

Translation of the Original Operational Instructions

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

Page 1:	- Contents
Page 2:	- Safety and Guideline Signs - Safety Regulations
Page 3:	- Clutch Illustrations EAS®-HSE Type 4130_0400
Page 4:	- Clutch Illustrations EAS®-HSE Type 4139_041_
Page 5:	- Parts List
Page 6:	- General Technical Data - Technical Data Type 4130_0400
Page 7:	- Technical Data Type 4139_041_ - Screw Tightening Torques
Page 8:	- Transmittable Torques of the Shrink Disk Hubs Frictional Locking
Page 9:	- Design - Scope of Delivery / State of Delivery - Function
Page 10:	- Re-engagement
Page 11:	- General Installation Guidelines - Clutch Installation - De-Installation of the Shrink Disks
Page 12:	- Permitted Shaft Misalignments - Clutch Alignment
Page 13:	- Torque Adjustment - Maintenance and Maintenance Intervals - Disposal
Attachment:	- Adjustment Diagram

Installation and Operational Instructions for EAS®-HSE element clutch Type 413_._04_ _ Sizes 2 to 9

(B.413.1.EN)

Safety and Guideline Signs

CAUTION



Danger of injury to personnel and damage to machines.



Please Observe!
Guidelines on important points.

Safety Regulations

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



It is forbidden to start initial operation of the product until you have ensured that all applicable EU directives and directives for the machine or system, into which the product has been installed, have been fulfilled. At the time these Installation and Operational Instructions go to print, the 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 impacts or foreign body impact.
- ☐ Replace self-locking hexagon nuts when they become ineffective after frequent loosening and tightening (for ROBA®-DS connection).
- ☐ The clutches may not be put into operation without an overload detection provided by the customer unless *mayr*® has been contacted and has agreed otherwise.

To prevent injury or damage, only specialist personnel are allowed to work on the components. They must be familiar with the dimensioning, transport, installation, initial operation, maintenance and disposal according to the relevant standards and regulations. Please read the Installation and Operational Instructions carefully prior to installation and initial operation of the device.

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

Installation and Operational Instructions for EAS®-HSE element clutch Type 413_04_ Sizes 2 to 9

(B.413.1.EN)

