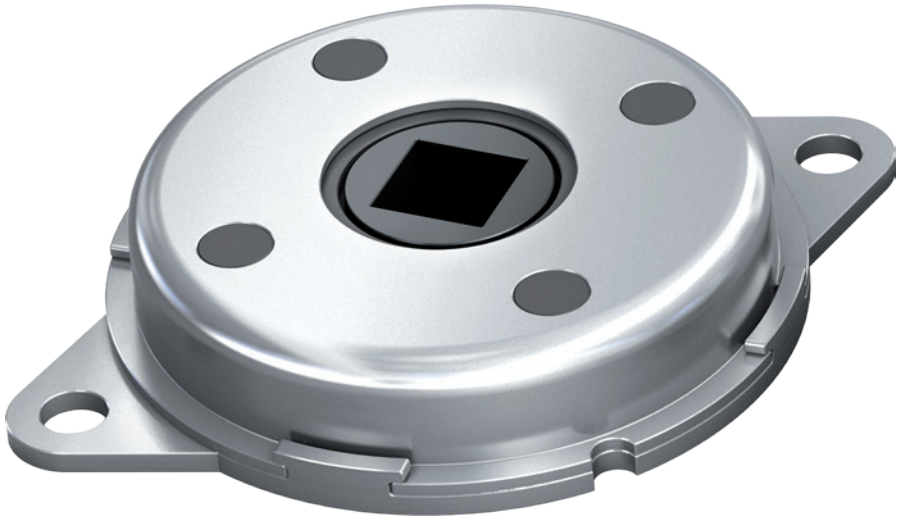
FDT
Rotary Dampers
The flat disc brake for two-sided damping

Continuous rotation

Damping torque 2 Nm to 8.7 Nm

FDT



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Manual

General instructions

This manual is for the disruption-free use of the product types listed on page 1; its compliance is a prerequisite for the fulfilment of any warranty claims.

Therefore, make sure to read this manual before use.

Always maintain the limits specified in the performance table. Take into account the predominant environmental conditions and restrictions. Note the regulations of the trade association, TÜV or corresponding national, international and European regulations. Installation and commissioning only according to mounting instructions.

Safety information

WARNING

If ACE rotary dampers are used where a failure of the product could lead to personal injuries and/or material damage, additional safety elements must be implemented.

Free-moving masses, such as lids, flaps, covers etc., can lead to injuries by crushing during installation of the rotary dampers. Secure moving flap/mass against falling down!

Intended use

ACE rotary dampers ensure the controlled opening and closing of small covers, compartments and drawers. They can brake directly at the pivot point or linearly via rack and pinion to attain a smooth and quiet movement. Sensitive components are preserved. The harmoniously gentle process increases the quality and value of the product.

Description and function

With continuously rotating rotary dampers, fluid damping is facilitated through shearing of thin silicone layers between the areas of a rotor and a stator. The damping torque is determined by the viscosity of the fluid or the dimensioning of the damping orifice.

ACE rotary dampers are maintenance-free and ready-to-install.

The damping direction is two-sided. The outer bodies are made of steel. Power is transmitted via a square mount.

Calculation and design

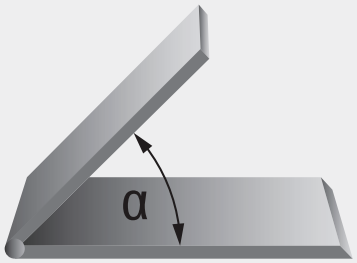
In order to ensure an optimum fault-free and durable function of the rotary dampers, they must be correctly dimensioned and designed. The following parameters must be known and used in the calculation.

- Temperature
- Damping torque
- Speed
- Cycle number

Should you have any further questions about the use of rotary dampers, please contact one of our ACE technicians.
For free calculation service, phone: +49 (0)2173 - 9226-20.

Calculation example: Damping of a flap

In order to select a suitable rotary damper for the calculation example shown, the length and the weight or centre of gravity of the flap must be specified. Once the max. torque value with an unfavourable angle of the flap has been determined, a suitable brake is selected.



Calculation steps

1. Calculate torque for unfavourable angle (see example on left: 0°).
2. Determine angular speed.
3. Choose a suitable rotary damper for the calculated torque.
4. With the aid of the damper performance curve, check whether the rpm matches the desired speed.
5. If the rpm is too high – choose a higher torque.
6. If the rpm is too low – choose a lower torque.

