

Tunnel Ventilation Damper

GERHMAN

MSD-EU TVD-LD

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For Tunnel Ventilation and Smoke Control

Multi-blade smoke control damper

MSD-EU TVD-LD is an opposed-blade, multi-blade metal damper developed for tunnel ventilation and smoke control systems. It consists of a reinforced duct casing, double-skin aerofoil blades and a mechanical drive with external linkage arms. Configurations with electric actuators provide open/close control and end-position feedback.

CONSTRUCTION, MATERIALS AND DRIVE

Feature	Standard	Options
Casing	Formed galvanised steel duct casing, 300 mm depth	Sheet thickness: 2.0 / 2.5 / 3.0 mm
Blades	Double-skin aerofoil profile, opposed-blade action	Sheet thickness: 1+1 / 1.2+1.2 / 1.5+1.5 mm
Material	Z275 galvanised steel	AISI 304 / 316 / 316L / 316Ti stainless steel
Shaft and linkage	Ø25 mm AISI 304 shaft, external linkage arms	—
Bearings	Bronze bushing	—
Sealing	Stainless steel edge seals	—
Module size	Single module: 250 × 250 – 2,800 × 2,800 mm	Modular above 2,800 × 2,800 mm
Drive	Spring-return (fail-safe) actuator	Electric 230 / 120 / 24 V · electro-hydraulic · pneumatic
Limit switch	250°C resistant	—
Position feedback	—	Auxiliary limit switch or dedicated position indicator

Applications: road and rail tunnels, metro and underground transport structures, ventilation shafts, smoke extraction ducts and high-temperature ventilation systems. Product selection must be based on the project operating scenario and the scope of the relevant test reports.

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Construction and Materials

Mechanical design and materials

Casing	Welded galvanised steel; sheet 2.0 / 2.5 / 3.0 mm
Blades	Double-skin aerofoil blades; 1+1 / 1.2+1.2 / 1.5+1.5 mm.
Reinforcement	Ø25 mm internal shaft reinforcement.
Mechanism	Linked opposed-blade mechanism; metal linkage arm.
Bearings / seals	Bronze bushings, spring steel side seals and blade seals.
Material options	Galvanised steel, SS304, SS316, SS316L and SS316Ti stainless steel (casing and blades).



Linked multi-blade mechanism — metal linkage arm, bronze bushings and spring steel seals

Design Principle

A rigid perimeter frame and linked multi-blade assembly provide a modular solution for larger ventilation openings. The selected actuator, seals and installation details must be coordinated with the operating temperature and pressure requirements. The final construction and surface finish are selected to suit project requirements.

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Actuator and Mechanism Arrangements

In-airstream / out-of-airstream and actuator options



Out-of-airstream arrangement



In-airstream arrangement

The damper is driven by an electric or pneumatic, spring-return, open/close fail-safe actuator sized for the module and operating environment. Motor position, thermal protection and position feedback are coordinated with the selected equipment.

Actuator Options

Commonly specified spring-return and non-spring-return actuator series:

Series	Type	Torque	Operation
Schischek ExMax	Electric quarter-turn, Ex (ATEX / IECEx)	30 / 50 Nm	Spring-return, open/close
Schischek InMax	Electric quarter-turn, safe area	24 / 40 Nm	Spring-return, open/close
Bernard AQ	Electric quarter-turn	50–10,000 Nm	Open/close (Class A, EN 15714-2), fail-safe option
Rotork RC	Pneumatic scotch-yoke	Up to ≈4,400 Nm	Spring-return (to position), open/close
Siemens / AUMA	Electric part-turn	depends on model	Spring-return / fail-safe variant

Actuator and thermal trigger are selected per project. Fire-safety performance is a property of the complete damper assembly and its documented test scope, not of the actuator alone.

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600°C / 2-Hour Fire Test

EN 1366-10 smoke control damper test · Class E performance

600°C **2 HOUR**

CLASS E PERFORMANCE

Integrity maintained for 120 minutes under 600°C furnace exposure



600°C / 2-hour fire test setup — EN 1366-10, Applus+ laboratory

The classification applies to the tested specimen size, installation position and drive configuration. Project applications must be based on the scope of the relevant test report.

