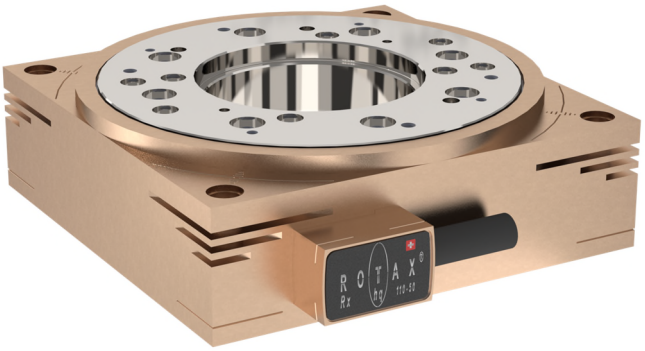
JENNY SCIENCE moving precisely, within tight space

Data Sheet
ROTAX® Rxhq 110-50T1.5

Edition February 2024

Hollow Shaft Motor
ROTAX® Rxhq = high torque



Highlights

Compact direct drive with high torque up to 4.0Nm *(35.40 lbf·in)*

Flexible positioning with a repeatability of ± 1arcsec

Single-turn absolute encoder

Large hollow shaft with a diameter of 50mm *(1.97”)*

No wear and tear, the direct drive ensures maximum precision over the entire service life

Variable one-cable connection to XENAX® in 180° grid orientation

Force control, force limitation and force recording with XENAX® servo controller

General

The direct drive developed in-house impresses with its flat design, compact external dimensions and a hollow shaft with a diameter of 50mm. Cables, vacuum or compressed air lines, light and laser beams, glass fibers or camera lenses can thus be easily guided through the hollow shaft.

The absolute measuring system allows an immediate start without previous referencing. With a resolution of 120'000, 648'000 or 2'592'000inc. per revolution, repeatability of ± 1arcsec can be achieved. The single-cable connection can be supplied in right-hand or left-hand output configuration.

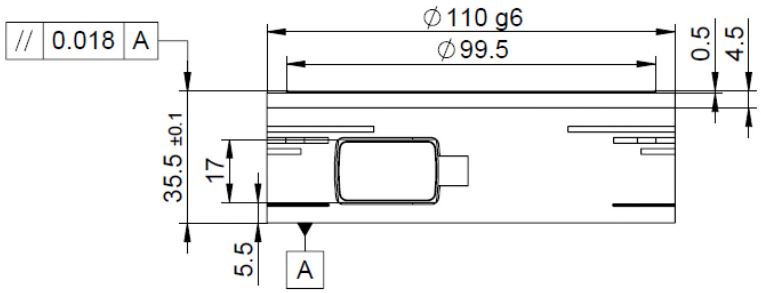
Together with the patented "Force Calibration" function, undesired cogging, weight and friction forces of the ROTAX® Rxhq direct drives can be easily compensated. This makes it possible to specify, limit and monitor forces in processes. Together with the Forceteq® basic technology included in the XENAX® servo controller, complete force/distance diagrams can be recorded - an additional torque sensor is not necessary.

