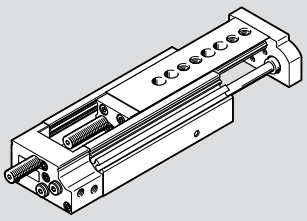
DGSL
Mini slide



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Operating instructions

8166553
2021-11i
[8166555]

Translation of the original instructions

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1 Applicable Documents

All available documents for the product ➔ www.festo.com/sp.

2 Safety

2.1 Safety instructions

- Take into account the ambient conditions at the location of use.
- Only use the product in its original condition without unauthorised modifications.
- Observe the identifications on the product.
- Store the product in a cool, dry environment protected from UV and corrosion. Keep storage times short.
- Before working on the product, switch off the compressed air supply and lock it to prevent it from being switched on again.
- Have the product repaired by the Festo repair service only.
- Observe the tightening torques. Unless otherwise specified, the tolerance is ± 20%.

2.2 Intended use

The product is intended for the space-saving transport of masses. The product is approved for slide operating mode.

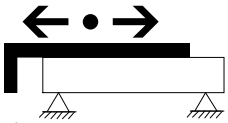


Fig.1

2.3 Foreseeable misuse

Operating the product without cushioning components will result in damage.
The product may be destroyed if the slide is moved without a (fixed) stop.
- Use suitable cushioning components ➔ www.festo.com/catalogue.

2.4 Training of qualified personnel

Work on the product may only be carried out by qualified personnel who can evaluate the work and detect dangers. The qualified personnel have skills and experience in dealing with pneumatic (open-loop) control technology.

3 Additional information

- Contact the regional Festo contact if you have technical problems ➔ www.festo.com.
- Accessories and spare parts ➔ www.festo.com/catalogue.

4 Function

The product is a non-rotating single-piston drive with bearing guide.
The slide is moved back and forth by alternate pressurisation of the supply ports.
The slide is braked at the end position by shock absorbers.
- For DGSL-...-E/-P/-P1: by external elastic shock absorbers.
- For DGSL-...-Y3/-Y11: with external hydraulic shock absorbers.

5 Product design

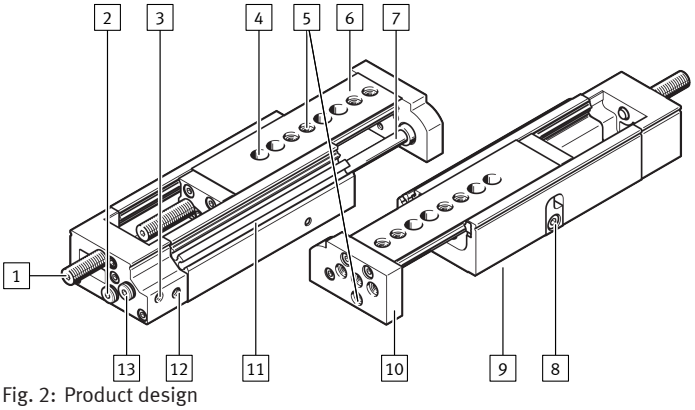


Fig. 2: Product design

1. Cushioning component:
   - DGSL-...-E/-P/-P1: elastic
   - DGSL-...-Y3/-Y11: hydraulic
   - DGSL-...-N: without
2. Supply port: retract, with plug screw
3. Supply port: advance
4. Drilled hole for mounting the mini slide, concealed
5. Thread with centring recess for mounting the payload
6. Slide with bearing guide
7. Piston rod
8. (Fixed) stop
9. Thread with centring recess for mounting the mini slide, concealed
10. Yoke plate
11. Slots for proximity switches
12. Supply port: retract
13. Supply port: advance, with plug screw

6 Transport and storage

NOTICE

Unexpected and unbraked movement of components
- Secure moving components for transport.

- Do not store near magnets.

