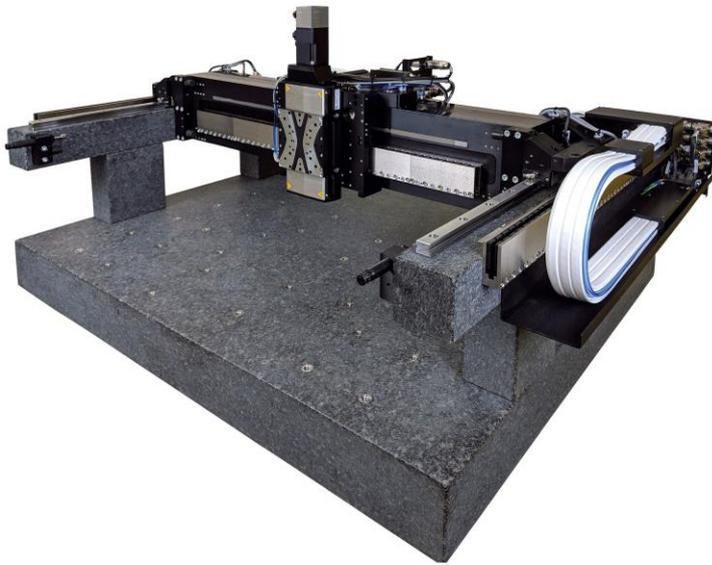


PIglide HGS Hybrid Gantry System

Hybrid Guide Design with Air Bearings and Recirculating Ball Bearing Guides for High Precision with Low Profile.



A-341

- Hybrid design: Gantry axis with recirculating ball bearing guides, bridge axis with air bearing
- Absolute encoder
- High-performance ironless linear motors
- Various travel ranges. Options and customized adaptations
- Flexible modular platform

Overview

The A-341 PIglide HGS hybrid gantry system was developed for applications that require overhead motion and long travel ranges.

The A-341 hybrid gantry has a unique hybrid guide design. The bridge axis is equipped with a friction-free guide with air bearings that allow exact control of velocity as well as outstanding repeatability and straightness. The guide with air bearings considerably reduces particle emission over the workspace. The gantry axis is equipped with recirculating ball bearing guides on both sides for robustness and precision in limited installation space.

This combination of different guide technologies means that the A-341 hybrid gantry is ideally suited to applications that are based on the step-and-scan principle and at the same time, require a compact design.

The A-341 is coupled with industry-leading controllers and drive modules from ACS that offer superior servo performance, advanced control algorithms to improve dynamic performance and error compensation, and a wide suite of software development tools.

Absolute encoder

Absolute encoders supply explicit position information that enables immediate determination of the position. This means that referencing is not required during switch-on, which increases efficiency and safety during operation.

PIMag® magnetic 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.

Options and customized adaptations

- Base made of granite or aluminum

- Adjustable work height
- Systems for reducing vibration
- Additional drag chains
- Performance of the linear motors
- Liquid cooling of the linear motors

Application fields

Scanning, Digital printing, Electronics assembly and inspection, AOI (Automatic Optical Inspection), Automation.

Specifications

Motion	Unit	Bridge axis	Gantry axis
Travel range	mm	300 500	300 500 750 1000
Guide		Air bearing, pneumatic preloading	Recirculating ball bearing guide
Drive		1 × Ironless 3-phase linear motor	2 × Ironless 3-phase linear motor
Measuring system		Absolute linear encoder, 1 nm sensor resolution, BiSS-C, steel measuring scale	2 × Absolute linear encoder, 1 nm sensor resolution, BiSS-C, steel measuring scale
Load capacity ⁽¹⁾		10 kg	
Positioning accuracy, calibrated ⁽²⁾	µm	±0.75	±2
XY orthogonality	µrad	25	
Max. velocity, unloaded ⁽³⁾	m/s	2	1
Moved mass	kg	5	Depending on the travel range of the bridge axis: 300 mm: 25 kg 500 mm: 30 kg

⁽¹⁾ Assumes an air bearing operating pressure of 550 kPa. The payload center of gravity may not be more than 50 mm away from the surface of the motion platform.

