



Hand in hand for tomorrow



Product data sheet

Force/torque sensor FT-AXIA 90

FT-AXIA

Force/torque sensor

Precise. Reliable. Robust.

6-axis force/torque sensor FT-AXIA

Rigid 6-axis force/torque sensor for precision measuring in all six degrees of freedom

Field of application

Universally applicable in robotic applications such as haptics, medicine, grinding, testing, inserting, and research and development



Advantages – Your benefits

Compact design due to space-saving set-up with integrated electronics

Two calibrations are available whereby two measurement ranges can be controlled via web interface

Plug & Work directly compatible for KUKA and Universal Robots via software module

Cost saving despite high precision due to optimized manufacturing

Robust design ensures due to a high overload range with protection against damage even with short-term overload

Version with LED display for status display on the sensor without evaluation via the controller



Sizes
Quantity: 3



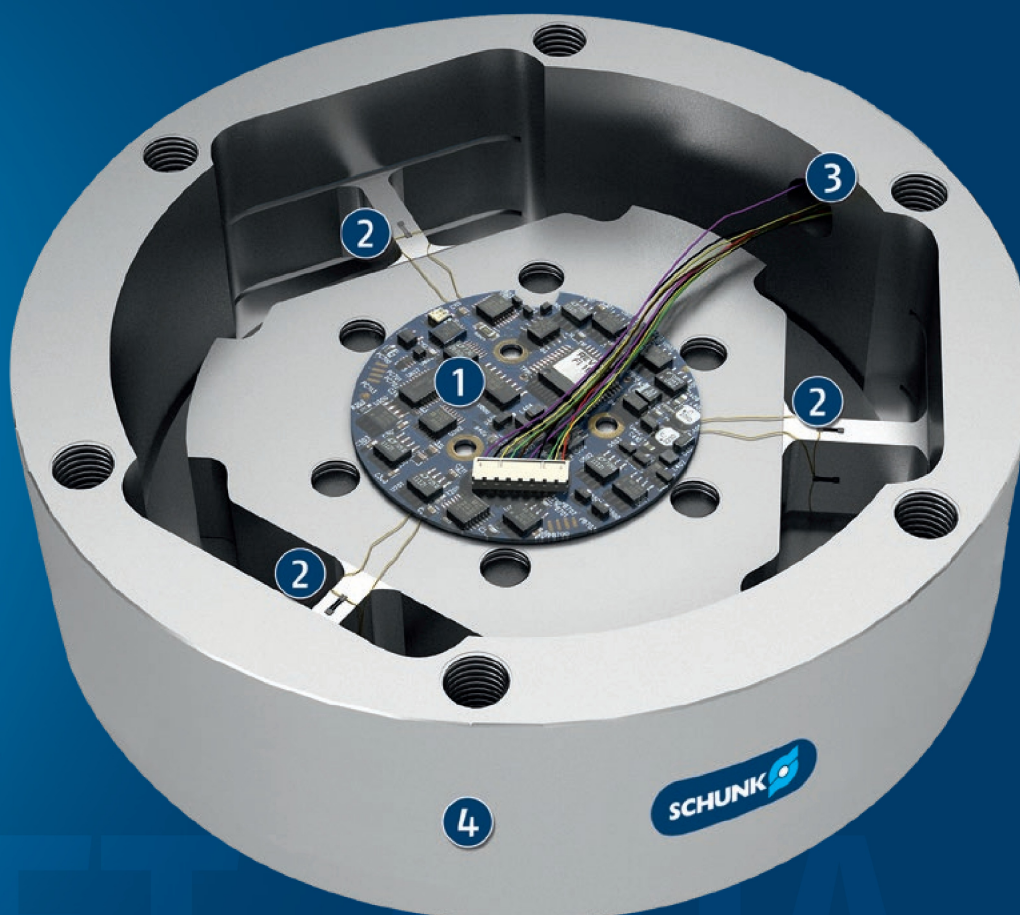
Measuring range of
force
 $\pm 75 \dots 4000 \text{ N}$



Measuring range of
moment load
 $\pm 4 \dots 300 \text{ Nm}$

Functional description

The strain gauges (DMS) of the 6-axis force/torque sensors measure the strain applied in all six degrees of freedom (Fx, Fy, Fz, Mx, My und Mz). The signals of the DMS are evaluated in the sensor and provided.