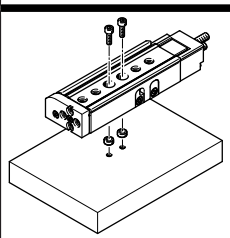
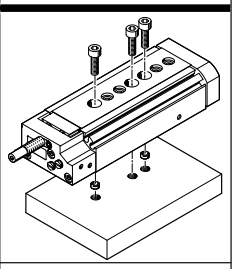
7 Assembly

7.1 Preparation

- Position the product to ensure that the operating elements are accessible, e.g. the clamping components for the shock absorbers.
- Mount the product without torsional stresses.
- If necessary: select the mounting components or the accessories.
  To prevent collisions: mount the mounting components outside the positioning range.

7.2 Mounting

1. Select a suitable adapter plate.
2. To make the through-holes accessible, move the slide to the retracted end position.
3. Use the included centring sleeves.
4. Mount the product according to the type of mounting according to stroke.

DGSL-...	-10 ... -40	-50 ... -200
Base-surface mounting with – Through-holes – Centring recess and centring sleeves		
Required retaining screws	2	3

7.3 Attachment

7.3.1 Attachment of yoke plate

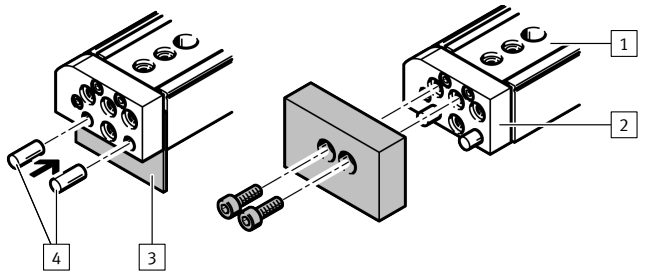


Fig. 3: Securing yoke plate

1	Housing	3	Metal plate
2	Yoke plate	4	Centring pins

1. Push a metal plate [3] between the yoke plate [2] and the housing [1] as a counter holder.
2. Press the centring pins [4] manually into the yoke plate.

> **i**
> Do not hammer in the centring pins.

7.3.2 Attaching the payload

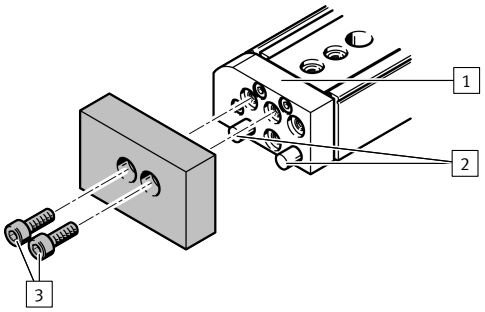


Fig. 4: Attachment of the payload

1	Yoke plate	3	Retaining screws
2	Centring pins		

1. Position the payload on the yoke plate [1] .
2. Fasten the payload with the retaining screws [3].

8 Installation

8.1 Installation of proximity switches

> **i**
> To avoid faulty switching and external influences, observe the minimum distances L_1 and L_2 between the static and moving ferritic masses and proximity switches.

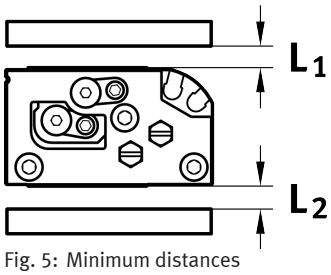


Fig. 5: Minimum distances

DGSL-...		-4	-6	-8	-10	-12	-16	-20	-25
L_1 to ferritic materials	[mm]	5	5	0					
L_2 to ferritic materials	[mm]	15	0						

