Pneumatic linear drive

DGO-...-A-B

FESTO

(en) Operating instructions

8074779
2017-10c
[8074781]

Original instructions

Symbols:

Warning, Caution

Please note

Antipollution

Accessories

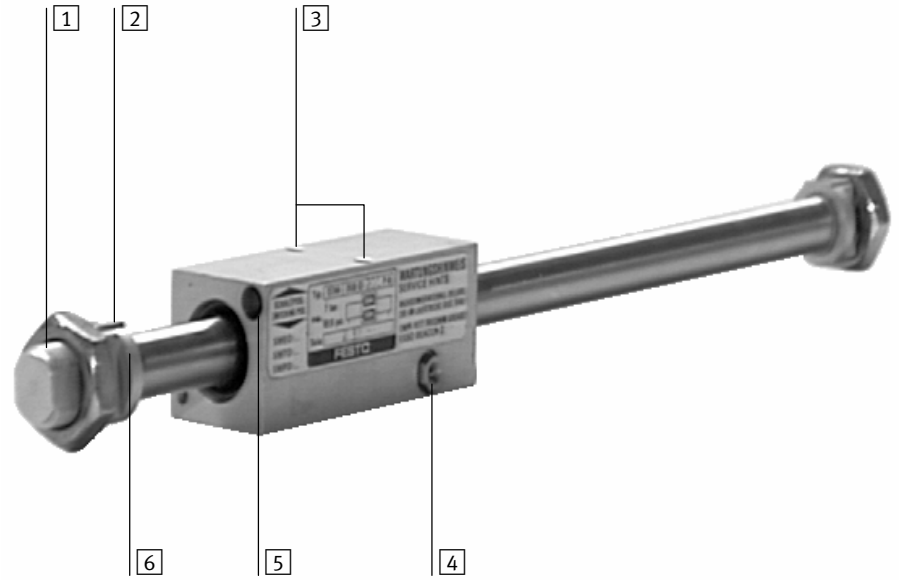
Fitting and commissioning to be carried out by qualified personnel only in accordance with the operating instructions.

Pneumatic linear drive DGO-...-A-B

Documentation on the product

For all available product documentation ➔ www.festo.com/pk

1 Operating parts and connections



1 Fastening thread

2 Compressed air port

3 Thread for fastening the work load

4 Lubricating nipple

5 Integrated switching magnet

6 Adjusting screw for end position cushioning (not with DGO-12-...)

Fig. 1

2 Function

When the compressed air ports are pressurized alternately, the piston moves backwards and forwards in the tubing. By means of a magnet coupling this movement is transferred to the outer slide.

3 Application

The DGO-... has been designed for transporting mass loads.

4 Transport and storage

- Consider the weight of the product.
  Depending on the design, the DGO-... weighs over 10 kg.

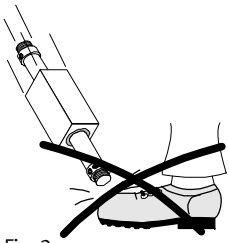


Fig. 2

5 Conditions of use

Please note
Malfunctions will occur if the device is not used correctly.
- Ensure that the specifications in this chapter are always observed.

- Compare the maximum values specified in these operating instructions with your actual application (e. g. forces, torques, temperatures, masses).

  The product can only be operated in accordance with the relevant safety guidelines if the maximum loading limits are observed.

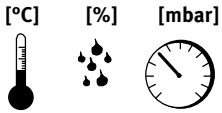


Fig. 3

- Observe the ambient conditions at your location.
  Corrosive elements in the environment (e. g. ozone) will reduce the service life of the product.
- Please comply with national and local safety laws and regulations.
- Use the product in its original state. Unauthorized modification is not permitted.
- Remove all transport packing such as foils, caps, cardboard.
  Exceptions: adhesive labels on compressed air ports (danger of dirt entering the tubing)

The packing is intended for recycling (except for: oiled paper which must be disposed of).

