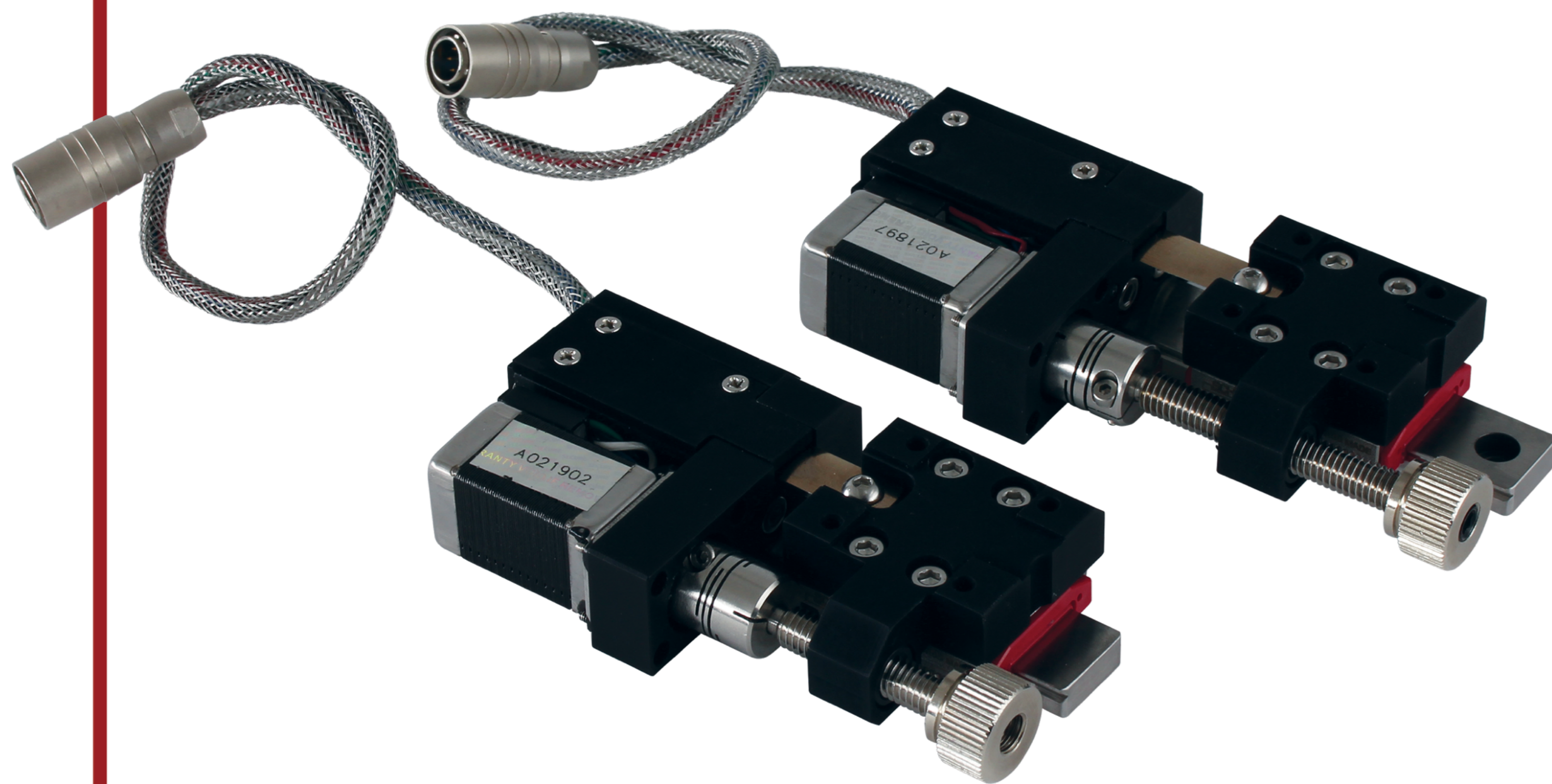


# AntRail



These miniature linear translation stages integrate a stainless steel recirculating ball bearing, a preloaded lead-screw drive, a stepper motor and a contactless home sensor and optional integrated linear measurement system for Closed loop control; this solution matches load capacity, compactness and micro-positioning performances at a competitive price. The lubricant free material choice makes them extremely clean and maintenance free. Multi-axes assemblies can be done with simple and pre-aligned interfaces for X or XYZ configurations. AntRail stages match sub micron positioning resolution and repeatability with high speed positioning and they are suitable for both laboratory and industrial environment. The dry lubrication lead screw is non reversible and keeps the position stable even when the motor is off, a knob allows to do manual adjustment which is always very useful in the system mounting operations before you connect the controller. The same technology is available in eXtreme version for HV and UHV. See AntRail eXtreme datasheet.



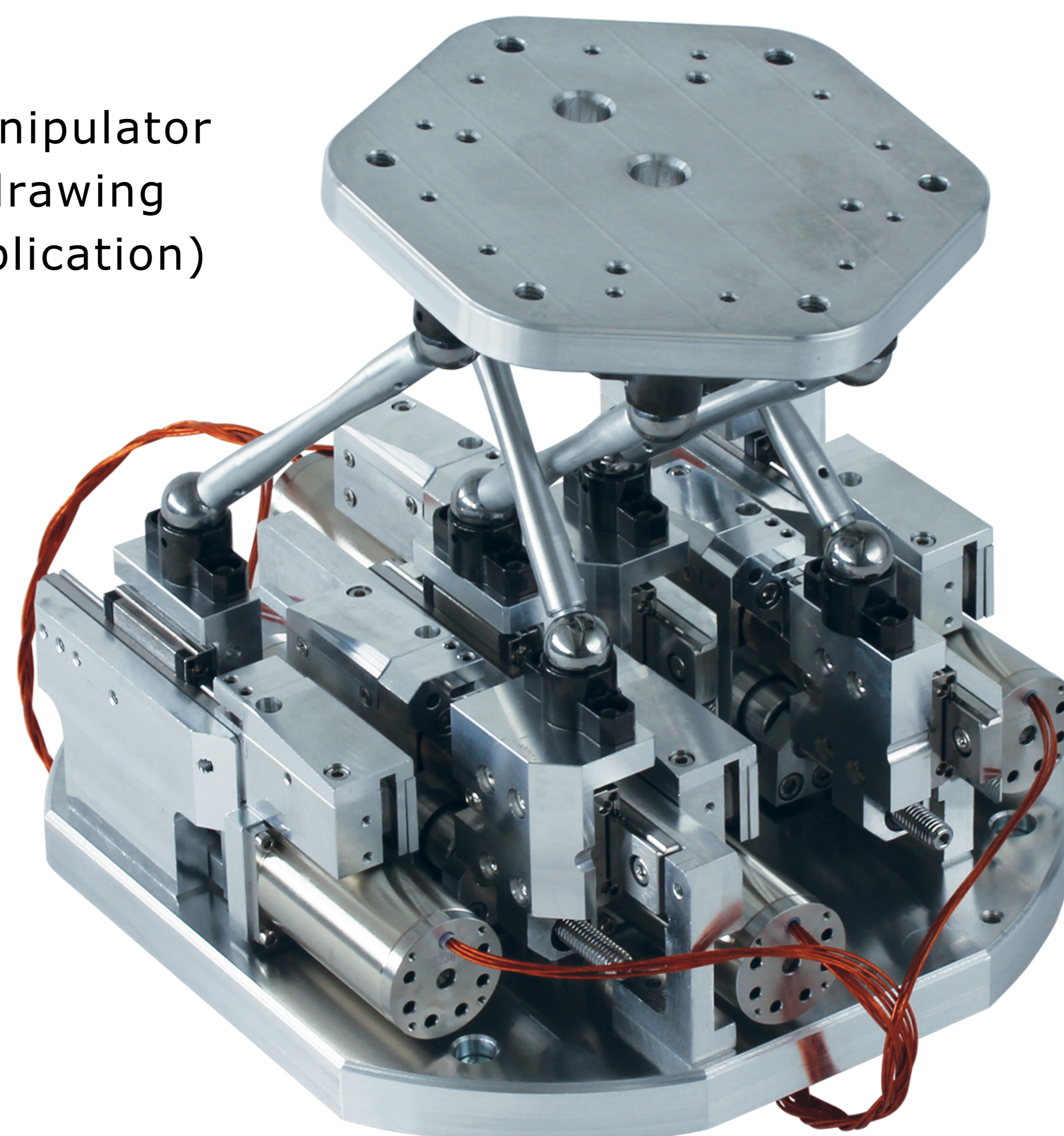
## AntRail motorized linear stages

- ultra compact and light weight
- high resolution and repeatability
- dry lubrication lead screw
- maintenance free and reliable
- XY and XYZ multi-axes assemblies
- stroke 13, 26, 50 and 100 mm
- open and closed loop
- hybrid stepper motor
- integrated home switch

