Installation and Operational Instructions for EAS®-Compact®
Ratchetting clutch, Type 49_._ _0._ Size 4
Synchronous clutch, Type 49_._ _5._ Size 4

(B.4.14.4.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.

Contents

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

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 use of the product until you have ensured that all applicable EU directives, 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 EAS®-clutches 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.

CAUTION

- ❒ If the EAS®-clutches 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.
- ❒ The clutches may not be put into operation without a limit switch unless *mayr*® has been contacted and has agreed otherwise.

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

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

Safety and Guideline Signs

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).

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
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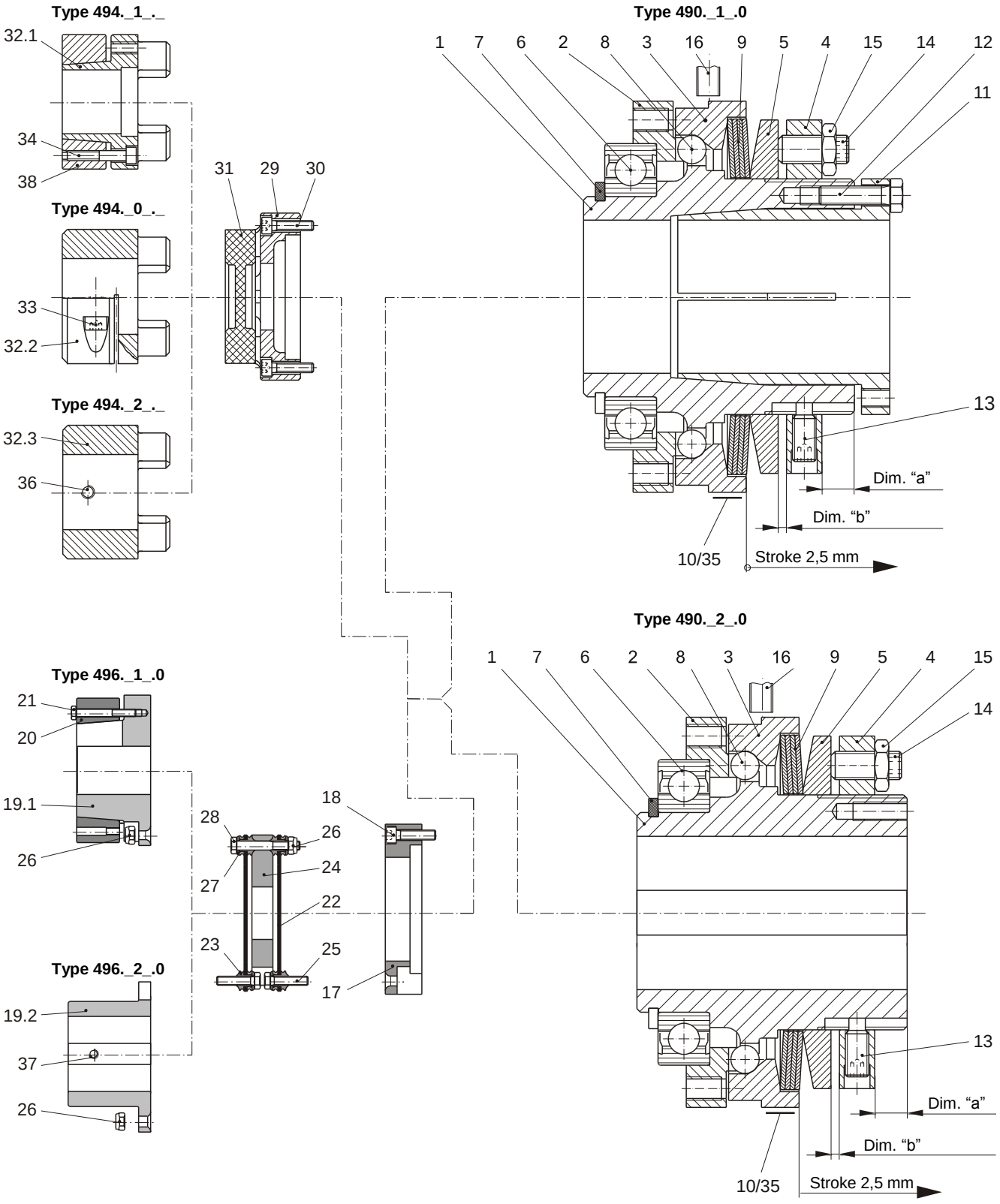

Fig. 1

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Eichenstraße 1, D-87665 Mauerstetten, Germany
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Parts List

Parts List (Only use mayr® original parts)

Parts for Type 490.-:	
Item	**Name**
1	Hub
2	Pressure flange
3	Thrust washer
4	Adjusting nut
5	Thrust ring
6	Deep groove ball bearing
7	Locking ring
8	Steel ball
9	Cup spring
10	Type tag
11	Cone bushing
12	Hexagon head screw
13	Set screw [1]
14	Set screw
15	Hexagon nut
16	Limit switch [2]
35	Adjustment table

Additional parts for Type 494.-:	
Item	**Name**
29	Connection flange
30	Cap screw
31	Elastomeric element [3]
32.1	Shrink disk hub
32.2	Clamping hub
32.3	Key hub
33	Cap screw
34	Cap screw
36	Set screw
38	Shrink disk

Additional parts for Type 496.-:	
Item	**Name**
17	Connection flange
18	Cap screw [1]
19.1	Shrink disk hub
19.2	Key hub
20	Shrink disk
21	Hexagon head screw
22	Disk pack
23	Collar bushing
24	Connection plate
25	Hexagon head screw
26	Hexagon nut
27	Washer
28	Hexagon head screw
37	Set screw

[1] Secure the set screws Item 13 and cap screws Item 18 with Loctite 243
[2] The limit switch Item 16 is not part of the standard scope of delivery
[3] Elastomeric element colours (hardness): red (98 Sh A), yellow (92 Sh A), green (64 Sh D)

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Tel.: +49 8341 804-0, Fax: +49 8341 804-421
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General Technical Data

Table 1

Size	Limit torque for overload M_G Type 49_.5_ _._ [Nm]	Type 49_.6_ _._ [Nm]	Type 49_.7_ _._ [Nm]	Type 49_.8_5._ [1] [Nm]	Max. speed [rpm]
4	120 – 300	240 – 600	480 – 1200	600 – 1500	800

1) Only available in synchronous design, max. speed = 250 rpm.

