Installation and Operational Instructions for ROBA®-slip hubs Sizes 0 – 12

(B.1.0.EN)

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.

Contents:

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.

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

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.

It is forbidden to start initial operation of the product until you have ensured that all applicable EU directives and directives for the machine or system, into which the product has been installed, have been fulfilled.
At the time these Installation and Operational Instructions go to print, the ROBA®-slip hubs accord with the known technical specifications and are operationally safe at the time of delivery.
Without a conformity evaluation, this product is not suitable for use in areas where there is a high danger of explosion. This statement is based on the ATEX directive.

DANGER

- ❒ If the ROBA®-slip hubs are modified.
- ❒ If 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.
- ❒ Do not breathe in the friction lining deposits. Remove the dust when cleaning by means of a vacuum cleaner.
- ❒ The ROBA®-slip hub heats up during slipping. On contact => Danger of burns.

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!

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

mayr® your reliable partner

Installation and Operational Instructions for ROBA®-slip hubs Sizes 0 – 12

(B.1.0.EN)

ROBA®-slip hub
Type series 100

ROBA®-max
Type series 170

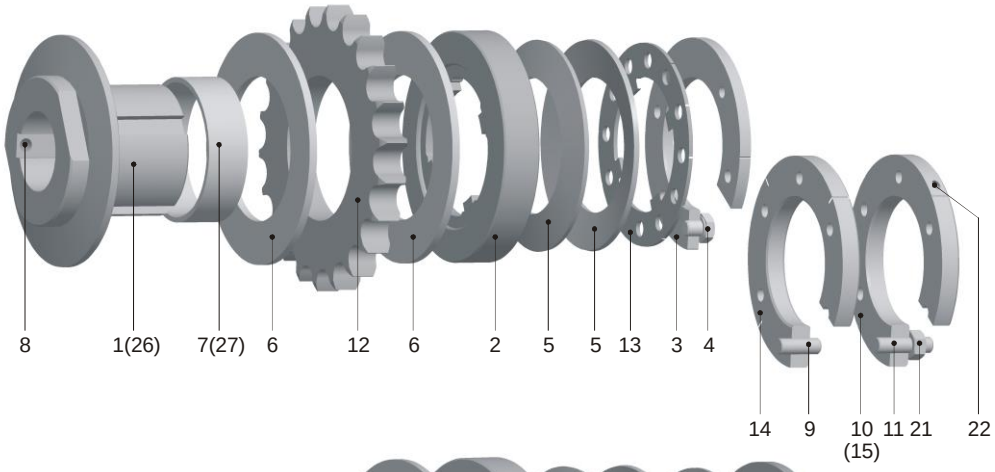


Fig. 1

ROBA®-min
Type series 121
Type series 123

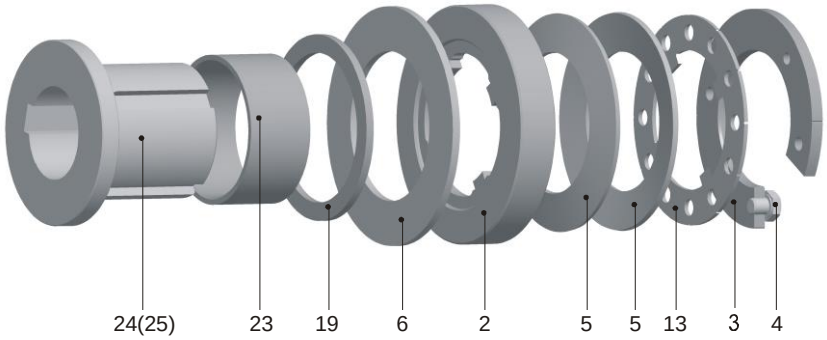


Fig. 2

ROBA®-slip hub with needle bearing
Type series 160

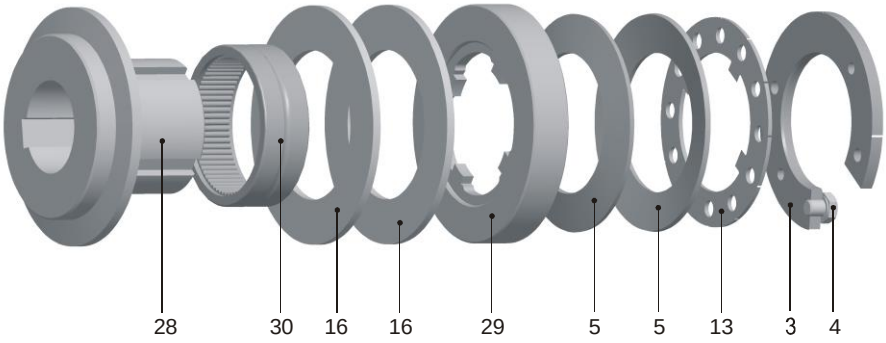


Fig. 3

Parts List *(Only use mayr® original parts)*

1 Hub (Type 100)
2 Thrust washer
3 Adjusting nut 0 (Sizes 0 – 5)
4 Locking screw
5 Cup springs
6 Friction lining No. 1
7 Bearing bushing (Type 100)
8 Adjusting screw
9 Cup spring supporting bolt (Sizes 6 – 12)
10 Adjusting nut 2 (Sizes 3 – 5)
11 Set screw (for torque adjustment)
12 Sprocket wheel
13 Lock washer
14 Adjusting nut 0 (Sizes 6 – 12)
15 Adjusting nut 1 (Sizes 0 – 5)
16 Friction lining (Type 160)
17* Friction lining No. 2
18* Rustproof disk
19 Friction lining (ROBA®-min)
20* Friction lining Nos. 4/5
21 Hexagon nut
22 Set screw for positive-locking securement
23 Bearing bushing (ROBA®-min)
24 Hub (Type 121)
25 Hub (Type 123)
26 Hub (Type 170)
27 Bearing bushing (Type 170)
28 Hub (Type 160)
29 Thrust washer (Type 160)
30 Needle bearing