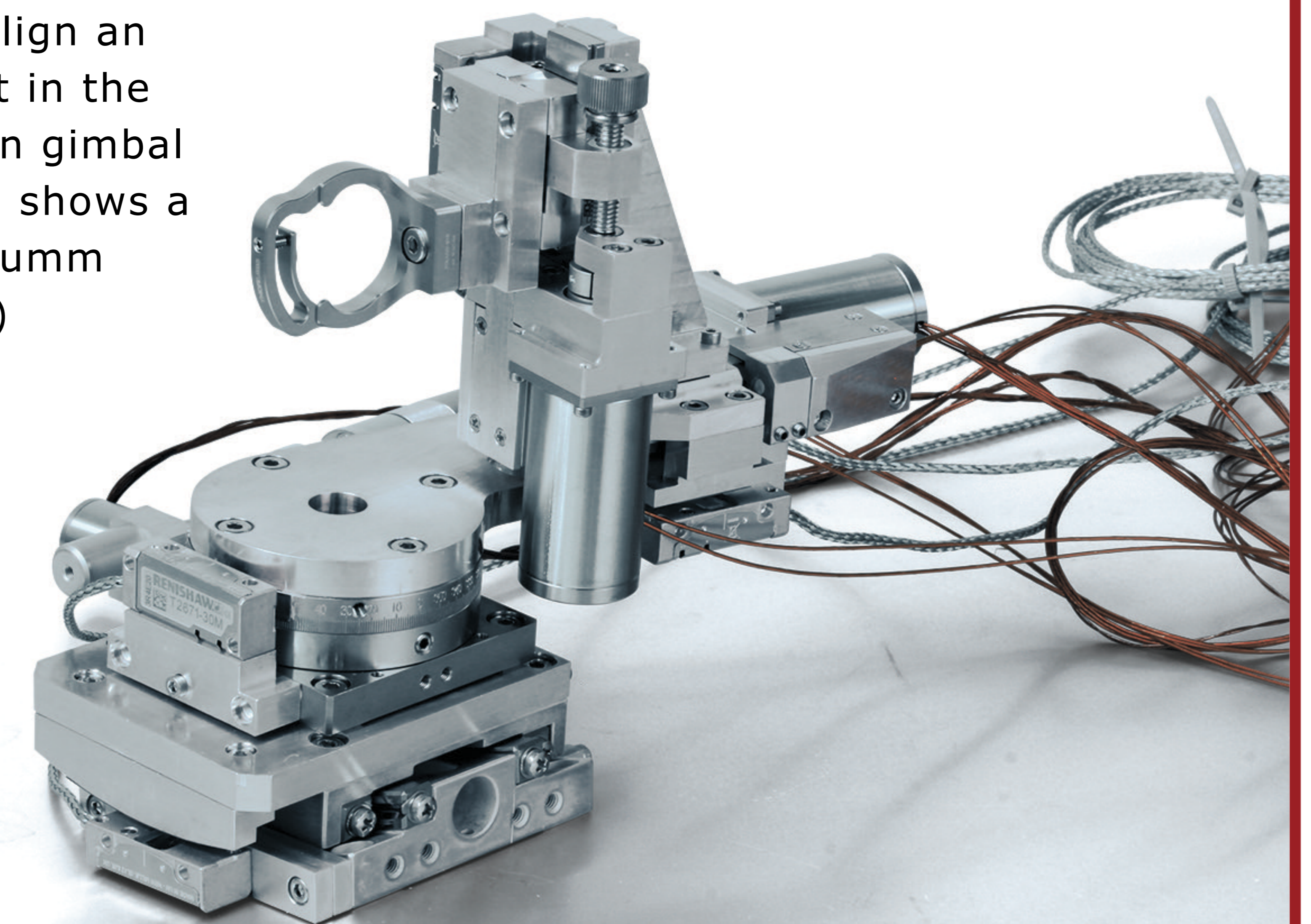
## - examples of applications -



6DOF parallel kinematic manipulator based on AntRail-M (the drawing shows a High Vacuum application)



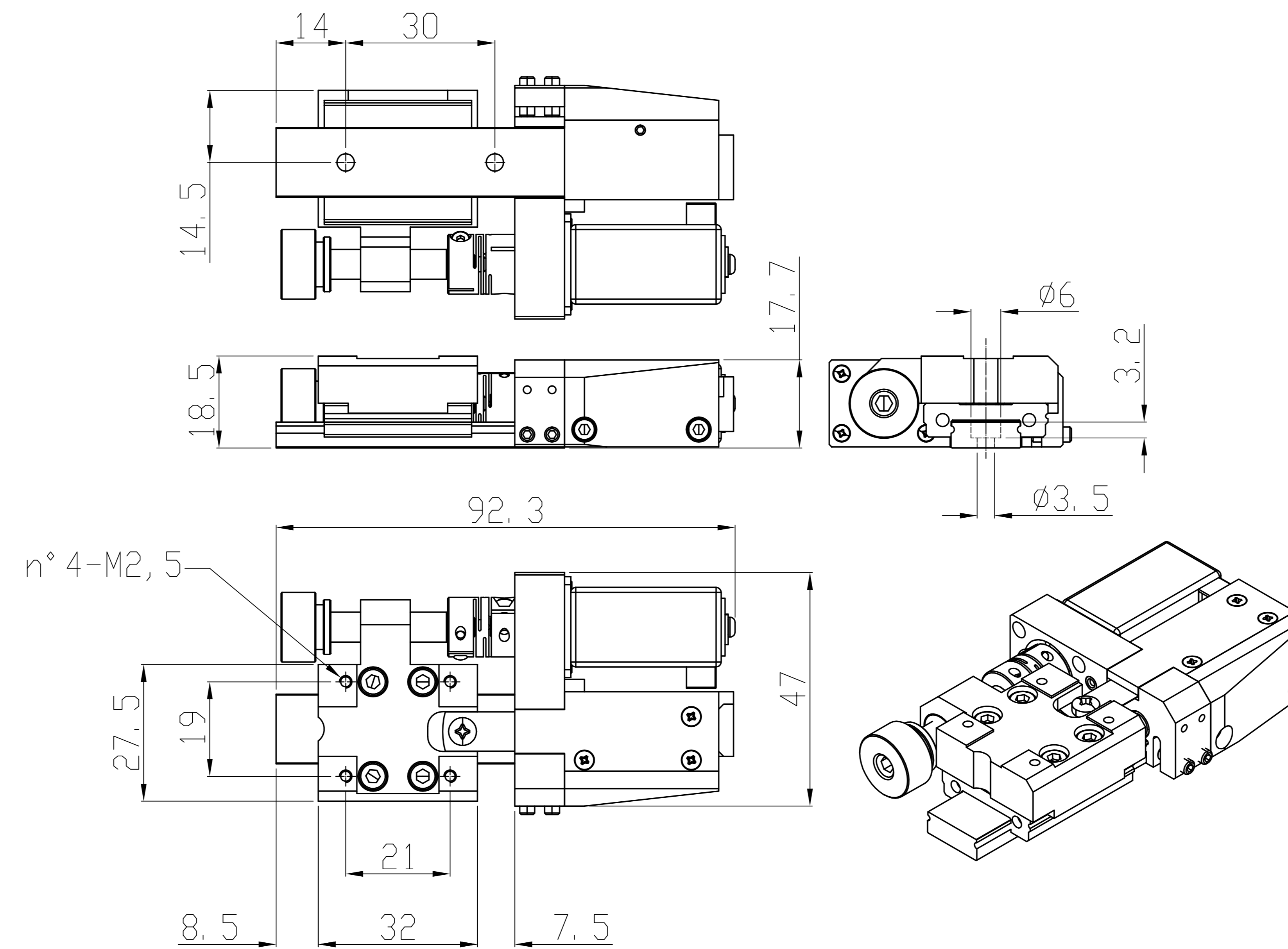
UHV 4 axis CLoop Goniometer: a two axis YZ assembly of AntRail-S-Cloop align an optical component in the center of a precision gimbal mount (the drawing shows a Ultra High Vacuum application)



# AR-S

## AntRail Small

Specifications (Typical*)	Value	Unit
Travel range	13	mm
Load capacity (Fz, FY)	30	N
Axial load capacity (Fx)	+/- 5	N
Moment (Mx, My, Mz)	6	Nm
Uni-directional repeatability (2σ)	+/- 1	μm
Bi-directional repeatability (2σ)	+/- 5	μm
smallest motion step	0.1	μm
motor full step equivalent motion	9.61	μm
Max Speed	25	mm/s



