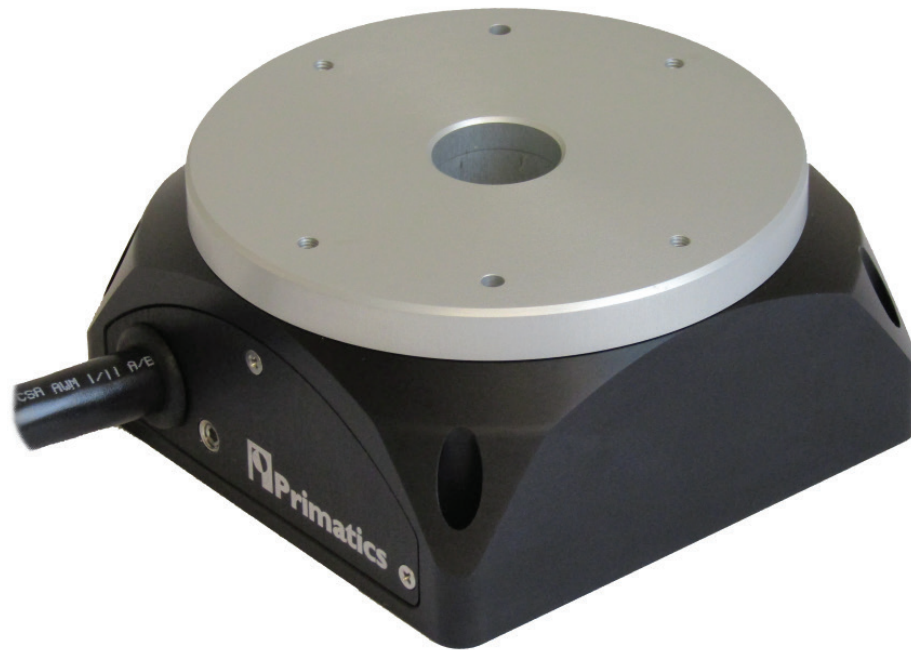


PDR110B

**Features**

- Direct drive continuous rotary motion
- Compact design
- Low maintenance and long life
- Resolution to 0.072 arcsec
- Home sensor
- Single cable connection
- Oversized cross roller bearing
- Error mapped accuracy option
- ISO 4 cleanroom option

Overview

Primatics PDR110B 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 PDR110B ideal for semiconductor wafer inspection, high speed laser machining and precision metrology. The compact design also yields a smaller footprint than comparable worm drives.

