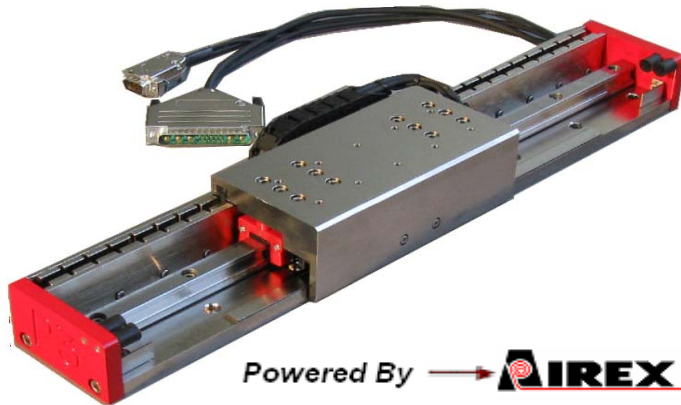


## LINEAR MOTOR POSITIONING STAGE



Powered By  *Linear Motor Technology*

### FEATURES

- **PRECISION** to 100  $\mu$ /meter
- **PERFORMANCE:** Velocity to 5 m/s with Acceleration to 10 g
- **POWER** from 4 Motor Sizes with Peak Force to 894 N
- Travels from 125 mm to 1 meter
- **Ironless, Brushless Linear Motor** with Zero Cogging & Backlash
- **Shorter Settling Times** than Screw and Belt drives
- **Integrated Motor Coil & Carriage Design** for Thermal Efficiency
- **Smooth Running Ball Type Linear Guideway**
- **Trapezoidal Rail** for Rigidity & High Multi-Directional Load Capacity
- **Guideway Sealed & Fitted with Grease Fittings** for Long Service Life
- **Magnetic & Optical Encoder** Options for Ruggedness, Speed & Precision
- **No Maintenance, Non-Contact Linear Motor** with Zero Magnetic Preload
- **Vacuum, Clean Room, Water/Air Cooled** Options
- **Integral Cable Carrier**
- **XY Mounting**

### APPLICATIONS

- Electronic Assembly & Test
- Cut on the Fly
- Paper Converting
- Image Scanning
- Photonics
- Life Sciences
- Packaging
- Semiconductor
- High Speed Automation
- Large Format Printing

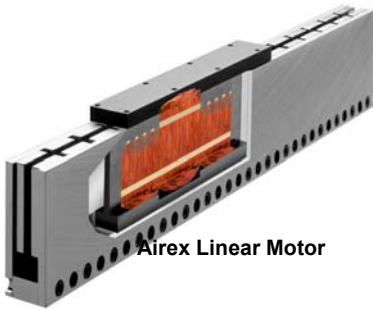
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***Precision – Performance – Power***

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## Integrated Linear Motor Positioning Stage

Schneeberger's **P3 Series™ Positioning Stage** offers the exact combination of precision, performance, and power required by a wide range of automation, packaging, electronic, semiconductor, and life science applications. The **P3** is the result of a joint development project by engineers at Schneeberger Linear Technology and Airex Corporation. Years of application experience have guided the selection of the best components, including ball-type linear guideways from Schneeberger™, linear motors from Airex™, and linear encoders from Renishaw™. The **P3 Series™** combines true state-of-the-art design AND “plug and play” installation to provide a cost-effective alternative to in-house design efforts.



The **P3 Series™** positioning stages are driven by Airex's industry proven **Solution Series™** ironless, brushless linear motors. These direct drive motors offer high stiffness, zero cogging, high acceleration, and high speed. The linear motor driven **P3 Series™** is ideal whether your application requires ultra-smooth motion for imaging or rapid move and settle times with precision positioning for high speed pick-and-place. Stages are available to accommodate a wide range of load and motion requirements. Two stage profiles are offered, each with two motor lengths resulting in a choice of four motors with continuous force ratings from 53 to 283 newtons, load capacities from 15 to 25 kg, and stage travels ranging from 125 mm to 1,000 mm.

