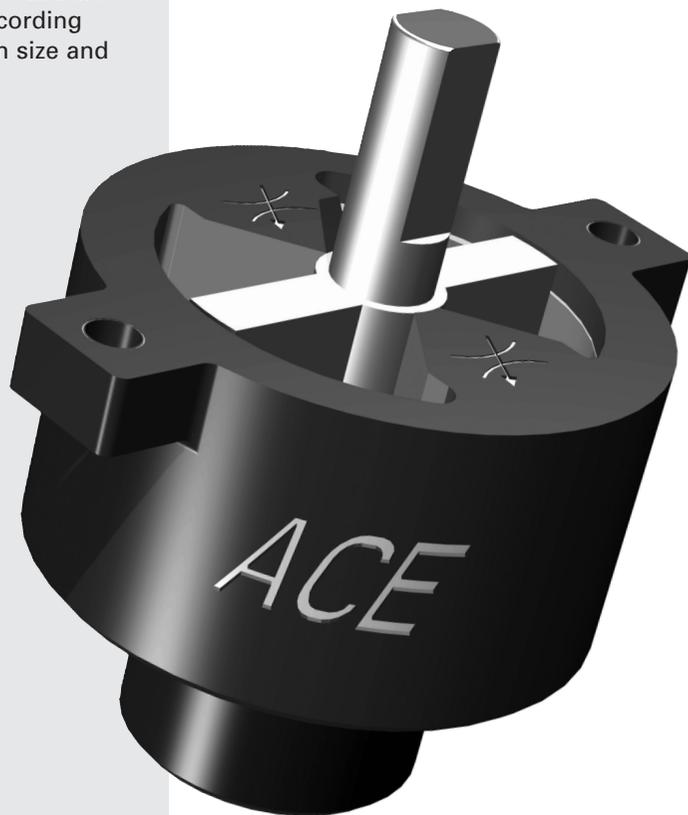
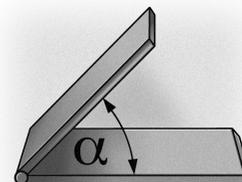


To achieve long lasting and trouble-free service life for our products please observe the following instructions. The operating instructions refer to all rotary dampers and are subdivided according to construction size and properties.



Prior to mounting, check whether the rotary damper can be used for your specific application.

The following conditions must be fulfilled:



Closing Torque T

$$T = L / 2 \cdot m \cdot g \cdot \cos \alpha \quad \text{Ncm.}$$

Attention: The following values must not be exceeded.
FRT/FRN: max. rotational speed 50 revs/min, number of cycles of 10/min.
FDT/FDN: max. rotational speed 50 revs/min, number of cycles of 12/min. (FFD 13/min.)

The indicated damping torque must not be exceeded. Don't use the rotary damper in high pressure or vacuum environments.

Important: Usage outside the specified ratings can result in a premature breakdown and/or damage of the damper.

Allowable temperature range

The allowable **temperature range** for FRT/FRN is between **0°C and 50°C** and for FDT/FDN between **-10°C and 50°C**. Usage outside the specified ratings can lead to damages of the damper. **Store** the rotary dampers between **-20°C to 70°C** (FFD **-10°C to 60°C**).

Oil filling: Silicone oil (FFD without oil)

Environmental requirements

To avoid a premature breakdown of the rotary dampers, they must be protected against dirt, splinters and aggressive fluids.

Mounting instructions for FRT/FRN

The dampers must be fixed so to the mountings that the load to be damped can't apply side loads against the damper. We recommend using an external guidance and/or bearing of the moved load. The pivot axis is not rated for side loads (see figure). If you have more questions about the use of rotary dampers please, contact an ACE technician.

Mounting instructions for FDT/FDN

Fix the damper to the mounting holes and connect the load to be decelerated via an appropriate mandrel on the shaft. We recommend using an external guidance and/or bearing of the moved load.

Calculation of Rotary Damper for a Lid

- m Mass of Lid (kg)
- L Length of Lid from pivot (cm.)
- n Rotation speed (r.p.m.)
- g Acceleration due to gravity (= 9.81)

Calculation Steps

- 1) Calculate max. torque damper will be exposed to. (with example shown max torque is at $\alpha = 0$)
- 2) Decide upon rotation speed desired.
- 3) Choose a rotary damper from catalogue that can handle the torque calculated above.
- 4) With the aid of the damper performance curves, check if the r.p.m. given at your torque corresponds to the desired closing speed of the lid.
- 5) If the r.p.m. is too high – Choose a damper with a higher torque rating.
If the r.p.m. is too low – Choose a damper with a lower torque rating.

The shaft must not be used as support. In order to increase the damping torque several dampers can be used in parallel due to the flat construction type. For the recommended shaft diameter for the FDT, FDN and FFD types see catalogue.



Side loading



End loading



Angular offset



Misalignment

Accessories

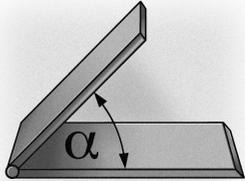
Indication of rotation direction
Right-hand damping = clockwise (top view on pivot)
Toothed racks in the modules 0,5 to 1,0 made of plastic (acetalic resin, Hostaform C or similar) available from stock.

Order designation

Toothed rack M 0.5, length 250 mm, width 4 mm
Toothed rack M 0.6, length 250 mm, width 4 mm
Toothed rack M 0.8 P, length 250 mm, width 4 mm
Toothed rack M 1.0, length 250 mm, width 10 mm
Toothed rack M 1.0, length 500 mm, width 10 mm

Prior to mounting, check whether the rotary damper can be used for your specific application.

