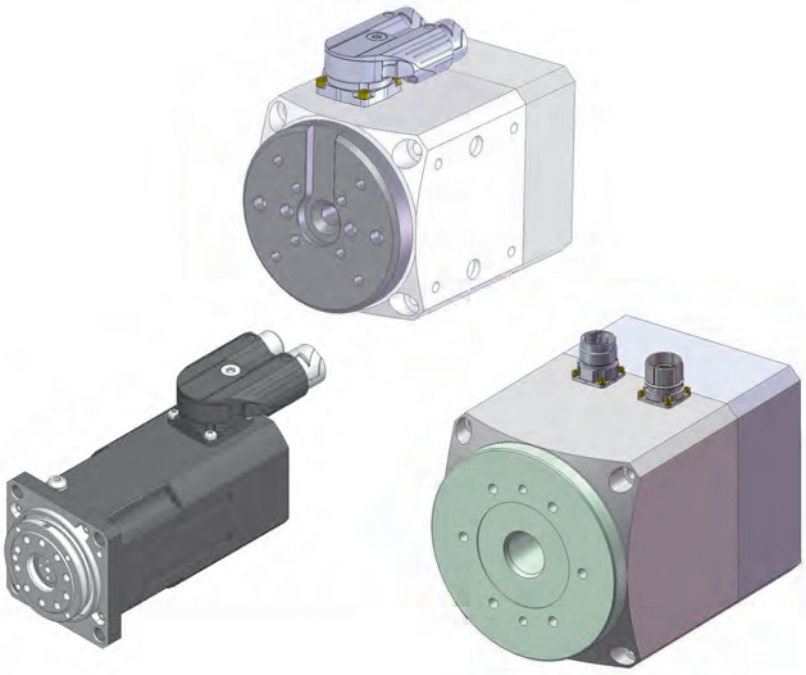
TORQUE ROTARY UNIT
ST0055A / ST0075A / ST0140A

MOUNTING INSTRUCTIONS

TD0041A-EN00-0000-00 022019_3.0_EN



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1 Introduction

1.1 About these mounting instructions

These mounting instructions describe the product "Torque Rotary Unit ST0055A / ST0075A / ST0140A" (also referred to as "product" in this document).

These mounting instructions are part of the product.

- You may only use the product if you have fully read and understood these mounting instructions.
- Verify that these mounting instructions are always accessible for any type of work performed on or with the product.
- Pass these mounting instructions as well as all other product-related documents on to all owners of the product.
- If you feel that these mounting instructions contain errors, inconsistencies, ambiguities or other issues, contact the manufacturer prior to using the product.

The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe these mounting instructions or from failure to comply with directives, regulations and standards and any other statutory requirements applicable at the installation site of the product.

1.2 Intended use

The product is a partly complete machine pursuant to Directive 2006/42/EU, articles 1g and 2g. The product is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment, thereby forming machinery to which Directive 2006/42/EU applies.

The product may only be used within the limits specified in these mounting instructions and in the applicable documents. The applicable documents are also part of the product.

The machinery must not be put into service until the machinery into which the product has been incorporated has been determined and declared in conformity with the provisions of Directive 2006/42/EU and with all other applicable directives and regulations.

In addition, perform a risk assessment in view of the planned application, according to an approved risk assessment method, and implement the appropriate safety measures, based on the results of the risk assessment. Take into account the consequences of installing or integrating the product into a system or a plant.

When using the product, perform all work and all other activities in conjunction with the product in compliance with the conditions specified in the mounting instructions, in the applicable documents, and on the nameplate, as well as with all directives, standards, and safety regulations applicable at the installation site of the product.

1.3 Predictable incorrect application

Any use of the product beyond the explicitly indicated intended use is an impermissible, incorrect application of the product.

The product must never be used in the following cases, under the following conditions, and for the following purposes:

- Operation in residential environments
- Operation in life-supporting systems
- Operation in potentially explosive atmospheres/hazardous areas
- Operation on ships, in rail vehicles, land craft or in aircraft
- Operation in military facilities
- Operation outside of the specified order data
- Applications involving transportation of persons (fairground rides)

1.4 Applicable documents

In addition to these mounting instructions, the following documents are binding for and apply to any type of use of the product:

- Order data (including, but not limited to, design data, load data, performance data, transportation and storage instructions, information attached to the product and the package, as well as other specifications).
- Documentations of the manufacturers of all products belonging to the scope of delivery (for example, motor, accessories, attachment parts). This includes, among other things:

Type of manual	Type	Manufacturer	Delivery	
			Paper format	Electronic
Mounting instructions	Encoder SEL37 (for product type ST0055A)	SICK STEGMANN GmbH	-	X
Mounting instructions	Encoder SEK52 (absolute) (for product type ST0075A)	SICK STEGMANN GmbH	-	X
Mounting instructions	Encoder SKS36/SKM36S (absolute) (for product type ST0075A)	SICK STEGMANN GmbH	-	X
Product information	Encoder ECN 413 (absolute) (for product type ST0075A)	DR. JOHANNES HEIDENHAIN GmbH	-	X
Mounting instructions	Encoder SEK90 (absolute) (for product type ST0140A)	SICK STEGMANN GmbH	-	X
Product information	Encoder ECN 113 (absolute) (for product type ST0140A)	DR. JOHANNES HEIDENHAIN GmbH	-	X

Type of manual	Type	Manufacturer	Delivery	
			Paper format	Electronic
Product information	Encoder ECN 225 (absolute) (for product type ST0140A)	DR. JOHANNES HEIDENHAIN GmbH	-	X
Safety data sheet	LE-Spezialfett Synt EP 2	HERM GmbH & Co. KG	-	X

In the case of delivery with WEISS GmbH controller/software package:			Delivery	
			Paper format	Electronic
User manual	"W.A.S. 2 COMPACT" TD0079A-XX00-0000-00	WEISS GmbH	-	X
User manual	"W.A.S. 2 SCALABLE" TD0081A-XX00-0000-00	WEISS GmbH	-	X
Electrical documentation	List of applicable documents, per product (see documents on the CD delivered with the product)	WEISS GmbH	-	X

1.5 Warranty

See our website for our General Terms and Conditions at www.weiss-international.com or your purchase order.

2 Safety

2.1 Safety messages and hazard categories

These mounting instructions contain safety messages to alert you to potential hazards and risks. Safety messages in these mounting instructions are highlighted with warning symbols and warning words.

The signal word describes the source of the hazard. The text contains instructions on how to avoid the hazard as well as the consequence resulting from failure to follow the instructions given in the safety message.

Depending on the severity of a hazard, the safety messages are classified according to different hazard categories.

⚠ DANGER

DANGER indicates an immediately hazardous situation, which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation, which, if not avoided, can result in death or serious injury or equipment damage.

⚠ CAUTION

CAUTION indicates a hazardous situation, which, if not avoided, can result in injury or equipment damage.

NOTICE

NOTICE indicates a hazardous situation, which, if not avoided, can result in equipment damage.

In addition to the instructions and safety messages provided in these mounting instructions, you must comply with all directives, standards, and safety regulations applicable at the installation site of the product.

2.2 Hazard symbols

The following symbols are used in these mounting instructions:

This is the general safety alert symbol. It alerts to injury hazards or equipment damage. Comply with all safety instructions in conjunction with this symbol to help avoid possible death, injury, or equipment damage.

This symbol alerts to hazardous electrical voltage. If this symbol is used in a safety message, there is a hazard of electric shock.

Hazard symbols may also be attached to the product.

Hazard of hot surface

Hazard of magnetic field

No access for persons with heart pacemakers or other medical implants

2.3 Responsibilities of the system integrator and/or operator

The system integrator (the person who incorporates the product in a machine pursuant to Directive 2006/42/EU, i.e., for example, the machine builder) and/or the operator must ensure the following:

- The application and use of the product must be limited to the specified intended use.
- In the integration of the product, all functional safety requirements must be met.
- All directives, standards, and safety regulations, including all regulations concerning workplace safety and prevention of accidents, applicable at the installation site of the product must be complied with.
- Any type of work whatsoever on and with the product may only be performed by qualified personnel.
- The product may only be operated when it is in flawless, fully functional condition.
- All safety equipment must operate as required and planned.
- The personal protective equipment for the personnel/operator must be available and must be used.
- The mounting instructions and all applicable documents must always be accessible in their entirety to the personnel at the installation site of the product.
- Safety instructions, labels, and any other information attached to the product must not be removed.
- A complete manual must be available for the machine into which the product is incorporated; this manual must describe all types of work on and with the machine and contain all information relevant with regard to the product.

