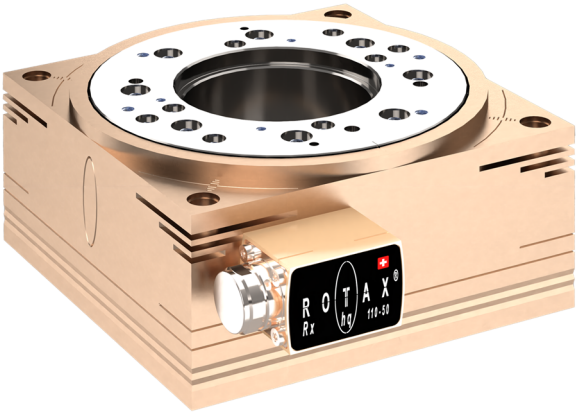
JENNY SCIENCE

moving precisely, within tight space

Data Sheet
ROTAX® Rxhq 110-50T4.0

Edition 13. Mai 2024

Hollow Shaft Motor
ROTAX® Rxhq = high torque



Highlights

Compact direct drive with high torque up to 12.0Nm *(106.2 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 90° grid orientation

Torque limitation and torque monitoring with XENAX® servo controller

General

The direct drive developed in-house impresses with its compact external dimensions and a hollow shaft with a diameter of 50 mm. Cables, vacuum or compressed air lines, light and laser beams, glass fibres or camera lenses can be guided through the hollow shaft without any problems.

The absolute measuring system allows an immediate start without previous referencing. With a resolution of 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 "IForce Calibration" function, undesired cogging, weight and friction forces of the ROTAX® Rxhq direct drives can be easily compensated. This makes it possible to limit and monitor torques in processes. Together with the Forceteq® basic technology included in the XENAX® servo controller, complete torque/distance diagrams can be recorded - an additional torque sensor is not necessary.

Alois Jenny
Jenny Science AG

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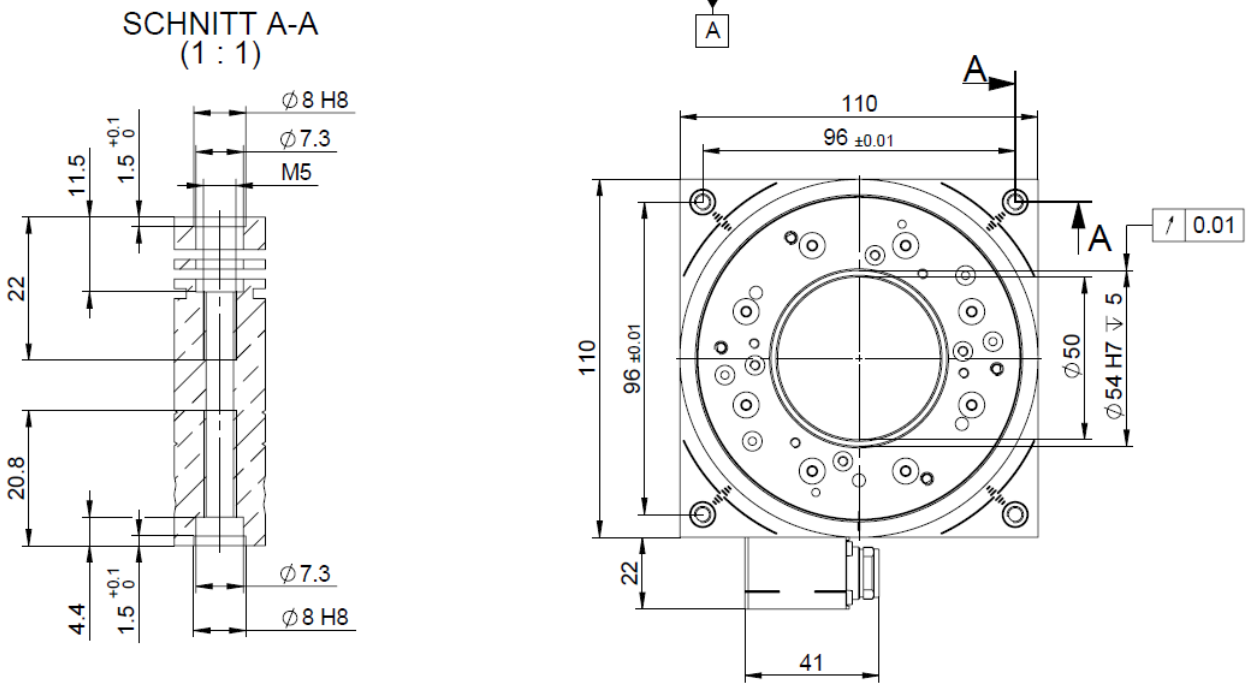
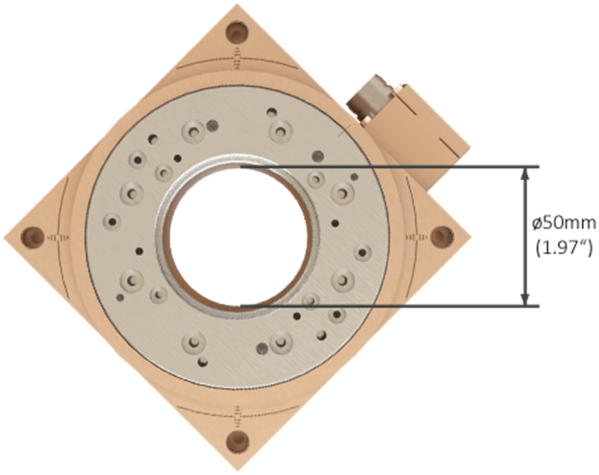
1 Dimension ROTAX® Rxhq 110-50T4.0

