

Please read the Operational Instructions carefully and follow them accordingly!

Ignoring these Instructions may lead to malfunctions or to clutch failure, resulting in damage to other parts.

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Manufacturer's Declaration

This product is intended for installation in a machine or system, based on the machine directive 98/37/EC.

It is forbidden to start use of the product until the machine or system into which it should be built is operating in accordance with the EC directives.

Safety Regulations

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.



Danger!

This warning applies if:

- the EAS[®]-clutches are modified.
- the relevant standards for safety and / or installation conditions are ignored.

User-implemented Protective Measures

- Cover all moving parts to protect against seizure, dust or foreign body impact.
- The clutch may not be put into operation without a limit switch unless *mayr*[®] has been contacted and has agreed otherwise.

To prevent injury or damage, only professionals and specialists should work on the devices, following the relevant standards and directives. Please read the Installation and Operational Instructions carefully before installation and initial operation of the device.

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

Warning:

Without a conformity inspection, this product is not suitable for areas where there is a high danger of explosion. This statement is based on directive 94/9 EC (ATEX directive).



Please Observe:

According to German notation, decimal points in this document are represented with a comma (e.g. 0,5 instead of 0.5).

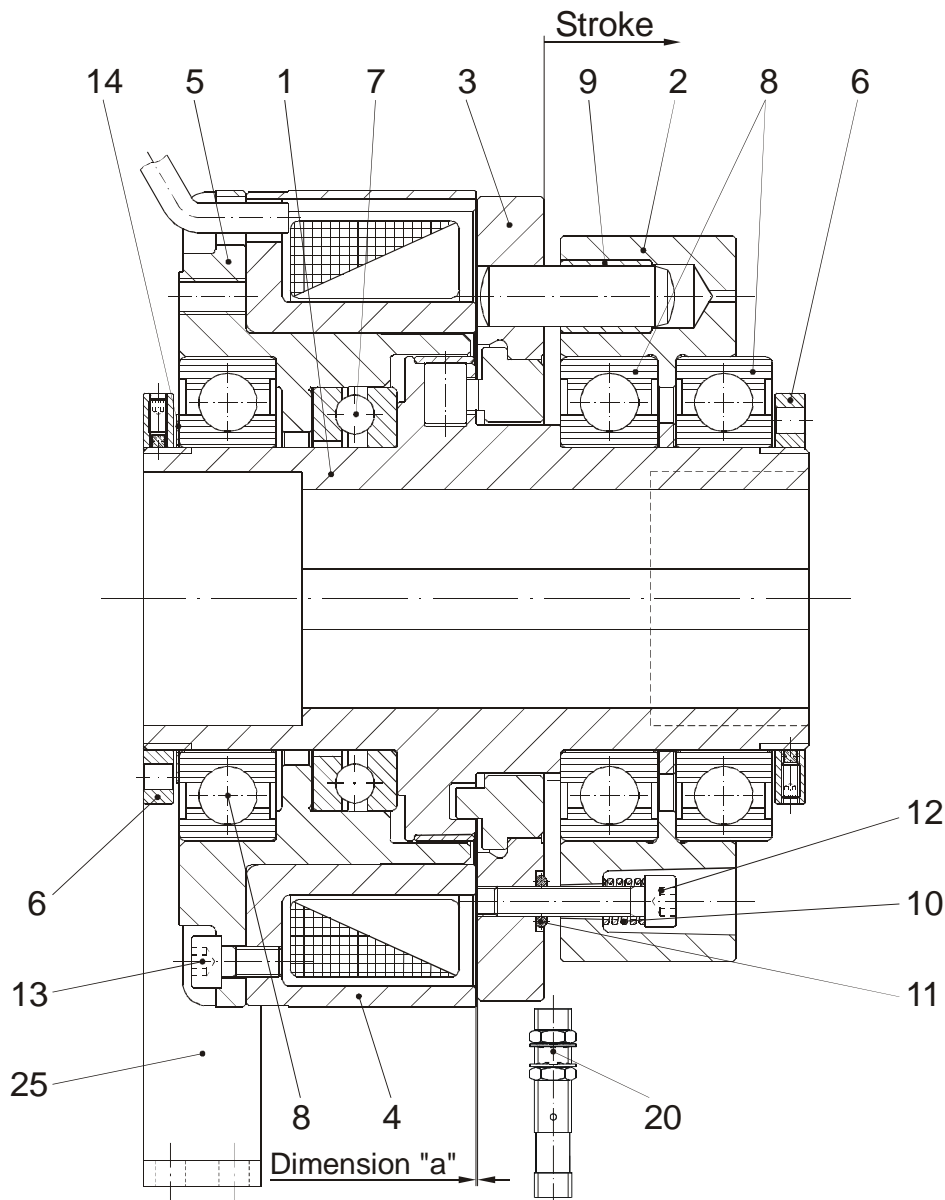


Fig. 1

Parts List

(Only use mayr[®] original parts)

- | | | | |
|---|---------------------------------|----|---|
| 1 | Hub with transmission rollers | 10 | Thrust spring |
| 2 | Transmission flange | 11 | O-ring |
| 3 | Armature disk | 12 | Cap screw |
| 4 | Coil carrier with magnetic coil | 13 | Cap screw |
| 5 | Bearing flange | 14 | Ball bearing compensation disk |
| 6 | Face nut | 20 | Proximity sensor (can be delivered as an accessory) |
| 7 | Axial deep groove ball bearing | 25 | Friction support (not included in delivery) |
| 8 | Deep groove ball bearing | | |
