



**+ 10,000**  
machines supplied



**30**  
Countries



More than  
**70 years**  
of tradition



# VENTILATION OF TUNNELS AND UNDERGROUND RAILWAYS



**ZVVZ MACHINERY, a.s.**

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**ZVVZ MACHINERY**  
Member of ZVVZ GROUP



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All thermally resistant ZVVZ fans have a valid certificate of thermal resistance issued by an authorized laboratory of a fire testing facility, where the fans undergo temperature tests and demonstrate a high degree of operability under high temperatures for the specified period of time.



The thermal resistance of the fans was tested under ČSN EN 12101-3 by the authorized testing laboratory PAVUS, a.s. and the fans were awarded a certificate for the following qualifications:  
**F300 60** – classification under EN 13501-4:2016  
**Ff300 120** – free classification under EN 12101-3:2015

## ZVVZ FANS PROVIDE FOR THE LONGITUDINAL AND DIAGONAL VENTILATION OF UNDERGROUND ROAD TUNNELS AND UNDERGROUND METRO ROUTES

IN SHORT, THESE FANS ARE NECESSARY FOR THE SAFE OPERATION OF UNDERGROUND TRANSPORT TUNNELS, I.E. FOR THE SUPPLY OF FRESH AIR AND, AS APPLICABLE, REMOVAL OF HARMFUL EMISSIONS FROM ROAD TRAFFIC OR FOR EMERGENCY VENTILATION, WHEN THEY REMOVE COMBUSTION GASES DURING FIRE IN THE TUNNEL TO ENSURE SAFE ESCAPE OF PEOPLE FROM THE AREA.

### ZVVZ fans meet the following strict requirements:

- › very high reliability,
- › maximum achievable efficiency,
- › lowest possible noise,
- › partial or full reversibility, as required,
- › thermal resistance, as required.

100% reliable operation of ZVVZ fans for tunnels and the Metro is guaranteed by a careful selection of a machine suitable for the specified air-conditioning parameters, suitable technical design of the machine for the specific working conditions, strict production quality monitoring and professional installation.



In addition to the specified standard equipment, selected fans can also be fitted with pressure, temperature, vibration, speed and other sensors and the following custom-made equipment:

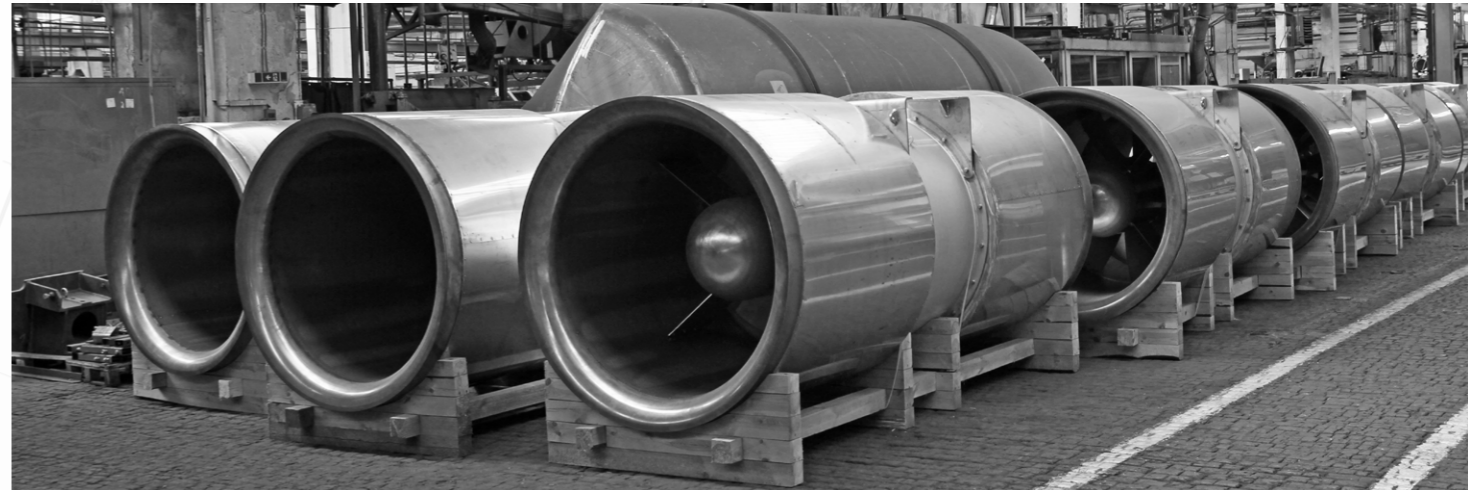
- › risk detector DRS (indication of unstable operation),
- › machine operation monitor MPS (recording and evaluation of temperature, vibration, etc., status indication – operation, failure, accident),
- › continuous measurement of the fans' air-conditioning parameters FLORA-C (continuous measurement of flow rate and pressure).

These values can be sent to master systems.