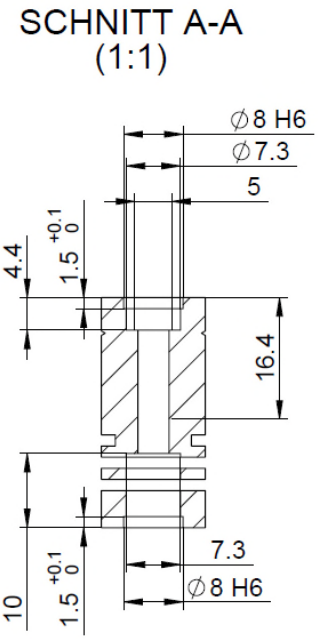
Alois Jenny
Jenny Science AG

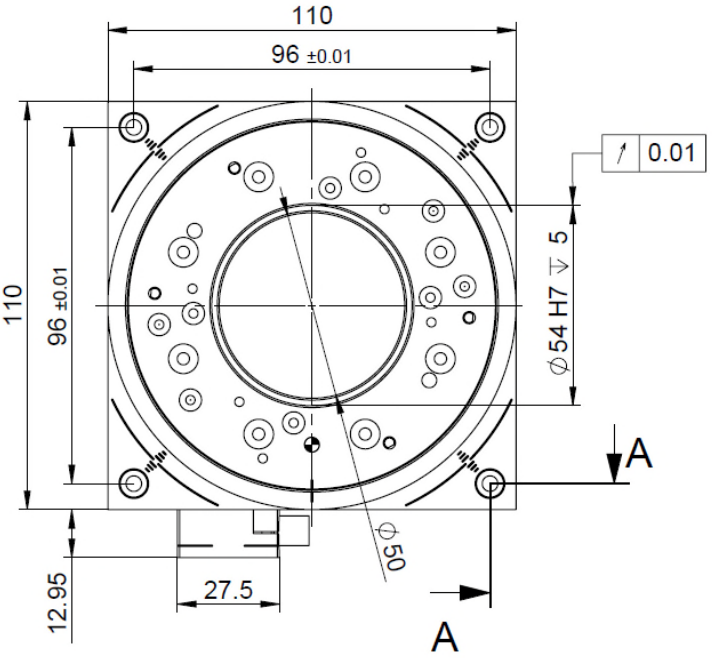
Inhaltsverzeichnis

1 Dimension ROTAX® Rxhq 110-50

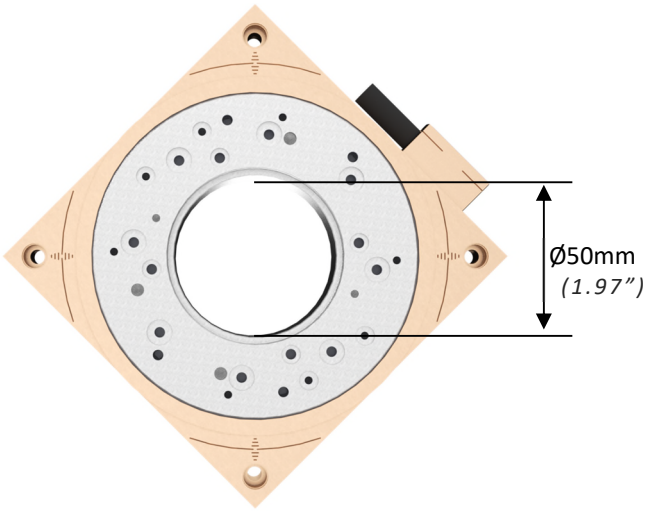
1.1 Installation dimension



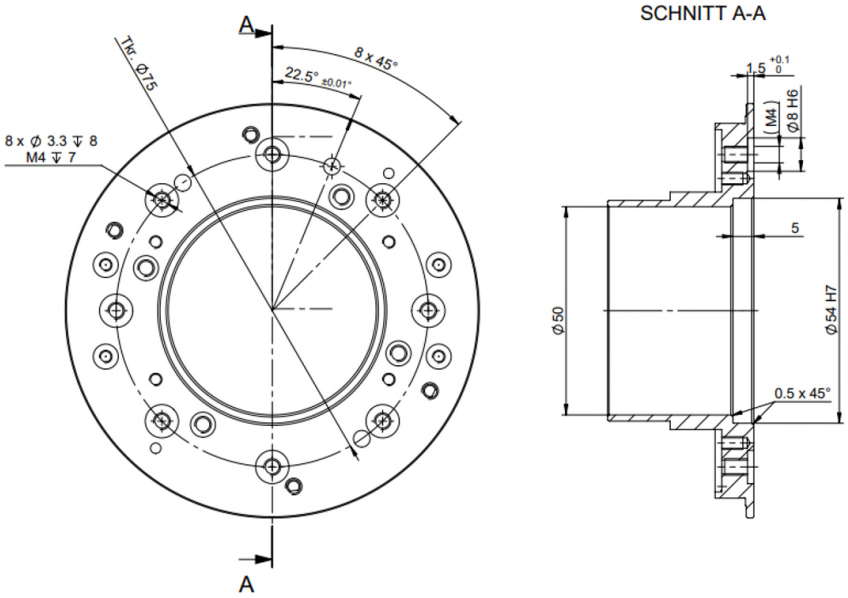




1.2 Hollow shaft