Table 2

Size	Thrust washer stroke (Fig. 1; Item 3) on overload [mm]	Bore from – to	
		Hub (1) with cone bushing (11) Ø d [mm]	Hub (1) with keyway Ø d_p [mm]
4	2,5	40 – 65	40 – 65

Table 3

Size	Type 49_.5_ _._ Maximum torque M_G [Nm]	Inspection dimension "a" (Fig. 1) at approx. 70 % M_G [mm]	Dimension "b" (Fig. 1) [mm]	Type 49_.6_ _._ Maximum torque M_G [Nm]	Inspection dimension "a" (Fig. 1) at approx. 70 % M_G [mm]	Dimension "b" (Fig. 1) [mm]
4	300	4,4	20	600	4,7	18
Size	**Type 49_.7_ _._ Maximum torque M_G [Nm]**	**Inspection dimension "a" (Fig. 1) at approx. 70 % M_G [mm]**	**Dimension "b" (Fig. 1) [mm]**	**Type 49_.8_5._ Maximum torque M_G [Nm]**	**Inspection dimension "a" (Fig. 1) at approx. 70 % M_G [mm]**	**Dimension "b" (Fig. 1) [mm]**
4	1200	4,8	14	1500	5,2	12

Table 4

Size	Max. permitted bearing loads: Axial forces [N]	Radial forces [N]: 1-bearing design	Radial forces [N]: 2-bearing design	Transverse force torques [2] [Nm]	Permitted ambient temperature
4	5000	5000	7500	50	-20 °C to +80 °C

[2] Torques, which put strain on the deep groove ball bearing due to the non-centric axial forces having an effect on the pressure flange.

Table 5

Size	Screw tightening torques [3] [Nm] Item 12	Item 18	Item 21	Item 25	Item 28	Item 30	Item 33	Item 34
4	25	75	25	35	35	75	200	90

3) Secure Item 18 with Loctite 243.

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Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
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Technical Data Type 494._ _ _._

Table 6

Size	Bore lastic-side from – to			Nominal and maximum torques flexible backlash-free shaft coupling T_{KN} and $T_{K\ max.}$					
				Type 494._ _ _.3 (yellow elastomeric element 92 Sh A)		Type 494._ _ _.4 (red elastomeric element 98 Sh A)		Type 494._ _ _.6 (green elastomeric element 64 Sh D)	
	Clamping hub Type 494._0_._ [mm]	Shrink disk hub Type 494._1_._ [mm]	Key hub Type 494._2_._ [mm]	T_{KN} [Nm]	$T_{K\ max.}$ [Nm]	T_{KN} [Nm]	$T_{K\ max.}$ [Nm]	T_{KN} [Nm]	$T_{K\ max.}$ [Nm]
4	45 – 80	45 – 75	38 – 80	900	1800	1040	2080	1250	2500

Table 7

Size	Transmittable torques [Nm] on clamping hubs frictional locking (Type 494._0_._ / Ø d_3) / on shrink disk hubs frictional locking (Type 494._1_._ / Ø d_4) – dependent on bore - suitable for tolerance constellation F7/k6 for clamping hubs and H7/k6 for shrink disk hubs															
	Ø 45		Ø 48		Ø 50		Ø 52		Ø 55		Ø 58		Ø 60		Ø 62	
	d_3	d_4	d_3	d_4	d_3	d_4	d_3	d_4	d_3	d_4	d_3	d_4	d_3	d_4	d_3	d_4
4	545	1402	590	1596	630	1731	662	1873	710	2095	764	2308	800	2420	840	2570

Size	Ø 65		Ø 68		Ø 70		Ø 72		Ø 75		Ø 78		Ø 80	
	d_3	d_4	d_3	d_4	d_3	d_4	d_3	d_4	d_3	d_4	d_3	d_4	d_3	d_4
4	900	2750	954	2989	990	3157	1032	3306	1095	3550	1158	-	1200	-

Table 8

Size	Shaft misalignments flexible coupling Type 494.							Dimension "E" (Fig. 7) [mm]	Locking set screw (36) for hub (Item 32.3 / Fig. 1)	
	Axial ΔK_a	Radial ΔK_r			Angular ΔK_w					
	[mm]	92 Sh A [mm]	98 Sh A [mm]	64 Sh D [mm]	92 Sh A [°]	98 Sh A [°]	64 Sh D [°]		Thread	Tightening torque [Nm]
4	2,6	0,25	0,18	0,13	1,0	0,9	0,8	35	M10	20

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

Technical Data Type 496._ _ _.0

Table 9

Size	Bore torsionally rigid side from – to		Nominal torque T_{KN} and peak torque T_{KS} for torsionally rigid backlash-free shaft coupling Type 496._ _ _.0	
	Shrink disk hub Type 496._1_.0 [mm]	Key hub Type 496._2_.0 [mm]	T_{KN} [Nm]	T_{KS} [Nm]
4	55 – 90	35 – 70	1600	2400

Table 10

Size	Transmittable torques [Nm] on shrink disk hubs frictional locking (Type 496._1_.0) - dependent on bore - suitable for tolerance constellation H7/g6							
	Ø 55	Ø 60	Ø 65	Ø 70	Ø 75	Ø 80	Ø 85	Ø 90
4	2074	2366	2658	2943	3213	3458	3666	3828

Table 11

Size	Max. permitted shaft misalignments for torsionally rigid coupling Type 496._ _ _.0			Locking set screw (37) for hub (Item 19.2 / Fig. 1)	
	Axial ΔK_a [1] [mm]	Radial ΔK_r [mm]	Angular ΔK_w [°]	Thread	Tightening torque [Nm]
4	1,5	0,3	1,4	M10	14

[1] Only permitted as a static or virtually static value.