Torque
$M = L / 2 \cdot m \cdot g \cdot \cos \alpha$
(L / 2 = centre of gravity)

m Mass in kg [1 kg = 9.81 N]
L Flap length in cm
n Speed in rpm

Delivery and storage

- After delivery please check the rotary dampers for any damage.
- The rotary damper can become damaged if it falls. Carefully remove rotary damper from the packaging.
- Rotary dampers can generally be stored in any position.
- Storage in the original packaging is preferred.
- Always store rotary dampers dry.
- The recommended maximum storage time is two years.
- Storage of rotary dampers is permissible at -20 °C to +70 °C.

Maintenance and care

Regularly check the rotary damper for oil loss and external damage. Rotary dampers are machine elements that are subject to continuous wear. Increased service life results in reduced braking effect. If this is no longer sufficient, the rotary dampers must be replaced or exchanged as appropriate.

Disassembly and disposal

Take account of environmental protection (recovery of problematic substances) during disposal of the rotary dampers. The rotary dampers are filled with silicone oil. The corresponding data sheet is available on request. By design, the silicone oil cannot be refilled. The rotary dampers cannot be repaired. Faulty brakes can be sent to our service department for determination of the cause of failure.

Rotary Damper FDT (continuous rotation)

Mounting instructions and mounting accessories

Installation instructions

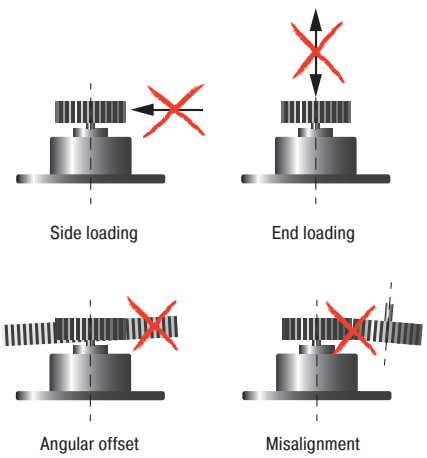
Before installation and use check whether the identification number on the product or on the packaging matches the respective designation on the delivery note.

Rotary dampers are maintenance-free and ready-to-install.

WARNING

- **The specified rated damping torque applies at a temperature of 23 °C or a speed of 20 rpm.** The damping torque can change depending on the temperature or speed. Please observe the characteristic curves in the mounting instructions.
- **The flap/mass can fall off during installation and removal of the rotary damper.** Secure moving flap/mass against falling down!
- **Depending on the application, failure of the product could lead to personal injuries and/or material damage.** Use additional safety elements.
- **Exceeding the permissible temperature range, the max. speed, the cycle number and the specified damping torque can lead to premature failure or destruction of the rotary damper.** Operating temperature range, speed of 50 rpm, cycle number of 12/min. and the specified damping torque must be maintained.
- **Dirt, swarf and aggressive liquids can cause premature failure of the rotary damper.** Protect or encapsulate rotary damper from external materials in the surrounding area.
- **Do not use rotary dampers in high-pressure or vacuum range.**

Note! The rotary axes, square mounts or free-wheel mounts are not designed for side loading.



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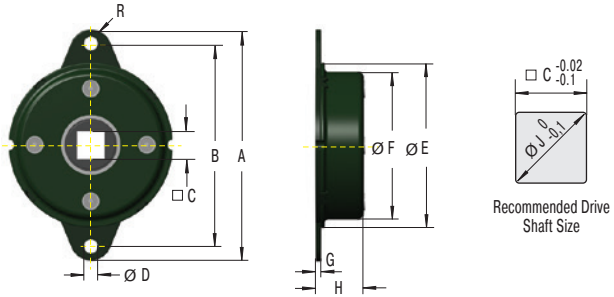


Performance data and dimensions

TYPES	[1] Damping torque Nm	Damping direction	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	R mm	J mm	Weight kg
FDT-47	2.0 +/- 0.3	two-sided	65	56	8	4.5	47	42.8	1.6	10.3	4.5	10	0.050
FDT-57	4.7 +/- 0.5	two-sided	79	68	10	5.5	57	52.4	1.6	11.2	5.5	13	0.075
FDT-63	6.7 +/- 0.7	two-sided	89	76	12.5	6.5	63	58.6	1.6	11.3	6.5	17	0.095
FDT-70	8.7 +/- 0.8	two-sided	95	82	12.5	6.5	70	65.4	1.6	11.3	6.5	17	0.110

[1] The indicated damping torques refer to a rotational speed of 20 rpm and an ambient temperature of 23 °C.

