

Features

- Direct drive continuous rotary motion
- Compact design
- Low maintenance and long life
- Resolution to 0.18 arcsec
- Home sensor
- Clean design; Single cable connection
- Oversized cross roller bearing
- Error mapped accuracy option
- ISO 4 cleanroom option

Overview

Primatics PDR210 rotary stage is among the most advanced direct drive tables available. It features a high performance direct drive motor that provides arcsecond repeatability and fast settling times making the PDR210 ideal for semiconductor wafer inspection, high speed laser machining, and precision metrology. The compact design also yields a smaller footprint than comparable worm drives.

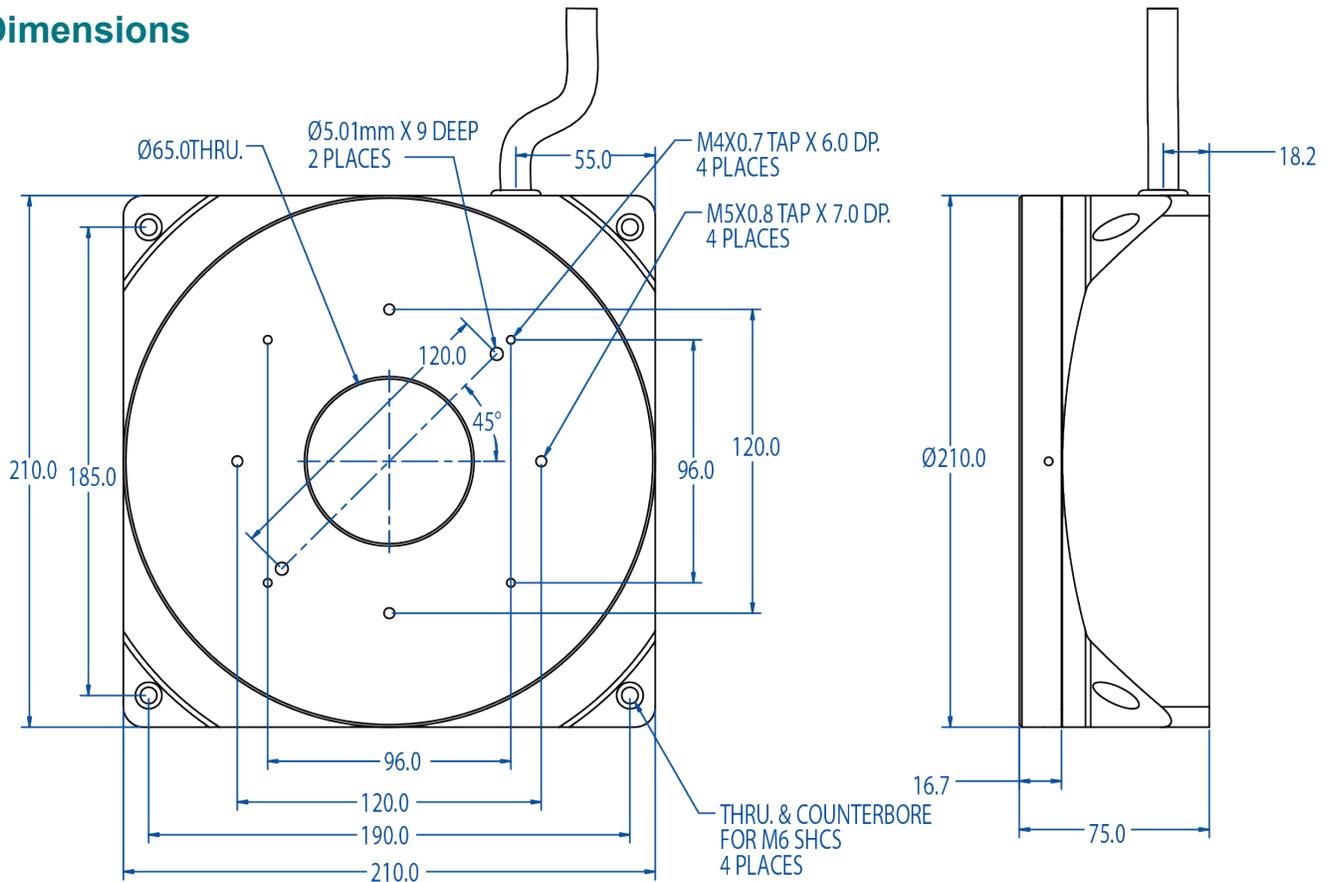
Smart Design

The PDR210 incorporates a high power brushless servo motor drivetrain. Direct output metrology is provided by a high resolution optical encoder, mounted directly to the rotating platen, yielding resolutions down to 0.18 arc-seconds. Internal multiplication electronics and a single cable exit from the stage, simplifies integration and cable management. An oversized cross roller bearing supports the rotating platform, delivering high load capacity, excellent rigidity, and long life. A large through hole allows convenient routing of vacuum and pneumatic air lines.

