

Translation of the Original Operational Instructions

Please read these Operational Instructions carefully and follow them accordingly!

Ignoring these Instructions may lead to malfunctions or to clutch failure, resulting in damage to other parts.
These Installation and Operational Instructions (I + O) are part of the clutch delivery.
Please keep them handy and near to the clutch at all times.

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Safety and Guideline Signs

DANGER



Immediate and impending danger, which can lead to severe physical injuries or to death.

CAUTION



Danger of injury to personnel and damage to machines.



Please Observe!
Guidelines on important points

Guidelines on EU Directives



Guidelines on the Declaration of Conformity

A conformity evaluation has been carried out for the product (electromagnetic ROBATIC® clutch) in terms of the EU Low Voltage Directive 2014/35/EU and the RoHS 2011/65/EU with 2015/863/EU. The Declaration of Conformity is laid out in writing in a separate document and can be requested if required.

Guidelines on the EMC Directive 2014/30/EU

The product cannot be operated independently according to the EMC directive.

Due to their passive state, clutches are also non-critical equipment according to the EMC.

Only after integration of the product into an overall system can this be evaluated in terms of the EMC.

For electronic equipment, the evaluation has been verified for the individual product in laboratory conditions, but not in the overall system.

Guidelines on the Machinery Directive 2006/42/EC

The product is a component for installation into machines according to the Machinery Directive 2006/42/EC.

The clutch then becomes a machine component and the machine manufacturer assesses the conformity to the directive.

It is forbidden to start use of the product until you have ensured that the machine accords with the regulations stated in the directive.

Guidelines on the EU Directive 2011/65/EU (RoHS II) with 2015/863/EU (RoHS III – from 22 July 2019)

These restrict the use of certain hazardous substances in electrical and electronic devices as well as in products / components (category 11), the proper operation of which is dependent on electric currents and electromagnetic fields.

Our electromagnetic products / components fulfill the requirements laid down in the RoHS Directive(s), taking into account the valid exceptions (according to Appendix III and IV RoHS (2011/65/EU) with delegated Directives (EU) 2018/739-741 from 01.03.2018 for Category 11 – until 21 July 2024) and comply with the RoHS.

Guidelines on the ATEX Directive

Without a conformity evaluation, this product is not suitable for use in areas where there is a high danger of explosion.

For application of this product in areas where there is a high danger of explosion, it must be classified and marked according to Directive 2014/34/EU.

Guidelines on the REACH Regulation (EC) No. 1907/2006

of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). This regulation governs the manufacture, placing on the market and use of chemical substances in preparations and, under certain conditions, also of substances in finished products.

mayr® power transmission exclusively manufactures products (articles: overload clutches, shaft couplings, electromagnetic brakes / clutches, permanent magnet motors and the appropriate control modules / rectifiers) in accordance with the definition in Article 3 of the REACH Regulation.

mayr® power transmission is aware of its responsibility towards the environment and society. As a matter of precaution, we pay attention to particularly critical substances in the supply chain and strive to avoid using any such substances completely or to replace them in the near future.

In compliance with Article 33 of the REACH Regulation, we would like to inform you that in our overload clutches and shaft couplings, electromagnetic brakes / clutches as well as permanent magnet motors, subcomponents with a lead content of > 0.1% are or may be used. These are manufactured from raw materials such as machining steel / copper alloys (e.g. brass, bronze) or aluminum alloys.

Besides high-melting-point (HMP) solders (electronics), this also affects integrated machine elements as well as standard parts (screws / nuts / set screws / pins / etc.) among others, provided that the relevant standards allow this.

For example, lead can occur as an alloying element with more than 0.1 mass percent, based on the respective total mass, in screws and set screws of the following property classes: 4.6, 4.8, 5.8, 6.8, 04, 4, 5, 6, 14H, 17H, 22H, 33H, 45H.

Products made from copper and copper alloys do not fall within the area of applicability of Regulation (EC) No. 1272/2008 of the European Parliament and Council on the Classification, Labeling and Packaging of Substances and Mixtures (CLP Regulation) and are therefore not subject to the classification and labeling obligations.

To our knowledge, when used for their intended purpose and disposed of correctly (recycling), the contained substances pose no threat to health or environment.

We would like to point out that the proportion of lead used here is not prohibited according to the REACH Regulation. It is merely necessary to declare the use of this substance.

Installation and Operational Instructions for ROBATIC® clutch Type 540.1 _ _ Sizes 3 – 9

(B.5.1.EN)

Guidelines on UK Directives / Conformity

Products / components from *mayr*® power transmission fulfill the requirements for the British economic area due to currently identical UK and EU directives.

In addition to the CE identification, the UKCA identification is attached to the product.

The UK Declaration of Conformity is available in a separate document.