- Make sure there is a supply of correctly prepared compressed air (see “Technical specifications”).

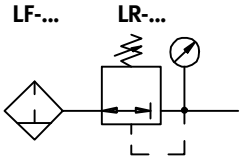


Fig. 4

6 Fitting

Fitting mechanical components

- Avoid damaging the cylinder barrel.

  Damage to the cylinder barrel will reduce the reliability and the service life of the DGO-...

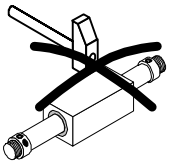


Fig. 5

- Place the DGO-... so that all the operating parts are accessible (lubricating nipple, adjusting screws).

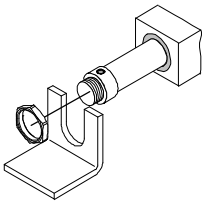


Fig. 6

- Make sure that the drive is fitted free of mechanical stress and distortion.

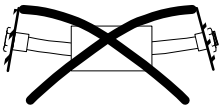


Fig. 7

When the drive is fitted in a vertical position:

- Make sure that the slide has reached a stable position when it comes to a stand (e. g. the lowest point or secure it with a moveable bolt).

Work loads with their own guide:

Please note
Jamming and non-permitted bending, e. g. due to tilting torques, reduce the service life of the DGO-... .
The max. permitted misalignment of parallel guiding is 1 mm.

- Make sure that a degree of freedom is maintained between the slide and the work load.

  Driver type FKG-... can be used for this purpose. (see chapter “Accessories”).

Fitting the work load:

- Place the work load so that the tilting torque of force F_{ax} parallel to the movement axis and lever arm “a” remains low (see Fig. 8).
- Observe the maximum values for radial force F_{rad} (see Fig. 8).

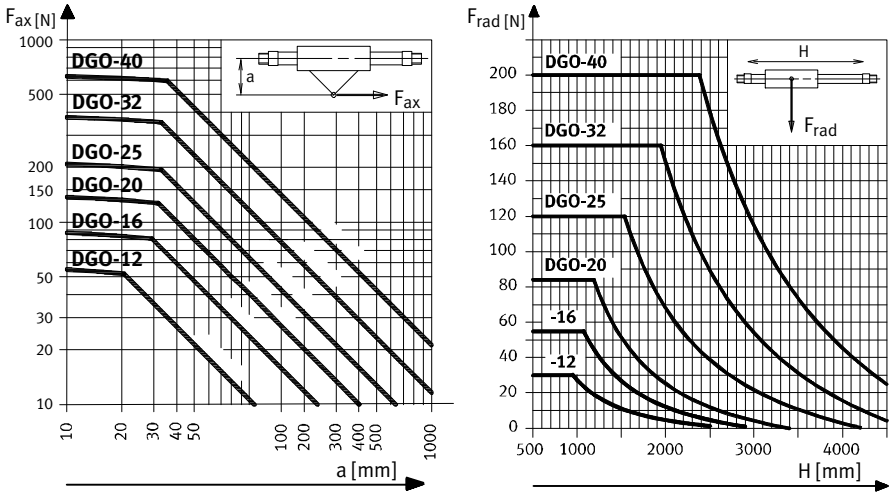


Fig. 8

With heavy work loads or at high and medium slide speeds:

- Make sure that the impulse of the load and the speed lies within the permitted range.

  Depending on the size of the work mass, the DGO-... will withstand maximum speeds as shown in the following diagram:

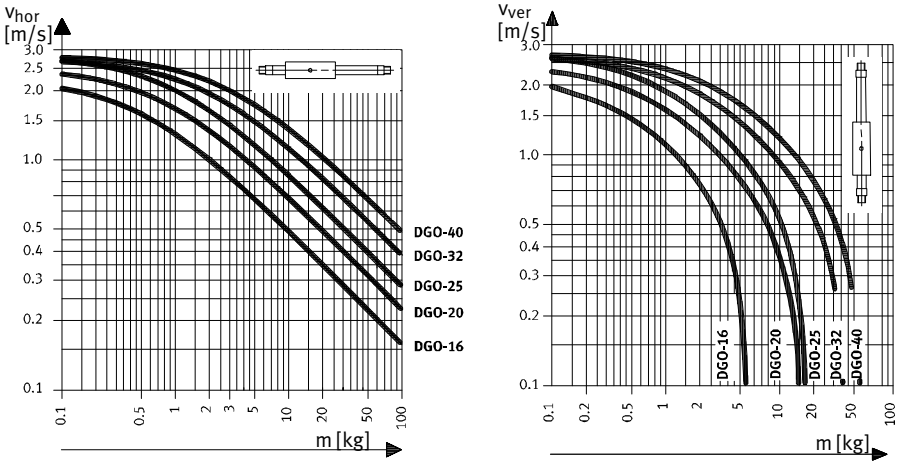


Fig. 9

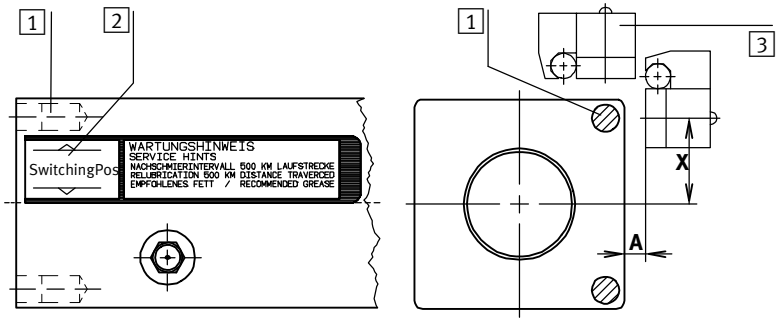
Loadings in excess of the specified maximum values:

Use additional external shock absorbers or fixed stops of sufficient size.

Fitting proximity switches:

- Place the proximity switches so that they can be actuated reliably by the magnet.

  In the following example the proximity switches are fitted onto a rod (dia. 6 mm) with the aid of fastening kit SMB-1.



1 Magnet
2 Switching range
3 Proximity switches

Fig. 10

- Always place the proximity switches in the gaps A and X.
  - If the gap is too small, this may lead to multiple switching.
  - If the gap is too large, the switch will not be actuated reliably.

	A	**X (± 0.5 mm)**						**Switch. path**	**Hysteresis**
		12	**18**	**20**	**25**	**32**	**40**		
SMEO-1, SMTO-1	6 ... 8 mm	10.5 mm	13.5 mm	16.5 mm	20.5 mm	25.5 mm	32.5 mm	7,5 ... 13 mm	1 ... 4.5 mm
SMPO-1-H-B	5 ... 6 mm							7 ... 15 mm	0,4 ... 2.5 mm

Fig. 11: Gaps for proximity switches

Fitting pneumatic components

Fitting in a vertical or sloping position:

Warning
If there is a pressure failure, the work mass will slide down.
Uncontrolled moving masses can cause injury to people or damage to property (danger of fingers being squashed).

- Check whether non-return valves (with control) of type HGL-... are required here. In this way, you can prevent the work mass from sliding down suddenly. (work mass = slide mass + mass of the work load)

Setting the slide speed:

- Screw one-way flow control valves of type GRLA-... into the compressed air ports.

  Other accessories with excessive screw depth L will damage the internal slide of the DGO-... . Fig. 12 shows the maximum screw depth:

DGO-...	16	20	25	32	40
L_{max}	4.8 mm	8 mm	7 mm	9 mm	10 mm

Fig. 12: Maximum screw depth L_{max} of the compressed air ports

Controlling the DGO-...:

- Use 3/2-way valves (in basic position open) for both compressed air ports.

