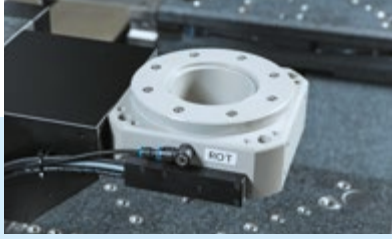


Product Catalog

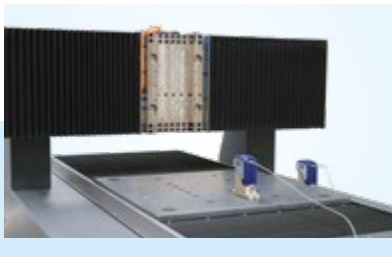
LAB Motion Systems



Rotary Solutions

Best-in-class rotary stages with unique motor technology and high-performance encoders.

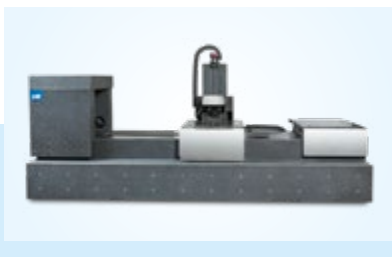
- > *rotary stages - p. 6*
- > *slip rings - p. 38*



Linear Solutions

High-precision linear stages and gantries with a multitude of customization options.

- > *linear stages - p. 40*
- > *Z stages - p. 42*
- > *XY stages - p. 44*
- > *gantry stages - p. 48*
- > *planar stages - p. 50*



Multi-axis Systems

Complete integrated motion systems for a variety of industries and clients.

- > *4 axis motion system - p. 56*
- > *9 axis motion system - p. 58*



Accessories

A selection of accessories, readily usable with LAB rotary or linear stages.

- > *drivebox - p. 60*
- > *air filters - p. 62*

Contents

4 About the Company

6 Rotary Stages

- 8 Air Bearing Stages*
- 10 Ball Bearing Stages*
- 11 RT-series Calculations*
- 12 RT-series Order Codes*
- 14 RT075S*
- 16 RT100S & RT100SX*
- 18 RT150S*
- 20 RT150SX*
- 22 RT150ST*
- 24 RT150U*
- 26 RT250S & RT250SX*
- 28 RT500S*
- 30 RT100B*
- 32 RT100BT*
- 34 RT150B*
- 36 RT200BT*
- 38 Integrated Slip Rings*

40 Linear Stages

42 Z Stages

44 XY Stages

- 46 XY150B-12*
- 47 XY250B-100*

48 Gantry Stages

50 Planar Stages

52 Systems

- 56 4 Axis Motion System*
- 58 9 Axis Motion System*

60 Drivebox 3.6

62 Compressed Air Preparation

- 64 Air Filter Order Codes*

66 Contact Our Team



About the Company

More than 15 years of experience in development and production of high-performance motion systems.

L AB Motion Systems is a high-tech company specialized in the development of machines that require advanced motion performance. State-of-the-art motion control is realized for OEM integrations, special developments and research applications. LAB is your preferred partner from concept generation up to series production. No other company offers a broader knowledge of precision engineering in all its aspects. Mechatronics is the key driver in our activities: we offer cutting-edge bearing technology, high-performance direct drives, servo drivers, high-accuracy positioning feedback and integrated motion control.

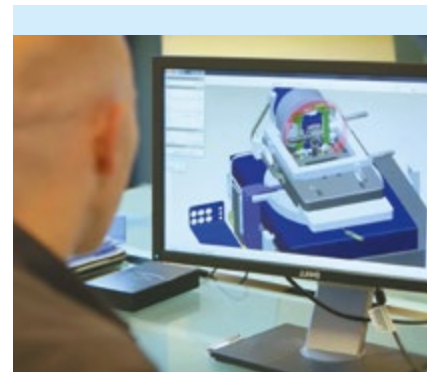
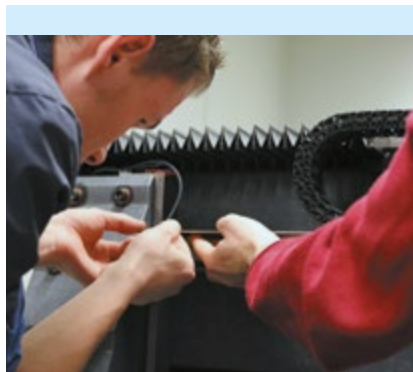
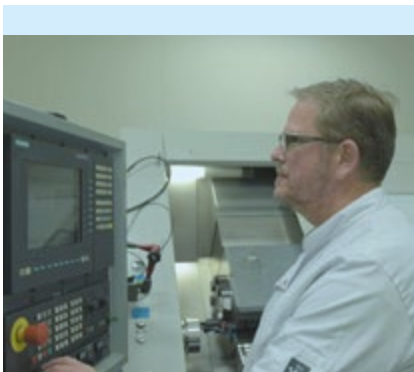
We rely on an excellent team of PhD's, development engineers and well-trained technicians. Continuous improvement and growth in the development of new products enables us to be the perfect partner in the field of high-precision applications. In order to respond adequately on increasing new demands, we can rely on unique, high-quality and robust air and mechanical bearings, cogging-free direct drives, state-of-the-art encoder technology and advanced motion control systems. As such, LAB can fulfill almost any precision-motion challenge!

Our products and systems are based on the profound knowledge and careful selection and application of a wealth of aspects and technologies:

- ✓ High-precision air bearings
- ✓ Precision ball bearings
- ✓ Specially developed ironless direct drives to minimize disturbance forces and realize an optimal performance
- ✓ Motion systems with inhouse developed servo driver or to be combined with your own drivers
- ✓ High precision with maximum work load
- ✓ Profound mechatronic knowledge
- ✓ Controller integration and optimization
- ✓ Complete service: from idea to series product!
- ✓ Calibration and measurement reports
- ✓ ISO9001 certified design- and production process

Operational Groups

LAB has three distinct operational groups. Synergy is key and each individual group exhibits world-class engineering skills in order to reach the ultimate performance.



Products

Products offers a well-balanced and carefully developed selection of standard high-performant rotary and linear stages. We offer off-the-shelf products but also have an extensive experience in developing series of customized products for OEM-applications. Our products provide complete rotary and linear solutions for your application. Also sample and prototype development in close collaboration with our customers is performed in an inimitable way.

Systems

Systems has the know-how and experience to realize complete integrated systems for high-performant motion. Our engineers master every aspect of mechatronics and precision engineering. We offer a complete service: from initial study and concepts to system design, optimization, manufacturing and assembly up to motion control and calibration. From single axis up to complex, multi-axis and synchronized motion solutions, LAB's Systems Group is the preferred partner for all your demands in the world of high-precision motion.

Custom Developments

The Custom Developments group is the backbone of our company. They conceive, develop and test future products and custom developments for our customers. Our R&D team continuously works on the development and improvement of new production methods and new motor and bearing technology in order to supply you with the best available products and solutions!

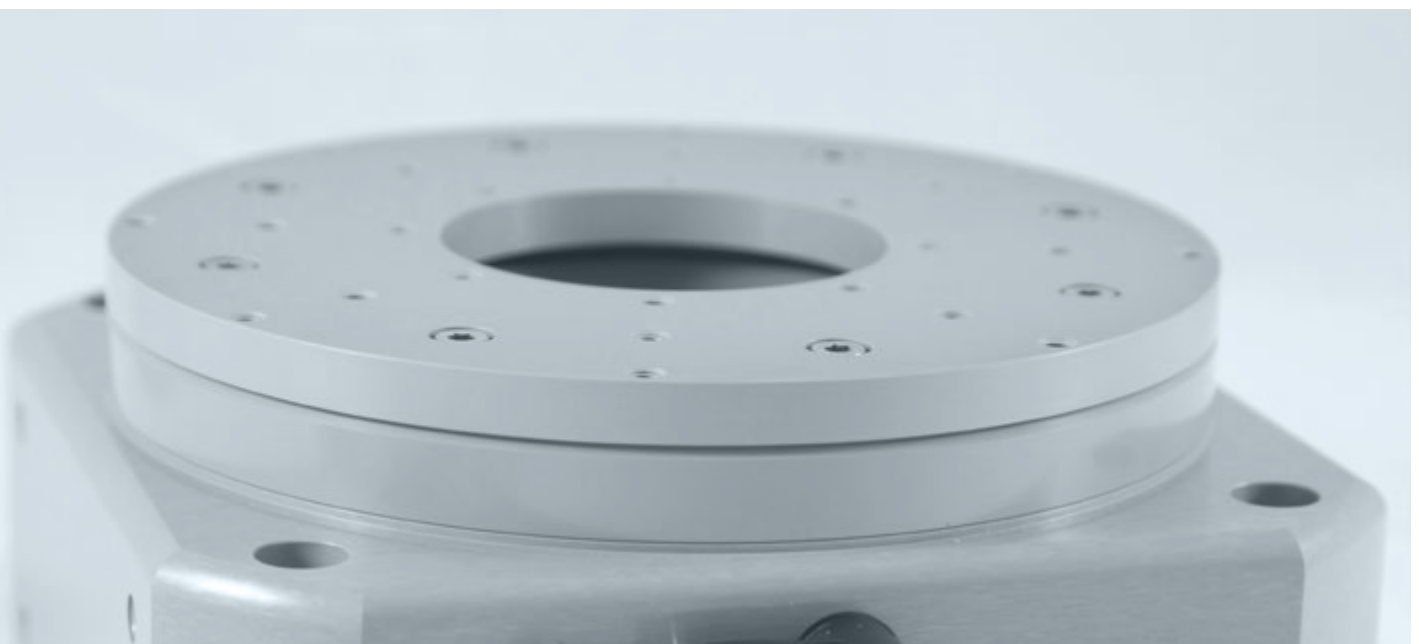
Rotary Stages

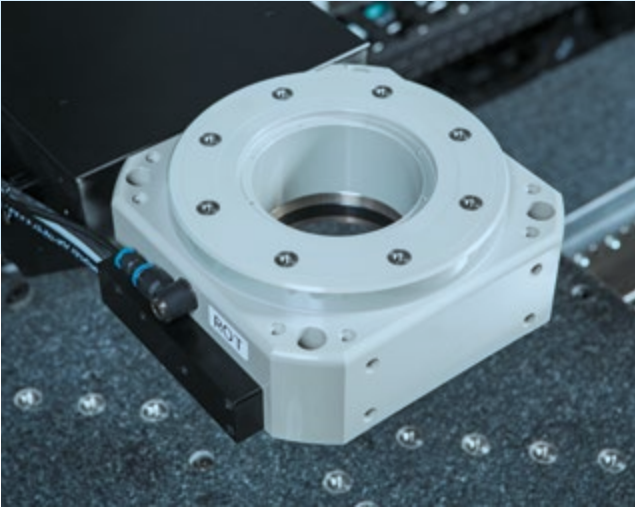
Our rotary stages are built with best-in-class air bearings and ball bearings, unique motor technology and high-performance encoder systems.

Rotary stages are equipped with specially developed ironless direct drives, which combine optimal precision and high dynamics. The dimensions are chosen to offer you the best integration in your application. Our air bearing technology combines maximum workload with high precision (error motion down to 20 nanometer) and wear-free movement.

The perfect solution for:

- ✓ Roundness measurements systems
- ✓ Micro- and nano-tomography
- ✓ Ultra-precision manufacturing
- ✓ Semiconductor industry
- ✓ Medical and research equipment
- ✓ Indexing tables
- ✓ Laser micro machining
- ✓ Aspherical micro machining





Air Bearing Stages

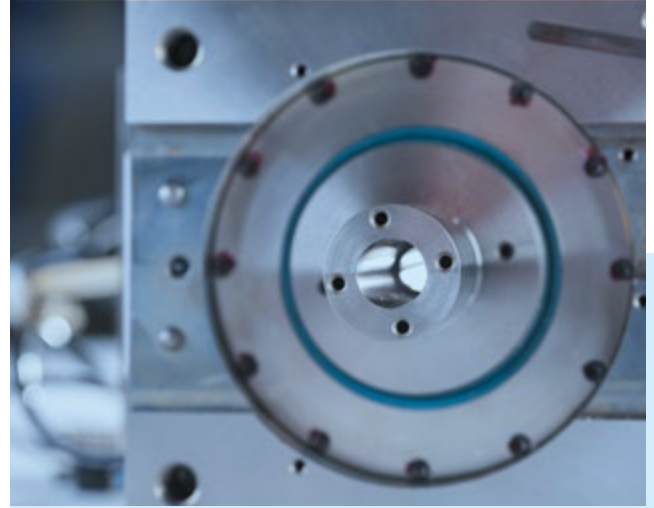
LAB's RT-S and RT-U series are your go-to choice when looking for rotary air bearing stages with superior error motion performance, high stiffness and high load-carrying capacity!

RT-S series

The low-profile design of the RT-S series houses a top-class air bearing, motor and encoder which enable excellent angular positioning and velocity stability. A large through hole facilitates slip ring integration, optical or other feedthrough for specific applications such as x-ray and optical inspection.

RT-U series

The RT-U series are best-in-class rotary stages that excel in their ultra-low error motion (below 20 nm!) and world-class motion performance. An uncompromised design fuses into an unrivalled precision and accuracy for this masterpiece of engineering. It is by far the best performing rotary stage on the market!



Ball Bearing Stages

RT-B series

The RT-B series is the optimal solution when you are looking for a robust rotary stage, without the need for a conditioned air supply! These ball bearing stages combine a high load-carrying capacity with a compact design. They provide you with a dynamic, disturbance-free drive, ready to serve any application! High-quality ball bearings ensure that the radial and axial error motions remain below 1 μm . Furthermore, LAB's RT-B series is easily integrated in any system or setup and can be equipped with MK2 conical mounts upon request.



Air Bearing Stages



RT075S
p. 14



RT100S
p. 16



RT100SX
p. 16



RT150S
p. 18

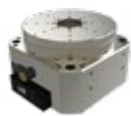


RT150SX
p. 20

TOP PLATE DIAMETER	mm	74	99	99	148,5	148,5
TOTAL HEIGHT	mm	40	50	50	65	73
AXIAL LOAD CAPACITY	N	137	264	264	434	434
RADIAL LOAD CAPACITY	N	40	78	78	226	226
AXIAL STIFFNESS	N/ μ m	68	103	103	217	217
RADIAL STIFFNESS	N/ μ m	20	39	39	113	113
TILT STIFFNESS	Nm/mrad	33	90	90	455	455
RAD. ERR. MOTION	nm	< 150	< 100	< 100	< 100	< 100
AXIAL ERR. MOTION	nm	< 50	< 50	< 50	< 50	< 50
ANGULAR ACCURACY	arcsec	\pm 13,8	\pm 10,3	\pm 10,3	\pm 6,9	\pm 6,9
NOMINAL TORQUE	Nm	0,04	0,13	0,13	0,45	0,45
PEAK TORQUE	Nm	0,13	0,40	0,40	1,35	1,35
MAX. SPEED	rpm	300	200	1200	200	725
AIR CONSUMPTION	NL/min	< 4	< 8	< 8	< 10	< 10
TOTAL MASS	kg	0,6	1,6	1,6	4,0	4,0



RT150ST
p. 22



RT150U
p. 24



RT250S
p. 26



RT250SX
p. 26



RT500S
p. 28

TOP PLATE DIAMETER	mm	148,5	150	248,5	248,5	495,5
TOTAL HEIGHT	mm	98,5	103,5	100	100	199
AXIAL LOAD CAPACITY	N	434	726	804	804	8300
RADIAL LOAD CAPACITY	N	226	264	452	452	2570
AXIAL STIFFNESS	N/μm	217	242	402	402	1660
RADIAL STIFFNESS	N/μm	113	88	226	226	514
TILT STIFFNESS	Nm/mrad	455	204	2380	2380	37400
RAD. ERR. MOTION	nm	< 100	< 20	< 100	< 100	< 100
AXIAL ERR. MOTION	nm	< 50	< 20	< 50	< 50	< 50
ANGULAR ACCURACY	arcsec	± 6,9	± 6,9	± 4,0	± 4,0	± 2,9
NOMINAL TORQUE	Nm	1,5	0,5	1,5	1,5	3,0
PEAK TORQUE	Nm	2,5	1,5	4,5	4,5	9,0
MAX. SPEED	rpm	725	200	90	150	60
AIR CONSUMPTION	NL/min	< 10	< 20	< 15	< 15	< 100
TOTAL MASS	kg	6,2	15,2	16,5	16,5	175



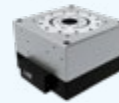
Ball Bearing Stages



RT100B
p. 30



RT100BT
p. 32



RT150B
p. 34



RT200BT
p. 36

TOP PLATE DIAMETER	mm	99	99	150	200
TOTAL HEIGHT	mm	68	76	105	138
AXIAL LOAD CAPACITY	N	300	300	740	1000
RADIAL LOAD CAPACITY	N	200	200	1525	670
AXIAL STIFFNESS	N/μm	100	100	160	175
RADIAL STIFFNESS	N/μm	200	200	320	366
RAD. ERR. MOTION	μm	< 1	< 2	< 1	< 2
AXIAL ERR. MOTION	μm	< 1	< 1	< 1	< 1
ANGULAR ACCURACY	arcsec	± 10,3	± 10,3	± 6,9	± 6,9
NOMINAL TORQUE	Nm	0,3	0,9	0,5	9
PEAK TORQUE	Nm	0,6	1,4	1,5	12
MAX. SPEED	rpm	200	1000	400	100
TOTAL MASS	kg	3,9	5	17,3	25

RT-series Calculations

Incremental encoders

Resolution: $resolution [arcsec] = \frac{360 \times 3600}{interpolation\ factor \times \#periods}$

$$1\ arcsec = \frac{1 \times 2\pi \times 10^6}{3600 \times 360} = 4,848\ \mu rad$$

Interpolation factor:

4x	20x	40x	100x	200x	400x	1000x	2000x	4000x	10000x	20000x
----	-----	-----	------	------	------	-------	-------	-------	--------	--------

Periods:

RT075	RT100	RT150	RT250	RT500
11840	15744	23600	40000	47200

Example:

RT100S with interpolation factor 20x

$$Encoder\ resolution = \frac{360 \times 3600}{20 \times 15744} = 4,12\ arcsec$$

$$Stage\ repeatability\ (typical) = 4,12 \times 2 = 8,24\ arcsec$$

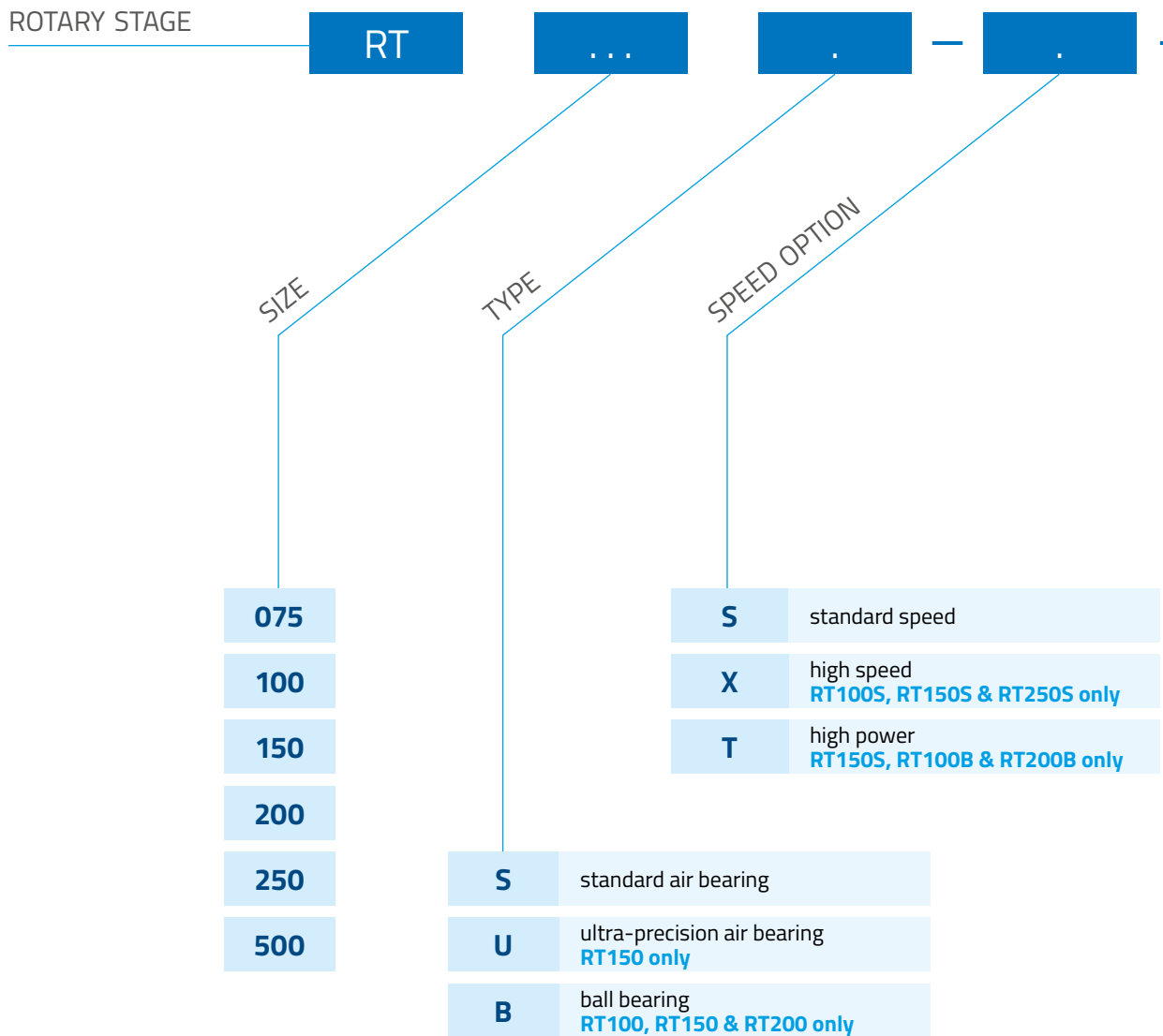
Absolute encoders

A stage with absolute encoder doesn't require a homing procedure. In addition a high encoder resolution doesn't compromise the stages maximum speed with the BiSS C communication protocol. Contact the LAB sales team for more info and other protocols.

Resolution:

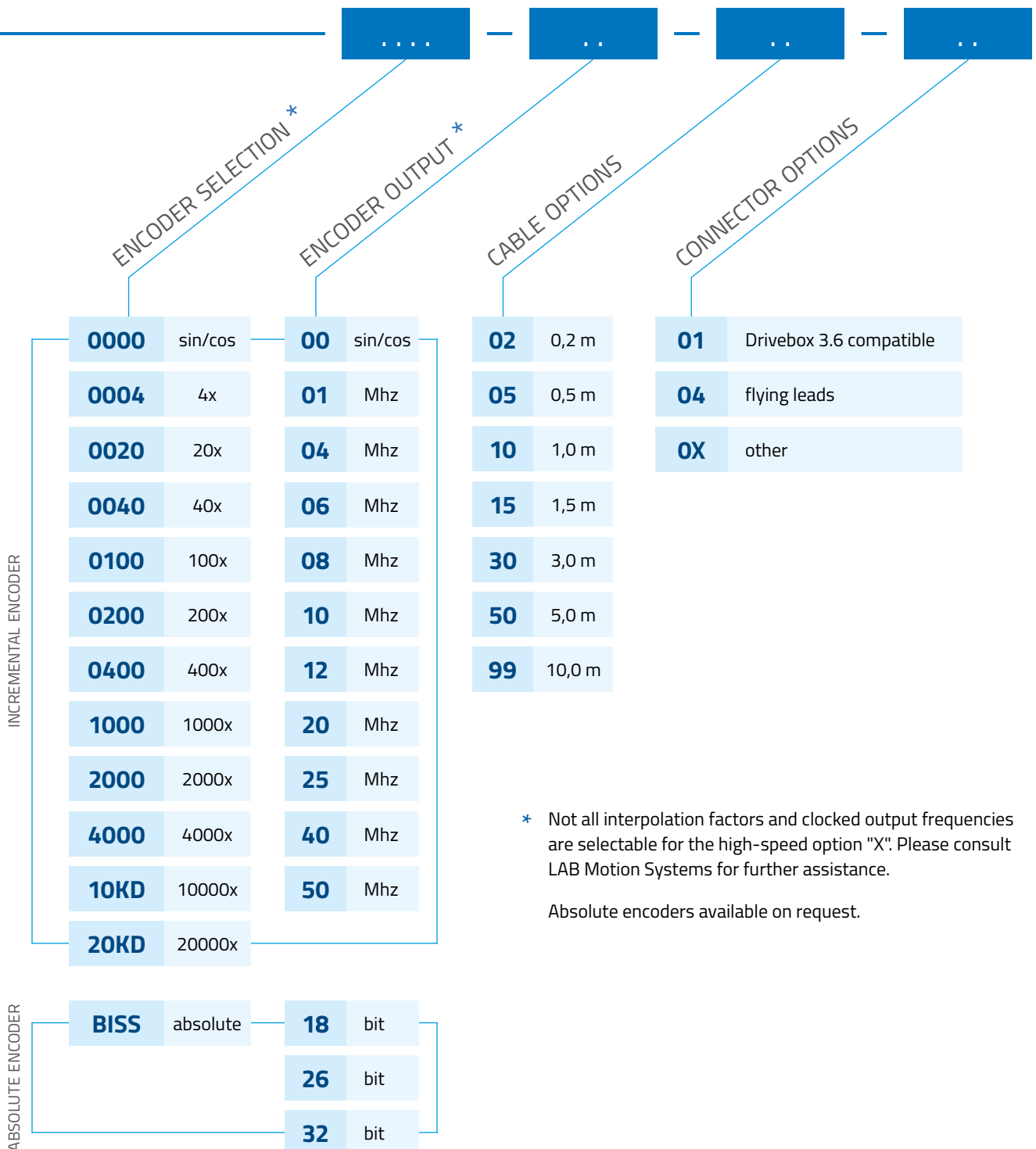
Resolution	Counts per revolution	Arc second
18 bit	262 144	≈ 4,94
26 bit	67 108 864	≈ 0,019
32 bit	4 294 967 296	≈ 0,00030

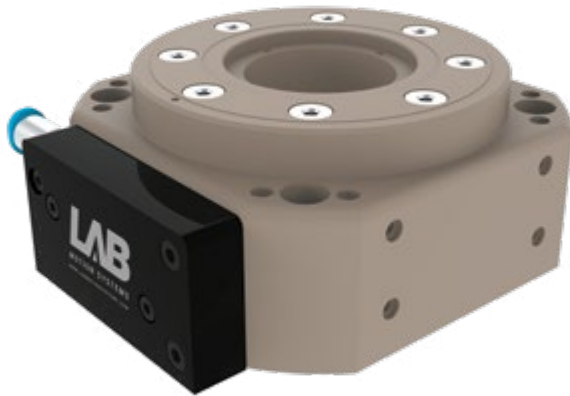
RT-series Order Codes



Example *RT150S - S - 0200 - 20 - 30 - 01*

RT150S air bearing rotary table with standard speed option, an encoder with 200x interpolation and 20 Mhz clocked output frequency, 3,0 m cable length and Drivebox DB 3.6 compatible connectors.