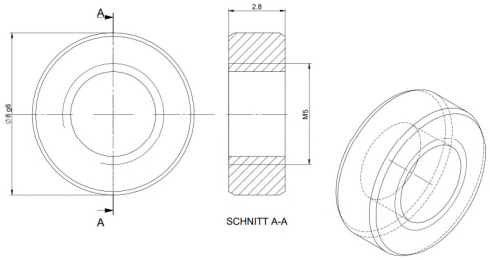


1.2.1 Front flange dimensions



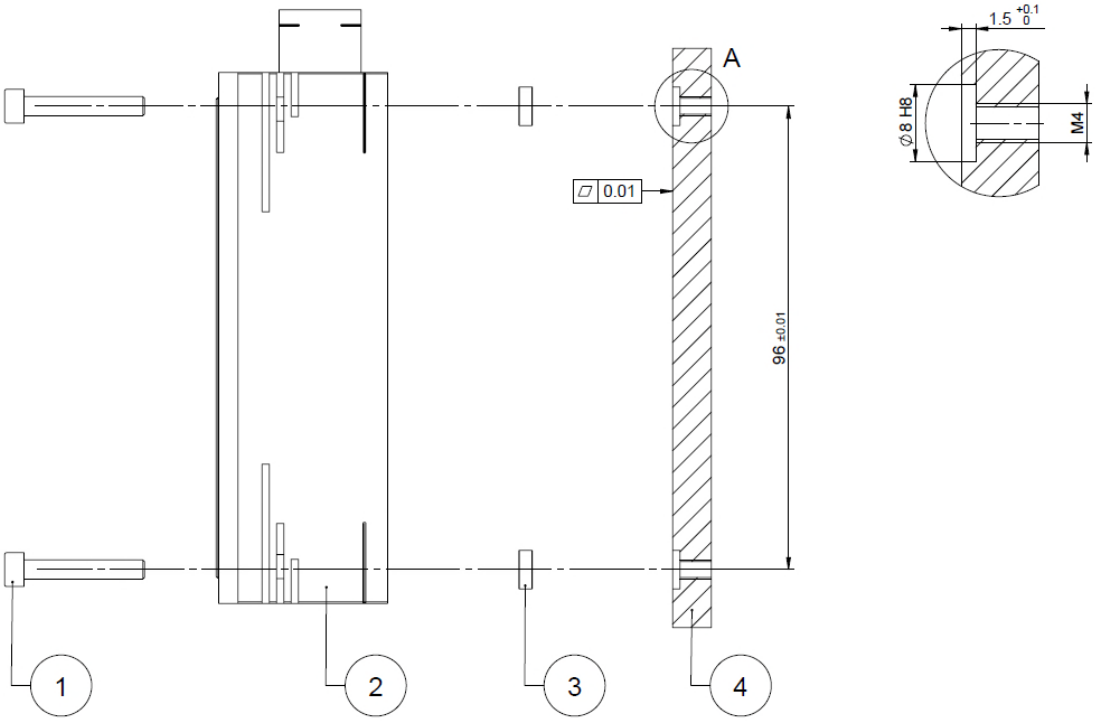
1.2.2 Centering rings

Centering rings for boreholes Ø8 g6 x 1.5 in
Pitch circle diameter 75

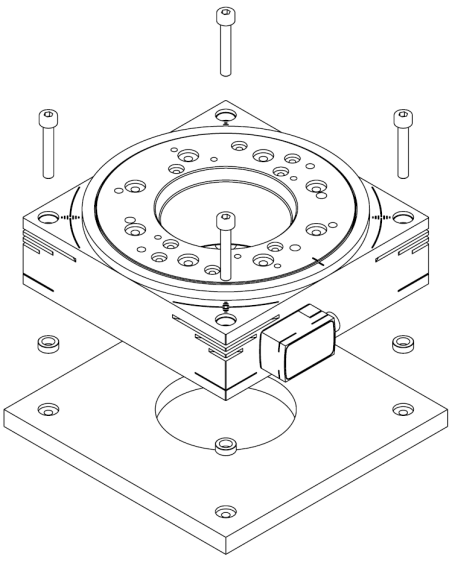


1.3 Installation options