Directives under EU Law	Directives under UK Law
Machinery Directive 2006/42/EC	Supply of Machinery (Safety) Regulations UK 2008 No. 1597
EMC Directive 2014/30/EU	Electromagnetic Compatibility Regulations UK 2016 No. 1091
EU Low Voltage Directive 2014/35/EU	Electrical Equipment (Safety) Regulations UK 2016 No. 1101
RoHS II 2011/65/EU	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations UK 2012 No. 3032

Guidelines on EU and UK REACH

According to the European Union (Withdrawal) Act 2018, the EU REACH Regulation was transposed into UK law on January 1, 2021, and is known as UK REACH.

REACH and related legislation have been replicated in the UK with the necessary changes to make it workable in a domestic context.

The fundamental principles of the EU REACH Regulation have been retained in UK REACH.

The remarks on the information obligation according to UK-REACH correspond in content to the REACH Regulation (EC) No. 1907/2006.

Safety Regulations

These Safety Regulations are user hints only and may not be complete!

General Guidelines

DANGER



Danger of death!
Do not touch voltage-carrying lines and components.

Clutches may generate further risks, among other things:



Hand injuries



Danger of seizure



Contact with hot surfaces



Magnetic fields

Severe injury to people and damage to objects may result if:

- ☐ the electromagnetic clutch is used incorrectly.
- ☐ the electromagnetic clutch is modified.
- ☐ the relevant standards for safety and / or installation conditions are ignored.

During the risk assessment required when designing the machine or system, the dangers involved must be evaluated and removed by taking appropriate protective measures.

To prevent injury or damage, only specialist personnel are allowed to work on the components.

They must be familiar with the dimensioning, transport, installation, inspection of the clutch equipment, initial operation, maintenance and disposal according to the relevant standards and regulations.



Before product installation and initial operation, please read the Installation and Operational Instructions carefully and observe the Safety Regulations. Incorrect operation can cause injury or damage. At the time these Installation and Operational Instructions go to print, the electromagnetic clutches accord with the known technical specifications and are operationally safe at the time of delivery.

- ☐ Technical data and specifications (Type tags and documentation) must be followed.
- ☐ The correct connection voltage must be connected according to the Type tag and wiring guidelines.
- ☐ Check electrical components for signs of damage before putting them into operation. Never bring them into contact with water or other fluids.
- ☐ Please observe the EN 60204-1 requirements for electrical connection when using in machines.



Only carry out installation, maintenance and repairs in a de-energized, disengaged state and secure the system against inadvertent switch-on.

Guidelines for Electromagnetic Compatibility (EMC)

In accordance with the EMC directive 2014/30/EU, the individual components produce no emissions. However, functional components e.g. mains-side energization of the clutches with rectifiers, phase demodulators, ROBA® switch devices or similar controls can produce disturbance which lies above the allowed limit values. For this reason it is important to read the Installation and Operational Instructions very carefully and to keep to the EMC directives.

Application Conditions



The catalogue values are guideline values which have been determined in test facilities. It may be necessary to carry out your own tests for the intended application. When dimensioning the clutches, please remember that installation situations, torque fluctuations, permitted friction work, bedding-in condition / conditioning of the friction surfaces and wear as well as general ambient conditions can all affect the given values. These factors should therefore be carefully assessed, and alignments made accordingly.

- ☐ Mounting dimensions and connection dimensions must be adjusted according to the size of the clutch at the place of installation.
- ☐ Use of the clutch in extreme environmental conditions or outdoors, directly exposed to the weather, is not permitted.
- ☐ The clutches are designed for a relative duty cycle of 100 %.
- ☐ The torque is dependent on the current bedding-in condition of the clutch. Bedding in / conditioning is necessary.
- ☐ The clutches are only designed for dry running. The torque is lost if the friction surfaces come into contact with oil, grease, water or similar substances or any other foreign bodies.
- ☐ The surfaces of the outer components have been phosphated manufacturer-side to form a basic corrosion protection.

CAUTION



The friction surfaces may rust up and seize up in corrosive ambient conditions and / or after longer downtimes.
The user is responsible for taking appropriate countermeasures.

Dimensioning

Attention!

When dimensioning the clutch, please take into consideration whether a load torque is present when selecting the protection.

- ☐ Load torques reduce the deceleration torque available.
- ☐ Load torques may increase the output speed:
 - ➔ during a possible processing time in the controls
 - ➔ during the clutch downtime

When calculating the friction work, please observe that the clutch nominal torque is subject to a tolerance.

Safety Regulations

These Safety Regulations are user hints only and may not be complete!

Climate Conditions

The electromagnetic clutch is suitable for applications with an ambient temperature of between -20 °C and +40 °C.



