

# Compact Rotation Stage

## Precision Positioning



## RS-40

- Unlimited travel range
- Repeatability to 87  $\mu\text{rad}$
- 20 mm  $\varnothing$  aperture
- Reference switch
- Vacuum-compatible variants available

### Standard-class rotation stage

Worm drive. Aperture with 20 mm  $\varnothing$ . Reference switch.

### Versions

- DC motor with gearhead, rotary encoder on the motor shaft
- Stepper motor with gearhead
- Vacuum versions available on request

### Application fields

Precision microassembly, research, automation, vacuum

Motion	Unit	Tolerance	321691001-0000	321692001
Active axes			$\theta Z$	$\theta Z$
Rotation range in $\theta Z$	$^\circ$		360	360
Maximum angular velocity in $\theta Z$ , unloaded	$^\circ/\text{s}$		7	5
Linear crosstalk in X with motion in $\theta Z$	$\mu\text{m}$	Typ.	$\pm 5$	$\pm 5$
Linear crosstalk in Y with motion in $\theta Z$	$\mu\text{m}$	Typ.	$\pm 5$	$\pm 5$
Linear crosstalk in Z with motion in $\theta Z$	$\mu\text{m}$	Typ.	$\pm 5$	$\pm 5$
Rotational crosstalk in $\theta X$ with motion in $\theta Z$	$\mu\text{rad}$	Typ.	$\pm 35$	$\pm 35$
Rotational crosstalk in $\theta Y$ with motion in $\theta Z$	$\mu\text{rad}$	Typ.	$\pm 35$	$\pm 35$

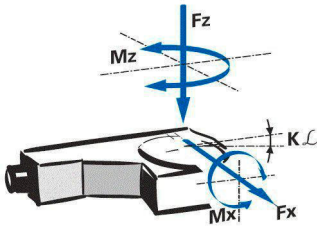
Positioning	Unit	Tolerance	321691001-0000	321692001
Minimum incremental motion in $\theta Z$	$\mu\text{rad}$	Typ.	87	87
Unidirectional repeatability in $\theta Z$	$\mu\text{rad}$	Typ.	$\pm 43.5$	$\pm 43.5$
Bidirectional repeatability in $\theta Z$	$\mu\text{rad}$	Typ.	1400	1400
Reference switch			Hall effect, N/C contact, 3.8 V to 24 V, NPN	Hall effect, N/C contact, 3.8 V to 24 V, NPN
Integrated sensor			Incremental rotary encoder	
Sensor signal			A/B quadrature, RS-422	
Sensor resolution	Cts./rev.		2048	

Drive Properties	Unit	Tolerance	321691001-0000	321692001
Drive type			DC gear motor	2-phase stepper motor with gearhead
Operating voltage	V		24	<38
Nominal current, RMS	A	Typ.	0.04	0.25
Peak current, RMS	A	Typ.	0.16	
Motor resolution	Full steps/rev.			24
Drive torque in $\theta Z$	N·m		0.2	0.2
Torque constant	N·m/A	Typ.	0.0083	
Time constant	ms		35	
Resistance phase-phase	$\Omega$	Typ.	60	12.5
Inductance phase-phase	mH		0.4	6.3
Back EMF, phase-phase, rotational	V/kRPM	Max.		4.4

Mechanical Properties	Unit	Tolerance	321691001-0000	321692001
Stiffness in $\theta X$	N·m/ $\mu$ rad		270	270
Permissible push force in X	N	Max.	10	5
Permissible push force in Y	N	Max.	10	5
Permissible push force in Z	N	Max.	20	10
Permissible torque in $\theta x$	N·m	Max.	2	1
Permissible torque in $\theta Y$	N·m	Max.	2	1
Holding torque in $\theta Z$ , passive	N·m		0.2	0.2
Moment of inertia in $\theta Z$ , unloaded	kg·mm <sup>2</sup>	$\pm 20\%$	15.5	15.5
Moved mass in Z, unloaded	g		90	90
Gear ratio i			76 : 1	76 : 1
Worm gear reduction			90 : 1	90 : 1
Bearing type			Ball bearings	Ball bearings
Overall mass	g		400	400
Material			Aluminum	Aluminum

