ILS Series

High-Performance Mid-Range Travel Linear Stages

The ILS Series is a robust line of sub-micron resolution linear stages, constructed with a light, stiff aluminum body and reliable components capable of high-duty cycle applications.

Backlash-free Ballscrew

ILS stages include a preloaded, backlash-free ball screw, which provides smooth, rapid motion with short step and settling time. The screw profile is designed to reduce heating effects, extending the life of the stage.

Recirculating Ball Bearing Slides

The recirculating ball bearing slides provide excellent payload capabilities and longer life with accurate linear trajectory. It mitigates the issue of ball cage migration, which is typically found on linear ball bearings or crossed roller bearings.

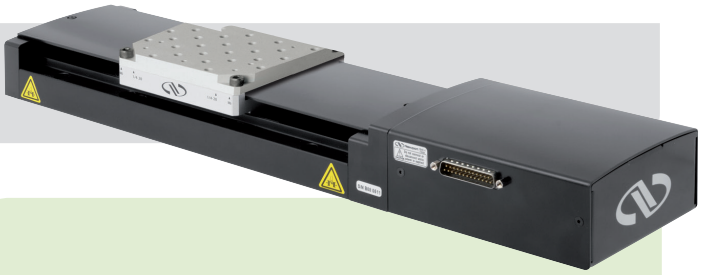
FEM-optimized Aluminum Body

The optimized aluminum body allows for extreme stiffness and minimizes bi-metal bending without compromising weight. The rigid body reduces deflection under load.

Integrated Encoder

A 4000 pts/rev. encoder is mounted directly on the screw in order to prevent screw/motor coupling errors consequently boosting stage motion accuracy. The HA version features an integrated linear scale with 0.3 µm MIM.

Key Features



- Stiff, FEM optimized extruded aluminum body prevents thermal bending effects
- Preloaded, backlash-free ballscrew drive allows rapid movements with short step and settling time
- Precision recirculating ball bearing slides provide accurate linear motion without ball cage migration
- 50–250 mm of travel
- Ideal for extended use in light industrial applications
- Plug and Play - ESP compatible

Need Higher Accuracy?

For critical positioning applications, Newport offers micropositioning calibration services. We will create, implement and verify an electronic compensation process to improve the absolute position accuracy of select ILS-HA Series stages when commanded by our XPS advanced motion control system. Compensation is performed at 20.0 °C, ±0.2 °C, for linear and non-linear errors, ensuring accuracy of up to 1 µm +1 µm/100 mm over center 80% of travel. A certificate of calibration per Newport Metrology Procedure A167 and measured error maps are provided.

Design Details	
Base Material	Extruded Aluminum
Bearings	Double-row recirculating ball bearinsg
Drive Mechanism	Backlash-free ball screw
Drive Screw Pitch (mm)	2
Feedback	ILS-CC, ILS-CCL, ILS-BPP: Screw mounted rotary encoder, 4,000 cts/rev, index pulse ILS-HA: Linear steel scale, 20 µm signal period, 0.1 µm resolution
Limit Switches	Optical
Origin	Optical, at center of travel, including mechanical zero signal
Cable	3 m long cable include

Metrology Report

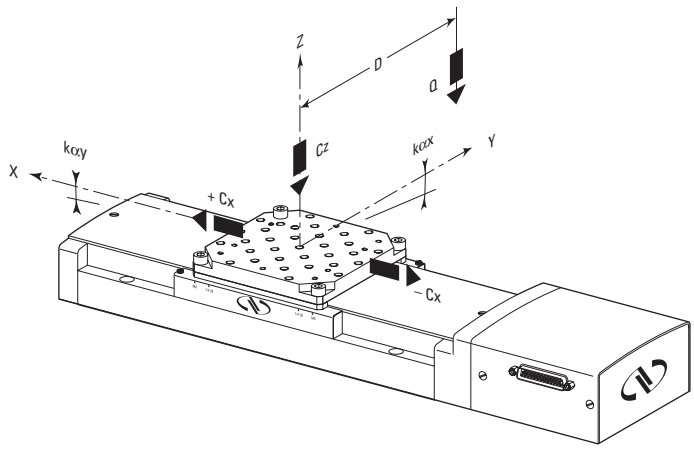
Included at No Additional Cost

Newport guarantees specification values which are measured and recorded following ASME B5.57 and ISO 230-2 standards. The typical performance values are two times better than the guaranteed specifications.

Other Features

A rigid top cover prevents damage to the drive train and protects it from dust and debris. ILS Series stages also feature an origin located at the center of travel for repeatable initialization, limit switches to prevent over travel, and elastomeric end-of-run dampers for smooth emergency braking.

