Installation and Operational Instructions for EAS®-Compact® overload clutch, Type 49_. _ _4._ Sizes 01 - 3 (B.4.14.1.GB)

Please read the Operational Instructions carefully and follow them accordingly!
Ignoring these Instructions may lead to malfunctions or to clutch failure, resulting in damage to other parts.

Contents:

Declaration of Conformity

It is forbidden to start use of the product until the machine or system into which it should be built is operating in accordance with all applicable EU directives.
Without a conformity inspection, 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.

Safety Regulations

These Installation and Operational Instructions (I + O) are part of the clutch delivery.
Please keep them handy and near the clutch at all times.

Danger!

This warning applies if:

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

User-implemented Protective Measures

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

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

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

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

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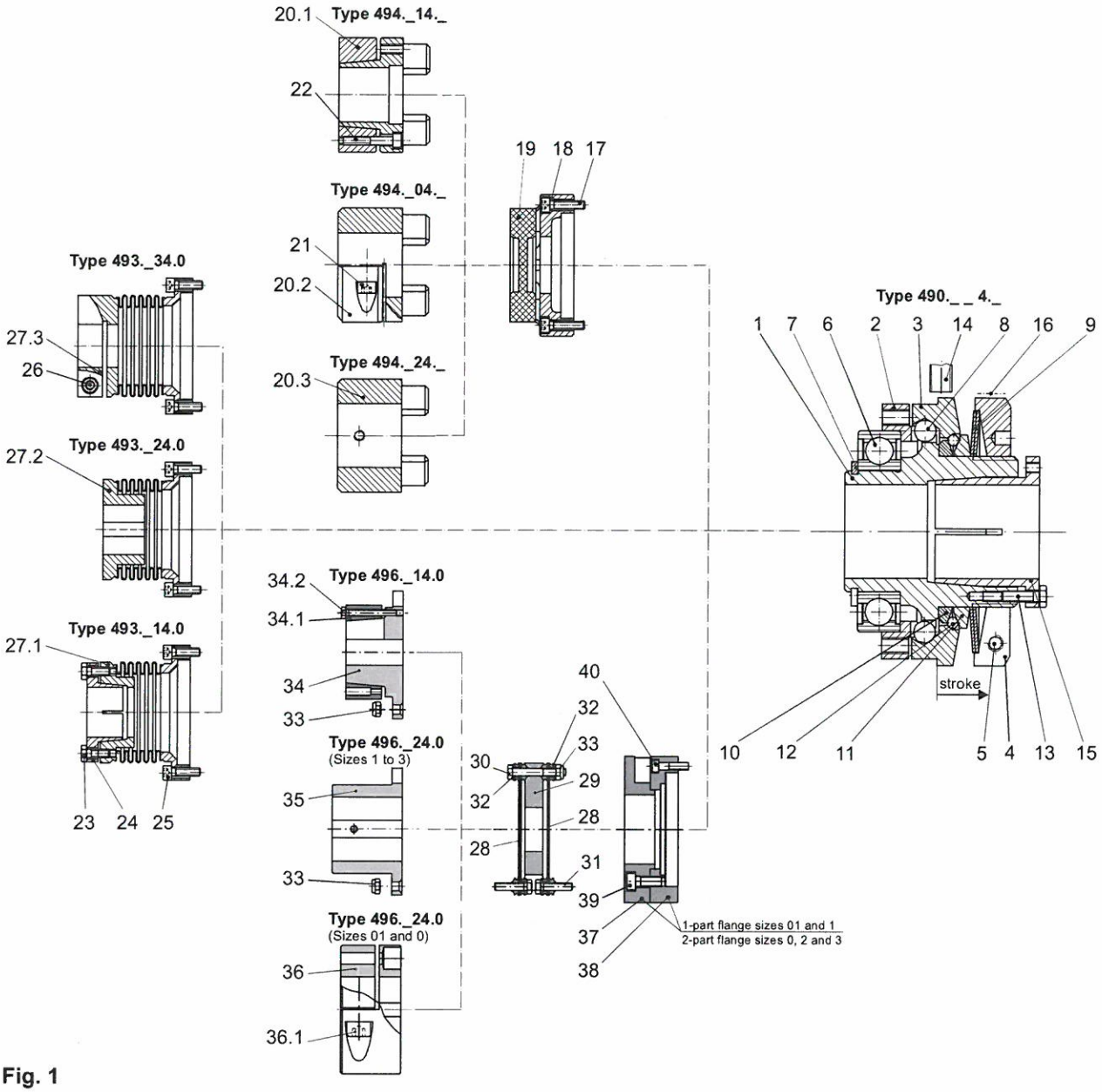

Fig. 1

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

Parts for Type 490.-:

1	Hub EAS®
2	Pressure flange
3	Thrust washer
4	Adjusting nut
5	Cap screw
6	Deep groove ball bearing
7	Locking ring
8	Steel ball
9	Cup spring
10	Supporting ring
11	Thrust ring
12	Steel ball
13	Hexagon head screw
14	Limit switch
15	Cone bushing
16	Type tag

Additional Parts for Type 494.-:

17	Cap screw
18	Connection flange
19	Flexible elastomeric element (red 98 Sh A / yellow 92 Sh A / green 64 Sh D)
20.1	Shrink disk hub
20.2	Clamping hub
20.3	Hub for keyway
21	Cap screw
22	Cap screw

Additional Parts for Type 493.-:

23	Hexagon head screw
24	Cone bushing
25	Cap screw
26	Cap screw
27.1	Steel bellows with flange and hub for cone bushing
27.2	Metal bellows with flange and hub for keyway
27.3	Metal bellows with flange and clamping hub

Additional Parts for Type 496.-:

28	Disk pack
29	Connection plate
30	Hexagon head screw
31	Hexagon head screw
32	Washer
33	Hexagon nut
34	Shrink disk hub
34.1	Shrink disk
34.2	Hexagon head screw
35	Key hub
36	Clamping hub
36.1	Cap screw
37	Connection flange
38	Intermediate flange
39	Cap screw
40	Cap screw

Please Observe!