If the system integrator himself is not in the position to comply with any of these obligations, the system integrator must impose compliance with these obligations on the operator.

2.4 Qualification of personnel

Only trained personnel who have fully read and understood the mounting instructions and all applicable documents for the product may perform work on and with the product.

This trained personnel must have sufficient technical training, knowledge, and experience, and be able to foresee and detect potential hazards that may be caused by using the product.

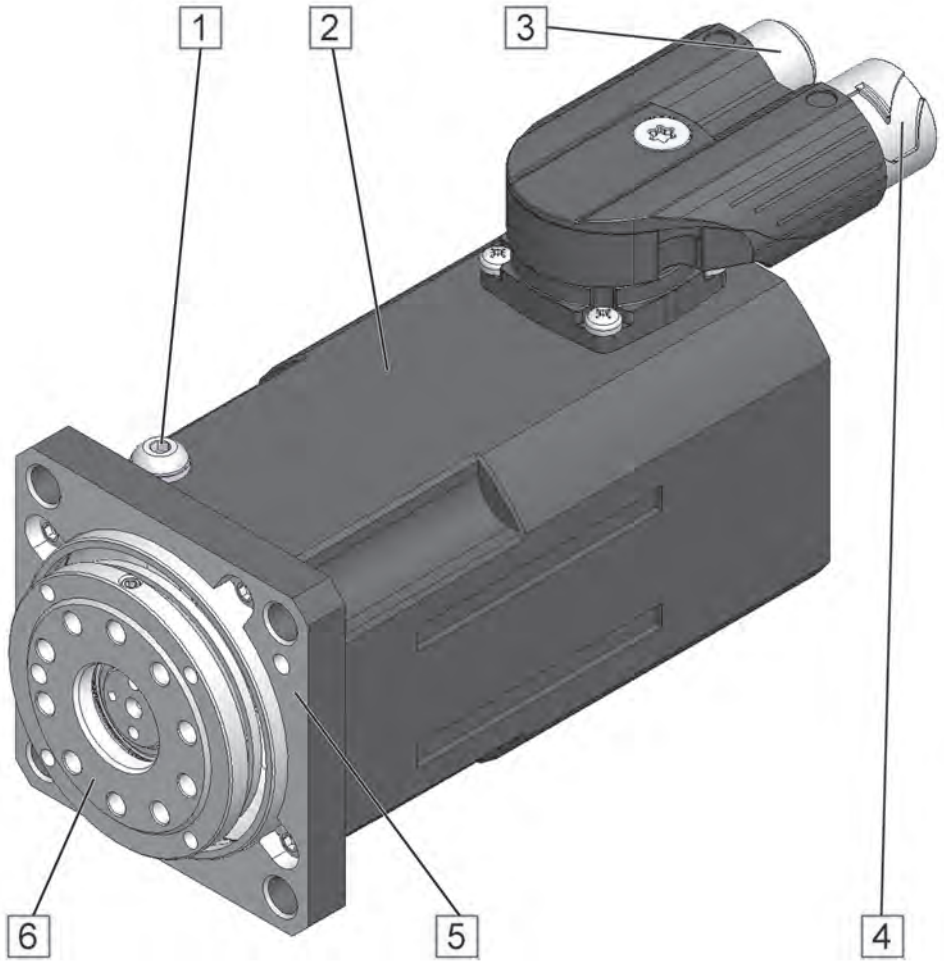
All trained personnel working on and with the product must be fully familiar with all directives, standards, and safety regulations that must be observed for performing such work.

3 Product description

3.1 Overview

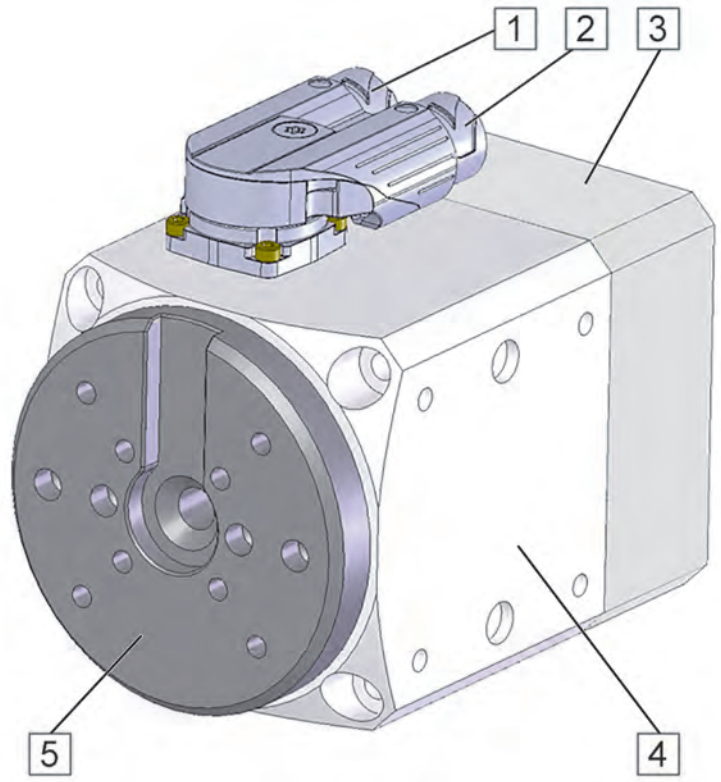
The product consists of the following components:

Product type: ST0055A



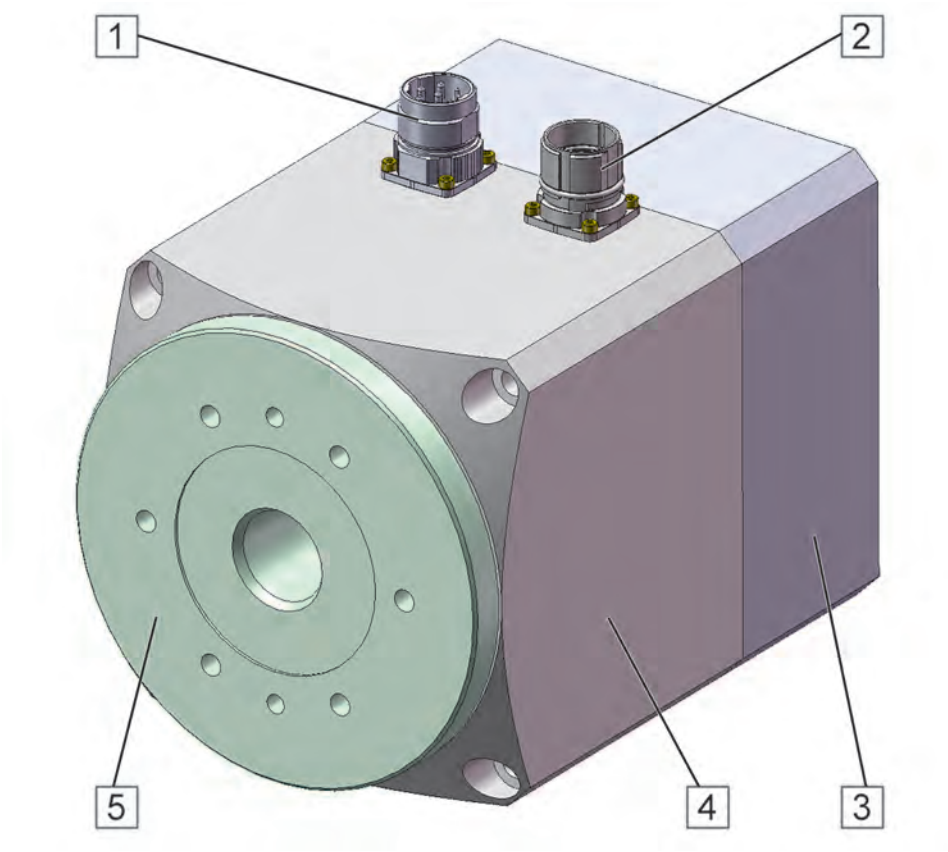
1	Oil drain screw	**4**	Connection encoder cable
2	Housing	**5**	Mounting surface
3	Connection motor cable	**6**	Output flange (rotary plate)

Product type: ST0075A



1	Connection motor cable	**4**	Housing
2	Connection encoder cable	**5**	Output flange (rotary plate)
3	Encoder and holding brake (optional)		

Product type: ST0140A



1	Connection motor cable	**4**	Housing
2	Connection encoder cable	**5**	Output flange (rotary plate)
3	Encoder and holding brake (optional)		

3.2 Function description

The servo motor is controlled by a servo drive according to a programmable motion profile and rotates, accelerates or decelerates the output flange (rotary plate) of the product.