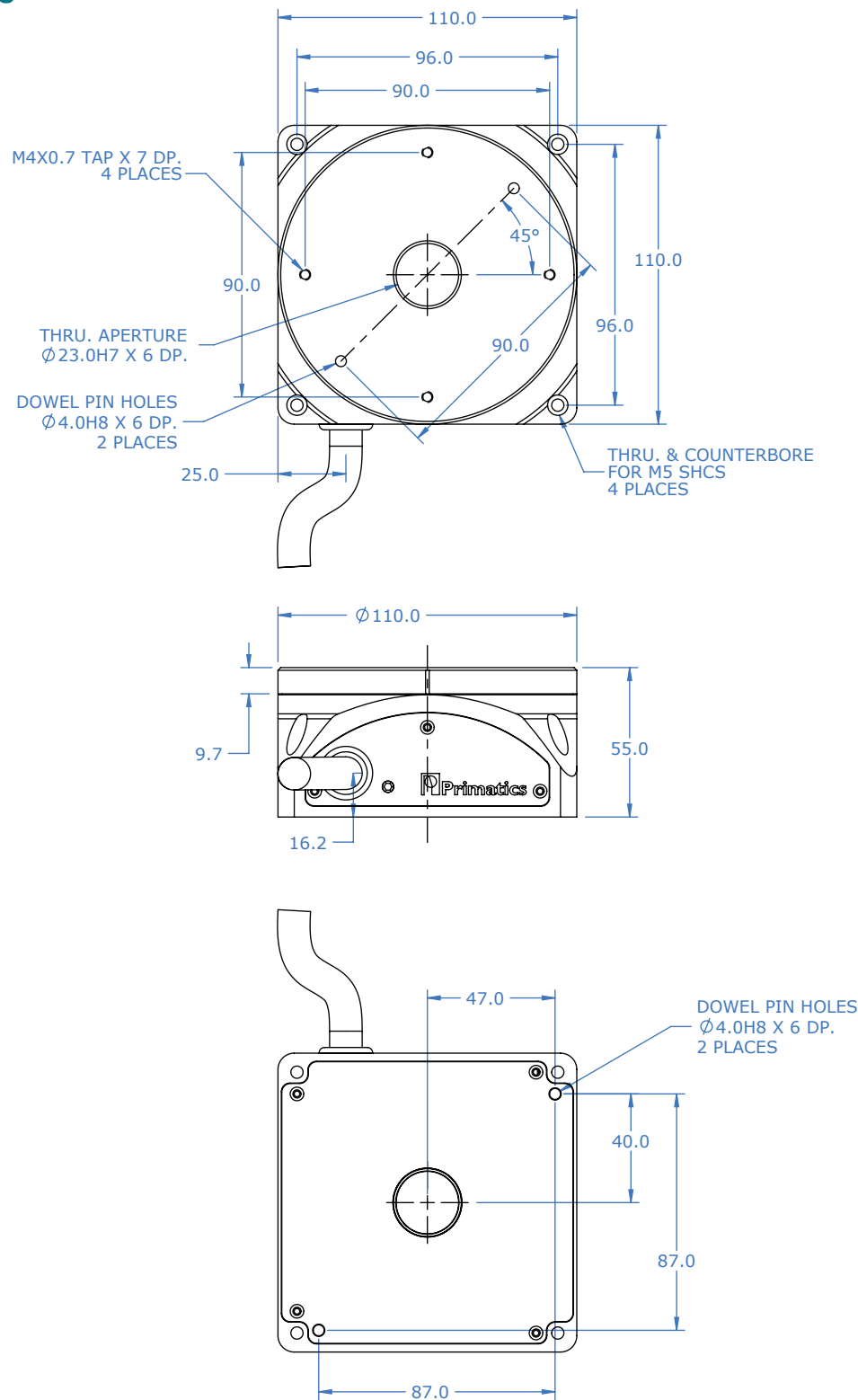
Smart Design

The PDR110B incorporates a high pole count brushless servo motor which provides low velocity ripple even at low speeds. The high resolution glass disk optical encoder mounted directly to the rotating platen yields arcsecond resolution. A single electrical cable affixed to the stage simplifies integration and cable management. The oversized cross roller bearing supports the rotating platform, delivering high load capacity, excellent rigidity and long life. A large center aperture allows a convenient routing of hoses or cables to the attached payload.

Applications

Direct drive technology eliminates the backlash and wear found in mechanical drives such as worm gears. The direct connection of the motor and high resolution encoder provide high servo stiffness and response. These features combine to make the PDR110B an ideal choice for inspection and measuring applications found in many markets. For larger payloads consider the PDR160B or PDR210.

Dimensions



Specifications

Specifications	Notes	PDR110B			
Travel (deg)		360 Continuous			
Resolution (arcsec)		0.072	0.36	3.6	21.6
Accuracy (arcsec)		+/-47		+/-50	+/-72
Error Mapped Accuracy (arcsec)	1		+/- 5	N/A	N/A
Max Speed (rpm)	1,2,5	30	110	350	
Bi-directional Repeatability (arcsec)			+/-1.44	+/-6	+/-35
Axial Runout (μm)		4			
Radial Runout (μm)		6			
Continuous Torque (N-m)	2,3	0.4			
Peak Torque (N-m)	2,4	2.7			
Axial Load Capacity (kg)		10			
Radial Load Capacity (kg)		5			
Stage Mass (kg)		1.9			

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; 5 - 12.5 MHz encoder; All specifications subject to change without notice.