Clutch Illustrations EAS®-HSE Type 4130_0400

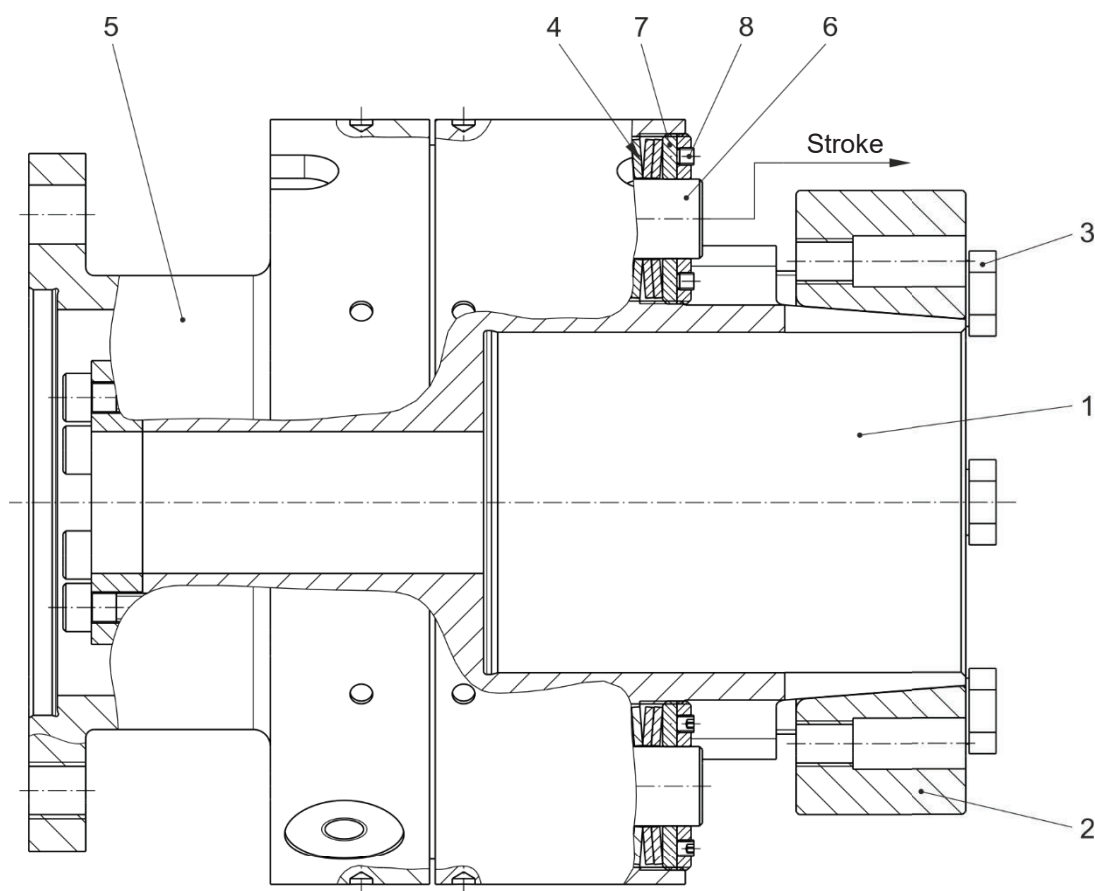


Fig. 1

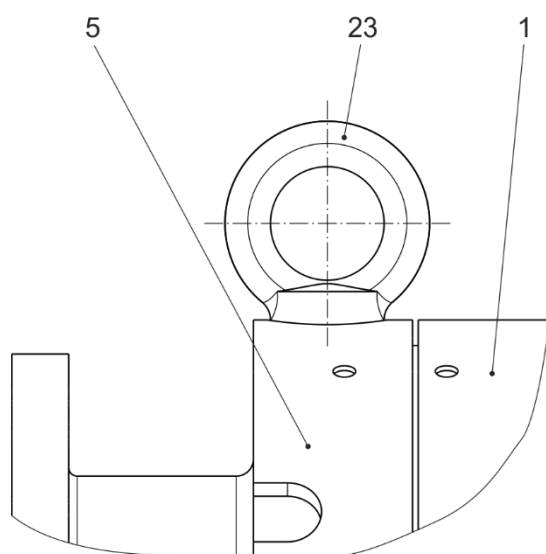


Fig. 1a

Installation and Operational Instructions for EAS®-HSE element clutch Type 413._.04._ Sizes 2 to 9

(B.413.1.EN)

Clutch Illustrations EAS®-HSE Type 4139._041_

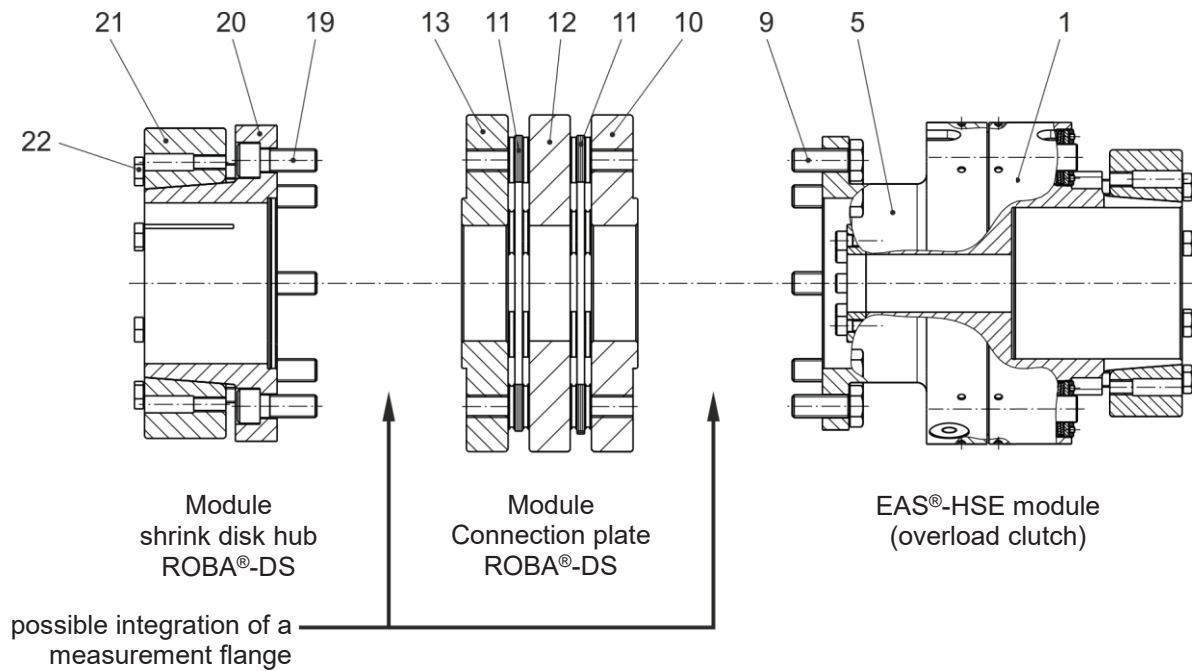
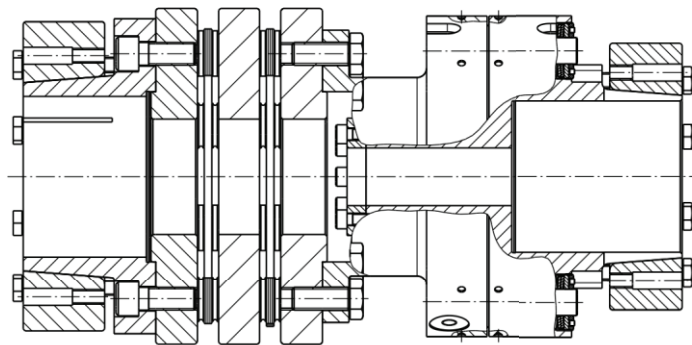