- ❒ Limit switch Item 14 is not part of the standard delivery
- ❒ Secure cap screws Items 17, 25 and 40 with Loctite 243

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Safety and Guideline Signs

Caution!
Danger of injury to personnel and damage to machines.

Please Observe!
Guidelines on important points

Design

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

State of Delivery

The EAS®-Compact® overload clutch is manufacturer-assembled and set to the torque requested on order.
If no torque adjustment is requested customer-side, the clutch will be pre-set manufacturer-side to c. 70 % of the maximum torque.
Check the state of delivery immediately!

Function

The clutch protects the drive line from excessively high, unpermitted torque impacts, which can occur due to unintentional blockages. After overload has taken place, the transmitting mechanism is completely disconnected.
Only the bearing friction continues to have an effect.
This means that no re-engagement impacts or metallic sliding movements occur on the clutch torque transmission geometries when using this clutch variant.
The clutch must be re-engaged for operation using a lever tool after overload occurrence.
When in operation, the EAS®-Compact® overload clutch (pressure flange (2)) transmits the set torque backlash-free from the motor shaft onto the output.
If the set torque is exceeded (overload), the clutch disengages and remains disengaged. Input and output are separated residual torque-free.
A limit switch (not included in standard delivery) must be installed. The limit switch registers the disengagement movement, and switches off the drive.
After-acting masses can run free.

Caution!
After overload occurrence, the clutch has no load-holding function!

Technical Data

Table 1

Size	Limit torques for overload M_G Type 490.5_4._ [Nm]	Type 490.6_4._ [Nm]	Type 490.7_4._ [Nm]	Type 490.8_4._ [Nm]	Max. speed [rpm]	Thrust washer stroke (Fig. 1 / Item 3) on overload [mm]	Bore EAS®-side from – to Type 49_._14._ + Type 494._04._ + Type 493._34._ [mm]	Type 49_._24._ [mm]
01	5 – 12,5	10 – 25	20 – 50	25 – 62,5	8000	2,0	10 – 20	12 – 20
0	10 – 25	20 – 50	40 – 100	50 – 125	7000	2,6	15 – 25	15 – 25
1	20 – 50	40 – 100	80 – 200	100 – 250	6000	3,2	22 – 35	22 – 30
2	40 – 100	80 – 200	160 – 400	200 – 500	5000	3,8	32 – 45	28 – 40
3	80 – 200	160 – 400	320 – 800	400 – 1000	4000	4,5	35 – 55	32 – 50

Table 2

Size	Type 49_.5_4._ Maximum torque M_G [Nm]	Inspection dimension "a" (Fig. 8) at c. 70 % M_G [mm]	Type 49_.6_4._ Maximum torque M_G [Nm]	Inspection dimension "a" (Fig. 8) at c. 70 % M_G [mm]	Type 49_.7_4._ Maximum torque M_G [Nm]	Inspection dimension "a" (Fig. 8) at c. 70 % M_G [mm]	Type 49_.8_4._ Maximum torque M_G [Nm]	Inspection dimension "a" (Fig. 8) at c. 70 % M_G [mm]
01	12,5	4,4	25	3,7	50	2,2	62,5	1,4
0	25	4,7	50	3,8	100	1,8	125	0,8
1	50	5,1	100	4,0	200	1,5	250	0,3
2	100	6,6	200	5,3	400	2,5	500	1,1
3	200	5,0	400	3,1	800	-0,4	1000	-2,1

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Table 3

Size	Thread in pressure flange (2) (Fig. 2) with screw quality (Items 17 and 25)	Max. screw-in depth in pressure flange (2) (Fig. 2) [mm]	Screw tightening torques													
			Item 5 [Nm]	Item 13 [Nm]	Item 17 [Nm]	Item 21 [Nm]	Item 22 [Nm]	Item 23 [Nm]	Item 25 [Nm]	Item 26 [Nm]	Item 30 [Nm]	Item 31 [Nm]	Item 34.2 [Nm]	Item 36.1 [Nm]	Item 39 [Nm]	Item 40 [Nm]
01	8 x M4 8.8	6	3	4	2,7	10	6	3	2,7	10	8,5	8,5	6	33	-	5
0	8 x M5 8.8	7	5	4	5,5	25	6	5	5,5	18	8,5	8,5	6	33	17,4	10
1	8 x M6 8.8	9	9	4	9,5	25	10	9,5	9,5	18	8,5	8,5	6	-	-	17,4
2	8 x M6 12.9	10	9	8	15	70	25	17	15	43	14	14	8,5	-	42	17,4
3	8 x M8 12.9	12	15	12	42	120	30	17	37,5	87	35	35	10	-	83	42

Table 4

Size	Bore lastic-side from – to			Nominal torque T_{KN} and maximum torque $T_{K\,max.}$ flexible backlash-free shaft coupling					
	Clamping hub Type 494._04._ [mm]	Shrink disk hub Type 494._14._ [mm]	Key hub Type 494._24._ [mm]	Type 494._ _ 4.3 (yellow elastomeric element 92 Sh A)		Type 494._ _ 4.4 (red elastomeric element 98 Sh A)		Type 494._ _ 4.6 (green elastomeric element 64 Sh D)	
				T_{KN} [Nm]	$T_{K\,max.}$ [Nm]	T_{KN} [Nm]	$T_{K\,max.}$ [Nm]	T_{KN} [Nm]	$T_{K\,max.}$ [Nm]
01	15 – 28	15 – 28	8 – 28	35	70	60	120	75	150
0	19 – 35	19 – 38	10 – 38	95	190	160	320	200	400
1	20 – 45	20 – 45	12 – 45	190	380	325	650	405	810
2	28 – 50	28 – 50	14 – 55	265	530	450	900	560	1120
3	35 – 55	35 – 60	20 – 60	310	620	525	1050	655	1310