The output flange (rotary plate) can rotate left, right or alternatingly.

The integrated encoder provides for high positioning accuracy and repeatability.

The optional holding brake holds the output flange (rotary plate) in position when it is at a standstill. The braking force is generated by means of springs. The holding brake is released when voltage is applied; the holding brake is applied when the supply voltage is switched off or in the case of power outages.

Product type ST0055A is not equipped with a holding brake.

An optional holding brake is available for the product types ST0075A and ST0140A.

3.3 Nameplate

The nameplate is attached to the housing of the product; it contains the following information:

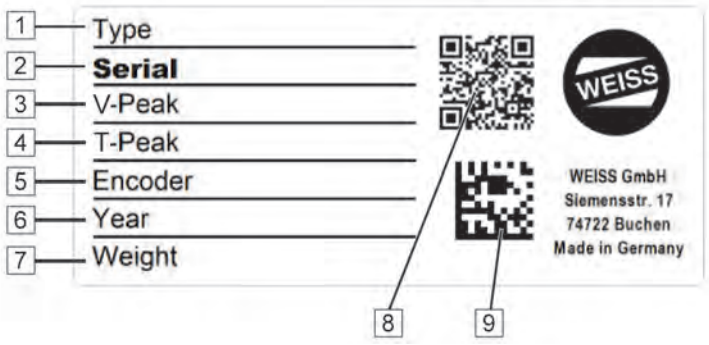


Figure 1: Example of nameplate

1	Type	**6**	Year of manufacture
2	Serial number	**7**	Weight
3	Maximum speed of rotation	**8**	QR code (company website)
4	Peak torque	**9**	DM code (serial number)
5	Encoder		

The scope of delivery contains a second nameplate. If the factory-mounted nameplate is covered by attachments, the second nameplate can be attached at a readily visible position of the product or machine for identification of the product.

3.4 Type code

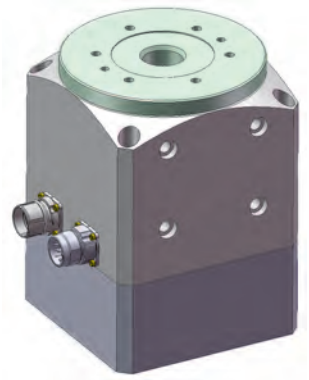
Structure of the type code:

Type	Size	Motor	Encoder	Winding	Holding brake
ST	0055 0075 0140	**A** (Standard) **1A** single-row magnetic ring **2A** double-row magnetic ring **3A** triple-row magnetic ring	**A** (Hiperface) **B** (EnDat) **C** (Incremental) **D** (DriveCliQ)	**A**	**A** (without holding brake) **B** (with holding brake)

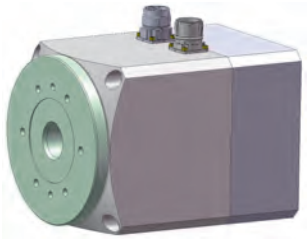
3.5 Mounting positions

Permissible standard mounting positions

The product may only be mounted as shown below.



Axis of rotation vertical, output flange at the top



Axis of rotation horizontal, output flange at the side

Special mounting positions

The following special mounting positions require explicit approval of the manufacturer for the product.

Axis of rotation vertical, output flange at the bottom

4 Technical data

4.1 General

Characteristic	Unit	Value					
		ST0055A	ST0075-1A	ST0075-2A	ST0075-3A	ST0140-1A	ST0140-2A
Direction of rotation	-	Programmable					
Indexing accuracy	arcsec	± 30"	Corresponds to system accuracy of encoder, see chapter 4.4				
Maximum axial runout output flange	mm	-	± 0.01				
Maximum radial runout output flange	mm	-	± 0.01				
Maximum diameter of rotary plate	mm	200	400	400	400	700	700
Weight	kg	1.1	1.7	2.2	2.7	6.9	8.6
Total weight including packaging	kg	See bill of delivery					
Sound pressure	dB(A)	< 70					
Lubricant	-	Grease Castrol/Optitemp TT1	LE-Spezialfett Synt EP 2				

4.2 Motor

Characteristic	Unit	Value					
		ST0055A	ST0075-1A	ST0075-2A	ST0075-3A	ST0140-1A	ST0140-2A
Number of pole pairs	-	3	7			11	
Voltage range	$V_{AC\ rms}$	200-230	200-600				
Voltage constant	mVmin	21	70	114	125	210	240
Nominal speed of rotation	min^{-1}	2000	3100	1700	1600	600	600
Maximum speed of rotation at 230 V	min^{-1}	4500	1000	400	450	600	600
Maximum speed of rotation at 400 V	min^{-1}	4500	3100	1700	1600	1400	1200
Stall torque	Nm	0.26	0.6	1.12	1.68	7.2	14.4
Nominal torque	Nm	0.24	0.5	1	1.4	6	12
Peak torque	Nm	1	1.4	2.8	4.2	18	36
Torque constant	Nm/A_{rms}	0.37	0.875	1.473	1.909	3.214	3.5
Stall current	A	0.7	0.6	0.76	0.88	2.24	4.20

Characteristic	Unit	Value					
Nominal current	A	0.68	0.5	0.63	0.73	1.87	3.50
Peak current	A	2.9	1.6	1.9	2.2	5.6	10.5
Winding cross section	mm^2	0.176	0.03941	0.04909	0.06158	0.17721	0.28274
Stator resistance at 20°C*	Ohm	36.8	87	85	68	16.5	9
Stator inductance*	Henry	0.036	0.105	0.148	0.132	0.039	0.023
Moment of inertia	kgm^2	0.000006	0.001	0.0014	0.0018	0.00276	0.0033
Friction torque	Nm	0.05	0.4	0.4	0.4	0.7	0.7
Temperature monitoring	-	Single PTC	Triple PTC				
Limit temperature	C°	-	120				
Output							
Gear ratio	i	1:63	-	-	-	-	-
Nominal speed of rotation	min^{-1}	30	-	-	-	-	-
Maximum speed of rotation	min^{-1}	70	-	-	-	-	-
Stall torque	Nm	18	-	-	-	-	-
Nominal torque	Nm	18	-	-	-	-	-
Peak torque	Nm	36	-	-	-	-	-

* Measured between phase and phase.

4.3 Holding brake

Characteristic	Unit	Value					
		ST0055A	ST0075-1A	ST0075-2A	ST0075-3A	ST0140-1A	ST0140-2A
Nominal current	A	-	0.5			1.25	
Nominal torque	Nm	-	4.5			50	
Braking torque	Nm	-	10			50	
Brake pressure (time delay for applying)	s	-	0.035			0.2	
Brake pressure (time delay for releasing)	s	-	0.007			0.12	

4.4 Encoder

Refer to the documentation of the manufacturer for the technical data of the additional encoder; see applicable documents.

