VPL Series

Vertical Pick and Place Linear Motor Module

- ■ High speed high acceleration

- ■ Fast response and quick settling time

- ■ Compact

- ■ No backlash

VPL32 / VPL48 / VPL51 Series

Features

- Direct drive and direct measurement
- Fast response and quick settling time
- Zero cogging ironless linear motor
- No backlash
- Choice of encoder resolutions of up to 0.1μm
- Integrated reference mark and two limit sensors
- High precision corrosion resistant linear guide with 2 high precision runner blocks
- Compact, light and easily integrated

VPL	Unit	VPL 32		VPL 48		VPL 51	
		up to 0.5μm	up to 0.1μm	up to 0.5μm	up to 0.1μm	up to 0.5μm	up to 0.1μm
	Motor	AUM2-SS2-K		AUM3-SS2-J		AUM4-SS2-J	
Electrical Parameters							
Continuous Force Coil @100ºC	N	22.0		72.0		112.0	
	lbf	4.9		16.2		25.2	
Peak Force	N	88.0		288.0		624.0	
	lbf	19.8		64.7		140.3	
Motor Constant	N/SqRt (W)	4.3		10.2		15.8	
	lbf/SqRt (W)	1.0		2.3		3.6	
Continuous Power	W	26.0		49.4		50.1	
Peak Power	W	416.0		790.8		1554.8	
Electrical Cycle	mm	30.0		60.0		60.0	
	in	1.2		2.4		2.4	
Max Bus Voltage	V	330.0		330.0		330.0	
Max Coil Temperature	ºC	125.0		125.0		125.0	
Continuous current	A (rms)	2.0		2.3		2.3	
Peak Current, I_{peak}	A (rms)	8.0		9.2		13.0	
Force Constant	N/A	11.0		31.4		48.0	
	lbf/A	2.5		7.1		10.8	
Back EMF Constant, V_{emf}	V/m/s	12.7		36.3		55.4	
	V/in/s	500.0		1429.1		2181.1	
Inductance	mH	1.5		6.3		7.0	
Terminal Resistance @ 25ºC	Ohms	6.5		9.4		9.2	
Electrical Time Constant	ms	0.2		0.7		0.8	
Mechanical Parameters							
Moving Mass	kg	0.33	0.33	1.05	1.05	1.31	1.31
	lb	0.73	0.73	2.31	2.31	2.89	2.89
Total Mass	kg	1.24	1.22	3.45	3.43	5.21	5.19
	lb	2.73	2.68	7.60	7.56	11.48	11.44
Recommended maximum load[1]	kg	0.50	0.50	2.00	2.00	5.00	5.00
	lb	1.10	1.10	4.41	4.41	11.02	11.02
Stroke	mm	50.00		50.00		50.00	

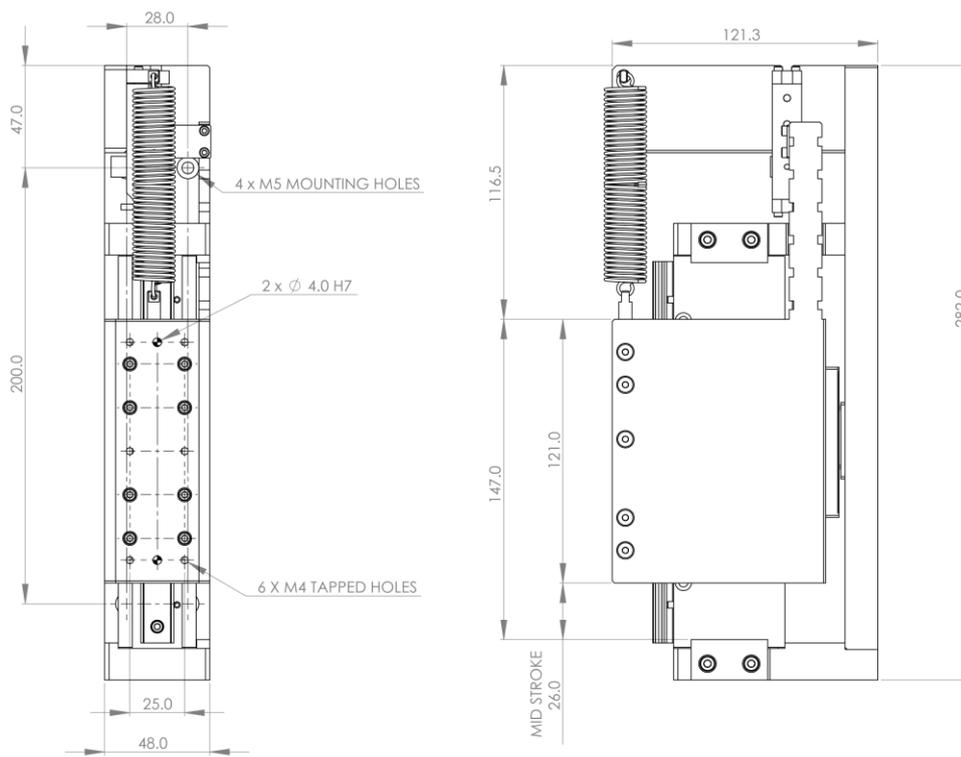*Note: Please contact us for customized stroke, and different loads.*