Tab. 1: Minimum distances

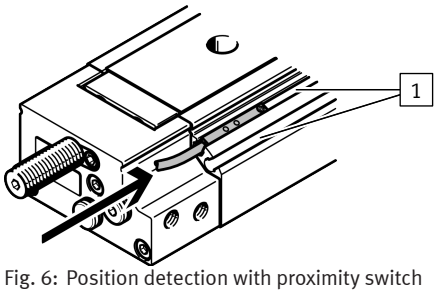


Fig. 6: Position detection with proximity switch

1	Slots for proximity switches

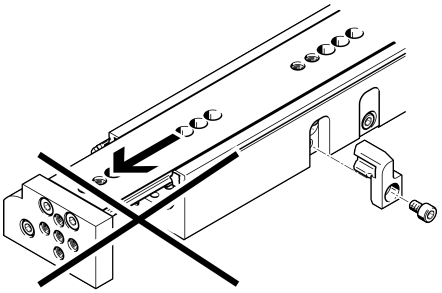
1. Position the proximity switches in the slots [1].

> **i**
> Use the lower slot for the DGSL-...-4 and DGSL-...-8 products.

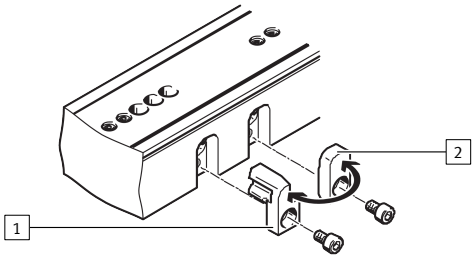
2. Temporarily lock the proximity switch.
3. After the test run, mount the proximity switch in the suitable position.

8.2 Rough setting of end positions

1. Position the slide at the desired end position by hand. Leave the slide in the retracted end position during the setting procedure.



2. Unscrew the retaining screws of the (fixed) stop [1] and the orifice [2].
   - Certain product variants allow coarse adjustment of the front-end position
     ➔ www.festo.com/catalogue.
   - A stroke reduction of max. 2 standard strokes is possible in combination with the precision adjustment.
3. Replace the (fixed) stop [1] with the orifice [2].



4. Screw in the retaining screws. Observe the tightening torque.

DGSL-...		-4	-6	-8	-10	-12	-16	-20	-25
Tightening torque	[Nm]	0.76	1.3	1.3	2.9	2.9	6	9	9

5. Carry out the precision adjustment of the end positions on the cushioning components.

8.3 Installation of cushioning components

Cushioning components for the DGSL-...-N product must be attached at both end positions.

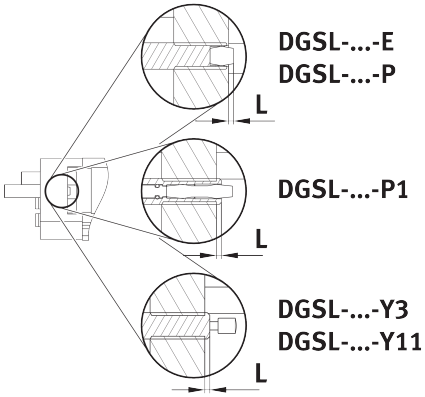
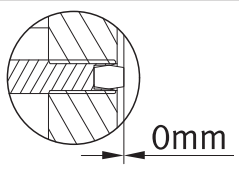
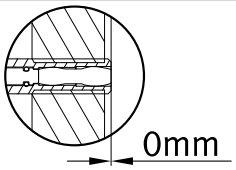
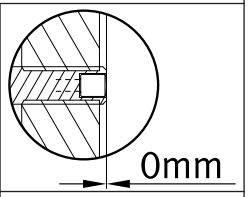


Fig. 7: Minimum distance L of the cushioning components

DGSL-...		-4	-6	-8	-10	-12	-16	-20	-25
Distance L with DGSL-...-E/-P/-P1	[mm]	1	1.5						
Distance L with DGSL-...-Y3/-Y11	[mm]	–	–	1.5					

Tab. 2: Minimum distances

DGSL-...-E/-P	DGSL-...-P1	DGSL-...-Y3/-Y11
no metallic stop	metallic stop	
		
The rubber buffer touches the slide.	The stop sleeve touches the slide against the force of the cushioning.	The shock absorber housing/ reducing sleeve (with DGSL-...-Y11) touches the slide against the force of the shock absorber.

