

## Feature Summary

- +/- 5 degrees of rotation
- Class 5 preloaded precision ball-screw with a brushless motor drivetrain for high precision.
- Resolution to 0.12 arc-seconds
- Precision cross-roller bearings deliver high capacity, excellent rigidity and long life.
- Very stiff rotational correction stage for heavy payloads

## Overview

Primatics PLR350 Series rotary positioning tables offer a variety of options for systems in need of small, stiff angular corrections. An innovative drive system creates arc-second accuracy and fast settling times, making the PLR350 ideal for fine position correction in assembly and optical applications where worm drives don't provide the necessary accuracy, throughput or life.

## Smart Design

The PLR350 Series drivetrain incorporates a Class 5 preloaded precision ballscrew with a brushless motor. The ballscrew nut is constrained in two dimensions, but is allowed to pivot in the third where it's tangentially attached to the output platen, providing +/- 5 degrees of rotation. Position feedback is provided by a high resolution encoder on the outer diameter of the platen. For servo motor configurations a rotary encoder is on the drivetrain for velocity feedback enabling better servo control. Precision cross roller bearings support the platen, delivering high capacity, excellent rigidity and long life. The use of a precision ballscrew drivetrain makes the PLR350 extremely stiff over a wide dynamic range, helping to eliminate backlash and reduce settling times.

## Versatile Application

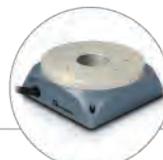
The low profile of the PLR350 supports its use in tight spaces. The open throat design allows cables to be routed through its center up to tooling mounted above the stage. Multiple mounting hole patterns ease integration of the PLR350 into many applications.

## Performance Verification

All PLR350 performance specifications are verified and a full set of accuracy & repeatability plots are included with each stage. Calibration data is also provided. In addition to test data, a 12 hour burn-in test is performed, insuring that the stage will perform as specified.



Linear Positioning



Rotary Positioning



Motion Controls

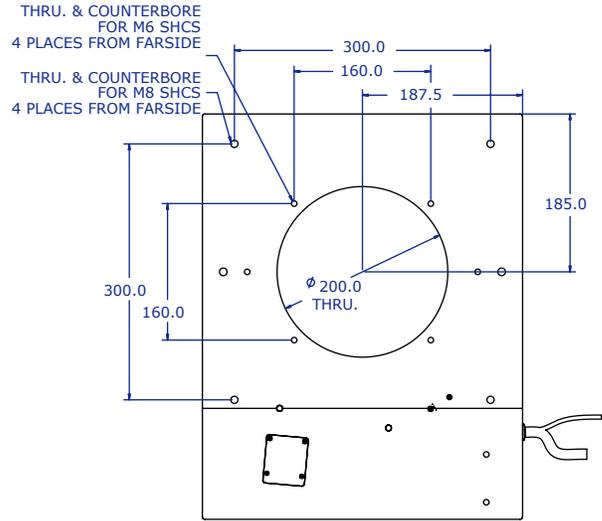
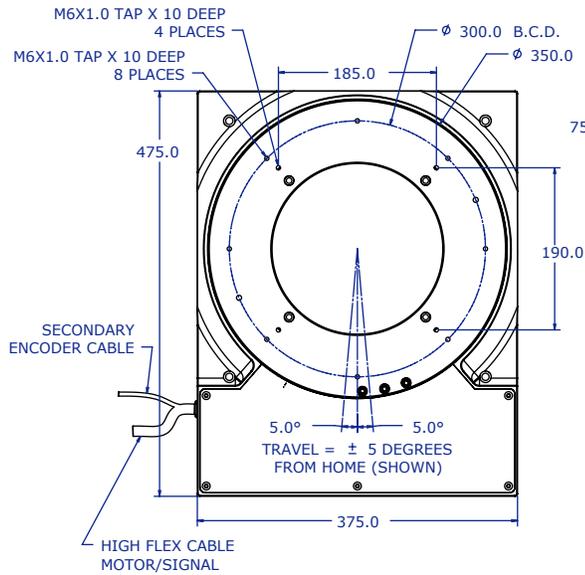


OEM Solutions

# PLR350

S E R I E S

## BALLSCREW WITH FRAMELESS MOTOR



All dimensions subject to change w/o notice.

## SPECIFICATIONS

5mm Ballscrew & 0.1 µm Tape Encoder	PLR350, Aluminum Precision Grade
Travel (degrees)	+/- 5
Table Diameter (mm)	350
Mechanical Drive System	Class 5, 5mm Lead Ballscrew
Max Speed (degrees / sec)	40
Axial Runout (µm)	+/- 0.5
Radial Runout (µm)	+/- 1
Accuracy (arc-seconds) (calibrated)	+/- 2
Bi-directional Repeatability (arc-seconds)	+/- 1
Minimum Resolution (arc-seconds)	0.12
Acceleration (deg-sec <sup>2</sup> )	360
Axial Load Capacity (kg)	140
Radial Load Capacity (kg)	70
Weight (kg)	26.2

All specifications subject to change w/o notice.