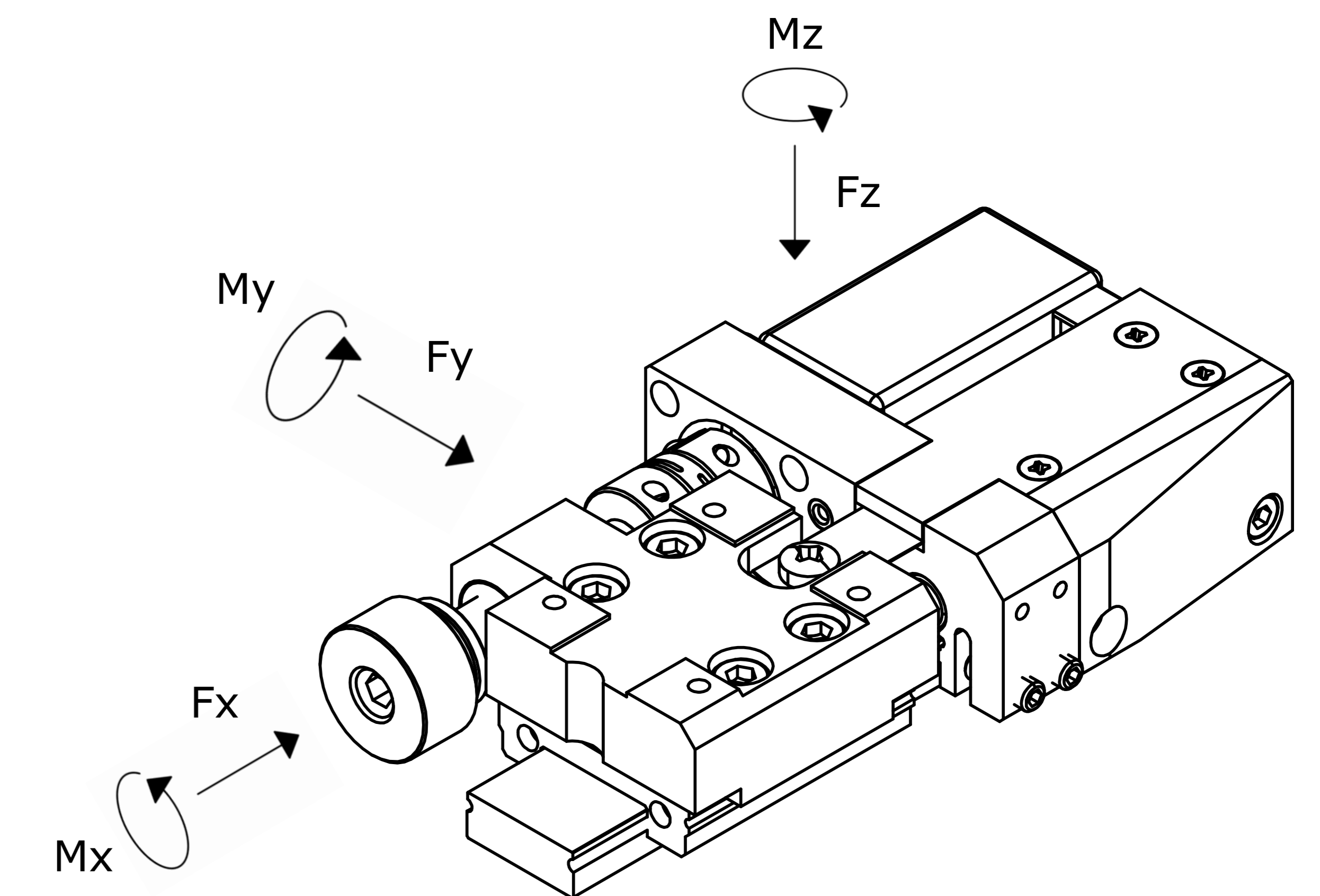
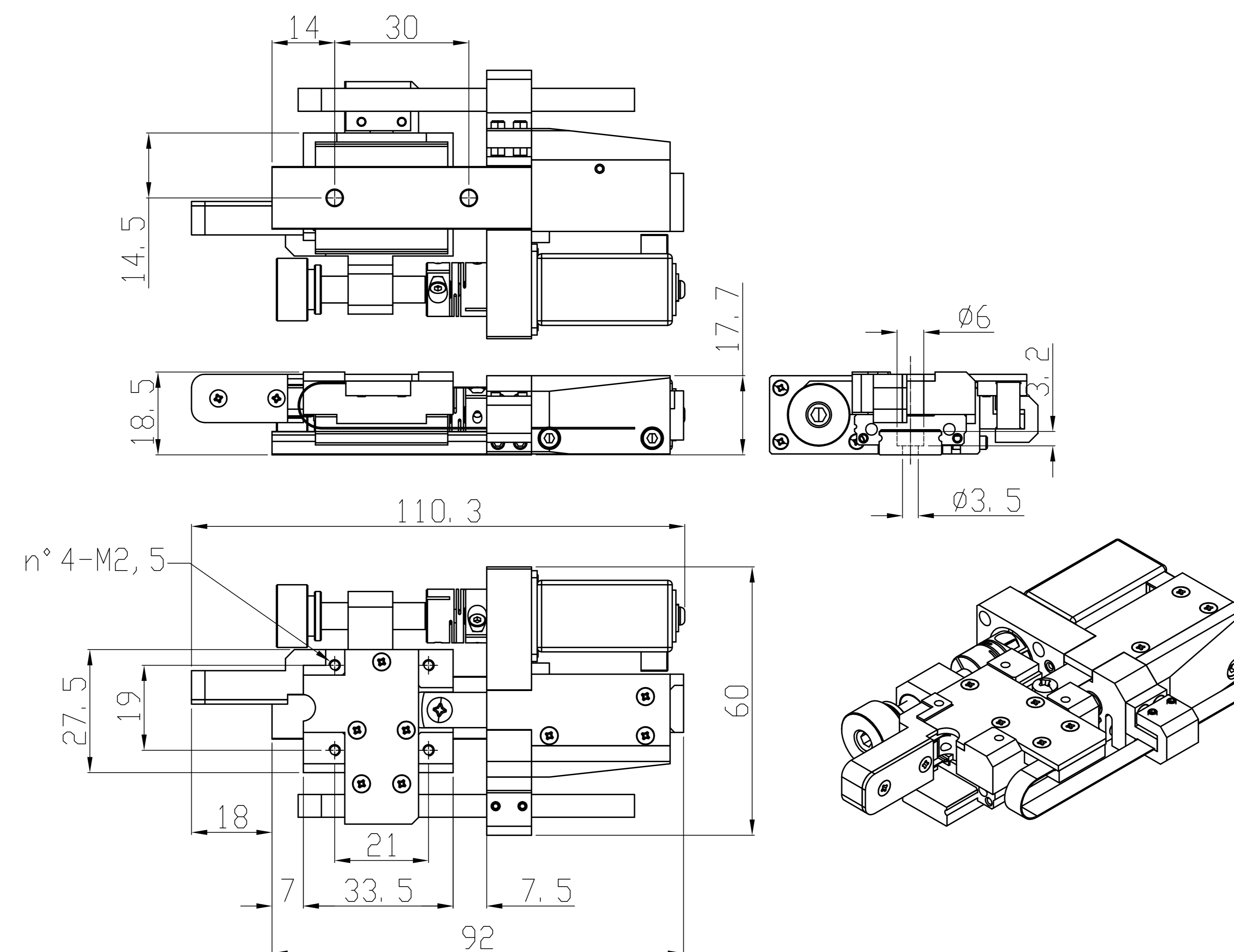
### Technical notes

- resolution and repeatability very much depend on the controller, we can supply you the complete package upon request
- load, speed and acceleration can also influence resolution and repeatability values
- measurement protocol delivered upon request

# AR-S-CLOOP

## AntRail Small Closed Loop

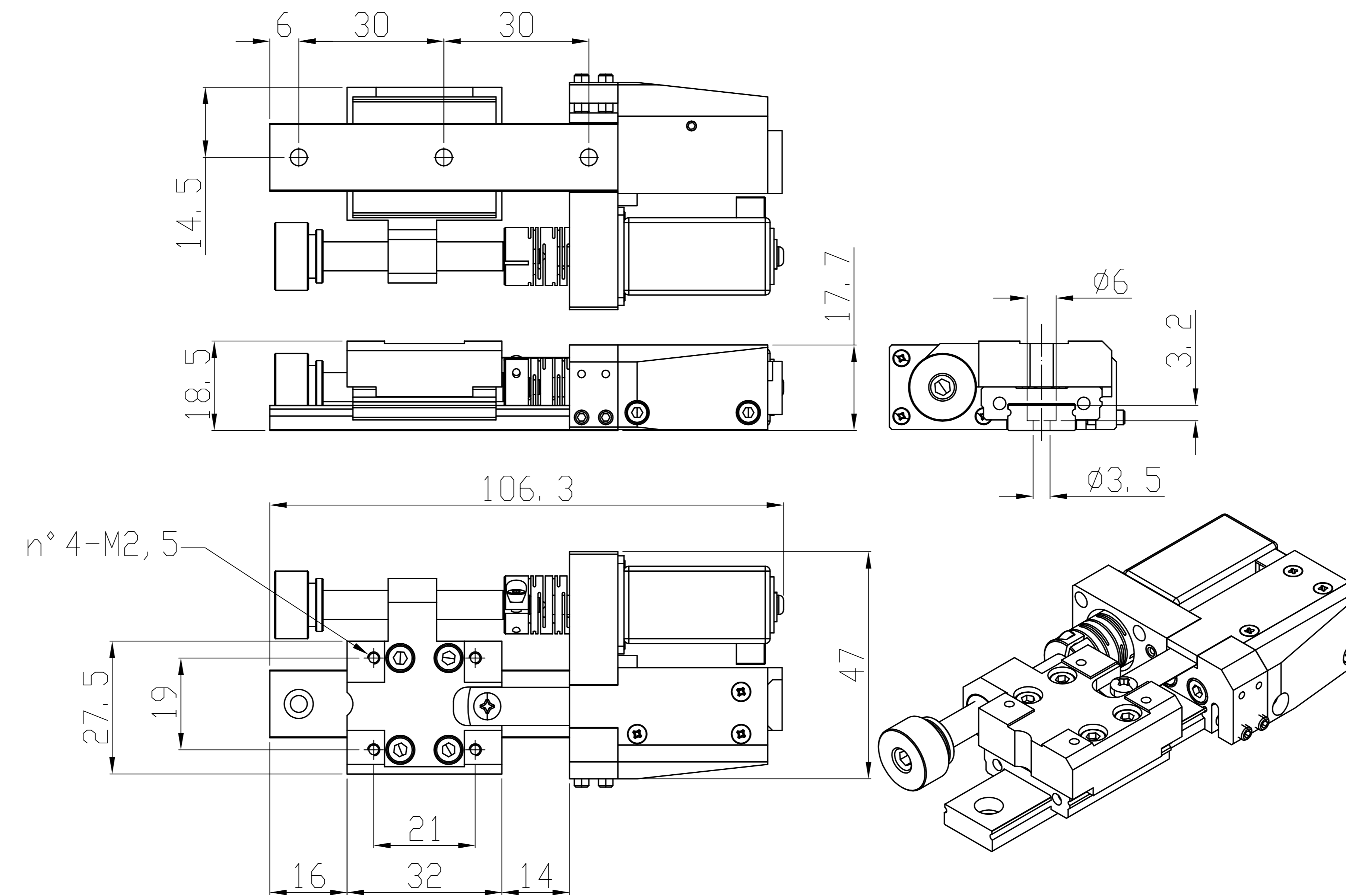
Specifications (Typical*)	Value	Unit
Travel range	13	mm
Load capacity (Fz, FY)	30	N
Axial load capacity (Fx)	+/- 5	N
Moment (Mx, My, Mz)	6	Nm
Uni-directional repeatability (2σ)	+/- 0,1	μm
Bi-directional repeatability (2σ)	+/- 0.1	μm
motor full step equivalent motion	9.61	μm
smallest motion step	0.1	μm
Max Speed	25	mm/s