Applications

The PDR210's neodymium high efficiency servo motor permits greater acceleration, shorter settling times and less motor heating than other types of direct drive stages. In addition, the motor has a high pole count, which aids in obtaining extremely low velocity ripple, even at very low speeds. The high performance motor, coupled with its platen mounted high resolution glass scale, results in high servo stiffness over a wide dynamic range.

Dimensions



All drawings subject to change without notice.

Specifications

Specifications	Notes	PDR210		
Travel (deg)		360 Continuous		
Resolution (arcsec)		0.18	1.0	11.3
Accuracy (arcsec)		+/-30		+/-40
Error Mapped Accuracy (arcsec)		+/-5	+/-7	N/A
Max Speed (rpm)	1,2	55	300	350
Bi-directional Repeatability (arcsec)		+/-0.72	+/-2	+/-22.5
Axial Runout (μm)		6		
Radial Runout (μm)		8		
Continuous Torque (N-m)	2,3	4.1		
Peak Torque (N-m)	2,4	30.2		
Axial Load Capacity (kg)		30		
Radial Load Capacity (kg)		15		
Stage Mass (kg)		9.0		

Notes: 1 - Resolution and controller dependent; 2 - 100VDC minimum bus voltage; 3 - Assumes maximum 25°C temperature rise; 4 - At 10% duty cycle and 1 second maximum; All specifications subject to change without notice.

Stage Information	Notes	PDR210
Tabletop Inertia (kg-m ²)		1.27E-2
Maximum Acceleration, Unloaded (rad/s ²)	1	1000
Typ. Drag Torque (N-m)		0.12
Max Motor Bus Voltage (VDC)		170
Length of Stage Cable (mm)		450
Bearing Life x 10 ⁶ (Revs)		100
Max Inertial Payload (kg-m ²)		1.0

Notes: 1 - Assumes 100VDC bus. All specifications subject to change without notice.

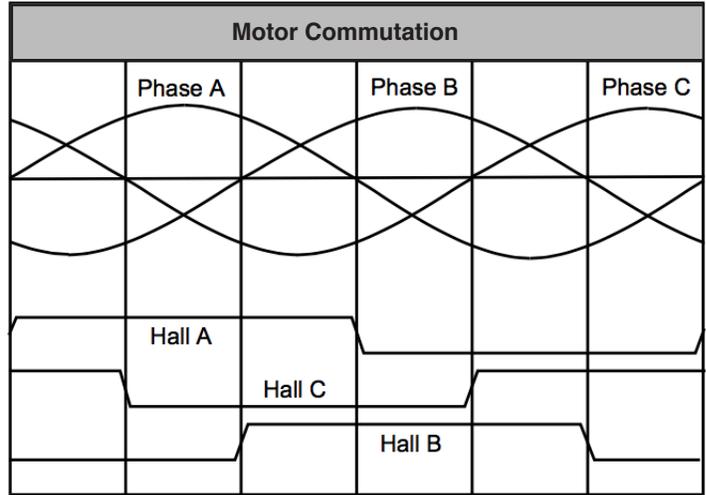
Motor, Encoder, Home Sensor Data

Parameter	Notes	PDR210
Motor		
Motor Type		Brushless Servo
Continuous Torque (N-m)	1	4.4
Continuous Current (Arms)	1	2.2
Peak Torque (N-m)	2,3	30.0
Peak Current (Arms)	2,3	15.0
Torque Constant (N-m/Arms)		2.0
Back EMF Constant (V/Krpm)		148.7
Winding Resistance (ohms)		4.7
Winding Inductance (mH)		14.7
Motor Constant (N-m \sqrt Watt)		0.65
Thermal Resistance ($^{\circ}$ C/W)		0.79
Poles		12
Hall Sensor Power		5 to 24VDC, 30mA
Hall Outputs		Open collector, current sinking, 20mA max
Encoder		
Encoder Power		5VDC +/- 5%, 330mA
Output		Square wave differential line driver
Index		Synchronized pulse, duration equal to one resolution bit
Home sensor		
Sensor Power		12 to 24VDC, 50mA
Output		Current sinking, 100mA max