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Size Range and Actuator Coverage

Single-module sizes and ordering information

MSD-EU TVD-LD is manufactured as a single module from 250 × 250 mm to 2,800 × 2,800 mm. The actuator is selected to suit the damper size; openings above 2,800 × 2,800 mm are covered by modular assemblies.

SIZE RANGE AND ACTUATOR COVERAGE (W × H, mm)

H \ W	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	2800
250	■	■	■	■	■	■						
500	■	■	■	■	■	■						
750	■	■	■	■	■	■						
1000	■	■	■	■	■	■						
1250	■	■	■	■	■	■						
1500	■	■	■	■	■	■						
1750												
2000												
2250												
2500												
2750												
2800												

■ **GGA326.1E:** up to 1,500 × 1,500 mm ■ **Other actuators:** up to 2,800 × 2,800 mm · modular above

Ordering Information

Specify model **MSD-EU TVD-LD**, width × height, casing material, blade material, actuator type, voltage, mounting orientation, position indicator and any thermal enclosure requirement.

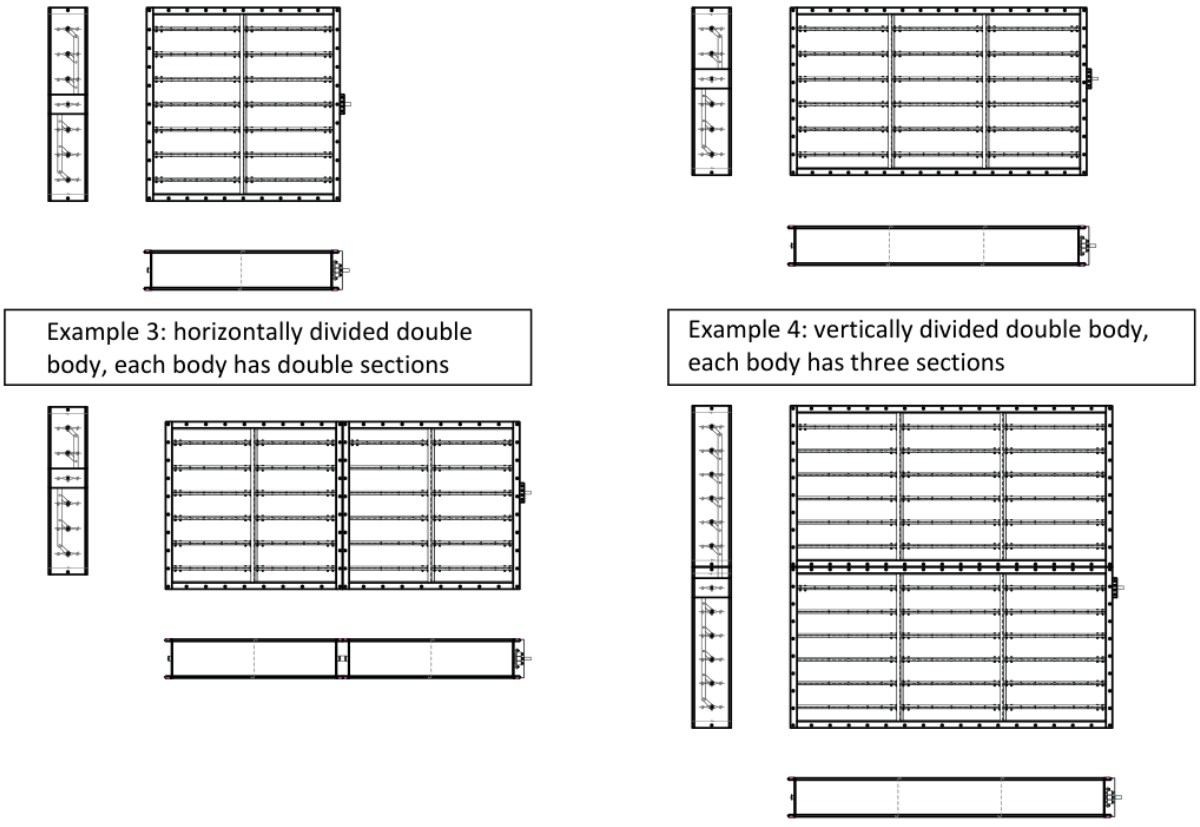
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Modular Design

Examples of single and combined multi-section assemblies

Openings above 2,800 × 2,800 mm are formed by combining modules horizontally or vertically. Alternative sizes and arrangements are subject to engineering review.