Type	System accuracy	Interface
SEL37 (for product type ST0055A)	± 270"	Hiperface
SEK52 (absolute) (for product type ST0075A)	± 280"	Hiperface
SKS36/SKM36S (absolute) (for product type ST0075A)	± 120"	Hiperface
ECN 413 (absolute) (for product type ST0075A)	± 60" ± 20"	EnDat 2.1
SEK90 (absolute) (for product type ST0140A)	± 120"	Hiperface
ECN 113 (absolute) (for product type ST0140A)	± 25"	EnDat 2.1
ECN 225 (absolute) (for product type ST0140A)	± 15"	EnDat 2.1

4.5 Climatic environmental conditions "Operation"

Characteristic	Unit	Value
Ambient temperature	°C	+15 ... +45
Relative humidity, non-condensing	%	+5 ... +95
Maximum surface temperature	°C	100
Maximum installation altitude above mean sea level	m	1000

4.6 Climatic environmental conditions "Transportation and Storage"

Characteristic	Unit	Value
Ambient temperature	°C	+5 ... +55
Relative humidity, non-condensing	%	+5 ... +95
Maximum storage duration of the mechanical components	-	see chapter 7

4.7 Dimensions

Product type: ST0055A

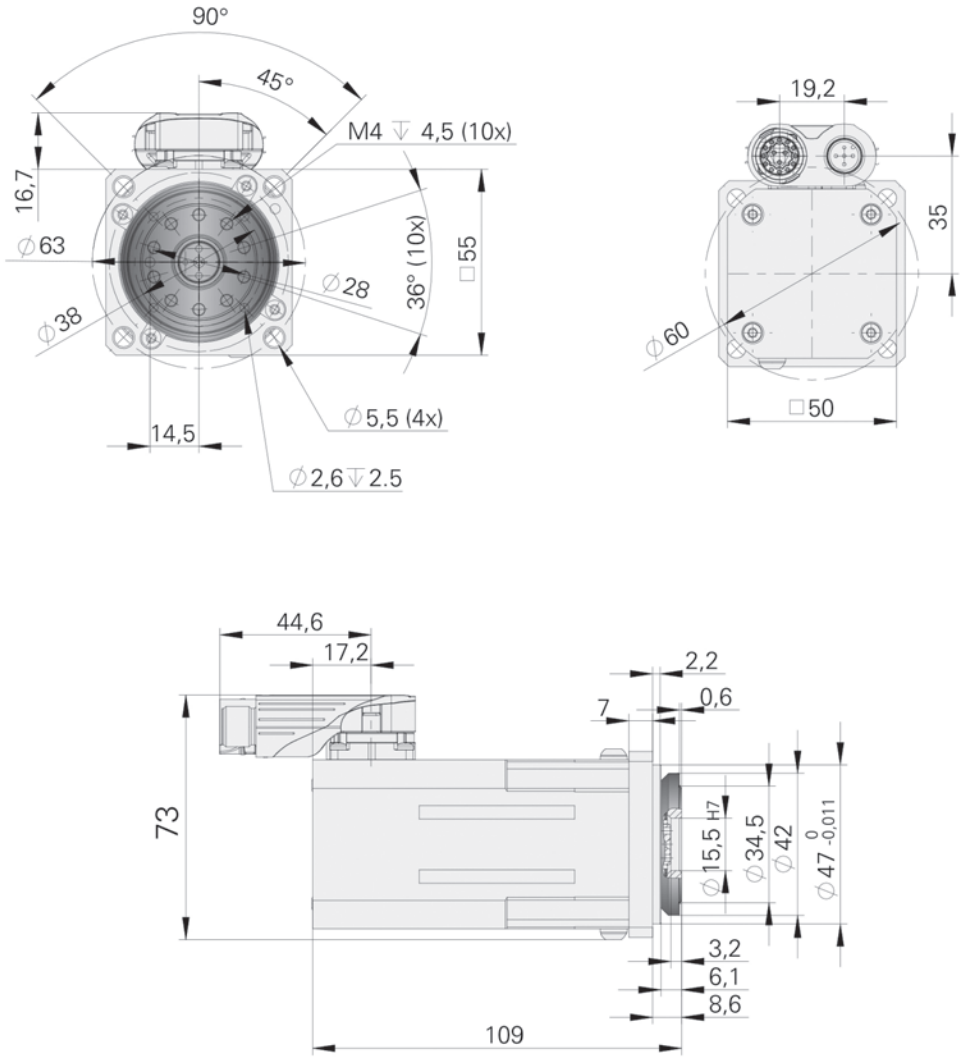


Figure 2: Lengths and diameters in mm

Product type: ST0075A

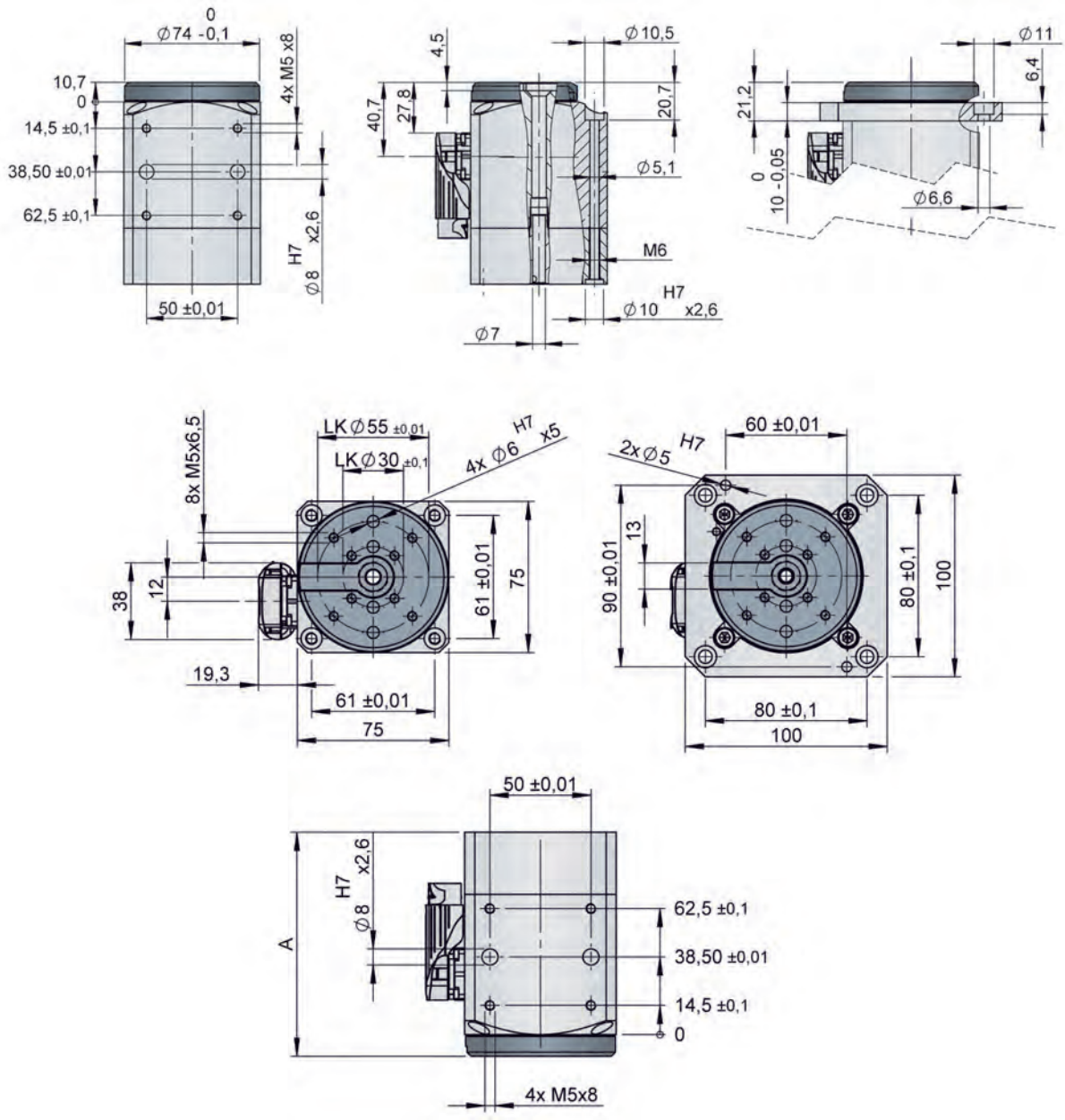


Figure 3: Lengths and diameters in mm

	A					
	SEK52		SKS36/SKM36S		ECN413	
	-	Holding brake	-	Holding brake	-	Holding brake
ST0075-1A	111 mm	150 mm	123 mm	165 mm	143 mm	181 mm
ST0075-2A	131 mm	170 mm	143 mm	185 mm	163 mm	201 mm
ST0075-3A	151 mm	190 mm	163 mm	205 mm	183 mm	221 mm