### Complex services

A team of professionals from ZVVZ installs and commissions the complete assembly. ZVVZ provides warranty and post-warranty services of fans worldwide. High level of provided services is guaranteed by more than seventy years tradition in fans and other HVAC equipment manufacturing in Milevsko.





## FANS FOR LONGITUDINAL VENTILATION OF TUNNELS

THE FANS ARE DESIGNED FOR THE LONGITUDINAL VENTILATION OF ROAD AND RAILWAY TUNNELS AND METRO TUNNELS DURING VENTING AND EMERGENCY VENTILATION.

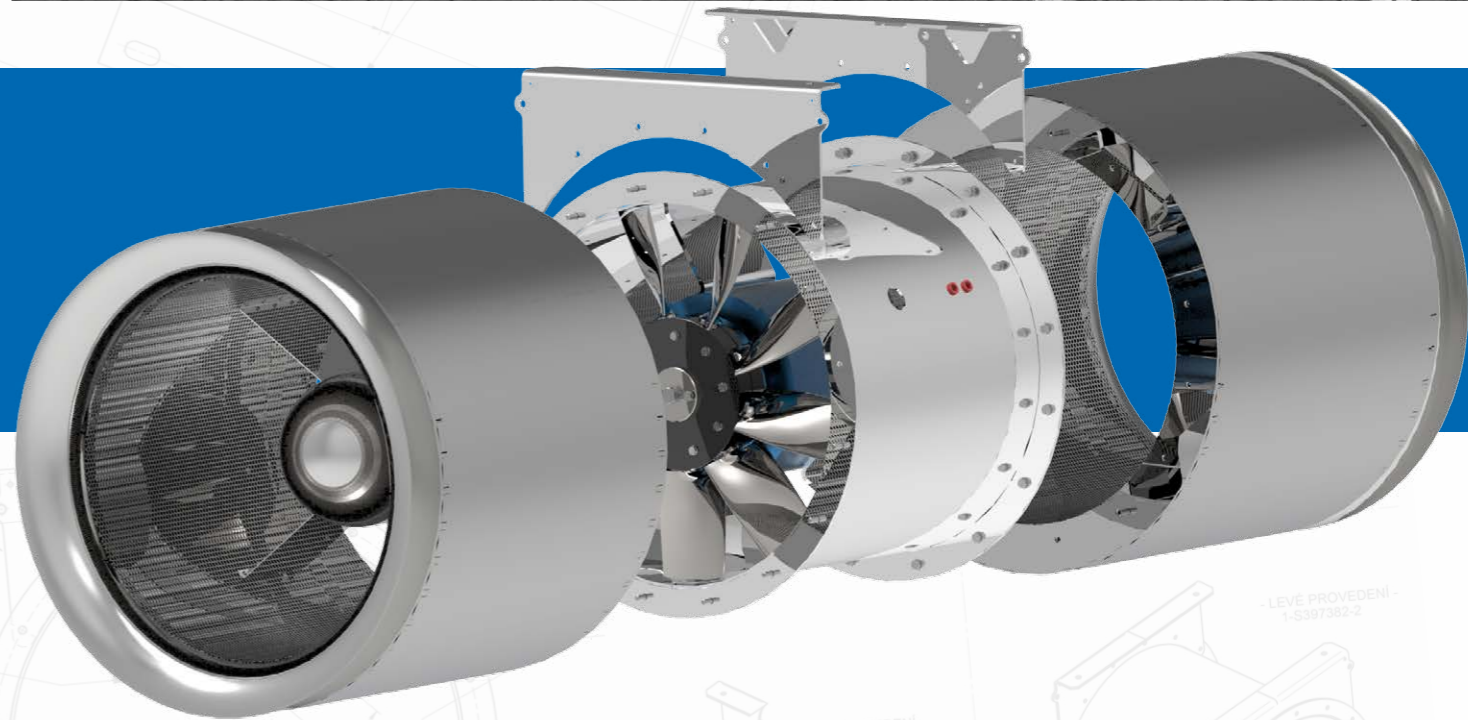
The fans are used for the longitudinal ventilation of tunnels wherever full reversibility of the flow direction and thermal resistance are required to ensure emergency ventilation.

The fans are usually equipped with noise silencers of variable length to reduce the acoustic load of the vicinity to the required values.





### The standard fan equipment includes:

- › air intakes,
- › anchor frame,
- › vibration absorbers,
- › safety grills on intake and discharge,
- › air mass flow baffle plates, etc.