# AR-M

## AntRail Medium

Specifications (Typical*)	Value	Unit
Travel range	26	mm
Load capacity (Fz, FY)	30	N
Axial load capacity (Fx)	+/- 5	N
Moment (Mx, My, Mz)	6	Nm
Uni-directional repeatability (2σ)	+/- 1	μm
Bi-directional repeatability (2σ)	+/- 5	μm
smallest motion step	0.1	μm
motor full step equivalent motion	9.61	μm
Max Speed	25	mm/s



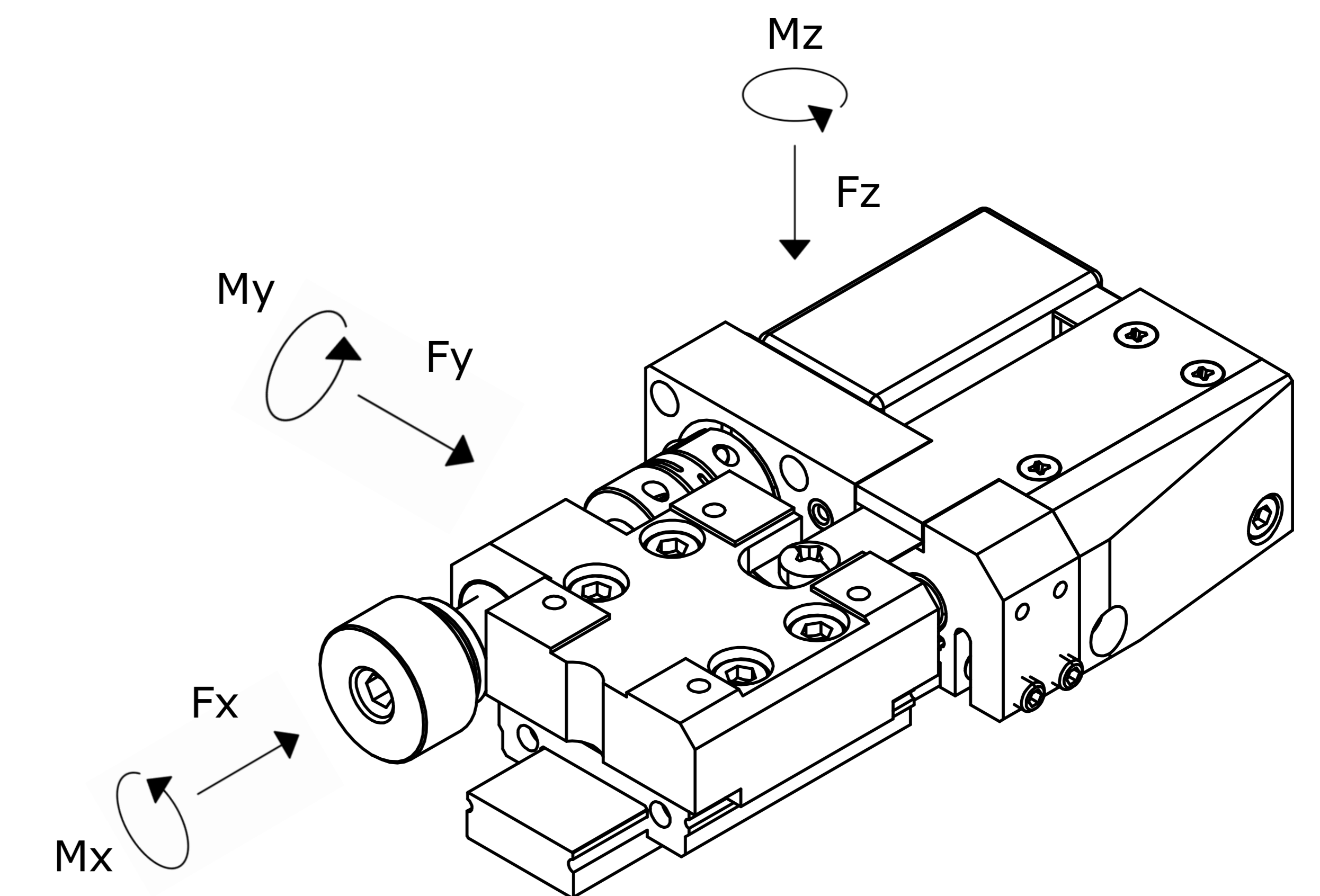
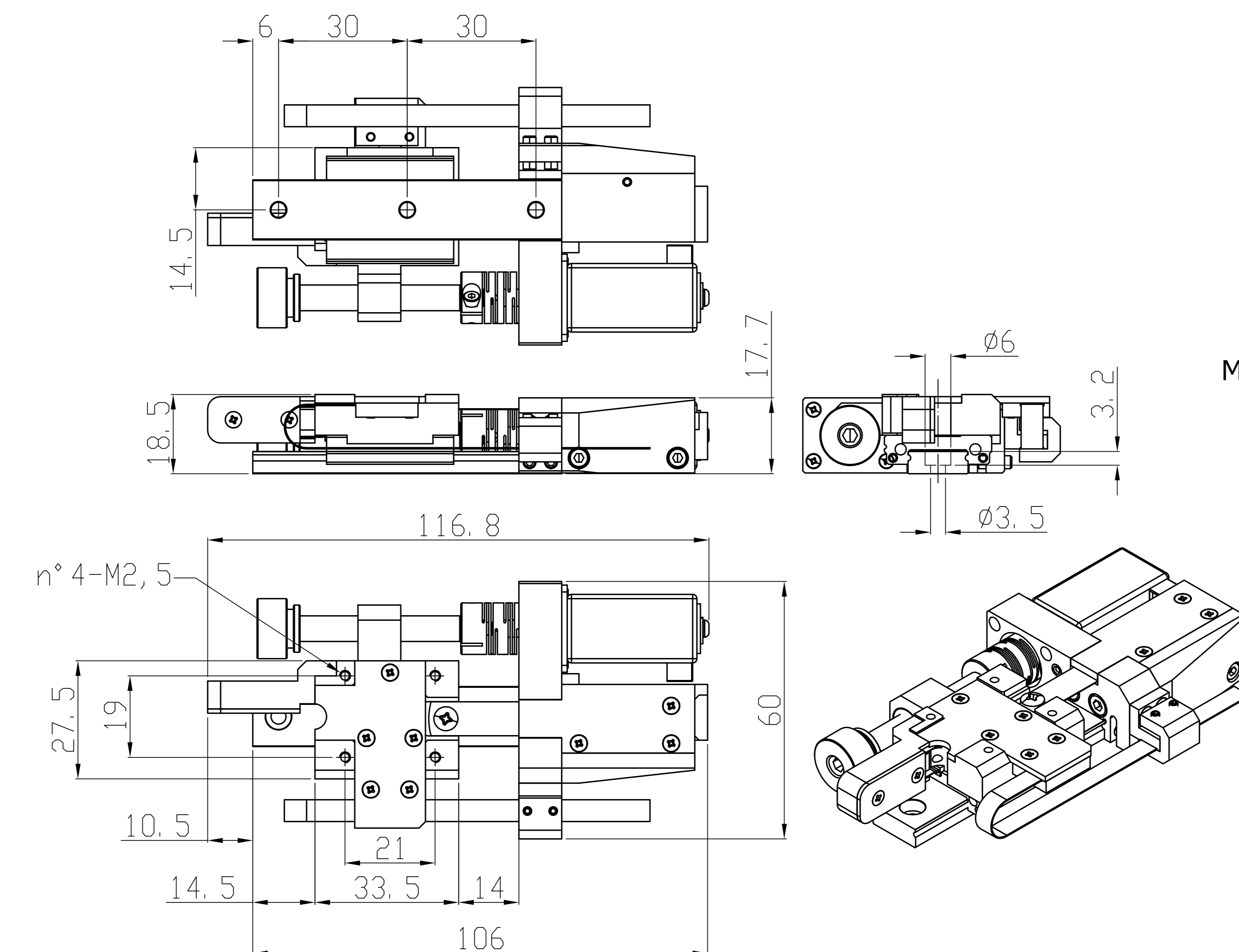
### Technical notes

- resolution and repeatability very much depend on the controller, we can supply you the complete package upon request
- load, speed and acceleration can also influence resolution and repeatability values
- measurement protocol delivered upon request

