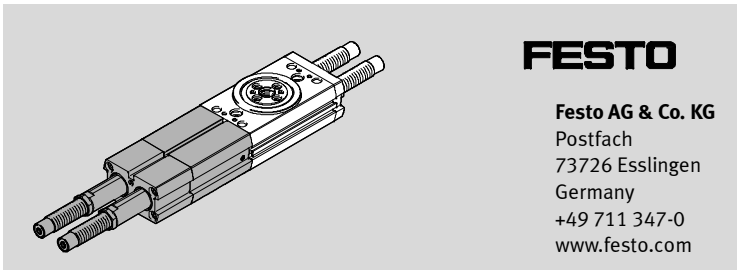


DRRD-...-PS1



Enclosure for operating instructions

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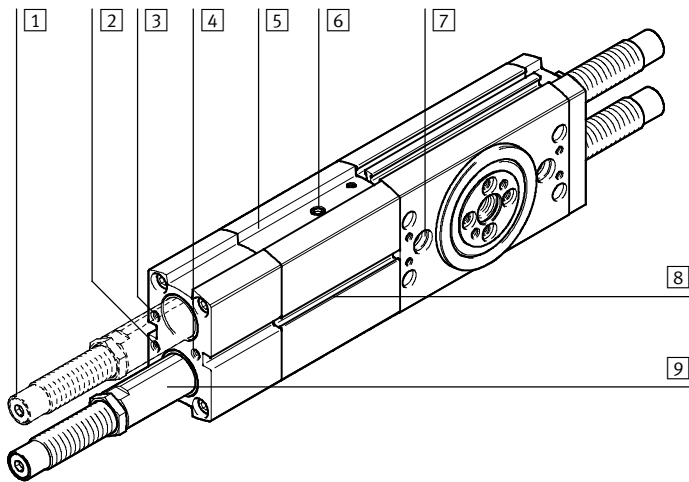
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Intermediate-position module DRRD-...-PS1 English

Note

- Observe the warnings and notes in the operating instructions for the DRRD semi-rotary drive.

1 Control sections and connections



- | | |
|---|--|
| 1 Shock absorbers or P-absorbers secured with lock nut (2x) | 5 Intermediate-position module DRRD-...-PS1 |
| 2 Supply port for semi-rotary drive (swivel clockwise) | 6 Venting hole with filter |
| 3 Supply port for semi-rotary drive (swivel anti-clockwise) | 7 Fastening interface at semi-rotary drive DRRD (2x) |
| 4 Compressed air supply port for intermediate-position module | 8 Slot for cylinder switch (2x) |
| | 9 Sleeve for reception of the shock absorber (2x) |

Fig. 1

2 Function and application

Note

The semi-rotary drive with intermediate-position module DRRD-...-PS1 can be destroyed through incorrect use.

- Make sure that the intermediate-position module is throttled.

The intermediate-position module DRRD-...-PS1 is intended to permit positioning of the flanged shaft in half of the nominal rotation angle of the semi-rotary drive DRRD. This intermediate position can be travelled through.

3 Transport and storage

- Take into account the weight of the semi-rotary drive with intermediate-position module.
Depending on the design, the DRRD-...-PS1 weights up to 20 kg.
- Transport the DRRD-...-PS1 by grasping the housing. Transporting it by grabbing the dampeners [1] is not recommended, since the dampeners of the intermediate position can move axially (no safe stop).

4 Installation

4.1 Installation, mechanical

- Secure the semi-rotary drive at the intended position and the effective load to the drive flange (→ Operating instructions DRRD).

4.2 Installation, pneumatic

- Connect tubes to the supply ports (→ Fig. 2):
 - intermediate position [4]
 - semi-rotary drive [2] (swivel clockwise)
 - semi-rotary drive [3] (swivel anti-clockwise).

Note

Sucked-in contamination and fluids disturb the function.

- Keep venting hole [6] clean and dry.
- Do not cover venting hole [6].

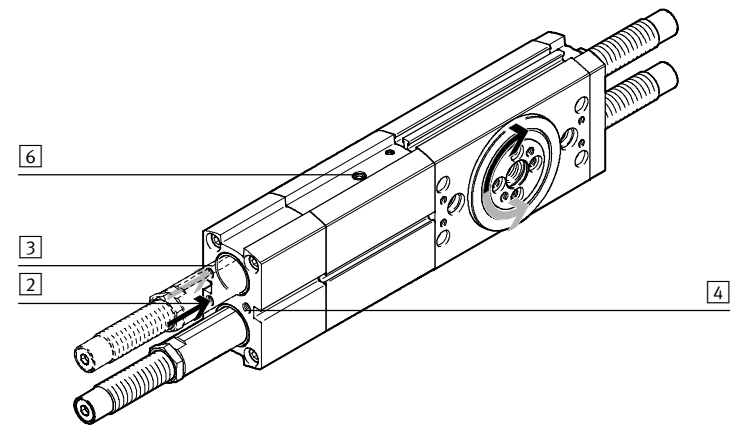


Fig. 2

To set the swivel speed at the semi-rotary drive:

- Use one-way flow control valves in all supply ports:
 - for DRRD-16/20 as close as possible to the supply ports
 - for DRRD-25 ... 50 screwed directly into the supply ports.