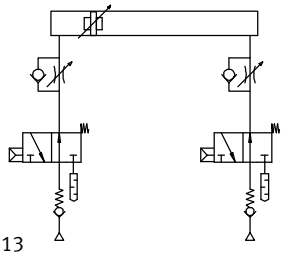


Fig. 13

7 Commissioning

Commissioning the complete system

- Always pressurize the complete system slowly.

  In this way you will prevent sudden uncontrolled movements.
  For slow start-up pressurization, use start-up valve type HEL-.../HEM-... .

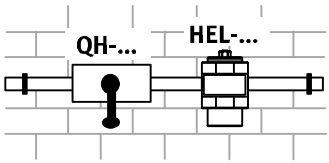


Fig. 14

Commissioning the DGO-...

Warning

Make sure that:

- ☐ nobody can place his/her hand in the path of the moving mass (e. g. by providing a protective grill).
- ☐ there are no objects in its path.

It must not be possible to touch the DGO-... until it has come to a complete stand.

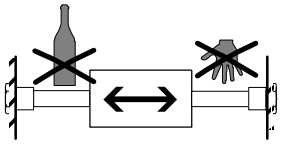


Fig. 15

1. Close both one-way flow control valves
   - – at first completely,
   - – then loosen them one turn.

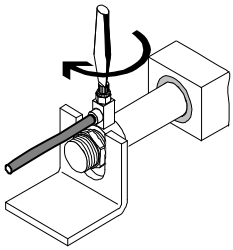


Fig. 16

2. Close the adjusting screws for the end position cushioning on both sides
   – completely,
   – then loosen them one turn.
3. Pressurize the DGO-... as follows:
   – slow pressurization of one side or
   – simultaneous pressurization of both sides with subsequent exhausting of one side.

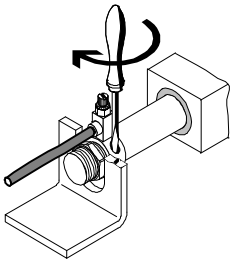


Fig. 17

Otherwise excessive loadings will occur at the start when the slide moves into an end position too quickly or without an air cushion.

For slow start-up pressurization, use start-up valve type HEL-... / HEM-... .

4. Start a test run.
5. Check whether the following settings need to be modified.
   – the slide speed
   – the end position cushioning.

Mass geometries with projection in the longitudinal direction of the slide:

Warning

Note that the following screws must only be turned when the DGO-... is at a stand:
– the adjusting screws for the end position cushioning
– the adjusting screws for the one-way flow control valves.

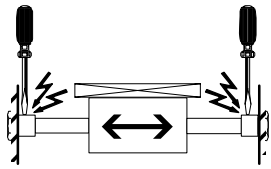


Fig. 18

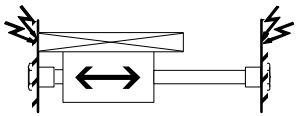


Fig. 19

6. Open up the one-way flow control valves slowly again until the desired speed is reached.

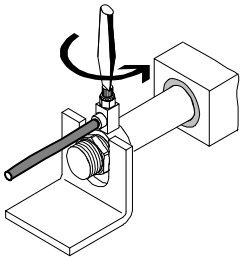


Fig. 20

7. Open up the adjusting screws for the end position cushioning on both sides until the desired cushioning is reached.
   The moveable mass should reach the end position safely without striking hard against it.

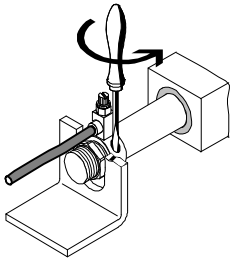


Fig. 21

8 Operation

Warning

Make sure that:

- nobody can place his/her hand in the path of the moving mass (e. g. by providing a protective grill).
- there are no objects in its path.

It must not be possible to touch the DGO-... until it has come to a complete stand.

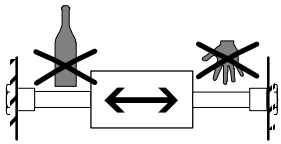


Fig. 22

Warning

Make sure that the moveable mass is always cushioned gently.