# AR-M-CLOOP

## AntRail Medium Closed Loop

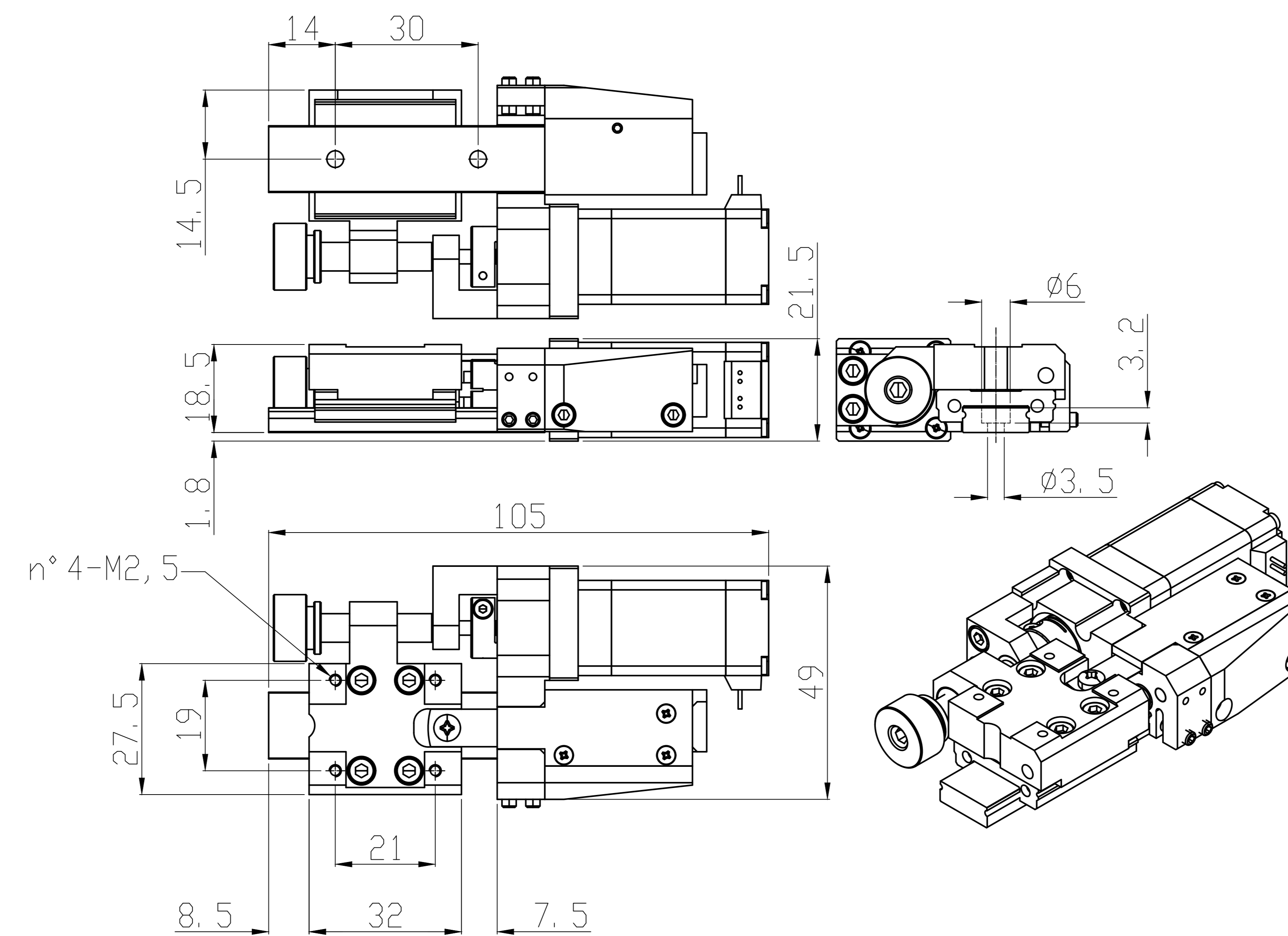
Specifications (Typical*)	Value	Unit
Travel range	26	mm
Load capacity (Fz, FY)	30	N
Axial load capacity (Fx)	+/- 5	N
Moment (Mx, My, Mz)	6	Nm
Uni-directional repeatability (2σ)	+/- 0,1	μm
Bi-directional repeatability (2σ)	+/- 0,1	μm
smallest motion step	0.1	μm
motor full step equivalent motion	9,61	μm
Max Speed	25	Mm/s



# AR-S-HL

## AntRail Small High Load

Specifications (Typical*)	Value	Unit
Travel range	13	mm
Load capacity (Fz, FY)	30	N
Axial load capacity (Fx)	30	N
Axial load capacity (F-x)	5	N
Moment (Mx, My, Mz)	6	Nm
Uni-directional repeatability (2σ)	+/- 1	μm
Bi-directional repeatability (2σ)	+/- 5	μm
smallest motion step	0.1	μm
motor full step equivalent motion	5	μm
Max Speed	25	mm/s



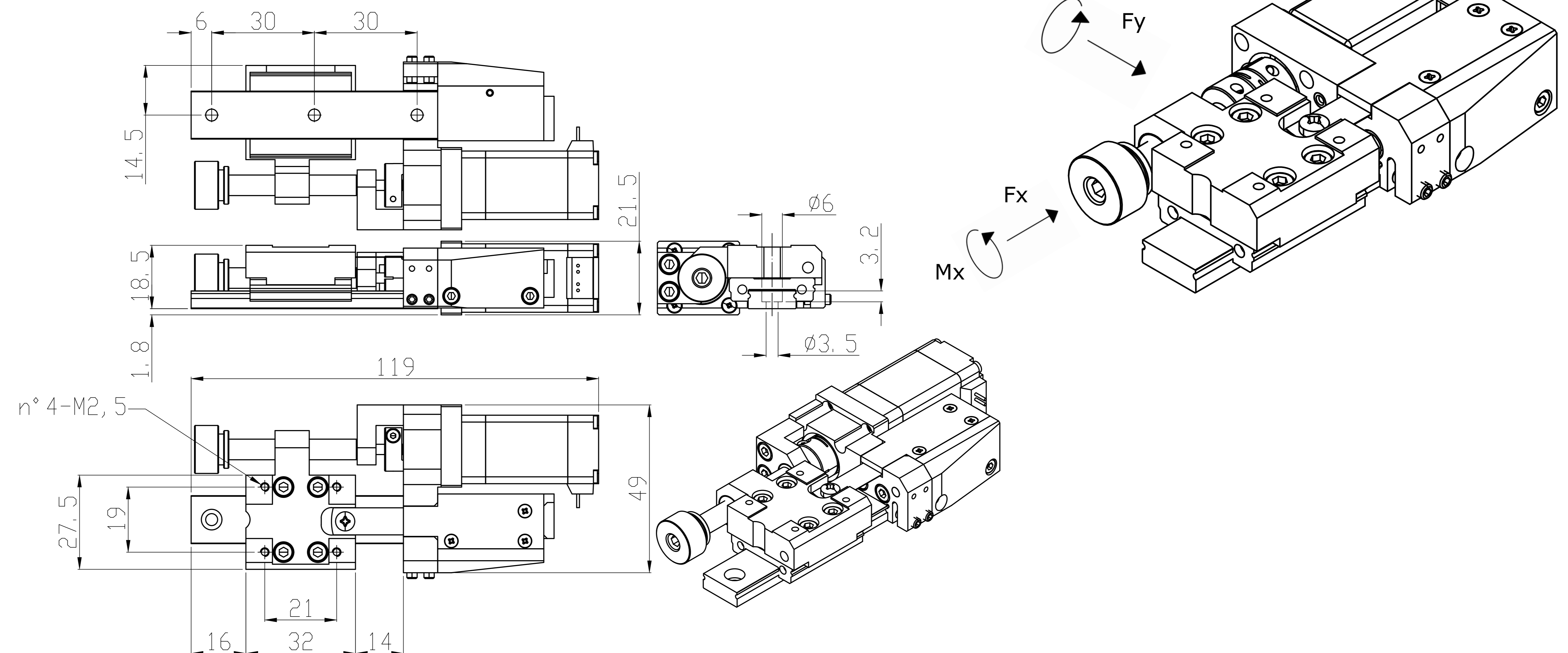
### Technical notes

- additional axial bearing on the lead-screw shaft
- resolution and repeatability very much depend on the controller, we can supply you the complete package upon request
- load, speed and acceleration can also influence resolution and repeatability values
- measurement protocol delivered upon request

