PIglide RM Rotation Stage with Air Bearings

Friction-Free, Ideal for Indexing, Positioning, Scanning, Measuring Technology

A-62x

- Cleanroom compatible
- Motion platform diameter from 50 mm to 300 mm
- Load capacity to 4170 N
- Eccentricity and flatness < 200 nm
- Can be mounted vertically or horizontally

Product overview

The PIglide RM series of motorized rotation stages are designed for accuracy, precision, high stiffness, and ease of use, and can be mounted in any orientation.

Various options can be combined to create a solution ideal for point-to-point indexing or constant velocity scanning.

The RM stages offer superior travel accuracy, flatness, and wobble performance. Because they are friction free and require no maintenance or lubrication, they are ideal for use in cleanrooms.

3-Phase torque motor

- Brushless
- Slotless
- Low cogging torque

Absolute encoder (optional)

Absolute encoders supply explicit position information that enables immediate determination of the position. Therefore, no referencing is necessary when switching on and this increases efficiency and safety during operation.

Accessories and options

- Encoder
- Optional tip/tilt platform
- Custom mounting flanges
- Vacuum feedthrough
- Slip rings
- PIglide filter and air preparation kits
- Single or multi-axis motion controllers and servo drives
- Base plates made of granite and systems for reducing vibration

Application fields

Optical alignment, metrology, inspection systems, calibration, scanning.

Motion	Unit	Tolerance	A-621.025A1	A-621.025B1	A-623.025A1	A-623.025B1	A-623.050A1	A-623.050B1	A-624.050A1	A-624.050B1
Active axes			θZ	θZ	θZ	θZ	θZ	θZ	θZ	θZ
Rotation range in θZ	°		360	360	360	360	360	360	360	360
Maximum angular velocity in θZ, unloaded	rpm		2500	2500	1200	1200	1200	1200	600	600
Radial error in X	µm	Max.	±0.15	±0.15	±0.087	±0.087	±0.087	±0.087	±0.05	±0.05
Axial error	µm	Max.	±0.05	±0.05	±0.037	±0.037	±0.037	±0.037	±0.025	±0.025
Tilt error around X (wobble)	µrad	Max.	±2.5	±2.5	±1.5	±1.5	±1.5	±1.5	±1	±1

Positioning	**Unit**	**Tolerance**	**A-621.025A1**	**A-621.025B1**	**A-623.025A1**	**A-623.025B1**	**A-623.050A1**	**A-623.050B1**	**A-624.050A1**	**A-624.050B1**
Positioning accuracy in θZ, calibrated	µrad	Typ.	±8	±8	±8	±8	±8	±8	±8	±8
Bidirectional repeatability in θZ	µrad	Typ.	8	8	8	8	8	8	8	8
Reference switch			1/revolution, differential pulse over one sensor signal period, 1 V peak-peak	—	1/revolution, differential pulse over one sensor signal period, 1 V peak-peak	—	1/revolution, differential pulse over one sensor signal period, 1 V peak-peak	—	1/revolution, differential pulse over one sensor signal period, 1 V peak-peak	—
Integrated sensor			Incremental angle-measuring system	Absolute angle-measuring system	Incremental angle-measuring system	Absolute angle-measuring system	Incremental angle-measuring system	Absolute angle-measuring system	Incremental angle-measuring system	Absolute angle-measuring system
Sensor signal			Sin/cos, 1 V peak-peak	BiSS-C	Sin/cos, 1 V peak-peak	BiSS-C	Sin/cos, 1 V peak-peak	BiSS-C	Sin/cos, 1 V peak-peak	BiSS-C
Sensor signal periods/U			8192	—	15744	—	15744	—	23600	—
Sensor resolution	nm		0.047	0.015	0.024	0.015	0.024	0.015	0.016	0.015
Sensor resolution, rotational	µrad		0.047	0.0015	0.024	0.0015	0.016	0.0015	0.016	0.0015