Table 5

Size	Preferred bores Ø d_3 (clamping hubs) / Ø d_4 (shrink disk hubs) and respective transmittable torques [Nm] on clamping hubs frictional locking (Type 494._0_._) / shrink disk hubs (Type 494._1_._)																			
	Ø 15		Ø 16		Ø 19		Ø 20		Ø 22		Ø 24		Ø 25		Ø 28		Ø 30		Ø 32		Ø 35	
	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	d_3	d_4	d_3	d_4	d_3	d_4
01	34	56	36	62	43	81	45	87	50	100	54	120	57	125	63	135	-	-	-	-	-	-
0	-	-	-	-	79	141	83	153	91	177	100	203	104	216	116	256	124	282	133	308	145	343
1	-	-	-	-	-	-	83	197	91	228	100	261	104	279	116	332	124	368	133	405	145	460
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	208	300	228	350	248	400	280	500
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	350	450

Size	Ø 38		Ø 40		Ø 42		Ø 45		Ø 48		Ø 50		Ø 52		Ø 55		Ø 58		Ø 60	
	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	d_3	d_4	d_3	d_4
01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	-	373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	158	513	166	547	174	577	187	617	-	-	-	-	-	-	-	-	-	-	-	-
2	315	600	340	680	365	730	404	790	442	850	470	880	-	-	-	-	-	-	-	-
3	390	500	420	600	455	720	505	850	560	1000	600	1180	640	1270	705	1353	-	1428	-	1471

Table 6

Size	Shaft misalignments flexible coupling Type 494.							Dimension "E" (Fig. 4) [mm]	Adjusting screws for hub (Item 20.3 / Figs. 1 and 2)	
	Axial ΔK_a	Radial ΔK_r			Angular ΔK_w				Thread	Tightening torque [Nm]
	92/98/64 Sh A/D [mm]	92 Sh A [mm]	98 Sh A [mm]	64 Sh D [mm]	92 Sh A [°]	98 Sh A [°]	64 Sh D [°]			
01	1,4	0,14	0,10	0,07	1,0	0,9	0,8	18	M5	2
0	1,5	0,15	0,11	0,08	1,0	0,9	0,8	20	M6	4,1
1	1,8	0,17	0,12	0,09	1,0	0,9	0,8	24	M8	8,5
2	2,0	0,19	0,14	0,1	1,0	0,9	0,8	26	M8	8,5
3	2,1	0,21	0,16	0,11	1,0	0,9	0,8	28	M8	8,5

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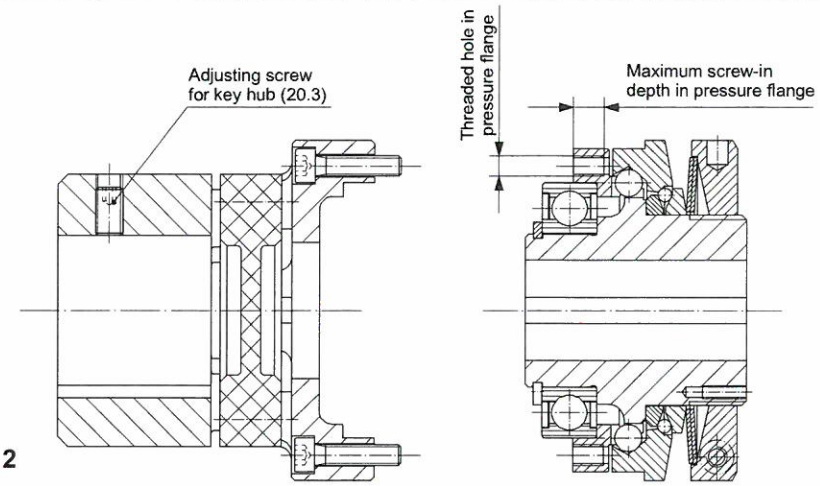

Fig. 2

Table 7

Size	Shaft misalignments steel bellows coupling Type 493.-			Nominal torque T_{KN} steel bellows coupling Type 493.-	Bores steel bellows side		
	Axial ΔK_a [mm]	Radial ΔK_r [mm]	Angular ΔK_w [°]	[Nm]	Type 493._14._ [mm]	Type 493._24._ [mm]	Type 493._34._ [mm]
01	0,4	0,15	2	50	9 – 20	9 – 20	12 – 25
0	0,6	0,15	2	100	12 – 25	12 – 25	15 – 32
1	0,8	0,20	2	200	15 – 35	15 – 35	25 – 42
2	1,0	0,25	2	350	22 – 42	22 – 42	30 – 45
3	1,0	0,30	2	600	32 – 50	32 – 50	35 – 55

Table 8

Size	Transmittable minimum nominal torque on the steel bellows coupling for Type 493.63 _.0 [Nm]																					
	Ø 12	Ø 13	Ø 14	Ø 15	Ø 16	Ø 17	Ø 18	Ø 19	Ø 20	Ø 21	Ø 22	Ø 23	Ø 24	Ø 25	Ø 26	Ø 27	Ø 28	Ø 29	Ø 30	Ø 31	Ø 32	Ø 33
01	21	23	24	25	25	25	25	25	25	25	25	25	25	25	-	-	-	-	-	-	-	-
0	-	-	-	38	40	43	45	47	49	50	50	50	50	50	50	50	50	50	50	50	50	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	63	65	67	69	71	73	75	77	79
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	133	136	140	144
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Size	Ø 34	Ø 35	Ø 36	Ø 37	Ø 38	Ø 39	Ø 40	Ø 41	Ø 42	Ø 43	Ø 44	Ø 45	Ø 46	Ø 47	Ø 48	Ø 49	Ø 50	Ø 51	Ø 52	Ø 53	Ø 54	Ø 55
01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	82	83	85	87	89	91	93	95	97	-	-	-	-	-	-	-	-	-	-	-	-	-
2	147	151	155	158	162	166	169	173	176	180	183	187	-	-	-	-	-	-	-	-	-	-
3	-	250	256	262	268	274	280	286	292	298	304	309	315	321	327	332	338	344	349	350	350	350