Air Bearing

MAX. AXIAL LOAD	N	137
MAX. RADIAL LOAD	N	40
AXIAL STIFFNESS *	N/ μ m	68
RADIAL STIFFNESS *	N/ μ m	20
TILT STIFFNESS *	Nm/mrad	33
RAD. ERR. MOTION ***	nm LSC	< 150
AXIAL ERR. MOTION ***	nm LSC	< 50
WOBBLE **	arcsec	typical
AIR CONSUMPTION	NL/min	< 4
TOTAL MASS	kg	0,6
ANGULAR ACCURACY	arcsec	\pm 13,8
MATERIAL		coated aluminium

Motor & Encoder

NOMINAL TORQUE	Nm	0,04
PEAK TORQUE	Nm	0,13
MAX. SPEED	rpm	300
ENCODER ****	periods	11840
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

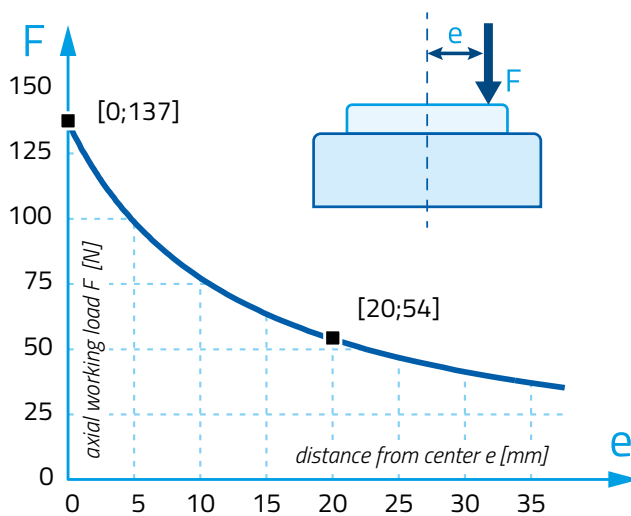
RT075S

All data valid at 5 bar air pressure.

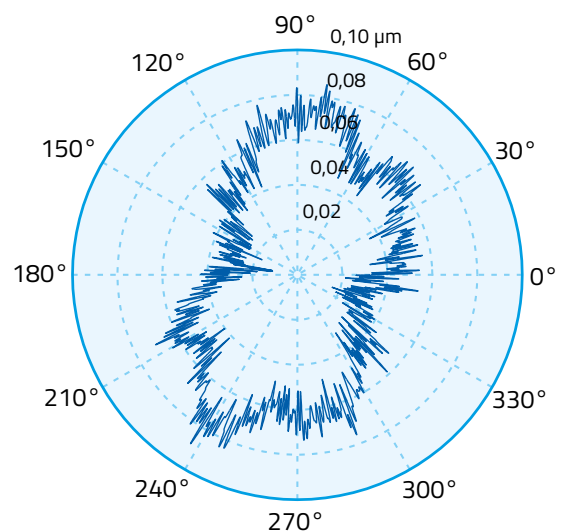
- * Tolerance on value +/- 20%
- ** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 100 mm above top surface.

****Absolute encoder also available

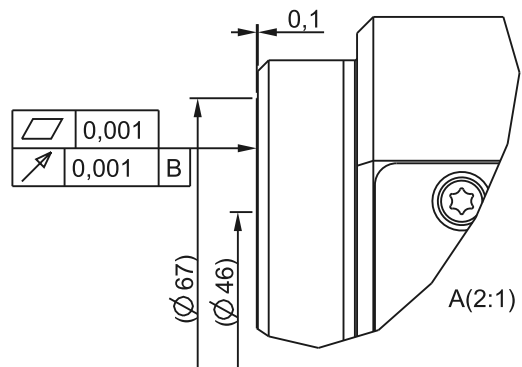
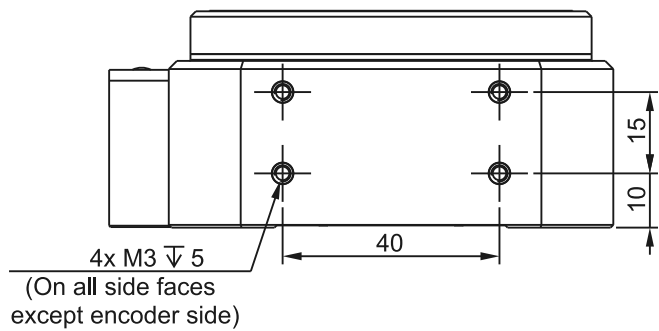
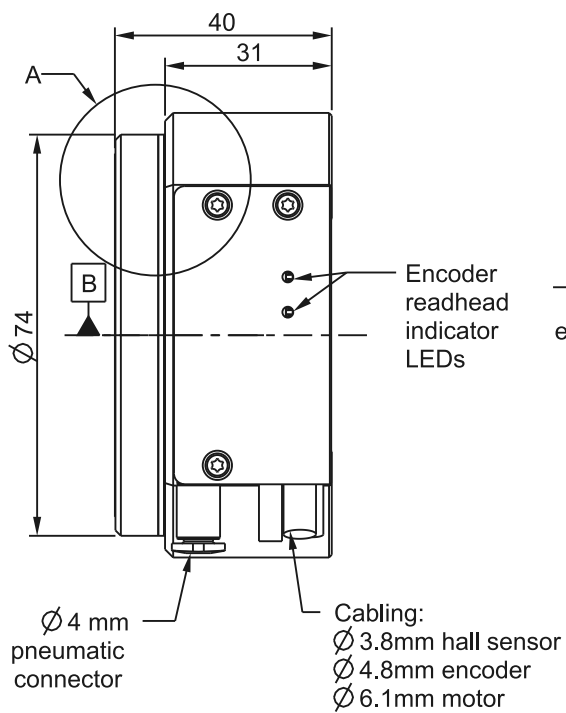
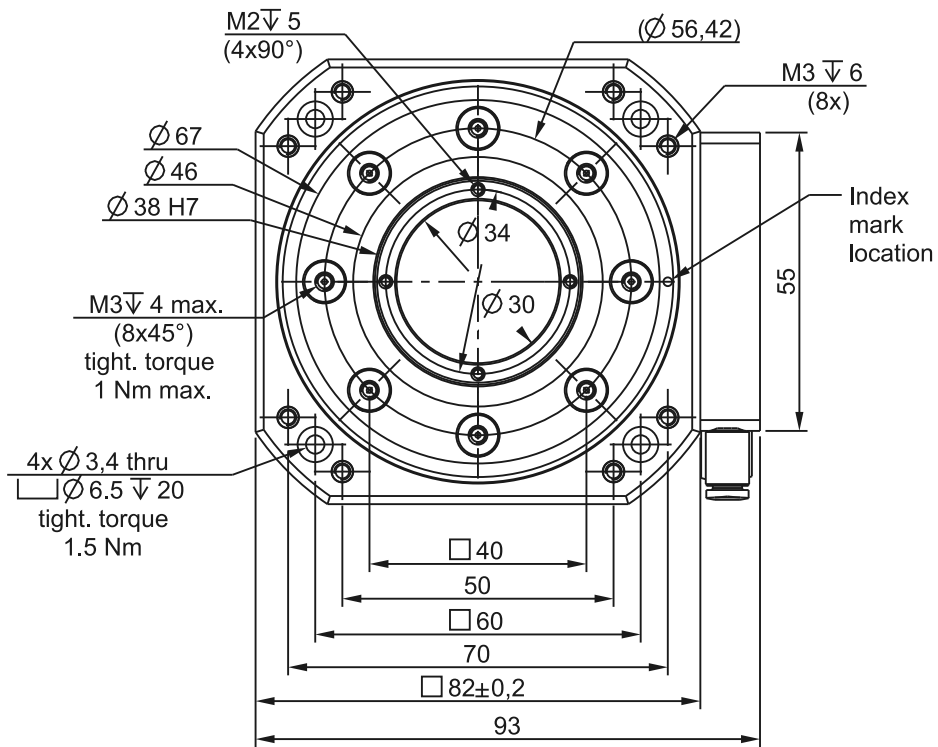


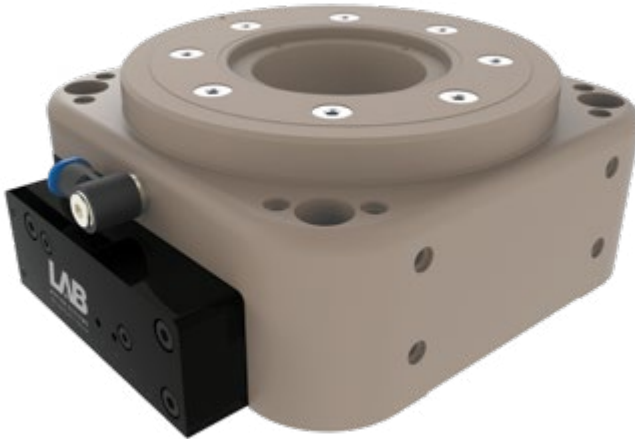
Max. working load vs. eccentricity



Roundness

error motion (typical value): LSC $\Delta r = 78,6$ nm
filter: 360 UPR, 1 revolution (9,6 rpm)





Air Bearing

MAX. AXIAL LOAD	N	264
MAX. RADIAL LOAD	N	78
AXIAL STIFFNESS *	N/ μ m	103
RADIAL STIFFNESS *	N/ μ m	39
TILT STIFFNESS *	Nm/mrad	90
RAD. ERR. MOTION ***	nm LSC	< 100
AXIAL ERR. MOTION ***	nm LSC	< 50
WOBBLE **	arcsec	typical
AIR CONSUMPTION	NL/min	< 8
TOTAL MASS	kg	1,6
ANGULAR ACCURACY	arcsec	$\pm 10,3$
MATERIAL		coated aluminium

Motor & Encoder

NOMINAL TORQUE	Nm	0,13
PEAK TORQUE	Nm	0,40
MAX. SPEED RT100S	rpm	200
MAX. SPEED RT100SX	rpm	1200
ENCODER ****	periods	15744
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

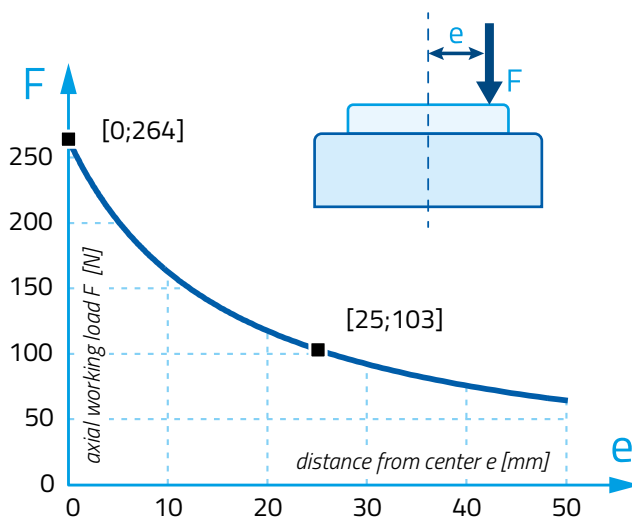
RT100S and RT100SX

All data valid at 5 bar air pressure.

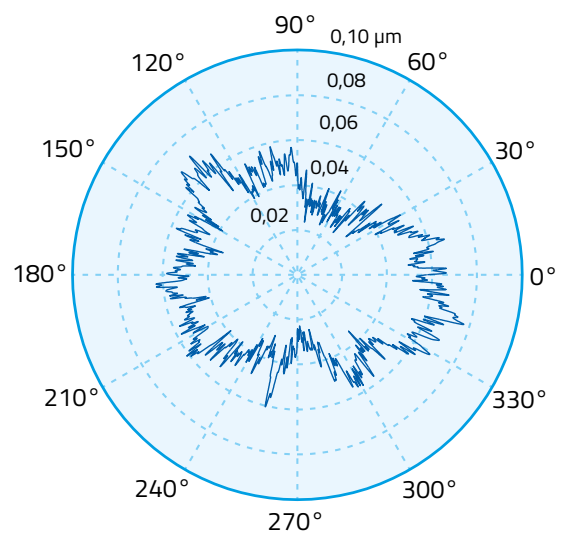
- * Tolerance on value +/- 20%
- ** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 111 mm above top surface.

**** Absolute encoder also available

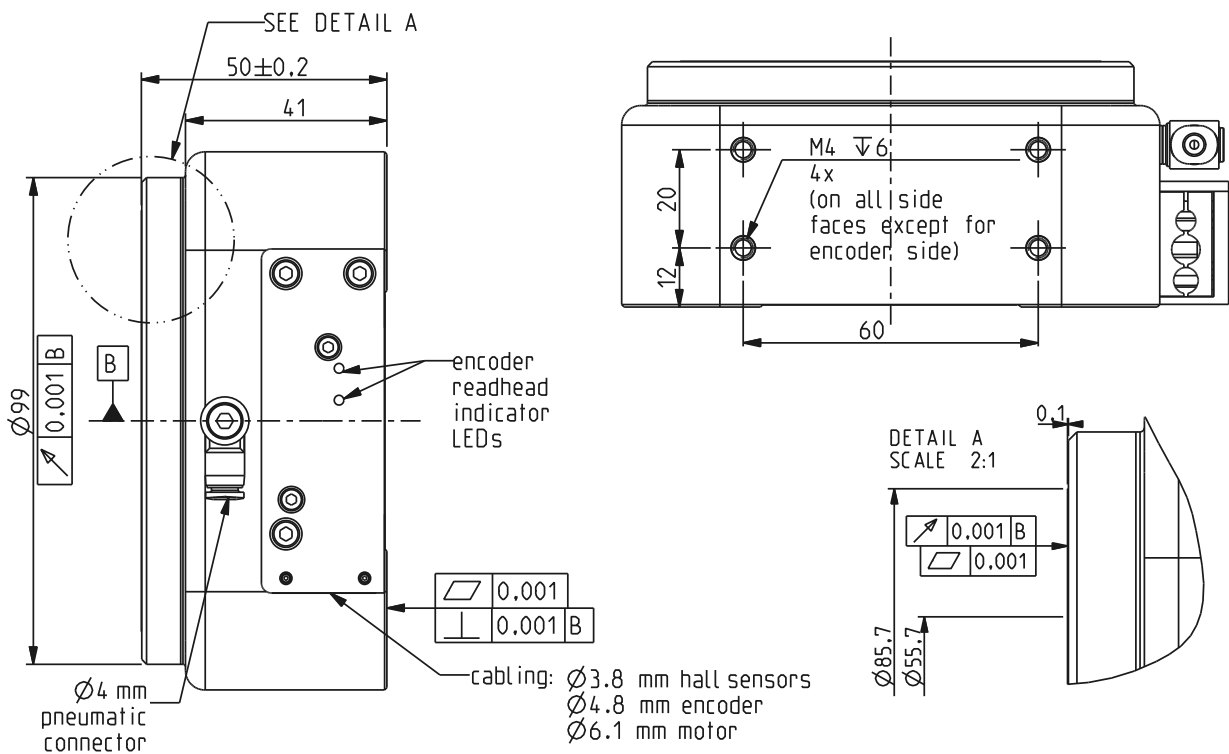
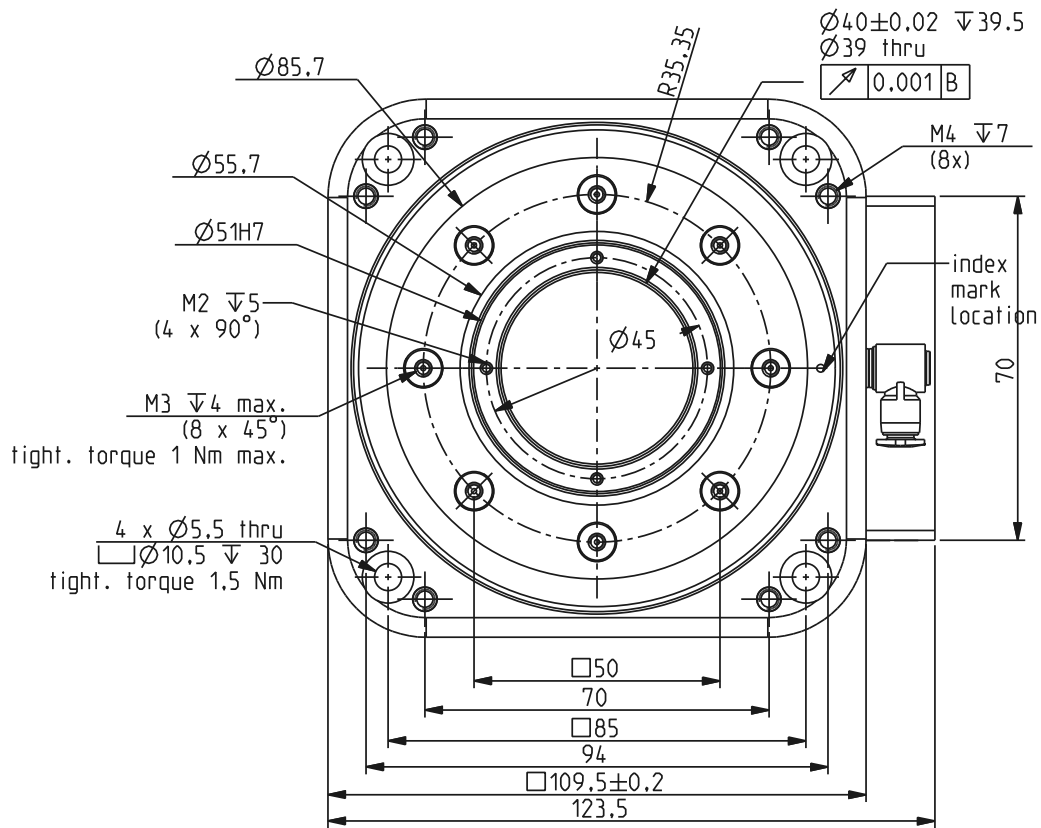


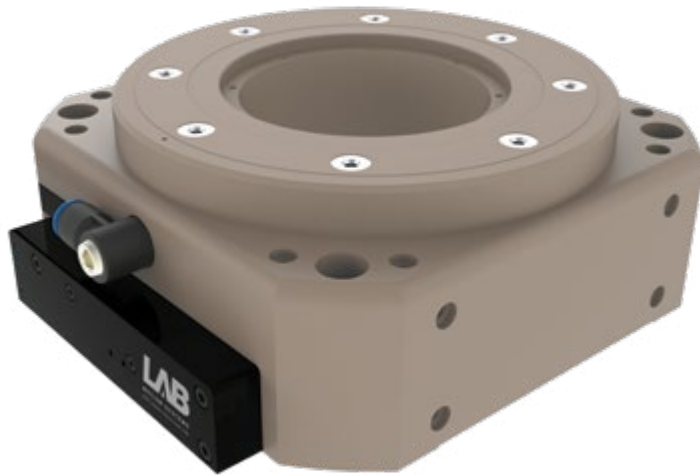
Max. working load vs. eccentricity



Roundness

error motion (typical value): LSC $\Delta r = 52,9$ nm
filter: 360 UPR, 1 revolution (9,6 rpm)





Air Bearing

MAX. AXIAL LOAD	N	434
MAX. RADIAL LOAD	N	226
AXIAL STIFFNESS *	N/ μ m	217
RADIAL STIFFNESS *	N/ μ m	113
TILT STIFFNESS *	Nm/mrad	455
RAD. ERR. MOTION ***	nm LSC	< 100
AXIAL ERR. MOTION ***	nm LSC	< 50
WOBBLE **	arcsec	typical
AIR CONSUMPTION	NL/min	< 10
TOTAL MASS	kg	4,0
ANGULAR ACCURACY	arcsec	\pm 6,9
MATERIAL		coated aluminium

Motor & Encoder

NOMINAL TORQUE	Nm	0,45
PEAK TORQUE	Nm	1,35
MAX. SPEED	rpm	200
ENCODER ****	periods	23600
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

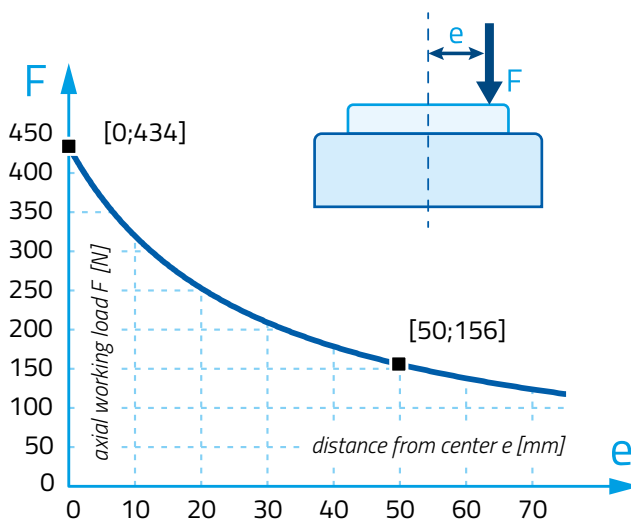
RT150S

All data valid at 5 bar air pressure.

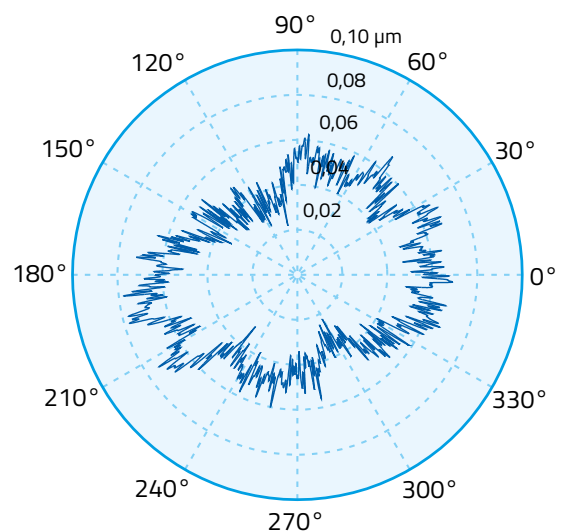
- * Tolerance on value +/- 20%
- ** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 106 mm above top surface.

