

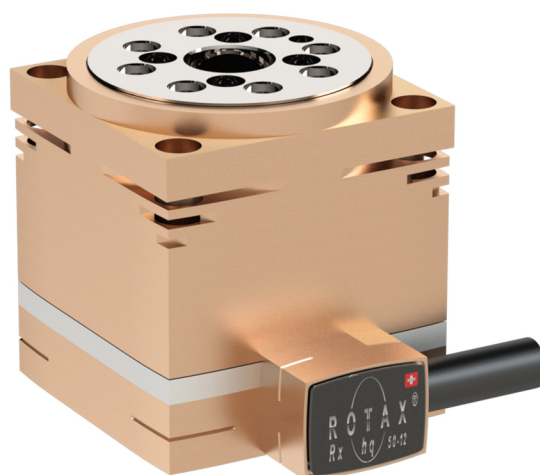


## Data Sheet

### ROTAX® Rxhq 50-12T0.3

Edition December 2021

**Compact Hollow Shaft Motor**  
**ROTAX® Rxhq = high torque**



### Highlights

Compact direct drive with high torque  
up to 1'020mNm (9.03 lbf·in)

Flexible positioning with a repeatability of  
 $\pm 0.003^\circ$  /  $\pm 11$  arcsec

Single-turn absolute encoder

Large hollow shaft with a diameter of  
12mm (0.47")

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

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

### **General**

The self-developed direct drive servo motor is based on the magnetic flux technology of wind turbine generators.

This generates a high torque at low speed.

In figures this means a factor 2-3 higher torque with the same construction volume compared to a conventional direct drive of competitors.

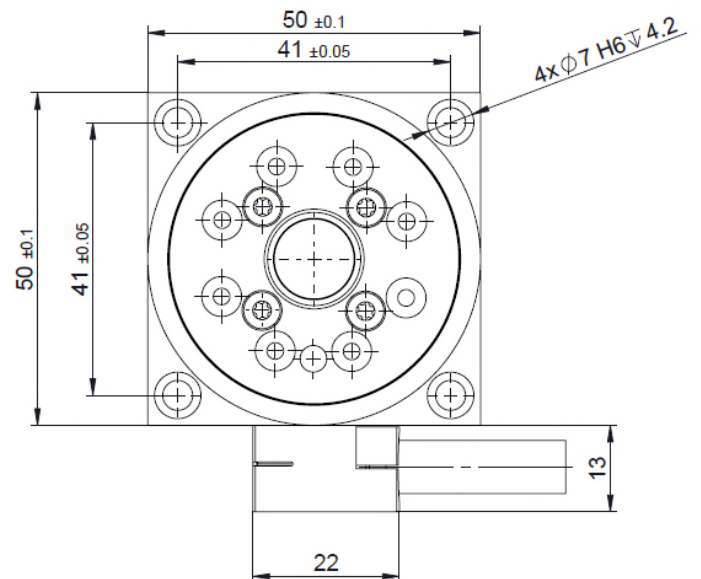
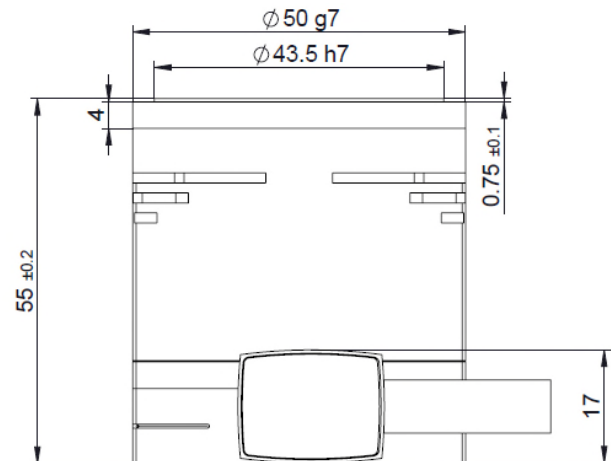
Alois Jenny  
Jenny Science AG

