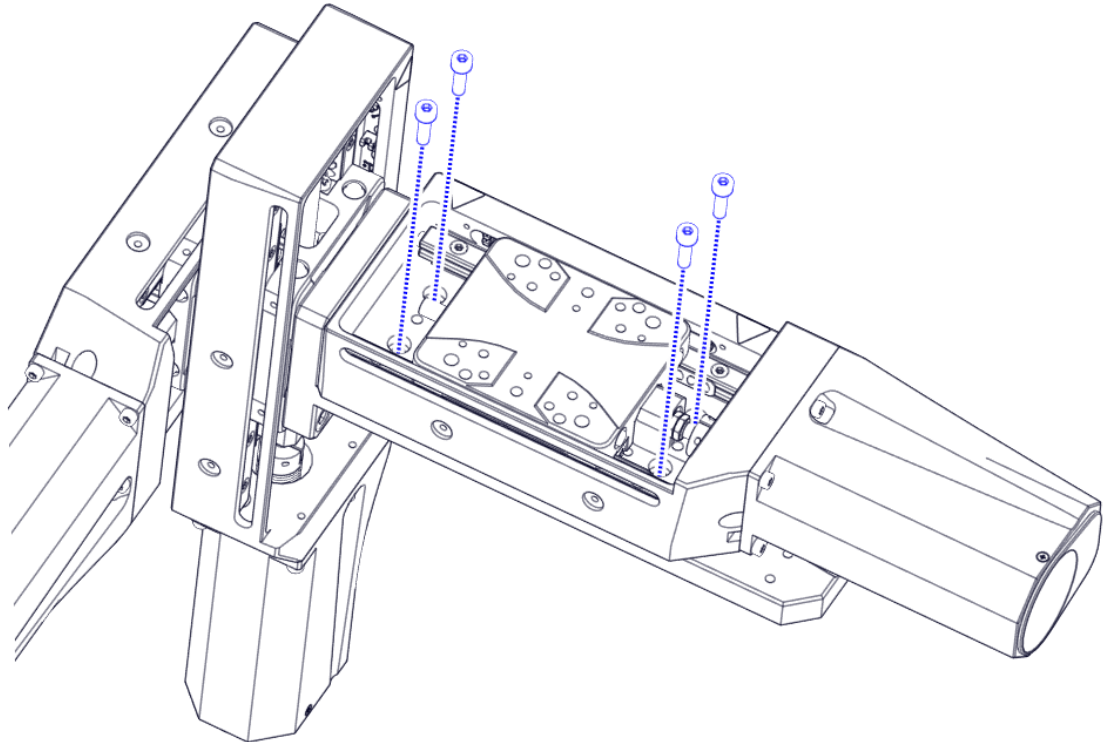
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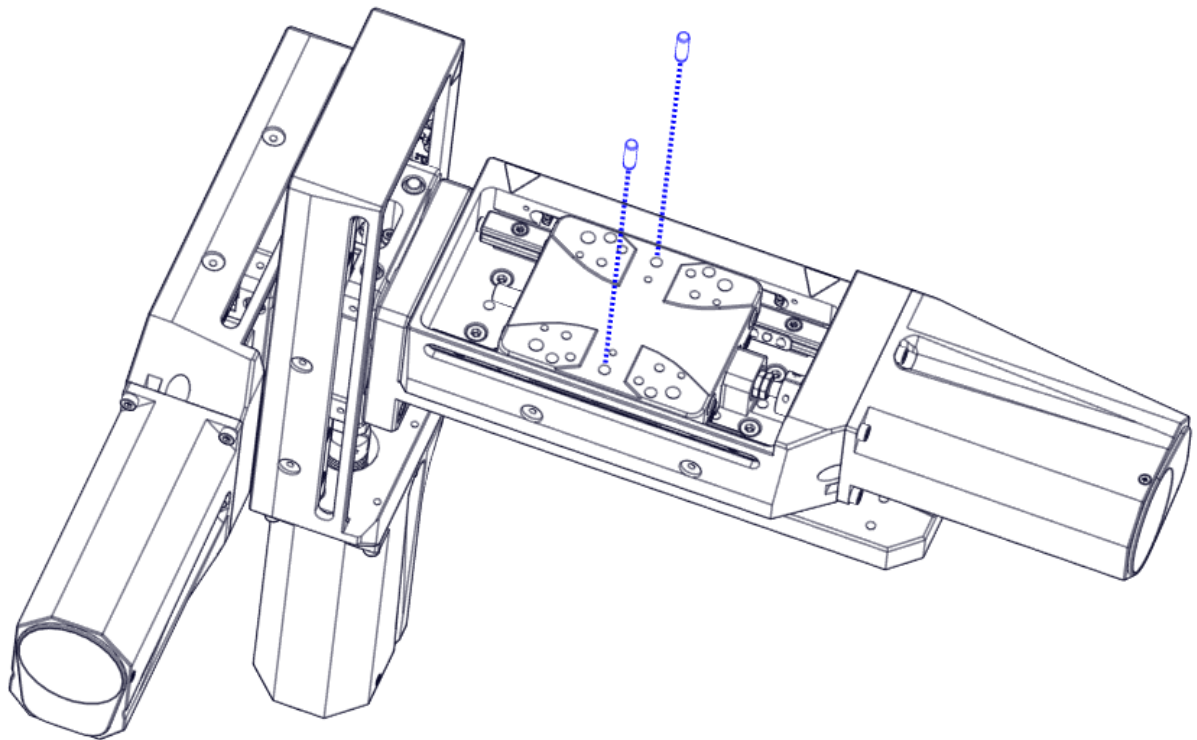
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12. Using a hex key AF3, mount 4 screws M4x14 as shown below.