Drive Properties	**Unit**	**Tolerance**	**A-621.025A1**	**A-621.025B1**	**A-623.025A1**	**A-623.025B1**	**A-623.050A1**	**A-623.050B1**	**A-624.050A1**	**A-624.050B1**
Drive type			Ironless 3-phase torque motor	Ironless 3-phase torque motor	Ironless 3-phase torque motor	Ironless 3-phase torque motor	Ironless 3-phase torque motor	Ironless 3-phase torque motor	Ironless 3-phase torque motor	Ironless 3-phase torque motor
Nominal voltage	V		48	48	48	48	48	48	48	48
Peak voltage	V		80	80	80	80	80	80	80	80
Nominal current	A	Typ.	3.3	3.3	3.1	3.1	3.1	3.1	2.3	2.3
Peak current	A	Typ.	9.9	9.9	9.3	9.3	9.3	9.3	6.9	6.9
Drive torque clockwise in θZ	N·m	Max.	0.07	0.07	0.7	0.7	0.7	0.7	1.57	1.57
Drive torque counterclockwise in θZ	N·m	Max.	0.07	0.07	0.7	0.7	0.7	0.7	1.57	1.57
Peak torque clockwise in θZ	N·m	Max.	0.21	0.21	2.1	2.1	2.1	2.1	4.71	4.71
Peak torque counterclockwise in θZ	N·m	Max.	0.21	0.21	2.1	2.1	2.1	2.1	4.71	4.71
Torque constant	N·m/A	Typ.	0.03	0.03	0.26	0.26	0.26	0.26	0.59	0.59
Resistance phase-phase	Ω	Typ.	2.7	2.7	4.2	4.2	4.2	4.2	6.7	6.7
Inductance phase-phase	mH		0.1	0.1	0.4	0.4	0.4	0.4	0.9	0.9
Back EMF, phase-phase, rotational	V/kRPM	Max.	4.1	4.1	31.8	31.8	31.8	31.8	71	71
Number of pole pairs			6	6	14	14	14	14	24	24

Mechanical Properties	Unit	Tolerance	A-621.025A1	A-621.025B1	A-623.025A1	A-623.025B1	A-623.050A1	A-623.050B1	A-624.050A1	A-624.050B1
Stiffness in X	N/µm		8	8	18	18	35	35	64	64
Stiffness in Y	N/µm		8	8	18	18	35	35	64	64
Stiffness in Z	N/µm		26	26	96	96	96	96	210	210
Permissible push force in X	N	Max.	57	57	115	115	229	229	344	344
Permissible push force in Y	N	Max.	57	57	115	115	229	229	344	344
Permissible push force in Z	N	Max.	134	134	536	536	536	536	1206	1206
Permissible pull force in X	N	Max.	57	57	115	115	229	229	344	344
Permissible pull force in Y	N	Max.	57	57	115	115	229	229	344	344
Permissible pull force in Z	N	Max.	134	134	536	536	536	536	1206	1206
Permissible torque in θX	N·m	Max.	0.57	0.57	1.7	1.7	4.52	4.52	22.6	22.6
Permissible torque in θY	N·m	Max.	0.57	0.57	1.7	1.7	4.52	4.52	22.6	22.6
Moment of inertia in θZ, unloaded	kg·mm^2	±20 %	290	290	1530	1530	2450	2450	10450	10450
Moved mass in θZ, unloaded	g	±5 %	400	400	1200	1200	1400	1400	3200	3200
Bearing type			Air bearings with air preload	Air bearings with air preload	Air bearings with air preload	Air bearings with air preload	Air bearings with air preload	Air bearings with air preload	Air bearings with air preload	Air bearings with air preload
Journal length	mm		25	25	25	25	50	50	50	50
Overall mass	g	±5 %	1200	1200	3100	3100	4500	4500	8600	8600
Material			Aluminum, stainless steel	Aluminum, stainless steel	Aluminum, stainless steel	Aluminum, stainless steel	Aluminum, stainless steel	Aluminum, stainless steel	Aluminum, stainless steel	Aluminum, stainless steel
Motion platform diameter	mm		50	50	100	100	100	100	150	150

Miscellaneous	Unit	Tolerance	A-621.025A1	A-621.025B1	A-623.025A1	A-623.025B1	A-623.050A1	A-623.050B1	A-624.050A1	A-624.050B1
Operating temperature range	°C		15 to 25	15 to 25	15 to 25	15 to 25	15 to 25	15 to 25	15 to 25	15 to 25
Connector			D-sub 9W4 (m)	D-sub 9W4 (m)	D-sub 9W4 (m)	D-sub 9W4 (m)	D-sub 9W4 (m)	D-sub 9W4 (m)	D-sub 9W4 (m)	D-sub 9W4 (m)
Sensor connector			D-sub 15 (m)	D-sub 15 (m)	D-sub 15 (m)	D-sub 15 (m)	D-sub 15 (m)	D-sub 15 (m)	D-sub 15 (m)	D-sub 15 (m)
Operating pressure	kPa		515 to 585	515 to 585	515 to 585	515 to 585	515 to 585	515 to 585	515 to 585	515 to 585
Air consumption	L/min	Max.	56	56	56	56	56	56	56	56
Air quality			Clean (filtered up 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	Clean (filtered up 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	Clean (filtered up 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	Clean (filtered up 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	Clean (filtered up 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	Clean (filtered up 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	Clean (filtered up 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	Clean (filtered up 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
Recommended controllers/drivers			A-81x, A-82x	A-81x, A-82x	A-81x, A-82x	A-81x, A-82x	A-81x, A-82x	A-81x, A-82x	A-81x, A-82x	A-81x, A-82x

