œrlikon
leybold vacuum

240.00.02
Excerpt from the Oerlikon Leybold Vacuum Full Line Catalog 2015/2016
Catalog Part High Vacuum Pumps

High Vacuum Pumps

Turbomolecular Pumps TURBOVAC
Turbomolecular Pumps TURBOVAC MAG
Oil Diffusion Pumps DIP/LEYBOJET/OB
Cryo Pumpes COOLVAC
Cold Heads COOLPOWER
Compressor Units COOLPAK

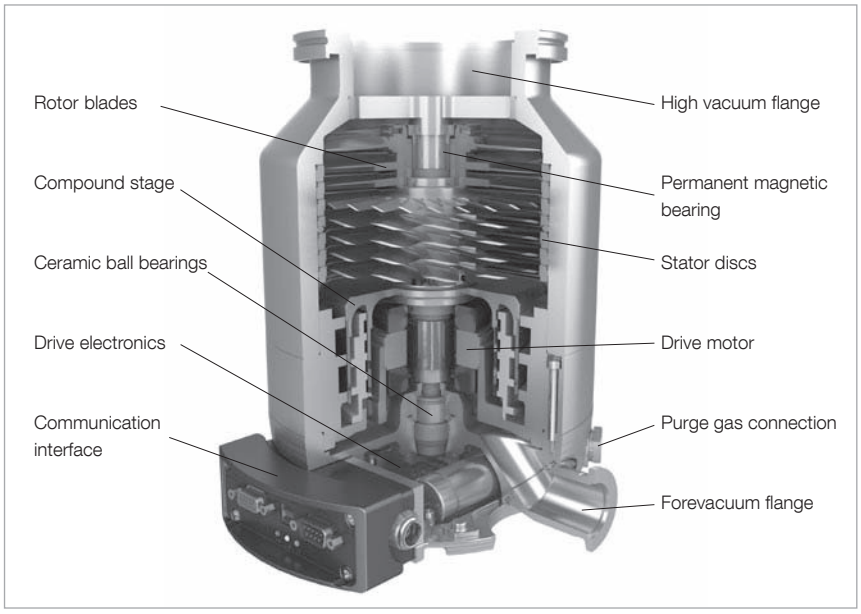
Notes

General to TURBOVAC Pumps

Turbomolecular vacuum pumps (TURBOVAC) are used in applications which require a clean high or ultrahigh vacuum like, for example, in research, development or in industrial fields like the semiconductor industry, analytical instrumentation or coating technology.

Principle of Operation

In principle, the turbomolecular pump is a turbine rapidly revolving in a housing where the rotor stages of the turbine are equipped with a number of rotor blades. Located between the rotating rotor blades are stationary stator disks with blades arranged in the opposite direction. By means of a momentum transfer from the rotating rotor blades to the gas molecules their initially non-directional thermal motion is changed in to a directional motion from the inlet flange of the pump in the axial direction towards the forevacuum flange. In the molecular flow range (i.e. at pressures below 10^{-3} mbar (0.75×10^{-3} Torr)) the mean free path of the gas molecules is larger then the spacing between the rotor and the stator blades (typically a few tenths of a millimetre). Correspondingly the molecules chiefly collide with the optically dense rotor blades, resulting in a highly efficient pumping action. In the laminar flow range (i.e. at pressures over 10^{-1} mbar (0.75×10^{-1} Torr)) the effect of the rotor is impaired by frequent collisions between molecules themselves. For this reason, a turbomolecular pump is not capable of pumping gases at atmospheric pressure.



Sectional drawing of a turbomolecular pump (TURBOVAC i)

Rotor Bearing

Oerlikon Leybold Vacuum offers different rotor bearing systems. A purely classic mechanical type of rotor bearing (TURBOVAC) or a magnetic rotor bearing (TURBOVAC MAG) and also a hybrid bearing (TURBOVAC i / iX) where the bearing on the forevacuum side is a ceramic ball bearing lubricated for life and where the bearing on the high vacuum side is implemented by way of a non-wearing magnetic bearing. Typical for all these types of bearing is that they do not require any lubricating oil which under circumstances like standstill of the pump might diffuse back into the vacuum chamber due to the lack of any pumping action.

Drive Electronics/Control Unit

Driving and monitoring the turbomolecular pump requires an electronic frequency converter (inverter). The frequency converter delivers the driving voltage and the output frequency for the motor and also automatically monitors the system. Optimum running up of the pump rotor is attained by a steadily increasing voltage and frequency feed. After attaining the nominal speed, the start-up current is reduced in a controlled manner to the level necessary for normal operation.

The frequency converter and the motor of the TURBOVAC have been designed for a minimal drop of speed even at high intake pressures. This ensures the highest possible gas throughput also in the transition range from molecular to viscous flow

Depending on the given system and installation conditions, the control unit may be supplemented by a comprehensive range of optional accessories facilitating easy integration within existing installations.

Forevacuum Pump

Since turbomolecular pumps are not capable of compressing directly against atmospheric pressure their operation will always require a sufficiently rated forevacuum pump. For the classic rotor arrangement with rotor blades, generally two-stage rotary vane pumps (TRIVAC) will be suitable. In some cases also single-stage rotary vane vacuum pumps (SOGEVAC BI) or scroll vacuum pumps (SCROLLVAC).In the case of the wide range variant where the rotor is equipped with an additional compression stage (compound stage) also diaphragm vacuum pumps (DIVAC) may be used.

Characteristic Quantities

Pumping speed (volume flow rate)

The pumping speed “S” is the conveyed volume flow through the intake opening of the pump. It is dependent on the type of gas so that for this reason the nominal pumping speed, i.e. the maximum attainable pumping speed of the pump is commonly stated for air, respectively nitrogen. In the field of high vacuum engineering it is common to state the pumping speed in the unit of measurement [l/s]. The pumping speed is a nonlinear function of the inlet pressure $S = S(p_1)$

Gas throughput

Gas throughput “Q”, unit of measurement [mbar x l/s] is linked to the pumping speed through the inlet pressure.
$Q = Q(p_1) = p_1 \times S(p_1)$.

Compression

Compression “K” is defined as the ratio between the pressure on the forevacuum side of the turbomolecular pump and the pressure on the high vacuum side.
$K = K(p_{VV}) = p_{VV}/p_{HV}$.
Compression is dependent on the type of gas.

Ultimate pressure (base pressure)

The ultimate pressure “p_{ult}” of a turbomolecular pump which can be baked out is defined through the ratio between forevacuum pressure and compression ratio which is attained in a test chamber 48 hours after a 24-hour bake-out (degassing) of the measurement arrangement.
$p_{ult} = p_{FV}/K_0$.

The maximum attainable ultimate pressure depends among other things on the cleanness of the apparatus, the type of forevacuum pump used, the types of seals used for the high vacuum flange and the bake-out conditions.

TURBOVAC Product Line

The TURBOVAC pumps are turbomolecular pumps with mechanical rotor suspension which are used in the pressure range from 10^{-1} mbar (0.75×10^{-1} Torr) to 10^{-10} mbar (0.75×10^{-10} Torr) Pumping speeds for air vary from 35 l x s^{-1} (inlet flange diameter = 40 mm (1.57 in.)) to 1,150 l x s^{-1} (inlet flange diameter = 250 mm (9.84 in.)).
Besides a variant with extremely reliable ceramic ball bearings on the forevacuum and the high vacuum side, Oerlikon Leybold Vacuum also offers a line of turbomolecular pumps equipped with hybrid bearings which on the forevacuum side are equipped with a ceramic ball bearing and on the high vacuum side with a permanent magnetic bearing (TURBOVAC i line).

Owing to their compact design and ease of operation, these pump lines are used in all high vacuum and ultrahigh vacuum fields of application. In particular, the TURBOVAC pumps are running very successfully in mass spectrometers, in CD, DVD and hard disk production units, in the manufacture of large area optical coatings, in non-corrosive semiconductor production processes and in laboratories as well as research institutes

The most important advantages of the TURBOVAC product line are:

- Oil-free pumps for the generation of clean high and ultra-high vacuum conditions
- Highest performance in any orientation
- Highest degree of operating reliability
- Easy to operate
- Compact design

TURBOVAC (T) 350 iX

TURBOVAC MAG Product Line

The TURBOVAC MAG pumps are turbomolecular pumps with magnetic rotor suspension which are used in the pressure range from 10^{-1} mbar (0.75×10^{-1} Torr) to 10^{-10} mbar (0.75×10^{-10} Torr). Pumping speeds for air vary from 300 l x s^{-1} (inlet flange diameter = 100 mm (3.94 in.)) to 3,200 l x s^{-1} (inlet flange diameter = 320 mm (12.6 in.)).
The TURBOVAC MAG pumps are mostly installed on semiconductor processing lines like etching, CVD, PVD and ion implantation, i.e. in applications where corrosive gases need to be pumped. Also electron beam microscopy is an important area of application for these pumps.

The most important advantages of the TURBOVAC MAG product line are:

- Hydrocarbon-free pumps for the generation of clean high and ultra-high vacuum conditions
- High performance in any orientation
- High degree of operating reliability
- Extremely low vibration
- Designed for pumping of corrosive gases
- Almost maintenance-free

TURBOVAC MAG 2200 iPL

Use of Turbomolecular Pumps in Analytical Instruments

All modern analytical methods for gas, liquid and plasma analysis – like for example GC-MS, LC-MS and ICP-MS – rely on mass spectrometers and for this reason require adequate high vacuum conditions. Also in electron microscopes and many surface analysis instruments the production of a high vacuum is essential. In over 90% of all high vacuum applications, the turbomolecular pump has been found to be ideal. Thanks to the hydrocarbon-free vacuum, most simple operation, compact design and almost maintenance-free operation it has in most cases displaced above all the diffusion pump.

On the basis of decades of experience and in cooperation with research facilities and the manufacturers of analytical instruments, Oerlikon Leybold Vacuum has continually optimized its products.

TURBOVAC MAG W 600 iP

Through the TURBOVAC wide range series, a further improvement has been attained, making available to users in the area of analytical engineering highly flexible and reliable products.

Owing to the modular concept the user may adapt the vacuum system precisely to his requirements. The components can be integrated perfectly and thus find the most cost-effective system configuration. Through the introduction of the TURBOVAC multi inlet series, Oerlikon Leybold Vacuum has, based on special customer requirements, achieved a major step ahead for analytical instruments.

Two or more analysis chambers can be pumped down simultaneously by a single multi-inlet pump. These pumps have been tailored for pumping speed and gas throughput in order to attain a higher detection sensitivity of analytical systems, for a smaller footprint and an increased sample throughput, for example. The benefits for the customers are the extreme compactness of the vacuum systems without sacrificing performance density, simple installation, stable vacuum connections and, compared to the use of discrete individual pumps, significantly lower investment costs for the entire system. The cartridge solution, moreover, allows for an innovative and cost-effective design of the customer's system and during servicing a simple replacement of the active unit without involved assembly work and leak searching.

Cartridge benefits, which convince

- Higher effective pumping speed
- No losses in conductance
- Compact vacuum system
- Easy pump replacement without having to disassemble the highly sensitive mass spectrometer chambers

The benefits for the customers are reflected by the efficiency of the analytical instruments:

- Increase in detection sensitivity
- Smaller analytical systems
- Increase in sample throughput
- Reduction of system costs
- Lower maintenance costs

In combination with backing pumps like the SOGEVAC, TRIVAC or SCROLLVAC, Oerlikon Leybold Vacuum is able to offer the best vacuum system optimized for all major applications in the area of analytical instrumentation.

TURBOVAC i Multi Inlet

Use of Turbomolecular Pumps in the Area of Semiconductor Processes

In the semiconductor industry turbomolecular pumps are used on the following processes, among others:

- Etching
- Sputtering
- Ion implantation
- CVD
- Lithography.

In these applications pumping of aggressive gases is often required. This may necessitate the use of pumps equipped with a purge gas facility or a magnetic suspension in order to avoid damaged bearings. Especially during metal etching, deposits may occur in the forevacuum space of the turbomolecular pump. In order to prevent this the pumps must be heated to a certain temperature. Such temperature controlled variants are optionally available for the MAG 1500 C, MAG 2000 C, MAG 2800 and MAG 3200.

In contrast to turbomolecular pumps with mechanical bearings, magnetically levitated pumps provide the advantage that they prevent overheating of the bearings at high gas flows and effectively exclude any damage to the magnetic bearings by aggressive media.

In electron microscopes and in lithographic equipment, low vibration levels are
exceptionally important. For this reason magnetically levitated turbomolecular pumps should be used here. The recommended backing pumps are rotary vane pumps from the TRIVAC range, possibly fitted with the BCS system.

TURBOVAC MAG W 2000 CT

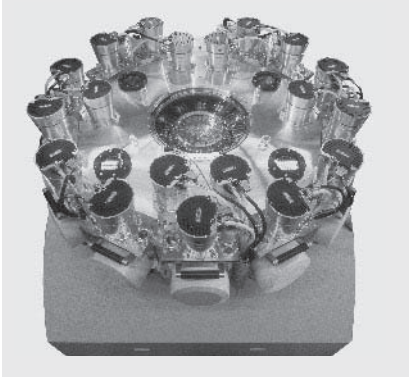
Use of Turbomolecular Pumps in the Area of Coating Systems

Coating of optical and magnetic storage media, optical components as well as architectural glass requires high vacuum conditions. This is the only way to ensure that the formed layers will be uniform and adhere to the substrate.

The way in which the vacuum is generated has a significant impact on the quality of the coating. By pumping the vacuum chamber down to pressures in the range of 10^{-6} mbar (0.75×10^{-6} Torr), interfering gas and water molecules are removed from the processing chamber. In the case of sputtering the coating process is run in the pressure range between 10^{-3} and 10^{-2} mbar (0.75×10^{-3} and 0.75×10^{-2} Torr), and in the case of evaporation coating, pressures below 10^{-4} mbar (0.75×10^{-4} Torr) are utilized.

The turbomolecular pump meets all requirements of the customers as to a hydrocarbon-free vacuum, very simple operation, compact design and almost maintenance-free operation in an almost ideal manner. The range of pumps from Oerlikon Leybold Vacuum includes pumps with flange diameters ranging from 40 mm to 250 mm (1.57 in. to 9.84 in.) nominal width.

Thus the right pump is available for each application, be it coating of data memories (CD, DVD, hard discs), coating of tools and coating of precision lenses in the area of optical components, displays or architectural glass.

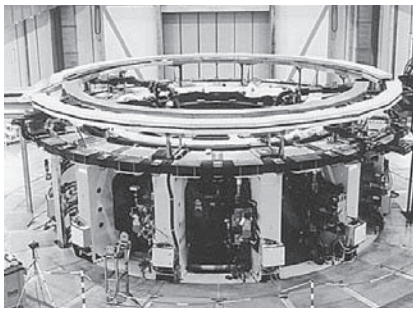


Entire high vacuum equipment of a CD/DVD coating system with TURBOVAC TW 250 S pumps

Use of turbomolecular pumps in research and development

In many applications in which new ideas shall be transformed into technical processes, vacuum technology is a basic requirement for being able to implement these processes at all.

In the field of research and development, all types of turbomolecular pumps from Oerlikon Leybold Vacuum are being used. Since the application requirements differ widely, for example are being used. Since the application requirements differ widely, for example between university basic research, industrial development, in research and in large laboratories, the right component or the matching system can be put together from the comprehensive range of equipment being offered.



Nuclear fusion technology

Applications for TURBOVAC Pumps

Pumps	TURBOVAC 50	TURBOVAC 151, 361 (C)	TURBOVAC 600 C	TURBOVAC 1000 C	TURBOVAC 1100 C	TURBOVAC SL 80	TURBOVAC TW 250 S	TURBOVAC (T) 350/450 i	TURBOVAC (T) 350/450 iX	TURBOVAC i Multi Inlet	MAG W 300/400/600/700 iP	MAG W 1300/1600/1700/2200 iP(L)	MAG W 300/400/600/700 P	MAG W 830/1300 C	MAG W 1500 CT	MAG W 2200 C	MAG W 2000 C/CT	MAG W 2800/3200 C/CT
Applications																		
Analytical Instruments																		
Leak detectors	■	■				■		■			■	■	■	■				
Mass spectrometers	■	■				■		■		■	■	■	■	■				
Gas chromatography (GC-MS)	■	■				■		■		■	■	■	■	■				
Liquid chromatography (LC-MS)	■	■				■	■	■		■	■	■	■	■				
Quadrupol time of flight (Q-TOF)								■		■	■	■	■	■				
Matrix assisted laser desorption time of flight (MALDI-TOF)	■							■		■	■	■	■	■				
Inductively coupled plasma mass spectrometry (ICP-MS)	■						■	■		■	■	■	■	■				
Electron beam microscopy	■					■		■	■		■	■	■	■				
Coating																		
Data storage / optical		■						■	■		■	■	■	■		■	■	■
Data storage / magnetic			■	■	■		■	■	■		■	■	■	■		■	■	■
Flat panel displays			■	■	■						■	■	■	■		■	■	■
Optical coating		■	■	■	■		■	■	■		■	■	■	■		■	■	■
Large area coating				■	■							■		■		■	■	■
Decorative coating				■	■							■		■		■	■	■
Metallization				■	■							■		■		■	■	■
Wear protection			■	■	■							■		■		■	■	■
Metallurgy				■	■							■		■		■	■	■
R & D (Research and Development)																		
Surface analysis				■		■					■	■	■	■	■	■	■	■
UHV / XHV systems		■	■	■	■	■		■	■		■	■	■	■			■	■
Particle accelerators		■		■	■						■	■	■	■		■	■	■
Fusion experiments			■	■	■						■	■	■	■	■	■	■	■
Space simulation			■	■	■						■	■	■	■	■	■	■	■
Semiconductor Processes																		
Load locks and transfer chambers	■	■	■	■	■	■	■	■	■		■	■	■	■				
Etch															■	■		■
PECVD											■	■	■	■	■	■	■	■
PVD											■	■	■	■	■	■	■	■
Ion implantation											■		■	■	■	■	■	■

Accessories for TURBOVAC Pumps

Pumps	TURBOVAC 50	TURBOVAC 151, 361 (C)	TURBOVAC 600 C	TURBOVAC 1000 C	TURBOVAC 1100 C	TURBOVAC SL 80	TURBOVAC TW 250 S	TURBOVAC (T) 350/450 i	TURBOVAC (T) 350/450 iX	TURBOVAC i Multi Inlet	MAG W 300/400/600/700 iP	MAG W 1300/1600/1700/2200 iP(L)	MAG W 300/400/600/700 P	MAG W 830/1300 C	MAG W 1500 CT	MAG W 2200 C	MAG W 2000 C/CT	MAG W 2800/3200 C/CT
Applications																		
Integrated Frequency Converter							■	■	■	■	■	■						
External Frequency Converter						■	■											
External Frequency Converter and Power Supply	■	■	■	■	■								■	■	■	■	■	■
Power Supply						■	■	■	■	■	■							
Mounting Kit		■	■				■	■	■	■								
Inlet screen / Splinter guard						■	■	■	■	■	■	■	■	■	■	■	■	■
Vibration absorber	■	■	■	■	■	■	■	■	■	■	■		■					
Air cooling unit	■	■	■	■		■		■	■	■	■		■					
Water cooling kit	■					■	■	■	■	■	■		■					
Flange heaters for CF flanges	■	■	■	■		■	■	■	■	■	■		■					
Venting valve	■	■	■	■	■	■	■	■	■		■		■					
Purge gas valve						■	■	■	■	■	■	■	■					
Purge gas and venting valve		■	■	■	■	■	■					■		■	■	■	■	■
Power failure venting valve		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Electronic brake module											■		■					
Relais box								■	■	■								
Accessories for serial interfaces		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Control Software for TURBOVAC		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

General to TURBOVAC i / iX Pumps

Turbomolecular Pumps with Hybrid (mechanical/ magnetic) Rotor Suspension

TURBOVAC i, iX / T i, T iX

The TURBOVAC i / iX series is a modular line of turbomolecular vacuum pumps. With the integrated drive electronics (frequency converter) it forms a single unit.
In the development of the TURBOVAC i / iX special emphasis was placed on the maximum attainable pump performance in consideration of its footprint. The specially developed rotor/stator design, upon request with an additional compression stage, guarantees excellent performance data as to pumping speed, gas throughput and compression especially also for light gases.
In all pumps of this line, the bearing consists of a non-wearing permanent magnetic bearing on the high vacuum side and an oil-free ceramic ball bearing which is lubricated for life on the forevacuum side. For this reason, the usually required standard maintenance involving an oil change is no longer necessary. The ceramic ball bearing is replaceable on-site, should this be required.
The pumps are equipped as standard with a venting and purge gas facility for directly connecting a venting valve, purge gas valve or purge gas throttle to the pump.

Owing to the many possible combinations (electronics, pump stage design, housing and the range of accessories) the TURBOVAC i / iX can be flexibly adapted to the specific application in each case.
For example, in comparison with the TURBOVAC i, the TURBOVAC iX is equipped with an integrated vacuum system control unit which drives accessory components like vacuum gauge, valves, fans and forevacuum pumps. Moreover, numerous optionally available communication interfaces facilitate easy integration within your installation.
The pump stage design (rotor, stator and Holweck stage) can be selected specifically in consideration of the respective process requirements and offers variants for highest possible gas throughput, pumping speed and/or compression in single or multi-chamber systems. Equally comprehensive is the range of housing and flange variants being offered where the vacuum connections can be adapted flexibly to the on-site installation conditions. The comprehensive range of accessories completes the TURBOVAC i / iX line thereby extending the fields of application for these pumps.

Advantages to the User

- High pumping performance from a compact size
- Cost-effective price-to-performance ratio
- Highly reliable, maintenance-free bearing concept without oil lubrication
- Owing to the overall modular concept, individually adaptable to the respective conditions and requirements
- Variety of housings and flange options
- Easy and easily adaptable installation, any mounting position
- Easy process integration due to the numerous interfacing options
- Flexible accessory options (power supply, cooling, heating, venting, installation etc.)

Overview of Variants

Electronics Variants

All pumps are equipped with integrated drive electronics with a 24 V/48 V power supply which controls the amount of drive power and which monitors all pump functions.

The individual requirements with regard to communication interfaces and the functional scope of the driving options for accessory components can be covered through a number of different electronics variants.

Left: TURBOVAC i with standard interface
Centre: **TURBOVAC i** with Anybus interface extension
Right: **TURBOVAC iX** with integrated vacuum system control unit and Anybus interface extension

Electronics Variants

TURBOVAC i (Standard)
Cost-effective solution equipped with basic functions and interfaces.

- Internal 24/48 V DC frequency converter
- Status LEDs
- Accessory connection for up to 2 controllable accessory components
- User-friendly interfaces (USB, RS 485, 15-pin digital I/O)

Standard interface USB, RS 485 and 15-pin digital I/O for TURBOVAC i

TURBOVAC i (Anybus interface extension)

Features like TURBOVAC I, additionally:

- User-friendly interfaces (USB, 15-pin digital I/O) and Anybus interface instead of the RS 485 for further interface options: RS 232, Profibus, Ethernet/IP (further interfaces upon request)

Anybus interface expansion for TURBOVAC i

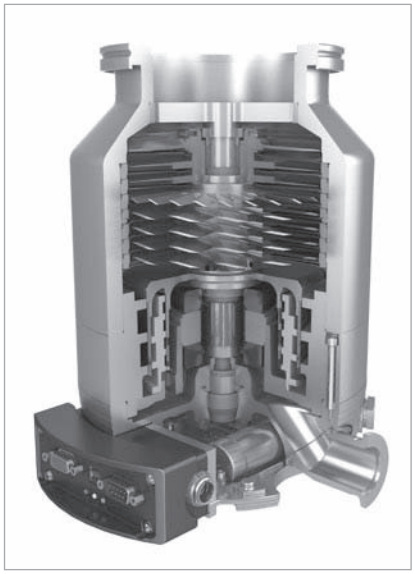
TURBOVAC iX (Vacuum system control unit)
With integrated vacuum system control unit and Anybus interface extension.

Features like TURBOVAC i (Anybus interface extension), additionally:

- 3 outputs for controlling vacuum pump accessories
- 1 vacuum gauge head connection for powering and data recording of vacuum gauge heads and application of pressure data for pump system control
- Flexibly programmable software, for customising the configuration of the control connections

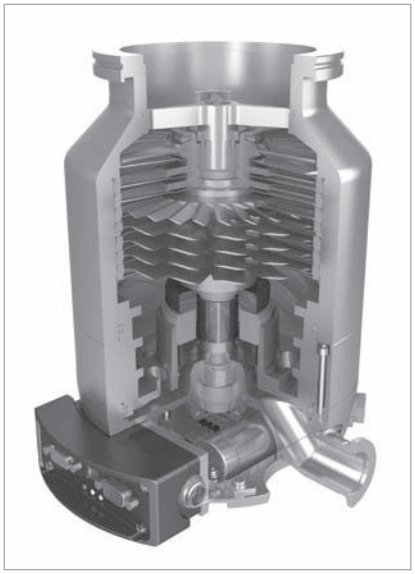
Integrated vacuum system control unit of the TURBOVAC iX

Performance Variants



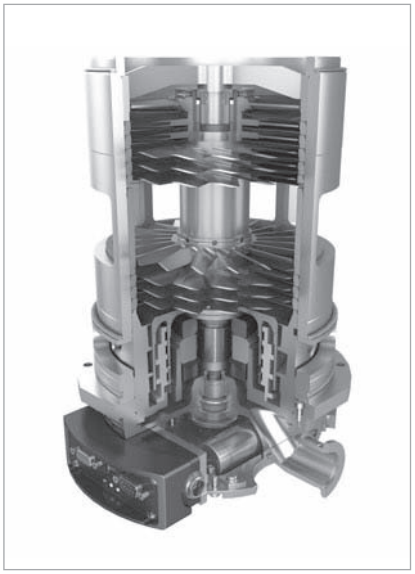
TURBOVAC i, iX

The standard variant for UHV applications and compact pump system solutions. Owing to the additional Holweck compression stage it delivers a high pumping speed and a high compression especially for light gases, and due to its high forevacuum tolerance it is suited for operation in connection with diaphragm or scroll forevacuum pumps.



TURBOVAC T i, T iX

The “T” version with its classic rotor design without additional compression stage is suited for deployment under more stringent process conditions and high gas loads. Compared to the standard variant it stands for faster run-up times, increased gas throughput and an improved tolerance with regard to pumping of particle or dust containing media.



TURBOVAC i Multi-Inlet

The variant with a special rotor design and two or more inlets as an efficient and compact vacuum solution for multi-chamber systems. It allows for a high degree of system integration and convinces compared to systems with discreet turbomolecular pumps through its lower weight and smaller footprint as well as an increased reliability of the entire vacuum system through the reliance on fewer components compared to similar systems equipped with discrete turbomolecular pumps.

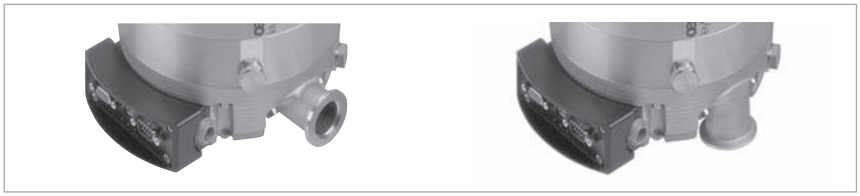
Housing and Flange Variants

The optimised rotor geometry has been specially adapted to the industrial standard sizes for maximum pump performance. Housings with ISO-K as well as CF flanges are available. Moreover, the standard housings with an additional inlet stage are available upon request.

Multiple inlet stages can be implemented through the **TURBOVAC Multi-Inlet**. Here in addition to the special cartridge solution which facilitates easy replacement in the field, also custom housing and chamber solutions are offered for utmost system integration.

Flexibility

The forevacuum connection on all pumps is rotatable thereby facilitating flexible installation within existing systems making optimum use of the available space. Moreover, the required amount of installation space may be reduced by a detachable cable connected interface module



Left: TURBOVAC i with radial forevacuum flange
Right: TURBOVAC i with axial forevacuum flange

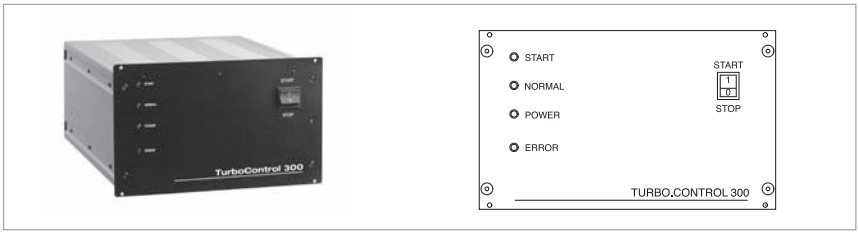
Accessories for TURBOVAC i, iX / T i, T iX

Power Supply TURBO.POWER integra

- Plug-and-play power supply for fitting underneath the pump, 100-240 V
- Including short connecting cable to the pump
- Also for benchtop placement with optional extension cable (1, 3, 5 m (3.5, 10.5, 17.5 ft))
- Requires a country-specific mains cord (EU, US, UK …)

Pump control unit with Power Supply TURBO.CONTROL 300

- Control unit and power supply for rack installation
- With on/off switch for the turbo-molecular pump
- Status LEDs and status relays for monitoring the pump
- For remote control via interface
- Requires a connection cable to the pump (1, 3, 5, 10, 20 m (3.5, 10.5, 17.5, 35.0, 70.0 ft)) and country-specific mains cord (EU, US, UK ...)



Connecting cables to the pump with bare wire ends of for customer specific power supply units

Relay Box

The relay box allows you to control via the 24 V DC output on the TURBOVAC i a mains powered electric consumer, like a backing pump, for example. Mains power and consumer are connected using mains power cords, the control voltage is connected through an M 8 connector.

- incl. connection cable with a M 8 plug, 2 m (7.0 ft) long

DC Pump Plug

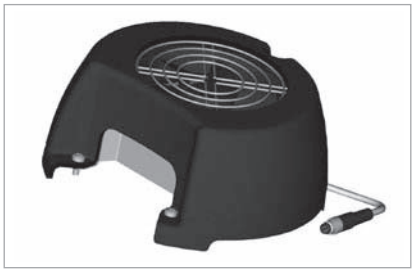
for adapting the supply voltage by the customer.

- 24/48 V DC-In plug TURBOVAC i

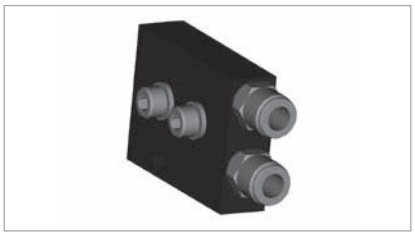
Radial air cooler
for lateral installation on the pump, including connection plug

- Flexible positioning

Axial air cooler
For installation underneath the pump, including connection plug



Water cooling
for flexible installation on the pump (required for degassing the turbomolecular pump)



Heating Collar
for degassing the pump

- Degassing temperature 100 °C (212 °F)
- Requires a country-specific mains cord (EU, US, UK …)
- With optional relay box and accessory cable, automatic control via the electronics of the TURBOVAC i / iX is possible

Accessory Valves

- Power supply 24 V DC
- G 1/8" inlet (inside thread) and discharge (outside thread) connection
- Including O-ring and connecting cable with M 8 plug for connection to the accessory input on the TURBOVAC i / iX

Purge Gas Valve (for connection to the purge gas connection on the turbomolecular pump)

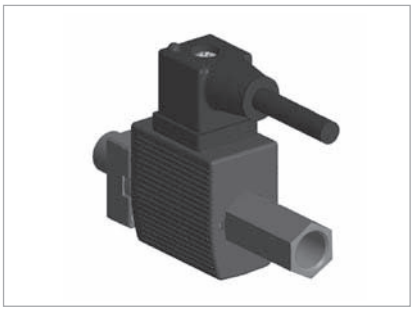
for controlling the admitted purge gas quantity

- The valve is normally closed

Venting Valve (for connection the venting connection)

for venting the turbomolecular pump

- The valve is normally closed



Power Failure Venting Valve (for connection the venting connection)

for venting the turbomolecular pump

- The valve is normally open

Purge Gas Throttle

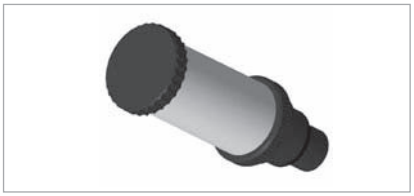
for passively controlling the admitted purge gas quantity

- G 1/8" inlet (inside thread) and discharge (outside thread) connection
- Purge gas throttle 24 sccm

Air Filter

for connection to the valves or throttles

- Prevents contamination and clogging of valves and throttles
- G1/8"



Y-Splitter

- Extends the M 8 accessory connection on the TURBOVAC i by a further connection for parallel driving of two accessory components.
  Here both accessory components are switched synchronously

Installation and Mounting Accessories

Mounting kit for safe mounting of the pump

The mounting kits include:
ISO-K kit (100 und 160):
centering rings and clamps
ISO-F kit (100 und 160):
collar flange, outside ring, bolts and nuts
CF kit (100 und 160):
2 copper gaskets, bolts, nuts and washers

Mounting kits (left ISO-KF, centre ISO-F, right CF)

Centering Rings with Splinter Guard (DN 100 and 160 ISO-K/F)

Centering Rings with Inlet Screens (DN 100 and 160 ISO-K/F)

Splinter Guards (DN 100 und 160 CF)

Inlet Screens (DN 100 und 160 CF)

for protecting the pump against ingesting parts.

Inlet screen, 3.2 mm (0.01 ft) mesh
Splinter guard, 0.8 mm (0.003 ft) mesh

Note:
For ISO-K/F, both inlet screen and splinter guard have been integrated in the centering ring.

Vibration Absorber (DN 100/160 ISO-K and 100/160 CF)

Prevents any possible vibration transfer from the pump to sensitive instrumentation or apparatus.

Software LEYASSIST

Software for PC-based communication, control and monitoring of turbomolecular pumps via USB, RS 485 or RS 232 interface with automatic pump detection.

Functions

- Display of vacuum system status
- Trend configuration and report
- Configuring the accessory functions of the TURBOVAC i / iX
- Reading/writing of parameters
- Data logging
- Alarm/warning message logging
- Interface uses USB (with USB cable 2.0, Type A/B, 1.8 m (6.3 ft) long), RS 485 or RS 232 (with dongle)
  - Functions: reading/writing of parameters, control and data acquisition
- Automatic detection of connected Leybold pump type or instrument
- Different languages and with different user access levels are available

Ordering Information

Software LEYASSIST for turbomolecular vacuum pumps	**Part. No. 230439V01**

Products

TURBOVAC
with Hybrid (mag/mech) Rotor Suspension

with integrated Frequency Converter
TURBOVAC (T) 350 i and (T) 450 i

TURBOVAC (T) 350 i (left) and (T) 450 i (right)

with integrated Frequency Converter and integrated Vacuum System Controller
TURBOVAC (T) 350 iX and (T) 450 iX

TURBOVAC (T) 350 iX (left) and (T) 450 iX (right)

Typical Applications

- Analytical technologies / Research & Development
  - Mass spectrometers
  - Electron microscopes
  - Surface analysis
  - X-ray-analysis
  - Particle accelerators and synchrotons
  - Laboratory coating systems
  - MBE (Molecular Beam Epitaxy)
  - UHV systems
- Life Sciences
  - Proton therapy
  - Gamma sterilisation
  - Production of high quality implants
- Industrial and Coating applications
  - PVD- Physical Vapour deposition
  - Optical coatings
  - CD/DVD/Blu-Ray Disc production
  - Thin film technologies, photovoltaics
- Load locks, transfer chambers, handling systems
- Electron beam welders
- Insulation vacuum and leak detection

Technical Features

TURBOVAC i

- Integrated electronic drive unit with 24/48 V DC supply
- Best in class pumping speed and compression especially for light gases
- Vacuum port design flexibility
- Installation in any orientation
- Superior reliability due to innovative pump and bearing design
- The only maintenance free hybrid mechanical TMP
  - no need for oil changes
- On-site maintenance possibility (bearing exchange) to reduce service costs and time
- Widest range of interface options (USB ,RS 485 and 15 pin Dig I/O as standard)
- Optimized size/performance ratio on 100 and 160 flanges

TURBOVAC iX

- Integrated vacuum system controller with flexible interfaces and several accessory ports for control of cooling units, valves, gauges, forevacuum pumps etc.
- Flexible accessory program options for easy plug & play
- Flexibility to match different process and application requirements

TURBOVAC T i, T iX

- Variant without Compound Stage
- increased gas throughput
- Increased tolerance against dust and particles
- Improved run-up time

Advantages to the User

TURBOVAC i

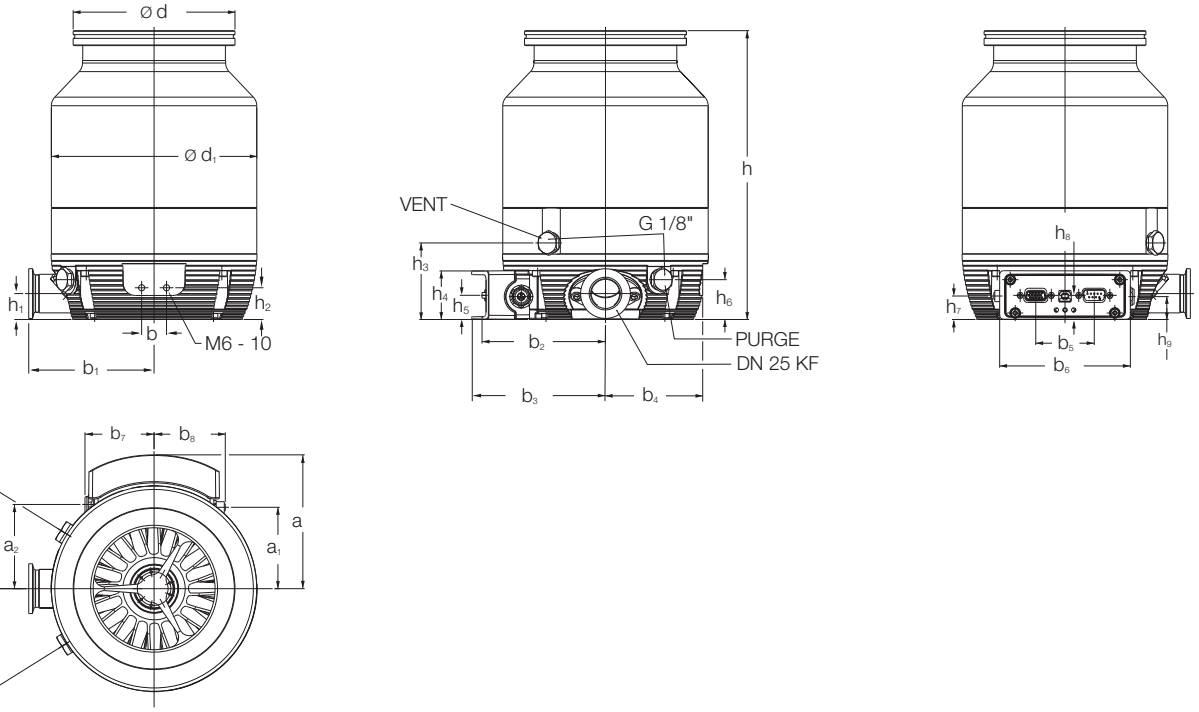
- Best performance and functionality for your money
- Maximum user flexibility for easy system integration, operation and control
- Highest productivity and system uptime at lowest CoO (Cost of Ownership)
- Improved pump-down time and target pressures
- Superior pumping performance for light gases
- Down-sizing of vacuum system in terms of costs and dimensions (use of small forevacuum pumps)

TURBOVAC iX

- Easy plug & play pump system control
- Avoid extra costs for separate pump system control units and cabling

TURBOVAC T i, T iX

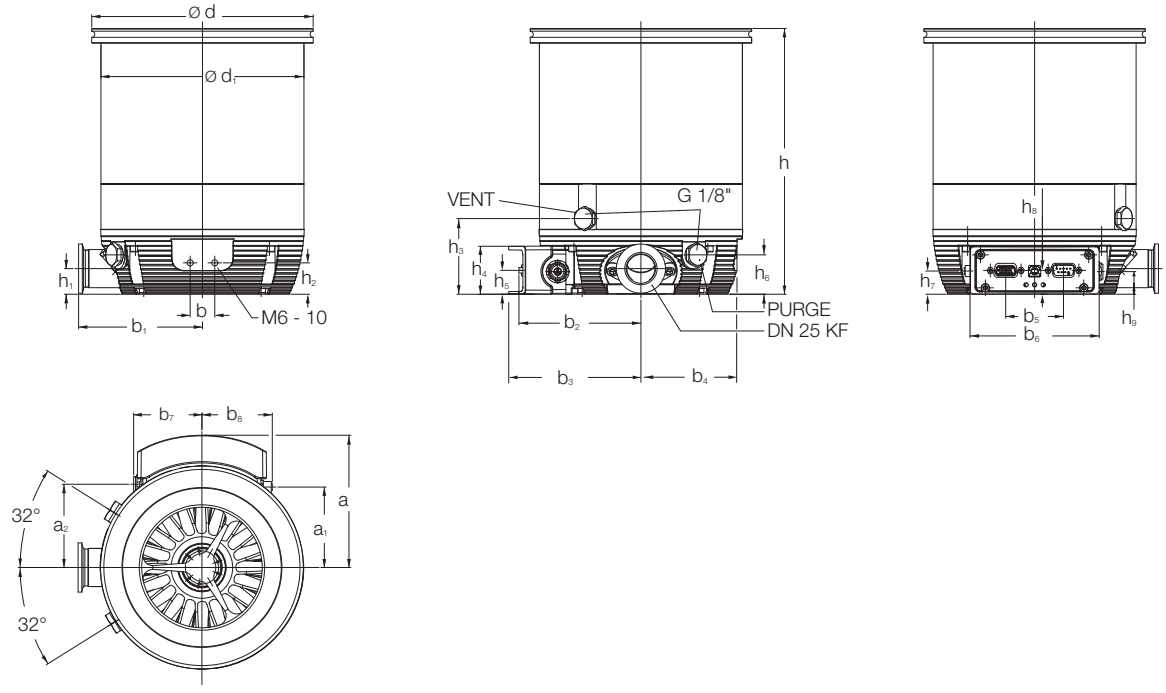
- Suitable for demanding process applications and high throughput operation
- Fast cycle operation and pump down possible