* See pages 4 and 5

When ordering replacement parts, the complete Type designation and the Size must be stated.
Order example: ROBA®-slip hub Type 100.210, Size 1, 1 set (2 pieces) of friction linings Item 6.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

ROBA®-lastic
Type series 135

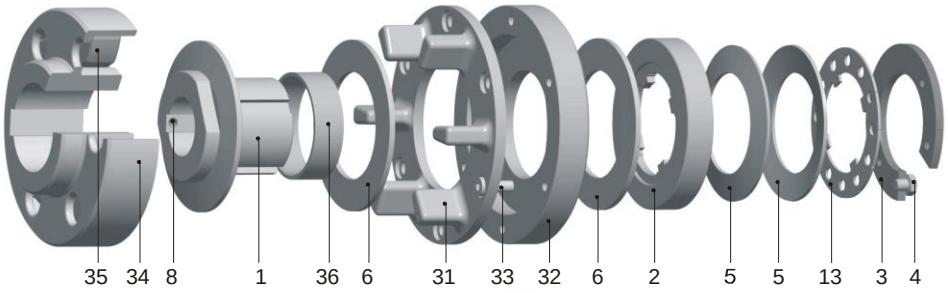


Fig. 4

ROBA®-lastic
Type series 131

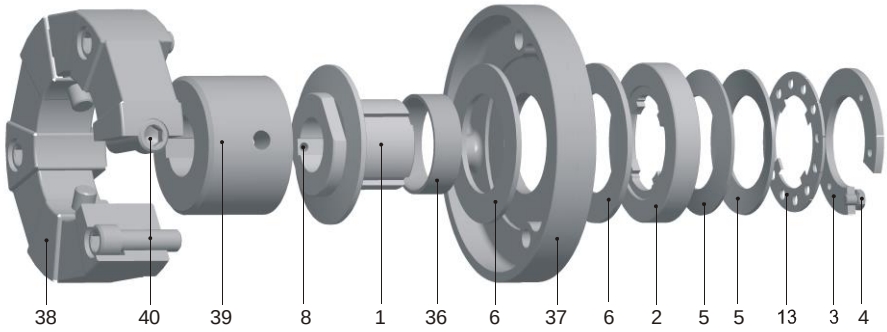


Fig. 5

ROBA®-lastic
Type series 132

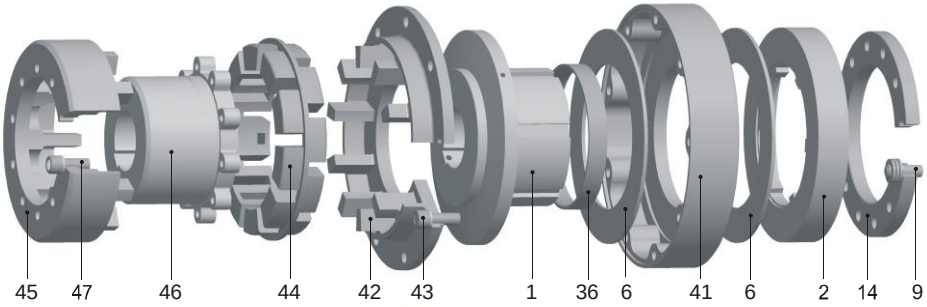


Fig. 6

ROBA®-LD
Type series 133, 134

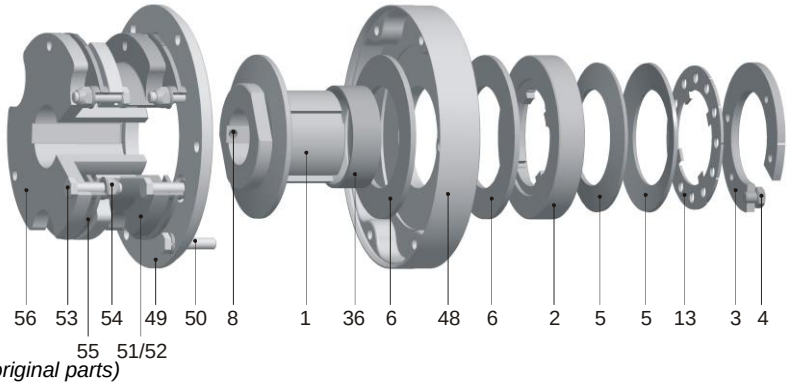


Fig. 7

Parts List *(Only use mayr® original parts)*

1 Hub
2 Thrust washer
3 Adjusting nut 0
4 Locking screw
5 Cup springs
6 Friction lining
8 Adjusting screw
13 Lock washer
31 Claw element (Type 135)
32 Transmission flange (Type 135)
33 Cap screws (Type 135)
34 Pocket element (Type 135)
35 Rubber buffer
36 Bearing bushing
37 Flange (Type 131)
38 Flexible ring (Type 131)
39 Hub for flexible coupling (Type 131)
40 Cap screws (Type 131)
41 Transmission flange (Type 132)
42 Coupling flange (Type 132)
43 Cap screws (Type 132)
44 Flexible intermediate ring (Type 132)
45 Claw ring (Type 132)
46 Flange hub (Type 132)
47 Cap screws (Type 132)
48 Connection flange (ROBA®-LD)
49 Connection disk (ROBA®-LD)
50 Hexagon head screws (ROBA®-LD)
51 Sleeve 0 (Type 133)
52 Sleeve 1 (Type 134)
53 Fitting bolts
54 Hexagon nuts
55 Disk pack
56 Hub (ROBA®-D)

When ordering replacement parts, the complete Type designation and the Size must be stated.
Order example: ROBA®-lastic Type 135.210, Size 1, 1 set (2 pieces) of friction linings Item 6.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

