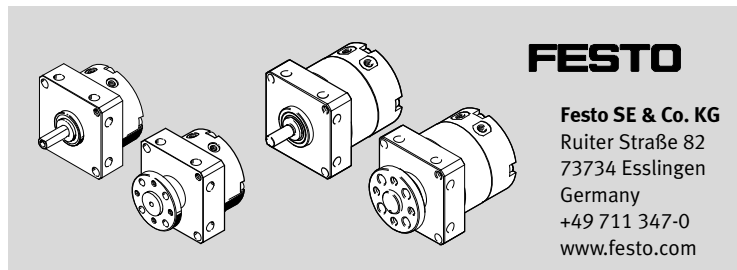


# DSM(-T)-6/-8/-10



Operating instructions 8068497  
 Original instructions 2017-05c  
 [8068499]

- Take into account the material specifications (→ Technical data).
  - Use the product in its original status, without any unauthorised product modifications.
  - Take into consideration the ambient conditions at the location of use. Corrosive environments (e.g. ozone) will reduce the service life of the product.
  - Compare the limit values specified in these operating instructions with your actual application (e.g. pressures, forces, torques, temperatures, loads, speeds).
  - Operation of the product in compliance with the relevant safety regulations is contingent on adherence to the load limits.
  - Take the tolerance of the tightening torques into account. Unless otherwise specified, the tolerance is  $\pm 20\%$ .
  - Make sure the compressed air is properly prepared (→ Technical data).
  - Maintain the selected medium for the total service life of the product. Example: Always use non-lubricated compressed air.
  - Slowly pressurise the system as a whole. There will then be no uncontrolled movements.
- For slow start-up pressurisation, use start-up valve type HEL.

## Semi-rotary drive DSM(-T)-6/-8/-10 ..... English

**→ Note**  
 Installation and commissioning are to be carried out only by qualified personnel in accordance with the operating instructions. First read through completely all the operating instructions supplied with the product.

### Control sections and connections

- 1 Mounting holes
- 2 Supply ports
- 3 Square
- 4 Output shaft
  - With DSM-....: stud shaft
  - With DSM-....-FW: flanged shaft
- 5 Mounting thread

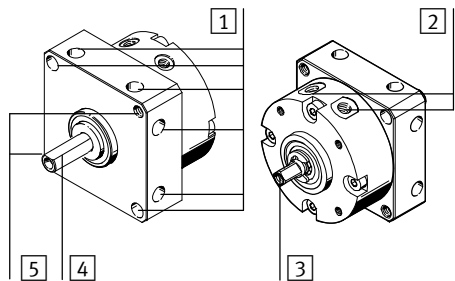


Fig. 1

### 1 Applicable documents

For all available product documentation → [www.festo.com/pk](http://www.festo.com/pk)

### 2 Function and application

When the compressed air supply ports 2 are pressurised reciprocally, the inner vane in the housing swivels backwards and forwards. This swivel movement is transferred to the drive shaft 4. The DSM semi-rotary drive has been designed for swivelling useful loads which do not have to carry out a complete revolution.

### 3 Transport and storage

- Make sure storage conditions are as follows:
  - short storage times
  - cool, dry, UV and corrosion resistant.

### 4 Requirements for product use

**→ Note**

Incorrect handling can result in malfunctions.

- Make sure that the specifications contained in this chapter are adhered to at all times. This is the only way to ensure correct and safe product behaviour.

- Take into consideration the legal regulations applicable for the destination, as well as:
  - regulations and standards
  - regulations of the testing organizations and insurers
  - national specifications.
- Note the warnings and instructions on the product and in the relevant operating instructions.
- Remove all transport packaging such as plastic sheets, caps and cartons (except for any covers in the pneumatic ports). The material used in the packaging has been specifically chosen for its recyclability (exception: oil paper = residual waste).

## 5 Installation

### 5.1 Mechanical installation

- Handle the DSM with care so that the drive shaft is not damaged. This applies in particular to the subsequent points:

1. Place the DSM so that you can easily reach the control section.
2. Fasten the DSM with at least 2 screws.

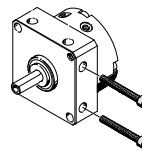


Fig. 2

When using the square for optional purposes:

3. Avoid any lateral forces on the square. This serves only as a connecting component for the extension modules WSM-... and KSM-... (→ Accessories).