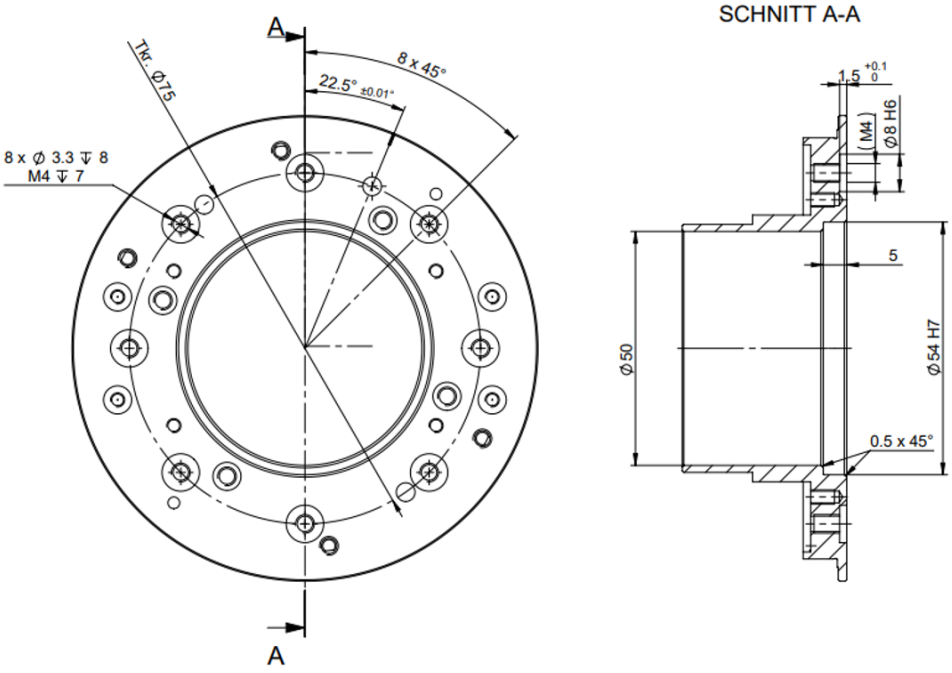
1.1 Installation dimension



1.2 Hollow shaft

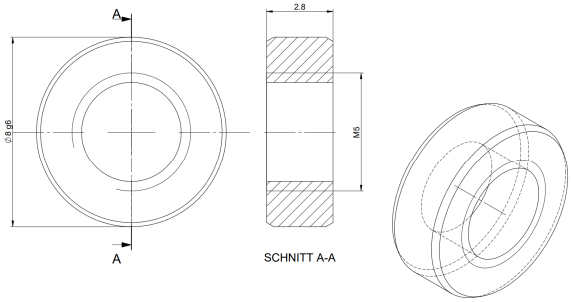


1.2.1 Front flange dimension