Fig. 2



EAS®-HSE Type 4139._0411, completely assembled

Fig. 2a

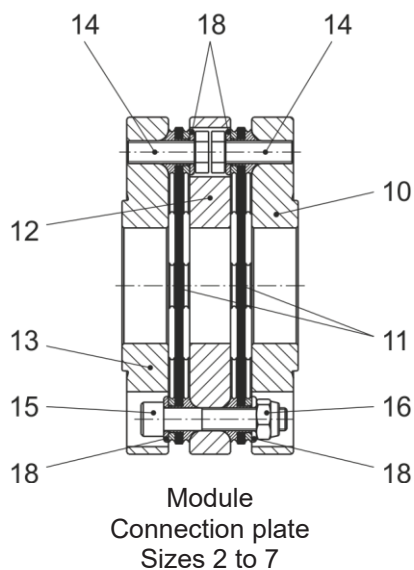


Fig. 2b

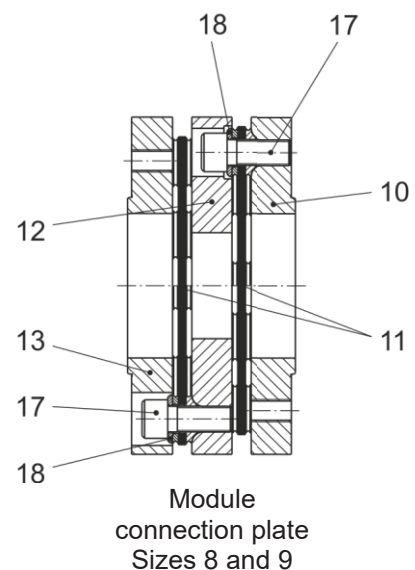


Fig. 2c

Installation and Operational Instructions for EAS®-HSE element clutch Type 413_._04_ _ Sizes 2 to 9

(B.413.1.EN)

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

Item	Name
1	Hub
2	Shrink disk
3	Hexagon head screw
4	Overload element
5	Pressure flange
6	Bolt
7	Adjusting nut
8	Set screw (only for Sizes 5 to 9)
9	Hexagon head screw
10	Flange
11	Disk pack
12	Connection plate
13	Flange
14	Hexagon head screw (only for Sizes 2 to 7)
15	Cap screw (only for Sizes 2 to 7)
16	Hexagon nut (only for Sizes 2 to 7)
17	Cap screw (only for Sizes 8 to 9)
18	Washer
19	Cap screw
20	Shrink disk hub
21	Shrink disk
22	Hexagon head screw
23	Eyebolt (installation aid / only Sizes 4 to 9)

Installation and Operational Instructions for EAS®-HSE element clutch Type 413._.04._ Sizes 2 to 9

(B.413.1.EN)

Table 1: General Technical Data

Size	Limit torques for overload M_G [Nm] (number of overload elements per clutch)				Hub bore (1) from – to [mm]	Bolt (6) stroke [mm]
	Type 413._.040._	Type 413._.504._	Type 413._.604._	Type 413._.704._		
2	45 – 90 (2)	68 – 136 (3)	90 – 180 (4)	135 – 270 (6)	20 – 36	2.5
3	93 – 186 (2)	140 – 280 (3)	185 – 370 (4)	280 – 560 (6)	25 – 45	2.5
4	125 – 250 (2)	250 – 500 (4)	375 – 750 (6)	500 – 1000 (8)	35 – 65	2.5
5	250 – 500 (2)	375 – 750 (3)	500 – 1000 (4)	750 – 1500 (6)	35 – 60	4
6	325 – 650 (2)	650 – 1300 (4)	1000 – 2000 (6)	1300 – 2600 (8)	42 – 80	4
7	500 – 1000 (2)	1000 – 2000 (2)	1500 – 3000 (3)	2000 – 4000 (4)	42 – 80	6
8	1150 – 2300 (2)	1750 – 3500 (3)	2300 – 4600 (4)	3500 – 7000 (6)	70 – 95	6
9	1400 – 2800 (2)	2800 – 5600 (4)	4200 – 8400 (6)	5600 – 11200 (8)	70 – 120	6

Table 2: Technical Data Type 4130._.0400

Size	Max. speed Type 4130._.0400 [rpm]		Permitted ambient temperature	
	Balanced clutch	Unbalanced clutch	Balanced clutch	Unbalanced clutch
2	25000	13600	+10 °C to +80 °C	-20 °C to +80 °C
3	22000	10100		
4	16000	8500		
5	14000	8500		
6	12000	6200		
7	11000	6200		
8	10000	5200		
9	8000	4400		