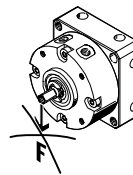


Fig. 3

4. When mounting the useful load, make sure that the following specifications are complied with (Fig. 4):
  - installation without tilting
  - permissible radial force  $F_z$
  - permissible axial force  $F_x$
  - permissible mass moment of inertia (→ Technical data).

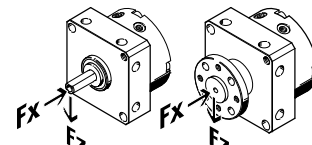


Fig. 4

The mass moment of inertia of the movable load should be calculated. Lever arms, cantilevers, useful load and mounting components at the drive shaft should be taken into account in the calculation.

To fasten the useful load:

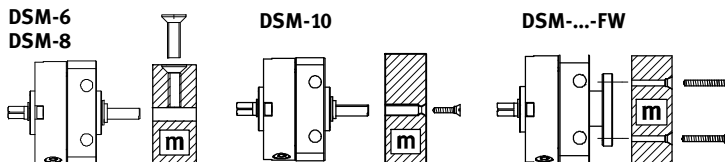


Fig. 5

- Push the useful load onto the output shaft (stud shaft/flanged shaft) (Fig. 5)
- Make sure that the useful load cannot slide off the drive shaft. The flattening with DSM(-T)-6/-8 and the thread on the front side of the Woodruff key with DSM(-T)-10 are helpful here.
- Use external shocks in the following cases:
  - when the DSM is operated without an air cushion on the exhaust side (e.g. after long breaks between the individual swivel motions)
  - when a more accurate swivel angle setting is required.

When external stops and shock absorbers are used:

**→ Note**

- Make sure that the following points are observed (Fig. 6):
  - point of impact in the mass moment of inertia (important for eccentric loads on the lever arm)
  - max. permissible stop force (→ Technical data)
  - Minimum stop radius  $r_{min}$  (→ Technical data).

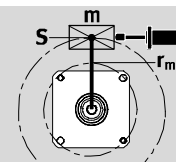
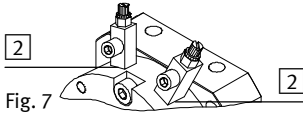
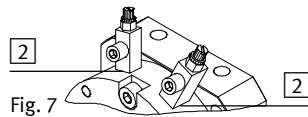


Fig. 6

## 5.2 Pneumatic installation

- Use GRLA one-way flow control valves for setting the swivel speed. These are screwed directly into the compressed air supply ports  (Fig. 7).



During the swivel procedure, the following relationship between swivel speed and flow control exists.

Factor	Supply air flow control	Exhaust air flow control	Supply and exhaust air flow control
Swivel speed	Increasing	Decreasing	Approach method constant
Swivel time	Short	Long	Long

Fig. 8

For eccentric loads:

- Check whether HGL controlled non-return valves or a VZS air reservoir are necessary. In this way you can prevent the useful load from sliding down suddenly if there is a sudden pressure drop.

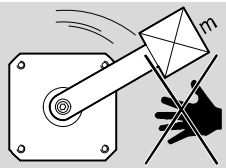
## 6 Commissioning



### Warning

Danger of injury from rotating loads.

- Make sure that the DSM is set into motion only with protective devices.
- Make sure that in the swivel angle of the DSM
  - nobody can reach in
  - no objects can enter (e.g. by means of an individual protective guard).



- Turn both upstream one-way flow control valves
  - at first completely closed
  - then open them again approximately one turn.
- Make sure that the operating conditions lie within the permissible ranges.
- Pressurize the drive optionally in one of the following ways:
  - slowly Pressurisation of one side
  - simultaneous pressurisation of both sides with subsequent venting of one side.
- Start a test run.
- During a test run check whether the following settings on the DSM need to be modified:
  - the swivel angle (only in combination with stop kit KSM-...)
  - the swivel speed.
- Slowly screw open the one-way flow control valves until the desired swivel speed is set. The internal rotary vane should reach the end position safely, but not strike hard against it.



### Note

If the impact is too hard, it will cause rebounding out of the end position and a reduction of the service life.