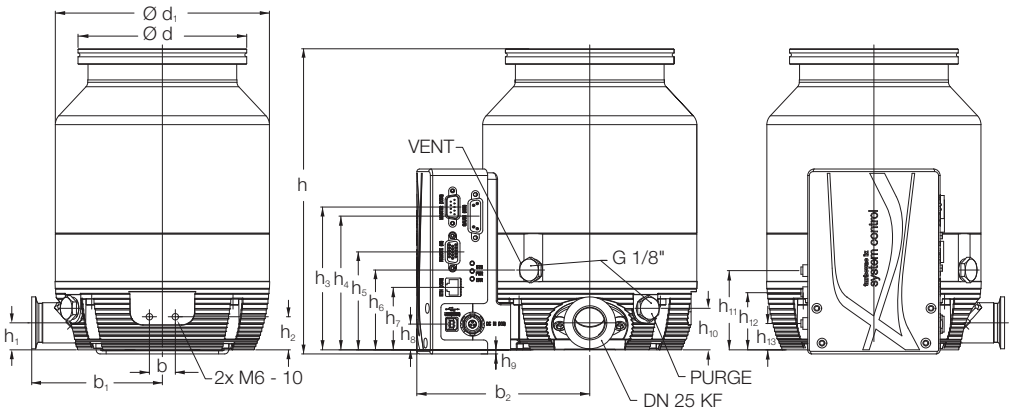
Type	DN		a	a_1	a_2	b	b_1	b_2	b_3	b_4
TURBOVAC (T) 350 i	ISO-K	mm (in.)	107.5 (4.23)	65.4 (2.57)	67.6 (2.66)	20.0 (0.79)	100.7 (3.96)	99.2 (3.91)	107.5 (4.23)	78.1 (3.07)
	CF	mm (in.)	107.5 (4.23)	65.4 (2.57)	67.6 (2.66)	20.0 (0.79)	100.7 (3.96)	99.2 (3.91)	107.5 (4.23	78.1 (3.07)
TURBOVAC (T) 450 i	ISO-K	mm (in.)	107.5 (4.23)	65.4 (2.57)	67.6 (2.66)	20.0 (0.79)	100.7 (3.96)	99.2 (3.91)	107.5 (4.23	78.1 (3.07)
	CF	mm (in.)	107.5 (4.23)	65.4 (2.57)	67.6 (2.66)	20.0 (0.79)	100.7 (3.96)	99.2 (3.91)	107.5 (4.23	78.1 (3.07)

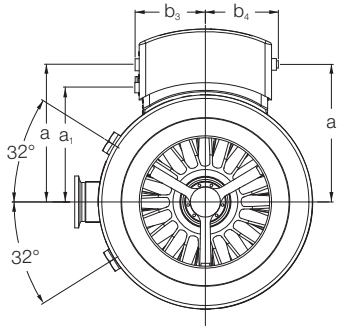
	DN		b_5	b_6	b_7	b_8	d	d_1	h	h_1
TURBOVAC (T) 350 i	ISO-K	mm (in.)	47.0 (1.85)	105.0 (4.13)	55.5 (2.19)	57.2 (2.25)	130.0 (5.12)	165.0 (6.5)	232.0 (9.13)	20.8 (0.82)
	CF	mm (in.)	47.0 (1.85)	105.0 (4.13)	55.5 (2.19)	57.2 (2.25)	180.0 (7.09)	165.0 (6.5)	245.0 (9.65)	20.8 (0.82)
TURBOVAC (T) 450 i	ISO-K	mm (in.)	47.0 (1.85)	105.0 (4.13)	55.5 (2.19)	57.2 (2.25)	130.0 (5.12)	165.0 (6.5)	216.0 (8.5)	20.8 (0.82)
	CF	mm (in.)	47.0 (1.85)	105.0 (4.13)	55.5 (2.19)	57.2 (2.25)	180.0 (7.09)	165.0 (6.5)	222.0 (8.74)	20.8 (0.82)

	DN		h_2	h_3	h_4	h_5	h_6	h_7	h_8	h_9
TURBOVAC (T) 350 i	ISO-K	mm (in.)	25.5 (1.0)	61.5 (2.42)	39.0 (1.54)	19.4 (0.76)	32.0 (1.26)	19.0 (0.75)	18.8 (0.74)	18.4 (0.72)
	CF	mm (in.)	25.5 (1.0)	61.5 (2.42)	39.0 (1.54)	19.4 (0.76)	32.0 (1.26)	19.0 (0.75)	18.8 (0.74)	18.4 (0.72)
TURBOVAC (T) 450 i	ISO-K	mm (in.)	25.5 (1.0)	61.5 (2.42)	39.0 (1.54)	19.4 (0.76)	32.0 (1.26)	19.0 (0.75)	18.8 (0.74)	18.4 (0.72)
	CF	mm (in.)	25.5 (1.0)	61.5 (2.42)	39.0 (1.54)	19.4 (0.76)	32.0 (1.26)	19.0 (0.75)	18.8 (0.74)	18.4 (0.72)



Dimensional drawing for the TURBOVAC (T) pumps, 350 i top and 450 i bottom

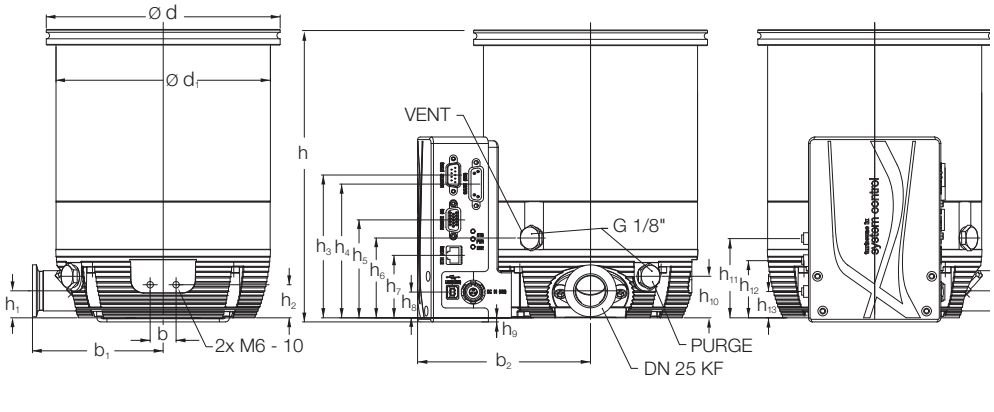


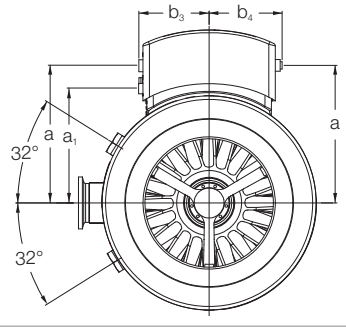


Type	DN		a	a_3	b	b_1	b_2	b_3	b_4	
TURBOVAC (T) 350 iX	ISO-K	mm (in.)	111.0 (4.37)	78.0 (3.07)	20.0 (0.79)	101.0 (3.98)	138.0 (5.43)	54.0 (2.13)	56.0 (2.2)	
	CF	mm (in.)	111.0 (4.37)	78.0 (3.07)	20.0 (0.79)	101.0 (3.98)	138.0 (5.43)	54.0 (2.13)	56.0 (2.2)	
TURBOVAC (T) 450 iX	ISO-K	mm (in.)	111.0 (4.37)	78.0 (3.07)	20.0 (0.79)	101.0 (3.98)	138.0 (5.43)	54.0 (2.13)	56.0 (2.2)	
	CF	mm (in.)	111.0 (4.37)	78.0 (3.07)	20.0 (0.79)	101.0 (3.98)	138.0 (5.43)	54.0 (2.13)	56.0 (2.2)	

	DN		d	d_1	h	h_1	h_2	h_3	h_4	h_5
TURBOVAC (T) 350 iX	ISO-K	mm (in.)	130.0 (5.12)	165.0 (6.5)	235.0 (9.25)	21.0 (0.83)	26.0 (1.02)	110.0 (4.33)	103.0 (4.06)	76.0 (2.99)
	CF	mm (in.)	180.0 (7.09)	165.0 (6.5)	248.0 (9.76)	21.0 (0.83)	26.0 (1.02)	110.0 (4.33)	103.0 (4.06)	76.0 (2.99)
TURBOVAC (T) 450 iX	ISO-K	mm (in.)	130.0 (5.12)	165.0 (6.5)	219.0 (8.62)	21.0 (0.83)	26.0 (1.02)	110.0 (4.33)	103.0 (4.06)	76.0 (2.99)
	CF	mm (in.)	180.0 (7.09)	165.0 (6.5)	225.0 (8.86)	21.0 (0.83)	26.0 (1.02)	110.0 (4.33)	103.0 (4.06)	76.0 (2.99)

	DN		h_6	h_7	h_8	h_9	h_{10}	h_{11}	h_{12}	h_{13}
TURBOVAC (T) 350 iX	ISO-K	mm (in.)	62.0 (2.44)	48.0 (1.89)	20.0 (0.79)	3.0 (0.12)	32.0 (1.26)	64.0 (2.52)	47.0 (1.85)	23.0 (0.91)
	CF	mm (in.)	62.0 (2.44)	48.0 (1.89)	20.0 (0.79)	3.0 (0.12)	32.0 (1.26)	64.0 (2.52)	47.0 (1.85)	23.0 (0.91)
TURBOVAC (T) 450 iX	ISO-K	mm (in.)	62.0 (2.44)	48.0 (1.89)	20.0 (0.79)	3.0 (0.12)	32.0 (1.26)	64.0 (2.52)	47.0 (1.85)	23.0 (0.91)
	CF	mm (in.)	62.0 (2.44)	48.0 (1.89)	20.0 (0.79)	3.0 (0.12)	32.0 (1.26)	64.0 (2.52)	47.0 (1.85)	23.0 (0.91)





Dimensional drawing for the TURBOVAC (T) pumps, 350 iX top and 450 iX bottom

Technical Data

TURBOVAC

		350 i / iX	450 i / iX	T 350 i / iX	T 450 i / iX
High-vacuum connection	DN	100 ISO-K 100 CF	160 ISO-K 160 CF	100 ISO-K 100 CF	160 ISO-K 160 CF
Forevacuum connection	DN	25 ISO-KF	25 ISO-KF	25 ISO-KF	25 ISO-KF
Pumping speed					
N_2	l x s^{-1}	290	430	290	430
Ar	l x s^{-1}	260	400	260	400
He	l x s^{-1}	360	440	360	440
H_2	l x s^{-1}	350	420	320	400
Gas throughput					
N_2	mbar x l x s^{-1}	4.5	4.5	11.5	11.5
Ar	mbar x l x s^{-1}	2.0	2.0	6.0	6.0
He	mbar x l x s^{-1}	8.0	8.0	20.0	20.0
H_2	mbar x l x s^{-1}	8.0	8.0	20.0	20.0
Compression ratio					
N_2		1×10^{11}	1×10^{11}	1×10^{10}	1×10^{10}
Ar		1×10^{11}	1×10^{11}	1×10^{11}	1×10^{11}
He		1×10^{8}	1×10^{8}	1×10^{6}	1×10^{6}
H_2		1×10^{6}	1×10^{6}	1×10^{4}	1×10^{4}
Ultimate pressure with 2-stage oil-sealed rotary vane vacuum pump ISO-K / CF flange	mbar (Torr)	$< 10^{-8}$ / $< 10^{-10}$ ($< 0.75 \times 10^{-8}$ / $< 0.75 \times 10^{-10}$)	$< 10^{-8}$ / $< 10^{-10}$ ($< 0.75 \times 10^{-8}$ / $< 0.75 \times 10^{-10}$)	$< 10^{-8}$ / $< 10^{-10}$ ($< 0.75 \times 10^{-8}$ / $< 0.75 \times 10^{-10}$)	$< 10^{-8}$ / $< 10^{-10}$ ($< 0.75 \times 10^{-8}$ / $< 0.75 \times 10^{-10}$)
Max. forevacuum pressure N_2	mbar (Torr)	10.0 (7.5)	10.0 (7.5)	0.5 (0.375)	0.5 (0.375)
Recommended forevacuum pumps TRIVAC SCROLLVAC DIVAC		D 4 B SC 5 D / 15 D 3.8 HV3	D 4 B SC 5 D / 15 D 3.8 HV3	D 16 B SC 15 D / 30 D –	D 16 B SC 15 D / 30 D –
Operating speed	min^{-1} (rpm)	60 000	60 000	60 000	60 000
Speed adjustment range	%	50 to 100	50 to 100	50 to 100	50 to 100
Run-up time, approx.	min	5.5	5.5	3.5	3.5
Ambient temperature during operation	°C (°F)	+5 to +45 (+41 to +113)	+5 to +45 (+41 to +113)	+5 to +45 (+41 to +113)	+5 to +45 (+41 to +113)
during storage	°C (°F)	-15 to -70 (+5 to -94)	-15 to -70 (+5 to -94)	-15 to -70 (+5 to -94)	-15 to -70 (+5 to -94)
Cooling standard optional		Convection Air or water	Convection Air or water	Convection Air or water	Convection Air or water
Cooling water connection alternatively		Plug connection for 6 x 1 hose G 1/8" Screw-in thread	Plug connection for 6 x 1 hose G 1/8“ Screw-in thread	Plug connection for 6 x 1 hose G 1/8“ Screw-in thread	Plug connection for 6 x 1 hose G 1/8“ Screw-in thread
Cooling water consumption	l/h	50 to 100	50 to 100	50 to 100	50 to 100
Permissible cooling water pressure	bar(g)	3 to 6	3 to 6	3 to 6	3 to 6
Permissible cooling water temperature	°C (°F)	+15 to +35 (+59 to +95)	+15 to +35 (+59 to +95)	+15 to +35 (+59 to +95)	+15 to +35 (+59 to +95)
Noise level with convection cooling with radial cooler with axial cooler	db(A) db(A) db(A)	< 44 < 47 < 49	< 44 < 47 < 49	< 44 < 47 < 49	< 44 < 47 < 49

Additional Technical Data for the Frequency Converter (i Version)		TURBOVAC 350 i	TURBOVAC 450 i	TURBOVAC T 350 i	TURBOVAC T 450 i
Technical Data for the integrated Drive Electronics					
Supply voltage	V DC	24/48 ±10%	24/48 ±10%	24/48 ±10%	24/48 ±10%
Max. current consumption	A	10 at 24 V DC	10 at 24 V DC	10 at 24 V DC	10 at 24 V DC
Max. power consumption	W	240	240	240	240
Power consumption at ultimate pressure	W	20	20	20	20
Type of protection	IP	40	40	40	40
Interfaces		RS 485, USB, 15-pin digital I/O	RS 485, USB, 15-pin digital I/O	RS 485, USB, 15-pin digital I/O	RS 485, USB, 15-pin digital I/O
Other interfaces		Upon request	Upon request	Upon request	Upon request
Accessory connection		1 pcs. M 8 connector 24 V DC	1 pcs. M 8 connector 24 V DC	1 pcs. M 8 connector 24 V DC	1 pcs. M 8 connector 24 V DC
Weight ISO-K / CF	kg (lbs)	7.5 / 11.5 (16.5 / 25.4)	7.7 / 12.5 (17.0 / 27.6)	7.0 / 11.0 (15.4 / 14.3)	7.2 / 12.0 (15.9 / 26.5)

Additional Technical Data for the Frequency Converter (iX Version)		TURBOVAC 350 iX	TURBOVAC 450 iX	TURBOVAC T 350 iX	TURBOVAC T 450 iX
Technical Data for the integrated Drive Electronics and Vacuum System Controller					
Supply voltage	V DC	24/48 ±10%	24/48 ±10%	24/48 ±10%	24/48 ±10%
Max. current consumption	A	10 at 24 V DC	10 at 24 V DC	10 at 24 V DC	10 at 24 V DC
Max. power consumption	W	240	240	240	240
Power consumption at ultimate pressure	W	20	20	20	20
Type of protection	IP	40	40	40	40
Interfaces		USB+,15 pin standard, Anybus (either RS 485, RS 232, Profibus, ...)	USB+,15 pin standard, Anybus (either RS 485, RS 232, Profibus, ...)	USB+,15 pin standard, Anybus (either RS 485, RS 232, Profibus, ...)	USB+,15 pin standard, Anybus (either RS 485, RS 232, Profibus, ...)
Accessory connections		3 pcs. M 8 connector 24 V DC	3 pcs. M 8 connector 24 V DC	3 pcs. M 8 connector 24 V DC	3 pcs. M 8 connector 24 V DC
Max. load for the 24 V DC output (cooler or valve supply)	V / W	24 / max. 12	24 / max. 12	24 / max. 12	24 / max. 12
Gauge head connection		15-way Sub-D	15-way Sub-D	15-way Sub-D	15-way Sub-D
Weight ISO-K / CF	kg (lbs)	8.0 / 12.0 (17.6 / 26.5)	8.2 / 13.0 (18.1 / 28.7)	7.5 / 11.5 (16.5 / 25.4)	7.7 / 12.5 (17.0 / 27.6)

Ordering Information

TURBOVAC

	Wide Range		Classic	
	350 i	450 i	T 350 i	T 450 i
TURBOVAC	Part No.	Part No.	Part No.	Part No.
with integrated frequency converter, RS 485, USB+ and 15-Pin digital I/O interface				
DN 100 ISO-K	830051V1000	–	830050V1000	–
DN 100 CF	830061V1000	–	830060V1000	–
DN 160 ISO-K	–	830071V1000	–	830070V1000
DN 160 CF	–	830081V1000	–	830080V1000
other interfaces	Upon request	Upon request	Upon request	Upon request

Ordering Information

TURBOVAC

	Wide Range		Classic	
	350 iX	450 iX	T 350 iX	T 450 iX
TURBOVAC	Part No.	Part No.	Part No.	Part No.
with integrated frequency converter and vacuum system controller, RS 485, USB+ and 15-Pin digital I/O interface				
DN 100 ISO-K	830051V3300	–	830050V3300	–
DN 100 CF	830061V3300	–	830060V3300	–
DN 160 ISO-K	–	830071V3300	–	830070V3300
DN 160 CF	–	830081V3300	–	830080V3300
other interfaces	Upon request	Upon request	Upon request	Upon request

Ordering Information

TURBOVAC (T)

350 i, iX / 450 i, iX

Mandatory Accessories	P PS	Part No.
Power supply TURBO.POWER integra, including 0.3 (1.1 ft) long cable		800100V0003
Mains cable, 3 m (10.5 ft)		
EU plug		800102V0002
UK plug		800102V0003
US plug 5-15P, 115 V		800102V1002
Cable pump - TURBO.POWER integra		
1 m (3.5 ft)		800096V0100
3 m (10.5 ft)		800096V0300
5 m (17.5 ft)		800096V0500
Mounting kit TURBOVAC		
DN 100 ISO-K		800134V0020
DN 160 ISO-K		800134V0030
DN 100 ISO-K auf ISO-F		800134V0025
DN 160 ISO-K auf ISO-F		800134V0035
DN 100 CF		800134V0021
DN 160 CF		800134V0031
Forevacuum pump		
TRIVAC D 4 B		
TRIVAC D 16 B		
see Catalog Part „Oil Sealed Vacuum Pumps“		
SCROLLVAC SC 5 D		
SCROLLVAC SC 15 D		
DIVAC 3.8 HV3		
see Catalog Part „Dry Compressing Vacuum Pumps“		

TURBOVAC (T) 350 i, iX
TURBOVAC (T) 450 i, iX

TURBO.POWER integra
(TURBO.CONTROL 300)

Ordering Information

TURBOVAC (T) 350 i / 450 i

Accessories, optional	P	Part No.
Power supply, cable, other accessories		
Power supply and control unit TURBO.CONTROL 300		800100V0001
Cable pump - TURBO.CONTROL 300 1 m (3.5 ft) 3 m (10.5 ft) 5 m (17.5 ft) 10 m (35 ft) 20 m (70 ft)		 800092V0100 800092V0300 800092V0500 800092V1000 800092V2000
24/48 V DC In plug TURBOVAC		800090V0000
USB cable 2.0, Type A/B, 1.8 m (6.3 ft) long		800110V0108
Y cable M 8		800110V0020
Relay box for forevacuum pump, 1-phase, 10 A		800110V0030
Start stop switch		800110V0021
Cooling		
Air cooler TURBOVAC 350/450 i radial axial		 800136V0005 800136V0006
Water cooling TURBOVAC 350/450 i		800135V0005
Venting and purge gas		
Venting valve, 24 V DC, G 1/8"		800120V0012
Power failure venting valve, 24 V DC, G 1/8"		800120V0022
Purge gas valve, 24 V DC, G 1/8", 24 sccm		800120V0013
Purge gas throttle, 24 sccm		800120V0014
Air filter, G 1/8"		800110V0022
Heating		
Flange heater DN 100 CF, 230 V DN 100 CF, 115 V DN 160 CF, 230 V DN 160 CF, 115 V		 800137V0005 800137V0006 800137V0007 800137V0008
Mains cable, 3 m (10.5 ft) (for connection of the heating collar) EU-plug UK-plug US-plug 5-15P, 115 V		 800102V0002 800102V0003 800102V1002
Vibration absorber DN 100 ISO-K DN 160 ISO-K DN 100 CF DN 160 CF		 800131V1100 500073 500071 500072
Centering ring with fine inlet screen, 0.8 mm (0.03") mesh DN 100 ISO-K/F DN 160 ISO-K/F with coarse inlet screen, 3.2 mm (0.13") mesh DN 100 ISO-K/F DN 160 ISO-K/F		 800133V0022 800133V0032 800133V0021 800133V0031
Fine Inlet screen, 0.8 mm (0.03") mesh DN 100 CF DN 160 CF		 800132V0022 800132V0032
Coarse inlet screen, 3.2 mm (0.13") mesh DN 100 CF DN 160 CF		 800132V0021 800132V0031
Included in the Delivery of the Pump	P	
High and forevacuum flanges are protective-capped		
The flange mounting components and the inlet screen are not included in the delivery		

Special Turbomolecular Pumps

TURBOVAC i Multi Inlet Cartridge

Precision is key when it comes to analytical instruments.

Outfitted with two or more inlets, the innovative turbopumps with integrated drive electronics provide extraordinary pumping performance and are adaptable to the system requirements of each instrument.

In combination with our support for the whole vacuum system design, it will result in the best possible level of pump system integration you have ever experienced.

The TURBOVAC 350-400 i Multi Inlet line has been especially developed to meet the requirements of analytical instruments and features an extremely high level of flexibility, allowing you to choose the number, height and position of the multiple vacuum ports. The result: a pump that is perfectly fitted to your specific performance needs and installation requirements.

Additionally, we offer the support and experience in vacuum system design which opens a wide range of possibilities, from the adaptation of the pump housing to your vacuum chamber through to the design of a custom-built housing/chamber that meets your particular needs. Your benefit: optimum system integration of the pump(s) into your instrument and a reduced time to market.

Your Advantage

- Perfect integration of the pump(s) within your instrumentation
- Cutting of system costs
- Smaller size of the analytical system
- Reduction in the number of individual vacuum components
- Choice between cartridge and custom pump housing

In order to simplify installation, operation and control, all TURBOVAC i variants feature an integrated electronic drive with 24/48 V DC supply and a detachable operator interface with USB, RS 485 and digital I/O connections.

Performance

- Industry-leading pumping speed especially for light gases (up to 60 % higher than existing products)
- Optimized rotor diameter to provide maximum pumping performance
- > 40 l/s pumping speed at Interstage port 2

Flexibility

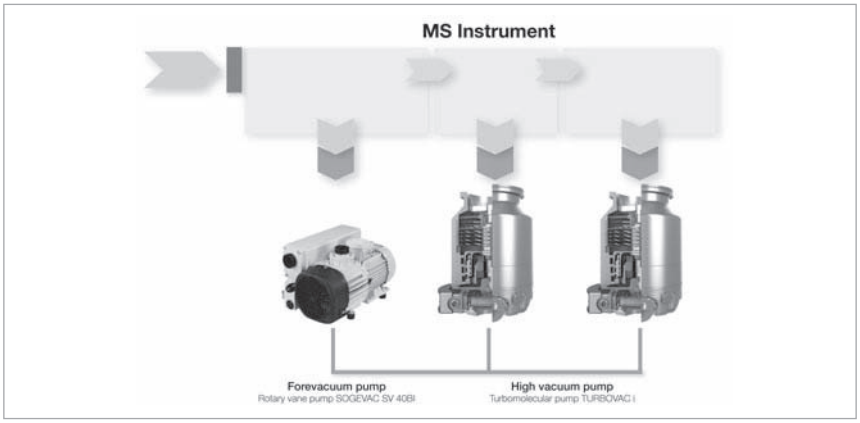
- Vacuum port design flexibility
  - Rotatable fore-vacuum port
  - Multiple interstage ports
  - High level of flexibility in terms of height and position of vacuum ports
- Unique cartridge solutions for optimized system integration with fast and simple field replacement
- Special pump housing solutions adapted to your instrument
- Complete vacuum system design including your vacuum chamber
- Variable rotor and Holweck design to adapt the performance to your application

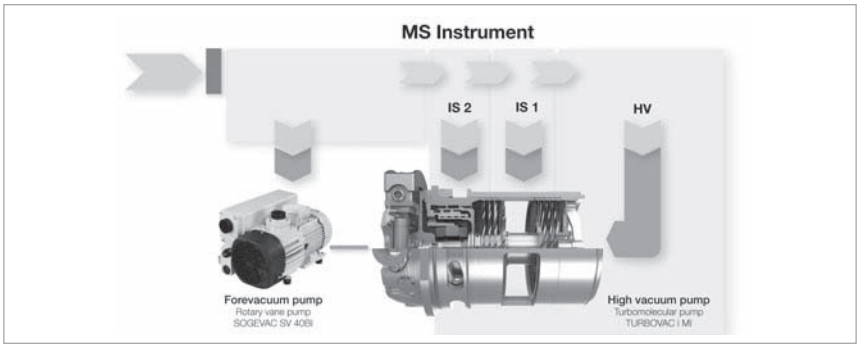
Installation, operation and control

- Integrated 24/48 V DC drive electronics to avoid expensive cabling
- Widest range of communication interfaces: USB, RS 485 and remote 15 pin digital I/O as standard options
- Highly efficient motor
- Thermal isolation by design for optimized cooling of bearing and improved pump lifetime
- Simply-supported shaft reduces vibration
- Maintenance free upper passive magnetic bearing
- Oil free, lifetime lubricated lower mechanical ceramic ball bearing, field-replaceable

Outstanding performance

Thanks to its variable rotor and drag stage design, our new Multi Inlet product line provides the highest performance for all mass spectrometer applications. With increased pumping speed levels especially for light gases which are up to 60% higher than those offered by other products currently on the market, it provides significant advantages for your instruments: lower pressures, improved detection sensitivity levels and higher sample throughput rates.





Superior reliability

The unique maintenance and oil free hybrid bearing system is characterized by its extreme reliability and durability – that's because we equipped it with an innovative lifetime lubrication system that never needs an oil change.
The simply-supported shaft system results in a low vibration pump design which reduces noise, mechanical stress and negative impact on vibration sensitive applications. Optimized cooling of the bearings is ensured through thermal isolation and the highly efficient motor. To protect the bearings from critical gases or particles, all pumps are equipped with a purge port. As a consequence, not only pump lifetime is increased significantly, but also system uptime as well as productivity. In combination with low costs of ownership, the operation of your vacuum system will be more efficient than ever.

Advantages to the User

- High gas throughput
- High effective pumping speed
- High efficiency for analytical instruments
- High detection sensitivity
- High sample throughput
- Free of hydrocarbons
- Hybrid bearing suspension for low vibration levels
- Space and weight saving
- Low component count
- Favourable price-to-performance ratio
- Installation and user friendly
- Practically maintenance free

Typical Applications

For example

- LC-MS (linking of a liquid chromatograph to a mass spectrometer)
- GC/MS (linking of a gas chromatograph to a mass spectrometer)
- TOF-MS (time-of-flight mass spectrometer)
- ICP-MS (inductively coupled plasma mass spectrometry)
- Helium leak detectors

Technical Features

- Dual Inlet (pumping down of two analysis chambers)
- Triple inlet (pumping down of three analysis chambers)
- High effective pumping speed

HV stage	up to 400 l/s
Interstage IS 1	up to 300 l/s
Interstage IS 2	up to 50 l/s

- Cartridge solutions (without pump housing) are available
- Compact vacuum system

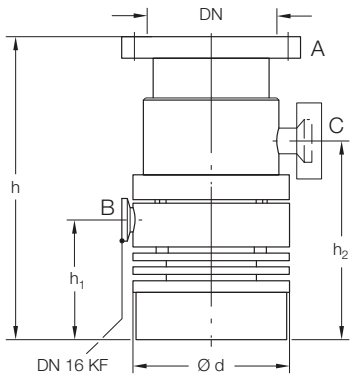
Customized versions are available upon request

Mechanical Rotor Suspension without Compound Stage

TURBOVAC 50

Typical Applications

- Leak detectors
- Mass spectrometers
- Electron beam microscopy
- TV tube manufacturing
- Load locks and transfer chambers
- High vacuum chambers

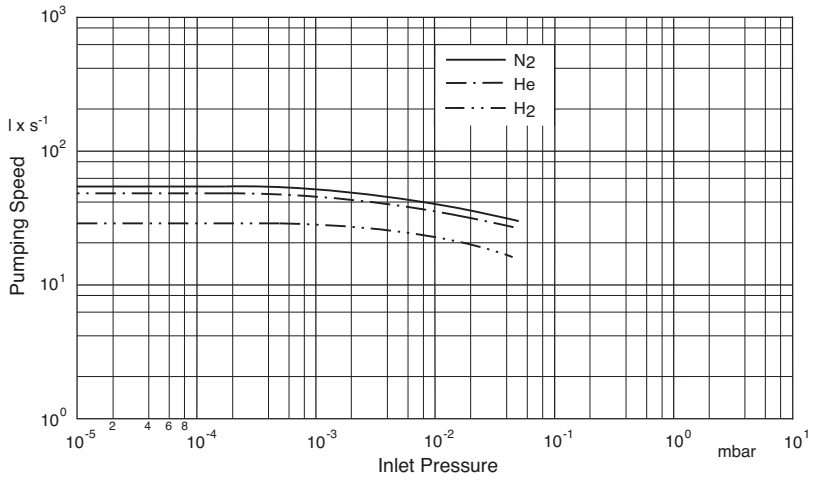


DN		a	b	d	h	h_1	h_2
40 ISO-KF	mm	54.5	55	93	166	71.5	119
	in.	2.15	2.17	3.66	6.54	2.81	4.69
63 ISO-K	mm	54.5	55	93	157.5	71.5	119
	in.	2.15	2.17	3.66	6.20	2.81	4.69

Dimensional drawing for the TURBOVAC 50

Technical Features

- Small footprint
- Installation in any orientation
- Cooling by convection is sufficient for most applications
- Air and water cooling can be added easily
- Oil-free pump for generating clean high and ultra-high vacuum conditions



Pumping speed as a function of the inlet pressure (TURBOVAC 50 with flange DN 63 ISO-K)

Advantages to the User

- Space-saving
- Easy to integrate into complex vacuum systems
- Low operating costs
- Highly reliable operation also in processes loaded with particles

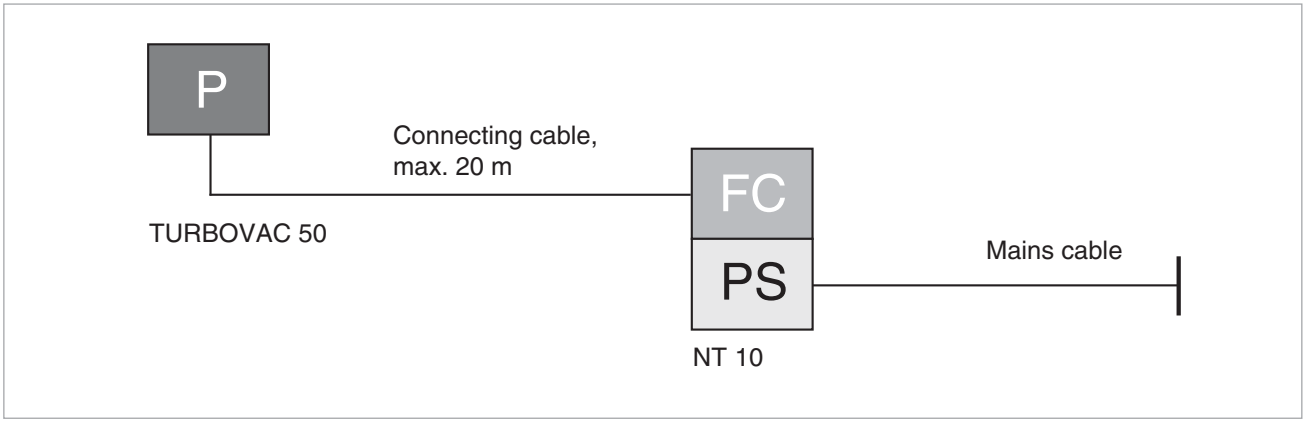
Technical Data — TURBOVAC 50

Connection			
Inlet	DN	40 ISO-KF • 40 CF	63 ISO-K • 63 ICF
Outlet	DN	16 ISO-KF	16 ISO-KF
Pumping speed			
N_2	l x s^{-1}	33	55
Ar	l x s^{-1}	30	50
He	l x s^{-1}	36	48
H_2	l x s^{-1}	28	30
Gas throughput			
N_2	mbar · l x s^{-1}	0.90	1.00
Ar	mbar · l x s^{-1}	0.70	0.80
He	mbar · l x s^{-1}	0.30	0.40
H_2	mbar · l x s^{-1}	0.25	0.30
Compression ratio			
N_2		2×10^6	2×10^6
Ar		2×10^6	2×10^6
He		5×10^2	5×10^2
H_2		2×10^2	2×10^2
Ultimate pressure	mbar (Torr)	< 5×10^{-8} (< 3.8×10^{-8})	< 5×10^{-8} (< 3.8×10^{-8})
Max. foreline pressure for N_2	mbar (Torr)	1×10^{-1} (7.5×10^{-2})	1×10^{-1} (7.5×10^{-2})
Recommended forevacuum pump		TRIVAC D 2,5 E	TRIVAC D 2,5 E
Nominal rotation speed	min^{-1} (rpm)	72 000	72 000
Run-up time, approx.	min	2	2
Max. power consumption	W	45	45
Power consumption at ultimate pressure	W	15	15
Admissible ambient temperature	°C (°F)	+10 to +55 (+50 to +131)	+10 to +55 (+50 to +131)
Cooling			
standard		Convection	Convection
optional		Air / Water	Air / Water
Cooling water connection		10 mm hose nozzle	10 mm hose nozzle
Cooling water consumption	l x h^{-1}	15 to 25	15 to 25
Permissible cooling water pressure	bar	3 to 7	3 to 7
Permissible cooling water temperature	°C (°F)	+10 to +35 (+50 to +95)	+10 to +35 (+50 to +95)
Weight	kg (lbs)	2.0 (4.4)	2.0 (4.4)

Technical Data — TURBOTRONIK NT 10

Mains connection	50/60 Hz	100-120 or 200-240 V
Max. power consumption	W	45
Max. output voltage	V	3 x 150
Max. output current	A	6
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	0 to +40 (+32 to +104)
Dimensions (W x H x D)	mm (in.)	106 x 128 x 233 (4.17 x 5.04 x 9.17)
Weight, approx.	kg (lbs)	1.5 (3.3)

TURBOVAC 50 without Compound Stage P	Part No.	
DN 40 ISO-KF, convection	854 00	
DN 40 CF, convection	853 99	
DN 63 ISO-K, convection	854 01	
DN 63 CF, convection	854 02	
Mandatory Accessories FC PS		
Electronic frequency converter TURBOTRONIK NT 10		
with EURO plug, 180-240 V	859 00	
with US plug, 90-140 V	859 01	
Connecting cable converter – TURBOVAC		
1.0 m (3.5 ft)	200 11 609	
3.0 m (10.5 ft)	121 08	
5.0 m (17.5 ft)	121 09	
10.0 m (35.0 ft)	161 10	
20.0 m (70.0 ft)	800150V2000	
Forevacuum pump		
TRIVAC D 2,5 E		
220-240 V, 50 Hz; 230 V, 60 Hz; Schuko plug, EURO version	140 000	
110-120 V, 200-240 V, 50/60 Hz; without plug, world version	140 001	
110-120 V, 50/60 Hz; NEMA plug, US version	140 002	
100 V, 50/60 Hz; NEMA plug, Japan version	140 003	
For further types, see Catalog Part “Oil sealed Vacuum Pumps”		



Ordering Information

TURBOVAC 50

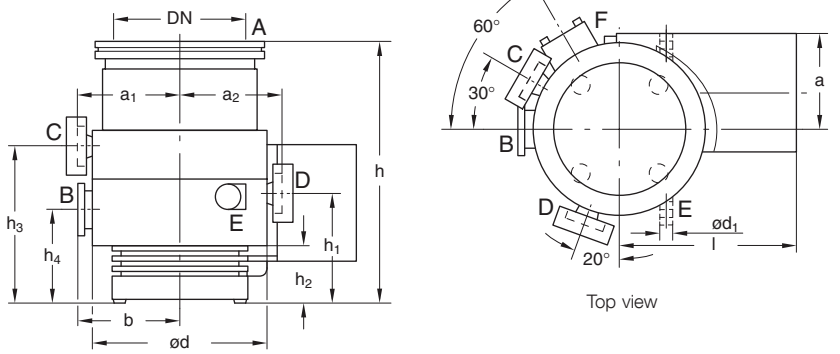
Accessories, optional	Part No.
Air cooling unit 230 V AC 100 - 115 V AC	 **854 05** **800152V0015**
Water cooling kit (hose nozzles ∅10 mm (0.4 in.)	**800135V0003**
Vibration absorber DN 63 ISO-K	 **800131V0063**
Solenoid venting valve, normally closed 24 V DC, DN 16 ISO-KF	 **800120V0011**
Power failure venting valve, normally open 24 V DC, DN 16 ISO-KF	 **800120V0021**
Included in the Delivery of the Pump P	
Inlet screen, centering ring with FPM sealing ring, outer ring	**ISO-K**
Inlet screen, centering ring with FPM O-ring, clamping ring	**ISO-KF**
Centering ring with O-ring, clamping ring	**Foreline Flange**
Included in the Delivery of the Frequency Converter FC PS	
Mains cable	

Mechanical Rotor Suspension without Compound Stage

TURBOVAC 151, 151 C ClassicLine

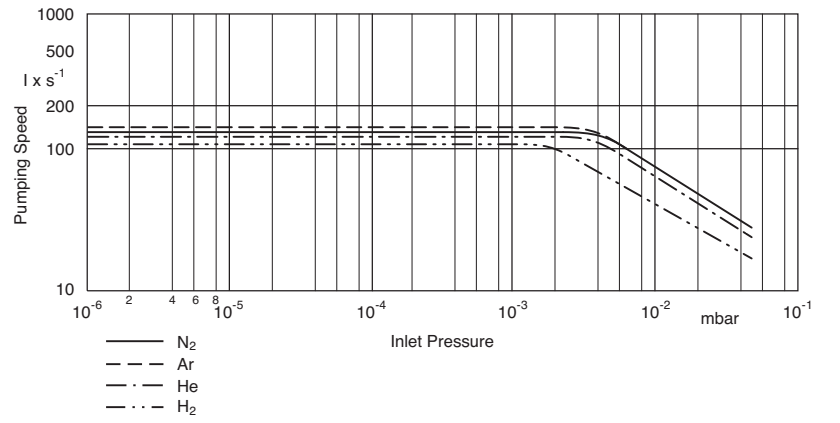
Turbomolecular pumps without a purge gas facility are only suited for pumping of air or inert gases.
They are not suited for pumping of aggressive or reactive gases.

TURBOVAC pumps with a “C” in the type designation are equipped with a purge gas facility.
The purge gas protects the bearing area and the motor of the TURBOVAC.



