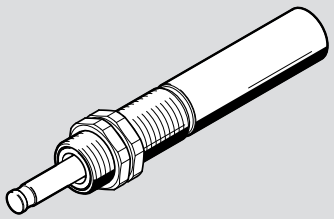
DYSR
Shock absorber



FESTO

Festo SE & Co. KG
Ruiter Straße 82
73734 Esslingen
Deutschland
+49 711 347-0

www.festo.com

Operating instructions

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[8158312]

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Translation of the original instructions

1 Applicable Documents

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

2 Safety

2.1 Safety instructions

- 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.
- Repair of the product is not permitted.
- Before working on the product, switch off the compressed air supply and lock it to prevent it from being switched on again.

2.2 Intended use

The product is intended for use in cushioning the force of linear moving masses in an axial direction.
The product is not suitable for rotary drives and for use in damp environments.

2.3 Training of qualified personnel

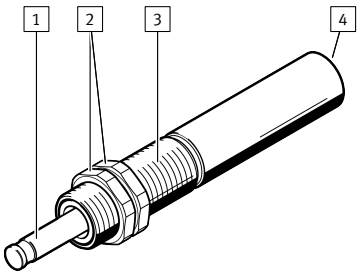
Work on the product may only be carried out by qualified personnel who can evaluate the work and detect dangers. Personnel must have the relevant mechanical training.

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 Product overview

4.1 Product design

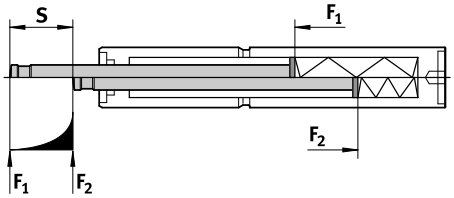


1 Piston rod
2 Lock nuts
3 Male thread
4 Internal hexagon for adjusting cushioning

Fig. 1: Product design

4.2 Function

Insertion force F2 acting on the buffer moves the piston rod of the hydraulic shock absorber through the cushioning length s to the end position.
When the piston rod is retracted, the hydraulic fluid in the shock absorber flows through an adjustable flow control valve and cushions the motion.
If the insertion force is less than the reset force F1 of the internal compression spring, the piston rod returns to the initial position.



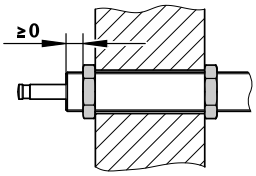
F1 Reset force
F2 Insertion force
s Stroke/cushioning distance

Tab. 1: Function

5 Mounting product

Mounting options:
- in through-hole
- in through thread

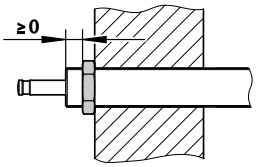
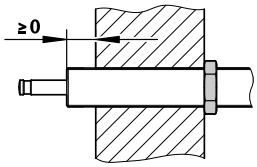
Mounting in drilled hole

Lock nut mounting, at both ends

The lock nuts must not protrude beyond the threaded area.

Tab. 2: Mounting in drilled hole

1. Insert the product up to the intended stop position.
2. Secure the product with lock nuts. Tighten the lock nuts to the tightening torque.

Mounting in thread

Lock nut mounting on one side	
	
The lock nut must not protrude beyond the threaded area.	The mounting surface must not protrude beyond the thread area.

Tab. 3: Mounting in thread

1. Screw in the product up to the intended stop position.
2. Tighten the lock nut to the tightening torque.

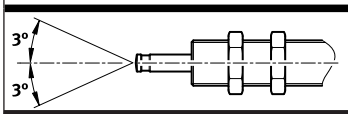
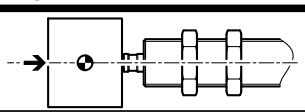
Size		8	12	16	20	25	32
Lock nut Tightening torque	[Nm]	5	20	35	60	80	100
		Tolerance ± 20%					

Tab. 4: Tightening torques

5.1 Mounting

5.2 Aligning product

- Observe the axial direction of force of the moving mass to the axis of the shock absorber.
- The mass must contact the piston rod over a wide area.

Force direction, max. deviation	Alignment of the mass
	

Tab. 5: Permissible axial force direction and alignment of the moving mass

5.3 Mounting accessories

To protect the piston rod and to reduce impact noise, a buffer is available as an accessory for mounting on the piston rod ➔ www.festo.com/catalogue.

6 Commissioning

6.1 Adjusting cushioning

The cushioning can be adjusted at the internal hexagon.
Adjustment range at the internal hexagon: approx. 3 revolutions

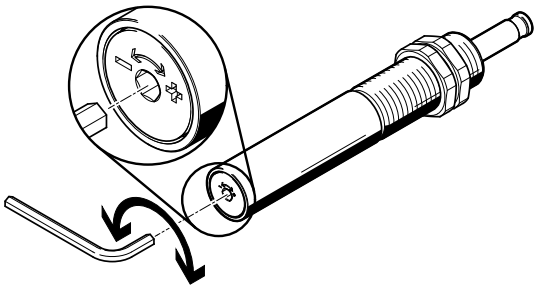


Fig. 2: Internal hexagon for adjusting cushioning

Increasing cushioning

- Turn the internal hexagon for adjusting cushioning in the "+" direction.
  ↳ The cushioning becomes harder.

