High-Load Linear Stage

High Performance • Linear Motor • Cost Effective • Fast Delivery

V-817

- Low profile (63 mm), 166 mm width, long travel ranges (to 813 mm)
- Highly dynamic, maintenance-free linear motor and high-precision incremental linear encoder
- Robust industrial design for a long lifetime
- Permanent load capacity to 600 N
- Fast integration thanks to reference edge, easily XY stackable
- Creation and delivery of test protocols as a standard

Industrial design for high performance and high load

With the V-817, PI has a linear stage in its portfolio for industrial solutions that has a high load capacity and high dynamics. Its design is consistently geared to demanding industrial conditions and it is characterized by high stiffness and the use of high-quality components: Recirculating ball bearing guides, 3-phase linear motor, incremental linear encoder. The high resolution of the encoders allows an excellent tracking performance, small tracking errors, and short settling times. Industry-compatible connectors offer a fast and secure connectivity. The optional motion platform offers versatile assembly options with a triple M6 hole pattern. A particularly low overall height is achieved without this platform, which offers advantages especially in XY combinations.

Linear motor with direct drive

3-phase magnetic direct drives do not use mechanical components in the drivetrain, they transmit the drive force to the motion platform directly and without friction. The drives reach high velocities and accelerations. Ironless motors are particularly suitable for positioning tasks with the highest demands on precision because there is no undesirable interaction with the permanent magnets. This allows smooth running even at the lowest velocities and at the same time, there is no vibration at high velocities. Nonlinearity in control behavior is avoided and any position can be controlled easily. The drive force can be set freely.

Fully integrated multi-axis systems

The V-817 linear stages are perfectly suited for being integrated into complex systems. Therefore, PI offers fully integrated XY or XYZ multi-axis systems with the suitable controller as well as accessories such as a granite base, machine frame, mounting adapter, cable set, and appropriate software support. For requests regarding multi-axis systems, contact our sales department.

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Application fields

Electronics assembly: Sensor and camera assembly. Noncontact inspection, X-ray inspection, and AOI (automated optical inspection). Sensor and ultrasonic tests. Semiconductor manufacturing: Wafer processing and inspection. Laser machining: Laser welding. Highly dynamic applications in precision automation, smooth scan motion, minimum tracking errors, and short settling times.

Specifications

Motion	V-817.09	V-817.17	V-817.25	V-817.33	Unit	Tole-rance
Active axes	X	X	X	X		
Travel range	204	407	610	813	mm	
Velocity, unloaded	3000	3000	3000	3000	mm/s	Max.
Bidirectional repeatability	±1	±1	±1.5	±1.5	µm	Max.
Positioning accuracy, uncalibrated	±12	±18	±22	±27	µm	Max.
Positioning accuracy, calibrated	±2.5	±3	±4	±6	µm	Max.
Pitch / yaw	±50	±60	±90	±100	µrad	Max.
Straightness / flatness	±6	±10	±14	±18	µm	Max.

Encoder options	V-817.xx6211Ex	Unit	Tole-rance
Integrated sensor	Incremental linear encoder		
Sensor signal	Sin/cos, 1 V peak-peak, 20 µm signal period		
Design resolution	0.3	nm	
Minimum incremental motion	10	nm	
Limit switches	Hall effect, N/C contact, 5 V, NPN		

Mechanical properties	V-817	Unit	Tole-rance
Guide type	Recirculating ball bearing guide		
Load capacity in Z	600	N	Max.