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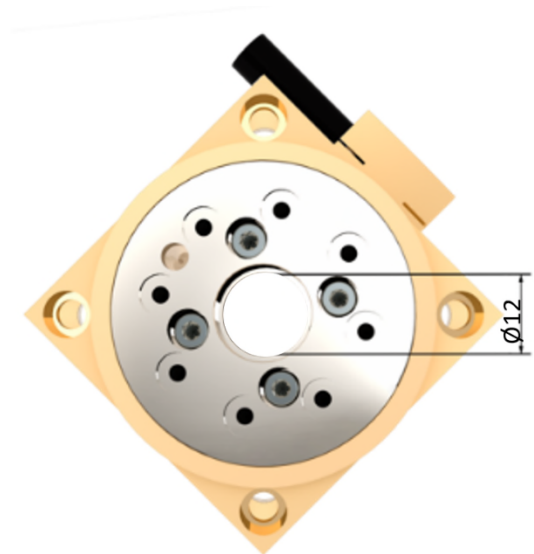
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## 1 Dimension ROTAX® Rxhq 50-12

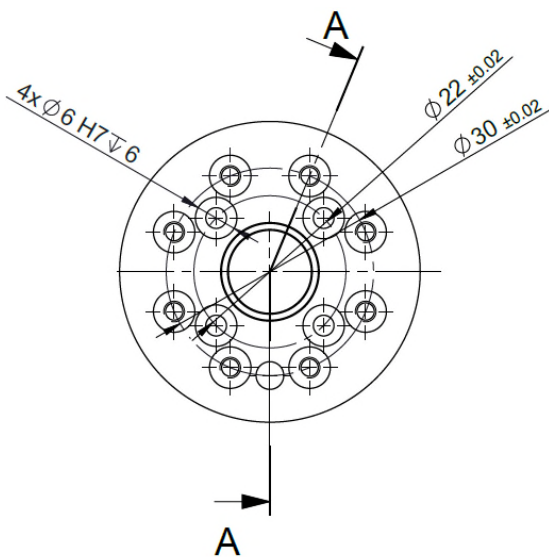
### 1.1 Installation dimension



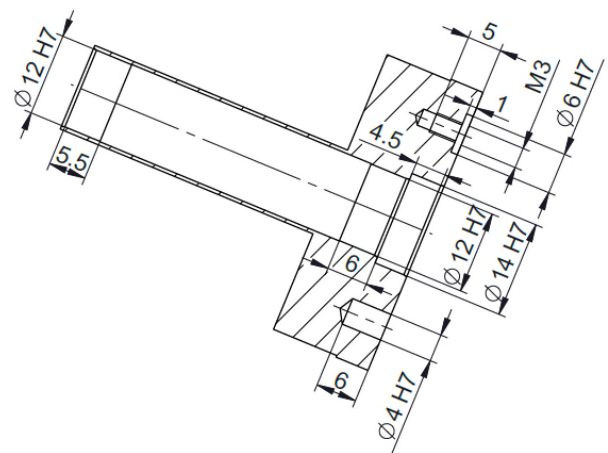
## 1.2 Hollow shaft



### 1.2.1 Front flange dimensions

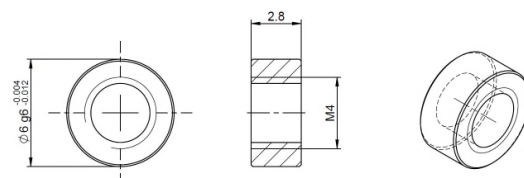


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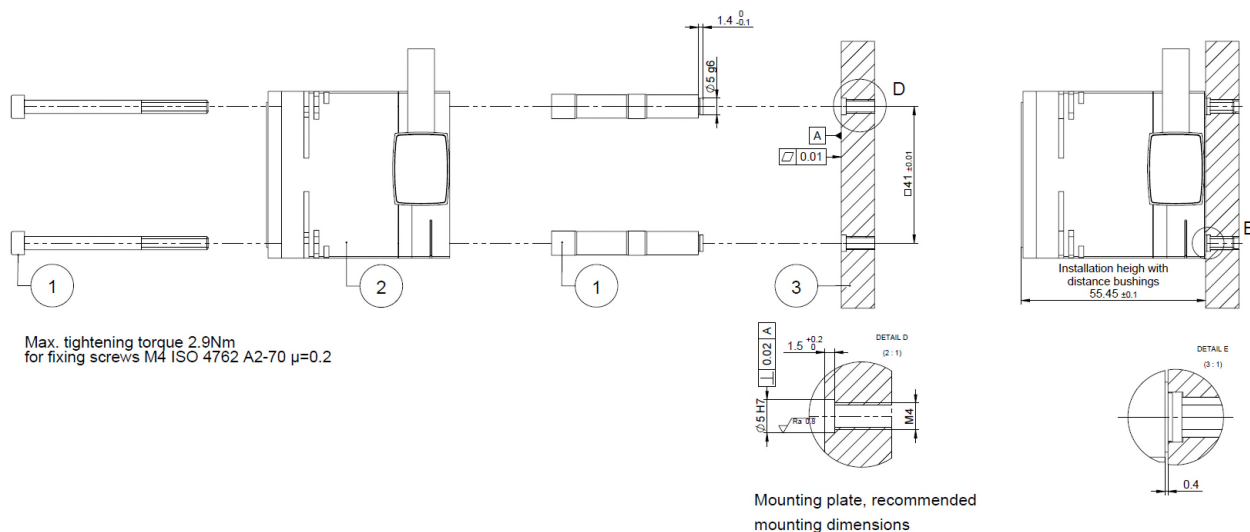
### 1.2.2 Centering rings