Reducing cushioning

- Turn the internal hexagon for adjusting cushioning in the "–" direction.
  ↳ The cushioning becomes softer.

6.2 Executing test run

1. Turn the internal hexagon socket in the "+" direction to the stop to set the cushioning.
2. Start the test run at the drive at reduced velocity.
3. If necessary, readjust the position of the shock absorber.
4. Gradually increase the velocity of the drive to the operating value in steps.
5. Turn the internal hexagon for setting the cushioning in the "–" direction until the end position is reached without a hard stop.
   With hard stop:
   – Turn cushioning setting in "+" direction.
   – Reduce the impact velocity if necessary.
   – Check function and design of the shock absorber.

6.3 Notes on operation

Energy absorption

- Only use the shock absorber within the permissible range of 25% to 100% of the maximum energy absorption ➔ 10 Technical data.

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Recommendation: use the shock absorber within the optimum range from 50% to 80% of the maximum energy absorption.

Energy absorption	Note
0 ... 25%	Unfavourable; fluid leakage at the shock absorber may be increased
25 ... 50%	Permitted
50 ... 80%	Optimal
80 ... 100%	Permitted
> 100%	Impermissible

Tab. 6: Energy absorption of the shock absorber

Cushioning effect

The viscosity of the hydraulic fluid declines over its operating life due to the generated friction heat. This can reduce the cushioning effect.

7 Maintenance

Maintenance interval	Maintenance work
Every 1 million load changes	Check shock absorber: – sealing, no fluid leakage – Cushioning distance s ➔ 10 Technical data In case of leakage, hard stop or cushioning distance too short: replace shock absorber.

Tab. 7: Maintenance schedule

The hydraulic fluid in the shock absorber cannot be topped up or changed.

8 Fault clearance

Malfunction	Possible cause	Remedy
Leakage/fluid leakage	Shock absorber faulty	Replace shock absorber.
Hard stop in the end position	Cushioning set too low	Increase cushioning.
	Shock absorber overloaded	Reduce impact velocity or check the layout of the shock absorber.
	Shock absorber faulty	Replace shock absorber.

Tab. 8: Fault clearance

9 Dismantling and disposal

⚠ CAUTION

The product contains pressurised hydraulic fluid that can escape in an uncontrolled manner if the housing is damaged.
The hydraulic fluid can injure people's eyes and skin and damage the environment.

- Have the product disposed of by a qualified waste disposal company.
- Do not destroy the product in order to drain the hydraulic fluid.

10 Technical data

Size		8	12	16
Stroke/cushioning distance s	[mm]	8	12	20
Male thread				
DYSR		M12x1	M15x1	M20x1.25
DYSR-...-T		–	M16x1	M22x1.5
Mode of operation		Single-acting, pushing		
Cushioning		Adjustable		
Mounting position		Any		
Max. mass[1)]	[kg]	40	90	160
Max. energy absorption per stroke at +20 °C[1)]	[J]	4	10.8	32
Max. energy absorption per hour at +20 °C[1)]	[kJ]	24	60	100
Impact velocity	[m/s]	0.1 ... 3		
Min. insertion force F_2	[N]	18	38	66
Max. stop force at end position	[N]	400	900	1600
Min. reset force F_1	[N]	1.8	4.5	5.4
Reset time at 20 °C[2)]	[s]	≤ 0.2		≤0.3
Ambient temperature	[°C]	–10 ... +80		

1) At higher temperatures in the range of 80 °C: the max. mass and the max. energy absorption are reduced approximately 50%.
2) At temperatures below 0 °C the reset time can increase to 3 s.

Tab. 9: Technical data, sizes 8 ... 16

Size		20	25	32
Stroke/cushioning distance s	[mm]	25	40	60
Male thread				
DYSR		M24x1.25	M30x1.5	M37x1.5
DYSR-...-T		M26x1.5	–	–
Mode of operation		Single-acting, pushing		
Cushioning		Adjustable		
Mounting position		Any		
Max. mass[1)]	[kg]	250	400	600
Max. energy absorption per stroke at +20 °C[1)]	[J]	62.5	160	384
Max. energy absorption per hour at +20 °C[1)]	[kJ]	135	220	330
Impact velocity	[m/s]	0.1 ... 3		
Min. insertion force F_2	[N]	110	155	175
Max. stop force at end position	[N]	2500	4000	6400
Min. reset force F_1	[N]	9	12.5	18
Reset time at 20 °C[2)]	[s]	≤ 0.3	≤ 0.4	≤ 0.6
Ambient temperature	[°C]	–10 ... +80		

1) At higher temperatures in the range of 80 °C: the max. mass and the max. energy absorption are reduced approximately 50%.
2) At temperatures below 0 °C the reset time can increase to 3 s.

Tab. 10: Technical data, sizes 20 ... 32