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Synchronous clutch, Type 49_._ _5._ Size 4

(B.4.14.4.EN)

Design

The EAS®-Compact® clutch is designed as a mechanical overload clutch according to the ball-detent principle.

State of Delivery

The EAS®-Compact® clutch is completely installed, including the clamping units, for backlash-free shaft installation.
If no other torque adjustment is requested customer-side, the EAS®-Compact® clutch will always be pre-set and calibrated to approx. 70 % of the maximum torque.
The set screws (13) are not secured with Loctite 243 on a calibrated clutch.
On **Type 496._ _ _.0**, the misalignment-flexible part (ROBA®-DS) must be separated for customer-side installation from the overload clutch (EAS®-compact®) by loosening the cap screws (18). On delivery, the cap screws (18) and the set screws (13) are not secured with Loctite 243.

Before initial operation of the clutch, please secure the set screws (13) and cap screws (18) (only on Type 496._ _ _.0) with Loctite 243.

Please check state of delivery!

Function

The clutch protects the drive line from excessively high, unpermitted torque impacts which can occur due to unintentional blockages.
When in operation, the EAS®-Compact® clutch transmits the set torque backlash-free from the hub (1) via the pressure flange (2) to the customer-side output element.
If the set limit torque is exceeded (overload), the clutch disengages, the thrust washer (3) carries out an axial hub movement, a customer-side mounted limit switch (16) senses this stroke movement and emits a signal to switch off the drive.

The residual torque is approx. 5 to max. 15 % of the set torque. This means that the EAS®-Compact® clutch is not load holding.

Once the overload is removed, the clutch is automatically ready for operation: It moves independently into an engaged position.

Re-engagement:
The ratchetting division on the EAS®-Compact® ratchetting clutch **Type 49_._ _0._** is 15°.
The ratchetting division on the EAS®-Compact® synchronous clutch **Type 49_._ _5._** is 360°.

General Installation Guidelines

The bore tolerance in the hubs (1 / 19.1 / 19.2 / 32.1 / 32.3) is designed as H7. The bore tolerance in the hub (32.2) is designed as F7.
The surface roughness depth in the bores is produced to Ra = 1,6 µm.

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Output Elements Installation

The output element is centred on a deep groove ball bearing (6) (tolerance H7/h5) and bolted together with the pressure flange (2).

Please observe the maximum permitted screw-in depth in the pressure flange (2) as well as the connection dimensions "a" and "e" for the output elements, see Figs. 3 or 4 and Table 12.

If the resulting radial force from the output element is anywhere near the centre of the ball bearing (6) and under the max. permitted radial load acc. Table 4, an additional bearing for the output element is not necessary.
No appreciable axial forces (see Table 4) should be transferred from the output element onto the clutch pressure flange (2).
The EAS®-Compact® with a long protruding hub (Type 490._ _ _.1 / Fig. 2) is recommended for extremely wide output elements, or for elements with small diameters.
On very small diameters, the output element is screwed together with the clutch pressure flange (2) via a customer-side intermediate flange.
In case of increased radial forces, a 2-bearing design (Type 490._ _ _.2 / Fig. 2) should be used.

Example:
Type 490.71_.1 Type 490.71_.2

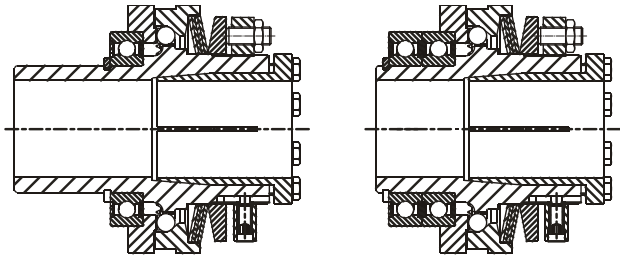

Fig. 2

Ball bearings, needle bearings or bearing bushings are suitable as bearings for the output element, depending on the installation situation and the installation space.
Please ensure that the output element bearing is designed as a fixed bearing (Fig. 4).