13. Using a hex key AF 3, mount 2 scrub screws onto the X stage's platform as shown below.



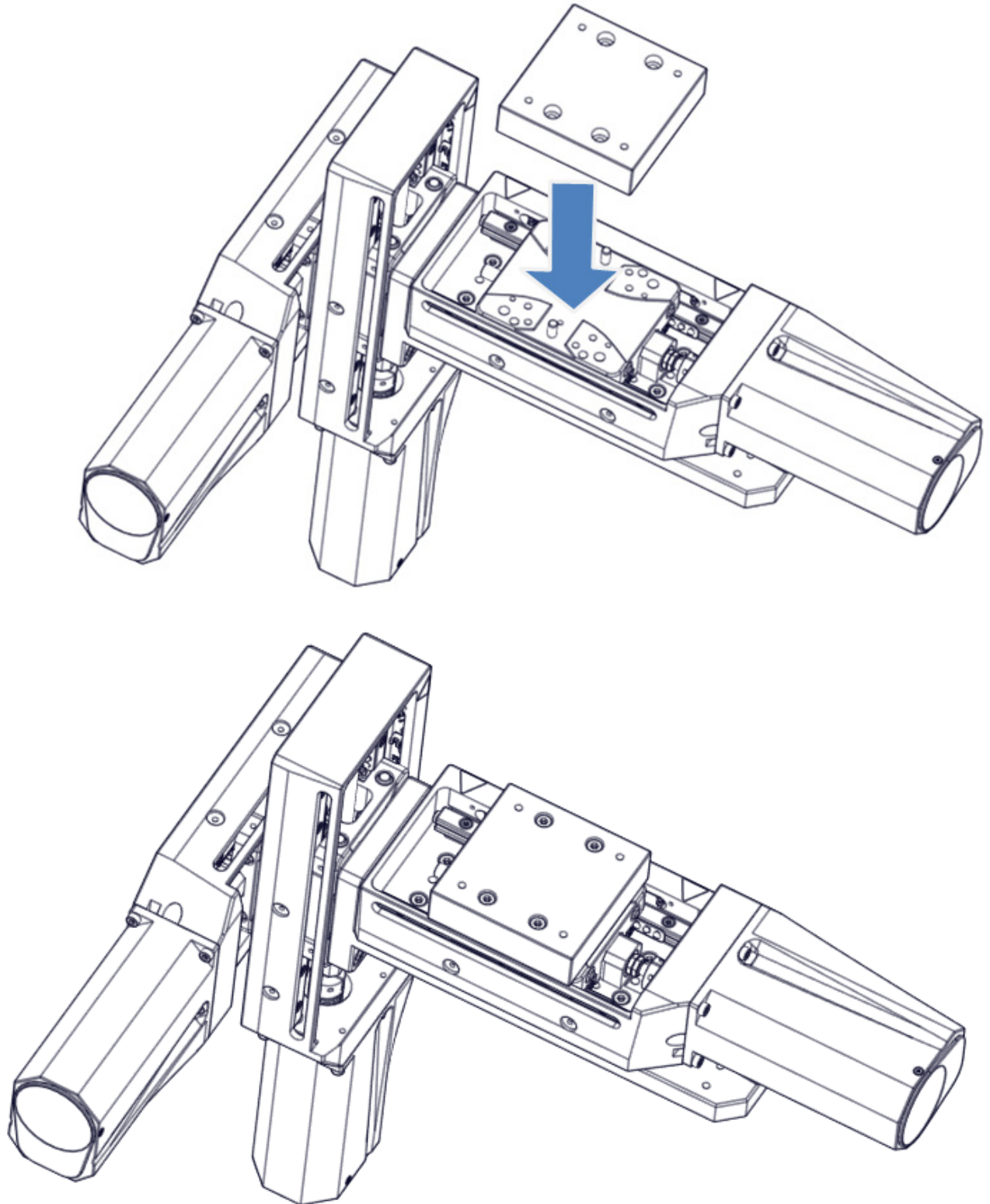
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14. Position the Θ z adapter onto the Z stage as shown below. Note that the protruding grub screws on the Z stage's platform side should insert in the corresponding holes of the Z adapter.



