

Gimbal

PIEZOELECTRIC BASED 2 AXES POSITIONER

ARQUIMEA's Gimbal devices are two axes positioners which function is to direct precisely a load. The gimbal is formed by two motors driven by piezoelectric stacks with electric redundancy. The gimbal includes two degrees of freedom: the rotation in roll and yaw axes. The gimbal shows moderate torque capabilities, providing a very high accuracy and very low backlash to the user avoiding the use of additional gearboxes.

Typical applications of Pre2Pos Gimbal include:

antennas, scientific instruments and reflectors pointing and positioning, as well as solar arrays, booms and masts deployments.

OPERATION

The Pre2Pos gimbal is based on the coordinated actuation of several piezoelectric stacks separated in two phases which operates with certain phase shift. This system provides individual rotative steps as small as $0,002^\circ$ with a moderate speed.

Adapting the working frequency, the output torque or the rotational speed can be adjusted according with the necessities of the moment.

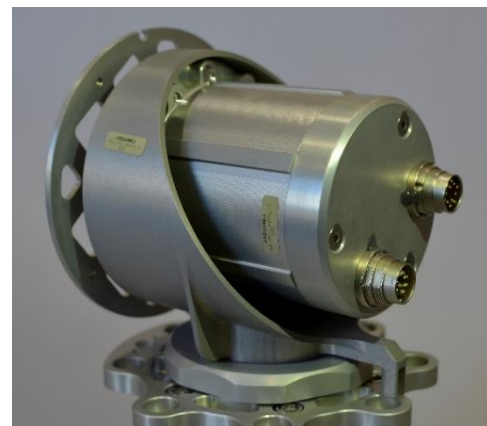
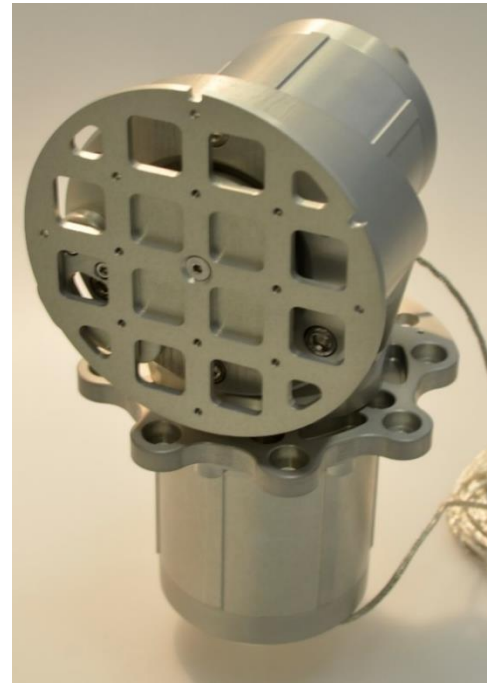
The position is controlled by an optical encoder.

KEY FEATURES

- Very high resolution
- Very low backlash
- High unpowered holding torque
- Absence of gears
- Absence of lubrication
- Redundant electrical connection in the piezoelectric elements
- Simple standard mechanical and electrical interfaces
- Space-qualified parts and materials
- Custom configurations available under request
- Full Gimbal system or individual motor available
- ITAR free

ABOUT PRE2POS

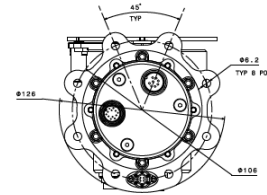
This gimbal based on piezoelectric technology has been developed under the framework of Pre2Pos project, as part of Horizon 2020 innovation Programme from the European Union (Grant Agreement No. 733209). Pre2Pos project has been developed by partners Phi Drive and Arquimea, aiming to foster the implementation of innovative piezo technologies and functioning principles in space mechanisms.



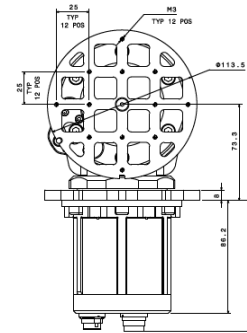
TECHNICAL SPECIFICATIONS

	Standard Operation Temp.
Actuator technology	Piezostacks
Output torque	1 Nm
Powered holding torque	1 Nm
Unpowered holding torque	1 Nm
Angular range	360° Yaw axis limited due to harness
Speed	80 rpm
Output resolution	< 0,002°
Measured angle resolution	0,002°
Mechanical I/F	8 x M6 x 16 to system Array of threaded connections to load (reconfig)
Electrical Interface	2 channels: 40V @ 20kHz Connector 1: Power – Circular 8 pins Connector 2: Encoder – Circular 12 pins
Operating Temp.	-30 / +50°C
Non-Operation Survival Temp.	-50 / +70°C
Life Cycles (min)	> 1000 rev
Mass	2100 g
Part Number	ARQ_16601_240000
Gimbal standard set includes:	
<ul style="list-style-type: none"> Gimbal device 	
The following accessories can be procured apart:	
<ul style="list-style-type: none"> Screws for the assembly to the spacecraft and to the load HDRM to hold the system during launch Aerial cables to connect the gimbal to the spacecraft EGSEs and MGSEs for test 	

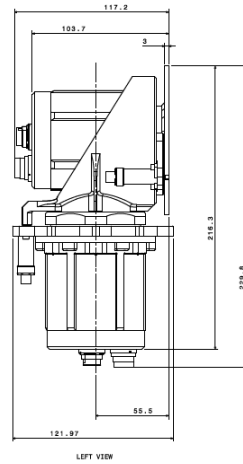
MECHANICAL INTERFACE



BOTTOM VIEW



FRONT VIEW



LEFT VIEW

QUALITY LEVELS

EM

EM acceptance tests include:

- Physical Measurements (envelop dimensions, mass)
- Electrical Measurements (input capacitance, grounding, insulation)
- Actuation Test (peak torque, maximum speed, voltage consumption and supplied current)
- Actuation Test with Redundant actuator (peak torque, maximum speed, voltage consumption and supplied current)

FM

FM acceptance tests include EM acceptance tests plus:

- Vibration (acceptance levels)
- Thermal Vacuum Cycling (actuation in extreme temperatures, voltage consumption and supplied current)

LEGAL WARNING AND EXCLUSION OF LIABILITY

The information herein contained is subject to variation depending on the use and environmental conditions. Under this document, the Company assumes no obligation towards third parties, liability or guarantee whatsoever.