# AR-M-HL

## AntRail Medium High Load

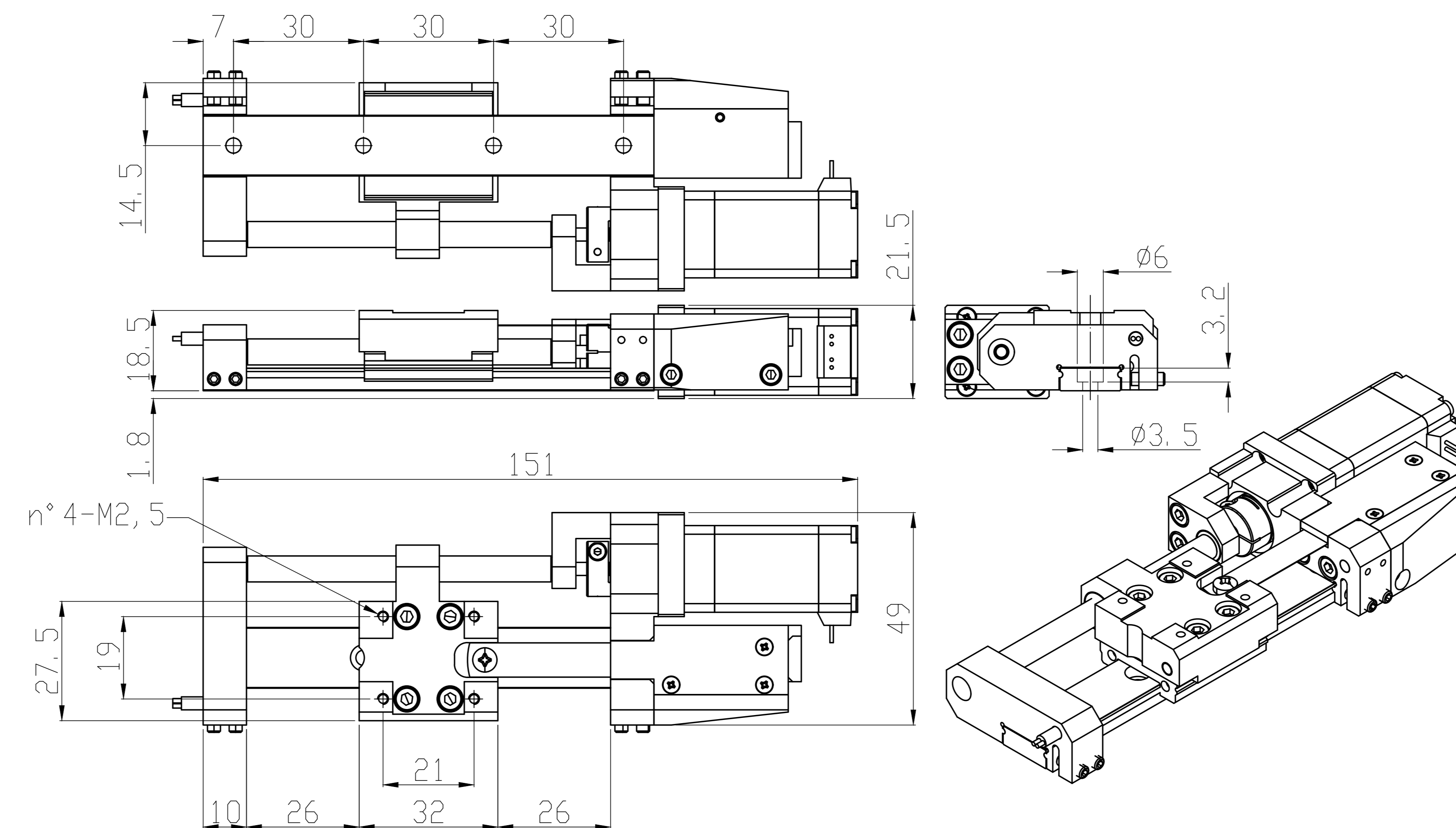
Specifications (Typical*)	Value	Unit
Travel range	26	mm
Load capacity (Fz, FY)	30	N
Axial load capacity (Fx)	5	N
Axial load capacity (F-x)	5	N
Moment (Mx, My, Mz)	6	Nm
Uni-directional repeatability (2σ)	+/- 1	μm
Bi-directional repeatability (2σ)	+/- 5	μm
smallest motion step	0.1	μm
motor full step equivalent motion	9.61	μm
Max Speed	25	mm/s



# AR-L-HL

## AntRail Large High Load

Specifications (Typical*)	Value	Unit
Travel range	50	mm
Load capacity (Fz, FY)	30	N
Axial load capacity (Fx)	+/- 30	N
Moment (Mx, My, Mz)	6	Nm
Uni-directional repeatability (2σ)	+/-1	μm
Bi-directional repeatability (2σ)	+/- 5	μm
smallest motion step	0.1	μm
motor full step equivalent motion	9.61	μm
Max Speed	25	mm/s



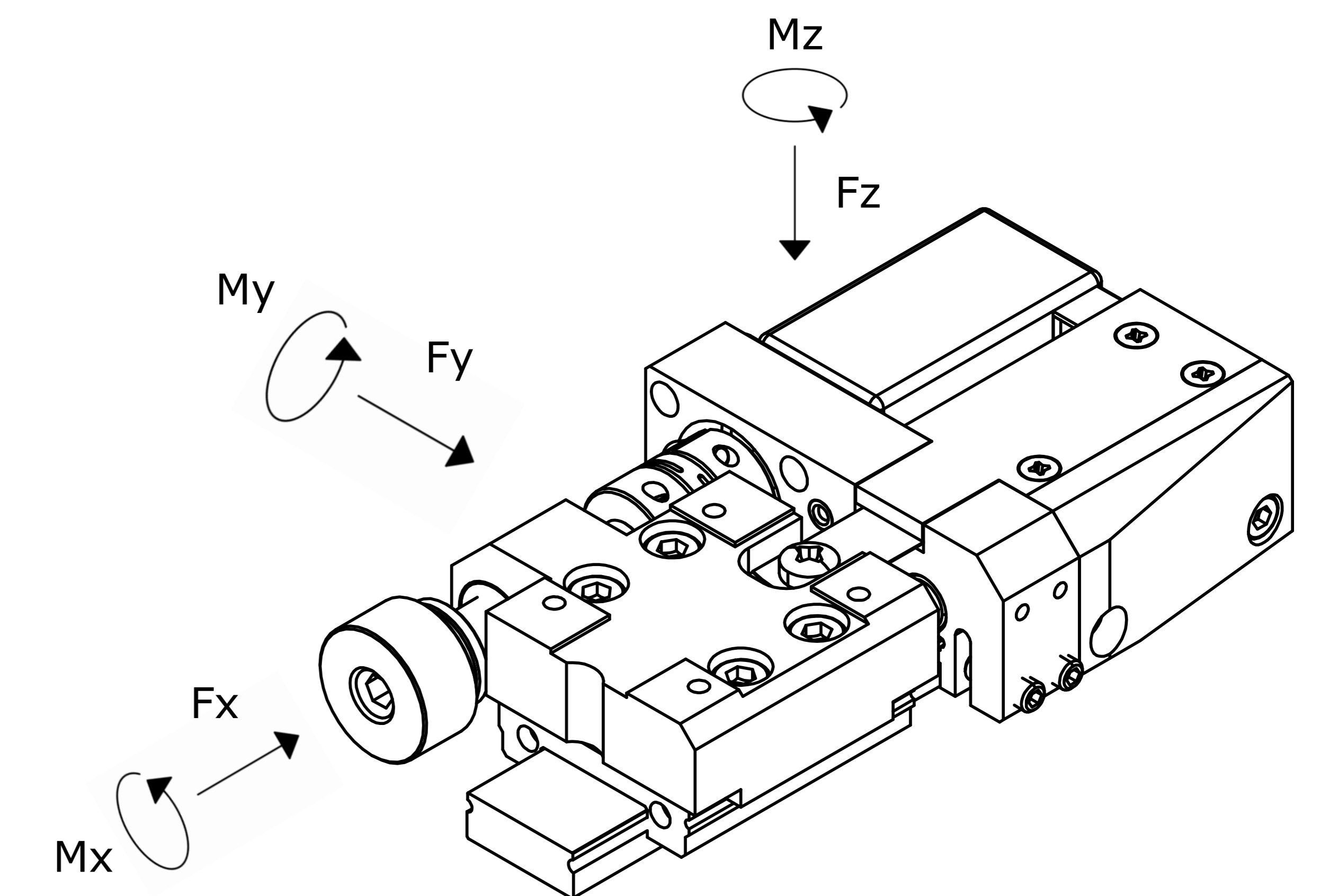
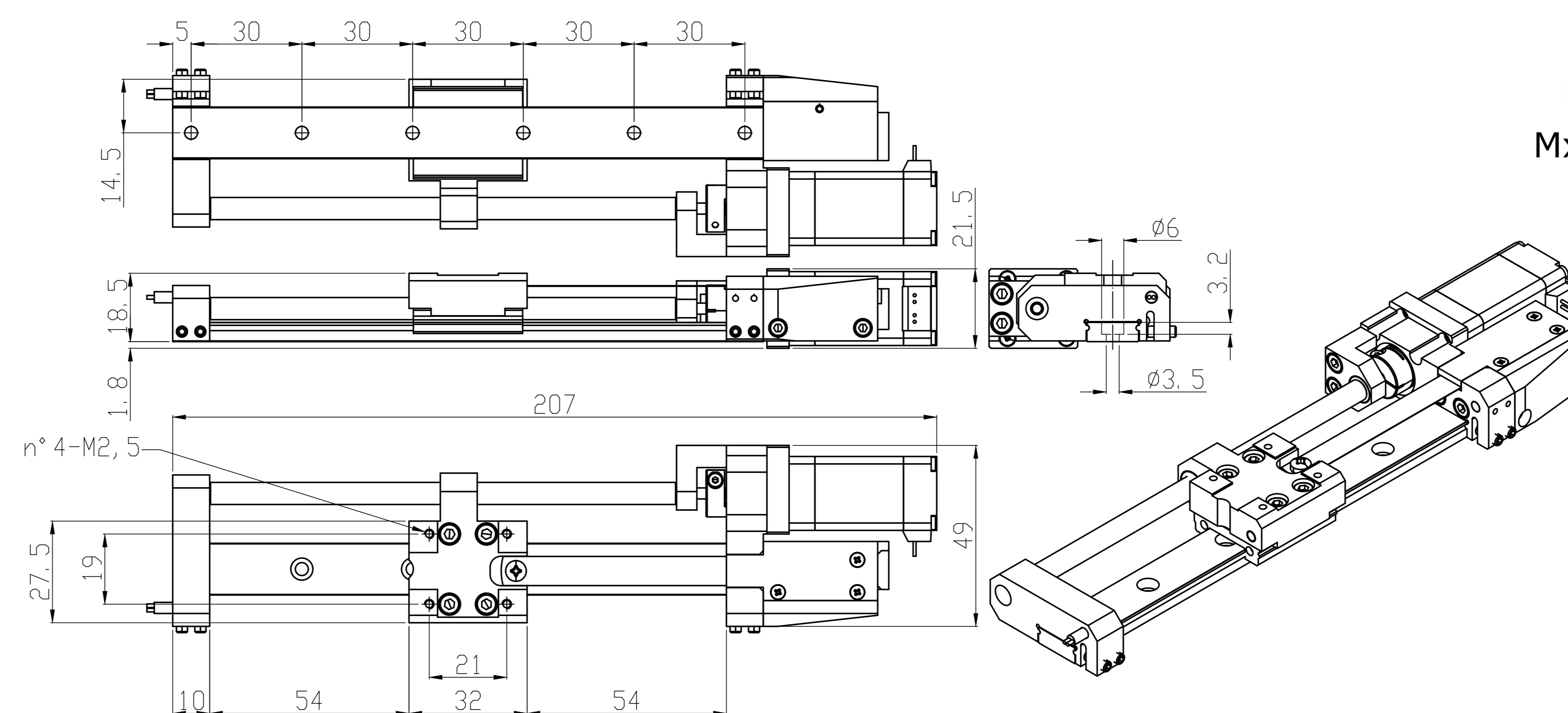
### Technical notes

