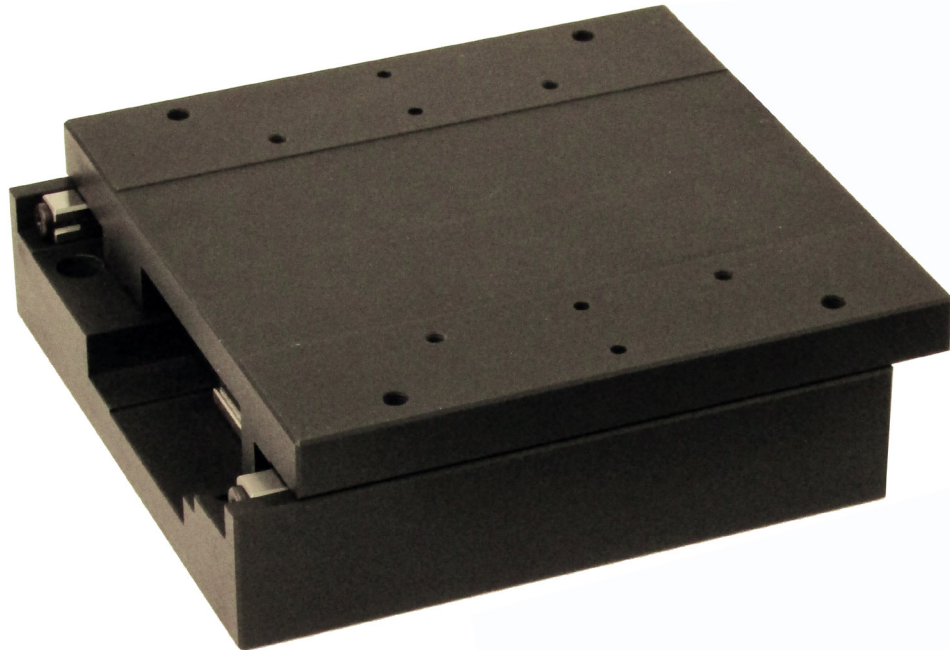


PXL43



Features

- < 2nm incremental motion possible
- Resolutions to 10nm and 1Vpp available
- Small footprint, low profile
- Travel to 150mm
- Linear motor
- Linear encoder
- Limit sensors
- Directly Stackable in XY configurations
- 100% tested for specification compliance

Overview

Primatics PXL43 is a small form factor, high precision linear motion stage. A linear motor and linear encoder provide precise positioning travels of 25, 85, 115, and 150mm. Anti-creep cage cross roller linear bearings result in smooth, flat, and straight motion.

Applications

The PXL43 series is ideal for use in applications for precision assembly and inspection. Its compact size is ideal for space constrained applications. The ironless linear motor and high resolution encoder yields extremely smooth motion for scanning applications. Process corrections are no problem due to the PXL43's incredible ability to make nanometer level steps.

