Installation and Operational Instructions for EAS®-Sp Clutch Type 45_.125._

(B.4.12.GB)

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:

Conformity Declaration

A conformity evaluation for the applicable EU directives was carried out for this product.
The conformity declaration is set out in writing in a separate document and can be requested if required.
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 Guidelines

These Installation and Operational Instructions (I+0) are included in the clutch delivery.
Please keep them handy and near to the clutch at all times.

Danger!

This caution applies if:

- ❒ The EAS®-Sp clutches are modified or retrofitted.
- ❒ The relevant STANDARDS for safety and / or installation conditions are ignored.

User-implemented Protection Measures

- ❒ Please cover moving parts to protect them against seizure, dust and foreign body impact.
- ❒ The clutches may not be put into operation without a limit switch unless *mayr*® has been consulted and has agreed otherwise.

To prevent injury or damage, only professionals and suitably qualified personnel should work on the devices, following the relevant standards and regulations. Please read the Installation and Operational Instructions carefully before installing and operating the device.

These Safety Guidelines 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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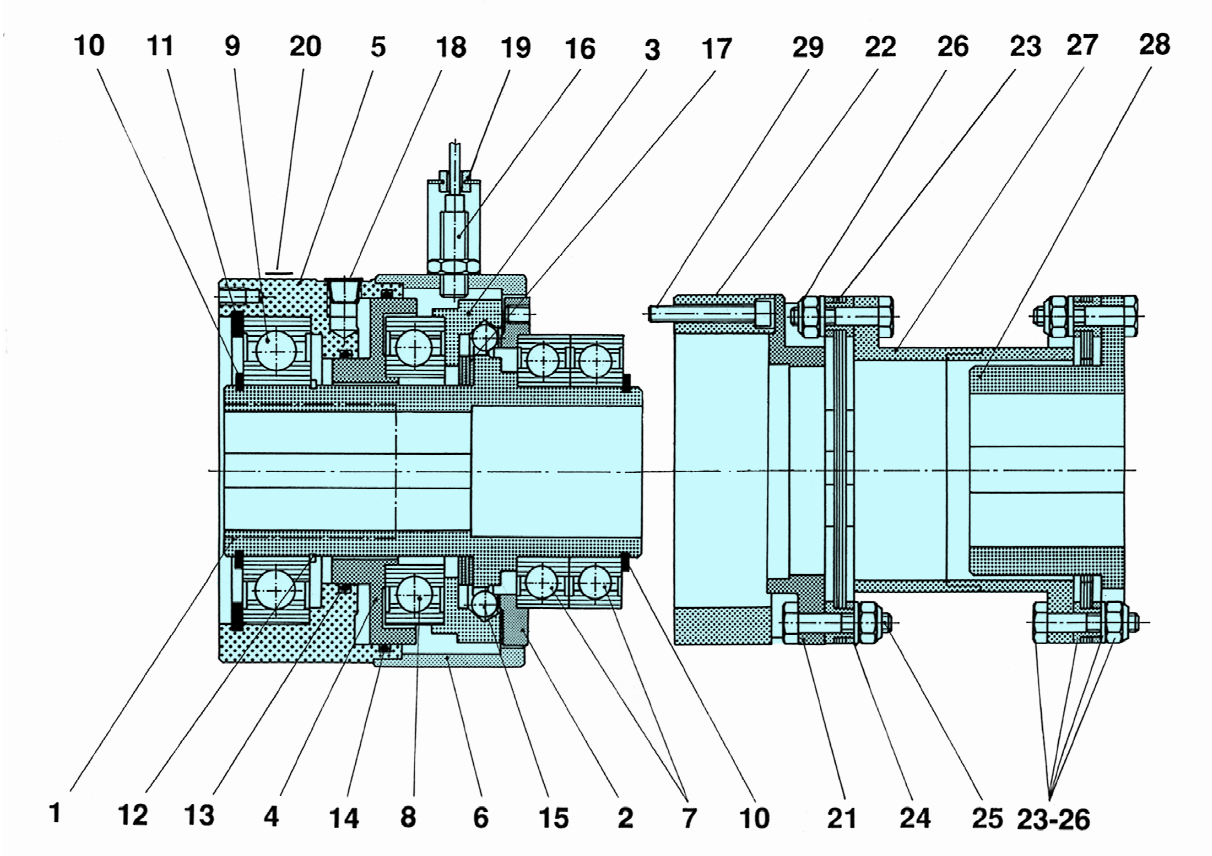