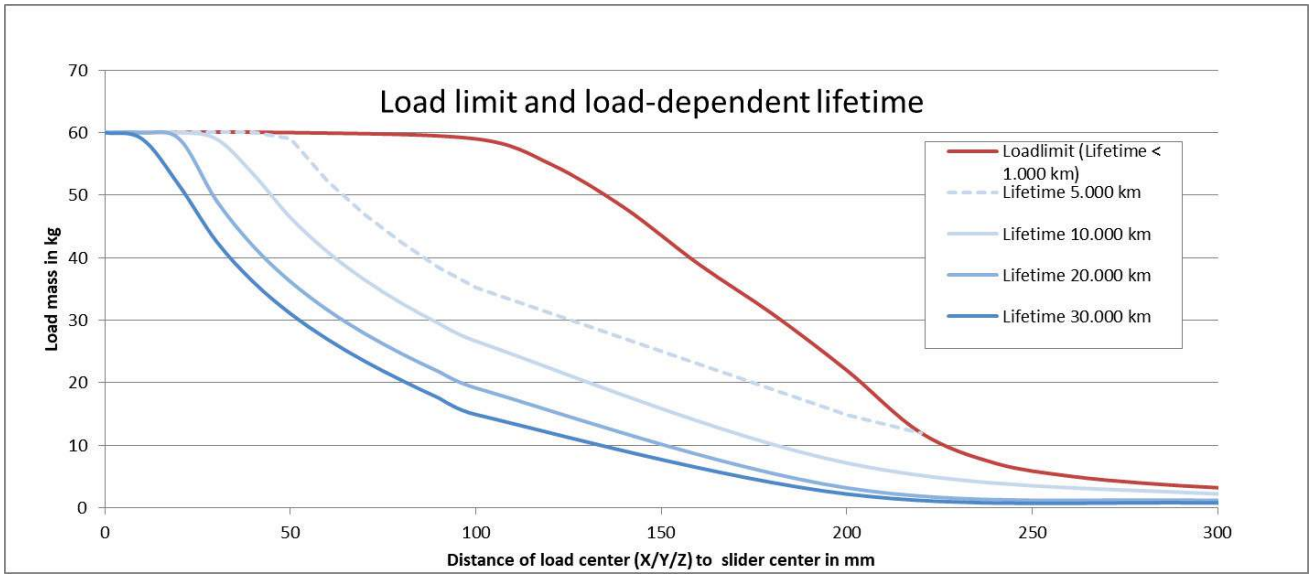
Drive properties	V-817	Unit	Tole-rance
Drive type	Ironless 3-phase linear motor		
Intermediate circuit voltage, RMS	325	V DC	Max.
Peak force	300	N	
Nominal force*	70	N	
Peak current, RMS	15	A	
Nominal current, RMS*	3.54	A	
Force constant, RMS	19.9	N/A	
Motor constant	8.4	N/√W	
Electrical time constant	0.35	ms	
Resistance phase-phase	3.6	Ω	
Inductance phase-phase	1.2	mH	

Drive properties	V-817	Unit	Tole-rance
Back EMF phase-phase	16	Vs/m	Max.
Pole pitch N-N	30	mm	

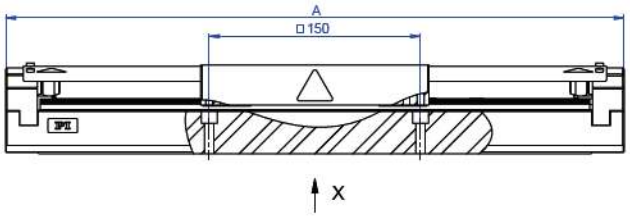
Miscellaneous	V-817.xx6211E0	Unit	Tole-rance
Material	Aluminum, black anodized Stainless steel		
Operating temperature range	5 to 40	°C	
Humidity	20 – 80 % rel., not condensing		
Overall mass	V-817.096211E0: 11.2 V-817.176211E0: 14.8 V-817.256211E0: 18.4 V-817.336211E0: 21.1	kg	±5 %
Moved mass	1.4 With platform V-817.TT1: 2.2	kg	±5 %
Lifetime/endurance**	30000	km	
Connector	M15 (motor) M15 (linear encoder)		
Recommended controllers***	Fully integrated plug & play solution: G-901.R519 Flexible integration with compact modules: ACS SPiiPlusEC and UDMpm Also compatible with other third-party controllers and servo drivers.		

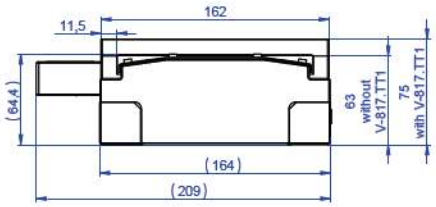
* At room temperature
** Up to 60 kg centrally mounted load. For other load capabilities, see the "Load limit and load-dependent lifetime" diagram.
*** Designed and tested with ACS high-performance controllers
Technical data is specified on a granite table with a flatness of ±2µm.
The specifications were determined at 20 °C (± 3 °C).
Connecting cables are not in the scope of delivery and must be ordered separately.
Ask about customized versions.