Load Characteristics and Stiffness



Cz,	Normal centered load capacity	250 N
-Cx, +Cx,	Axial load capacity	<40 N
Kαx,	Compliance in roll	15 µrad/Nm
Kαy,	Compliance in pitch	10 µrad/Nm
Kαz,	Compliance in yaw	10 µrad/Nm
Q,	Off-center load (N)	Q ≤Cz ÷ (1 + D/60)
	Where D = Cantilever distance (mm)	

Specifications

	ILS-BPP, ILS-CC, ILS-CCL (1)	ILS-HA
Travel Range (mm)	50, 100, 150, 200 and 250	
Minimum Incremental Motion (µm)	1.0	0.3
Uni-directional Repeatability, Typical (Guaranteed) (µm)	1.0	0.4
Bi-directional Repeatability, Typical (Guaranteed) [2] (µm)		
ILS50	±0.40 (±1.0)	±0.10 (±0.35)
ILS100	±0.40 (±1.0)	±0.10 (±0.35)
ILS150	±0.45 (±1.0)	±0.15 (±0.35)
ILS200	±0.45 (±1.0)	±0.15 (±0.35)
ILS250	±0.60 (±1.0)	±0.15 (±0.35)
Accuracy CC, BPP & CCL, Typical (Guaranteed) [2] (µm)		
ILS50	±0.6 (±1.5)	±0.3 (±1.25)
ILS100	±0.8 (±2.0)	±0.6 (±1.5)
ILS150	±1.5 (±2.5)	±1.2 (±2.0)
ILS200	±1.2 (±3.7)	±0.8 (±3.0)
ILS250	±1.7 (±5.0)	±1.5 (±3.75)
Maximum Speed (mm/s)	ILS-BPP, ILS-CCL: 50 ILS-CC: 100	100
Pitch, Typical (Guaranteed) [2][3] (µrad)		
ILS50	±15 (±25)	±17 (±25)
ILS100	±20 (±50)	±25 (±50)
ILS150	±37 (±75)	±50 (±75)
ILS200	±37 (±100)	±35 (±100)
ILS250	±42 (±125)	±45 (±125)
Yaw, Typical (Guaranteed) [2][3] (µrad)		
ILS50	±12 (±25)	±7 (±25)
ILS100	±17 (±37)	±17 (±37)
ILS150	±20 (±65)	±25 (±65)
ILS200	±25 (±80)	±25 (±80)
ILS250	±25 (±95)	±30 (±95)
MTBF (h) 20,000	20,000	

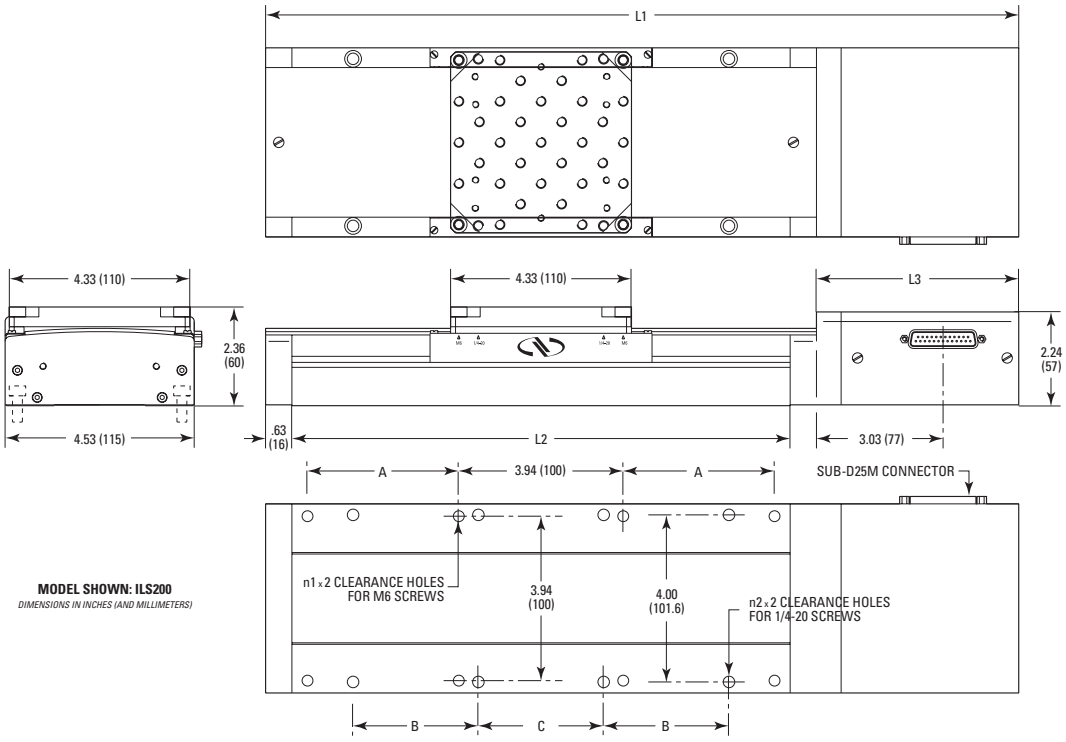
1) ILS-CCL used with the SMC100CC controller only.