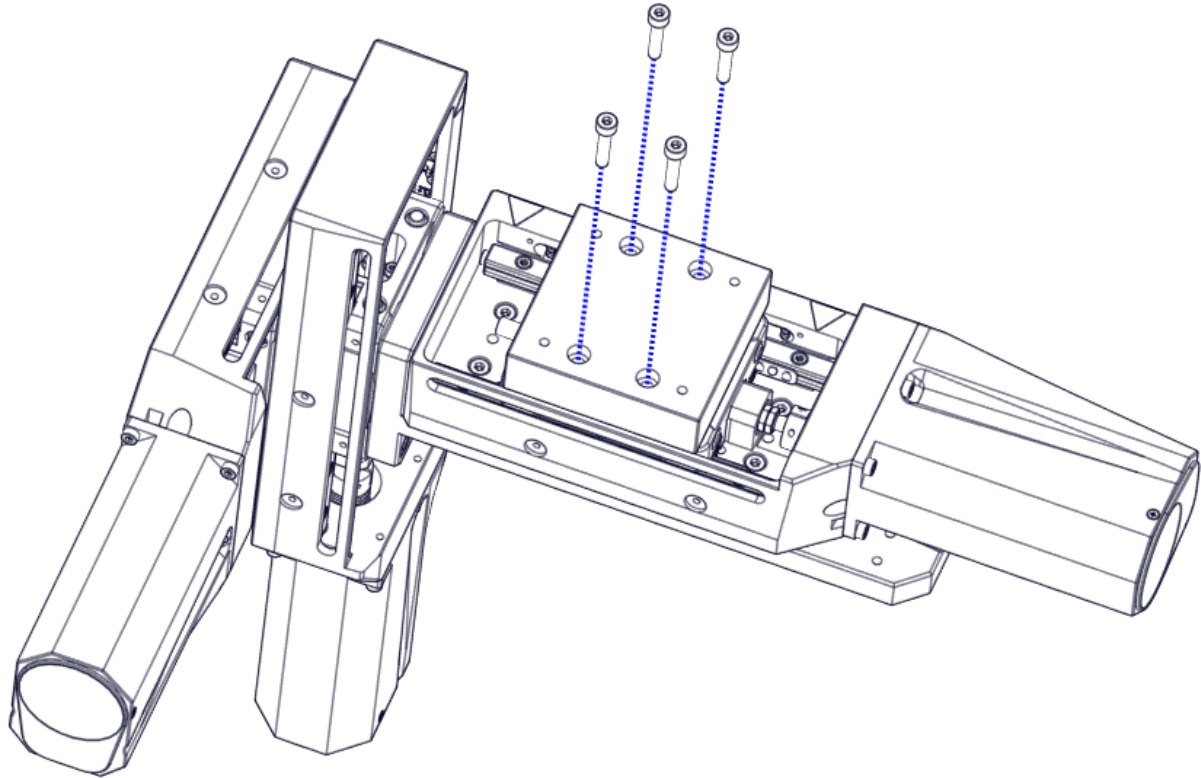
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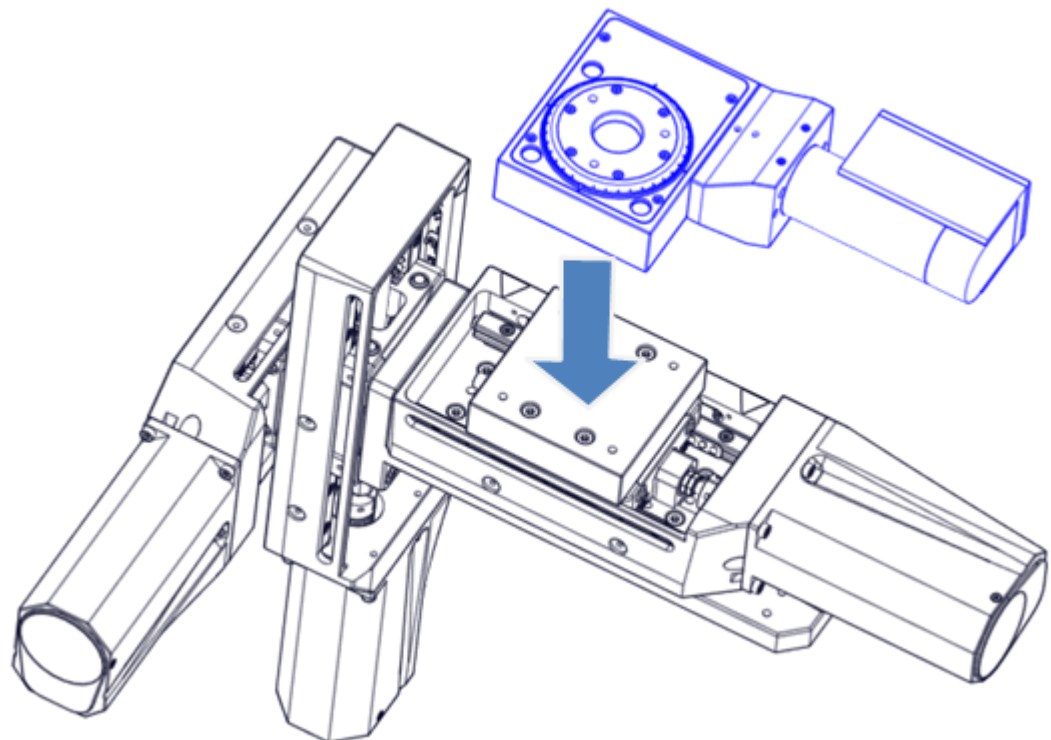
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15. Using a hex key AF 3, mount 4 screws M4x20 onto the adapter as shown below.