- | | |
|---|---|
| <p>① Electronics
no interfering contour, as integrated in the housing</p> <p>② Resistance strain gauges
Silicon gauges provide a signal 75 times stronger than conventional foil gages. This signal is amplified resulting in near-zero noise distortion.</p> | <p>③ Interfaces
Data evaluation via Ethernet, EtherCAT, RS-422 or RS-485</p> <p>④ Protection class IP
FT-AXIA 80 with IP64
Sizes FT-AXIA 90 and FT-AXIA 130 with IP67</p> |
|---|---|

Detailed functional description



The 6-axis force/moment sensor is connected to the control line via the sensor cable. The control line is divided into voltage supply and data transfer. The connection between the controller and sensor is made via EtherNet or EtherCAT depending on the model. The following components are included in the scope of delivery:

- ① FT-AXIA
- ② Sensor cable
- ③ Control line

General notes about the series

Measuring accuracy: < 2% of the upper limit value of the measuring range at 22 °C

evaluation via: EtherCAT, Ethernet, RS-422, RS-485

Warranty: 12 months

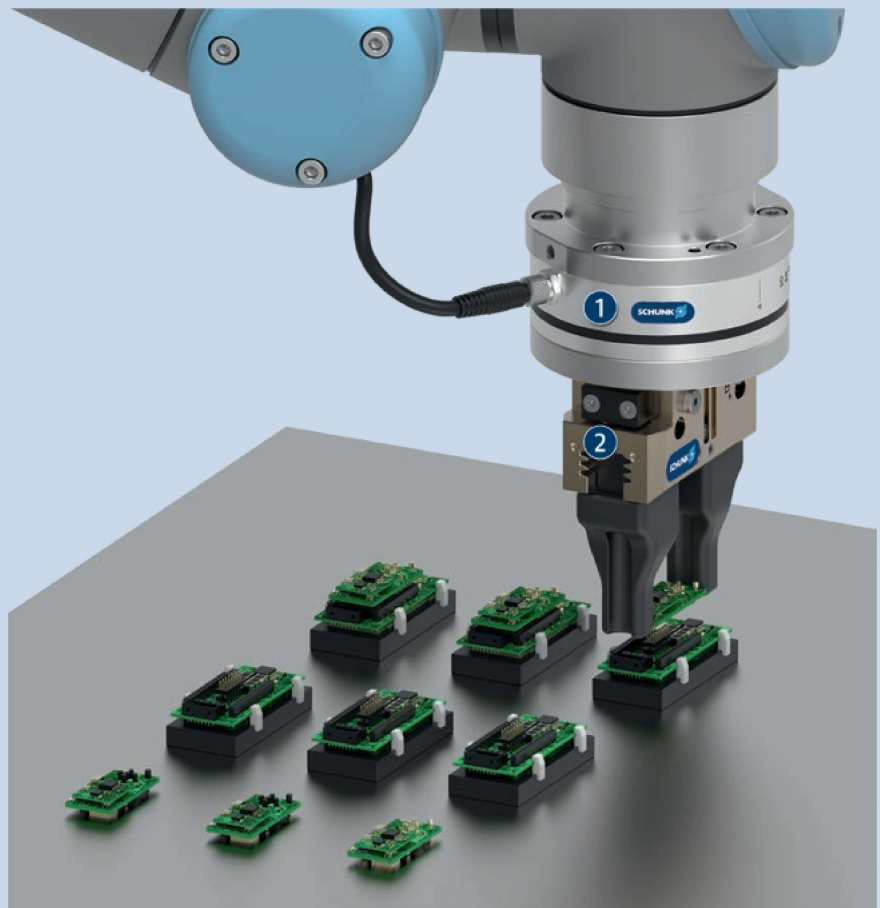
Harsh environmental conditions: Please note that use under harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service life of the units, and we will not take over any warranty. However, in many cases we can find a solution. Please contact us for assistance.

Handling weight: is the weight of the total load attached to the flange. When designing, the permissible forces and moments have to be paid attention to. Please note that exceeding the recommended handling weight will shorten the lifespan.