Reduction in torque can occur

Condensation can form on the clutch and cause a loss in torque:

- ☐ due to fast changes in temperature
- ☐ at temperatures of around or under freezing point

The user is responsible for taking appropriate countermeasures (e.g. forced convection, heating, drain screw).



Clutch malfunctions can occur

Condensation can form on the clutch and cause malfunctions:

- ☐ at temperatures around or under freezing point, the clutch can freeze over and not release any more.

The user is responsible for taking appropriate countermeasures (e.g. forced convection, heating, drain screw).

The system function must be checked by the user after longer downtimes.



At high temperatures and in high humidity or with occurring dampness, the rotor can seize up to the armature disk or the bearing shield / the flange plate after longer downtimes.

Intended Use

ROBATIC® clutches have been developed, manufactured and tested in compliance with the DIN VDE 0580 standard and in accordance with the EU Low Voltage Directive as electromagnetic components. During installation, operation and maintenance of the product, the requirements for the standard must be observed.

ROBATIC® clutches are for use in machines and systems and must only be used in the situations for which they are ordered and confirmed. Using them for any other purpose is not allowed.

Grounding Connection

The clutch is designed for Protection Class I. This protection covers not only the basic insulation, but also the connection of all conductive parts to the protective conductor (PE) on the fixed installation. If the basic insulation fails, no contact voltage will remain. Please carry out a standardized inspection of the protective conductor connections to all contactable metal parts!

Class of Insulation F (+155 °C)

The insulation components on the magnetic coils are manufactured at least to class of insulation F (+155 °C).

Protection

(electrical) IP54: Dust-proof and protected against contact as well as against water spray from any direction. Valid for coil, casting compound and connection strands.

Clutch Storage

- ☐ Store the clutches in a horizontal position, in dry rooms and dust and vibration-free.
- ☐ Relative air humidity < 50 %.
- ☐ Temperature without major fluctuations within a range from -20 °C up to +40 °C.
- ☐ Do not store in direct sunlight or UV light.
- ☐ Do not store aggressive, corrosive substances (solvents / acids / lyes / salts / oils / etc.) near to the brakes.

For longer storage of more than 2 years, special measures are required (please contact the manufacturer).

Storage acc. DIN EN 60721-3-1 (including the limitations / additions described above): classes 1K21; 1Z1; 1B1; 1C2; 1S11; 1M11

Handling

Before installation, the clutch must be inspected and found to be in proper condition.

The clutch function must be inspected both **once attachment has taken place** as well as **after longer system downtimes**, in order to prevent the drive starting up against possibly seized friction surfaces.

User-implemented Protective Measures:

- ☐ Please cover moving parts to protect **against injury through seizure**.
- ☐ Place a cover on the magnetic part to protect **against injury through high temperatures**.
- ☐ **Protection circuit:** When using DC-side switching, the coil must be protected by a suitable protection circuit according to VDE 0580, which is integrated in *mayr*®-rectifiers. To protect the switching contact from consumption when using DC-side switching, additional protective measures are necessary (e.g. series connection of switching contacts). The switching contacts used should have a minimum contact opening of 3 mm and should be suitable for inductive load switching. Please make sure on selection that the rated voltage and the rated operating current are sufficient. Depending on the application, the switching contact can also be protected by other protection circuits (e.g. *mayr*® spark quenching unit, half-wave and bridge rectifiers), although this may of course then alter the switching times.
- ☐ Take precautions **against freeze-up of the friction surfaces** in high humidity and at low temperatures.

Installation and Operational Instructions for ROBATIC® clutch Type 540.1 _ _ Sizes 3 – 9

(B.5.1.EN)

Safety Regulations

These Safety Regulations are user hints only and may not be complete!

Standards, Directives and Regulations Used and To Be Applied

DIN VDE 0580	Electromagnetic devices and components, general specifications
DIN EN 61140	Protection against electric shock - Common aspects for installation and equipment
DIN EN IEC 63000	Technical documentation for the assessment of electrical and electronic equipment regarding the restriction of hazardous substances
DIN EN IEC 60529	Degrees of protection provided by enclosures (IP Code)
2014/35/EU	Low Voltage Directive
2011/65/EU	RoHS II - Directive
2015/863/EU	RoHS III- Directive
EN ISO 12100	Safety of machinery – General principles for design - Risk assessment and risk reduction
DIN EN 61000-6-4	Interference emission
DIN EN 61000-6-2	Interference immunity

Liability

The information, guidelines and technical data in these documents were up to date at the time of printing. Demands on previously delivered clutches are not valid. Liability for damage and operational malfunctions will not be taken if:

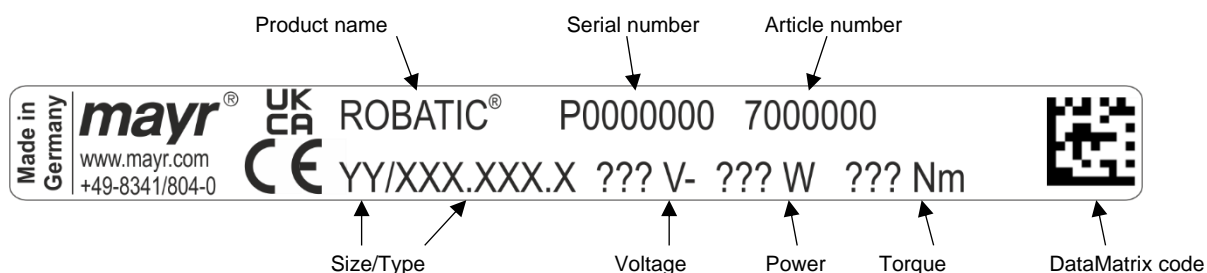
- the Installation and Operational Instructions are ignored or neglected.
- the clutches are used inappropriately.
- the clutches are modified.
- the clutches are worked on unprofessionally.
- the clutches are handled or operated incorrectly.

Guarantee

- ☐ The guarantee conditions correspond with the Chr. Mayr GmbH + Co. KG sales and delivery conditions.
- ☐ Mistakes or deficiencies are to be reported to *mayr*® at once!

Identification

mayr® components are clearly marked and described on the Type tag:



CE Identification



according to the Low Voltage Directive 2014/35/EU (only for voltage DC > 75 V) and/or RoHS Directive 2011/65/EU with 2015/863/EU

UKCA Identification



according to the Low Voltage Directive UK 2016 No. 1101 (only for voltage DC > 75 V) and/or RoHS Directive UK 2012 No. 3032

Installation and Operational Instructions for **ROBATIC® clutch Type 540.1** _ _ **Sizes 3 – 9**

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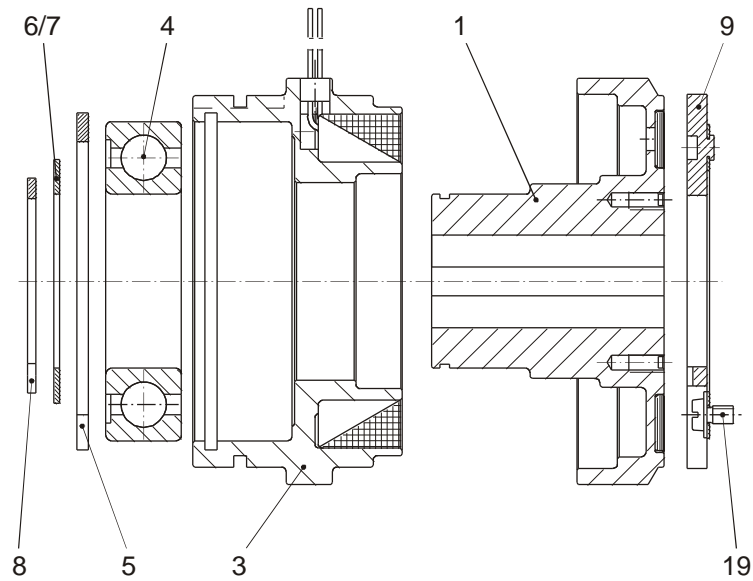