DN		151 h	151 C h	151 C h_1	h_2	h_3	h_4	a	a_1	a_2	b	d	d_1	l
100 ISO-K	mm	207	207	88	47	126	73	76	79	78	76	132	10	136
	in.	8.14	8.14	3.46	1.85	4.96	2.87	2.99	3.11	3.07	2.99	5.20	0.39	5.35
100 CF	mm	224	–	–	47	126	73	76	79	78	76	132	10	136
	in.	8.82	–	–	1.85	4.96	2.87	2.99	3.11	3.07	2.99	5.20	0.39	5.35

Dimensional drawing for the TURBOVAC 151 and 151 C



Pumping speed as a function of the inlet pressure (TURBOVAC 151 with flange DN 100)

Typical Applications

- Leak detectors
- Mass spectrometers
- Optical coating
- R & D
  - UHV systems
  - Particle accelerators
- Load locks and transfer chambers

Technical Features

- Small footprint
- Operation in any orientation
- Oil-free pump for generating clean high and ultra-high vacuum conditions
- Bearing temperature measurement through the TURBO.DRIVE TD 20 *classic*

Advantages to the User

- Space-saving
- Easy to integrate into complex vacuum systems
- Low operating costs
- Highly reliable operation also in processes loaded with particles

Technical Data — TURBOVAC 151 (C)

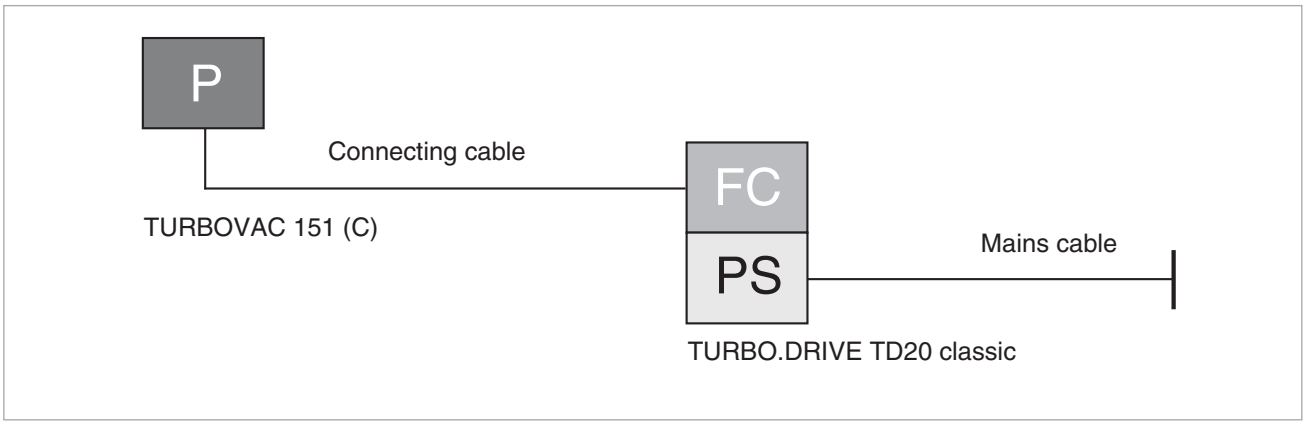
Connection			
Inlet	DN	100 ISO-K	100 CF
Outlet	DN	25 ISO-KF	25 ISO-KF
Pumping speed			
N_2	l x s^{-1}	145	145
Ar	l x s^{-1}	150	150
He	l x s^{-1}	135	135
H_2	l x s^{-1}	115	115
Gas throughput			
N_2	mbar · l x s^{-1}	1.5	1.5
Ar	mbar · l x s^{-1}	1.3	1.3
He	mbar · l x s^{-1}	1.5	1.5
H_2	mbar · l x s^{-1}	1.0	1.0
Compression ratio			
N_2		1×10^9	1×10^9
Ar		1×10^9	1×10^9
He		2×10^4	2×10^4
H_2		8×10^2	8×10^2
Ultimate pressure	mbar (Torr)	< 1×10^{-10} (< 7.5×10^{-11})	< 1×10^{-10} (< 7.5×10^{-11})
Max. foreline pressure for N_2	mbar (Torr)	5×10^{-1} (3.8×10^{-1})	5×10^{-1} (3.8×10^{-1})
Recommended forevacuum pump		from TRIVAC D 4 B to D 16 B	from TRIVAC D 4 B to D 16 B
Nominal rotation speed	min^{-1} (rpm)	50 000	50 000
Run-up time, approx.	min	2	2
Max. power consumption	W	300	300
Power consumption at ultimate pressure	W	70	70
Admissible ambient temperature	°C (°F)	10 to 55 (50 to 131)	10 to 55 (50 to 131)
Cooling			
standard		Water	Water
optional		Air	Air
Cooling water connection		10 mm hose nozzle	10 mm hose nozzle
Cooling water consumption	l x h^{-1}	15 to 35	15 to 35
Permissible cooling water pressure	bar	3 to 7	3 to 7
Permissible cooling water temperature	°C (°F)	10 to 25 (50 to 77)	10 to 25 (50 to 77)
Weight	kg (lbs)	8 (17)	8 (17)

Technical Data — TURBO.DRIVE TD 20 *classic*

Mains connection	50/60 Hz	100 to 240 V (+15 % / -10 %)
Max. power consumption	W	500
Max. output voltage	V	3 x 47
Max. output current	A	5
Interface		Without, RS 232 C, RS 485 C, Profibus or 25-way terminal strip
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	213 x 128 x 315 (8.39 x 5.04 x 12.40)
Weight, approx.	kg (lbs)	4.0 (8.8)

TURBOVAC 151 (C) without Compound Stage P	Part No.	
DN 100 ISO-K, water-cooled	**856 31**	
DN 100 ISO-K, water-cooled (C version)	**856 35**	
DN 100 CF, water-cooled	**856 32**	
DN 100 CF, water-cooled (C version)	**103 41**	
Mandatory Accessories FC PS		
TURBO.DRIVE TD 20 *classic*		
without interface	**800075V0001**	
with RS 232 C interface	**800075V0002**	
with RS 485 C interface	**800075V0004**	
with Profibus	**800075V0003**	
with 25-pol I/O	**800075V0005**	
Connecting cable TURBOVAC - frequency converter		
3 m (10.5 ft)	**857 65**	
5 m (17.5 ft)	**857 66**	
10 m (35.0 ft)	**857 67**	
20 m (70.0 ft)	**857 68**	
50 m (175.0 ft)	**800152V0008**	
60 m (210.0 ft)	**800152V0007**	
80 m (280.0 ft)	**800152V0080**	
140 m (490.0 ft)	**800152V0140**	
Mains cable		
3 m (10.5 ft)		
EURO plug	**800102V0002**	
UK plug	**800102V0003**	
US plug 5-15 P	**800102V1002**	
2 m (7.5 ft)		
US plug 115 V AC	**992 76 513**	
Forevacuum pump		
TRIVAC D 4 B		
1 phase motor; 230 V, 50 Hz	**112 45**	
1 phase dual voltage motor; 100-120 V / 200-240 V; 50/60 Hz	**140 081** [1]	
TRIVAC D 8 B		
1 phase motor; 230 V, 50 Hz	**112 55**	
1 phase dual voltage motor; 100-220 V / 200-240 V; 50/60 Hz	**140 082** [1]	
TRIVAC D 16 B		
1 phase motor; 230 V, 50 Hz	**112 65**	
1 phase motor; 230 V, 50/60 Hz	**113 25**	
3 phase motor; 200-240 V/380-400 V, 50 Hz / 200-240 V/380-480 V, 60 Hz	**112 66**	
SCROLLVAC SC 30 D		
1 phase motor; 200-230 V, 50/60 Hz	**133 002**	
1 phase motor; 100-115 V, 50/60 Hz	**133 102**	
3 phase motor; 380-415 V, 50 Hz / 200-230 V, 460 V 60 Hz	**133 004**	
For further types, see Catalog Parts “Oil Sealed Vacuum Pumps” and “Dry Compressing Vacuum Pumps”		

[1] The mains cord (Part No. 200 81 091) must be ordered additionally



Ordering Information

TURBOVAC 151 (C)

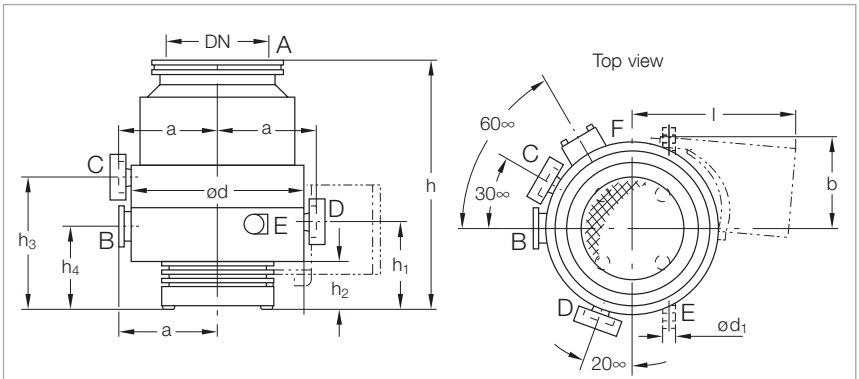
Accessories, optional	Part No.
Air cooling unit	
230 V AC	855 31
100 - 115 V AC	800152V0016
Flange heater	
DN 100 CF, 230 V, 50 Hz	854 27
DN 100 CF, 115 V, 60 Hz	854 28
Vibration absorber	
DN 100 ISO-K	800131V0100
DN 100 CF	500 071
Solenoid venting valve, with gas admission filter, normally closed	
24 V DC, DN 16 ISO-KF	800120V0011
Power failure venting valve, with gas admission filter, normally open	
24 V DC, DN 16 ISO-KF	800120V0021
Purge gas and venting valve	
gas flow at 1 bar 0.4 mbar x l x s^{-1} (24 sccm),	
pump connection DN 10 ISO-KF / gas connection G 1/4"	
230 V AC	800152V0014
100 - 115 V AC	800152V0041
24 V DC	800152V0013
Gas filter to G 1/4" for purge gas and venting valve	800110V0012
Replacement filter (for gas filter to G 1/4" for purge gas and venting valve)	E 200 18 515
Included in the Delivery of the Pump P	
Inlet screen, centering ring with FPM sealing ring, outer ring	ISO-K
Inlet screen	CF
Centering ring with O-ring, clamping ring	Foreline Flange
Pivoted threaded fittings to replace the included hose nipples	Water Cooling

Mechanical Rotor Suspension without Compound Stage

TURBOVAC 361, 361 C ClassicLine

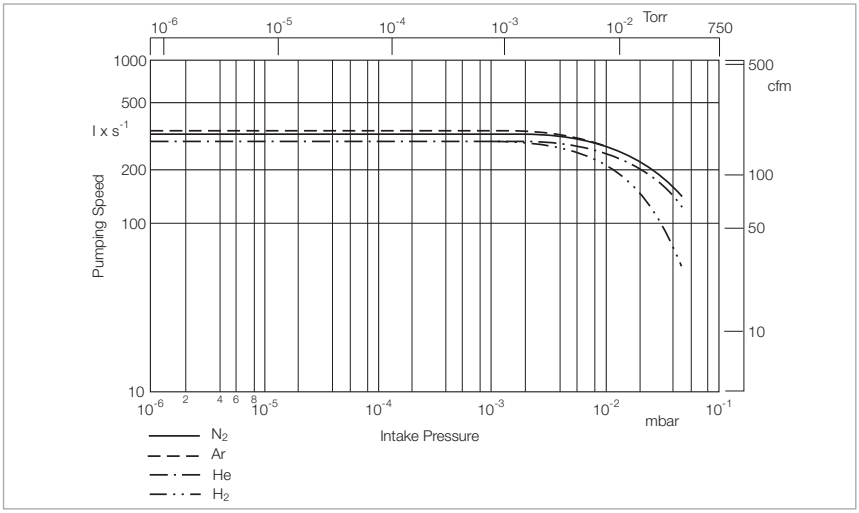
Turbomolecular pumps without a purge gas facility are only suited for pumping of air or inert gases.
They are not suited for pumping of aggressive or reactive gases.

TURBOVAC pumps with a “C” in the type designation are equipped with a purge gas facility.
The purge gas protects the bearing area and the motor of the TURBOVAC.



DN		361 h	361 C h	361 C h_1	h_2	h_3	h_4	a	b	d_1	l
100 ISO-K	mm	254	254	88	47	135	77	98	94	10	166
	in.	10	10	3.46	1.85	5.31	3.03	3.86	3.70	0.39	6.54
100 CF	mm	268	–	–	47	135	77	98	94	10	166
	in.	10.55	–	–	1.85	5.31	3.03	3.86	3.70	0.39	6.54
160 ISO-K	mm	227	227	88	47	135	77	98	94	10	166
	in.	8.94	8.94	3.46	1.85	5.31	3.03	3.86	3.70	0.39	6.54
160 CF	mm	226	–	–	47	135	77	98	94	10	166
	in.	8.90	–	–	1.85	5.31	3.03	3.86	3.70	0.39	6.54

Dimensional drawing for the TURBOVAC 361 and 361 C



Pumping speed as a function of the inlet pressure (TURBOVAC 361 with flange DN 100)

Typical Applications

- Leak detectors
- Mass spectrometers
- Data storage
- Optical coating
- R & D
  - UHV systems
  - Particle accelerators
- Load locks and transfer chambers

Technical Features

- Small footprint
- Installation in any orientation
- Oil-free pump for generating clean high and ultra-high vacuum conditions
- Bearing temperature measurement through the TURBO.DRIVE TD 20 *classic*

Advantages to the User

- Space-saving
- Easy to integrate into complex vacuum systems
- Low operating costs
- Highly reliable operation also in processes loaded with particles

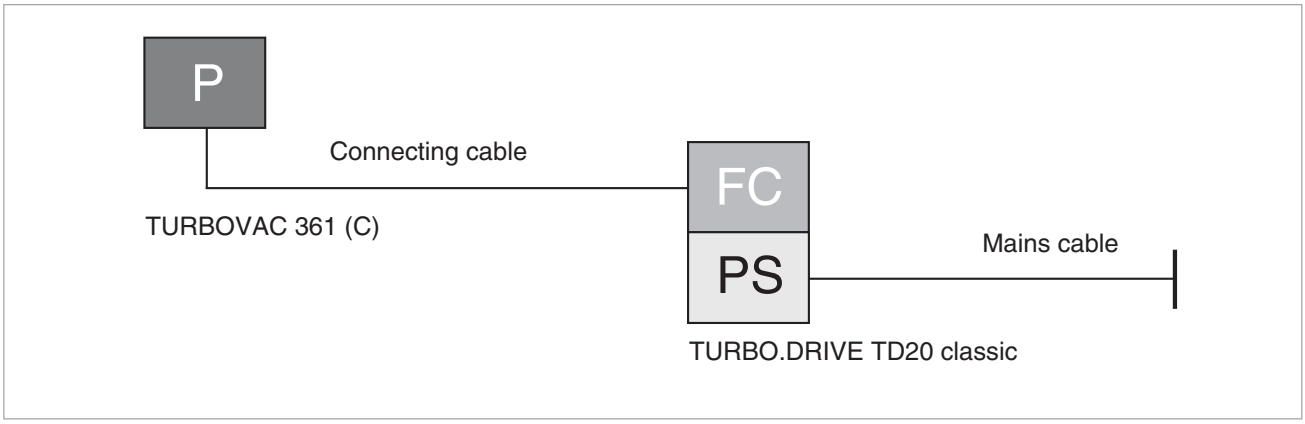
Technical Data — TURBOVAC 361 (C)

Connection			
Inlet	DN	100 ISO-K • 100 CF	160 ISO-K • 160 CF
Outlet	DN	25 ISO-KF	25 ISO-KF
Pumping speed			
N_2	l x s^{-1}	345	400
Ar	l x s^{-1}	350	410
He	l x s^{-1}	340	380
H_2	l x s^{-1}	340	370
Gas throughput			
N_2	mbar · l x s^{-1}	3.0	3.0
Ar	mbar · l x s^{-1}	2.5	2.5
He	mbar · l x s^{-1}	3.0	3.0
H_2	mbar · l x s^{-1}	2.0	2.0
Compression ratio			
N_2		1×10^9	1×10^9
Ar		1×10^9	1×10^9
He		6×10^4	6×10^4
H_2		3×10^3	3×10^3
Ultimate pressure	mbar (Torr)	< 1×10^{-10} (< 7.5×10^{-11})	< 1×10^{-10} (< 7.5×10^{-11})
Max. foreline pressure for N_2	mbar (Torr)	5×10^{-1} (4×10^{-1})	5×10^{-1} (3.8×10^{-1})
Recommended forevacuum pump		from TRIVAC D 16 B to D 25 B	from TRIVAC D 16 B to D 25 B
Nominal rotation speed	min^{-1} (rpm)	45 000	45 000
Run-up time, approx.	min	2	2
Max. power consumption	W	300	300
Power consumption at ultimate pressure	W	70	70
Admissible ambient temperature	°C (°F)	10 to 55 (50 to 131)	10 to 55 (50 to 131)
Cooling			
standard		Water	Water
optional		Air	Air
Cooling water connection		10 mm hose nozzle	10 mm hose nozzle
Cooling water consumption	l x h^{-1}	15 to 35	15 to 35
Permissible cooling water pressure	bar	3 to 7	3 to 7
Permissible cooling water temperature	°C (°F)	10 to 25 (50 to 77)	10 to 25 (50 to 77)
Weight	kg (lbs)	12 (26)	12 (26)

Technical Data — TURBO.DRIVE TD 20 *classic*

Mains connection	50/60 Hz	100 to 240 V (+15 % / -10 %)
Max. power consumption	W	500
Max. output voltage	V	3 x 47
Max. output current	A	5
Interface		Without, RS 232 C, RS 485 C, Profibus or 25-way terminal strip
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	213 x 128 x 315 (8.39 x 5.04 x 12.40)
Weight, approx.	kg (lbs)	4.0 (8.8)

TURBOVAC 361 (C) without Compound Stage P	Part No.	
DN 100 ISO-K, water-cooled	856 70	
DN 100 ISO-K, water-cooled (C version)	856 75	
DN 100 CF, water-cooled	856 71	
DN 100 CF, water-cooled (C version)	112 09	
DN 160 ISO-K, water-cooled	856 72	
DN 160 ISO-K, water-cooled (C version)	856 77	
DN 160 CF, water-cooled	856 73	
Mandatory Accessories FC PS		
TURBO.DRIVE TD 20 *classic*		
without interface	800075V0001	
with RS 232 C interface	800075V0002	
with RS 485 C interface	800075V0004	
with Profibus	800075V0003	
with 25-pol I/O	800075V0005	
Connecting cable TURBOVAC - frequency converter		
3 m (10.5 ft)	857 65	
5 m (17.5 ft)	857 66	
10 m (35.0 ft)	857 67	
20 m (70.0 ft)	857 68	
50 m (175.0 ft)	800152V0008	
60 m (210.0 ft)	800152V0007	
80 m (280.0 ft)	800152V0080	
140 m (490.0 ft)	800152V0140	
Mains cable		
3 m (10.5 ft)		
EURO plug	800102V0002	
UK plug	800102V0003	
US plug 5-15 P	800102V1002	
2 m (7.5 ft)		
US plug 115 V AC	992 76 513	
Forevacuum pump		
TRIVAC D 16 B		
1 phase motor; 230 V, 50 Hz	112 65	
1 phase motor; 230 V, 50/60 Hz	113 25	
3 phase motor; 200-240 V/380-400 V, 50 Hz / 200-240 V/380-480 V, 60 Hz	112 66	
TRIVAC D 25 B		
1 phase motor; 230 V, 50 Hz	112 75	
1 phase motor; 230 V, 50/60 Hz	113 35	
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz	112 76	
SCROLLVAC SC 30 D		
1 phase motor; 200-230 V, 50/60 Hz	133 002	
1 phase motor; 100-115 V, 50/60 Hz	133 102	
3 phase motor; 380-415 V, 50 Hz / 200-230 V, 460 V, 60 Hz	133 004	
For further types, see Catalog Parts “Oil Sealed Vacuum Pumps” and “Dry Compressing Vacuum Pumps”		



Ordering Information

TURBOVAC 361 (C)

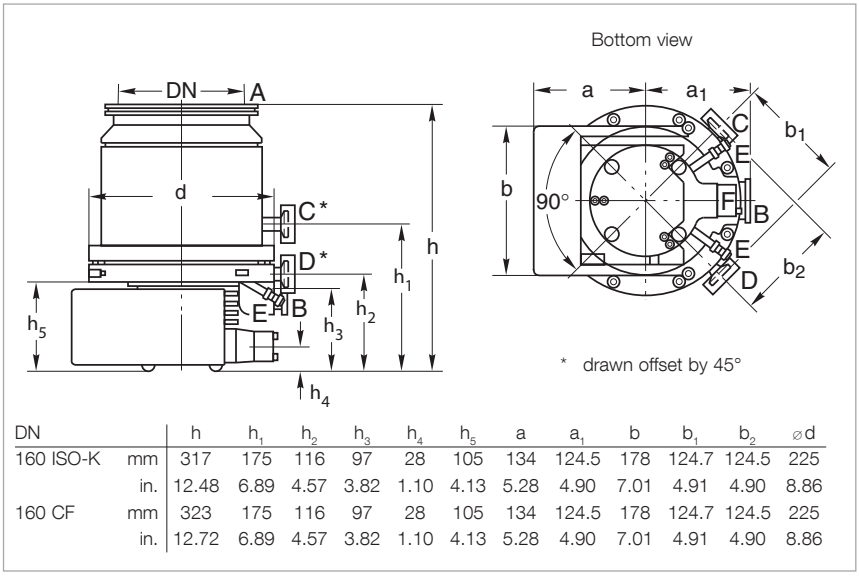
Accessories, optional	Part No.
Air cooling unit	
230 V AC	855 31
100 - 115 V AC	800152V0016
Flange heater	
DN 100 CF, 230 V, 50 Hz	854 27
DN 100 CF, 115 V, 60 Hz	854 28
DN 160 CF, 230 V, 50 Hz	854 37
DN 100 CF, 115 V, 60 Hz	854 38
Vibration absorber	
DN 100 ISO-K	800131V0100
DN 100 CF	500 071
DN 160 ISO-K	500 073
DN 160 CF	500 072
Solenoid venting valve, with gas admission filter, normally closed	
24 V DC, DN 16 ISO-KF	800120V0011
Power failure venting valve, with gas admission filter, normally open	
24 V DC, DN 16 ISO-KF	800120V0021
Purge gas and venting valve	
gas flow at 1 bar 0.4 mbar x l x s^{-1} (24 sccm),	
pump connection DN 10 ISO-KF / gas connection G 1/4"	
230 V AC	800152V0014
100 - 115 V AC	800152V0042
24 V DC	800152V0013
Gas filter to G 1/4" for purge gas and venting valve	800110V0012
Replacement filter	E 200 18 515
Included in the Delivery of the Pump P	
Inlet screen, centering ring with FPM sealing ring, outer ring	ISO-K
Inlet screen	CF
Centering ring with O-ring, clamping ring	Foreline Flange
Pivoted threaded fittings to replace the included hose nipples	Water Cooling

Mechanical Rotor Suspension without Compound Stage

TURBOVAC 600 C ClassicLine

Typical Applications

- Load locks and transfer chambers
- Optical coating
- Flat panel displays
- R & D

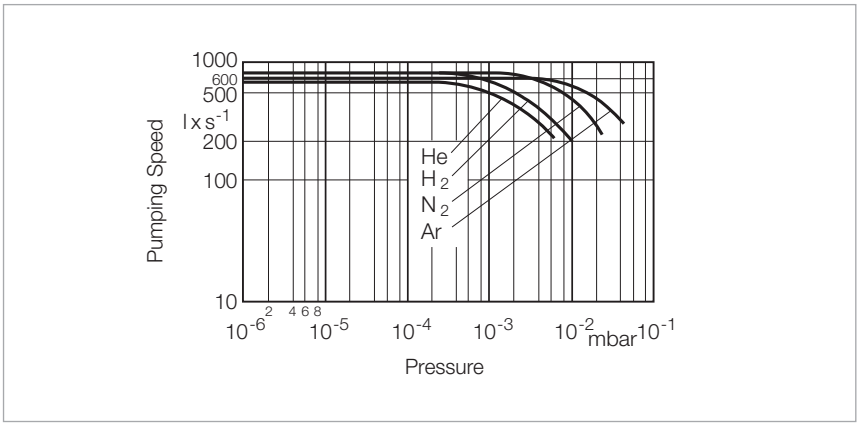


DN		h	h_1	h_2	h_3	h_4	h_5	a	a_1	b	b_1	b_2	⌀d
160 ISO-K	mm	317	175	116	97	28	105	134	124.5	178	124.7	124.5	225
	in.	12.48	6.89	4.57	3.82	1.10	4.13	5.28	4.90	7.01	4.91	4.90	8.86
160 CF	mm	323	175	116	97	28	105	134	124.5	178	124.7	124.5	225
	in.	12.72	6.89	4.57	3.82	1.10	4.13	5.28	4.90	7.01	4.91	4.90	8.86

Dimensional drawing for the TURBOVAC 600 C

Technical Features

- Small footprint
- Installation in any orientation
- Oil-free pump for generating clean high and ultra-high vacuum conditions
- Bearing temperature measurement through the TURBO.DRIVE TD 20 *classic*
- Seal gas connection
- Venting connection



Pumping speed for different gases as a function of intake pressure
(TURBOVAC 600 C with flange DN 160 ISO-K)

Advantages to the User

- Installation in any orientation
- Highly reliable due to hybrid ceramic ball bearings

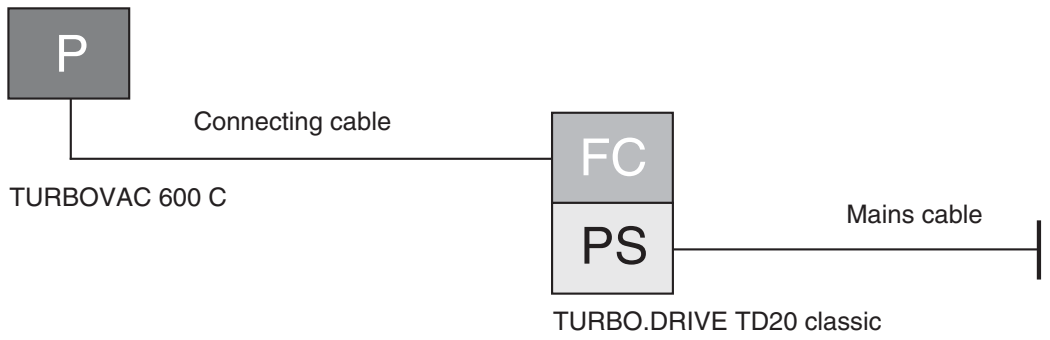
Technical Data — TURBOVAC 600 C

Connection		
Inlet	DN	160 ISO-K • 160 CF
Outlet	DN	40 ISO-KF
Pumping speed		
N_2	l x s^{-1}	560
Ar	l x s^{-1}	550
He	l x s^{-1}	600
H_2	l x s^{-1}	570
Gas throughput		
N_2	mbar · l x s^{-1}	4.0
Ar	mbar · l x s^{-1}	4.0
He	mbar · l x s^{-1}	5.5
H_2	mbar · l x s^{-1}	4.0
Compression ratio		
N_2		> 10^9
Ar		> 10^9
He		2.0 x 10^4
H_2		1.1 x 10^3
Ultimate pressure	mbar (Torr)	< 1.0 x 10^{-10} (< 7.5 x 10^{-11})
Max. foreline pressure for N_2	mbar (Torr)	1.0 x 10^{-1} (7.5 x 10^{-2})
Recommended forevacuum pump		TRIVAC D 25 B / D 40 B
Nominal rotation speed	min^{-1} (rpm)	36 000
Run-up time, approx.	min	3
Max. power consumption	W	400
Power consumption at ultimate pressure	W	90
Admissible ambient temperature	°C (°F)	10 to 55 (50 to 131)
Cooling		
standard		Water
optional		Air
Cooling water connection		10 mm hose nozzle
Cooling water consumption	l x h^{-1}	20 to 80
Permissible cooling water pressure	bar	3 to 7
Permissible cooling water temperature	°C (°F)	10 to 30 (50 to 86)
Weight	kg (lbs)	17.0 (37.5)

Technical Data — TURBO.DRIVE TD 20 *classic*

Mains connection	50/60 Hz	100 to 240 V (+15 % / -10 %)
Max. power consumption	W	500
Max. output voltage	V	3 x 47
Max. output current	A	5
Interface		Without, RS 232 C, RS 485 C, Profibus or 25-way terminal strip
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	213 x 128 x 315 (8.39 x 5.04 x 12.40)
Weight, approx.	kg (lbs)	4.0 (8.8)

TURBOVAC 600 C without Compound Stage	P	Part No.	
DN 160 ISO-K, water-cooled		800150V0015	
DN 160 CF, water-cooled		800150V0017	
	FC PS		
TURBO.DRIVE TD 20 *classic*			
without interface		800075V0001	
with RS 232 C interface		800075V0002	
with RS 485 C interface		800075V0004	
with Profibus		800075V0003	
with 25-pol I/O		800075V0005	
Connecting cable TURBOVAC - frequency converter			
3 m (10.5 ft)		857 65	
5 m (17.5 ft)		857 66	
10 m (35.0 ft)		857 67	
20 m (70.0 ft)		857 68	
50 m (175.0 ft)		800152V0008	
60 m (210.0 ft)		800152V0007	
80 m (280.0 ft)		800152V0080	
140 m (490.0 ft)		800152V0140	
Mains cable			
3 m (10.5 ft)			
EURO plug		800102V0002	
UK plug		800102V0003	
US plug 5-15 P		800102V1002	
2 m (7.5 ft)			
US plug 115 V AC		992 76 513	
Forevacuum pump			
TRIVAC D 25 B			
1 phase motor; 230 V, 50 Hz		112 75	
1 phase motor; 230 V, 50/60 Hz		113 35	
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz;		112 76	
TRIVAC D 40 B			
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz		112 86	
3 phase motor; 200/346 V, 50 Hz / 208/360 V, 60 Hz		113 47	
SCROLLVAC SC 30 D			
1 phase motor; 200-230 V, 50/60 Hz		133 002	
1 phase motor; 100-115 V, 50/60 Hz		133 102	
3 phase motor; 380-415 V, 50 Hz / 200-230 V, 460 V, 60 Hz		133 004	
For further types, see Catalog Parts “Oil Sealed Vacuum Pumps” and “Dry Compressing Vacuum Pumps”			



Ordering Information

TURBOVAC 600 C

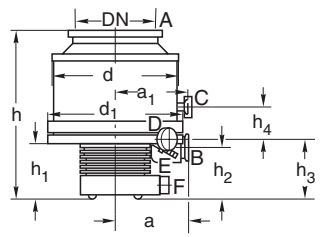
Accessories, optional	Part No.
Air cooling unit	
230 V AC	**855 41**
100 - 115 V AC	**800152V0017**
Flange heater	
DN 160 CF, 230 V, 50 Hz	**854 37**
DN 100 CF, 115 V, 60 Hz	**854 38**
Vibration absorber	
DN 160 ISO-K	**500 073**
DN 160 CF	**500 072**
Solenoid venting valve, with gas admission filter, normally closed	
24 V DC, DN 16 ISO-KF	**800120V0011**
Power failure venting valve, with gas admission filter, normally open	
24 V DC, DN 16 ISO-KF	**800120V0021**
Purge gas and venting valve	
gas flow at 1 bar 0.6 mbar x l x s^{-1} (36 sccm),	
pump connection DN 10 ISO-KF / gas connection G 1/4"	
230 V AC	**800152V0040**
100 - 115 V AC	**800152V0043**
24 V DC	**800152V0012**
Gas filter to G 1/4" for purge gas and venting valve	**800110V0012**
Replacement filter	**E 200 18 515**
Included in the Delivery of the Pump P	
Inlet screen, centering ring with FPM sealing ring, outer ring	**ISO-K**
Inlet screen	**CF**
Centering ring with O-ring, clamping ring	**Foreline Flange**
Pivoted threaded fittings to replace the included hose nipples	**Water Cooling**

Mechanical Rotor Suspension without Compound Stage

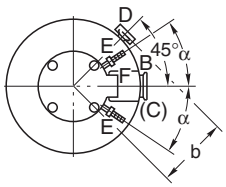
TURBOVAC 1000 C ClassicLine

Typical Applications

- Research systems



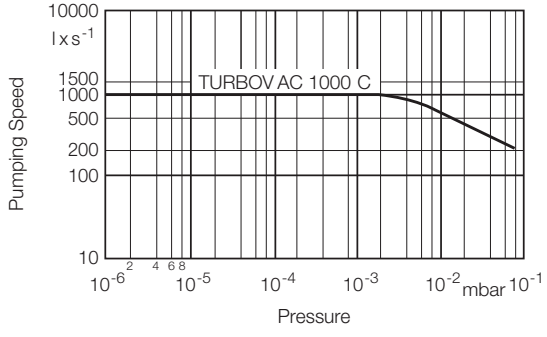
Bottom view



[1] DN 40 ISO-KF, cast base flange
[2] DN 63 ISO-K, screwed in

DN		h	h_1	h_2	h_3	h_4	a	a_1	b	∅ d	∅ d_1
160 ISO-K/40 ISO-KF [1]	mm	338	111	102	123	62	140	133	141	241	258
	in.	13.31	4.37	4.02	4.84	2.44	5.51	5.24	5.55	9.49	10.16
160 ISO-K/63 ISO-K [2]	mm	341	111	94	123	62	153	133	152	241	258
	in.	13.43	4.37	3.7	4.84	2.44	6.02	5.24	5.98	9.49	10.16
160 CF/40 ISO-KF [1]	mm	348	108	99	121	83	140	133	141	241	258
	in.	13.70	4.25	3.90	4.76	3.27	5.51	5.24	5.55	9.49	10.16
200 ISO-K/40 ISO-KF [1]	mm	351	111	102	123	62	140	133	141	241	258
	in.	13.82	4.37	4.02	4.84	2.44	5.51	5.24	5.55	9.49	10.16
200 CF/40 ISO-KF [1]	mm	336	108	99	121	83	140	133	141	241	258
	in.	13.23	4.25	3.90	4.76	3.27	5.51	5.24	5.55	9.49	10.16
250 ISO-K/40 ISO-KF [1]	mm	307	108	99	121	83	140	133	141	241	258
	in.	12.09	4.25	3.90	4.76	3.27	5.51	5.24	5.55	9.49	10.16
250 ISO-K/63 ISO-K ISO-KF [2]	mm	310	111	94	121	91	153	133	141	241	258
	in.	12.20	4.37	3.70	4.76	3.58	6.02	5.24	5.55	9.49	10.16

Dimensional drawing for the TURBOVAC 1000 C



Pumping speed for air as a function of intake pressure (TURBOVAC 1000 C with DN 250 flange)

Technical Features

- Robust rotor design
- Installation in any orientation
- Highest pumping speed and highest throughput
- Bearing temperature measurement through the TURBO.DRIVE TD 20 *classic*
- Seal gas connection
- Venting connection

Advantages to the User

- Installation in any orientation
- Highly reliable due to hybrid ceramic ball bearings
- Standard model: water cooling
- Purge gas facility

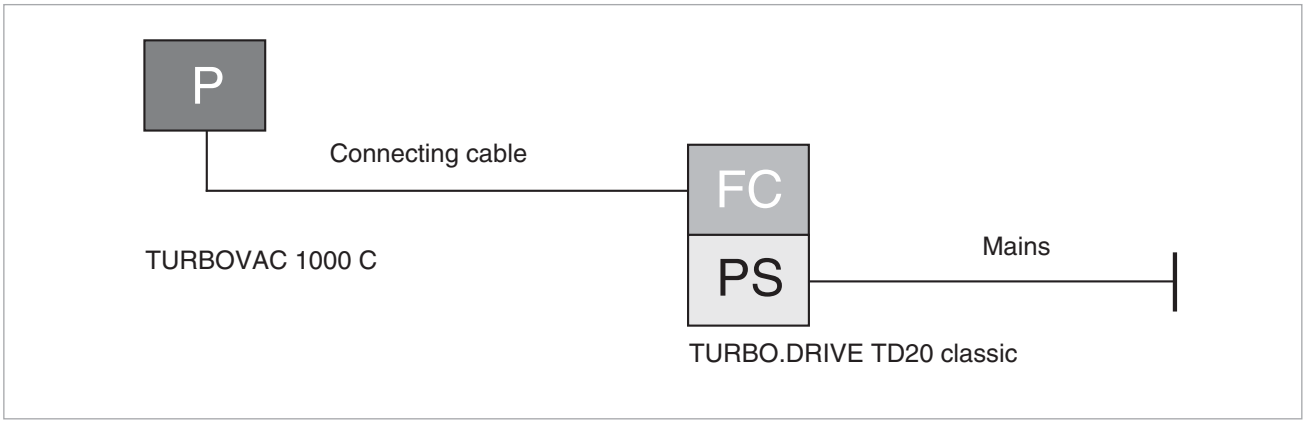
Technical Data — TURBOVAC 1000 C

Connection				
Inlet	DN	160 ISO-K • 160 CF	200 ISO-K • 200 CF	250 ISO-K
Outlet	DN	40 ISO-KF • 63 ISO-K	40 ISO-KF	40 ISO-KF • 63 ISO-K
Pumping speed				
N_2	l x s^{-1}	850	1100	1150
Ar	l x s^{-1}	810	1050	1100
He	l x s^{-1}	880	975	1000
H_2	l x s^{-1}	900	970	1000
Gas throughput				
N_2	mbar · l x s^{-1}	6.5	6.5	6.5
Ar	mbar · l x s^{-1}	4.0	4.0	4.0
He	mbar · l x s^{-1}	7.0	7.0	7.0
H_2	mbar · l x s^{-1}	8.0	8.0	8.0
Compression ratio				
N_2		> 1 x 10^9	> 1 x 10^9	> 1 x 10^9
Ar		> 1 x 10^9	> 1 x 10^9	> 1 x 10^9
He		5 x 10^4	5 x 10^4	5 x 10^4
H_2		1 x 10^4	1 x 10^4	1 x 10^4
Ultimate pressure	mbar (Torr)	< 1 x 10^{-10} (< 7.5 x 10^{-11})	< 1 x 10^{-10} (< 7.5 x 10^{-11})	< 1 x 10^{-10} (< 7.5 x 10^{-11})
Max. foreline pressure for N_2	mbar (Torr)	5 x 10^{-2} (3.8 x 10^{-2})	5 x 10^{-2} (3.8 x 10^{-2})	5 x 10^{-2} (3.8 x 10^{-2})
Recommended forevacuum pump				
for standard operation		TRIVAC D 25 B / D 40 B	TRIVAC D 25 B / D 40 B	TRIVAC D 25 B / D 40 B
for purge gas operation		TRIVAC D 40 B / D 65 B	TRIVAC D 40 B / D 65 B	TRIVAC D 40 B / D 65 B
Nominal rotation speed	min^{-1} (rpm)	36 000	36 000	36 000
Run-up time, approx.	min	9	9	9
Max. power consumption	W	300	300	300
Power consumption at ultimate pressure	W	200	200	200
Admissible ambient temperature	°C (°F)	10 to 55 (50 to 131)	10 to 55 (50 to 131)	10 to 55 (50 to 131)
Cooling				
standard		Water	Water	Water
optional		Air	Air	Air
Cooling water connection		10 mm hose nozzle	10 mm hose nozzle	10 mm hose nozzle
Cooling water consumption	l x h^{-1}	20 to 80	20 to 80	20 to 80
Permissible cooling water pressure	bar	3 to 7	3 to 7	3 to 7
Permissible cooling water temperature	°C (°F)	10 to 30 (50 to 86)	10 to 30 (50 to 86)	10 to 30 (50 to 86)
Weight	kg (lbs)	25.0 (55.1)	25.0 (55.1)	25 (55.1)

Technical Data — TURBO.DRIVE TD 20 *classic*

Mains connection	50/60 Hz	100 to 240 V (+15 % / -10 %)
Max. power consumption	W	500
Max. output voltage	V	3 x 47
Max. output current	A	5
Interface		Without, RS 232 C, RS 485 C, Profibus or 25-way terminal strip
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	213 x 128 x 315 (8.39 x 5.04 x 12.40)
Weight, approx.	kg (lbs)	4.0 (8.8)

TURBOVAC 1000 C without Compound Stage	P	Part No.	
DN 160 ISO-K / DN 40 ISO-KF, water-cooled		855 35	
DN 160 ISO-K / DN 63 ISO-K, water-cooled		855 38	
DN 160 CF / DN 40 ISO-KF, water-cooled		854 91	
DN 200 ISO-K / DN 40 ISO-KF, water-cooled		153 00	
DN 200 CF / DN 40 ISO-KF, water-cooled		117 64	
DN 250 ISO-K / DN 40 ISO-KF, water-cooled		855 36	
DN 250 ISO-K / DN 63 ISO-K, water-cooled		855 39	
Mandatory Accessories	FC PS		
TURBO.DRIVE TD 20 *classic*			
without interface		800075V0001	
with RS 232 C interface		800075V0002	
with RS 485 C interface		800075V0004	
with Profibus		800075V0003	
with 25-pol I/O		800075V0005	
Connecting cable TURBOVAC - frequency converter			
3 m (10.5 ft)		857 65	
5 m (17.5 ft)		857 66	
10 m (35.0 ft)		857 67	
20 m (70.0 ft)		857 68	
50 m (175.0 ft)		800152V0008	
60 m (210.0 ft)		800152V0007	
80 m (280.0 ft)		800152V0080	
140 m (490.0 ft)		800152V0140	
Mains cable			
3 m (10.5 ft)			
EURO plug		800102V0002	
UK plug		800102V0003	
US plug 5-15 P		800102V1002	
2 m (7.5 ft)			
US plug 115 V AC		992 76 513	
Forevacuum pump			
TRIVAC D 25 B			
1 phase motor; 230 V, 50 Hz		112 75	
1 phase motor; 230 V, 50/60 Hz		113 35	
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz		112 76	
TRIVAC D 40 B			
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz		112 86	
3 phase motor; 200/346 V, 50 Hz / 208/360 V, 60 Hz		113 47	
TRIVAC D 65 B			
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz		112 96	
3 phase motor; 230/346 V, 50 Hz / 208/360 V, 60 Hz		113 57	
SCROLLVAC SC 30 D			
1 phase motor; 200-230 V, 50/60 Hz		133 002	
1 phase motor; 100-115 V, 50/60 Hz		133 102	
3 phase motor; 380-415 V, 50 Hz / 200-230 V, 460 V, 60 Hz		133 004	
For further types, see Catalog Parts “Oil Sealed Vacuum Pumps” and “Dry Compressing Vacuum Pumps”			