Table 9

Size	Bore torsionally rigid side from – to			Nominal torque and impact torque torsionally rigid backlash-free shaft coupling T_{KN} and T_{KS} Type 496._ _ 4.0	
	Shrink disk hub Type 496._14.0 [mm]	Key hub Type 496._24.0 [mm]	Clamping hub with keyway Type 496._24.0 [mm]	T_{KN} [Nm]	T_{KS} [Nm]
01	19 – 38	–	19 – 35	100	150
0	25 – 45	–	25 – 42	150	225
1	25 – 45	16 – 32	–	300	450
2	40 – 60	25 – 50	–	650	975
3	45 – 70	30 – 55	–	1100	1650

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Table 10

Größe	Preferred bores Ø d_S (shrink disk hubs) and respective transmittable torques [Nm] on shrink disk hubs frictional locking (Type 496._14.0)																			
	Ø 19	Ø 20	Ø 22	Ø 24	Ø 25	Ø 28	Ø 30	Ø 32	Ø 35	Ø 38	Ø 40	Ø 42	Ø 45	Ø 48	Ø 50	Ø 52	Ø 55	Ø 60	Ø 65	Ø 70
01	150	150	150	150	150	150	150	150	150	150	-	-	-	-	-	-	-	-	-	-
0	-	-	-	-	225	225	225	225	225	225	225	225	225	-	-	-	-	-	-	-
1	-	-	-	-	339	404	448	492	558	620	659	694	738	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	873	937	1036	1132	1195	1255	1338	1454	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	1268	1394	1480	1565	1691	1890	2065	2204

Table 11

Size	Max. permitted shaft misalignments torsionally rigid clutch Type 496._ _4.0			Adjusting screw for hub (Item 35 / Fig. 1)	
	Axial* ΔK_a [mm]	Radial ΔK_r [mm]	Angular ΔK_w [°]	Thread	Tightening torque [Nm]
01	0,9	0,2	2,0	-	-
0	1,1	0,2	2,0	-	-
1	0,8	0,2	1,4	M5 (up to Ød_p= 22) - M6 (from Ød_p= 22)	2 / 4,1
2	1,1	0,25	1,4	M6	4,1
3	1,3	0,3	1,4	M8	8,5

* Only permitted as static or virtually static value.

Table 12

Size	Connection dimensions	
	$a^{+0,1}$ [mm]	$e^{H7/h5}$ [mm]
01	5	47
0	7	62
1	9	75
2	10	90
3	10	100

Re-engagement

Important: Re-engagement must only take place when the device is not running or at a low differential speed (< 10 rpm).
Re-engagement of the EAS®-Compact® overload clutch takes place simply by placing axial pressure onto the thrust washer (3). Slight twisting between the clutch input and output sides may be necessary.
Depending on the application possibilities and ease of entrance at the installation point, re-engagement can take place in different ways:

- ❒ Manually e.g. using a plastic hammer or installation levers supported on the adjusting nut (4) (e.g. two screwdrivers placed opposite each other).
- ❒ With an engagement device. The engagement device can be automated using pneumatic or hydraulic cylinders.

Installation of the Output Elements (Fig. 3)

The output element is centred on the deep groove ball bearing (6) (tolerance H7/h5) and screwed together with the pressure flange (2).
If the resulting radial force from the output element lies anywhere near the centre of the ball bearing (6) and below the maximum permitted radial load acc. Table 13, an additional output element bearing is unnecessary.
No appreciable axial forces (see Table 13) may be transmitted from the output element onto the clutch pressure flange (2).
The EAS®-Compact® with a long protruding hub (Type 490._ _ 4.1) is recommended for extremely wide output elements, or for elements with small diameters. On very small diameters, the output element is screwed to a customer-side intermediate flange with the clutch pressure flange (2).
Ball bearings, needle bearings or bearing bushings are suitable as bearings for the output element, depending on installation situation and installation space.
In order to prevent axial wandering of the output element (pressure flange (2)) in the direction of the thrust washer (3) during disengagement, please make sure that the output element bearing is a location bearing (Fig. 3).

Table 13

Size	Axial forces [N]	Radial forces [N]	Radial force torques [Nm]
01	650	650	5
0	1000	1000	10
1	1500	1500	20
2	2400	2400	30
3	4200	4200	40

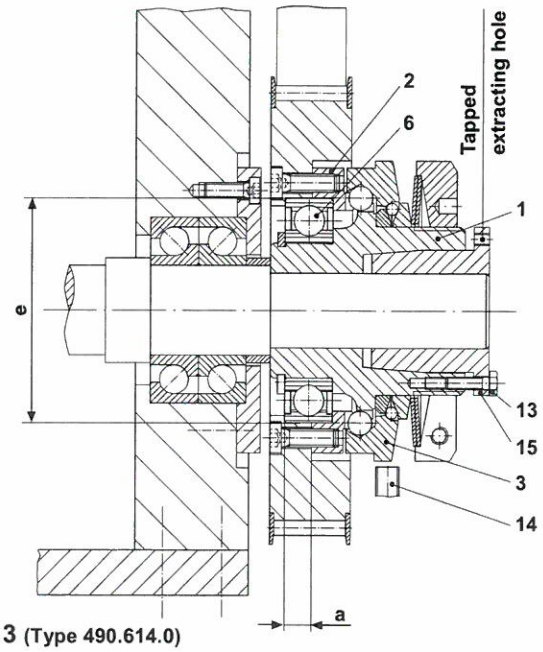

Fig. 3 (Type 490.614.0)

Please observe!
Please observe the connection dimensions „a" and „e" for the output elements (Fig. 3 and Table 12).

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Mounting the Device onto the Shaft

EAS®-Compact® clutches include pre-installed cone bushings, shrink disks, clamping hubs or keyways in the standard delivery.
Please observe the following points during installation of cone bushings, shrink disks and clamping hubs:

- ❒ Shaft tolerances:
  Up to diameter 38 h6 to k6,
  over diameter 38 h8 to k6
- ❒ Surfaces of shafts:
  finely turned or ground (Ra = 0,8 µm)
- ❒ Shaft material: yield point at least 400 N/mm², e.g. St 60, St 70, C 45, C 60.
- ❒ Before clutch or clutch hub installation, the shafts and bores must be degreased, or conserving layers removed.
  Greasy or oily bores or shafts do not transmit the torques defined in the catalogue.
- ❒ Mount the clutch or the clutch hubs using a suitable device onto both shaft ends and bring into the correct position.
- ❒ Tighten the clamping screws in two steps crosswise and then in three to max. six tightening turns evenly using a torque wrench to the tightening torque shown in Table 3.
- ❒ The transmittable torques for the shaft-hub connections are dependent on the bore diameter and the quality of the drive shaft used. Please observe the respective Transmission Tables in the applicable product catalogue.