16. Position the Θz stage onto the Θz adapter as shown below.

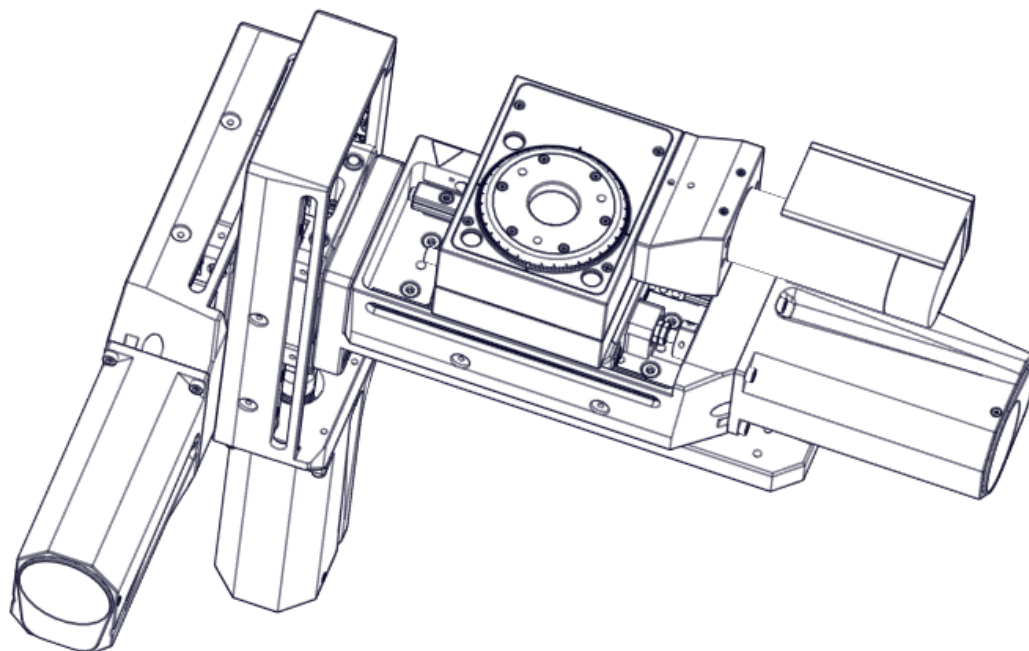


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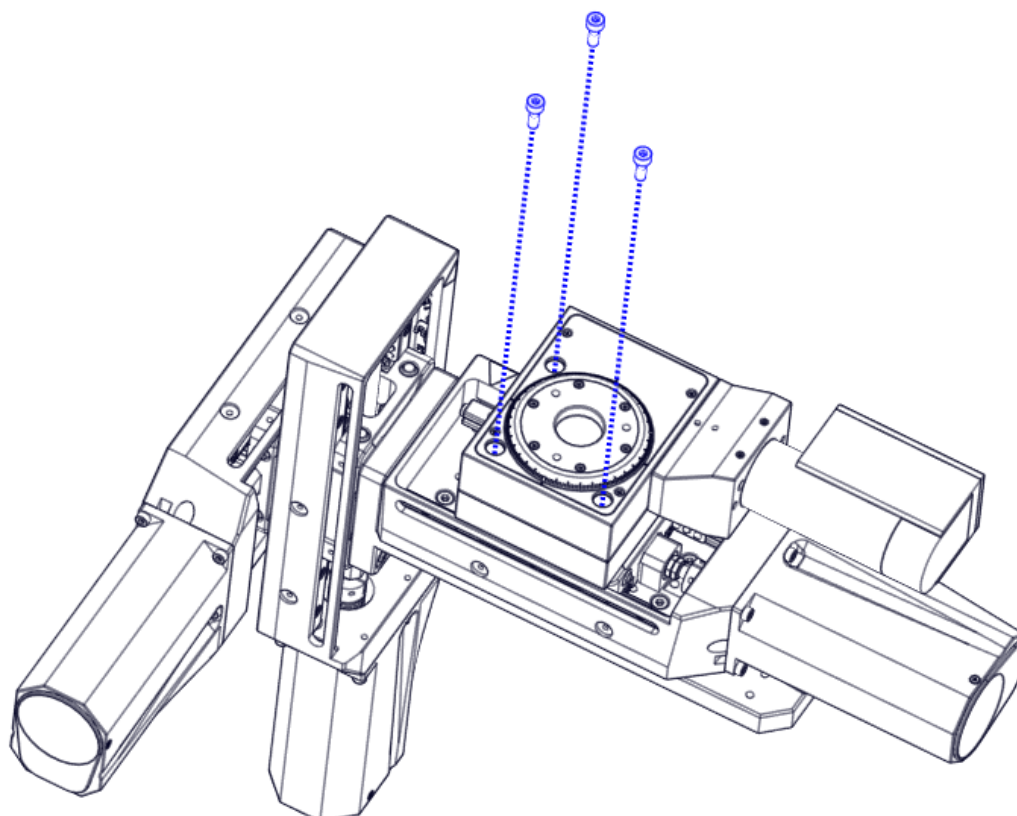
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17. Mount 3 screws M4x12 as shown below.

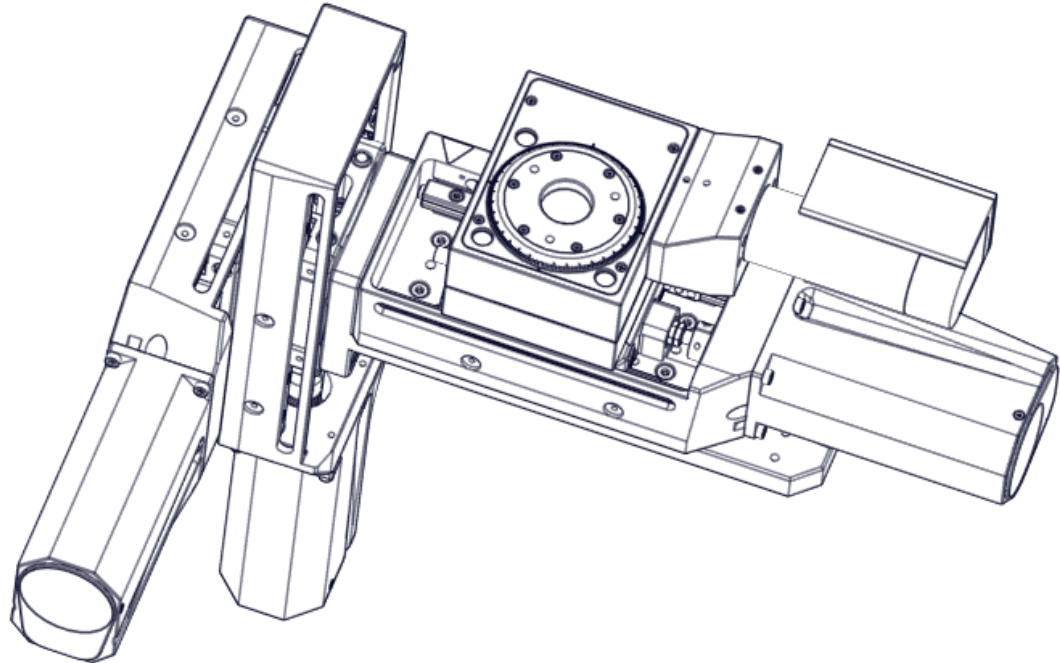


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18. Check the assembly for firm connection of the components. Check whether the assembly corresponds to scheme below.



19. For further information (e.g. electrical connections, operation, controllers), see the corresponding user manuals. For dimensions of the included components, see below.