****Absolute encoder also available

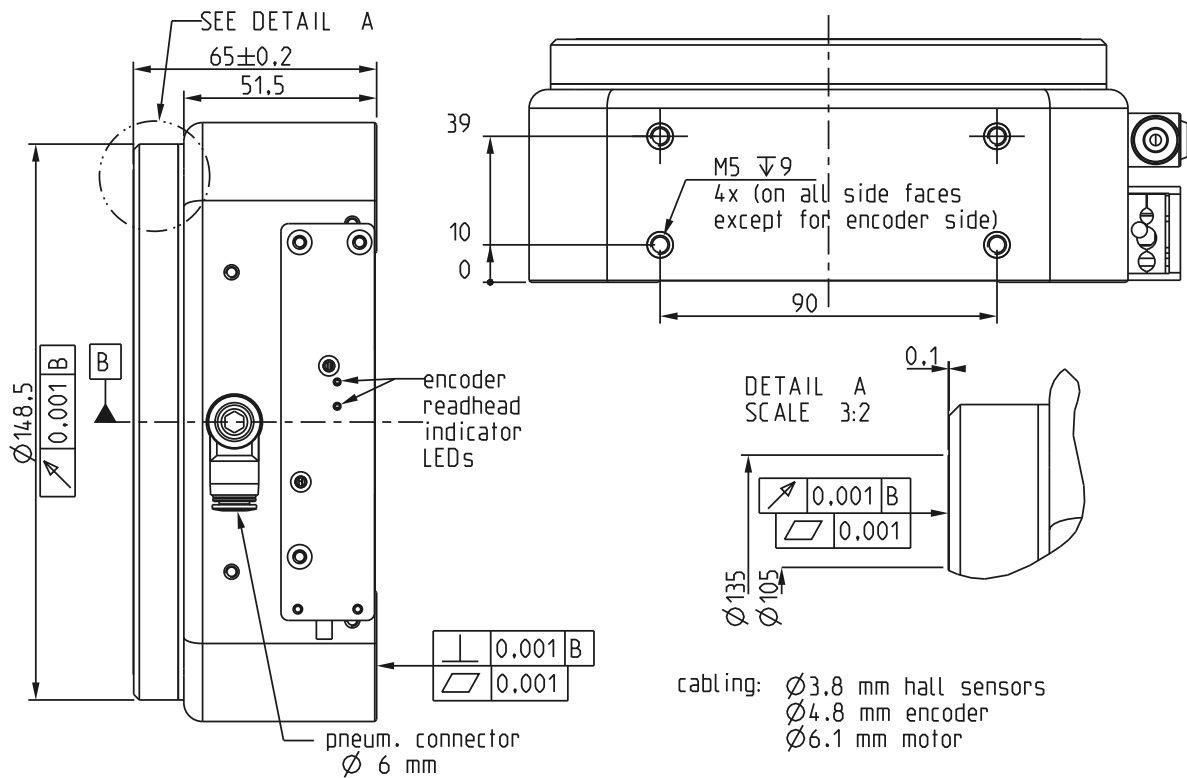
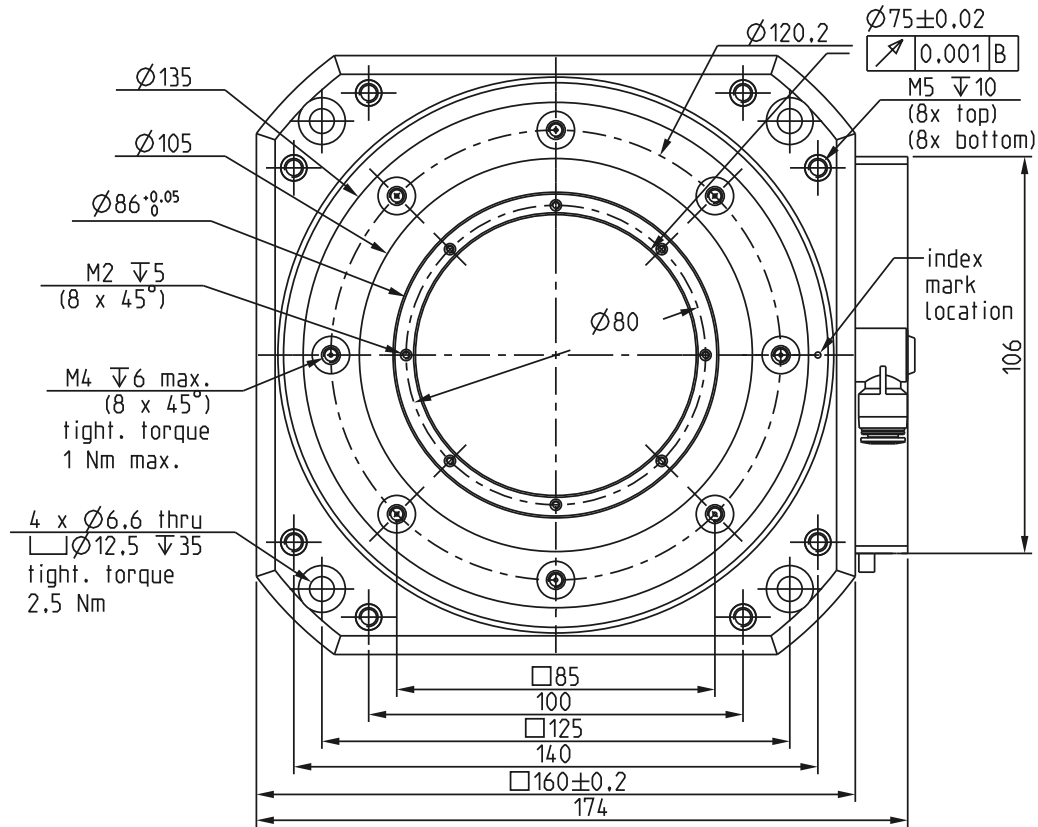


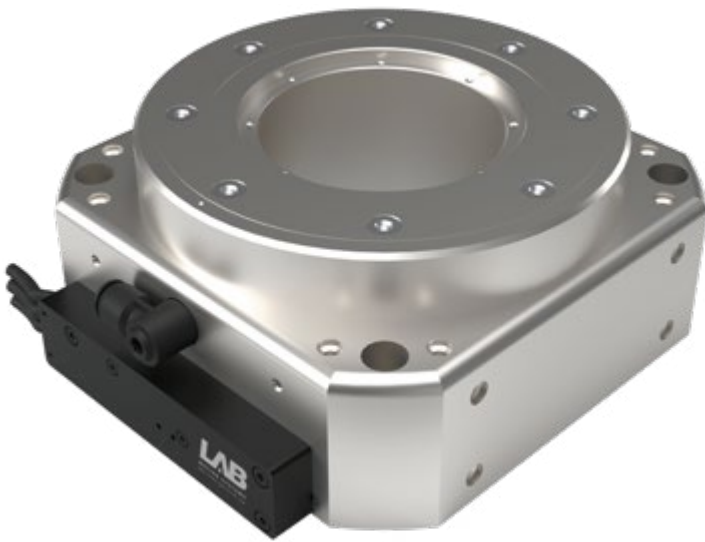
Max. working load vs. eccentricity



Roundness

error motion (typical value): LSC $\Delta r = 54,8$ nm
filter: 360 UPR, 1 revolution (9,6 rpm)





Air Bearing

MAX. AXIAL LOAD	N	434
MAX. RADIAL LOAD	N	226
AXIAL STIFFNESS *	N/ μ m	217
RADIAL STIFFNESS *	N/ μ m	113
TILT STIFFNESS *	Nm/mrad	455
RAD. ERR. MOTION ***	nm LSC	< 100
AXIAL ERR. MOTION ***	nm LSC	< 50
WOBBLE **	arcsec	typical
AIR CONSUMPTION	NL/min	< 10
TOTAL MASS	kg	4,0
ANGULAR ACCURACY	arcsec	\pm 6,9
MATERIAL		coated aluminium

Motor & Encoder

NOMINAL TORQUE	Nm	0,45
PEAK TORQUE	Nm	1,35
MAX. SPEED	rpm	725
ENCODER ****	periods	23600
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

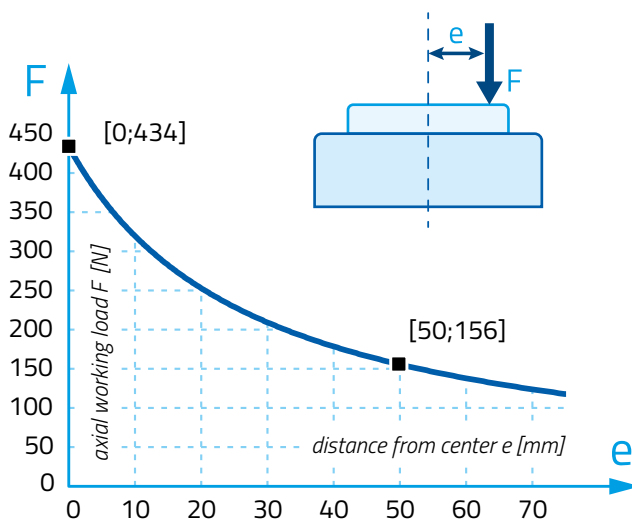
RT150SX

All data valid at 5 bar air pressure.

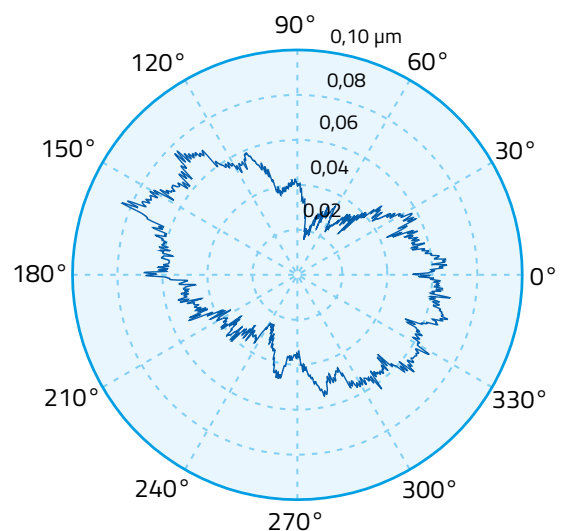
- * Tolerance on value +/- 20%
- ** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 106 mm above top surface.

**** Absolute encoder also available

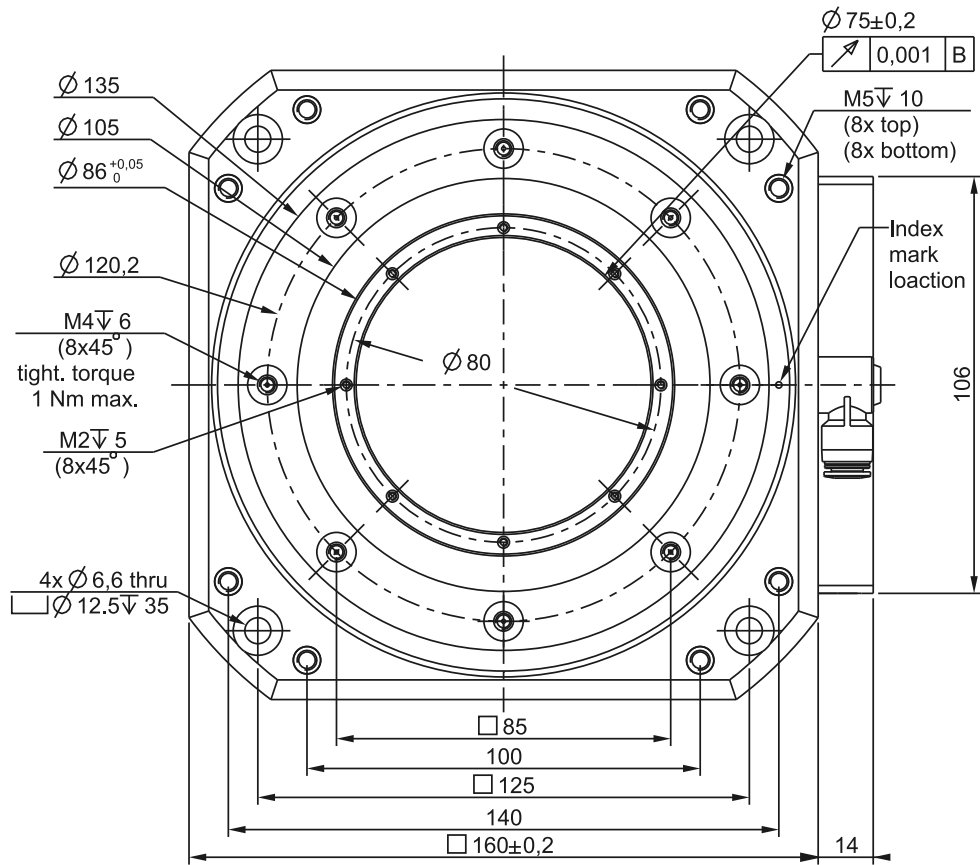


Max. working load vs. eccentricity

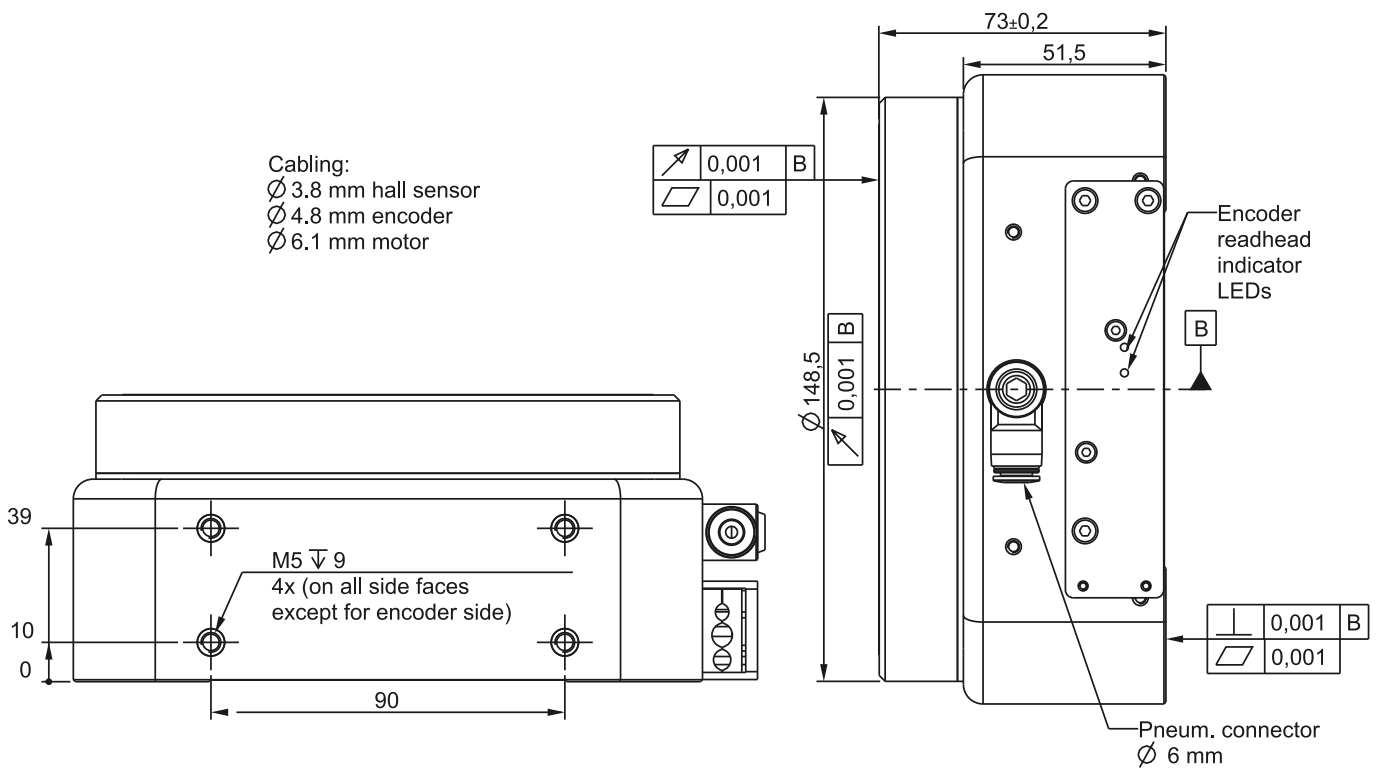


Roundness

error motion (typical value): LSC $\Delta r = 69,3$ nm
filter: 360 UPR, 5 revolutions (10 rpm)



Cabling:
 $\varnothing 3.8$ mm hall sensor
 $\varnothing 4.8$ mm encoder
 $\varnothing 6.1$ mm motor





Air Bearing

MAX. AXIAL LOAD	N	434
MAX. RADIAL LOAD	N	226
AXIAL STIFFNESS *	N/ μ m	217
RADIAL STIFFNESS *	N/ μ m	113
TILT STIFFNESS *	Nm/mrad	455
RAD. ERR. MOTION ***	nm LSC	< 100
AXIAL ERR. MOTION ***	nm LSC	< 50
WOBBLE **	arcsec	typical
AIR CONSUMPTION	NL/min	< 10
TOTAL MASS	kg	6,2
ANGULAR ACCURACY	arcsec	\pm 6,9
MATERIAL		coated aluminium

Motor & Encoder

NOMINAL TORQUE	Nm	1,5
PEAK TORQUE	Nm	2,5
MAX. SPEED	rpm	725
ENCODER ****	periods	23600
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

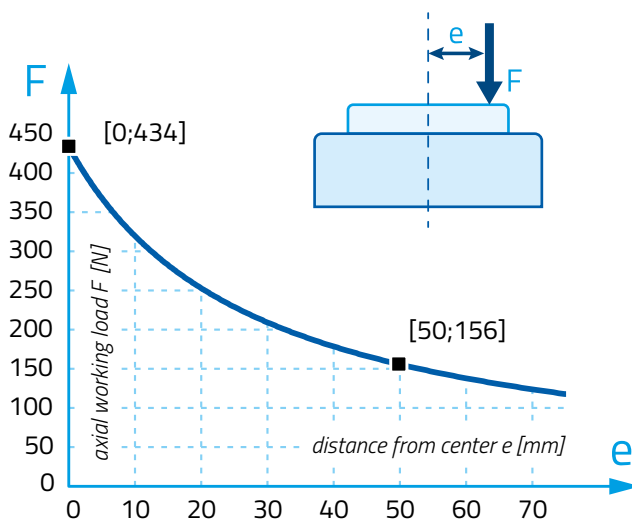
RT150ST

All data valid at 5 bar air pressure.

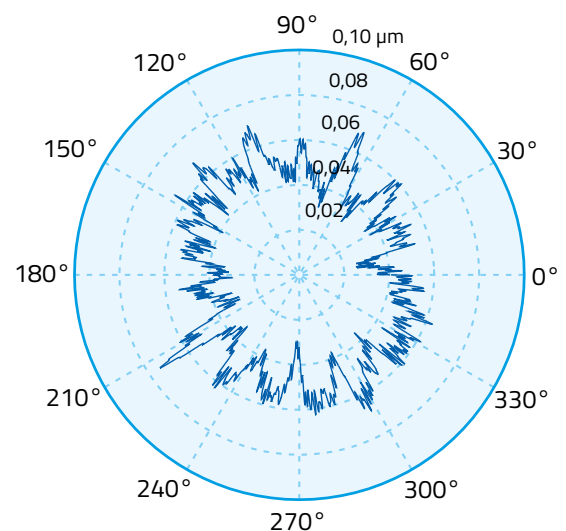
- * Tolerance on value +/- 20%
- ** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 106 mm above top surface.

****Absolute encoder also available

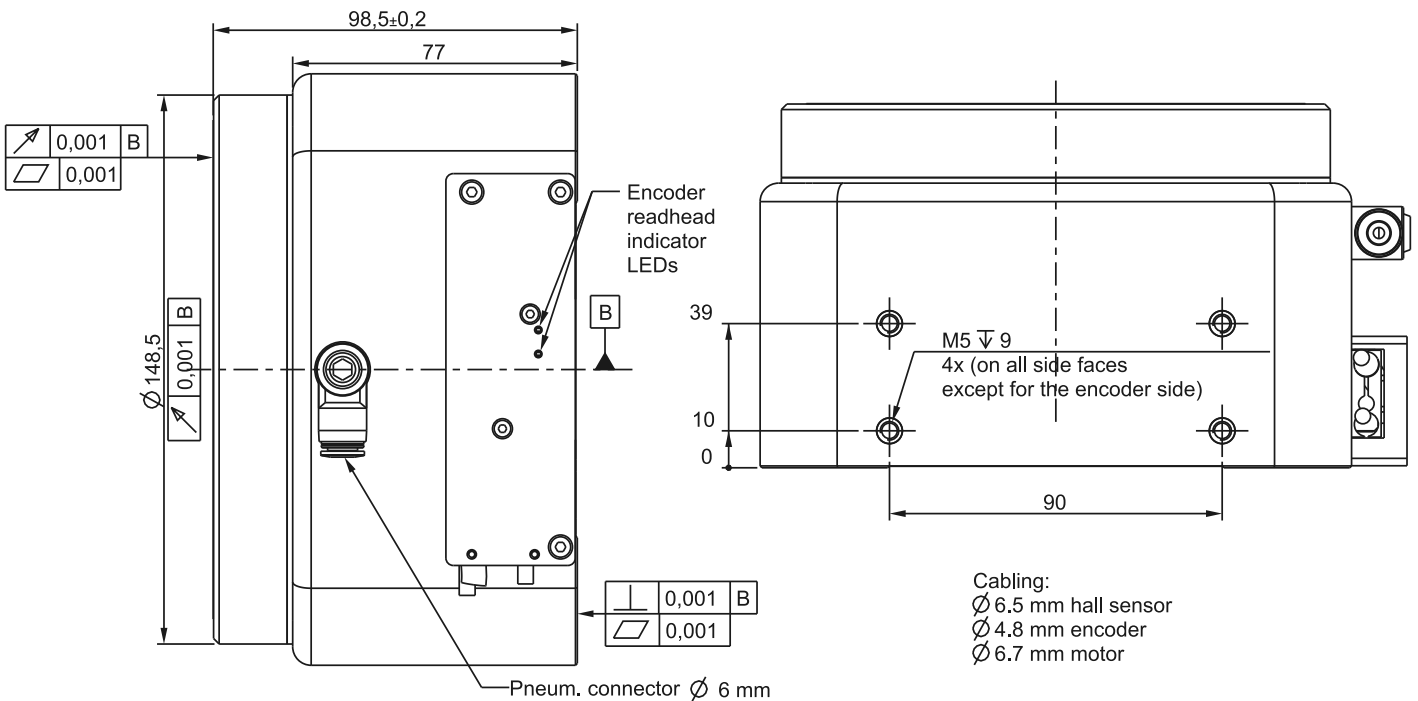
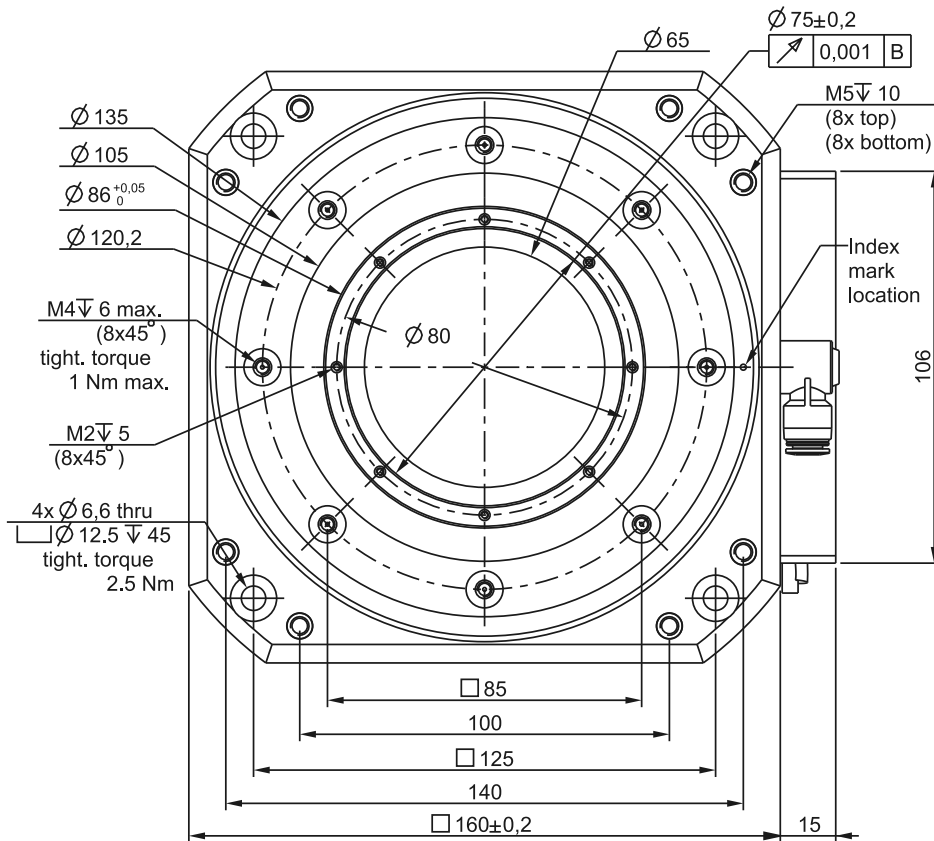


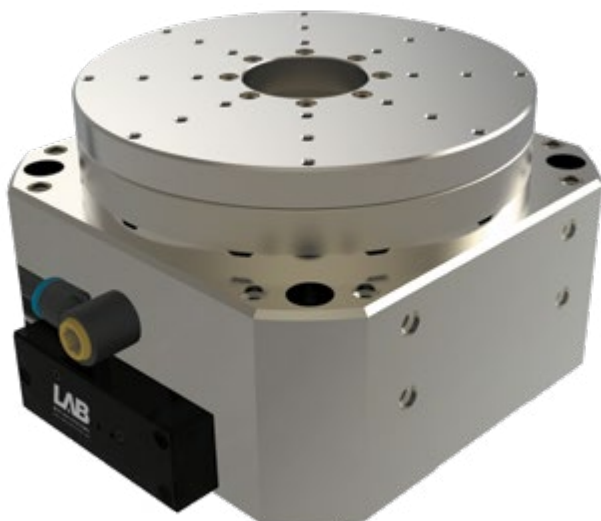
Max. working load vs. eccentricity



Roundness

error motion (typical value): LSC $\Delta r = 48,6$ nm
filter: 360 UPR, 5 revolutions (10 rpm)





Air Bearing



MAX. AXIAL LOAD	N	726
MAX. RADIAL LOAD	N	264
AXIAL STIFFNESS *	N/ μ m	242
RADIAL STIFFNESS *	N/ μ m	88
TILT STIFFNESS *	Nm/mrad	204
RAD. ERR. MOTION ***	nm LSC	< 20
AXIAL ERR. MOTION ***	nm LSC	< 20
WOBBLE **	arcsec	typical
AIR CONSUMPTION	NL/min	< 20
TOTAL MASS	kg	15,2
ANGULAR ACCURACY	arcsec	\pm 6,9
MATERIAL		stainless steel



Motor & Encoder

NOMINAL TORQUE	Nm	0,5
PEAK TORQUE	Nm	1,5
MAX. SPEED	rpm	200
ENCODER ****	periods	23600
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

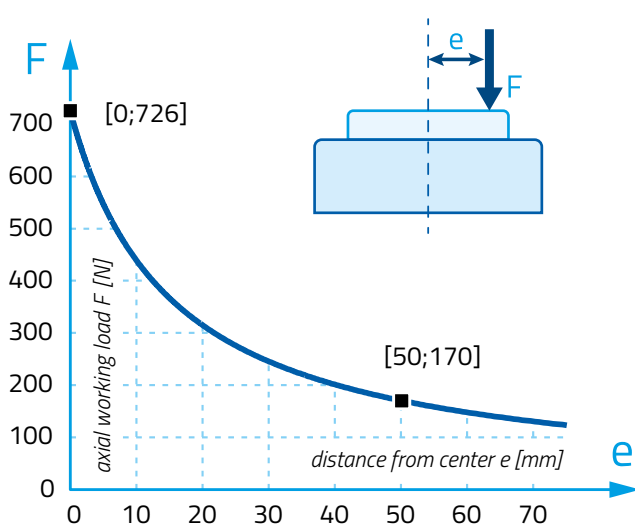
RT150U

All data valid at 5 bar air pressure.

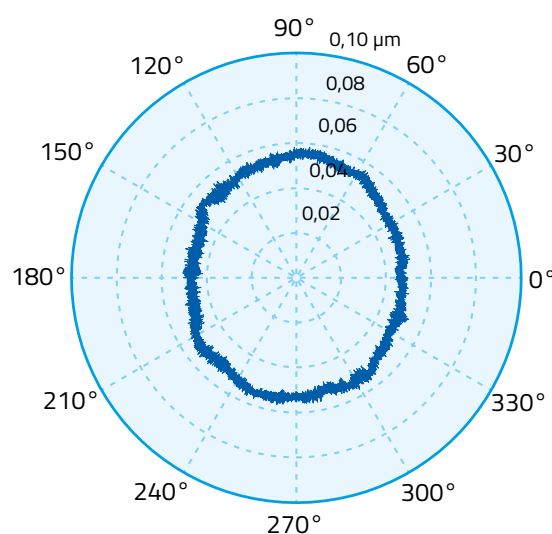
- * Tolerance on value +/- 20%
- ** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 95 mm above top surface.