Please Observe!
When the cone bushing is tightened, the clutch or clutch hub carries out an axial movement in the direction of the cone bushing.
Because of this effect, please ensure that on the EAS®-Compact® clutch with steel bellows (Type 493._ _ 4.0), first one cone bushing is completely tightened (e.g. Item 15), then the other (steel bellows) side (Item 24, Fig. 1, page 2).
Please also ensure during installation of Type 493._4.0 that no axial pressure is placed on the steel bellows (can cause damage).

Disassembly

Tapped extracting holes are located next to the clamping screws (13, 22, 23 and 34.2) in the cone bushings or shrink disks.

1) Loosen all clamping screws by several thread turns.
2) Screw out the clamping screws next to the tapped extracting holes, and screw them up to their limits into the tapped extracting holes. Then tighten these screws until the clamping connection is loosened.

Shaft Installation via the Key Connection

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 central thread (EAS®-side) and/or a set screw (adjusting screw, lastic-side see Figs. 2 and 4).

Joining the Clutch Hubs (1/20) EAS®-Compact® Type 494._ _ 4._ (Fig. 4)

The flexible elastomeric element (19) is pre-tensioned between the metal jaws by joining components 20.1/20.2/20.3 with component 18. To do this, an axial installation force is required. The amount of force required can be reduced by lightly greasing the elastomeric element.

Please Observe!
Please use PU - compatible grease (e.g. Mobilgrease Hp 222)!

Please Observe!
After the clutch hubs have been joined, no unpermittedly high axial pressure should be placed on the elastomeric element (19).
Please keep to the distance dimension "E" acc. Fig. 4 and Table 6!

Joining (Screwing Together) Both Clutch Hubs (1/27) EAS®-Compact® Type 493._ _4.0 (Fig. 1)

Caution!
When mounting the hubs (1 and 27), the joining force must not be transferred via the steel bellows
=> danger of bellows deformation.

Joining Both Clutch Parts EAS®-Compact® Type 496._ _4.0 (Fig. 1)

Join the misalignment-flexible part and the overload clutch and screw together with cap screws (Item 40) to the tightening torque given in Table 3.
The cap screws (Item 40) must be painted with a locking solution, e.g. Loctite 243.

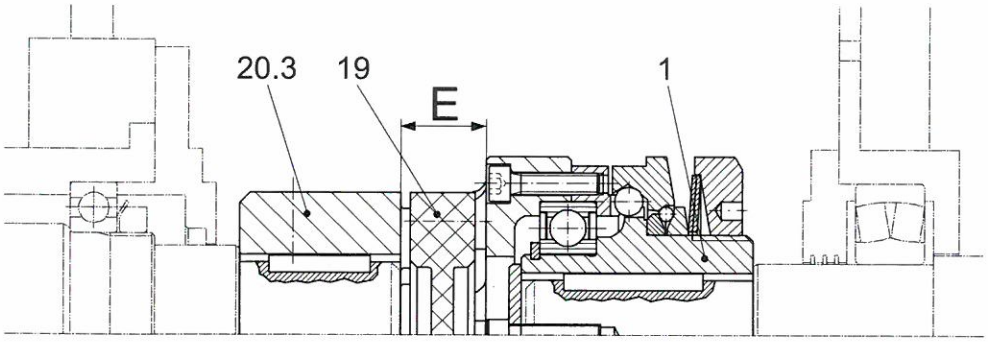

Fig. 4 (Type 494.624._)

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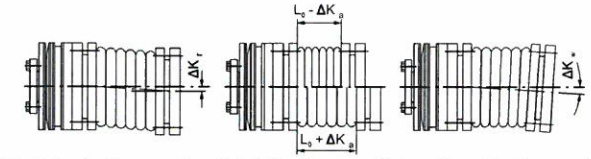
Installation and Operational Instructions for EAS®-Compact® overload clutch, Type 49_. _ _4._ Sizes 01 - 3 (B.4.14.1.GB)

Permitted Shaft Misalignments

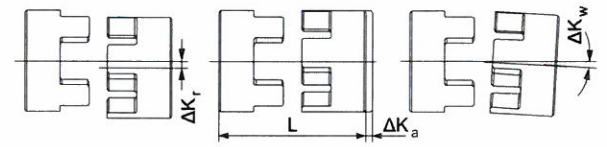
EAS®-Compact® clutches Type 494._ _ 4._ (lastic backlash-free), 493._ _ 4.0 (with steel bellows) and 496._ _ 4.0 (torsionally rigid backlash-free) compensate for radial, axial and angular shaft misalignment (Fig. 5), without losing their backlash-free function. However, the permitted shaft misalignments shown in Tables 6, 7 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. 6).
Therefore, the sum total of the actual misalignments in percent of the maximum value may not exceed 100 %.
The permitted misalignment values shown in Tables 6, 7 and 11 refer to clutch operation with nominal torque, an ambient temperature of +30 °C and an operating speed of 150 0 rpm. In other or more extreme clutch operational conditions, please observe the design guidelines in the individual shaft coupling catalogues, or contact the manufacturers.