| 9 | PAP bushing | | |

Table 1: Technical Data General

Size	Limit torques for overload M_G [Nm]	Max. speed [rpm]	Input power P_{20} [W]	Armature disk stroke (3) on overload (Fig. 1) [mm]	Bore hub (1) from – to [mm]	Weight with maximum bore, without cover [kg]
0	6 – 25	4000	36	1,2	9 – 22	4,0
1	12 – 50	3000	46	1,5	14 – 35	6,0
2	25 – 100	2500	57	1,8	19 – 42	9,0
3	50 – 200	2000	73	2,0	22 – 50	13,7
4	100 – 375	2000	105	2,2	24 – 60	20,2

Table 2: Technical Data for mounted ROBA[®]-D coupling, Type 436.03__.

EAS [®] -Sm / EAS [®] -Zr clutch Size	ROBA [®] -D coupling Size	Hexagon fitting bolt	Screw tightening torque [Nm]	maximum permitted shaft misalignments		
				axial [mm]	angular [°]	radial [mm]
0	3	M6	10,5	0,6	2	0,90
1	5	M6	10,5	0,8	2	1,10
2	10	M6	10,5	1,0	2	1,25
3	20	M8	25	1,2	2	1,50
4	40	M8	25	1,4	2	1,85

Safety and Guideline Signs



Danger!

Danger of injury to personnel and damage to machines.



Please Observe!

Guidelines on important points.

Design

The EAS[®]-Sm/Zr clutch is designed as an electrical torque limiting clutch with a switching function.

State of Delivery

The clutch is manufacturer-assembled and set to the torque requested on order.

Please check the state of delivery immediately!

Function

1. Switching function

The clutch is electrically switchable. When the clutch coil is energised, the torque is transmitted from input to output. When the coil is de-energised, the torque transmission is interrupted.

2. Overload function

When it is energised, the clutch transmits the set torque. If this torque is exceeded (due to overload), the clutch disengages. The input and output-side are separated. At the same time, a limit switch is operated which emits a signal to switch off the power supply. The limit torque for overload on the clutch is steplessly adjustable via the coil power, and can be changed during operation.

3. Re-engagement

When the magnetic coil is energised, the armature disk (3) is attracted. If the engagement position is not yet reached, the clutch input side must carry out a movement relative to the output side. In this way, the hub (1) transmission rollers re-engage into the armature disk (3) grooves. The permitted re-engagement speeds depend on the type of power used for the clutch.

