

LINEAR SERVO SLIDE

**Ultimate Solution for High Throughput
Precision Positioning**



- ❑ **Turn-key solution**
- ❑ **Modular design**
- ❑ **Direct linear drive**
- ❑ **High speed and acceleration**
- ❑ **Zero backlash**
- ❑ **Fast settling time**
- ❑ **Long stroke**
- ❑ **Protective seal strip**
- ❑ **Integrated cable track**

The Direct Drive Linear System

Linear Servo Slide system is a direct drive actuator that eliminates wear, friction, backlash and compliances associated with mechanical transmissions, such as ball/lead screws, rack & pinion, belts/pulses and gearboxes

IntelLiDrives Linear Motors Benefits

- Zero maintenance
- Zero backlash and compliance
- High stiffness
- High positional accuracy
- Compact mechanical assembly
- Reduced parts count in the machine
- Smooth velocity

Linear Motor Forcer

Brushless linear servomotor features non-contact design and low cogging for fast and accurate positioning

High Strength Aluminum Body

Extruded aluminum housing is precision machined to provide outstanding straightness and flatness for installations in horizontal or vertical orientations.

Protective Seals

Stainless steel strip provides IP30 protection to interior as well as enhance overall performance

Carriage support bearings

Double rail bearing system is integrated into the slide to support moving carriage and to provide dynamic stiffness and precise straightness of travel

Integral Linear Encoder

Precision non-contact linear position feedback with selectable resolution from 0.1 to 10 microns is mounted in the carriage to minimize thermal drift

Limit Sensors

Stage has limit and home sensors to establish end of travel and "home" positions

Connector Panel

Provides "plug-in" connectivity and quick disconnect for all signal and power requirements

Cable Transport Module

Cable track with high flex robotic cable is installed and pre-wired to the connector panel

Ease of mounting

is achieved using housing T-slots and clamp-down brackets

Multi-axes systems

Gantry and XYZ arms can be easily constructed using [Linear Servo Slides](#)

SPECIFICATIONS

| Parameter | Unit | | LSS120 Medium frame | LSS200 Wide frame |
|-----------------------------|------|-------|------------------------|----------------------|
| Peak force (note 1) | Fp | N | 450 | 1300 |
| Continuous force (note 2) | Fc | N | 160 | 570 |
| Peak current (note 3) | Ip | Amp | 10 (14) | 16 |
| Continuous current (note 3) | Ic | Amp | 6 (8) | 7 |
| Max speed at Fp (note 3) | Vp | m/sec | 3.2 (4.4) | 1.7 |
| Max speed at Fc (note 3) | Vp | m/sec | 7.0 (9.5) | 2.9 |
| Cogging force | Fc | N | 3 | 15 |
| Accuracy (note 4) | | mkm | | 10 - 50 |
| Resolution (note 4) | | mkm | | 0.1 - 25 |
| Repeatability | | mkm | | 1 - 5 |
| Carriage weight | Mf | Kg | 3 | 6.5 |
| Max payload weight | Mp | Kg | 70 | 200 |
| Travel stroke (note 5) | S | mm | 100 + n * 96 | 100 + n * 128 |
| Stage length | L | mm | S + 338 | S + 536 |