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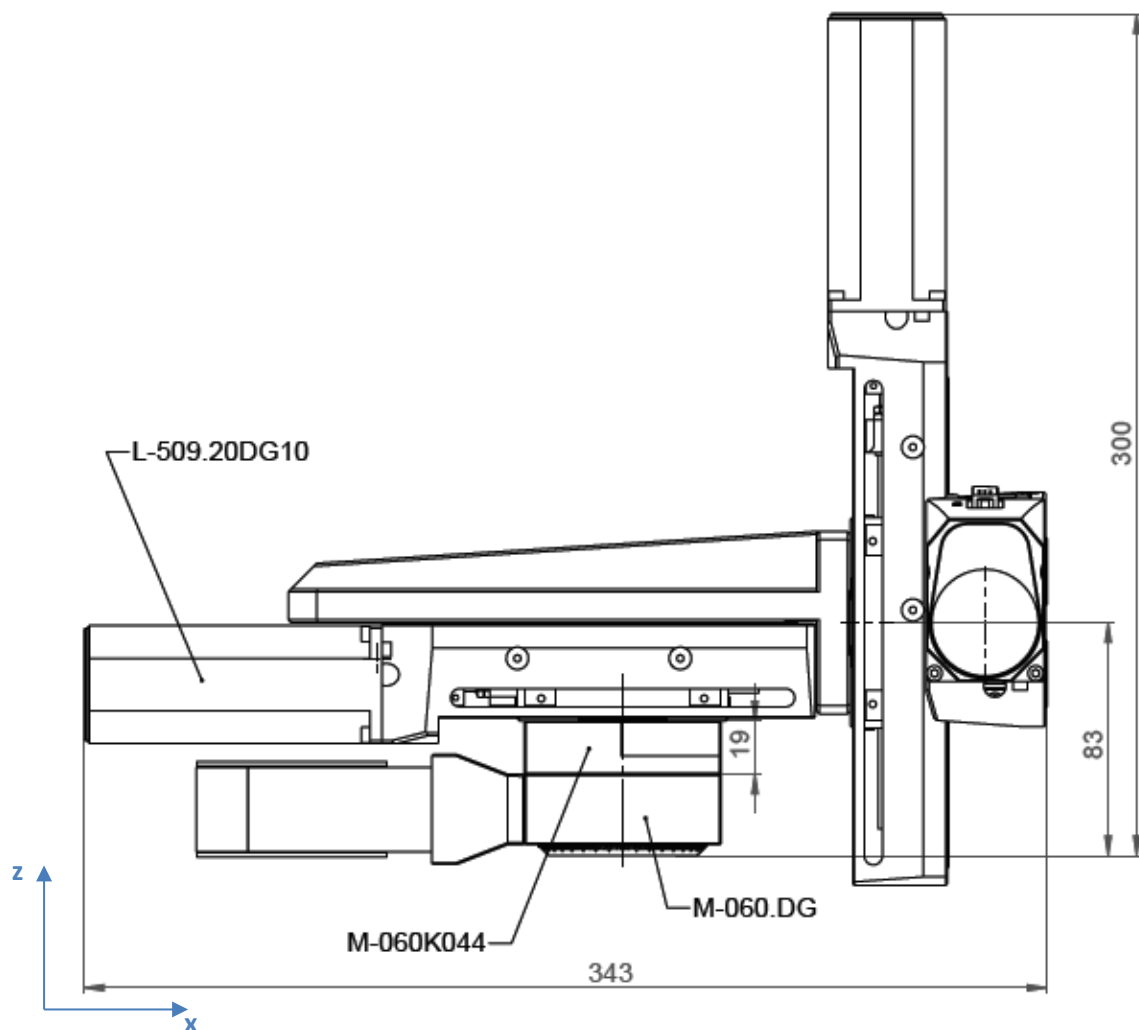
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Specifications

For further specifications of the included stages, see the individual user manuals stated above.

Dimensions in mm; decimal places are separated by a comma.