Stage Information	Notes	PDR110B
Tabletop Inertia ($\text{kg}\cdot\text{m}^2$)		6.52E-04
Maximum Acceleration, Unloaded (rad/s^2)	1	3600
Typ. Breakaway Torque (N-m)		0.06
Typ. Running Torque (N-m)		0.045
Max Motor Bus Voltage (VDC)		100
Length of Stage Cable (mm)		450
Bearing Life x 10^6 (Revs)		100
Max Inertial Payload ($\text{kg}\cdot\text{m}^2$)		0.01

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

Motor, Encoder, Home Sensor Data

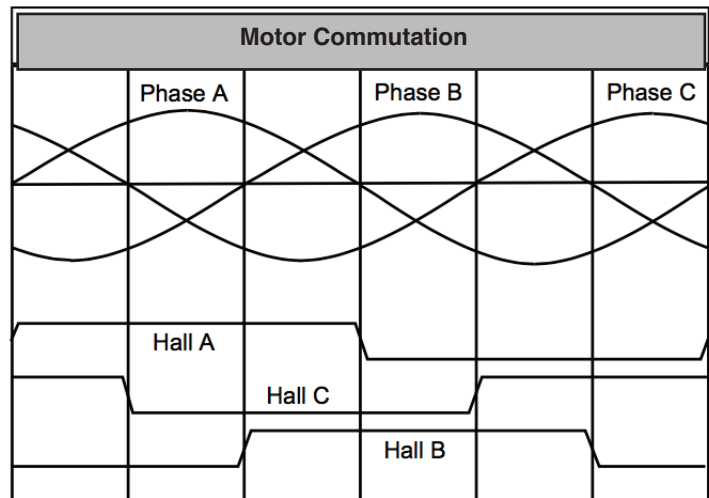
Parameter	Notes	PDR110B
Motor		
Motor Type		Brushless Servo
Continuous Torque (N-m)	1	0.4
Continuous Current (Arms)	1	0.5
Peak Torque (N-m)	2,3	2.7
Peak Current (Arms)	2,3	3.4
Torque Constant (N-m/Arms)		0.81
Back EMF Constant (V/Krpm)		60.5
Winding Resistance (ohms)		20.7
Winding Inductance (mH)		20.0
Motor Constant (N-m/ $\sqrt{\text{Watt}}$)		0.12
Thermal Resistance ($^{\circ}\text{C/W}$)		1.8
Poles		12
Hall Sensor Power		5 to 24VDC, 30mA
Hall Outputs		Open collector, current sinking, 20mA max
Encoder		
Encoder Power		5VDC +/- 5%, 180mA
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°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 CHI 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

Example: **PDR110B H1 L1 E1 P4**

Model Series	
PDR110B: Direct Drive Rotary	
Home Sensor	
H1: Normally Closed	
H2: Normally Open	
Limit Signals¹	
L1: Normally Closed	
L2: Normally Open	
Encoder Resolution²	
E1: 21.6 arcsec; 60,000 cts/rev	
E2: 3.6 arcsec; 360,000 cts/rev	
E3: 0.36 arcsec; 3,600,000 cts/rev	
E4: 0.072 arcsec; 18,000,000 cts/rev	
Environment	
P1: ISO 7	
P4: ISO 4	
Customization (optional)	
-M: Mapping	
-F25: 25 MHz Max Encoder Output Frequency	

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 -DMC40X0-1200	Use with Galil DMC-40x0-I200 with trap servo drives. 12 ft. standard
CABLE-SERVO-STAGE -DMC40X0-1200-SINE	Use with Galil DMC-40x0-I200 with trap 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