

Delfa – 3-Axis F/T Sensor

Datasheet



Properties

This compact, lightweight, cost-effective sensor enables **force (Z-axis)** and **torque (Mx, My)** measurement on robotic end effectors. It is designed primarily for integration with the **Meca500** robotic arm from Mecademic, and a dedicated flange is available for easy mounting. The sensor includes **fully integrated electronics** that output digital measurement values via **UART or RS485**, eliminating the need for an external amplifier.

- ◆ **Small, lightweight design** (49 × 20 mm, ~55 g)
- ◆ **Easy installation** on the Meca500 with the dedicated flange and matching mounting interface
- ◆ **Plug-and-play operation** with no additional signal amplifier required
- ◆ **Digital communication** via UART and RS485
- ◆ **Robust, rubber-like sensing element** withstanding shear forces, shocks, and vibration
- ◆ **Integrated electronics** for direct digital measurement output

Applications

- ◆ Force and Torque Measurement on Robotic End-of-Arm Tooling (EOAT)
- ◆ Pick-and-place operations
- ◆ Peg-in-hole assembly and insertion tasks
- ◆ Grinding, polishing, and surface-processing applications

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Technical Data

- Different information within one row describes orderable options, see chapter ordering code for details.
- All the following information represents our technical standard. Other configurations/specifications are available on request.

Mechanical and Environmental Data

Parameter	Symbol	Value	Unit	Comments
Measurement Range	F_z	± 20	N	
	M_x / M_y	± 1	Nm	
Weight	m	~ 55	g	Sensor with electronic w/o cable and flange
Stiffness	Y	120	N/mm	in z-direction
Electrical Connector		Bare ends	USB-connector	Can be customized, too
Operating Temperature	T_{op}	5 ... 40	°C	Extended range upon request
Storage Temperature	T_{st}	-40 ... 100	°C	
IP Classification		IP62	IP67	

Electrical Data

Parameter	Symbol	Value	Unit	Comments
Supply Voltage	V_{sup}	5	V	Tolerance $\pm 20\%$
Power Consumption	P_{tot}	≤ 1	W	
Communication		UART / RS485		

Performance Data

Parameter	Symbol	Value	Unit	Comments
Sampling Frequency*	f_s	≤ 1000	Hz	Maximum refresh rate
Resolution Fz		0.07	N	Smallest detectable output change
		0.4	N	Smallest detectable output change including noise
Resolution Mx/My		0.001	Nm	Smallest detectable output change
		0.007	Nm	Smallest detectable output change including noise
Repeatability Fz		< 0.15	N	Maximum error when loaded to same value
Repeatability Mx/My		< 0.003	Nm	Maximum error when loaded to same value

*Specifications performed at 125 Hz

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Materials

Part	Material
Housing	Anodized Aluminum
Cable	PVC
Sensor element	PDMS
Others	PA12

Please contact us for further information.

Other Materials are available on request.

Electrical Connection

Bare Ends

Color code: t.b.d.

Protocol: t.b.d.

USB

Protocol: t.b.d.

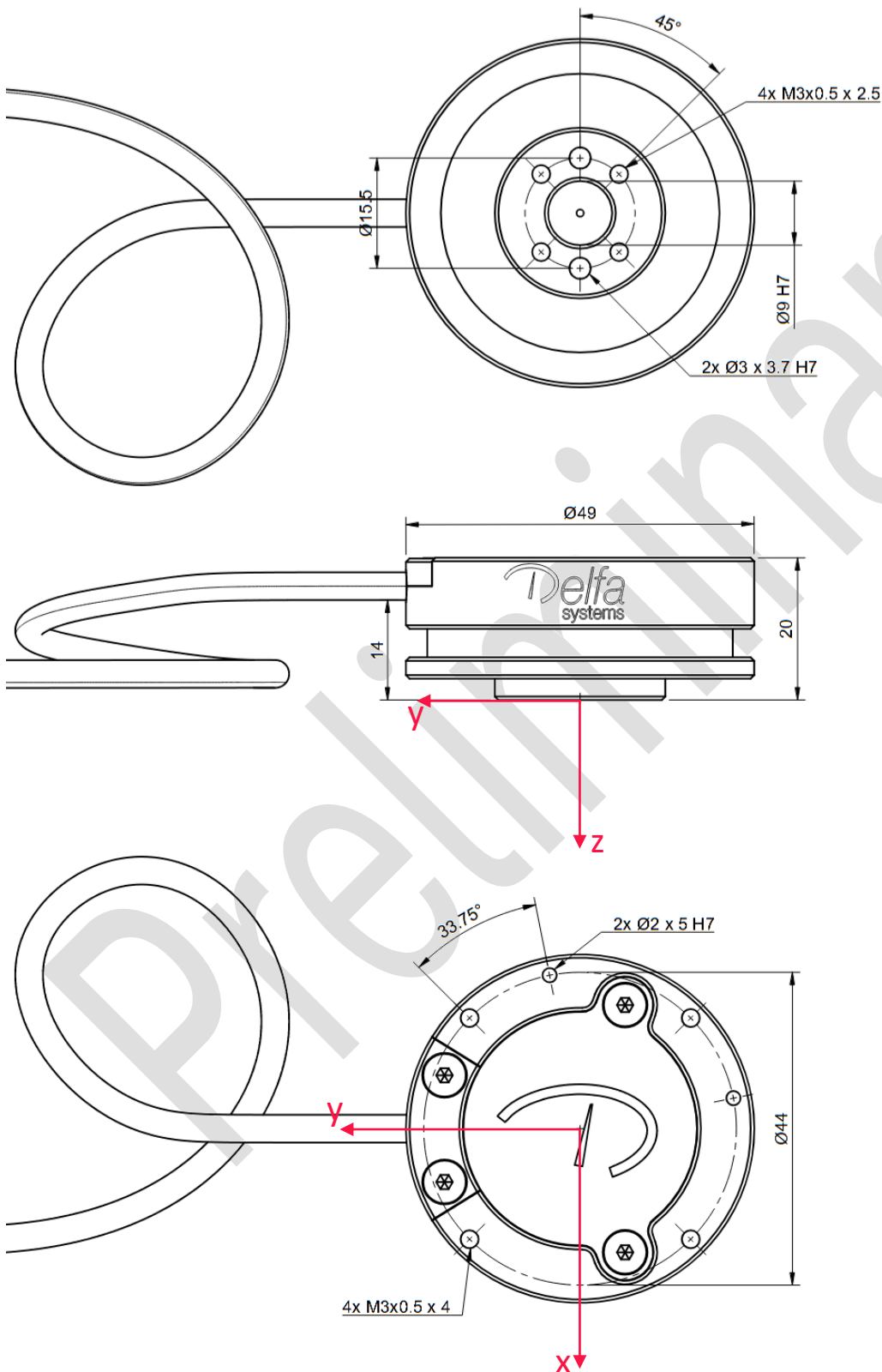
Other electrical connections are available on request!

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Mechanical Dimensions in mm



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Order Code t.b.d.

Optional Features

Add corresponding suffix to end of order code without separator.

Leave blank if no options are desired.

Order code table	
IP	IP67 protection

Customer-specific sensor systems are assigned a factory order code.

Preliminary

Accessories

Mounting flange for Meca500

