

Please read and observe this Operating Instruction carefully!

A possible malfunction or failure of the clutch and damage may be caused by not observing it.

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Manufacturer's declaration

The product is a component within the scope of the Machinery Directive 98/37/EC for installation into machines or equipment.

An initial start-up is prohibited until it has been noticed that the machinery or the equipment into which this product has been incorporated correspond to the EC-Directive.

Safety regulations

The submitted installation and operating instructions (E+B) are part of the shipment.
Keep the E+B always well accessible near the ROBA®-slip hub.



Danger!

- ☐ If the ROBA®-slip hub has been modified or retrofitted.
- ☐ If the relevant standards of the safety or installation conditions are not observed.

Necessary protective measures to be undertaken by the user

- ☐ Cover all moving parts for protection against squeezing, seizing, dust deposit and hit of foreign objects.
- ☐ Do not breathe in the friction lining deposits. Suck off the dust in case of cleaning.
- ☐ The ROBA®-slip hub heats-up when slipping. => Caution very hot – do not touch.

Only qualified and well-trained specialists should work on the units to avoid any personal injury or damage to machinery under observance of the valid standards and guidelines. The installation and operating instructions are to be read carefully before installation and operation.

With these safety notes no claim on completeness is raised!

Attention:

Based on the guideline 94/9/EC (ATEX-guideline) this product is not suitable for the application in potential explosive areas without evaluation of the conformity.

Safety and information signs



Attention!

Danger of injury for persons and damage at the machine possible.



Note!

Reference to important points which are to be considered.

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

(B.1.0.GB)

ROBA®-slip hub
Type 100
ROBA®-sproc
Type 110
ROBA®-max
Type 170

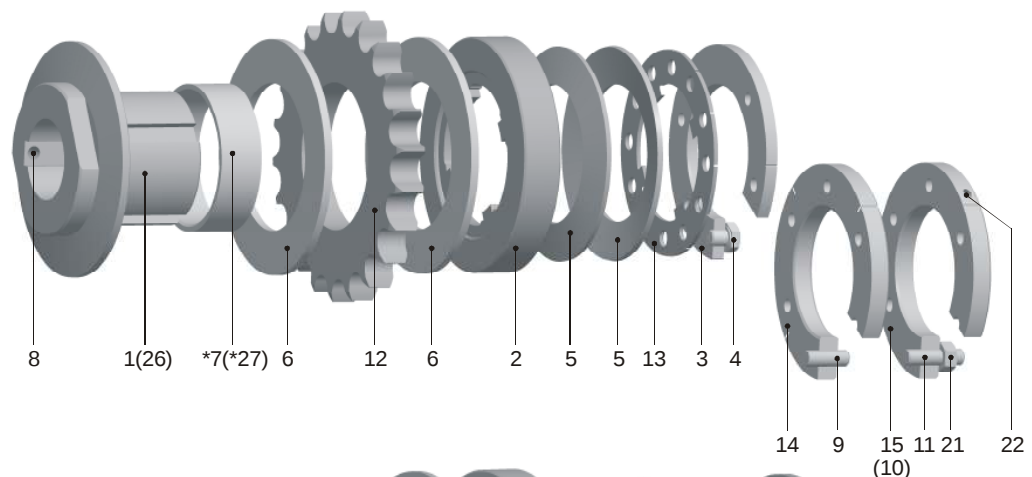


Fig. 1

ROBA®-min
Type 121
Type 123

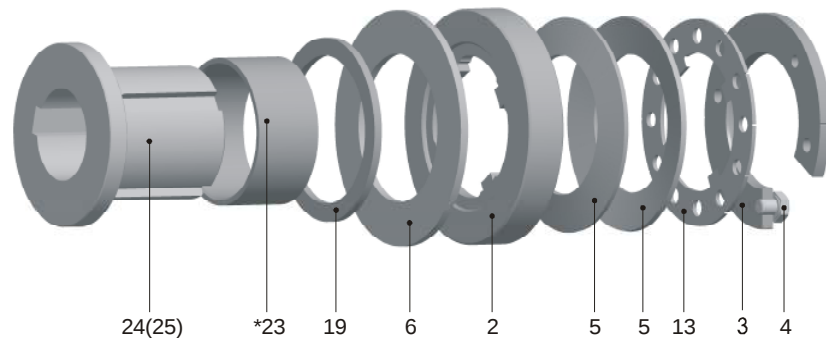


Fig. 2

**ROBA®-slip hub
with needle bearing**
Type 160

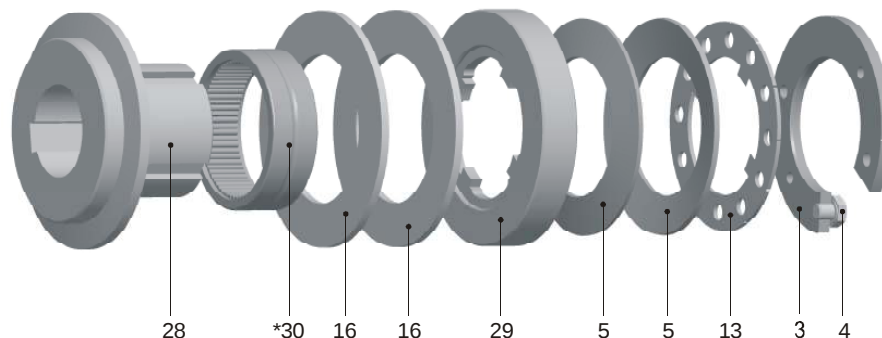


Fig. 3

Parts List (Only mayr®-original parts are to be used)

- | | |
|--|--|
| 1 Hub (Type 100) | 16 Friction lining (Type 160) |
| 2 Thrust washer | 17* Friction lining No. 2 |
| 3 Adjusting nut 0 | 18* Rustproof disc |
| 4 Set screw | 19 Friction lining (ROBA®-min) |
| 5 Cup springs | 20* Friction lining No. 4/5 |
| 6 Friction lining No. 1 | 21 Hexagon nut |
| 7* Bushing (Type 100) | 22 Threaded pin for moulding securing part |
| 8 Regulating screw | 23* Bushing (ROBA®-min) |
| 9 Cup spring support pins (sizes 6 - 12) | 24 Hub (Type 121) |
| 10 Adjusting nut .2 (sizes 3 – 5) | 25 Hub (Type 123) |
| 11 Threaded pin (for torque adjustment) | 26 Hub (Type 170) |
| 12 Chain sprocket | 27* Bushing (Type 170) |
| 13 Lock washer | 28 Hub (Type 160) |
| 14 Adjusting nut 0 (sizes 6 – 12) | 29 Thrust washer (Type 160) |
| 15 Adjusting nut 1 (sizes 0 – 5) | 30* Needle bearing |

* See pages 4/5

In case of a spare part order the complete Type designation and size must be indicated.

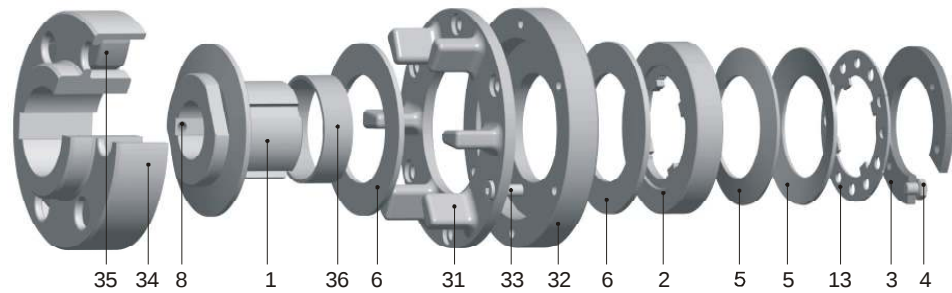
Example for order: ROBA®-sproc Type 110.210, size 1, 1 set (2 pieces) friction linings component 6.

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

(B.1.0.GB)

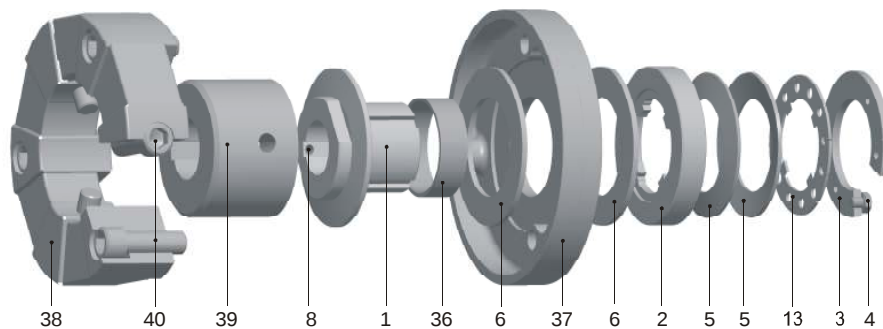
**ROBA®-lastic
Type 135**

Fig. 4



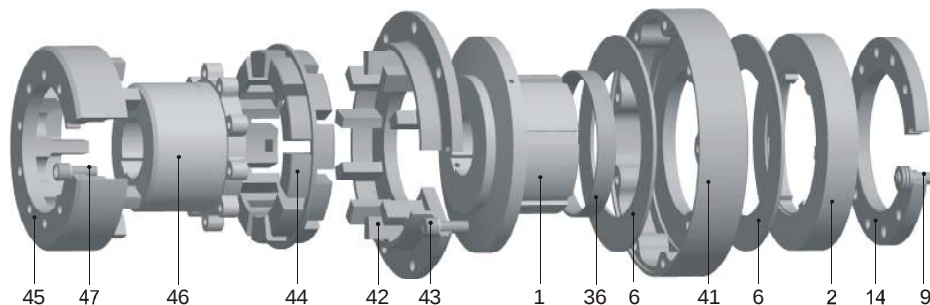
**ROBA®-lastic
Type 131**

Fig. 5



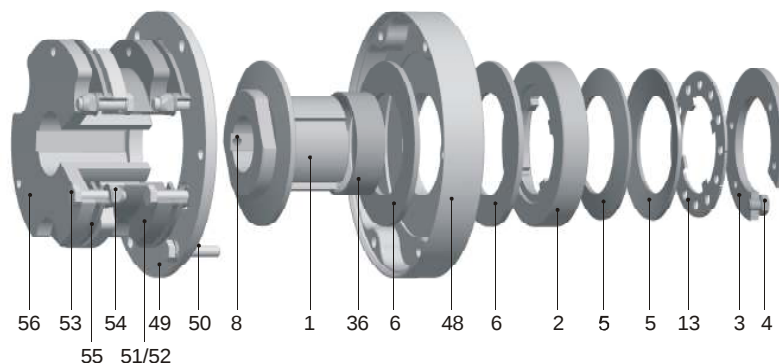
**ROBA®-lastic
Type 132**

Fig. 6



**ROBA®-LD
Type 133, 134**

Fig. 7



Parts List (Only mayr®-original parts are to be used)

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

In case of a spare part order the complete Type designation and size must be indicated.

Example for order: ROBA®-lastic Type 135.210 Size 1, 1 set (2 pieces) friction linings component 6

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

(B.1.0.GB)

Function (Fig. 1)

ROBA®-slip hubs are used as overload protection for machine drives with chain sprockets or belt pulleys. The drive element (chain sprocket or similar) is placed on the bushing (7) and clamped between the friction linings (6) with the aid of the thrust washer (2), the cup springs (5) and the adjusting nut (3) with the lock washer (13).

The more powerfully the cup springs (5) are compressed by the adjusting nut (3), the higher the torque at which the drive element slips.

The precise torque setting operation is described on page 7/8.

The ROBA®-slip hub is thermally stressed as a function of the slip speed, slip time and the adjusted torque.

The described friction power parameters must not be exceeded, so that the friction linings of the ROBA®-slip hub are not overheated or damaged.

The values represented in the diagram of recommended values are reference values and represent max. slip speed limits. The speed limits refer to a max. slip time of 1 sec.

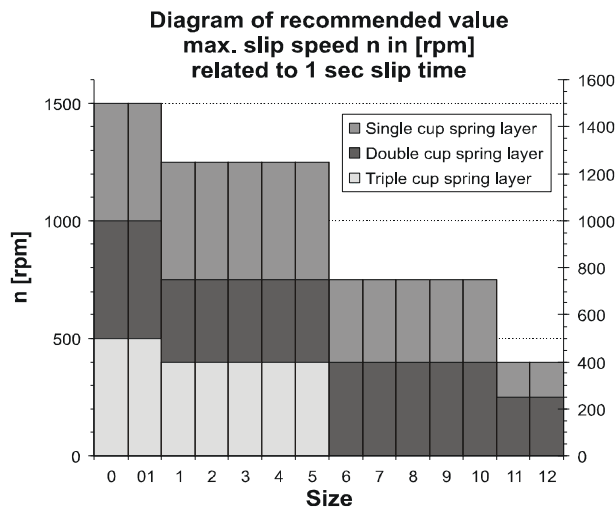
The slip speed must be reduced with a correspondingly longer slip time.

In the case of doubt application-related friction work calculations are to be carried out.



When exceeding the permissible slip duration the ROBA®-slip hub is overloaded => damage of the friction linings.

For monitoring the slip speed use the speed monitor ROBA®-tron.



Supply condition

ROBA®-slip hubs are supplied in a pre-assembled condition. The cup spring layer or friction lining assembling depends on the used type and corresponds to the order indication provided by the customer.

ROBA®-slip hubs are available with finish bore (bore fit H7) and keyway to DIN 6885 (fit of keyway JS9) as standard.

We recommend to use a k6-fit for the shaft.

For other tolerances please contact the factory.

If the order does not contain any details regarding the overall width of the drive element (chain sprocket etc.), we supply the bearing bushing (7) for the maximum overall width.

Friction linings

As shown in below-mentioned Table 1 four different types of friction linings are available.

The torque and speed details given in the slip hub catalogue apply to standard friction linings for dry running. For the other friction linings the corresponding values are shown in Table 1 or must be requested for the respective application.

Table 1

Friction lining	Application	Attainable torques of M_{max}
1	Standard for dry running	100 %
2	Rustproof friction paring	100 %
4	Bronze friction lining for oil bath	30 %
5	Special low-friction material (only for single cup spring layer and with reduced friction power)	50 %

Table 2

Size	Limiting 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	-

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(B.1.0.GB)

Rustproof friction pairing

The standard friction lining can form a rust compound with cast iron and iron surfaces, which increases the slip torque quite considerably.

Therefore ROBA®-slip hubs can be equipped with a rustproof pairing of friction linings (friction lining 2).

This rustproof friction lining pairing consists of two stainless steel discs (item 18), anchored in the slip hub, and of two special friction linings (item 17) which cannot stick (Fig. 8).

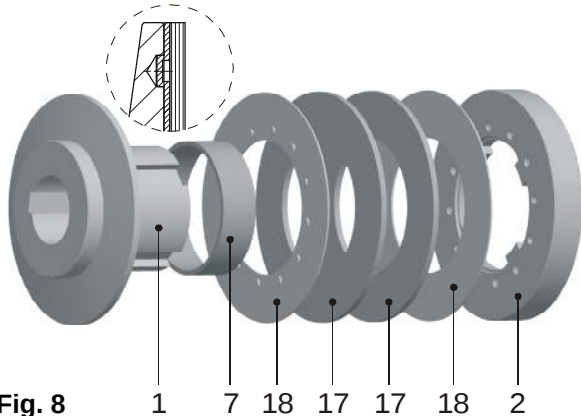


Fig. 8

Important assembly instructions

- ❑ Bores, shafts, friction linings and friction surfaces at the drive element must be free of oil and grease.
- ❑ The shaft surface is finely turned or ground ($R_a = 0,8 \mu\text{m}$)
Shaft material: yield point at least 350 N/mm^2 .

Assembly

The series of the assembly is to be taken from the explosion drawings Figs. 1 – 4 or with the needle bearing design from Fig. 9.

Before assembling the adjusting nut (item 3), the thread of the adjusting nut and the lock washer must be slightly greased.



Important!
Observe the correct cup spring layer
(see paragraph cup spring layer)!
It must be ensured that no grease gets onto the
friction linings!

During assembly of the ROBA®-lastic types additionally the operation instruction of the flexible coupling is to be taken.

The slip hub can be fixed axially onto the motor shaft end by means of a regulating screw (item 8, Fig. 1) or as shown on Fig. 11 by means of a cover.

ROBA®-slip hubs are available with finish bore (bore fit H7) and keyway to DIN 6885 (fit of keyway JS9) as standard.

We recommend to use a k6-fit for the shaft (see Fig. 11).

The drive element should show exact plane parallelism and a surface ground finely in the bore range or in the range of friction surfaces (see Fig. 10 and Table 3).

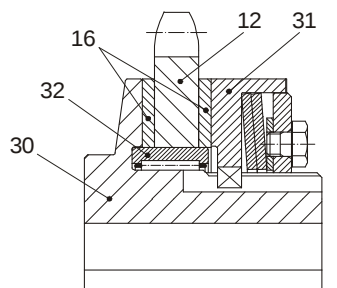


Fig. 9

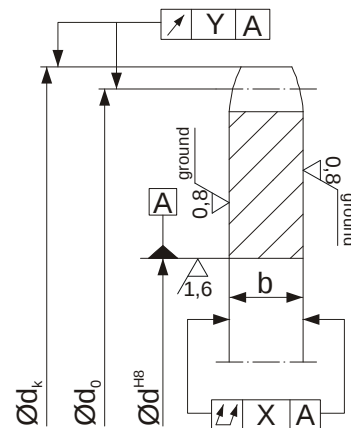


Fig. 10

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

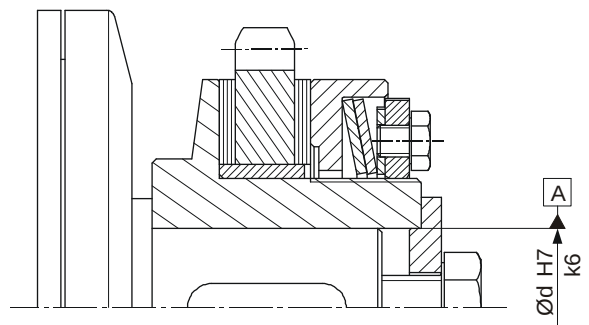


Fig. 11

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

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Bearing bushing (items 7, 23, 27)

If the order contains no details regarding the overall width of the drive element (chain sprocket, etc.) we supply the bearing bushing for the maximum overall width (b_{max}).

If an overall width narrower than b_{max} is needed, the bearing bushing must be shortened accordingly at the end without the internal chamfer.

The bearing bushing is to be assembled with the internal chamfer at the front, as shown in Fig. 12.

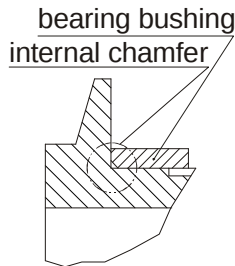


Fig. 12

Bearing bushing width standard friction pairing = :
overall width + 1,5 x friction lining width + 0,5 mm

Bearing bushing width rustproof friction pairing = :
overall width + 1,5 x friction lining width
+ 2 x width rustproof disc

Where there are high radial loads and large slipping frequencies, we recommend to use the slip hub with needle bearing.

Needle bearing (item 30)

As the needle bearing (item 30) cannot be adjusted to the overall width "b" with its length, the overall width "b" is commanded with the Type 160 (refer to Table 4).

The drive element is to be drilled with the drilling tolerance N7 and it has to be pressed onto the needle bearing as shown in Fig. 9.

Table 4

Size	Friction lining width "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 layers

A correct cup spring layer is the condition for a satisfactory function of the clutch and for a torque adjustment without problems.

The respective type dependent cup spring layers are shown in the subsequent Figs. 13 to 19.

Rule of thumb:

ROBA®-slip hub Type 1_0.1_ for large friction work and low torque (cup springs single layer, single applied force);

ROBA®-slip hub Type 1_0.2_ for medium friction work and higher torque (cup springs double layer, double applied force);

ROBA®-slip hub Type 1_0.3_ for small friction work and high torque (cup springs triple layer, triple applied force).

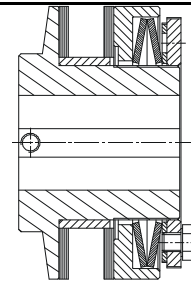


Fig. 13
Sizes 0 – 5
Single layer

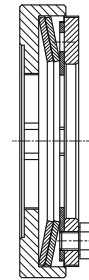


Fig. 14
Sizes 0 – 5
Double layer

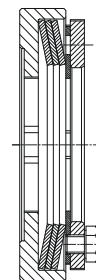


Fig. 15
Sizes 1 – 2
Triple layer

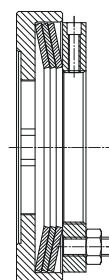


Fig. 16

Sizes 3 – 5
Triple layer



Fig. 17

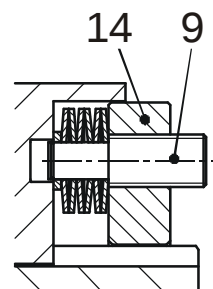


Fig. 18
Single layer

Sizes
6 - 12

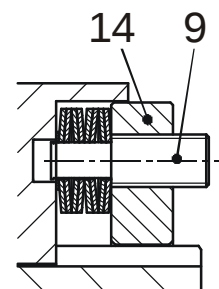


Fig. 19
Double layer

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

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Torque adjustment Sizes 0 - 5

Both ambient conditions and longer downtimes can impair the set slipping torque.

Load-specifically larger deviations of the slipping torque can occur with triple layers. The values mentioned on the setting chart are only recommended values.

When the torque is set the first time the ROBA®-slip hub should slip several times at 50 % of the maximum torque in order to obtain an uniform friction surface of the friction lining. An occasional adjustment is necessary depending on the slipping frequency due to lining wear.



Note:

Due to cup spring tolerances torque setting values might be only recommended values.

Torque adjustment with standard adjusting nut (item 3) Cup springs single or double layers.

The thrust washer (item 2) has twelve markings on the back (size 0; 24 markings), the adjusting nut (item 3) has four markings (Fig. 20). The adjusting nut with the lock washer are moved manually until they make contact with the cup springs; the four markings must coincide with markings of the thrust washer.

The adjusting nut is now turned by the number of graduations, corresponding to the required slipping torque. A setting chart (Fig. 21) is glued onto the clutch sizes 1 – 5, and can be used to obtain the number of graduations to be set to suit the torque.

For size 0 the setting chart is in the operation manual (Fig. 21).

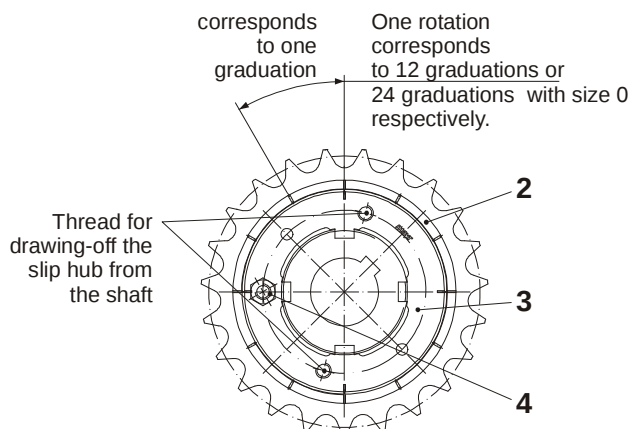


Fig. 20

Example:

In case of a slip hub, size 0, with single layer cup springs a torque of 5 Nm shall be set. Using the chart you can see immediately that 8 graduations are necessary for this case (Fig. 21).

After the torque has been set, the adjusting nut must be secured by tightening the set screw (item 4).

ROBA® - slip hub size 0	Turn nut to contact cup spring, then count TS. 24TS=1 turn	Single cup spring I \								
			Nm	2	4	5	6	8	10	
Surface ground chain sprocket for friction lining No. 1, run-in condition		Double cup spring II	TS	4	6	8	10	13	16	
		Triple cup spring III	Nm		9	12	15	17	20	
			TS		4	5	6	7	8	
			Nm			18	23	26	30	
			TS			5	6	7	8	

Fig. 21

Torque adjustment with cup springs triple layer sizes 1-5 (Figs. 15 and 16).

The ROBA®-slip hubs with cup springs triple layer do not have a setting chart which is **glued on**.

Adjustment sizes 1 and 2

Type 1 __.310 adjusting nut "0".

The thrust washer (item 2) has twelve markings on the back, the adjusting nut (item 3) has four markings on the back (Fig. 20). The adjusting nut with the lock washer are moved manually until they make contact with the cup springs; the four markings must coincide with the markings of the thrust washer.

The adjusting nut is now turned by the number of graduations (using a face wrench), corresponding to the required slipping torque. A setting chart is attached to the clutch and can be used to obtain the number of graduations to be set to suit the torque.

After the torque has been set, the adjusting nut must be secured by tightening the set screw (item 4).

Adjustment sizes 1 and 2

Type 1 __.311 adjusting nut "1"

(for radial adjustment with a hook wrench).

Distance "a" in Fig. 23 indicates the size of the set slipping torque setting regardless of the degree of the friction lining wear. An adjusting diagram is attached to the clutch, which shows the dimension "a" for a given slipping torque related to the cup spring layer.

After the torque has been set, the adjusting nut has to be secured via a set screw which is to be screwed in radially into one groove of the hub. A clamping onto the thread is not permissible, as shown in Fig. 24.

Adjustment sizes 3 - 5

Type 1 __.311 adjusting nut "1"

(for radial adjustment with a hook wrench).

Tighten the adjusting nut without any force until it makes contact with the cup springs.

The adjusting has to be secured via a set screw which is to be screwed in radially into one groove of the hub. A clamping onto the thread is not permissible, as shown in Fig. 24.

Now uniformly tighten the single set screws (item 11) in the adjusting nut in stages of approx. ¼ turn until the dimension "a" from the adjusting diagram or the required torque is achieved.

Lock the set screws with hexagon nuts (item 21).

The suitable wrenches for the torque adjustment with slip hubs are available ex works.



Note:
Due to cup spring tolerances torque setting values can only be recommended values.

Adjusting the torque with adjusting nut for radial adjustment

These ROBA®-slip hubs do not have a setting chart which is glued on.

Distance "a" in Figs. 22 and 23 indicates the sizes of the slipping torque setting regardless of the degree of the friction lining wear. An adjusting table is attached to the clutch, which shows the dimension "a" for a given slipping torque related to the cup spring layer.

After the torque has been set, the adjusting nut has to be secured via a set screw which is to be screwed in radially into one groove of the hub. A clamping onto the thread is not permissible, as shown in Fig. 24.

Adjusting the torque with standard adjusting nut sizes 6 – 12

When the torque is set the first time the ROBA®-slip hub should slip several times at 50 % of the maximum torque in order to obtain an uniform friction surface of the friction lining. An occasional adjustment is necessary depending on the slipping frequency due to lining wear.

In the case of slip hubs sizes 6 – 12, dimension "a" is determined by using the chart, which is glued, and moved on the adjusting nut (item 14) in accordance with the Fig. 22 with a face wrench via the hexagon-socket of the cup spring supporting pins (9) without any force until they make contact with the cup springs, or if necessary the cup spring supporting pins must slightly be turned back



Note:
Do not unscrew the cup spring supporting pins above the resistance of the snap ring.

After the torque has been set, the adjusting nut has to be secured via a set screw (23) which is to be screwed in radially into one groove of the hub. A clamping onto the thread is not permissible, as shown in Fig. 24.

Then the cup spring supporting pins (item 9) are tightened uniformly in stages of approx. ¼ turn until they are flush with the adjusting nut.

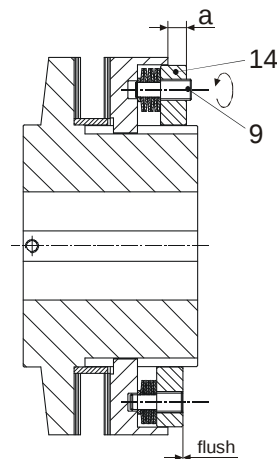


Fig. 22

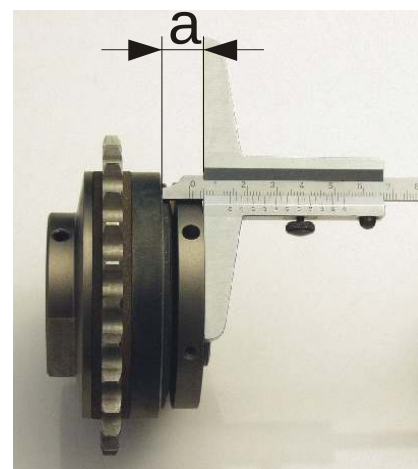


Fig. 23

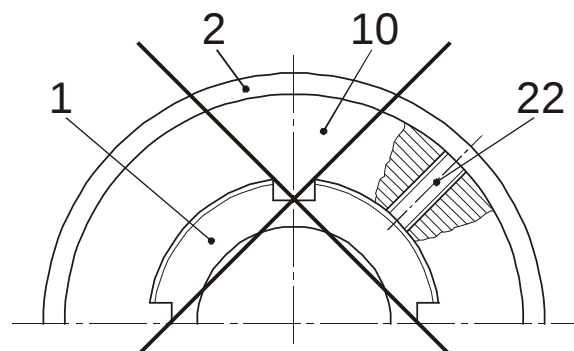


Fig. 24

Disposal

The components of our slip hubs must separately be supplied to the disposal due to the different material components

All metal components:	steel scrap	(Code No. 160117)
Friction linings:	brake linings	(Code No. 160112)
(press materials)		
Friction linings:	plastic	(Code No. 160119)
(plastic)		
Elastomers:	plastic	(Code No. 160119)