1: At this maximum loading, the load will be retracted up to the top when the power is shut down.

   Optional: equilibrium position is at the middle with a different counter-balance spring.
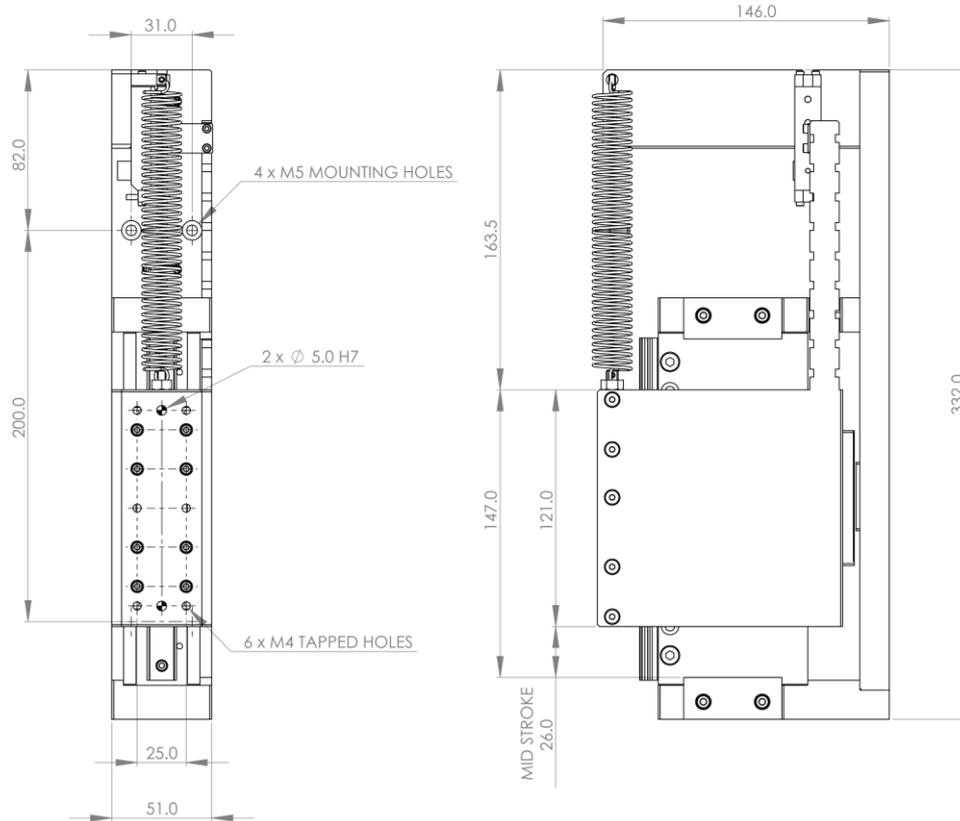
Dimensional Drawing