Table 3: Technical Data Type 4130._.0400

Size	Screw connection on pressure flange			Mass moment of inertia [10^{-3} kgm ²] ¹⁾		Weight ¹⁾ [kg]
	Pitch	Thread	Bore [mm]	Hub-side	Pressure flange-side	
2	6 x 60°	M8	8.2	2.05	1.65	3.55
3	6 x 60°	M8	8.2	3.34	2.02	4.37
4	8 x 45°	M10	10.4	10.44	4.99	7.53
5	8 x 45°	M10	10.4	14.93	6.41	10.63
6	8 x 45°	M12	12.4	44.45	20.91	18.35
7	8 x 45°	M12	12.4	66.76	38.67	24.73
8	8 x 45°	M14	14.4	144.52	65.10	39.63
9	8 x 45°	M16	16.4	335.58	140.52	61.80

¹⁾ Mass inertias and weights are valid for Type 4130.50400 and maximum bore.

Installation and Operational Instructions for EAS®-HSE element clutch Type 413._.04._ Sizes 2 to 9

(B.413.1.EN)

Table 4: Technical Data for Type 4139._.041_ with a Mounted ROBA-DS Coupling Type 9210._0100

The clutches are completely balanced with a balance quality of G2.5 at 3000 rpm.

Size	Corresponding ROBA®-DS Size	Nominal torque ROBA®-DS [Nm]	Permitted misalignments			Max. speed Type 4139. [rpm]	Bore from – to Shrink disk hub (Item 20) [mm]
			axial ΔK_a [mm]	radial ΔK_r [mm]	angular ΔK_w [°]		
2	16F	190	0.2	0.06	0.3	25000	25 – 45
3	16	300	0.2	0.06	0.2	22000	25 – 45
4	64	1100	0.3	0.08	0.2	16000	45 – 70
5	64	1100	0.3	0.08	0.2	14000	45 – 70
6	300	3500	0.4	0.08	0.16	12000	50 – 85
7	300	3500	0.4	0.08	0.16	11000	50 – 85
8	500	5800	0.4	0.11	0.16	10000	60 – 100
9	850	10000	0.5	0.13	0.16	8000	70 – 120

²⁾ Angular misalignment per disk pack

Table 5: Technical Data for Type 4139._.041_ with a Mounted ROBA-DS Coupling Type 9210._0100

Size	Mass moment of inertia ¹⁾ ROBA®-DS-side [10 ⁻³ kgm ²]		Weight ¹⁾ [kg]		Permitted ambient temperature
	Type 4139.50411	Type 4139.5041M	Type 4139.50411	Type 4139.5041M	
2	3.39	1.86	6.28	5.12	+10 °C to +80 °C
3	3.38	1.85	7.04	5.88	
4	19.27	10.78	15.13	11.79	
5	19.27	10.78	18.03	14.69	
6	84.93	50.46	37.89	29.86	
7	84.93	50.46	46.32	38.29	
8	191.42	110.42	69.48	56.12	
9	478.42	274.68	115.19	91.83	

¹⁾ Mass inertias and weights are valid for Type 4139.5041_ and maximum bores.

Table 6

Size	Screw tightening torques [Nm]				
	Item 3	Items 9 / 19	Items 14 / 15 / 16	Item 17	Item 22
2	6	37	8.5	-	6
3	6	37	8.5	-	6
4	24	74	35	-	24
5	32	74	35	-	24
6	32	127	120	-	35
7	63	127	120	-	35
8	127	220	-	240	56
9	93	340	-	450	93

Installation and Operational Instructions for EAS®-HSE element clutch Type 413_04_ _ Sizes 2 to 9

(B.413.1.EN)

Table 7

Size	Transmittable torques T_R [Nm] of the shrink disk hubs frictional locking (Item 1) - dependent on bore - valid for tolerance constellation H6/g6												
	Ø 20	Ø 22	Ø 25	Ø 28	Ø 30	Ø 32	Ø 35	Ø 38	Ø 40	Ø 42	Ø 45	Ø 48	Ø 50
2	283	320	375	428	468	509	568	-	-	-	-	-	-
3	-	-	339	404	448	492	558	620	659	694	738	-	-
4	-	-	-	-	-	-	865	1024	1138	1258	1451	1660	1807
5	-	-	-	-	-	-	1291	1432	1533	1642	1817	2010	2148
6	-	-	-	-	-	-	-	-	-	2234	2453	2650	2794
7	-	-	-	-	-	-	-	-	-	2938	3179	3437	3621
8	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-