The **Solution Series™** ironless linear motors have numerous advantages over iron core motors including lower moving mass, lower inductance, lower losses, well contained magnetic fields, higher stiffness, and higher peak force capacity resulting in higher acceleration and speed, higher bandwidth, reduced settling time, and low velocity ripple even at low speeds. In addition, Schneeberger's **P3 Series™** integrated linear motor design has a unique motor cooling capability. Thermal conductivity is significantly improved by integrating the linear motor coil directly into the moving carriage. This design maximizes useable output power enabling the **P3** to handle the high duty cycle operations required in today's competitive manufacturing environment.

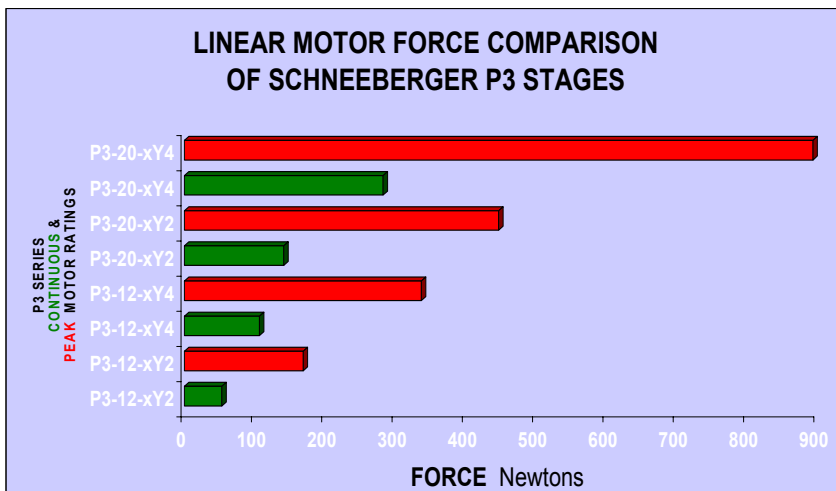
The **P3 Series™** incorporates Schneeberger's MONORAIL BM™ series ball-type linear guideway. Its innovative design uses fewer, yet optimally designed components with a smaller number of transitions in the ball tracks of the bearing blocks to achieve outstanding running characteristics such as smoothness, low friction, and high traveling speeds. The trapezoidal rail cross-section results in high rigidity, high multi-directional load-bearing capacity, and long service life.

Renishaw™ magnetic and optical linear positioning encoders are utilized in the **P3**. The magnetic encoder option offers a cost-effective, yet robust, solution for operation in difficult environments with resolutions from 1 to 5 μ (micron). The optical encoder option offers higher accuracy with resolutions down to 0.1 μ.



Schneeberger  
Linear Guideway

The “plug and play” design of the Schneeberger **P3 Series™** includes ± over travel limit switches, and index or home reference output option from the linear encoder, 3-phase motor inputs and Hall commutation outputs, and an integral cable carrier with power and sensor connectors.

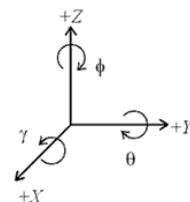
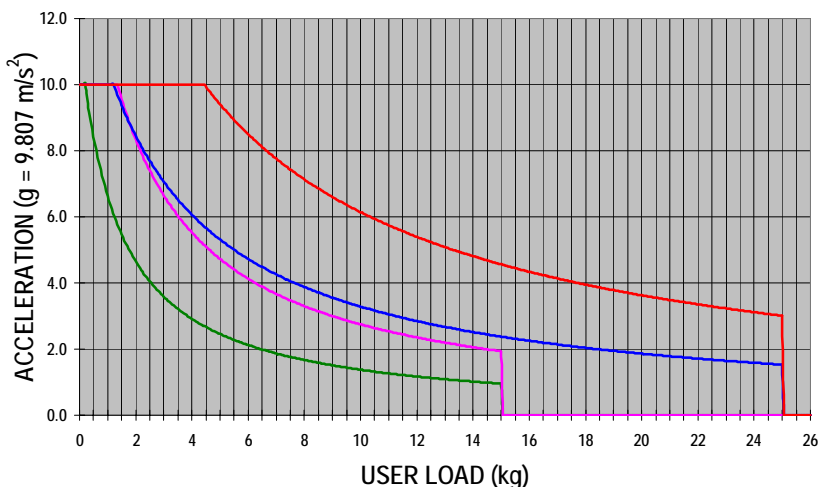