Fig. 1: Type 540.100

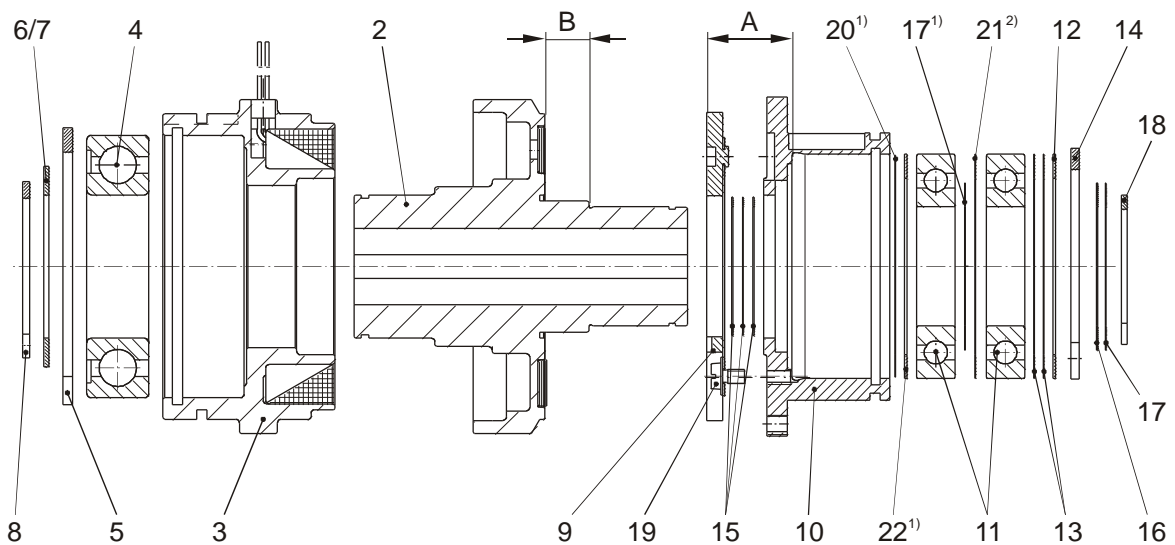


Fig. 2: Type 540.140

¹⁾ Only Sizes 7 to 9

²⁾ Only Sizes 3 to 6 (on Sizes 3 and 4: 0.1 mm thick; on Sizes 5 and 6: 0.15 mm thick)

Installation and Operational Instructions for ROBATIC® clutch Type 540.1 _ _ Sizes 3 – 9

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Parts List (Only use mayr® original parts)

Item	Name	Item	Name
1	Rotor Type 540.100	12	Shim ring
2	Rotor Type 540.140	13	Shim ring
3	Coil carrier	14	Locking ring
4	Deep groove ball bearing	15	Shim ring
5	Locking ring	16	Shim ring
6	Shim ring	17	Shim ring
7	Shim ring	18	Locking ring
8	Locking ring	19	Cap screw
9	Armature disk incl. transmission spring	20	Ball bearing compensation disk
10	Driver flange	21	Shim ring
11	Deep groove ball bearing	22	Shim ring

Table 1: Technical Data

	Size	3	4	5	6	7	8	9
Nominal torque M_2 ³⁾	[Nm]	10	20	45	80	160 ⁴⁾	320 ⁴⁾	640 ⁴⁾
Maximum bore d_{max} in rotor (1)	[mm]	20	25	30	40	55	70	80
Maximum bore d_{max} in rotor (2)	[mm]	15	19	24	33	46	58	65
Nominal air gap "a" (Fig. 6)	[mm]	0.2 ^{+0.1 -0.05}	0.2 ^{+0.15 -0.05}	0.2 ^{+0.15 -0.05}	0.3 ^{+0.15 -0.05}	0.3 ^{+0.15 -0.05}	0.5 ^{+0.15 -0.1}	0.5 ^{+0.15 -0.1}
Max. working air gap	[mm]	0.6	0.8	1.0	1.2	1.5	1.8	2.0
Max. permitted center offset "V" (Fig. 6)	[mm]	0.05	0.05	0.05	0.05	0.1	0.1	0.1
Tightening torque of the cap screws (19)	[Nm]	1.1	2.9	5.7	9.9	24	48	83

³⁾ Please observe run-in specifications and minimum speed acc. Table 2.

⁴⁾ On Type 540.140 / Sizes 7 – 9, installation of a key into the driver flange (10) is absolutely necessary for safe torque transmission.

Installation and Operational Instructions for ROBATIC® clutch Type 540.1 _ _ Sizes 3 – 9

(B.5.1.EN)

Scope of Delivery / State of Delivery

Please check the scope of delivery according to the Parts List as well as the state of delivery immediately after receiving the goods.

mayr® will take no responsibility for belated complaints.

Please report transport damage immediately to the deliverer.

Please report incomplete delivery and obvious defects immediately to the manufacturer.

Function

ROBATIC® clutches are energized-to-engage, electromagnetic pole face clutches.

When DC voltage is applied to the magnetic coil in the coil carrier (3), a magnetic field is built up. The armature disk (9) is attracted to the rotor (1 or 2).

The torque is transmitted via frictional locking.



In new condition, torque transmission first takes place via the metal outer pole on the rotor (1 or 2) and, after a short operation period, then additionally via the inner pole. After the entire run-in procedure, an even mixed friction occurs on the metal poles and on the friction lining lying between them.

Design

ROBATIC® clutches have Electrical Protection IP54 and Insulation Class F (up to 155 °C) for coil, casting compound and connection strands. On the design with a connection terminal, the connection terminal itself corresponds to Protection IP00. At 100 % duty cycle, the coil carrier has a temperature of approx. 65 °C.

The surfaces on the coil carrier (3), rotor (1 and 2) and driver flange (10) are phosphated, the armature disk (9) is gas nitro-carburized (friction surfaces are ground) and the transmission spring is made of stainless steel.

The clutch rotor (1 or 2) is supplied either pilot bored or finish bored with a keyway acc. DIN 6885. When the rotor bore and keyway are produced customer-side, the Guidelines on page 10 of the Installation and Operational Instructions, "Boring the Rotor Hub" must be followed!

