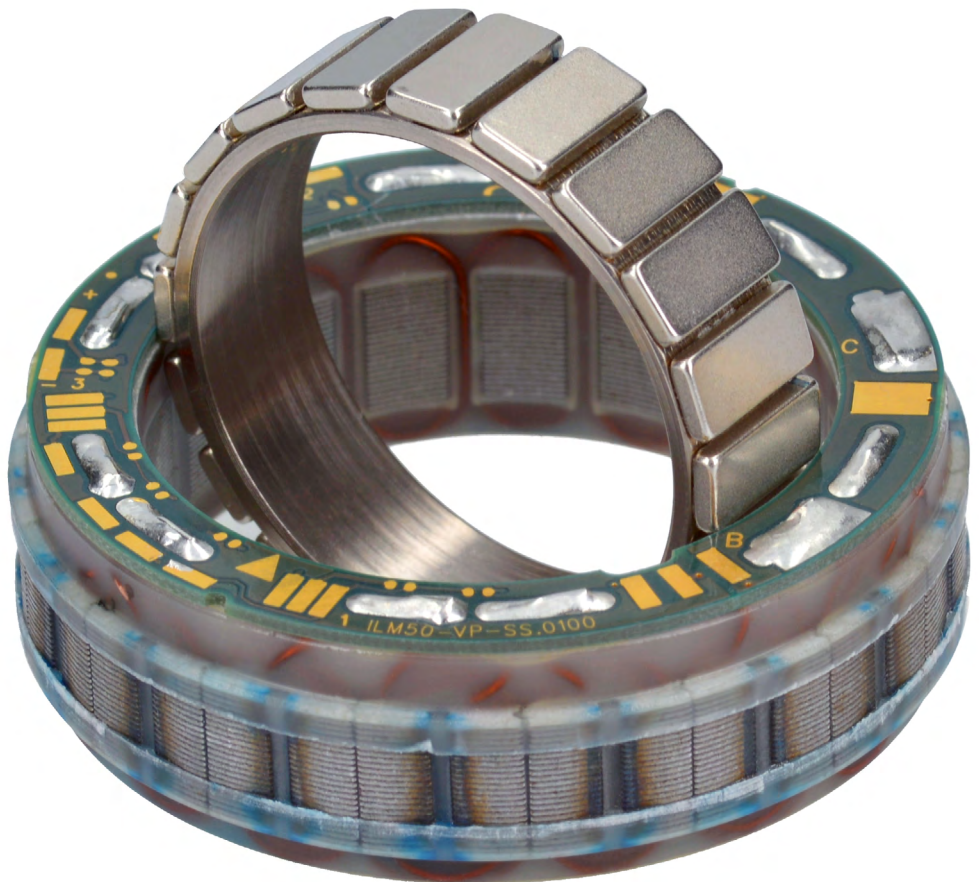




# Assembly Instructions ILM Servo Kits

Edition 03/2021 EN



We have checked the content of this publication for conformity with the unit described in it. There may nevertheless still be differences, so we cannot guarantee complete accuracy and correctness.

However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

All trademarks mentioned in this manual are the property of their respective owners (see section 1.13 on page 9).

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TQ-Systems GmbH | Mühlstr. 2, Gut Delling | 82229 Seefeld | Germany

Phone: +49 (0) 8153 9308-0 | Fax: +49 (0) 8153 4223

info@tq-group.com | www.tq-robodrive.com

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## 1 INTRODUCTION

### 1.1 Notes on the assembly instructions



These instructions contain important information that should be followed when installing the ILM servo kits.

- ▶ Read all the instructions carefully before starting assembly to avoid possible risks and mistakes.
- ▶ These instructions are part of the product. Keep the instructions in a safe place for future reference.

### **WARNING**

- ▶ Follow ALL danger and warning instructions and notes on precautionary measures.
- ▶ Read section „2 Safety“ on page 10 carefully.

### 1.2 Description

RoboDrive's ILM series of stator-rotor installation kits provides solutions for structurally integrated drive engineering. An ILM (internal rotor motor) servo kit consists of a cast stator and a rotor with permanent magnets for installation in machines and devices in the commercial environment.

The RoboDrive technology provides the highest power density at maximum torque and overload capability in a compact design.

The flexible concept offers solutions for a variety of demanding drive applications. Alternative nominal currents, increased rotational speeds and customised torque-speeds are available upon request.

The implementation of customer-specific solutions to achieve a compact and thermally-optimized design is supported by extensive documentation and RoboDrive development expertise.

ILM servo kits offer the following stand-out features:

- Installation kits for maximum freedom of design
- Hollow shaft capability
- Low voltage 12 V – 48 V
- Excellent copper fill factor offering high torque density and dynamic response

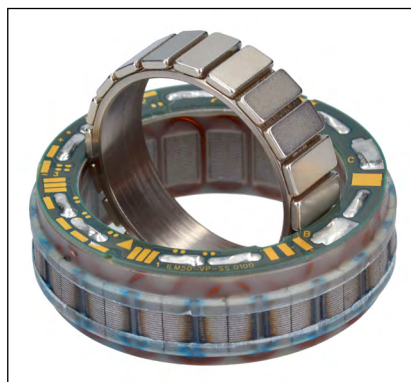


Fig. 1: ILM servo kit

- Concentrated windings for low losses
- Thermally-optimized actuator design thanks to structural integration and heat-conducting epoxide casting resin
- Drive systems developed to optimize weight and installation space on the basis of load profile analyses
- High bandwidth and minimal harmonics for optimal control quality

### 1.3 System components available from TQ-Drives

TQ-Drives RoboDrive is a complete drive technology supplier, offering the servo kit, motors and motor-gearbox units right through to customised drive systems.