Fig. 1: Type 45_.125._Sizes 01 - 5

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

EAS®-Sp Standard
Type 450.125.0

1	Hub - EAS®
2	Pressure flange
3	Thrust washer
4	Piston
5	Stator part
6	Sealing cover
7	Deep groove ball bearing
8	Deep groove ball bearing
9	Deep groove ball bearing
10	Locking ring
11	Locking ring
12	Snap ring
13	Quad ring
14	Quad ring
15	Steel ball
16	Proximity switch
17	Cup spring
18	Cone plug
19	Protective bar (from size 0)
20	Type tag

EAS®-Sp torsionally rigid
Type 456.125.8

1–20	(as EAS®-Sp Standard)
21	Flange Sp
22	Intermediate flange Sp
23	Disc pack
24	Washer
25	Fitting screw
26	Hexagon nut
27	Sleeve 0
28	Hub - ROBA®-D
29	Cap screw

Safety and Guideline Signs

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

Please observe!
Guidelines on important points.

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Functioning Principle EAS®-Sp (Fig. 1)

The EAS®-Sp clutch is a pneumatically operated overload clutch with switching function.

The torque transmission takes place via steel balls (15) in radially and axially placed recesses in the hub (1) and the pressure flange (2) and is therefore frictionally locked. Using the supply pressure of 1 – 6 bar, the disengagement torque can be continuously adjusted.

Overload function:
During operation, the clutch transmits the torque regulated by the pneumatic pressure backlash-free from the input to the output. If this torque is exceeded (overload), the steel balls (15) are pushed out of the recesses in the hub (1) and the pressure flange (2). The clutch disengages. At the same time, the integrated limit switch (PNP normally closed contact) is damped and a signal is passed on to the EAS®-Sp control unit device. The clutch is released (quick release valve), input and output are separated residual torque-free.

Switching function:
The clutch is pneumatically switchable.
When pressure is applied, the transmission steel balls (15) are pressed into the recesses of the hub (1) and the pressure flange (2).
This leads to backlash-free torque transmission.

Please observe!
For EAS®-Sp Clutch Type 45_.125._ (synchronous clutch), please observe:

Engagement can only take place in one position; torsional angle 360°. As long as the engagement position is not rea ched, the clutch transmits a residual torque of approx. 10 % of the nominal torque.

Please observe!

Engagement of the clutch should only take place at crawl speed or when the system is stopped. It may not be carried out under load.
In order to couple larger flywheel masses or to transmit higher starting torques, it is possible for the re-engagement pressure of the EAS®-Sp clutch to deviate from the operational pressure (2-pressure system); however, the maximum pressure (6 bar) may not be exceeded.

State of Delivery

(Please check state of delivery)!

The EAS®-Sp clutch is completely installed, including the proximity switch (16).
The EAS®-Sp control unit device for monitoring or control can be delivered as an accessory for the device.
The pneumatic unit must be provided or connected by the customer.
You can find the dimensions of the connection thread for the pneumatic unit in Table 1 on page 5. You can find switching examples in Figs. 5 and 6 on page 6.

Installation of the Drive Elements (Figs 1 and 3)

On the EAS®-Sp, the drive elements are centred on both deep groove ball bearings (7) and are screwed to the pressure flange (2).
For thread diameter, max. screw-in depth and tightening torque see Table 1.
The drive elements must be secured against axial movement in the direction of the sealing cover (6) (on pressureless clutch), via a collar, a locking ring or similar component. (see Fig. 3).
If the resulting radial force from the drive element lies anywhere near both of the ball bearings (7), an additional drive bearing element will not be necessary (see Fig. 2).

Mounting the clutch onto the shaft (Figs. 2 and 3)

EAS®-Sp clutches come as a standard delivery with finish bore and keyway according to DIN 6885. The clutch, including the mounted drive element, is mounted onto the shaft using a suitable fitting device.
The device is fixed axially onto the shaft via a press cover and a screw, screwed into the central thread of the shaft (see Figs. 2 and 3).
On EAS®-Sp with torsionally rigid flexible all-steel couplings, a set screw holds the hub (28) of the flexible coupling onto the shaft (Fig. 3).