Type 493._ _ 4.0 (with metal bellows)



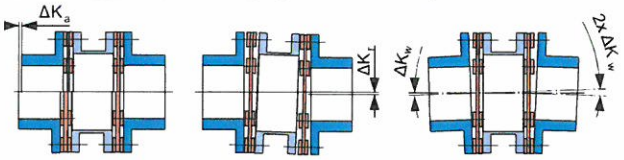
Radial misalignment Axial displacement Angular misalignment

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



Radial misalignment Axial displacement Angular misalignment

Type 496._ _ 4.0 (torsionally rigid backlash-free)



Radial misalignment Axial displacement Angular misalignment

Fig. 5

Example:
Type 493. _ _ 4.0, Size 2:

Axial displacement occurrence K_a = 0,4 mm which equals 40 % of the permitted maximum value $K_{a\,max}$ = 1,0 mm.

Radial misalignment occurrence K_r = 0,09 mm which equals 30 % of the permitted maximum value $K_{r\,max}$ = 0,3 mm.

=> Permitted angular misalignment K_w = 30 % of the maximum value $K_{w\,max}$ = 2,0° => K_w = 0,6°

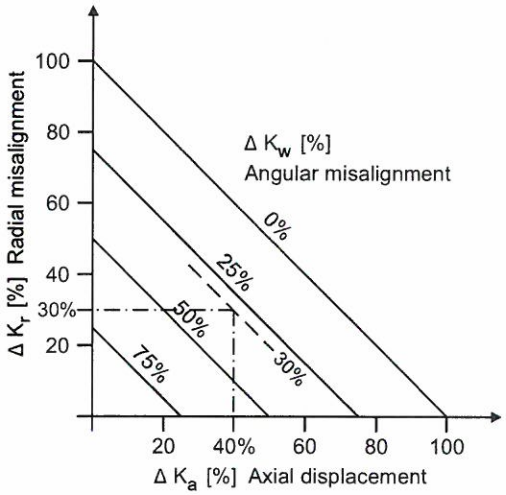


Fig. 6

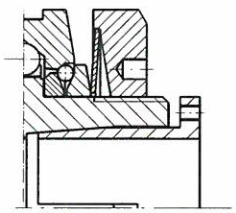
Coupling Alignment

Exact coupling alignment greatly increases the coupling lifetime and reduces the load on the shaft bearings.
In drives with very high speeds, we recommend coupling alignment using a dial gauge or a special alignment device. Normally, however, shaft alignment using a straight edge at two vertical levels next to each other is sufficient.

Cup Spring Layering (Fig. 7)

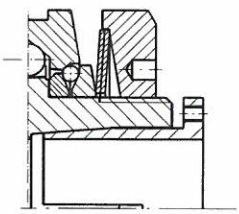
Correct cup spring layering is a prerequisite for problem-free clutch function, and for problem-free torque adjustment.
On all sizes, **one** cup spring (Type 49_.**5**_ 4._) is required for the lower torque range, **two** cup springs (Type 49_.**6**_ 4._) are required for the medium torque range, **four** cup springs are required for the high torque range and **five** cup springs (Type 49_.**8**_ 4._) are required for the maximum torque range.

Single (1x) layering



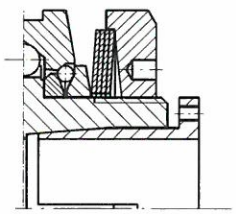
Type 49_.**5**_4._

Double (2x) layering



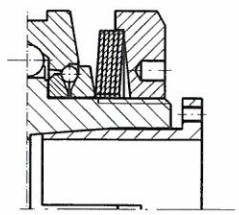
Type 49_.**6**_4._

Quadruple (4x) layering



Type 49_.**7**_4._

Quintuple (5x) layering



Type 49_.**8**_4._

Fig. 7

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Torque Adjustment (Manufacturer-side)

Adjustment takes place by turning the adjusting nut (4). The installed cup springs (9) are operated in the negative range of the characteristic curve (see Fig. 10). This means that tightening the adjusting nut (4) causes a reduction in spring force. Loosening the adjusting nut (4) causes an increase in spring force.
If no particular torque adjustment is requested customer-side, the clutch will always be manufacturer-side **preset** and **marked** (calibrated) to c. 70 % of the maximum torque.
It is possible to check the **„spring operation in the operating range"** (Fig. 10) using the dimension "a" (distance from the adjusting nut, facing-side (4) to the hub edge (1) (Fig. 8)).
Please see Table 2 for the respective values.

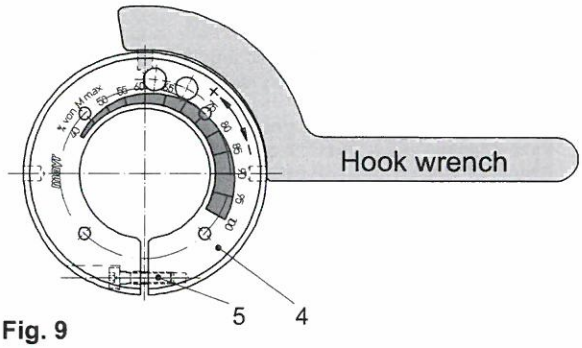

Fig. 9

Please Observe!
Turning the adjusting nut (4) clockwise produces a decrease in torque. Turning it anti-clockwise increases the torque.
Please face the adjusting nut (4) as shown in Figs. 8 and 9.

Changing the Torque

a) Please convert the required torque using the formula below into percent of the maximum adjustment value (see Table 2).

Required torque adjustment / Max. torque adjustment (Table 2)	x 100 = Adjustment in %

b) Loosen the locking screw (5) in the adjusting nut (4).

c) Turn the adjusting nut (4) using the engraved adjustment scale (Fig. 9) clockwise or anti-clockwise using a hook or a face wrench until the required torque is reached.

d) The required torque results from the marking overlap on the hub (1) and the percent value on the adjusting nut (4) (Figs. 8 and 9).

e) Re-tighten the locking screw (5).
(Observe the tightening torque acc. Table 3).