Explanation of Terms

The **nominal torque** M_2 is the largest transmittable torque (after run-in has been completed), with which the closed clutch can be loaded without slipping occurring.

The **friction work** Q_a is the friction work per acceleration.

The **relative duty cycle** is the ratio of duty cycle to cycle time in percent (% duty cycle).

Torque Characteristics

In new condition, approx. 50 % of the catalogue nominal torque (M_2) are transmitted.

The components reach the catalogue nominal torque when the friction surfaces are run in. As a rough guideline value, approx. 100 – 200 switchings in dynamic operation, a typical speed of approx. 500 to 1000 rpm and a medium friction work (see Table 2) can be given.

Longer slipping of the clutch is to be avoided, especially at low speeds, as this can cause scoring formation and therefore damage to the friction surfaces.

Clutches used in static or virtually static operation do not reach the nominal torque (M_2) stated in the Technical Data (Table 1).

If requested, the clutches can also be run in at the place of manufacture. For this, please ensure exact installation customer-side according to the specifications in order to reproduce the friction conditions as precisely as possible. At the same time, the "friction carbon" produced must not be rubbed off.

If the clutches are run in to the nominal torque at the place of manufacture and then operated in static or virtually static mode, please allow for a drop to approx. 60 – 70 % of the nominal torque.

This is the case if the clutch falls below the speed n_{min} or friction work Q_a stated in Table 2.

Table 2: Technical Data for Run-in Procedure

Size	Min. friction work Q_a	Min. clutch speed n_{min}
	[J]	[rpm]
3	16	300
4	29	250
5	55	200
6	105	160
7	200	130
8	380	120
9	600	100

Installation and Operational Instructions for ROBATIC® clutch Type 540.1 _ _ Sizes 3 – 9

(B.5.1.EN)

Run-in Conditions

An "artificial" run-in is to be carried out if a run-in procedure is not possible in the machine due to the type of application (see Section "Torque Characteristics"), e. g. due to insufficient friction work, speed or switching frequencies.

Run-in Possibility 1

- ☐ Apply a voltage approx. $1/3$ of U_{Nenn}
(do not apply nominal voltage!)
- ☐ Speed on Sizes 3 – 6: approx. 50 rpm
on Sizes 7 – 9: approx. 30 rpm
- ☐ Approx. 2 – 3 minutes slipping against blocked output

Run-in Possibility 2

- ☐ Synchronize against unblocked output by producing a larger rotating mass and / or
by synchronizing at higher speed (values should lie above the minimum values, Table 2)
- ☐ Allow to synchronize approx. 2 – 3 minutes

General Installation Guidelines

- ☐ Mount the clutch using a suitable device or press-fit it. Mounting onto the shaft via hammer blows is not permitted!
- ☐ Secure the coil carrier (3) against distortion (Fig. 3).
- ☐ Keep the friction surfaces of rotor (1 or 2) and armature disk (9) free of oil and grease.
- ☐ Remove the clutch from the shaft over the snap ring groove on the coil carrier (3) using a locking ring (Fig. 4), or over the threaded holes on the rotor facing side (only for rotor Type 540. 100 / Fig. 5).
The locking ring (Fig. 4) is not included in the standard scope of delivery.

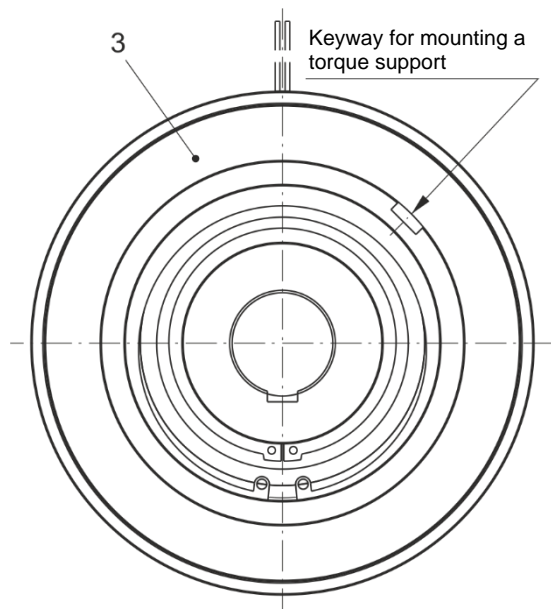


Fig. 3

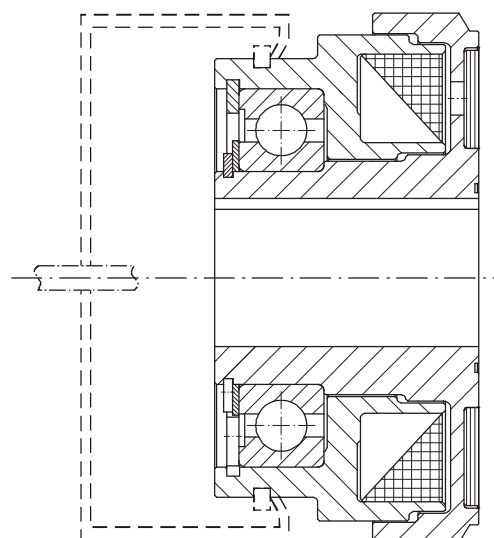


Fig. 4

Boring the Rotor Hub (Fig. 5)