#### 1.3.1 Example with system components for hollow shaft motors

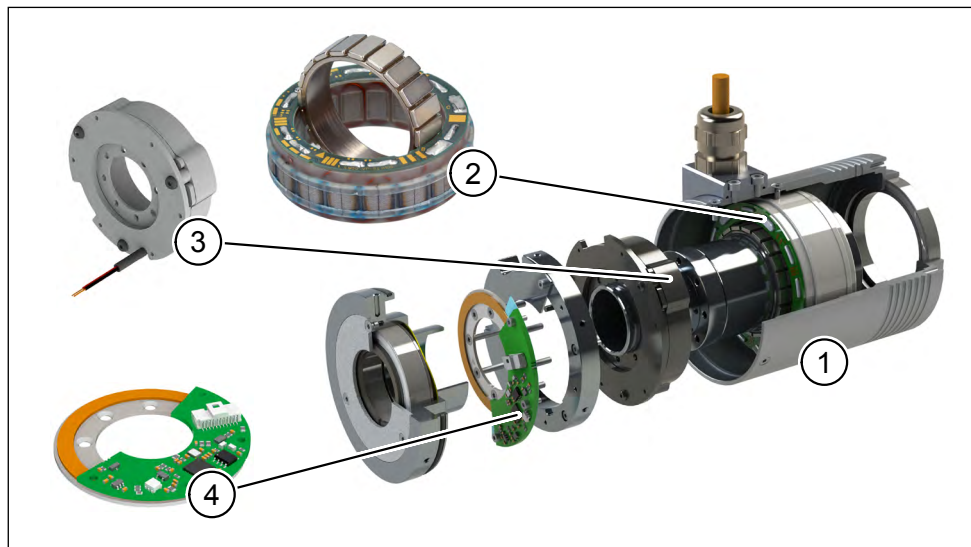


Fig. 2: Example with system components for hollow shaft motors

Item	Designation
1	Hollow shaft motor with integrated safety brake
2	ILM servo kit
3	Safety brake
4	Absolute position sensor

1.3.2 Example with system components for solid shaft motors

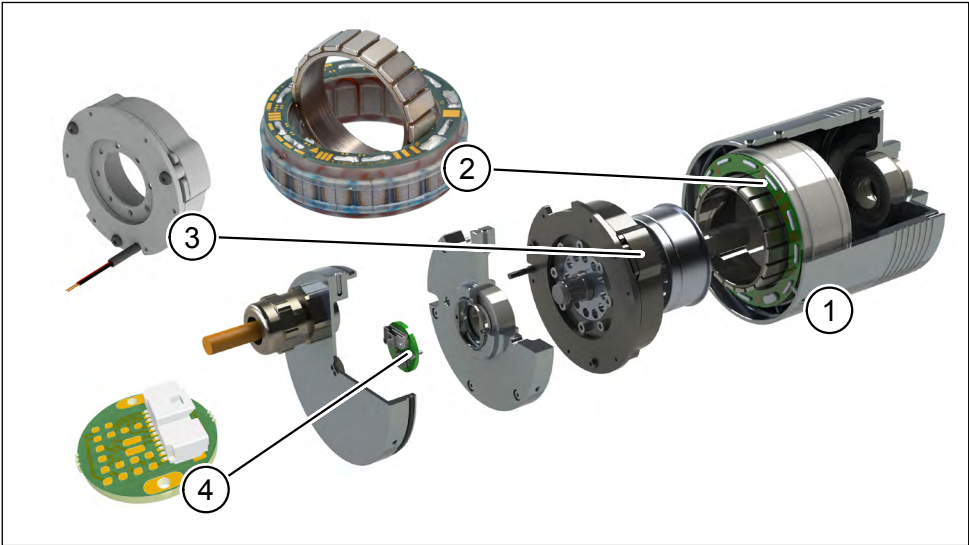


Fig. 3: Example with system components for solid shaft motors

Item	Designation
1	Solid shaft motor with integrated safety brake
2	ILM servo kit
3	Safety brake
4	Absolute position sensor

1.4 Revision index

Manual	Edition	Item no.	Language
ILM Servo Kit Assembly Instructions	03/2021, second version	304188.0200	EN

Table 1: Revision index

1.5 Supplementary documents

Installation drawings are available for different sizes on our website.

## 1.6 Explanation of the symbols used

- This symbol indicates an action to be taken.
- This symbol indicates a list.

## 1.7 Training

The manufacturer offers training courses on the general handling of the ILM servo kits. Please contact the [TQ-Drives division of TQ-Systems GmbH](#) as required.

## 1.8 Declaration of incorporation

The ILM servo kits are regarded as "partly-completed machinery" as defined in the Machinery Directive 2006/42/EC. The declaration of incorporation is an integral part of this installation manual (see section 8 on page 26).

## 1.9 Serial number

- The serial number is shown on the label attached to the stator.
- The serial number is shown on the Label attached to the Rotor.

### NOTE

The Label on the rotor must be removed without residue before installation.

## 1.10 Warranty

TQ-Systems GmbH guarantees that, if used for the agreed purpose, the ILM servo kits fulfil the contractually defined specifications and functionality and correspond to the state of the art at the time of delivery.

The warranty is limited to material, manufacturing and processing defects.

The manufacturer's liability and warranty shall not apply in the following cases:

- Genuine parts were not replaced with genuine parts or parts approved by TQ-Systems GmbH.
- The assembly or set-up work was carried out without following these assembly instructions or was otherwise carried out incorrectly.
- Unauthorized repairs
- Incorrect operation
- Incorrect use
- Application of force
- Other modifications to the contractual product

## NOTE

The warranty period is 12 months and starts upon delivery to the customer.

Please contact the [TQ-Drives division of TQ-Systems GmbH](#) for all claims under the warranty.

### 1.11 Transportation and storage

- The stator and rotor of the ILM servo kit are shipped in separate packing units.
- Always transport the ILM servo kits in the original packaging to avoid mechanical damage or damage due to static electricity.
- During transportation, avoid hard impacts or vibrations that could affect the ILM servo kits.

### 1.12 Environmentally-friendly disposal

#### DANGER

##### **Danger of death by powerful magnetic fields.**

The life of persons with passive or active implants such as pacemakers, defibrillators, insulin pumps etc. is put at risk if they stand in the vicinity of the ILM servo kit.