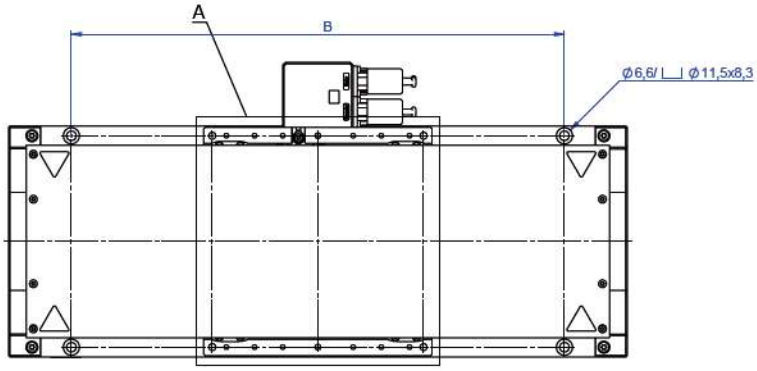
Drawings / Images

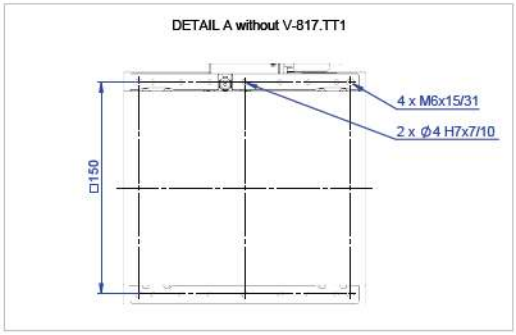


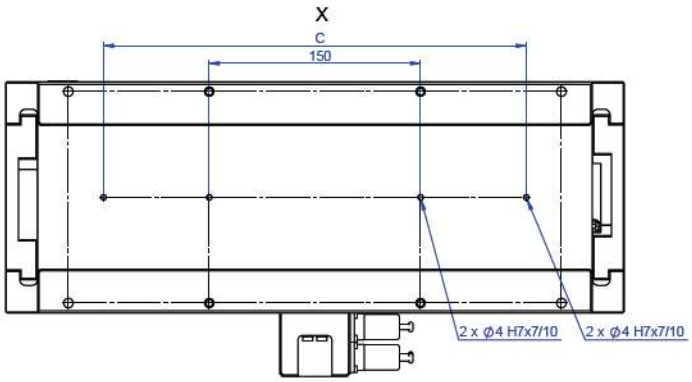
Lifetime and load limit of the V-817.xx6211E0 depending on the load mass and the distance of the center of gravity of the load from the center of the slider.