The following conditions must be fulfilled:



Closing Torque T
 $T = L / 2 \cdot m \cdot g \cdot \cos \alpha \quad \text{Ncm.}$

Attention: max. rotation angle 120° for FRX-A1
 max. rotation angle 110° for FYN-N1
 max. rotation angle 108° for FYN-K1

The indicated damping torque must not be exceeded. Don't use the rotary damper in high pressure or vacuum environments.

Important: Usage outside the specified ratings can result in a premature breakdown and/or damage of the damper.

Allowable temperature range

The allowable **temperature range** for the **FRX-A1** type is between **0°C and 50°C**, for the **FYN-N1** type between **-5°C and 50°C** and for the **FYN-K1** type between **-5°C and 50°C**.

Usage outside the specified ratings can lead to damages of the damper.

Store the rotary dampers between **-20°C to 70°C**.

Oil filling: Silicone oil

Environmental requirements

To avoid a premature failure of the rotary dampers, they must be protected against dirt, splinters and aggressive fluids.

Mounting instructions

The dampers must be fixed so that the load to be decelerated can't apply side loads against the damper. We recommend using an external guidance and/or bearing of the moved load. The pivot axis is not rated for side loads (see figure).

Calculation of Rotary Damper for a Lid

- m Mass of Lid (kg)
- L Length of Lid from pivot (cm.)
- n Rotation speed (r.p.m.)
- g Acceleration due to gravity (= 9.81)

Calculation Steps

- 1) Calculate max. torque damper will be exposed to. (with example shown max torque is at $\alpha = 0$)
- 2) Decide upon rotation speed desired.
- 3) Choose a rotary damper from catalogue that can handle the torque calculated above.
- 4) With the aid of the damper performance curves, check if the r.p.m. given at your torque corresponds to the desired closing speed of the lid.
- 5) If the r.p.m. is too high – Choose a damper with a higher torque rating.
 If the r.p.m. is too low – Choose a damper with a lower torque rating.

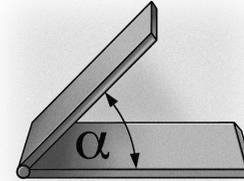
The FRX-A1 and FYN-K1 types must be fixed through the mounting holes and the FRN-N1 type through the base-sided, rectangular retainer. The damping action is in one direction – in top view on axle anti-clockwise (L) = to the left, clockwise (R) = to the right. In the other direction there is a type-dependent turn back damping torque.

The rotary dampers have a limited rotation angle and must not be used as final end stop. Provide mechanical stops for each stroke direction.

If you have more questions about the use of rotary dampers please, contact an ACE-technician.

Prior to mounting, check whether the rotary damper can be used for your specific application.

The following conditions must be fulfilled:



Closing Torque T
 $T = L / 2 \cdot m \cdot g \cdot \cos \alpha \quad \text{Ncm.}$

Attention: At the beginning of a movement there might be a slack of approximately 5°.
 max. rotation angle 105° for FYT-H1 and FYN-H1
 max. rotation angle 210° for FYT-LA3 and FYN-LA3

The rated damping torque must not be exceeded. Don't use the rotary damper in high pressure or vacuum environments.

Important: Usage outside the specified ratings can result in a premature breakdown and/or damage of the damper.

Allowable temperature range

The allowable **temperature range** is between **-5°C and 50°C**.

Usage outside the specified ratings can lead to damages of the damper.

Store the rotary dampers between **-20°C to 70°C**.

Oil filling: Silicone oil

Environmental requirements

To avoid a premature failure of the rotary dampers, they must be protected against dirt, splinters and aggressive fluids.

Mounting instructions

The dampers must be mounted so that the load to be decelerated can only apply the least possible side loads against the damper. We recommend using an external guidance and/or bearing of the moved load.

Calculation of Rotary Damper for a Lid

- m Mass of Lid (kg)
- L Length of Lid from pivot (cm.)
- n Rotation speed (r.p.m.)
- g Acceleration due to gravity (= 9.81)

Calculation Steps

- 1) Calculate max. torque damper will be exposed to. (with example shown max torque is at $\alpha = 0$)
- 2) Decide upon rotation speed desired.
- 3) Choose a rotary damper from catalogue that can handle the torque calculated above.
- 4) With the aid of the damper performance curves, check if the r.p.m. given at your torque corresponds to the desired closing speed of the lid.
- 5) If the r.p.m. is too high – Choose a damper with a higher torque rating.
 If the r.p.m. is too low – Choose a damper with a lower torque rating.

Only a limited radial force Pmax (see catalogue instructions) may be applied against the axis. The damping action can be in both directions (FYT-H1 and FYT-LA3 types) or only in one direction – in top view on axle anti-clockwise (L) = left, clockwise (R) = right. With unidirectional dampers there is a type dependent turn back damping torque into the other direction (see catalogue instructions).

The rotary dampers have a limited rotation angle and must not be used as final end stop. Provide mechanical stops for each stroke direction.

Adjustability

The damping torque can be adjusted in the type-dependent range. To do this unscrew the set screw by one or two turns with the delivered wrench. Then the damping torque can be adjusted by the set screw. If the desired damping torque is set the set screw must be tightened again.

If you have more questions about the use of rotary dampers please, contact an ACE-technician.