Installation and Operational Instructions for ROBA®-slip hubs Sizes 0 – 12

(B.1.0.EN)

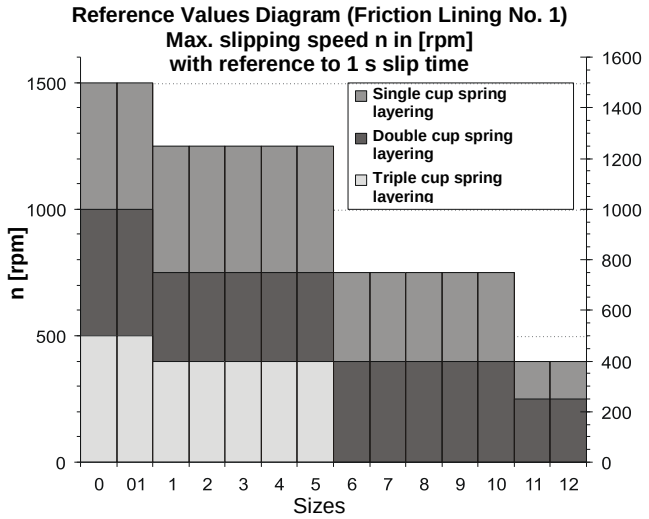
Function (Fig. 1)

ROBA®-slip hubs are used to protect against overload in machine drives with chain sprockets or toothed wheels.
The drive element (chain sprocket or similar) is pushed onto the bearing bushing (7) and clamped between the friction linings (6) using the thrust washer (2), the cup springs (5) and the adjusting nut (3) with the lock washer (13).
The more the cup springs (5) are pre-tensioned via the adjusting nut (3), the higher is the torque at which the drive element slips.
For an exact description of the torque adjustment, please see pages 7 and 8.

The ROBA®-slip hub is subjected to thermal loads depending on the slipping speed, slip time and the set torque.
To make sure that the ROBA®-slip hub friction linings are not overheated or destroyed, the specified friction parameters must not be exceeded.
The values presented in the reference values diagram are reference values, and represent maximum slipping speed limits of the standard friction linings in dry running. These speed limits refer to a maximum slip time of 1 second.
For longer slip times, the slipping speed must be reduced.
If in doubt, please carry out application-related friction work calculations.

If the permitted slipping duration is exceeded, the ROBA®-slip hub will be subjected to overload
=> Destruction of the friction linings

Use a slip monitor (speed monitor) to monitor the slipping speed.



State of Delivery

ROBA®-slip hubs are delivered pre-assembled.
The cup spring layering or the number of friction linings are dependent on the Type and correspond to the respective order data stipulated by the customer.
ROBA®-slip hubs in standard delivery feature a finish bore (bore tolerance H7) and a keyway acc. DIN 6885 (keyway tolerance JS9).
We recommend a k6 shaft tolerance.
For other tolerances, please contact the manufacturers.
If the order does not contain any information on the installation width of the drive element (sprocket wheel or similar), the bearing bushing (7) is delivered with maximum width.

Additional Instructions for Types 13_._ _ _

For all Types 13_._ _ _ , additional instructions regarding installation, permitted shaft misalignments and further technical data for the shaft coupling are part of the delivery.
The following Additional Instructions are included in delivery:

for Type 131: **B.1.3._ _**
for Type 132: **B.1.1._ _**
for Type 133: **B.9.0._ _**
for Type 134: **B.9.0._ _**
for Type 135: **B.1.7._ _**

Friction Linings

As shown in Table 1 below, four different friction linings are available.
The torque and speed values stated in the slip hubs catalogue refer to standard friction linings in dry running. For all other friction linings, please see Table 1 for the corresponding values, or request the values for the respective application.

We recommend that you replace the friction linings at the latest after they have worn down by 0,5 x dimension “s” (see Table 4 / page 6) per friction lining.

Table 1

Friction lining	Application	Achievable torque from $M_{max.}$
1	Standard for dry running	100 %
2	Rustproof friction pairing	100 %
4	Bronze friction lining for oil running	30 %
5	Special low-friction material (only for single cup spring layering and with reduced friction)	50 %

Table 2

Size	Limit torque for overload [Nm]		
	Type 100.1 - -	Type 100.2 - -	Type 100.3 - -
0	2 – 10	10 – 20	18 – 30
01	6 – 30	30 – 60	60 – 90
1	14 – 70	70 – 130	130 – 200
2	26 – 130	130 – 250	250 – 400
3	50 – 250	250 – 550	550 – 800
4	110 – 550	550 – 1100	1100 – 1600
5	140 – 700	700 – 1400	1400 – 2100
6	240 – 1200	1200 – 2400	-
7	400 – 2000	2000 – 4000	-
8	680 – 3400	3400 – 6800	-
9	1200 – 6000	6000 – 12000	-
10	2000 – 10000	10000 – 20000	-
11	3400 – 17000	17000 – 34000	-
12	5000 – 25000	25000 – 50000	-

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

Rustproof Friction Pairing

In wet ambient conditions the standard friction lining might form a rust compound with grey iron and steel surfaces. This could increase the slipping torque substantially.
Therefore, it is possible to equip ROBA®-slip hubs with a rustproof friction pairing (friction lining No. 2).
This pairing consists of two rustproof steel disks (Item 18), which are secured in the slip hub, and two special friction linings (Item 17), which do not stick (Fig. 8).