- ▶ Make sure that no persons who could possibly be affected by powerful magnetic fields are able to approach the ILM servo kit. They must maintain a safe distance of at least 2 m.
- ▶ Instruct persons in the vicinity of the potential risk.



The ILM servo kits must not be disposed of in the residual waste bin.

- ▶ In Germany, metal and plastic components should be disposed of at the local recycling centre. The national regulations in other EU states should also be followed.
- ▶ In Germany, electrical components should be disposed of in accordance with the Electrical and Electronic Equipment Act (ElektroG). In other EU states, the national implementation of the Waste Electrical and Electronic Equipment Directive 2002/96/EC (WEEE) should be followed.
- ▶ The regulations and statutory requirements in your own country concerning disposal should also be followed.

### 1.13 Trademarks

- HYSOL® is a trademark of Henkel.
- LOCTITE® is a trademark of Henkel.
- Kapton® is a trademark of DuPont.

## 2 SAFETY

These instructions contain notes that you must follow for your own personal safety and to avoid injury and damage to property. They are highlighted by warning triangles and are shown as follows according to the level of danger.

### 2.1 Hazard classification

#### **DANGER**

The signal word designates a hazard with a **high** degree of risk which, if it is not avoided, will result in death or severe injury.

#### **WARNING**

The signal word designates a hazard with a **medium** degree of risk which, if it is not avoided, will result in death or severe injury.

#### **CAUTION**

The signal word designates a hazard with a **low** degree of risk which, if it is not avoided, could result in minor or moderate injury.

#### **NOTE**

A note as used in these instructions contains important information about the product or about a part of the manual to which particular attention should be paid.

### 2.2 Target group

The activities described in this manual must only be carried out by technicians with the following qualifications:

- Training in the installation and commissioning of electrical devices (qualified electrician as defined in EN 50110-1: a person with technical training, knowledge and experience sufficient to allow them to recognise and avoid the risks that might be posed by electricity)
- Extensive knowledge in the fields of electrical engineering and drive technology
- Training in electrical and mechanical hazards and the local safety requirements
- Knowledge of the relevant standards and directives
- Knowledge and observance of this document and all the safety instructions

Any employee who does not have the relevant training must be given appropriate training and instruction. The instruction is to be given by authorised personnel with the appropriate training.

## 2.3 Intended use

The ILM servo kits must be used only for the applications listed in the technical descriptions, i.e. as a structurally-integrated drive. Any different or more extensive usage will be regarded as contrary to the intended use and will invalidate the warranty.

The ILM servo kits are regarded as "partly-completed machinery" as defined in the Machinery Directive 2006/42/EC and must not be brought into service until it has been determined that the machines in which the ILM servo kits are to be installed conform to the provisions of the Machinery Directive 2006/42/EC.

The ILM servo kits are not domestic appliances; as components they are intended exclusively for reuse for commercial or professional purposes as defined by IEC/EN 61000-3-2.

Intended use also includes compliance with this manual and the instructions it contains. If the ILM servo kits are to be used safely and without interruption, they must have been correctly transported, stored, assembled and set up.

For any use contrary to the intended use, TQ-Systems GmbH shall accept no liability for any damage that may occur and offers no warranty that the product will work perfectly and correctly.

## 2.4 Working environment and operation

The ILM servo kits must only be operated under the conditions of use and within the performance limits specified in the documentation.

The ILM servo kits are not permitted to be used in the following areas:

- in potentially explosive areas
- in areas in which harmful substances as defined in EN 60721 may be encountered, such as oils, acids, gases, vapours or dusts
- underwater
- in areas exposed to radiation
- in a vacuum

## 2.5 Safety instructions for the ILM servo kit

### DANGER

#### **Danger of death by powerful magnetic fields.**

The life of persons with passive or active implants such as pacemakers, defibrillators, insulin pumps etc. is put at risk if they stand in the vicinity of the ILM servo kit.

- ▶ Make sure that no persons who could possibly be affected by powerful magnetic fields are able to approach the ILM servo kit. They must maintain a safe distance of at least 2 m.
- ▶ Instruct persons in the vicinity of the potential risk.
- ▶ Attach warning instructions, stating POWERFUL MAGNETIC FIELDS at the installation area and storage location.

- The rotors of the ILM servo kit will attract other magnetic materials. The forces of attraction can be so great that the magnets of the servo kit splinter on impact and tiny fragments fly into the eyes.
  - ▶ Wear safety goggles to protect your eyes until you have finished installing the ILM servo kit.
- If the ILM servo kit is operated below the specified temperature, the magnets can become detached from the rotor and fly around due to thermal stressing of the adhesive.
  - ▶ Always operate the ILM servo kit within the specified temperature range.
- If the ILM servo kit operating voltage is too high, it will exceed the maximum permitted rotational speed. There is a risk of parts becoming detached and flying around.
  - ▶ Always operate the ILM servo kit within the specified voltage and speed ranges.
- The electromagnetic interference (EMI) emitted by the ILM servo kit is negligible in nominal operation. However it is not possible to entirely exclude the possibility that it will affect electrical devices.
- Fast acceleration of the ILM servo kit rotor can cause an inadequately secured ILM servo kit to move suddenly and be flung out of its original position.
- The drive train that is connected to the ILM servo kit must be designed for the maximum rotational speed of the ILM servo kit, otherwise the drive train may be damaged or crack.

- The ILM servo kit reaches high temperatures during operation. If there is a thermal bridge between the housing and the ILM servo kit installed in it, there is a risk of burns on the housing surface.
- Body parts (fingers, arms, hair, etc.) may be injured or torn off due to the rotation of exposed mechanical parts such as motor shafts. There is also the risk that items of clothing (ties, scarves, chains, rings, etc.) or objects (cables, etc.) may be wound onto the motor shaft and injure the wearer.
  - ▶ Never touch rotating components (motor shafts, clutches, etc.).
  - ▶ Do not wear belts, chains, ties or clothing with wide sleeves at the workplace.
  - ▶ Wear a hairnet if you have long hair.
  - ▶ Make sure that there are no exposed rotating parts.
- Rotating shafts can crack and parts (such as screws, etc.) can be flung about.
  - ▶ Secure rotating shafts with a protective cover.
- Install the ILM servo kit only in a dry environment.
- Protect the ILM servo kit against moisture and wet conditions.