Otherwise the magnet coupling will tear off (see “Eliminating faults”).
With vertical or sloping drive mountings, the moveable mass will then slide down.

- Make sure that the operating medium selected at the start is maintained for the entire service life of the product.

Changing from lubricated to non-lubricated compressed air:

Wear will increase due to the washed-out service life lubrication.

- Return the DGO-... to Festo for overhaul.

If modifications are made to the project planning:

- Make sure that the maximum limits are observed, especially for forces and torques (see Fig. 8) and maximum speeds (see Fig. 9).

9 Care and maintenance

- Clean the cylinder barrel if required with a soft cloth.
  The following cleaning agents are permitted: all non-abrasive media.
- Lubricate the DGO-... at the lubricating nipple with Festo special grease type LUB-KC1 (silicon-free).
  Lubrication intervals: every 500 kilometres run
- Note that lubrication must be undertaken more often:
  – if the drive is operated in high temperatures
  – if there is excessive dirt
  – if there are fat-solvent fluids or fumes in the vicinity.

10 Repairs

- Make use of the opportunity to have your DGO-... overhauled by our repair service.

11 Accessories

Accessories	Type
Driver for compensating for misalignments and for avoiding tilting torques (for dia. 16...40)	FKG-...
Foot fastening (for dia. 12...25) Flange fastening (for dia. 12...25) Flange fastening (for dia. 32, 40)	HBN-... FBN-... FV-...
Proximity switch	SMEO-1-... / SMTO-1-... / SMPO-1-...
Fastening kit for proximity switches Sockets for proximity switches	SMB-1 SIM-M8-...
One-way flow control valve Non-return valve with control	GRLA-... HGL-...
Screw connector	QS-...
Lubricating grease	see chapter 9

12 Eliminating faults

Fault	Possible cause	Remedy
Uneven movement of the slide	One-way flow control valve not fitted correctly	If possible restrict exhaust
	Lubrication missing	Lubricate
	Cylinder barrel dirty	Clean, provide a cover
	Cylinder barrel damaged	Consult Festo after-sales service
Slide does not come into stroke end position	Adjusting screw of end position cushioning completely closed	Open adjusting screw
	Magnetic coupling is interrupted	Press the external slide into the end position until the internal slide couples in again against the magnetic repelling force

13 Technical specifications

DGO-...	12	16	20	25	32	40
Medium	Filtered compressed air, lubricated or non-lubricated; other media on demand					
Design	Double-acting, with magnet coupling, without piston rod					
Pressure range [bar]	2 ... 7	1.7 ... 7	1.6 ... 7	1.5 ... 7	1.4 ... 7	1.3 ... 7
Temperature range	- 20 ... + 60 °C					
Connections						
Fastening for the cylinder barrel	M 16 x 1.5	M 16 x 1.5	M 22 x 1.5	M 22 x 1.5	M 30 x 1.5	M 38 x 1.5
Compressed air port	M 5	M 5	G 1/8	G 1/8	G 1/8	G 1/4
Fastening the load	M 5				M 6	M 8
Lubricating nipple	DIN 3405 AM 6					
Magnetic pull-off strength	100 N	160 N	270 N	400 N	680 N	1050 N
Theor. force at 6 bar	68 N	121 N	188 N	295 N	483 N	754 N
Mounting position	As desired					
End position cushioning	Pneumatic, adjustable (not with DGO-12-...-P-A-B)					
Cushioning length	–	14 mm	17 mm	19 mm	20 mm	23 mm
Axial torsional strength of the external slide	360°					
Materials	Slide and end cover: Al (anodized) Cylinder barrel: Steel, stainless Seals: Buna N; polyurethane					

Copyright:
Festo SE & Co. KG
Ruiter Straße 82
73734 Esslingen
Germany

Phone:
+49 711 347-0

Fax:
+49 711 347-2144

E-mail:
service_international@festo.com

Internet:
www.festo.com