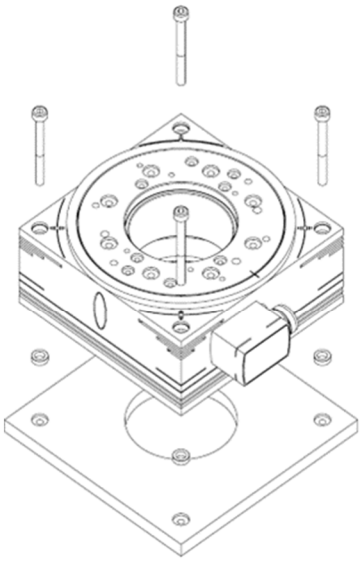
1.2.2 Centering rings

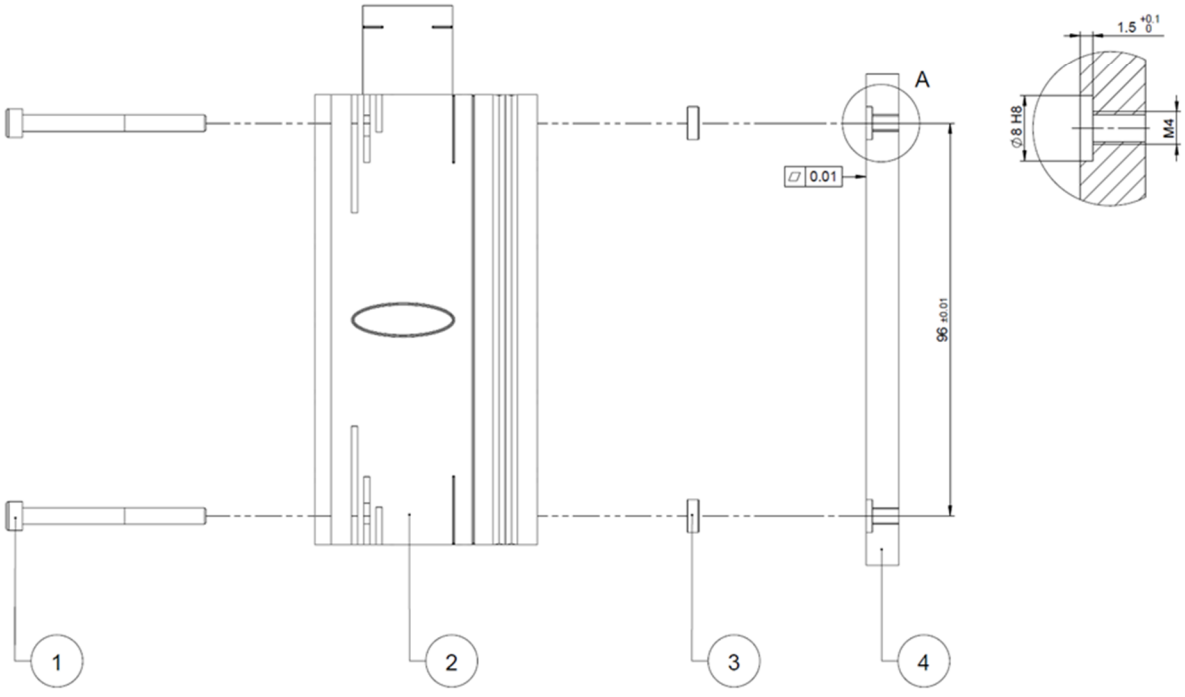
Centering rings for boreholes Ø8 g6 x 1.5 in
Pitch circle diameter 75