Rotary Motor Specifications	PLR350
Continuous Torque (N-m) <sup>1</sup>	0.44
Continuous Current (Amps)	3.4
Peak Torque (N-m) <sup>2</sup>	5.8
Peak Current (Amps)	45
Torque Constant (N-m/Amps)	0.13
Back EMF Constant (V/Krpm)	13.5
Resistance (Ω)	1.0
Inductance (mH)	1.2
Poles	6

Encoder Specifications	Specification
Input Power	5 VDC +/- 5%, 150 ma
Output	Square wave differential line driver
Reference (Z channel)	Synchronized pulse, duration equal to one resolution bit

Stage Information	PLR350
Max Breakaway Torque at Motor (N-m)	0.3
Max Running Torque at Motor (N-m)	0.25
Maximum Motor Bus Voltage (VDC)	170
Length of Stage Cable (mm)	450
Bearing Life x 10 <sup>6</sup> Revs	100

Limit & Home Specifications	Specification
Input Power	+12 to +24 VDC, 50 ma
Output <sup>3</sup>	Current Sinking, Sink current maximum of 100 ma

Hall Effect Specifications	Specification
Input Power	+5 to +12 VDC, 30 ma
Output	Open collector, Current sinking, 20 ma Max

<sup>1</sup> At 25°C temp rise

<sup>2</sup> At 10% duty cycle and 1 second maximum

<sup>3</sup> Home located in center of travel

All specifications subject to change without notice

## CONNECTOR PINOUTS

### Servo Axis connector

Mate: FCI (Burndy) Female, Circular Connector, 28 Contacts, Size 20 Shell Pin-out

Pin	Function
A	Motor A
B	Motor B
C	Motor C
D	Motor Shield
E	Encoder 5V - power for encoder
F	Encoder A+ output
G	Encoder A- output
H	Encoder B+ output
J	Encoder B- output
K	Encoder Shield
L	12VDC - for limit, home, and temp sensor
M	DCCOM
N	Home - Switch to DCCOM when forward of home position
P	NC
R	NC
S	Chassis
T	Hall V+
U	Hall V
V	Encoder Common
W	Encoder Index +
X	Encoder Index -
Y	Forward Limit
Z	Reverse Limit
a	NC
b	Hall A
c	Hall B
d	Temperature monitor
e	Hall C

### Secondary Rotary Encoder

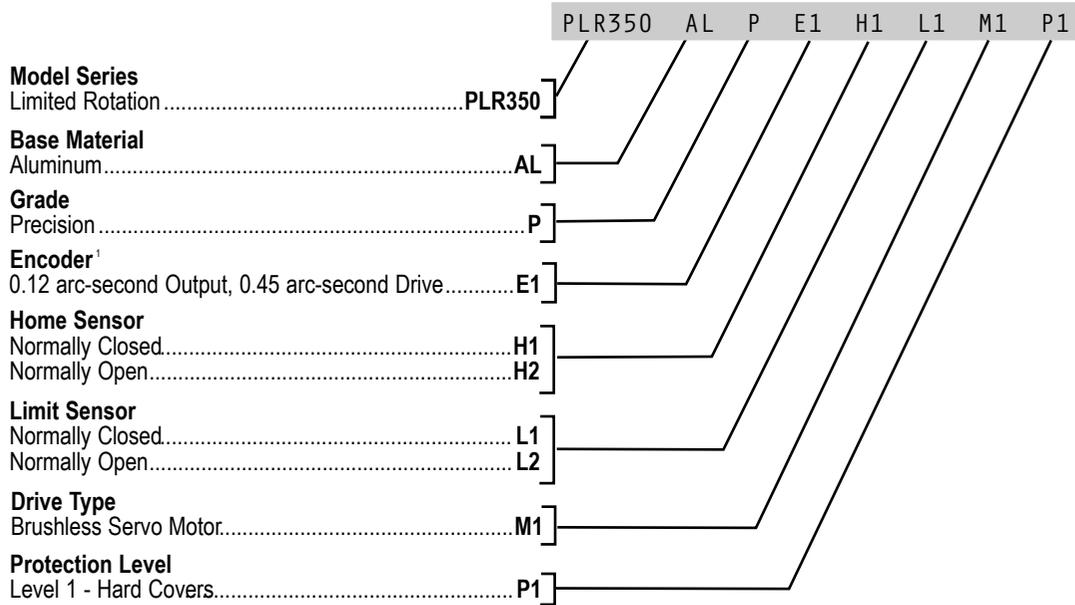
Mate: Dsub 9 position with sockets

Pin	Function
1	Encoder 5V - power for encoder
2	Encoder V-
3	Encoder A+ output
4	Encoder A- output
5	Encoder B+ output
6	Encoder B- output
7	Encoder Index + output
8	Encoder Index - output
9	Encoder Shield
10	NC

# MODEL NUMBER CONFIGURATION

OPTIONS :

SAMPLE MODEL NUMBER :



<sup>1</sup>The output encoder directly reads the rotary position. The drive encoder is on the motor drive and is used for motor velocity feedback for dual-loop positioning control.