Tab. 3: End position cushioning components

DGSL-...		-4	-6	-8	-10
Only for DGSL-...-Y3					
Max. torque, cushioning component	[Nm]	–	–	0.5	0.8
Shock absorber DYSW-...-Y1F	[Nm]	–	–	4 ... 6	5 ... 8
Only for DGSL-...-Y11					
Max. torque reducing sleeve	[Nm]	–	–	–	0.8
Max. torque cushioning component	[Nm]	–	–	–	0.5
Shock absorber DYSW-...-Y1F	[Nm]	–	–	–	4 ... 6

Tab. 4: Tightening torque

DGSL-...		-12	-16	-20	-25
Only for DGSL-...-Y3					
Max. torque, cushioning component	[Nm]	2.2	5	8	13
Shock absorber DYSW-...-Y1F	[Nm]	7 ... 10	8 ... 14	10 ... 17	12 ... 20
Only for DGSL-...-Y11					
Max. torque reducing sleeve	[Nm]	2.2	5	8	13
Max. torque cushioning component	[Nm]	0.8	2.2	5	8
Shock absorber DYSW-...-Y1F	[Nm]	5 ... 8	7 ... 10	8 ... 14	10 ... 17

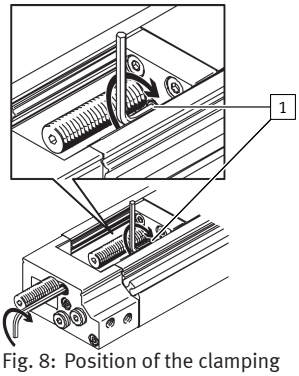
Tab. 5: Tightening torque

9 Commissioning

9.1 Precision adjustment of the end positions

i

Note
Check the correct positioning of the slide under compressed air. Correct the positioning.



1 Clamping components

Fig. 8: Position of the clamping components

1. Loosen the clamping components [1].
2. Position the slide at the desired end position by hand.
3. Turn the cushioning component with a hex wrench until the end position is reached.
4. Tighten the clamping component.

DGSL-...		-4	-6	-8	-10	-12	-16	-20	-25
Tightening torque of clamping component	[Nm]	0.15	0.2	0.3	0.8	1.2	2.5	2.5	3.5

9.2 Test run

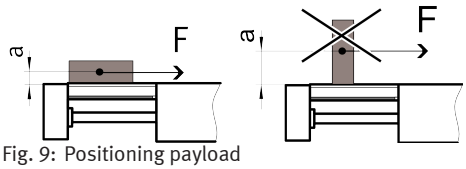
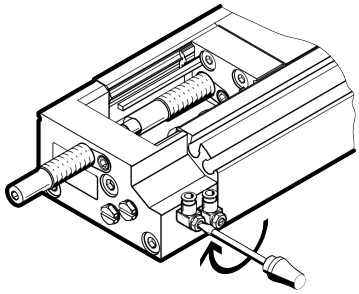


Fig. 9: Positioning payload

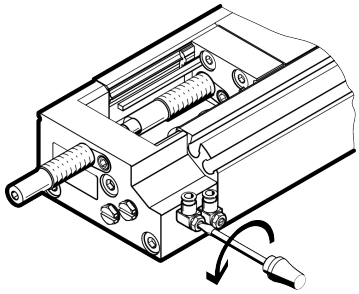
1. Position the payload on the slide. Position the centre of gravity of the payload as low as possible.
2. Close the one-way flow control valves.



3. Open the one-way flow control valves by one revolution.
4. Pressurise the drive. Slowly pressurise with an on-off valve.
   ↳ The slide moves to an end position.
5. Start a test run with a moveable mass.
6. Take the following into account in the test run:
   – The speed and the acceleration of the moveable mass
   – The end position
   – The mass of the payload
   – The position of the proximity switches
7. Only make changes when the slide is stationary.
8. Unscrew the one-way flow control valves until the required speed of the slide is reached.

i

An increased speed when approaching the end position can result in the slide rebounding from the end position.