1.3 Installation options

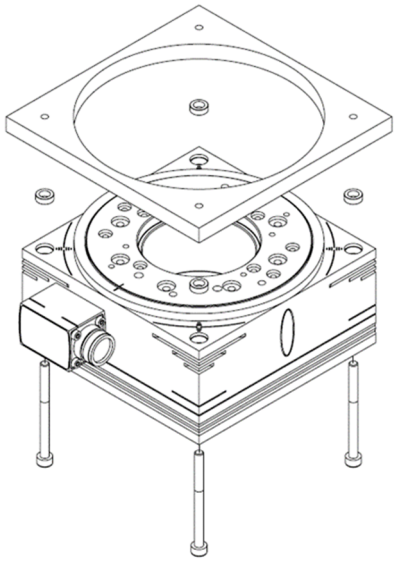
1.3.3 Installation rear side with distance sleeves

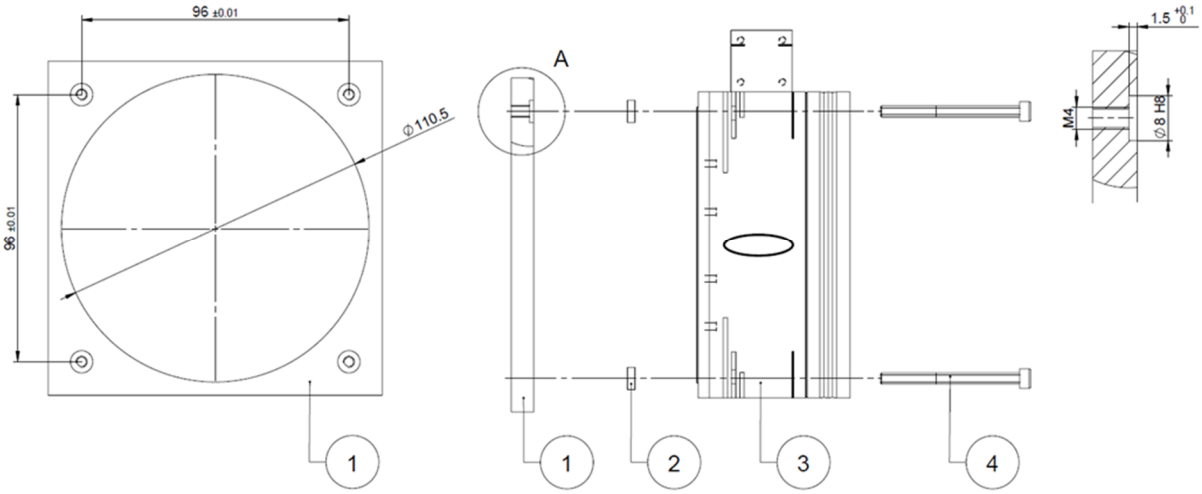




Pos.	QTY	Designation (available in a set)
1	4	Fixing screws M4x45 (max. tightening torque 2.9Nm)
2	1	ROTAX® Rxhq 110-50T4.0
3	4	Centering rings (Ø8 g6 x 2.8)
4	1	Mounting plate customer

1.3.4 Installation flange side with centering ring



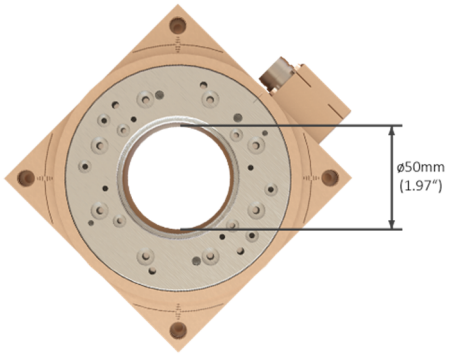


Pos.	QTY	Designation
1	1	Mounting plate, customer – Flange side
2	4	Centering ring (Ø8 g6 x 2.8)
3	1	ROTAX® Rxhq 110-50T4.0
4	4	Fixing screws M4x50 (max. tightening torque 2.9Nm)