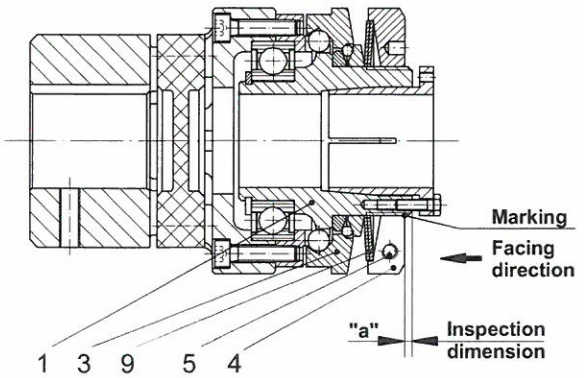

Fig. 8

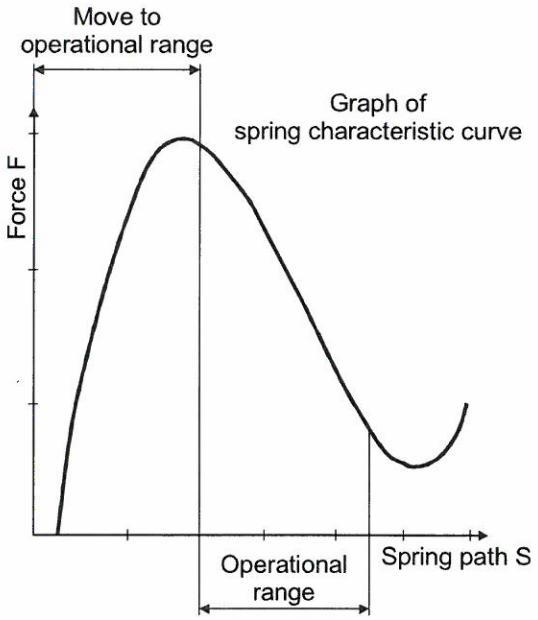

Fig. 10

Please Observe!
Adjusting the adjusting nut (4) or distorting the cup springs (9) out of the cup spring characteristic curve operational range (see Fig. 10) stops the clutch functioning.
The inspection dimension "a" can vary due to construction tolerances or to clutch wear.

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Limit Switch (Item 14; Figs. 1 and 11)

In order to limit slow-down times after overload occurrence, a limit switch must be mounted onto the overload clutch.
Limit switches with appropriate explosion protection certification are suitable.
Grinding, mechanically operated limit switches are only permitted for application in Ex-areas if it can be proved that there is no danger of ignition caused by the grinding movement of the mechanical limit switch on the clutch.
The contactless limit switch must be mounted onto the clutch switching edge (Fig. 11) so that, in normal operation, no limit switch signal change is caused by the usual run-out discrepancies.
On overload, the thrust washer (3) performs a stroke movement (see Table 1, page 3) in the direction of the adjusting nut (4) (Figs. 1 and 11), which is used to change the limit switch signal. A signal change should occur at the latest after an axial stroke of 0,5 mm. At the same time, a radial minimum distance of 0,5 mm should be observed so that the limit switch does not rub.

Limit Switch Installation

- Adjust the switch distances for the contactless limit switch according to Fig. 11.
- Please ensure that the limit switch is functioning correctly.

Contactless limit switch (mounting example)

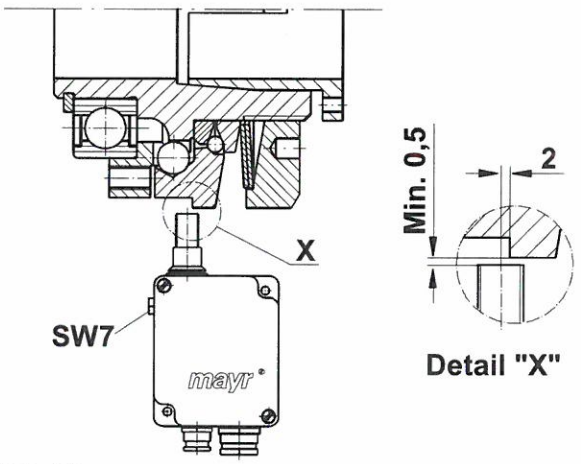

Fig. 11

Maintenance

The maintenance intervals refer to the set clutch torque inspections, shaft-hub connection inspections and screw tightening torque inspections. Please keep to the tightening torques specified according to Table 3. Re-greasing the clutch must only be carried out by specially trained personnel and is only necessary in extreme operating conditions such as heavy dust, dirt or at very high operating speeds. In these cases, the ball transmission geometries must be re-greased.

The following maintenance and inspection intervals are to be kept to:

1.) Visual inspection, installation parameter inspection (tightening torques), clutch running behaviour, clutch release, set torque and sensor switching function **before initial operation.**

2.) Visual inspection, tightening torques inspection, clutch release inspection, torque inspection and, if necessary, re-greasing
after 2000 hours, after 100 overload occurrences or at the latest after every 6 months.

Disposal

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

All Steel Components:
Steel scrap (Code No. 160117)

All Aluminium Components:
Non-ferrous metals (Code No. 160118)

Seals, O-rings, V-seals, elastomere:
Plastics (Code No. 160119)

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Installation and Operational Instructions for EAS®-Compact® overload clutch, Type 49_. _ _4._ Sizes 01 - 3 (B.4.14.1.GB)

Malfunctions / Breakdowns

Malfunction	Possible Causes	Solutions
Premature clutch release	Incorrect torque adjustment	1) Set the system out of operation 2) Check the torque adjustment 3) 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 adjustment 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 disengaging 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 adjustment has changed (position)	
	Disengaging mechanism is blocked by foreign bodies	
	Worn clutch	
Running noises on overload occurrence as clutch slows down	Bearing on the output flange is worn or has been previously damaged	1) Set the system out of operation 2) Inspect the clutch at the place of manufacture
	Worn disengaging mechanism	
Running noises in normal operation	Insufficient clutch securement	1) Set the system out of operation 2) Check the clutch securements 3) Check the screw tightening torques 4) Check the torque adjustment and that the adjusting nut sits securely
	Loosened screws	
	Loosened adjusting nut	
Changes in running noise and / or vibration occurrence Type 494.-	Incorrect alignment	1) Set the system out of operation 2) Solve the cause of incorrect alignment (e. g. loose foundation screws, motor securement breakage, warmth expansion of system components, changes in the coupling installation dimension "E") 3) Check the coupling for wear
	Wear on the elastomeric element, temporary torque transmission due to metal contact	1) Set the system out of operation 2) Dismantle the coupling and remove the remains of the elastomeric element 3) Check the coupling parts and replace if damaged 4) Insert a new elastomeric element, install coupling parts 5) Check the alignment and correct if necessary