Ordering Information

TURBOVAC 1000 C

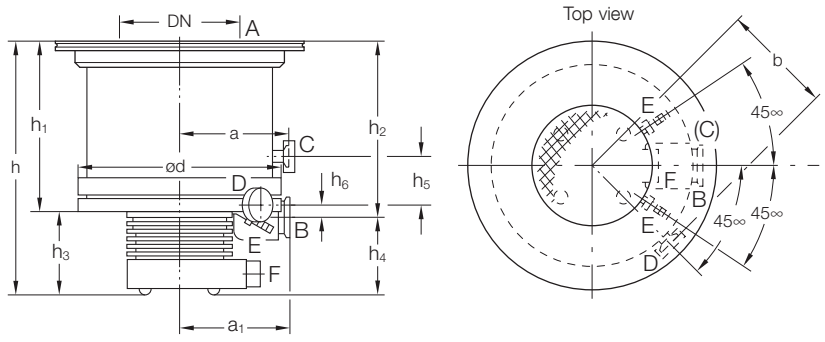
Accessories, optional	Part No.
Air cooling unit	
230 V AC	855 41
100 - 115 V AC	800152V0017
Flange heater	
DN 160 CF, 230 V, 50 Hz	854 37
DN 100 CF, 115 V, 60 Hz	854 38
Vibration absorber	
DN 160 ISO-K	500 073
DN 160 CF	500 072
Solenoid venting valve, with gas admission filter, normally closed	
24 V DC, DN 16 ISO-KF	800120V0011
Power failure venting valve, with gas admission filter, normally open	
24 V DC, DN 16 ISO-KF	800120V0021
Purge gas and venting valve	
gas flow at 1 bar 0.6 mbar x l x s^{-1} (36 sccm),	
pump connection DN 10 ISO-KF / gas connection G 1/4"	
230 V AC	800152V0040
100-115 V AC	800152V0043
24 V DC	800152V0012
Gas filter to G 1/4" for purge gas and venting valve	800110V0012
Replacement filter	E 200 18 515
Included in the Delivery of the Pump P	
Inlet screen, centering ring with FPM sealing ring, outer ring	ISO-K
Inlet screen	CF
Centering ring with O-ring, clamping ring	Foreline Flange
Pivoted threaded fittings to replace the included hose nipples	Water Cooling

Mechanical Rotor Suspension without Compound Stage

TURBOVAC 1100 C ClassicLine

Typical Applications

- Data storage
- Flat panel displays
- Optical coating
- Large area coating
- Load locks and transfer chambers

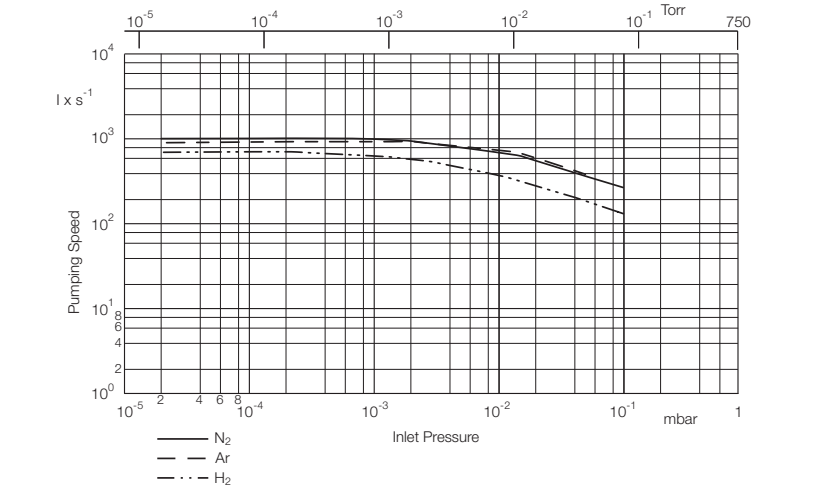


DN		h	h_1	h_2	h_3	h_4	h_5	h_6	a	a_1	b	d
160 ISO-K	mm	341	230	247	111	94	63	28.5	133	153	141	258
	in.	13.43	9.06	9.72	4.37	3.70	2.48	1.12	5.24	6.02	5.55	10.16
200 ISO-K	mm	325	214	231	111	94	63	28.5	133	153	141	258
	in.	12.80	8.43	9.09	4.37	3.70	2.48	1.12	5.24	6.02	5.55	10.16
250 ISO-K	mm	310	200	217	111	94	63	28.5	133	153	141	258
	in.	12.20	7.87	8.54	4.37	3.70	2.48	1.12	5.24	6.02	5.55	10.16

Dimensional drawing for the TURBOVAC 1100 C

Technical Features

- Robust rotor design
- Installation in any orientation
- Highest pumping speed and highest throughput
- Bearing temperature measurement through the TURBO.DRIVE TD 20 *classic*
- Oil-free pump for generating clean high and ultra-high vacuum conditions
- Seal gas connection
- Venting connection



Pumping speed as a function of the inlet pressure (TURBOVAC 1100 C with flange DN 250)

Advantages to the User

- Space-saving
- Easy to integrate into complex vacuum systems
- High productivity
- Low operating costs
- Highly reliable operation also in processes loaded with particles

Technical Data

TURBOVAC 1100 C

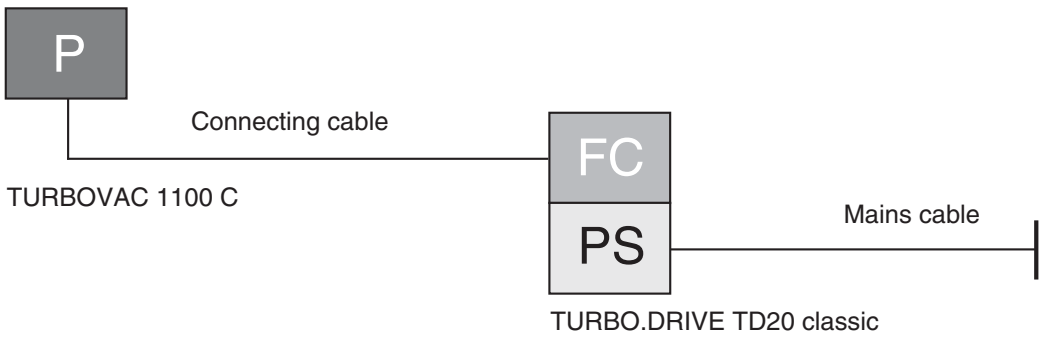
Connection				
Inlet	DN	160 ISO-K	200 ISO-K	250 ISO-K
Outlet	DN	63 ISO-K	63 ISO-K	63 ISO-K
Pumping speed				
N_2	l x s^{-1}	710	830	1050
Ar	l x s^{-1}	660	760	980
He	l x s^{-1}	650	750	850
H_2	l x s^{-1}	520	600	630
Gas throughput				
N_2	mbar · l x s^{-1}	6.5	6.5	6.5
Ar	mbar · l x s^{-1}	6.5	6.5	6.5
He	mbar · l x s^{-1}	8.0	8.0	8.0
H_2	mbar · l x s^{-1}	9.0	9.0	9.0
Compression ratio				
N_2		> 1 x 10^7	> 1 x 10^7	> 1 x 10^7
Ar		> 1 x 10^7	> 1 x 10^7	> 1 x 10^7
He		3 x 10^4	3 x 10^4	3 x 10^4
H_2		1 x 10^3	1 x 10^3	1 x 10^3
Ultimate pressure	mbar (Torr)	< 3.0 x 10^{-10} (< 2.3 x 10^{-10})	< 3.0 x 10^{-10} (< 2.3 x 10^{-10})	< 3.0 x 10^{-10} (< 2.3 x 10^{-10})
Max. foreline pressure for N_2	mbar (Torr)	< 1.0 x 10^{-1} (< 7.5 x 10^{-2})	< 1.0 x 10^{-1} (< 7.5 x 10^{-2})	< 1.0 x 10^{-1} (< 7.5 x 10^{-2})
Recommended forevacuum pump		TRIVAC D 65 B / SCROLLVAC SC 15/30 D	TRIVAC D 65 B / SCROLLVAC SC 15/30 D	TRIVAC D 65 B / SCROLLVAC SC 15/30 D
Nominal rotation speed	min^{-1} (rpm)	30 000	30 000	30 000
Run-up time, approx.	min	9	9	9
Max. power consumption	W	400	400	400
Power consumption at ultimate pressure	W	300	300	300
Admissible ambient temperature	°C (°F)	10 to 55 (50 to 131)	10 to 55 (50 to 131)	10 to 55 (50 to 131)
Cooling				
standard		Water	Water	Water
optional		Air	Air	Air
Cooling water connection		10 mm hose nozzle	10 mm hose nozzle	10 mm hose nozzle
Cooling water consumption	l x h^{-1}	24 to 60	24 to 60	24 to 60
Permissible cooling water pressure	bar	3 to 7	3 to 7	3 to 7
Permissible cooling water temperature	°C (°F)	10 to 30 (50 to 86)	10 to 30 (50 to 86)	10 to 30 (50 to 86)
Weight	kg (lbs)	22 (48)	22 (48)	22 (48)

Technical Data

TURBO.DRIVE TD 20 *classic*

Mains connection	50/60 Hz	100 to 240 V (+15 % / -10 %)
Max. power consumption	W	500
Max. output voltage	V	3 x 47
Max. output current	A	5
Interface		Without, RS 232 C, RS 485 C, Profibus or 25-way terminal strip
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	213 x 128 x 315 (8.39 x 5.04 x 12.40)
Weight, approx.	kg (lbs)	4.0 (8.8)

TURBOVAC 1100 C without Compound Stage P	Part No.	
DN 160 ISO-K / DN 63 ISO-K, water-cooled	800150V0030	
DN 200 ISO-K / DN 63 ISO-K, water-cooled	800150V0031	
DN 250 ISO-K / DN 63 ISO-K, water-cooled	800150V0032	
Mandatory Accessories FC PS		
TURBO.DRIVE TD 20 *classic*		
without interface	800075V0001	
with RS 232 C interface	800075V0002	
with RS 485 C interface	800075V0004	
with Profibus	800075V0003	
with 25-pol I/O	800075V0005	
Connecting cable TURBOVAC - frequency converter		
3 m (10.5 ft)	857 65	
5 m (17.5 ft)	857 66	
10 m (35.0 ft)	857 67	
20 m (70.0 ft)	857 68	
50 m (175.0 ft)	800152V0008	
60 m (210.0 ft)	800152V0007	
80 m (280.0 ft)	800152V0080	
140 m (490.0 ft)	800152V0140	
Mains cable		
3 m (10.5 ft)		
EURO plug	800102V0002	
UK plug	800102V0003	
US plug 5-15 P	800102V1002	
2 m (7.5 ft)		
US plug 115 V AC	992 76 513	
Forevacuum pump		
TRIVAC D 65 B		
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz	112 96	
3 phase motor; 230/346 V, 50 Hz / 208/360 V, 60 Hz	113 57	
SCROLLVAC SC 30 D		
1 phase motor; 200-230 V, 50/60 Hz	133 002	
1 phase motor; 100-115 V, 50/60 Hz	133 102	
3 phase motor; 380-415 V, 50 Hz / 200-230 V, 460 V, 60 Hz	133 004	
For further types, see Catalog Parts “Oil Sealed Vacuum Pumps” and “Dry Compressing Vacuum Pumps”		



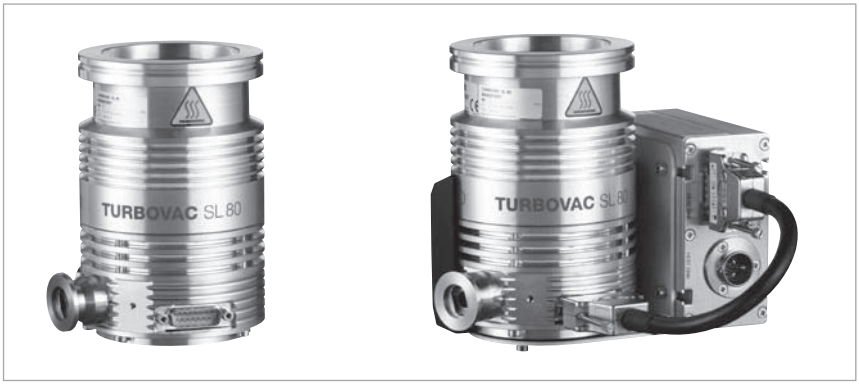
Ordering Information

TURBOVAC 1100 C

Accessories, optional	Part No.
Vibration absorber DN 160 ISO-K	**500 073**
Solenoid venting valve, with gas admission filter, normally closed 24 V DC, DN 16 ISO-KF	**800120V0011**
Power failure venting valve, with gas admission filter, normally open 24 V DC, DN 16 ISO-KF	**800120V0021**
Purge gas and venting valve gas flow at 1 bar 0.6 mbar x l x s^{-1} (36 sccm), pump connection DN 10 ISO-KF / gas connection G 1/4" 230 V AC 100-115 V AC 24 V DC	 **800152V0040** **800152V0043** **800152V0012**
Gas filter to G 1/4" for purge gas and venting valve	**800110V0012**
Replacement filter	**E 200 18 515**
Included in the Delivery of the Pump P	
Inlet screen, centering ring with FPM sealing ring, outer ring	**ISO-K**
Inlet screen	**CF**
Centering ring with O-ring, clamping ring	**Foreline Flange**
Pivoted threaded fittings to replace the included hose nipples	**Water Cooling**

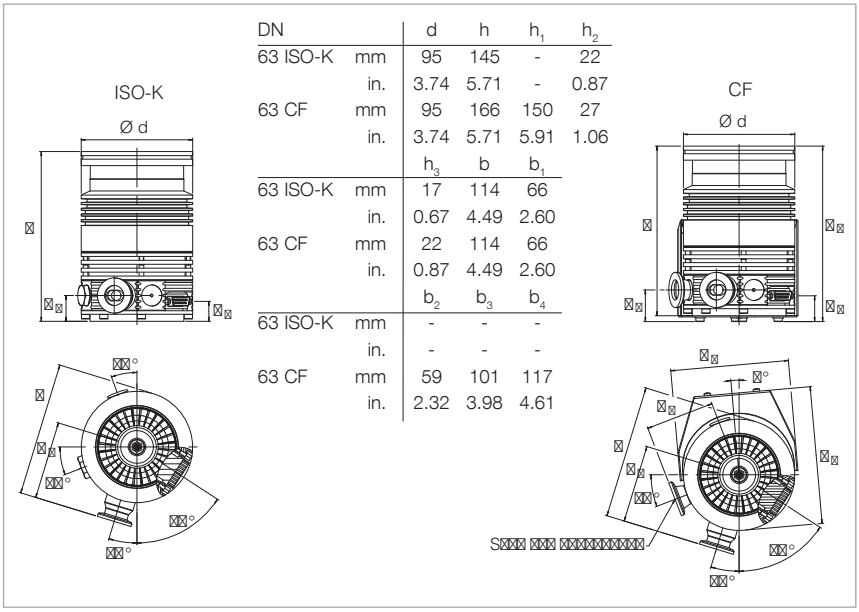
Mechanical Rotor Suspension with Frequency Converter for Attaching or Separate with or without Compound Stage

TURBOVAC SL 80 / L 80 H / SL 80 C



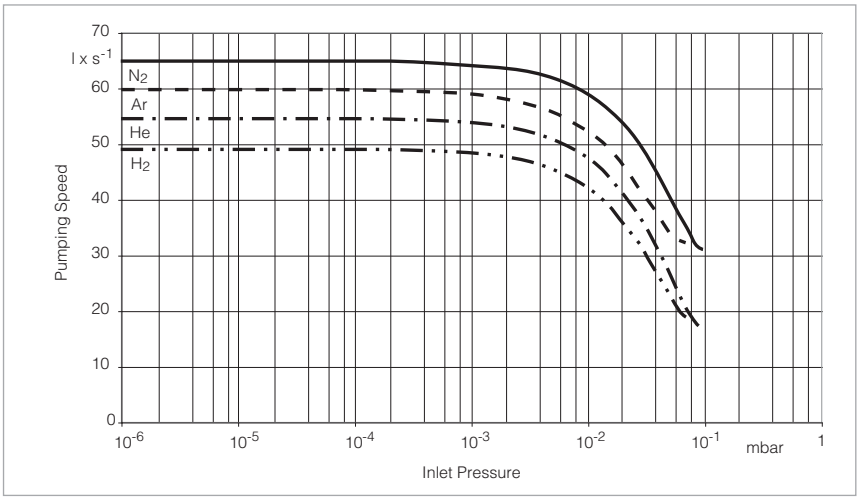
Typical Applications

- Helium leak detectors
- Mass spectrometers (gas chromatography GC-MS), liquid chromatography (LC-MS), residual gas analysis, mobile analytical systems, etc.)
- Electron beam microscopy
- XHV-/UHV systems
- Transfer chambers



DN		d	h	h_1	h_2
63 ISO-K	mm	95	145	-	22
	in.	3.74	5.71	-	0.87
63 CF	mm	95	166	150	27
	in.	3.74	5.71	5.91	1.06
		h_3	b	b_1	
63 ISO-K	mm	17	114	66	
	in.	0.67	4.49	2.60	
63 CF	mm	22	114	66	
	in.	0.87	4.49	2.60	
		b_2	b_3	b_4	
63 ISO-K	mm	-	-	-	
	in.	-	-	-	
63 CF	mm	59	101	117	
	in.	2.32	3.98	4.61	

Dimensional drawing for the TURBOVAC SL 80: attachment examples



Pumping speed as a function of the inlet pressure

Technical Features

- Oil-free pump
- High pressure foreline tolerance
- Excellent resistance to vibration due to proven mechanical bearings
- Efficient convection cooling due to a large number of cooling fins
- Purge gas/venting connection
- Installation in any orientation
- Flexible attachment of the frequency converter to the pump
- Small footprint
- Delayed venting through the frequency converter TURBO.DRIVE TD 400 (optional)
- Selection of interfaces, USB, RS 232 C, RS 485 C, Profibus

Advantages to the User

- Easy to integrate into complex vacuum systems
- Space-saving
- Prepared for pumping of slightly corrosive gases owing to the seal gas connection
- High reliability, MTTF over 200,000 hours
- Matching accessories (fan, water cooling, seal gas/venting valves, power failure venting valves, flange heaters, different cable lengths etc.)
- High reliability due to self-monitoring

Technical Data

TURBOVAC

		SL 80	SL 80 H	SL 80 C
Connection				
Inlet	DN	40 ISO-KF 63 ISO-K 63 CF	63 ISO-K 63 CF	63 ISO-K
Outlet	DN	16 ISO-KF	16 ISO-KF	16 ISO-KF
Pumping speed				
N_2	l x s^{-1}	40 65 65	65	70
Ar	l x s^{-1}	34 60 60	60	65
He	l x s^{-1}	44 55 55	55	50
H_2	l x s^{-1}	40 49 49	49	45
Gas throughput				
N_2	mbar · l x s^{-1}	2.0	0.9	3.5
Ar	mbar · l x s^{-1}	1.6	0.8	3.5
He	mbar · l x s^{-1}	1.2	1.5	2.0
H_2	mbar · l x s^{-1}	0.5	0.6	1.0
Compression ratio				
N_2		> 1 x 10^{11}	> 1 x 10^{11}	2 x 10^{6}
Ar		> 1 x 10^{11}	> 1 x 10^{11}	2 x 10^{6}
He		2 x 10^{6}	6 x 10^{6}	6 x 10^{2}
H_2		4 x 10^{4}	8 x 10^{4}	2 x 10^{2}
Ultimate pressure	mbar	< 2 x 10^{-10}	< 2 x 10^{-10}	< 5 x 10^{-8}
	Torr)	(< 1.5 x 10^{-10})	(< 1.5 x 10^{-10})	(< 4.0 x 10^{-8})
Max. foreline pressure for N_2	mbar (Torr)	16 (12)	16 (12)	0.35 (0.26)
Recommended forevacuum pump		TRIVAC D 2,5 E / D 4 B SCROLLVAC SC 5 D / 15 D DIVAC 1.4 HV3	TRIVAC D 2,5 E / D 4 B SCROLLVAC SC 5 D / 15 D DIVAC 1.4 HV3	TRIVAC D 2,5 E / D 4 B SCROLLVAC SC 5 D / 15 D –
Nominal rotation speed	min^{-1} (rpm)	72 000	72 000	72 000
Run-up time, approx.	min	1.5	1.5	1.5
Max. power consumption	W	120	120	120
Power consumption at ultimate pressure	W	17	17	17
Admissible ambient temperature	°C (°F)	+15 to +45 (+50 to +113)	+15 to +45 (+50 to +113)	+15 to +45 (+50 to +113)
Cooling				
standard		Convection	Convection	Convection
optional		Water / Air	Water / Air	Water / Air
Cooling water connection		G 1/8", inside thread / 8 mm hose nozzle	G 1/8", inside thread / 8 mm hose nozzle	G 1/8", inside thread / 8 mm hose nozzle
Cooling water consumption	l x h^{-1}	15 to 60	15 to 60	15 to 60
Permissible cooling water pressure	bar	2 to 7	2 to 7	2 to 7
Permissible cooling water temperature	°C (°F)	10 to 40 (50 to 104)	10 to 40 (50 to 104)	10 to 40 (50 to 104)
Weight, approx.	kg	1.8 1.9) 3.1	1.9 3.1	1.9
	(lbs)	(3.97) (4.19) (6.84)	(4.19) (6.84)	(4.19)

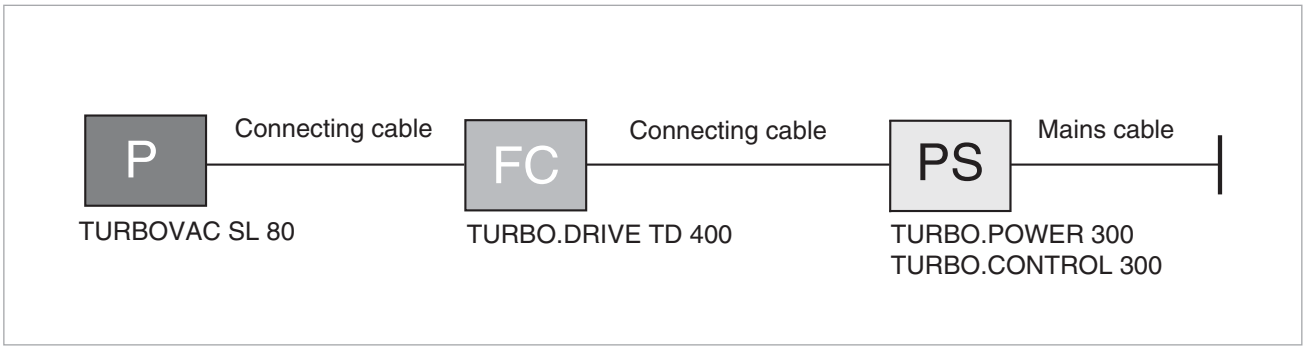
Technical Data

TURBO.DRIVE TD 400

Mains connection	V DC	24
Max. current consumption	A	8
Max. power consumption	W	190
Max. output voltage	V	3 x 24
Interface		USB, RS 232 C, RS 485 C or Profibus
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	+5 to +45 (+41 to +113)
Dimensions (W x H x D)	mm (in.)	100 x 90 x 100 (3.9 x 3.5 x 3.9)
Weight, approx.	kg (lbs)	0.7 (1.6)

TURBOVAC SL 80 P	Part No.	
with compound stage		
DN 40 ISO-KF	800002V3004	
DN 63 ISO-K / DN 16 ISO-KF	800002V3001	
DN 63 ISO-K / DN 16 ISO-KF (SL 80 H)	800002V3005	
DN 63 CF / DN 16 ISO-KF	800002V3002	
DN 63 CF / DN 16 ISO-KF (SL 80 H)	800002V3006	
without compound stage		
DN 63 ISO-K / DN 16 ISO-KF (SL 80 C)	800002V3008	
Mandatory Accessories P FC PS		
Electronic frequency converter TURBO.DRIVE TD 400		
with USB interface	800073V0008	
with RS 232 C interface	800073V0002	
with RS 485 C interface	800073V0003	
with Profibus	800073V0004	
Connecting cable pump - frequency converter		
0.2 m (0.7 ft)	800152V0021	
0.3 m (1.1 ft)	800152V0023	
0.4 m (1.4 ft)	800152V0022	
0.5 m (1.75 ft)	800152V0050	
1.0 m (3.5 ft)	152 47	
2.5 m (8.75 ft)	864 49	
3.0 m (10.5 ft)	864 40	
5,0 m (17.5 ft)	864 50	
10.0 m (35.0 ft)	800080V1000	
Power supply and control unit TURBO.CONTROL 300	800100V0001	
24 V connecting cable power supply - TURBO.CONTROL 300		
1 m (3.5 ft)	800091V0100	
3 m (10.5 ft)	800091V0300	
5 m (17.5 ft)	800091V0500	
10 m (35.0 ft)	800091V1000	
20 m (70.0 ft)	800091V2000	
Power supply TURBO.POWER 300	800100V0002	
24 V connecting cable power supply - TURBO.POWER 300		
1 m (3.5 ft)	800094V0100	
3 m (10.5 ft)	800094V0300	
5 m (17.5 ft)	800094V0500	
10 m (35.0 ft)	800094V1000	
20 m (70.0 ft)	800094V2000	
Mains cable 3 m (10.5 ft) - TURBO.CONTROL 300 / TURBO.POWER 300		
with EURO plug	800102V0002	
with UK plug	800102V0003	
with US plug 5-15 P	800102V1002	
with US plug 115 V AC, 2 m (7.5 ft)	992 76 513	
START/STOP switch for manual operation of the turbomolecular pump	152 48	
Forevacuum pump		
TRIVAC D 2,5 E		
220-240 V, 50 Hz; 230 V, 60 Hz; Schuko plug, EURO version	140 000	
110-120 V / 220-240 V, 50/60 Hz, without plug, (world version)	140 001	
TRIVAC D 4 B		
1 phase EURO motor; 230 V, 50 Hz	112 45	
1 phase dual voltage motor; 100-120 V / 200-240 V; 50/60 Hz	140 081 [1]	
DIVAC 1.4 HV3		
90-230 V, 50/60 Hz	127 90 V	
SCROLLVAC SC 5 D		
1 phase motor; 200-230 V, 50/60 Hz	133 000	
1 phase motor; 100-115 V, 50/60 Hz	133 100	
SCROLLVAC SC 15 D		
1 phase motor; 200-230 V, 50/60 Hz	133 001	
1 phase motor; 100-115 V, 50/60 Hz	133 101	
3 phase motor; 380-415 V, 50 Hz / 200-230 V, 460 V, 60 Hz	133 003	
For further types, see Catalog Parts "Oil Sealed Vacuum Pumps" and "Dry Compressing Vacuum Pumps"		

[1] The mains cord (Part No. 200 81 091) must be ordered additionally



Ordering Information

TURBOVAC

SL 80 / SL 80 H / SL 80 C

Accessories, optional	P FC PS	Part No.
Mounting kit TD 400 for SL 80, incl. 0.2 m (0.7 ft.) long connecting cable pump - frequency converter		
for installing the frequency converter beside the pump		800110V0005
for installing the frequency converter beneath the pump (not for 800073V0007)		800110V0008
Water cooling unit with 2x G 1/8" connections, including 2 hose nozzles G 1/8" 8 mm (0.3 in.) OD, 2 gaskets (copper) 10 x 14 x 1 mm (0.4 x 0.6 x 0.04 in.) and hose clamps		800135V0001
Air cooling unit		800136V0001
Flange heater		
DN 63 CF, 230 V, 50 Hz		854 04
DN 63 CF, 115 V, 60 Hz		854 07
Inlet screen		
DN 40 ISO-KF		E 200 17 169
DN 63 ISO-K (coarse)		E 200 17 170
DN 63 CF (coarse)		E 200 17 171
Fine filter with centering ring		
DN 63 ISO-K		887 20
Vibration absorber		
DN 63 ISO-K		800131V0063
DN 63 CF		500 070
Pump connection adapter DN 10 ISO-KF / pump connection M 8 (incl. O-ring, filter and clamping ring)		800110V0011
Purge gas and venting valve		
gas flow at 1 bar 0.4 mbar x l x s^{-1} (24 sccm), pump connection DN 10 ISO-KF / gas connection G 1/4"		
230 V AC		800152V0014
100 - 115 V AC		800152V0042
24 V DC		800152V0013
Gas filter to G 1/4" for purge gas and venting valve		800110V0012
Replacement filter		E 200 18 515
Power failure venting valve, normally open		
24 V DC, DN 16 ISO-KF		800120V0021
Power failure venting valve, normally open		
24 V DC, DN 10 ISO-KF		174 46
230 V AC / 50/60 Hz, DN 10 ISO-KF		174 26
Hat rail adaptor as mounting aid		800110V0003
Fin type cooler		800110V0001

Mechanical Rotor Suspension with integrated Frequency Converter with Compound Stage

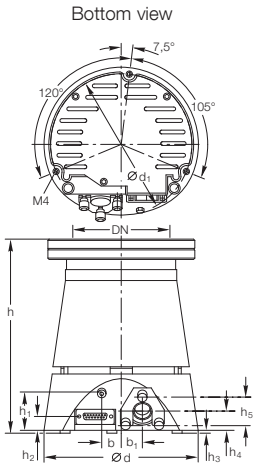
TURBOVAC TW 250 S

Typical Applications

- Analytical Instruments
- Coating
- R & D
- Transfer chambers

		b	b_1	d	d_1	h
DN 100 ISO-K	mm	20	22	160	146.6	175
	in.	0.79	0.87	6.30	5.77	6.89
DN 100 CF	mm	20	22	160	146.6	175
	in.	0.79	0.87	6.30	5.77	6.89

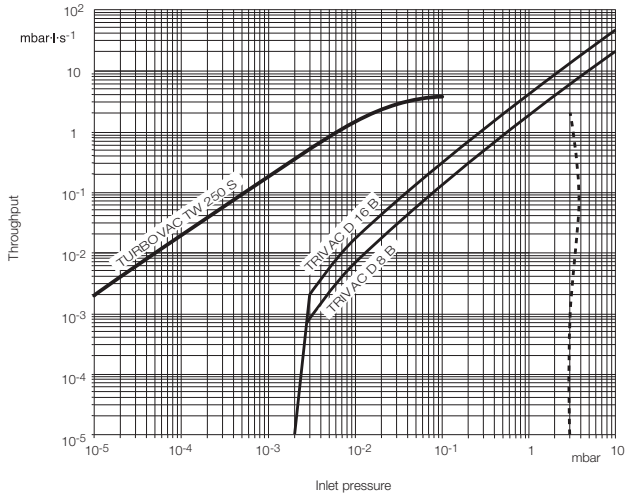
		h_1	h_2	h_3	h_4	h_5
DN 100 ISO-K	mm	37	14	4	20	40
	in.	1.46	0.55	0.16	0.79	1.57
DN 100 CF	mm	37	14	4	20	40
	in.	1.46	0.55	0.16	0.79	1.57



Dimensional drawing for the TURBOVAC TW 250 S without frequency converter

Technical Features

- High gas throughput
- Oil-free pump
- Insensitive to impact and movement due to the mechanical bearing concept
- Installation in any orientation
- Small footprint
- Integrated fan
- Purge gas/venting connection



Operation diagram for nitrogen for TURBOVAC TW 250 S

Advantages to the User

- Highest throughput for N_2 and Ar
- Highest reliability in operation
- Space-saving
- High reliability due to self-monitoring
- Easy to integrate into complex vacuum systems

Technical Data — TURBOVAC TW 250 S

Connection		
Inlet	DN	100 ISO-K • 100 CF
Outlet	DN	16 ISO-KF
Pumping speed		
N_2	l x s^{-1}	230
Ar	l x s^{-1}	210
He	l x s^{-1}	150
H_2	l x s^{-1}	80
Gas throughput		
N_2	mbar · l x s^{-1}	3.7
Ar	mbar · l x s^{-1}	3.5
He	mbar · l x s^{-1}	2.4
H_2	mbar · l x s^{-1}	1.1
Compression ratio		
N_2		1×10^8
Ar		1×10^8
He		1×10^4
H_2		5×10^2
Ultimate pressure	mbar (Torr)	< 2×10^{-8} (< 1.5×10^{-8})
Max. foreline pressure for N_2	mbar (Torr)	3.0 (2.3)
Recommended forevacuum pump		TRIVAC D 2,5 E TRIVAC D 8 B (at purge gas operation)
diaphragm pump with an ultimate pressure < 3 mbar (< 2.3 Torr)		upon request
Nominal rotation speed	min^{-1} (rpm)	51 600
Run-up time, approx.	min	3
Max. power consumption	W	140
Power consumption at ultimate pressure	W	20
Admissible ambient temperature	°C (°F)	+15 to +40 (+59 to +104)
Cooling		
standard		Air
optional		Water
Cooling water connection		G 1/8", inside thread / 10 mm hose nozzle
Cooling water consumption	l x h^{-1}	30 to 60
Permissible cooling water pressure	bar	3 to 7
Permissible cooling water temperature	°C (°F)	20 to 40 (+68 to +104)
Weight	kg (lbs)	5.8 (12.8)

Technical Data — TURBO.DRIVE TD 400

Mains connection	V DC	24
Max. current consumption	A	8
Max. power consumption	W	190
Max. output voltage	V	3 x 24
Interface		USB, RS 232 C, RS 485 C or Profibus
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	+5 to +45 (+41 to +113)
Dimensions (W x H x D)	mm (in.)	100 x 90 x 100 (3.9 x 3.5 x 3.9)
Weight, approx.	kg (lbs)	0.7 (1.6)

TURBOVAC TW 250 S with Compound Stage P	Part No.	
DN 100 ISO-K / DN 16 ISO-KF, water-cooled, Profibus	114 37	
DN 100 ISO-K / DN 16 ISO-KF, water-cooled, Profibus, inlet screen coarse	800150V0016	
DN 100 ISO-K / DN 16 ISO-KF, air-cooled, Profibus, inlet screen coarse	800150V0009	
DN 100 ISO-K / DN 16 ISO-KF, air-cooled, RS 232 C interface	800150V0011	
DN 100 ISO-K / DN 16 ISO-KF, air-cooled, RS 485 C interface	800150V0013	
DN 100 CF/ DN 16 ISO-KF, air-cooled, RS 232 C interface	800150V0012	
DN 100 CF / DN 16 ISO-KF, air-cooled, RS 485 C interface	800150V0014	
Mandatory Accessories P FC PS		
Power supply and control unit TURBO.CONTROL 300	800100V0001	
24 V connection line frequency converter TD 400 - TURBO.CONTROL 300		
1 m (3.5 ft)	800091V0100	
3 m (10.5 ft)	800091V0300	
5 m (17.5 ft)	800091V0500	
10 m (35.0 ft)	800091V1000	
20 m (70.0 ft)	800091V2000	
Power supply TURBO.POWER 300	800100V0002	
24 V connection line frequency converter TD 400 - TURBO.POWER 300		
1 m (3.5 ft)	800094V0100	
3 m (10.5 ft)	800094V0300	
5 m (17.5 ft)	800094V0500	
10 m (35.0 ft)	800094V1000	
20 m (70.0 ft)	800094V2000	
Mains cable 3 m (10.5 ft) - TURBO.CONTROL 300 / TURBO.POWER 300		
with EURO plug	800102V0002	
with UK plug	800102V0003	
with US plug 5-15 P	800102V1002	
with US plug 115 V AC, 2 m (7.5 ft)	992 76 513	
START/STOP switch for manual operation of the turbomolecular pump	152 48	
Forevacuum pump		
TRIVAC D 2,5 E		
220-240 V, 50 Hz; 230 V, 60 Hz; Schuko plug, EURO version	140 000	
110-120 V / 220-240 V, 50/60 Hz, without plug, (world version)	140 001	
TRIVAC D 8 B		
1 phase EURO motor; 230 V, 50 Hz	112 55	
1 phase dual voltage motor; 100-120 V / 200-240 V; 50/60 Hz	140 082 [1]	
For further types, see Catalog Part “Oil Sealed Vacuum Pumps”		

[1] The mains cord (Part No. 200 81 091) must be ordered additionally

Ordering Information

TURBOVAC TW 250 S

Accessories, optional	P FC PS	Part No.
Flange heater		
DN 100 CF, 230 V, 50 Hz		**854 27**
DN 100 CF, 115 V, 60 Hz		**854 28**
Inlet screen		
DN 100 ISO-K (coarse)		**800132V0101**
DN 100 ISO-K (fine)		**800132V0102**
Vibration absorber		
DN 100 ISO-K		**800131V0100**
DN 100 CF		**500 071**
Included in the Delivery of the Pump	P	
Centering ring with FPM sealing ring, clamping shoe with gasket		**Foreline Flange**
Sealing screw and a gasket ring		**Vent Port**
High vacuum connection elements are not part of the supplied equipment		

Mechanical Rotor Suspension without integrated Frequency Converter with Compound Stage

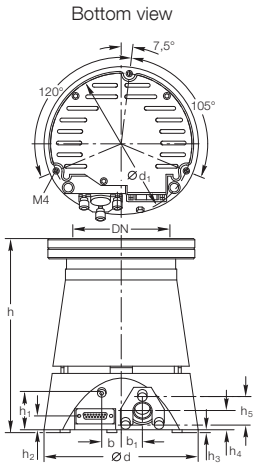
TURBOVAC TW 250 S

Typical Applications

- Analytical Instruments
- Coating
- R & D
- Transfer chambers

		b	b_1	d	d_1	h
DN 100 ISO-K	mm	20	22	160	146.6	175
	in.	0.79	0.87	6.30	5.77	6.89
DN 100 CF	mm	20	22	160	146.6	175
	in.	0.79	0.87	6.30	5.77	6.89

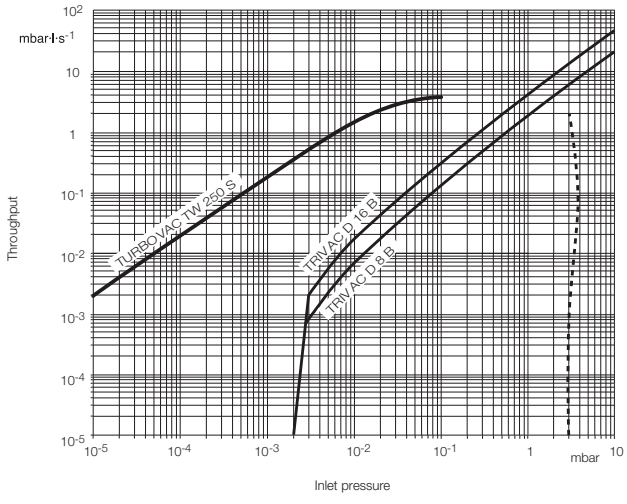
		h_1	h_2	h_3	h_4	h_5
DN 100 ISO-K	mm	37	14	4	20	40
	in.	1.46	0.55	0.16	0.79	1.57
DN 100 CF	mm	37	14	4	20	40
	in.	1.46	0.55	0.16	0.79	1.57



Dimensional drawing for the TURBOVAC TW 250 S without frequency converter

Technical Features

- High gas throughput
- Oil-free pump
- Insensitive to impact and movement due to the mechanical bearing concept
- Installation in any orientation
- Small footprint
- Integrated fan
- Purge gas/venting connection



Operation diagram for nitrogen for TURBOVAC TW 250 S

Advantages to the User

- Highest throughput for N_2 and Ar
- Highest reliability in operation
- Space-saving
- High reliability due to self-monitoring
- Easy to integrate into complex vacuum systems