- Bore fitting H7 /Fitting in the keyway JS9
- Roughness depth in the boring Ra = 1,6 µm
- Shaft surface: finely turned or ground Ra = 1,6 µm
- Shaft material: yield point at least 350 N/mm^2, e.g. St 60, St 70, C 45, C 60.

Clutch Removal

You must use a suitable fitting device to remove the EAS®-Sp clutch from the shaft. Avoid damage to the bearings.

On the EAS®-Sp torsionally stiff models, the clutch may under no circumstances be removed by pulling it over the flexible part. This would cause distortion of the disc pack and prevent the clutch from functioning correctly.

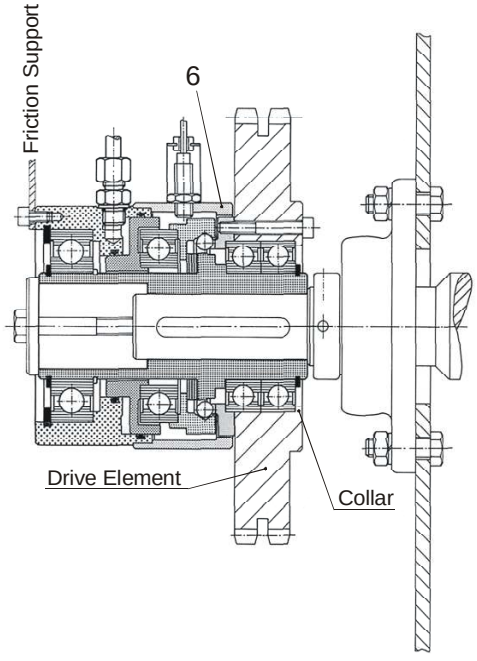

Fig. 2

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EAS®-Sp torsionally rigid

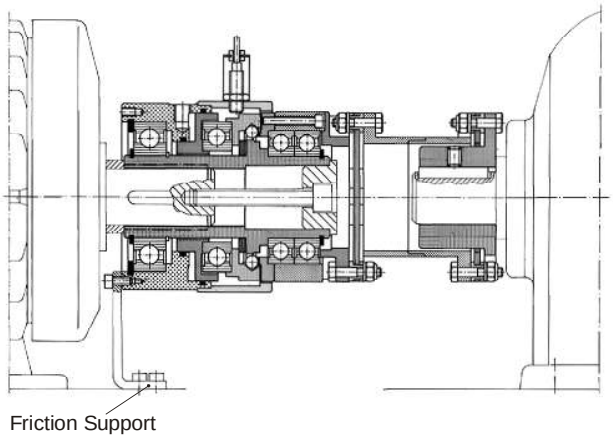

Fig. 3

Coupling Alignment

The flexible coupling compensates for radial and angular shaft misalignments and for axial displacement (please observe the maximum permitted values, Table 1).
Exact coupling alignment greatly increases the service life time and decreases the load on the shaft bearings.
In drives with very high speeds, we recommend that alignment should be carried out using a suitable alignment device (e.g. laser).
Normally, however, aligning the coupling with a straight edge at two vertical levels next to each other is sufficient.

Permitted shaft misalignments

EAS®-Sp torsionally rigid with compensation for axial displacement and radial and angular misalignments, Fig. 4.
The maximum permitted shaft misalignments are to be found in Table 1.
If several different kinds of misalignment occur at the same time, they influence each other. Therefore, the permitted misalignment values are dependent on one another as seen in Fig. 5.

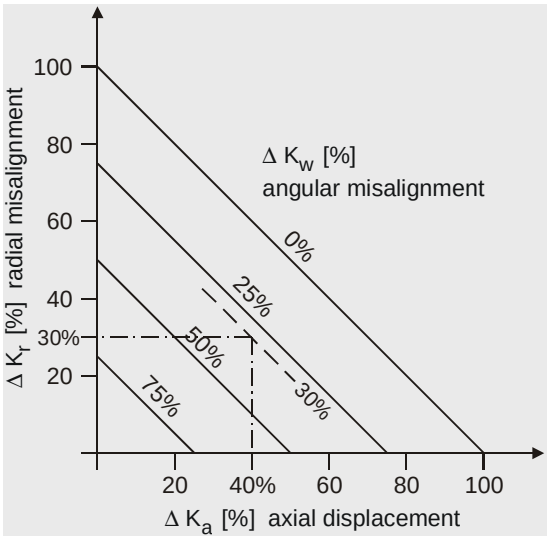

Fig. 5

Example:
EAS®-Sp Size 4
Axial displacement occurrence: ΔK_a = 0,6 mm
Angular misalignment occurrence: ΔK_w = 0,6°
We are looking for: permitted radial misalignment ΔK_r.