note 1 duration 1 sec

note 2 coil at 120°C

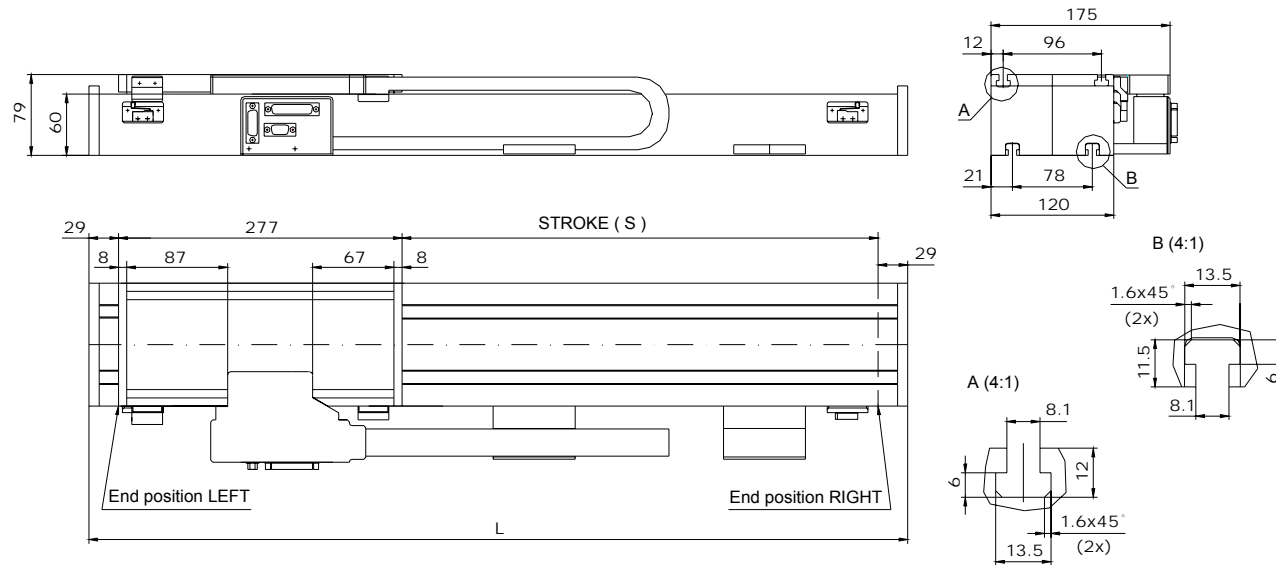
note 3 motor bus voltage 310 VDC (ISERV voltage 220 VAC)
value in parenthesis is for high speed motor winding

note 4 stage can be equipped with magnetic and optical contact-less
linear encoders. Consult the factory

Note 5 n = 0, 1 ...96 (LSS120) n = 0, 1 ...40 (LSS200)
stroke above 2m consult the factory

DRAWINGS

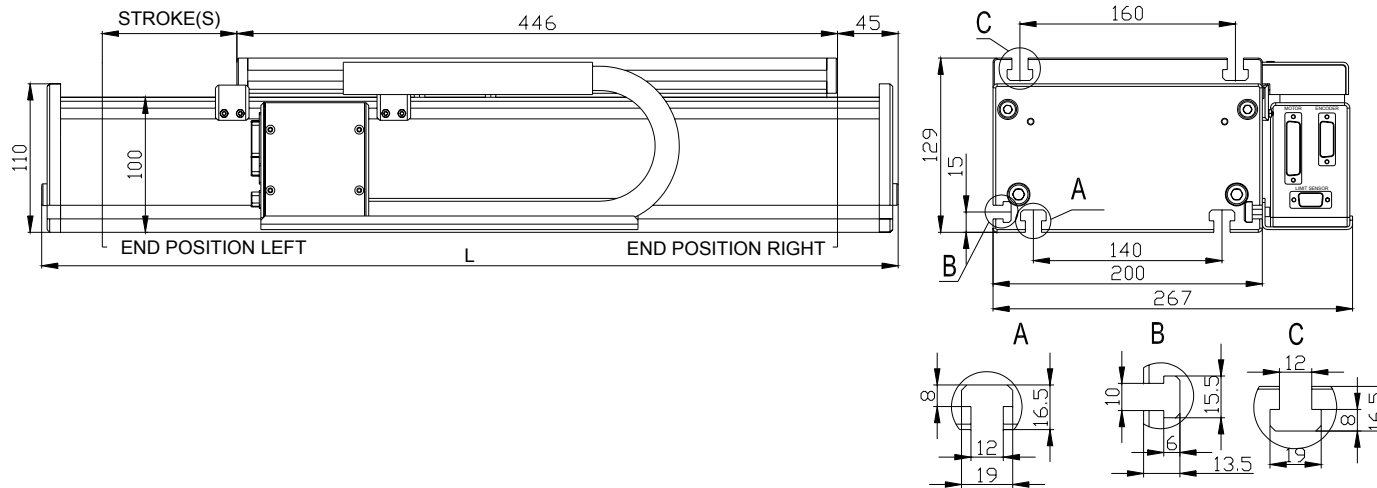
LSS-120



Stroke S [mm] = 100 + n * 96 (n = 0, 1 ... 55)