Size	Ø 52	Ø 55	Ø 60	Ø 65	Ø 70	Ø 75	Ø 80	Ø 85	Ø 90	Ø 95	Ø 100	Ø 110	Ø 120
2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1962	2207	2653	3148	-	-	-	-	-	-	-	-	-
5	2295	2530	2967	-	-	-	-	-	-	-	-	-	-
6	2930	3150	3488	3835	4255	4627	5214	-	-	-	-	-	-
7	3834	4119	4680	5309	6011	6790	7650	-	-	-	-	-	-
8	-	-	-	-	7501	8329	9238	10231	11314	12490	-	-	-
9	-	-	-	-	10723	11719	12750	13750	14777	15720	16665	18607	20603

Table 8

Size	Transmittable torques T_R [Nm] of the shrink disk hubs frictional locking (Item 20 / Type 4139_0411) - dependent on bore - valid for tolerance constellation H5/h5											
	Ø 25	Ø 28	Ø 30	Ø 32	Ø 35	Ø 38	Ø 40	Ø 42	Ø 45	Ø 48	Ø 50	Ø 52
2	320	368	403	442	506	579	632	689	782	-	-	-
3	320	368	403	442	506	579	632	689	782	-	-	-
4	-	-	-	-	-	-	-	-	1935	2118	2241	2381
5	-	-	-	-	-	-	-	-	1935	2118	2241	2381
6	-	-	-	-	-	-	-	-	-	-	3101	3249
7	-	-	-	-	-	-	-	-	-	-	3101	3249
8	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-

Size	Ø 55	Ø 60	Ø 65	Ø 68	Ø 70	Ø 75	Ø 80	Ø 85	Ø 90	Ø 95	Ø 100	Ø 110	Ø 120
2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	2591	2988	3436	3730	3938	-	-	-	-	-	-	-	-
5	2591	2988	3436	3730	3938	-	-	-	-	-	-	-	-
6	3472	3883	4340	4637	4845	5402	6016	6687	-	-	-	-	-
7	3472	3883	4340	4637	4845	5402	6016	6687	-	-	-	-	-
8	-	4679	5136	5430	5635	6177	6768	7411	8107	8890	9674	-	-
9	-	-	-	-	7726	8354	9088	9850	10670	11585	12500	14606	17008

Installation and Operational Instructions for EAS®-HSE element clutch Type 413_.04_ Sizes 2 to 9

(B.413.1.EN)

Design

The EAS®-HSE element clutch **Type 4130_.0400** (EAS®-HSE module) is designed as a mechanically disengaging overload clutch according to the ball detent principle.

The EAS®-HSE module is balanced with G 2.5 at 3000 rpm in the standard design but can also be obtained unbalanced for subordinate speed requirements.

Type 4139_.041_ combines the EAS®-HSE module with the high-speed ROBA®-DS Type 9210_.0100 design for connection to a measurement flange with compensation capability for shaft misalignments.

The misalignment-flexible coupling part compensates for axial, radial and angular shaft misalignments, whereby the total sum of misalignments must not exceed 100%.



In the case of clutches with special application data released by the manufacturer, these are defined with any associated restrictions in the corresponding configurator drawings or release drawings.

Scope of Delivery / State of Delivery

- ☐ Clutches **Types 4130_.0400** are manufacturer-assembled ready for installation.
- ☐ Clutches **Types 4139_.0411** are delivered in 3 modules, which are manufacturer-assembled ready for installation (Fig. 2).
- ☐ Clutches **Types 4139_.041M** are delivered in 2 modules, which are manufacturer-assembled ready for installation (Fig. 2 / without module shrink disk hub).
- ☐ The torque is set manufacturer-side according to the customer's request (please compare the torque stipulated in the order with the torque imprinted/engraved in the identification).
Otherwise, the clutch must be adjusted to the required torque by using the Adjustment Diagram (attachment) (see section Torque Adjustment).
- ☐ All screw connections are tightened to tightening torque.
- ☐ Clutches **Types 4130_.0400** are balanced with a balance quality of G2.5 at 3000 rpm in the standard version, but can also be supplied unbalanced on customer request.
The clutch modules **Types 4139_.041_** are generally balanced with a balance quality of G2.5 at 3000 rpm.

Please check the scope of delivery according to the Parts List as well as the state of delivery immediately after receiving the goods. *mayr®* will take no responsibility for belated complaints.

Please report transport damage immediately to the deliverer.

Please report incomplete delivery and obvious defects immediately to the manufacturer.

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. In order to make the clutch ready for operation again after an overload occurrence, the clutch must be re-engaged.

When in operation, the set torque is transmitted backlash-free from the drive via the EAS®-clutch, if necessary with the misalignment-flexible coupling (ROBA®-DS), onto the output. If the set limit torque is exceeded (overload), the clutch disengages. On disengagement, the bolts (6) in the overload elements (4) perform an axial movement (stroke).

The bolts (6) remain disengaged. Input and output are separated residual torque-free.

After-acting masses can slow down freely.