## 2.6 Warning labels

- ▶ Attach warning labels that indicate the relevant risks to the machines in which the ILM servo kits are installed.
- ▶ Make sure that the warning labels are always clearly identifiable.
- ▶ Replace any damaged warning labels.
- ▶ Replace any warning labels that are missing.

### 3 TECHNICAL DATA

#### 3.1 Data sheet

You will find the technical data for the ILM servo kits in the data sheet provided in the ILM servo kits [download area](#).

#### 3.2 Connection diagram (star-serial configuration)

Connections A, B and C can be found on the ILM servo kit.

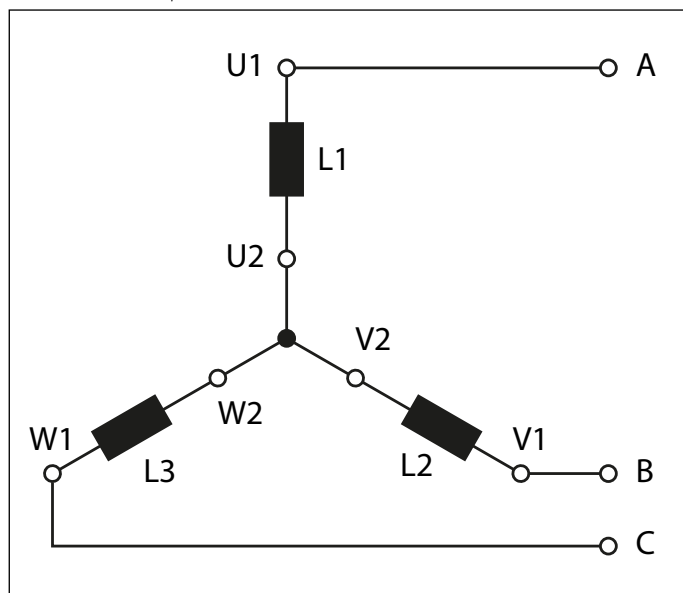


Fig. 4: Measuring points on the ILM servo kit (star-serial configuration)

Measured variable	Measured values
Nominal voltage $U_n^*$ [V]	See data sheet in our <a href="#">download area</a>
Nominal current $I_n^*$ [A]	
Terminal resistance $R_{TT}^*$ at 20 °C [mΩ]	
Terminal inductance $L_{TT}^*$ [μH]	

Table 2: Measuring points on the ILM servo kit (star-serial configuration)

3.3 Installation dimensions

	ILM 25×04	ILM 25×08	ILM 38×06	ILM 38×12	ILM 50×08	ILM 50×14	ILM 70×10
Outer diameter stator D js8 [mm]	25	25	38	38	50	50	69
Board diameter G [mm]	23.8	23.8	36.2	36.2	47.6	47.6	66.8
Winding head diameter g [mm]	23.8	23.8	36	36	47.6	47.6	66
Stator length L [mm]	10.8	15.2	15.3	22.3	16.4	22.8	22.6
Inner diameter rotor d H7 [mm]	11.6	11.6	18	18	30	30	42
Rotor length l [mm]	6.3	9.7	8.1	16.2	9.9	16.1	12.7

Table 3: Installation dimensions – part 1

	ILM 70×18	ILM 85×04	ILM 85×13	ILM 85×23	ILM 85×26	ILM 115×25	ILM 115×50
Outer diameter stator D js8 [mm]	69	85	85	85	85	115	115
Board diameter G [mm]	66.8	82.8	82.8	82.8	82.8	111.8	111.8
Winding head diameter g [mm]	66	81	81	81	81	110	110
Stator length L [mm]	30.5	17.6	27.2	37.2	40.7	39.0	68.4
Inner diameter rotor d H7 [mm]	42	52	52	52	52	74	74
Rotor length l [mm]	20.7	7.1	15.7	25.1	27.2	27.1	54.2

Table 4: Installation dimensions – part 2

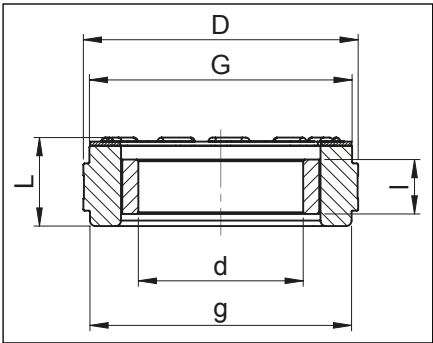


Fig. 5: Dimension designations

## 4 ILM SERVO KIT CONFIGURATIONS

### 4.1 Basic servo kit with connection board

Possible configurations:

- Star-serial
- Star-parallel
- Delta-serial
- Delta-parallel

A temperature sensor is included as standard.

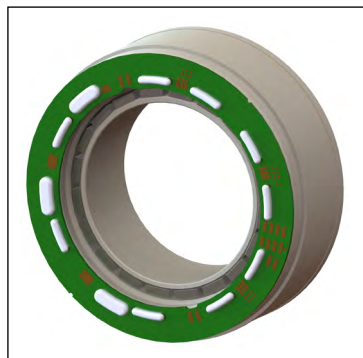


Fig. 6: Basic servo kit with connection board

### 4.2 Servo kit with Hall commutation

Basic servo kit with:

- Digital Hall elements
- Extended rotor

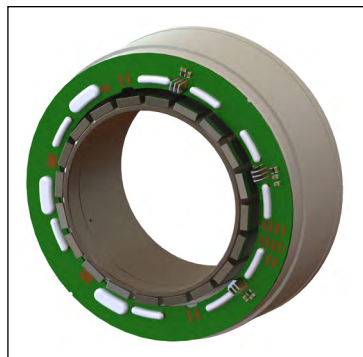


Fig. 7: Servo kit with Hall commutation

### 4.3 Servo kit with three pins on the stator

The servo kit without connection board is available with three pins on the stator as a custom solution.