2) Shown are peak to peak, guaranteed specifications or ±half the value as sometimes shown. For the definition of typical specifications which are about 2X better than the guaranteed values, visit www.newport.com for the Motion Control Metrology Primer.

3) To obtain arcsec units, divide µrad value by 4.8.

Dimensional Drawing

(M-)ILS

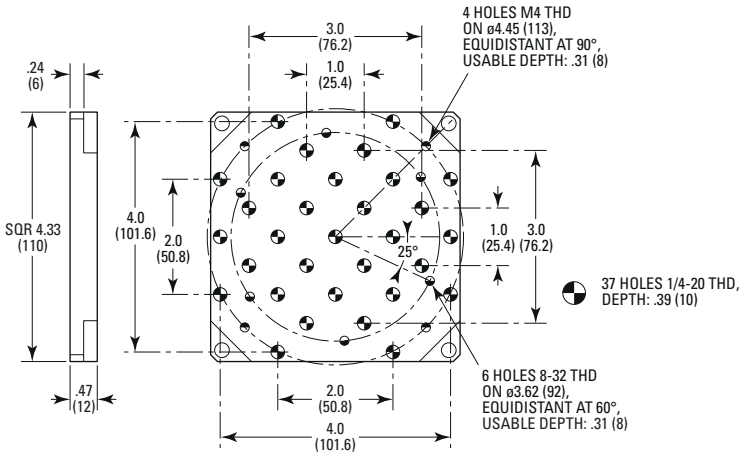


MODEL SHOWN: ILS200
DIMENSIONS IN INCHES (AND MILLIMETERS)

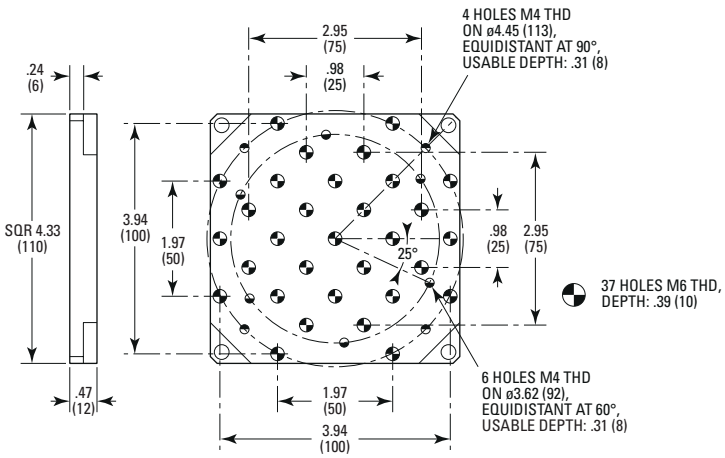
							VERSIONS CC, CCL AND PP		VERSION CCHA	
MODEL (METRIC)	A	n1	B	C	n2	L2	L1	L3	L1	L3
(M-)ILS50	–	2	–	5.0 (127)	2	8 (203)	14 (358)	4.8 (123)	15.5 (394)	6.3 (159)
(M-)ILS100	–	2	–	3.0 (76.2)	2	10 (253)	16 (408)	4.8 (123)	17.5 (444)	6.3 (159)
(M-)ILS150	–	2	3.0 (76.2)	3.0 (76.2)	4	12 (303)	18 (458)	4.8 (123)	19.4 (494)	6.3 (159)
(M-)ILS200	3.94 (100)	4	3.0 (76.2)	3.0 (76.2)	4	14 (353)	20 (508)	4.8 (123)	21.4 (544)	6.3 (159)
(M-)ILS250	3.94 (100)	4	3.0 (76.2)	3.0 (76.2)	4	16 (403)	22 (558)	4.8 (123)	23.4 (594)	6.3 (159)

Top Plate

MODEL SHOWN: ILS & ILS-LM INTERFACE
DIMENSIONS IN INCHES (AND MILLIMETERS)



MODEL SHOWN: M-ILS & M-ILS-LM INTERFACE
DIMENSIONS IN INCHES (AND MILLIMETERS)



Ordering Information

Model	Series	Travel (mm)	Drive
M-	ILS	50, 100, 150, 200, 250	CC, CCL, HA, BPP

Example:
*The **ILS150HA** is an ILS stage with 150 mm travel, a DC motor drive with linear encoder, in English version.*