ΔK_a = 0,6 mm , equal to 40 % of the permitted Table value
ΔK_a = 1,6 mm
ΔK_w = 0,6° equal to 30 % of the permitted Table value
ΔK_w = 2°

The permitted radial misalignment in % is calculated from Fig. 5

ΔK_r = 30 % of permitted ΔK_r = 2,2 mm: 0,7 mm is given for this particular exception as the permitted radial misalignment.

Friction Support Installation

The deep groove ball bearing (9) which holds the stator (5) causes a minor friction torque on the stator part (5) or on the sealing cover (6): the customer must add a friction support.
The stator part or the sealing cover must not rotate.
One of the four threaded holes on the facing side of the stator part (5) are to be used when mounting the friction support.
The friction support may not place forces worthy of note onto the clutch or cause tensions on the stator part (5) bearing (see Figs. 2 and 3).

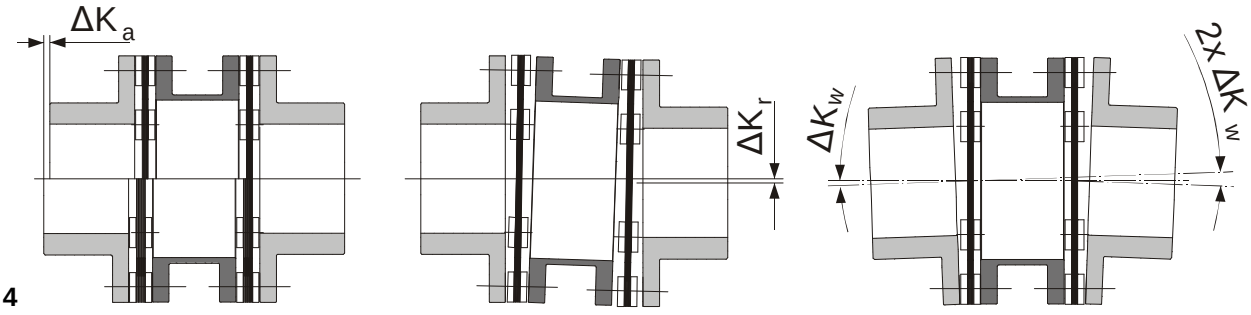

Fig. 4

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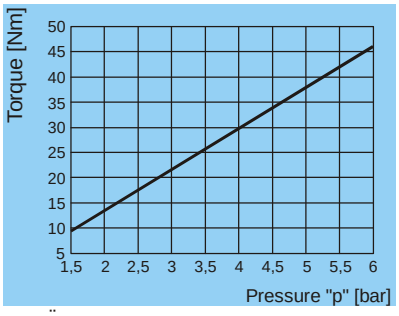
EAS®-Sp	Size	01	0	1	2	3	4	5
Connection thread for pressurised air	[in]	G 1/8“	G 1/8“	G 1/8“	G 1/8“	G 1/4“	G 1/4“	G 1/4“
Tightening torque M_A Fitting screw Part 25	[Nm]	-	10,5	10,5	26	26	89	215
Tightening torque M_A Cap screw Part 29	[Nm]	-	6,1	6,1	10,5	26	51	89
Thread / max. screw-in depth Part 29	[mm]	M5/5,5	M5/5,5	M5/6,5	M6/8	M8/8	M10/11	M12/15
EAS®-Sp torsionally rigid axial displacement ΔK_a	[mm]	-	0,8	1,0	1,2	1,4	1,6	1,8
EAS®-Sp torsionally rigid radial misalignment ΔK_r	[mm]	-	0,65	0,7	0,85	1,0	1,25	1,4
EAS®-Sp torsionally rigid ang. misalignment ΔK_w	[°]	-	2	2	2	2	2	2