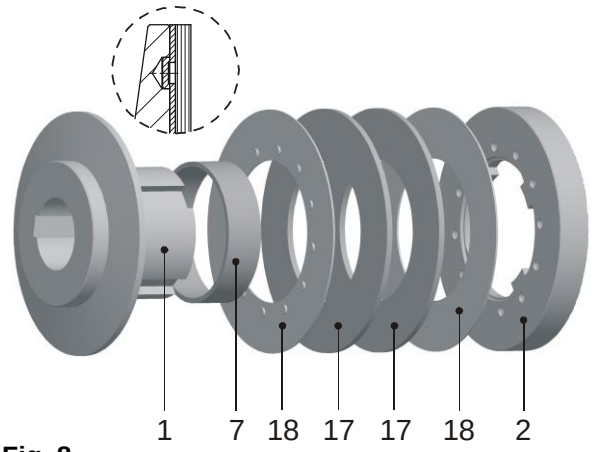


Fig. 8

Important Installation Guidelines

- ❒ The bores, shafts, friction linings and friction surfaces on the drive element must be grease and oil-free.
- ❒ Shaft surface: finely turned or ground (Ra = 0,8 µm)
  Shaft material: Yield point at least 350 N/mm^2.

Installation

The installation sequence can be seen in the exploded drawings Figs. 1 to 7, or Fig. 9 for needle bearing design.

For adjusting nut (Item 3) installation, the adjusting nut thread and the lock washer must be greased lightly.

Please make sure that the cup spring layering is correct (see also section Cup Spring Layering)!
Make sure that no grease gets onto the friction linings!

When installing ROBA®-lastic Types, please also use the Installation Instructions for the flexible coupling.

The slip hub can be secured axially onto the motor shaft end using a set screw (Item 8, Fig. 1) or, as shown in Fig. 11, using a press cover.

ROBA®-slip hubs in standard delivery feature a finish bore (bore tolerance H7) and a keyway acc. DIN 6885 (keyway tolerance JS9).

We recommend a k6 tolerance for the shaft (see Fig. 11).

Please make sure that the drive element is plane parallel and has a finely ground surface in the bore area or in the area of the friction surfaces (see Fig. 10 and Table 3).

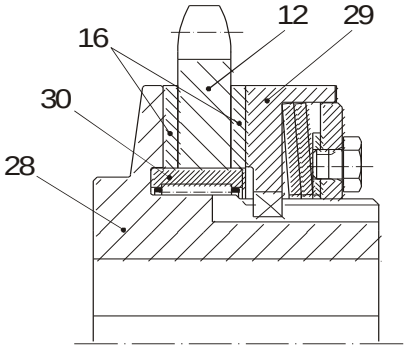


Fig. 9

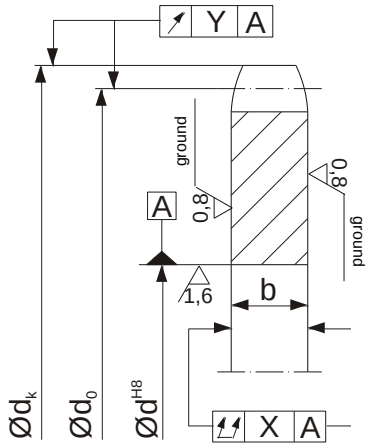


Fig. 10

Table 3

Size	X [mm]	Y [mm]
0 – 2	0,05	0,10
3 – 5	0,08	0,15
6 – 8	0,10	0,20
9 – 12	0,12	0,30

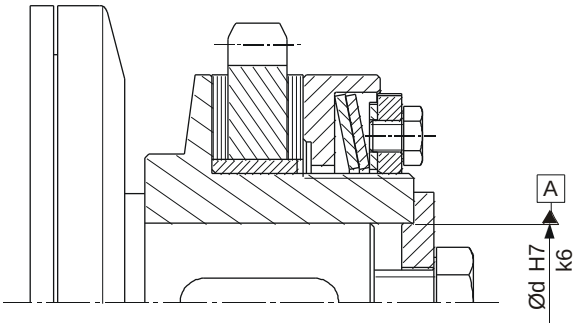


Fig. 11

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

Bearing Bushing (Items 7, 23, 27)

If the order does not contain any information on the installation width of the drive element (chain sprocket or similar), the bearing bushing (7) is delivered for a maximum installation width (b_{max}). If a smaller installation width is required, the bearing bushing must be shortened accordingly on the end without the inner chamfer.
The bearing bushing must be mounted with the inner chamfer facing forward, as shown in Fig. 12.

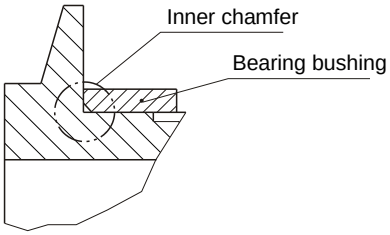


Fig. 12

Bearing bushing width standard friction pairing = installation width + 1,5 x friction lining thickness + 0,5 mm

Bearing bushing width rustproof friction pairing = Installation width + 1,5 x friction lining thickness + 2 x width rustproof disk + 0,5 mm

For high radial load and high slipping frequency, we recommend using a slip hub with needle bearing.

Needle Bearing (30)

As it is not possible to adjust the needle bearing (30) length to the installation width “b”, the installation width “b” on Type 160 is predefined (see Table 4).
Please bore the drive element using a bore tolerance of N7, and press it onto the needle bearing as shown in Fig. 9.

Table 4

Size	Friction lining thickness “s” [mm]	Width of the drive element “b” Type 160 [mm]
1	3	7
2	3	10,3
3	4	12,5
4	4	16
5	5	18

Cup Spring Layering

Correct cup spring layering is a prerequisite for problem-free clutch function and torque adjustment.
In Figs. 13 to 19, the respective cup spring layering arrangements dependent on the size are shown.

Rule of thumb:

ROBA®-slip hub Type 1_ _.1_ _ for high friction work and low torque values (cup springs are single-layered, single contact force).

ROBA®-slip hub Type 1_ _.2_ _ for medium friction work and higher torque values (cup springs are double-layered, double contact force).