Motion	Unit	Tolerance	A-625.065A1	A-625.065B1	A-627.075A1	A-627.075B1
Active axes			θZ	θZ	θZ	θZ
Rotation range in θZ	°		360	360	360	360
Maximum angular velocity in θZ, unloaded	rpm		500	500	500	500
Radial error in X	µm	Max.	±0.05	±0.05	±0.037	±0.037
Axial error	µm	Max.	±0.025	±0.025	±0.02	±0.02
Tilt error around X (wobble)	µrad	Max.	±1	±1	±0.5	±0.5

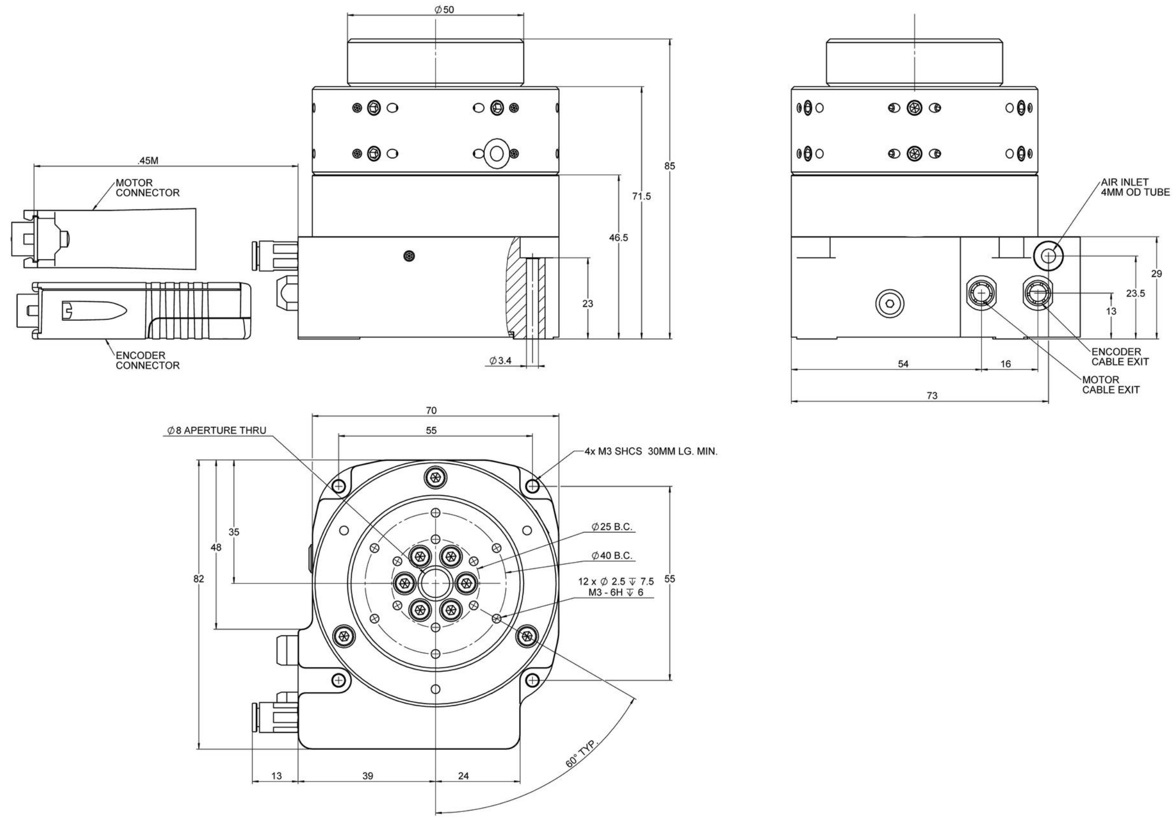
Positioning	**Unit**	**Tolerance**	**A-625.065A1**	**A-625.065B1**	**A-627.075A1**	**A-627.075B1**
Positioning accuracy in θZ, calibrated	µrad	Typ.	±8	±8	±8	±8
Bidirectional repeatability in θZ	µrad	Typ.	8	8	8	8
Reference switch			1/revolution, one count over one step of the encoder, synchronized to output signal	1/revolution, one count over one step of the encoder, synchronized to output signal	1/revolution, differential pulse over one sensor signal period, 1 V peak-peak	—
Integrated sensor			Incremental angle-measuring system	Absolute angle-measuring system	Incremental angle-measuring system	Absolute angle-measuring system
Sensor signal			Sin/cos, 1 V peak-peak	BiSS-C	Sin/cos, 1 V peak-peak	BiSS-C
Sensor signal periods/U			31488	—	47200	—
Sensor resolution	nm		0.012	0.015	0.008	0.015
Sensor resolution, rotational	µrad		0.012	0.0015	0.008	0.0015