**** Absolute encoder also available

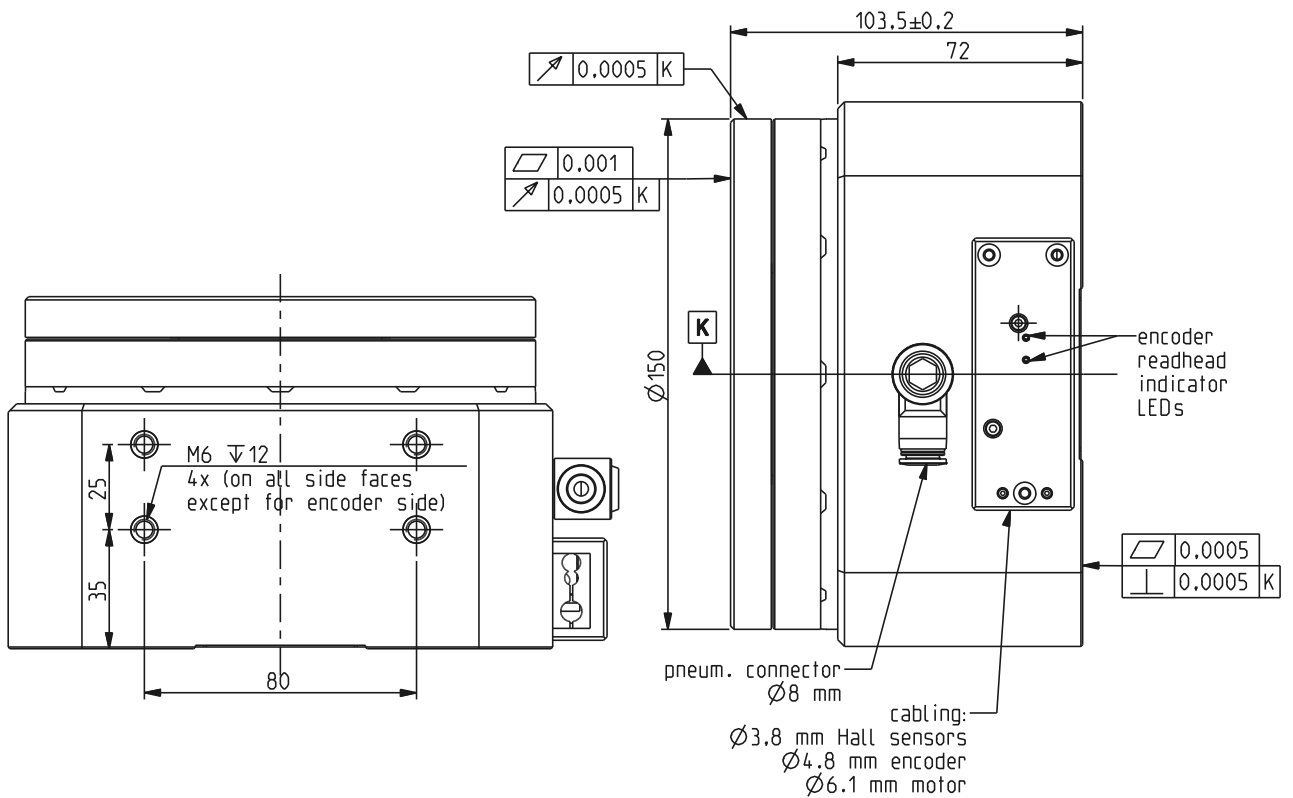
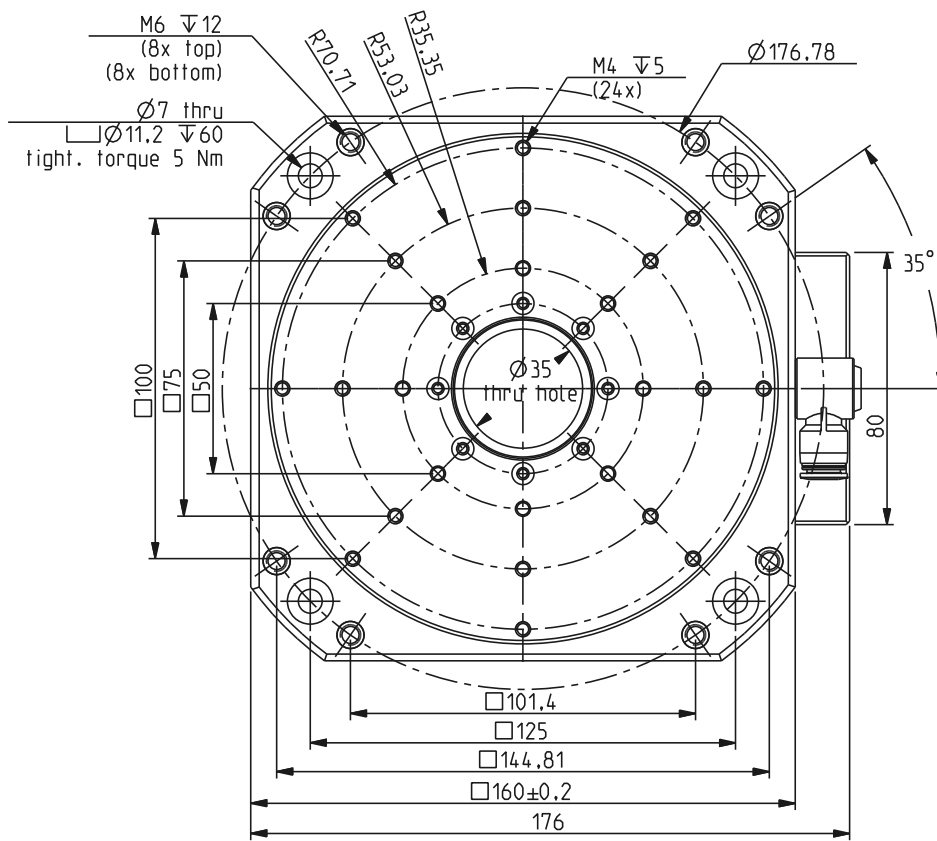


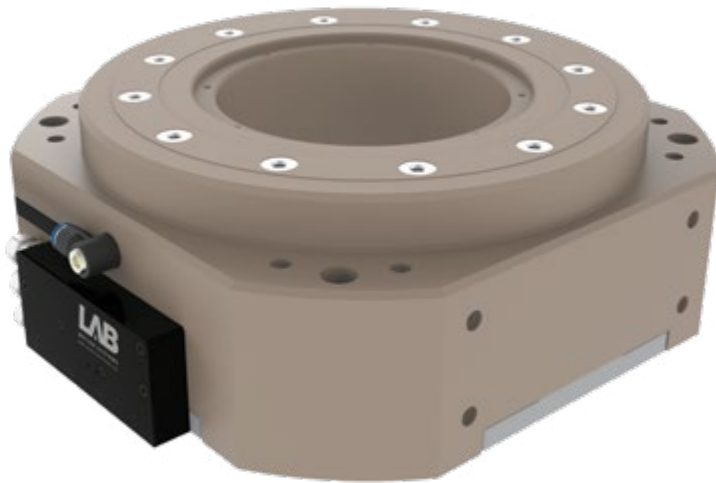
Max. working load vs. eccentricity



Roundness

error motion (typical value): LSC $\Delta r = 16,6$ nm
filter: none, 10 revolutions (2 rpm)





Air Bearing

MAX. AXIAL LOAD	N	804
MAX. RADIAL LOAD	N	452
AXIAL STIFFNESS *	N/μm	402
RADIAL STIFFNESS *	N/μm	226
TILT STIFFNESS *	Nm/mrad	2380
RAD. ERR. MOTION ***	nm LSC	< 100
AXIAL ERR. MOTION ***	nm LSC	< 50
WOBBLE **	arcsec	typical
AIR CONSUMPTION	NL/min	< 15
TOTAL MASS	kg	16,5
ANGULAR ACCURACY	arcsec	± 4,0
MATERIAL		coated aluminium

Motor & Encoder

NOMINAL TORQUE	Nm	1,5
PEAK TORQUE	Nm	4,5
MAX. SPEED RT250S	rpm	90
MAX. SPEED RT250SX	rpm	150
ENCODER ****	periods	40000
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

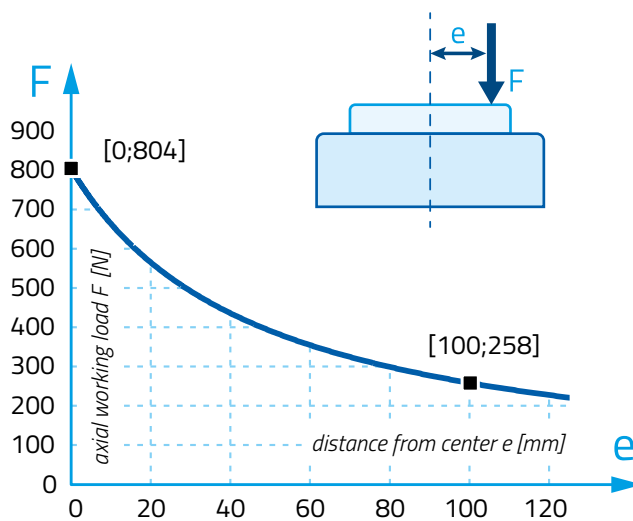
RT250S and RT250SX

All data valid at 5 bar air pressure.

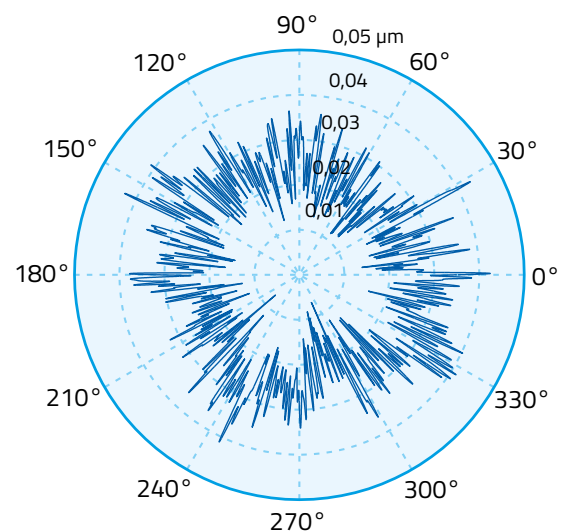
- * Tolerance on value +/- 20%
- ** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 141 mm above top surface.

**** Absolute encoder also available

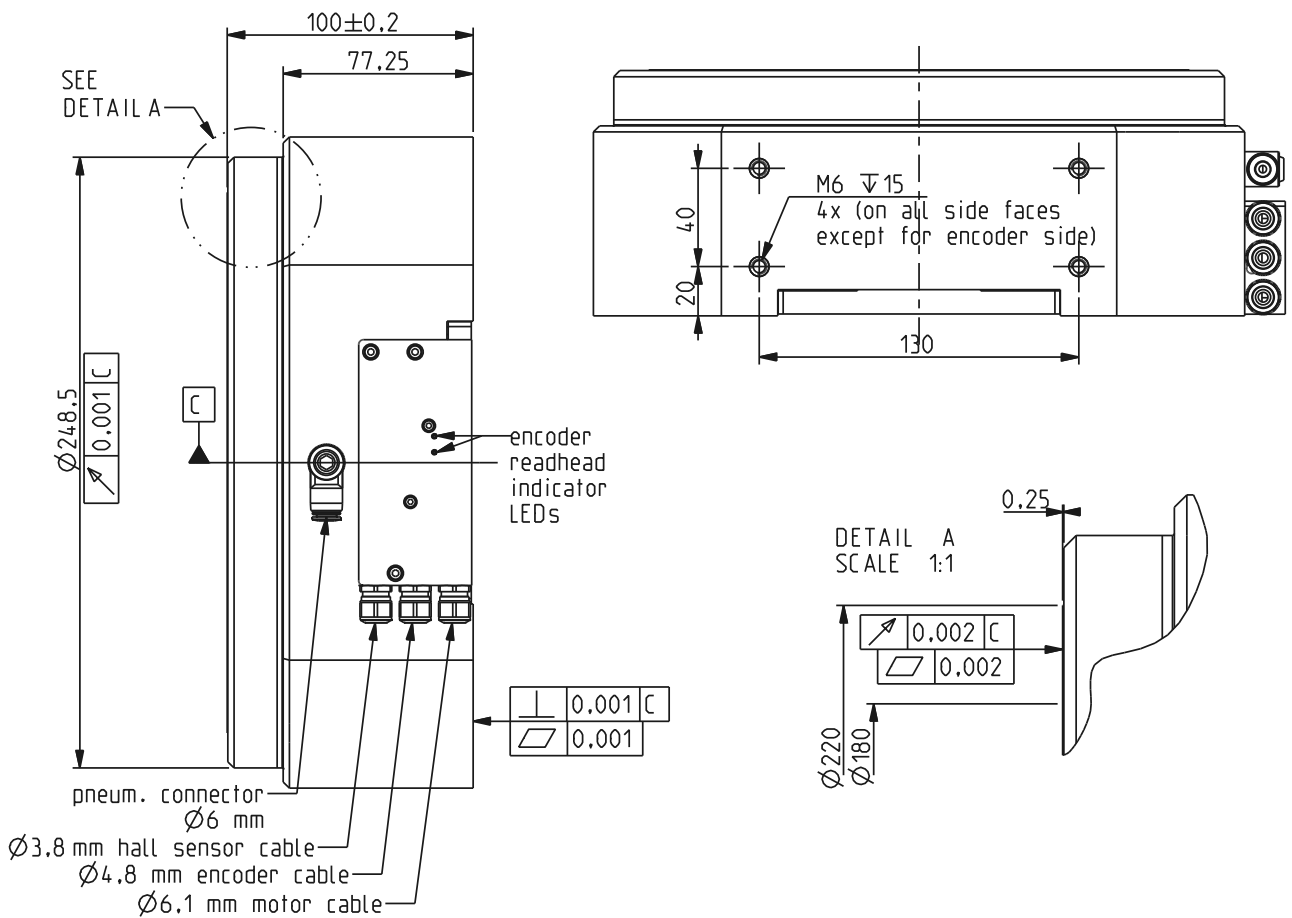
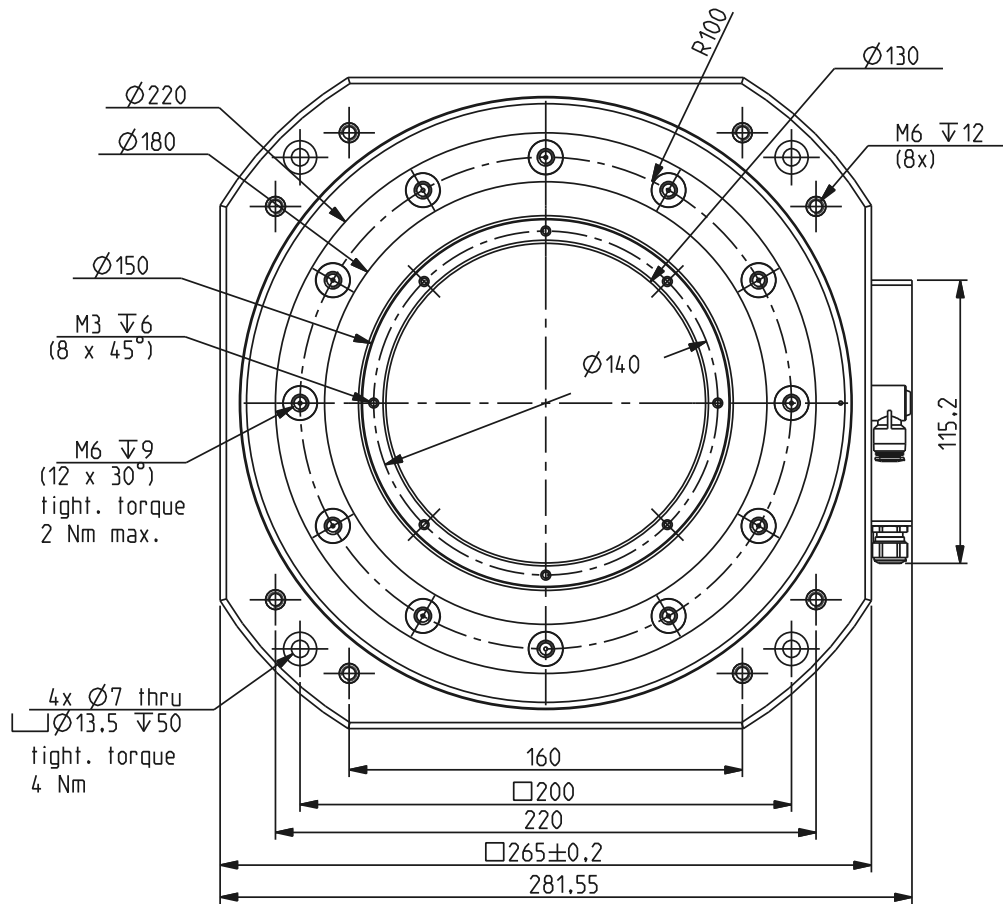


Max. working load vs. eccentricity



Roundness

error motion (typical value): LSC $\Delta r = 36,6$ nm
filter: 360 UPR, 1 revolution (9,6 rpm)



Supply voltage 48 V DC only.

Required flatness for mounting surfaces is 1 μ m (rotor and stator).

Contact LAB Motion Systems support for advice on side-mounting requirements.



Air Bearing

MAX. AXIAL LOAD	N	8300
MAX. RADIAL LOAD	N	2570
MAX. TILT LOAD	Nm	748
AXIAL STIFFNESS *	N/μm	1660
RADIAL STIFFNESS *	N/μm	514
TILT STIFFNESS *	Nm/mrad	37400
RAD. ERR. MOTION ***	nm LSC	< 100
AXIAL ERR. MOTION ***	nm LSC	< 50
WOBBLE **	arcsec	typical
AIR CONSUMPTION	NL/min	< 100
TOTAL MASS	kg	175
ANGULAR ACCURACY	arcsec	± 2,9
MATERIAL		stainless steel

Motor & Encoder

NOMINAL TORQUE	Nm	3,0
PEAK TORQUE	Nm	9,0
MAX. SPEED	rpm	60
ENCODER ****	periods	47200
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

RT500S

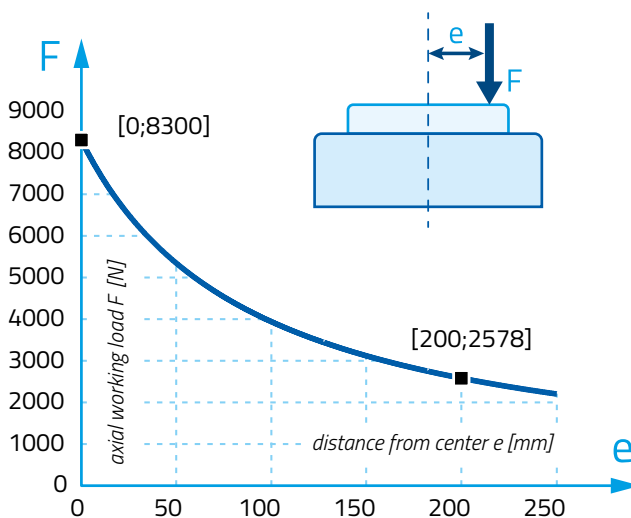
All data valid at 5 bar air pressure.

- * Tolerance on value +/- 20%
- ** Measurement report of the wobble error motion can be provided on request.

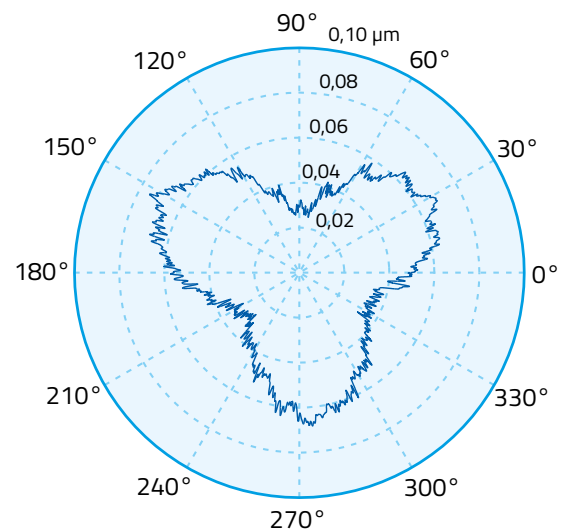
*** Error motion measured on spherical artefact with center at 175 mm above top surface.

**** Absolute encoder also available

***** Custom granite base can be supplied by LAB Motion Systems

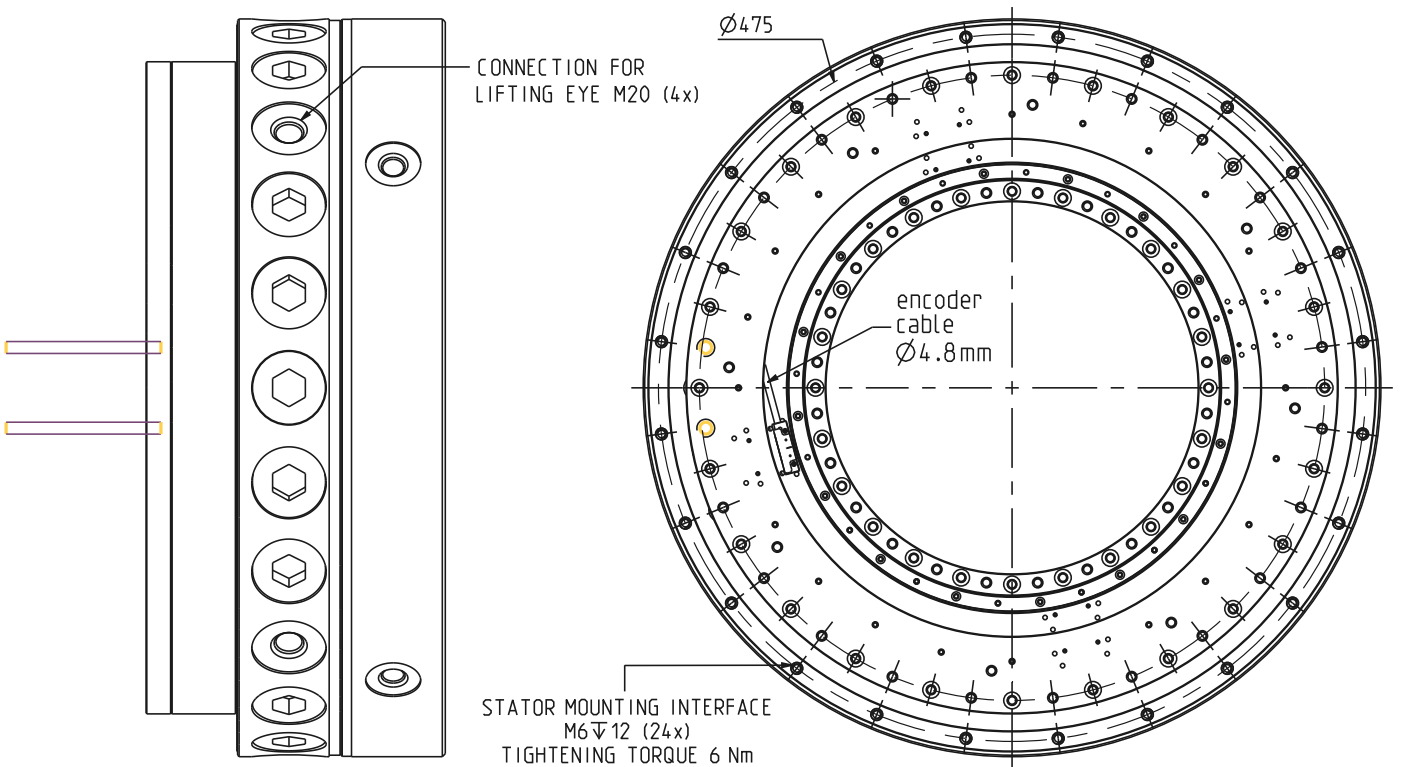
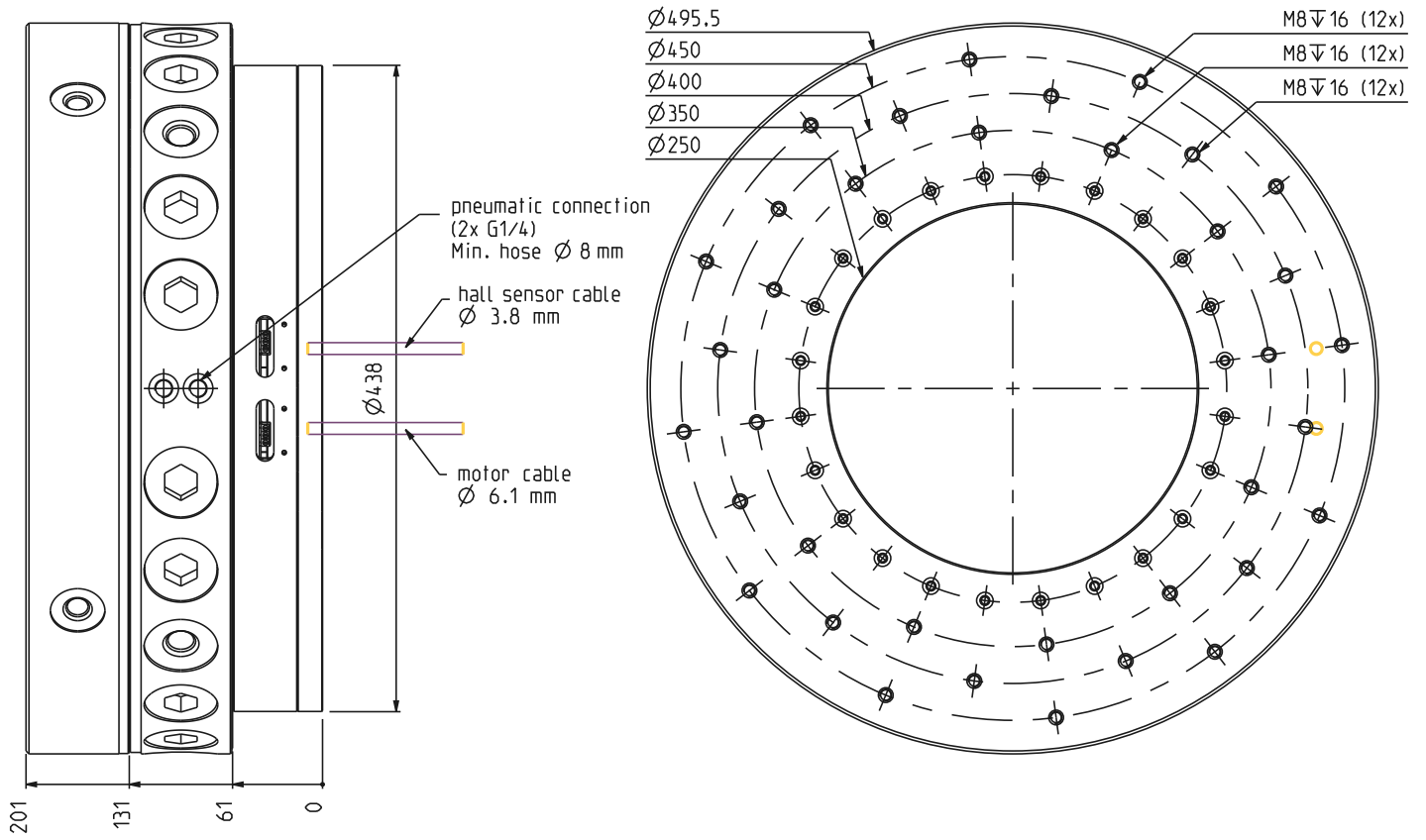