ROBA®-slip hub Type 1_ _.3_ _ for low friction work and very high torque values (cup springs are triple-layered, triple contact force).

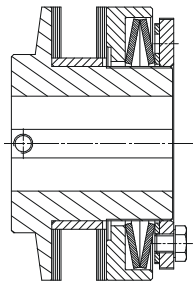


Fig. 13
Sizes 0 – 5
Single layering

Fig. 14
Sizes 0 – 5
Double layering

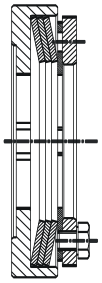


Fig. 15
Sizes 0 – 2
Triple layering

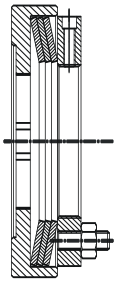


Fig. 16

Sizes 3 – 5
Triple layering

Fig. 17

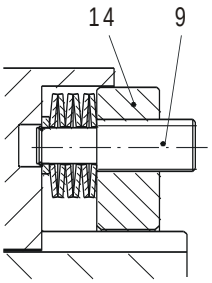


Fig. 18
Single layering

Size
6 – 12

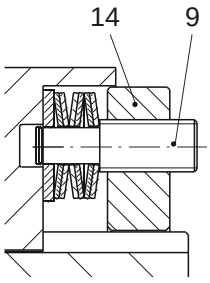


Fig. 19
Double layering

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

Torque Adjustment Sizes 0 – 5

Both ambient conditions and longer downtimes can influence the set slipping torque.
On triple layering, more slipping torque scattering might occur specific to the respective load.
The values in the Adjustment Table are only reference values.
During initial adjustment, please let the ROBA®-slip hub slip several times at 50 % of the maximum torque in order to achieve a clear friction lining wear pattern.
Depending on the slipping frequency, occasional re-adjustment is necessary due to friction lining wear.

Due to cup spring tolerances, the torque adjustment values can only be considered reference values.

Torque adjustment on standard adjusting nut (3)
Cup springs (5) single-layered or double-layered

There are 12 markings engraved on the thrust washer (2) facing side (Size 0: 24 markings), and 4 markings engraved on the adjusting nut (3) (Fig. 20).

1. Unscrew the locking screw (4) from the adjusting nut (3).
2. The adjusting nut (3) with lock washer (13) is adjusted by hand up to contact on the cup springs (5). The 4 markings and the markings on the thrust washer (2) must align.
3. Turn the adjusting nut (3) further to the number of graduation lines which relates to the required slipping torque.
   For the number of graduation lines that need to be adjusted, dependent on the torque, please see the Adjustment Table.
   The Adjustment Table is adhered to the clutches Sizes 01 to 5.
   For Size 0, the Adjustment Table is printed in the Installation and Operational Instructions (Table 5).
4. Secure the adjusting nut (3) by screwing in the locking screw (4).

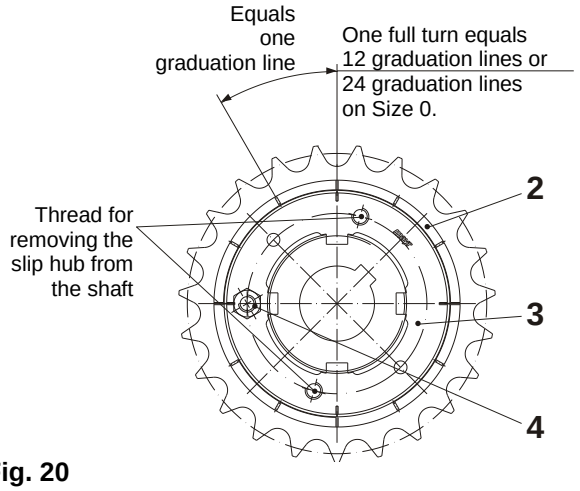
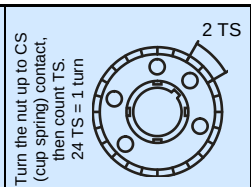


Fig. 20

Example:
On a slip hub Size 0 with single-layered cup springs, a torque of 5 Nm must be adjusted.
Table 5 shows that 8 graduation lines are required for this.
After torque adjustment is completed, the adjusting nut must be secured by screwing in the locking screw (4).

Table 5: Adjustment Table for Size 0 / Type 1_ _._10

ROBA®-RN Size 0 Surface-ground chain sprocket for friction lining No. 1 run-in condition								
	Single CS /\	Nm	2	4	5	6	8	10
		TS	4	6	8	10	13	16
	Double CS //	Nm		9	12	15	17	20
		TS		4	5	6	7	8
	Triple CS ///	Nm			18	23	26	30
		TS			5	6	7	8

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

Torque adjustment on cup springs triple-layered Sizes 0 – 5 (Figs. 15 and 16)

The ROBA®-slip hubs with triple cup spring layering do not have an Adjustment Table adhered to them.
For these Types, the Adjustment Tables on pages 11 and 12, as well as Table 5 on page 7 for Size 0, are valid.

Adjustment Sizes 0 – 2
Type 1_ _.310 adjusting nut 0

There are 12 markings engraved on the thrust washer (2) facing side and 4 markings engraved on the adjusting nut (3) (Fig. 20).

1. Unscrew the locking screw (4) from the adjusting nut (3).
2. The adjusting nut (3) with lock washer (13) is adjusted by hand up to contact on the cup springs (5). The 4 markings and the markings on the thrust washer (2) must align.
3. Turn the adjusting nut (3) further using a face wrench to the number of graduation lines which relates to the required slipping torque.
   For the number of graduation lines that need to be adjusted dependent on the torque, please see Tables 5, 12 and 13.
4. Secure the adjusting nut (3) by screwing in the locking screw (4).

Adjustment Sizes 0 – 2
Type 1_ _.311 adjusting nut 1
(for radial adjustment using hook wrench)

The distance dimension “a” in Fig. 21 indicates the size of the adjusted slipping torque independent of friction lining wear. The clutch delivery includes an Adjustment Diagram, which indicates dimension “a” dependent on the cup spring layering for a certain slipping torque.

1. Unscrew the set screw (22) from the adjusting nut (15).
2. Turn the adjusting nut (15) using a hook wrench to the required dimension “a” which relates to the required slipping torque.
3. The adjusting nut (15) must be secured by screwing the radially arranged set screw (22) into one of the 4 hub keyways.

Clamping onto the thread as shown in Fig. 22 is not permitted.
If necessary, the adjusting nut (15) may have to be turned.

Adjustment Sizes 3 – 5
Type 1_ _.312 adjusting nut 2

1. Unscrew the set screw (22) from the adjusting nut (10).
2. Tighten the adjusting nut (10) until dimension “b”, as stated in the Adjustment Table (Tables 16 – 18) is reached.
3. The adjusting nut (10) must be secured by screwing the radially arranged set screw (22) into one of the 4 hub keyways.

Clamping onto the thread as shown in Fig. 22 is not permitted.
If necessary, the adjusting nut (10) may have to be turned.

4. Tighten the individual set screws (11) in the adjusting nut (10) evenly in steps of approx. 1/4 turn until dimension “a” as stated in the Adjustment Table or the required torque is reached.
5. Counter the set screws (11) using the hexagon nuts (21).

The respective keys for torque adjustment on slip hubs are available at the place of manufacture.

Torque adjustment on adjusting nut for radial adjustment Sizes 01 – 5

These ROBA®-slip hubs do not have an Adjustment Table adhered to them.
The distance dimension “a” in Fig. 21 indicates the size of the adjusted slipping torque independent of friction lining wear. For the respective required dimension “a” dependent on the cup spring layering for a certain slipping torque, please see the Adjustment Tables on page 9 (Tables 6 – 11).

1. Unscrew the set screw (22) from the adjusting nut (15).
2. Turn the adjusting nut (15) using a hook wrench to the required dimension “a” which relates to the required slipping torque.
3. The adjusting nut (15) must be secured by screwing the radially arranged set screw (22) into one of the 4 hub keyways.

Clamping onto the thread as shown in Fig. 22 is not permitted.
If necessary, the adjusting nut (15) may have to be turned.

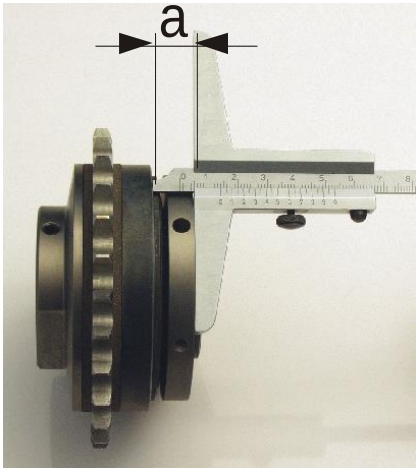


Fig. 21

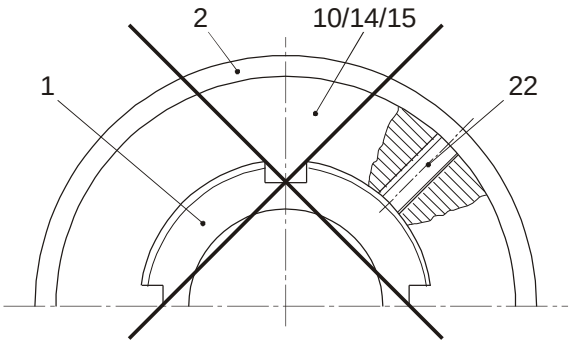


Fig. 22

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

Torque Adjustment Sizes 6 – 12 on Standard Adjusting Nut (14)

During initial adjustment, please let the ROBA®-slip hub slip several times at 50 % of the maximum torque in order to achieve a clear friction lining wear pattern.
Depending on the slipping frequency, occasional re-adjustment is necessary due to friction lining wear.

On slip hubs Sizes 6 – 12, the distance dimension “a” indicates the size of the adjusted slipping torque (Figs. 23 and 25).

Torque adjustment (Figs. 23 and 24)

For Sizes 6 – 8, dimension “a” is indicated in the Adjustment Table adhered onto the clutch.
For Sizes 9 – 12, an Adjustment Diagram must be requested if required.

1. Unscrew the set screw (22) from the adjusting nut (14).
2. Adjust the adjusting nut (14) including the relaxed cup spring supporting bolts (the cup spring supporting bolts (9) protrude from the adjusting nut (14)) to the required dimension “a” using a face wrench. Here, the face wrench pilots must be inserted into two hexagon sockets of the cup spring supporting bolts (9) in order to turn the adjusting nut (14).

Do not continue to turn the cup spring supporting bolts (9) against the snap ring resistance (Fig. 23).

3. The adjusting nut (14) must be secured by screwing the radially arranged set screw (22) into one of the 4 hub keyways.

Clamping onto the thread as shown in Fig. 22 is not permitted.
If necessary, the adjusting nut (14) may have to be turned.

4. Then the cup spring supporting bolts (9) are turned in evenly, in steps of approx. 1/4 turns, until they are flush with the adjusting nut (14) (Fig. 23).

Torque adjustment for countered cup spring supporting bolts (Fig. 25)

The clutch delivery includes an Adjustment Diagram, which indicates dimensions “a” and “b”.

1. Unscrew the set screw (22) from the adjusting nut (14).
2. Adjust the adjusting nut (14) including the relaxed cup spring supporting bolts (the cup spring supporting bolts (9) protrude from the adjusting nut (14)) to the dimension “b” using a face wrench. Here, the face wrench pilots must be inserted into two hexagon sockets of the cup spring supporting bolts (9) in order to turn the adjusting nut (14).

Do not continue to turn the cup spring supporting bolts (9) against the snap ring resistance (Fig. 25).

3. The adjusting nut (14) must be secured by screwing the radially arranged set screw (22) into one of the 4 hub keyways.

Clamping onto the thread as shown in Fig. 22 is not permitted.
If necessary, the adjusting nut (14) may have to be turned.

4. Then the cup spring supporting bolts (9) are turned in evenly, in steps of approx. 1/4 turns until dimension “a” or the required torque is reached.
5. Counter the cup spring supporting bolts (9) with the hexagon nuts (9.1).

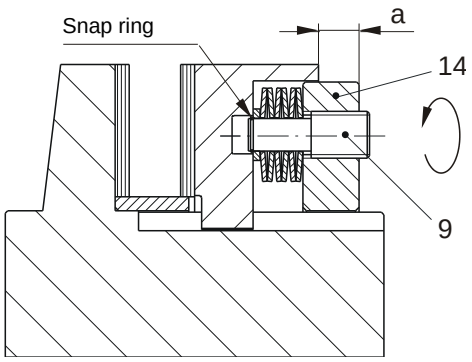


Fig. 23

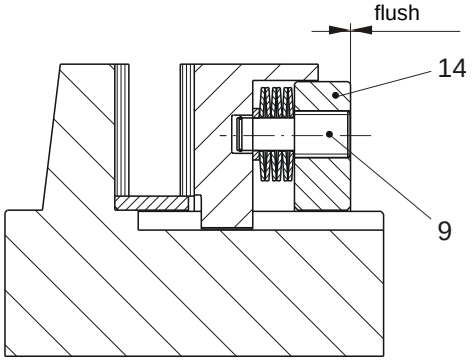


Fig. 24

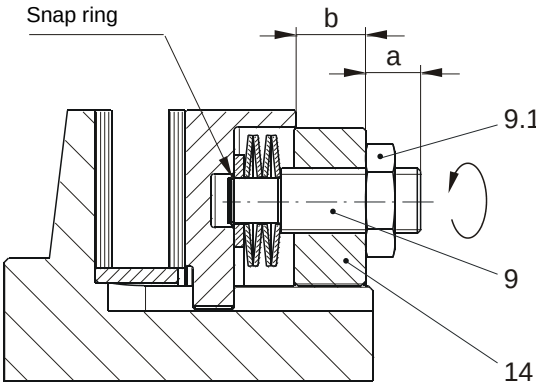


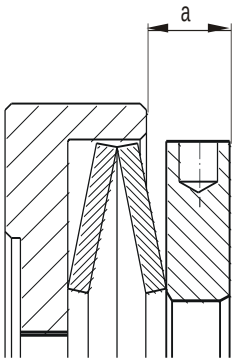
Fig. 25 **Cup spring supporting bolt (9) with counter nut (9.1)**

Adjustment Tables / Adjustment Diagrams for the torque adjustment can only be considered reference values, as they can vary substantially due to cup spring tolerances, friction value fluctuations and surface characteristics or the run-in condition of the output element. Exact torque adjustment requires manufacturer-side adjustment on a test stand (preferably using the customer-side provided output element) or direct torque measurement on the installed clutch or system.

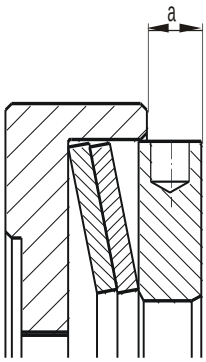
Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

Adjustment Tables for Adjusting Nut for Radial Adjustment on Sizes 01 to 5

The values stated in the Adjustment Tables are only reference values.
Due to manufacturing tolerances, the actual torque values can in part deviate **substantially** from the values stated in the Table.



Single cup spring layering
Type 1_ _.111



Double cup spring layering
Type 1_ _.211

Table 6: Adjustment Table for Size 01 with Radial Adjusting Nut (15)

Single CS layering	**Torque [Nm]**	6	10	17	21	24,5	27	29	30
	Dimension "a" [mm]	9,8	9,6	9,2	9	8,7	8,5	8,2	8
Double CS layering	**Torque [Nm]**				20	35	46	53	60
	Dimension "a" [mm]				8,2	8,1	8	7,9	7,7

Table 7: Adjustment Table for Size 1 with Radial Adjusting Nut (15)

Single CS layering	**Torque [Nm]**	15	24	32	39	44	48	53	60	70
	Dimension "a" [mm]	11,1	10,7	10,3	10	9,6	9,2	8,8	8,4	8,1
Double CS layering	**Torque [Nm]**			70	85	100	110	120	125	130
	Dimension "a" [mm]			9,1	9	8,8	8,7	8,6	8,5	8,3

Table 8: Adjustment Table for Size 2 with Radial Adjusting Nut (15)

Single CS layering	**Torque [Nm]**	25	36	52	70	80	95	110	120	130
	Dimension "a" [mm]	13,4	13,2	13	12,8	12,5	12,1	11,8	11,4	11
Double CS layering	**Torque [Nm]**			120	148	175	200	220	235	250
	Dimension "a" [mm]			10,4	10,3	10,2	10	9,9	9,8	9,7

Table 9: Adjustment Table for Size 3 with Radial Adjusting Nut (15)

Single CS layering	**Torque [Nm]**	50	62	80	100	130	150	200	235	250
	Dimension "a" [mm]	13,9	13,8	13,5	13,3	13	12,8	12,5	12,3	12
Double CS layering	**Torque [Nm]**	250	295	340	375	420	450	480	520	550
	Dimension "a" [mm]	10,2	10	9,9	9,8	9,7	9,5	9,4	9,3	9,2