- Double axial bearing on the lead-screw shafts
- resolution and repeatability very much depend on the controller, we can supply you the complete package upon request
- load, speed and acceleration can also influence resolution and repeatability values
- measurement protocol delivered upon request

# AR-XL-HL

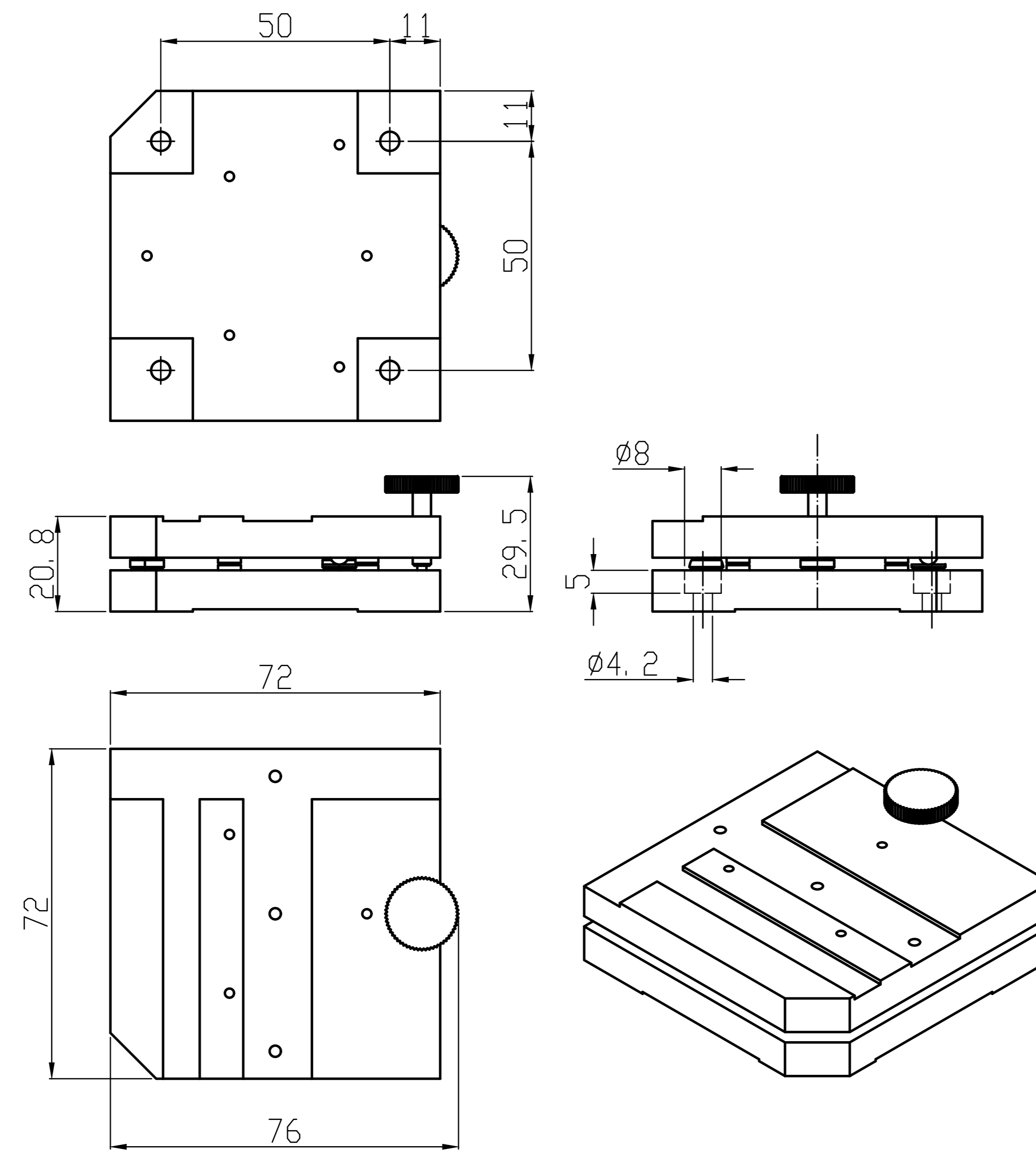
## AntRail eXtra Large High Load

Specifications (Typical*)	Value	Unit
Travel range	100	mm
Load capacity (Fz, FY)	30	N
Axial load capacity (Fx)	+/-30	N
Moment (Mx, My, Mz)	6	Nm
Uni-directional repeatability (2σ)	+/-1	μm
Bi-directional repeatability (2σ)	+/-5	μm
smallest motion step	0.1	μm
motor full step equivalent motion	9.61	μm
Max Speed	25	mm/s



# AR-KB

## AntRail Kinematic Base



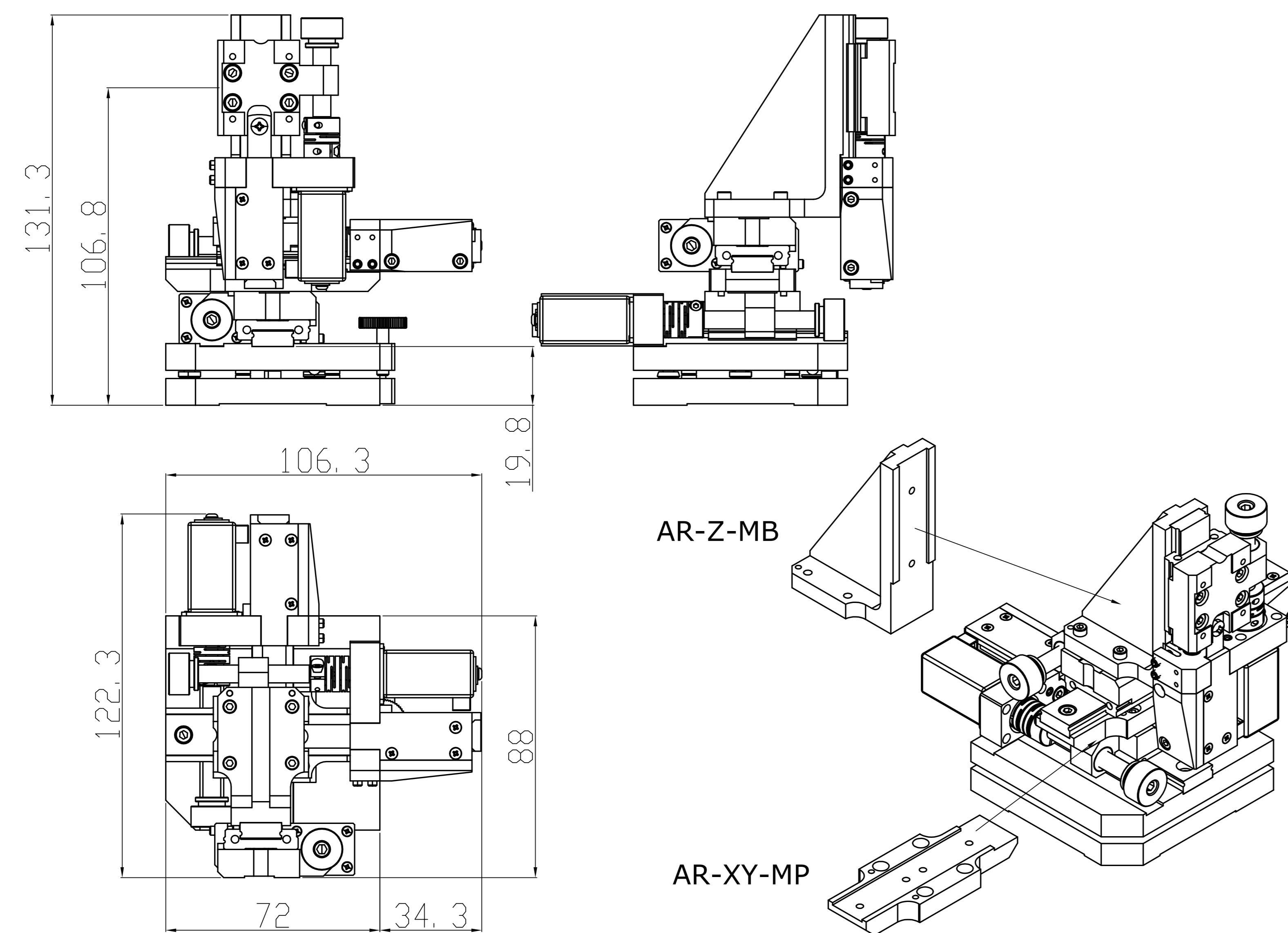
### Technical notes

The AntRail Kinematic Base is made of two parts: a base plate to be fixed on the optical table and a cover plate where the AntRail stages are mounted.

The upper block can be taken away and repositioned with micro range repeatability. A magnetic force keeps the two parts together, a thread knob helps distancing the two parts when dismantling.