Drive Properties	**Unit**	**Tolerance**	**A-625.065A1**	**A-625.065B1**	**A-627.075A1**	**A-627.075B1**
Drive type			Ironless 3-phase torque motor	Ironless 3-phase torque motor	Ironless 3-phase torque motor	Ironless 3-phase torque motor
Nominal voltage	V		48	48	48	48
Peak voltage	V		80	80	80	80
Nominal current	A	Typ.	2.3	2.3	4.5	4.5
Peak current	A	Typ.	6.9	6.9	13.9	13.9
Drive torque clockwise in θZ	N·m	Max.	1.57	1.57	2.82	2.82
Drive torque counterclockwise in θZ	N·m	Max.	1.57	1.57	2.82	2.82
Peak torque clockwise in θZ	N·m	Max.	4.71	4.71	8.46	8.46
Peak torque counterclockwise in θZ	N·m	Max.	4.71	4.71	8.46	8.46
Torque constant	N·m/A	Typ.	0.59	0.59	0.61	0.61
Resistance phase-phase	Ω	Typ.	6.7	6.7	4.5	4.5
Inductance phase-phase	mH		0.9	0.9	0.6	0.6
Back EMF, phase-phase, rotational	V/kRPM	Max.	71	71	74	74
Number of pole pairs			24	24	32	32

Mechanical Properties	**Unit**	**Tolerance**	**A-625.065A1**	**A-625.065B1**	**A-627.075A1**	**A-627.075B1**
Stiffness in X	N/µm		110	110	204	204
Stiffness in Y	N/µm		110	110	204	204
Stiffness in Z	N/µm		385	385	788	788
Permissible push force in X	N	Max.	577	577	1203	1203
Permissible push force in Y	N	Max.	577	577	1203	1203
Permissible push force in Z	N	Max.	2144	2144	4244	4244
Permissible pull force in X	N	Max.	577	577	1203	1203
Permissible pull force in Y	N	Max.	577	577	1203	1203
Permissible pull force in Z	N	Max.	2144	2144	4244	4244
Permissible torque in θX	N·m	Max.	39.6	39.6	141.3	141.3
Permissible torque in θY	N·m	Max.	39.6	39.6	141.3	141.3
Moment of inertia in θZ, unloaded	kg·mm²	±20 %	32240	32240	196020	196020
Moved mass in θZ, unloaded	g	±5 %	6900	6900	21500	21500
Bearing type			Air bearings with air preload	Air bearings with air preload	Air bearings with air preload	Air bearings with air preload
Journal length	mm		65	65	75	75
Overall mass	g	±5 %	14000	14000	50000	50000
Material			Aluminum, stainless steel	Aluminum, stainless steel	Aluminum, stainless steel	Aluminum, stainless steel
Motion platform diameter	mm		200	200	300	300