For vertical installation and eccentric loads:

- Use the controlled throttle check valves HGL or an air reservoir VZS.
In this way you can prevent the effective load from sliding down suddenly if there is a sudden pressure drop.

4.3 Installation, electric

- Place the cylinder switches in the slots [8] to interrogate the intermediate position directly at the semi-rotary drive. Slot [8] can be used to interrogate the intermediate position piston.

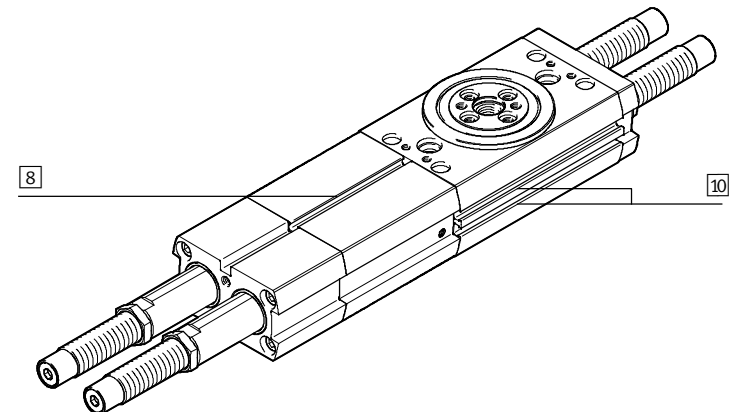


Fig. 3

5 Commissioning

5.1 Adjustment of the intermediate position



Note

Without counter pressure, the connection between the sleeve and the screw-in connector inside the intermediate-position module can loosen. This can result in failure to function.

- Turn the lock nut or dampener only with simultaneous counter pressure on the spanner flat of the sleeve [9].

- Check the setting dimension of the two dampeners [1]:
 - setting dimension X1 and X2 are the same size (dimension Y = 0 → Fig. 5, delivery status)
 - setting dimension lies between X_{min} and X_{max} (→ Fig. 6).

- If necessary, adjust the intermediate position as follows:

1. Loosen the lock nuts on both dampeners [1].
2. Turn the dampener [1] until the desired intermediate position is reached. When doing this, hold the sleeve [9]. The setting dimension must lie between X_{min} and X_{max} (→ Fig. 6).

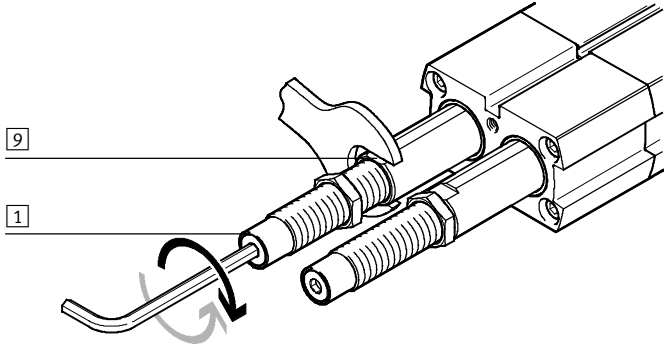


Fig. 4

3. Press the dampeners into the travelled-in end position until they meet resistance. The shaft of the semi-rotary drive thereby rotates into the intermediate position.

Through the off-set mounting of the shock absorber (dimension Y), the mid-position ($W=90^\circ$) can be adjusted by $\pm 10^\circ$.

The following settings are possible (→ Fig. 5 and Fig. 6).