Technical Data — TURBOVAC TW 250 S

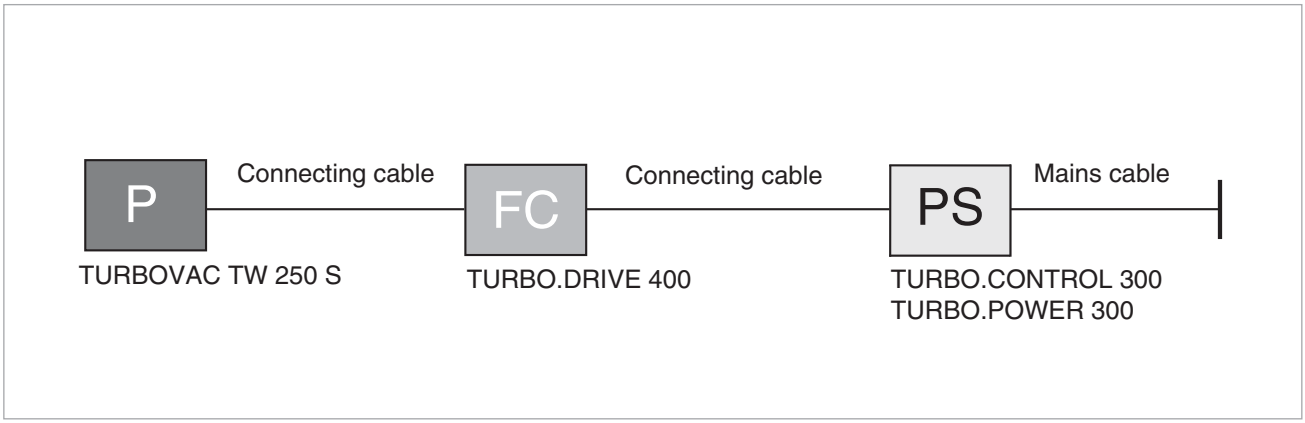
Connection		
Inlet	DN	100 ISO-K
Outlet	DN	16 ISO-KF
Pumping speed		
N_2	l x s^{-1}	230
Ar	l x s^{-1}	210
He	l x s^{-1}	150
H_2	l x s^{-1}	80
Gas throughput		
N_2	mbar · l x s^{-1}	3.7
Ar	mbar · l x s^{-1}	3.5
He	mbar · l x s^{-1}	2.4
H_2	mbar · l x s^{-1}	1.1
Compression ratio		
N_2		1×10^8
Ar		1×10^8
He		1×10^4
H_2		5×10^2
Ultimate pressure	mbar (Torr)	$< 2 \times 10^{-8}$ ($< 1.5 \times 10^{-8}$)
Max. foreline pressure for N_2	mbar (Torr)	3.0 (2.3)
Recommended forevacuum pump		TRIVAC D 2,5 E TRIVAC D 8 B (at purge gas operation)
diaphragm pump with an ultimate pressure < 3 mbar (< 2.3 Torr)		upon request
Nominal rotation speed	min^{-1} (rpm)	51 600
Run-up time, approx.	min	≈ 3
Max. power consumption	W	140
Power consumption at ultimate pressure	W	20
Admissible ambient temperature	°C (°F)	+15 to +40 (+59 to +104)
Cooling		
standard		Air
optional		Water
Cooling water connection		G 1/8", inside thread / 10 mm hose nozzle
Cooling water consumption	l x h^{-1}	30 to 60
Permissible cooling water pressure	bar	3 to 7
Permissible cooling water temperature	°C (°F)	+20 to +40 (+68 to +104)
Weight	kg (lbs)	5 (11)

Technical Data — TURBO.DRIVE TD 400

Mains connection	V DC	24
Max. current consumption	A	8
Max. power consumption	W	190
Max. output voltage	V	3 x 24
Interface		USB, RS 232 C, RS 485 C or Profibus
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	+5 to +45 (+41 to +113)
Dimensions (W x H x D)	mm (in.)	100 x 90 x 100 (3.9 x 3.5 x 3.9)
Weight, approx.	kg (lbs)	0.7 (1.6)

TURBOVAC TW 250 S with Compound Stage [P]	Part No.	
DN 100 ISO-K / DN 16 ISO-KF, air-cooled, inlet screen coarse	**113 52**	
DN 100 ISO-K / DN 16 ISO-KF, air-cooled, inlet screen coarse (with vibration absorber)	**800150V0007**	
Mandatory Accessories [P] [FC] [PS]		
Electronic frequency converter TURBO.DRIVE TD 400		
with USB interface	**800073V0008**	
RS 232 C interface	**800073V0002**	
RS 485 C interface	**800073V0003**	
Connecting cable pump - TURBO.DRIVE TD 400		
1 m (3.5 ft)	**152 47**	
3 m (10.5 ft)	**864 40**	
5 m (17.5 ft)	**864 50**	
Power supply and control unit TURBO.CONTROL 300	**800100V0001**	
24 V connecting cable TURBO.DRIVE TD 400 - TURBO.CONTROL 300		
1 m (3.5 ft)	**800091V0100**	
3 m (10.5 ft)	**800091V0300**	
5 m (17.5 ft)	**800091V0500**	
10 m (35.0 ft)	**800091V1000**	
20 m (70.0 ft)	**800091V2000**	
Power supply TURBO.POWER 300	**800100V0002**	
24 V connecting cable TURBO.DRIVE TD 400 - TURBO.POWER 300		
1 m (3.5 ft)	**800094V0100**	
3 m (10.5 ft)	**800094V0300**	
5 m (17.5 ft)	**800094V0500**	
10 m (35.0 ft)	**800094V1000**	
20 m (70.0 ft)	**800094V2000**	
Mains cable 3 m (10.5 ft) - TURBO.CONTROL 300 / TURBO.POWER 300		
with EURO plug	**800102V0002**	
with UK plug	**800102V0003**	
with US plug 5-15 P	**800102V1002**	
with US plug 115 V AC, 2 m (7.5 ft)	**992 76 513**	
Forevacuum pump		
TRIVAC D 2,5 E		
220-240 V, 50 Hz; 230 V, 60 Hz; Schuko plug, EURO version	**140 000**	
110-120 V / 220-240 V, 50/60 Hz, without plug, (world version)	**140 001**	
TRIVAC D 8 B		
1 phase EURO motor; 230 V, 50 Hz	**112 55**	
1 phase dual voltage motor; 100-120 V / 200-240 V; 50/60 Hz	**140 082** [1]	
For further types, see Catalog Part “Oil Sealed Vacuum Pumps”		

[1] The mains cord (Part No. 200 81 091) must be ordered additionally



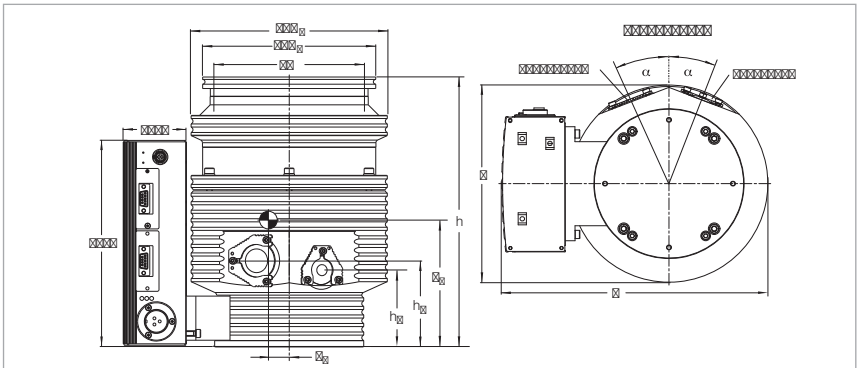
Ordering Information

TURBOVAC TW 250 S

Accessories, optional	P FC PS	Part No.
Inlet screen		
DN 100 ISO-K (coarse)		**800132V0101**
DN 100 ISO-K (fine)		**800132V0102**
Vibration absorber		
DN 100 ISO-K		**800131V0100**
DN 100 CF		**500 071**
Included in the Delivery of the Pump	P	
Centering ring with FPM sealing ring, blank flange with clamping shoe		**Foreline Flange**
Sealing screw and a gasket ring		**Vent Port**
DC coupling for the power supply is included		

MAG INTEGRA - Magnetic Rotor Suspension with integrated Frequency Converter, with Compound Stage

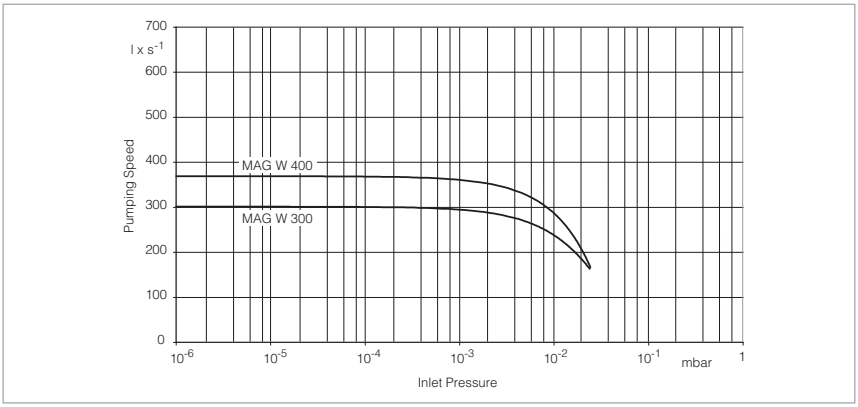
TURBOVAC MAG W 300/400 iP



		DN	⌀ d_1	⌀ d_2	h	h_1	h_2	l	b	b*	α	s_1	s_2
MAG W 300 iP	mm	100 ISO-K	130.0	155.0	250.0	77.7	70.0	156.0	250.0	233.0	16°	19.0	103.0
	in.		5.12	6.10	9.84	3.06	2.76	6.14	9.84	9.17	16°	0.75	4.06
	mm	100 CF	151.5	155.0	264.3	77.7	70.0	156.0	250.0	233.0	16°	15.0	129.0
	in.		5.96	6.10	10.41	3.06	2.76	6.14	9.84	9.17	16°	0.59	5.08
MAG W 400 iP	mm	160 ISO-K	180.0	155.0	241.0	77.7	70.0	168.5	262.5	245.5	16°	19.0	106.0
	in.		7.09	6.10	9.49	3.06	2.76	6.63	10.33	9.67	16°	0.75	4.17
	mm	160 CF	202.5	155.0	234.7	77.7	70.0	181.2	273.7	256.7	16°	14.0	129.0
	in.		7.97	6.10	9.24	3.06	2.76	9.13	10.78	10.11	16°	0.55	5.08

b* = width with plug of the DRIVE/BEARING cable connected instead of MAG.DRIVE iS

Dimensional drawing for the TURBOVAC MAG W 300/400 iP



Pumping speed for N_2 of the TURBOVAC MAG W 300/400 iP as a function of the inlet pressure

Typical Applications

- Gas analysis systems
- Particle accelerators
- Electron microscopes
- Research
- Coating systems

Technical Features

- Installation in any orientation
- DN 100 or 160 ISO-K and/or CF high vacuum connection
- DN 16 ISO-KF with clamped fore vacuum connection
- Purge gas/venting connection DN 16 ISO-KF with clamped connection (purge/vent)
- Water or air cooling optional
- 2 slots for industrial communications modules
  - Standard 9 pin 24 V SPS PLC-IO in Control Slot
  - RS 232 C in Service Slot
  - further interfaces can be fitted: Profibus, RS 485 C, DeviceNet, EtherNet IP, EtherCat

Advantages to the User

- Highest pumping speed from the smallest possible size
- New standard regarding maintenance-free systems
- Suitability for vibration sensitive applications in the area of analytical engineering, thin-film technology, electron microscopes, research, development among others
- Flexibility due to the modular concept; the converter is optionally also available by way of a bench top unit

Technical Data

TURBOVAC MAG

		W 300 iP		W 400 iP	
Inlet flange	DN	100 ISO-K	100 CF	160 ISO-K	160 CF
Pumping speed					
N_2	l x s^{-1}	300	300	365	365
Ar	l x s^{-1}	260	260	330	330
He	l x s^{-1}	260	260	280	280
H_2	l x s^{-1}	190	190	200	200
Operating speed	min^{-1}	58 800	58 800	58 800	58 800
Compression ratio					
N_2		1.0×10^{10}	1.0×10^{10}	1.0×10^{10}	1.0×10^{10}
H_2		3.2×10^{3}	3.2×10^{3}	3.2×10^{3}	3.2×10^{3}
He		9.2×10^{4}	9.2×10^{4}	9.2×10^{4}	9.2×10^{4}
Ultimate pressure	mbar (Torr)	$< 10^{-8}$ ($< 0.75 \times 10^{-8}$)	$< 10^{-10}$ ($< 0.75 \times 10^{-10}$)	$< 10^{-8}$ ($< 0.75 \times 10^{-8}$)	$< 10^{-10}$ ($< 0.75 \times 10^{-10}$)
Max. degassing temperature	°C (°F)	–	80 (176)	–	80 (176)
Max. foreline pressure for N_2	mbar (Torr)	8 (6)	8 (6)	8 (6)	8 (6)
Recommended backing pump		TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B
Run-up time	min	< 5	< 5	< 5	< 5
Foreline flange (clamped)	DN	16 ISO-KF	16 ISO-KF	16 ISO-KF	16 ISO-KF
Purge / vent port (clamped)	DN	16 ISO-KF	16 ISO-KF	16 ISO-KF	16 ISO-KF
Water cooling connection (optional)	G	1/8"	1/8"	1/8"	1/8"
Weight, approx.	kg (lbs)	12 (26)	12 (26)	12 (26)	12 (26)

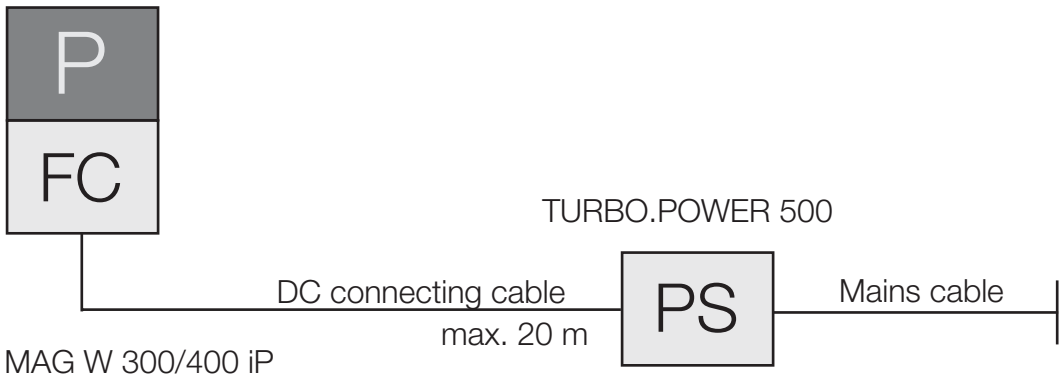
Technical Data

Integrated Frequency Converter TURBO.DRIVE iS

Power supply	V	48	48	48	48
Ripple	%	< 2	< 2	< 2	< 2
Power consumption					
maximum	W	400	400	400	400
at ultimate pressure	W	259	259	259	259
DC current consumption, max.	A	7.5 to 9.3	7.5 to 9.3	7.5 to 9.3	7.5 to 9.3
DC power supply voltage range	V	43 to 53	43 to 53	43 to 53	43 to 53
Length of the DC connection cable, max.					
at 3 x 1.5 mm^2	m (ft)	5 (17.5)	5 (17.5)	5 (17.5)	5 (17.5)
at 3 x 2.5 mm^2	m (ft)	20 (70.0)	20 (70.0)	20 (70.0)	20 (70.0)
Contact rating for the relays, max.		32 V; 0,5 A	32 V; 0,5 A	32 V; 0,5 A	32 V; 0,5 A
Permissible ambient temperature					
during operation	°C (°F)	+10 to +40 (+50 to +104)	+10 to +40 (+50 to +104)	+10 to +40 (+50 to +104)	+10 to +40 (+50 to +104)
during storage	°C (°F)	0 to +60 (0 to +140)	0 to +60 (0 to +140)	0 to +60 (0 to +140)	0 to +60 (0 to +140)
Relative humidity of the air, non-condensing	%	5 to 85	5 to 85	5 to 85	5 to 85
Protection class	IP	30	30	30	30
Overvoltage category		II	II	II	II
Pollution category		2	2	2	2

TURBOVAC MAG W 300 iP P FC with Integrated Frequency Converter and Seal Gas Connection	Part No.	
DN 100 ISO-K	410300V0505	
DN 100 CF	410300V0506	
TURBOVAC MAG W 400 iP P FC with Integrated Frequency Converter and Seal Gas Connection		
DN 160 ISO-K	410400V0505	
DN 160 CF	410400V0506	
Mandatory Accessories P FC		
Power supply TURBO.POWER 500	410300V0221	
DC cable frequency converter - power supply	410300V2001	
1 m (3.5 ft)	410300V2003	
3 m (10.5 ft)	410300V2005	
5 m (17.5 ft)	410300V2010	
10 m (35.0 ft)	410300V2020	
20 m (70.0 ft)		
Mains cable, 3 m (10.5 ft)	800102V0002	
with EURO plug	800102V1002	
with US plug 5-15 P		
Forevacuum pump		
TRIVAC D 2,5 E	140 000	
220-240 V, 50 Hz; 230 V, 60 Hz; Schuko plug, EURO version	140 002	
110-120 V, 50/60 Hz; NEMA plug, US version		
TRIVAC D 8 B	112 55	
1 phase motor; 230 V, 50/60 Hz	112 56	
3 phase motor; 230/400 V, 50 Hz; 250/440 V, 60 Hz		

With integrated Frequency Converter

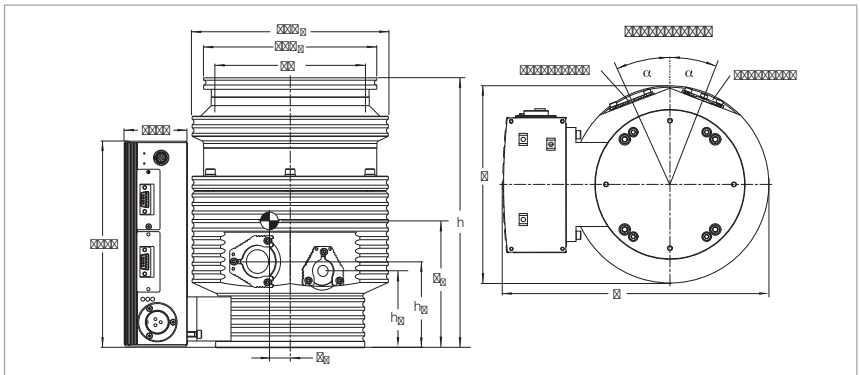


Ordering Information **TURBOVAC MAG W 300/400 iP**

Accessories, optional P	Part No.
Inlet screen	
DN 100 ISO-K	
coarse (3.2 x 3.2 mm (0.13 x 0.13 in.))	800132V0101
fine (1.6 x 1.6 mm (0.06 x 0.06 in.))	800132V0102
DN 100 CF	
coarse (3.2 x 3.2 mm (0.13 x 0.13 in.))	200 91 514
fine (1.6 x 1.6 mm (0.06 x 0.06 in.))	E 200 17 195
DN 160 ISO-K	E 200 00 307
DN 160 CF	E 200 17 247
Flange heater	
100 CF, 230 V, 50 Hz	854 27
100 CF, 115 V, 60 Hz	854 28
160 CF, 230 V, 50 Hz	854 37
160 CF, 115 V, 60 Hz	854 38
Water cooling unit	410300V0101
Air cooling unit	410300V0102
START/STOP switch for manual operation of the turbomolecular pump	152 48
DC plug	800 001 694
Solenoid venting valve, normally closed	
24 V DC, DN 16 ISO-KF	800120V0011
Power failure venting valve, normally open	800120V0021
Included in the Delivery of the Pump P	
Flanges for forevacuum, venting and purge gas are blank-flanged	
Centering ring with FPM sealing ring and a clamping yoke	

MAG INTEGRA - Magnetic Rotor Suspension with integrated Frequency Converter, with Compound Stage

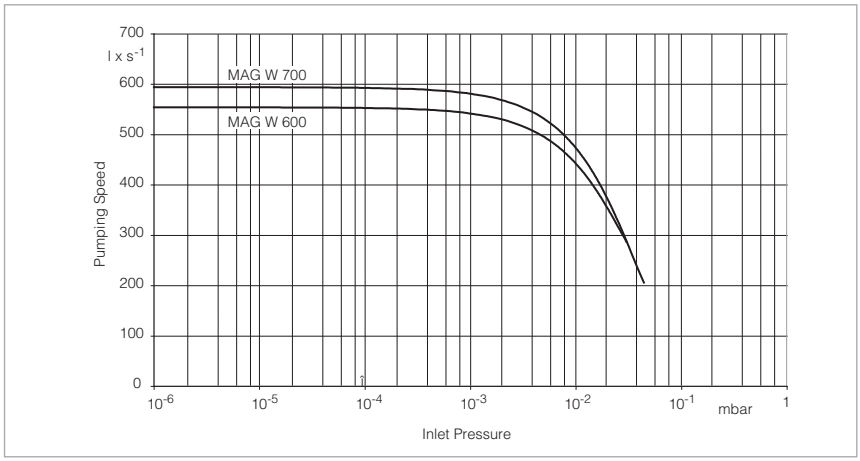
TURBOVAC MAG W 600/700 iP



		DN	⌀ d_1	⌀ d_2	h	h_1	h_2	l	b	b*	α	s_1	s_2
MAG W 600 iP	mm	160 ISO-K	180.0	204.0	281.5	90	80	204.0	274.5	257.5	21°	13.0	121.0
	in.		7.09	8.03	11.08	3.54	3.15	8.03	10.81	10.14	21°	0.51	4.76
	mm	160 CF	202.5	204.0	294.0	90	80	204.0	274.5	257.5	21°	10.0	150.0
	in.		7.97	8.03	11.57	3.54	3.15	8.03	10.81	10.14	16°	0.39	5.91
MAG W 700 iP	mm	200 ISO-K	240.0	204.0	280.5	90	80	240.0	292.5	275.5	21°	13.0	130.0
	in.		9.45	8.03	11.04	3.54	3.15	9.45	11.52	10.85	21°	0.51	5.12
	mm	200 CF	253.0	204.0	275.0	90	80	253.0	299.0	282.0	21°	9.0	156.0
	in.		9.96	8.03	10.83	3.54	3.15	9.96	11.77	11.10	21°	0.35	6.14

b* = width with plug of the DRIVE/BEARING cable connected instead of MAG.DRIVE iS

Dimensional drawing for the TURBOVAC MAG W 600/700 iP



Pumping speed for N_2 of the TURBOVAC MAG W 600/700 iP as a function of the inlet pressure

Typical Applications

- Gas analysis systems
- Particle accelerators
- Electron microscopes
- Research
- Coating systems

Technical Features

- Installation in any orientation
- DN 160 or 200 ISO-K and/or CF high vacuum connection
- DN 25 ISO-KF with clamped fore-vacuum connection
- Purge gas/venting connection DN 16 ISO-KF with clamped connection (purge/vent)
- Water or air cooling optional
- 2 slots for industrial communications modules
  - Standard 9 pin 24 V SPS PLC-IO in Control Slot
  - RS 232 C in Service Slot
  - further interfaces can be fitted: Profibus, RS 485 C, DeviceNet, EtherNet IP, EtherCat

Advantages to the User

- Highest pumping speed from the smallest possible size
- New standard regarding maintenance-free systems
- Suitability for vibration sensitive applications in the area of analytical engineering, thin-film technology, electron microscopes, research, development among others
- Flexibility due to the modular concept; the converter is optionally also available by way of a bench top unit

Technical Data

TURBOVAC MAG

		W 600 iP		W 700 iP	
Inlet flange	DN	160 ISO-K	160 CF	200 ISO-K	200 CF
Pumping speed					
N_2	l x s^{-1}	550	550	590	590
Ar	l x s^{-1}	520	520	540	540
He	l x s^{-1}	570	570	600	600
H_2	l x s^{-1}	410	410	430	430
Operating speed	min^{-1}	48 000	48 000	48 000	48 000
Compression ratio					
N_2		1.6×10^{10}	1.6×10^{10}	1.6×10^{10}	1.6×10^{10}
H_2		3.4×10^{4}	3.4×10^{4}	3.4×10^{4}	3.4×10^{4}
He		1.7×10^{6}	1.7×10^{6}	1.7×10^{6}	1.7×10^{6}
Ultimate pressure	mbar	$< 10^{-8}$	$< 10^{-10}$	$< 10^{-8}$	$< 10^{-10}$
	(Torr)	($< 0.75 \times 10^{-8}$)	($< 0.75 \times 10^{-10}$)	($< 0.75 \times 10^{-8}$)	($< 0.75 \times 10^{-10}$)
Max. degassing temperature	°C (°F)	–	80 (176)	–	80 (176)
Max. foreline pressure for N_2	mbar (Torr)	6.0 (4.5)	6.0 (4.5)	6.0 (4.5)	6.0 (4.5)
Recommended backing pump		TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B
Run-up time	min	< 6	< 6	< 6	< 6
Foreline flange (clamped)	DN	25 ISO-KF	25 ISO-KF	25 ISO-KF	25 ISO-KF
Purge / vent port (clamped)	DN	16 ISO-KF	16 ISO-KF	16 ISO-KF	16 ISO-KF
Water cooling connection (optional)	G	1/8"	1/8"	1/8"	1/8"
Weight, approx.	kg (lbs)	17 (37.5)	17 (37.5)	17 (37.5)	17 (37.5)

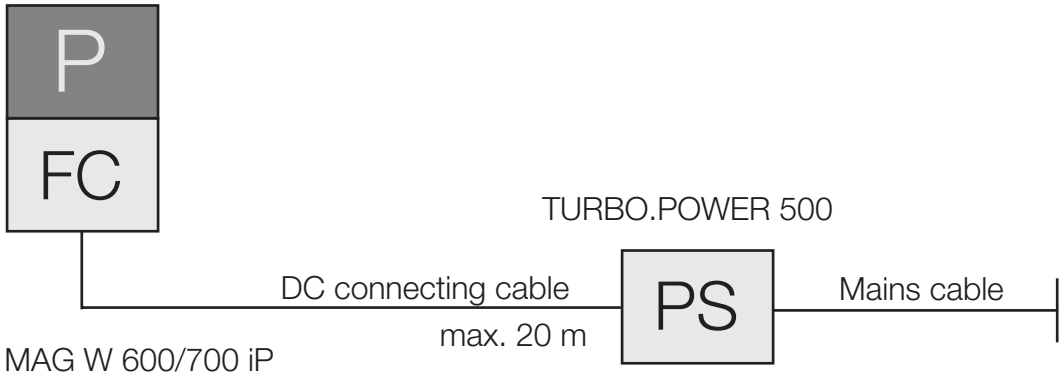
Technical Data

Integrated Frequency Converter TURBO.DRIVE iS

Power supply	V	48	48	48	48
Ripple	%	< 2	< 2	< 2	< 2
Power consumption					
maximum	W	400	400	400	400
at ultimate pressure	W	259	259	259	259
DC current consumption, max.	A	7.5 to 9.3	7.5 to 9.3	7.5 to 9.3	7.5 to 9.3
DC power supply voltage range	V	43 to 53	43 to 53	43 to 53	43 to 53
Length of the DC connection cable, max.					
at 3 x 1.5 mm^2	m (ft)	5 (17.5)	5 (17.5)	5 (17.5)	5 (17.5)
at 3 x 2.5 mm^2	m (ft)	20 (70.0)	20 (70.0)	20 (70.0)	20 (70.0)
Contact rating for the relays, max.		32 V; 0,5 A	32 V; 0,5 A	32 V; 0,5 A	32 V; 0,5 A
Permissible ambient temperature					
during operation	°C	+10 to +40	+10 to +40	+10 to +40	+10 to +40
	(°F)	(+50 to +104)	(+50 to +104)	(+50 to +104)	(+50 to +104)
during storage	°C	0 to +60	0 to +60	0 to +60	0 to +60
	(°F)	(0 to +140)	(0 to +140)	(0 to +140)	(0 to +140)
Relative humidity of the air, non-condensing	%	5 to 85	5 to 85	5 to 85	5 to 85
Protection class	IP	30	30	30	30
Overvoltage category		II	II	II	II
Pollution category		2	2	2	2

TURBOVAC MAG W 600 iP P FC with Integrated Frequency Converter and Seal Gas Connection	Part No.	
DN 160 ISO-K	410600V0505	
DN 160 CF	410600V0506	
TURBOVAC MAG W 700 iP P FC with Integrated Frequency Converter and Seal Gas Connection		
DN 200 ISO-K	410700V0505	
DN 200 CF	410700V0506	
Mandatory Accessories P FC		
Power supply TURBO.POWER 500	410300V0221	
DC cable frequency converter - power supply		
1 m (3.5 ft)	410300V2001	
3 m (10.5 ft)	410300V2003	
5 m (17.5 ft)	410300V2005	
10 m (35.0 ft)	410300V2010	
20 m (70.0 ft)	410300V2020	
Mains cable, 3 m (10.5 ft)		
with EURO plug	800102V0002	
with US plug 5-15 P	800102V1002	
Forevacuum pump		
TRIVAC D 2,5 E		
220-240 V, 50 Hz; 230 V, 60 Hz; Schuko plug, EURO version	140 000	
110-120 V, 50/60 Hz; NEMA plug, US version	140 002	
TRIVAC D 8 B		
1 phase motor; 230 V, 50/60 Hz	112 55	
3 phase motor; 230/400 V, 50 Hz; 250/440 V, 60 Hz	112 56	

With integrated Frequency Converter

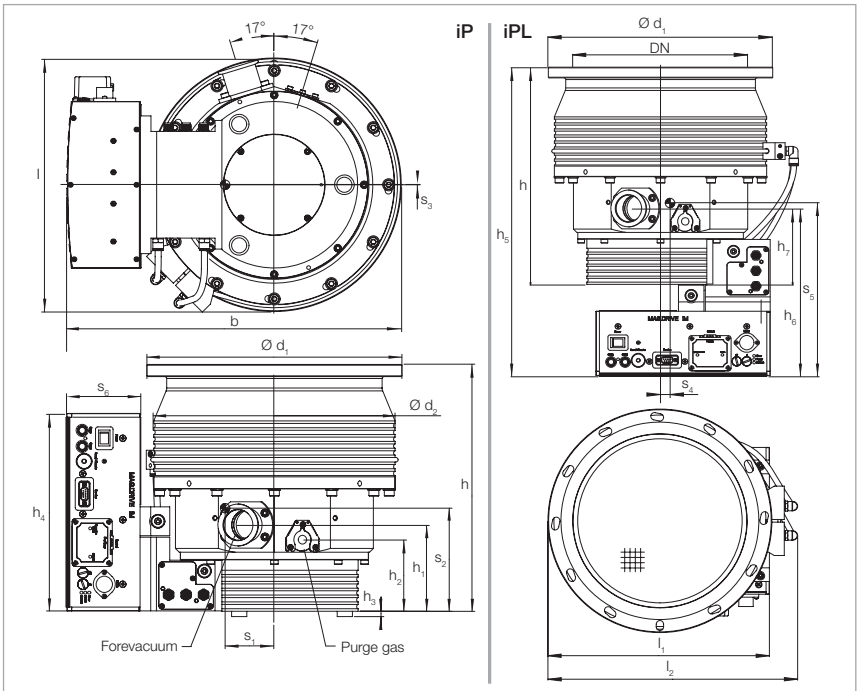


Ordering Information **TURBOVAC MAG W 600/700 iP**

Accessories, optional P	Part No.
Inlet screen	
DN 160 ISO-K	**E 200 00 307**
DN 160 CF	**E 200 17 247**
DN 200 ISO-K	**200 91 639**
DN 200 CF	**400 001 515**
Flange heater	
160 CF, 230 V, 50 Hz	**854 37**
160 CF, 115 V, 60 Hz	**854 38**
Water cooling unit	**410600V0101**
Air cooling unit	**410600V0102**
START/STOP switch for manual operation of the turbomolecular pump	**152 48**
DC plug	**800 001 694**
Solenoid venting valve, normally closed	
24 V DC, DN 16 ISO-KF	**800120V0011**
Power failure venting valve, normally open	**800120V0021**
Included in the Delivery of the Pump P	
Flanges for forevacuum, venting and purge gas are blank-flanged	
Centering ring with FPM sealing ring and a clamping yoke	

MAG INTEGRA - Magnetic Rotor Suspension with integrated Frequency Converter, with Compound Stage

TURBOVAC MAG W 1300 iP(L) to 2200 iP(L)



Type	DN		b	d_1	d_2	h	h_1	h_2	h_3	h_4	h_5	h_6
MAG W 1300	200 ISO-F	mm	420 [1]	285	285	305	114	94	7	260	442	251
		in.	16.54 [1]	11.22	11.22	12.01	4.49	3.70	0.38	10.24	17.40	9.88
	200 CF	mm	416	254	285	335	114	94	7	260	472	251
		in.	16.38	10.00	11.22	13.19	4.49	3.70	0.38	10.24	18.58	9.88
MAG W 1600/1700	250 ISO-F	mm	442	335	317	325	114	94	7	260	463	251
		in.	17.40	13.19	12.48	12.80	4.49	3.70	0.38	10.24	18.23	9.88
	250 CF	mm	432	305	317	330	114	94	7	260	467	251
		in.	17.01	12.01	12.48	12.99	4.49	3.70	0.38	10.24	18.39	9.88
MAG W 2200	250 ISO-F	mm	450	335	349	355	114	94	7	260	492	251
		in.	17.18	13.19	13.74	13.19	4.49	3.70	0.38	10.24	19.37	9.88
	250 CF	mm	446	305	349	372	114	94	7	260	506	251
		in.	17.56	12.01	13.74	14.65	4.49	3.70	0.38	10.24	19.92	9.88

			h_7	l	l_1	l_2	s_1	s_2	s_3	s_4	s_5	s_6
MAG W 1300	200 ISO-F	mm	114	311 [1]	311 [1]	332 [1]	42	140	0	15	241	98
		in.	4.49	12.24 [1]	12.24 [1]	13.07 [1]	1.65	5.51	0	0.59	9.49	3.86
	200 CF	mm	114	307	307	–	32	164	0	–	–	98
		in.	4.49	12.09	12.09	–	1.26	6.46	0	–	–	3.86
MAG W 1600/1700	250 ISO-F	mm	114	335	331	374	39	154	0	14	259	98
		in.	4.49	13.19	12.24	14.72	1.54	6.06	0	0.55	10.20	3.86
	250 CF	mm	114	335	322	–	29	173	0	9	285	98
		in.	4.49	13.19	12.68	–	1.14	6.81	0	0.35	11.22	3.86
MAG W 2200	250 ISO-F	mm	114	343	340	392	34	165	0	12	272	98
		in.	4.49	13.50	13.39	15.43	1.34	6.50	0	0.47	10.71	3.86
	250 CF	mm	114	339	340	–	26	187	0	8	302	98
		in.	4.49	13.35	13.39	–	1.02	7.36	0	0.32	11.89	3.86

[1] 4 mm (o.16 in.) for cooling coil

Dimensional drawing for the MAG INTEGRA, dimensions in mm

Typical Applications

- PVD coatings systems
- Coating of architectural glass
- Optical coatings
- LC displays
- Flat panels
- Research
- Analytical systems

Technical Features

- Installation in any orientation
- DN 200 and/or 250 in ISO-F and/or CF high vacuum connection
- DN 40 KF forevacuum connection
- Purge gas/venting connection DN 16 KF with clamped connection (purge/vent)
- Water cooling
- Protection class IP 54
- 2 slots for industrial communications modules
  - Standard ProfiBus
  - RS 232 C in Service Slot
  - further interfaces can be fitted: RS 485 C, 9 pin 24 V PLC, DeviceNet, EtherNet IP, EtherCat

Advantages to the User

- Highest pumping speed and gas throughput from a very small size
- Rugged and reliable operation in industrial applications
- Sets new benchmarks for maintenance-free systems
- Suited for vibration sensitive applications in the areas of analytical, thin-film, electron microscopy, research and development among others.
- Flexibility through the modular concept; the converter is either attached to the side or under the pump

Technical Data

TURBOVAC MAG W

		1300 iP(L)	1600 iP(L) Booster	1700 iP(L)	2200 iP(L)
Inlet flange	DN	200 ISO-F 200 CF	250 ISO-F	250 ISO-F 250 CF	250 ISO-F 250 CF
Pumping speed					
N_2	l x s^{-1}	1100	1600	1610	2100
Ar	l x s^{-1}	1050	1470	1480	1900
He	l x s^{-1}	1220	1770	1710	2050
H_2	l x s^{-1}	1130	1570	1660	1750
Operating speed	min^{-1}	37 800	33 000	33 000	30 600
standby speed adjustable from	min^{-1}	13 800 (230 Hz)	13 800 (230 Hz)	13 800 (230 Hz)	13 800 (230 Hz)
to nominal speed					
Max. compression ratio					
N_2		> 10^8	> 10^7	> 10^8	> 10^8
Ar		> 10^8	> 10^7	> 10^8	> 10^8
He at 1 sccm		2.0 x 10^5	6.0 x 10^4	2.0 x 10^5	5.0 x 10^4
H_2 at 1 sccm		8.0 x 10^3	1.0 x 10^3	4.0 x 10^3	5.0 x 10^3
Max. gas throughput					
N_2 briefly, e.g. during pumpdown	mbar x l x s^{-1}	30	60	30	30
N_2 in continuous operation	mbar x l x s^{-1}	20	30	20	17
Ar briefly, e.g. during pumpdown	mbar x l x s^{-1}	20	30	20	20
Ar in continuous operation	mbar x l x s^{-1}	15	20	15	12
Ultimate pressure					
ISO-F flange	mbar (Torr)	< 10^{-8} (< 7.5 x 10^{-9})	< 10^{-8} (< 7.5 x 10^{-9})	< 10^{-8} (< 7.5 x 10^{-9})	< 10^{-8} (< 7.5 x 10^{-9})
CF flange	mbar (Torr)	< 10^{-10} (< 7.5 x 10^{-11})	–	< 10^{-10} (< 7.5 x 10^{-11})	< 10^{-10} (< 7.5 x 10^{-11})
Max. degassing temperature	°C (°F)	80 (176)	80 (176)	80 (176)	80 (176)
Max. foreline pressure					
N_2	mbar (Torr)	4.0 (3.00)	1.0 (0.75)	4.0 (3.00)	2.5 (1.9)
Ar	mbar (Torr)	0.6 (0.45)	1.0 (0.75)	0.6 (0.45)	2.5 (1.9)
Recommended backing pump		TRIVAC B or dry compressing pumps			
Run-up time	min	< 5	< 7	< 7	< 10
Foreline flange	DN	40 KF	40 KF	40 KF	40 KF
Purge / vent port (clamped)	DN	16 KF	16 KF	16 KF	16 KF
Water cooling connection	G	1/8"	1/8"	1/8"	1/8"
Weight, approx.	kg (lbs)	40 (88)	45 (99)	45 (99)	50 (110)
Noise level acc. ISO 3744	dB(A)	< 41	< 41	< 41	< 41
Vibration level at high vacuum flange at max. speed	µm	0.01	0.01	0.01	0.01

Technical Data

Integrated Frequency Converter

MAG.DRIVE iM

Power supply	V	200 - 240 ±10%
Mains frequency	Hz	50 / 60
Power consumption		
maximum	W	750
at ultimate pressure	W	150
Contact rating for the relays, max.		32 V, 0.5 A
Permissible ambient temperature		
during operation	°C (°F)	+10 to +45 (+50 to +113)
during storage	°C (°F)	-10 to +60 (+14 to +140)
Relative humidity of the air, non-condensing	%	5 to 85
Protection class	IP	54
Overvoltage category		II
Pollution category		2

TURBOVAC MAG W 1300 P FC PS with Integrated Frequency Converter and Purge Gas Connection	Part No.
MAG W 1300 iP, DN 200 ISO-F, Profibus	411300V0504
MAG W 1300 iP, DN 200 ISO-F, 24 V SPS interface	411300V0514
MAG W 1300 iP, DN 200 CF, Profibus	411300V0506
MAG W 1300 iP, DN 200 CF, 24 V SPS interface	411300V0516
MAG W 1300 iPL, DN 200 ISO-F, Profibus	411300V0704
MAG W 1300 iPL, DN 200 ISO-F, 24 V SPS interface	411300V0714
MAG W 1300 iPL, DN 200 CF, Profibus	411300V0706
MAG W 1300 iPL, DN 200 CF 24 V SPS interface	411300V0716
TURBOVAC MAG W 1600 Booster P FC PS with Integrated Frequency Converter and Purge Gas Connection	
MAG W 1600 iP Booster, DN 250 ISO-F, Profibus	411600V0504
MAG W 1600 iP Booster, DN 250 ISO-F, 24 V SPS interface	411600V0514
MAG W 1600 iPL Booster, DN 250 ISO-F, Profibus	411600V0704
MAG W 1600 iPL Booster, DN 250 ISO-F, 24 V SPS interface	411600V0714
TURBOVAC MAG W 1700 P FC PS with Integrated Frequency Converter and Purge Gas Connection	
MAG W 1700 iP, DN 250 ISO-F, Profibus	411700V0504
MAG W 1700 iP, DN 250 ISO-F, 24 V SPS interface	411700V0514
MAG W 1700 iP, DN 250 CF, Profibus	411700V0506
MAG W 1700 iP, DN 250 CF, 24 V SPS interface	411700V0516
MAG W 1700 iPL, DN 250 ISO-F, Profibus	411700V0704
MAG W 1700 iPL, DN 250 ISO-F, 24 V SPS interface	411700V0714
MAG W 1700 iPL, DN 250 CF, Profibus	411700V0706
MAG W 1700 iPL, DN 250 CF, 24 V SPS interface	411700V0716
TURBOVAC MAG W 2200 P FC PS with Integrated Frequency Converter and Purge Gas Connection	
MAG W 2200 iP, DN 250 ISO-F, Profibus	412200V0504
MAG W 2200 iP, DN 250 ISO-F, 24 V SPS interface	412200V0514
MAG W 2200 iP, DN 250 CF, Profibus	412200V0506
MAG W 2200 iP, DN 250 CF, 24 V SPS interface	412200V0516
MAG W 2200 iPL, DN 250 ISO-F, Profibus	412200V0704
MAG W 2200 iPL, DN 250 ISO-F, 24 V SPS interface	412200V0714
MAG W 2200 iPL, DN 250 CF, Profibus	412200V0706
MAG W 2200 iPL, DN 250 CF, 24 V SPS interface	412200V0716
Other interfaces upon request	