The engagement position possibilities are dependent on the individual clutch design. On the EAS[®]-Sm clutch, engagement takes place exactly at the point at which the device disengaged (synchronous clutch). In operation, the input and output sides always have the same angular position to each other. On the EAS[®]-Zr clutch, the grooves in the armature disk (3) allow re-engagement every 15°.

Clutch engagement takes place either using the set nominal power or with overexcitation (temporarily increased current value). This can be used to produce a higher torque temporarily in order to accelerate large masses.

Re-engagement

EAS[®]-Sm clutch **Type 4___.036__.** according to 360°
EAS[®]-Zr clutch **Type 4___.038__.** according to 15°

General Installation Guidelines

The EAS[®]-Sm/Zr clutch is a permanently energised switchable and controllable torque limiting clutch. In this context, it should be mentioned that magnetic fields also affect the clutch supports or their output elements and can therefore influence their function.

After operating the mechanical limit switch, the clutch output should stop immediately, otherwise the lever on the limit switch is worn by armature disk (3) grinding, meaning that the clutch or limit switch function can no longer be guaranteed.

On clutches which are operated in the upper torque range: at maximum current, please ensure that the ambient temperature does not exceed 40 °C. When operating with low torque (low current), the permitted ambient temperature increases.

Clutch Installation

Standard Design

The drive element is centred on the deep groove ball bearing (8) and screwed to the transmission flange (2) as shown in Fig. 2. The min. screw-in depth is 2,5 x thread Ø.

The clutch, including the mounted drive element, is mounted onto the shaft using a suitable mounting device and secured axially. Axial securement takes place using press covers, set collars or locking rings.

The cover shown in Fig. 2 (Protection IP 54) prevents the clutch from becoming dirty. At the same time, the cover serves as a mount for the limit switch (proximity sensor). The friction support (Fig. 2) absorbs the bearing friction torque and prevents the magnetic part from rotating.

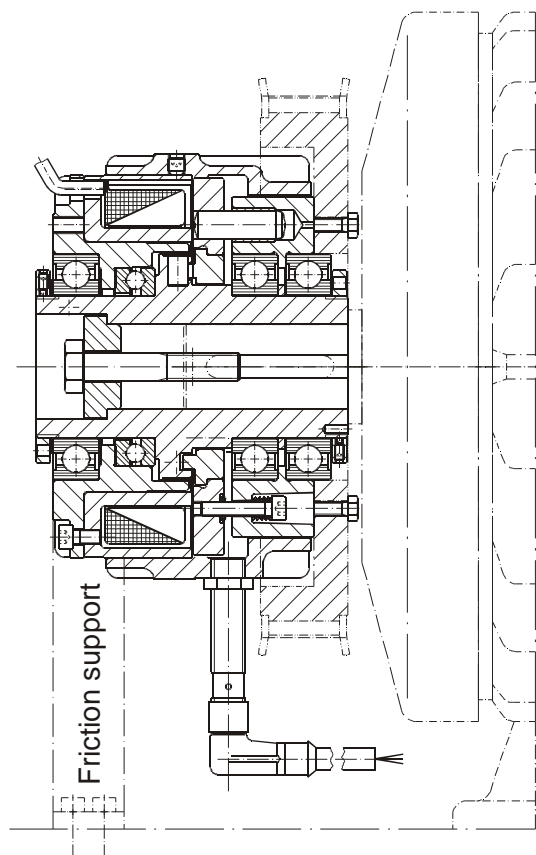


Fig. 2

Design with torsionally stiff flexible all-steel clutch for connection of two shafts, Type 436.03...

The EAS[®]-Sm or EAS[®]-Zr clutch is mounted onto the shaft and fixed axially, Fig. 3. A set screw holds the hub of the torsionally stiff clutch to the shaft. Installation and adjustment of the ROBA[®]-D coupling takes place according to the "Installation and Operational Instructions for ROBA[®]-D couplings Type 91... (B.9.0.GB)".

The torsionally stiff flexible coupling part compensates for radial, axial and angular shaft misalignment. The maximum permitted shaft misalignments, fitting bolt dimensions and screw tightening torques can be found in Table 2.