Possible configurations:

- Star-serial

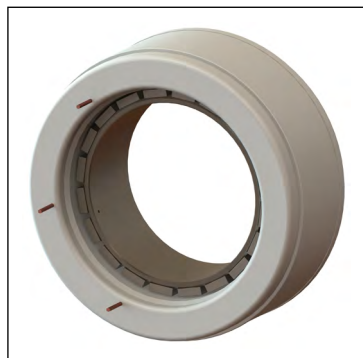


Fig. 8: Servo kit with three pins on the stator

5 SOLDER PADS ON THE CONNECTION BOARD

Fig. 9 shows the solder pads on the connection board by way of example. Detailed drawings for your type of ILM servo kit are available on our website.

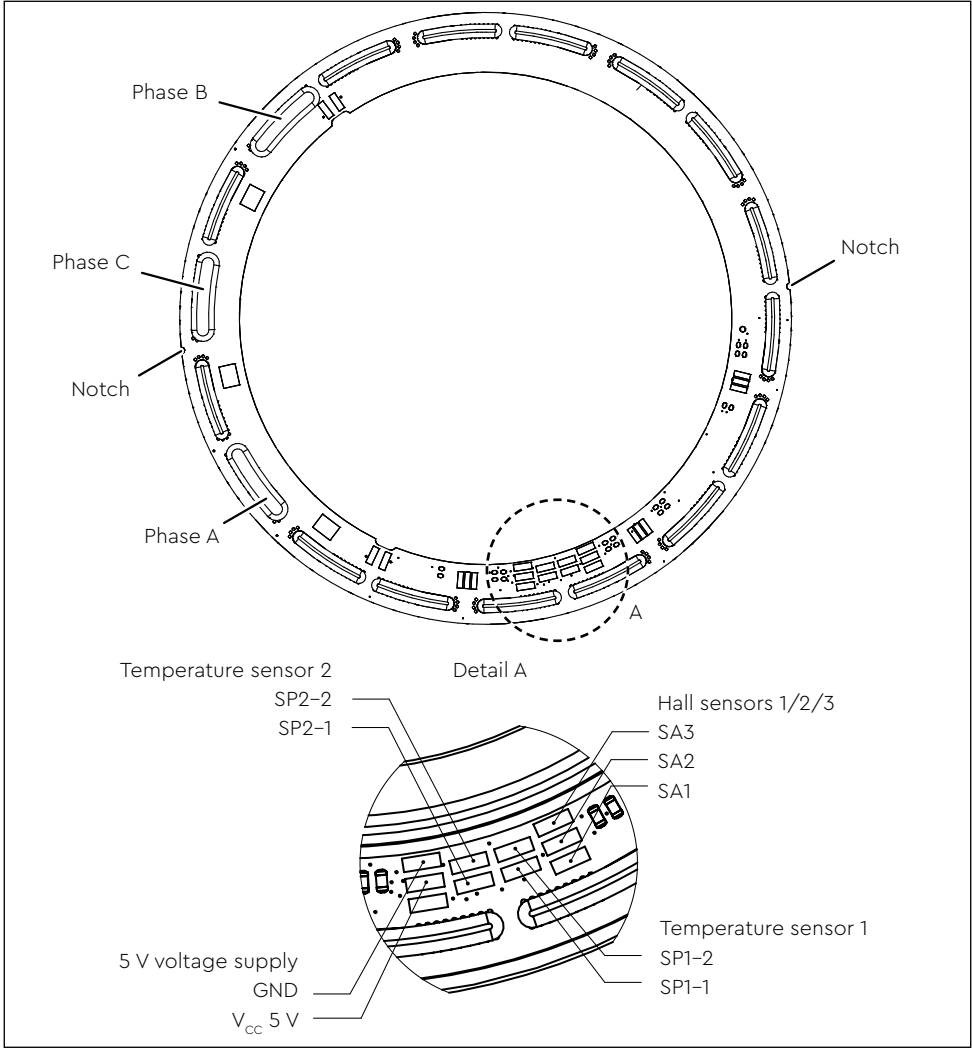


Fig. 9: Solder pads on the connection board

## 6 REFERENCE DESIGN FOR ILM SERVO KITS

Fig. 10 shows a reference design with installation notes for integrating the ILM servo kit. The design specifications for the specific type of ILM servo kit are contained in the "Drawing ILM XXXXX" drawings which are available on our website. Joining of the rotor and shaft or stator and housing can also be carried out by TQ-Drives, if required.