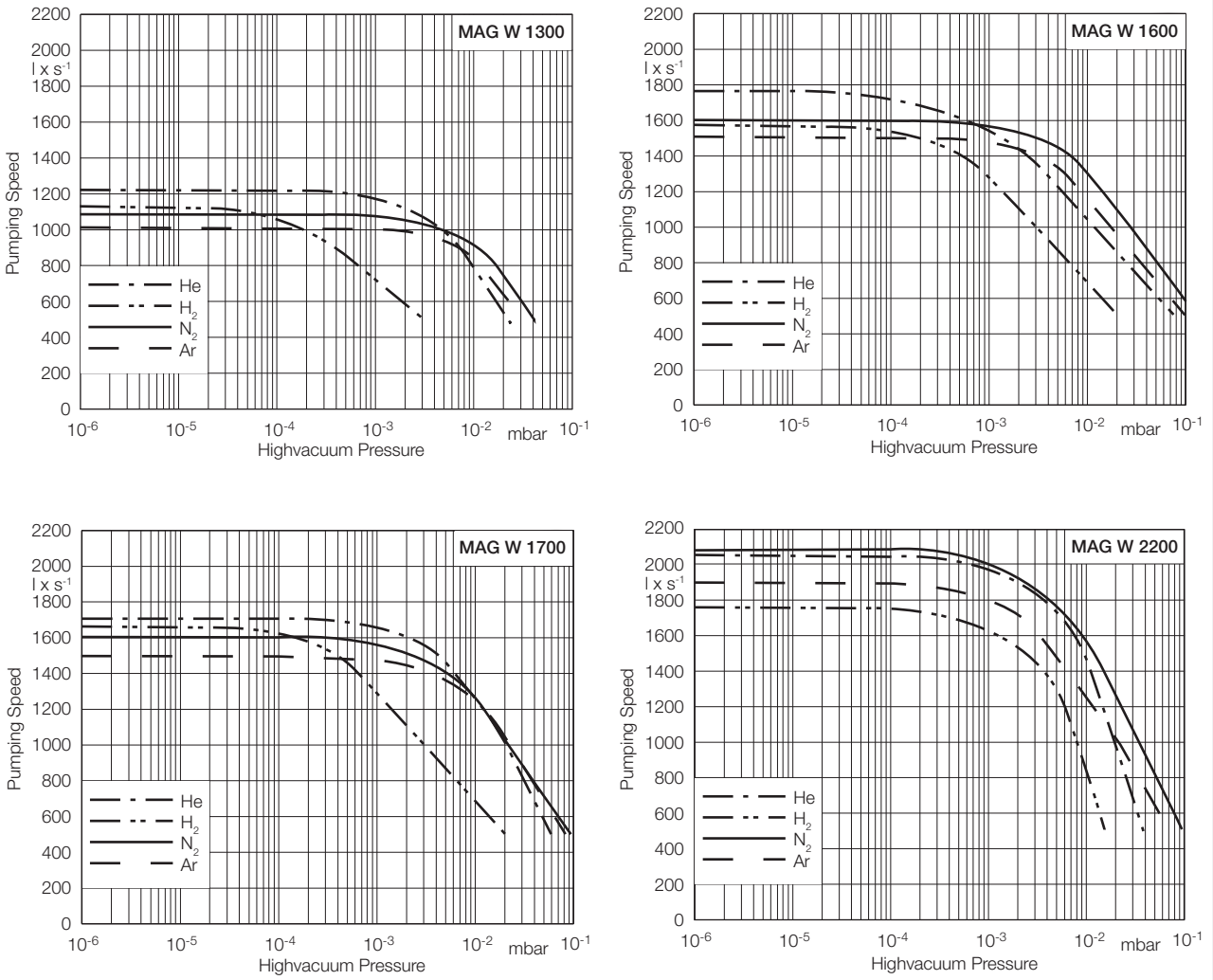
With integrated Frequency Converter and Power Supply

MAG W 1300 iP(L),
MAG W 1600 iP(L) Booster,
MAG W 1700 iP(L),
MAG W 2200 iP(L)

Ordering Information

TURBOVAC MAG
W 1300/1600/1700/2200 iP(L)

Mandatory Accessories P	Part No.
Set of bolts, nuts and washers for ISO-F flange (12 each)	
Bolts M 10 x 50	**400153V0012**
Bolts M 10 x 35	**400153V0010**
Centering with O-ring	
Al/FPM	
DN 200	**268 44**
DN 250	**268 45**
Stainless steel/FPM	
DN 200	**887 02**
DN 250	**887 08**
Set of bolts, nuts and washers for CF flange (8 each)	
Bolts M 8 x 40	**400153V0016**
(For DN 200, 3 sets are required; for DN 250, 4 sets)	
Copper gasket rings for CF flange	
DN 200 (Set of 10 pieces)	**839 47**
DN 250 (Set of 5 pieces)	**839 48**
Set of hex. bolts with nuts, bolts and washers for CF flange	
DN 200	**839 07**
DN 250 (2 sets required)	**839 07**
Accessories, optional P FC PS	
Mains cable, 2.5 m (8.75 ft)	
with EURO plug	**411310V03**
with US plug	**411320V03**
Seal Kit DN 250 Metal	**200 07 901**
Seal kit, metal, for other flanges	**upon request**
Purge gas and venting valve 24 V DC	
0.6 mbar·l/s at 1.5 to 6 bar	**121 33**
0.6 mbar·l/s at 1 to 1.5 bar	**800152V0010**
Cable set (2 pieces) for connection to the pump	**411300V01**
Cooling water valve kit	**411300V02**
Spare Parts	
Inlet screen	
DN 200 ISO-F and DN 200 CF	**E 200 04 558**
DN 250 ISO-F and DN 250 CF	**E 200 04 557**
Included in the Delivery of the Pump P	
Flanges for forevacuum, venting and purge gas are blank-flanged	
Converter-side mains plug (IP 54)	
Inlet screen	

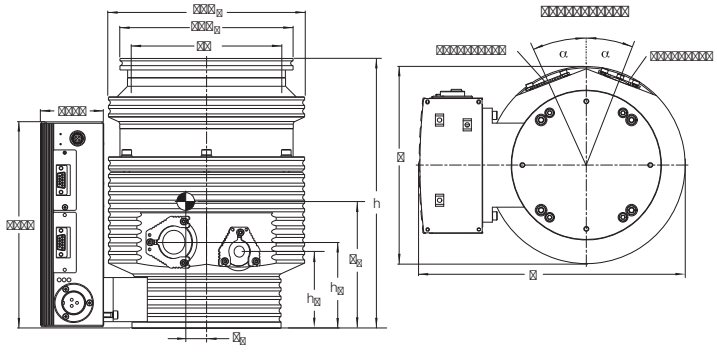


Pumping speed curves of the MAG W 1300, W 1600, W 1700 and W 2200

Notes

MAG DIGITAL - Magnetic Rotor Suspension with separate Frequency Converter, with Compound Stage

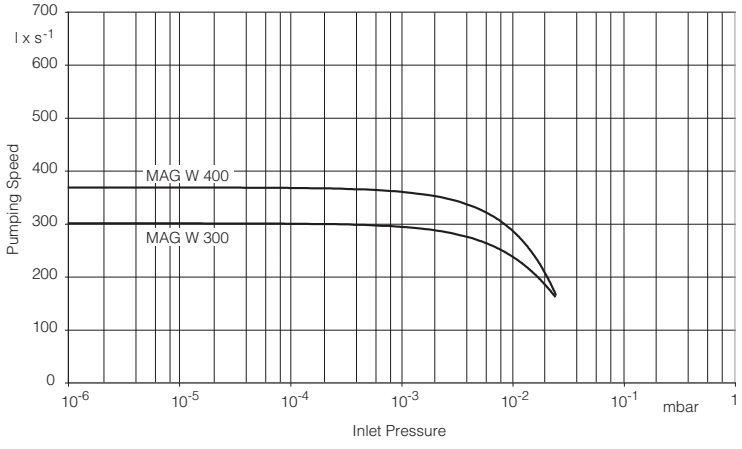
TURBOVAC MAG W 300/400 P



	DN		∅ d_1	∅ d_2	h	h_1	h_2	l	b	b*	α	s_1	s_2
MAG W 300 P	100 ISO-K	mm	130.0	155.0	250.0	77.7	70.0	156.0	250.0	233.0	16°	19.0	103.0
		in.	5.12	6.10	9.84	3.06	2.76	6.14	9.84	9.17	16°	0.75	4.06
	100 CF	mm	151.5	155.0	264.3	77.7	70.0	156.0	250.0	233.0	16°	15.0	129.0
		in.	5.97	6.10	10.41	3.06	2.76	6.14	9.84	9.17	16°	0.59	5.08
MAG W 400 P	160 ISO-K	mm	180.0	155.0	241.0	77.7	70.0	168.5	262.5	245.5	16°	19.0	106.0
		in.	7.09	6.10	9.49	3.06	2.76	6.63	10.34	9.67	16°	0.75	4.17
	160 CF	mm	202.5	155.0	234.7	77.7	70.0	181.2	273.7	256.7	16°	14.0	129.0
		in.	7.97	6.10	9.24	3.06	2.76	7.13	10.78	10.11	16°	0.55	5.08

b* = width with plug of the DRIVE/BEARING cable connected instead of MAG.DRIVE iS

Dimensional drawing for the TURBOVAC MAG W 300/400 P



Pumping speed for N_2 of the TURBOVAC MAG W 300/400 P as a function of the inlet pressure

Typical Applications

- Gas analysis systems
- Particle accelerators
- Electron microscopes
- Research
- Coating systems

Technical Features

- Installation in any orientation
- DN 100 or 160 ISO-K and/or CF high vacuum connection
- DN 16 ISO-KF with clamped forevacuum connection
- Purge gas/venting connection DN 16 ISO-KF with clamped connection (purge/vent)
- Water or air cooling optional

Advantages to the User

- Highest pumping speed from the smallest possible size
- New standard regarding maintenance-free systems
- Suitability for vibration sensitive applications in the area of analytical engineering, thin-film technology, electron microscopes, research, development among others
- Flexibility due to the modular concept; alternatively the pump is available also with an integrated frequency converter

Technical Data

TURBOVAC MAG

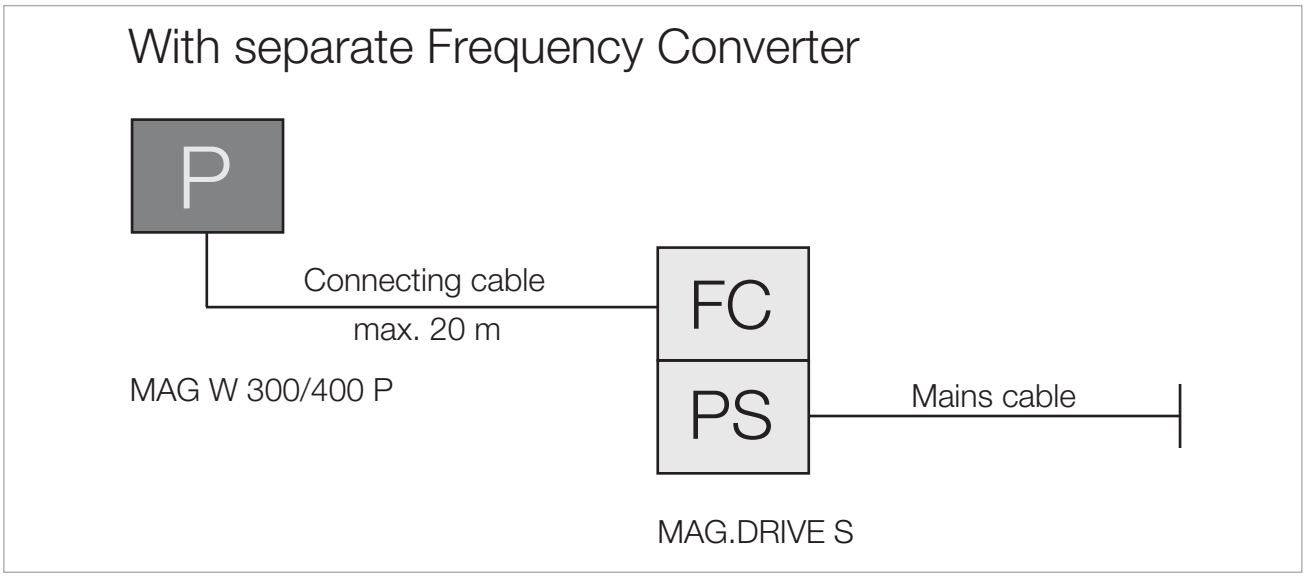
		W 300 P		W 400 P	
Inlet flange	DN	100 ISO-K	100 CF	160 ISO-K	160 CF
Pumping speed					
N_2	l x s^{-1}	300	300	365	365
Ar	l x s^{-1}	260	260	330	330
He	l x s^{-1}	260	260	280	280
H_2	l x s^{-1}	190	190	200	200
Operating speed	min^{-1}	58 800	58 800	58 800	58 800
Compression ratio					
N_2		1.0×10^{10}	1.0×10^{10}	1.0×10^{10}	1.0×10^{10}
H_2		3.2×10^{3}	3.2×10^{3}	3.2×10^{3}	3.2×10^{3}
He		9.2×10^{4}	9.2×10^{4}	9.2×10^{4}	9.2×10^{4}
Ultimate pressure	mbar	$< 10^{-8}$	$< 10^{-10}$	$< 10^{-8}$	$< 10^{-10}$
	(Torr)	($< 0.75 \times 10^{-8}$)	($< 0.75 \times 10^{-10}$)	($< 0.75 \times 10^{-8}$)	($< 0.75 \times 10^{-10}$)
Max. degassing temperature	°C (°F)	–	80 (176)	–	80 (176)
Max. foreline pressure for N_2	mbar (Torr)	8 (6)	8 (6)	8 (6)	8 (6)
Recommended backing pump		TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B
Run-up time	min	< 5	< 5	< 5	< 5
Foreline flange (clamped)	DN	16 ISO-KF	16 ISO-KF	16 ISO-KF	16 ISO-KF
Purge / vent port (clamped)	DN	16 ISO-KF	16 ISO-KF	16 ISO-KF	16 ISO-KF
Water cooling connection (optional)	G	1/8"	1/8"	1/8"	1/8"
Weight, approx.	kg (lbs)	12 (26)	12 (26)	12 (26)	12 (26)

Technical Data

MAG.DRIVE S

Voltage range	V	100 - 240, ±10 %
Nominal frequency	Hz	50 / 60
Power consumption		
stand-by	W	100
maximum	W	400
Max. motor voltage	V	48
Max. pump current	A	6
Fuses F1, F2 5 x 20 mm		10 A fast blow high breaking capacity 250 V
System fuse		L or G characteristic
Max. frequency	Hz	0 to 2000
Load capability, relay output X1	V / A	32 / 0,5
Temperature		
during operation	°C (°F)	0 to +45 (+32 to +113)
during storage	°C (°F)	-10 to +60 (+14 to +140)
Relative humidity of the air	%	95 (non-condensing)

TURBOVAC MAG W 300 P with separate Frequency Converter and Compound Stage	P	Part No.	
DN 100 ISO-K		**410300V0005**	
DN 100 CF		**410300V0006**	
TURBOVAC MAG W 400 P **with separate Frequency Converter and Compound Stage**	**P**		
DN 160 ISO-K		**410400V0005**	
DN 160 CF		**410400V0006**	
Mandatory Accessories	**P FC**		
Electronic frequency converter			
MAG.DRIVE S		**410300V0202**	
MAG.DRIVE S with display		**410300V0212**	
Connecting cable DRIVE/BEARING (connection between pump and MAG.DRIVE S)			
3.0 m (10.5 ft)		**410300V4003**	
5.0 m (17.5 ft)		**410300V4005**	
10.0 m (35.0 ft)		**410300V4010**	
20.0 m (70.0 ft)		**410300V4020**	
Mains cable			
3.0 m (10.5 ft)			
EURO plug		**800102V0002**	
US plug 5-15 P		**800102V1002**	
2.0 m (7.5 ft)			
US plug 115 V AC		**992 76 513**	
Forevacuum pump			
TRIVAC D 2,5 E			
220-240 V, 50 Hz; 230 V, 60 Hz; Schuko plug, EURO version		**140 000**	
110-120 V, 50/60 Hz; NEMA plug, US version		**140 002**	
TRIVAC D 8 B			
1 phase motor; 230 V, 50/60 Hz		**112 55**	
3 phase motor; 230/400 V, 50 Hz; 250/440 V, 60 Hz		**112 56**	



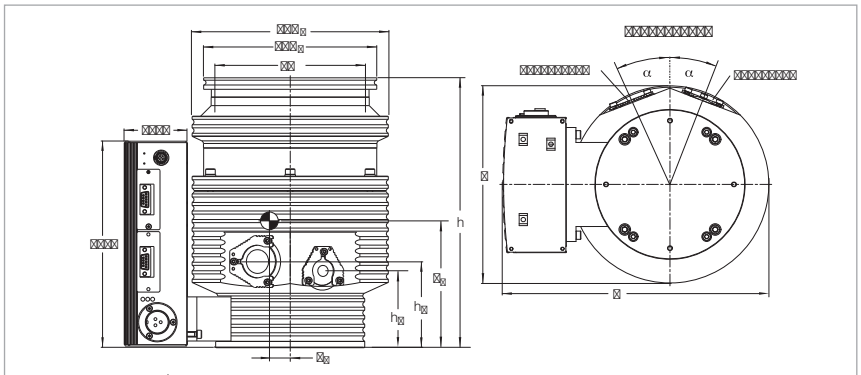
Ordering Information

TURBOVAC MAG W 300/400 P

Accessories, optional P	Part No.
Inlet screen	
DN 100 ISO-K	
coarse (3.2 x 3.2 mm (0.13 x 0.13 in.)	800132V0101
fine (1.6 x 1.6 mm (0.06 x 0.06 in.))	800132V0102
DN 100 CF	
coarse (3.2 x 3.2 mm (0.13 x 0.13 in.))	200 91 514
fine (1.6 x 1.6 mm (0.06 x 0.06 in.))	E 200 17 195
DN 160 ISO-K	E 200 00 307
DN 160 CF	E 200 17 247
Flange heater	
100 CF, 230 V, 50 Hz	854 27
100 CF, 115 V, 60 Hz	854 28
160 CF, 230 V, 50 Hz	854 37
160 CF, 115 V, 60 Hz	854 38
Water cooling unit	410300V0101
Air cooling unit	410300V0102
Solenoid venting valve, normally closed	
24 V DC, DN 16 ISO-KF	800120V0011
Power failure venting valve, normally open	800120V0021
Included in the Delivery of the Pump P	
Flanges for forevacuum, venting and purge gas are blank-flanged	
Centering ring with FPM sealing ring and a clamping yoke	

MAG DIGITAL - Magnetic Rotor Suspension with separate Frequency Converter, with Compound Stage

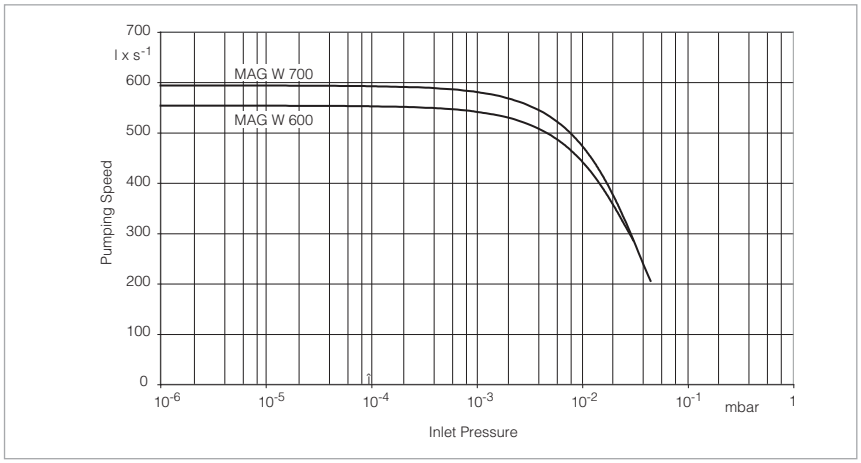
TURBOVAC MAG W 600/700 P



		DN	ø d_1	ø d_2	h	h_1	h_2	l	b	b*	α	s_1	s_2
MAG W 600 P	mm	160 ISO-K	180.0	204.0	281.5	90	80	204.0	274.5	257.5	21°	13.0	121.0
	in.		7.09	8.03	11.08	3.54	3.15	8.03	10.81	10.14	21°	0.51	4.76
	mm	160 CF	202.5	204.0	294.0	90	80	204.0	274.5	257.5	21°	10.0	150.0
	in.		7.97	8.03	11.57	3.54	3.15	8.03	10.81	10.14	21°	0.39	5.91
MAG W 700 P	mm	200 ISO-K	240.0	204.0	280.5	90	80	240.0	292.5	275.5	21°	13.0	130.0
	in.		9.45	8.03	11.04	3.54	3.15	9.45	11.52	10.85	21°	0.51	5.12
	mm	200 CF	253.0	204.0	275.0	90	80	253.0	299.0	282.0	21°	9.0	156.0
	in.		9.96	8.03	10.83	3.54	3.15	9.96	11.77	11.10	21°	0.35	6.14

b* = width with plug of the DRIVE/BEARING cable connected instead of MAG.DRIVE iS

Dimensional drawing for the TURBOVAC MAG W 600/700 P



Pumping speed for N_2 of the TURBOVAC MAG W 600/700 P as a function of the inlet pressure

Typical Applications

- Gas analysis systems
- Particle accelerators
- Electron microscopes
- Research
- Coating systems

Technical Features

- Installation in any orientation
- DN 160 or 200 ISO-K and/or CF high vacuum connection
- DN 25 ISO-KF with clamped forevacuum connection
- Purge gas/venting connection DN 16 ISO-KF with clamped connection (purge/vent)
- Water or air cooling optional

Advantages to the User

- Highest pumping speed from the smallest possible size
- New standard regarding maintenance-free systems
- Suitability for vibration sensitive applications in the area of analytical engineering, thin-film technology, electron microscopes, research, development among others
- Flexibility due to the modular concept; alternatively the pump is available also with an integrated frequency converter

Technical Data

TURBOVAC MAG

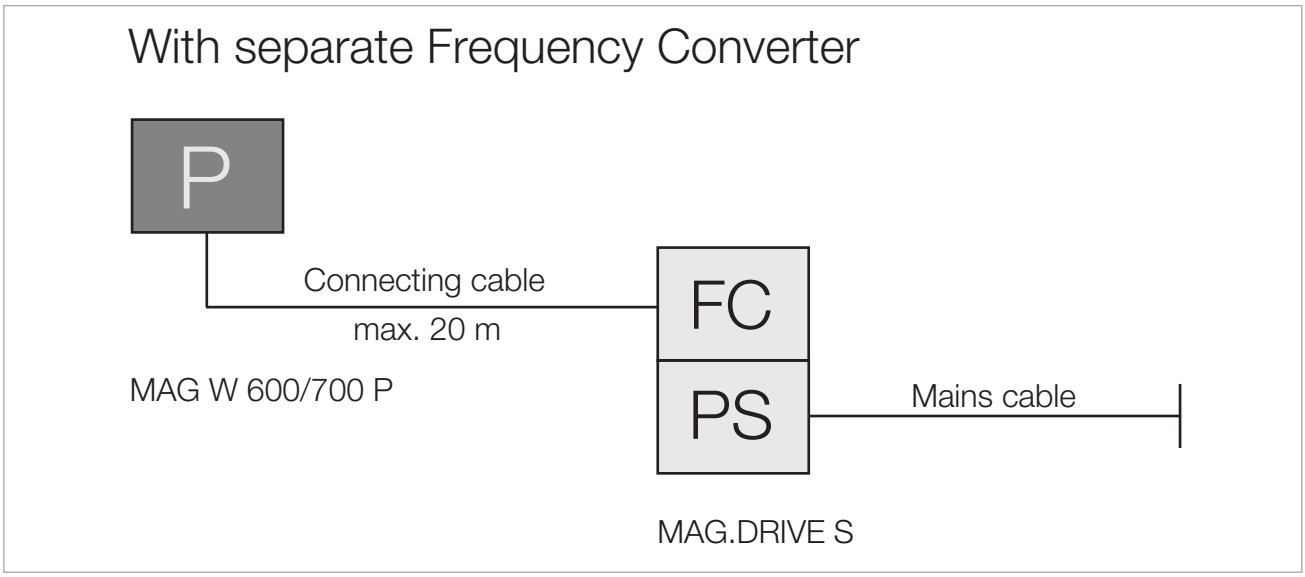
		W 600 P		W 700 P	
Inlet flange	DN	160 ISO-K	160 CF	200 ISO-K	200 CF
Pumping speed					
N_2	l x s^{-1}	550	550	590	590
Ar	l x s^{-1}	520	520	540	540
He	l x s^{-1}	570	570	600	600
H_2	l x s^{-1}	410	410	430	430
Operating speed	min^{-1}	48 000	48 000	48 000	48 000
Compression ratio					
N_2		1.6×10^{10}	1.6×10^{10}	1.6×10^{10}	1.6×10^{10}
H_2		3.4×10^{4}	3.4×10^{4}	3.4×10^{4}	3.4×10^{4}
He		1.7×10^{6}	1.7×10^{6}	1.7×10^{6}	1.7×10^{6}
Ultimate pressure	mbar	$< 10^{-8}$	$< 10^{-10}$	$< 10^{-8}$	$< 10^{-10}$
	(Torr)	($< 0.75 \times 10^{-8}$)	($< 0.75 \times 10^{-10}$)	($< 0.75 \times 10^{-8}$)	($< 0.75 \times 10^{-10}$)
Max. degassing temperature	°C (°F)	–	80 (176)	–	80 (176)
Max. foreline pressure for N_2	mbar (Torr)	6.0 (4.5)	6.0 (4.5)	6.0 (4.5)	6.0 (4.5)
Recommended backing pump		TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B	TRIVAC D 2,5 E TRIVAC D 8 B
Run-up time	min	< 6	< 6	< 6	< 6
Foreline flange (clamped)	DN	25 ISO-KF	25 ISO-KF	25 ISO-KF	25 ISO-KF
Purge / vent port (clamped)	DN	16 ISO-KF	16 ISO-KF	16 ISO-KF	16 ISO-KF
Water cooling connection (optional)	G	1/8"	1/8"	1/8"	1/8"
Weight, approx.	kg (lbs)	17 (37.5)	17 (37.5)	17 (37.5)	17 (37.5)

Technical Data

MAG.DRIVE S

Voltage range	V	100 - 240, ±10 %
Nominal frequency	Hz	50 / 60
Power consumption		
stand-by	W	100
maximum	W	400
Max. motor voltage	V	48
Max. pump current	A	6
Fuses F1, F2 5 x 20 mm		10 A fast blow high breaking capacity 250 V
System fuse		L or G characteristic
Max. frequency	Hz	0 to 2000
Load capability, relay output X1	V / A	32 / 0,5
Temperature		
during operation	°C (°F)	0 to +45 (+32 to +113)
during storage	°C (°F)	-10 to +60 (+14 to +140)
Relative humidity of the air	%	95 (non-condensing)

TURBOVAC MAG W 600 P with separate Frequency Converter and Compound Stage P	Part No.	
DN 160 ISO-K	**410600V0005**	
DN 160 CF	**410600V0006**	
TURBOVAC MAG W 700 P **with separate Frequency Converter and Compound Stage P**		
DN 200 ISO-K	**410700V0005**	
DN 200 CF	**410700V0006**	
Mandatory Accessories P FC		
Electronic frequency converter		
MAG.DRIVE S	**410300V0202**	
MAG.DRIVE S with display	**410300V0212**	
Connecting cable DRIVE/BEARING		
(connection between pump and MAG.DRIVE S)		
3.0 m (10.5 ft)	**410300V4003**	
5.0 m (17.5 ft)	**410300V4005**	
10.0 m (35.0 ft)	**410300V4010**	
20.0 m (70.0 ft)	**410300V4020**	
Mains cable		
3.0 m (10.5 ft)		
EURO plug	**800102V0002**	
US plug 5-15 P	**800102V1002**	
2.0 m (7.5 ft)		
US plug 115 V AC	**992 76 513**	
Forevacuum pump		
TRIVAC D 2,5 E		
220-240 V, 50 Hz; 230 V, 60 Hz; Schuko plug, EURO version	**140 000**	
110-120 V, 50/60 Hz; NEMA plug, US version	**140 002**	
TRIVAC D 8 B		
1 phase motor; 230 V, 50/60 Hz	**112 55**	
3 phase motor; 230/400 V, 50 Hz; 250/440 V, 60 Hz	**112 56**	



Ordering Information

TURBOVAC MAG W 600/700 P

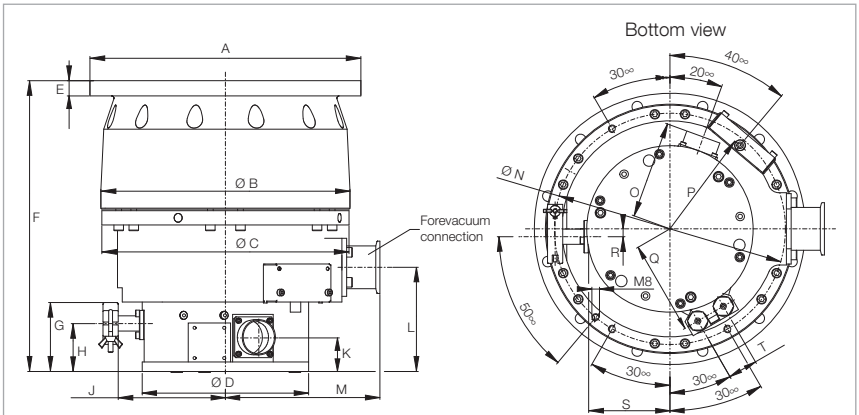
Accessories, optional	P	Part No.
Inlet screen		
DN 160 ISO-K		**E 200 00 307**
DN 160 CF		**E 200 17 247**
DN 200 ISO-K		**200 91 639**
DN 200 CF		**400 001 515**
Flange heater		
160 CF, 230 V, 50 Hz		**854 37**
160 CF, 115 V, 60 Hz		**854 38**
Water cooling unit		**410600V0101**
Air cooling unit		**410600V0102**
Solenoid venting valve, normally closed		
24 V DC, DN 16 ISO-KF		**800120V0011**
Power failure venting valve, normally open		**800120V0021**
Included in the Delivery of the Pump	P	
Flanges for forevacuum, venting and purge gas are blank-flanged		
Centering ring with FPM sealing ring and a clamping yoke		

MAG DIGITAL - Magnetic Rotor Suspension with separate Frequency Converter, with Compound Stage

TURBOVAC MAG W 830/1300 C

Typical Applications

- Semiconductor processes, like PVD and ion implantation
- Transfer chambers
- Particle accelerators
- Research
- Coating systems



	Forevacuum flange	Inlet flange		A	B	C	D	E
MAG W 830 C	DN 40 ISO-KF	160 ISO-F	mm	225	262	260	175	16
	DN 40 ISO-KF	160 ISO-F	in.	8.86	10.31	10.24	6.89	0.63
MAG W 1300 C	DN 40 ISO-KF / DN 25 ISO-KF	200 ISO-F	mm	285	262	260	175	16
	DN 40 ISO-KF / DN 25 ISO-KF	250 ISO-F	in.	11.22	10.31	10.24	6.89	0.63
MAG W 1300 C	DN 40 ISO-KF	250 ISO-F	mm	335	262	260	175	16
	DN 40 ISO-KF	250 ISO-F	in.	13.19	10.31	10.24	6.89	0.63

		F	G	H	J	K	L	M	N
MAG W 830 C	mm	353	72	50	113	35	109.5	163	243
	in.	13.9	2.83	1.97	4.45	1.38	4.31	6.42	9.57
MAG W 1300 C	mm	306	72	50	113	35	109.5	163	243
	in.	12.05	2.83	1.97	4.45	1.38	4.31	6.42	9.57
MAG W 1300 C	mm	306	72	50	113	35	109.5	163	243
MAG W 1300 C	in.	12.05	2.83	1.97	4.45	1.38	4.31	6.42	9.57

		O	P	Q	R	S	T
MAG W 830 C	mm	103	114.7	98	8.3	85	31
	in.	4.06	4.52	3.86	0.33	3.35	1.22
MAG W 1300 C	mm	103	114.7	98	8.3	85	31
	in.	4.06	4.52	3.86	0.33	3.35	1.22
MAG W 1300 C	mm	103	114.7	98	8.3	85	31
	in.	4.06	4.52	3.86	0.33	3.35	1.22

Dimensional drawing for the TURBOVAC MAG W 830/1300 C

Technical Features

- Active 5-axis magnetic bearing system
- Digital monitoring of the bearing system
- Low noise and vibration levels
- Installation in any orientation
- Advanced rotor design for high throughput
- Purge gas connection
- Intelligent power control system

Advantages to the User

- Maintenance-free
- High throughput for all process gases
- High pumping speed at low pressure
- High foreline pressure tolerance: up to 2 mbar (1.5 Torr)
- Lowest weight and size in its class
- Application specific design

Technical Data

TURBOVAC MAG

		W 830	W 830 C	W 1300	W 1300 C	
Inlet flange	DN	160 CF	160 ISO-F	200 CF	200 ISO-F	250 ISO-F
Pumping speed according to PNEUROP						
N_2	l x s^{-1}	900	700	1170	1100	1220
Ar	l x s^{-1}	750	650	1100	1050	1180
He	l x s^{-1}	900	500	1150	1100	1200
H_2	l x s^{-1}	740	350	920	920	1020
Operating speed	min^{-1}	36 000	24 000	36 000	36 000	36 000
Compression ratio						
N_2		1.5 x 10^8	> 5 x 10^7	1.5 x 10^8	> 10^8	> 10^8
Ultimate pressure according to DIN 28 400						
	mbar	< 1 x 10^{-10}	< 10^{-8}	< 1 x 10^{-10}	< 10^{-8}	< 10^{-8}
	(Torr)	(< 0.75 x 10^{-10})	(< 0.75 x 10^{-8})	(< 0.75 x 10^{-10})	(< 0.75 x 10^{-8})	(< 0.75 x 10^{-8})
Max. foreline pressure for N_2						
with convection cooling	mbar (Torr)	0.2 (0.15)	–	0.2 (0.15)	–	–
with water cooling	mbar (Torr)	2.0 (1.5)	2.0 (1.5)	2.0 (1.5)	2.0 (1.5)	2.0 (1.5)
Recommended backing pump						
Rotary vane pump		TRIVAC D 65 BCS	TRIVAC D 65 BCS	TRIVAC D 65 BCS	TRIVAC D 65 BCS	TRIVAC D 65 BCS
or dry compressing pump offering a pumping speed of 100 m^3/h						
Run-up time	min	< 6	< 4	< 6	< 6	< 6
Foreline flange	DN	40 ISO-KF	40 ISO-KF	40 ISO-KF	40 ISO-KF	40 ISO-KF
Purge and vent port	DN	10 ISO-KF/ 16 ISO-KF	10 ISO-KF/ 16 ISO-KF	10 ISO-KF/ 16 ISO-KF	10 ISO-KF/ 16 ISO-KF	10 ISO-KF/ 16 ISO-KF
Cooling water connection (OD of tube)	mm (in.)	1/4"	1/4"	1/4"	6	6
Weight, approx.	kg (lbs)	35 (77.3)	32 (70.6)	35 (77.3)	32 (70.6)	32 (70.6)

Technical Data

MAG.DRIVE digital

Mains connection, 50/60 Hz	V	200 - 240, +10 %/-15 %
Current for connected consumers max.	A	20
Max. motor voltage	V	60
Nominal frequency	Hz	50/60
Permissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	483 x 213 x 1/2 19" (19.02 x 8.39 x 1/2 19")
Weight, approx.	kg (lbs)	10 (22)

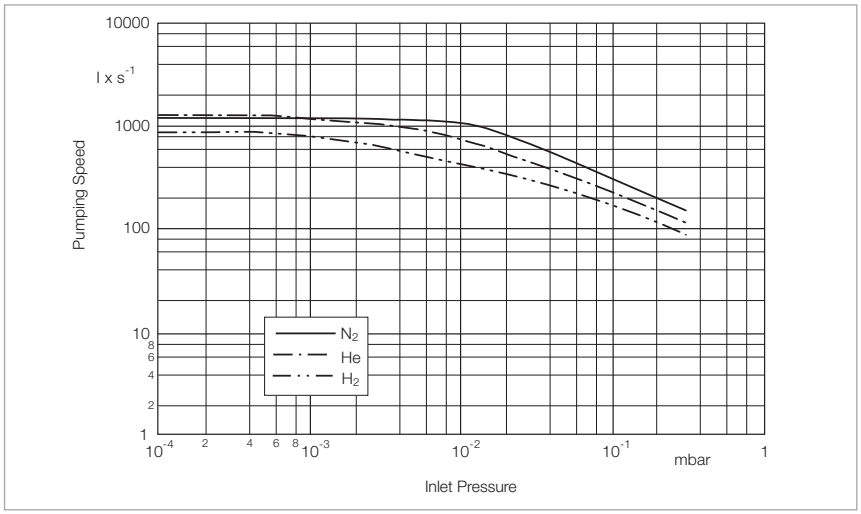
Ordering Information

TURBOVAC MAG
W 830 (C) / W 1300 (C)

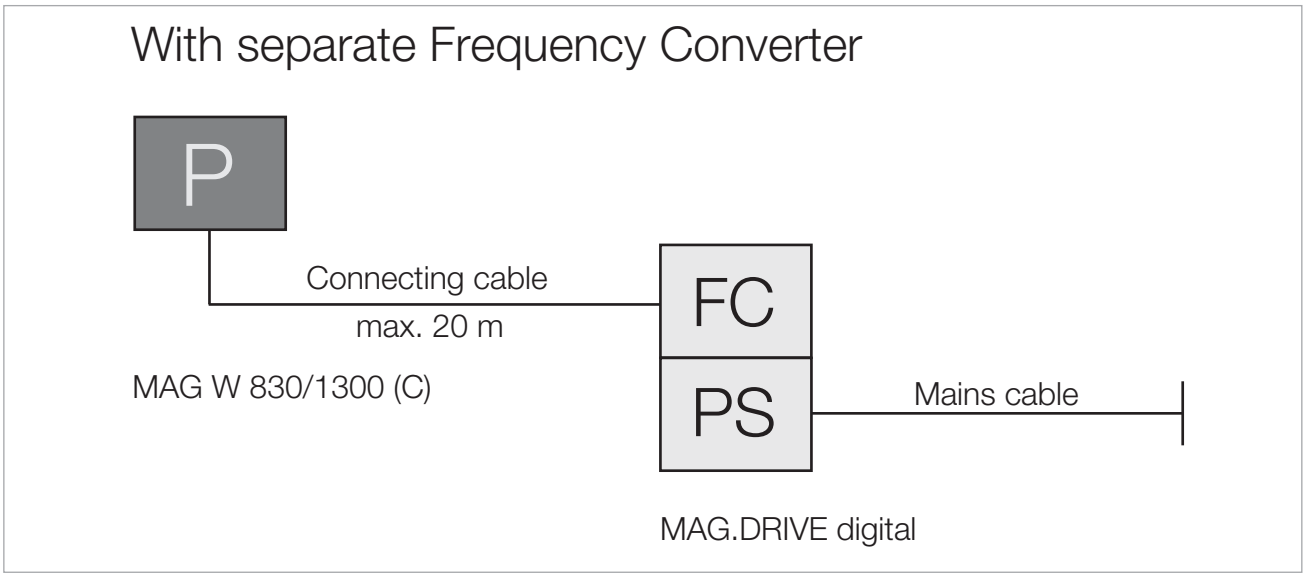
TURBOVAC MAG W 830 (C) with separate Frequency Converter and Compound Stage [P]	**Part No.**	
DN 160 CF (MAG W 830)	**400100V0041**	
DN 160 ISO-F (MAG W 830 C)	**400100V0005**	
TURBOVAC MAG W 1300 (C) with separate Frequency Converter and Compound Stage [P]		
DN 200 CF (MAG W 1300)	**400110V0051**	
DN 200 ISO-F (MAG W 1300 C)	**400110V0011**	
DN 250 ISO-F (MAG W 1300 C)	**400110V0021**	
Mandatory Accessories [P] [FC]		
Electronic frequency converter [1]		
MAG.DRIVE digital	**400035V0011**	
MAG.DRIVE digital, Profibus	**400035V0013**	
MAG.DRIVE digital, RS 232 C interface	**400035V0014**	
Plug-in control	**121 36**	
Connecting cable converter – pump [2]		
1.5 m (5.25 ft) DRIVE/BEARING	**400036V0001**	
3.0 m (10.5 ft) DRIVE/BEARING	**400036V0008**	
5.0 m (17.5 ft) DRIVE/BEARING	**400036V0004**	
10.0 m (35.0 ft) DRIVE/BEARING	**400036V0002**	
20.0 m (70.0 ft) DRIVE/BEARING	**400036V0003**	
Forevacuum pump		
TRIVAC D 65 B		
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz	**113 98**	
3 phase motor; 208-23/460 V, 60 Hz / 200-220/380 V, 60 Hz	**913 98-2**	
For further types, see Catalog Part “Oil Sealed Vacuum Pumps”		

[1] Included are 2 mains cords. One with EURO plug and one with US plug (220 V AC). Replacement mains cord are Part Numbers 180 097 or 180 096 respectively

[2] Further connecting cables can be found under MAG.DRIVE digital in the chapter “Turbomolecular Pumps with Magnetic Rotor Suspension”, para. “Electronic Frequency Converters”



Pumping speed of the TURBOVAC MAG W 1300 C (DN 250) as a function of the inlet pressure