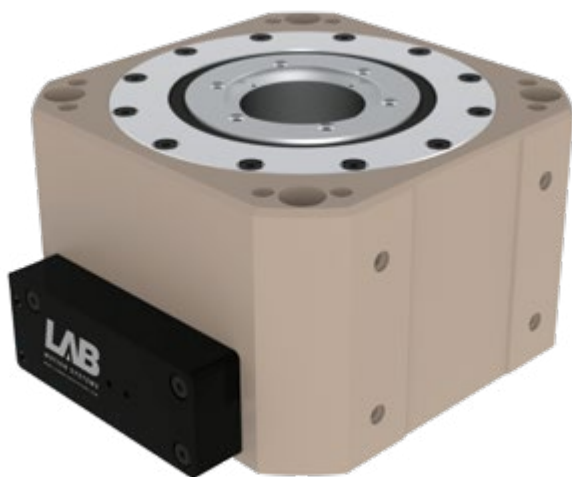
Max. working load vs. eccentricity



Roundness

error motion (typical value): LSC $\Delta r = 50,1$ nm
filter: 360 UPR, 1 revolution (9,6 rpm)





Ball Bearing

Motor & Encoder

NOMINAL TORQUE	Nm	0,3
PEAK TORQUE	Nm	0,6
MAX. SPEED	rpm	200
ENCODER ****	periods	15744
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

MAX. AXIAL LOAD	N	300
MAX. RADIAL LOAD	N	200
AXIAL STIFFNESS *	N/ μ m	100
RADIAL STIFFNESS *	N/ μ m	200
RAD. ERR. MOTION ***	μ m LSC	< 1
AXIAL ERR. MOTION ***	μ m LSC	< 1
WOBBLE **	arcsec	typical
TOTAL MASS	kg	3,9
ANGULAR ACCURACY	arcsec	\pm 10,3
MATERIAL		coated aluminium

RT100B

* Tolerance on value +/- 20%

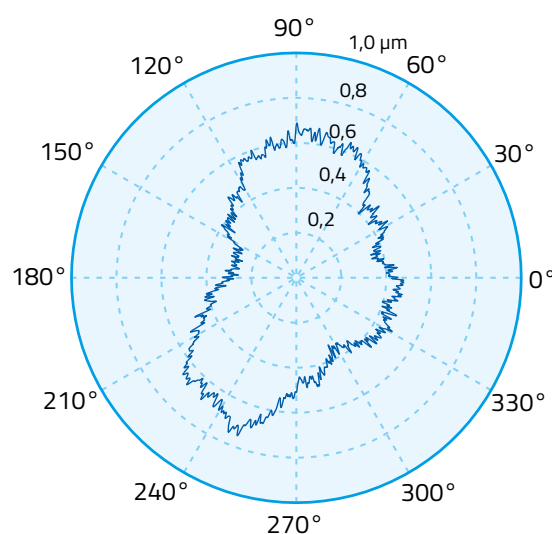
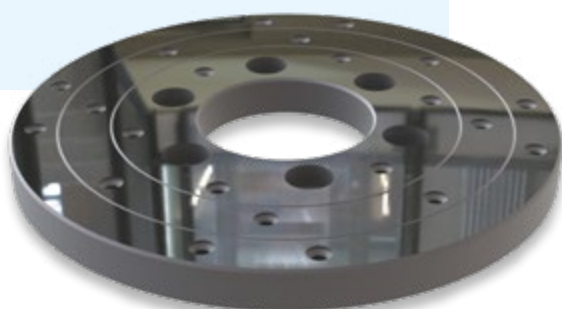
** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 100 mm above top surface.

****Absolute encoder also available

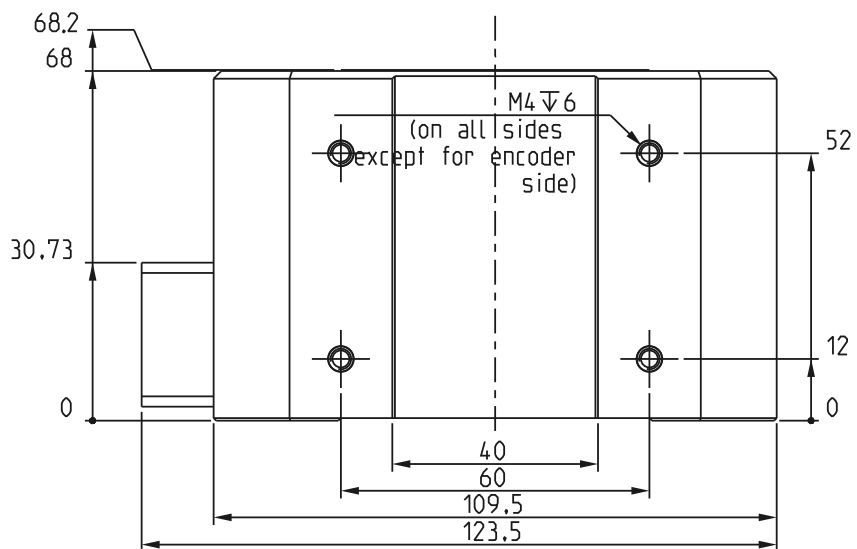
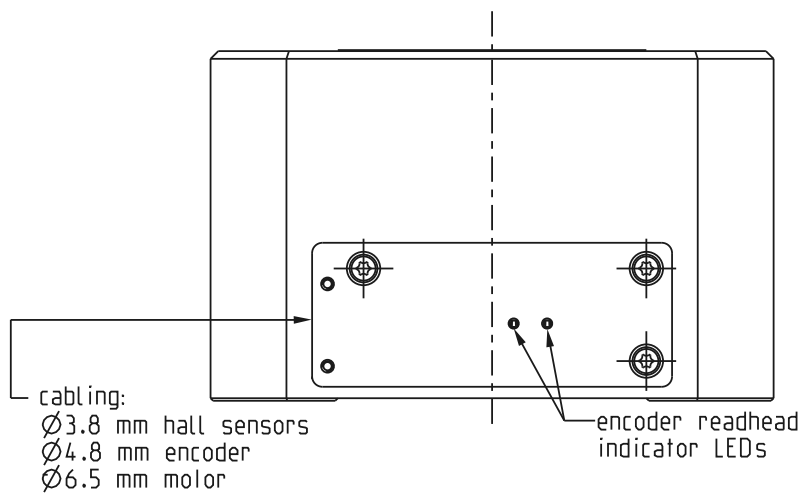
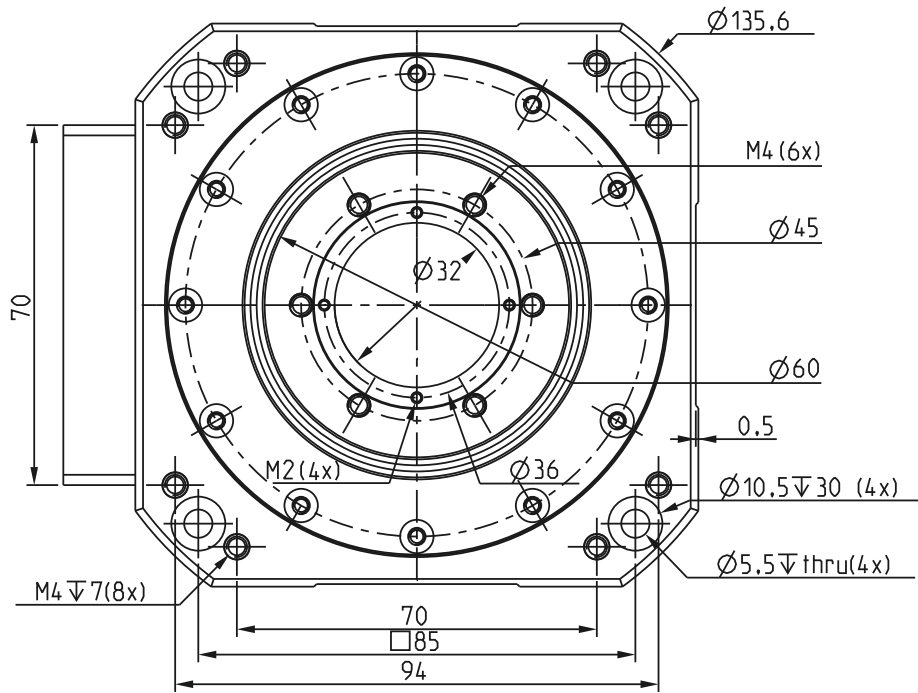
RT100B top plate options:

- 1 Standard rotary stage without top plate
- 2 Standard top plate with standard hole pattern, axial and radial runout < 20 μ m
- 3 Precision top plate with standard hole pattern, axial and radial runout < 2 μ m
- 4 Customized top plate with custom hole pattern, custom features and customer specific runout



Roundness

error motion (typical value): LSC $\Delta r = 520,9$ nm
filter: 360 UPR, 10 revolutions (10 rpm)





Ball Bearing



MAX. AXIAL LOAD	N	300
MAX. RADIAL LOAD	N	200
AXIAL STIFFNESS *	N/μm	100
RADIAL STIFFNESS *	N/μm	200
RAD. ERR. MOTION ***	μm LSC	< 2
AXIAL ERR. MOTION ***	μm LSC	< 1
WOBBLE **	arcsec	typical
TOTAL MASS	kg	5
ANGULAR ACCURACY	arcsec	± 10,3
MATERIAL		coated aluminium

Motor & Encoder

NOMINAL TORQUE	Nm	0,9
PEAK TORQUE	Nm	1,4
MAX. SPEED	rpm	1000
ENCODER ****	periods	15744
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

RT100BT

* Tolerance on value +/- 20%

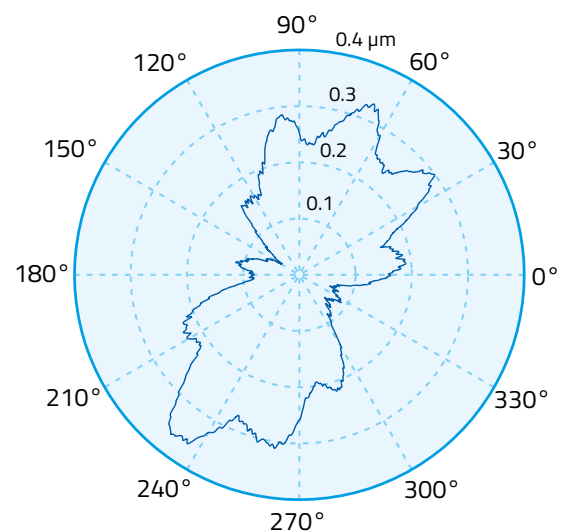
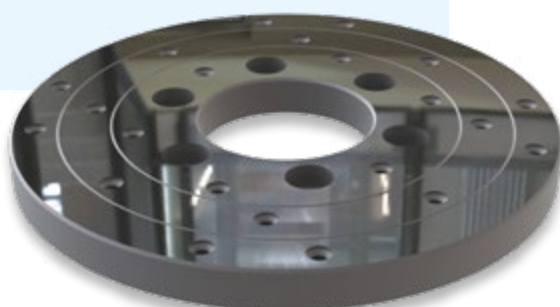
** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 100 mm above top surface.

****Absolute encoder also available

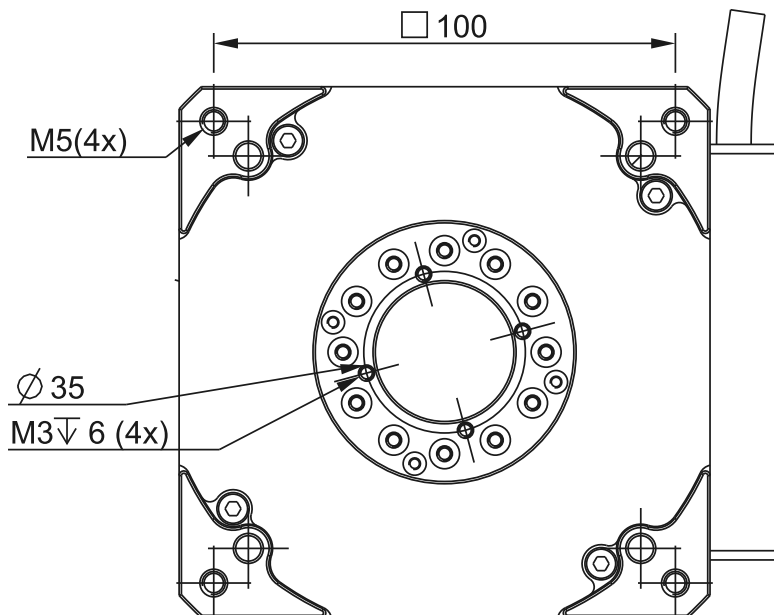
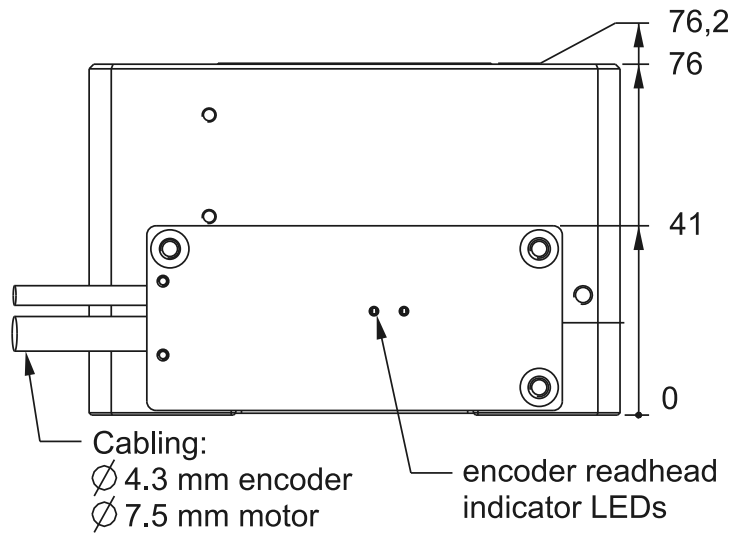
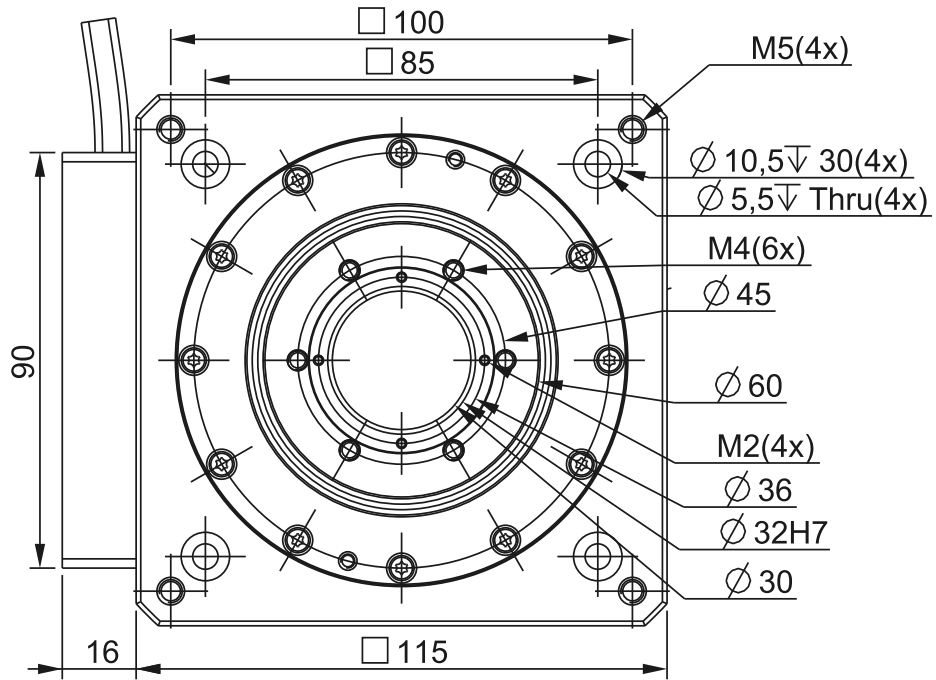
RT100BT top plate options:

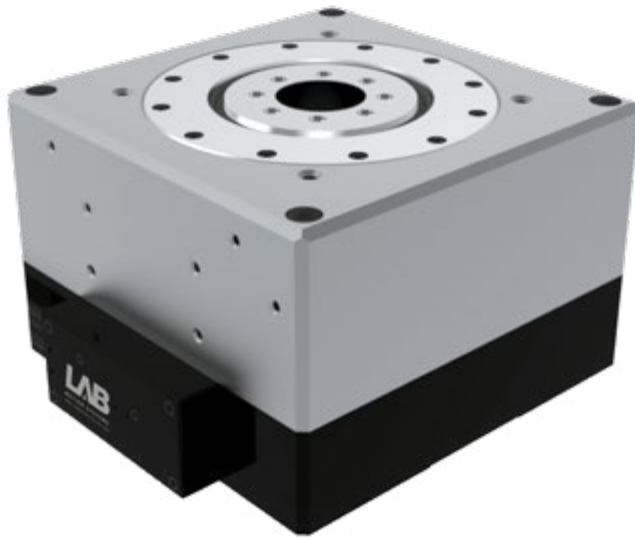
- 1 Standard rotary stage without top plate
- 2 Standard top plate with standard hole pattern, axial and radial runout < 20 μm
- 3 Precision top plate with standard hole pattern, axial and radial runout < 2 μm
- 4 Customized top plate with custom hole pattern, custom features and customer specific runout



Roundness

error motion (typical value): LSC $\Delta r = 322,3$ nm
filter: 360 UPR, 5 revolutions (10 rpm)





Ball Bearing



MAX. AXIAL LOAD	N	740
MAX. RADIAL LOAD	N	1525
AXIAL STIFFNESS *	N/μm	160
RADIAL STIFFNESS *	N/μm	320
RAD. ERR. MOTION ***	μm LSC	< 1
AXIAL ERR. MOTION ***	μm LSC	< 1
WOBBLE **	arcsec	typical
TOTAL MASS	kg	17,3
ANGULAR ACCURACY	arcsec	± 6,9
MATERIAL		stainless steel

Motor & Encoder

NOMINAL TORQUE	Nm	0,5
PEAK TORQUE	Nm	1,5
MAX. SPEED	rpm	400
ENCODER ****	periods	23600
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

RT150B

* Tolerance on value +/- 20%

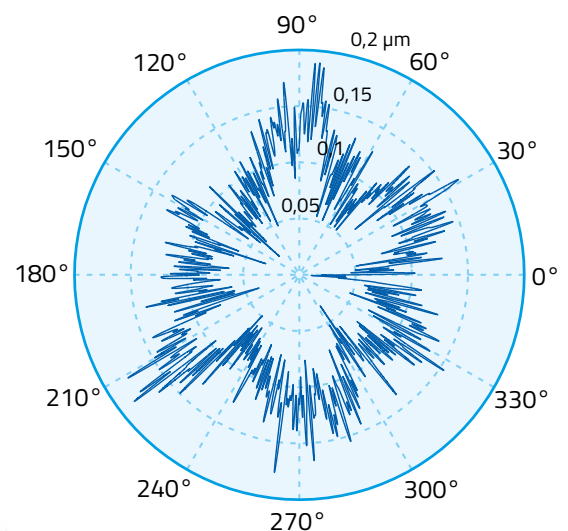
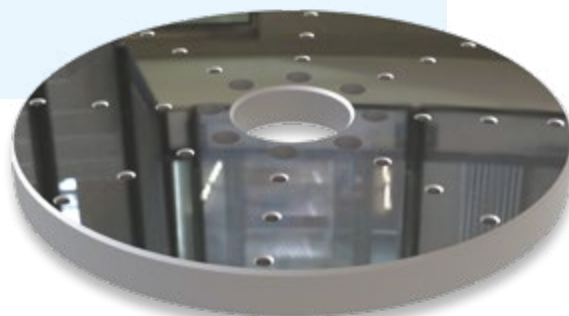
** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 50 mm above top surface.

****Absolute encoder also available

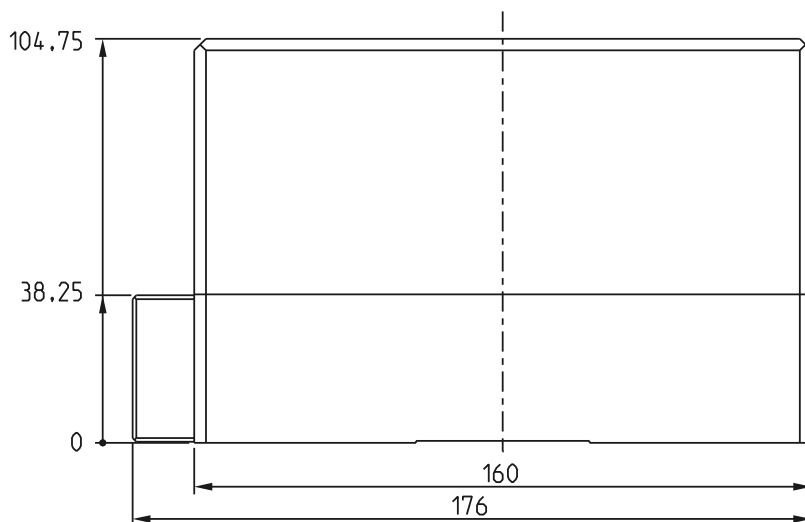
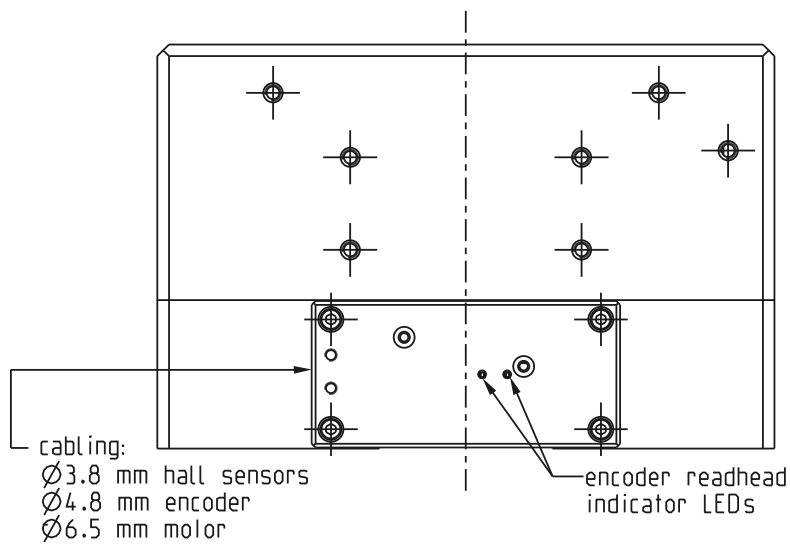
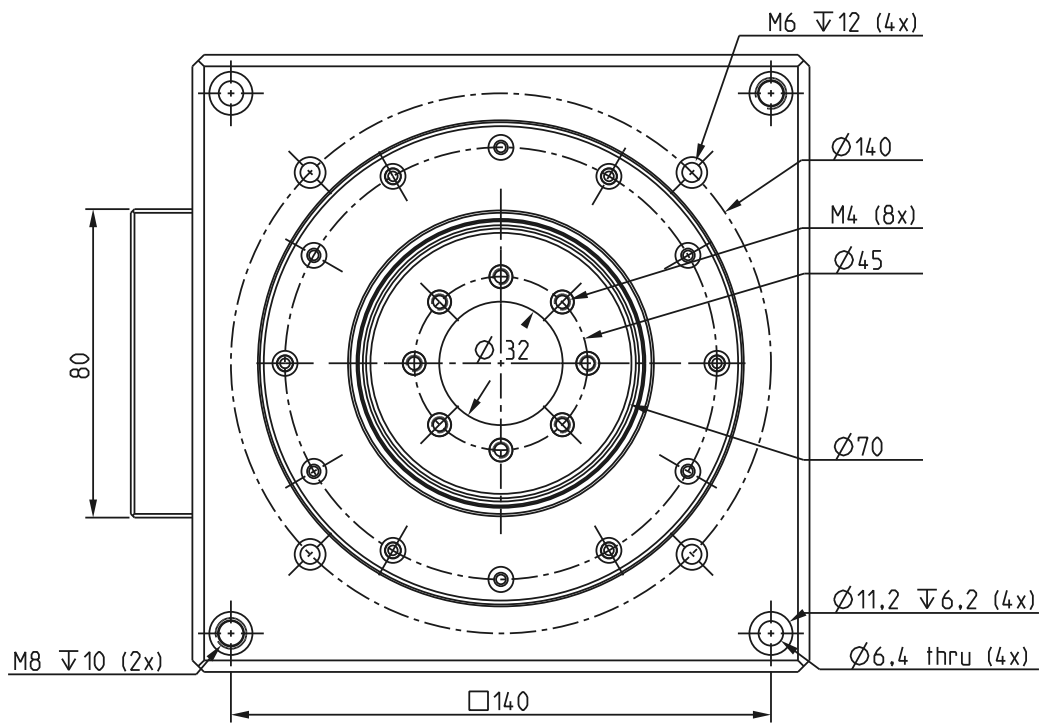
RT150B top plate options:

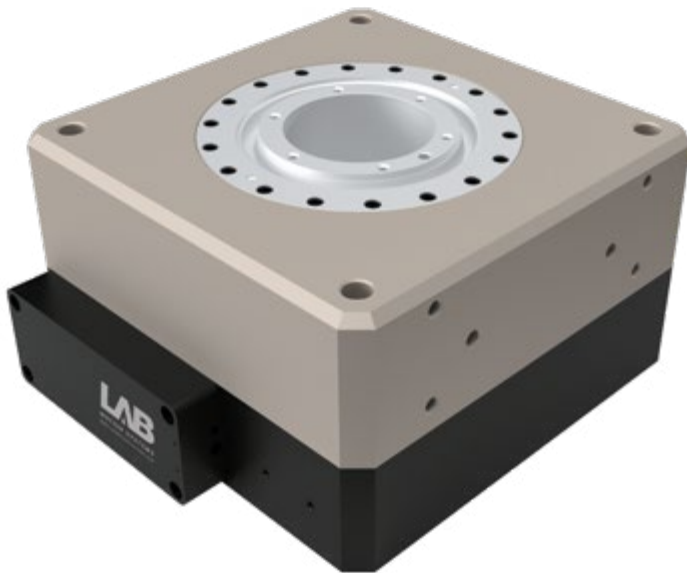
- 1 Standard rotary stage without top plate
- 2 Standard top plate with standard hole pattern, axial and radial runout < 20 μm
- 3 Precision top plate with standard hole pattern, axial and radial runout < 2 μm
- 4 Customized top plate with custom hole pattern, custom features and customer specific runout



Roundness

error motion (typical value): LSC $\Delta r = 177,7$ nm
filter: 360 UPR, 1 revolution (5 rpm)





Ball Bearing



MAX. AXIAL LOAD	N	1000
MAX. RADIAL LOAD	N	670
AXIAL STIFFNESS *	N/μm	175
RADIAL STIFFNESS *	N/μm	366
RAD. ERR. MOTION ***	μm LSC	< 2
AXIAL ERR. MOTION ***	μm LSC	< 1
WOBBLE **	arcsec	typical
TOTAL MASS	kg	25
ANGULAR ACCURACY	arcsec	± 6,9
MATERIAL		coated aluminium

Motor & Encoder

NOMINAL TORQUE	Nm	9
PEAK TORQUE	Nm	12
MAX. SPEED	rpm	100
ENCODER ****	periods	23600
ENCODER RESOLUTION	arcsec	go to p. 11
REPEATABILITY	arcsec	resolution x2

RT200BT

* Tolerance on value +/- 20%

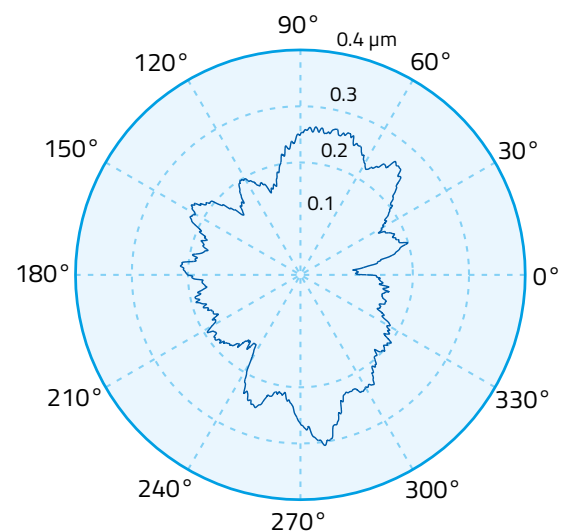
** Measurement report of the wobble error motion can be provided on request.