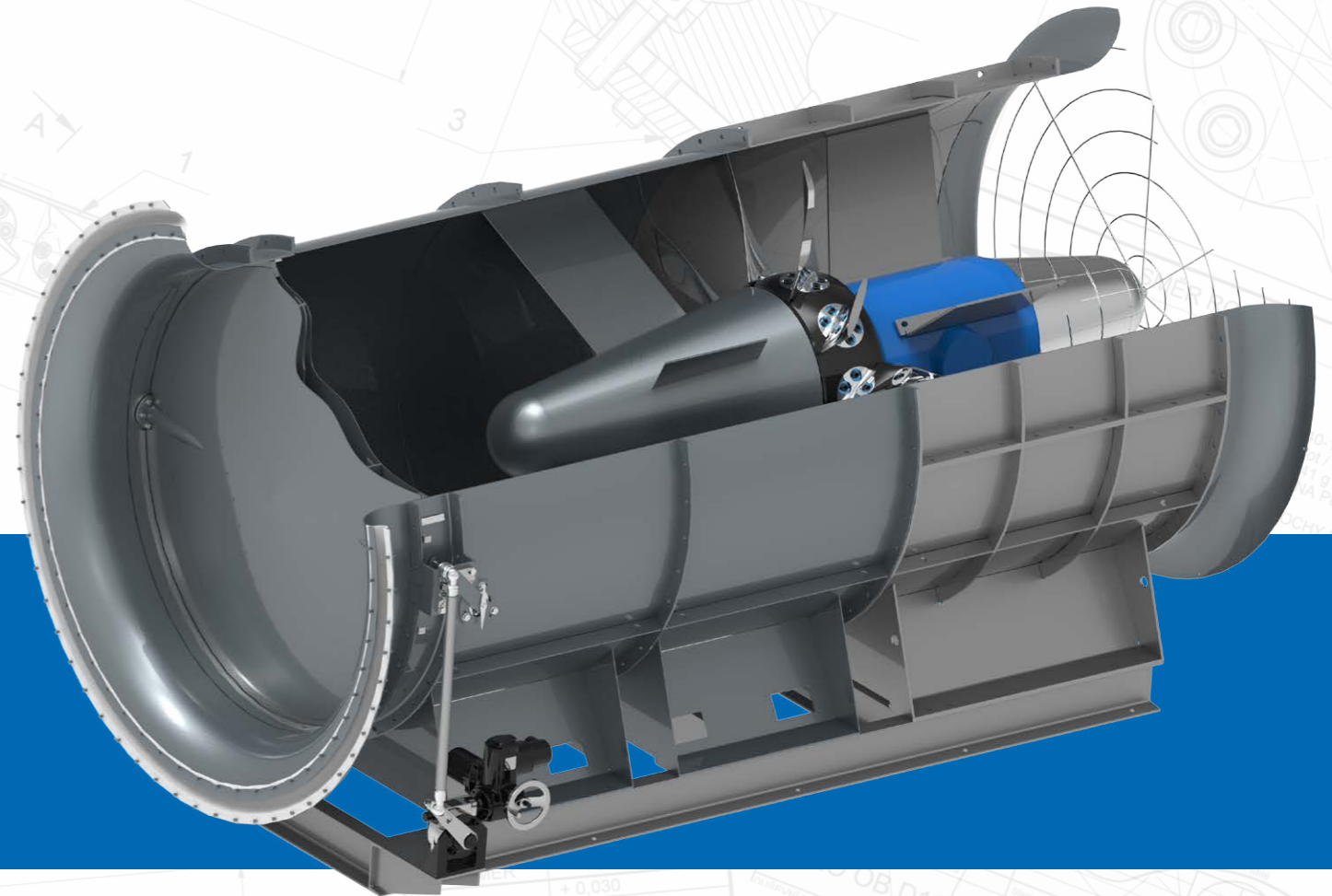
Air-conditioning output can be controlled by a frequency changer.



## JET FANS - REVERSIBLE JET FANS FOR LONGITUDINAL VENTILATION

-  **THERMALLY RESISTANT**  
Certificate for up to 300 °C or 400 °C
-  **FULLY REVERSIBLE**  
95% flow in reverse direction
-  **REGULAR SIZES**  
500 mm to 1,600 mm
-  **STANDARD AIR MASS TEMPERATURE**  
-25°C to +40°C





## FANS FOR DIAGONAL VENTILATION OF TUNNELS

THE FANS ARE DESIGNED FOR THE DIAGONAL VENTILATION OF ROAD AND RAILWAY TUNNELS AND METRO TUNNELS DURING VENTING AND EMERGENCY VENTILATION.

The fans are used for the diagonal ventilation of tunnels wherever thermal resistance is required to ensure emergency ventilation or, as applicable, full reversibility of the flow direction.

- › In the reversible design the fans are manufactured in sizes D1400 to D 2240, with a certificate for thermal resistance of up to 300°C.
- › In the one-way design they are manufactured in sizes D1300 to D 3350 and a certificate for thermal resistance of up to 400°C.

**The standard fan equipment includes:**

- › air intakes,
- › noise silencers,
- › shut-off valve,
- › vibration absorbers,
- › expansion joints.

Air-conditioning output can be controlled by a frequency changer

### REVERSIBLE AND ONE-WAY FANS FOR DIAGONAL VENTILATION



**THERMALLY RESISTANT**  
Certificate for up to 300°C or 400°C



**REVERSIBLE**  
95% flow in reverse direction



**REGULAR SIZES**  
1,400 to 2,800 mm  
1,300 to 3,350 mm



**STANDARD AIR MASS TEMPERATURE**  
-25°C to +40°C