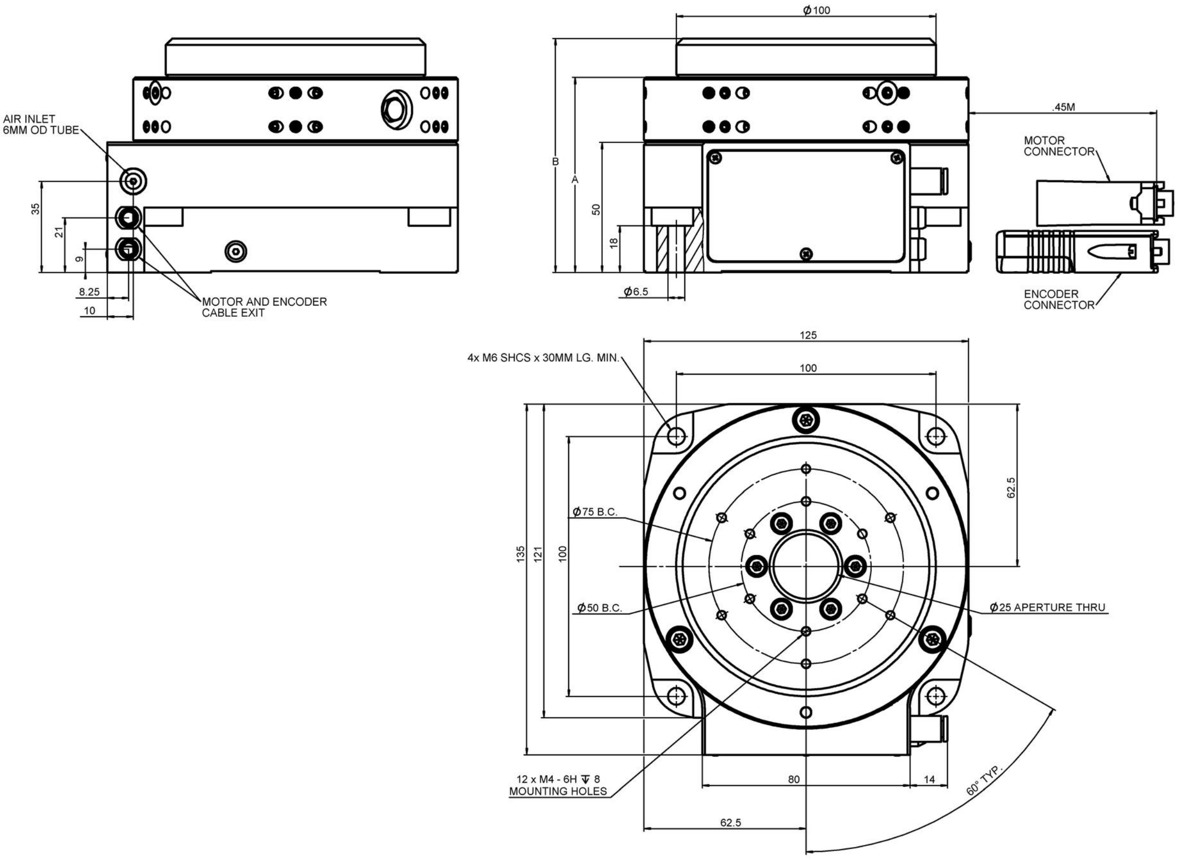
Miscellaneous	Unit	Tolerance	A-625.065A1	A-625.065B1	A-627.075A1	A-627.075B1
Operating temperature range	°C		15 to 25	15 to 25	15 to 25	15 to 25
Connector			D-sub 9W4 (m)	D-sub 9W4 (m)	D-sub 9W4 (m)	D-sub 9W4 (m)
Sensor connector			D-sub 15 (m)	D-sub 15 (m)	D-sub 15 (m)	D-sub 15 (m)
Operating pressure	kPa		515 to 585	515 to 585	515 to 585	515 to 585
Air consumption	L/min	Max.	56	56	56	56
Air quality			Clean (filtered up 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	Clean (filtered up 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	Clean (filtered up 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	Clean (filtered up 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
Recommended controllers/ drivers			A-81x, A-82x	A-81x, A-82x	A-81x, A-82x	A-81x, A-82x

