

**oerlikon**  
leybold vacuum

# **TST S and D**

## Turboradial Blowers

TURBOSTREAM,  
Single-Stage and Dual-Stage

173.03.02

Excerpt from the Oerlikon Leybold Vacuum Full Line Catalog

Product Section C18

Edition May 2007

# Contents

## General

TURBOSTREAM Blowers for the Laser Industry. . . . . C18.03

## Products

Turboradial blower

TURBOSTREAM Classic, with mechanical bearings

TST S (single-stage)

TST D (two-stage)

TURBOSTREAM MAG, magnetically levitated

MAG TST S (single-stage)

as well as corresponding operating units and accessories

**Regarding technical data, versions, applications and ordering information please contact your nearest Oerlikon Leybold Vacuum representative.**

## TURBOSTREAM Blowers for the Laser Industry

Beginning in 1988, the TURBOSTREAM technology was introduced by Oerlikon Leybold Vacuum GmbH. Since that time improvements have been worked out and implemented together with our customers on a continual basis. This was very much facilitated by the modular concept of the units, which also today puts us in a position where we are able to fulfil your future requirements as to a tailor-made solution.

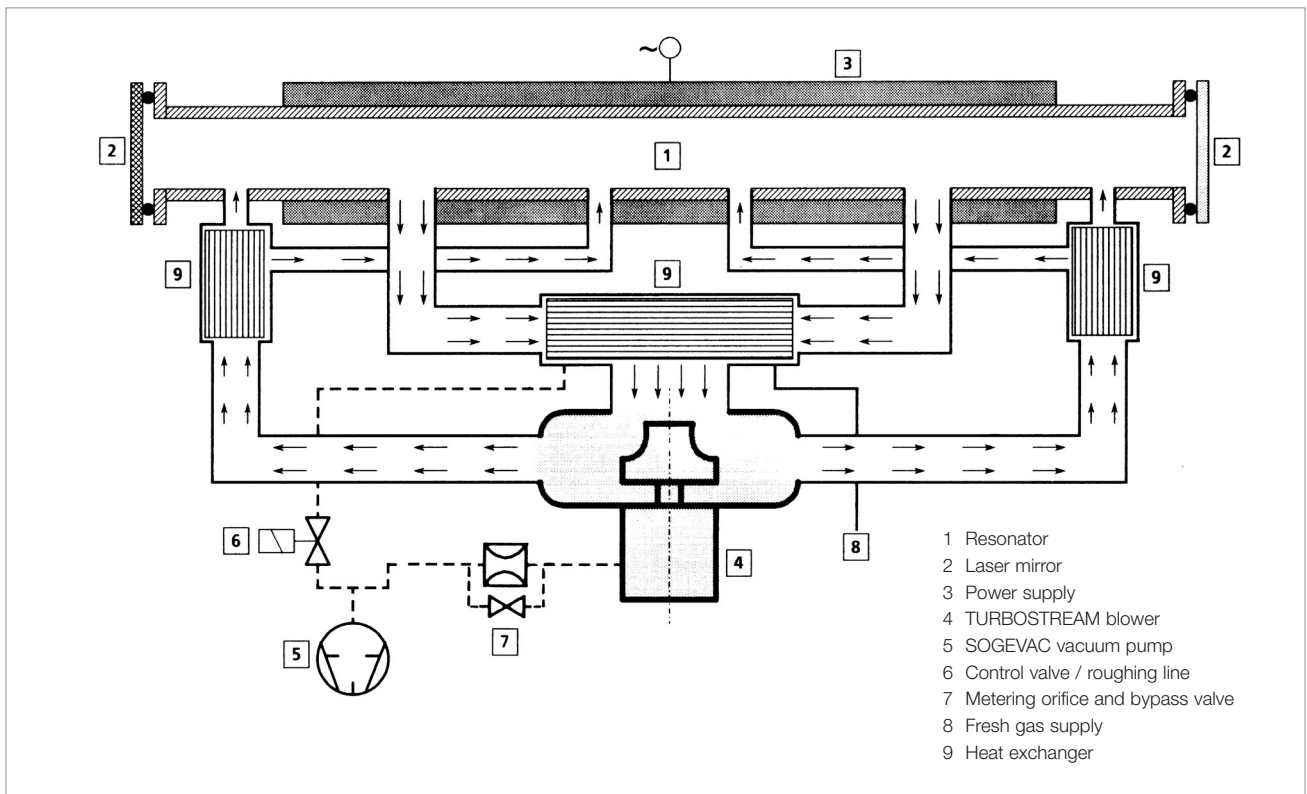
Today the unique TURBOSTREAM range from Oerlikon Leybold Vacuum is capable of improving the capabilities of your Laser system both at the Laser manufacturer and the end user with regard to:

- Quality
- Productivity
- Compactness
- Efficiency
- Reliability and
- Saving of costs

Just see how this works for you!

### TURBOSTREAM Blower and Fast-flow CO<sub>2</sub> Laser

The CO<sub>2</sub> containing gas mixture which maintains in the resonator the laser effect is discharged from the resonator in the hot state and is cooled in the heat exchanger. After the gas has passed through the TURBOSTREAM, the gas is cooled once more in the downstream heat exchanger before it is returned back into the resonator.



Gas circulation in a fast axial flow CO<sub>2</sub> laser with TURBOSTREAM blower

## Design Principle

The gas flows via the inlet flange (1) into the pump chamber of the blower. There it is radially accelerated by the rotating blade wheel (2) and is deflected via diffuser (4) into the ducts (5).

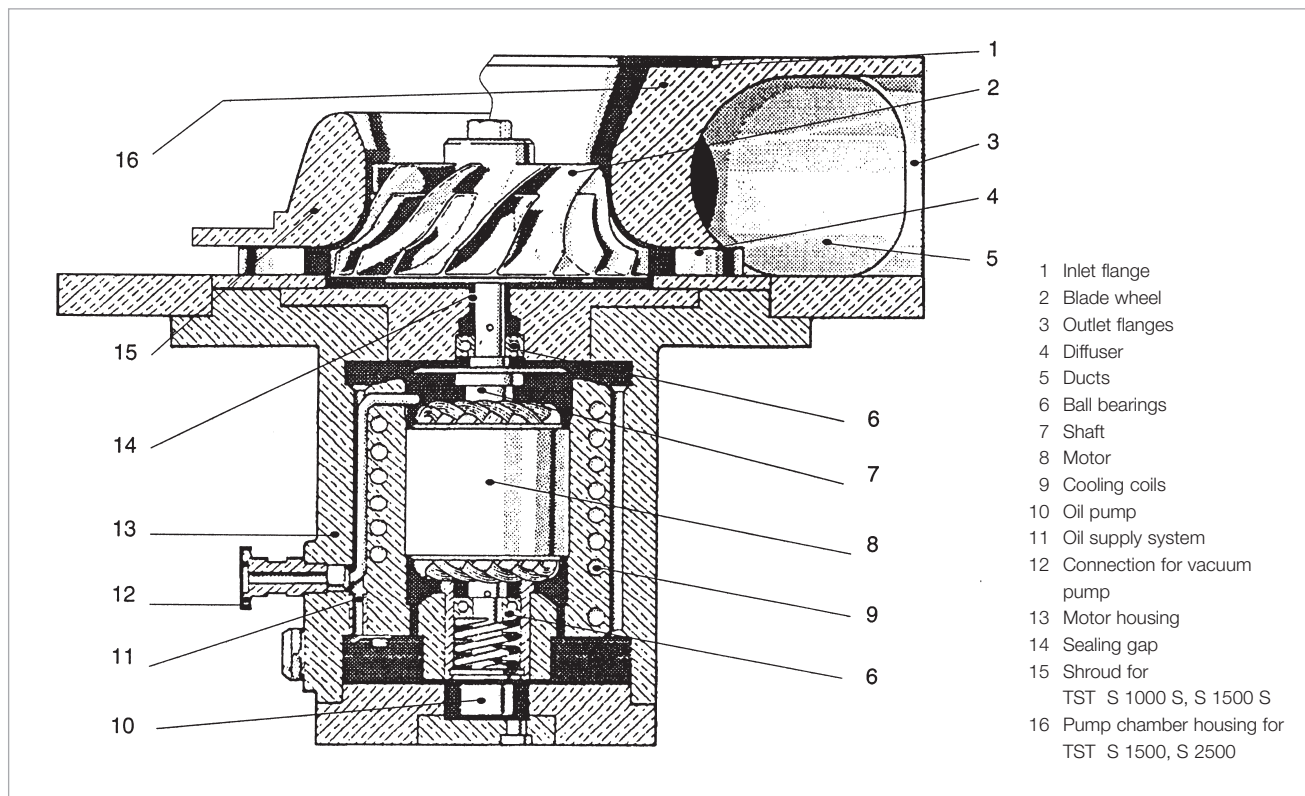
The gas then leaves the TURBOSTREAM through the outlet flanges (3).