*** Error motion measured on spherical artefact with center at 100 mm above top surface.

****Absolute encoder also available

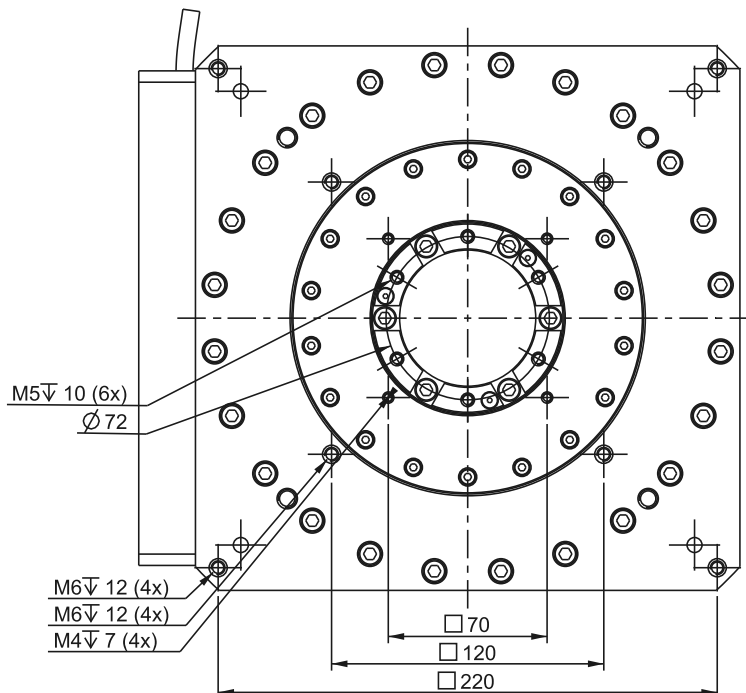
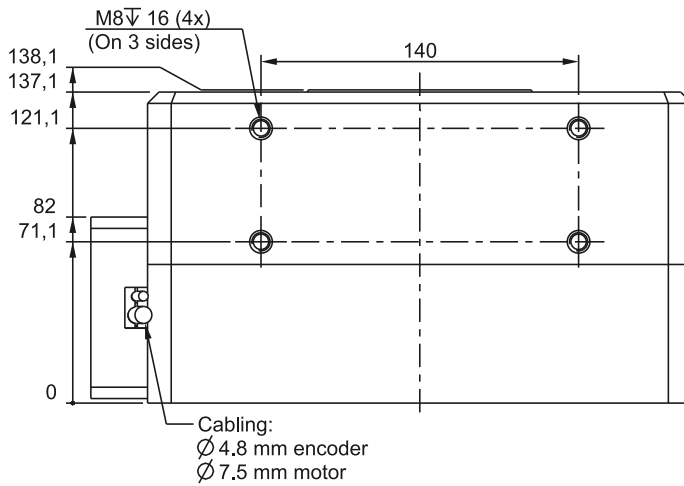
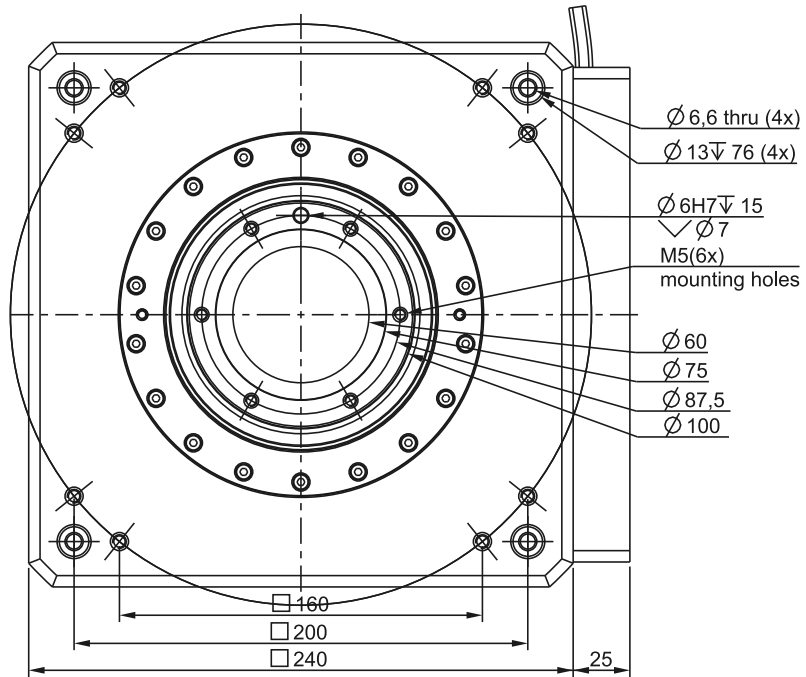
RT200BT top plate options:

- 1 Standard rotary stage without top plate
- 2 Standard top plate with standard hole pattern, axial and radial runout < 25 μm
- 3 Precision top plate with standard hole pattern, axial and radial runout < 3 μm
- 4 Customized top plate with custom hole pattern, custom features and customer specific runout



Roundness

error motion (typical value): LSC Δr = 217,9 nm
filter: 360 UPR, 5 revolutions (10 rpm)



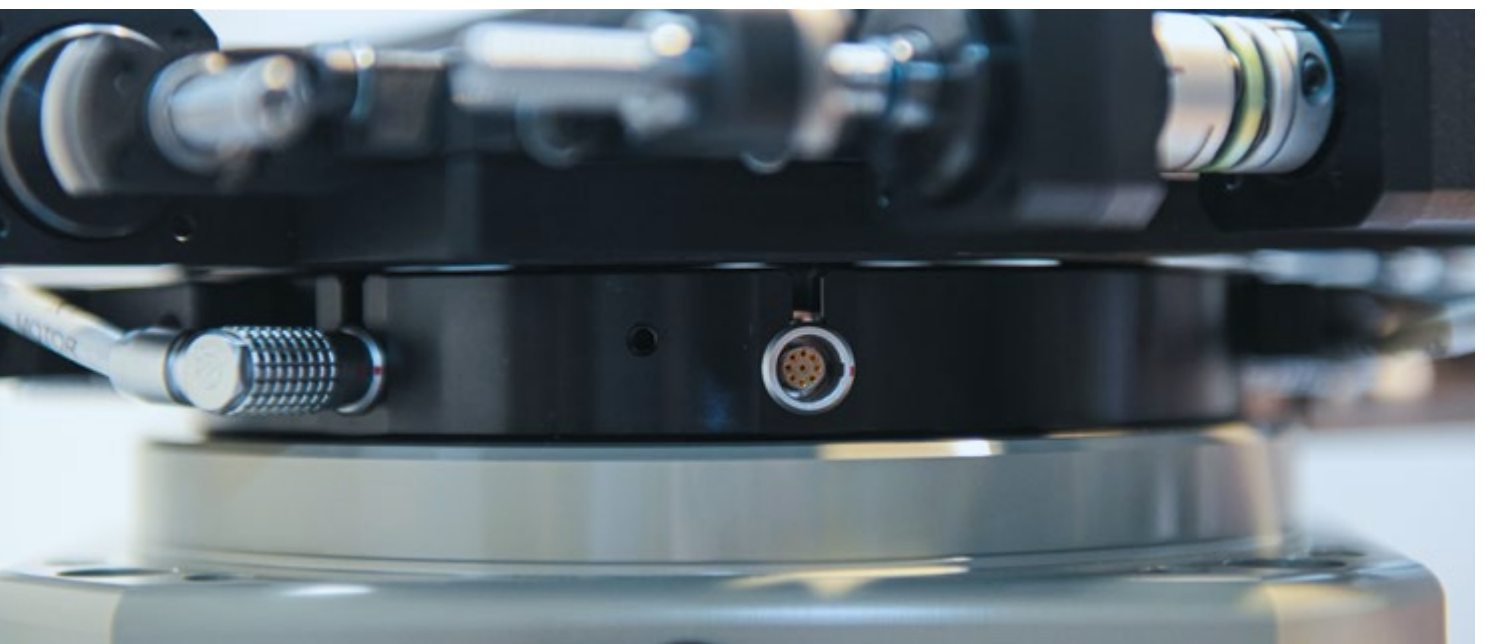
Integrated Slip Rings

A variety of electrical slip rings to build and combine LAB stages into your motion system.

L AB's rotary stages can easily be integrated into multi-degree-of-freedom systems. Often, other motion stages are built on top of our rotary products. For example, combinations with XY stages for alignment, gonio-stages or other rotary stages are among the possibilities. In these integrated setups, the air bearing and ball bearing stages require a slip ring to guide power and control signals to the rotating part of the stage. LAB offers several slip ring accessories that allow for an easy integration of these stacked solutions with limited deterioration of the running accuracy of our rotary stages.

Standard electrical slip ring solutions

Stage	Circuits
RT075 S	12
RT100 S/SX	12, 24
RT150 S/SX/ST	12, 24, 36
RT250 S/SX	12, 24, 36, 56





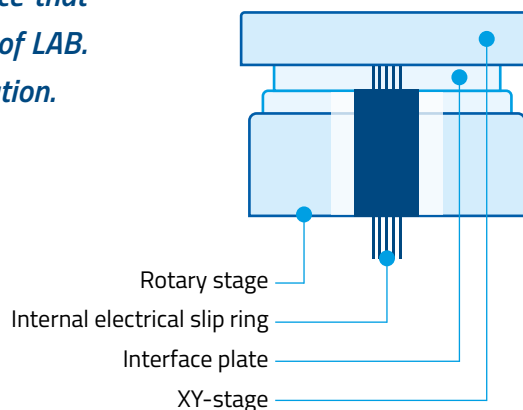
Beyond electrical slip rings

Our standard electrical slip rings will only serve as a passthrough for power and electrical control signals. Customized solutions for fluids, gasses, different requirements and stages are available. Contact the LAB Motion Systems support team for more information.

Our slip rings are delivered with an interface that exactly matches every specific rotary stage of LAB. This allows for fast and easy system integration.

Specifications

- Maximum current:
1A /lead for ≤ 24 circuits
2A /lead for ≥ 36 circuits
- Maximum voltage: 240 VDC/VAC
- Maximum velocity: up to 1000 rpm
- Lead length: 300 mm



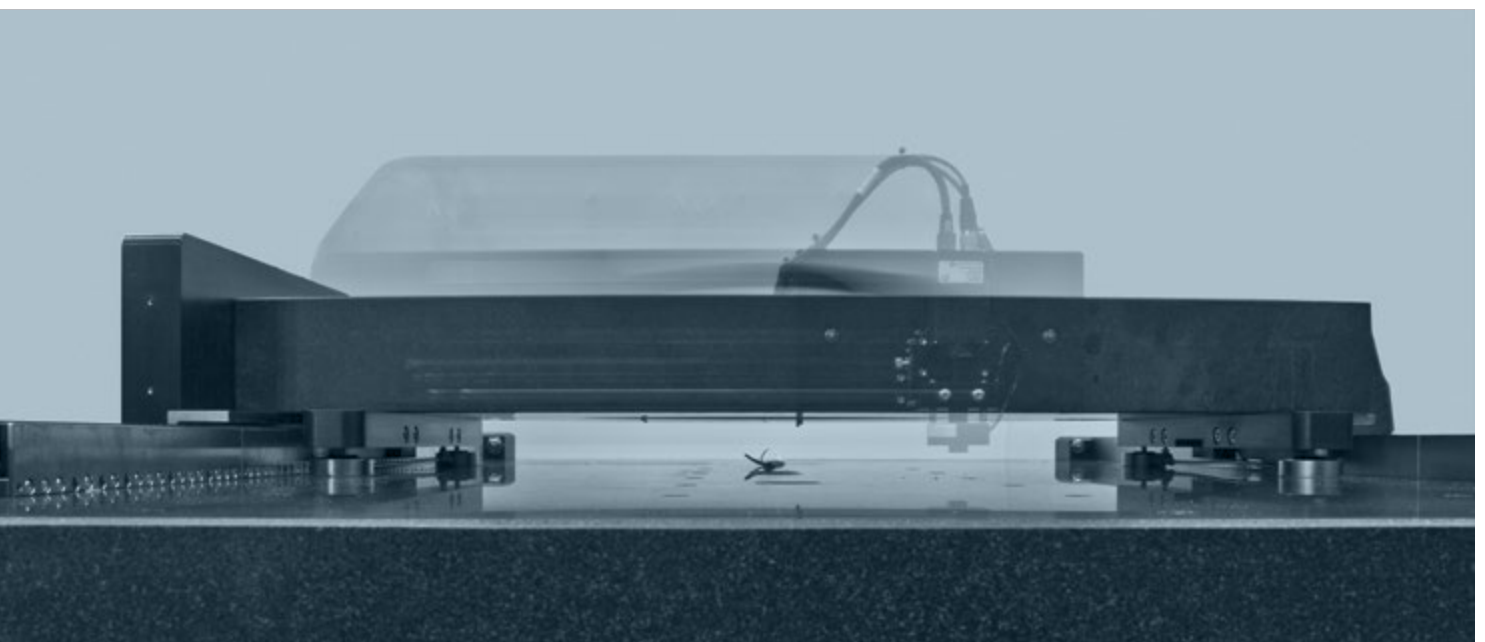
Linear Stages

A series of high-precision linear motion systems with a multitude of customization options.

The **standard linear products line** includes a wide range of high-precision linear stages for various applications. An optimized air bearing design ensures an optimal stiffness, damping, workload and running precision. Ironless linear drives and high-accuracy optical linear encoders lead to an unrivalled precision.

The perfect solution for:

- ✓ High-performance scanning
- ✓ Optical inspection systems
- ✓ Ultra-precision grinding and milling
- ✓ Photovoltaic systems
- ✓ Medical systems
- ✓ X-ray
- ✓ Laser processing
- ✓ Semiconductor industry
- ✓ Wafer handling



Custom design and engineering

We offer a range of standard linear stages, but other dimensions or other applications are also possible. LAB can flexibly integrate XY-stages, gantries, Z-stages or any other combination, both with ball bearing and air bearing technology. Feel free to contact us for a customized solution and step into a new world of possibilities!



Introducing the LS-G series

The LS-G series has been added to our product portfolio of linear air bearing stages. These granite based stages were developed to move and position heavy loads up to 200 kg with the highest precision. For optimal performance, the base granite guideway can be integrated in your machine bed, obtaining a precision level unseen before.



Specifications

		LS100	LS200	LS500	LS1000	LS500G	LS1000G	LS2000G
TRAVEL	mm	100	200	500	1000	500	1000	2000
LOAD CAPACITY	kg	35	35	35	35	200	200	200
SIZE MOVING PLATFORM	mm	238 x 248	238 x 248	238 x 248	238 x 248	440 x 445	440 x 445	440 x 445
TOTAL MASS	kg	35	43	60	105	270	400	800
SPEED *	m/s	1	1	1	1	0,5	0,5	0,5
ACCELERATION *	m/s ²	10	10	10	10	3	3	3
ACCURACY **	µm	± 0,3	± 0,3	± 0,4	± 0,5	± 0,4	± 0,5	± 0,7
ENCODER RESOLUTION	nm	1,5, ... 1000	1,5, ... 1000	1,5, ... 1000	1,5, ... 1000	1,5, ... 1000	1,5, ... 1000	1,5, ... 1000
REPEATABILITY	µm	0,1	0,1	0,1	0,1	0,1	0,1	0,1
FLATNESS ***	µm	± 0,5	± 0,7	± 1	± 2	± 0,8	± 3	± 5
STRAIGHTNESS	µm	± 0,25	± 0,4	± 1,5	± 3	± 1	± 3	± 5
PITCH ***	µrad	± 3	± 6	± 15	± 40	± 10	± 15	± 40
YAW ***	µrad	± 4	± 8	± 20	± 40	± 10	± 15	± 40
ROLL ***	µrad	± 3	± 8	± 15	± 40	± 10	± 10	± 40

* Maximum speed and acceleration based on stage load, encoder resolution and controller

** After calibration, depends on stroke

*** Required mounting flatness of 2 µm, better values possible with thicker customized base

Z Stages

Introducing a new range of vertical stages or Z-stages.

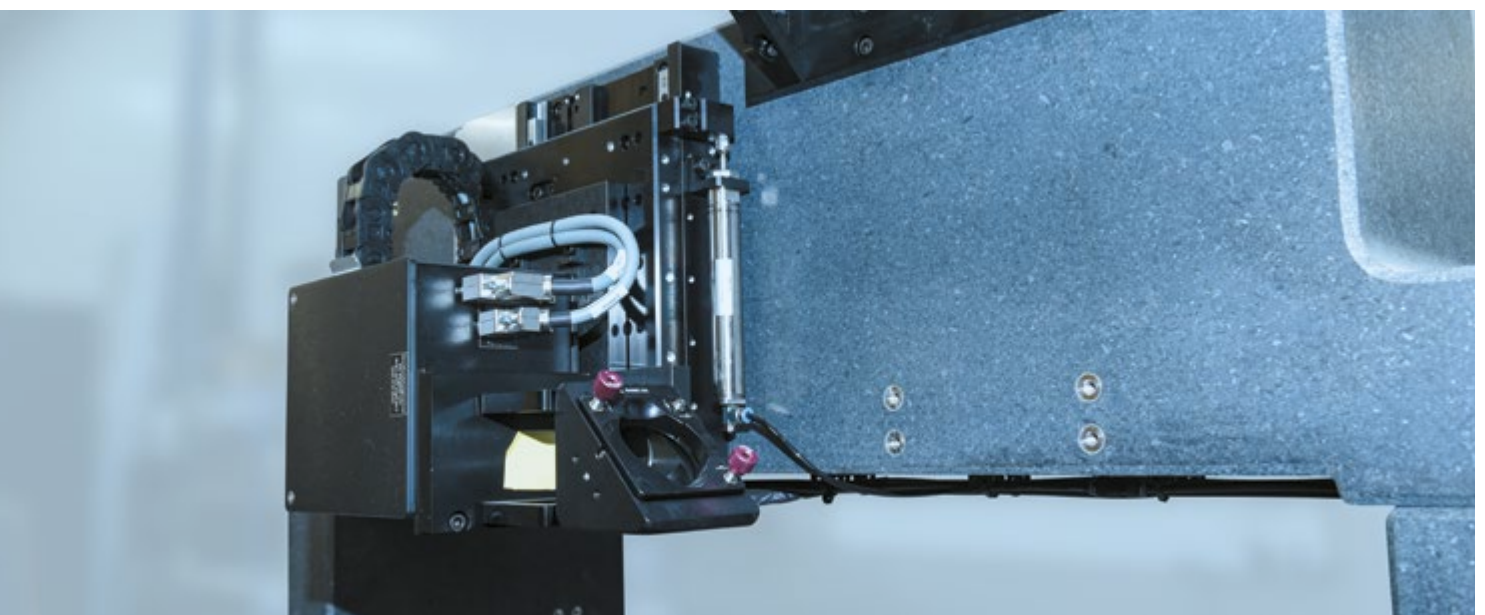
We used to only deliver Z-stages in custom client projects, but now we've included them in our standard products family. Vertical stages always come with a motor and allow for precise, smooth and stable height adjustments. Multiple versions exist with a variety of strokes and motor types. The Z-stages are compatible with our rotary and XY-stages. They can be used in applications where rotary and linear axes are moving synchronized (helical scanning). To help the controller with accurate positioning, we can install a linear incremental or absolute encoder. For less accurate systems you can use the rotary encoder on a stepper motor.

Series highlights:

- ✓ Mass compensated
- ✓ Sub-micrometer accuracy
- ✓ Stepper, brushless DC (BLDC) or linear motors available
- ✓ Incremental or absolute encoder options
- ✓ High position stability

ZS50

The vertical Z-stage ZS50 is our smallest standard Z-stage. It offers a stroke of 50 mm and can be ordered with three different kinds of motor options. With a load capacity of 15 or 25 kg (depending on motor selection) the ZS50 can easily lift an air bearing rotary stage with an integrated XY and your sample. We can supply an L-bracket to mount the stage in your machine or lab.





Motor options

Stepper, DC or direct drive linear motor options are available to automate the movement. The BLDC motor option is the workhorse that combines stability with dynamics and the highest load capacity. It is ideally suited for demanding applications. The stage with stepper motor option excels in position stability. The last option with the linear motor and frictionless mass balanced piston results in the highest dynamics.

Mass compensation

A frictionless mass compensation option allows you to achieve the highest accuracy with best in class dynamics. Contact us for more information on these stages and options.

Specifications

		ZS50B-LM	ZS100B-LM	ZS50B-BL	ZS100B-BL	ZS50B-ST	ZS100B-ST
TRAVEL	mm	50	100	50	100	50	100
MOTOR TYPE		linear motor	linear motor	BLDC	BLDC	Stepper	Stepper
LOAD CAPACITY	kg	20	20	25	25	25	25
SIZE MOVING PLATFORM	mm	240 x 190	300 x 190	240 x 190	300 x 190	240 x 190	300 x 190
TOTAL MASS	kg	10	12	10	12	10	12
SPEED *	mm/s	300	500	15	15	4	4
ACCELERATION *	m/s ²	10	10	0,005	0,005	0,005	0,005
ACCURACY **	µm	± 0,5	± 0,5	± 0,5	± 0,5	± 0,5	± 0,5
ENCODER RESOLUTION	nm	1,5, ... 1000	1,5, ... 1000	1,5, ... 1000	1,5, ... 1000	1,5, ... 1000	1,5, ... 1000
REPEATABILITY	nm	± 75	± 75	± 100	± 100	± 100	± 100
FLATNESS ***	µm	± 0,75	± 1	± 0,75	± 1	± 0,75	± 1
STRAIGHTNESS	µm	± 0,75	± 1	± 0,75	± 1	± 0,75	± 1
PITCH ***	µrad	± 50	± 70	± 50	± 70	± 50	± 70
YAW ***	µrad	± 75	± 100	± 75	± 100	± 75	± 100
ROLL ***	µrad	± 50	± 70	± 50	± 70	± 50	± 70

* Maximum speed and acceleration based on stage load, encoder resolution and controller

** After calibration, depends on stroke

*** Required mounting flatness of 5 µm

XY Stages

XY-stages combine sub-micron positioning with micrometer level straightness.