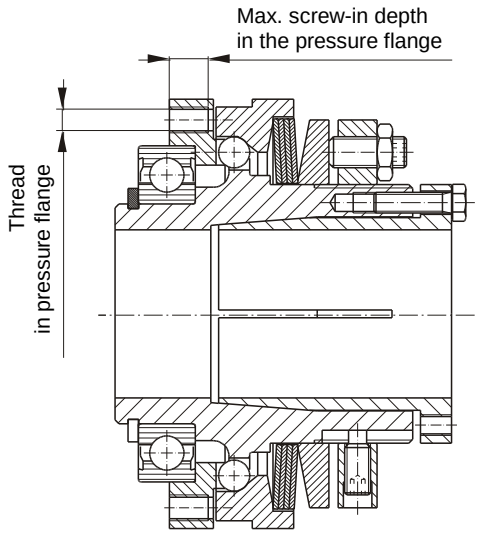

Fig. 3

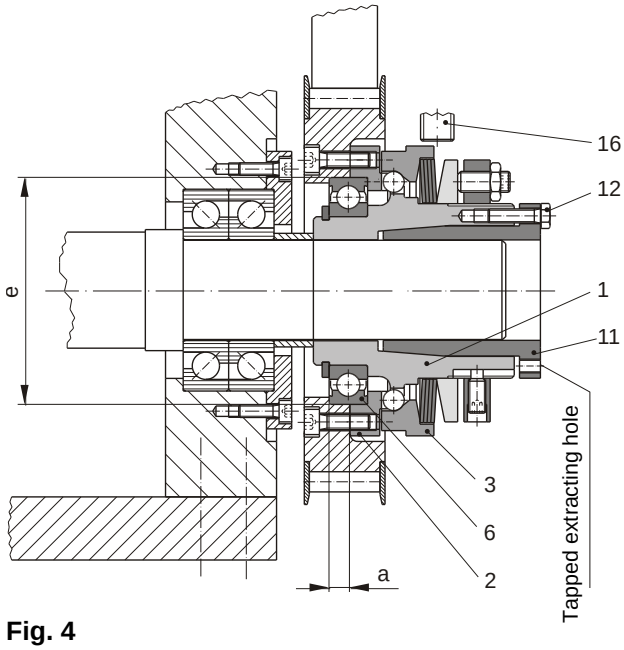

Fig. 4

Table 12

Size	Thread in the pressure flange (Fig. 3) with required screw quality and tightening torque for the customer-side screw connection	Max. screw-in depth [mm] in the pressure flange (Fig. 3)	Connection dimensions [mm] (Fig. 4)	
			$a^{+0,1}$	e_{h5}^{H7}
4	8 x 45° / M10 or 6 x 60° / M10 12.9 75 Nm	15	12	130

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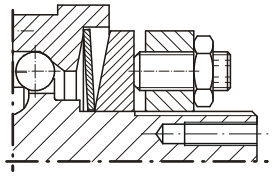
Cup Spring Layering (Fig. 5)

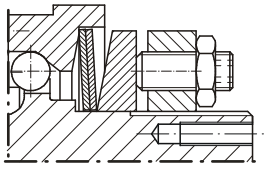
Correct cup spring layering is a prerequisite for problem-free clutch function and torque adjustment.
For the different torque ranges (see Adjustment Table (35)) **one** cup spring for Type 49_.5_ _._, **two** cup springs for Type 49_.6_ _._, **four** cup springs for Type 49_.7_ _._ and **five** cup springs for Type 49_.8_5._ are installed (Fig. 4).
The maximum torque range (Type 49_.8_5._) can only be delivered in synchronous clutch design.

1x layered



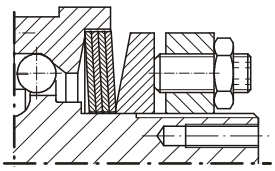
Type 49_.5_ _._

2x layered



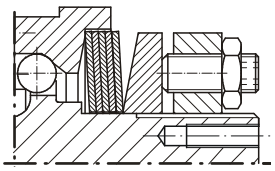
Type 49_.6_ _._

4x layered



Type 49_.7_ _._

5x layered



Type 49_.8_5._

Fig. 5

Mounting onto the Shaft

EAS®-Compact® clutches Size 4 include cone bushings or shrink disks or keyways as part of the standard delivery.
During installation of cone bushings or shrink disks, please observe the following:

- ❒ The shafts must be solid shafts without a keyway. Shaft tolerance up to diameter 38 h6, over diameter 38 h8 or k6.
- ❒ Shaft surface:
  finely turned or ground (Ra = 0,8 µm).
- ❒ Shaft material: Yield point at least 350 N/mm^2,
  e. g. St 60, St 70, C 45, C 60.
- ❒ Degrease or remove conserving layers on the shafts and bores before installing the clutch or the clutch hubs.
  Greasy or oily bores or shafts do not transmit the torques defined in the catalogue.
- ❒ Mount the clutch or clutch hubs onto both shaft ends using a suitable device and bring it / them into the correct position.
- ❒ Tighten the tensioning screws (12) of the cone bushing (11) in 2 steps cross-wise and then in 3 to max. 6 tightening sequences evenly using a torque wrench to the torque stated in Table 5.
- ❒ Type 494.-:
  Tighten the tensioning screws (34) in the shrink disks (38) stepwise (in 3 to max. 6 tightening sequences) and cross-wise evenly using a torque wrench to the torque stated in Table 5.
- ❒ Type 496.-:
  Tighten the tensioning screws (21) in the shrink disks (20) using a torque wrench evenly and one after the other in max. 6 sequences to the torque stated in Table 5.
- ❒ The transmittable torques of the shaft-hub connection are dependent on the bore diameter and the quality of the drive shafts used. Please observe the respective transmission tables in the valid and applicable product catalogue.

De-installation of the Cone Bushings and Shrink Disks

In the cone bushings and the shrink disks, there are tapped extracting holes next to the tensioning screws (12/21/34).

1) Loosen all tensioning screws (12/21/34) by several thread turns.
2) Screw out the tensioning screws (12/21/34) located next to the tapped extracting holes and screw them into the tapped extracting holes up to their limits.
3) Tighten the tensioning screws (12/21/34) evenly and step-wise so that the cone bushing (11) or the shrink disk (20/38) is loosened from the hub (1/19.1/32.1).
4) Screw out the tensioning screws (12/21/34) from the tapped extracting holes.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
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Shaft Installation via Key Connection (Figs. 1 and 6)

On the EAS®-Compact® with a keyway, the clutch must be axially fixed onto the shaft after mounting, e.g.

- ❒ with a press cover and a screw, screwed into the shaft threaded centre hole (for Type 490._2_._)
- ❒ and/or a locking set screw (for Types 494._2_._ and 496._2_.0):
  - ➔ Locking set screw (36) for hub (32.3), see Fig. 1 on page 3 and table 8 on page 6,
  - ➔ Locking set screw (37) for hub (19.2), see Fig. 1 on page 3, Fig. 6 on page 11 and table 11 on page 7.