Product type: ST0140A

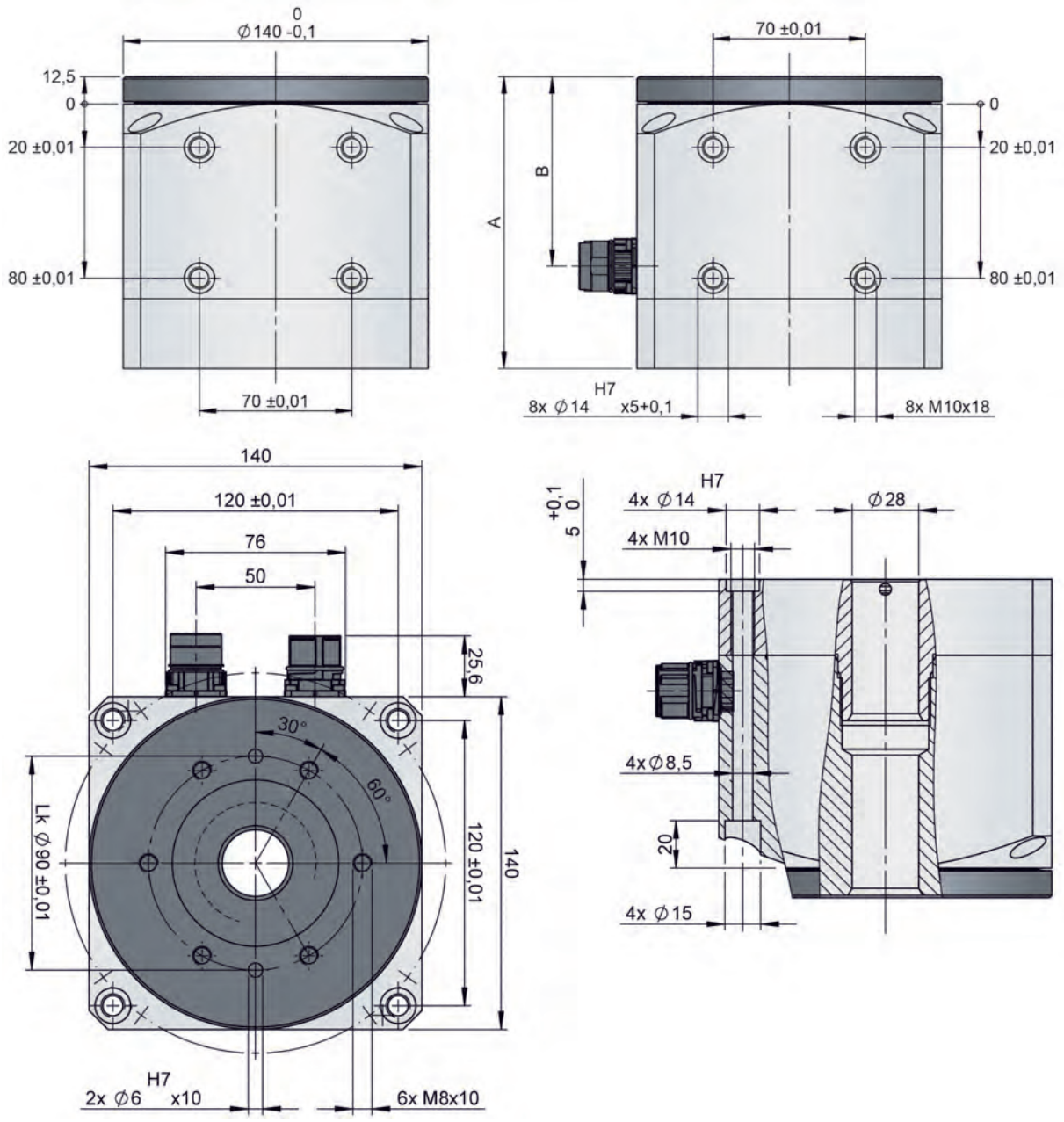


Figure 4: Lengths and diameters in mm

	A						B
	SEK90		ECN113		ECN225		-
	-	Holding brake	-	Holding brake	-	Holding brake	-
ST0140-1A	134 mm	189.5 mm	168 mm	224 mm	168 mm	224 mm	87 mm
ST0140-2A	161.5 mm	217 mm	195.5 mm	251.5 mm	195.5 mm	251.5 mm	114.5 mm

4.8 Load data

Load data for output flange (rotary plate)

Characteristic	Unit	Value					
		ST0055A	ST0075-1A	ST0075-2A	ST0075-3A	ST0140-1A	ST0140-2A
Permissible static moment of tilt	Nm	44	40	50	70	130	180
Permissible dynamic moment of tilt	Nm	-	20	25	35	65	90
Permissible static axial force	N	1900	500	500	500	800	800
Permissible dynamic axial force	N	-	150	150	150	300	300
Permissible static radial force	N	1440	500	650	800	800	1000
Permissible dynamic radial force	N	-	200	220	250	400	500

5 Packaging

5.1 Types of packaging

Packaging in Europe
The product is factory-screwed onto a palette and packaged in special cardboard.

Packaging for air and sea freight
The product is factory-packaged in Corpac-co-ex-VCI film, screwed onto a palette and then stored in a wooden box.

5.2 Unpacking the product

1. Do not remove the packaging until immediately prior to mounting.
2. Dispose of the packaging material in compliance with all directives, standards, and safety regulations applicable at the installation site.

5.3 Verification of the delivery

- Check the delivery for completeness and transportation damage upon reception.
- In the case of damage, reject the delivery or accept it only conditionally.
- Document the damage in the transportation documents/bill of delivery (any damage detected must be immediately reported to the forwarding agent and confirmed by the forwarding agent).
- Take photographs of the damage.
- Report the damage to WEISS GmbH.

6 Transportation

⚠ WARNING

FALLING, TOPPLING, OR LOWERING LOADS
Insufficiently rated load lifting and handling equipment may break. Transportation vehicles, lifting gear, chains, belts, and other equipment not rated for the product may fail or tilt.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Only use transportation vehicles, lifting gear, chains, belts, and other lifting and handling equipment that comply with all applicable regulations and that are rated for the weight of the product including packaging.
- Verify that there are no persons in the danger zone.
- Verify that the product is properly secured against falling and toppling.

7 Storage

7.1 Storing the product

NOTICE

INCORRECT STORAGE

Failure to follow these instructions can result in equipment damage.

- Verify compliance with all conditions specified in these mounting instructions and all applicable documents when storing the product.

The mechanical components of the product can be stored for a period of up to two years.

Conditions for the specified maximum storage duration:

- Storage in original packaging
- Compliance with all specified storage conditions
- Storage in suitable closed, dry, dust-free room, protected against direct sunlight
- No contact with corrosive media
- Corrosion protection intact

The electrical components have a different maximum storage duration (see documentations of the manufacturers).

If the maximum storage duration has been exceeded, you must contact the manufacturer prior to commissioning the product. This also applies if the machine in which the product has been incorporated has not been operated for a period of time exceeding the maximum storage durations specified for the mechanical and electrical components.

If you plan to store the product for a period of time exceeding the maximum permissible storage duration specified for the mechanical components, you must uninstall the electrical components prior to storing the product. The electrical components must be stored according to the specifications of the manufacturers (see documentations of the manufacturers).

If the product is to be stored for a period of more than three months, the product must first be preserved. If the factory-applied anti-corrosion agent is no longer intact, you must request preservation instructions from the manufacturer.

8 Mounting

8.1 Prerequisites for mounting

Prior to mounting, verify that the dimensions of the installation site and construction conditions meet the requirements and the dimensions specified in these mounting instructions and the applicable documents.

- Verify that the supporting base is level and rigid.
- Verify that the supporting structure at the installation site has a sufficient structural strength to carry the weight of the product and of all loads.

8.2 Equipment and tools

The following is required for mounting:

- Set of hex keys
- Torque wrench

8.3 Tightening torques and property classes

Only use screws with the property class shown in the following table unless a different property class is explicitly specified for a screw connection.