The TURBOSTREAM blower is driven

by a 3-phase motor (8). Blade wheel (2) and motor rotor are located on one shaft (7). The stator of the motor has been built into the motor housing (13). The two hybrid ball bearings (6) of the shaft are oil-lubricated. An oil pump (10) feeds the oil through the shaft to the bearings. The motor housing of the TURBOSTREAM is water-cooled (9).

Pump chamber housing and motor housing are separated by a wear-free sealing gap.

Pump chamber housing and motor housing are separated by a wear-free sealing gap. To prevent small amounts of oil mist from entering the pump chamber via the gap (14), a small quantity of gas is constantly extracted (12) from the motor housing by the vacuum pump of the laser system. This ensures a steady gas flow from the pump chamber to the motor housing, reliably excluding the entry of oil into the pump chamber.



Cross-section of a TURBOSTREAM blower, left upper half: with shroud; right upper half: with pump chamber housing

## Supplied Equipment

Depending on customer requirements the mechanical interface to the resonator can be designed either as a pump chamber housing or a shroud. The pump chamber housing completely matches the contour of the blade wheel. Only the intake piping and the two gas discharge pipings need to be provided for integrating this blower flow-wise in the resonator circuit. The shroud version of the blower utilises for a partial section of the blade wheel the matching structures provided by the system. This arrangement of “resonator / TURBOSTREAM with shroud” can thus be more compact.

- Generally all TURBOSTREAM blowers are equipped with a vibration sensor (GUARD) which monitors the ball bearings. The electrical connection between vibration sensor and frequency converter is provided by a connecting cable which is laid separately.

- The TURBOSTREAM is equipped with an integrated motor temperature monitoring sensor (PTC) which – should the motor cooling facility fail, due to an insufficient supply of cooling water, for example – will protect the electric motor against overheating.
- Some versions of the TURBOSTREAM are equipped with an oil level monitoring facility which automates regular monitoring of the oil level.

## Electric Power Supply

A separate frequency converter supplies power to the TURBOSTREAM blower.

The TURBOSTREAM blower and the frequency converter are connected to each other by a connecting cable and by a PTC monitoring cable.

The frequency converter must be built into an electrical cabinet. It has been provided with protection against output short circuits, short circuits to ground and overloads. It is equipped with a 5 digit display for indicating the operating status, a floating contact for indicating error conditions and a connection for the PTC resistor for the purpose of monitoring the motor temperature.

The GUARD vibration sensor is supplied with power from the frequency converter. The error status generated when the GUARD comes into action is evaluated by the frequency converter and results in an interruption of the power supply to the TURBOSTREAM blower and an error message on the frequency converter.

The drive of the TURBOSTREAM blower and the frequency converter have been optimally matched.

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