Centering rings for boreholes Ø6H7x1 in  
Pitch circle diameter 30



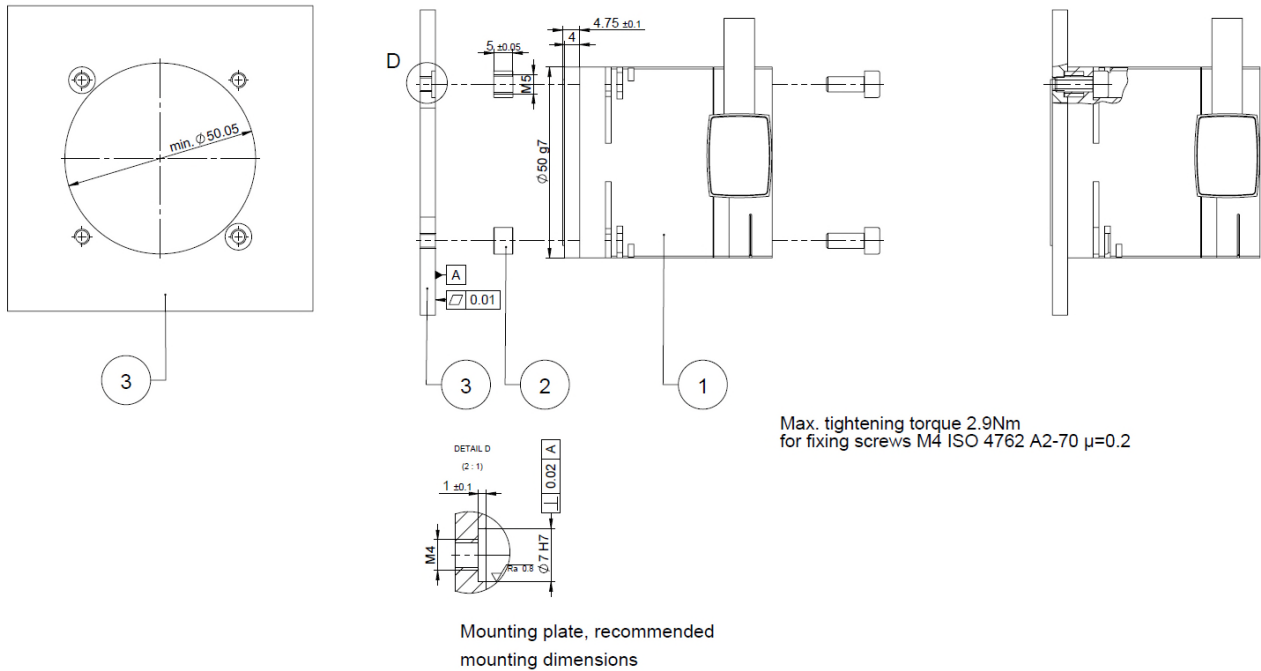
### 1.3 Installation options

#### 1.3.1 Installation rear side with distance sleeves



Pos.	QTY	Designation
1	4	Fixing screws with distance bushings ROTAX® Rxhq 50-12
2	1	ROTAX® Rxhq 50-12
3	1	Mounting plate, customer

### 1.3.2 Installation flange side with centering ring



Pos.	QTY	Designation
1	1	ROTAX® Rxhq 50-12
2	4	Centering ring D7x5 ROTAX®
3	1	Mounting plate, customer

## 2 Modular System

### 2.1 Angle bracket to LINAX® Lxu F60

Mounting to LINAX® Lxu F60 base plate  
Grid 40 x 40mm (1.57" x 1.57")

2 x Dowel pin Ø4 x 8  
4 x Torx, M4 x 14

4 x Distance bushings with centering Rxhq 50-12  
4 x Hexagon socket screws, M4 x 55



### 2.2 Angle bracket to LINAX® Lxc F10/F40

Mounting to LINAX® Lxc F10/F40 slider  
Grid 33 x 28mm (1.30" x 1.10")

2 x Dowel pin Ø2.5 x 6  
4 x Torx, M3 x 12

4 x Distance bushings with centering Rxhq 50-12  
4 x Hexagon socket screws, M4 x 55



### 2.3 Angle bracket to ELAX® Ex F20

Mounting to ELAX® Ex F20 slider  
Grid 20 x 25mm (0.79" x 0.98")

2 x Centering ring Ø6  
4 x Torx, M3 x 12

4 x Distance bushings with centering Rxhq 50-12  
4 x Hexagon socket screws, M4 x 55

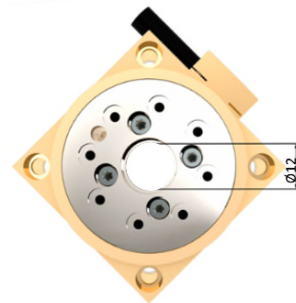




### 3 Smart Praxis Oriented Details

#### 3.1 Hollow shaft diameter

The large hollow shaft with a diameter of 12mm (0.47") offers generous space for cables, vacuum or compressed air lines, light and laser beams, glass fibres and other media.



#### 3.2 Single-Turn Absolut Encoder

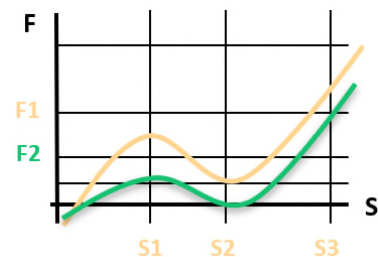
Thanks to the integrated absolute encoder with a resolution of 120,000inc. per revolution, repeatability of  $\pm 11\text{arcsec}$  can be achieved.

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



#### 3.3 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.



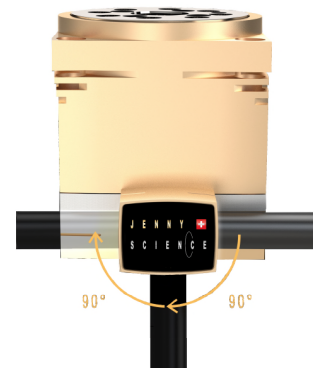
### 3.4 One-Cable connection reduces cabling requirements

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.