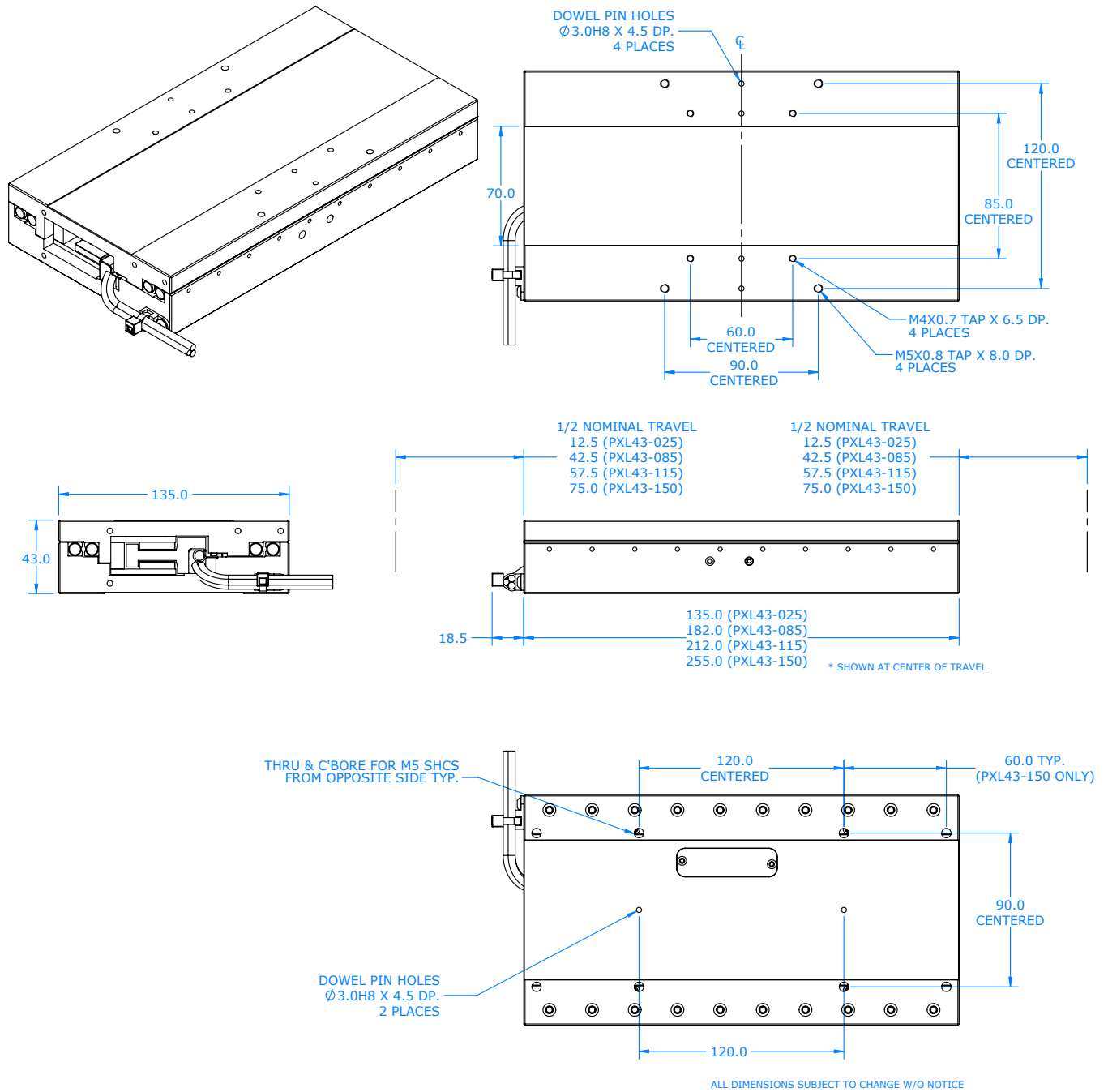
Features

Standard features include a precision linear encoder with index at the center of travel. Multiple resolutions and clock frequencies are available along with a 1Vpp analog version. Forward and reverse limit sensors are also standard. Two PXL43's can be directly stacked for XY configurations with a total height of 86mm and the smaller PXL33 can be stacked on a PXL43.

Options

For use in vertical applications an optional pneumatic counterbalance is available. The counterbalance is adjusted for the payload after installation. Improved accuracy can be achieved with the Mapping option. Data is provided from laser interferometer measurements to generate position correction information along the entire travel of the stage.

Dimensions



Specifications

Specifications	Notes	PXL43-025	PXL43-085	PXL43-115	PXL43-150
Travel (mm)		25	85	115	150
Positional Accuracy Over Total Travel (μm)	1,2,3,4,6				
1.00 μm resolution		+/- 2.7	+/- 3.0	+/- 3.5	+/- 4.0
0.10 μm resolution		+/- 1.0	+/- 2.0	+/- 2.7	+/- 3.6
0.05 μm resolution		+/- 1.0	+/- 2.0	+/- 2.7	+/- 3.6
0.01 μm resolution		+/- 1.0	+/- 2.0	+/- 2.7	+/- 3.6
Analog		+/- 1.0	+/- 2.0	+/- 2.7	+/- 3.6
Mapped Accuracy Over Total Travel (μm)	2,3,4,6				
1.00 μm resolution		N/A	N/A	N/A	N/A
0.10 μm resolution		+/- 0.9	+/- 0.9	+/- 0.9	+/- 0.9
0.05 μm resolution		+/-0.75	+/-0.75	+/-0.75	+/-0.75
0.01 μm resolution		+/-0.45	+/-0.45	+/-0.45	+/-0.45
Analog		+/-0.45	+/-0.45	+/-0.45	+/-0.45
Bi-directional Repeatability (μm)	1,2,3,6				
1.00 μm resolution		+/- 2.0	+/- 2.0	+/- 2.0	+/- 2.0
0.10 μm resolution		+/- 0.3	+/- 0.3	+/- 0.3	+/- 0.3
0.05 μm resolution		+/- 0.25	+/- 0.25	+/- 0.25	+/- 0.25
0.01 μm resolution		+/- 0.10	+/- 0.10	+/- 0.10	+/- 0.10
Analog		+/- 0.10	+/- 0.10	+/- 0.10	+/- 0.10
Straightness of Travel Over Total Travel (μm)	2,3	+/- 1.0	+/- 1.1	+/- 1.5	+/- 1.9
Flatness of Travel Over Total Travel (μm)	2,3	+/- 1.0	+/- 1.1	+/- 1.5	+/- 1.9
Max Speed (mm/sec)	5	450 (90 for 0.01 μm resolution) @ 12MHz 670 (130 for 0.01 μm resolution) @ \geq 20MHz			
Max Acceleration (g's, No Load)	5	3	3	3	3
Direct Loading Capacity (kg)		12			
Carriage Mass (kg)		1.30	1.82	2.13	2.53
Stage Mass (kg)		2.61	3.49	4.04	4.77
Stage Mass with Counterbalance (kg)		-	-	-	-