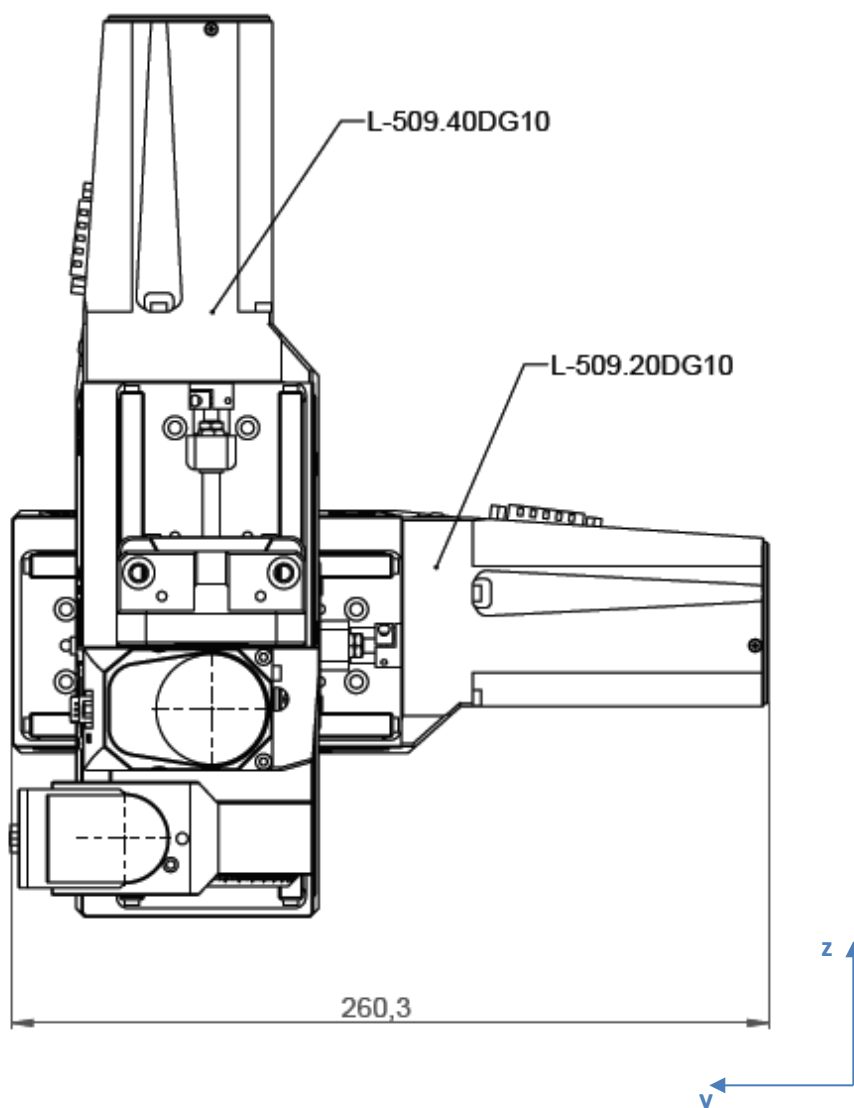
Dimensions of the Assembly



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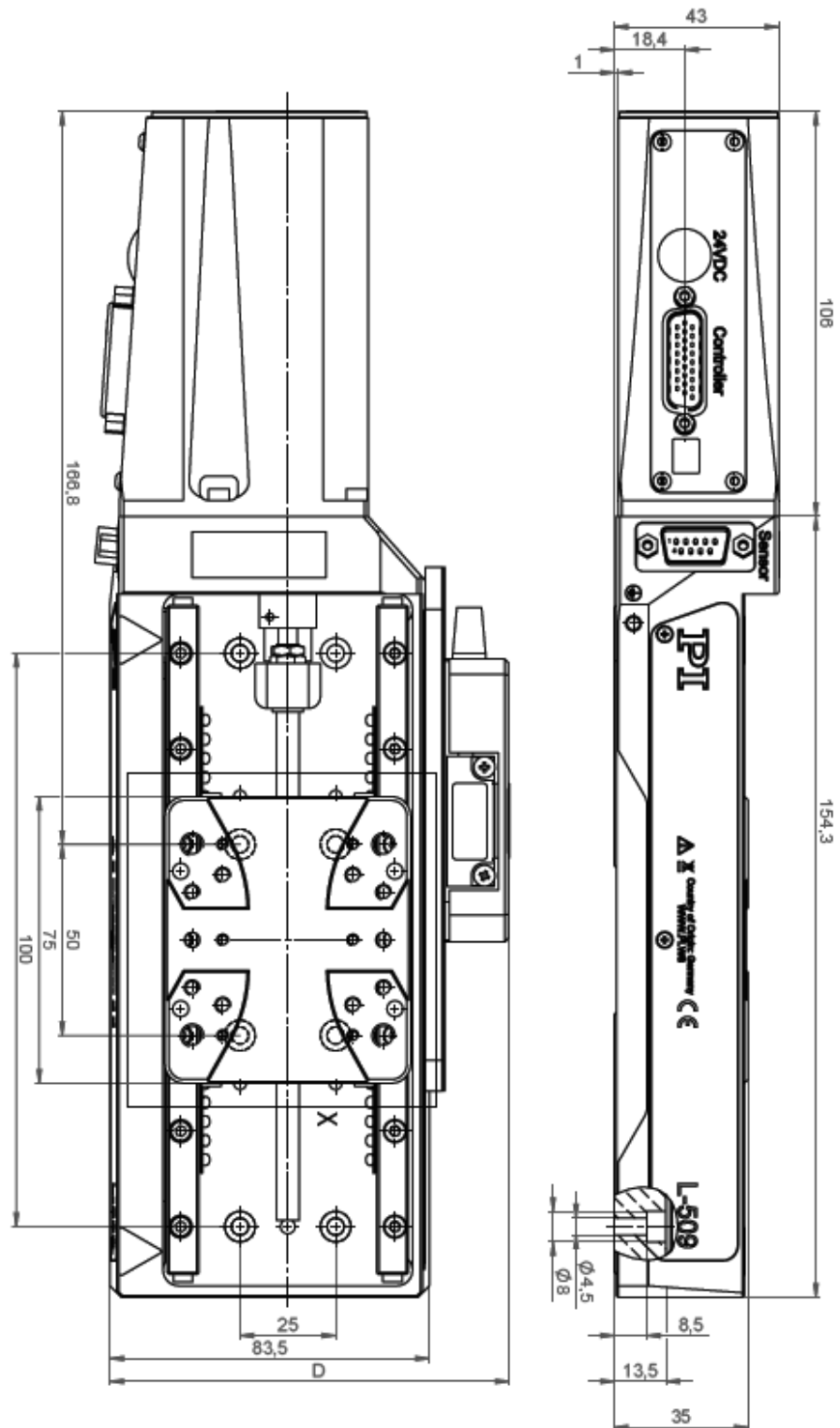
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Dimensions of the Stages

L-509.20DG10



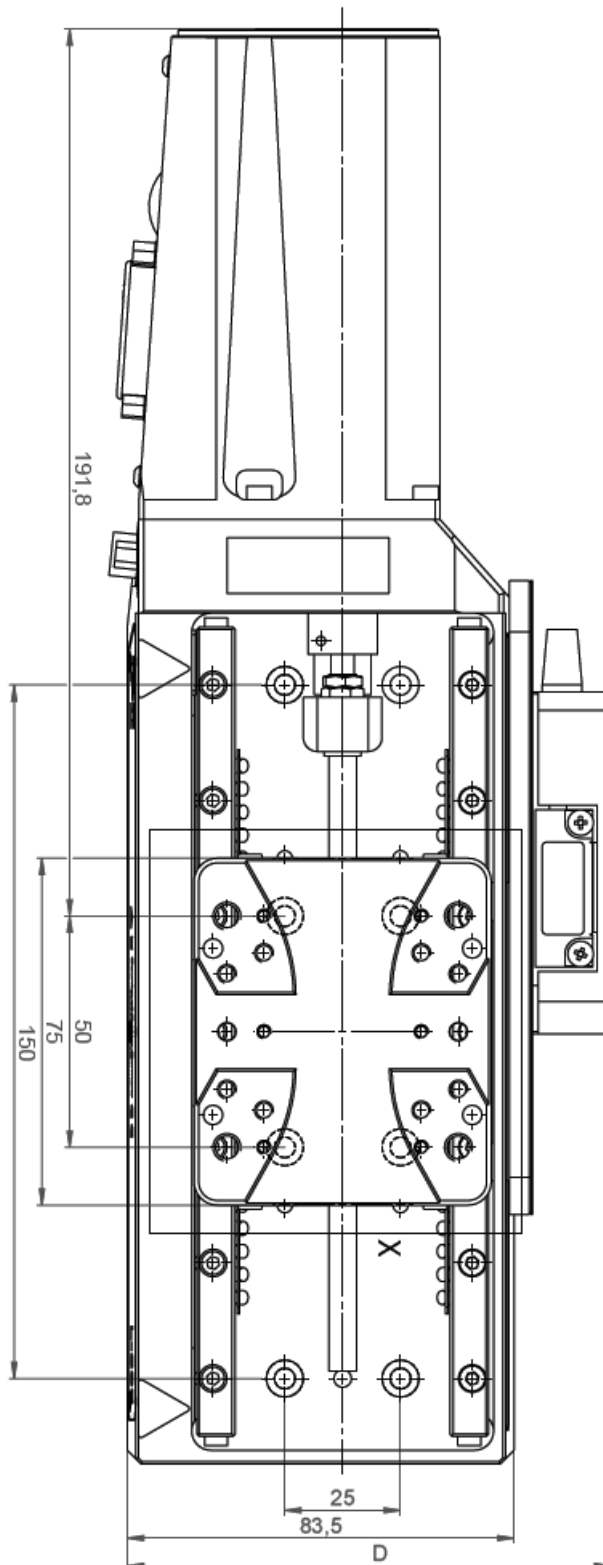
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L-509.40DG10