### 3.5 Cabel 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.



## 4 Performance data

### 4.1 Techniscal specification

Supply voltage			24V DC	48V DC
Max speed	$n_0$	rpm	1'200	2'400
Nominal speed <sup>(1)</sup>	$n_N$	rpm	500	1'500
Stall torque	$M_0$	Nm (lbf·in)	0.32 (2.83)	0.32 (2.83)
Nominal torque <sup>(1)</sup>	$M_N$	Nm (lbf·in)	0.30 (2.66)	0.29 (2.57)
Peak torque <sup>(2)</sup>	$M_P$	Nm (lbf·in)	1.02 (9.03)	1.02 (9.03)
Nominal current <sup>(1)</sup>	$I_N$	A	2.30	2.28
Peak current <sup>(2)</sup>	$I_P$	A	7.85	7.85

### Mechanical Data

Max. axial load <sup>(3)</sup>		N (lbf)	1750 (393.4)
Max. moment load <sup>(3)</sup>		Nm (lbf·in)	5 (44.25)
Rotor moment of inertia	$J_{Rot}$	g·cm <sup>2</sup> (lbf·in <sup>2</sup> )	400 (0.137)
Total weight	m	g (lbs)	440 (0.970)

(1) continuous operation with 25C° (77°F) ambient temperature and convection cooling (ambient air)

(2) peak operation (duty 10%)