VPL32

VPL48

Akribis
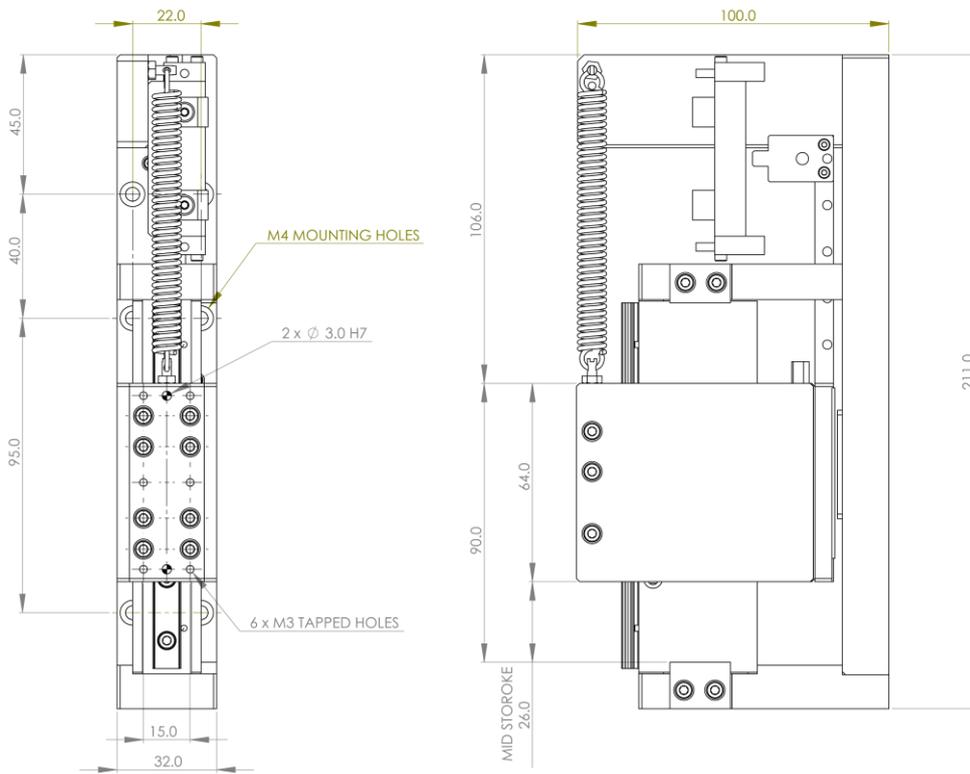
VPL51

Performance Parameters

| Velocity[2]	m/s	1.5	0.7	1.5	0.7	1.5	0.7
Straightness	µm	±3µm/25mm					
Flatness	µm	±3µm/25mm					
Bidirectional Repeatability	µm	±1.5µm	±1µm	±1.5µm	±1µm	±1.5µm	±1µm
Linearity without mapping	µm	±3µm/25mm					
Linearity with mapping	µm	±0.5µm/25mm					

Note: The straightness, bidirectional repeatability and linearity are qualified according to ISO 230-2:1997.
2: Based on 20MHz counter frequency.

Bearing Parameters[2]

Maximum static load capacity	N	420.0	1140.0	1140.0
Maximum static row moment, M_{ROW}	Nm	69.3	342.0	342.0
Maximum static pitch moment, M_{PITCH}	Nm	69.3	342.0	342.0
Maximum static yaw moment, M_{YAW}	Nm	9.6	40.4	40.4
Recommended maximum load[3]	kg	0.5	2.0	5.0
Recommended row moment	Nm	6.9	34.2	34.2
Recommended pitch moment	Nm	6.9	34.2	34.2
Recommended yaw moment	Nm	1.0	4.0	4.0

2: The bearings come with a light preload C1, with radial clearance of -12 to -4µm.

