INVENT iTURBO®-Blower

The most effective technology to reduce energy consumption for aeration systems
Water needs responsibility

Water is the basis and the source of all life. However, the pollution of our waters keeps reaching ever more ominous proportions. This makes the purification of contaminated water and the provision of water of high quality the most important ecological tasks of our times.

Since the early 1990s INVENT Umwelt- und Verfahrenstechnik AG has developed, produced and globally sold innovative machines, systems and processes for the purification and treatment of water. Our daily work and our efficient products contribute to the preservation of water quality on a global scale.
iTURBO®, the INVENT high speed Turbo Blower

INVENT is focussed on municipal and industrial water and wastewater treatment. The iTURBO®-Blower is specially suited for supplying air to aeration systems in activated sludge plants. The iTURBO® complements INVENT’s line of high efficiency aeration systems and aeration control products, maximizing system performance while minimizing energy costs. The iTURBO® is designed for peak efficiency and the perfect harmony of stability and reliability.

Overview of advantages of the iTURBO®-Blower

- Compact, light weight package for quick and simple installation
- Integrated low noise design with motor, turbo, VFD¹ and control system in a single package
- Reduce operating cost by up to 30% when compared to conventional blowers
- The only maintenance item is the changing of air filters
- User friendly HD touch screen HMI
- Customised turbo impellers to provide peak efficiencies over the desired flow range
- High speed PMSM² optimised for speed and torque control

The iTURBO®-Blower iTB 50 with Input
Power 50 hp/42 kW

¹ VFD: Variable Frequency Drive
² PMSM: Permanent Magnet Synchronous Motor
The Permanent Magnet Synchronous Motor

The Permanent Magnet Synchronous Motor (PMSM) uses imbedded rare earth material within the rotor to provide the motor’s magnetic field. This eliminates losses of electro-magnetic induction. Supremely suited to variable frequency drivers, PMSM motors offer the best torque-speed characteristics for high speed, low torque & power dense rotating applications. The iTURBO®-Blower is an advanced compact and simple design with very low noise and peak electrical efficiency of up to 98%.

**Impeller**
- Customized aerodynamic shapes tailored to meet site specific airflow ranges and pressures.
- Computational Fluid Dynamic (CFD) analysis and tuning to achieve peak efficiency.
- Precision 5 axis CNC machining of 7075-T6 Aluminium Alloy for maximum strength and accuracy.

**Air Foil Bearing**
- Simple, reliable and dynamically stable bearings independent of external control systems.
- Frictionless operation to maximize blower energy efficiency.
- Unique cartridge design for high load capacity and inspection capability.

**Rotor**
- Centerless ground “Inconel” superalloy light weight shaft.
- Rare earth Samarium Cobalt (SmCo) permanent magnet core.
- Quality controlled precise fully assembly rotor balancing and documented analysis.

**Stator**
- Double immersion vacuum pressure impregnation for increased durability.
- Direct coupled “boundary layer” cooling fan providing no noise high flow motor cooling.
- Class H+ motor winding temperature classification.

With only one single moving part, the iTURBO® direct drive optimizes the rotational speed and Turbo Impeller profile for peak performance.

- Maximum efficiency
- Optimized turndown
- Customized pressure capability
- Integrated air cooling

High speed direct drive technology
Design of the iTURBO®-Blower

INVENT is moving forward to get value for the technology. We only supply the most reliable turbo blower in the industry through our engineering passion, long term experience and advanced technology.

Variable Frequency Drive (VFD)

The high speed PMSM motor operates with an integrated variable frequency drive. The VFD not only drives the motor but also monitors the torque, power and speed delivered to the motor to ensure reliable operation.

- Stable high speed operation through sensor-less vector control
- VFD efficiencies of > 96 %
- Inbuilt torque monitoring for surge fail safe operation
- Motor protection and status for overload, shutdown and tripping

Controller

The iTURBO® Blower has an operator focused high definition touch screen interface, easy to navigate with real time display of key blower performance parameters, such as discharge pressure, power consumption, speed etc.