Construction size: Ø 47 mm to 70 mm

Max. speed: 50 rpm

Lifetime: 50,000 cycles (1 cycle = 360° left-hand, 360° right-hand), at least 80 % of the original damping torque after this. The service life may be significantly higher or lower, depending on the application.

Operating temperature range: -10 °C to +50 °C

Damping medium: Silicone oil

Material: Outer body: Steel; Output shaft sleeve: Nylon

Damping direction: Top view of the shaft left-hand (L) = anticlockwise, right-hand (R) = clockwise.

Mounting: in any position

Mounting information: Secure brake at the mounting holes and connect the part to be braked via a suitable shaft to the output shaft sleeve. An external guide or support of the moved part is recommended. Thanks to the flat design, numerous dampers can be fitted in parallel to increase the damping torque.

No axial or radial forces may be introduced via the shaft. The rotary axis was not designed for side loading (see diagrams).

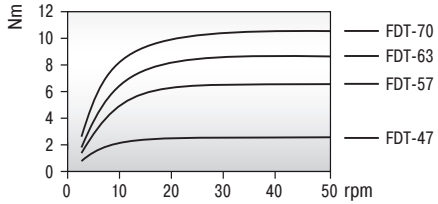
Safety instructions: Do not use rotary dampers as supports. Provide an external guide or support.

On request: Special designs available on request.

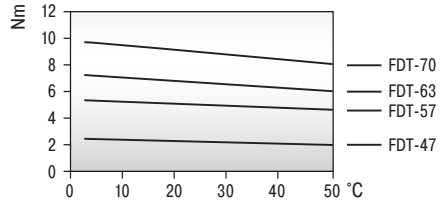
Packaging disposal: Please dispose of the transportation packaging in an environmentally-friendly manner. Recycling packaging materials saves raw materials and reduces waste. The packaging materials do not contain any prohibited materials.

Characteristic curves

At 23 °C ambient temperature



At 20 rpm speed



Warranty

Fundamentally, all modifications to the product by third parties lead to exclusion from the warranty.

Obvious defects must be reported to the vendor in writing immediately after delivery, no later than one week, but in any case before processing or installation, otherwise the assertion of a warranty claim is excluded. A timely dispatch is sufficient to keep the term.

The vendor is to be given an opportunity to check on site. If the complaint is justified the vendor offers warranty by repair or replacement at its own discretion. If the rectification fails, the buyer may choose to demand reduction of payment or cancellation of the contract. If there is only a minor lack of conformity, particularly with only minor defects, the buyer nevertheless has a right of withdrawal.

If, after failed rectification, the buyer chooses to cancel the contract due to a defect of title or material defect, they are not entitled to additionally claim for damages.

If, after failed fulfilment, the buyer chooses compensation, the goods remain with the buyer, if this is reasonable. The compensation is limited to the difference between the purchase price and the value of the defective item. This does not apply if the vendor maliciously causes the breach of contract.

The quality of the goods is only considered as agreed upon with the product description of the vendor. Public statements, claims or advertising of the manufacturer do not represent an additional contractual specification of quality of the goods.

If the buyer receives defective mounting instructions, the buyer is only obligated to deliver defect-free mounting instructions and only if the defect to the mounting instructions prevents proper mounting.

The warranty period is two years and begins upon completion. Exchange and return of custom products are fundamentally excluded. The factory conditions of the manufacturing factory apply to parts not manufactured and processed by the vendor, which can be viewed by the orderer at the vendor at any time. Construction and installation parts are delivered according to the present standard of engineering.

Expected service life

ACE rotary dampers are generally tested for a lifetime of 50,000 cycles with a max. speed of 50 rpm and a max. cycle number of 10/min. After this the dampers still have approx. 80 % of their original damping torque. Depending on use the service life can be significantly longer or shorter. In practice significantly longer lifetimes have been achieved.

Manufacturer's declaration

Manufacturer's declaration as part of the EC Machinery Directive 2006/42/EC

We hereby declare that the model of industrial shock absorbers, industrial gas springs, hydraulic dampers, rotary dampers and profile dampers or individual positions thereof are intended for installation in a machine in the execution delivered by us. Its commissioning is forbidden until such a time that it is established that the machine, into which the elements above are to be fitted, meets the regulations of the EC Directive version 2006/42/EC of 17 May 2006.

The products listed above are not autonomous or incomplete machines and do not fall under the Machinery Directive 2006/42/EC.

Applied harmonised standards are EN 983 and DIN EN 60204, in particular.

This declaration is not an assurance of properties in the sense of the product liability law. The safety information of the product information should be observed.

Jürgen Roland **Langenfeld, 11.09.2013**

(Executive Director)