(3) maximum load only with prescribed mounting according to point 1.3

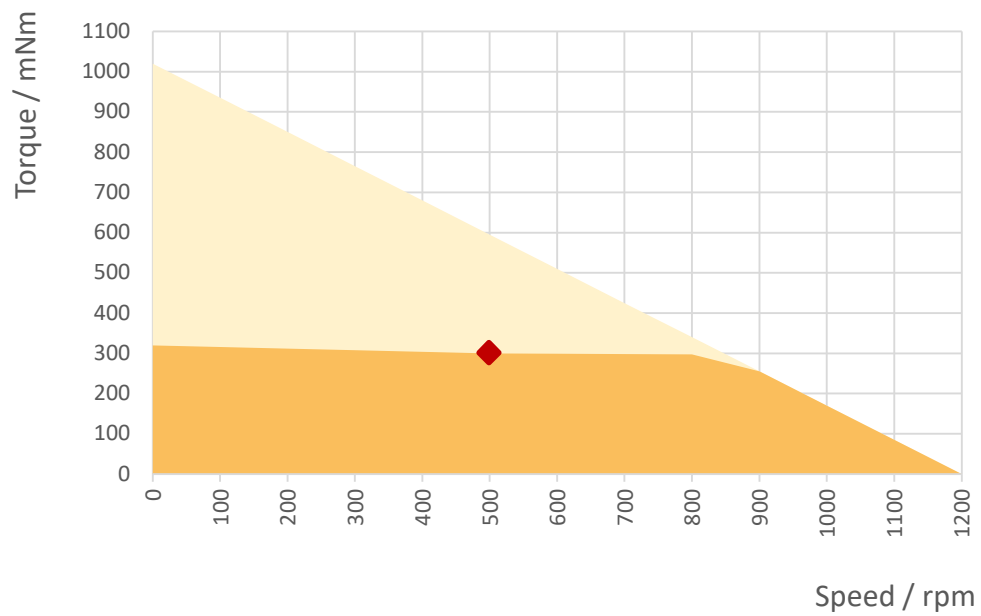
## 4.2 Torque/Speed curve

Nominal operation

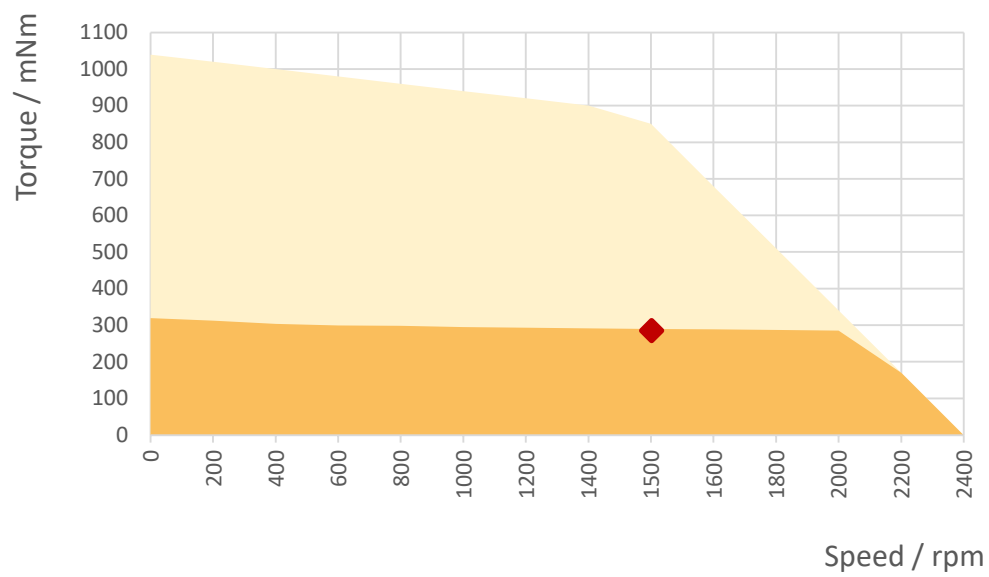
Continuous operation

Peak operation

Supply voltage  $U_s = 24\text{VDC}$



Supply voltage  $U_s = 48\text{VDC}$



## 5 Accuracy

### 5.1 Positioning

Resolution polling

120'000 Inc. / revolution

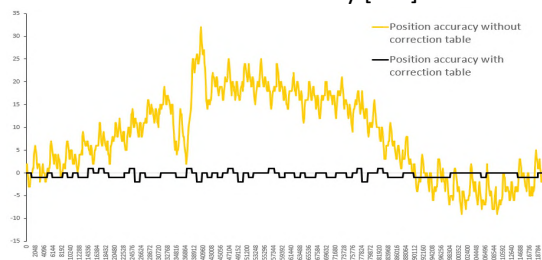
Position accuracy absolute with  
correction table <sup>(1)</sup>

± 23.4 arcsec (± 3 Inc.)

Position accuracy absolute  
without correction table

± 378.0 arcsec (±35 Inc.)

Position accuracy [Inc.]



(1) Correction table available if following conditions are given:

- XENAX® Xvi 75V8S or Xvi 48V8
- XENAX® FW-Version >= V4.16
- ROTAX® Serial number >= 50-12.2027.0234

Uni-directional repeatability

± 7 arcsec

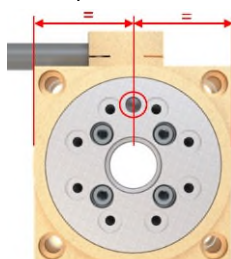
Bi-directional repeatability

± 11 arcsec

Reference drive

With the single-turn absolute encoder the position is available immediately after power-on. Therefore no reference drive is necessary.

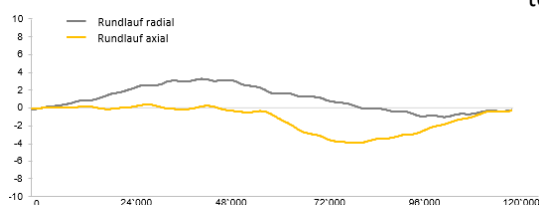
Zero point absolut



For the alignment of the rotor flange a single hole Ø4H7 is provided. With centric alignment of this hole on the side of the connector housing, the absolute zero point can be found.

### 5.2 Mechanical accuracy

Runout [µm]



Der ROTAX® Rxhq is delivered with the following tolerances as standard.

Runout radial 10µm

Runout axial<sup>(2)</sup> 10µm

(2) Measuring point 20mm radial from the centre of the front flange

## 6 Maintenance, Life time

### 6.1 Lubrication

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

### 6.2 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.

## 7 Safety, Environment

### 7.1 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

### 7.1 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  
Cooling

10-90% non-condensing.  
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

## 8 Note

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Information in this instruction manual is subject to Modifications.

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