Drawings / Images



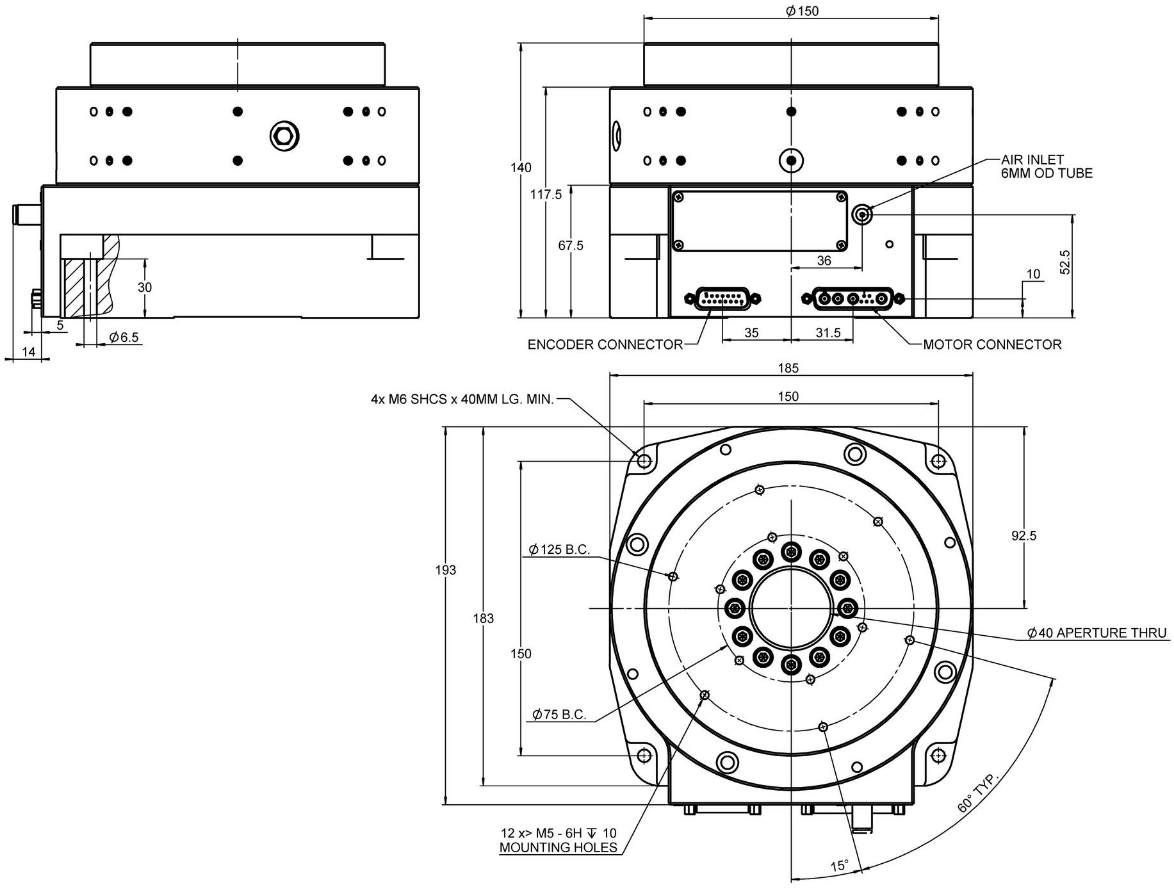
A-621.025xx, dimensions in mm

Drawings / Images