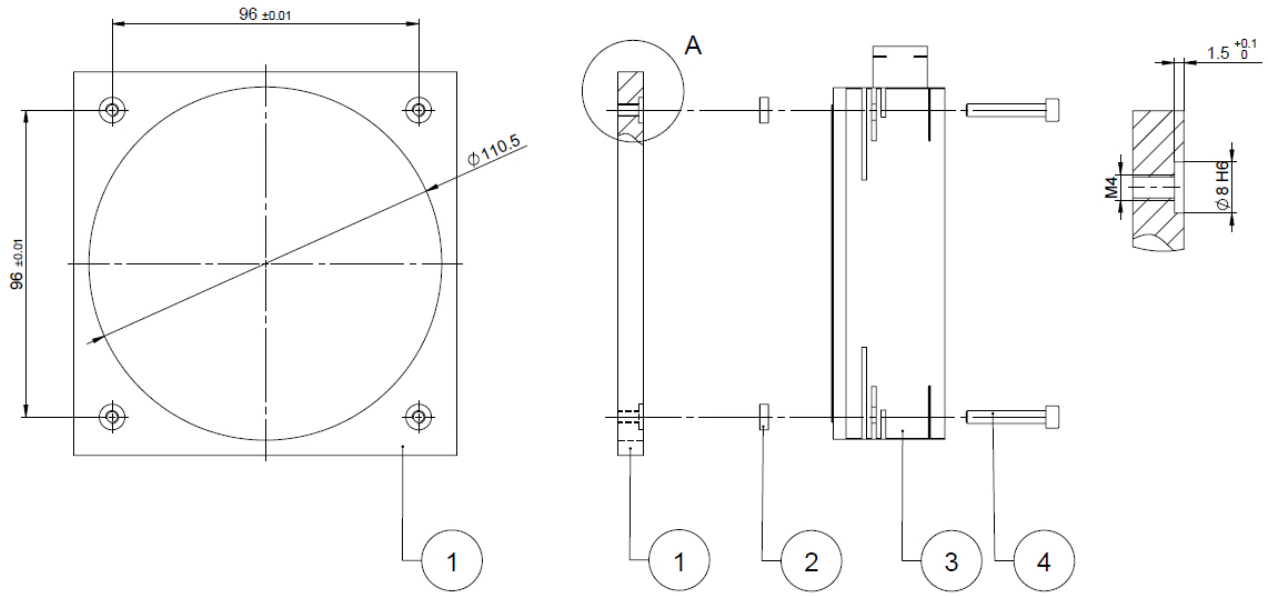
1.3.1 Installation rear side with distance sleeves



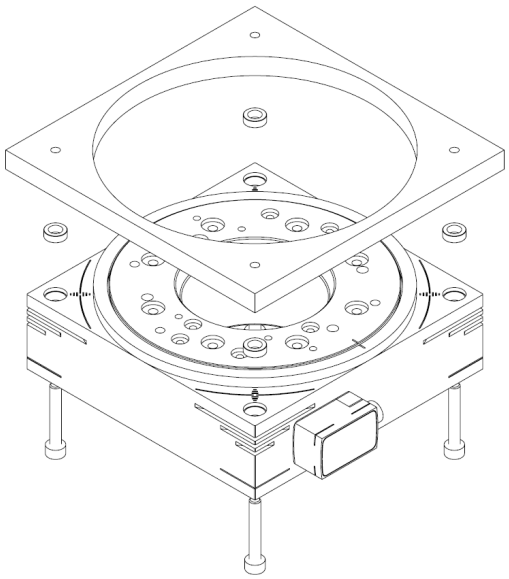
Pos.	QTY	Designation
1	4	Fixing screws M4 (max. tightening torque 2.9Nm *(25lbf·in)*)
2	1	ROTAX® Rxhq 110-50
3	4	Centering rings (Ø8 g6 x 1.5)
4	1	Mounting plate customer