Use the tightening torque shown in the following table unless a different tightening torque is explicitly specified for a screw connection.

Property class of screws	10.9 (coefficient of friction $\mu_{tot.}$ 0.12)	
Thread	M5	M8
Tightening torque (as per property class 8.8 due to aluminum housing)	6 Nm	25 Nm

8.4 Bolting down the product

⚠ WARNING

FALLING, TOPPLING, OR LOWERING LOADS

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Verify that the product is properly secured against falling and toppling.

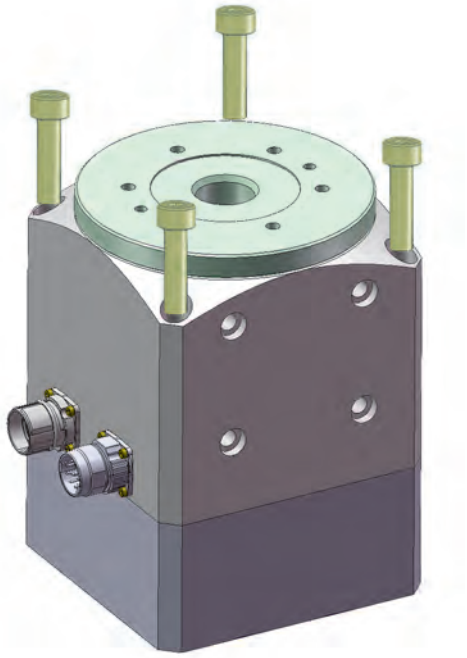
⚠ WARNING

IMPROPERLY FASTENED PARTS

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Verify that the supporting structure and/or the frame and/or the mounting surface for fastening the product are sufficiently rated to withstand all static and dynamic loads and forces during operation.
- Verify that the fastening parts comply with the specifications indicated and that they are sufficiently rated for all load conditions during operation.

The product features several holes and threaded holes for mounting the product in the permissible mounting positions.



Mounting possibility

Use screws with the property class specified to mount the product. When determining the length of the screws, take into account the loads and forces acting in your application as well as the characteristics of the supporting structure to which the product is mounted.

1. Place the product at the mounting site in compliance with the transportation instructions and align it according to the holes/threaded holes.
2. Screw the screws into the holes/threaded holes.
3. Tighten the screws cross-wise.

8.5 Mounting additional components

⚠ WARNING

INCORRECT USE AND/OR FASTENING OF ADDITIONAL COMPONENTS

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Only mount components to the output flange that are approved by the manufacturer.
- Only use existing holes in the output flange for mounting additional components to the output flange.
- Do not drill holes into the output flange.
- Do not attach further parts to the output flange (for example, by means of welding) to mount additional components.

⚠ WARNING

IMPROPERLY FASTENED PARTS

Failure to follow these instructions can result in death, serious injury, and equipment damage.

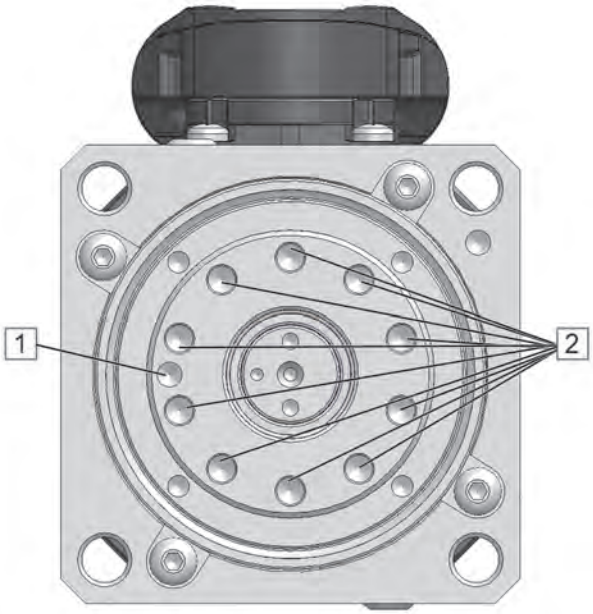
- Verify that the supporting structure and/or the frame and/or the mounting surface for fastening the product are sufficiently rated to withstand all static and dynamic loads and forces during operation.
- Verify that the fastening parts comply with the specifications indicated and that they are sufficiently rated for all load conditions during operation.

Mounting the rotary plate

A rotary plate may only be mounted via the fit holes or threads.

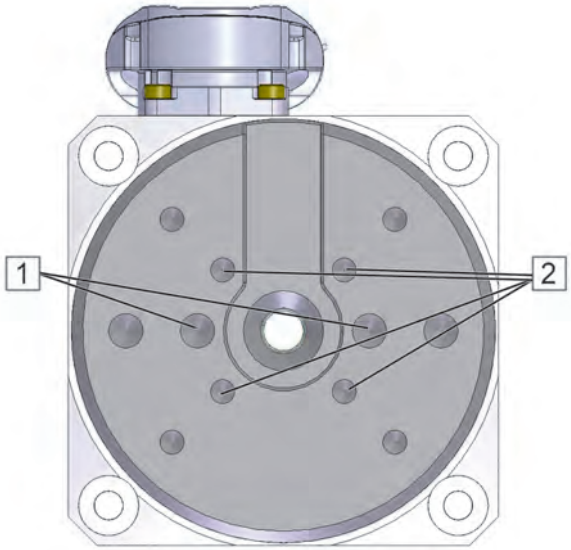
If there is a centering collar at the stationary center part of the product, this centering collar must not be used to fasten an additional indexing plate.

For this reason, the center hole of a rotary plate must be approx. 2 mm larger than the centering collar. When determining the length of the screws, take into account the loads and forces acting in your application as well as the characteristics of the supporting structure to which the product is mounted.

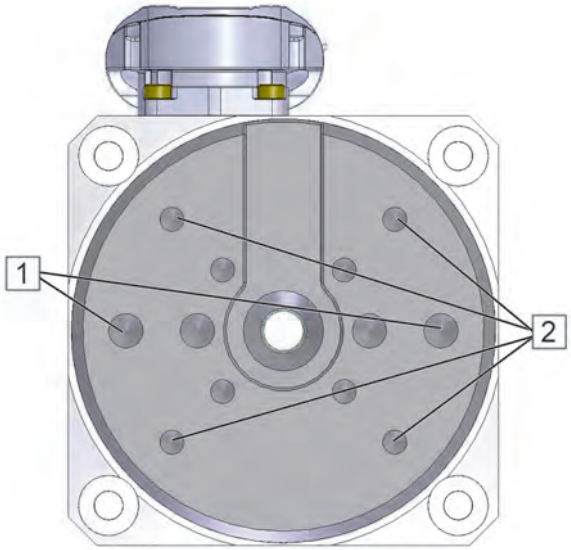


Product type: ST0055A

1. Fit the rotary plate.
2. Center the parallel pins and then drive in the first parallel pin [1] by one third of the way.
3. Screw in the screws [2] and tighten them.
4. Fully drive in the first parallel pin [1].
5. Tighten the screws [2] cross-wise with a tightening torque suitable for the application.
6. Set the zero point.



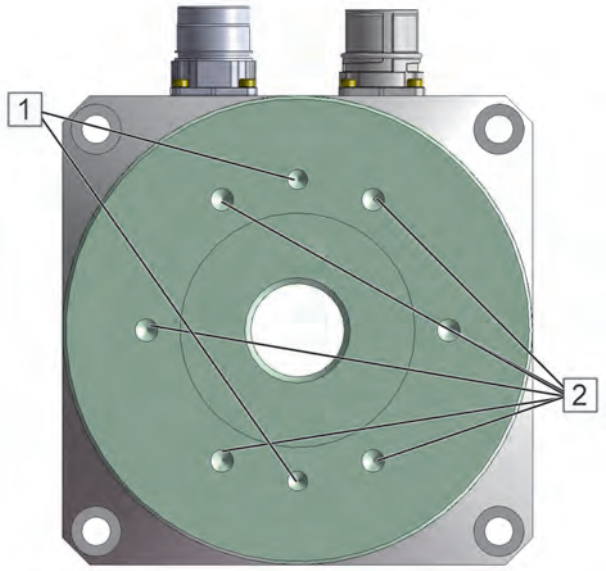
Mounting possibility 1



Mounting possibility 2

Product type: ST0075A

1. Fit the rotary plate.
2. Center the parallel pins and then drive in the first parallel pin [1] by one third of the way.
3. Screw in the screws [2] and tighten them.
4. Fully drive in the second parallel pin [1].
5. Fully drive in the first parallel pin [1].
6. Tighten the screws [2] cross-wise with a tightening torque suitable for the application.
7. Set the zero point.