Joining Both Clutch Components (1/32) for Type 494._ _ _._ (Figs. 1 and 7)

The flexible elastomeric element (31) is pre-tensioned between the metallic claws by joining the hub (32.1, 32.2 or 32.3) with the connection flange (29). To do this, an axial installation force is required.
The force required can be reduced by lightly greasing the elastomeric element.

Use PU-compatible lubricants (e. g. Vaseline or Mobilgrease XHP 222)!
No unpermittedly high axial pressure should be placed on the elastomeric element (31) in completely assembled condition.
Keep to distance dimension “E” acc. Fig. 7 and Table 8!

Joining Both Clutch Components for Type 496._ _ _.0 (Fig. 1)

Join the misalignment-flexible part and the overload clutch and screw together with cap screws (18) to the tightening torque 75 Nm.
The cap screws (18) must be protected using a screw-securing product, e.g. Loctite 243.

The clutch or clutch hub carries out an axial movement in the direction of the cone bushing (11) when tightening the cone bushing (11). Because of this effect, please ensure that on the EAS®-Compact® clutch with disk pack (Type 496._ _ _.0), first the cone bushing (11) is completely tightened, then the other (disk pack) side.

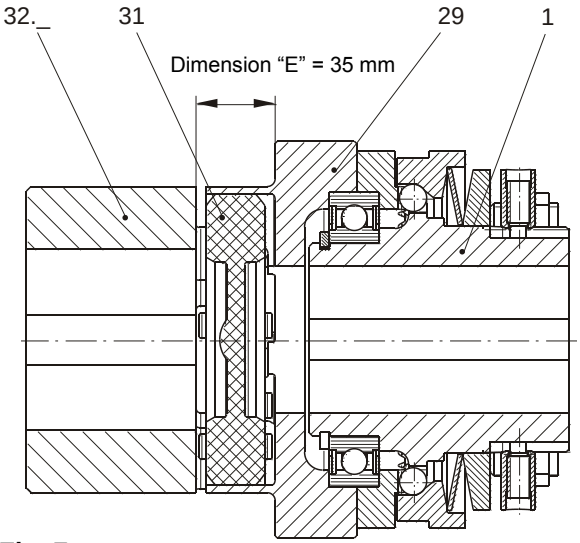

Fig. 7

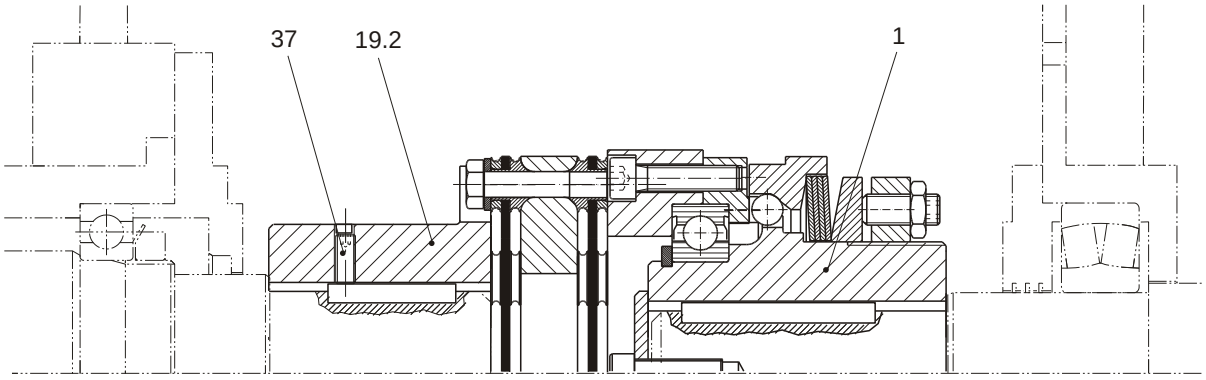

Fig. 6

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Eichenstraße 1, D-87665 Mauerstetten, Germany
Tel.: +49 8341 804-0, Fax: +49 8341 804-421
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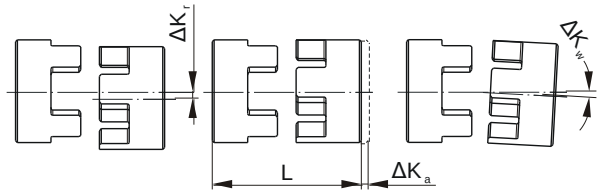
Permitted Shaft Misalignments

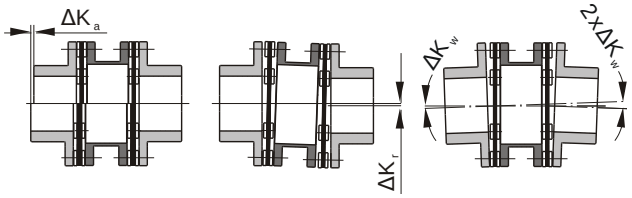
The EAS®-Compact® clutches Types 494._ _ _._ (lastic backlash-free) and 496._ _ _.0 (torsionally rigid backlash-free) compensate for radial, axial and angular shaft misalignments (Fig. 8) without losing their backlash-free function.
However, the Type-specific permitted shaft misalignments indicated in Tables 8 and 11 must not simultaneously reach their maximum value.
If more than one kind of misalignment takes place simultaneously, they influence each other. This means that the permitted misalignment values are dependent on one another, see Fig. 9.
The sum total of the actual misalignments in percent of the maximum value must not exceed 100 %.
The permitted misalignment values given in Tables 8 and 11 refer to clutch operation at nominal torque, an ambient temperature of +30 °C and an operating speed of 1500 rpm. If the clutch is operated in other or more extreme operating conditions, please observe the dimensioning guidelines stated in the individual shaft coupling catalogues or contact the manufacturer.