Stage Length L [mm] = S + 338

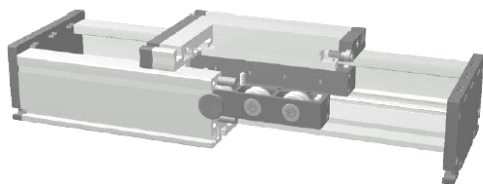
LSS-200



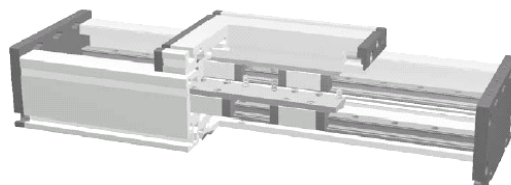
Stroke S [mm] = $100 + n \cdot 128$ ($n = 0, 1 \dots 40$)

Stage Length L [mm] = $S + 536$

Stage construction



LSS 120



LSS 200

Stage load rating

Forces and torques

The diagram illustrates a linear stage with a coordinate system. The x-axis is horizontal, the y-axis is vertical, and the z-axis is diagonal. Forces F_x , F_y , and F_z are shown acting on the stage. Torques M_x , M_y , and M_z are shown acting around the respective axes. The stage is represented by a rectangular block with a smaller rectangular block on top of it.

| Size | 120 | | 160 | | 200 | |
|----------------|--------|---------|--------|---------|--------|---------|
| Forces/Torques | static | dynamic | static | dynamic | static | dynamic |
| F_y (N) | 1100 | 900 | 3000 | 2000 | 4400 | 3100 |
| F_x (N) | 1250 | 1000 | 3500 | 2800 | 4900 | 4400 |
| M_x (Nm) | 150 | 125 | 400 | 320 | 600 | 510 |
| M_y (Nm) | 140 | 120 | 360 | 300 | 560 | 480 |
| M_z (Nm) | 100 | 90 | 180 | 150 | 310 | 275 |

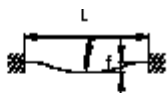
Speed

| | | | |
|-------------|---|---|---|
| (m/sec) max | 4 | 6 | 8 |
|-------------|---|---|---|

Geometrical moments of inertia of aluminium profile

| | | | |
|-----------------------------------|--------------------|---------------------|---------------------|
| I_x mm ⁴ | $6,6 \times 10^5$ | $22,2 \times 10^5$ | $63,8 \times 10^5$ |
| I_y mm ⁴ | $38,6 \times 10^5$ | $122,0 \times 10^5$ | $335,0 \times 10^5$ |
| Elastic modulus N/mm ² | 70000 | 70000 | 70000 |

$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



f = deflection (mm)
 F = load (N)
 L = free length (mm)
 E = elastic modulus 70000 (N/mm²)
 I = second moment of area (mm⁴)

XY Multi-axes Systems

Arms and Gantry Systems

Common combination of Cartesian Systems supplied as complete pre-configured systems

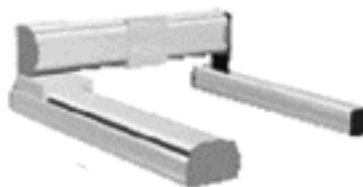
XY Arm with Y moving carriage



XY Arm with Y moving slide



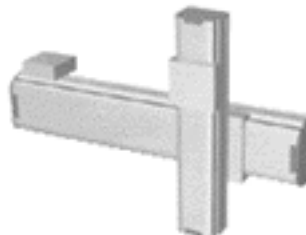
XY Gantry with parallel beam



XZ Arm with poll type Z



XZ Arm with Pusher Z



Other variations of the XYZ systems are available. [Contact the factory](#)

Order example

| LSS | -120 | - NS | - RH | -P | - 292 | -1 | - 5 | - 50 |
|---------------|--------------------|--------------------------------------|---|---|--|---|----------------------------------|--------------------------------|
| Series | Frame width | Forcer winding | Cable carrier | Cable exit | Stroke (mm) | Number of forcers | Encoder resolution (µm) | Encoder accuracy (µm/m) |
| | 120 | NS (normal speed) HS (high speed) | RH horizontal right LH horizontal left | P connectorized panel C cable with wires 3m long standard | 100 + n * 96 (n = 0, 1 ... 55) | 1, 2, 3 | 0.1, 0.5 1.0, 5.0 10.0, 25 | 10, 25, 50, 100 |
| | 200 | NS (normal speed) | | | 100 + n * 128 (n = 0, 1 ... 40) | Requires additional cable carrier and encoder read-head | | |
| | | | | Consult the factory | Consult the factory length above 2m | Consult the factory | | Consult the factory |