The overload - i.e. the relative movement between the hub (1) and the pressure flange (5) - can be detected using the keyways of the two components (each 2 x 180° on the circumference, see Fig. 3 on page 10) which are aligned in operating condition, e. g. by means of speed monitors or optoelectronic sensors.

CAUTION



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



The run-out time after disengagement must be max. 2 minutes.

In order to prepare the clutch for renewed operation, the bolts (6) must be re-engaged manually (see section Re-engagement).

Installation and Operational Instructions for EAS®-HSE element clutch Type 413_04_ _ Sizes 2 to 9

(B.413.1.EN)

Re-engagement (Figs. 3 and 4)

In order to make the clutch ready for operation again after overload occurrence, the bolts (6) in the overload elements (4) must be re-engaged.

For Types 4130_0400 (balanced) and 4139_041_:

Both of the yellow guideline signs for regaining the synchronous position (due to balance quality) on the outer diameters of the hub (1) and the pressure flange (5) must align with each other (Fig. 3).

For Types 4130_0400 (unbalanced):

The marking bores on the outer diameters of the hub (1) and the pressure flange (5) must align with each other (Fig. 3).

Re-engagement takes place by placing axial pressure onto the bolt end of each overload element (4).

Depending on the equipment available, the accessibility of the installation point etc., re-engagement can be carried out in the following ways:

- ☐ Manually, using a suitable tool.
- ☐ By using an engagement mechanism. The engagement procedure can also be automated using pneumatic or hydraulic cylinders.

The level of engagement force is dependent on the set limit torque for overload and can be roughly calculated using the formula below.

$$F_E = 1.5 \times M_G \text{ [kN]}$$

F_E = Total engagement force of all clutch overload elements [kN].

M_G = Set limit torque for overload [kNm].

F_U = Engagement force per overload element [kN].

$$F_U = \frac{F_E}{n}$$

n = Number of overload elements

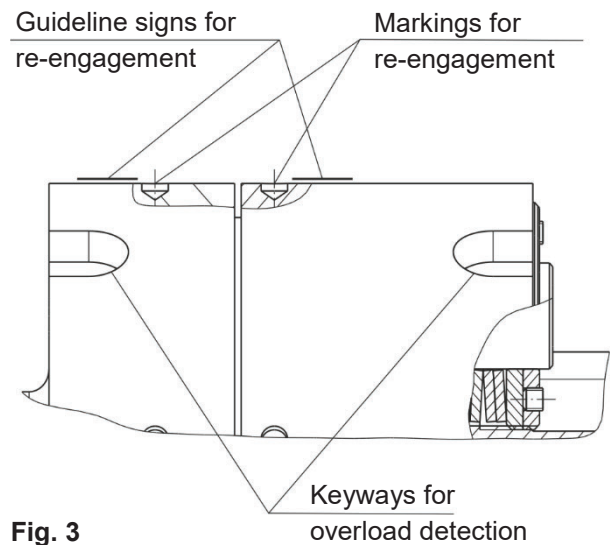


Fig. 3

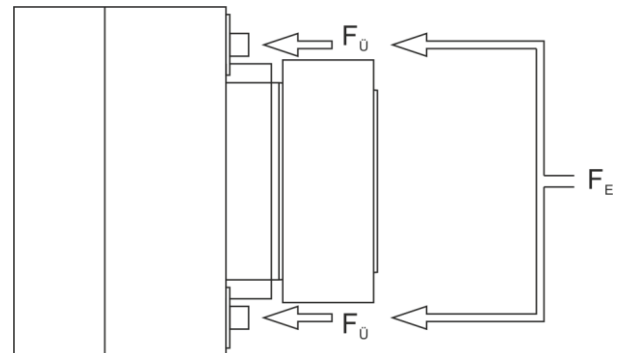


Fig. 4

Installation and Operational Instructions for EAS®-HSE element clutch Type 413_04_ _ Sizes 2 to 9

(B.413.1.EN)

General Installation Guidelines

□ Recommended fit tolerances for the shafts:

Hub	Standard hub tolerances	Recommended shaft tolerances
Item 1	H6	g6
		h6
	F6	k6
		m6
Item 20	H5	g5
		h5
	F5	k5
		m5

- Shaft surface:
finely turned or ground $R_a = 0.8 \mu\text{m}$
- Shaft material: Yield point min. 350 N/mm^2 .
- The shafts must be solid shafts without a keyway.
- The shafts and the hub bores must not be oiled or greased.
- Any conserving layers in the clutch bores must be removed.

Clutch Installation

Type 4130_0400 (Fig. 1)

1. Mount the EAS®-HSE clutch onto the input shaft using a suitable device and bring it into position.
Please see the note in Fig. 5 regarding the clutch alignment.
2. Tighten the hexagon head screws (3) in the shrink disk (2) using a torque wrench evenly and one after the other in max. 6 sequences to the tightening torque acc. Table 6.
3. Produce a screw connection between the measurement flange and the pressure flange (5).
The customer is responsible for defining the screw tightening torque and for providing the screws.