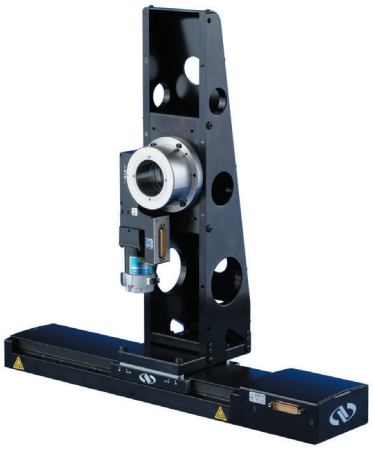
M-: For metric version
CC: DC motor
CCL: DC motor for SMC100CC controller
HA: DC motor with linear encoder
BPP: Stepper motor

Recommended Controllers / Drivers

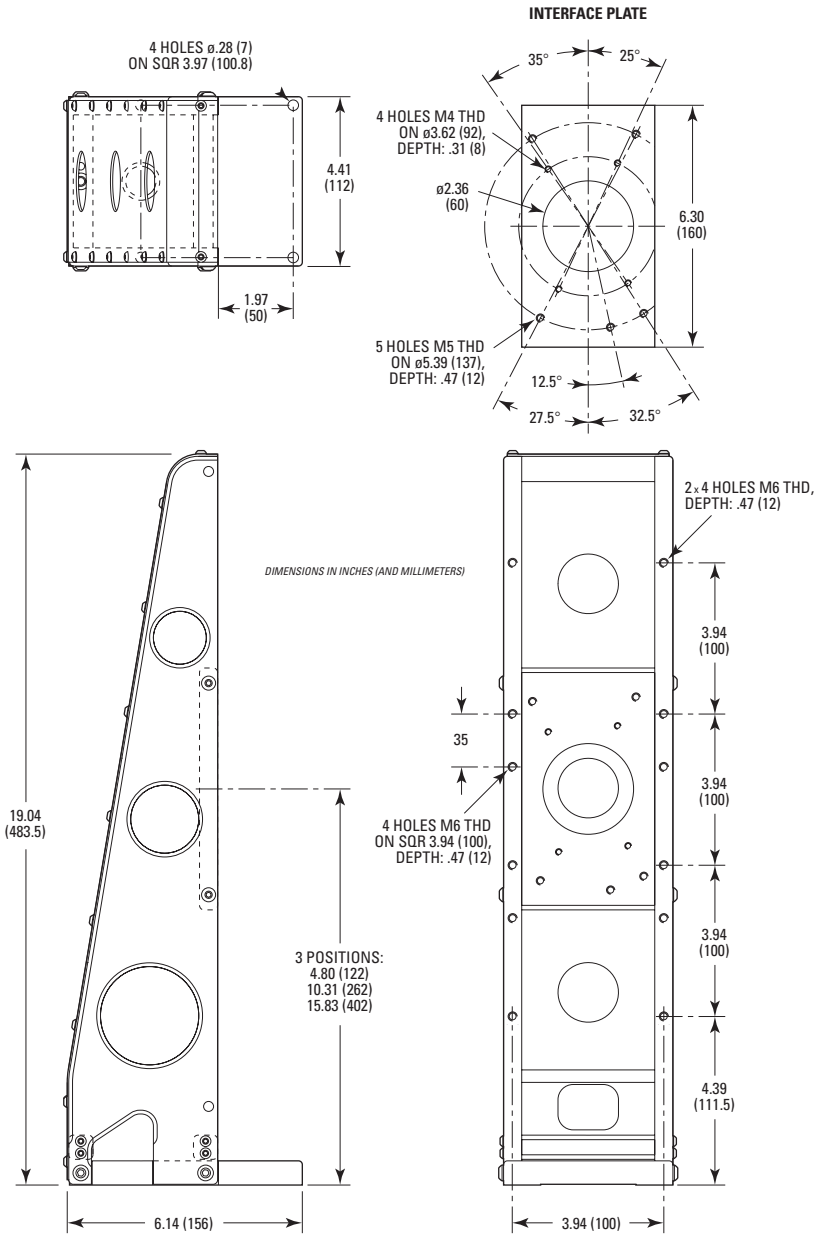
Model Number	
XPS-Dx	1- to 8-axis universal high-performance motion controller/driver
XPS-DRV11	1 Universal digital driver card for stepper, DC and direct motors
XPS-RLDx	1- to 4-axis universal high-performance motion controller/driver
ESP302-xN	1- to 3-axis motion controller/driver
SMC100CC	Single-axis DC motor controller/driver
SMC100PP	Single-axis stepper motor controller/driver

Two IMS stages, one ILS stage, and one EQ120bracket in an XYZ configuration.

Accessory Bracket Dimensional Drawing: EQ120



An RVS80 mounted in a vertical configuration with an EQ120 bracket to an ILS stage.



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