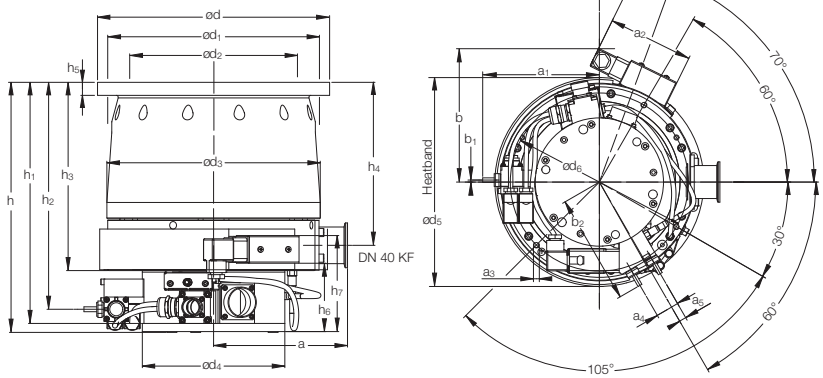
Ordering Information

TURBOVAC MAG
W 830 (C) / W 1300 (C)

Accessories, optional	P	Part No.
Purge gas and venting valve		**121 33**
Connecting cable for optional purge gas valve (pump/converter)		
1.5 m (5.25 ft)		**400038V0007**
3.0 m (10.5 ft)		**400038V0006**
10.0 m (35.0 ft)		**400038V0002**
20.0 m (70.0 ft)		**400038V0009**
Included in the Delivery of the Pump	P	
Inlet screen		
DN 160 ISO-F		**E 200 00 307**
DN 160 CF		**E 200 17 247**
DN 200 ISO-F		**200 91 470**
DN 200 CF		**E 200 17 248**
DN 250 ISO-F		**200 91 471**

MAG DIGITAL - Magnetic Rotor Suspension with separate Frequency Converter, with Compound Stage

TURBOVAC MAG W 1500 CT



Bottom view

		a	a_1	a_2	a_3	a_4	a_5	b	b_1	b_2	d	d_1	d_2
200 ISO-F	mm	164.5	159	116.5	M8 x 15	32	9	182	3	150	285	260	213
	in.	6.48	6.26	4.59	M8 x 0.6	1.26	0.35	7.17	0.12	5.91	11.22	10.24	8.39
250 ISO-F	mm	164.5	159	116.5	M8 x 15	32	9	182	3	150	335	310	261
	in.	6.48	6.26	4.59	M8 x 0.6	1.26	0.35	7.17	0.12	5.91	11.22	12.20	10.28

		d_3	d_4	d_5	d_6	h	h_1	h_2	h_3	h_4	h_5	h_6	h_7
200 ISO-F	mm	262	175	285	243	307	296	279	231	200	16	84	118
	in.	10.31	6.89	11.22	9.57	12.09	11.65	10.98	9.09	7.87	0.63	3.31	4.65
250 ISO-F	mm	262	175	285	243	307	296	279	231	200	16	84	118
	in.	10.31	6.89	11.22	9.57	12.09	11.65	10.98	9.09	7.87	0.63	3.31	4.65

Dimensional drawing for the TURBOVAC MAG W 1500 CT

Typical Applications

- All major semiconductor processes such as Etch, CVD, PVD and Ion Implantation

Technical Features

- Active 5-axis magnetic bearing system
- Bearing and temperature system are controlled digitally
- Corrosion resistant
- Low noise and vibration levels
- Installation in any orientation
- Advanced rotor design for high pump speeds and forevacuum pressures
- Integrated purge gas system
- Integrated temperature management system (TMS)
- Intelligent power control system

Advantages to the User

- Maintenance-free
- High throughput for all process gases
- High pumping speed at low pressure
- High foreline pressure tolerance: up to 2.6 mbar (1.95 Torr)
- High resistance against corrosive gases
- Robust against particles and deposits
- Temperature control up to 90 °C (194 °F) to avoid condensation
- Lowest weight and size in its class
- Application specific design

Technical Data — TURBOVAC MAG W 1500 CT

Inlet flange	DN	200 ISO-F	250 ISO-F	200 CF
Pumping speed according to PNEUROP				
N_2	l x s^{-1}	1100	1220	1100
Ar	l x s^{-1}	1050	1180	1050
He	l x s^{-1}	1100	1200	1100
H_2	l x s^{-1}	920	1020	920
Operating speed	min^{-1}	36 000	36 000	36 000
Compression ratio				
N_2		> 10^8	> 10^8	> 10^8
Ultimate pressure according to DIN 28 400	mbar (Torr)	< 10^{-8} (< 0.75 x 10^{-8})	< 10^{-8} (< 0.75 x 10^{-8})	< 10^{-10} (< 0.75 10^{-10})
Max. foreline pressure for N_2	mbar (Torr)	2.6 (1.95)	2.6 (1.95)	2.6 (1.95)
Recommended backing pump Rotary vane pump or dry compressing pump offering a pumping speed of 100 m^3/h		TRIVAC D 65 BCS	TRIVAC D 65 BCS	TRIVAC D 65 BCS
Run-up time at 95% of nominal speed	min	< 6	< 6	< 6
Foreline flange	DN	40 ISO-KF	40 ISO-KF	40 ISO-KF
Purge and vent port	VCR	1/4"	1/4"	1/4"
Cooling water connection (OD of tube)	mm (in.)	6.4 (0.25)	6.4 (0.25)	6.4 (0.25)
Weight, approx.	kg (lbs)	32 (70.6)	32 (70.6)	32 (70.6)

Technical Data — MAG.DRIVE digital

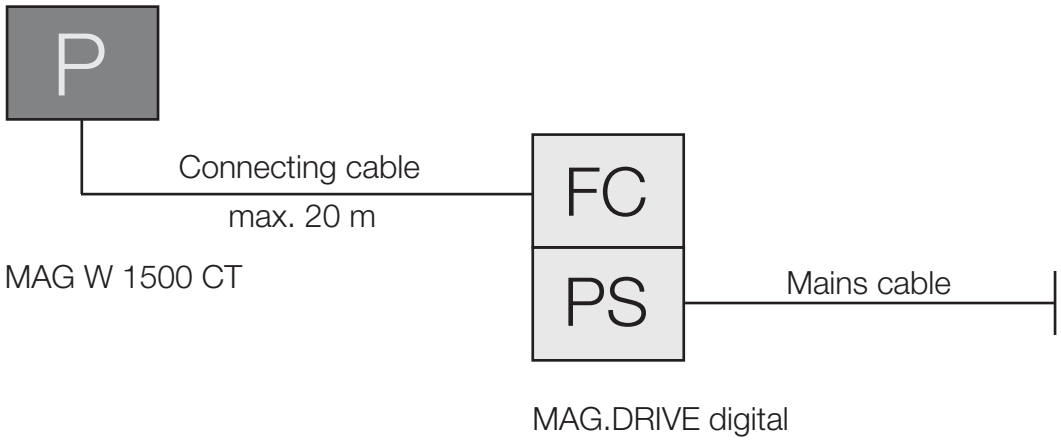
Mains connection, 50/60 Hz	V	200 - 240, +10 %/-15 %
Current for connected consumers max.	A	20
Max. motor voltage	V	60
Nominal frequency	Hz	50/60
Permissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	483 x 213 x 1/2 19" (19.02 x 8.39 x 1/2 19")
Weight, approx.	kg (lbs)	10 (22)

TURBOVAC MAG W 1500 CT with separate Frequency Converter and Compound Stage P	Part No.	
DN 200 ISO-F	400026V0002	
DN 250 ISO-F	400027V0002	
DN 200 CF	400030V0002	
Mandatory Accessories P FC		
Electronic frequency converter [1]		
MAG.DRIVE digital	400035V0011	
MAG.DRIVE digital, Profibus	400035V0013	
MAG.DRIVE digital, RS 232 C interface	400035V0014	
Connecting cable converter – pump [2]		
1.5 m (5.25 ft) DRIVE/BEARING	400036V0001	
1.5 m (5.25 ft) TMS	400037V0001	
3.0 m (10.5 ft) DRIVE/BEARING	400036V0008	
3.0 m (10.5 ft) TMS	400037V0008	
5.0 m (17.5 ft) DRIVE/BEARING	400036V0004	
5.0 m (17.5 ft) TMS	400037V0004	
10.0 m (35.0 ft) DRIVE/BEARING	400036V0002	
10.0 m (35.0 ft) TMS	400037V0002	
20.0 m (70.0 ft) DRIVE/BEARING	400036V0003	
20.0 m (70.0 ft) TMS	400037V0003	
Plug-in control	121 36	
Forevacuum pump		
TRIVAC D 65 B		
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz	113 98	
3 phase motor; 208-23/460 V, 60 Hz / 200-220/380 V, 60 Hz	913 98-2	
For further types, see Catalog Part “Oil Sealed Vacuum Pumps”		

[1] Included are 2 mains cords. One with EURO plug and one with US plug (220 V AC). Replacement mains cord are Part Numbers 180 097 or 180 096 respectively

[2] Further connecting cables can be found under MAG.DRIVE digital in the chapter “Turbomolecular Pumps with Magnetic Rotor Suspension”, para. “Electronic Frequency Converters”

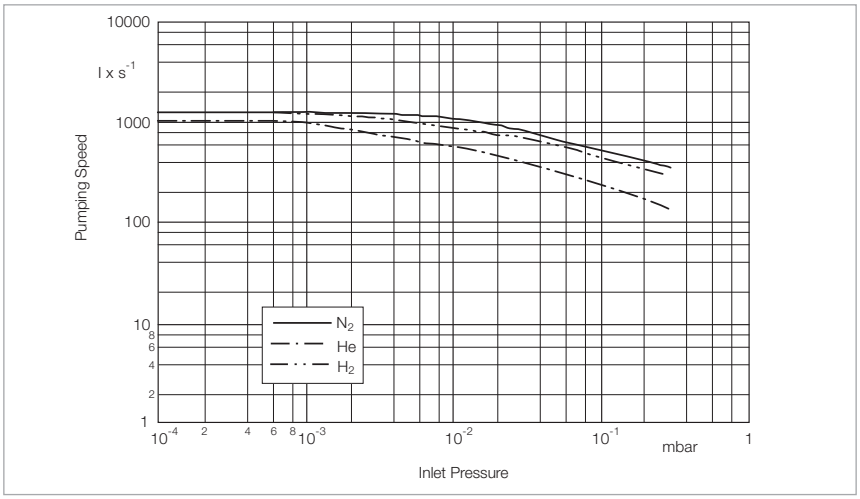
With separate Frequency Converter



Ordering Information

TURBOVAC MAG W 1500 CT

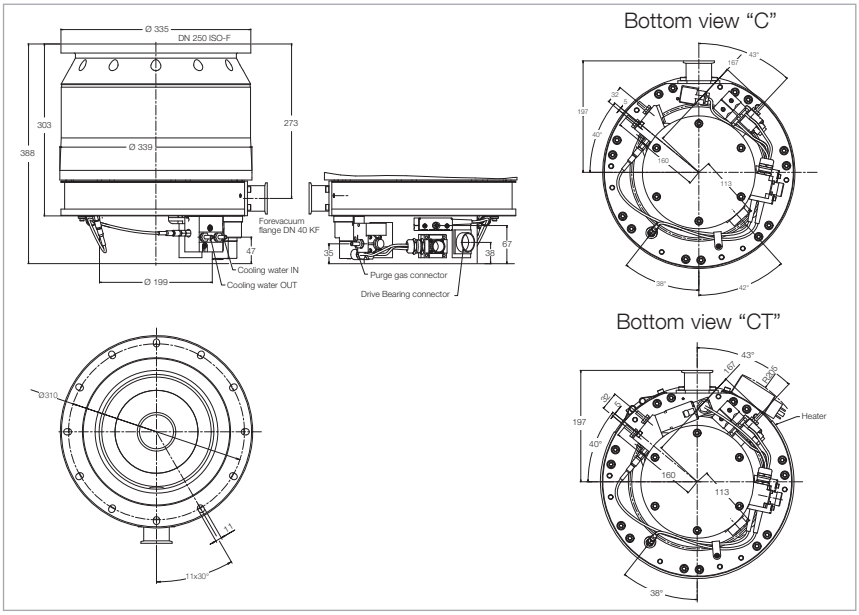
Accessories, optional	P	Part No.
Seal kit DN 250 metal		**200 07 901**
Included in the Delivery of the Pump	P	
Inlet screen DN 200 ISO-F DN 250 ISO-F DN 250 CF		**200 91 470** **200 91 471** **200 91 638**
Integrated purge gas system VRC nut 1/4"		
Integrated temperature management system		
Cooling water connection Swagelock 1/4" tube		
Included in the Delivery of the Frequency Converter	FC	
Mains cord, 3 m (10.5 ft.) long, approx. with EURO or US plug		



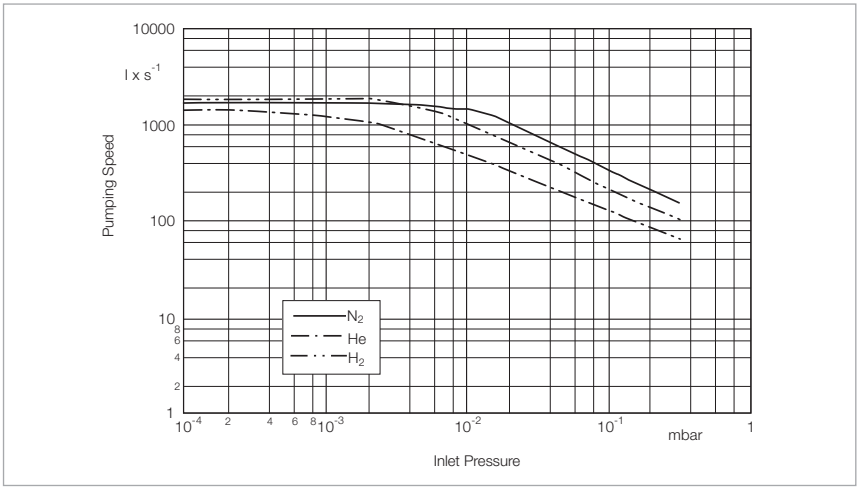
Pumping speed of the TURBOVAC MAG W 1500 CT (DN 250) as a function of the inlet pressure

MAG DIGITAL - Magnetic Rotor Suspension with separate Frequency Converter with Compound Stage

TURBOVAC MAG W 2000 C/CT



Dimensional drawing for the TURBOVAC MAG W 2000 C/CT



Pumping speed of the TURBOVAC MAG W 2000 CT (DN 250) as a function of the inlet pressure

Typical Applications

- All major semiconductor processes such as Etch, CVD, PVD and Ion Implantation

Technical Features

- Active 5-axis magnetic bearing system
- Patented KEPLA-COAT® for rotor and stator to prevent corrosion
- Low noise and vibration levels
- Installation in any orientation
- Advanced rotor design for high pump speeds and forevacuum pressures
- Integrated purge gas system
- CT versions: Integrated temperature management system (TMS)

Advantages to the User

- Maintenance-free
- High throughput for all etch gases
- High pumping speed at low pressure
- High foreline pressure tolerance: up to 5.3 mbar (4 Torr)
- High resistance against corrosive gases
- Robust against particles and deposits
- Temperature management system (TMS) to avoid condensation
- Application specific design

Technical Data

TURBOVAC MAG

	W 2000 C	W 2000 CT
Inlet flange DN	250 ISO-F	250 ISO-F
Pumping speed according to PNEUROP		
N_2 l x s^{-1}	1760	1760
Ar l x s^{-1}	1650	1650
He l x s^{-1}	1800	1800
H_2 l x s^{-1}	1500	1500
Operating speed min^{-1}	28 800	28 800
Compression ratio N_2	> 10^8	> 10^8
Ultimate pressure according to DIN 28 400 mbar (Torr)	< 10^{-8} (< 0.75 x 10^{-8})	< 10^{-8} (< 0.75 x 10^{-8})
Max. foreline pressure for N_2 mbar (Torr)	3.5 (2.63)	3.5 (2.63)
Recommended backing pump Rotary vane pump or dry compressing pump offering a pumping speed of 100 m^3/h	TRIVAC D 65 BCS	TRIVAC D 65 BCS
Run-up time min	< 8	< 8
Foreline flange DN	40 ISO-KF	40 ISO-KF
Purge and vent port VCR	1/4"	1/4"
Cooling water connection (OD of tube) mm (in.)	6.4 (0.25)	6.4 (0.25)
Weight, approx. kg (lbs)	68 (150)	68 (150)

Technical Data

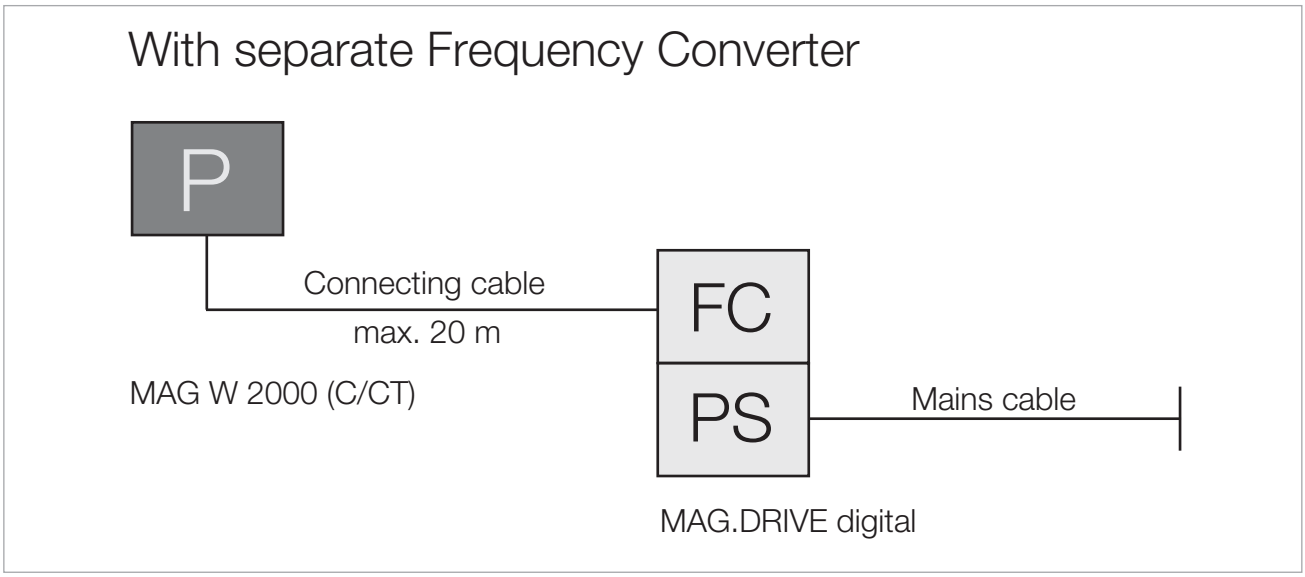
MAG.DRIVE digital

Mains connection, 50/60 Hz V	200 - 240, +10 %/-15 %
Current for connected consumers max. A	20
Max. motor voltage V	60
Nominal frequency Hz	50/60
Permissible ambient temperature °C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D) mm (in.)	483 x 213 x 1/2 19" (19.02 x 8.39 x 1/2 19")
Weight, approx. kg (lbs)	10 (22)

TURBOVAC MAG W 2000 C/CT with separate Frequency Converter and Compound Stage P	Part No.	
DN 250 ISO-F (MAG W 2000 C) DN 250 ISO-F (MAG W 2000 CT)	400047V0001 400047V0002	
Mandatory Accessories P FC		
Electronic frequency converter [1] MAG.DRIVE digital MAG.DRIVE digital, Profibus MAG.DRIVE digital, RS 232 C interface	 400035V0011 400035V0013 400035V0014	
Connecting cable converter – pump [2]		
1.5 m (5.25 ft) DRIVE/BEARING	400036V0001	
1.5 m (5.25 ft) TMS	400037V0001	
3.0 m (10.5 ft) DRIVE/BEARING	400036V0008	
3.0 m (10.5 ft) TMS	400037V0008	
5.0 m (17.5 ft) DRIVE/BEARING	400036V0004	
5.0 m (17.5 ft) TMS	400037V0004	
10.0 m (35.0 ft) DRIVE/BEARING	400036V0002	
10.0 m (35.0 ft) TMS	400037V0002	
20.0 m (70.0 ft) DRIVE/BEARING	400036V0003	
20.0 m (70.0 ft) TMS	400037V0003	
Plug-in control	121 36	
Forevacuum pump TRIVAC D 65 B 3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz 3 phase motor; 208-23/460 V, 60 Hz / 200-220/380 V, 60 Hz	 113 98 913 98-2	
For further types, see Catalog Part “Oil Sealed Vacuum Pumps”		

[1] Included are 2 mains cords. One with EURO plug and one with US plug (220 V AC). Replacement mains cord are Part Numbers 180 097 or 180 096 respectively

[2] Further connecting cables can be found under MAG.DRIVE digital in the chapter “Turbomolecular Pumps with Magnetic Rotor Suspension”, para. “Electronic Frequency Converters”



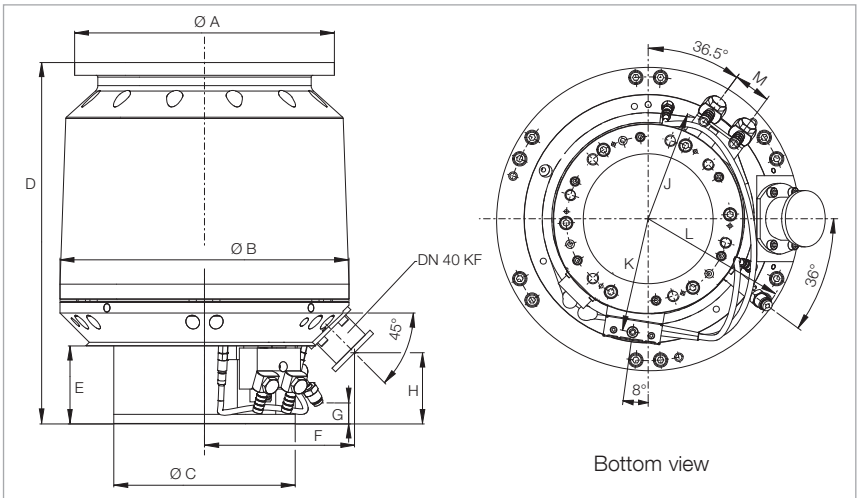
Ordering Information

TURBOVAC MAG W 2000 C/CT

Included in the Delivery of the Pump P	Part No.
Inlet screen DN 250 ISO-F	**200 91 471**
Integrated purge gas system VRC nut 1/4"	
Integrated temperature management system (only CT version)	
Cooling water connection Swagelock 1/4" tube	
Included in the Delivery of the Frequency Converter FC	
Mains cord, 3 m (10.5 ft.) long, approx. with EURO or US plug	

MAG DIGITAL - Magnetic Rotor Suspension with separate Frequency Converter, with Compound Stage

TURBOVAC MAG W 2200 C/CT



		A	B	C	D	E	F	G	H	J	K	L	M
200 ISO-F	mm	285	317	199	396	85.5	164.6	23	78	117	120	155	39
	in.	11.22	12.48	7.83	15.59	3.37	6.48	0.91	3.07	4.61	4.72	6.10	1.54
250 ISO-F	mm	335	317	199	371	85.5	164.6	23	78	117	120	155	39
	in.	13.19	12.48	7.83	14.61	3.37	6.48	0.91	3.07	4.61	4.72	6.10	1.54
250 CF	mm	305	317	199	401	85.5	164.6	23	78	117	120	155	39
	in.	12.01	12.48	7.83	15.79	3.37	6.48	0.91	3.07	4.61	4.72	6.10	1.54

Dimensional drawing for the TURBOVAC MAG W 2200 C

Typical Applications

- All major semiconductor processes such as Etch, CVD, PVD and Ion Implantation
- Coating systems

Versions with CF high vacuum connection

- Particle accelerators
- Research

Technical Features

- Active 5-axis magnetic bearing system
- Digital monitoring of the bearing system
- Low noise and vibration levels
- Installation in any orientation
- Advanced rotor design for high pump speeds and forevacuum pressures
- Purge gas connection
- Intelligent power control system
- Integrated temperature management System (TMS) (“CT” version only)

Advantages to the User

- Maintenance-free
- High throughput for all process gases
- High pumping speed at low pressure
- High foreline pressure tolerance: up to 2 mbar (1.5 Torr)
- Lowest weight and size in its class
- Application specific design

Technical Data

TURBOVAC MAG

		W 2200 C/CT		W 2200
Inlet flange	DN	200 ISO-F	250 ISO-F	250 CF
Pumping speed according to PNEUROP				
N_2	l x s^{-1}	1600	2000	1800
Ar	l x s^{-1}	1450	1900	1700
He	l x s^{-1}	1780	1980	1980
H_2	l x s^{-1}	1720	1930	1930
Operating speed	min^{-1}	29 400	29 400	29 400
Compression ratio N_2		> 1 x 10^8	> 1 x 10^8	1 x 10^8
Ultimate pressure according to DIN 28 400	mbar (Torr)	< 10^{-8} (< 0.75 x 10^{-8})	< 10^{-8} (< 0.75 x 10^{-8})	< 1 x 10^{-10} (< 0.75 x 10^{-10})
Max. foreline pressure for N_2				
with convection cooling	mbar (Torr)	–	–	0.1 (0.075)
with water cooling	mbar (Torr)	2 (1.5)	2 (1.5)	1 (0.75)
Recommended backing pump Rotary vane pump or dry compressing pump offering a pumping speed of 100 m^3/h		TRIVAC D 65 BCS	TRIVAC D 65 BCS	TRIVAC D 65 BCS
Run-up time at 95% of nominal speed	min	< 8	< 8	< 8
Foreline flange	DN	40 ISO-KF	40 ISO-KF	40 ISO-KF
Purge and vent port		1/4" VCR	1/4" VCR	DN 10/16
Cooling water connection (OD of tube)		1/2"	1/2"	Swagelok tube 1/4"
Weight, approx.	kg (lbs)	48 (106)	48 (106)	60 (132)

Technical Data

MAG.DRIVE digital

Mains connection, 50/60 Hz	V	200 - 240, +10 %/-15 %
Current for connected consumers max.	A	20
Max. motor voltage	V	60
Nominal frequency	Hz	50/60
Permissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	483 x 213 x 1/2 19" (19.02 x 8.39 x 1/2 19")
Weight, approx.	kg (lbs)	10 (22)

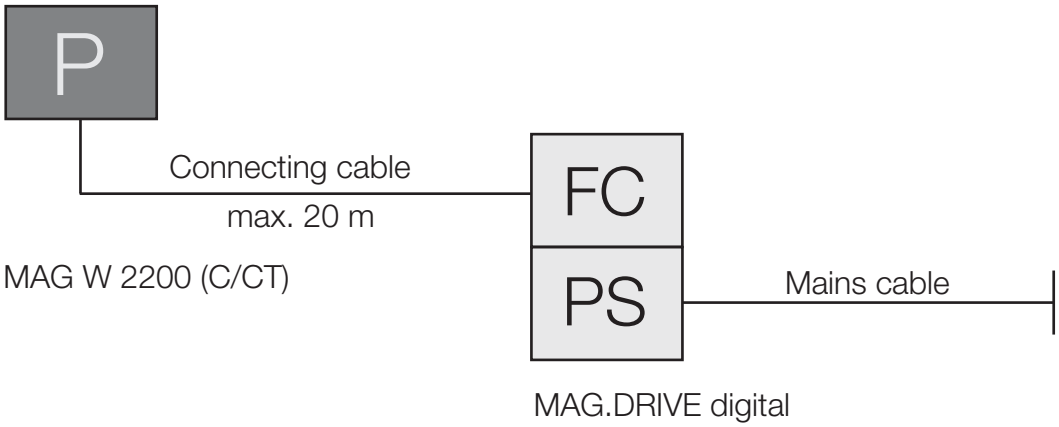
TURBOVAC MAG W 2200 C/CT with separate Frequency Converter and Compound Stage P	Part No.	
DN 200 ISO-F (MAG W 2200 C)	400081V0011	
DN 250 ISO-F (MAG W 2200 C)	400081V0021	
DN 250 CF (MAG W 2200)	400081V0061	
DN 200 ISO-F (MAG W 2200 CT)	400081V0013	
DN 250 ISO-F (MAG W 2200 CT)	400081V0023	
Mandatory Accessories P FC		
Electronic frequency converter [1]		
MAG.DRIVE digital	400035V0011	
MAG.DRIVE digital, Profibus	400035V0013	
MAG.DRIVE digital, RS 232 C interface	400035V0014	
Connecting cable converter – pump [2]		
1.5 m (5.25 ft) DRIVE/BEARING	400036V0001	
1.5 m (5.25 ft) TMS [3]	400037V0001	
3.0 m (10.5 ft) DRIVE/BEARING	400036V0008	
3.0 m (10.5 ft) TMS [3]	400037V0008	
5.0 m (17.5 ft) DRIVE/BEARING	400036V0004	
5.0 m (17.5 ft) TMS [3]	400037V0004	
10.0 m (35.0 ft) DRIVE/BEARING	400036V0002	
10.0 m (35.0 ft) TMS [3]	400037V0002	
20.0 m (70.0 ft) DRIVE/BEARING	400036V0003	
20.0 m (70.0 ft) TMS [3]	400037V0003	
Plug-in control	121 36	
Forevacuum pump		
TRIVAC D 65 B		
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz	113 98	
3 phase motor; 208-23/460 V, 60 Hz / 200-220/380 V, 60 Hz	913 98-2	
For further types, see Catalog Part “Oil Sealed Vacuum Pumps”		

[1] Included are 2 mains cords. One with EURO plug and one with US plug (220 V AC). Replacement mains cord are Part Numbers 180 097 or 180 096 respectively

[2] Further connecting cables can be found under MAG.DRIVE digital in the chapter “Turbomolecular Pumps with Magnetic Rotor Suspension”, para. “Electronic Frequency Converters”

[3] TMS connecting cables are only needed for the “CT” version of the TURBOVAC MAG W 2200

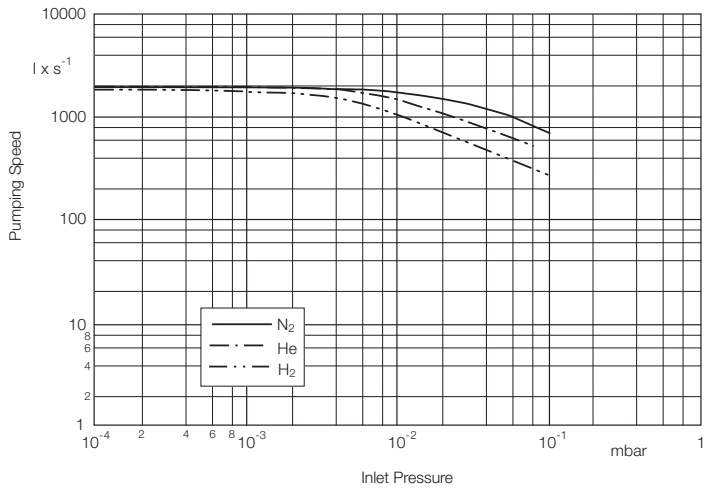
With separate Frequency Converter



Ordering Information

TURBOVAC MAG W 2200 C/CT

Accessories, optional	P	Part No.
Purge gas and venting valve		121 33
Connection cable for optional seal gas valve (pump/converter)		
1.5 m (5.25 ft)		400038V0007
3.0 m (10.5 ft)		400038V0006
10.0 m (35.0 ft)		400038V0002
20.0 m (70.0 ft)		400038V0009
Seal kit		
DN 250 metal		200 07 901
Included in the Delivery of the Pump	P	
Inlet screen		
DN 200 ISO-F		E 400 000 096
DN 250 ISO-F		E 400 000 100
DN 250 CF		E 200 15 157
Included in the Delivery of the Frequency Converter	FC	
Mains cord, 3 m (10.5 ft.) long, approx. with EURO or US plug		

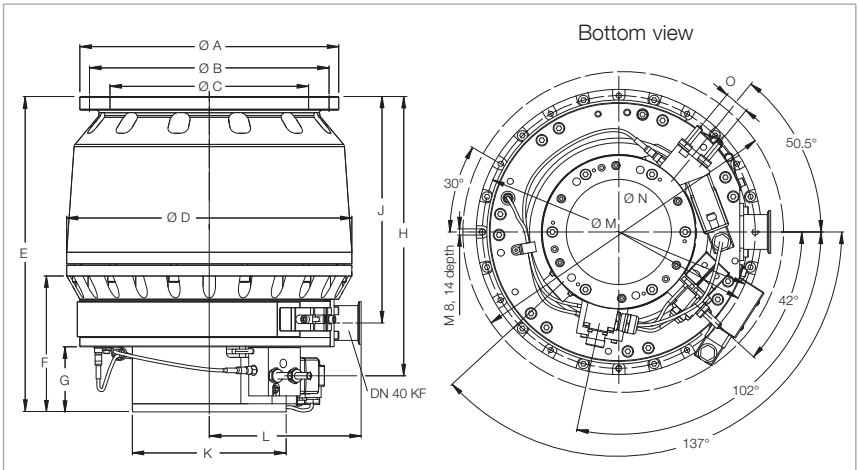


Pumping speed of the TURBOVAC MAG W 2200 C (DN 250) as a function of the inlet pressure

MAG DIGITAL - Magnetic Rotor Suspension with separate Frequency Converter, with Compound Stage

TURBOVAC MAG W 2800/3200 C/CT

TURBOVAC MAG W 2800 CT (left) and TURBOVAC MAG W 3200 CT (right)



		A	B	C	D	E	F	G	H	J
250 ISO-F	mm	335	310	261	293	408	176	89	361	293
	in.	13.19	12.2	10.28	11.54	16.06	6.93	3.50	14.21	11.54
250 CF	mm	305	284	268	307	422	176	89	391	248
	in.	12.01	11.18	10.55	12.09	16.61	6.93	3.50	15.39	9.76
320 ISO-F	mm	425	395	318	248	363	176	89	316	248
	in.	16.73	15.55	12.52	9.76	14.29	6.93	3.50	12.44	9.76

		K	L	M	N	O
250 ISO-F	mm	199	196.5	353	415	32
	in.	7.83	7.74	13.9	16.34	1.26
250 CF	mm	199	196.5	353	415	32
	in.	7.83	7.74	13.9	16.34	1.26
320 ISO-F	mm	199	196.5	353	415	32
	in.	7.83	7.74	13.9	16.34	1.26

Dimensional drawing for the TURBOVAC MAG W 2800/3200 C/CT

Typical Applications

- All major semiconductor processes such as Etch, CVD, PVD and Ion Implantation

Versions with CF high vacuum connection

- Particle accelerators
- Research

Technical Features

- Active 5-axis magnetic bearing system
- Bearing and temperature system are controlled digitally
- Corrosion resistant
- Low noise and vibration levels
- Installation in any orientation
- Advanced rotor design for high pump speeds and forevacuum pressures
- Integrated purge gas system
- CT versions: Integrated temperature management system (TMS)
- Intelligent power control system

Advantages to the User

- Maintenance-free
- High throughput for all process gases
- High pumping speed at low pressure
- High foreline pressure tolerance: up to 2 mbar (1.5 Torr)
- High resistance against corrosive gases
- Robust against particles and deposits
- Temperature control up to 90 °C (194 °F) to avoid condensation
- Lowest weight and size in its class
- Application specific design

Technical Data

TURBOVAC MAG

	W 2800 C	W 2800 CT	W 2800	W 3200 CT
Inlet flange DN	250 ISO-F	250 ISO-F	250 CF	320 ISO-F
Pumping speed according to PNEUROP				
N_2 l x s^{-1}	2650	2650	2650	3200
Ar l x s^{-1}	2450	2450	2450	3000
He l x s^{-1}	2650	2650	2650	3000
H_2 l x s^{-1}	2100	2100	2100	2250
Operating speed min^{-1}	28 800	28 800	28 800	28 800
Compression ratio				
N_2	1 x 10^8	1 x 10^8	1 x 10^9	1 x 10^8
Ultimate pressure according to DIN 28 400				
mbar	< 10^{-8}	< 10^{-8}	< 1 x 10^{-10}	< 10^{-8}
(Torr)	(< 0.75 x 10^{-8})	(< 0.75 x 10^{-8})	(< 0.75 x 10^{-10})	(< 0.75 x 10^{-8})
Max. foreline pressure for N_2				
with convection cooling mbar (Torr)	–	–	0.3 (0.23)	–
with water cooling mbar (Torr)	2.0 (1.5)	2.0 (1.5)	3.0 (2.3)	2.0 (1.5)
Recommended backing pump Rotary vane pump or dry compressing pump offering a pumping speed of 100 m^3/h	TRIVAC D 65 BCS	TRIVAC D 65 BCS	TRIVAC D 65 BCS	TRIVAC D 65 BCS
Run-up time min	< 10	< 10	< 10	< 10
Foreline flange DN	40 ISO-KF	40 ISO-KF	40 ISO-KF	40 ISO-KF
Purge / vent port	1/4" VCR	1/4" VCR	DN 10/16	1/4" VCR
Cooling water connection Swagelok tube	1/4"	1/4"	1/4"	1/4"
Weight, approx. kg (lbs)	64 (141.3)	64 (141.3)	75 (165.6)	65 (143.5)

Technical Data

MAG.DRIVE digital

Mains connection, 50/60 Hz V	200 - 240, +10 %/-15 %
Current for connected consumers, max. A	20
Max. motor voltage V	60
Nominal frequency Hz	50/60
Permissible ambient temperature °C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D) mm (in.)	483 x 213 x 1/2 19" (19.02 x 8.39 x 1/2 19")
Weight, approx. kg (lbs)	10 (22)

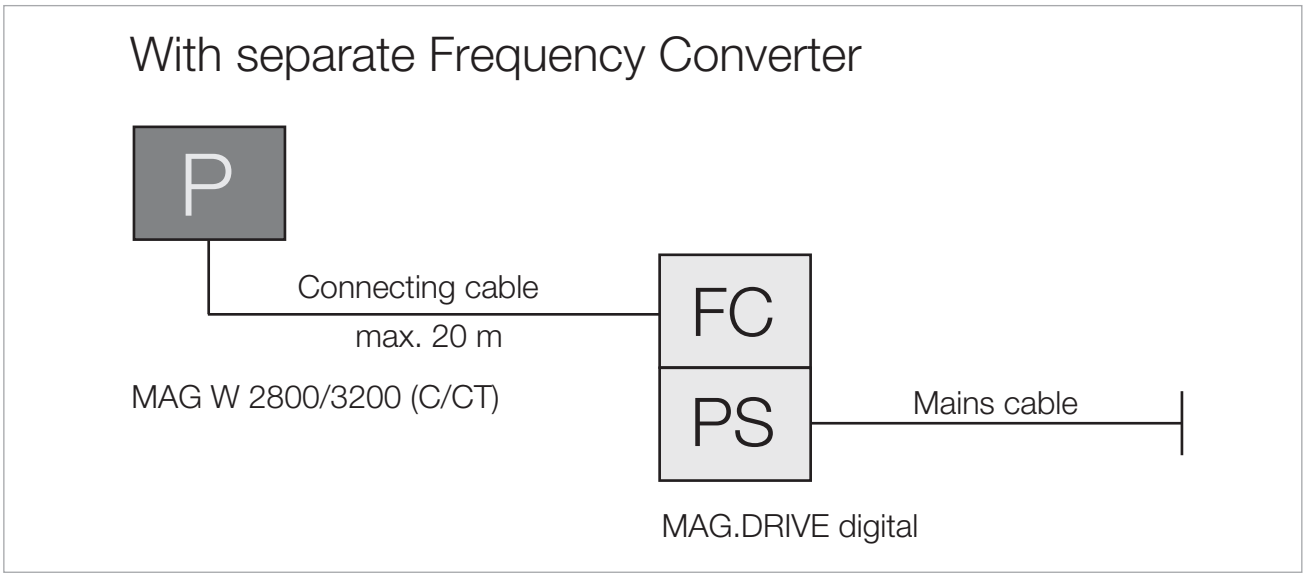
Ordering Information

TURBOVAC MAG W 2800 / 3200 C/CT

TURBOVAC MAG W 2800 (C/CT) with separate Frequency Converter and Compound Stage	P	Part No.	
DN 250 CF (MAG W 2800)		400006V0071	
DN 250 ISO-F (MAG W 2800 C)		400000V0001	
DN 250 ISO-F (MAG W 2800 CT)		400000V0002	
TURBOVAC MAG W 3200 (C/CT) with separate Frequency Converter and Compound Stage	**P**		
DN 320 ISO-F (MAG W 3200)		400003V0003	
DN 320 ISO-F (MAG W 3200 C)		400003V0001	
DN 320 ISO-F (MAG W 3200 CT)		400003V0002	
Mandatory Accessories	**P FC**		
Electronic frequency converter [1]			
MAG.DRIVE digital		400035V0011	
MAG.DRIVE digital, Profibus		400035V0013	
MAG.DRIVE digital, RS 232 C interface		400035V0014	
Plug-in control		121 36	
Connecting cable converter – pump [2]			
1.5 m (5.25 ft) DRIVE/BEARING		400036V0001	
1.5 m (5.25 ft) TMS		400037V0001	
3.0 m (10.5 ft) DRIVE/BEARING		400036V0008	
3.0 m (10.5 ft) TMS		400037V0008	
5.0 m (17.5 ft) DRIVE/BEARING		400036V0004	
5.0 m (17.5 ft) TMS		400037V0004	
10.0 m (35.0 ft) DRIVE/BEARING		400036V0002	
10.0 m (35.0 ft) TMS		400037V0002	
20.0 m (70.0 ft) DRIVE/BEARING		400036V0003	
20.0 m (70.0 ft) TMS		400037V0003	
Forevacuum pump			
TRIVAC D 65 B			
3 phase motor; 230/400 V, 50 Hz / 250/440 V, 60 Hz		112 96	
3 phase motor; 208-23/460 V, 60 Hz / 200-220/380 V, 60 Hz		912 96-2	
For further types, see Catalog Part “Oil Sealed Vacuum Pumps”			