The rotor (1 or 2) must not be bent during boring. Do not place pressure on the outer, thin-walled rotor (1 or 2) area, see Fig. 5. To bore, clamp the rotor (1 or 2) onto the hub, as shown in Fig. 5.

The max. permitted bore diameter d_{max} according to Table 1 must not be exceeded.

We recommend H7/k6 as a suitable hub-shaft tolerance.

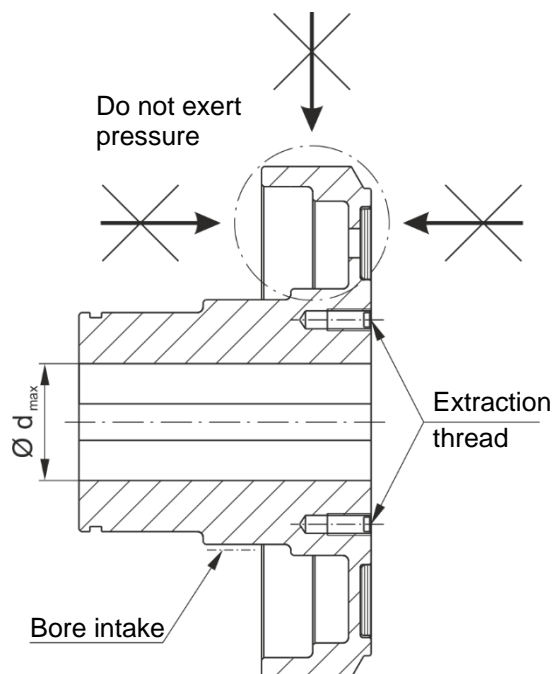


Fig. 5

Installation and Operational Instructions for ROBATIC® clutch Type 540.1 _ _ Sizes 3 – 9

(B.5.1.EN)

Installation Type 540.100 (Fig. 1)

1. Press the deep groove ball bearing (4) onto the outer ring in the coil carrier (3) and secure it using the locking ring (5).
2. Press the coil carrier (3) incl. the deep groove ball bearing (4) onto the bearing inner ring up to the rotor (1) contact. Align it backlash-free with the shim rings (6 and 7) and secure it using the locking ring (8).

Installation Type 540.140 (Fig. 2)

1. Press the deep groove ball bearing (4) onto the outer ring in the coil carrier (3) and secure it using the locking ring (5).
2. Press the coil carrier (3) incl. the deep groove ball bearing (4) onto the bearing inner ring up to the rotor (2) contact. Align it backlash-free with the shim rings (6 and 7) and secure it using the locking ring (8).
3. **a) Sizes 3 to 6:**
Press the first deep groove ball bearing (11) onto the outer ring in the driver flange (10) and insert a shim ring (21); Press the second deep groove ball bearing (11) onto the outer ring in the driver flange (10), align it axially backlash-free with the shim rings (12, 13) and secure using the locking ring (14).
b) Sizes 7 to 9:
Insert the ball bearing compensation disk (20) and then a shim ring 0.5 mm (22) into the driver flange (10); insert the first deep groove ball bearing (11) into the driver flange (10) by hand (making sure that it moves easily). Then insert the shim ring 0.5 mm (17) aligning to the ball bearing inner ring and insert the second deep groove ball bearing (11) into the driver flange (10) by hand (making sure that it moves easily). Bring the deep groove ball bearing into position using an installation device against the force of the ball bearing compensation disk (20) (0.3 – 0.6 mm before the compensation disk blocks), align it axially with the shim rings (12, 13) and secure using the locking ring (14).
4. Mount the armature disk assembly (9) onto the driver flange (10) and align to a radial run-out of max. 0.15 mm.



Exception => Size 6:

Position the calculated shim rings (15) before installation of the armature disk (9) onto the driver flange (10) on the ball bearing inner ring (11).