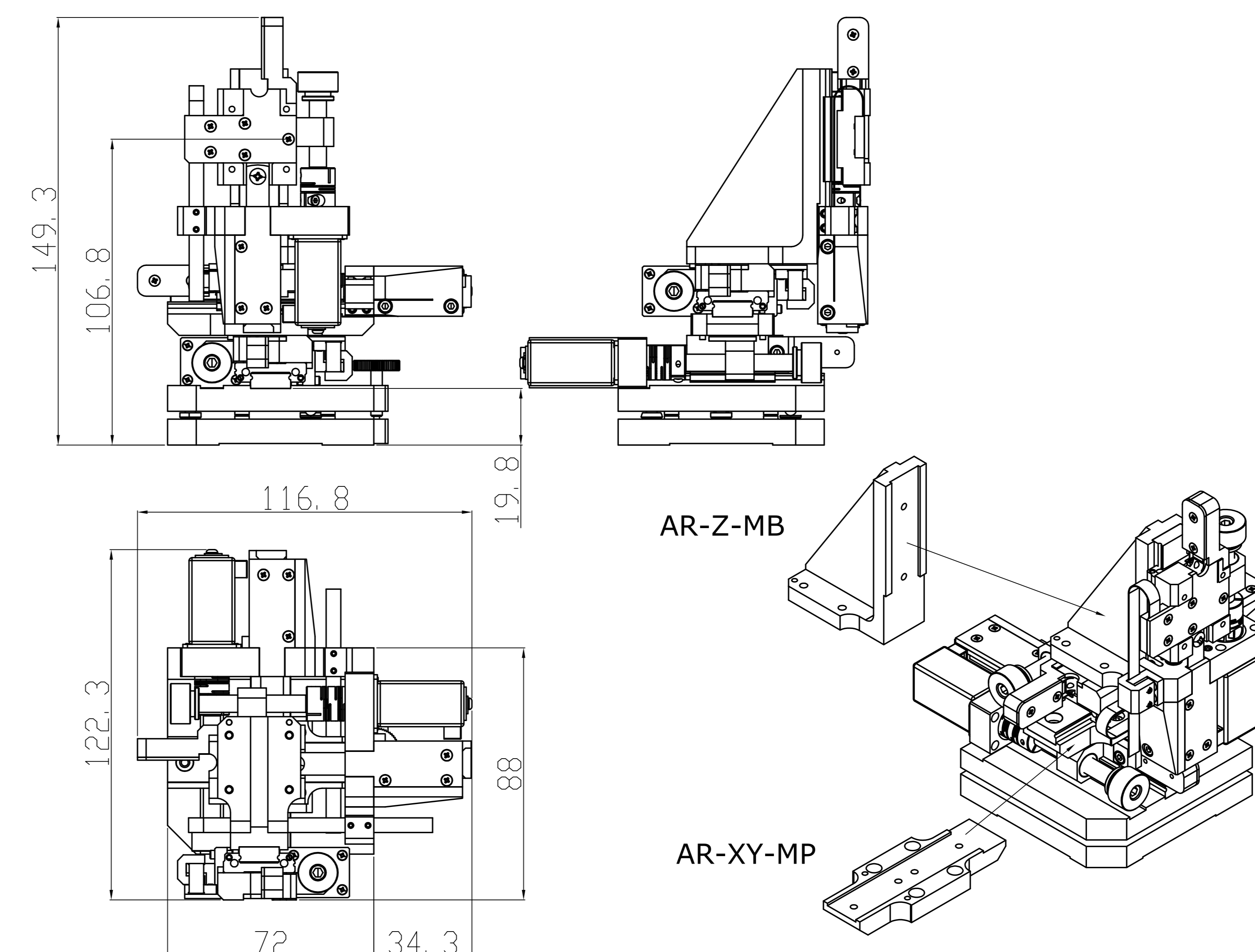
# AR-XYZ

## AntRail XYZ Mounting



# AR-XYZ-CLOOP

## AntRail XYZ Mounting Closed Loop



# Questionnaire

Fill in this questionnaire and mail it to [ufficiovendite@vacuumfab.it](mailto:ufficiovendite@vacuumfab.it) to get our consultancy for the positioning system design, free of charges:

## CUSTOMER'S REFERENCE

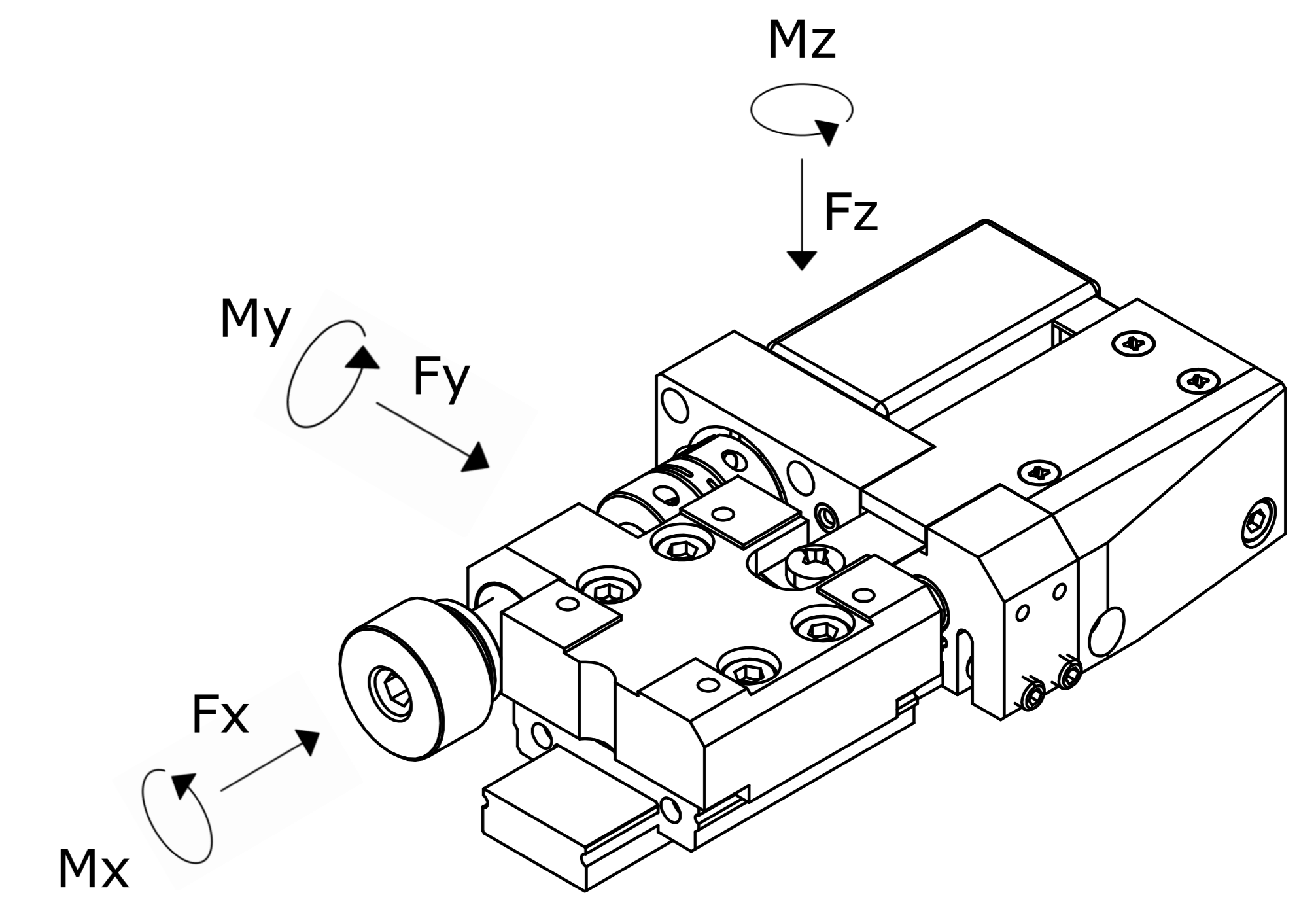
Name, surname:  
Phone Number:

Institute/company:  
Email:

## WEIGHT/SPECIMEN INFORMATION

Dimensions (mm):  
Shape: (description or better attach drawing)  
Weight (g):  
Center of gravity coordinates from the center of the carrier (mm):  
Notes:

length	width	height
X	Y	Z



## POSITIONING REQUIREMENT

Travel range required (mm):  
Positioning resolution required ( $\mu\text{m}$ ):  
Repeatability required ( $\mu\text{m}$ ):  
Applied force (N):  
Applied Moment (Nm):  
Speed required (mm/s):  
Acceleration required ( $\text{mm/s}^2$ ):  
Duty Cycle:  
Other degrees of freedom required: please specify and possibly add a sketch and a description of the application

<input type="checkbox"/> uni-directional	<input type="checkbox"/> bi-directional	
Fx	Fy	Fz
Mx	My	Mz

## WIRING REQUIREMENT

Cable length in air from the mechanics to the controller (m):

## CONTROLLER REQUIREMENT

Motion control type:  
Positioning application type:  
Computer connection port:  
Software compatibility:

<input type="checkbox"/> point to point	<input type="checkbox"/> linear interpolation	<input type="checkbox"/> contouring	
<input type="checkbox"/> high resolution	<input type="checkbox"/> high repeatability	<input type="checkbox"/> other (specify)	
<input type="checkbox"/> Ethernet	<input type="checkbox"/> USB	<input type="checkbox"/> EPICS	
<input type="checkbox"/> DLL	<input type="checkbox"/> LabVIEW	<input type="checkbox"/> TANGO	

Notes:

Date and signature: