

# Cost Effective Overload Protection for

*Production Machinery  
Conveyors and Materials Handling Equipment  
Packing Machinery  
Construction Machinery  
Textile Machinery*

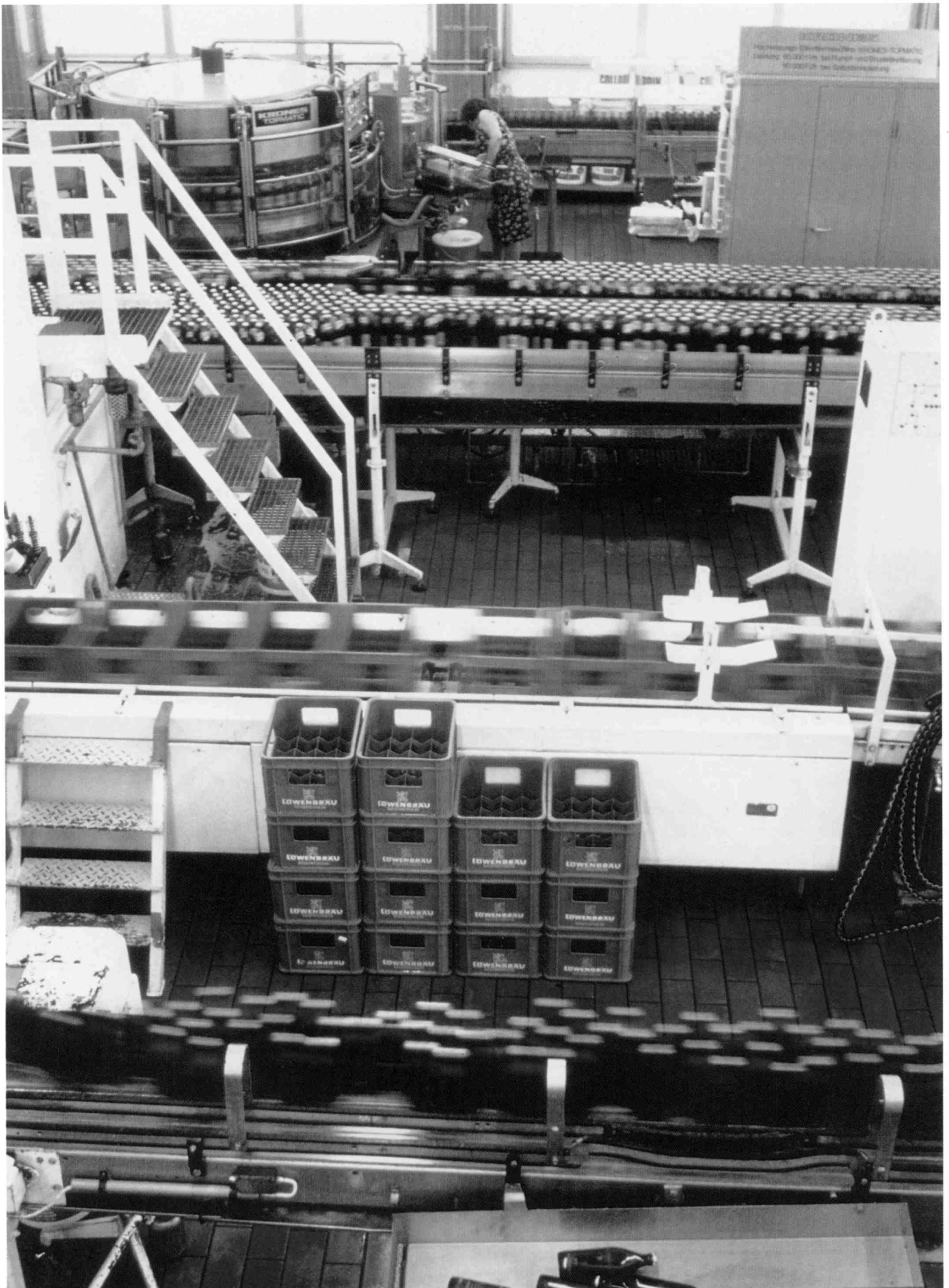
## **ROBA<sup>®</sup>** **slip hubs**

- *Robust and reliable*
- *Load holding*
- *Easy fitting and assembly*
- *Suitable for high friction work and high torque capacities*

[www.mayr.de](http://www.mayr.de)

K.123.05.GB

**mayr<sup>®</sup>**  
power  
transmission



ROBA<sup>®</sup> slip hubs operate as reliable, robust, durable overload protection devices in machine drives of all types. For instance on conveyor drive applications.

**M**ayr, market leader in torque overload control and manufacturer of electromagnetic clutches, brakes and combination clutch/brake units is today one of the most significant and innovative Companies.

*Our success is due to our experienced, inventive, motivated and highly qualified personnel, who function critically, sensibly and with contemporary equipment. If you are looking for the optimum solution for your power transmission requirements, you are in capable hands.*

*Service, quality and flexibility is our strength. To enable us to constantly improve our high standards latest technologies are fully applied.*

*Our local engineers will advise and visit from the outset and are able to draw on a wealth of knowledge and many years' experience.*

*For quick deliveries and availability of complete components we have installed a large capacity data-bank.*

*Before a product leaves our works, it must pass the strict controls applied by our quality control department. You have the guarantee that you can rely on mayr<sup>®</sup>, with absolute security.*

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ROBA<sup>®</sup> is a trade-name which has been the symbol of quality and experience in clutch construction for several decades. A comprehensive range of torque limiters originated from the robust jaw clutches (ROBA<sup>®</sup> safety slip clutch).

ROBA<sup>®</sup> slip hubs are simple to use. The table makes it possible to set the torque according to a scale and offers considerably simplified fitting. ROBA<sup>®</sup> slip hubs are reasonably priced drive elements which protect machinery and equipment against costly

damage, and downtimes resulting from intricate repairs. As a result of their high-strength materials and careful manufacture with optimum utilisation of space, ROBA<sup>®</sup> slip hubs are smaller than comparable torque limiters.

Ten different designs and combinations are available. There is a solution for all drive units. However, if any of your wishes remain unanswered, please contact us. ROBA<sup>®</sup> means: confidence in safety.

## Application

ROBA<sup>®</sup> slip hubs are used as overload protection for machine drives with chain sprockets, gears or pulleys. The ROBA<sup>®</sup> slip hub is used wherever expensive, sensitive motors

transmission units or machinery components need to be protected against overloads. If overloading occurs, the drive element slips and, therefore, limits the torque. ROBA<sup>®</sup> slip hubs are used in

packing machines, transport systems and equipment, construction machinery, textile machinery, agricultural machinery, mechanical handling equipment, feed units, loading

systems, in equipment for the chemical industry and in machinery and equipment for the general engineering industry.

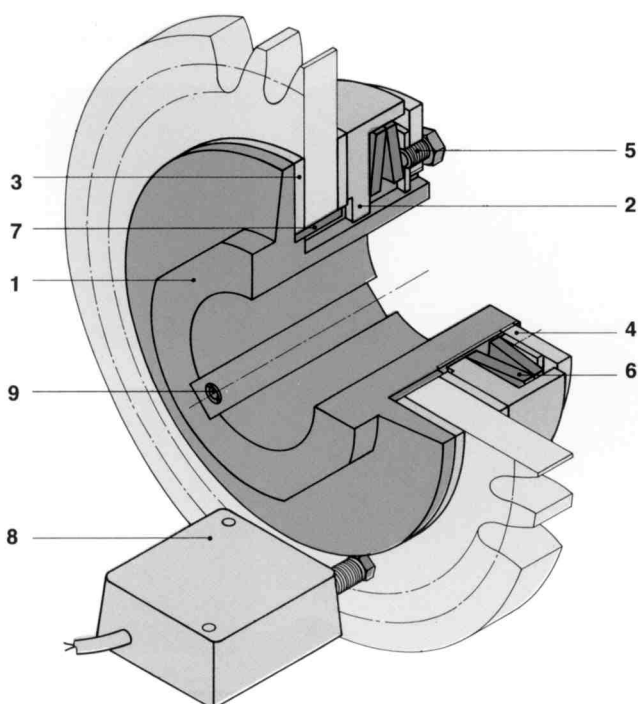
## Construction

Despite their simple construction, ROBA<sup>®</sup> slip hubs are high-quality machine components. The ROBA<sup>®</sup> slip hub is fully machined and phosphated and, therefore, protected against rust. It is of fully enclosed construction,

preventing dirt from reaching its internal components. The ROBA<sup>®</sup> slip hub, which is a rotating component, fits very easily into all drive systems as a result of its smooth construction. It is particularly suitable for

attachment to the outside of machines and for those systems which must be kept clean easily, e. g. in the food industry. ROBA<sup>®</sup> slip hubs are designed in such a way that they can be adapted very easily to very

varied working conditions, e. g. high slipping frequency and low torque or low friction work and extremely high torque, as well as all intermediate stages of torque and friction work, and the desired service life.



- 1 The short, robust hub ensures compact overall dimensions of the complete slip hub, together with easy assembly and fitting.
- 2 Four wide dogs engage in the external keyways of the hub and guarantee reliable torque transmission even under shock or reversing load conditions.
- 3 Asbestos free friction linings with a large surface area together with low wear rate ensure a long working life.
- 4 Adjusting nut together with graduation scale for simple torque setting and adjustment for wear.
- 5 Self contained torque adjustment nut assembly with a lock washer and screw preventing unintentional rotation of the adjusting nut.
- 6 Low rate cup springs maintain a minimal torque reduction due to wear. Alternative spring layers ensure a wide torque range per size.
- 7 Bronze bearing bushing can be shortened to suit the width of the drive element.
- 8 The ROBA<sup>®</sup>-tron overspeed monitor prevents too lengthy slippage of the drive elements on the ROBA<sup>®</sup> slip hub or is used to monitor chain breakage on the driven unit.
- 9 The set screw applies pressure onto the keyway of the shaft and locks the slip hub axially on the shaft.

Fig. 2



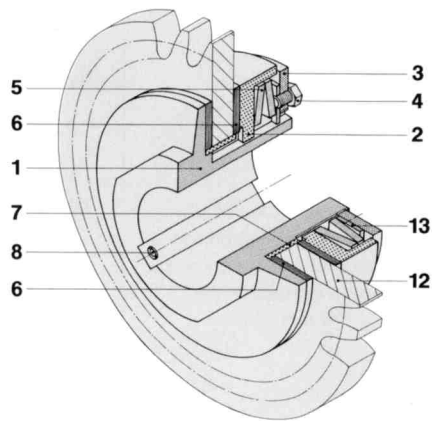


Fig. 3 sizes 0–5

## Parts list – sizes 0–5

1 hub	6 friction linings
2 thrust washer	7 bearing bushing
3 adjusting nut 0	8 set screw
4 locking screw	12 chain sprocket
5 cup springs	13 lock washer

## Function

The drive element (12) (chain sprocket or V-belt pulley) is placed on the bushing (7) as shown in figure 3 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 (12) slips. The precise torque setting operation is described on page 21.

It should also be noted that the difference in torque is lowest in the case of friction lining wear and highest with triple cup springs. In addition, a torque setting in the uppermost quarter of the maximum torques gives a particularly uniform setting (the spring characteristic has its gentlest slope in this area). Other friction linings are also available for special applications (see further details on page 19).

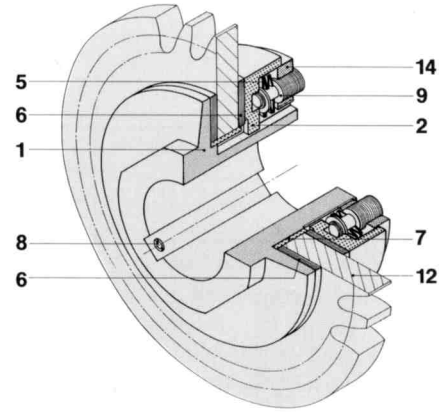


Fig. 4 sizes 6–12

## Parts list – sizes 6–12

1 hub	8 set screw
2 thrust washer	9 cup spring support pin
5 cup springs	12 chain sprocket
6 friction linings	14 adjusting nut 0
7 bearing bushing	

The ROBA<sup>®</sup> slip hub is available for three different torque ranges.

### Rule of thumb:

ROBA<sup>®</sup> slip hub for high friction work and low torque (single-layer cup springs, single contact force).

ROBA<sup>®</sup> slip hub for moderate friction work and higher torque (double-layer cup springs, double contact force).

ROBA<sup>®</sup> slip hub for low friction work and very high torque (triple-layer cup springs, triple contact force).

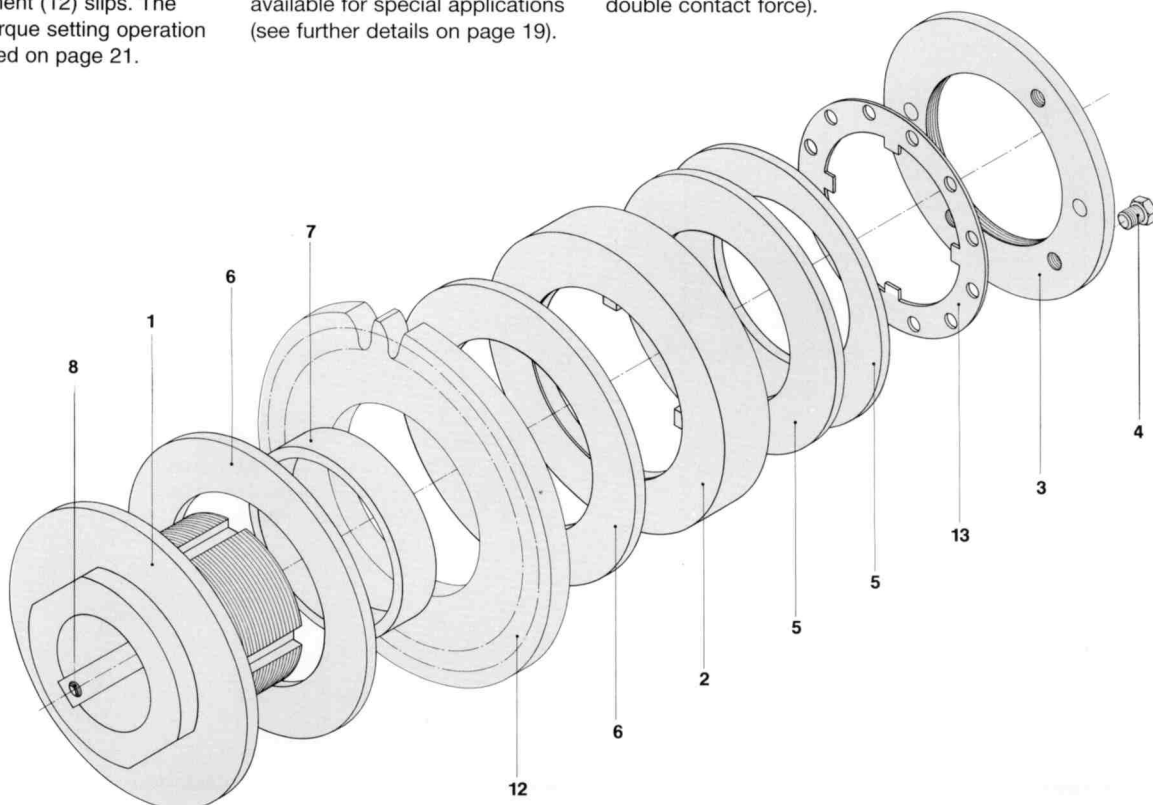
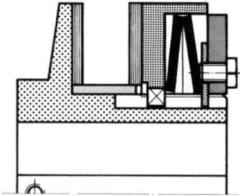
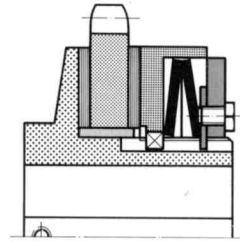
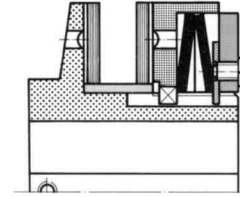
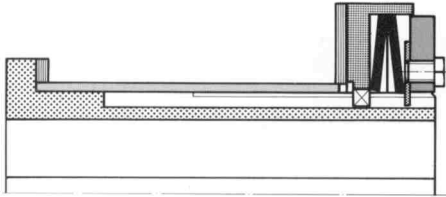
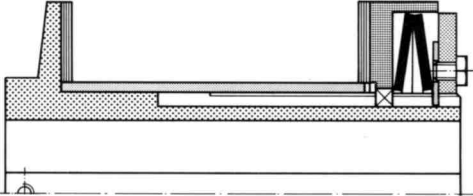
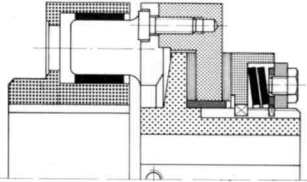
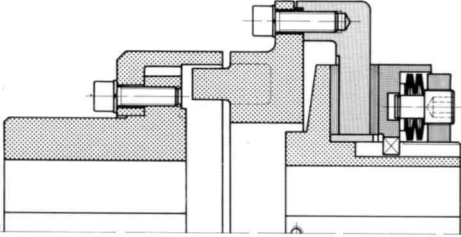
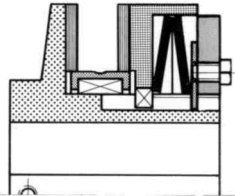
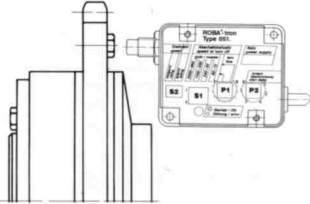
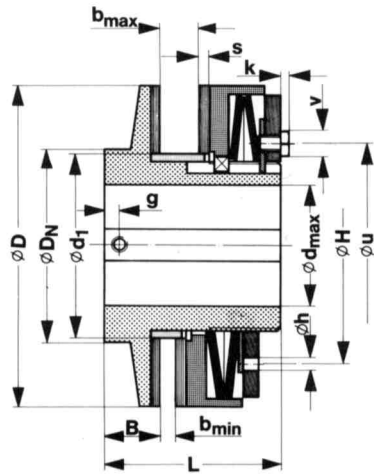


Fig. 5

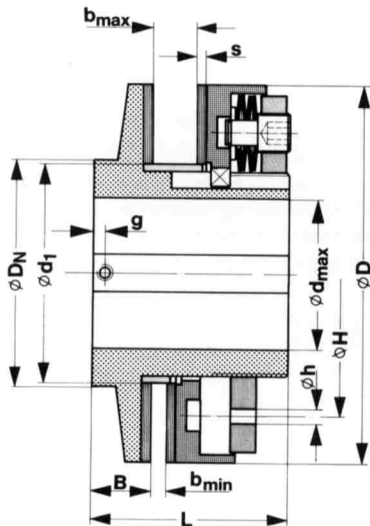
ROBA <sup>®</sup> slip hub	Torque (Nm)	Application	Type	Page
<p><b>ROBA<sup>®</sup> standard slip hub</b></p> 	<p>2 ÷ 50 000</p>	<p>Safety clutch for machine drives requiring protection against overloads. When the preset overload torque is reached, the drive element slips and consequently prevents damage to the drive system.</p>	<p>100. _ _ _</p>	<p><b>8</b></p>
<p><b>ROBA<sup>®</sup>-sproc</b></p> 	<p>6 ÷ 1 400</p>	<p>Slip hub complete with chain sprocket as a reasonably priced drive element with a high safety factor for all chain drives.</p>	<p>110. _ _ _</p>	<p><b>10</b></p>
<p><b>ROBA<sup>®</sup> slip hub with rustproof friction lining</b></p> 	<p>6 ÷ 2 400</p>	<p>For drives in the open air, for particularly strong influences caused by moisture or for long stoppages.</p>	<p>100. _ 2 _</p>	<p><b>11</b></p>
<p><b>ROBA<sup>®</sup>-min</b></p> 	<p>8 ÷ 1 100</p>	<p>For drive elements with particularly small diameters and very large overall widths. Larger overall width than type 100 but capable of transmitting lower torques.</p>	<p>121. _ _ _ 123. _ _ _</p>	<p><b>12</b></p>

ROBA <sup>®</sup> slip hub	Torque (Nm)	Application	Type	Page
<p><b>ROBA<sup>®</sup>-max</b></p> 	<p>2 ÷ 2 100</p>	<p>For drive elements (chain sprockets, gears, etc.) with especially large overall widths (e.g. double-row chain sprockets). Same overall width as type 123, but higher torques can be transmitted.</p>	<p>170. . . .</p>	<p>14</p>
<p><b>ROBA<sup>®</sup>-lastic minimum play</b></p> 	<p>2 ÷ 1 400</p>	<p>Minimum play, torsionally flexible safety clutch to connect two shafts. Elastic clutch component designed as a torsionally elastic, resilient push-fit clutch.</p>	<p>135. . . .</p>	<p>16</p>
<p><b>ROBA<sup>®</sup>-lastic positive</b></p> 	<p>240 ÷ 50 000</p>	<p>Positive, torsionally flexible overload clutch for connecting two shafts. The flexible coupling section is designed as a torsionally flexible, resilient slip-on coupling.</p>	<p>132. . . .</p>	<p>17</p>
<p><b>ROBA<sup>®</sup> slip hub with needle bearing</b></p> 	<p>9 ÷ 1 260</p>	<p>For drive elements with high radial loads, high slipping frequency and increased true running accuracy (e. g. gears).</p>	<p>160. . . .</p>	<p>18</p>
<p><b>ROBA<sup>®</sup>-tron overspeed monitor</b></p> 		<p>To monitor slip or breakage of drives with ROBA<sup>®</sup> slip hubs. The ROBA<sup>®</sup>-tron overspeed monitor prevents prolonged slipping of the drive element for example.</p>	<p>051.00 . . 6</p>	<p>24</p>

sizes 0 – 12    Type 100.1 \_\_ \_\_ , 100.2 \_\_ \_\_  
sizes 1 – 5    Type 100.3 \_\_ \_\_



Type 100.110 sizes 0 – 5



Type 100.110 sizes 6 – 12

**Order example:**

To be included when ordering, please state:	size	type	bore Ø d <sup>H7</sup>	keyway to DIN	width of the drive element b	with speed monitoring system
Order number:		100. __ __				see page 24

0 ÷ 12 →

- \* lower torque range .....1
- \* medium torque range .....2
- \* high torque range 6) .....3
- standard friction lining .....1
- friction lining for oil bath 7) .....4
- special low-friction material 7) .....5
- adjusting nut standard .....0
- adjusting nut with radial adjustment 8) .....1
- adjusting nut for triple layer .....2
- (with high torque range: sizes 3–5)

depending on size; when not stated we will deliver with a bearing bushing for maximum overall width  $b_{max}$ . For smaller drive elements the bearing bushing is shortened, see page 19.

6885/1  
6885/3  
depending on size

\* see technical data, limiting torque for overload  
6) only sizes 1 ÷ 5  
7) available torques on request  
8) only sizes 0 ÷ 5

**Example:** Order number 4/100.210/50/6885-1/15



## Technical data

size	max. torque for overload				speed $n_{max}$ rpm	weight pilot bored kg
	type 100.11 _ Nm	type 100.21 _ Nm	type 100.31 _ sizes 1, 2 Nm	type 100.312 sizes 3, 4, 5 Nm		
0	2 – 10	10 – 20	–	–	8500	0,3
01	6 – 30	30 – 60	–	–	6600	0,6
1	14 – 70	70 – 130	130 – 200	–	5600	0,9
2	26 – 130	130 – 250	250 – 400	–	4300	1,6
3	50 – 250	250 – 550	–	550 – 800	3300	3,1
4	110 – 550	550 – 1100	–	1100 – 1600	2700	5,4
5	140 – 700	700 – 1400	–	1400 – 2100	2200	9,0
6	240 – 1200	1200 – 2400	–	–	1900	12,4
7	400 – 2000	2000 – 4000	–	–	1600	21,2
8	680 – 3400	3400 – 6800	–	–	1300	30,7
9	1200 – 6000	6000 – 12000	–	–	1100	79
10	2000 – 10000	10000 – 20000	–	–	920	125
11	3400 – 17000	17000 – 34000	–	–	780	179
12	5000 – 25000	25000 – 50000	–	–	690	278

## Dimensions

size	B	b <sub>min</sub>	b <sub>max</sub>	D	D <sub>N</sub>	d <sub>1</sub> <sup>H8</sup> *	d <sub>min</sub>	d <sub>max</sub>	G
0	8,5	2	6	45	45	35	7	20 <sup>1)</sup>	M4
01	16	3	8	58	40	40	12	22	2)
1	17	3	10	68	45	44	12	25	2.1)
2	19	4	12	88	58	58	15	35	3)
3	21	5	15	115	75	72	19	45	4)
4	23	6	18	140	90	85	25	55	M8
5	29	8	20	170	102	98	30	65	M8
6	31	8	23	200	120	116	40	80	M8
7	33	8	25	240	150	144	48	100	M10
8	35	8	25	285	180	170	60	120	M10
9	53	12	28	350	225	237	57	140	M12
10	60	15	35	415	255	270	80	160	M12
11	73	20	45	490	285	305	90	180	M16
12	79	25	55	555	315	335	100	200	M16

size	g	H	h	k	L	SW	s	u	v
0	3	37	3	– <sup>5)</sup>	33	–	2,5	37	2 <sup>5)</sup>
01	4	46	5	– <sup>5)</sup>	45	32	3	46	2,5 <sup>5)</sup>
1	5	50	5	1,3 <sup>5)</sup>	52	41	3	50	3 <sup>5)</sup>
2	5	67	6	3	57	50	3	67	10
3	5	84	6	5,5	68	65	4	84	13
4	6	104	7	5,5	78	80	4	97	13
5	8	125	8	5,5	92	90	5	109	13
6	8	150	10	–	102	105	5	–	–
7	8	185	10	–	113	135	5	–	–
8	8	230	10	–	115	165	5	–	–
9	9	290	10	–	162	220	6	–	–
10	10	340	10	–	185	250	6	–	–
11	11	400	10	–	222	280	7	–	–
12	11	450	10	–	250	310	7	–	–

1) up to Ø 19 keyway to DIN 6885/1  
over Ø 19 keyway to DIN 6885/3

2) up to Ø 12 M4  
over Ø 12 M5

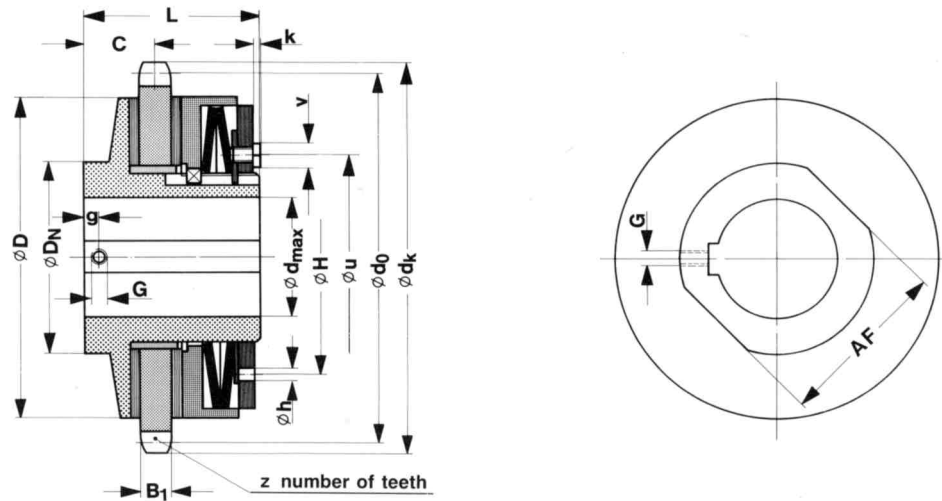
2.1) up to Ø 12 M4  
over Ø 12 up to Ø 17 M5  
over Ø 17 M6

3) up to Ø 17 M5  
over Ø 17 M6

4) up to Ø 22 M6  
over Ø 22 M8

5) hexagon socket  
countersunk head  
cap screw to  
DIN 7991

\* fit indication H8 refers to bore of the output element



Type 110.110

ROBA<sup>®</sup>-sproc is a standard chain sprocket fully assembled with the appropriate ROBA<sup>®</sup> slip hub.

The smallest possible chain sprocket for the corresponding slip hub has been chosen for the ROBA<sup>®</sup>-sproc.

The ROBA<sup>®</sup>-sproc is the most reasonably priced drive element for all chain drives with a high safety factor.

Sizes 6 to 12 of ROBA<sup>®</sup>-sproc available on request. In addition, all existing chain sprockets can be used, taking into account the overall dimensions of the ROBA<sup>®</sup> slip hub.

**Technical data and dimensions**

size	max. torque for overload		speed $n_{max}$ rpm	weight pilot bored kg	$B_1$	C	D	$D_N$	$d_{min}$	$d_{max}$	$d_0$
	type 110.11_ Nm	type 110.21_ Nm									
01	6 – 30	30 – 60	6600	0,7	5,0	18,5	58	40	12	22	69,95
1	14 – 70	70 – 130	5600	1,1	7,0	20,5	68	45	12	25	89,24
2	26 – 130	130 – 250	4300	1,9	7,0	22,5	88	58	15	35	109,40
3	50 – 250	250 – 550	3300	3,8	10,5	26,25	115	75	19	45	133,86
4	110 – 550	550 – 1100	2700	6,9	15,3	30,65	140	90	25	55	170,43
5	140 – 700	700 – 1400	2200	11,2	15,3	36,65	170	102	30	65	194,59

size	$d_k$	G	g	H	h	k	L	SW	u	v	z	chain for standard chain sprocket
01	74	1)	4	46	5	— <sup>4)</sup>	45	32	46	2,5 <sup>4)</sup>	23	3/8" x 7/32"
1	95	1.1)	5	50	5	1,3 <sup>4)</sup>	52	41	50	3 <sup>4)</sup>	22	1/2" x 5/16"
2	115	2)	5	67	6	3	57	50	67	10	27	1/2" x 5/16"
3	142,5	3)	5	84	6	5,5	68	65	84	13	22	3/4" x 7/16"
4	182	M8	6	104	7	5,5	78	80	97	13	21	1" x 17 mm
5	206	M8	8	125	8	5,5	92	90	109	13	24	1" x 17 mm

1) up to Ø 12 M4 over Ø 12 M5

1.1) up to Ø 12 M4 over Ø 12 to Ø 17 M5 over Ø 17 M6

2) up to Ø 17 M5 over Ø 17 M6

3) up to Ø 22 M6 over Ø 22 M8

4) hexagon socket countersunk head cap screw to DIN 7991

**Order example:**

To be included when ordering, please state:	size	type	bore Ø d <sup>H7</sup>	keyway to DIN	with speed monitoring system
Order number:		110 . _ _ _ _			see page 24

01 ÷ 5

- \* lower torque range . . . . . 1
- \* medium torque range . . . . . 2
- standard friction lining . . . . . 1
- rustproof paired lining . . . . . 2
- friction lining for oil bath 5) . . . . . 4
- special low-friction material 5) . . . . . 5
- adjusting nut standard . . . . . 0
- adjusting nut with radial adjustment . . . . . 1

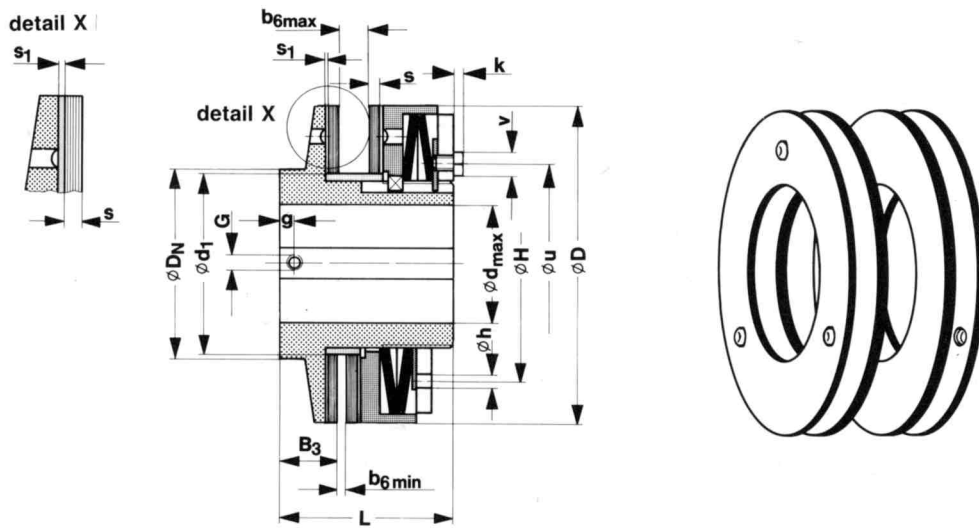
6885/1  
depending on size

\* see technical data, limiting torque for overload  
5) available torques on request

**Example:** Order number 3/110.211/40/6885-1

with rustproof friction lining

sizes 01 – 6 Type 100.12 \_ , 100.22 \_



Type 100.120

With gray cast iron and other ferrous surfaces, the standard friction lining 1 can form a rust compound which increases the coefficient of friction and, therefore, the torque quite considerably. However, a greatly increased torque no longer offers

the machine any safety. For this reason, ROBA® slip hubs can be equipped with friction lining 2, a rustproof pairing of friction linings, for use with drive units running in the open and exposed to moisture. The rustproof friction lining pairing consists of the

stainless steel discs used in the ROBA® slip hub, which work together, with a special friction lining which cannot stick. We have tested this friction lining pairing under tropical conditions and, even after being stationary for many weeks in a corrosive

climate, it still gave an absolute identical torque. ROBA® slip hubs with rustproof friction lining offer increased safety to drive units in the open and where moisture has a particular influence or there are long stoppages.

## Technical data and dimensions

size	max. torque for overload		speed $n_{max}$ rpm	weight pilot bored kg	$B_3$	$b_{6\ min}$	$b_{6\ max}$	D	$D_N$	$d_1$ H8 *
	type 100.12 _ Nm	type 100.22 _ Nm								
01	6 – 30	30 – 60	6600	0,6	17	1	6	58	40	40
1	14 – 70	70 – 130	5600	0,9	18	1	8	68	45	44
2	26 – 130	130 – 250	4300	1,7	20	2	10	88	58	58
3	50 – 250	250 – 550	3300	3,2	22	3	13	115	75	72
4	110 – 550	550 – 1100	2700	5,5	24,5	3	15	140	90	85
5	140 – 700	700 – 1400	2200	9,2	30,5	5	17	170	102	98
6	240 – 1200	1200 – 2400	1900	12,9	32,5	5	20	200	120	116

size	$d_{min}$	$d_{max}$	G	g	H	h	k	L	s	$s_1$	u	v
01	12	22	1)	4	46	5	– 4)	45	3	1	46	2,5 4)
1	12	25	1.1)	5	50	5	1,3 4)	52	3	1	50	3 4)
2	15	35	2)	5	67	6	3	57	3	1	67	10
3	19	45	3)	5	84	6	5,5	68	4	1	84	13
4	25	55	M8	6	104	7	5,5	78	4	1,5	97	13
5	30	65	M8	8	125	8	5,5	92	5	1,5	109	13
6	40	80	M8	8	150	10	–	102	5	1,5	–	–

1) up to Ø 12 M4  
over Ø 12 M5

1.1) up to Ø 12 M4  
over Ø 12 to Ø 17 M5  
over Ø 17 M6

2) up to Ø 17 M5  
over Ø 17 M6

3) up to Ø 22 M6  
over Ø 22 M8

4) hexagon socket countersunk head cap screw  
to DIN 7991

\* fit indication H8 refers to bore of the output element

## Order example:

To be included when ordering, please state:	size	type	bore Ø d H7	keyway to DIN	width of the drive element $b_6$	with speed monitoring
Order number:		100. _ 2 _				see page 24

01 ÷ 6

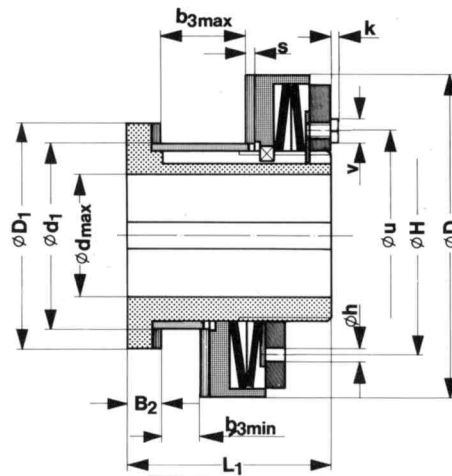
\* lower torque range ..... 1  
\* medium torque range ..... 2  
adjusting nut standard ..... 0  
adjusting nut with radial adjustment 5) 1

\* see technical data, max. torque for overload  
5) only sizes 01 ÷ 5

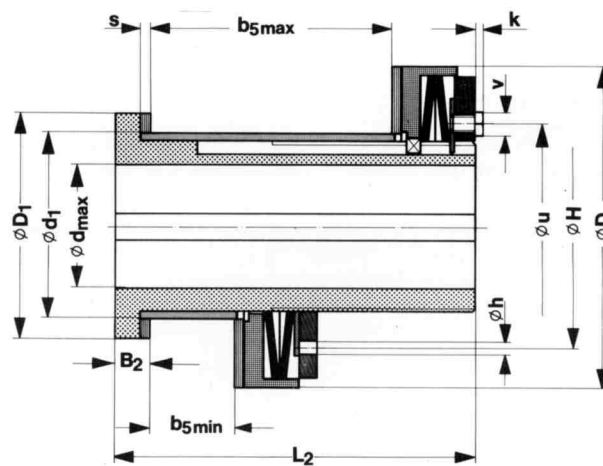
depending on size; when not stated, we deliver with a bearing bushing for maximum overall width  $b_{6\ max}$ . For smaller drive elements the bearing bushing is shortened, see page 19. 6885/1 depending on size

Example: Order number 4/100.220/50/6885-1/12

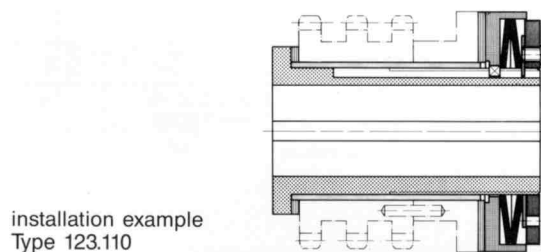
sizes 1 – 5 Type 121.1 \_\_, 121.2 \_\_  
sizes 1 – 5 Type 123.1 \_\_, 123.2 \_\_



Type 121.110



Type 123.110



installation example  
Type 123.110

ROBA<sup>®</sup>-min Types 121 and 123 are slip hubs for drive elements, chain sprockets or gears with especially small diameters.

ROBA<sup>®</sup>-min are used in particular, for high transmission ratios or else for double or triple-row chain sprockets or wide

gears. When compared with the standard Type 100, the ROBA<sup>®</sup>-min Types 121 and 123 transmit lower torques.

An advantage of Types 121 and 123 is that the drive element comes very close to the shaft bearing as a result of the short hub shoulder.

## Technical data

size	max. torque for overload		speed $n_{max}$ rpm	weight pilot bored	
	type 121.11 _ type 123.11 _ Nm	type 121.21 _ type 123.21 _ Nm		type 121. _ _ _ kg	type 123. _ _ _ kg
1	8 – 40	40 – 80	2800	0,8	1,0
2	16 – 80	80 – 160	2200	1,6	2,2
3	40 – 200	200 – 400	1600	3,2	4,2
4	80 – 400	400 – 800	1400	5,7	7,9
5	110 – 550	550 – 1100	1100	9,1	13,5

## Dimensions

size	B <sub>2</sub>	b <sub>3</sub> min	b <sub>3</sub> max	b <sub>5</sub> min	b <sub>5</sub> max	D	D <sub>1</sub>	d <sub>1</sub> H8 *	d min
1	8	10	15	15	43	68	59	44	12
2	10	12	19,5	19,5	53,5	88	77	58	15
3	13,5	15	27	27	62	115	89,5	72	19
4	16	18	38	38	91,5	140	104	85	25
5	18	20	44	44	126	170	119,5	98	30

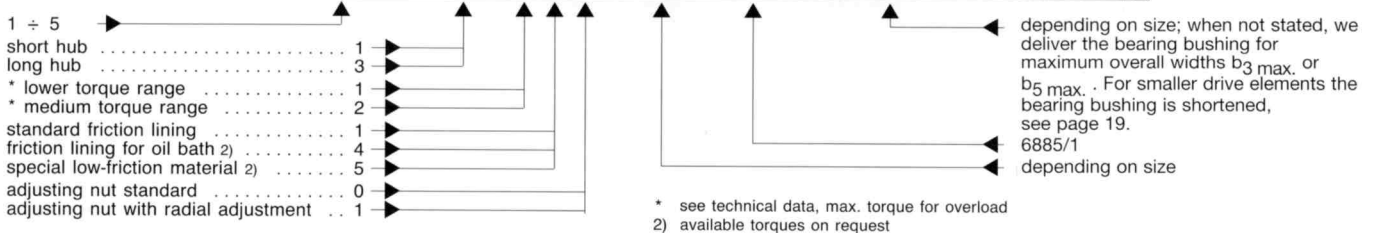
size	d <sub>max</sub>	H	h	k	L <sub>1</sub>	L <sub>2</sub>	s	u	v
1	25	50	5	1,3 <sup>1)</sup>	48	76	3	50	3 <sup>1)</sup>
2	35	67	6	3	56	90	3	67	10
3	45	84	6	5,5	73	108	4	84	13
4	55	104	7	5,5	93	146,5	4	97	13
5	65	125	8	5,5	107	188,5	5	109	13

1) hexagon socket countersunk head cap screw to DIN 7991

\* fit indication H8 refers to bore of the output element

## Order example:

To be included when ordering please state:	size	type	bore ∅d H7	keyway to DIN	widths of the drive elements b <sub>3</sub> resp. b <sub>5</sub>	with speed monitoring system
Order number:		12 _ . _ _ _				see page 24



**Example:** Order number 2/123.210/30/6885-1/50

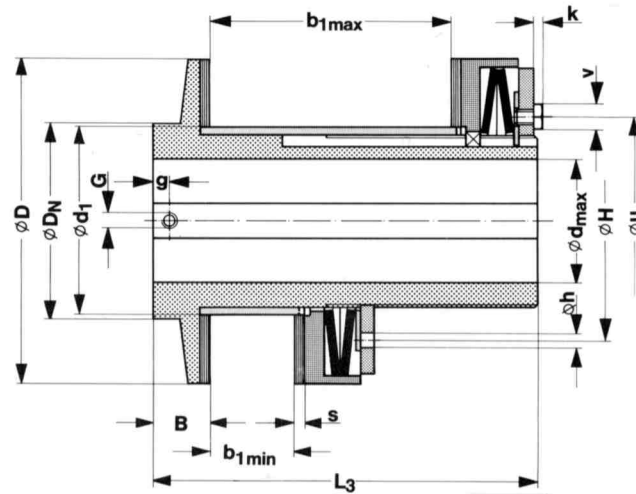


sizes 0 – 8

Type 170.1 \_\_, 170.2 \_\_

sizes 1 – 5

Type 170.3 \_\_



sizes 0 – 5 Type 170.110

ROBA<sup>®</sup> slip hubs are used to provide overload protection in machine drives with chain sprockets, V-belt pulleys or gears. Type 170 has a longer

hub than the standard Type 100. As a result, Type 170 is particularly suitable for wide drive elements. The permissible maximum torques and the

diameter correspond to the standard model. ROBA<sup>®</sup>-max Type 170 can transmit a higher torque than the ROBA<sup>®</sup>-min Type 123

with the same overall width. Type 170 can be used for all mechanical engineering applications.

Technical data

size	max. torque for overload				speed n <sub>max</sub> rpm	weight pilot bored kg
	type 170.11 _ Nm	type 170.21 _ Nm	type 170.31 _ sizes 1, 2 Nm	type 170.312 sizes 3, 4, 5 Nm		
0	2 – 10	10 – 20	–	–	8500	0,4
01	6 – 30	30 – 60	–	–	6600	0,8
1	14 – 70	70 – 130	130 – 200	–	5600	1,2
2	26 – 130	130 – 250	250 – 400	–	4300	2,4
3	50 – 250	250 – 550	–	550 – 800	3300	4,6
4	110 – 550	550 – 1100	–	1100 – 1600	2700	8,5
5	140 – 700	700 – 1400	–	1400 – 2100	2200	14,9

Dimensions

size	B	b <sub>1</sub> min	b <sub>1</sub> max	D	D <sub>N</sub>	d <sub>min</sub>	d <sub>max</sub>	d <sub>1</sub> H8 *
0	8,5	9	25	45	45	10	20 <sup>1)</sup>	35
01	16	12	33	58	40	12	22	40
1	17	15	43	68	45	12	25	44
2	19	19,5	53,5	88	58	15	35	58
3	21	27	62	115	75	20	45	72
4	23	38	91,5	140	90	25	55	85
5	29	44	126	170	102	30	65	98

size	G	g	H	h	k	L <sub>3</sub>	s	u	v
0	M4	3	37	3	–	50	2,5	37	2 <sup>5)</sup>
01	2) <sup>2)</sup>	4	46	5	– <sup>5)</sup>	70	3	46	2,5 <sup>5)</sup>
1	2.1) <sup>2)</sup>	5	50	5	1,3 <sup>5)</sup>	85	3	50	3 <sup>5)</sup>
2	3) <sup>2)</sup>	5	67	6	3	99	3	67	10
3	4) <sup>2)</sup>	5	84	6	5,5	115,5	4	84	13
4	M8	6	104	7	5,5	153,5	4	97	13
5	M8	8	125	8	5,5	199,5	5	109	13

- 1) up to Ø 19 keyway to DIN 6885/1 over Ø 19 keyway to DIN 6885/3
- 2) up to Ø 12 M4 over Ø 12 M5
- 2.1) up to Ø 12 M4 over Ø 12 up to Ø 17 M5 over Ø 17 M6
- 3) up to Ø 17 M5 over Ø 17 M6
- 4) up to Ø 22 M6 over Ø 22 M8
- 5) hexagon socket countersunk head cap screw to DIN 7991

\* fit indication H8 refers to bore of the output element

Order example:

To be included when ordering, please state:	size	type	bore Ø d <sup>H7</sup>	keyway to DIN	width of the drive element b <sub>1</sub>	with speed monitoring system
Order number:		170 . _ _ _				see page 24

0 ÷ 5 →

- \* lower torque range .....1
- \* medium torque range .....2
- \* high torque range .....3
- standard friction lining .....1
- rustproof paired lining 8) .....2
- friction lining for oil bath 7) .....4
- special low-friction material 7) .....5
- adjusting nut standard .....0
- adjusting nut with radial adjustment .....1
- adjusting nut for triple layer .....2
- (with high torque range: sizes 3–5)

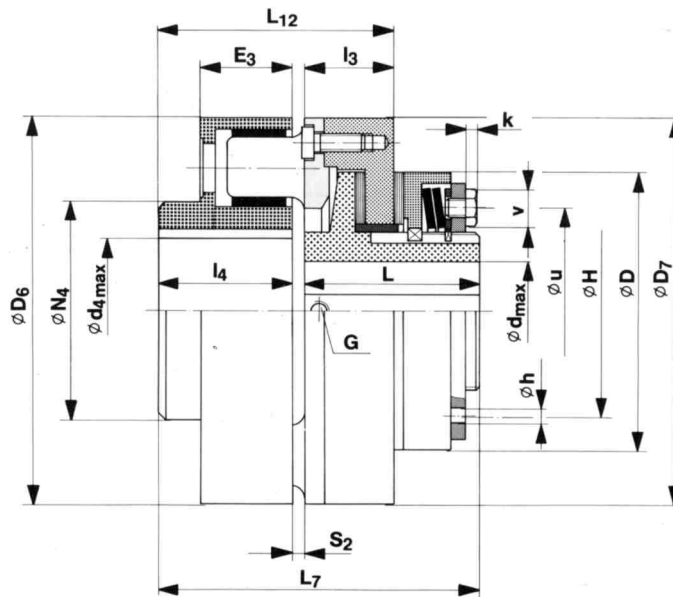
depending on size; when not stated, we deliver the bearing bushing for maximum overall width b<sub>1max</sub>. For smaller drive elements the bearing bushing is shortened, see page 19.

6885/1  
6885/3  
depending on size

\* see technical data, limiting torque for overload  
6) only sizes 1 ÷ 5  
7) available torques on request  
8) only sizes 01 ÷ 5

Example: Order number 4/170.210/50/6885-1/80

sizes 0 – 5 Type 135.1 \_ \_ , 135.2 \_ \_



sizes 0 – 5 Type 135.210

ROBA<sup>®</sup>-lastic Type 135 is a flexible safety coupling with adjustable torque for connecting

two shafts. The flexible coupling element is designed as a simple plug coupling.

The torque is transmitted via flexible rubber buffers made of wear and oil resistant plastic

material insensitive to temperature changes.

**Technical data and dimensions**

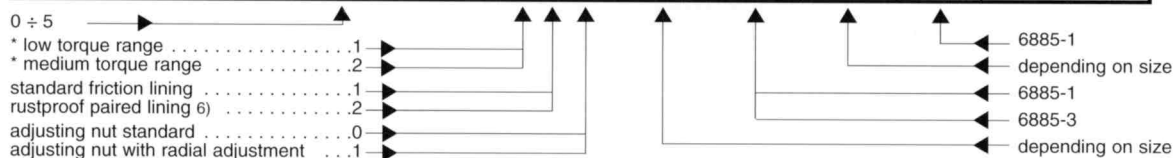
size	limiting torque for overload		speed n <sub>max</sub> rpm	weight pilot bored kg	D	D <sub>6</sub>	D <sub>7</sub>	d <sub>min</sub>	d <sub>max</sub>	d <sub>4 min</sub>	d <sub>4 max</sub>
	type 135.11 _ Nm	type 135.21 _ Nm									
0	2 – 10	10 – 20	7000	1,3	45	80	80	7	20 <sup>1)</sup>	11	30
01	6 – 30	30 – 60	6500	3,0	58	105	105	12	22	11	42
1	14 – 70	70 – 130	5600	3,2	68	105	105	12	25	11	42
2	26 – 130	130 – 250	4300	6,5	88	135	135	15	35	13	60
3	50 – 250	250 – 550	3300	10,1	115	160	160	19	45	25	60
4	110 – 550	550 – 1100	2700	19,5	140	198	198	25	55	30	75
5	140 – 700	700 – 1400	2200	23,4	170	198	208	30	65	50	75

size	E <sub>3</sub>	G	H	h	k	L	L <sub>7</sub>	L <sub>12</sub>	l <sub>3</sub>	l <sub>4</sub>	N <sub>4</sub>	S <sub>2</sub>	u	v
0	23	M4	37	3	– <sup>5)</sup>	33	66	48	14	30	50 <sub>h11</sub>	4	37	2 <sup>5)</sup>
01	32	2)	46	5	– <sup>5)</sup>	45	91	68	22	42	65 <sub>h11</sub>	4	46	2,5 <sup>5)</sup>
1	32	2.1)	50	5	1,3 <sup>5)</sup>	52	98	69	23	42	65 <sub>h11</sub>	4	50	3 <sup>5)</sup>
2	36	3)	67	6	3	57	116	86	27	55	85 <sub>h11</sub>	4	67	10
3	38	4)	84	6	5,3	68	129	92	31	55	90	6	84	13
4	47	M8	104	7	5,3	78	166	121	33	82	115	6	97	13
5	47	M8	125	8	5,3	92	180	127	39	82	115	6	109	13

- 1) up to Ø 19 keyway to DIN 6885-1 over Ø 19 keyway to DIN 6885-3    2) up to Ø 12 M4 over Ø 12 M5    2.1) up to Ø 12 M4 over Ø 12 up to Ø 17 M5 over Ø 17 M6    3) up to Ø 17 M5 over Ø 17 M6    4) up to Ø 22 M6 over Ø 22 M8    5) hexagon socket countersunk head cap screw to DIN 7991  
6) from size 01 on

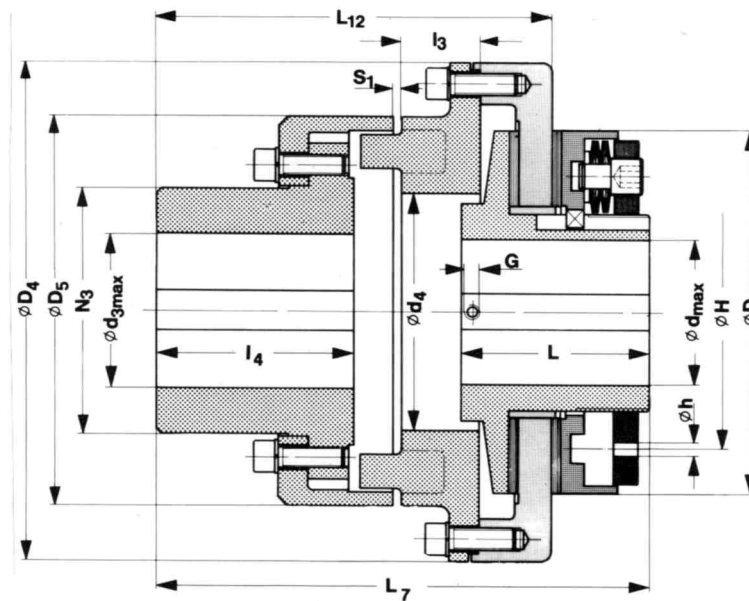
**Order example:**

To be included when ordering, please state:	size	type	bore Ø d <sup>H7</sup>	keyway to DIN	bore Ø d <sub>4</sub> <sup>H7</sup>	keyway to DIN	with speed monitoring system
Order number:		135. _ _ _					see page 24



\* see technical data, limiting torque for overload

**Example:** Order number 5/135.210/60/6885-1/60/6885-1



sizes 6 – 12 Type 132.110

ROBA®-lastic Type 132 is a positive, flexible safety coupling with adjustable torque for connecting two shafts.

The flexible coupling is designed as a positive claw coupling. The input and output can be disconnected without dismantling

the coupling. The torque is transmitted via an interchangeable flexible intermediate ring made of highly damping, oil resistant

material insensitive to temperature changes.

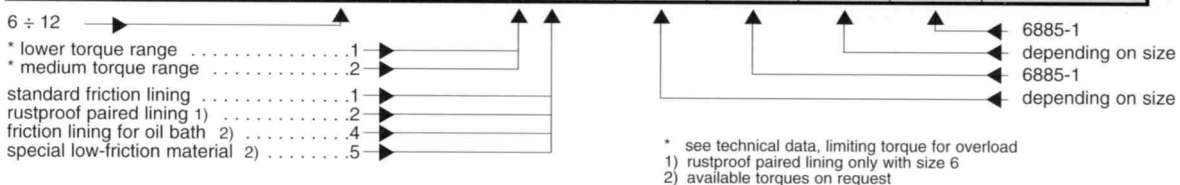
### Technical data and dimensions

size	limiting torque for overload		speed $n_{max}$ rpm	weight pilot bored kg	D	D <sub>4</sub>	D <sub>5</sub>	d <sub>min</sub>	d <sub>max</sub>
	type 132.11 _ Nm	type 132.21 _ Nm							
6	240 – 1200	1200 – 2400	1900	48	200	274	214	40	80
7	400 – 2000	2000 – 4000	1600	70	240	314	240	48	100
8	680 – 3400	3400 – 6800	1300	98	285	344	265	60	120
9	1200 – 6000	6000 – 12000	1100	200	350	430	330	57	140
10	2000 – 10000	10000 – 20000	920	330	415	500	415	80	160
11	3400 – 17000	17000 – 34000	780	506	490	615	480	90	180
12	5000 – 25000	25000 – 50000	690	738	555	692	575	100	200

size	d <sub>3 min</sub>	d <sub>3 max</sub>	d <sub>4</sub>	G	H	h	L	L <sub>7</sub>	L <sub>12</sub>	l <sub>3</sub>	l <sub>4</sub>	N <sub>3</sub>	S <sub>1</sub>
6	50	95	130	M8	150	10	102	267	216	42	107	135,5	4 ± 2
7	50	100	145	M10	185	10	113	307	247	45	117	146	4 ± 2
8	60	115	160	M10	230	10	115	337	282	50	137	164	5,5 ± 2
9	70	135	200	M12	290	10	162	416	332	56	156	208	8 ± 2,5
10	85	180	270	M12	340	10	185	478	383	65	196	275	8 ± 2,5
11	85	190	320	M16	400	10	222	537	423	65	220	289	8 ± 2,5
12	110	240	400	M16	450	10	250	585	454	65	240	368	8 ± 2,5

### Order example:

To be included when ordering, please state:	size	type	bore Ø d <sup>H7</sup>	keyway to DIN	bore Ø d <sub>3</sub> <sup>H7</sup>	keyway to DIN	with speed monitoring system
Order number:		132. __ _ 0					see page 24



Example: Order number 6/132.210/60/6885-1/80/6885-1

with needle bearing

sizes 1 – 5 Type 160.1 \_\_, 160.2 \_\_

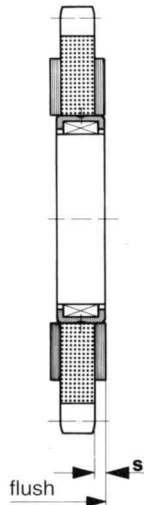


Fig. 1

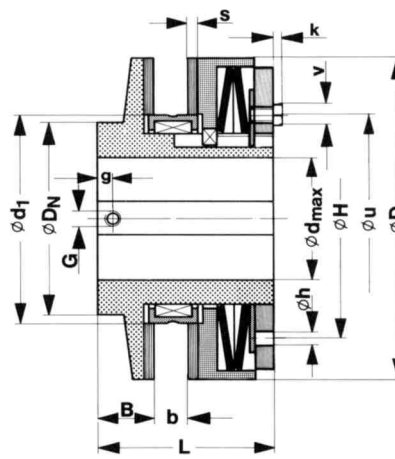


Fig. 2 Type 160.110

ROBA<sup>®</sup> slip hubs are used to provide overload protection in machine drives with sprockets, V-belt pulleys or gears. The difference between the Type 160 and the standard Type 100 is that the former has a needle bearing instead of a bronze

bearing bushing. As a result, Type 160 is particularly suitable when there are high radial loads, high slipping frequencies and increased true running accuracy (gears). With low torque settings and low speeds, it can be used as a continuous

slip clutch. The needle bearing is free from wear, in contrast to the bronze bearing bushing. The drive element is pressed onto the needle bearing as shown in fig. 1. It must be ensured that the friction lining is flush with the needle bearing

on the right-hand side. The needle bearing with its drive element and the two friction linings are then pushed onto the hub. Type 160 can be used throughout the mechanical engineering industry.

**Technical data and dimensions**

size	max. torque for overload		speed n <sub>max</sub> rpm	weight pilot bored kg	B	b±0,5	D	D <sub>N</sub>
	type 160.11 _ Nm	type 160.21 _ Nm						
1	9 – 45	45 – 90	4200	0,9	17	7	68	45
2	23 – 115	115 – 230	3200	1,7	19	10,3	88	75
3	46 – 230	230 – 460	2400	3,3	21	12,5	115	89,5
4	80 – 400	400 – 800	2000	5,5	23	16	140	90
5	126 – 630	630 – 1260	1600	9,2	29	18	170	102

size	d <sub>min</sub>	d <sub>max</sub>	d <sub>1</sub> N7 *	G	g	H	h	k	L	s	u	v
1	11	25	47	1)	4	50	5	1,3 <sup>3)</sup>	52	3	50	3 <sup>3)</sup>
2	15	35	63	2)	4	67	6	3	57	3	67	10
3	15	45	78	M6	4	84	6	5,5	68	4	84	13
4	25	55	95	M8	5,5	104	7	5,5	78	4	97	13
5	30	65	110	M8	6	125	8	5,5	92	5	109	13

1) up to ∅ 12 M4  
over ∅ 12 to ∅ 17 M5  
over ∅ 17 M6

2) up to ∅ 17 M5  
over ∅ 17 M6

3) hexagon socket countersunk head cap screw to DIN 7991

\* fit indication N7 refers to bore of the output element

**Order example:**

To be included when ordering, please state:	size	type	bore ∅ d H7	keyway to DIN	with speed monitoring system
Order number:		<b>160 . . . . .</b>			see page 24

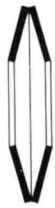
- 1 ÷ 5 →
- \* lower torque range ..... 1 →
- \* medium torque range ..... 2 →
- standard friction lining ..... 1 →
- special low-friction material 4) ..... 5 →
- adjusting nut standard ..... 0 →
- adjusting nut with radial adjustment .. 1 →
- 6885/1  
depending on size
- \* see technical data, limiting torque for overload
- 4) available torques on request

**Example:** Order number: 3/160.210/40/6885-1



## Technical explanations

Single layer



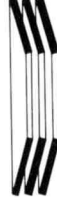
sizes 0 – 12  
Fig. 1

Double layer



sizes 0 – 12  
Fig. 2

Triple layer



sizes 1 – 5  
Fig. 3

Single cup spring layer

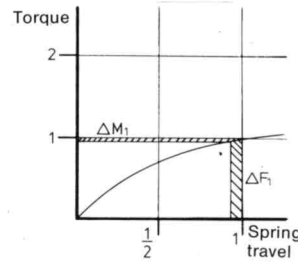


Fig. 4

Double cup spring layer

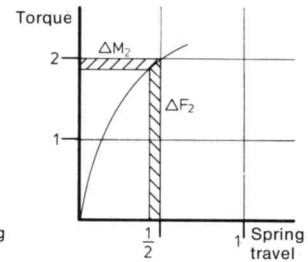


Fig. 5

## Torques – Cup spring layers

The cup spring layers shown in figs. 1 to 3 correspond to the standard model of our ROBA® slip hub. Each number of layers gives a different spring characteristic or spring force (torque). The following can be applied as a rule of thumb for using ROBA® slip hubs:

ROBA® slip hub for high friction work and low torque: single-layer cup springs.

ROBA® slip hub for moderate friction work and higher torque: double-layer cup springs.

ROBA® slip hub for low friction work and very high torque: triple-layer cup springs.

The torque curve of the ROBA® slip hubs, in case of friction lining wear, can be seen from figures 4 and 5. Figure 4 shows that the drop in torque is very low as a result of wear when using single-layer cup springs.

From figure 5 it can be seen that the change in torque for double-layer cup springs is already greater and that, with triple-layer springs, there is the greatest drop in torque.

However, the cup springs are designed with a relatively gentle characteristic so that high wear paths are obtained without a considerable drop in torque.

**For special applications, weaker cup springs are also available for the individual slip hub sizes, making it possible to go below the minimum torques.**

In addition, each individual application can be satisfied with different cup spring layers (e. g. combination of double and single layers).

Figures 4 and 5 show that a torque setting in the uppermost quarter of the spring characteristic (torques) gives a particularly uniform torque, as the spring characteristic has its gentlest slope in this area.

**Attention! During the running in phase (bedding in of friction components) or after long downtimes, or long periods of slippage the torque capacity may vary due to changes in the coefficient of friction and lining area.**

## Friction linings

As shown in table 1 opposite, 4 different types of friction linings are available for the various applications. The torque and speed details given in the tables of dimensions apply to standard friction linings for dry

running. The corresponding values for the respective application must be requested for other friction linings. For details of rustproof friction lining pairings, see page 11.

Friction lining number	Application
1	Standard for dry running
2	Rustproof friction lining pairing (for further details, see page 11)
4	Bronze friction lining for oil bath
5	Special low-friction material

Table 1

## Attachment to the shaft

The ROBA® slip hub can be attached to the stub shaft in two different ways: as shown in figure 6, radial attachment of the ROBA® slip hub with a keyway and axial locking by means of a

set screw or according to fig. 7, radial attachment of the ROBA® slip hub with a keyway and axial locking with a holding disc.

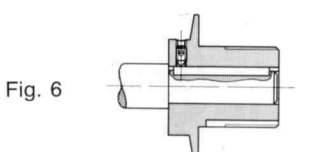


Fig. 6

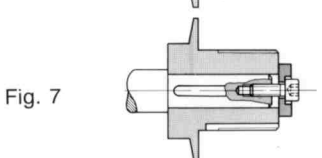


Fig. 7

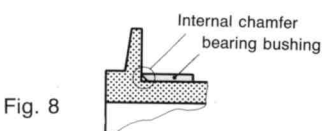


Fig. 8

## Bearing bushing

If the order contains no details regarding the overall width of the drive element (chain sprocket, etc.), we supply the bearing bushing (fig. 8) 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 must be assembled with the internal chamfer at the front, as shown in figure 8.

## Bearing bushing width:

$$l = b + 1,5 \cdot s + 0,5 \quad [\text{mm}]$$

$$l_1 = b + 1,5 \cdot s + 2 \cdot s_1 \quad [\text{mm}] \quad (\text{for Types 100.120.220})$$

- l [mm] = bearing bushing width (tolerance  $-0,2$  mm)
- $l_1$  [mm] = bearing bushing width for slip hubs with rustproof lining (see page 11)
- b [mm] = max. overall width of the drive element (rated dimension + tolerance)
- s [mm] = friction lining width (see page 8)
- $s_1$  [mm] = width of the rustproof disc (see page 11)

When there are high radial loads and slipping frequencies, we recommend the ROBA® slip hub with needle bearing, Type 160 (page 18).

**Technical explanations**

**Adjusting nuts**

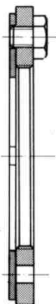


Fig. 9  
adjusting nut 0  
sizes 0-5



Fig. 10  
adjusting nut 0  
sizes 6-12

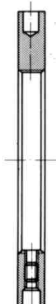


Fig. 11  
adjusting nut 1  
sizes 0-5

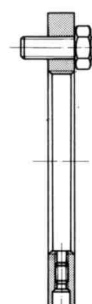


Fig. 12  
adjusting nut 2  
sizes 3-5

The standard adjusting nut for sizes 0 - 5 (adjusting nut 0, figure 9) is adjusted with a face wrench (figure 13). The adjusting nut is secured using a lock washer with 4 tabs, as well as 1 hexagon screw which is screwed through the adjusting nut into the holes in the lock washer. The standard adjusting nut for sizes 6 - 12

(adjusting nut 0, figure 10) has no lock washer. It is locked by a stud which presses radially into one of the four hub grooves. There is also the adjusting nut for radial adjustment for sizes 0 - 5. Here adjustment is made with a hook wrench (figure 14). With this type (adjusting nut 1, figure 11), the thrust washer has to

be shortened. In addition, protection against torsion is provided via a stud which is to be screwed in radially and which presses into one of the four hub grooves. In the case of triple-layer springs, adjusting nut 0 is used for ROBA<sup>®</sup> slip hubs, sizes 1 - 2 and adjusting nut 2 (figure 12) for sizes 3 - 5.

Adjusting nut 2 of the ROBA<sup>®</sup> slip hub has its torque set via six axial studs, in contrast to adjusting nut 0 of the ROBA<sup>®</sup> slip hub. It is secured with a radial stud, in the same way as adjusting nut 1. In case of high torque adjustments it might be necessary to lengthen the arm at the face or hook wrenches (for example: lengthening by means of a tube).

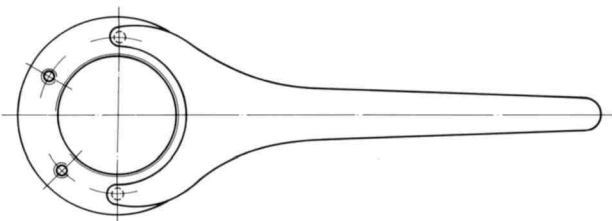


Fig. 13

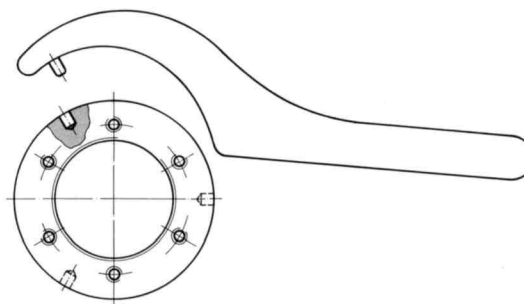


Fig. 14

**Maintenance – Assembly**

The ROBA<sup>®</sup> slip hub is easy to clean as a result of its smooth design. When the friction linings become worn, the ROBA<sup>®</sup> slip hub has to be adjusted and,

in the case of more extensive wear, the friction linings must be changed. Otherwise, the ROBA<sup>®</sup> slip hub needs no maintenance at all.

During assembly, it must be ensured that no oil or grease gets onto the friction surfaces. In addition, the drive element must have a precision ground

surface and precisely parallel faces in the region of the friction surface.

## Adjusting the torque

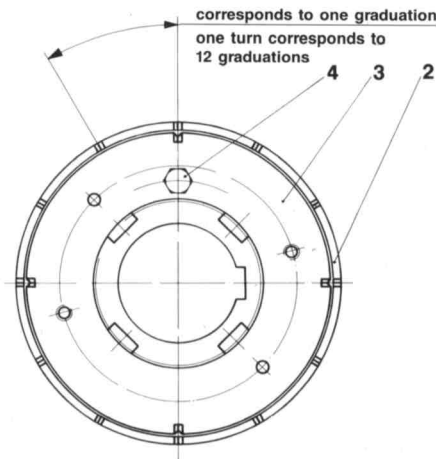


Fig. 15 sizes 0 – 5

In case of ROBA® slip hubs of sizes 1 - 5, the thrust washer (item 2) has twelve markings on the back (24 markings in case of size 0) and the adjusting nut (item 3) has four markings (figure 15). The adjusting nut and lock washer are moved manually until they make contact with the cup springs; the four notches in the adjusting nut and the notches in the thrust washer must coincide when doing so. The adjusting nut is

now turned by the number of graduations corresponding to the required torque. A setting chart (figure 17) is glued on the clutch and can be used to obtain the number of graduations to be set, to suit the torque. If a torque value falls between two graduations, the lower value should be set (positive spring force tolerance). After the torque has been set, the adjusting nut must be secured by tightening the set screw (item 4).

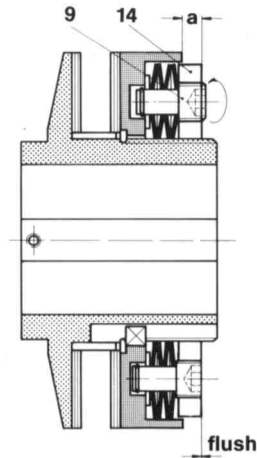
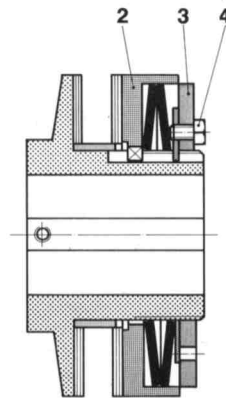


Fig. 16 sizes 6 – 12

In cases of ROBA® slip hubs of sizes 6 - 12, dimension „a“ (see figure 16) is determined for the requisite torque, using the chart (figure 18), and is set on the adjusting nut (item 14)

in accordance with figure 16. The cup spring supporting pins (item 9) are then tightened gradually in stages of approx. 1/4 turn until they are flush with the adjusting nut.

<b>mayr</b> ® power transmission D-87665 Mauerstetten	ROBA® slip hub size 3	Turn nut to contact cup spring; then count 12 TS = 1 turn		Single cup spring	Torque Nm	50	85	109	133	155	174	192	210	233	250
	Surface ground chain sprocket for friction lining no. 1 run-in condition				Graduations TS	5	8	10	12	14	16	18	20	23	26
					Double cup spring	Torque Nm	239	289	336	377	420	460	490	520	550
					Graduations TS	7	8	9	10	11	12	13	14	15	

Fig. 17

<b>mayr</b> ® power transmission D-87665 Mauerstetten	ROBA® slip hub size 6		spring bolt flush	Cup spring single	M [Nm]	240	300	420	540	660	780	900	1020	1140	1200
	Surface ground chain sprocket for friction lining no. 1 run-in condition				a =	14,9	14,8	14,4	14,0	13,6	13,2	12,7	12,2	11,7	11,4
					Cup spring double	M [Nm]	666	840	1080	1320	1560	1800	2040	2280	2400
					a =	12,6	12,4	12,2	12,0	11,8	11,6	11,4	11,1	10,9	

Fig. 18

No setting chart is attached to the ROBA® slip hub with triple spring layers. The torque is set as follows: Tighten the adjusting nut without using

excessive force, then tighten the individual screws in the adjusting nut uniformly approx. 1/4 turn until the requisite torque is obtained.

When being set for the first time, the ROBA® slip hub should slip a few times at 50 % of the maximum torque indicated in the catalogue in order to obtain a clean contact pattern on the friction lining.

Depending on the slipping frequency, occasional adjustment is necessary as a result of lining wear. The ROBA® slip hub can naturally be supplied complete with drive element and preset torque for an extra charge.

**Mounting examples**

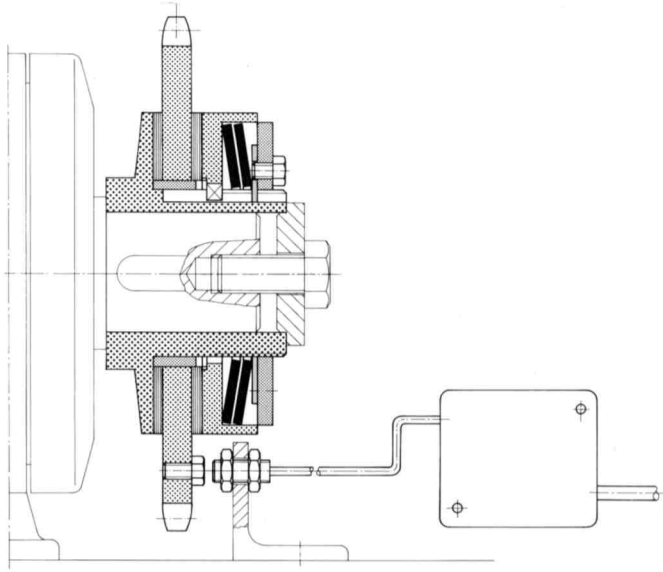


Fig. 19



ROBA<sup>®</sup> slip hub standard

Type: 100.210

Features: Simple, robust and reasonably priced torque limitation for protection against overload damages.

Application: Protection of drives with small drive elements, e.g. single chain sprocket.

Details: The axial location onto the shaft is made via a washer and screw, screwed into the central thread of the drive shaft. Slip monitoring is made via the ROBA<sup>®</sup>-tron overspeed monitor with external initiator.

Fig. 20



ROBA<sup>®</sup> slip hub with rustproof friction surface

Type: 100.220

Features: Slip hub with additional discs made of stainless steel to prevent rusting of the friction linings.

Application: Overload protection for machines that are exposed to humidity or long down periods.

Details: This slip hub is held on the shaft via a set screw which applies pressure onto the keyway. The rustproof discs do not adhere to the friction lining. The ROBA<sup>®</sup>-tron overspeed monitor prevents excessive slipping in the event of an overload.

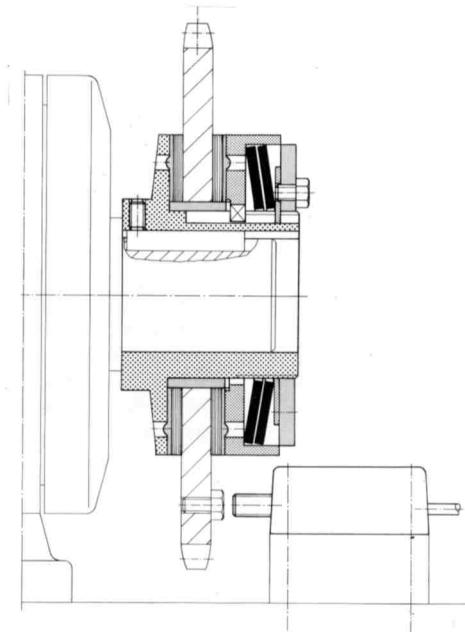


Fig. 21



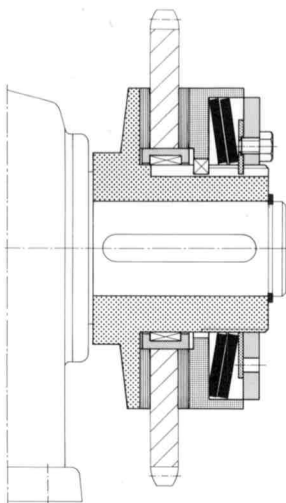
ROBA<sup>®</sup> slip hub with needle bearing

Type: 160.210

Features: Needle bearing in place of the standard bearing bushing; suitable for constant slipping at low speed and torque.

Application: Drives with high radial loads, high slipping frequency and increased true running accuracy.

Details: The axial attachment onto the shaft is made via set screw and washer, or, as indicated in the drawing, over a locking ring. The width of the drive element is not variable due to fixed length of the needle bearing.



## Mounting examples

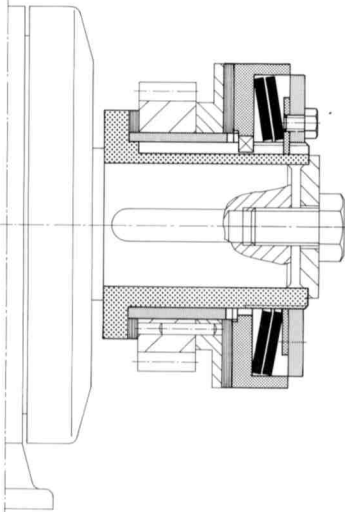


Fig. 22



ROBA®-min

Type: 121.210

Features: Slip hub with a standard friction lining and a small bronze friction lining on the hub collar side.

Application: For drive elements with very small outside diameters and large overall widths.

Details: The hub collar and the corresponding friction lining are of reduced diameter. On the side with the standard friction lining additionally an intermediate flange is attached between lining and drive element and pinned to the drive element.

Fig. 23

ROBA®-max

Type: 170.210

Features: Slip hub with a long hub, the transmittable torques correspond to the standard ROBA® slip hub.

Application: For acceptance of very wide drive elements, e.g. multiple chain sprockets.

Details: The ROBA®-max can take drive elements with a large width range. The bearing bushing is modified to the required overall width. The location onto the shaft takes place via a set screw which applies pressure onto the keyway.

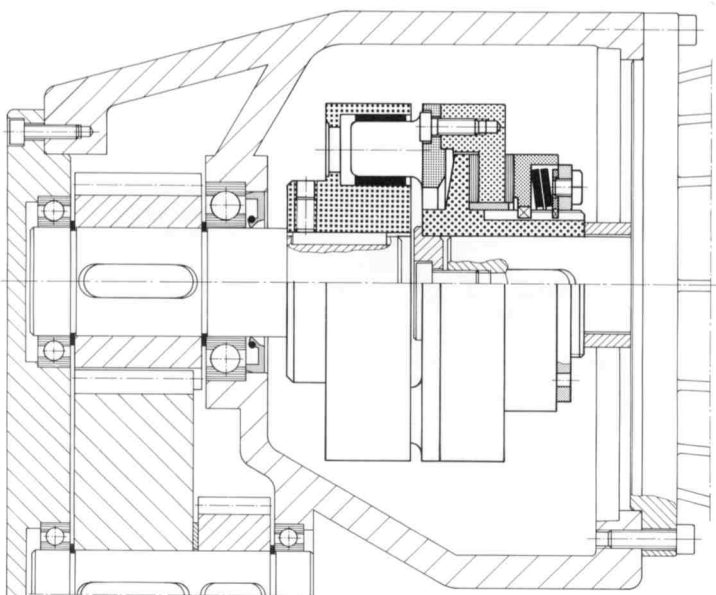
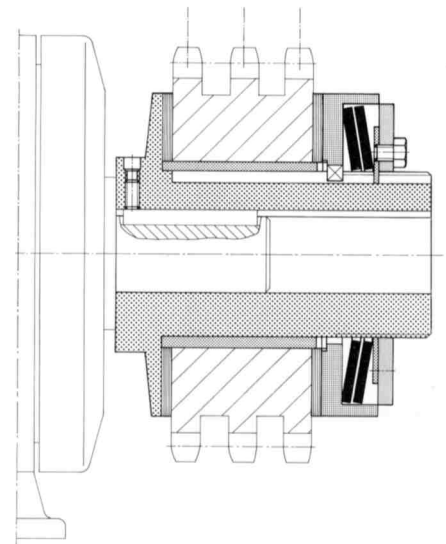


Fig. 24



ROBA®-lastic minimum play

Type: 135.211

Features: ROBA® slip hub with minimum play, torsionally flexible, blind assembly coupling.

Application: For connecting two shafts, for protection against overload damages and to compensate shaft misalignments.

Details: The slip hub is attached onto the shaft via a washer. The hub of the flexible coupling element is located via a set screw over the keyway. Because of the restricted mounting conditions, the torque is adjusted with the radial adjusting nut Type 1.



## Manufacturing declaration

The ROBA<sup>®</sup>-tron is a component for installation into a machine according to the machine guideline 98/392/EWG. An operation is prohibited until it has been noticed that the machine in which this unit is fitted, corresponds to the EG-regulations. The ROBA<sup>®</sup>-tron corresponds to the low voltage regulation 73/23/EWG as well as to directives for resistance against malfunctions acc. to 89/336/EWG. There are no malfunction signals acc. to the EMV-regulation from the ROBA<sup>®</sup>-tron.

## Safety regulations!



**Attention**

Hazardous voltage when connecting the mains-supply voltage. Only qualified and well-trained specialists should work at the units to avoid any personal and material damages.



**Important**

Electronic units are principally not fail-safe! The installation and operating instruction has to be read carefully and the safety regulations have to be observed before installation and initial operation



Contactless signal receiving by internal (or external) NAMUR-transmitter according to DIN 19234.

DIP-switch for selection of the monitoring ranges for decreasing or increasing speeds.

Indication for operating conditions: „active operation“ LED signals green „OFF“ or „malfunction“ LED doesn't signal.

- self-monitoring system in case of voltage failure, breakage of cable, failure of the NAMUR transmitter
- Compact overall dimensions enabling unit to be mounted close to the monitored drive
- Sealed components, unaffected by outside influences

## Application

- To monitor decreasing and increasing speeds. For example turbines, mill works, conveyor systems, agitating machines, centrifuges, hoisting units.
- Special application in connection with the ROBA<sup>®</sup>-slip hub to avoid long slipping times in case of an overload.
- Trouble indicator in connection with linear overload protection (for example, EAS<sup>®</sup>-axial)

## Function:

The ROBA<sup>®</sup>-tron monitors “increasing” or “decreasing” speeds. If the adjusted speed is achieved, The ROBA<sup>®</sup>-tron will signal the drive “off” or it is used for another control function. A signal is transmitted when the control flag passes through the initiator zone. This is compared with the pre-set switch-off speed.

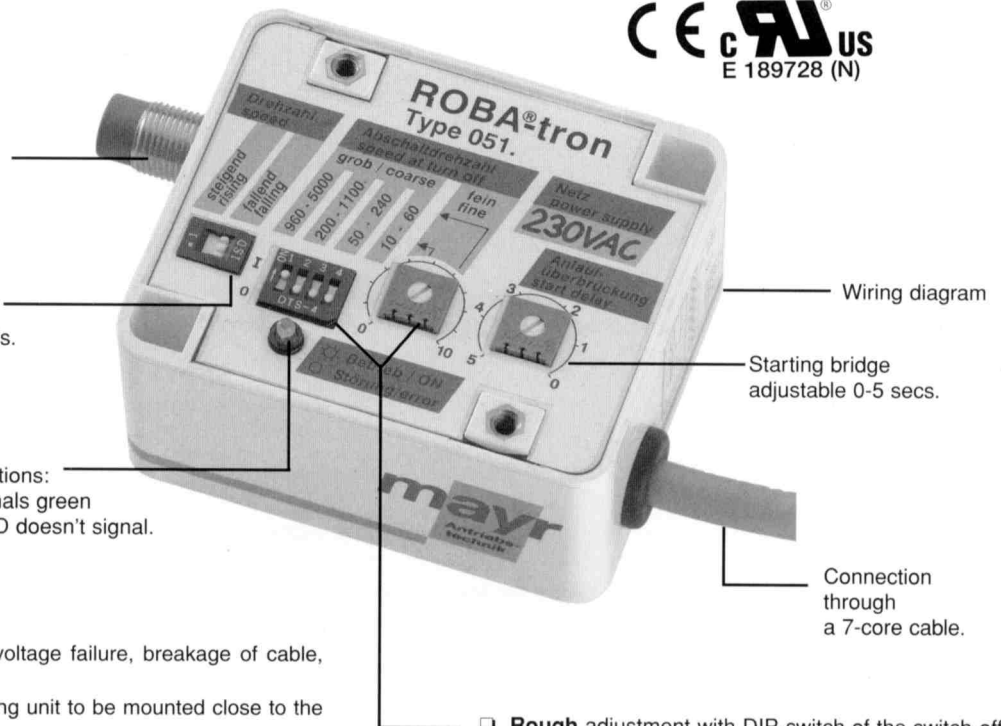
The monitoring ranges can be selected and determined with a DIP-switch.

In case of decreasing speeds the ROBA<sup>®</sup>-tron becomes active when the operating speed has “fallen” to the pre-set switch-off speed and the output relay switches from “operation” to “interference”.

In case of increasing speeds this process is repeated when the operating speed is increased up to the switch-off speed.

The switch-off speed is pre-set “roughly” with a 4-step DIP-switch and “sensitively” with a potentiometer.

A starting bridge (0 -5 secs., adjustable via an external potentiometer) allows the slow raising of the drive up to the operating speed, when the unit is pre-set to the monitoring of decreasing speeds, for example.



Wiring diagram

Starting bridge adjustable 0-5 secs.

Connection through a 7-core cable.

- **Rough** adjustment with DIP-switch of the switch-off speed between 10-5000 rpm\*) or -cycle speed between 6-0,012 sec.\*).

\*) These values refer to an operation with 1 sensor lug

- Potentiometer for **sensitive** adjustment

## Technical data

Supply voltages	<ul style="list-style-type: none"> <li>• 230 VAC , + 6 % / -10 % , 50–60 Hz</li> <li>• 115 VAC , + 6 % / -10 % , 50–60 Hz</li> <li>• 24 VAC , ± 5 % ; pole connection safe</li> </ul>
Signal-relay	potential free switch over contact
Max. load	230 VAC / 3 Amp
Impact time	1 ms
Power consumption	2 VA
Protections	<ul style="list-style-type: none"> <li>• IP 65 (compound filled)</li> <li>• NAMUR transmitter IP 67 flameproof protection to ExiG5, DIN 19234</li> </ul>
Operating temperature	<ul style="list-style-type: none"> <li>-10 °C to +60 °C (amplifier)</li> <li>-25 °C to +60 °C (NAMUR transmitter)</li> </ul>
Storage temperature	-25 °C to +70 °C
Starting bridge	0 to 5 s

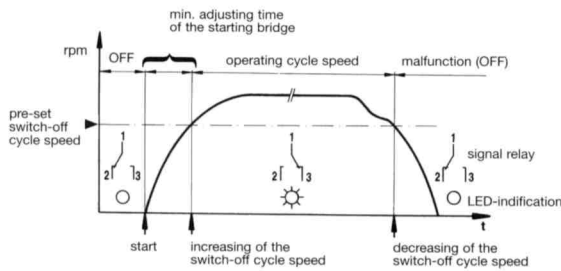
### NAMUR transmitter internal:

switching distance  $S_n$  4 mm  
metal cylinder M12x1  
max. switching frequency 1 kHz  
(flush installation is not possible)

### NAMUR transmitter external:

switching distance  $S_n$  2 mm  
metal cylinder M12x1  
max. switching frequency 2 kHz  
(flush installation is not possible)

## Adjustment to monitor decreasing speeds



### Signal relay and LED-indication

#### Operation:

- **Start** by – closing the start-button or – switching on the supply voltage
- **Signal relay** is energised. Open contacts 1-2, close 1-3
- **LED-illuminates** "ON".

The **Signal relay** remains energised, when

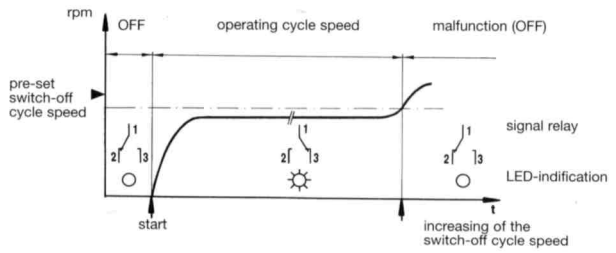
- a) the starting bridge is set (max. 5s.)
- b) the operating speed is achieved, i.e. over the switch-off speed.

#### Interference

- **Interference is signalled**, when
  - a) the operating speed has not been reached during start-up and the starting bridge passed.
  - b) the operating speed reducing slowly has achieved the switch-off speed.
- **Signal relay** is de-energised. Close contacts 1-2, open 1-3.
- **LED-distinguished** "OFF"..

**Signal relay remains de-energised and can only be energised by a new start.**

## Adjustment to monitor increasing speeds



### Signal relay and LED-indication

#### Operation:

- **Start** by – closing the start-button or – switching on the supply voltage
- **Signal relay** is energised. Open contacts 1-2, close 1-3
- **LED-illuminates** "ON".

The **signal relay** remains energised, when

- a) a speed "zero" or
- b) the speed is below the switch-off speed.

#### Interference

- **Interference is signalled**, when the operating speed has achieved the switch-off speed.
- **Signal relay** is de-energised. Close contacts 1-2, open 1-3.

**Note:** If the operating speed exceeds the switch-off speed in the starting phase for a short time, the signal for interference can be suppressed with the starting bridge.

## Functional process

To start by closing the start-button.

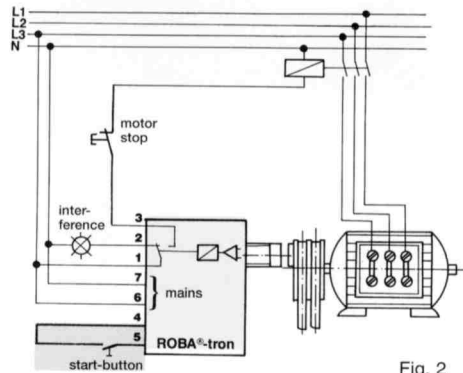


Fig. 2

To start by switching mains supply, i.e. pressing the motor start-button

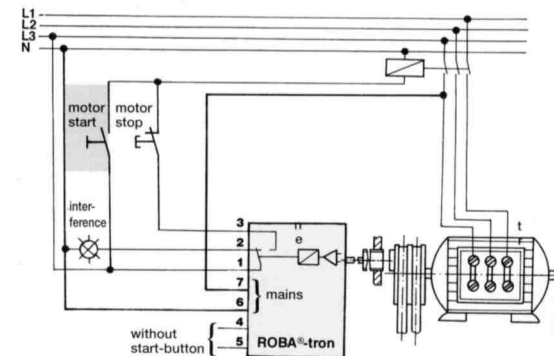
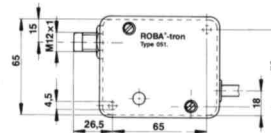
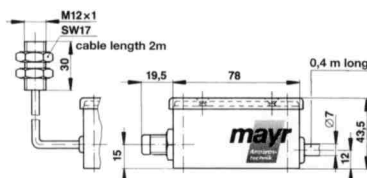


Fig. 3

## Dimensions



## Order example

To be included when ordering, please state:	type	supply voltage
Order number:	051.00_.6	---

transmitter internal .....2  
transmitter external .....1

**Example:** order number 051.002.6 / 230 VAC

supply voltage

- 230 VAC
- 115 VAC
- 24 VDC

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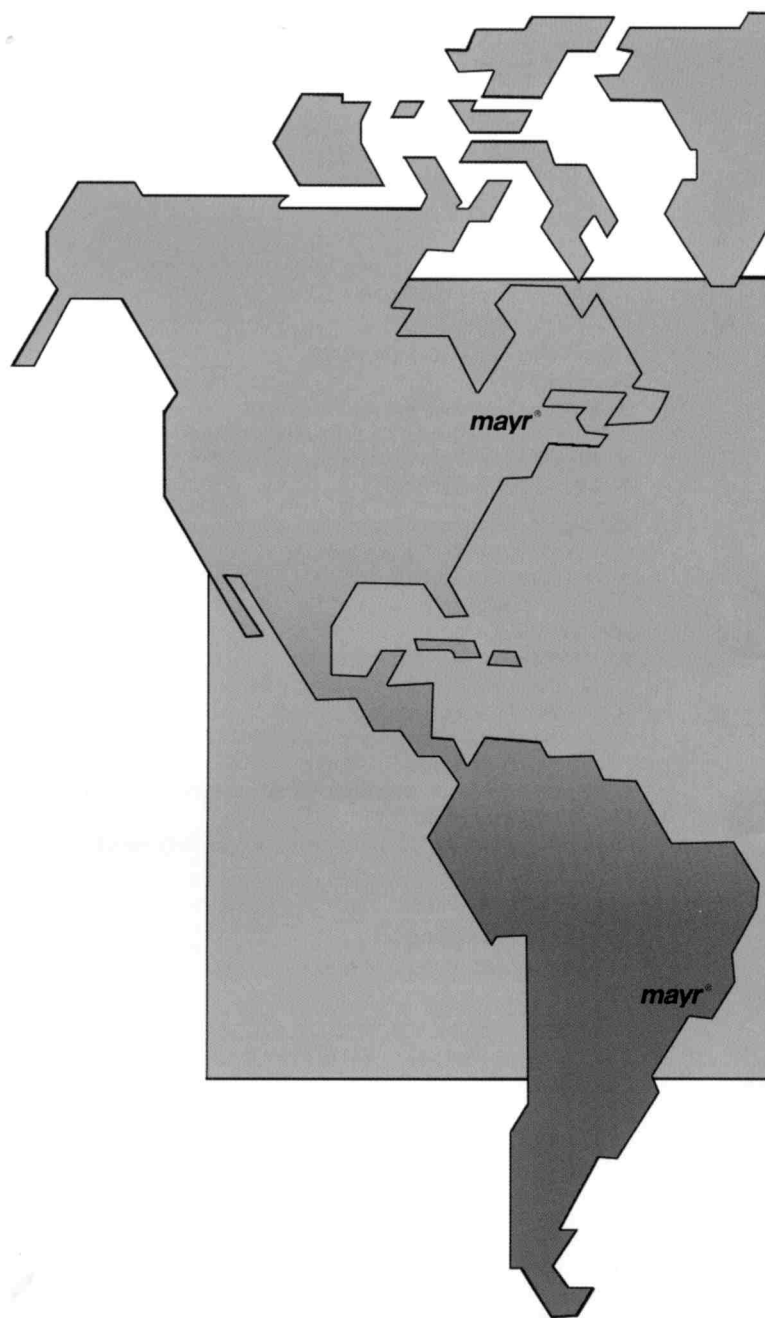
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# Delivery Programme



## Safety clutches/ torque limiters

- ❑ **EAS®-Compact/EAS®-NC**  
Backlash-free, positive safety clutches
- ❑ **EAS®-standard**  
Positive safety clutch with backlash
- ❑ **EAS®-overload/EAS®-elements**  
Modular overload clutch for heavy duty applications
- ❑ **EAS®-axial**  
Overload protection for linear movements
- ❑ **EAS®-Sp/EAS®-Sm/EAS®-Zr**  
Pneumatically or electromagnetically controlled torque limiting clutches with ON/OFF control
- ❑ **ROBA®-slip hubs**  
Load holding, friction type safety clutches



## Shaft couplings

- ❑ **smartflex®**  
Precision shaft coupling for servo applications, direct drive systems and stepping motors
- ❑ **ROBA®-DX**  
Backlash-free, torsionally rigid flexible steel bellows coupling
- ❑ **ROBA®-ES**  
Backlash-free and flexible for vibratory critical drives
- ❑ **ROBA®-DS**  
Backlash-free, torsionally rigid and shock-proof all-steel flexible coupling
- ❑ **ROBA®-D**  
Backlash-free, torsionally rigid all steel flexible coupling



## Electromagnetic brakes/clutches

- ❑ **ROBA-stop® safety brakes**  
Electromagnetic spring applied safety brakes
- ❑ **ROBA-stop®-M motor brakes**  
Electromagnetic spring applied safety brakes
- ❑ **ROBA-stop®-Z dual circuit fail safe brakes**  
Double security or double braking torque
- ❑ **ROBA®-quick brakes**  
Electromagnetic pole face brakes
- ❑ **ROBATIC®-clutches**  
Electromagnetic pole face clutches
- ❑ **ROBA®-takt**  
Clutch brake units



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