- Fully programmed PLC and HMI Touch Screen
- A choice of PLC makes to suit specific client needs, or standardisations
- IP Protocol communications or hard wire I/O

Package design

The package design is light weight and compact. Removable panels on both sides of the unit provide easy access to the turbo unit section which incorporates the integrated “blow-off” valve and cooling air silencers. The power components including VFD and power supply MCCB¹ are within separate lockable compartments. The unit is supplied standard with adjustable mounts for installation onto any load bearing trafficable surface.

The complete package is acoustically engineered with all surfaces lined internally with an attenuating shell to limit breakout noise to less than 78 dB (A) during operation.

Simple and easy maintenance

The iTURBO® incorporates a two part air filter system to maximise the filter longevity, reducing the costs associated with filter changes.

<table>
<thead>
<tr>
<th>Prefilter</th>
<th>Main Filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO Corase &gt;10µm</td>
<td>ISO ePM10 90 %</td>
</tr>
<tr>
<td>Material</td>
<td>Non-woven Fabrics</td>
</tr>
<tr>
<td>Expected Life</td>
<td>6 - 12 Months</td>
</tr>
</tbody>
</table>

¹MCCB: Moulded Case Circuit Breaker
### Technical information

#### System diagram

![System diagram](image)

#### Technical data

<table>
<thead>
<tr>
<th>Model</th>
<th>ITB 30</th>
<th>ITB 50</th>
<th>ITB 75</th>
<th>ITB 100</th>
<th>ITB 150</th>
<th>ITB 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length Dimension (mm)</td>
<td>1,300</td>
<td>1,300</td>
<td>1,460</td>
<td>1,460</td>
<td>1,760</td>
<td>1,760</td>
</tr>
<tr>
<td>Width Dimension (mm)</td>
<td>800</td>
<td>800</td>
<td>900</td>
<td>900</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Height Dimension (mm)</td>
<td>1,200</td>
<td>1,200</td>
<td>1,400</td>
<td>1,400</td>
<td>1,650</td>
<td>1,650</td>
</tr>
<tr>
<td>Flange Dimension (mm)</td>
<td>150</td>
<td>150</td>
<td>200</td>
<td>200</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>530</td>
<td>550</td>
<td>580</td>
<td>600</td>
<td>900</td>
<td>950</td>
</tr>
<tr>
<td>Pressure Range</td>
<td>40 kPa to 150 kPa (5.5 psi to 17 psi)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Power (hp/kW)</td>
<td>30/25</td>
<td>50/42</td>
<td>75/63</td>
<td>100/84</td>
<td>150/126</td>
<td>200/168</td>
</tr>
<tr>
<td>Supply Power/Network Frequency</td>
<td>380 - 580 V, 50 &amp; 60 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>500 Nm³/hr to 10,000 Nm³/hr</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Dimensions of the iTURBO®-Blower

![Dimensions](image)
INVENT worldwide

Headquarter
INVENT Umwelt- & Verfahrenstechnik AG
Am Pestalozziring 21
91058 Erlangen
Deutschland
Tel: +49 (0) 9131 690 98 - 0
Fax: +49 (0) 9131 690 98 - 99
Email: info@invent-uv.de
www.invent-uv.de

US Office
INVENT Environmental Technologies, Inc.
218 Little Falls Road · Units 7 & 8
Cedar Grove, NJ 07009, USA
Tel: +1 973 571 2223
Fax: +1 973 571 2474
Email: info@invent-et.com

Middle East Office
INVENT Middle East (FZE)
SAIF Office P8-09-07
P.O. Box 121720
Sharjah
United Arab Emirates
Tel: +971 (06) 54 89 139
Fax: +971 (06) 54 89 138
Email: info@invent-me.ae

Italy Office
INVENT Aeration Services S.R.L.
Via Parravicini 30
20052 Monza
Italy
Tel: +39 039 2317125
Fax: +39 039 2302624
Email: info@invent-as.it

Pacific Office
INVENT Pacific Pty. Limited
Unit 3, 1 Trappit Place
Orange NSW
Australia 2800
Tel: +61 408 997 774
Email: invent@invent-pacific.com

Leaders in mixing and aeration

Please find our current list of sales partners at www.invent-uv.de