Table 1

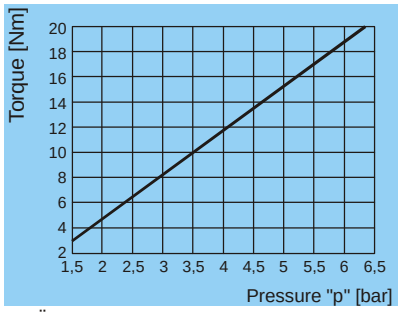
Torque Adjustment

Torque adjustment takes place using air pressure.
The torque rises or falls proportionally to the air pressure (see also torque curves below).

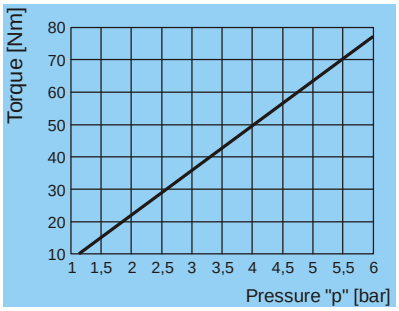
Static Torque Curves [1)]



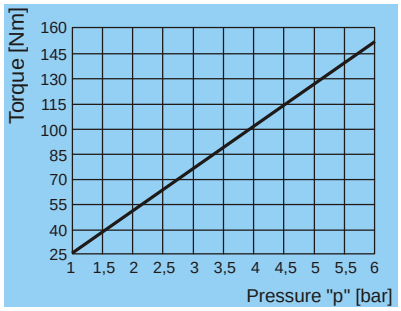
EAS®-Sp 01/450.125.H



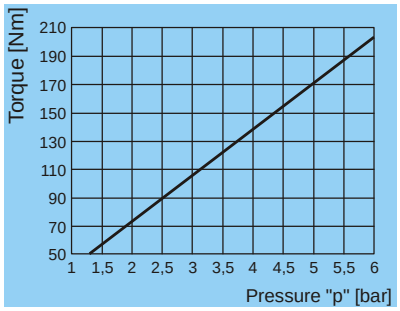
EAS®-Sp 01/450.125.L



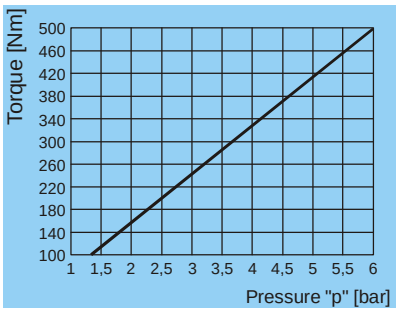
EAS®-Sp 0/450.1_ _._



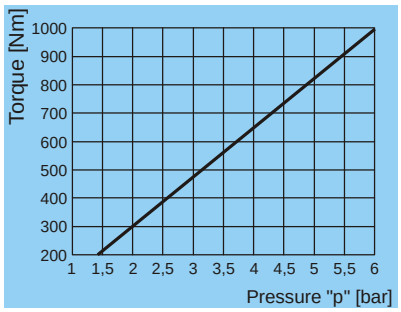
EAS®-Sp 1/450.1_ _._



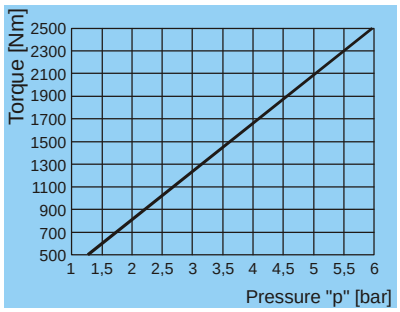
EAS®-Sp 2/450.1_ _._



EAS®-Sp 3/450.1_ _._



EAS®-Sp 4/450.1_ _._



EAS®-Sp 5/450.1_ _._

1) The values given in the diagrams are guideline values which can be subject to by certain tolerances.

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Pneumatic Control

In order to reach a high switching dynamic, the cable wire cross sections are to be adequately dimensioned. The cable lengths between the pressure reservoir and the clutch are to be kept short.
In order to make immediate release of the clutch (the piston space) possible, a quick release valve positioned as near to the clutch as possible must be installed (see also switching and control examples Figs. 5 and 6).