Notes: 1 - Assumes maximum 25 $^{\circ}$ C temperature rise; 2 - Assumes 100VDC bus; 3 - At 10% duty cycle and 1 second maximum; All specifications subject to change without notice

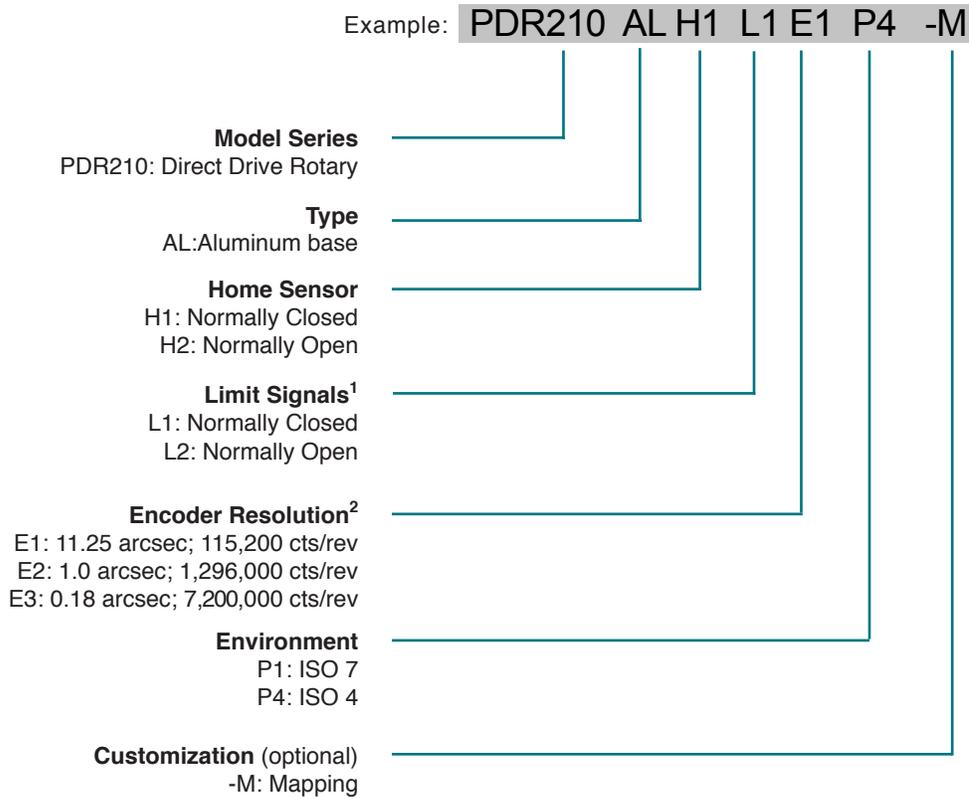
Connector

Motor, Encoder and Home	
Connector: Canon 1929926-0480	
Size 20, 28 pins	
PIN	Function
A	Motor Phase A
B	Motor Phase B
C	Motor Phase C
D	Motor Shield
E	Encoder 5V
F	Encoder Ch A+
G	Encoder Ch A-
H	Encoder Ch B+
J	Encoder Ch B-
K	Encoder Shield
L	Home Power
M	Home Return and Signal Common
N	Home
P	Not Used
R	Not Used
S	Signal Shield
T	Hall V+
U	Hall V-
V	Encoder Power Return
W	Encoder Ch I+
X	Encoder Ch I-
Y	Forward Limit (see Note)
Z	Reverse Limit (see Note)
a	Key
b	Hall A
c	Hall B
d	Not Used
e	Hall C



Notes: The PDR series does not include limit sensors. The Limit Signal options are provided for compatibility with motion controller requirements.

Model Configuration



Notes: 1) The PDR series does not include limit sensors. The Limit Signal options are provided for compatibility with motion controller requirements. 2) Standard encoder max output frequency is 12.5 MHz.
Not all configurations are valid - consult factory for assistance

Accessories

Model	Description
CABLE-SERVO-STAGE-PIGTAIL	Un-terminated at user end. 12 ft. standard
CABLE-SERVO-STAGE -DMC40X0-I200	Use with Galil DMC-40x0-I200 with trap servo drives. 12 ft. standard
CABLE-SERVO-STAGE -DMC40X0-I200-SINE	Use with Galil DMC-40x0-I200 with sine servo drives. 12 ft. standard
CABLE-SERVO-STAGE-MC4U W/ HALLS	Use with ACS MC4U. 12 ft. standard
CABLE-SERVO-ACS-CMNT-DIG	Use with ACS MC4U. 12 ft. standard