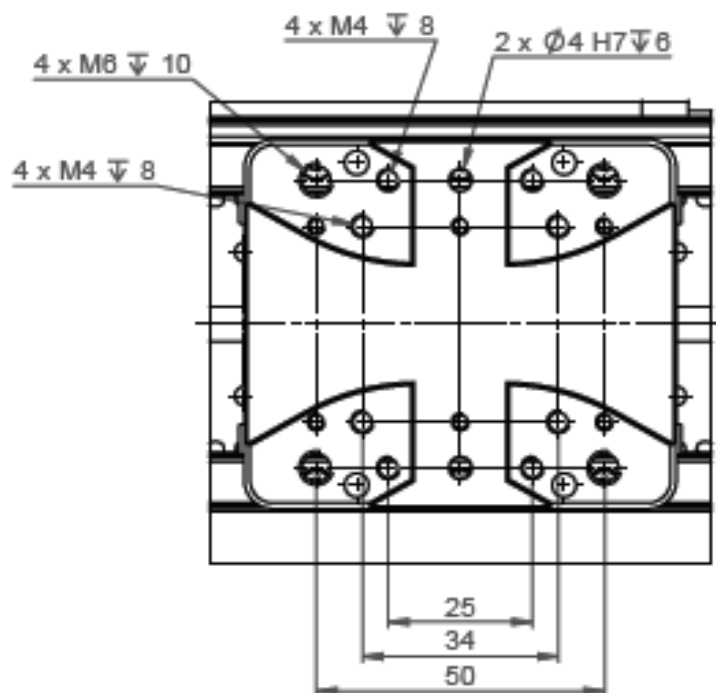


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Hole Pattern of the Included Platforms (L-509)



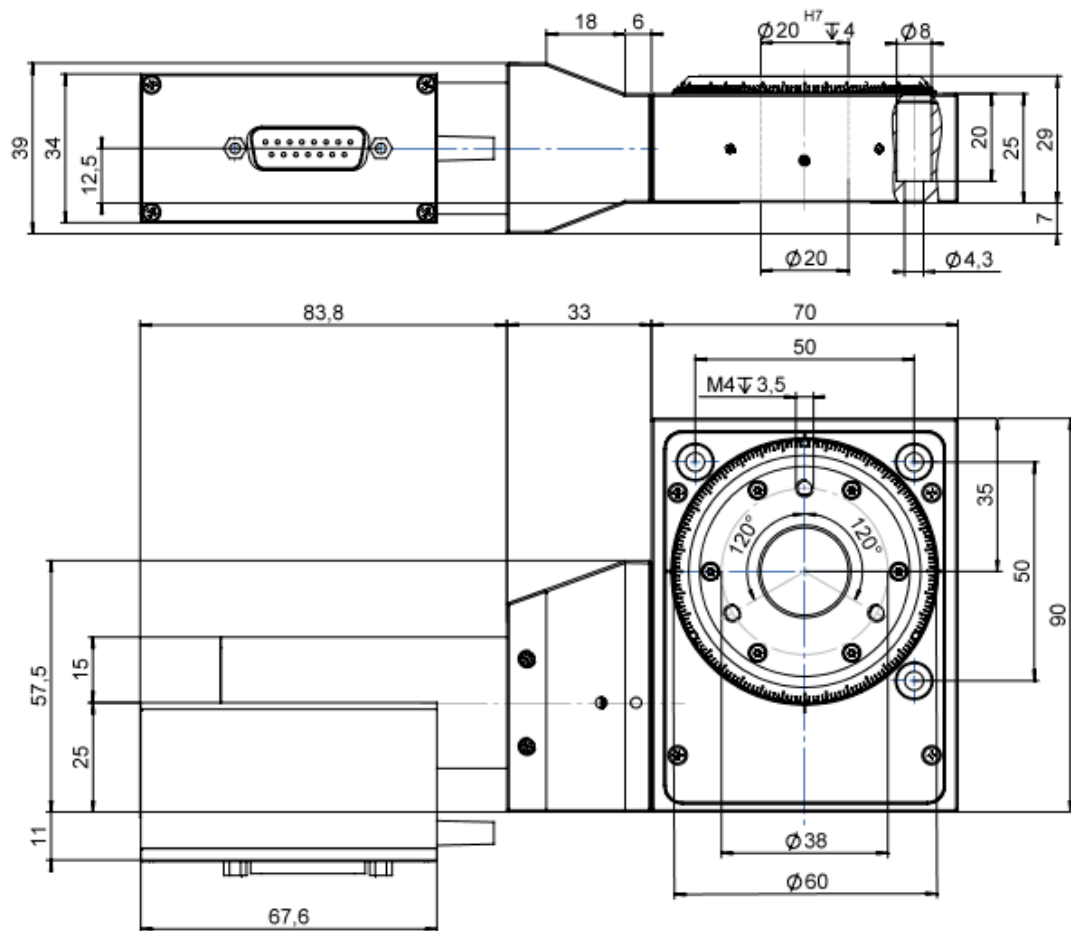
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M-060.DG