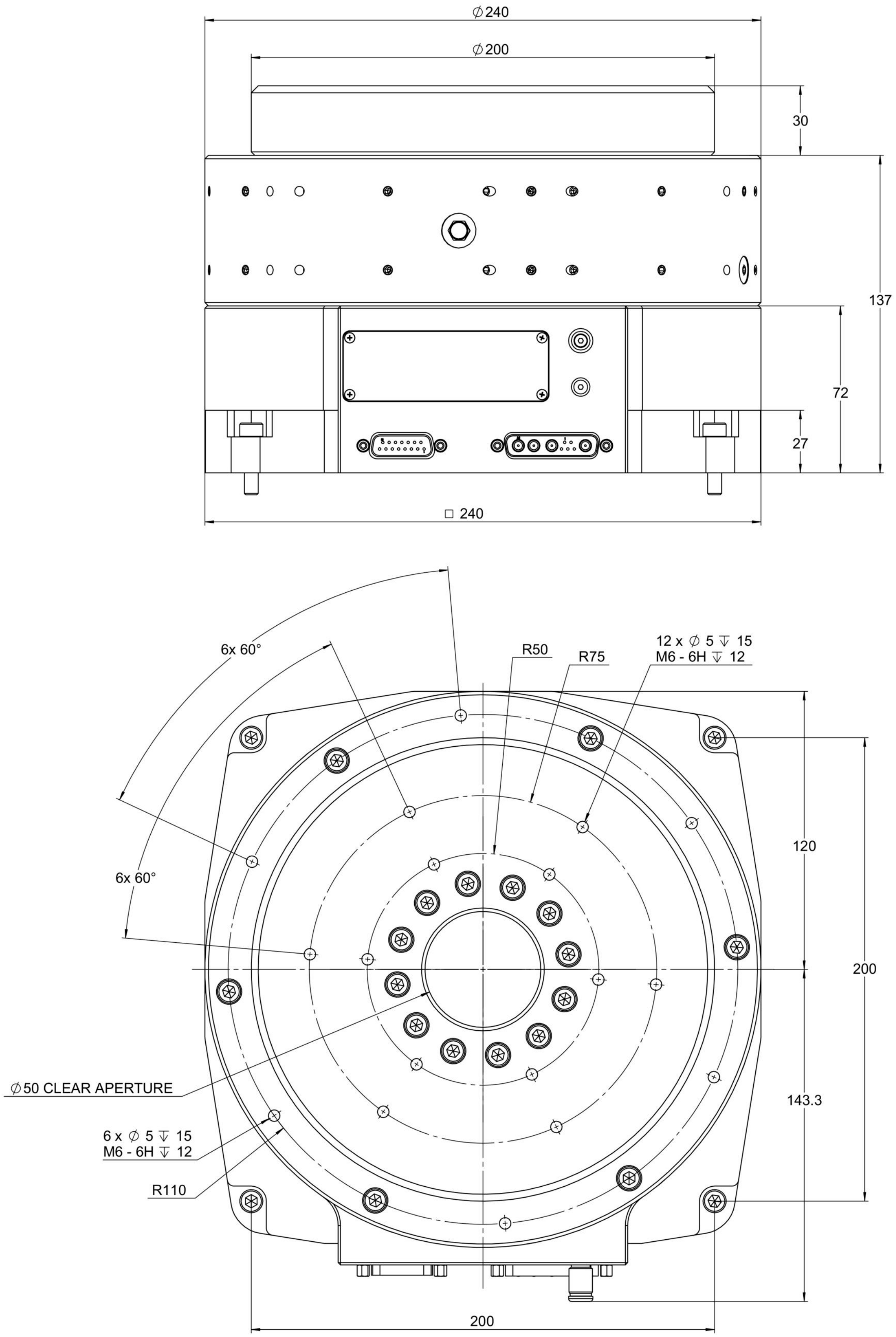
A-623.xxxxx, dimensions in mm (A-623.025xx: A=75 mm; B=90 mm; A-623.050xx: A=100 mm; B=115 mm)