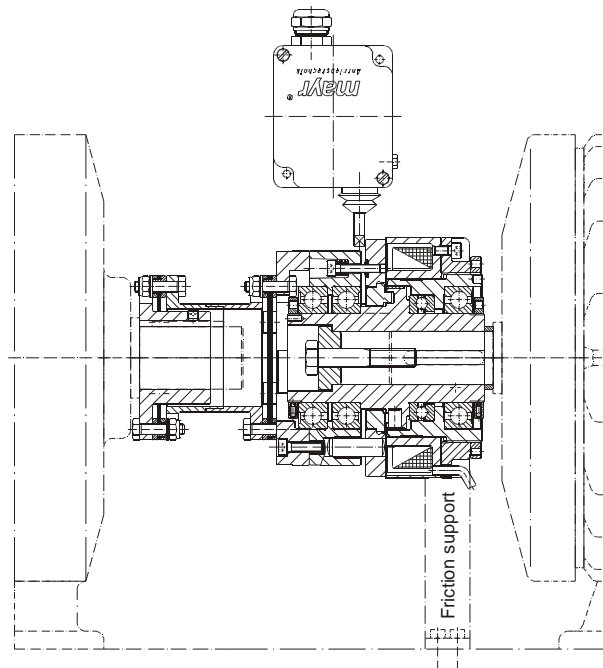


Fig. 3

Friction Support Installation

The axial deep groove ball bearing (7) and the deep groove ball bearing (8) produce a minor friction torque which must be absorbed by mounting a friction support.

The coil carrier (4) must not rotate.

Two threaded holes (Fig. 1) are located on the outer diameter of the bearing flange (5) for friction support securement.

During friction support installation, please make sure that no appreciable forces are transmitted onto the clutch. Please ensure that the friction support screws are secured.

Torque Adjustment

The clutch torque is regulated via the coil current. In order to keep the torque as consistent as possible, the coil current must be kept as consistent as possible, independent of ambient or operating temperature. This task is carried out, among other things, by the Sm/Zr control unit.

Limit Switch Installation

Contactless sensing with proximity sensor M12x1, Type 055.009.6 –magnetic field-resistant-

Installation in EAS[®]-Sm/Zr clutch with cover

Screw in the proximity sensor (20) without connection cable on the disengaged clutch up to its limit, and then turn it back again by c. 1,25 turns. Counter against turning using a counter nut.

