

# Turbo

## Turbomolecular Vacuum Pumps TM 1100 - 2200 A



Turbo is the new range of turbomolecular vacuum pumps from Busch. Turbo vacuum pumps are designed for use in a wide range of industrial applications, from glass coating to vacuum furnaces. In these industries, manufacturers share a need for robust, reliable, production-friendly vacuum technology. Focusing on the total cost of ownership, Busch continues to deliver innovative vacuum solutions that maximize throughput, tolerate varying operating conditions and simplify maintenance. This ensures maximum uptime and efficiency.

Busch Turbo pumps are designed to withstand heavy industrial use. They can handle high gas loads and are unaffected by accidental air in-rushes. Turbo vacuum pumps have an innovative ceramic bearing design that is oil free, contamination free and requires no preventive maintenance. The bearing design also allows the pump to be mounted in any position and maintain its vacuum performance. Busch offers a compact, comprehensive range of turbomolecular vacuum pumps and systems for industrial uses, with truly integrated electronics mounted within the pump body.

### Applications

- Glass coating equipment (architectural glass, automotive glass, flat panel display substrates)
- Thin film solar cell production (photo voltaic)
- Surface treatments for materials and applying wear coatings
- Functional and decorative coatings, including metallization
- Optical coating (ophthalmic, precision opto-electronics)
- Roll/web coating on films or foils
- PVD and other plasma process systems with high gas loads
- Vacuum furnaces/brazing
- Electron beam welding



**Turbo – for maximum power  
in industrial high-vacuum.**



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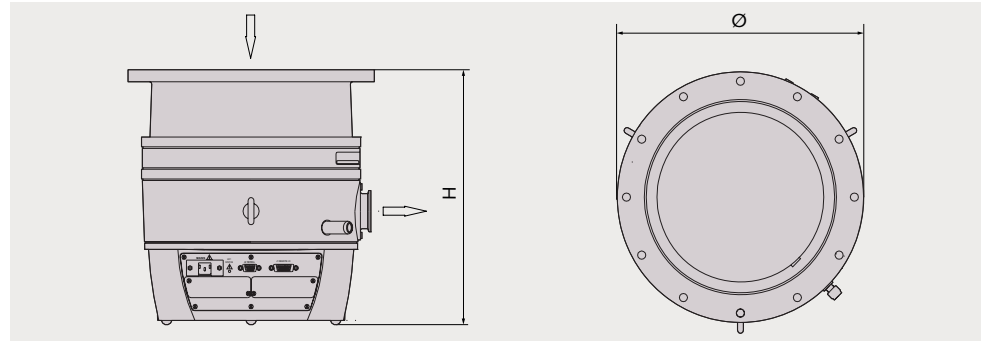
### Technical specifications

The Turbo TM 1100 - 2200 A range of turbomolecular vacuum pumps operate using the principle of a turbine blade. The rapidly rotating rotor blades give momentum to the gas molecules and their initially random movement is changed to a controlled flow within the pump body.

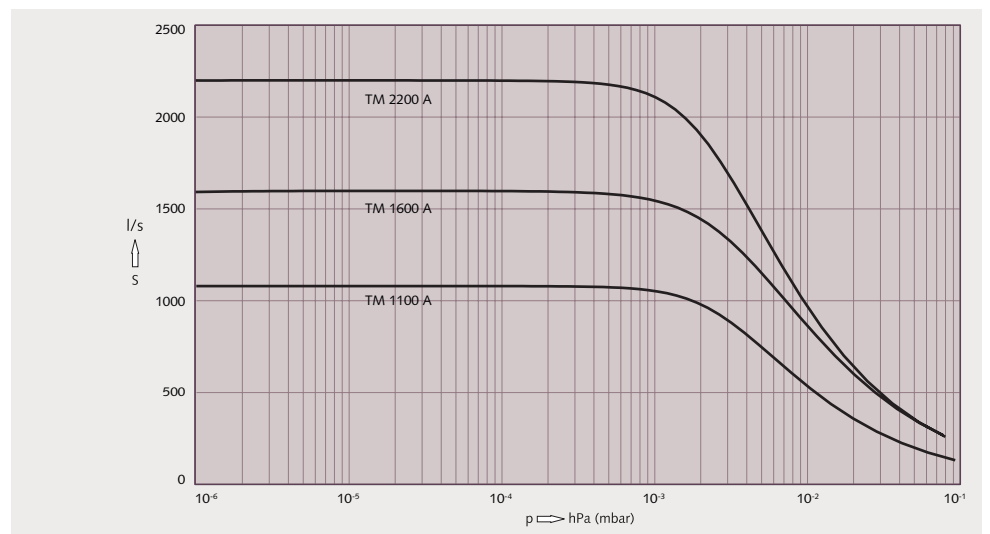
The pumping process of the turbomolecular vacuum pump moves the gas molecules through the pump from the low pressure inlet flange to the high pressure exhaust port. To create this momentum in the gas molecules, the tips of the rotor blades have to move at high speed (> 30.000 min<sup>-1</sup>).

The Turbo compact rotor design has the highest performance and throughput combined with a small footprint. The integrated molecular drag technology allows higher foreline pressures resulting in high system efficiency and requiring smaller backing pumps. All the Turbo series turbomolecular vacuum pumps use permanently lubricated ceramic ball bearings with a mean time to failure (MTTF) over 200.000 operating hours.

Turbo TM 1100-2200 A



Pumping speed N<sub>2</sub> at 70 °F. Tolerance: ± 10%



Technical Data		TM 1100 A	TM 1600 A	TM 2200 A
Nominal pumping speed for N <sub>2</sub>	l/s	1080	1600	2200
Recommended size of backing pump	m <sup>3</sup> /h	>36	>40	>60
Ultimate pressure *	hPa (mbar)	> 1·10 <sup>-10</sup>	>5·10 <sup>-8</sup>	> 1·10 <sup>-8</sup>
Maximum foreline pressure for N <sub>2</sub>	hPa (mbar)	<1	<1	<0.5
Noise level (ISO 2151)	dB(A)	<45	<45	<60
Maximum operating power	W	400	400	515
Required ambient temperature	°C	5 - 35	5 - 40	5 - 35
Cooling water consumption	l/h	>200	>200	>200
Allowed cooling water pressure	bar	3 - 5	3 - 5	3 - 5
Allowed cooling water temperature	°C	10 - 20	10 - 35	10 - 30
Approximate weight	Lbs.	71	82	119
Dimensions (H x Ø)	inches	10 7/16 x 15 3/16	13 3/16 x 13 3/16	14 7/16 x 13 3/16
Connection flange pressure/suction side	DN	40 KF / 200 ISO-F	40 KF / 250 ISO-F	40 KF / 250 ISO-F

All performance data is based on ambient conditions of 14.7 PSIA and 70 °F, and has a tolerance of ± 10%. \* with recommended backing pump

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Technical data is subject to change. Created in Germany 09/14