Notes: 1 - Slope corrected; 2 - Measured 50mm above center of carriage; 3- Stage affixed to flat continuous surface; 4 - Controller and drive dependent; 5 - Maximum obtainable speed is load, resolution, encoder output frequency and move profile dependent.; 6 - Analog version tested at \leq 10nm using ACS controller. All specifications subject to change without notice.

Motor / Encoder / Sensor Data

Parameter	Notes	Value
Motor		
Motor Type		Brushless Servo Linear Motor
Continuous Force (N)	1	18
Continuous Current (Arms)	1	1.1
Peak Force (N)	2	128
Peak Current (Arms)	2	8.0
Motor Constant (N/vW)		5.3
Force Constant (N/Arms)		16.0
Back EMF Constant (V/m/s)		13.5
Winding Resistance (ohms)		9.8
Winding Inductance (mH)		2.3
Thermal Resistance (°C/W)		2.1
Magnetic Pitch (mm)		30
Hall Sensor Power		5 to 24VDC, 50mA
Hall Outputs		Open collector, current sinking, 20mA max
Encoder		
Analog Encoder Power		5VDC +/- 10%, 160mA
Digital Encoder Power		5VDC +/- 10%, 275mA
Encoder Clock Frequency		12 MHz (standard)
		20 MHz (optional)
Output		Square wave differential line driver
Index		Synchronized pulse, duration equal to one resolution bit
Limit sensors		
Limit Power		Powered by Encoder
Output - L1 and L2 options		Current sinking, 20mA max

Notes: 1 - At 25°C maximum temperature rise; 2 - At 10% duty cycle and 1 second maximum; All specifications subject to change without notice.

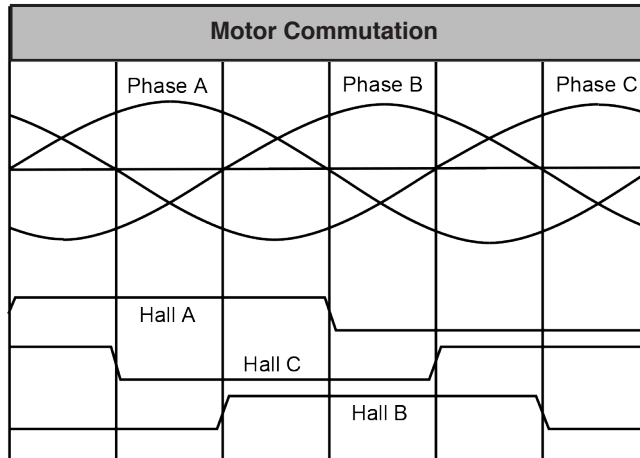
Stage Information

Stage Information	
Typ. Drag Force (N)	0.2
Nominal Cable Length (mm)	PXL43-025: 925
	PXL43-085: 900
	PXL43-115: 890
	PXL43-150: 870
Life at Listed Specifications (km)	2000
Counterbalance Option	
Max Vertical Payload Capacity (kg)	PXL43-025: 5.5
	PXL43-085: 5.0
	PXL43-115: 4.6
Max Air Pressure (psi)	50
Force Factor (N/psi)	1.37