Product type: ST0140A

1. Fit the rotary plate.
2. Center the parallel pins and then drive in the first parallel pin [1] by one third of the way.
3. Screw in the screws [2] and tighten them.
4. Fully drive in the second parallel pin [1].
5. Fully drive in the first parallel pin [1].
6. Tighten the screws [2] cross-wise with a tightening torque suitable for the application.
7. Set the zero point.

8.6 Mounting safety equipment

The product is a partly complete machine pursuant to Directive 2006/42/EU and intended to be incorporated into or assembled with other machinery. The requirements concerning functional safety and the corresponding safety equipment result from the risk analysis and the risk assessment for the final machine or plant.

Selection, mounting, installation, commissioning, operation and maintenance of the safety equipment must be performed by the system integrator (the person who incorporates the product in a machine pursuant to Directive 2006/42/EU, i.e., for example, the machine builder) and/or the operator.

The product requires at least the following safety equipment:

- Emergency Stop system as per IEC 60204-1 / ISO 13850
- Lockable main switch to interrupt the complete power supply to all electrical components of the product

9 Electrical connection

⚠ DANGER

ELECTRIC SHOCK CAUSED BY LIVE PARTS

Failure to follow these instructions will result in death or serious injury.

- Disconnect the mains supply voltage before performing the work and ensure that it cannot be switched on.
- Verify that no hazards can be caused by electrically conductive objects.
- Verify that all cables for the power supply are disconnected from power.

⚠ WARNING

UNANTICIPATED MOVEMENT

Interchanging the motor connections inverts the direction of rotation of the motor.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Verify correct wiring and connection of all electrical connections.

⚠ CAUTION

IMPROPERLY INSTALLED CABLES

Failure to follow these instructions can result in injury or equipment damage.

- Verify that the cables are correctly routed.
- Verify compliance with the bend radius specifications for the electrical lines.
- Only use cables with the correct cross sections.
- Verify that the electrical cables are correctly connected to the terminals.

The following components must be connected for the motor:

- Lockable main switch
- Suitable Emergency Stop equipment (as per IEC 60204-1 / EN ISO 13850)

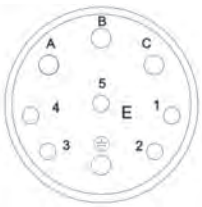
Plug connectors

Product types ST0055A and ST0075A are equipped with a rotatable dual connector at the housing for connection of the motor cable and the encoder cable.

Product type ST0140A is equipped with two fixed connectors at the housing for connection of the motor cable and the encoder cable.

9.1 Connection assignment

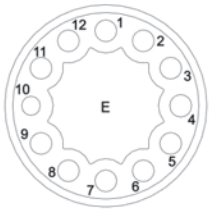
Connection motor (product types: ST0055A / ST0075A)

Rotatable dual connector	Isolation piece 8-pin E	Pin assignment		
		**Pin**	**Designation**	**Function**
		A	U	Motor phase U
		B	V	Motor phase V
		C	W	Motor phase W
			PE	Protective ground conductor
		1	T+	Temperature sensor +
		2	T-	Temperature sensor -
		3	B+	Holding brake +
		4	B-	Holding brake -
		5	---	---

Connection encoder "Hiperface" (product types: ST0055A / ST0075A)

Rotatable dual connector	Isolation piece 12-pin E	Pin assignment		
		**Pin**	**Designation**	**Function**
		1	GND	GND
		2	+7 ... 12 V	Encoder + 7 ... 12 V
		3	SIN+	SIN+
		4	REFSIN	REFSIN
		5	COS+	COS+
		6	REFCOS	REFCOS
		7	DATA+	Data
		8	DATA-	Data inverted
		9	---	---
		10	---	---
		11	---	---
		12	---	---

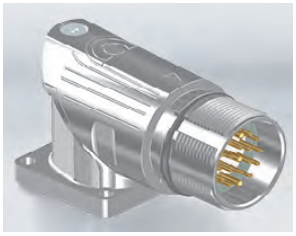
Connection encoder "EnDat 2.1" (product type: ST0075A)

Rotatable dual connector	Isolation piece 12-pin E	Pin assignment		
		**Pin**	**Designation**	**Function**
		1	GND	GND
		2	+ 5 V	Encoder 5 V
		3	A+	Cosine
		4	A-	Cosine inverted
		5	B+	Sine
		6	B-	Sine inverted
		7	Clock+	Clock
		8	Clock-	Clock inverted
		9	DATA+	Data
		10	DATA-	Data inverted
		11	Sense GND	Sense GND
		12	Sense 5 V	Sense + 5 V

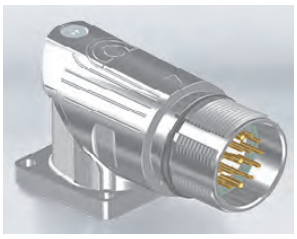
Connection motor (product type: ST0140A)

Motor connector with male thread M23	Isolation piece 8-pin E	Pin assignment		
		**Pin**	**Designation**	**Function**
		1	U	Motor phase U
		4	V	Motor phase V
		3	W	Motor phase W
			PE	Protective ground conductor
		A	T+	Temperature sensor +
		B	T-	Temperature sensor -
		C	B+	Holding brake +
		D	B-	Holding brake -

Connection encoder "EnDat 2.1" (product type: ST0140A)

Encoder connector with male thread M23	Isolation piece 17-pin E	Pin assignment		
		**Pin**	**Designation**	**Function**
		1	Sense + 5 V	Sense + 5 V
		2	---	---
		3	---	---
		4	Sense GND	Sense GND
		5	---	---
		6	---	---
		7	+ 5 V	Encoder 5 V
		8	CLOCK+	Clock
		9	CLOCK-	Clock inverted
		10	GND	GND
		11	---	---
		12	B+	Sine
		13	B-	Sine inverted
		14	DATA+	Data
		15	A+	Cosine
		16	A-	Cosine inverted
		17	DATA-	Data inverted

Connection encoder "Hiperface" (product type: ST0140A)

Encoder connector with male thread M23	Isolation piece 12-pin E	Pin assignment		
		**Pin**	**Designation**	**Function**
		1	---	---
		2	---	---
		3	COS+	COS+
		4	REFCOS	REFCOS
		5	SIN+	SIN+
		6	REFSIN	REFSIN
		7	DATA-	Data inverted
		8	DATA+	Data
		9	---	---
		10	---	---
		11	GND	GND
		12	+7 ... 12 V	Encoder + 7 ... 12 V

10 Controller

10.1 Basic information on control

⚠ WARNING

LOSS OF CONTROL

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Consider all potential failure modes of all control paths in your control concept.
- Implement means and measures for all critical functions to achieve a safe state if a control path fails (for example, emergency stop, overtravel of positions, power outage, and restart).
- Implement separate or redundant control paths for all critical functions.
- If the control system of the machine comprises communication links, consider the consequences of unanticipated transmission delays or failures of the link and implement appropriate measures.
- Subject each machine in which the product described in these mounting instructions is used to a comprehensive and thorough commissioning test before operating the machine.

10.2 WEISS GmbH controller/software package (optional)

WEISS GmbH offers a controller/software package for controlling the product.

If this option is used, you must follow all instructions in the corresponding documentations. The documentations can be found on the CD shipped with the product in the controller/software package.

11 Commissioning

11.1 Prerequisites for commissioning

The following requirements must be met before the product may be commissioned:

- The product is properly mounted.
- The electrical equipment for the power supply of the motor and the holding brake is mounted correctly.
- All cables including the protective ground conductors are properly routed and connected.
- All electrical connections have been made properly.
- All parts of the system are properly grounded in compliance with directives, regulations, and standards.
- All safety equipment and EMERGENCY-STOP circuits are operational.
- The drive is not damaged and not blocked.
- All environmental conditions are respected.
- All protective covers are properly mounted.
- All tools, equipment, and other objects have been removed from the zone of operation of the product.
- All hazards are excluded.