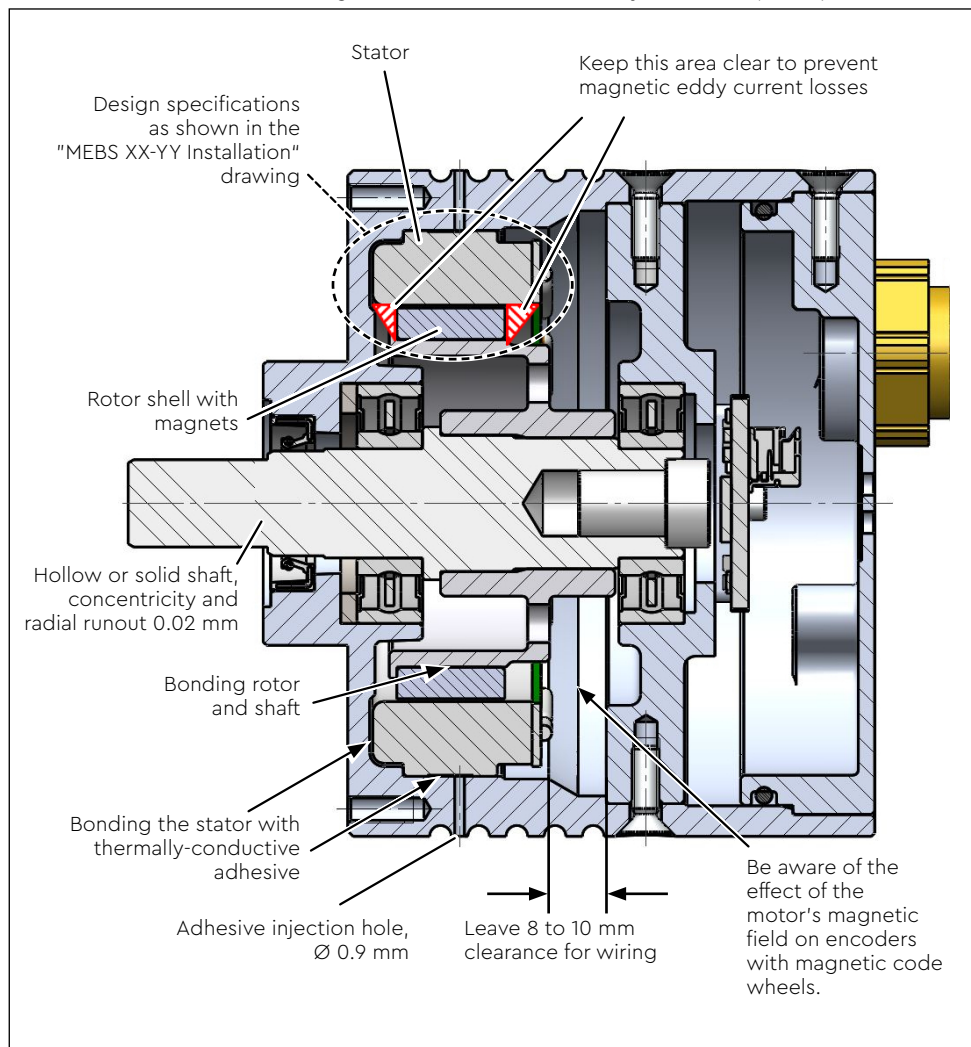


Fig. 10: Reference design for ILM servo kits

## 7 ASSEMBLY

### **DANGER**

#### **Danger of death by powerful magnetic fields.**

The life of persons with passive or active implants such as pacemakers, defibrillators, insulin pumps etc. is put at risk if they stand in the vicinity of the ILM servo kit.

- ▶ Make sure that no persons who could possibly be affected by powerful magnetic fields are able to approach the ILM servo kit. They must maintain a safe distance of at least 2 m.
- ▶ Instruct persons in the vicinity of the potential risk.
- ▶ Attach warning instructions stating POWERFUL MAGNETIC FIELDS to the packaging, at the installation area and at the storage location.

### **DANGER**

#### **Danger of death by electric shock.**

The ILM servo kit is supplied with electrical voltage for operation. Touching live conductors can result in death or severe injuries.

- ▶ Use the main switch to switch off all power to the complete system before starting installation or maintenance work.
- ▶ Observe the five safety rules (DIN VDE 0105-100) for working on electrical systems:
  - Disconnect from mains (all-pole disconnection of a system from live parts)
  - Secure against reconnection
  - Check that the system is voltage-free
  - Earth and short-circuit
  - Cover or block off access to adjacent live parts

 **DANGER****Danger of death by electric shock or arcing at the power connections of the ILM servo kit**

The contacts of the power connections carry potentially fatal voltages and high current strengths. Removing the cables to the power connections of the ILM servo kit during operation can cause arcing, resulting in serious or fatal injury.

Depending on the installed buffer capacity, the DC link of a connected inverter can continue to carry dangerous voltages for some time, even after the power supply to the entire system is switched off.

- ▶ Never detach electrical connections on the ILM servo kit or the inverter while they are live.
- ▶ Use a permitted meter to check that the power connections are voltage-free before you carry out installation work on the device.

 **WARNING****Danger of eye injuries caused by splintering magnetic parts**

The rotors of the ILM servo kit will attract other magnetic materials. The forces of attraction can be so great that the magnets of the servo kit splinter on impact and tiny fragments fly into the eyes.

- ▶ Wear safety goggles to protect your eyes until you have finished installing the ILM servo kit.
- ▶ Keep the rotors of the ILM servo kit away from other magnetic materials.

## 7.1 Bonding surfaces on stator and rotor

The bonding surfaces must be compatible with the adhesive used. This should be checked in particular if passivation or another surface treatment is envisaged or has been carried out.

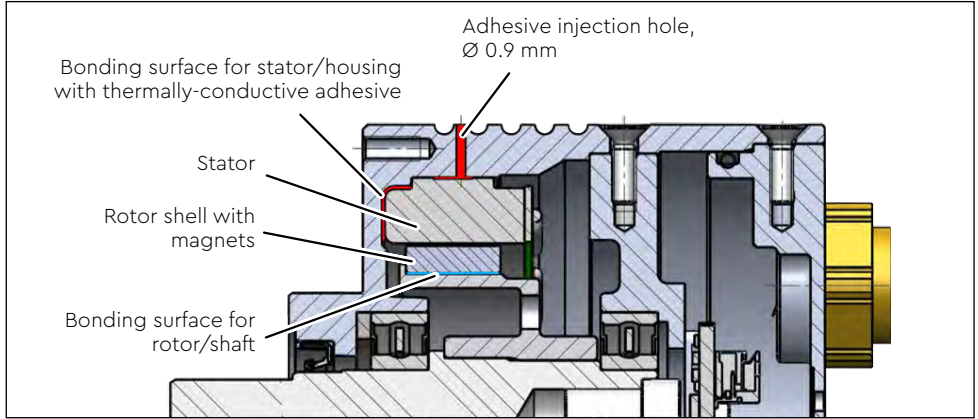


Fig. 11: Bonding surfaces on stator and rotor

## 7.2 Tools and equipment required

- Non-magnetic tool
- Centring guides for rotor and stator
- TQ-Drives stator bonding kit with:
  - Dispensing gun (25/50 ml)
  - Thermally conductive adhesive (e.g. LOCTITE Hysol 9497, 50 ml)
  - Mixing tube
  - Disposable syringe 1 ml
  - Dispensing needle 0.9 mm
- Bonding adhesive for rotor (e.g. LOCTITE 648)
- Kapton tape
- Cleaning agents
- Lint-free cloths
- Antistatic coat
- ESD grounding wrist strap
- Safety goggles
- Protective gloves

## 7.3 Bonding instructions

### WARNING

#### Danger of eye injury and skin irritation by adhesives

The adhesives used for bonding can cause severe eye injuries and skin irritations.