I-SERV™ DIGITAL SERVO AMPLIFIER and INDEXER



Features:

- Advanced sine wave commutation technology
- Accurate force control
- Stand-alone or CAN distributed drive
- Step/direction interface
- Electronic gearing to master encoder
- $\pm 10V$ velocity/current command interface
- Field oriented controls
- Auto-phasing and auto-tuning of the current loop
- 115/230VAC operation
- 24VDC stay-alive control power

Operational modes:

- Force/Torque control – from analog to CAN command
- Velocity control – from analog to CAN command
- Pulse/direction interface
- Position control – indexer or CAN command

Motion indexing:

- Stores up to 8 motion profiles in memory
- Start motion through CAN or digital I/O
- Homing function

Order example

| ISRV | - A | -110 | - 18 | - ED | - 3 | - R15 | - HS |
|-------------|-----------------------------|----------------|--|--|--|----------------------------|-------------|
| Series | Version | AC voltage | Peak current | Motor encoder | Cable length | Regenerative resistor | Heatsink |
| | A (servoamp) I (indexer) | 115 230 | 6A cont/18A pk 12A cont/36A pk 20A cont/40A pk | ED (digital RS422 encoder) EA (analog 1Vpp encoder) | 1, 2, 3 m cable set includes motor, encoder, control cables | 15 Ω 30 Ω | |

Specifications

| | |
|------------------------|--|
| Output Current | ISRV-230-18: 18 A dc peak, 6 A dc continuous ISRV-230-36: 36 A dc peak, 12 A dc continuous ISRV-230-40: 40 A dc peak, 20 A dc continuous |
| Mains Input | 100 to 240 Vac, 1Ø or 3Ø, 47 to 63 Hz |
| Control Power | +24 Vdc, 500 mA maximum |
| Motor Inductance | 200 µH minimum |
| Motor Current Limiting | FT algorithm on all phases |
| Protection | Short circuits (phase-phase, phase-ground), over/under voltage, motor and amplifier overtemperature, encoder power loss |
| Regeneration | Open collector IGBT output for driving external energy dissipating resistor Programmable for resistor power rating |
| Feedback | Digital quadrature encoder, analog encoder, Hall signals for commutation |
| Digital Encoder | Quadrature with differential outputs, 5 M Lines/sec maximum |
| Analog Encoder | Sinusoidal, 1 Vp-p, differential outputs |
| Halls | Single-ended, 120° electrical between signals |
| Encoder Power | +5 Vdc @ 250 mA |
| Analog Command Input | ±10 Vdc for velocity or current control, 12 bit resolution |
| Digital Command Input | Step/direction, CW/CCW, or quadrature encoder for position following with programmable output/input ratio, 2 MHz maximum input pulse or encoder line frequency |
| Digital Inputs | 12, one of which is a dedicated to Amp Enable function, eleven which have programmable functions. Programmable pull-up or pull-down in four groups with programmable active-hi or active-low for each input |
| Digital Outputs | 4, MOSFET, programmable functions, 1 A dc max, +40 Vdc max One is configured for motor brake operation (see below), three have 10 kΩ pull-ups to +5 Vdc with a series-diode for driving PLC inputs that source current from +24 Vdc |
| Motor Brake Output | Optically-isolated, sinks with internal flyback diode to +24 Vdc input, Sinks 1 A dc from load connected to +24 Vdc, programmable actuation delays |
| Encoder Output | Same resolution as feedback encoder, differential line-driver outputs |
| Serial Interface | RS-232, 9600 to 115,200 Baud for operation with CME 2™ software for amplifier configuration |
| Network Interface | CAN physical layer, CANopen data protocol, dual RJ-45 connectors |
| Indicators | Bicolor LEDs for amplifier and CAN bus status |
| Temperature Range | Maximum heatplate temperature is 70 °C, optional standard or low-profile heatsinks can be used to match amplifier power dissipation to local environment |
| Humidity | 0% to 95% RH, non-condensing |
| Mounting | Panel mounting |
| Weights & Dimensions | 7.55 x 2.55 x 5.54 in, 3.0 lb without heatsink (191.7 x 64.8 x 140.7 mm, 1.36 kg) |

Connections