1.3.2 Installation flange side with centering ring



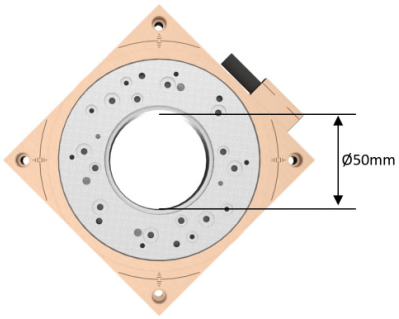
Pos.	QTY	Designation
1	1	Mounting plate, customer – Flange side
2	4	Centering ring (Ø8 g6 x 1.5)
3	1	ROTAX® Rxhq 110-50
4	1	Fixing screws M4 (max. tightening torque 2.9Nm *(25lbf·in)*)



2 Smart Praxis Oriented Details

2.1 Hollow shaft diameter 50mm *(1.97")*

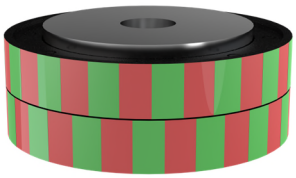
The large hollow shaft with a diameter of 50mm *(1.97")* offers generous space for cables, vacuum or compressed air lines, light and laser beams, glass fibres and other media.



2.2 Single-Turn Absolut Encoder

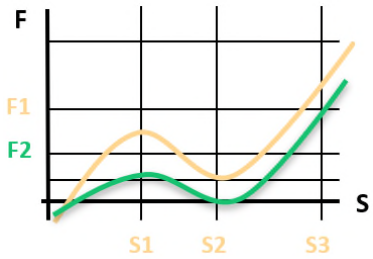
Thanks to the integrated absolute encoder with a resolution of 120'000 inc. per revolution, repeatability of ± 11arcsec can be achieved. The optical measuring systems with 648'000 inc. and 2'592'000 inc. then achieve ± 4 arcsec resp. ± 1 arcsec repeatability.

Due to the absolute position, the ROTAX® Rxhq is immediately ready for operation after power-on, no reference drive is necessary.



2.3 Record and Limit Forces

The patented function „Force Calibration" is able to compensate the magnetic cogging forces, the load and the friction forces of the Rotax® direct drive in a very simple way. This is how it becomes possible to control, to limit and to monitor forces in process. Together with the XENAX® servo controller it is also possible to record complete force/way diagrams. No need for an additional force sensor.

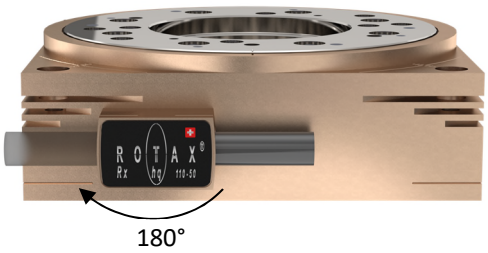


2.4 One-Cable connection reduces cabling requirements

The one-cable connection from Jenny Science simplifies the whole machine cabling complexity. In addition, the cable chains are more compact and lighter, need less room and achieve higher dynamics.

2.5 Cabel connection 180° pattern

The cable connection can be selected to the right, left and downwards. The corresponding article number must be specified when ordering. The cable outlet cannot be turned by yourself.