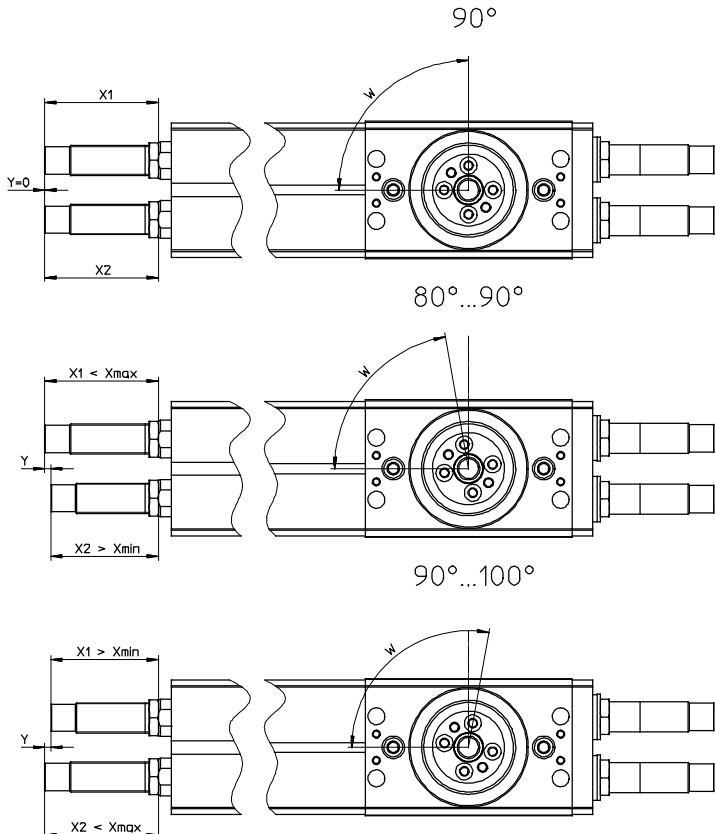


Fig. 5

If the setting dimension X_{max} is exceeded, the shock absorber does not cushion correctly at the intermediate position.

If the setting dimension X_{min} is fallen below, the shock absorber not only cushions the intermediate position, but also the end position of the semi-rotary drive. The cushioning time of the end position might rise as a result. The cushioning time of the intermediate position is not affected by this.

| Size | 16 | 20 | 25 | 32 | 35 | 40 | 50 |
|---|------|------|------|------|------|------|-----|
| Setting dimension X (P-cushioning) | | | | | | | |
| Xmin [mm] | 7.7 | 14.9 | 14.2 | 12.5 | – | – | – |
| Xmax [mm] | 10.1 | 17.8 | 20.6 | 23.2 | – | – | – |
| Setting dimension X (Y9-cushioning) | | | | | | | |
| Xmin [mm] | 29.6 | 41.8 | 56.9 | 70.3 | 88.6 | 86.7 | 114 |
| Xmax [mm] | 32 | 44.5 | 60.4 | 78.5 | 96.2 | 92.7 | 128 |
| Angle change per revolution at the dampener [°] | 4.3 | 4.5 | 3.3 | 4.1 | 4.1 | 2.7 | 1.9 |
| Dimension Y for 10° swivel angle change [mm] | 2.3 | 2.4 | 3.2 | 3.7 | 3.7 | 5.6 | 8 |
| Lock nut | | | | | | | |
| Spanner size [mm] | 13 | 15 | 19 | 27 | 32 | 32 | 36 |
| Tightening torque [Nm] | 3 | 5 | 20 | 35 | 60 | 60 | 80 |

Fig. 6

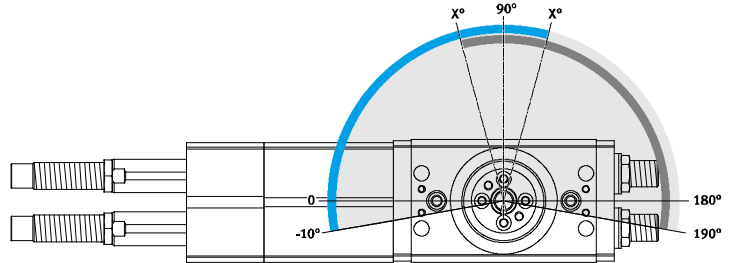


Fig. 7 Entire setting range on the DRRD-...-PS1

4. Check the intermediate position under pressure.
5. Readjust the dampener, if required.

After the end of the settings:



Note

Without counter pressure, the connection between the sleeve and the screw-in connector inside the intermediate-position module can loosen. This can result in failure to function.

- Tighten the locking nuts again. Tightening torque (→ Fig. 6).

To lock the hex nuts, the spanner flat of the sleeve or the internal hexagon socket of the dampener must be counter held.