5. Tighten the cap screws (Item 19 with spring washers). **Secure the screws with Loctite 243 and observe the tightening torque acc. Table 1!**
6. Measure dimension "A"
(= armature disk friction surface to bearing inner ring, see Fig. 2).
7. Measure dimension "B"
(= rotor friction surface to bearing contact on collar, see Fig. 2).
8. Calculate the shim ring dimension:

$$\text{Shim ring dimension (15)} = \text{"A"} + \text{"a"} (\text{Table 1}) - \text{"B"}$$

9. Push the calculated shim ring (15) onto the rotor (2). Press the driver flange (Item 10 on bearing inner ring) onto the rotor (2), align it axially backlash-free with the shim rings (16 and 17) and secure it using the locking ring (18).



Not valid for Size 6, see point 4.

10. Inspect dimension "a" (acc. Table 1) and correct if necessary by removing or adding shim rings (15).

Clutch Installation

The mounting parts, such as the shafts or flanges, are to be mounted and secured so that no axial backlash is possible and so that the specified dimension "a" (air gap between the rotor (1 or 2) and the armature disk (9)) acc. Table 1 is maintained. Axial backlash on the mounting parts alters dimension "a" and can lead to the rotor (1 or 2) rubbing against the armature disk (9). Additionally, please observe the permitted center offset "V" of the mounted parts on Type 540.100 (see Fig. 6 and Table 1).

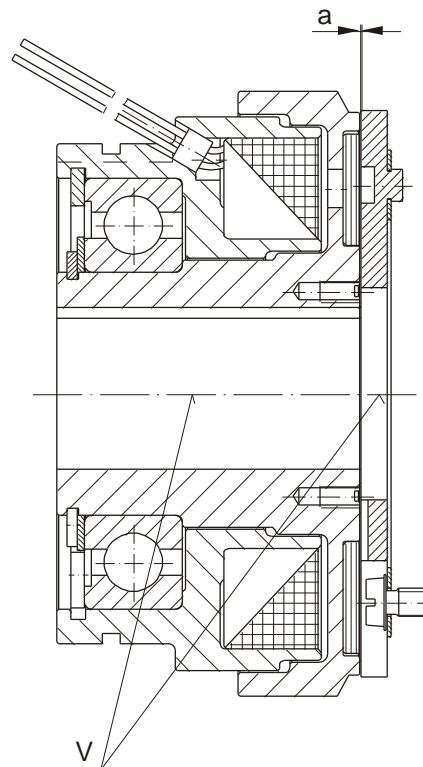


Fig. 6

Electrical Connection

The clutch coil is connected to a DC voltage supply. The voltage value is stated on the Type tag.

Maintenance and Inspection

Please inspect the air gap "a" and the permitted center offset "V" acc. Table 1 at regular intervals. Bearing backlash and wear on the friction surfaces alter the permitted Table values. Apart from this, ROBATIC® clutches are maintenance-free.

Installation and Operational Instructions for ROBATIC® clutch Type 540.1 _ _ Sizes 3 – 9

(B.5.1.EN)

Disposal

Our electromagnetic clutch components must be disposed of separately as they consist of different materials. Please also observe the relevant authority regulations. Code numbers may vary according to the disassembling process (metal, plastic and cables).

Electronic Components

(Rectifier / ROBA®-switch):

Products which have not been disassembled can be disposed of under Code No. 160214 (mixed materials) or components under Code No. 160216, or can be disposed of by a certified disposal firm.

Coil carriers (steel pads with coil and strands) and all other steel components:

Steel scrap (Code No. 160117)

Clutch rotors (steel pads with friction linings):

Brake linings (Code No. 160112)

Guidelines on the WEEE Directive 2012/19/EU

Avoidance of waste from electrical and electronic devices and the reduction of such waste through recycling.

Our electromagnetic products (brakes, clutches) as well as the components required to control them (rectifiers) are frequently used in electrical and electronic devices within the appropriate area of application of WEEE, independent of the applicable product categories.

The stated products do not fall within the area of application of this Directive. They have been classified as electromagnetic / electronic components (VDE 0580) or as electronic equipment (DIN EN 50178), and have been determined for installation in devices for "use in accordance with the intended purpose". Only products which are to be viewed as devices in terms of the Directive and not as parts or components are subject to registration obligations.

Malfunctions / Breakdowns

Malfunction	Possible Causes	Solutions
Clutch does not engage	<input type="checkbox"/> Incorrect voltage applied <input type="checkbox"/> Rectifier failure <input type="checkbox"/> Air gap too large <input type="checkbox"/> Coil interruption	<input type="checkbox"/> Apply correct voltage <input type="checkbox"/> Replace rectifier <input type="checkbox"/> Re-adjust air gap <input type="checkbox"/> Replace the clutch
Clutch does not couple	<input type="checkbox"/> Grease and / or oil on the friction surfaces	<input type="checkbox"/> De-grease the friction surfaces/ run in clutch again



mayr® will take no responsibility or guarantee for replacement parts and accessories which have not been delivered by mayr®, or for damage resulting from the use of these products.