Modular design — single and combined multi-section assemblies (example arrangements)

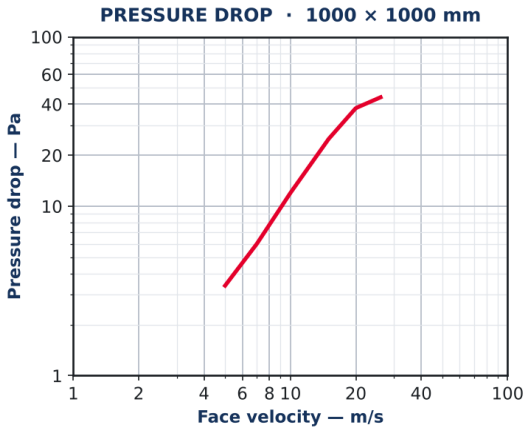
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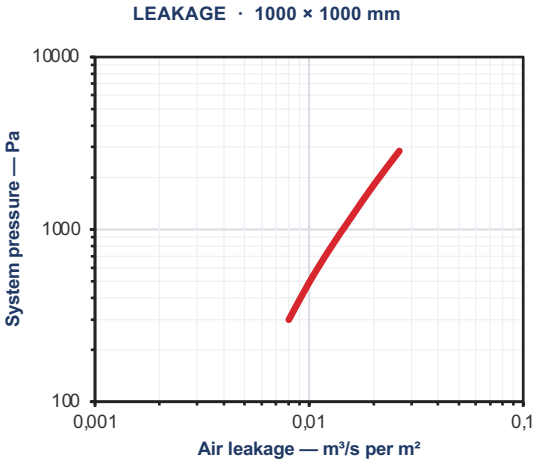


Technical Performance

Test / standard	Result
Temperature resistance — 600°C / 2 hours	Integrity maintained for 120 min
Classification — EN 13501-4	E600-S
Horizontal + vertical operation test	250°C / 1 hour continuous operation, no failure
Thermal resistance — thermal shock	Full open / close after −5…+250°C thermal shock
Mechanical endurance	Performance guaranteed after 100,000 cycles, no wear
Leakage — EN 1751, 2,000 Pa	Closed-blade leakage Class 4 (1,000–2,000 Pa)



Pressure drop — face velocity · 1000 × 1000 mm



Air leakage — system pressure · 1000 × 1000 mm

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From Production

Manufacturing and inspection images



Production — assembly and inspection



Production line — before shipment

Factory Acceptance Test (FAT) FAT-TVD/2025/TR

Before shipment, every TVD tunnel damper passes a four-stage FAT run by the Gerhman QA team at our Istanbul factory, witnessed by the customer's representative and, on request, an independent third-party inspector.

01 Visual inspection

- Product label and serial number verification
- Surface and coating: check for dents, scratches, corrosion
- Blade alignment and clearance: free movement without friction
- Actuator, wiring, IP rating and accessory mounting

02 Function tests

- Manual full opening / closing without resistance
- Actuator response to control signal
- Limit switch triggering in open / closed positions
- Return to safe position via spring / torque return; noise and vibration within limits

03 Optional tests

- Static air leakage test to EN 1751
- Actuator torque measurement with torque meter
- Simulated open-close cycle test (10 cycles)
- Scope agreed with the customer before order

04 Records and shipment approval

- Serial label, actuator label and open / closed blade photos per unit (Annex A)
- Non-conformities and agreements recorded in the report
- Shipment approval signed by Gerhman QA, customer and any third party



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SCAN

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Specifications are subject to change. Confirm the exact scope of test reports, dimensions, materials and actuator options before ordering. · Catalogue edition 2026 / EN / Rev. 01 · © 2026 Gerhman Global GmbH.