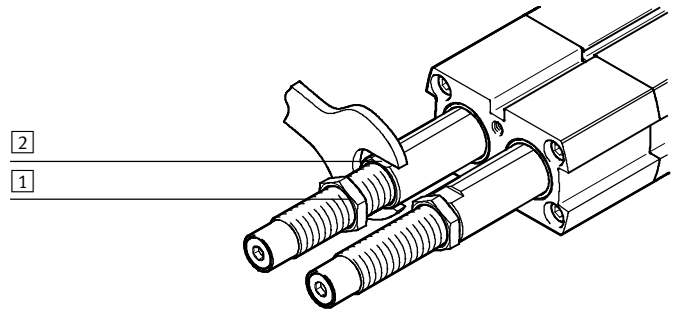


Fig. 8

5.2 Setting of the swivel speed



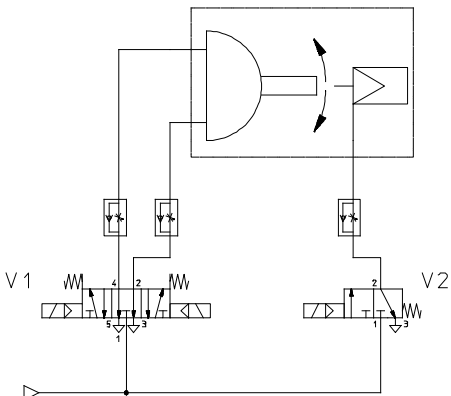
Note

- Observe the following relationship when setting the swivel speed:
 - The flow control valves at the connections for rotation of the semi-rotary drive affect the speed with which the intermediate position is travelled to. Both directions can be adjusted separately from each other.
 - The flow control valve at the connection for the intermediate position regulates the speed with which the end position (from out of the intermediate position) is travelled to. Both directions are hereby regulated simultaneously.

- Select one of the activation alternatives:

Alternative 1

Circuit diagram (activation with 5/3-way valve and 3/2-way valve)



Control sequence

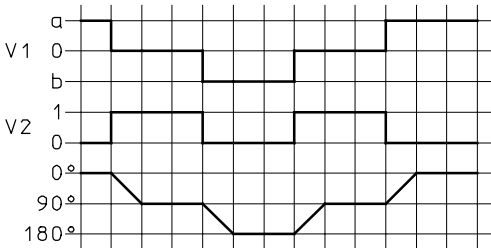
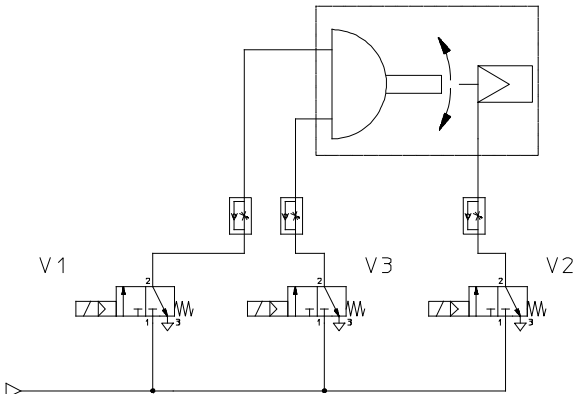


Fig. 9

Alternative 2

Circuit diagram (activation only with 3/2-way valves)



Control sequence

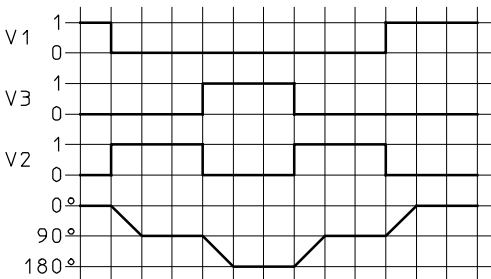
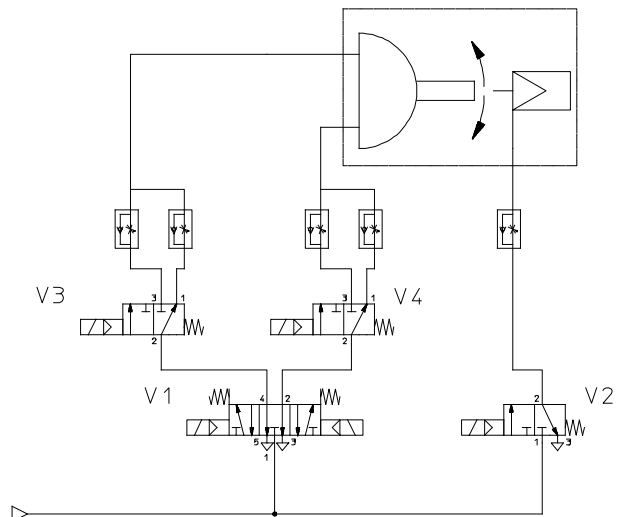


Fig. 10

The intermediate position may only be travelled to (valve V2) if the semi-rotary drive is simultaneously exhausted. This ensures that the flow control valves fulfil their function and no accidental change in rotation angle takes place. Fundamentally, an overswing may occur in the intermediate position. This can be minimised through corresponding restriction of speeds (exhaust air flow control).