YAW MOMENT

ROW MOMENT

PITCH MOMENT
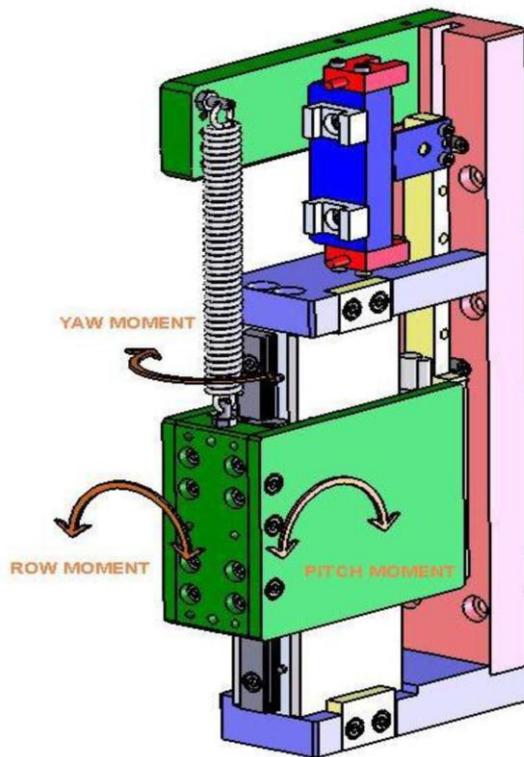
MOTOR

COLOUR	Signal
Grey/Yellow	M1
Blue/Orange	M2
Green/Red	M3
Brown	Temp/Device
Brown/Black	Temp/Device
Balck	Ground

HALL

PIN	Signal
1	H_a
2	H_b
3	H_c
4	+5 Volt
5	Ground
6	
7	
8	
9	
Case	Shield

ENCODER

	Resolution (µm)
PIN	0.5 & 0.1
1	X
2	Ground
3	E-
4	Z-
5	B-
6	A-
7	+5 Volt
8	-5 Volt
9	Ground
10	Q
11	P
12	Z+
13	B+
14	A+
15	Inner Shield
Case	Outer Shield

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Part Numbering

* Common Definition：

* L0100 = 100g Payload

* L0200 = 200g Payload

* L0500 = 500g Payload

* L1000 = 1000g Payload

* E00 = Counter-balance Device activitated and Resting Position at 0mm

* E15 = Counter-balance Device activitated and Resting Position at 15mm

* E20 = Counter-balance Device activitated and Resting Position at 20mm

* E25 = Counter-balance Device activitated and Resting Position at 25mm

* E50 = Counter-balance Device activitated and Resting Position at 50mm

Vertical Application

VPL 32

Model	Coil Type Options	Effective Stroke (mm)	Encoder Options	Encoder Resolution (um) Options	Customer Payload *	Position At Rest *
VPL32	AUM2-S-S2-K-3.0	50	M1	1500-1.0 / 1500-0.5 / 2000-0.1 / 3000-0.1	L0000 to L0500	E00 to E50
	AUM2-P-S2-K-3.0					

Module

Example: VPL32-AUM2-S-S2-K-3.0-50-M1-1500-1.0-L0200-E15

VPL 48

Model	Coil Type Options	Effective Stroke (mm)	Encoder Options	Encoder Resolution (um) Options	Customer Payload *	Position At Rest *
VPL48	AUM3-S-S2-J-3.0	50	M1	1500-1.0 / 1500-0.5 / 2000-0.1 / 3000-0.1	L0000 to L1000	E00 to E50
	AUM3-P-S2-J-3.0					

Module

Example: VPL48-AUM3-S-S2-K-3.0-50-M1-1500-1.0-L0500-E20

VPL 51

Model	Coil Type Options	Effective Stroke (mm)	Encoder Options	Encoder Resolution (um) Options	Customer Payload *	Position At Rest *
VPL51	AUM4-S-S2-J-3.0	50	M1	1500-1.0 / 1500-0.5 / 2000-0.1 / 3000-0.1	L0000 to L2000	E00 to E50
	AUM4-P-S2-J-3.0					

Module

Example: VPL51-AUM4-P-S2-K-3.0-50-M1-1500-1.0-L0800-E50

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