2 Smart Praxis Oriented Details

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

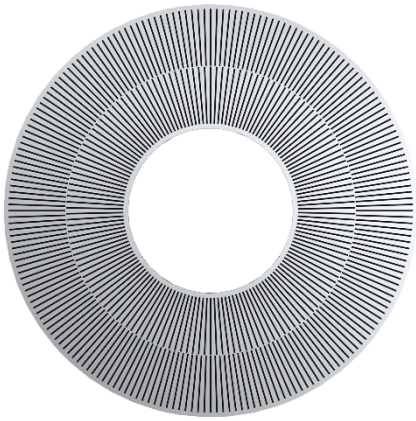
The large hollow shaft with a diameter of 50mm *(1.97")* offers generous space for cables, vacuum or compressed air lines, light and laser beams, glass fibres and other media.



2.2 Single-Turn Absolute Encoder

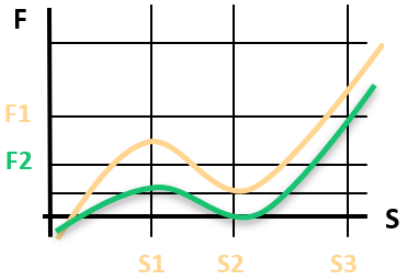
Thanks to the integrated absolute encoder with a resolution of 648'000 Inc. or 2'592'000 Inc. per per revolution, repeatability of ± 4 arcsec resp. ± 1 arcsec can be achieved.

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



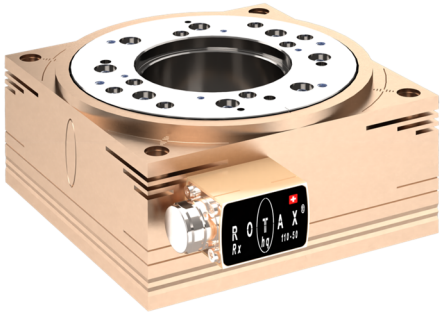
2.3 Torque limitation and torque measurement

The patented function „IForce Calibration" is able to compensate the magnetic cogging forces, the load and the friction forces of the ROTAX® Rxhq direct drive in a very simple way. This makes it possible to limit and monitor torques in processes. Together with the XENAX® servo controller, complete torque/displacement diagrams can also be recorded - an additional sensor is not necessary.



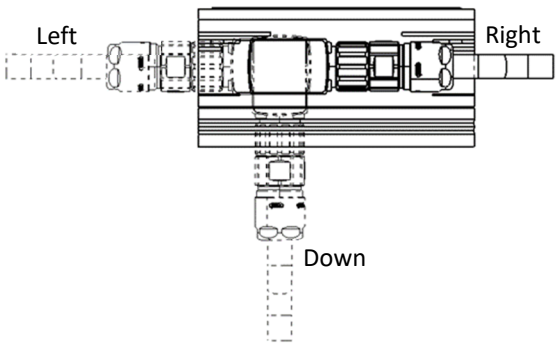
2.4 One-Cable solution

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 Cable connection 90° 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 Rxhq 110-50T4.0