Application example

Gripping unit in combination with force/torque sensor for delicate assembly of printed circuit boards

- ❶ 6-axis force/torque sensor
FT-AXIA
- ❷ 2-finger parallel gripper
PGN-plus-P



SCHUNK offers more ...

The following components make the product even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.



Manual change system



Tool changer



Rotary feed-through



Universal gripper



Universal gripper

① For more information on these products can be found on the following product pages or at [schunk.com](https://www.schunk.com).

Options and special information

6-axis force/torque sensor: Strain gauges (DMS) measure the strain applied in all six degrees of freedom (F_x , F_y , F_z , M_x , M_y and M_z). The signals from the DMS are directly processed in the sensor, and are made available as forces and moments via various communication protocols.

Sensor cable: The sensor cable connects the sensor to the control line via an M8 connector or an M12 connector through an 8-pin M12 connector. The voltage supply and communication line are integrated into the sensor cable and shielded. The highly flexible sensor line protects the sensor signals against electrical fields and mechanical loads.

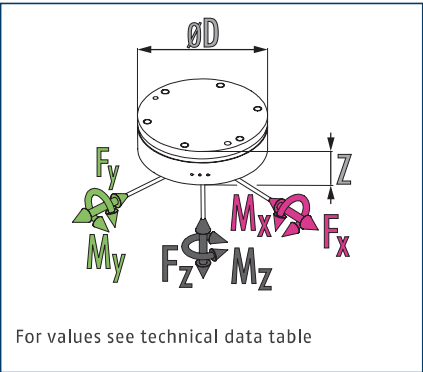
Control line: The control line is a Y-distribution cable and is connected to the sensor line via an M12 socket. It supplies the sensor with voltage via a 3-pin open wire strand and allows separate communication with the sensor via EtherNet or EtherCAT via an RJ-45 connector, depending on the version.

FT-AXIA 90

Force/torque sensor



Dimensions and maximum loads



① All forces and torques acting on the sensor must be within the specified measurement range. Exceeding the measurement range will reduce the maximum number of load cycles and may lead to damage of the sensor. Please contact us if your application exceeds the measurement range.

Technical data

Description		FTN-AXIA90 SI-1000-50
ID		1512819
evaluation via		EtherNet
Housing material		Aluminum
Weight	[kg]	0.744
Calibration 1		SI-1000-50
Measuring range F_x, F_y /measuring range F_z	[N]	$\pm 1000/\pm 2000$
Measuring range M_x, M_y /measuring range M_z	[Nm]	$\pm 50/\pm 50$
Overload F_x, F_y /overload F_z	[N]	$\pm 5000/\pm 10000$
Overload M_x, M_y /overload M_z	[Nm]	$\pm 250/\pm 250$
Resonant Frequency F_x, F_y, M_z	[Hz]	2300
Resonant Frequency F_z, M_x, M_y	[Hz]	2900
Resolution F_x, F_y /resolution F_z	[N]	0.4/0.4
Resolution M_x, M_y /resolution M_z	[Nm]	0.01/0.01
IP protection class		67
Dimensions $\varnothing D \times Z$	[mm]	89.9 x 26.9
Technical data deviations for FTE		
Description		FTE-AXIA90 SI-1000-50
ID		1512827
evaluation via		EtherCAT
Technical data deviating from FTRS		
Description		FTRS422-AXIA90 SI-1000-50
ID		1512848
evaluation via		serial interface (RS-422)

Technical drawing of a circular mechanical part, showing three views: front, side, and back.