- ▶ Wear safety goggles to protect your eyes and wear safety gloves until you have finished installing the ILM servo kit.
- ▶ Read and follow the safety data sheets provided with the adhesive.

### 7.3.1 Stator

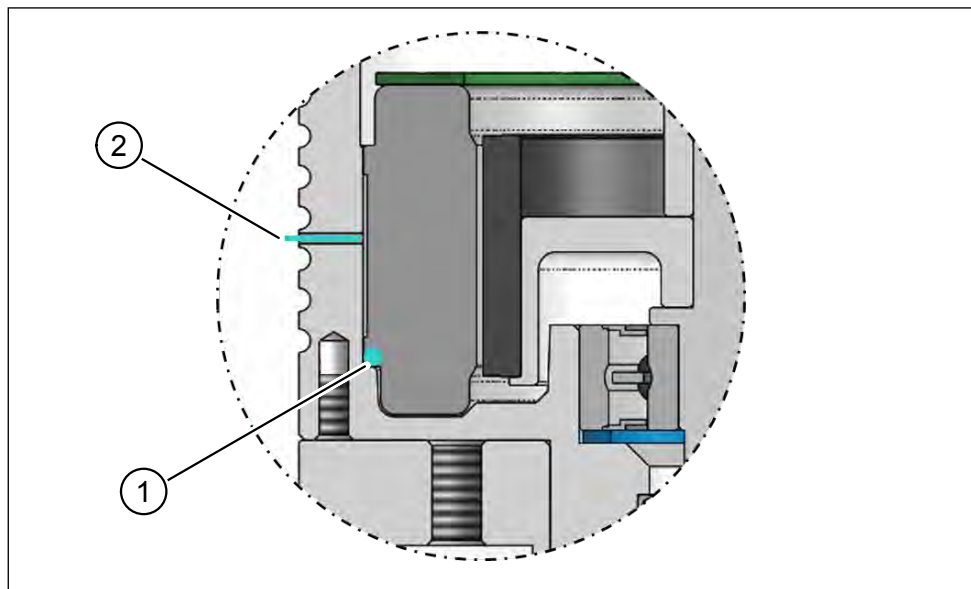


Fig. 12: Bonding the stator in position

- ▶ Assemble the bonding kit for the TQ-Drives stator.
- ▶ Clean and degrease the bonding surfaces (see Fig. 11 on page 21) following the adhesive manufacturer's instructions.
- ▶ Apply a bead of adhesive (e.g. LOCTITE 9497) all around the edge (item 1 in Fig. 12) inside the housing.
- ▶ Push the stator into the housing as far as it will go. The adhesive is distributed by the stator.
- ▶ Remove any excess adhesive.

- ▶ Cure the adhesive for approx. 10 minutes in the curing oven. Make sure that no excess adhesive can bond to the floor of the curing oven.
- ▶ Attach the 0.9 mm dispensing needle to the disposable syringe.
- ▶ Fill the disposable syringe (e.g. with LOCTITE 9497).
- ▶ Inject adhesive into the hole (item 2 in Fig. 12) in the housing until the adhesive emerges from the hole on the opposite side. Twist the needle a little from side to side as you inject to evenly distribute the adhesive.
- ▶ Remove the adhesive that emerges and seal both holes with Kapton tape.
- ▶ Place the stator in the curing oven so that it cures fully. Follow the manufacturer's instructions concerning time and temperature.

### 7.3.2 Rotor

- ▶ Clean and degrease the bonding surfaces on the shaft (item 1 in Fig. 13) and rotor (item 1 in Fig. 14) following the adhesive manufacturer's instructions.
- ▶ Heat the rotor for 5 minutes at 60 °C in the curing oven.
- ▶ Following the manufacturer's instructions, apply a thin ring of adhesive (item 2 in Fig. 13) to the bonding surface on the shaft (item 1 in Fig. 13).
- ▶ Following the manufacturer's instructions, apply a thin ring of adhesive (item 2 in Fig. 14) to the inner surface in the vicinity of the indexing hole (item 3 in Fig. 14) on the rotor.
- ▶ Align the rotor so that the indexing hole (item 2 in Fig. 15) points towards the shaft (see Fig. 15).
- ▶ Push the rotor (item 1 in Fig. 15) onto the shaft (item 3 in Fig. 15) and gently push it as far as it will go.

#### NOTE

- Do not press on the surfaces of the rotor magnets as this will damage their coating.
  - Only press on the inner ring (item 1 in Fig. 16) of the rotor when you push it onto the shaft. The pressure points (item 2 in Fig. 16) should be opposite one another.
- ▶ Quickly remove any excess adhesive with a dry cloth. Do not use solvents on the shaft or magnets.
  - ▶ Carry out the curing process following the adhesive manufacturer's instructions.