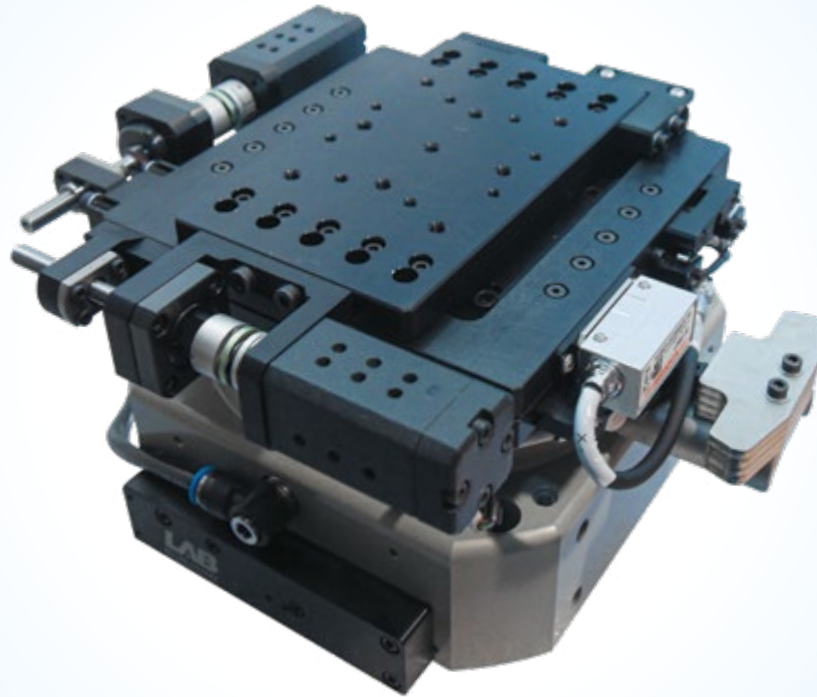
A range of precise XY-stages has been developed. Our stages are used in various industries and applications: synchrotrons, industrial market, metrology and precision alignment applications in general. Stepper or DC motors with precision ground ball screws are used to achieve best in class accuracy and repeatability. The preloaded ball screw ensures zero backlash and the cross rollers are of a premium brand.

These stages are ideally suited to mount on our rotary tables. LAB Motion Systems offers a range of off-the-shelf sliprings to pass all electrical signals through the rotary table. This enables full continuous rotation of the rotary stage and the XY-stage. Some spare wires can be foreseen for customer use to power a sample or connect to sensors. We also offer a wide variety of drivers and controllers to help you get moving in no time.

Series highlights:

- ✓ Compatible with our rotary stages
- ✓ High load capacity
- ✓ Optional linear encoder
- ✓ Stepper or DC motors
- ✓ High position stability



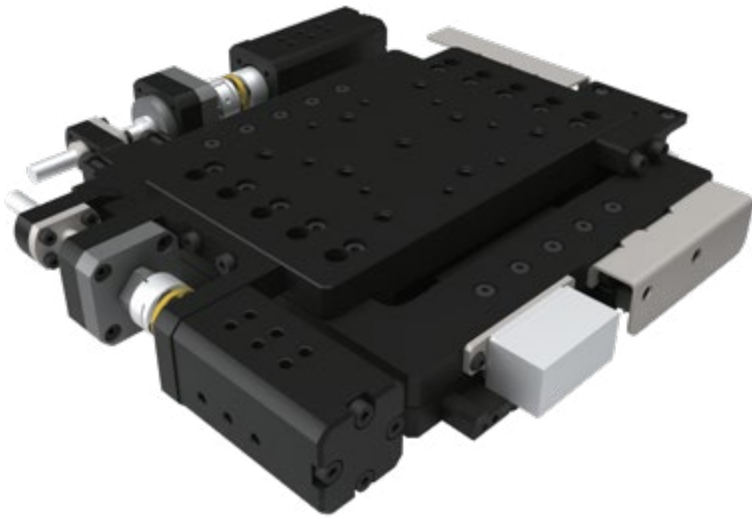


XY150B-12

The youngest addition to our family of XY-stages is also the smallest: the XY150B-12. Its design is very compact thus enabling a lower height in stacked setups. With a useable stroke of 12 mm (± 6 mm) it can move loads up to 10 kg. It matches ideally with our air and ball bearing stages' RT150 and RT250 families. A slipping can be integrated in the rotary stage to reliably pass all the needed signals and motor power. Spare wires can be foreseen for customer use.

Highest accuracy and repeatability

Optionally a high resolution linear incremental encoder can be installed. This will further improve the accuracy and repeatability of movement and the stability over a range of operating conditions. The minimum resolution that can be achieved is 50 nm. The signal can be sin cos or digital, both options are available. An absolute encoder further decreases the startup time: the time consuming homing operation is no longer needed. Contact us for all information about these stages and options.

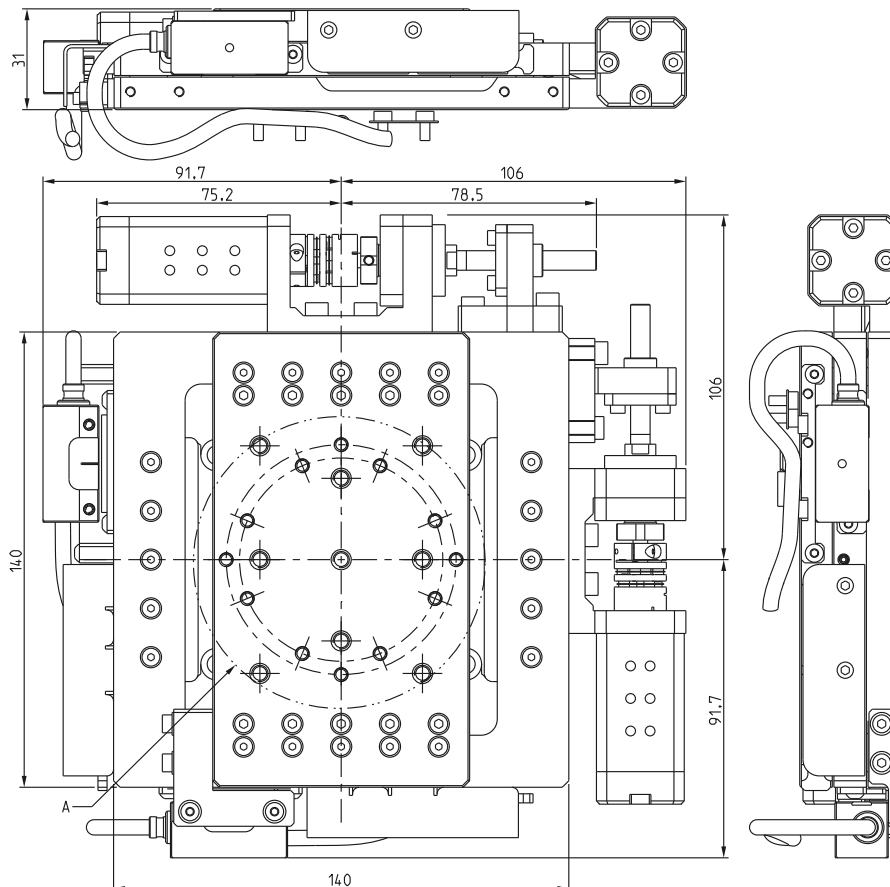


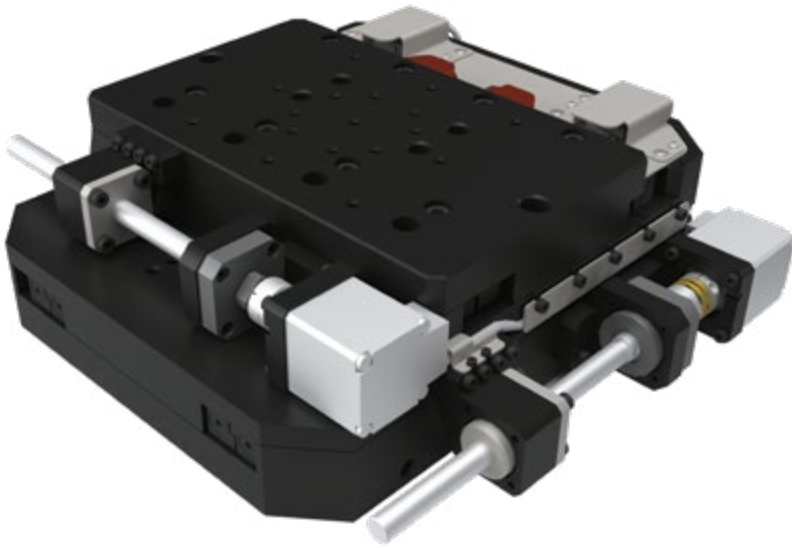
Specifications

STROKE	mm	± 6
LOAD CAPACITY	kg	10
MIN. INCR. MOTION	µm	0,1
REPEATABILITY	µm	± 0,2
SPEED	mm/s	0,22
TOTAL MASS	kg	2,1
MATERIAL	coated aluminium	

XY150B-12

- ✓ Optimally compatible with rotary stages RT150 and RT250



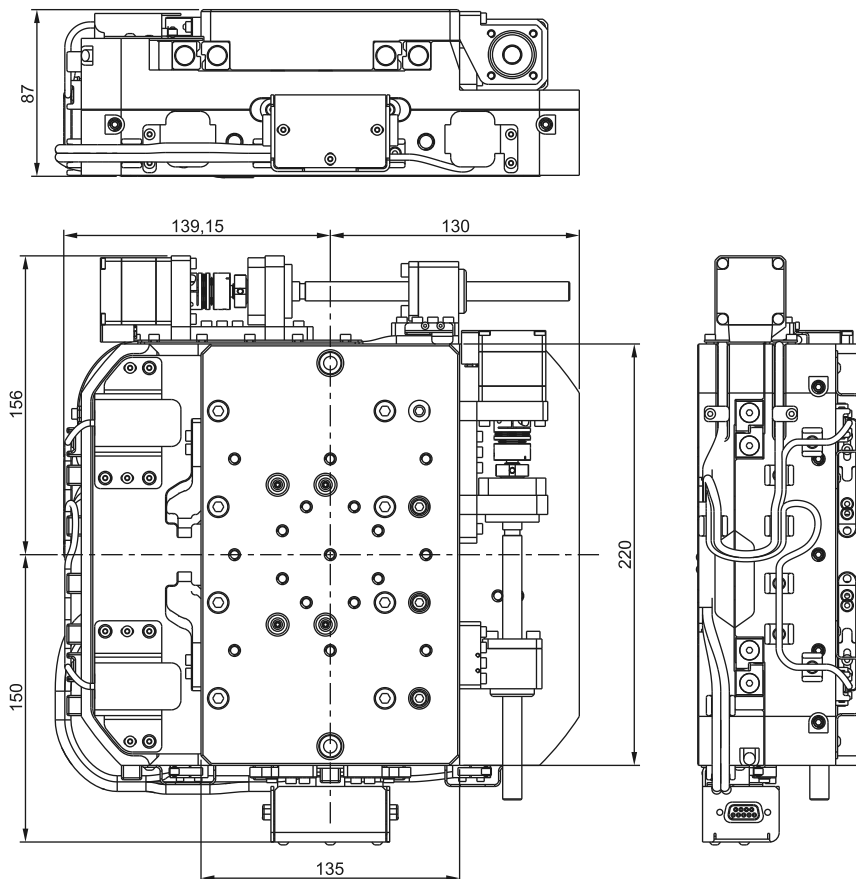


Specifications

STROKE	mm	± 50
LOAD CAPACITY	kg	80
MIN. INCR. MOTION	µm	0,1
REPEATABILITY	µm	± 0,2
SPEED	mm/s	30
TOTAL MASS	kg	13
MATERIAL	coated aluminium	

XY250B-100

- ✓ Optimally compatible with rotary stages RT250 and RT500



Gantry Stages

With the development of the GT300 and GT600 LAB Motion Systems has raised the bar.

The **double axis motion stage** consists of two air bearing axis. The bottom one uses a solid granite base with a moving granite platform on top. On the gantry the second axis has a moving steel platform running over a granite bridge. A sub-micron flatness is achieved making this system ideally suited for inspection machines with the highest demands in precision motion and positioning. Our team created a modular system, so please get in touch if you have a special request for a gantry system. Our application engineering team is ready to assist you.

The perfect solution for:

- ✓ Metrology
- ✓ Industrial CT
- ✓ Optical inspection
- ✓ CMM
- ✓ Flatness measurements



Series highlights:

- ✓ Precision air bearing for ultra-smooth motion
- ✓ Linear motors in combination with optical linear encoders
- ✓ Extreme low sub-micron flatness error
- ✓ Fully preloaded air bearing design results in the highest stiffness
- ✓ High load capacity

Specifications

		GT300MA	GT300LA	GT600LA
STROKE	mm	310 x 310	310 x 310	610 x 610
SIZE MOVING PLATFORM X	mm	450 x 450	600 x 600	600 x 600
OUTER DIMENSIONS L x W x H	mm	1050 x 920 x 850	1200 x 1070 x 890	1500 x 1300 x 890
TOTAL MASS	kg	950	1300	1700
LOAD CAPACITY X	kg	50	150	150
LOAD CAPACITY Y	kg	8	15	15
SPEED *	mm/s	300	300	300
ACCELERATION *	mm/s ²	0,5	0,3	0,3
ENCODER RESOLUTION	nm	20	20	20
REPEATABILITY	µm	0,1	0,1	0,1
ACCURACY **	µm	< 1	< 1	< 1
FLATNESS X ,Y ***	µm	1	1	1
XY COMBINED FLATNESS OVER 300 x 300 MM AREA	µm	< 1	< 1	< 1
XY ORTHOGONALITY	µrad	10	10	10
PITCH ***	µrad	± 5	± 5	± 5
YAW ***	µrad	± 5	± 5	± 5
ROLL ***	µrad	± 5	± 5	± 5

* Maximum speed and acceleration based on stage load, encoder resolution and controller

** After calibration, depends on stroke

*** Required mounting flatness of 2 µm

Planar Stages

Modular two-axis planar systems built for customization.

P L-series planar products have two axes that are both floating over the same base granite. Therefore the top axis air bearing is not floating over the lower axis, as it would be in a stacked setup, but directly over the base granite. Both axes can move independently from each other and that there is no mechanical coupling between both axes. Major benefit is that the stiffness doubles and precision increases. The XY motion platform moves at high speeds and floats only microns above the precision granite base. With or without load it offers a dynamic, smooth and repeatable movement.

High dynamics

A combination of light aluminum and precision granite results in high dynamic motion with extreme positioning precision. Double ironless linear motors and absolute linear encoders add to the smooth vibrationless motion.

Modular design

Our design engineers paid special attention during the design to build a modular system. This enables us to easily change the strokes, the size or add additional axes thus creating a custom made solution for you. A gimbal setup can be added optionally to the planar stage.

The perfect solution for:

- ✓ Laser machining
- ✓ Semiconductor industry
- ✓ Display manufacturing
- ✓ Photonics
- ✓ Metrology



Series highlights:

- ✓ Modular design, easy to optimize for your application
- ✓ High dynamic planar air bearing with sub-micron precision
- ✓ Granite gantry for highest precision
- ✓ Absolute linear encoders
- ✓ Contact us for cleanroom solutions and environments

Specifications

		PL100	PL300	PL1000
STROKE	mm	100 x 100	300 x 300	1000 x 1000
OUTER DIMENSIONS MOVING PLATFORM	mm	250 x 250	250 x 250	250 x 250
LOAD CAPACITY	kg	30	30	30
SPEED *	m/s	1	1	1
ACCELERATION *	m/s ²	10	10	10
ENCODER RESOLUTION	nm	1	1	1
REPEATABILITY	µm	0,1	0,1	0,1
ACCURACY X **	µm	± 0,3	± 0,4	± 0,5
ACCURACY Y **	µm	± 0,3	± 0,4	± 0,5
FLATNESS	µm	± 0,3	± 0,5	± 0,8
XY COMBINED FLATNESS OVER 300 x 300 MM AREA	µm	± 1	± 1	± 1
STRAIGHTNESS X , Y	µm	± 0,3	± 0,5	± 0,8
XY ORTHOGONALITY	µrad	10	10	10
PITCH	µrad	± 3	± 5	± 8
YAW	µrad	± 3	± 5	± 8
ROLL	µrad	± 3	± 5	± 8

* Maximum speed and acceleration based on stage load, encoder resolution and controller

** After calibration, depends on stroke



Systems

Extensive experience to realize complete integrated motion systems for a variety of industries and clients.



Rely on our extensive knowledge of mechatronics and control engineering, as we translate your needs into a complete solution. LAB is the right partner to translate abstract ideas into feasible concepts and reliable prototypes. Our state-of-the-art production facilities are used to create and assemble customized products to meet the demands of our customers. We proudly offer our clients a custom solution, starting from concept generation to development up to series production. We adopt a mechatronic approach: servo drivers, control software, motors and bearings are all dimensioned and optimized for the specific application. Our custom services range from high-performance systems for the semiconductor industry to all high-precision manufacturing equipment. LAB Motion Systems supports the development from the initial study into the complete system design, manufacturing and assembly process. Whether you are working on a unique product or in need of a yearly production capacity: we surely have the right solution for you!

What

The Systems group has experience in designing complete systems that are adapted to dedicated customer requirements. Therefore, our machines are very diverse in composition and functions. Our main focus are systems that meet high demands in the field of precision (precisions lower than 1 μm !). Depending on the required motion, we offer both air bearing and ball bearing solutions for linear and rotational movements.

LAB will realize your high-performance motion system from scratch in record time! This is achievable by our inhouse series of linear and rotary stages, which can be easily customized by LAB's team of development engineers and designers.

Our motion systems are a combination of several movement directions. Systems with 7 motion axes (and more!) are part of our expertise. Additionally, synchronized movements of different axes and bridge systems can be offered.

In addition to the mechanical integration of several motion axes, LAB also supplies you with a general operating control system, which allows the user to monitor and guide the desired movements.

How

Because of the profound knowledge of bearing technology, LAB Motion Systems is capable of making fully customizable axial movement. Different motion axes can be integrated smoothly together, resulting in a system that performs excellently due to its compactness and stiffness.

For the design of these customized systems, LAB Motion Systems has a team of experts available. We adopt a mechatronic approach: servo drivers, control software, motors and bearings are all dimensioned and developed specifically for each application. Furthermore, crucial parts or assemblies are calculated with the help of simulations.

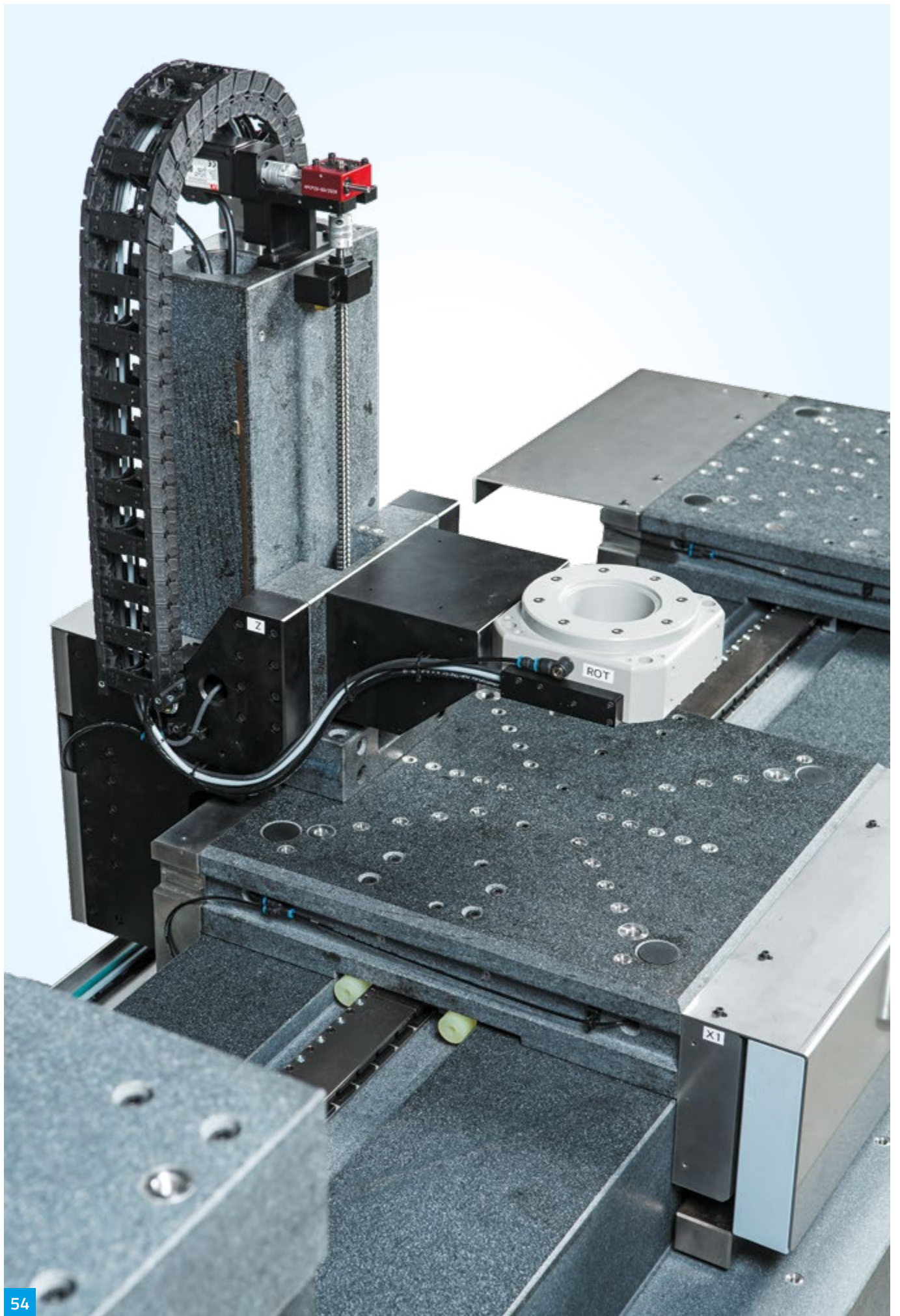
Applications

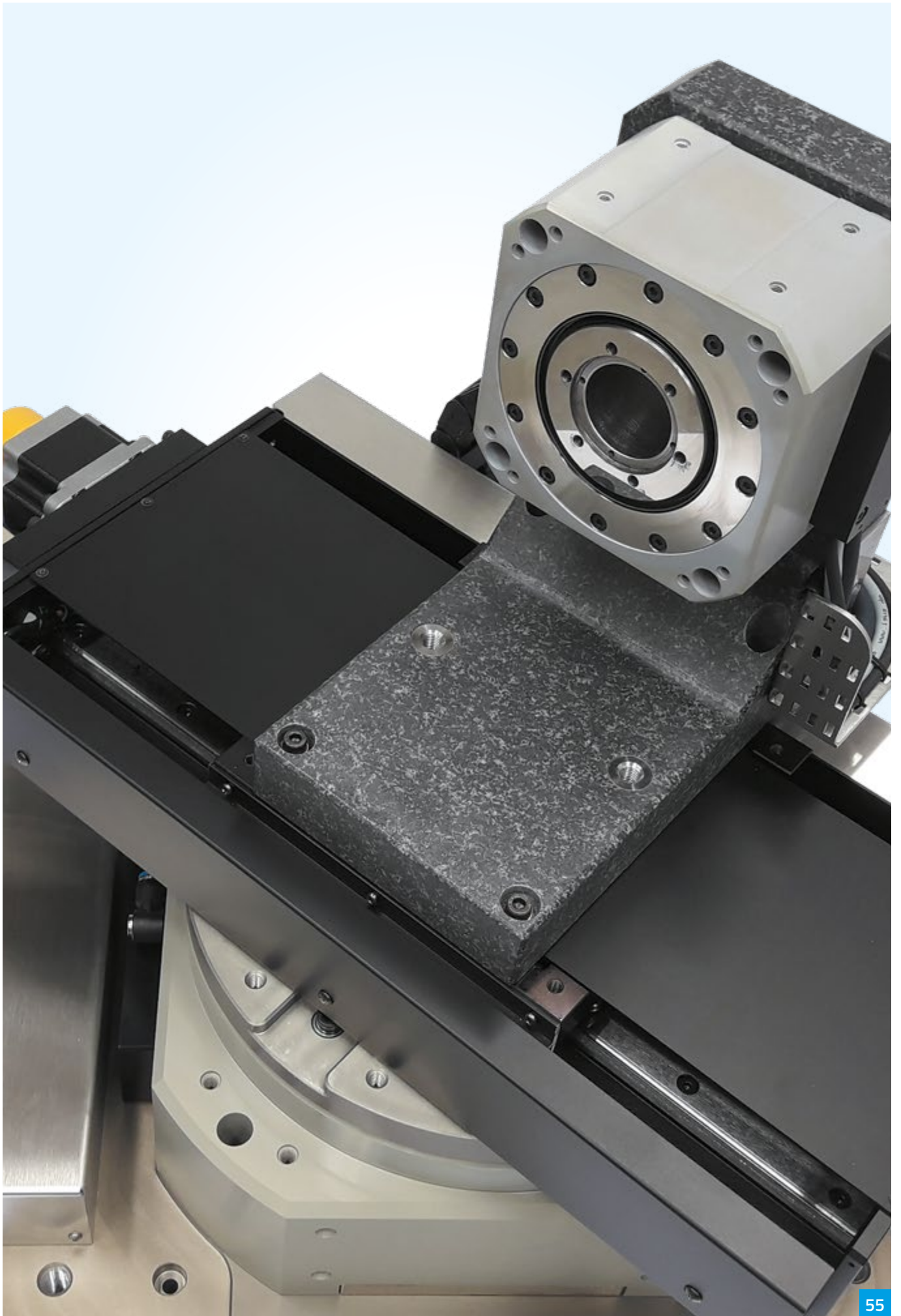
LAB produces systems for a wide range of applications where the need for precision movements is a central focal point. In general, there are two categories: precision production machines and positioning systems for measuring equipment.

Production machines can be high-speed pick-and-place machines, (micro) laser cutting and welding machines, fly cutter machines for surface treatments, ...

Positioning machines include X-ray applications, semiconductor inspection and laser equipment. LAB Motion Systems has extensive experience in these fields. Often sample positioning machines exist of precise linear moving axes (horizontally and vertically) with an integrated rotary stage and a cross table on top.







