3 Degree-of-Freedom Force Sensor

Unique Features of The Equipment

The **3DOF Force Sensor** is developed and adapted to be used as foot sensors in walking robots with its high precision, bandwidth, compactness, durability, cost efficiency and waterproofness.

General Description

The new design and technology of the **3DOF Force Sensor**, enables force measurements in 3 degrees; X, Y and Z. Conventional robot foot sensors typically only measures 1 degree, which results in loss of data whenever the robot legs force vector is not angled perpendicular to the walking surface or when the robot walks on the inclination and rough terrain.

With University of Southern Denmark's **3DOF Force Sensor** it is possible to create a 3DOF force vector which will not only determine the complete load on the leg, but also indicate the direction that external forces are pushing and pulling the leg.

These enhanced features enable more advance control and dynamics of the robots. Another novelty of the **3DOF Force Sensor** is the design's cost efficiency and high durability.

Current design is adapted to 5,00 kg robot walking robots. Future designs will enable higher weight robots

TECHNICAL SPECIFICATIONS

1. Physical:

Weight:	20 g

Footprint	Overall	Ø24,20 mm x 42,50 mm
Attachment flange to robot:	Dimension:	Ø12,00 mm x 12,50 mm
Side attachment flange to robot:	Flat flange threads:	M2,50 x 14,00 mm DEEP
	Flat flange seperation	
	Round flange threads:	M2,50 x 5,00 mm DEEP
Attachment flange to foot:	Dimension:	Ø10,00 mm x 10 mm
	Side thread:	M3,00
	Bottom thread:	M4,00
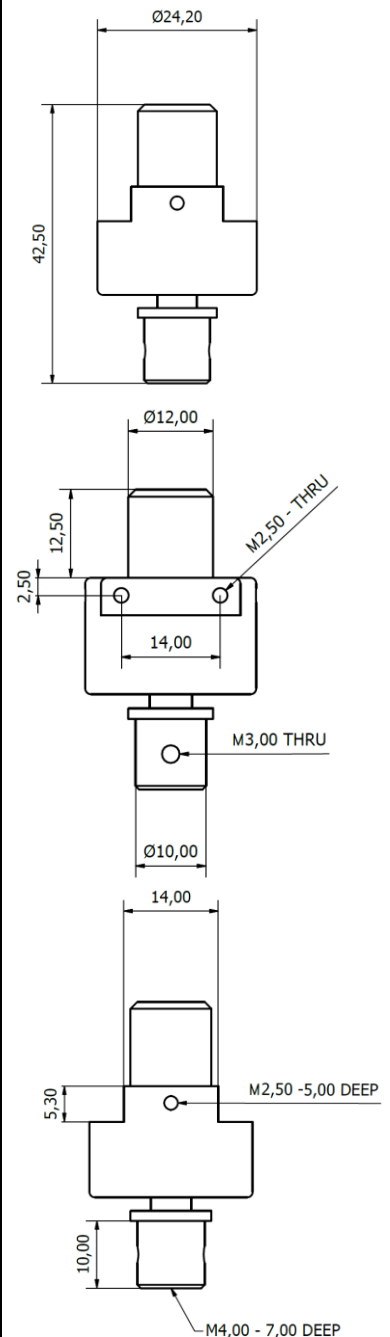
2. Operation

Interface:	3.3 Volt TTL UART, 115200Baud
Output data rate:	62.5Hz
X and Y axis range:	± 2 Nm
Z axis range:	± 75 N
Accuracy:	Is to be defined
Robot max mass:	5,00 kg