Please observe the Installation Guidelines of the measurement flange manufacturer when mounting the measurement flange.

Type 4139_041_ (Fig. 2)

1. Mount the EAS®-HSE module using a suitable mounting device onto the shaft and bring it into position.
Please see the note in Fig. 5 regarding the clutch alignment.
2. Tighten the tensioning screws (3) of the shrink disk (2) using a torque wrench evenly and one after the other in max. 6 sequences to the torque stated in Table 6.
3. If necessary, mount the module "shrink disk hub" onto the shaft and bring it into position.
4. Tighten the tensioning screws (22) in the shrink disk (21) using a torque wrench evenly and one after the other in max. 6 sequences to the torque stated in Table 6.

5. Produce the screw connections between the measurement flange and the modules. Please observe the tightening torques acc. Table 6.



Please also observe the Installation Guidelines of the measurement flange manufacturer when mounting the measurement flange.



Before initial operation of the clutch, please remove the eyebolt (23) (installation aid).

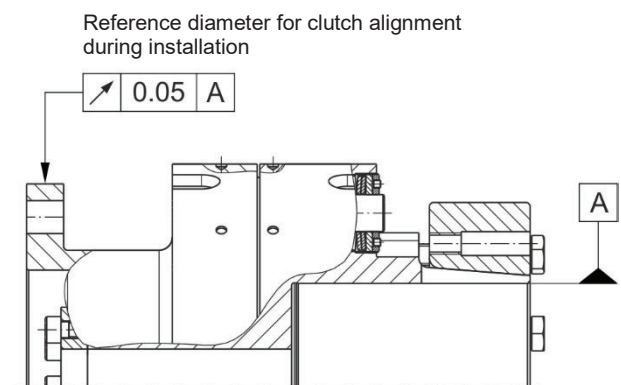


Fig. 5

De-Installation of the Shrink Disks (Items 2/21):

1. Unscrew all hexagon head screws (Items 3/22) completely and screw them into the tapped extracting holes next to them up to their limits.
2. Tighten the hexagon head screws (Items 3/22) evenly and step-wise so that the shrink disk (Items 2/21) is loosened from the hub (Items 1/20).

Installation and Operational Instructions for EAS®-HSE element clutch Type 413_._04_ _ Sizes 2 to 9

(B.413.1.EN)

Permitted Shaft Misalignments

The EAS®-HSE element clutches Types 4139._____. compensate for radial, axial and angular shaft misalignments (Fig. 6) without losing their backlash-free function. However, the permitted shaft misalignments indicated in Table 4 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. 7. The sum total of the actual misalignments in percent of the maximum value must not exceed 100 %. The permitted misalignment values given in Table 4 refer to clutch operation at nominal torque and an ambient temperature of +30 °C. If the clutch is operated in other or more extreme operating conditions, please contact the manufacturers.

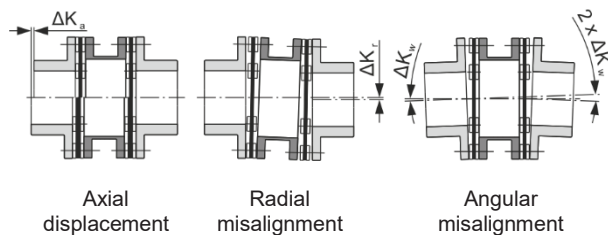


Fig. 6

Example (Size 5 / Type 4139.50411):
Axial displacement occurrence $\Delta K_a = 0.12$ mm equals 40 % of the permitted maximum value $\Delta K_a = 0.3$ mm.
Angular misalignment occurrence $\Delta K_w = 0.06^\circ$ equals 30 % of the permitted maximum value $\Delta K_w = 0.2^\circ$.
=> permitted radial misalignment $K_r = 30$ % of the maximum value
 $\Delta K_r = 0.08$ mm => $\Delta K_r = 0.024$ mm

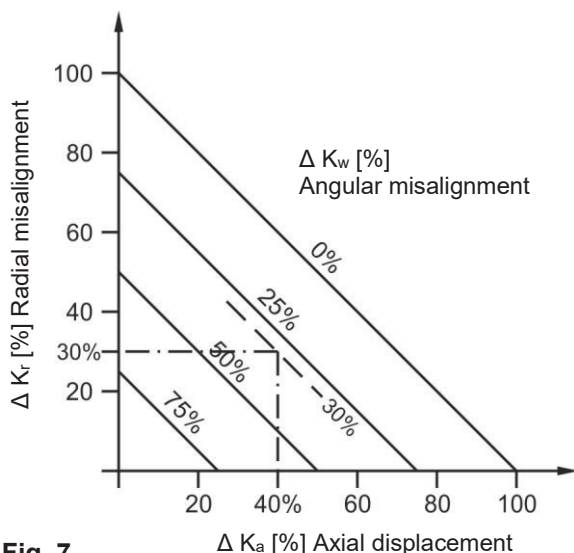


Fig. 7

Clutch Alignment

Exact alignment of the clutch increases the clutch service lifetime and reduces the load on the shaft bearings. However, we recommend alignment of the clutch (of the shaft ends) using a dial gauge or laser measurement devices on drives operating at very high speeds.