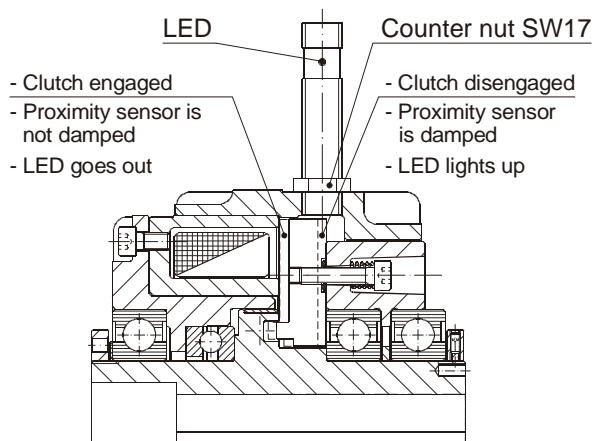


Fig. 4

Mounting on EAS[®]-Sm/Zr clutch without cover

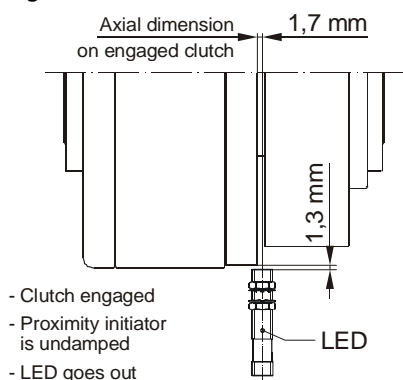


Fig. 5

Mechanical sensing with limit switch Type 055.000.5

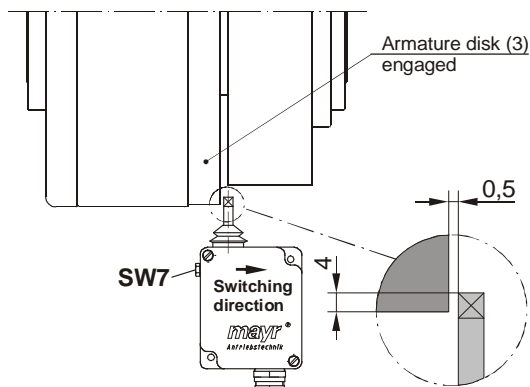


Fig. 6

Adjustment of the axial dimension of 0,5 mm takes place with the clutch engaged and can be finely adjusted using the hexagon head screw SW7.



Please Observe!

Incorrect limit switch installation leads to functional mistakes or to no overload monitoring. With a disengaged clutch and a running drive, the switch lever is worn down. In this case, please use the contactless sensor.

Electrical Connection

The clutch magnetic coil is operated according to the design with 24 V or 96 V DC voltage. The coil nominal voltage is shown on the clutch Type tag. A PTC resistor (2-wire, grey) is located in the coil and used for monitoring the coil temperature. This does not have to be connected for the clutch to operate; however, please observe that if the PTC resistor is not functioning, coil overheating cannot be recognised (see also wiring diagram Fig. 7).

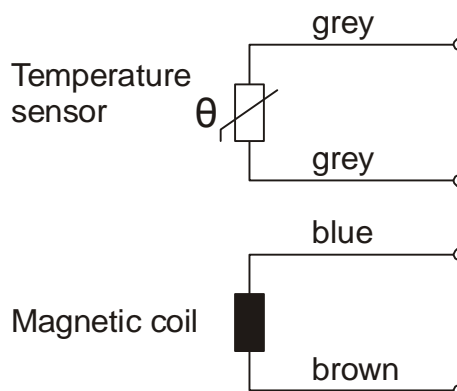


Fig. 7



Please Observe!

In order to avoid interference to the PTC resistor signal, please ensure that, when using long supply cables from the control unit to the clutch, both control cables to the PTC resistor (grey / grey) run separately to the coil cable (brown / blue).

Connection of the clutch and the mounted limit switch usually take place via the Sm/Zr control unit. The data for connection and for adjustment of the Sm/Zr control unit can be found in the Installation and Operational Instructions B.0100002.GB.

Maintenance

The EAS[®]-Sm or EAS[®]-Zr clutches are greased with a grease filling which should last their entire lifetime. The air gap “a” between the coil carrier (4) and the armature disk (3) is set manufacturer-side to the nominal dimension and need not be readjusted. On couplings with a cover, there is an inspection opening for the air gap. The opening is plugged with a plastic plug. At certain intervals, an inspection of the axial backlash on the shaft on which the clutch is mounted should be carried out. Too much backlash may cause the clutch to shift axially; this in turn causes changes in the limit switch distance.

Disposal

Electronic components

(Limit switch):

Products which have not been dismantled can be disposed of under the Code No. 160214 (Mixed Materials) or Components under Code No. 160216; or the objects can be disposed of by a certified waste disposal firm.

Coil carriers with coil / cable and all other steel components:

Steel scrap (Code No. 160117)

All aluminium components:

Non-ferrous metals (Code No. 160118)

Seals, O-rings, V-seals, elastomere,

Plastics (Code No. 160119)

Malfunctions / Breakdowns

Malfunction	Possible Causes	Solutions
Premature clutch release	Incorrect torque adjustment	1) Set the system out of operation 2) Check the torque adjustment 3) If the cause of the problem cannot be found, the clutch must be inspected at the place of manufacture
	Worn clutch	
Clutch does not release on overload	Incorrect torque adjustment	1) Set the system out of operation 2) Check the torque adjustment 3) If the cause of the problem cannot be found, the clutch must be inspected at the place of manufacture



Please Observe!

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