9. Fix the proximity switches in the final positioning position.

10 Maintenance

10.1 Replacement of cushioning components

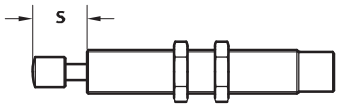


Fig. 10: Cushioning distance s

1. Check the cushioning elements every 2 million cycles.
2. Check the cushioning length s ➔ 12 Technical data
3. Replace the cushioning components if there are signs of wear.
4. Replace the cushioning components after max. 5 million cycles.

10.2 Cleaning

Clean the product with a clean, soft cloth and non-abrasive cleaning agents.
For use with reduced particle emission:
– Remove abraded particles and soil from the product:
  – Prior to initial commissioning
  – Regularly during operation

10.3 Lubrication

i

Note
Check the need for shorter lubrication intervals:
- At high temperatures.
- With excessive dirt accumulation.
- In the vicinity of grease-dissolving liquids or grease-dissolving vapours.

1. Lubricate the product as required.
2. Lubricate the piston rod and the guide rail.
   Use the following lubricant:
   – Festo LUB-KC1
3. Move the slide by hand for even lubrication.

11 Fault clearance

Fault description	Cause	Remedy
The slide moves unevenly.	The one-way flow control valves are not installed correctly.	Control the exhaust air flow.
The slide is in initial position despite pressurisation.	The tubing is faulty.	Check the tubing.
The slide speed is too low.	The air volume is insufficient.	– Increase the connection cross-sections. – Check the flow control valve setting. – Connect a volume upstream.
The slide stops in the end position without cushioning.	The speed is too high.	Reduce the speed.
	The cushioning is too low.	– Re-adjust the shock absorber and the (fixed) stop ➔ 9 Commissioning. – Reduce the speed. – Check the shock absorbers and replace if necessary.
	The air cushion is not present.	Pressurise both supply ports simultaneously, then exhaust one side.
	The shock absorbers are faulty.	Replace the shock absorbers.
	The payload is too large	Reduce the payload.
The proximity switches have no function.	The slide has been magnetised.	Contact Festo ➔ www.festo.com.

Tab. 6: Fault clearance

12 Technical data

DGSL-...		-4	-6	-8	-10
Design		double-acting drive with Scotch yoke system and ball-bearing cage guide			
Mounting position		any			
Cushioning					
DGSL-...-E/-P		elastic cushioning, without metallic end position, at both ends			
DGSL-...-P1		elastic cushioning, with metallic end position, metal end positions at both ends			
DGSL-...-Y3		–		with progressive shock absorber and metallic end position, both ends	
DGSL-...-Y11		–			with progressive shock absorber and metallic end position, both ends
DGSL-...-N		–		without cushioning	
Operating conditions					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Information on the operating medium		lubricated operation possible, in which case lubricated operation will always be required			
Operating pressure	[MPa]	0.25 ... 0.8	0.15 ... 0.8		
	[bar]	2.5 ... 8	1.5 ... 8		
	[psi]	36 ... 116	22 ... 116		
Ambient temperature	[°C]	0 ... 60 (observe temperature range of proximity switches)			
Repetition accuracy					
DGSL-...-E/-P	[mm]	0.3			
DGSL-...-P1/-Y3/.../-Y11	[mm]	± 0.01			
Materials					
Note on materials		Free of copper and PTFE			
Housing, cover, yoke plate		Anodised wrought aluminium alloy			
Screws		Steel			
Piston rod, slide, adjusting screw		High-alloy stainless steel			
Cover, stops, driver		Beryllium bronze, nickel-plated			
Buffer		Nitrile rubber			
Seals		Hydrated nitrile rubber, polyurethane			