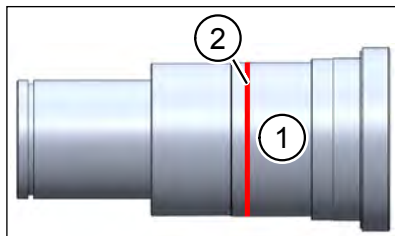


Fig. 13: Adhesive ring on the shaft

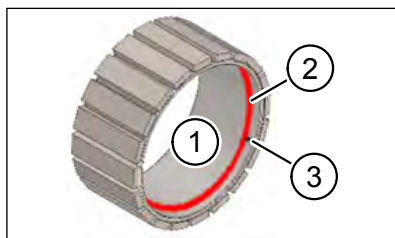


Fig. 14: Adhesive ring on the rotor

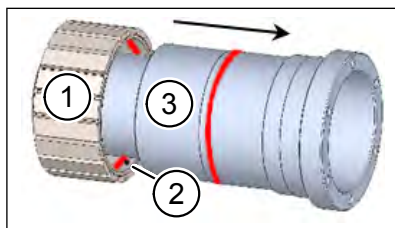


Fig. 15: Pushing the rotor onto the shaft

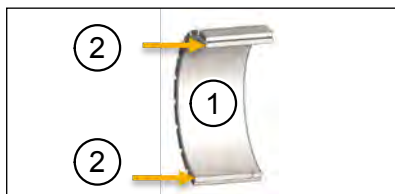


Fig. 16: Pressure points on the inner ring

### 7.3.3 Double rotor

A double rotor is needed for some versions of the ILM servo kits, for example some with Hall commutation. For this purpose, the rotor length is extended so that the rotation can be detected by the Hall sensors on the connection board. Installation of the double rotor is described in a separate document which is available on our website.

### 7.4 Inserting the rotor into the stator

#### WARNING

##### **Danger of crushing, catching or cutting injuries to the hands.**

For example, the rotor can move suddenly under the effect of magnetic forces. This can result in severe injuries.

- ▶ To prevent sudden movements of the rotor during installation, use a mechanical means to lock the rotor in place.
- ▶ When inserting the rotor into the stator, use a mechanical centring guide to prevent the rotor moving suddenly towards the stator due to magnetic attraction.
- ▶ Wear safety goggles to protect your eyes and wear safety gloves until you have finished installing the ILM servo kit.

#### NOTE

- ▶ Make sure that the rotor is not tilted as it is inserted, otherwise parts of the magnets on the rotor can splinter off or the inner surface of the stator and other parts can be damaged.
  - ▶ When inserting the rotor into the stator, be aware of the powerful magnetic forces that can pull the rotor suddenly into the stator. The centring aid must therefore be held in place with appropriate force.
- ▶ Use a mechanical centring guide to insert the rotor into the stator.

## 8 DECLARATION OF INCORPORATION

### Declaration of Incorporation of Partly Completed Machinery according with Annex IIB, 2006/42/EG



We

Company name:	TQ Systems GmbH
Address:	Mühlstr. 2, Gut Delling D - 82229 Seefeld

hereby declare that a declaration of incorporation has been issued, in sole responsibility, for the following partly completed machinery:

Product category:	Partly completed machinery
Product name:	ILM Servo Kit
Model name / Type name:	ILM25x04, ILM25x08, ILM38x06, ILM38x12, ILM50x08, ILM50x14, ILM70x10, ILM70x18, ILM85x04, ILM85x13, ILM85x23, ILM85x26, ILM115x25, ILM115x50

This partly completed machinery meets the following health and safety protection requirements in accordance with Annex I of EC Machinery Directive 2006/42/EC:

Essential requirement	If applicable: Place of finding in harmonized standard
Risk assessment (General principles)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02
Principles of safety integration (No. 1.1.2.)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02
Materials and products (No. 1.1.3.)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02 EN ISO 50581:2012
Design of machinery to facilitate its handling (No. 1.1.5.)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02 EN ISO 61800-5-1:2007 + A1:2017 EN IEC 60034-6:1996
Safety and reliability of control systems (No. 1.2.1.)	EN ISO 61800-5-1:2007 + A1:2017
Risk of break-up during operation (No. 1.3.2.)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02
Risks due to falling or ejected objects (No. 1.3.3.)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02
Risks related to moving parts (No. 1.3.7)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02
Electricity supply (No. 1.5.1.)	EN 61800-5-1:2007 + A1:2017
Static electricity (No. 1.5.2.)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02
Errors of fitting (No. 1.5.4.)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02
Information and warnings on the machinery (No. 1.7.1)	EN 61310-1:2008 EN 61310-2:2008



Declaration of Incorporation of Partly Completed Machinery  
according with Annex IIB, 2006/42/EG



Essential requirement	If applicable: Place of finding in harmonized standard
Warning of residual risks (No. 1.7.2.)	EN ISO 12100:2010-11 EN IEC 62061:2005-04 + AC:2010-02 + A1:2013-02
Marking of machinery (No. 1.7.3.)	EN 61310-1:2008 EN 61310-2:2008

The relevant technical documentation has been compiled in accordance with Annex VII, Part B of EC Machinery Directive 2006/42/EC. We undertake, in response to a reasoned request, to supply it in electronic form to the market surveillance authorities within a reasonable period.

The following person is authorized to compile the technical documentation in accordance with Annex II, part 1, B, no. 2, 2006/42/EC:

Name:	Fassbender, Holger
Address:	Mühlstr. 2, Gut Delling, D - 82229 Seefeld
Position in the company of the manufacturer:	R&D Quality and Regulation

When installing in a machine or when finishing a machine that works on its own, the specifications provided in the assembly instructions must be adhered to. The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive.

Additional information:

This declaration of incorporation is a translation of the original declaration, issued on 2018-09-18.

This partly completed machinery further meets the safety requirements of the following European directives: Low Voltage Directive 2014/35/EU

Seefeld, 2.04.2019

i.V. Bastian Thomas  
Geschäftsbereichsleitung TQ- Drives

Document item no.: 304188.0200

TQ-Systems GmbH | TQ-Drives  
Mühlstr. 2, Gut Dellling | 82229 Seefeld | Germany  
Phone: +49 (0) 8153 9308-0 | Fax: +49 (0) 8153 4223  
info@tq-group.com | www.tq-robodrive.com