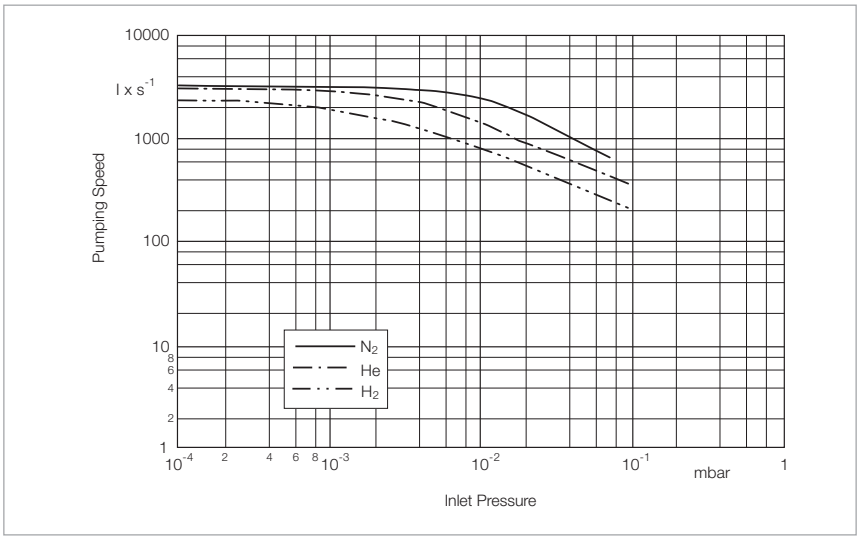
[1] Included are 2 mains cords. One with EURO plug and one with US plug (220 V AC). Replacement mains cord are Part Numbers 180 097 or 180 096 respectively

[2] Further connecting cables can be found under MAG.DRIVE digital in the chapter “Turbomolecular Pumps with Magnetic Rotor Suspension”, para. “Electronic Frequency Converters”



Ordering Information

		TURBOVAC MAG W 2800 C/CT / 3200 CT
Accessories, optional	P	**Part No.**
Purge gas and venting valve		**121 33**
Seal kit		
DN 250 metal		**200 07 901**
Included in the Delivery of the Pump	P	
Inlet screen		
DN 250 ISO-F		**E 400 000 100**
DN 250 CF		**200 15 157**
DN 320 ISO-F		**E 400 000 134**
Included in the Delivery of the Frequency Converter	FC	
Mains cord, 3 m (10.5 ft.) long, approx. with EURO or US plug		



Pumping speed of the TURBOVAC MAG W 3200 C (DN 320) as a function of the inlet pressure

Accessories

Electronic Frequency Converters for Pumps with Mechanical Rotor Suspension

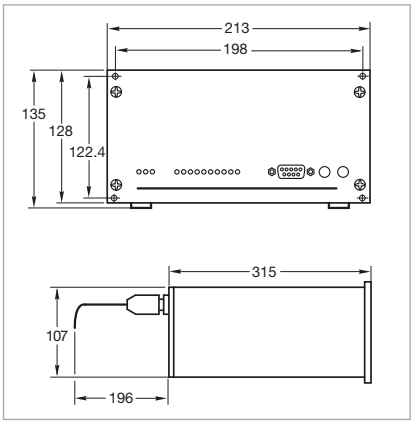
TURBO.DRIVE TD 20 *classic*

Technical Features

- For operating the TURBOVAC 151 (C), 361 (C), 600 C, 1000 C and 1100 C turbomolecular pump
- Front panel with LED
  - Status, Power, Error, pump run-up, pumping power
- Wide voltage range mains input
- Current interfaces like Profibus, DeviceNet, Ethernet/IP, RS 232 C, RS 485 C and 25-way terminal strip, available as options

Advantages to the User

- Easy integration within a vacuum system owing to the large variety of different modern interfaces as well as for modernising older systems
- Start/stop function through keys on the front panel
- Remote control and process control through analog and PLC compatible inputs and outputs
- Compatible to frequency converter NT 20, NT 151/361 and NT 361



Dimensional drawing for the electronic frequency converter TURBO.DRIVE TD 20 *classic*

Technical Data

TURBO.DRIVE TD 20 classic

Mains connection	50/60 Hz	100 to 240 V (+15 % / -10 %)
Max. power consumption	W	500
Max. output voltage	V	3 x 47
Max. output current	A	5
Interface		Without, RS 232 C, RS 485 C, Profibus or 25-way terminal strip
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	213 x 128 x 315 (8.39 x 5.04 x 12.40)
Weight, approx.	kg (lbs)	4.0 (8.8)

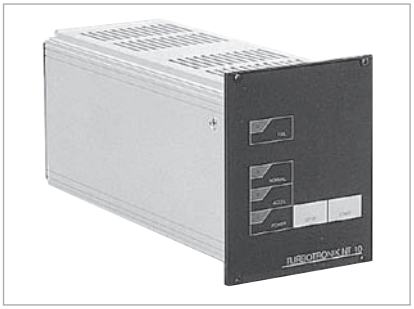
Ordering Information

TURBO.DRIVE TD 20 classic

	Part No.
TURBO.DRIVE TD 20 classic	
without interface	**800075V0001**
with RS 232 C interface	**800075V0002**
with RS 485 C interface	**800075V0004**
with Profibus	**800075V0003**
with 25-pol I/O	**800075V0005**
Mains cable	
3 m (10.5 ft)	
EURO plug	**800102V0002**
UK plug	**800102V0003**
US plug 5-15 P	**800102V1002**
2 m (7.5 ft)	
US plug 115 V AC	**992 76 513**
Connecting cable TURBOVAC - frequency converter	
3 m (10.5 ft)	**857 65**
5 m (17.5 ft)	**857 66**
10 m (35.0 ft)	**857 67**
20 m (70.0 ft)	**857 68**
50 m (175.0 ft)	**800152V0008**
60 m (210.0 ft)	**800152V0007**
80 m (280.0 ft)	**800152V0080**
140 m (490.0 ft)	**800152V0140**
19" rack mounting frame 3 HU	**161 00**
Pump adapter cable	**800 000 006**
Adapter cable, 0.2 m (0.7 ft) long 25-way PLC interface to 2x Phoenix plugs (required when a NT 20 with connected PLC interface needs to be replaced)	**800152V0020**
PC software TURBO.DRIVE Server [1]	**800110V0102** (see Chapter "Accessories" at the end of the section)

[1] Software supports only RS 232 C, RS 485 C and Profibus

TURBOTRONIK NT 10



Technical Features

- For operating the TURBOVAC 50 turbomolecular pump
- Bench top unit
- Also for rack mounting (1/4 19", 3 HU)
- Controls and indicators on the front panel
- Inputs for remote control and process controller
- Freely assignable relays (e.g. to control the backing pumps)

Technical Data

TURBOTRONIK NT 10

Mains connection	50/60 Hz	100-120 or 200-240 V
Max. power consumption	W	45
Max. output voltage	V	3 x 150
Max. output current	A	6
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	0 to +40 (+32 to +104)
Dimensions (W x H x D)	mm (in.)	106 x 128 x 233 (4.17 x 5.04 x 9.17)
Weight, approx.	kg (lbs)	1.5 (3.3)

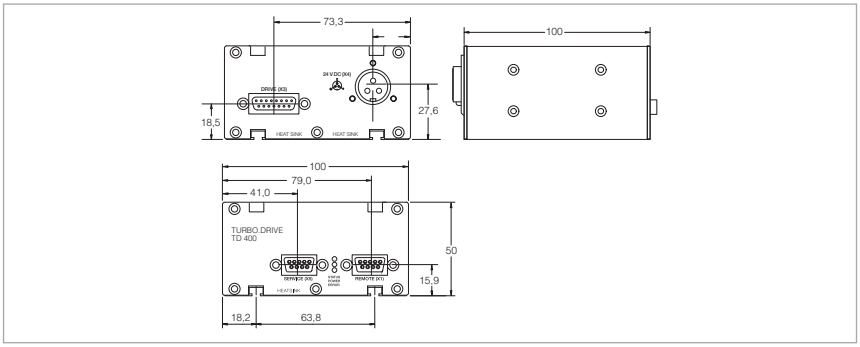
Ordering Information

TURBOTRONIK NT 10

	Part No.
100 - 120 V (with US plug)	**859 01**
200 - 240 V (with EURO plug)	**859 00**
Connecting cable pump - converter	
1 m (3.5 ft)	**200 11 609**
3 m (10.5 ft)	**121 08**
5 m (17.5 ft)	**121 09**
10 m (35.0 ft)	**161 10**
15 m (52.5 ft)	**119 90**
20 m (70.0 ft)	**800150V2000**

TURBO.DRIVE TD 400 (TD 400) for TURBOVAC SL 80 and TW 250 S

TURBO.DRIVE TD 400 (Front side)



Dimensional drawing for the TURBO.DRIVE TD 400

Technical Features

- Small footprint
- USB, RS 232 C, RS 485 C, Profibus or Ethernet/IP interface
- Configurations:
  - as a separate frequency converter
  - integrated within the turbomolecular pump
- Remote control via remote interface
- Flexible mounting options
- Cost-effective supply of 24 V DC

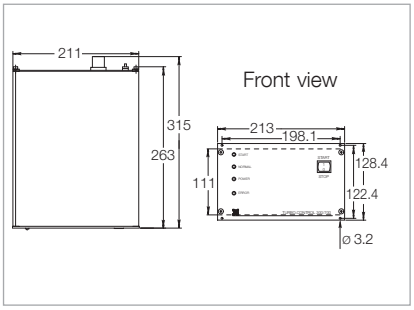
Technical Data — TURBO.DRIVE TD 400

Mains connection	V DC	24
Max. current consumption	A	8
Max. power consumption	W	190
Max. output voltage	V	3 x 24
Interface		USB, RS 232 C, RS 485 C or Profibus
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	+5 to +45 (+41 to +113)
Dimensions (W x H x D)	mm (in.)	100 x 90 x 100 (3.9 x 3.5 x 3.9)
Weight, approx.	kg (lbs)	0.7 (1.6)

Ordering Information — TURBO.DRIVE TD 400

	Part No.
TURBO.DRIVE TD 400	
with USB interface	**800073V0008**
with RS 232 C interface	**800073V0002**
with RS 485 C interface	**800073V0003**
with Profibus	**800073V0004**
Connecting cable TD 400 - Pump	
0.2 m (0.70 ft)	**800152V0021**
0.3 m (1.15 ft)	**800152V0023**
0.4 m (1.40 ft)	**800152V0022**
0.5 m (1.75 ft)	**800152V0050**
1.0 m (3.50 ft)	**P152 47**
2.5 m (8.75 ft)	**864 49**
3.0 m (10.5 ft)	**864 40**
5.0 m (17.5 ft)	**864 50**
START/STOP switch (for manual operation)	**152 48**
Hat rail adaptor as mounting aid	**800110V0003**
Accessories for RS 232 C and RS 485 C interfaces	(see Chapter “Accessories” at the end of the section)

TURBO.CONTROL 300
Power Supply Unit for TURBO.DRIVE TD 400



Dimensional drawing for the power supply TURBO.CONTROL 300

Technical Features

- Cost-effective supply of 24 V DC power for SL 80, TW 250 S and TURBO.DRIVE TD 400
- Plug & play
- Bench top unit or for cabinet mounting
- Mains switch
- START/STOP switch for the turbo-molecular pump
- Remote control via remote interface
- Status indicating LEDs and status relays

Technical Data

Power Supply
TURBO.CONTROL 300

Mains connection	50/60 Hz	85-264 V
Max. power consumption	W	300
Max. output voltage	V DC	24
Max. current consumption	A	8.4
Protection rating	IP	20
Admissible ambient temperature	°C (°F)	0 to +40 (+32 to +104)
Dimensions (W x H x D)	mm (in.)	213 x 129 x 320 (8.4 x 5.1 x 12.6)
Weight, approx.	kg (lbs)	1.5 (3.3)

Ordering Information

Power Supply
TURBO.CONTROL 300

	Part No.
Power supply TURBO.CONTROL 300	**800100V0001**
DC cable frequency converter - power supply	24 V DC control cable
1 m (3.5 ft)	**800091V0100**
3 m (10.5 ft)	**800091V0300**
5 m (17.5 ft)	**800091V0500**
10 m (35.0 ft)	**800091V1000**
20 m (70.0 ft)	**800091V2000**
Mains cable	
3 m (10.5 ft)	
with EURO plug	**800102V0002**
with UK plug	**800102V0003**
with US plug 5-15 P	**800102V1002**
2 m (7.5 ft)	
US plug 115 V AC	**992 76 513**

Electronic Frequency Converters for Pumps with Magnetic Rotor Suspension

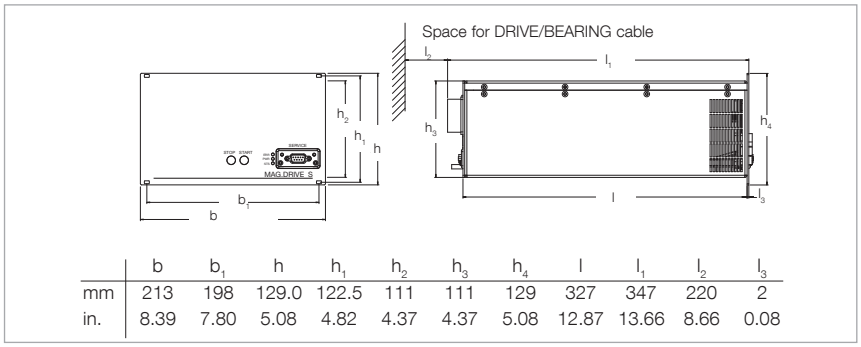
MAG.DRIVE S

MAG.DRIVE S without display

MAG.DRIVE S with display

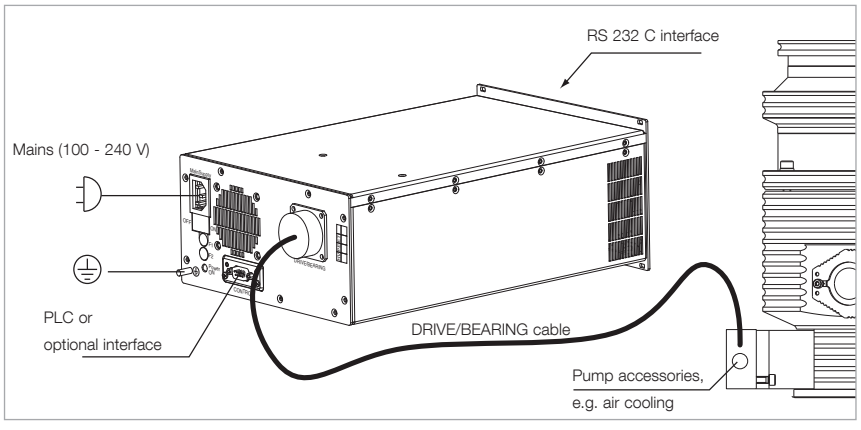
Advantages to the User

- Operation of turbomolecular pumps with magnetically levitated rotors:
  MAG W 300/400 P and
  MAG W 600/700 P
- Easy operation through the controls
- Communication to host computer of the customer via serial interface and conventional interface possible
- Setting of speed and other functions
- Warning in case the pump is running out of specification
- Storing of all parameters in the pump's memory
- Small size and low weight
- Integrated fan
- 2 slots for industrial communications modules
  - rear side:
    Standard 9 pin 24 V SPS
    PLC-IO in Control Slot
  - front side:
    RS 232 C in Service Slot
  - further interfaces can be fitted:
    Ethernet, Profibus, DeviceNet,
    RS 485 C



	b	b_1	h	h_1	h_2	h_3	h_4	l	l_1	l_2	l_3
mm	213	198	129.0	122.5	111	111	129	327	347	220	2
in.	8.39	7.80	5.08	4.82	4.37	4.37	5.08	12.87	13.66	8.66	0.08

Dimensional drawing for the MAG.DRIVE S



Overview connection lines

Technical Data

MAG.DRIVE S

Voltage range	V	100 - 240, ± 10%
Nominal frequency	Hz	50 / 60
Power consumption		
stand-by	W	100
maximum	W	400
Max. motor voltage	V	48
Max. pump current	A	6
Fuses F1, F2 5 x 20 mm		10 A fast blow high breaking capacity 250 V
System fuse		L or G characteristic
Max. frequency	Hz	0 to 2000
Load capability, relay output X1	V / A	32 / 0,5
Temperature		
during operation	°C (°F)	0 to +45 (+32 to +113)
during storage	°C (°F)	-10 to +60 (+14 to +140)
Relative humidity of the air	%	95 (non-condensing)
Weight, approx.	kg (lbs)	65 (14.35)

Ordering Information

MAG.DRIVE S

	Part No.
Electronic frequency converter	
MAG.DRIVE S	**410300V0202**
MAG.DRIVE S with display	**410300V0212**
Connecting cable DRIVE/BEARING (connection between pump and MAG.DRIVE S)	
3.0 m (10.5 ft)	**410300V4003**
5.0 m (17.5 ft)	**410300V4005**
10.0 m (35.0 ft) [1]	**410300V4010**
20.0 m (70.0 ft) [1]	**410300V4020**
Mains cable	
3.0 m (10.5 ft)	
EURO plug	**800102V0002**
US plug 5-15 P	**800102V1002**
2.0 m (7.5 ft)	
US plug 115 V AC	**992 76 513**

[1] Suited for operating the MAG W 300/400 only

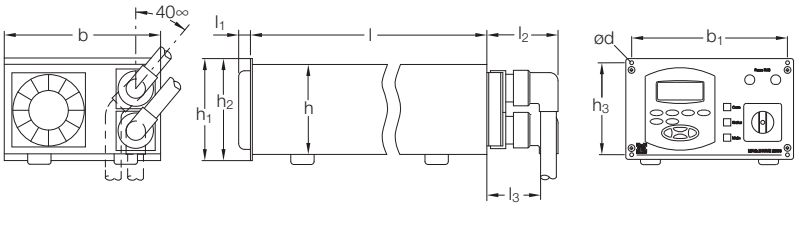
MAG.DRIVE digital

MAG.DRIVE digital without plug-in control

MAG.DRIVE digital with plug-in control

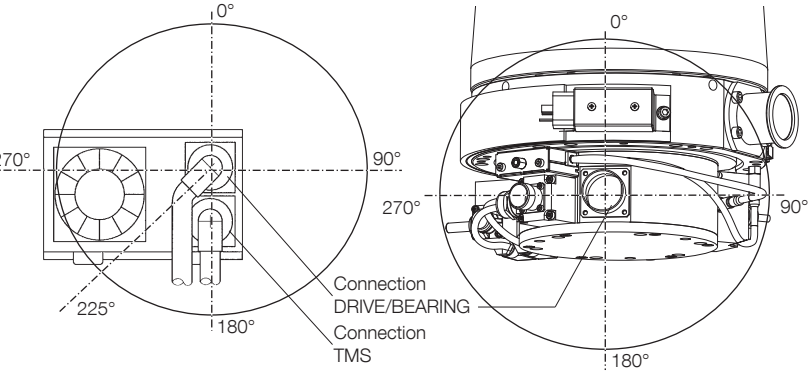
Advantages to the User

- Operation of turbomolecular pumps with magnetically levitated rotors:
  MAG W 830/1300 C,
  MAG (W) 1500 CT,
  MAG W 2000 C/CT,
  MAG W 2200 C/CT and
  MAG W 2800/3200 C/CT
- Easy operation through the controls or the use of plug-in control unit
- Communication to host computer of the customer via serial interface and conventional interface possible
- Setting of speed, temperature of the basic flange and other functions
- Warning in case the pump is running out of specification
- Storing of all parameters in the pump's memory
- Plug-in control
- Small size and low weight
- Integrated fan
- Integrated temperature management system (TMS)



	b	b_1	d	h	h_1	h_2	h_3	l	l_1	l_2	l_3
mm	213	198	3.3	113	135	128	122.4	455	27	100	70
in.	8.39	7.80	0.13	4.45	5.31	5.04	4.82	17.91	1.06	3.94	2.76

Dimensional drawing for the MAG.DRIVE digital



Overview connection lines

Technical Data

MAG.DRIVE digital

Mains connection, 50/60 Hz	V	200 - 240, +10%/-15%
Current for connected consumers, max.	A	20
Max. motor voltage	V	60
Nominal frequency	Hz	50/60
Permissible ambient temperature	°C (°F)	0 to +45 (+32 to +113)
Dimensions (W x H x D)	mm (in.)	483 x 213 x 1/2 19" (19.02 x 8.39 x 1/2 19")
Weight, approx.	kg (lbs)	10 (22)

Ordering Information

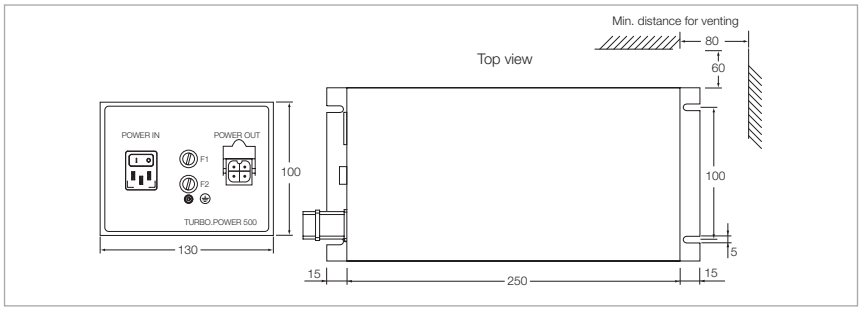
MAG.DRIVE digital

				Part No.
Electronic frequency converter [1]				
MAG.DRIVE digital				**400035V0011**
with Profibus interface				**400035V0013**
with RS 232 C interface				**400035V0014**
Plug-in control				**121 36**
Connection line leading to the DRIVE/BEARING of the TURBOVAC MAG ... C/CT				
	Cable outlet frequency converter DRIVE/BEARING	Cable outlet pump DRIVE/BEARING	Cable outlet pump PK	
1.5 m (5.25 ft)	bended 225°	straight	straight	**400036V0001**
1.5 m (5.25 ft)	bended 40°	bended 180°	straight	**400036V0025**
3.0 m (10.5 ft)	straight	bended 180°	straight	**400036V0006**
3.0 m (10.5 ft)	bended 225°	straight	straight	**400036V0008**
3.0 m (10.5 ft)	straight	bended 270°	straight	**400036V0009**
5.0 m (17.5 ft)	bended 225°	straight	straight	**400036V0004**
5.0 m (17.5 ft)	straight	straight	straight	**400036V0010**
8.0 m (28.0 ft)	bended 225°	straight	straight	**400036V0005**
10.0 m (35.0 ft)	bended 225°	straight	straight	**400036V0002**
20.0 m (70.0 ft)	bended 225°	straight	straight	**400036V0003**
23.0 m (80.5 ft)	bended 225°	straight	straight	**400036V0012**
30.0 m (105 ft)	bended 225°	straight	straight	**400036V0011**
TMS (only for CT versions)				
	Cable outlet frequency converter TMS	Cable outlet pump TMS	Heater	
1.5 m (5.25 ft)	bended 225°	straight	bended 180°	**400037V0001**
1.5 m (5.25 ft)	bended 40°	straight	bended 180°	**400037V0025**
3.0 m (10.5 ft)	bended 225°	straight	bended 180°	**400037V0008**
5.0 m (17.5 ft)	bended 225°	straight	bended 180°	**400037V0004**
8.0 m (28.0 ft)	bended 225°	straight	bended 180°	**400037V0005**
10.0 m (35.0 ft)	bended 225°	straight	bended 180°	**400037V0002**
20.0 m (70.0 ft)	bended 225°	straight	bended 180°	**400037V0003**
Purge / Vent (only for optional purge vent valve Part No. 121 33)				
	Cable outlet frequency converter TMS	Cable outlet pump Purge	Vent	
1.5 m (5.25 ft)	straight	bended	bended	**400038V0007**
3.0 m (10.5 ft)	bended 225°	bended	bended	**400038V0006**
10.0 m (35.0 ft)	bended 225°	bended	bended	**400038V0002**
20.0 m (70.0 ft)	straight	bended	bended	**400038V0009**
Connector for hardware interface				**upon request**
19" installation frame				**161 00**

[1] Included are 2 mains cords. One with EURO plug and one with US plug (220 V AC). Replacement mains cord are Part Numbers 180 097 or 180 096 respectively

Power Supply TURBO.POWER 500

for TURBOVAC MAG W 300/400/600/700 iP



Dimensional drawing for the power supply TURBO.POWER 500

Technical Features

- For supplying 48 V DC power to the MAG W 300/400/600/700 iP
- Bench top unit or for cabinet mounting

Technical Data

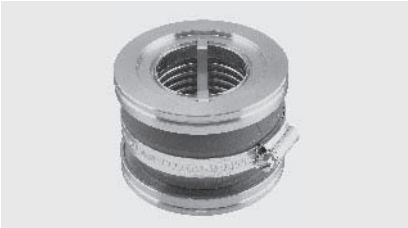
		Power Supply TURBO.POWER 500
Power supply (POWER IN)	V	100 - 240, ± 10%
Nominal frequency	Hz	50 / 60
Power consumption		
maximum	VA	650
at ultimate pressure operation of the pump	VA	450
DC voltage range		
POWER OUT	V DC	48
max.	A	10
Length of the DC connection cable, max.		
at 3 x 1.5 mm²	m (ft)	5 (17.5)
at 3 x 2.5 mm²	m (ft)	20 (70.0)
Ambient temperature		
during operation	°C (°F)	+10 to +40 (+50 to +104)
during storage	°C (°F)	-10 to -70 (+14 to -94)
Relative humidity of the air	%	5 to 85 (non-condensing)
Protection class	IP	30
Overvoltage category		II
Pollution category		2
Weight, approx.	kg (lbs)	4.0 (8.8)

Ordering Information

	Power Supply TURBO.POWER 500 Part No.
Power supply TURBO.POWER 500	**410300V0221**
DC cable (connection between TURBO.POWER 500 and MAG.DRIVE iS)	
1.0 m (3.5 ft)	**410300V2001**
3.0 m (10.5 ft)	**410300V2003**
5.0 m (17.5 ft)	**410300V2005**
10.0 m (35.0 ft)	**410300V2010**
20.0 m (70.0 ft)	**410300V2020**
Mains cable	
3.0 m (10.5 ft)	
EURO plug	**800102V0002**
US plug 5-15 P	**800102V1002**
2.0 m (7.5 ft)	
US plug 115 V AC	**992 76 513**

Vibration Absorber

Vibration absorbers are used to inhibit the propagation of vibrations from the turbomolecular pump to highly sensitive instruments like electron beam microscopes, micro-balances or analytical instruments.

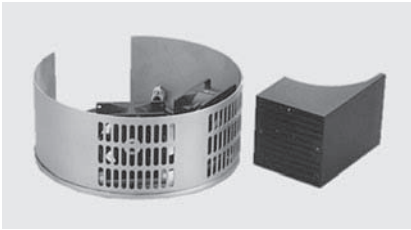


Ordering Information — Vibration Absorber

		Part No.
Vibration absorber		
DN 63 ISO-K	66 mm (2.60 in.) long	**800131V0063**
DN 63 CF	81 mm (3.19 in.) long	**500 070**
DN 100 ISO-K	84 mm (3.31 in.) long	**800131V0100**
DN 100 CF	100 mm (4.09 in.) long	**500 071**
DN 160 ISO-K	84 mm (3.31 in.) long	**500 073**
DN 160 CF	104 mm (4.09 in.) long	**500 072**

Air Cooling Unit for TURBOVAC ClassicLine Pumps

For the purpose of retrofitting the TURBOVAC 50, 151, 361 and 600 pumps for air cooling, an air cooling unit is available by way of a retrofit kit. This kit can be easily fitted to the respective pump using the fitting components included with the accessories.



Technical Data — Air Cooling Unit

Rated power consumption of the air cooling unit when connected to		
TURBOVAC 50, 151 (C)/361 (C)	W	10.5
TURBOVAC 600 C, 1000 C	W	21.0

Ordering Information — Air Cooling Unit

	Part No.	Part No.
Air cooling unit for	230 V	100-115 V
TURBOVAC 50	**854 05**	**800152V0015**
TURBOVAC 1 51 (C)/361 (C)	**855 31**	**800152V0016**
TURBOVAC 600 C, 1000 C	**855 41**	**800152V0017**

Air Cooling Unit for TURBOVAC SL Pump

For fitting to the turbomolecular pump SL 80

Air cooling units for the pump SL 80

Technical Data		Air Cooling Unit
Power supply voltage	V DC	24
Current rating	mA	39
Power	W	0.9
Operating temperature	°C (°F)	+10 to +40 (+50 to +104)
Protection class	IP	20
Weight, approx.	kg (lbs)	0.23 (0.51)
Volume flow	m^3/h	20

Ordering Information	Air Cooling Unit
	Part No.
Air cooling unit for TURBOVAC SL 80	**800136V0001**

Flange Heater for CF High Vacuum Flanges

Most TURBOVAC pumps can be baked out in order to improve the ultimate pressure attained in the UHV range. Degassing of the turbomolecular pump will only be useful when simultaneously baking out the vacuum chamber.

Technical Data		Flange Heater
Rated power consumption of the flange heater		
DN 63 CF, DN 100 CF	W	100
DN 160 CF	W	150

Ordering Information	Flange Heater	
	Part No.	**Part No.**
Flange heater	230 V	115 V
DN 63 CF	**854 04**	**854 07**
DN 100 CF	**854 27**	**854 28**
DN 160 CF	**854 37**	**854 38**

Fine Filter

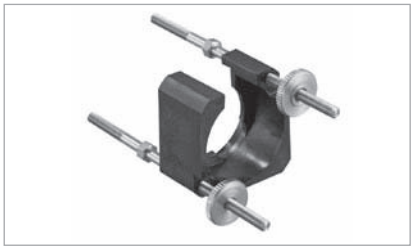
A fine filter integrated in the centering ring protects the pump against particles and dust on the high vacuum side.

Ordering Information — Fine Filter

	Part No.
Connection flange of the fine filter	
DN 40 ISO-KF	883 98
DN 63 ISO-K	887 20
DN 100 ISO-K	887 21

Securing Collar for Octal Socket Plugs for ClassicLine Pumps TURBOVAC 151 (C), 361 (C), 600 C, 1000 C and 1100 C

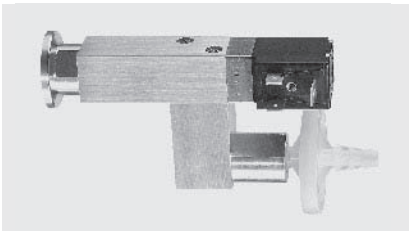
The securing collar serves the purpose of securing the plug on the ClassicLine pumps TURBOVAC 151 (C), 361 (C), 600 C, 1000 C and 1100 C against being disconnected inadvertently.



Ordering Information — Securing Collar for Octal Socket Plugs

	Part No.
Securing collar for octal socket plugs	800001830

Solenoid Venting Valve



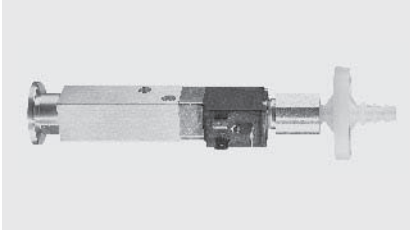
Technical Data — Venting Valve

		Venting Valve
Drive voltage	V DC	24
Power consumption	W	4
Connecting flange	DN	16 ISO-KF
Weight, approx.	kg (lbs)	0.3 (0.66)

Ordering Information — Venting Valve

	Part No.
Solenoid venting valve, normally closed	800120V0011

Power Failure Venting Valve



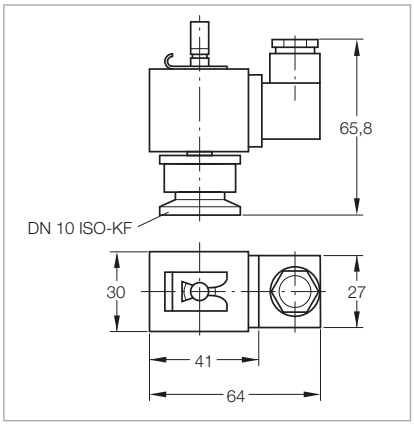
Technical Data — Power Failure Venting Valve

		Power Failure Venting Valve
Drive voltage	V DC	24
Power consumption	W	4
Connecting flange	DN	16 ISO-KF
Weight, approx.	kg (lbs)	0.3 (0.66)

Ordering Information — Power Failure Venting Valve

	Part No.
Power failure venting valve, normally open	800120V0021

Power Failure Venting Valve, Electromagnetically Actuated



Dimensional drawing for the electromagnetically astuated power failure venting valve

Technical Data — Power Failure Venting Valve

Technical data	See Catalog “Valves”, para. “Special Valves”

Ordering Information — Power Failure Venting Valve

	Part No.
Power failure venting valve DN 10 ISO-KF, electromagnetically actuated	
24 V DC	**174 46**
230 V AC / 50/60 Hz	**174 26**

Purge Gas and Venting Valve

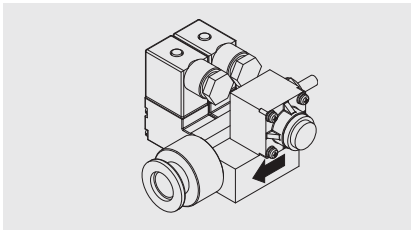
Technical Data — Purge Gas and Venting Valve

Connecting flange	DN	10 ISO-KF
Weight, approx.	kg (lbs)	0.7 (1.55)

Ordering Information — Purge Gas and Venting Valve

	Part No.
Purge gas and venting valve, 230 V	
0.2 mbar x l x s^{-1} (12 sccm)	**855 19**
0.4 mbar x l x s^{-1} (24 sccm)	**855 29**

Purge Gas and Venting Valve



Technical Data — Purge Gas and Venting Valve

Connecting flange		
Inlet		1/4" tube
Outlet		pump specific or DN 16 ISO-KF
Purge gas pressure, abs.	bar	1.5 to 6,0
Weight, approx.	kg (lbs)	0.5 (1.1)

Ordering Information — Purge Gas and Venting Valve

	Part No.
Purge gas and venting valve, 24 V DC	
0.6 mbar x l x s^{-1}	**121 33**

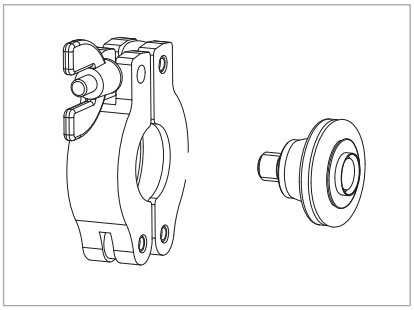
Further 0.6 mbar x l x s^{-1} valves upon request

Purge Gas and Venting Valve for ClassicLine and SL Pumps

Technical Data		Purge Gas and Venting Valve
Connecting flange		
Pump side	DN	10 ISO-KF
Gas connection	G	1/4"
Seal gas pressure, abs.	bar	1
Weight, approx.	kg (lbs)	0.3 (0.66)

Ordering Information	Purge Gas and Venting Valve
	Part No.
Purge gas and venting valve at 1 bar	
0.2 mbar x l x s^{-1} (12 sccm), 24 V DC	**113 50**
0.2 mbar x l x s^{-1} (12 sccm), 110 - 115 V AC	**800152V0041**
0.2 mbar x l x s^{-1} (12 sccm), 230 V AC	**800152V0019**
0.4 mbar x l x s^{-1} (24 sccm), 24 V DC	**800152V0013**
0.4 mbar x l x s^{-1} (24 sccm), 110 - 115 V AC	**800152V0042**
0.4 mbar x l x s^{-1} (24 sccm), 230 V AC	**800152V0014**
0.6 mbar x l x s^{-1} (36 sccm), 24 V DC	**800152V0012**
0.6 mbar x l x s^{-1} (36 sccm), 110 - 115 V AC	**800152V0043**
0.6 mbar x l x s^{-1} (36 sccm), 230 V AC	**800152V0040**

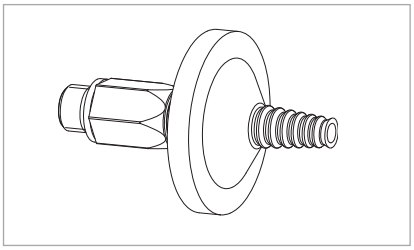
Adapter Set for Seal Gas and Venting Valve for the SL pumps



Technical Data	Adapter Set
Pump flange adapter	M8 / DN 10 ISO-KF
incl. adapter centering ring	
with sinter filter insert and clamping ring	DN 10 / DN 16 ISO-KF

Ordering Information	Adapter Set
	Part No.
Adapter set for purge gas and venting valve	**800110V0011**

Gas Filter to G 1/4" for Purge Gas and Venting Valve



Technical Data	Gas Filter
Gasfilter including fitting G 1/4" and 2 gaskets	

Ordering Information	Gas Filter
	Part No.
Gas filter to G 1/4" for seal gas and venting valve	**800110V0012**
Replacement filter for gas filter to G 1/4" for seal gas and venting valve	**E 200 18 515**

Accessories for Serial Interfaces RS 232 C and RS 485 C

Through these accessories many control, monitoring and information capabilities can be implemented in connection with the electronic frequency converters and turbomolecular pumps.

All turbomolecular pumps or electronic frequency converters are supported.

PC Software LEYASSIST

Software for PC-based communication, control and monitoring of turbomolecular pumps via USB, RS 485 or RS 232 interface with automatic pump detection.

Functions

- Display of vacuum system status
- Configuring the accessory functions of the TURBOVAC i / iX
- Reading/writing of parameters
- Data logging
- Alarm/warning message logging

Ordering Information **PC Software LEYASSIST**

	Part No.
PC software LEYASSIST	**230439V01**

Interface Adaptor for Frequency Converter with RS 232 C/RS 485 C Interface

Ordering Information **Interface Adaptor RS 232 C/RS 485 C**

	Part No.
Adaptor RS 232 C/RS 485 C mains connection 230 V, 50 Hz, EURO plug	**800110V0101**
Adaptor USB/RS 232 C for connection of RS 232 C to USB (PC), including CD with drivers and manual	**800110V0103**

Services for Mechanically Suspended Turbomolecular Pumps

Complete Refurbishing at the Service Centre

Complete refurbishing at the service centre includes the following:
Complete disassembly, cleaning, replacement of all wearing parts, mounting, electrical safety test, final test including vibration measurement

Complete Refurbishing with Decontamination at the Service Centre

Complete refurbishing with decontamination at the service centre includes the following:
Complete disassembly, cleaning and decontamination, replacement of all wearing parts, mounting, electrical safety test, final test including vibration measurement

Ordering Information	Complete Refurbishing at the Service Centre	Complete Refurbishing with Decontamination at the Service Centre
	Part No.	Part No.
For pump		
TURBOVAC 35 / 50D	**AS 2165**	**AS 2165 D**
TURBOVAC 50	**AS 2133**	**AS 2133 D**
TURBOVAC SL 80	**LAS 2368**	**LAS 2368 D**
TURBOVAC TW 70 H	**AS 2368**	**AS 2368 D**
TURBOVAC 151	**AS 2134**	**AS 2134 D**
TURBOVAC TW 250 S	**AS 2168**	**AS 2168 D**
TURBOVAC SL 300	**LAS 2369**	**LAS 2369 D**
TURBOVAC TW 300	**AS 2369**	**AS 2369 D**
TURBOVAC 361	**AS 2135**	**AS 2135 D**
TURBOVAC 600 / 1000	**AS 2136**	**AS 2136 D**
TURBOVAC TW 701 / 690	**AS 2330**	**AS 2330 D**
TURBOVAC 1100	**AS 2137**	**AS 2137 D**

Services for Magnetically Levitated Turbomolecular Pumps

Complete Refurbishing at the Service Centre

Complete refurbishing at the service centre includes the following:
Complete disassembly, cleaning, replacement of all wearing parts, mounting, electrical safety test, final test including vibration measurement

Complete Refurbishing with Decontamination at the Service Centre

Complete refurbishing with decontamination at the service centre includes the following:
Complete disassembly, cleaning and decontamination, replacement of all wearing parts, mounting, electrical safety test, final test including vibration measurement

Ordering Information	Complete Refurbishing at the Service Centre	Complete Refurbishing with Decontamination at the Service Centre
	Part No.	**Part No.**
For pump		
TURBOVAC 340 M	**AS 2141**	**AS 2141 D**
TURBOVAC 340 MC/MCT	**AS 2142** [1]	**AS 2142 D** [1]
TURBOVAC MAG 400 C/CT	**AS 2143** [1]	**AS 2143 D** [1]
MAG (W) 1600 / 2000	**AS 2164** [1]	**AS 2164 D** [1]
MAG (W) 830 / 1300 / 1500	**AS 2370** [1]	**AS 2370 D** [1]
MAG 900 / 1000 / 1200	**AS 2160** [1]	**AS 2160 D** [1]
MAG 2200	**AS 2200** [1]	**AS 2200 D** [1]
MAG 2800 / 3200	**AS 2800** [1]	**AS 2800 D** [1]

Notes

The listed services include the costs for material and working hours for standard pumps. Services for pump variants upon request.
If additional spare parts are needed for repairs, then these are invoiced separately according to a cost estimate.

[1] Including rotor replacement