3 Performance data

3.1 Techniscal specification

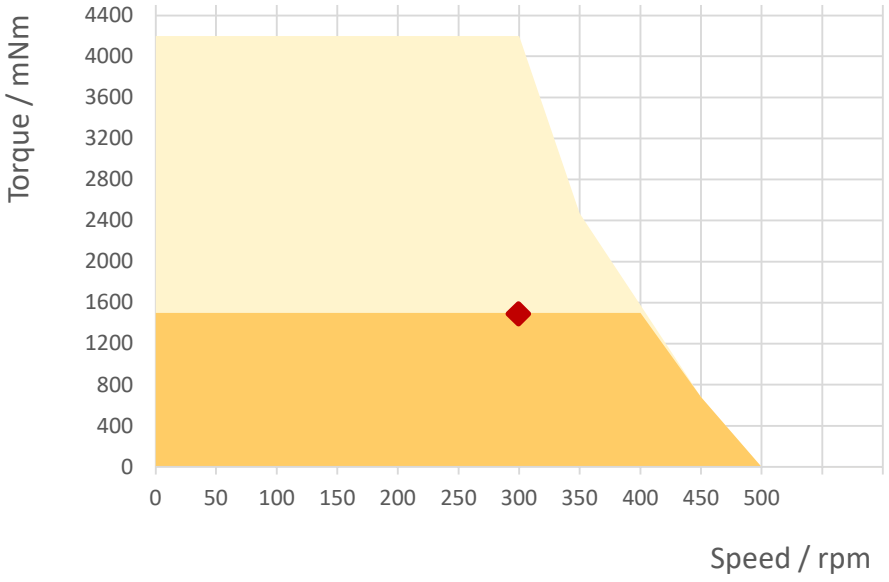
Supply voltage					24V DC	48V DC
Nominal speed (1)	120`000 Inc.	n_N	rpm		300	600
Nominal speed (1)	648`000 Inc.	n_N	rpm		300	600
Nominal speed (1)	2`592`000 Inc.	n_N	rpm		200	200
Stall torque		M_0	Nm	(lbf·in)	1.6 (14.16)	1.6 (14.16)
Nominal torque (1)		M_N	Nm	(lbf·in)	1.5 (13.28)	1.5 (13.28)
Peak torque (2)		M_P	Nm	(lbf·in)	4.0 (35.40)	4.0 (35.40)
Nominal current (1)		I_N	A		4.0	4.0
Peak current (2)		I_P	A		12.0	12.0
Mechanical Data						
Max. axial load			N	(lbf)	10'000 (2248.0)	
Max. moment load			Nm	(lbf·in)	250 (2212.7)	
Rotor moment of inertia		J_{Rot}	g·cm²	(lbf·in²)	4'800 (1.6402)	
Total weight		m	g	(lbs)	1'200 (2.6500)	

(1) continuous operation with 25C° *(77°F)* ambient temperature and convection cooling (ambient air)
(2) peak operation (duty 10%)