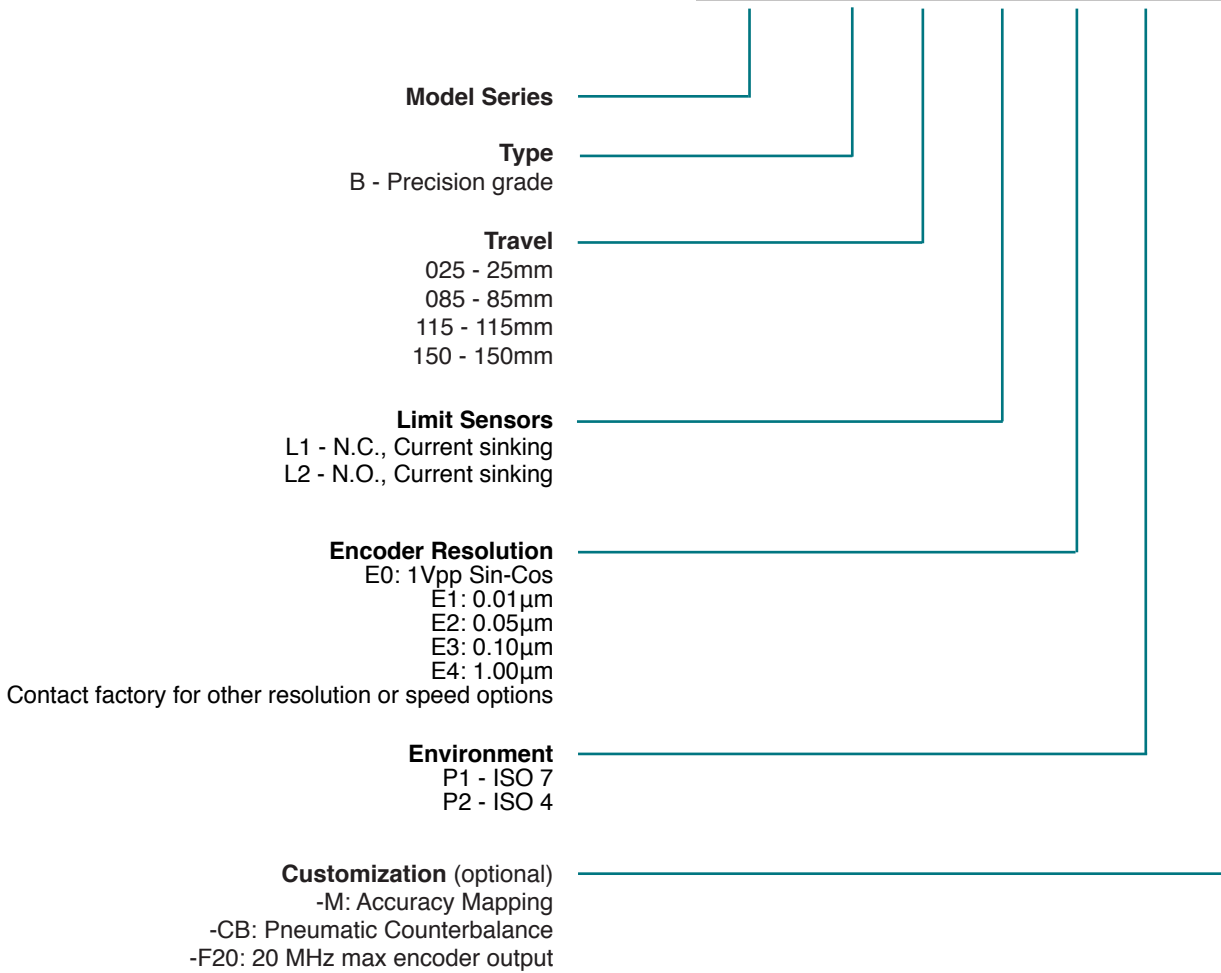
Connector

PXL43		
Motor Connector: DB9W4P		
PIN	Function	
A1	Motor Phase A	
A2	Motor Phase B	
A3	Motor Phase C	
A4	Motor Shield	
1	Hall V+	
2	Hall V-	
3	Hall A	
4	Hall B	
5	Hall C	
Shell	Signal Shield	
Encoder Connector: DB15P		
PIN	Digital Encoder	Analog Encoder
1	N/A	Encoder Cos-
2	Encoder GND	Encoder Sin-
3	N/A	Encoder Index+
4	Encoder I-	Encoder 5V
5	Encoder B-	N/A
6	Encoder A-	N/A
7	Encoder 5V	Forward Limit
8	N/A	Reverse Limit
9	N/A	Encoder Cos+
10	Reverse Limit	Encoder Sin+
11	Forward Limit	Encoder Index-
12	Encoder I+	Encoder GND
13	Encoder B+	N/A
14	Encoder A+	N/A
15	N/A	N/A
Shell	Encoder Shield	Encoder Shield



Model Configuration

Example: **PXL43 B 025 L1 E3 P1 -M**



Not all configurations are valid - consult factory for assistance

Accessories

Model	Description
PXL43 CONNECTOR KIT	Mating connectors for PXL43, solder terminals and backshells