Installation and Operational Instructions for EAS®-HSE element clutch Type 413_04_ _ Sizes 2 to 9

(B.413.1.EN)

Torque Adjustment (Figs. 1, 8 and 9)

Set the limit torque M_G for overload on the clutch by changing the cup spring pre-tension on each overload element (4) according to the Adjustment Diagram.

On the clutch the adjusting nuts (7) are adjusted by turning them in the overload elements (4) using a face wrench.



During torque adjustment, please ensure that all overload elements (4) on the clutch are evenly adjusted!

Torque Adjustment:

1. Determine the limit torque M_G for overload.
2. Please determine dimension "a" using the Adjustment Diagram included in the clutch delivery.
This dimension is equal to the required limit torque M_G .
3. Set all overload elements (4) by turning the adjusting nut (7) to the dimension "a" found in the Adjustment Diagram.
4. Apply Loctite 290 to the joint between the adjusting nut (7) and component (1) (Fig. 8).

Alternatively, for Sizes 5 to 9 and 2-piece adjusting nut, anti-rotation lock with set screws (Fig. 9):

Loosen locking set screws (8) in the adjusting nuts (7) before adjusting the adjusting nut (7) and tighten them again after adjustment.

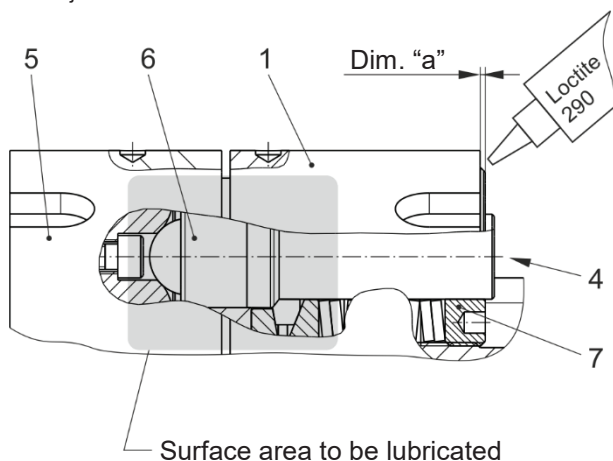


Fig. 8

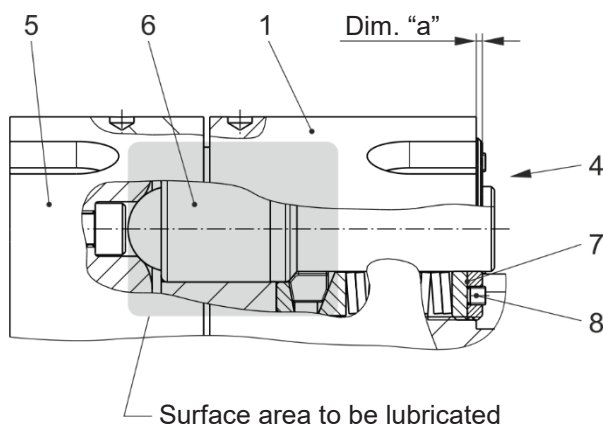


Fig. 9



In order to guarantee low-wear clutch operation, it is essential that the clutch torque is set to a sufficiently high service factor (overload torque to operating torque). Our experience has shown that an adjustment factor of 1.5 to 4 gives good results. In case of very high load alternations, high accelerations and irregular operation, please set the adjustment factor higher.

Maintenance and Maintenance Intervals

Maintenance work, which should be carried out after 2000 operating hours, after 1000 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 (see table 6 on page 7) must be maintained.
- ➔ Clutch release inspection
- ➔ Inspection of the set torque
- ➔ Inspection of the bearing or bearing pre-tension
- ➔ Re-greasing of the contact components of the overload elements (4).

Depending on the load type and intensity, re-lubrication work on the clutch is required. For this purpose, the overload elements (4) must be opened and the individual components must be removed, cleaned, greased and reassembled.

Specialist knowledge is required for lubricating the contact components of the overload elements (4). Lubrication may therefore only be carried out by specially trained personnel or at the manufacturer's plant.

See Fig. 8 for the surface area to be lubricated.

Please use NLGI Class 1.5 grease with a basic oil viscosity of 460 mm²/s at 40 °C, e.g. Mobilith SHC460.

Re-lubrication of the clutch bearing is not required.

When re-installing the clutch, please secure all screws with Loctite 243 (medium hard).

Once installation has been completed, the torque must be re-adjusted and re-checked.

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 maintenance intervals.

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)