Table 10: Adjustment Table for Size 4 with Radial Adjusting Nut (15)

Single CS layering	**Torque [Nm]**	220	255	290	335	365	400	440	480	510	535	550
	Dimension "a" [mm]	16,9	16,8	16,4	16,1	15,8	15,4	14,9	14,4	13,9	13,7	13,3
Double CS layering	**Torque [Nm]**		550	605	630	760	825	860	950	1000	1050	1100
	Dimension "a" [mm]		13,1	12,9	12,7	12,6	12,4	12,2	12,1	11,9	11,7	11,4

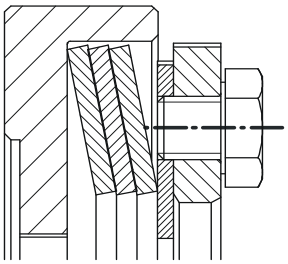
Table 11: Adjustment Table for Size 5 with Radial Adjusting Nut (15)

Single CS layering	**Torque [Nm]**	120	190	265	330	395	465	530	570	620	660	700
	Dimension "a" [mm]	19,4	19,1	18,7	18,4	18,1	17,7	17,4	17,1	16,7	16,4	15,9
Double CS layering	**Torque [Nm]**		440	600	700	800	900	1000	1100	1200	1300	1400
	Dimension "a" [mm]		14,5	14,3	14,2	14	13,8	13,7	13,5	13,3	13,2	13

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

Adjustment Tables for Triple Layering on Sizes 1 and 2 and Type 1_ _.310:

The values stated in the Adjustment Tables are only reference values.
Due to manufacturing tolerances, the actual torque values can in part deviate **substantially** from the values stated in the Table.



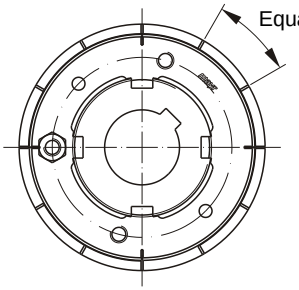


Table 12: Adjustment Table for Size 1 / Type 1_ _.310

Torque [Nm]	120	140	155	165	175	185	192	200
Graduation lines	7	8	9	10	11	12	13	14

Table 13: Adjustment Table for Size 2 / Type 1_ _.310

Torque [Nm]	220	250	285	320	350	380	410
Graduation lines	6	7	8	9	10	11	12

Adjustment Tables for Triple Layering on Sizes 1 and 2 and Type 1_ _.311:

The values stated in the Adjustment Tables are only reference values.
Due to manufacturing tolerances, the actual torque values can in part deviate **substantially** from the values stated in the Table.

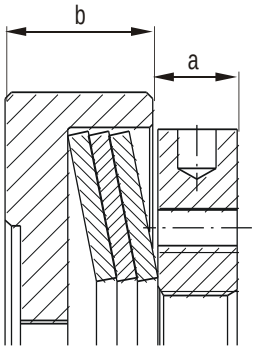


Table 14: Adjustment Table for Size 1 / Type 1_ _.311

Torque [Nm]	100	120	140	160	180	195	205
Dimension “a” [mm]	11,1	11,0	10,9	10,8	10,7	10,6	10,5
Dimension “b” [mm]	10,3						

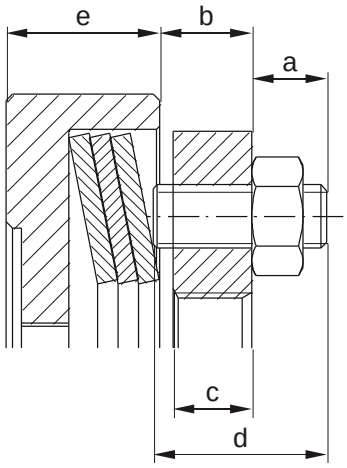
Table 15: Adjustment Table for Size 2 / Type 1_ _.311

Torque [Nm]	220	245	270	290	320	350	370	385	400
Dimension “a” [mm]	12,9	12,8	12,7	12,6	12,5	12,4	12,3	12,2	12,1
Dimension “b” [mm]	10,7								

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com

Adjustment Tables for Triple Layering on Sizes 3 to 5:

The values stated in the Adjustment Tables are only reference values.
Due to manufacturing tolerances, the actual torque values can in part deviate **substantially** from the values stated in the Table.



Size	e	c	d
3	14,5	9	M8 x 20
4	17,5	11	M10 x 25
5	19,8	12	M10 x 25

Table 16: Adjustment Table for Size 3 / Type 1_ _.312

Torque [Nm]	110	225	330	425	505	580	655	710	755	800
Dimension “a” [mm]	10,5	10,3	10,1	9,9	9,7	9,5	9,3	9,1	8,9	8,7
Dimension “b” [mm]	14									

Table 17: Adjustment Table for Size 4 / Type 1_ _.312

Torque [Nm]	485	600	710	820	930	1050	1150	1250	1330	1410	1505	1600
Dimension “a” [mm]	13,0	12,9	12,8	12,7	12,6	12,5	12,4	12,3	12,2	12,1	12,0	11,9
Dimension “b” [mm]	17,5											

Table 18: Adjustment Table for Size 5 / Type 1_ _.312

Torque [Nm]	530	660	800	985	1160	1300	1455	1620	1785	1940	2100
Dimension “a” [mm]	11,9	11,8	11,7	11,6	11,5	11,4	11,3	11,2	11,1	11,0	10,9
Dimension “b” [mm]	19,5										

Disposal

Our slip hub components must be disposed of separately as they consist of different materials.

All metal components:	Steel scrap	(Code No. 160117)
Friction linings: (Compression materials)	Brake linings	(Code No. 160112)
Friction linings: (Plastic)	Plastic	(Code No. 160119)
Elastomers:	Plastic	(Code No. 160119)

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, E-Mail: info@mayr.com