Prior to commissioning, perform a test for each prerequisite mentioned and verify compliance with all information and specifications contained in these mounting instructions, in all applicable documents, and in all applicable directives, regulations, and standards.

11.2 Performing commissioning

⚠ WARNING

UNANTICIPATED MOVEMENT
Incorrect connections or external influences on electrical equipment can cause unanticipated movements.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Verify correct wiring.
- Verify that there are no persons or obstacles in the danger zone of the product before starting the product.
- Perform initial test movements without loads and without other processing units.
- Verify that all safety equipment and EMERGENCY STOP circuits are activated prior to commissioning.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION
Incorrect or unsuitable parameter values or settings can cause unintended movements, trigger signals, and compromise functional safety.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Verify that parameter values and settings can only be modified by authorized personnel who fully understand each and every effect of such a modification.
- Verify that all parameter values and settings are correct by performing a test run.

⚠ WARNING

HOT SURFACES
The temperature of the motor and the holding brake can exceed 100 °C during operation.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive objects in the vicinity of hot surfaces.
- Before performing work on the motor or the holding brake, verify that you wait for a sufficient period of time to allow such parts to cool down to a temperature that allows for safe contact.

Power on the power supply to the product via the main switch.

Check the following points during commissioning:

- Operating state, potential error conditions, and protective equipment
  - During commissioning, perform tests for all operating states and error conditions. In doing so, verify that all protective equipment operates as planned and required.
- Correct operation of the motor
  - There are no overloads.
  - There are no unusual fluctuations in the speed of rotation. Immediately stop the product in the case of overloads or unusual fluctuations in the speed of rotation and verify correct mounting.
- Noise emission
  - Excessive noise emission can be an indication of incorrect mounting, for example, an uneven ground that causes mechanical stress at the output flange. Immediately stop the product in the case of high noise emission and verify correct mounting.
- Heat
  - Verify that the heat dissipation is sufficient and that the specified climatic environmental conditions are respected by performing a test run under maximum load conditions.

If the product and/or the machine into which the product is incorporated is temporarily decommissioned, it must be recommissioned. For recommissioning, the same prerequisites must be met as for initial commissioning.

Perform the same tests for each recommissioning of the product as for initial commissioning.

12 Operation

12.1 Basic information on operation

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION
Incorrect or unsuitable parameter values or settings can cause unintended movements, trigger signals, and compromise functional safety.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Verify that parameter values and settings can only be modified by authorized personnel who fully understand each and every effect of such a modification.
- Verify that all parameter values and settings are correct by performing a test run.

⚠ WARNING

UNANTICIPATED MOVEMENT OF THE OUTPUT FLANGE
If the holding brake becomes inoperative, the output flange can move even if the motor is at a standstill.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Block or safeguard the output flange in such a way that a movement of the output flange is safely prevented before starting work on the output flange.

The product is a partly complete machine pursuant to Directive 2006/42/EU and intended to be incorporated into or assembled with other machinery. The information required for operation results from the functionality of the machine or system into which the product is incorporated and from the application implemented with it.

The instructions for the safe operation of the final machine or system must be provided by the system integrator (the person who incorporates the product in a machine pursuant to Directive 2006/42/EU) and/or the operator in the form of a manual with operating instructions, see chapter 2.3.

These operating instructions must be a complete manual which describes all work on and with the product and which contains all information relevant to the product. The system integrator and/or operator must ensure compliance of the operating instructions with all applicable directives, regulations, and standards.

13 Troubleshooting

13.1 Issue, cause and remedy

⚠ DANGER

ELECTRIC SHOCK CAUSED BY LIVE PARTS

Failure to follow these instructions will result in death or serious injury.

- Disconnect the mains supply voltage before performing the work and ensure that it cannot be switched on.
- Verify that no hazards can be caused by electrically conductive objects.
- Verify that all cables for the power supply are disconnected from power.

⚠ WARNING

MOVING PARTS

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Verify that the zone of operation of the moving parts of the product/machine is safeguarded.

⚠ WARNING

HOT SURFACES

The temperature of the motor and the holding brake can exceed 100 °C during operation.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive objects in the vicinity of hot surfaces.
- Before performing work on the motor or the holding brake, verify that you wait for a sufficient period of time to allow such parts to cool down to a temperature that allows for safe contact.

Issue	Cause	Remedy
Output flange does not rotate or does not reach the next position	Bearing is inoperable	▪ Contact the Weiss Service Department, see chapter 19.1
The defined position is no longer valid	Encoder is inoperative	
The product generates unusual noise	Bearing is inoperable	

14 Cleaning

14.1 Performing cleaning

⚠ DANGER

ELECTRIC SHOCK CAUSED BY LIVE PARTS

Failure to follow these instructions will result in death or serious injury.

- Disconnect the mains supply voltage before performing the work and ensure that it cannot be switched on.
- Verify that no hazards can be caused by electrically conductive objects.
- Verify that all cables for the power supply are disconnected from power.

⚠ WARNING

MISSING PROTECTIVE EQUIPMENT

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Immediately reinstall protective equipment that you may have removed to perform maintenance work after having completed the maintenance work and verify the effectiveness of the protective equipment.

⚠ WARNING

MOVING PARTS

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Verify that the zone of operation of the moving product/machine parts is safeguarded.

⚠ WARNING

HOT SURFACES

The temperature of the motor and the holding brake can exceed 100 °C during operation.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive objects in the vicinity of hot surfaces.
- Before performing work on the motor or the holding brake, verify that you wait for a sufficient period of time to allow such parts to cool down to a temperature that allows for safe contact.

For cleaning of electrical components and additional components, respect the instructions in the documentations of the manufacturer; refer to the applicable documents.

Use the following cleaning agents for cleaning the product:

Component	Cleaning agents
Housing	Neutral, mildly alkaline
Output flange	

1. Remove fine impurities and dust with a dry, lint-free cloth.
2. Use a wet cloth and a neutral, mildly alkaline cleaning agent to remove stains on the housing and/or on the output flange.
3. Dry the cleaned areas.
4. Remove all equipment from the product.
5. Restore the readiness for operation of the product.

15 Maintenance

15.1 Maintenance plan

When	Activity
At least every six months or if required	▪ Clean all surfaces of the product, see chapter 14.1
	▪ Verify all screw connections of the product for correct tightening torque
	▪ Verify correct connection of all plug connections

15.2 Lubricant

The product features lifetime lubrication. Refer to the documentation of the manufacturer for information on the lubricants used; see applicable documents.

16 Decommissioning

16.1 Decommissioning the product

1. Switch off the product and secure it against unintended switching on.
2. Remove all workpieces and all other objects not belonging to the product from the product.
3. In the case of recommissioning, follow the instructions described, see chapter 11.

17 Dismounting

17.1 Dismounting the product

⚠ WARNING

FALLING, TOPPLING, OR LOWERING LOADS

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Verify that the product is properly secured against falling and toppling.

1. Switch off the supply voltage.
2. Dismount the product (reverse sequence of steps), see chapter 8.

18 Disposal

18.1 Disposing of the product

Dispose of the product in compliance with all applicable directives, standards, and safety regulations.

Environmental protection

Dispose of lubricants, greases, residue of cleaning agents and other non-recyclable materials according to the applicable directives, standards, and safety regulations.

19 Service and spare parts

19.1 Worldwide service

If you need the assistance of our service departments, please provide the following information:

- Serial number of the product (see nameplate)
- Description of the problem
- Time of occurrence and circumstances of the problem
- Suspected cause

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19.2 Ordering spare parts

⚠ WARNING

UNSUITABLE SPARE PARTS AND ACCESSORIES

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Only use spare parts and accessories which are approved by the manufacturer.

Please provide the following information when ordering spare parts:

- Serial number of the product (see nameplate)
- Part number of the spare part according to spare parts list
- Quantity of spare parts required

INSPIRING PEOPLE
GREAT SOLUTIONS

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