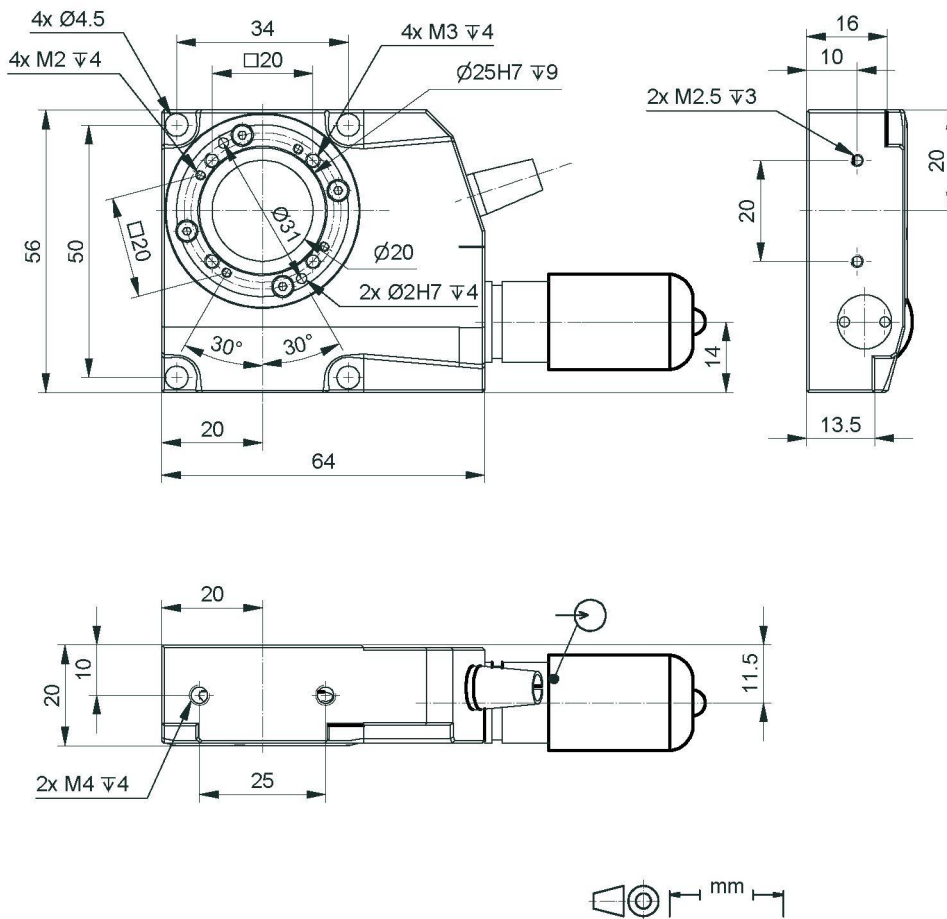
Miscellaneous	Unit		321691001-0000	321692001
Operating temperature range	$^{\circ}$ C		5 to 40	5 to 40
Connector			D-sub 15-pin (m)	HD D-sub 15-pin (m)
Recommended controllers / drivers			C-863 C-885 with C-863.20C885 C-884 ACS modular controller	C-663 C-885 with C-663.12C885 ACS modular controller

## Drawings / Images



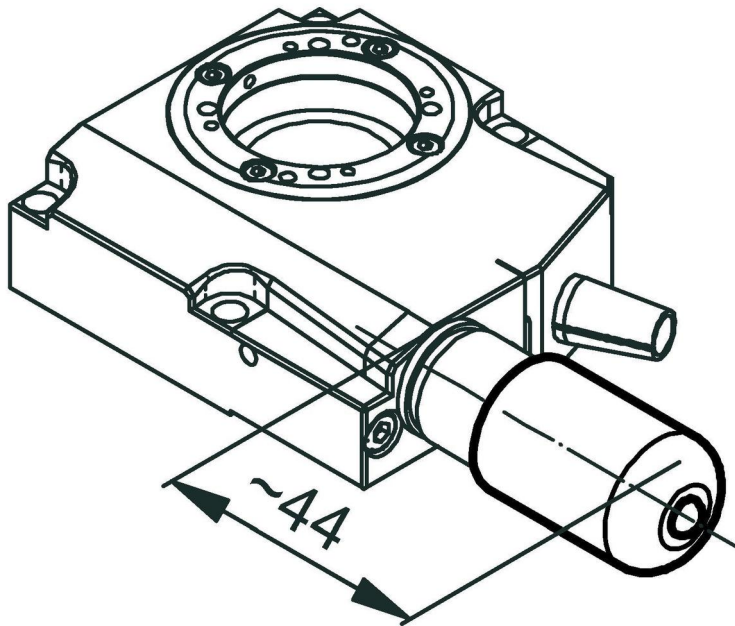
Direction of the axes and torques for rotation stages

## Drawings / Images

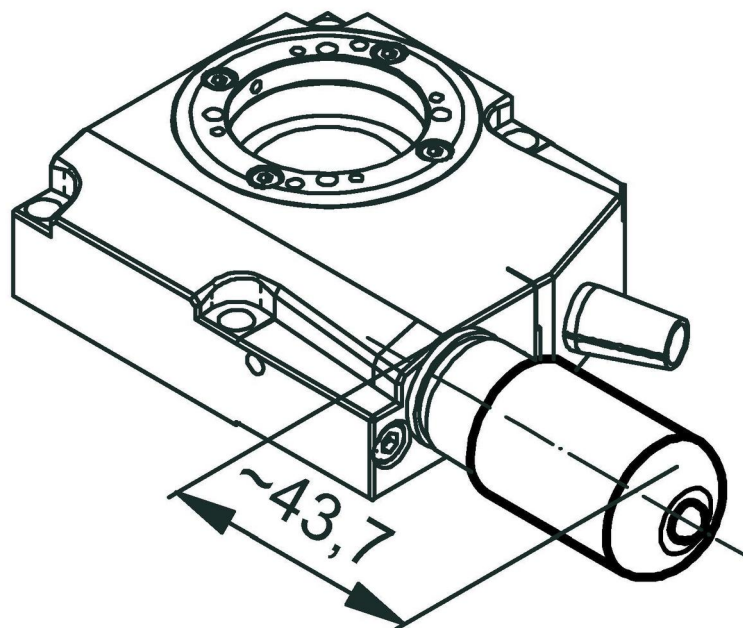


RS-40 rotation stage, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.

## Drawings / Images



RS-40 rotation stage, DC motor, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.



RS-40 rotation stage, stepper motor, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.

## Order Information

**321691001-0000**

Compact rotation stage; DC gear motor; 360° rotational angle; 20 N load capacity; 7 °/s maximum angular velocity; incremental rotary encoder, 2048 cts./rev. sensor resolution, A/B quadrature, RS-422

**321692001**

Compact rotation stage; 2-phase stepper motor with gearhead; 360° rotational angle; 10 N load capacity; 5 °/s maximum angular velocity