Control Switching Examples

1-Pressure System

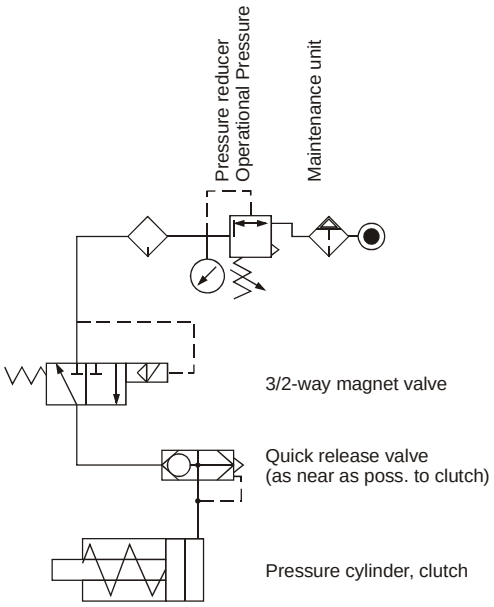

Fig. 5

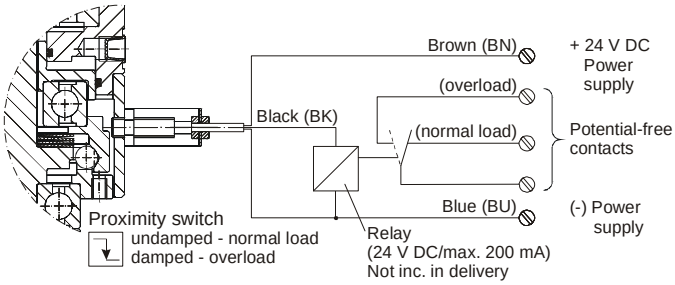

Fig. 7

Electrical Connection Limit Switch

The proximity switch (6) integrated in the sealing cover (16) is examined for functionality and adjusted manufacturer-side.
The electrical connection usually takes place via the EAS®-Sp control unit. The data for connection and for control unit adjustment can be found in the Operational Instructions B.0090002.GB.

Compressed air characteristics

The pressurised air must be filtered and oiled.
Viscosity Class VG32 according to ISO 3448.
The quality of the compressed air according to ISO 8573-1 should have a quality class 4 or higher.

2-Pressure system

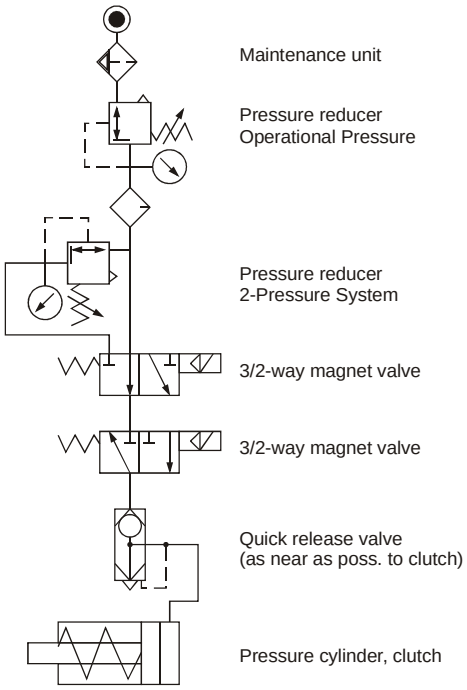

Fig. 6

Maintenance

The EAS®-Sp clutch is mainly maintenance-free.
The only maintenance work necessary is restricted to regular inspections of functional capability.
Special maintenance work may be necessary in extreme ambient or load conditions, or in the presence of large amounts of dirt or dust. This special maintenance includes:

- ❑ Bearing inspections
- ❑ Tightening torque inspections
- ❑ Lubrication of the transmitting geometries, balls, detents and sealing elements.

In these conditions, it may well be necessary to carry out inspections at much shorter intervals.

We strongly recommend that maintenance work should be carried out at the site of manufacture!

Disposal

Electronic Components (limit switch):
Products which have not been dismantled can be disposed of under the 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)

Seals, O-rings, V-seals, elastomere:

plastics (Code No. 160119)

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