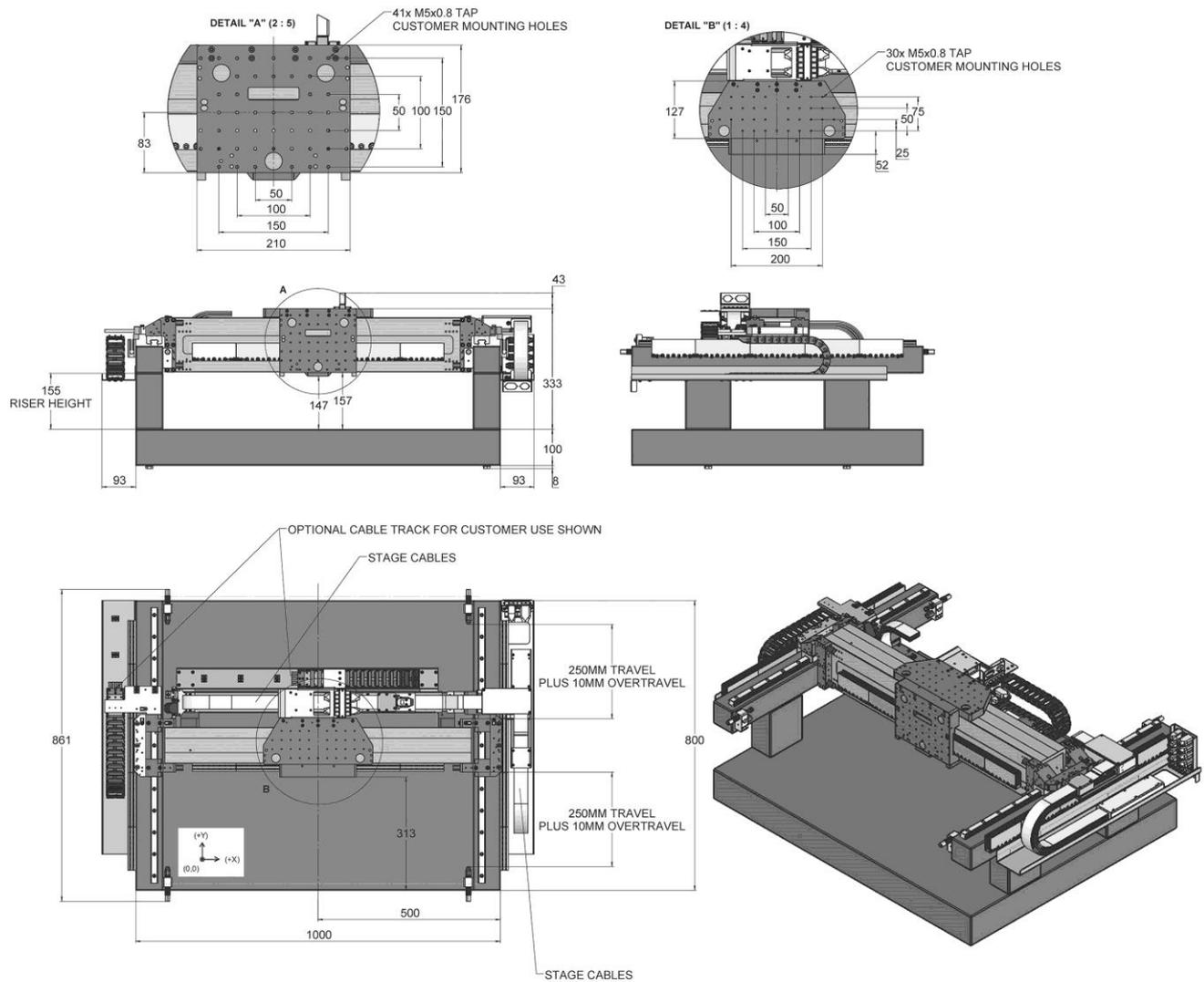
⁽²⁾ Accuracy values assume short time duration and do not consider the long-term effects of thermal drift on the stage.

⁽³⁾ Depends on the motor selected, controller performance, duty cycle, load, and other application-specific parameters.

Drive properties	Unit	Option 1	Option 2
Nominal voltage	V DC	70	
Peak voltage	V DC	300	
Nominal force	N	58	87
Peak force	N	200	300
Nominal current, RMS	A	2.9	4.4
Peak current, RMS	A	10	15
Back EMF phase-phase	V·s/m	16	16
Resistance phase-phase	Ω	5.6	3.6
Inductance phase-phase	mH	1.8	1.2

Miscellaneous	
Operating pressure	550 ±35 kPa (80 ±5 psi)
Air consumption	< 30 l/min (1SCFM)
Air quality	Clean (filtered to 1.0 µm or better) - ISO 8573-1 Class 1 Oil free - ISO 8573-1 Class 1 Dry (-15 °C dew point) - ISO 8573-1 Class 3
Materials	Hardcoat aluminum Guide rails made of steel, cleanroom grease (guide rails made of stainless steel on request) Mounting hardware made of stainless steel

Drawings / Images



A-341 gantry system, dimensions in mm

Ordering Information

A-341 HGS basic configuration

Hybrid XY gantry system, air bearings (gantry axis) and recirculating ball bearing guides (bridge axis), 3-phase linear motors, absolute linear encoder, travel range to 500 mm × 1000 mm (please specify in the request)

A-341 factory option: L-511 as Z axis

Modified L-511 linear stage with synchronous servo motor and holding brake, 50 to 150 mm travel range

A-341 factory option: V-408 as Z axis

Modified V-408 linear stage with 3-phase linear motor, holding brake, and pneumatic weight force compensation, 50 mm travel range

A-341 factory option: Additional drag chains

The A-341 can be equipped with additional drag chains to accommodate additional cables and hoses of the customer's setup.

A-341 factory option: Motor cooling

For applications with a high duty cycle and high accelerations can be equipped with liquid-cooled linear motors. Individual liquid cooling is also possible for the linear motor of the bridge axis. An external radiator is necessary.

A-341 factory option: Base materials

The base plate and the base structure of the gantry axis can be either granite or aluminum. Customized hole patterns are possible.