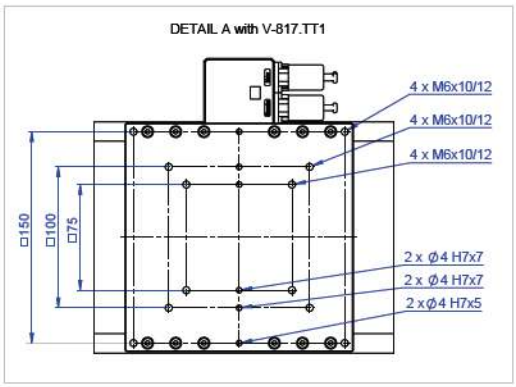






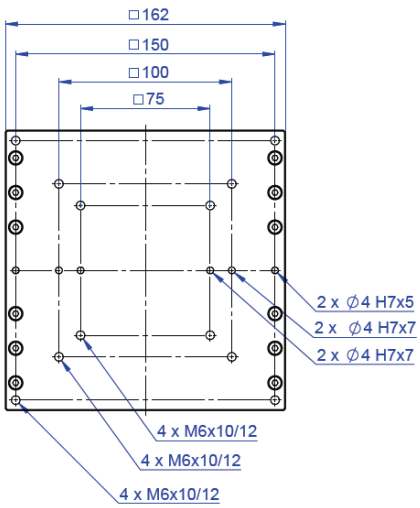


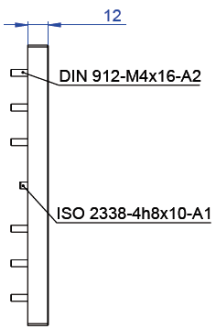


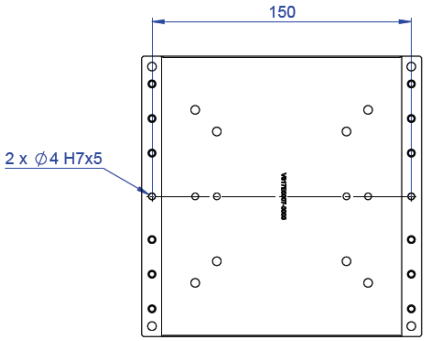


BASIS MODELL	TRAVEL NOMINAL	LIMITSWITCH to LIMITSWITCH LSW	HARDSTOP to HARDSTOP HDS	A	B	C
V-817.096211E0	204 (8")	204 - 207	213	439	150, 350	300
V-817.176211E0	407 (16")	407 - 410	418	842	150, 350, 550	550
V-817.256211E0	610 (24")	610 - 613	618	845	150, 350, 550, 750	750
V-817.336211E0	813 (32")	813 - 816	823	1048	150, 350, 550, 750, 950	750

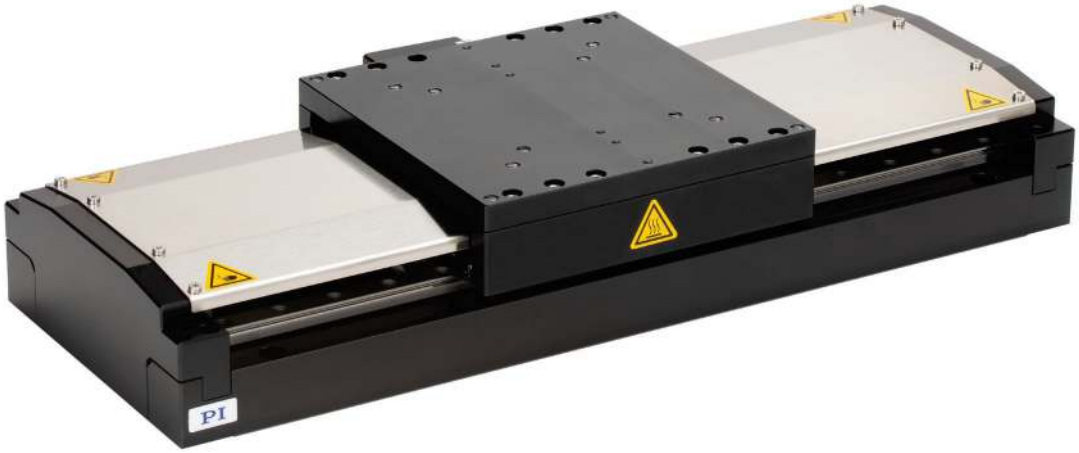
V-817, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.







Optional accessory: V-817.TT1 motion platform, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.



V-817 with mounted V-817.TT1 motion platform

V-817 XY combination with optional V-817.TT1 motion platform on top positioner

Assembly of a V-817 XY combination with V-817.TT1 motion platform on top positioner

Ordering Information

V-817.096211E0
High-load linear stage, 204 mm travel range, 166 mm width, 600 N load capacity, incremental linear encoder with sin/cos signal transmission, 20 µm signal period, ironless 3-phase linear motor, to 325 V

V-817.176211E0
High-load linear stage, 407 mm travel range, 166 mm width, 600 N load capacity, incremental linear encoder with sin/cos signal transmission, 20 µm signal period, ironless 3-phase linear motor, to 325 V

V-817.256211E0
High-load linear stage, 610 mm travel range, 166 mm width, 600 N load capacity, incremental linear encoder with sin/cos signal transmission, 20 µm signal period, ironless 3-phase linear motor, to 325 V

V-817.336211E0
High-load linear stage, 813 mm travel range, 166 mm width, 600 N load capacity, incremental linear encoder with sin/cos signal transmission, 20 µm signal period, ironless 3-phase linear motor, to 325 V

Accessories (please order separately)

V-817.TT1
Motion platform for V-817 high-load linear stage