Type 494._ _ 4._ (lastic backlash-free)



Radial misalignment | Axial displacement | Angular misalignment

Type 496._ _ _.0 (torsionally rigid backlash-free)



Axial displacement | Radial misalignment | Angular misalignment

Fig. 8

Example (Type 496._ _ _.0):
Axial displacement occurrence ΔK_a = 0,6 mm equals 40 % of the permitted maximum value ΔK_a = 1,5 mm.
Angular misalignment occurrence ΔK_w = 0,42° equals 30 % of the permitted maximum value ΔK_w = 1,4°.
=> permitted radial misalignment ΔK_r = 30 % of the maximum value ΔK_r = 0,3 mm => ΔK_r = 0,09 mm

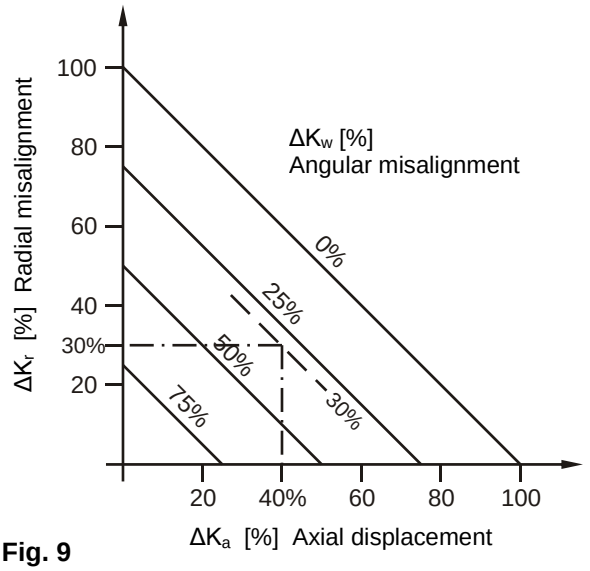


Fig. 9

Clutch Alignment

Exact alignment of the clutch improves the running smoothness of the drive line substantially, reduces the load on the shaft bearings and increases the clutch service lifetime.
We recommend alignment of the clutch using a dial gauge or special laser on drives operating at very high speeds.

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 (Manufacturer-side)

The clutch is set to the torque stipulated in the order.
Adjustment is carried out via dimension “a” by turning the set screws (14) (Fig. 11).

The installed cup springs (9) are operated in the negative range of the characteristic curve (see Fig. 10); this means that a stronger pre-tensioning of the cup spring results in a decrease of the spring force.
Turning the set screws (14) clockwise causes a reduction in torque. Turning them anti-clockwise causes an increase in torque. You should be facing the adjusting nut (4) as shown in Fig. 11.

Even if the customer does not intend to change the pre-set torque, the hexagon head screw (13) must still be screwed out customer-side, painted with Loctite 243 and screwed back in again.

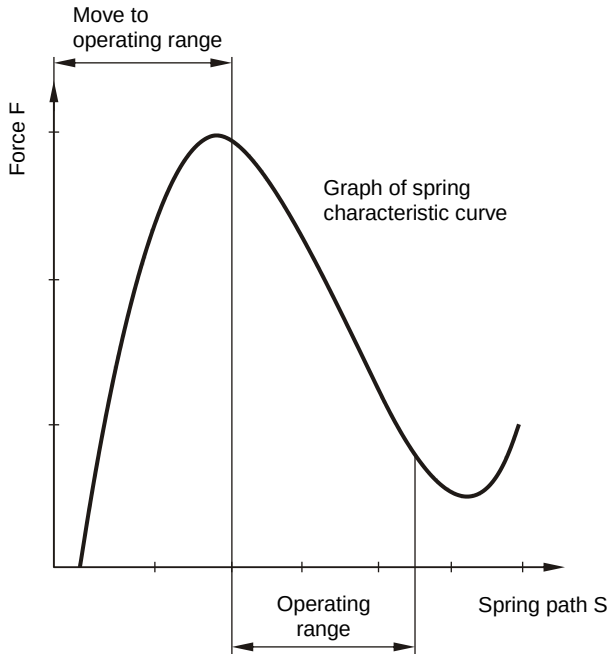


Fig. 10

Changing the Torque (Fig. 11)

CAUTION

The torque is changed exclusively via the set screws (14) and not via the adjusting nut (4).

- ❑ Loosen all hexagon nuts (15) (6 pieces).
- ❑ Adjust all set screws (14) (6 pieces) evenly to the required dimension “a” using a hexagon socket wrench.
- ❑ **Find dimension “a” in the Adjustment Table (35) (Fig. 12)** (the Adjustment Table (35) is glued to the thrust washer (3), see also Fig. 12).
- ❑ Counter (secure) set screws (14) (6 pieces) again using hexagon nuts (15).

Adjusting the adjusting nut (4) or distorting the cup spring (9) outside of the cup spring characteristic curve (see Fig. 10) stops the clutch functioning.
The inspection dimension “a” (see Table 3) can show deviations due to construction tolerances or to clutch wear. After de-installing the clutch (e.g. due to cup spring replacement or changes to the cup spring layering), the clutch must be re-adjusted and calibrated using dimension “a” and dimension “b” (see Adjustment Table (35) Fig. 12, Table 3 and Fig. 11).