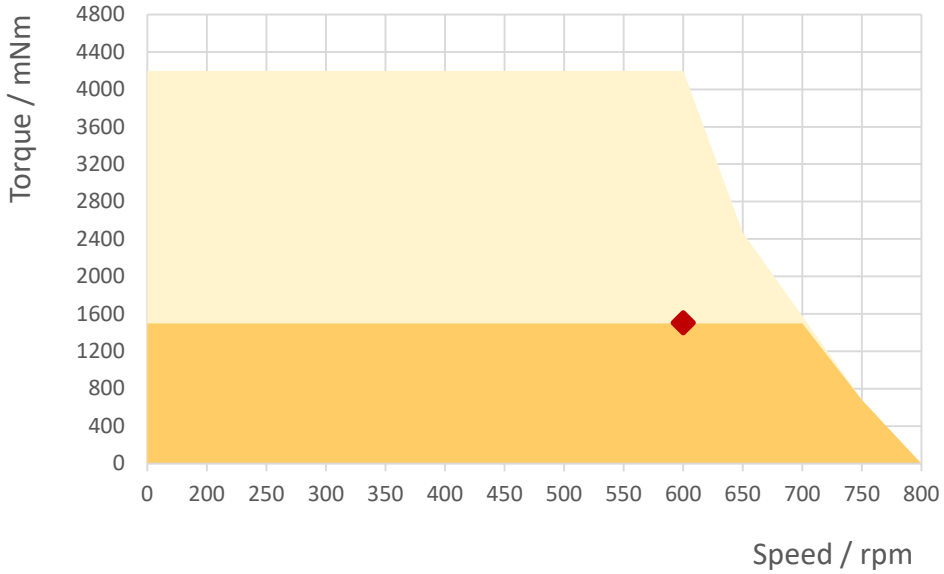
3.2 Torque/Speed curve

Nominal operation | Continous operation | Peak operation

Supply voltage U_S = 24VDC (120'000Inc. encoder)



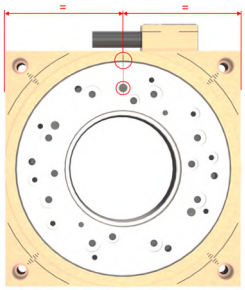
Supply voltage U_S = 48VDC (120'000Inc. encoder)



4 Accuracy

4.1 Positioning

Standard resolution polring Bi-directional repeatability	120`000 Inc., Vmax 600 rpm ± 11 arcsec
Optional optical resolution Bi-directional repeatability	648`000 Ink., Vmax 600 rpm ± 4 arcsec
Optional optical resolution Bi-directional repeatability	2'592`000 Ink., Vmax 200 rpm ± 1 arcsec
Reference drive	With the single-turn absolute encoder the position is available immediately after power-on. Therefore no reference drive is necessary.
Zero point absolut	For the alignment of the rotor flange, a single bore Ø4H6 with aligned marking on the shaft and a marking on the symmetry axis of the housing is provided. The absolute zero point is in straight alignment of the two markings.



4.2 Mechanical accuracy

Runout [µm]	Der ROTAX® Rxhq is delivered with the following tolerances as standard. (Smaller tolerances are possible by selection individual motors from serial production i.E <5µm)
Runout radial on Ø54H7	<10µm
Runout axial on Ø94	<10µm

5 Maintenance, Life time

5.1 Lubrication

The double row angular contact ball bearing of the ROTAX® Rxhq is maintenance-free and cannot be relubricated.

5.2 Life time

The ROTAX® Rxhq is a direct drive. This means no wear and tear and therefore highest precision over the whole lifetime.

Basically, the preloaded double row angular contact ball bearing is the life-determining element.

Actions with which life time can be extended:

- Trajectories with curve profiles instead of trapezoidal profiles (XENAX® Servo controller, default value S-curve profile = 20%).
- Dynamics not higher than needed.
- Completing non cycle time critical motions slower.
- Avoid pollution in the guides.

6 Safety, Environment

6.1 Safety with XENAX® Servo Controller

EN 61000-6-2:2005 Electromagnetic compatibility (EMC), Immunity for industrial environments	EMC Immunity Testing, Industrial Class A
EN 61326-3-1 IFA:2012 EN 61326-1, EN 61800-3, EN 50370-1	Immunity for Functional Safety Functional safety of power drive systems Electrostatic discharges ESD, Electromagnetic Fields, Fast electric transients Bursts, radio frequency common mode
EN 61000-6-3:2001 Electromagnetic compatibility (EMC), Emission standard for residential, commercial and light-industrial environments	EMC Emissions Testing, Residential Class B
EN 61326-1, EN61800-3, EN50370-1 IFA:2012	Radiated EM Field, Interference voltage Functional safety of power drive systems

6.1 Environmental Conditions

Storage and transport	No outdoor storage. Storage rooms have to be well vented and dry. Storage temperature -25°C up to +55°C *(-13°F up to 131°F)*.
Operational temperature	5°C - 50°C *(41°F - 122°F)* Environment, reduction in performance at 40°C *(104°F)*.
Operational humidity	10-90% non-condensing.
Cooling	No need of external cooling. The mechanical mounting to a flange allows additional heat dissipation thanks to thermal conduction. This allows a higher performance.
Protection category	IP 40

7 Note

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