4 Axis Motion System

A combination of standard products, customized products and a custom developed air bearing vertical stage.

This custom developed XXZ θ -motion system is 2,4 meters long and contains two horizontal air bearing stages with a travel of 1 meter each. They run on the same granite base, guaranteeing a perfect alignment. On one horizontal air bearing stage, a vertical air bearing stage is built that holds a standard LAB RT150S air bearing rotary stage. All axes can be driven and synchronized with LAB's motion controllers or with commercially available controllers.



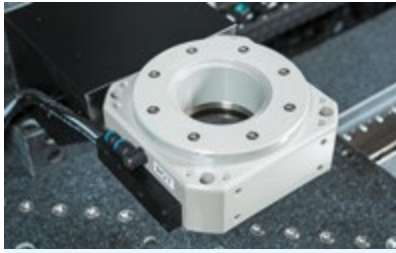
X-stage

TRAVEL	mm	1000
MINIMAL INCREMENTAL MOTION	μm	0,1
HORIZONTAL STRAIGHTNESS *	μm	$\pm 0,4$
VERTICAL STRAIGHTNESS *	μm	$\pm 0,4$
PITCH *	μrad	± 2
ROLL *	μrad	± 3
YAW *	μrad	± 3

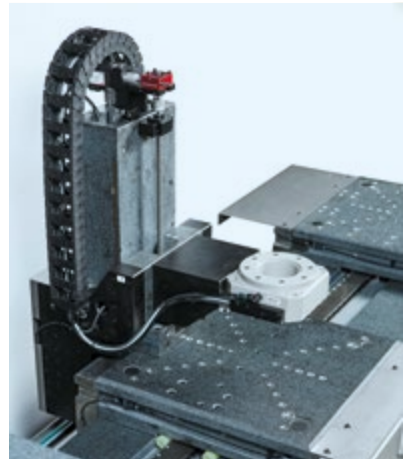
* over full travel

Z-stage

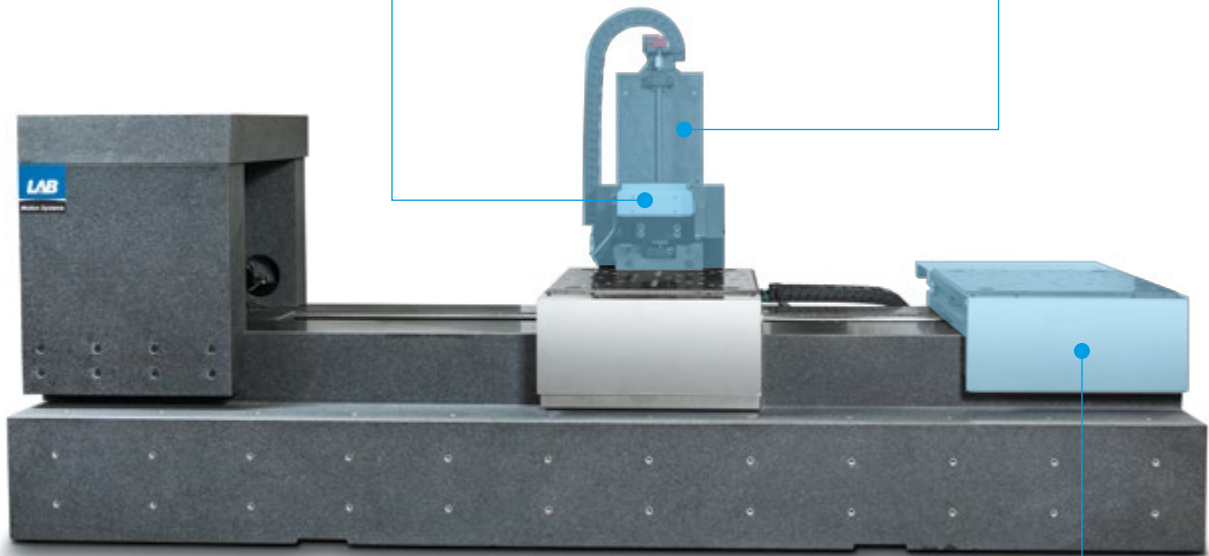
TRAVEL	mm	300
MINIMAL INCREMENTAL MOTION	μm	0,1
HORIZONTAL STRAIGHTNESS *	μm	$\pm 0,2$
VERTICAL STRAIGHTNESS *	μm	$\pm 1,0$
PITCH *	μrad	± 7
ROLL *	μrad	± 2



Standard RT150S air bearing stage



Custom developed air bearing Z-stage



Customized X-stage

9 Axis Motion System

This 9-axis motion system is developed for advanced measuring tasks. It is a nice example of combining standard LAB products with customized designs.

Air bearing axis and a rotary stage are combined to realize object manipulation in the μm -range over a volume of 2,0 m x 1,0 m x 0,8 m.

A customized XY-stage combines air bearings with a vacuum or preload realizing a large XY-stroke and very precise and straight motion. Inside this XY-stage, a standard LAB RT250S air bearing stage is integrated. On top of this stage, the LAB CT250B cross table is mounted with a standard slip ring assembly.

XY-stage

TRAVEL	mm x mm	1000 x 500
MINIMAL INCREMENTAL MOTION	μm	0,1
HORIZONTAL STRAIGHTNESS *	μm	$\pm 0,5$
VERTICAL STRAIGHTNESS *	μm	$\pm 0,5$
PITCH *	μrad	± 2
ROLL *	μrad	± 2
YAW *	μrad	± 2

* over full travel

To realize a large and precise vertical travel, we developed a custom air bearing Z-stage. In combination with a precision air bearing design, a special preload system and a weight compensation system, very accurate vertical motion is realized.

A control cabinet that steers every motion axis and takes care of all synchronization allows easy integration into your specific application. Less critical motions make use of ball bearings.

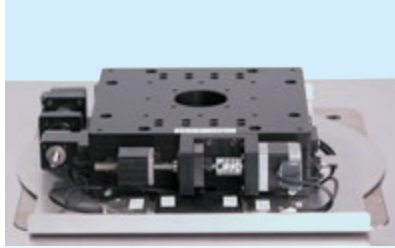
Z-stage

TRAVEL	mm	800
MINIMAL INCREMENTAL MOTION	μm	0,1
PITCH *	μrad	25





Standard RT250S air bearing stage



Standard CT250B cross table



Control cabinet with motion controllers, monitoring system and master PLC



Custom developed air bearing Z-stage



Customized air bearing XY-stage



Drivebox 3.6

A versatile drive controller, readily usable with any standard LAB rotary or linear stage.

Drivebox motion controller combines a versatile motor controller with numerous customizations for precise, safe and user-friendly control of both brushed and brushless motors. This product can readily be used with any LAB rotary or linear stage. It is highly configurable to suit a very wide range of applications, and supports communication standards such as EtherCAT/Ethernet, CAN, RS232 and USB. The Drivebox can be controlled by a master device, or operate in stand-alone mode by running a user program and a convenient set of on-board I/O's. For an easy integration in a variety of systems and environments, the Drivebox is available in panel-mount versions and a rack-mount version.

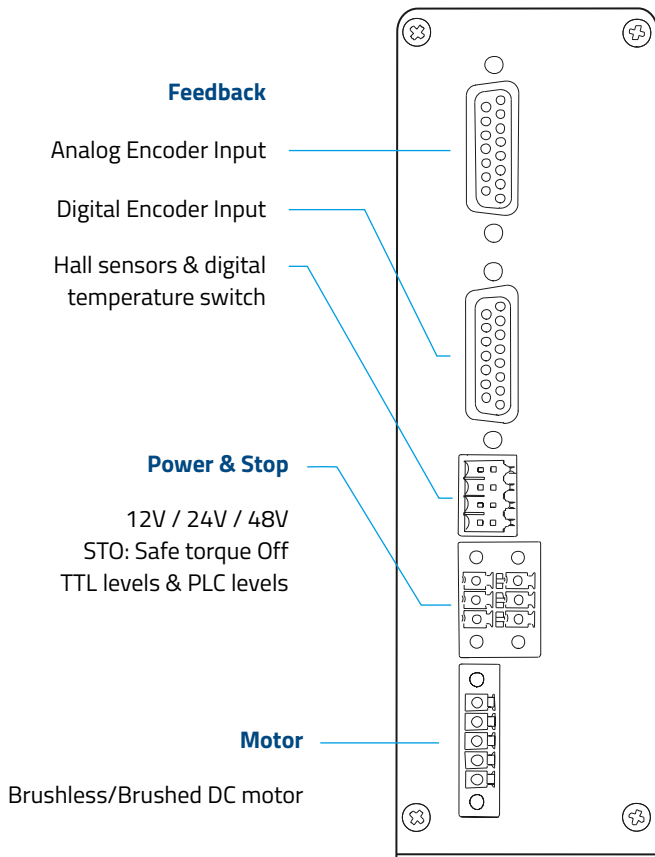
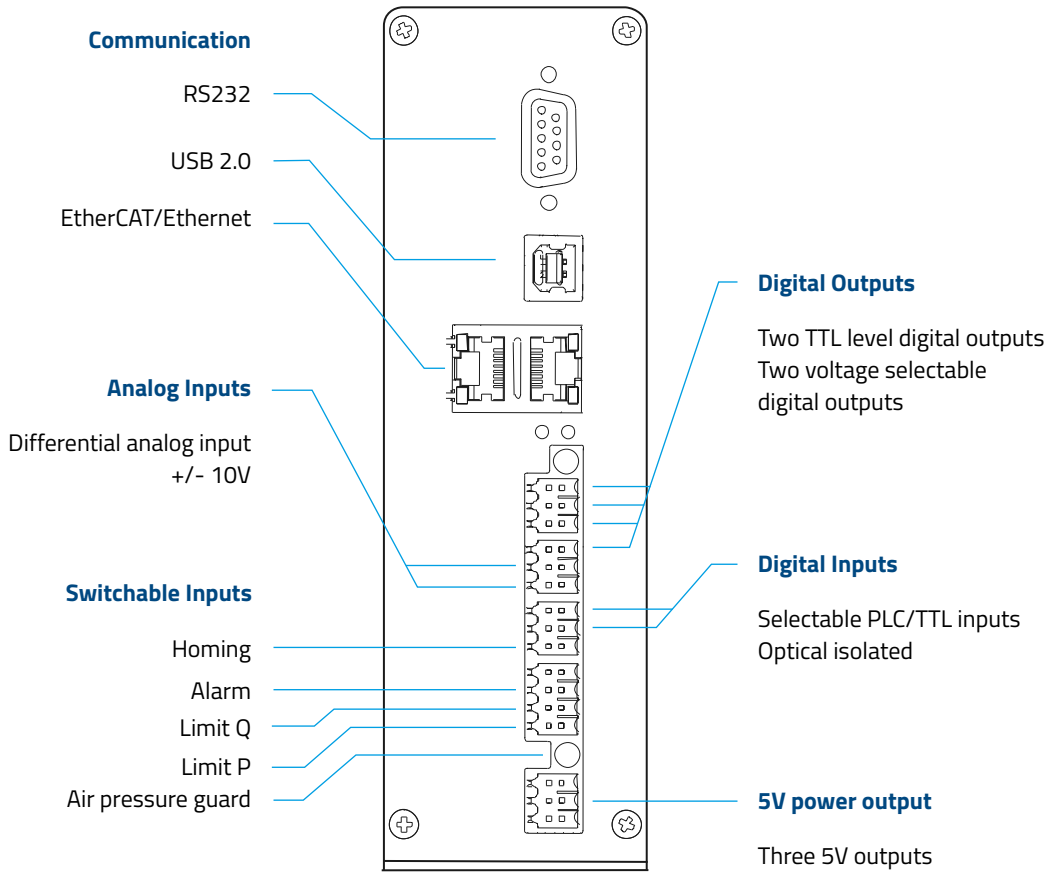
Key features:

- ✓ Readily usable with LAB rotary or linear products
- ✓ Highly configurable for a wide range of applications
- ✓ Supports communication standards such as EtherCAT/Ethernet, CAN, RS232 and USB
- ✓ Controllable by master device or operational in stand-alone mode by running a user program and set of onboard I/O's.



Specifications

- Dimensions L x W x H: 169 x 51,6 x 163 mm
- Supply voltages: 12V/24V/48V
- Digital inputs (2): TTL or PLC levels
- Switch inputs (5): Dry contact
- Analog input: 1 (differential, +/-10V)
- Digital outputs: 4 (2 x TTL + 2 x voltage selectable)
- Hall sensor inputs
- Analog and digital encoder inputs
- Motor temperature safety guard input
- Safe Torque Off (STO) inputs: 2



Compressed Air Preparation

ISO certified air filter units
to combine with any LAB air bearing products.

LAB air bearing stages require pressurized air in well-defined conditions to guarantee the optimal performance and the unlimited lifetime of the air bearing systems as intended by our R&D team. Therefore, we provide a selection of air filter accessories to alleviate the task of air preparation.

Our products require clean, oil-free and dry air at a constant air pressure to be delivered to the motion stages. LAB uses the ISO 8573-1:2010 Class 1.3.1 standard to specify the required air quality. The requirements included in this standard are listed on the right.

To achieve these stringent air quality levels, a careful approach to component selection is needed. When using an oil-free air compressor and storage tank with draining point, LAB's air filter units can be used to reach the required air quality level. The following schematic shows a layout of the general system setup.

✓ Class 1: particulate

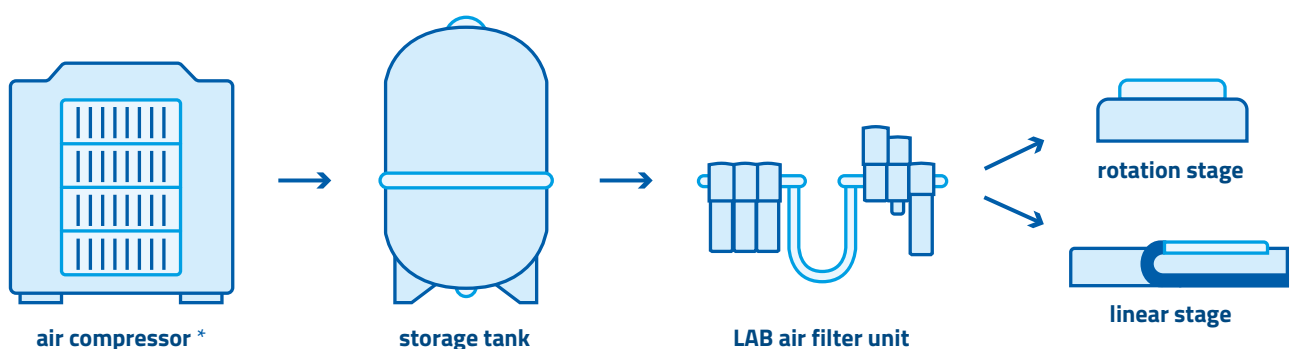
In each cubic meter of compressed air, the particulate count should not exceed 20.000 particles in the 0,1 – 0,5 micron size range, 400 particles in the 0,5 - 1 micron size range and 10 particles in the 1 - 5 micron size range.

✓ Class 3: water

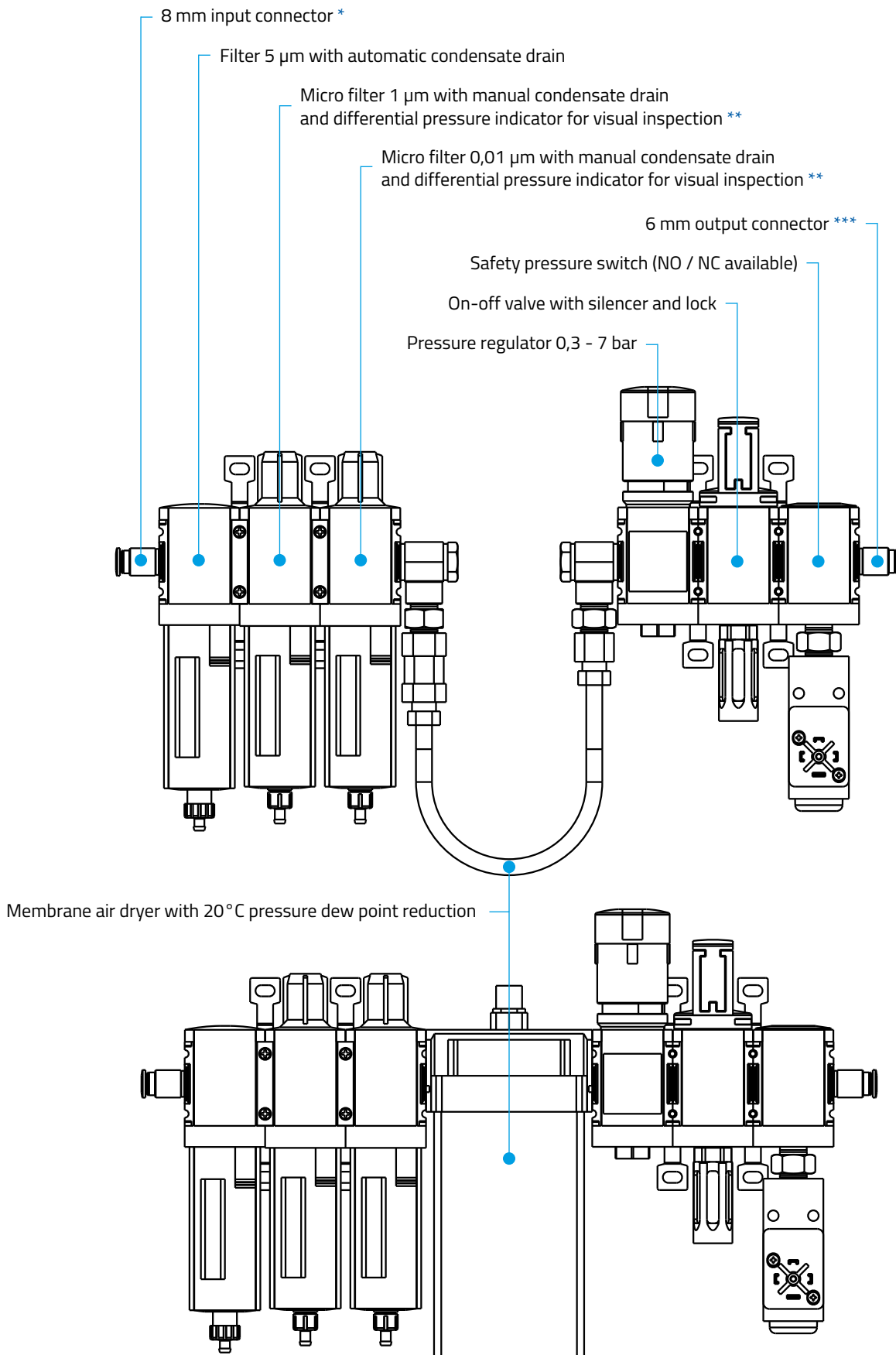
A pressure dewpoint (PDP) of -20°C or better is required and no liquid water is allowed.

✓ Class 1: oil

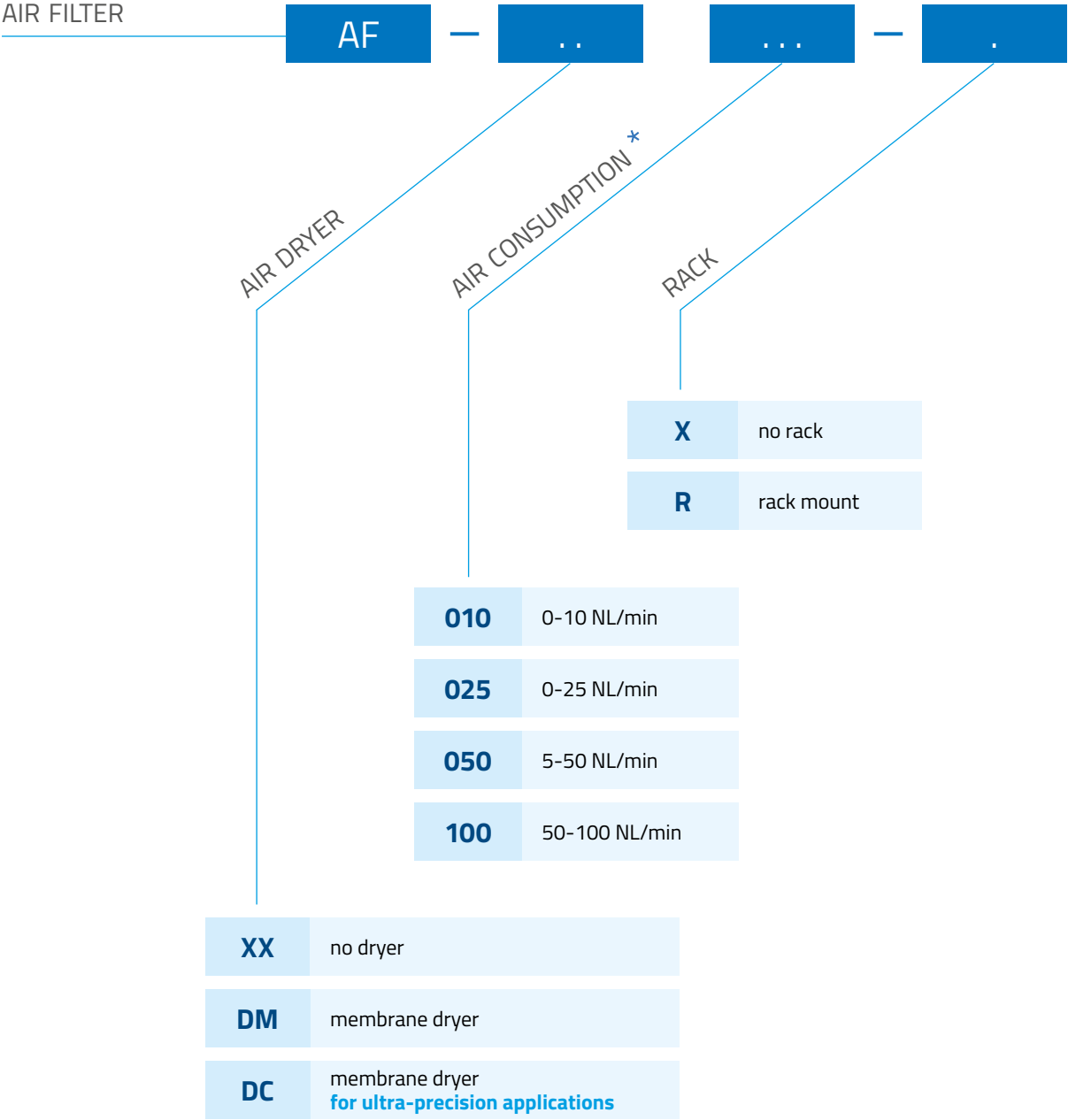
In each cubic meter of compressed air the amount of oil is limited to 0,01 mg. This is a total limit for liquid oil, oil aerosol and oil vapour combined.



- * Limit the tube length and maximize the tube diameter to limit the pressure loss.
- ** Automatic inspection is available upon request.
- *** For RT075S and RT100S a diameter reduction is foreseen, as close as possible to the rotation stage.

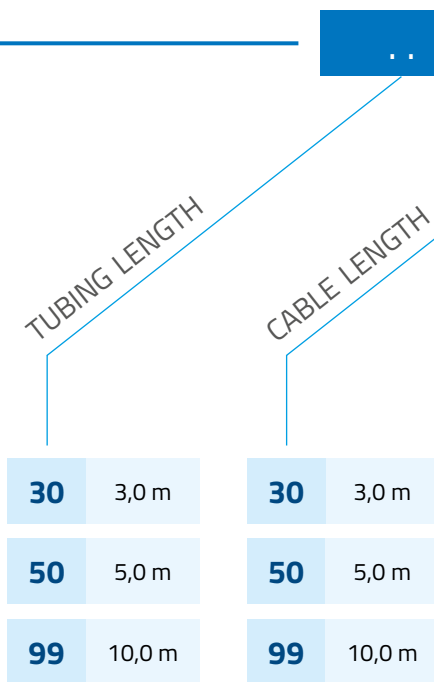


Air Filter Order Codes



Example *AF-DM050-X-30-50*

LAB Air Filter with a membrane dryer and a total air consumption between 5-50 NL/min. No rack mount is required. The product will be shipped with a tubing length of 3,0 meters at both inlet and outlet side, and a pressure switch cable length of 5,0 meters.



Air Filter Selection

AF-DM010

Filter combination for total air consumption up to 10 NL/min (e.g. RT075S – RT100S – RT150S)

AF-DM025

Filter combination for total air consumption of 10 - 25 NL/min (e.g. RT250S)

AF-DC025

Filter combination for ultraprecision air bearing systems (e.g. RT150U). Apart from the standard layout, they are equipped with:

- ✓ Active carbon filter
- ✓ Clean room compatible filters
- ✓ Precision pressure regulator

AF-DM100

Filter combination for total air consumption of 50 - 100 NL/min (e.g. RT500S)



Contact Our Team

Feel free to ask us for a quote or gain detailed information on our latest products and services!

General info@labmotionsystems.com +32 13 29 40 35

General questions or remarks? Get in touch! We are listening.

Your message will be handled swiftly and with the greatest care.

Our team can support you in [English](#), [German](#), [French](#), [Spanish](#), [Dutch](#) and [Chinese](#).

Sales sales@labmotionsystems.com

Looking for a motion solution? Interested in our standard products or in search for something specific for your system? Contact the LAB sales team! Our sales engineers are happy to provide you with a quotation and detailed information on our products and services. They can also assist you with brainstorming and thinking towards the best solution for your challenge.

LAB Motion Systems has sales representation in [Europe](#), [The Americas](#) and [Asia](#).

Support support@labmotionsystems.com

Are you already a LAB Motion Systems customer or product user? In need of technical assistance?

Contact our support team to get a fast response! Our technical staff is at your disposal for troubleshooting and additional help. We will get your system up and running in no time.



Langerode 9
3460 Bekkevoort
Belgium

T +32 13 29 40 35
VAT : BE 0878.309.561

www.labmotionsystems.com
info@labmotionsystems.com





LAB Motion Systems

Langerode 9

3460 Bekkevoort

Belgium

T +32 13 29 40 35

VAT : BE 0878.309.561

www.labmotionsystems.com

info@labmotionsystems.com