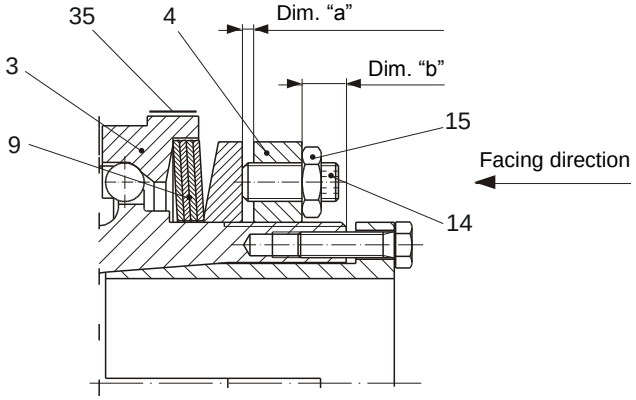


Fig. 11

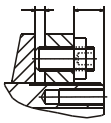
	Größe/size4 DURA/SYN	Tellerfeder cup springs	M-Bereich torque range	“b” [mm]	“a” [mm] 100%	90%	80%	70%	60%	50%	40%
	49-.5--.-	1x1 /	120-300Nm	20	3.4	3.8	4.1	4.4	4.7	5.1	5.4
	49-.6--.-	1x2 //	240-600Nm	18	3.7	4.1	4.4	4.7	5.1	5.4	5.7
	49-.7--.-	1x4 ////	480-1200Nm	14	3.8	4.1	4.4	4.8	5.1	5.5	5.7
	49-.8--.-	1x5 /////	600-1500Nm	12	4.1	4.5	4.9	5.2	5.5	5.8	6.2

Fig. 12 (Adjustment Table (35))

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Limit Switch Installation

The switching direction arrow on the housing lid of the mechanical limit switch faces in the direction of the adjusting nut (4) or in the thrust washer (3) stroke direction, Fig. 1. Adjust the switch distances for the contactless and mechanical limit switch acc. Fig. 13 or Fig. 14. The distance from the switching point to the thrust washer (3) can be finely adjusted using a hexagon head screw SW7 (Figs. 13 and 14).

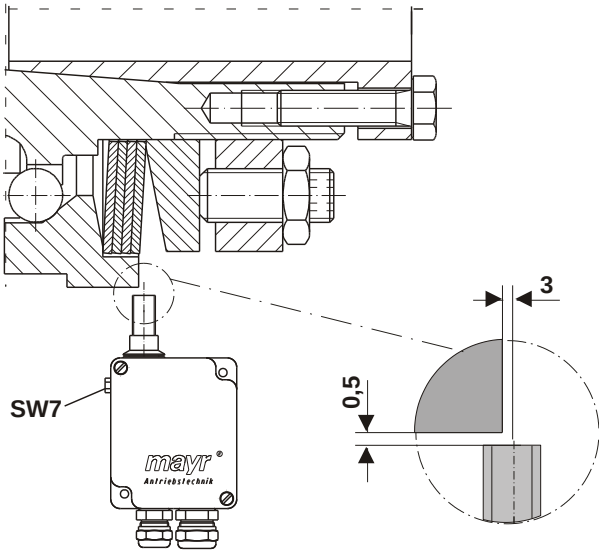

Fig. 13: contactless limit switch

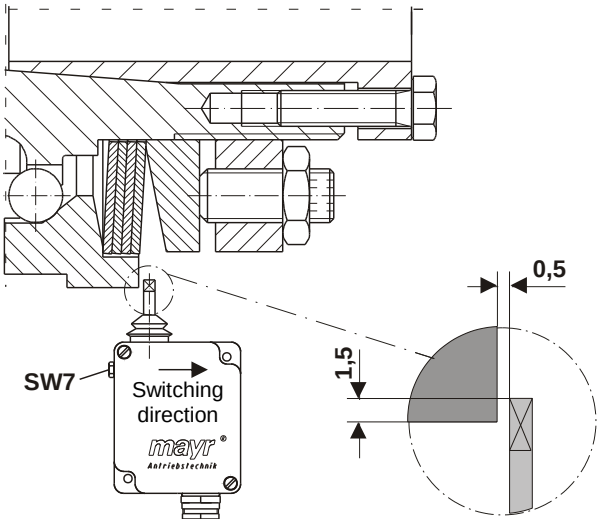

Fig. 14: mechanical limit switch

Maintenance and Maintenance Intervals

Maintenance work, which should be carried out after approx. 2000 operating hours, after 100 disengagements or at the latest after 1 year, includes:

- ➔ Visual inspection
- ➔ Functional inspection
- ➔ Inspection of the shaft-hub connection
- ➔ Inspection of the screw tightening torques
  The specified tightening torques (Table 5) must be maintained.
- ➔ Inspection of the set torque
- ➔ Clutch release inspection
- ➔ Bearing or bearing pre-tension inspection
- ➔ Re-greasing of the transmission geometries, balls, recesses and sealing elements.

Clutch re-greasing must only be carried out by specially trained personnel.
For greasing, please use NLGI Class 2 grease with a basic oil viscosity of 220 mm^2/s at 40 °C, e.g. Mobilgrease XHP222.
When re-installing the clutch, please secure all screws with Loctite 243 (medium hard).

If large amounts of dirt or dust are present or in extreme ambient conditions, it may well be necessary to carry out inspections at shorter intervals.
We recommend that maintenance work is carried out at the site of manufacture.