Tab. 7: Technical data DGSL, size 4 ... 10

DGSL-...		-12	-16	-20	-25
Design		double-acting drive with Scotch yoke system and ball-bearing cage guide			
Mounting position		any			
Cushioning					
DGSL-...-E/-P		elastic cushioning, without metallic end position, at both ends			
DGSL-...-P1		elastic cushioning, with metallic end position, metal end positions at both ends			
DGSL-...-Y3		with progressive shock absorber and metallic end position, both ends			
DGSL-...-Y11		with progressive shock absorber and metallic end position, both ends			
DGSL-...-N		without cushioning			
Operating conditions					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Information on the operating medium		lubricated operation possible, in which case lubricated operation will always be required			
Operating pressure	[MPa]	0.1 ... 0.8			
	[bar]	1 ... 8			
	[psi]	14.5 ... 116			
Ambient temperature	[°C]	0 ... 60 (observe temperature range of proximity switches)			
Repetition accuracy					
DGSL-...-E/-P	[mm]	0.3			
DGSL-...-P1/-Y3/.../-Y11	[mm]	± 0.01			
Materials					
Note on materials		Free of copper and PTFE			
Housing, cover, yoke plate		Anodised wrought aluminium alloy			
Screws		Steel			
Piston rod, slide, adjusting screw		High-alloy stainless steel			
Cover, stops, driver		Beryllium bronze, nickel-plated			
Buffer		Nitrile rubber			
Seals		Hydrated nitrile rubber, polyurethane			

Tab. 8: Technical data DGSL, size 12 ... 25

DGSL-...		-4	-6	-8	-10
Impact energy at the end positions					
DGSL-...-E/-P	[Nm]	0.015	0.05	0.08	0.12
DGSL-...-P1	[Nm]	0.005	0.02	0.03	0.04
DGSL-...-Y3	[Nm]	–	–	0.5	1
DGSL-...-Y11	[Nm]	–	–	–	0.5
Theoretical force at 0.6 MPa (6 bar, 87 psi)					
Advancing	[N]	17	30	47	68
Retracting	[N]	13	23	40	51
Max. permissible forces and torques		➔ www.festo.com/catalogue.			
Max. velocity	[m/s]	0.5	0.5	0.8	0.8
Weight min. stroke	[kg]	0.08	0.16	0.24	0.4
Weight max. stroke	[kg]	0.1	0.23	0.45	0.8

Tab. 9: Technical data DGSL, size 4 ... 10

DGSL-...		-12	-16	-20	-25
Impact energy at the end positions					
DGSL-...-E/-P	[Nm]	0.25	0.35	0.45	0.55
DGSL-...-P1	[Nm]	0.06	0.12	0.2	0.25
DGSL-...-Y3	[Nm]	2	4	7	10
DGSL-...-Y11	[Nm]	1	2	4	7
Theoretical force at 0.6 MPa (6 bar, 87 psi)					
Advancing	[N]	121	188	295	483
Retracting	[N]	104	158	247	415
Max. permissible forces and torques		➔ www.festo.com/catalogue.			
Max. velocity	[m/s]	0.8	0.8	0.8	0.8
Weight min. stroke	[kg]	0.6	0.9	1.5	2.5
Weight max. stroke	[kg]	1.5	2.0	4.3	6.1

Tab. 10: Technical data DGSL, size 12 ... 25

DYSW-...		-4 ... -6	-5 ... -8	-7 ... -10
Cushioning distance (s)	[mm]	6	8	10
Max. energy absorption per stroke	[J]	0.8	1.3	2.5
Max. energy absorption per hour	[kJ]	7	10	15

Tab. 11: Technical data DYSW

DYSW-...		-8 ... -14	-10 ... -17	-12 ... -20
Cushioning distance (s)	[mm]	14	17	20
Max. energy absorption per stroke	[J]	4	8	12
Max. energy absorption per hour	[kJ]	21	30	41

Tab. 12: Technical data DYSW