Alternative 3 (shortened swivel time in 180°-operation in a swivel direction)

Circuit diagram (activation with 5/3-way valve and 3/2-way valve)



Control sequence

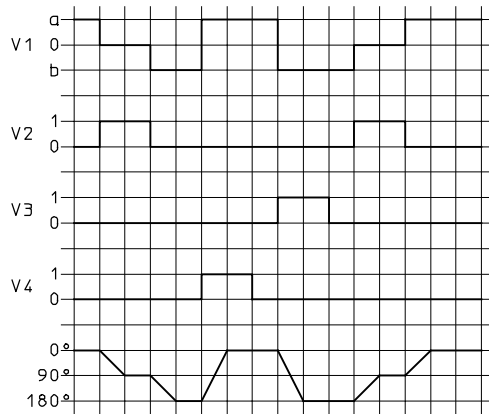


Fig. 11

5.3 Carrying out commissioning

Warning

Danger of injury due to uncontrolled movement of the semi-rotary drive (e.g. through extending dampener [1]).

- Consider that the pneumatic actuation of the semi-rotary drive can trigger a movement in case of:
 - eccentrically attached payload, due to the strong unbalance
 - function variant Y9/Y12 due to the resetting force (back pressure) of the shock absorber.
- When the intermediate position is exited, make sure that nobody/nothing is in the movement area of the dampener.
- Start the test run at first with reduced operating pressure.

Note

Excessive loads can damage the DRRD-...-PS1.

- Make sure that the following values are not exceeded when swivelling into the intermediate position:
 - the maximum permissible mass moment of inertia (→ 7 Technical data) and the maximum permissible swivel time of the intermediate-position module DRRD-...-PS1 (→ www.festo.com/catalogue).
- Make sure that the following values are not exceeded while swivelling into the end position:
 - the maximum permissible mass moment of inertia of the semi-rotary drive DRRD.
 For the swivel motion from the intermediate position into the end positions, the respective values of the corresponding function variants of the semi-rotary drive are permissible (→ Technical data in the operating instructions for the DRRD).

1. Turn the upstream one-way flow control valve of the semi-rotary drive and intermediate position completely closed and open it back up one rotation.
2. Pressurize the system and the product.
3. Start a test run with low swivel frequency.
4. Turn all one-way flow control valves open one additional rotation until the desired speed of the end position and intermediate position is reached. This can be the case at different times.

6 Operation



Note

The intermediate-position module can be destroyed if it runs against an unpressurised chamber.

- Make sure that the chamber from the previous operating status is pressurized at the semi-rotary drive. Only when the valves are reversed simultaneously is an air cushion present in the chamber, which makes the function of the exhaust air flow control valve possible.

7 Technical data

| Size | 16 | 20 | 25 | 32 | 35 | 40 | 50 |
|--|---|------|------|------|-------|-------|-------|
| Mass moment of inertia (swivelling into intermediate position) | | | | | | | |
| P (min.) [kgcm ²] | 0 | 0 | 0 | 0 | – | – | – |
| P (max.) [kgcm ²] | 150 | 300 | 400 | 500 | – | – | – |
| Y9/Y12 (min.) [kgcm ²] | 15 | 40 | 100 | 100 | 500 | 1000 | 2000 |
| Y9/Y12 (max.) [kgcm ²] | 500 | 900 | 1500 | 8000 | 15000 | 23000 | 40000 |
| Max. perm. swivel time | (→ www.festo.com/catalogue) | | | | | | |
| Pneumatic port | M5 | | | | | | G1/8 |
| Operating pressure range | | | | | | | |
| P [bar] | 4 ... 8 | | | | – | | |
| Y9/Y12 [bar] | 2 ... 10 | | | | | | |
| Swivel angle | | | | | | | |
| Intermediate position [°] | 90 ±10 | | | | | | |
| End positions [°] | 0 ... 80; 100 ... 180 | | | | | | |
| Materials | | | | | | | |
| Housing, cover | Anodised aluminium | | | | | | |
| Dampener, | Steel, NBR | | | | | | |
| Sleeves | Stainless steel | | | | | | |
| Weight (total load) | | | | | | | |
| P [kg] | 1.10 | 1.47 | 2.35 | 5.0 | – | – | – |
| Y9 [kg] | 1.12 | 1.53 | 2.41 | 5.28 | 8.51 | 10.52 | 19.12 |

Fig. 12