Front View (Left):

- Outer diameter: $\varnothing 90$
- Inner diameter: $\varnothing 31.525^{+0.025}_0/6$
- Chamfers: $45^\circ (8x)$
- Mounting holes: $M6/10 (7x)$
- Central hole: $\varnothing 50$
- Flange thickness: 53.4
- Coordinate system: $+X$, $-X$, $+Y$, $-Y$
- Bottom hole: $\varnothing 6/8$ (73, 2)

Side View (Middle):

- Outer diameter: $\varnothing 90$
- Inner diameter: $\varnothing 62.95^{+0.025}_0$
- Flange thickness: 26.95
- Flange width: 7
- Coordinate system: $+Z$, $-Z$
- Bottom hole: $\varnothing 4.5 (6x)$
- Bottom hole: $\varnothing 8.25/4.4 (6x)$
- Bottom hole: 7.4

Back View (Right):

- Outer diameter: $\varnothing 81.1$
- Inner diameter: $\varnothing 3.033^{+0.025}_0/7$
- Chamfers: $52^\circ (3x)$
- Mounting holes: $\varnothing 3/7$
- Central hole: $\varnothing 3.033^{+0.025}_0/7$
- Flange thickness: 36.12 ± 0.025
- Coordinate system: $+X$, $-X$, $+Y$, $-Y$
- Bottom hole: $\varnothing 6/8$ (73, 2)
- Bottom hole: $\varnothing 3.033^{+0.025}_0/7$
- Bottom hole: 18.404 ± 0.025
- Bottom hole: 34°
- Bottom hole: $68^\circ (3x)$
- Bottom hole: 22.321 ± 0.025
- Bottom hole: 33.998 ± 0.025
- Bottom hole: 73
- Bottom hole: 1
- Bottom hole: 24

① Robot-side connection ②④ Bolt circle
② Tool-side connection ⑦③ Fit for centering pins

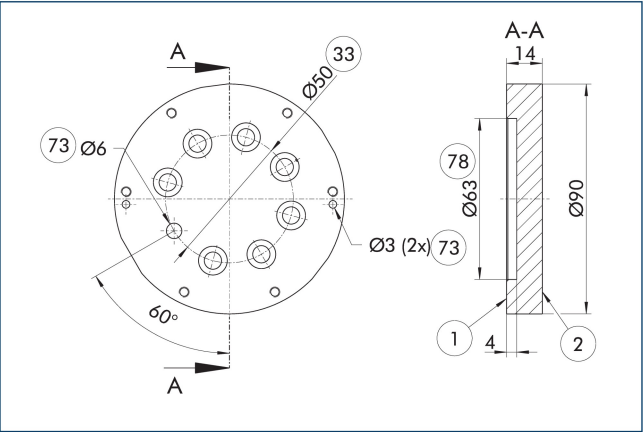
- | Description | ID | |
|--------------------------|---------|--|
| Adapter plate | | |
| A-FT-AXIA-90-ISO-A31.5-R | 1512882 | |

- | Description | ID | |
|------------------------|---------|--|
| Adapter plate | | |
| A-FT-AXIA-90-ISO-A40-R | 1512880 | |

FT-AXIA 90

Force/torque sensor

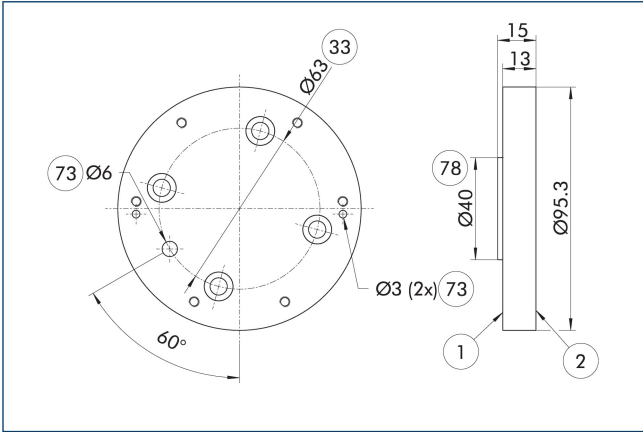
Adapter plate ISO-A50-R



- 1 Robot-side connection
- 2 Tool-side connection
- 33 DIN ISO-9409 bolt circle
- 73 Fit for centering pins
- 78 Fit for centering

Description	ID	
Adapter plate		
A-FT-AXIA-90-ISO-A50-R	1512866	

Adapter plate ISO-A63-R



- 1 Robot-side connection
- 2 Tool-side connection
- 33 DIN ISO-9409 bolt circle
- 73 Fit for centering pins
- 78 Fit for centering

Description	ID	
Adapter plate		
A-FT-AXIA-90-ISO-A63-R	1512885	