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Malfunctions / Breakdowns

Malfunction	Possible Causes	Solutions
Changes in running noise and / or vibration occurrence Type 494.-	Clamping screws and socket set screws or locking set screw for hub axial securement loosened	1) Set the system out of operation 2) Check the coupling alignment 3) Tighten the clamping and set socket screws for axial securement of the hubs as well as the connecting screws to the specified torque, or tighten the locking set screw and paint it with locking solution against self-loosening 4) Check the coupling for wear
	Loosened connecting screws	
Cam breakage Type 494.-	Wear on the elastomeric element, temporary torque transmission due to metal contact	1) Set the system out of operation 2) Replace the entire coupling 3) Check the alignment
	Cam breakage due to high impact energy / overload	1) Set the system out of operation 2) Replace the entire coupling 3) Check the alignment 4) Find the cause of overload
	Operating parameters do not match the coupling performance	1) Set the system out of operation 2) Check the operating parameters and select a suitable coupling (please observe installation space) 3) Install a new coupling 4) Check the alignment
	Operational mistakes on the system lead to the coupling characteristic data being exceeded.	1) Set the system out of operation 2) Check coupling dimensioning 3) Replace the entire coupling 4) Check the alignment 5) Train operating personnel
Premature wear on the elastomeric element Type 494.-	Incorrect alignment	1) Set the system out of operation 2) Solve the cause of incorrect alignment (e. g. loose foundation screws, motor securement breakage, warmth expansion of system components, changes in the coupling installation dimension "E") 3) Check the coupling for wear 4) Insert a new elastomeric element
	e.g. Contact with aggressive fluids / oils, ozone influences, excessively high ambient temperatures etc. which lead to physical changes in the elastomeric element	1) Set the system out of operation 2) Dismantle the coupling and remove the remains of the elastomeric element 3) Check the coupling parts and replace them if damaged 4) Insert a new elastomeric element, install the coupling components 5) Check the alignment and replace if necessary 6) Make sure that there can be no further physical changes to the elastomeric element

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Malfunctions / Breakdowns

Malfunction	Possible Causes	Solutions
Premature wear on the elastomeric element Type 494.-	The ambient or contact temperatures permitted for the elastomeric element are exceeded	1) Set the system out of operation 2) Dismantle the coupling and remove the remains of the elastomeric element 3) Check the coupling parts and replace them if damaged 4) Insert a new elastomeric element, install the coupling components 5) Check the alignment and correct if necessary 6) Check the ambient or contact temperatures and regulate them (if necessary using other elastomeric element materials)
Premature wear on the elastomeric element (material liquidation inside the elastomeric element toothing) Type 494.-	Drive vibrations	1) Set the system out of operation 2) Dismantle the coupling and remove the remains of the elastomeric element 3) Check the coupling parts and replace them if damaged 4) Insert the new elastomeric element, install the coupling component 5) Check the alignment and correct if necessary 6) Find the cause of vibration (if necessary using elastomeric element products with a lower or higher shore hardness)
Bellows breakage Type 493.-	Incorrect alignment	1) Set the system out of operation 2) Replace the entire coupling 3) Check the alignment
	Bellows have already been damaged in transport or during installation	1) Set the system out of operation 2) Replace the entire coupling 3) Check the alignment
	Operating parameters do not match coupling performance	1) Set the system out of operation 2) Check the operating parameters and choose a suitable clutch (observe the installation position) 3) Install a new coupling 4) Check the alignment
	Bellows are energised in natural frequency; resonance	1) Set the system out of operation 2) Redesign the line characteristics 3) Replace the entire coupling 4) Check the alignment
Changes in running noise and / or vibration occurrence Type 493.-	Screws are loosened, resonances, insufficient coupling securement	1) Set the system out of operation 2) Check the screw tightening torques 3) Check the line characteristics 4) Inspect the coupling parts and replace them if damaged

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Installation and Operational Instructions for EAS®-Compact® overload clutch, Type 49_. _ _4._ Sizes 01 - 3 (B.4.14.1.GB)

Malfunctions / Breakdowns

Malfunction	Possible Causes	Solutions
Changes in running noise and / or vibration occurrence Type 496.-	Incorrect alignment, incorrect installation	1) Set the system out of operation 2) Solve the cause of incorrect alignment 3) Check the coupling for wear
	Loose connection screws, minor friction corrosion under the screw head and on the disk pack	1) Set the system out of operation 2) Check the coupling parts and replace them if damaged 3) Tighten the connecting screws to the specified torque 4) Check the alignment and correct if necessary
	Clamping screws or locking set screw for hub axial securement loosened	1) Set the system out of operation 2) Check the coupling alignment 3) Tighten the clamping and set socket screws for axial securement of the hubs or the locking set screw to the specified torque, and paint them with locking solution against self-loosening 4) Check the coupling for wear
Disk pack breakage Type 496.-	Disk pack breakage due to high load impacts / overload	1) Set the system out of operation 2) Dismantle the coupling and remove the remains of the elastomeric element 3) Check the coupling parts and replace them if damaged 4) Find the cause of overload and remove it
	Operating parameters do not match coupling performance	1) Set the system out of operation 2) Check the operating parameters and choose a suitable coupling (observe the installation position) 3) Install a new coupling 4) Check the alignment
	Incorrect operation on the system unit	1) Set the system out of operation 2) Dismantle the coupling and remove the remains of the disk pack 3) Inspect coupling components and replace if damaged 4) Train the operating personnel
Disk pack or connection screws breakage / cracks Type 496.-	Drive vibrations	1) Set the system out of operation 2) Dismantle the coupling and remove the remains of the disk pack 3) Inspect coupling components and replace if damaged 4) Check the alignment and correct if necessary 5) Find the cause of the vibrations and remove it

Please Observe!

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

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