Contact Schneeberger today for more information about the **P3 Series™** - positioning with precision, performance, and power.

## Specifications

↓MOTOR SPECIFICATION↓ →MODEL→	P3-12-PY2	P3-12-PY4	P3-20-DY2	P3-20-DY4
Force Constant N/amp (lbf/amp)	14.5 (3.3)	29.1 (6.5)	18.1 (4.1)	36.3 (8.2)
Phase Resistance (Wye @ 25 °C) Ω	8.53	17.06	1.94	3.88
Phase Resistance (Wye @ 125 °C) Ω	13.23	26.45	2.69	5.38
Inductance @ 1kHz mH	1.9	3.8	0.7	1.3
Continuous Force N (lbf)	53.3 (12)	106.7 (24)	141.3 (31.8)	282.6 (63.5)
Continuous Current amp	3.67	3.67	7.79	7.79
Continuous Power (@ 125 °C) watt	178	357	163	327
Peak Force* N (lbf)	169 (38)	337 (76)	447 (100)	894 (201)
Peak Current* amp	11.61	11.61	24.64	24.64
Peak Power (@ 125 °C, 10% Duty Cycle) watt	1783	3567	1633	3265
Back EMF Constant V/m/s (V/in/s)	14.5 (0.4)	29.1 (0.7)	18.1 (0.5)	36.3 (0.9)
Electrical Time Constant (@ 25 °C) ms	0.22	0.22	0.34	0.34
Maximum Operating Temperature °C	125	125	125	125
Maximum Temperature Rise °C	105	105	105	105
↓STAGE SPECIFICATION↓ →MODEL→	P3-12-PY2	P3-12-PY4	P3-20-DY2	P3-20-DY4
Velocity - Maximum m/s	5	5	5	5
Acceleration - Maximum g	10	10	10	10
Travel - Minimum to Maximum mm	125 - 1000	125 - 1000	125 - 1000	125 - 1000
Dimensions - Envelope h x w mm	54.4 x 81.0	54.4 x 81.0	91.3 x 117.5	91.3 x 117.5
Linear Accuracy μm/m	100	100	100	100
Straightness μm/m	100	100	100	100
Flatness μ/m	15	15	15	15
Roll arc-sec	30	30	30	30
Pitch arc-sec	15	15	15	15
Yaw arc-sec	15	15	15	15
Load - Top Maximum Driven kg	15	15	25	25
Load - Top Maximum Stationary Dynamic N	17,100	17,100	40,090	40,090
Moment - Maximum Static Roll Nm	166	166	578	578
Moment - Maximum Dynamic Roll Nm	362	362	1262	1262
Moment - Maximum Static Pitch/Yaw Nm	842	1725	1724	4062
Moment - Maximum Dynamic Pitch/Yaw Nm	1841	3784	3762	8960
↓ENCODER SPECIFICATION↓ →ENCODER→	Magnetic		Optical	
Resolution Options μm	1	5	0.1	0.5
Linear Accuracy μm	40		20	
Maximum Velocity m/s	4.16	5	0.7	3.0