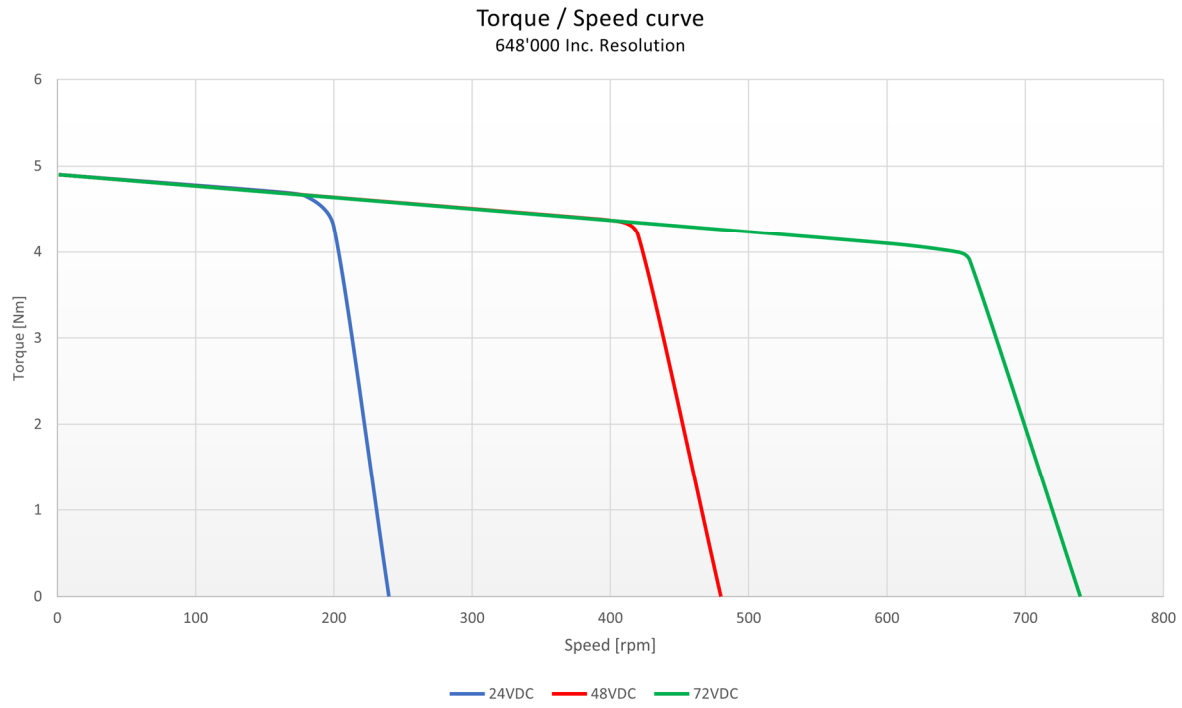
3.1 Technical specification

Supply voltage				24V DC	48V DC	72V DC
Nominal speed (1)	648`000 Inc.	n_N	rpm	180	420	650
Nominal speed (1)	2`592`000 Inc.	n_N	rpm	200	200	200
Stall torque		M_0	Nm (lbf in)		4.2 (37.2)	
Nominal torque (1)		M_N	Nm (lbf in)		4.0 (35.4)	
Peak torque (2)		M_P	Nm (lbf in)		12.0 (106.2)	
Nominal current (1)		I_N	A		6.3	
Peak current (2)		I_P	A		20.0	

Mechanical Data			
Max. axial load		N (lbf)	10'000 (2248)
Max. moment load		Nm (lbf in)	250 (2213)
Rotor moment of ineria	JRot	kg·m^2(lbs in^2)	0.001105 (3.78)
Total weight	m	g (lbs)	2250 (4.96)

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

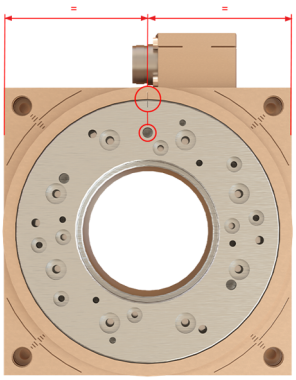
3.2 Torque/Speed curve



4 Accuracy

4.1 Positioning

Resolution	648`000 Inc., Vmax 650 rpm
Bi-directional repeatability	± 4 arcsec
Resolution	2'592`000 Inc., Vmax 200 rpm
Bi-directional repeatability	± 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]	The 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, Enviroment

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

6.2 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 50

7 Note

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