Disposal

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

All steel components:
Steel scrap (Code No. 160117)

Seals, O-rings, V-seals, elastomers:
Plastic (Code No. 160119)

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Malfunctions / Breakdowns Type 490._ _ _._

Malfunction	Possible Causes	Solutions
Premature clutch release	Incorrect torque adjustment	1) Set the system out of operation 2) Check the torque adjustment 3) Secure the adjusting nut 4) If the cause of malfunction cannot be found, the clutch must be inspected at the place of manufacture
	Adjusting nut has changed position	
	Worn clutch	
Clutch does not release on overload	Incorrect torque adjustment	1) Set the system out of operation 2) Check whether foreign bodies influence the disengagement mechanism function 3) Check the torque adjustment 4) Secure the adjusting nut 5) If the cause of malfunction cannot be found, the clutch must be inspected at the place of manufacture
	Adjusting nut has changed position	
	Worn clutch	
Running noises in normal operation	Insufficient clutch securement	1) Set the system out of operation 2) Check the clutch securement 3) Check the screw tightening torques 4) Check the torque adjustment and that the adjusting nut sits securely 5) If the cause of malfunction cannot be found, the clutch must be inspected at the place of manufacture
	Loosened screws	
	Loosened adjusting nut	

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Malfunctions / Breakdowns Type 494._ _ _._

Malfunction	Possible Causes	Solutions
Changes in running noise and / or vibration occurrence	Incorrect alignment	1) Set the system out of operation 2) Find / resolve the cause of incorrect alignment (e. g. loose foundation screws, motor securement breakage, heat expansion of system components, changes in the clutch installation dimension “E”) 3) Check the clutch for wear
	Wear on the elastomeric element, temporary torque transmission due to metal contact	1) Set the system out of operation 2) Dismantle the clutch and remove the remainders of the elastomeric element 3) Check the clutch parts and replace if damaged 4) Insert a new elastomeric element, install clutch components 5) Check the alignment and correct if necessary.
	Tensioning and clamping screws or locking set screw for axial hub securement or connection screws are loose	1) Set the system out of operation 2) Check the clutch alignment 3) Tighten the tensioning and clamping screws for axial hub securement and the connection screws to the required torque or tighten the locking set screw and secure it against self-loosening using sealing lacquer 4) Check the clutch for wear
Cam breakage	Wear on the elastomeric element, torque transmission due to metal contact	1) Set the system out of operation 2) Replace the entire clutch 3) Check the alignment
	Cam breakage due to high impact energy / overload / excessively high shaft misalignments	1) Set the system out of operation 2) Replace the entire clutch 3) Check the alignment 4) Find the cause of overload
	Operating parameters are not appropriate for the clutch performance	1) Set the system out of operation 2) Check the operating parameters and select a suitable clutch (observe installation space) 3) Install a new clutch 4) Check the alignment
	Operational mistakes due to clutch characteristic data being exceeded	1) Set the system out of operation 2) Check clutch dimensioning 3) Replace the entire clutch 4) Check the alignment 5) Train and advise operating personnel

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Malfunctions / Breakdowns Type 494._ _ _._ (continued)

Malfunction	Possible Causes	Solutions
Premature wear on the elastomeric element	Incorrect alignment	1) Set the system out of operation 2) Find / resolve the cause of incorrect alignment (e. g. loose foundation screws, motor securement breakage, heat expansion of system components, changes in the clutch installation dimension “E”) 3) Check the clutch for wear 4) Insert a new elastomeric element
	e.g. Contact with aggressive liquids / oils, ozone influences, excessively high ambient temperature etc., which lead to physical changes in the elastomeric element	1) Set the system out of operation 2) Dismantle the clutch and remove the remainders of the elastomeric element 3) Check the clutch parts and replace if damaged 4) Insert a new elastomeric element, install clutch components 5) Check the alignment and correct if necessary 6) Make sure that further physical changes to the elastomeric element can be ruled out
	The ambient or contact temperatures permitted for the elastomeric element are exceeded	1) Set the system out of operation 2) Dismantle the clutch and remove the remainders of the elastomeric element 3) Check the clutch parts and replace if damaged 4) Insert a new elastomeric element, install clutch components 5) Check the alignment and correct if necessary 6) Check the ambient or contact temperature and regulate them (if necessary, use other elastomeric element materials)
Premature wear on the elastomeric element (material liquidation inside the elastomeric element toothing)	Drive vibrations	1) Set the system out of operation 2) Dismantle the clutch and remove the remainders of the elastomeric element 3) Check the clutch parts and replace if damaged 4) Insert a new elastomeric element, install clutch components 5) Check the alignment and correct if necessary. 6) Find the cause of vibration (if necessary, use an elastomeric element with a lower or higher shore hardness)

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Malfunctions / Breakdowns Type 496._ _ _.0

Malfunction	Possible Causes	Solutions
Changes in running noise and / or vibration occurrence	Incorrect alignment, incorrect installation	1) Set the system out of operation 2) Find / resolve the cause of incorrect alignment 3) Check the clutch for wear
	Loose connecting screws, minor fretting corrosion under the screw head and on the disk pack	1) Set the system out of operation 2) Check the clutch parts and replace if damaged 3) Tighten the connecting screws to the specified torque 4) Check the alignment and correct if necessary
	Tensioning screws or locking set screw for axial securement of the hubs are loose	1) Set the system out of operation 2) Check the clutch alignment 3) Tighten the tensioning and clamping screws for axial hub securement to the required torque or tighten the locking set screw and secure it against self-loosening using sealing lacquer 4) Check the clutch for wear
Disk pack breakage	Disk pack breakage due to high load impacts / overload	1) Set the system out of operation 2) Dismantle the clutch and remove the remainders of the disk packs 3) Check the clutch parts and replace if damaged 4) Find the cause of overload and remove it
	Operating parameters are not appropriate for the clutch performance	1) Set the system out of operation 2) Check the operating parameters and select a suitable clutch (observe installation space) 3) Install a new clutch 4) Check the alignment
	Incorrect operation of the system unit	1) Set the system out of operation 2) Dismantle the clutch and remove the remainders of the disk packs 3) Check the clutch parts and replace if damaged 4) Train and advise operating personnel
Disk packs / connecting screws cracks or breakage	Drive vibrations	1) Set the system out of operation 2) Dismantle the clutch and remove the remainders of the disk packs 3) Check the clutch parts and replace if damaged 4) Check the alignment and correct if necessary 5) Find the cause of vibration and remove it

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