If the rotary vane audibly strikes hard:

- Interrupt the test run. Causes of hard impact may be:
  - mass moment of inertia of the moving load too high
  - swivel speed too high
  - no compressed air cushion on the exhaust side.
- Make sure you remedy the above-mentioned causes.
- Repeat the test run.

When all necessary corrections have been made:

- End the test run.

## 7 Operation

For several uninterrupted swivel cycles:

- Make sure that the maximum permissible swivel frequency is observed (→ Technical data). Otherwise, the operational reliability will be impaired by excessive temperature rise.

## 8 Maintenance and care

If the device is dirty:

- Clean the DSM with a soft cloth. All non-abrasive cleaning agents are permissible (e.g. warm soap suds up to +60 °C).

## 9 Disassembly and repair

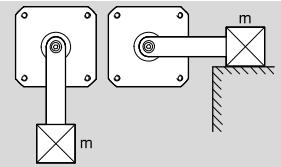
For eccentric masses on the lever arm:



### Warning

Risk of injury from masses that slide down suddenly if there is a drop in pressure.

- Make sure that the load has reached a stable position before venting (e.g. the lowest point).



Recommendation:

- Return the product to our repair service for overhaul. This way the fine tuning and tests that are required will be taken into particular consideration.

Information about spare parts and accessories can be found at:

[www.festo.com/spareparts](http://www.festo.com/spareparts).

## 10 Accessories



### Note

- Please select the corresponding accessories from our catalogue (→ [www.festo.com/catalogue](http://www.festo.com/catalogue)).

## 11 Troubleshooting

Malfunction	Possible cause	Remedy
Uneven movement	Flow control valves inserted incorrectly	– Check the flow control valve functions (exhaust air flow control)
– Hard impact at the end position – Drive shaft does not remain in the end position	Residual energy too high	– Select lower swivel speed – Use external shock absorbers – Move only against residual air cushion on the exhaust side – Select lighter loads of the useful load

Fig. 9

## 12 Technical data

Size	6	8	10	
Pneumatic connection	M3			
Design	Swivel module with rotary vane			
Type of mounting	With female thread			
Mounting position	Any			
Max. swivel frequency at 6 bar				
DSM(-T)-...-90	[Hz]	3		
DSM(-T)-...-180	[Hz]	3		
DSM(-T)-...-240	[Hz]	–	2	
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]			
Min. operating pressure				
DSM	[bar]	3.5	2.5	
DSM-T	[bar]	4	3.5	
Max. operating pressure	[bar]	8		
Ambient temperature	[°C]	0 ... +60		
Theoretical torque at 6 bar				
DSM	[Nm]	0.15	0.35	0.85
DSM-T	[Nm]	0.3	0.7	1.7
Permissible stop radius $r_{min}$	[mm]	10		13
Permissible stop force $F_{max}$	[N]	15	30	60
Max. permissible force on the drive shaft				
Axial force $F_x$	[N]	10		
Radial force $F_z$	[N]	15	20	30
Note on materials	Free of copper and PTFE			
Material information and product weight	→ <a href="http://www.festo.com/catalogue">www.festo.com/catalogue</a>			
Permissible mass moment of inertia <sup>1)</sup>	[10 <sup>-5</sup> kg m <sup>2</sup> ]	0.5	1.0	2.0
Cushioning	Flexible cushioning at both ends			
Cushioning angle	[°]	0.5		
Swivel angle <sup>2)</sup>				
DSM(-T)-...-90	[°]	90 <sup>+5 3)</sup>	90 <sup>+5</sup>	90 <sup>+5</sup>
DSM(-T)-...-180	[°]	0...180 <sup>+5 3)</sup>	0...180 <sup>+5</sup>	0...180 <sup>+5</sup>
DSM(-T)-...-240	[°]	–	–	0...240 <sup>+5</sup>
DSM(-T)-...-180-...-FF-...	[°]	0...180 <sup>+5 3) 4)</sup>	0...180 <sup>+5 4)</sup>	–
DSM(-T)-...-240-...-FF-...	[°]	–	–	0... 200 <sup>+5 4)</sup>

1) Unthrottled.

2) Adjustment of swivel angle at DSM(-T)-... only with accessories.

3) Only adjustable symmetrical to the centre.

4) Precision adjustment (–5 ... +1°) via adjusting screw.

Fig. 10