P3 ACCELERATION VS. LOAD



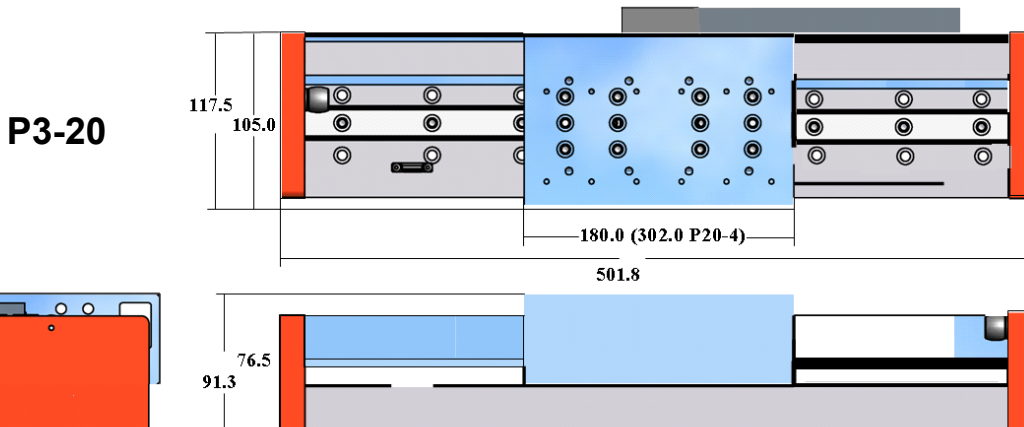
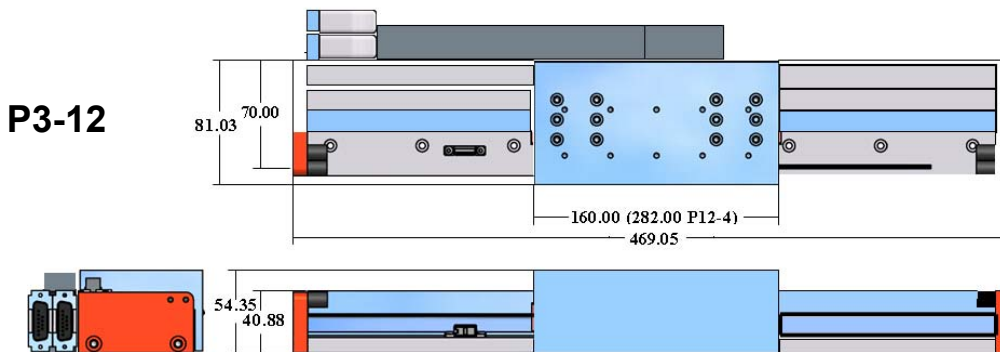
Angular or Abbé Errors

- P3-12-2
- P3-12-4
- P3-20-2
- P3-20-4

For a linear stage, a rotational error about the axis of travel is defined as "roll". In this diagram, if X represents the axis of travel, then  $\gamma$  represents roll. If Y is parallel to the top surface of the stage, then  $\theta$  represents "pitch" and  $\phi$  represents "yaw".

## Ordering Information

P3	-	ss	-	ccc	-	tttt	-	eee	-	xxxx
		<b>Series</b>		<b>Coil/Carriage</b>		<b>Travel mm</b>		<b>Encoder</b>		<b>Reserved</b>
		12	>	PY2		0125, 0250		M50 5 μ Magnetic		
		12	>	PY4		0375, 0500		M10 1 μ Magnetic		
		20	>	DY2		0625, 0750		E05 0.5 μ Optical		
		20	>	DY4		0875, 1000		E01 0.1 μ Optical		



For Additional Information Contact Your Authorized Schneeberger Sales Office:

For over 60 years, the name SCHNEEBERGER has been synonymous with modern linear motion technology used by OEM clients renowned as industry leaders in the machine tool, semi-conductor, solar, life science, and medical technology markets. Customers worldwide trust Schneeberger with their most demanding requirements for linear bearings, guideways, and high performance, turnkey linear motion systems, all designed and produced in our ISO 9001 certified facilities. We are proud to offer the P3 Precision Linear Motor Stage as a natural extension of our high performance linear technology products, supported by a competent sales and application staff from our Bedford, MA facility.

«Essentials for the Best!»

**SCHNEEBERGER**  
LINEAR TECHNOLOGY

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