Drawings / Images



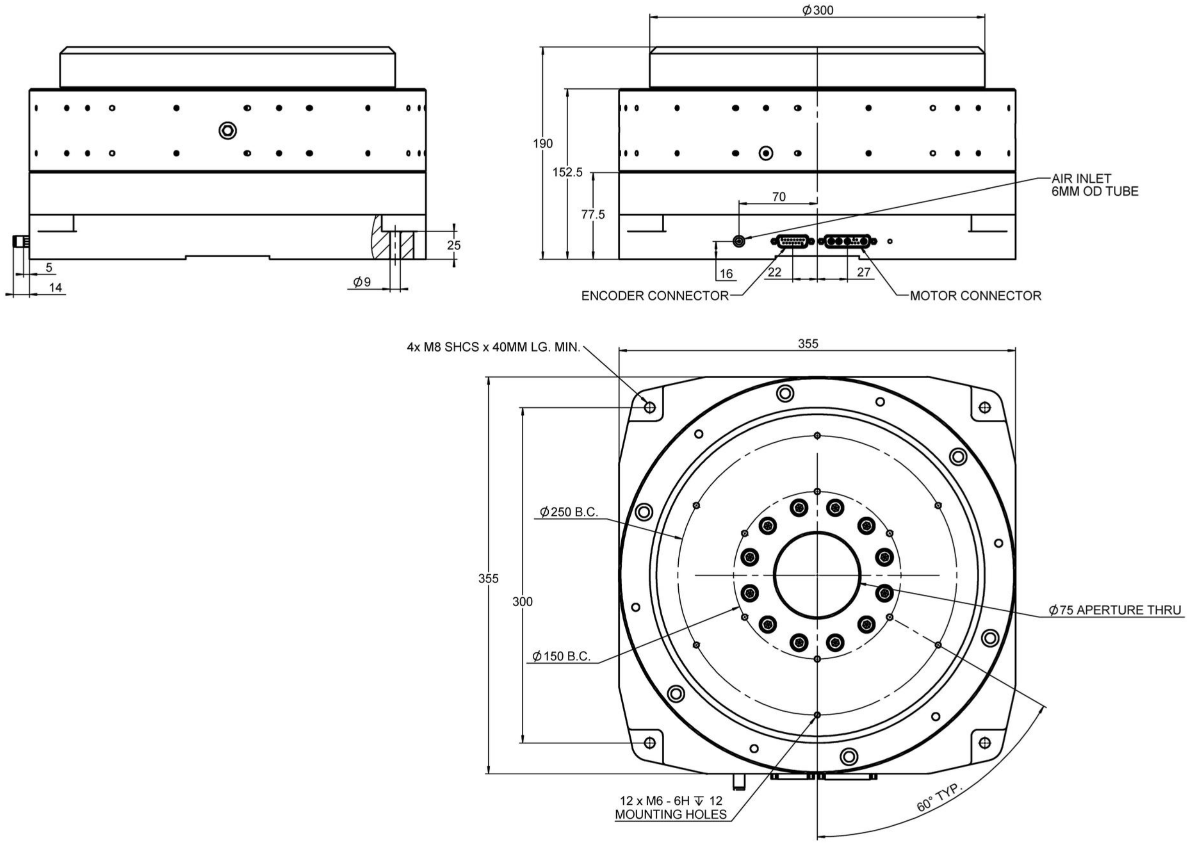
A-624.050xx, dimensions in mm

Drawings / Images



A-625.065xx, dimensions in mm

Drawings / Images



A-627.075xx, dimensions in mm

Order Information

A-621.025A1
PIglide RM rotation stage, air bearing, 50 mm motion platform diameter, 25 mm journal length, incremental angle measuring system with sin/cos signal transmission, 8192 lines/revolution, slotless, brushless 3-phase torque motor

A-621.025B1
PIglide RM rotation stage, air bearing, 50 mm motion platform diameter, 25 mm journal length, absolute angle-measuring system with BiSS-C signal transmission, 0.0015 µrad sensor resolution, slotless, brushless 3-phase torque motor

A-623.025A1
PIglide RM rotation stage, air bearing, 100 mm motion platform diameter, 25 mm journal length, incremental angle measuring system with sin/cos signal transmission, 15744 lines/revolution, slotless, brushless 3-phase torque motor

Order Information

A-623.025B1
PIglide RM rotation stage, air bearing, 100 mm motion platform diameter, 25 mm journal length, absolute angle-measuring system with BiSS-C signal transmission, 0.0015 µrad sensor resolution, slotless, brushless 3-phase torque motor

A-623.050A1
PIglide RM rotation stage, air bearing, 100 mm motion platform diameter, 50 mm journal length, incremental angle measuring system with sin/cos signal transmission, 15744 lines/revolution, slotless, brushless 3-phase torque motor

A-623.050B1
PIglide RM rotation stage, air bearing, 100 mm motion platform diameter, 50 mm journal length, absolute angle-measuring system with BiSS-C signal transmission, 0.0015 µrad sensor resolution, slotless, brushless 3-phase torque motor

A-624.050A1
PIglide RM rotation stage, air bearing, 150 mm motion platform diameter, 50 mm journal length, incremental angle measuring system with sin/cos signal transmission, 23600 lines/revolution, slotless, brushless 3-phase torque motor

A-624.050B1
PIglide RM rotation stage, air bearing, 150 mm motion platform diameter, 50 mm journal length, absolute angle-measuring system with BiSS-C signal transmission, 0.0015 µrad sensor resolution, slotless, brushless 3-phase torque motor

A-625.065A1
PIglide RM rotation stage, air bearing, 200 mm motion platform diameter, 65 mm journal length, incremental angle measuring system with sin/cos signal transmission, 31488 lines/revolution, slotless, brushless 3-phase torque motor

A-625.065B1
PIglide RM rotation stage, air bearing, 200 mm motion platform diameter, 65 mm journal length, absolute angle-measuring system with BiSS-C signal transmission, 0.0015 µrad sensor resolution, slotless, brushless 3-phase torque motor

A-627.075A1
PIglide RM rotation stage, air bearing, 300 mm motion platform diameter, 75 mm journal length, incremental angle measuring system with sin/cos signal transmission, 47200 lines/revolution, slotless, brushless 3-phase torque motor

A-627.075B1
PIglide RM rotation stage, air bearing, 300 mm motion platform diameter, 75 mm journal length, absolute angle-measuring system with BiSS-C signal transmission, 0.0015 µrad sensor resolution, slotless, brushless 3-phase torque motor