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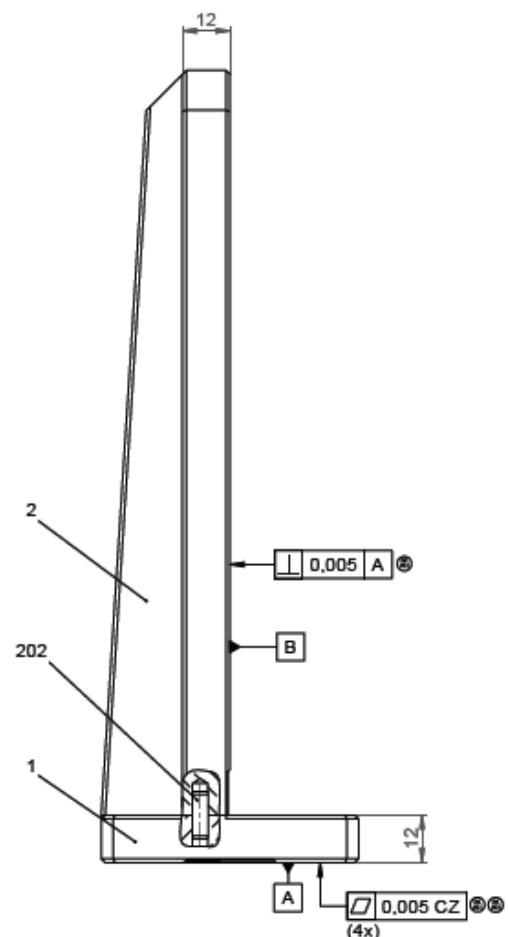
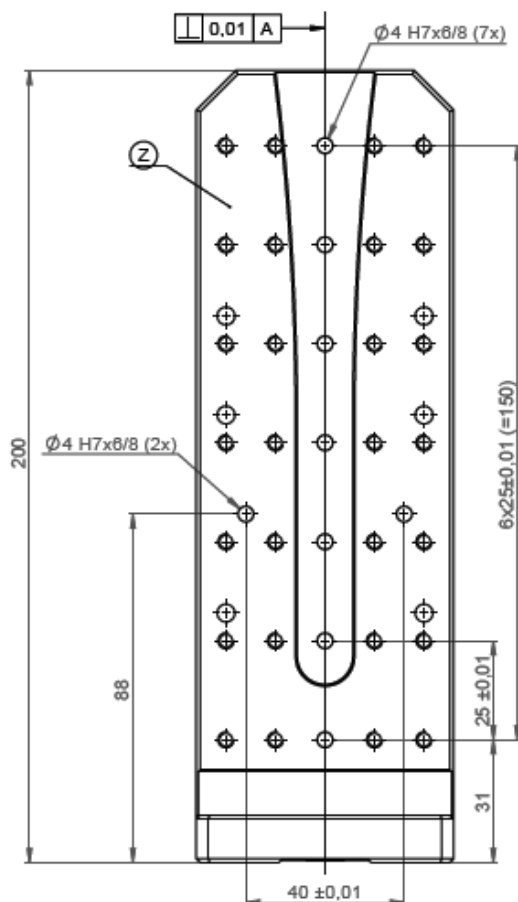
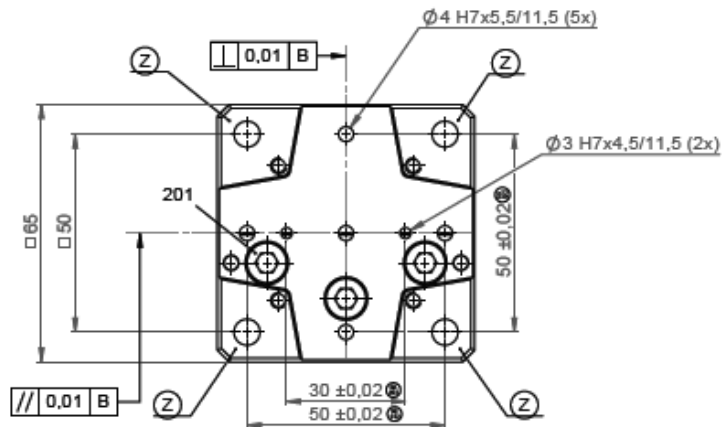
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Dimensions of the Adapter Brackets/Plates

L-500.AV3

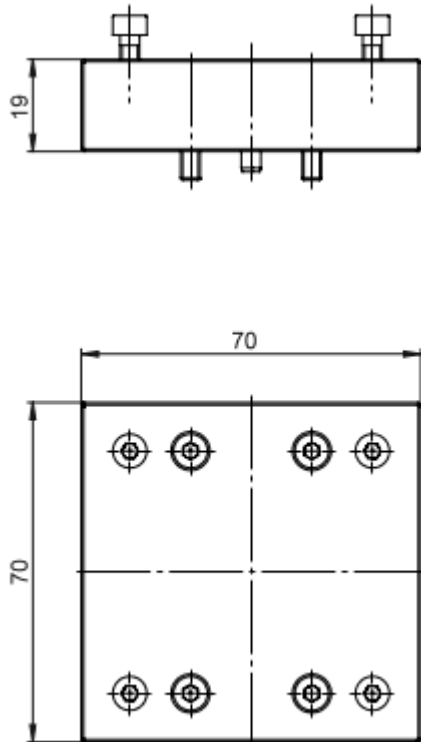


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M-060K044



European Standards Compliance (CE)

For the included stages, an EC Declaration of Conformity has been issued in accordance with the following European directives:

- EMC Directive
- RoHS Directive

The applied standards certifying the conformity are listed below.

- Electrical Safety: EN 61010-1
- EMC: EN 61326-1
- RoHS: EN 50581