

# HIPACE 300 H

The turbopump with high compression, especially for light gases. Maximum reliability with best performance.



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# Highest level of compression

With its new HiPace 300 H, Pfeiffer Vacuum presents a turbopump with the highest level of compression available in the 300 l/s pumping speed class. The pump has a compression ratio of 10<sup>7</sup> for hydrogen, making it ideal for generating high and ultra-high vacuum. The high compression ratio results in a low residual gas background in the chamber, which is desirable for mass spectrometry applications, for example.

## High-performance technology

Thanks to the sophisticated design of the rotor, the HiPace 300 H has an extraordinarily high max. fore-vacuum pressure of 30 hPa. This allows the pump to achieve ultrahigh vacuum even when operated with a high fore-vacuum pressure, which occurs in combination with diaphragm pumps. The integrated "Intermittent mode" function ensures that a connected backing pump is switched on by the HiPace 300 H only when the fore-vacuum pressure is no longer adequate. This reduces the energy consumption of the overall vacuum system by more than 90 %.

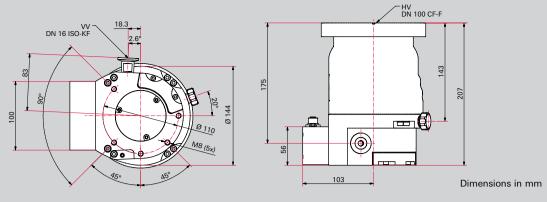
#### **Highest reliability**

Based on a so-called hybrid bearing, a combination of ceramic ball bearings on the fore-vacuum side and permanently magnetic radial bearings on the high vacuum side, our HiPace turbopumps have a particularly robust bearing design. Therefore the pumps have a long life cycle with a maintenance interval of approximately 4 years.

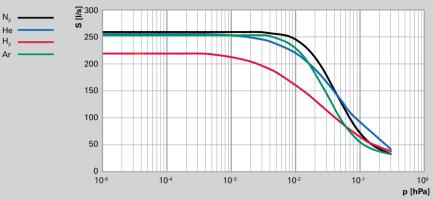
#### **Customer benefits**

- The highest level of compression, especially for light gases
- Ideal for HV and UHV applications
- Best UHV pressures even in combination with diaphragm pumps
- Intermittent mode offers energy savings of more than 90 % without any reduction in performance

#### **Dimensions**



#### **Pumping speed**



#### **Technical data**

Flange (in)	HiPace 300 H	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F	
Venting connection         G 1/8"           Pumping speed for Ar         255 l/s           Pumping speed for H₂         220 l/s           Pumping speed for He         255 l/s           Pumping speed for N₂         260 l/s           Rotation speed ±2%         60,000 min⁻¹           Run-up time         3 - 3.5 min.           Gas throughput at full rotational speed for Ar         0.5 hPa l/s           Gas throughput at full rotational speed for H₂         10 hPa l/s           Gas throughput at full rotational speed for H₂         3.5 hPa l/s           Gas throughput at full rotational speed for N₂         1.5 hPa l/s           Compression ratio for Ar         > 1 ⋅ 10¹³           Compression ratio for Ar         > 1 ⋅ 10¹³           Compression ratio for H₂         1 ⋅ 10²           Compression ratio for H₂         2.5 ⋅ 10³           Compression ratio for N₂         > 1 ⋅ 10¹³           Fore-vacuum max for Ar         25 hPa           Fore-vacuum max for H₂         15 hPa           Fore-vacuum max for N₂         30 hPa           Ultimate pressure according to PNEUROP         < 1 ⋅ 10⁻¹ hPa	Flange (in)	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F	
Pumping speed for Ar         255 l/s           Pumping speed for H₂         220 l/s           Pumping speed for He         255 l/s           Pumping speed for N₂         260 l/s           Rotation speed ±2%         60,000 min⁻¹           Run-up time         3 - 3.5 min.           Gas throughput at full rotational speed for Ar         0.5 hPa l/s           Gas throughput at full rotational speed for H₂         10 hPa l/s           Gas throughput at full rotational speed for He         3.5 hPa l/s           Gas throughput at full rotational speed for H₂         1.5 hPa l/s           Campression ratio for Ar         > 1 ⋅ 10⁻¹           Compression ratio for H₂         1 ⋅ 10⁻¹           Compression ratio for H₂         1 ⋅ 10⁻¹           Compression ratio for N₂         > 1 ⋅ 10⁻¹           Compression ratio for N₂         > 1 ⋅ 10⁻¹           Compression ratio for N₂         > 1 ⋅ 10⁻¹           Fore-vacuum max for Ar         25 hPa           Fore-vacuum max for H₂         15 hPa           Fore-vacuum max for H₂         30 hPa           Ultimate pressure according to PNEUROP         < 1 ⋅ 10⁻¹ hPa	Flange (out)	DN 16 ISO-KF / G 1/4"			
Pumping speed for H₂       255 l/s         Pumping speed for He       255 l/s         Pumping speed for N₂       260 l/s         Rotation speed ±2%       60,000 min⁻¹         Run-up time       3 - 3.5 min.         Gas throughput at full rotational speed for Ar       0.5 hPa l/s         Gas throughput at full rotational speed for H₂       10 hPa l/s         Gas throughput at full rotational speed for H₂       1.5 hPa l/s         Gas throughput at full rotational speed for N₂       1.5 hPa l/s         Compression ratio for Ar       > 1 ⋅ 10¹³         Compression ratio for Ar       1.5 hPa l/s         Compression ratio for H₂       1.5 hPa l/s         Compression ratio for N₂       1.10¹³         Compression ratio for N₂       > 1 ⋅ 10¹³         Compression ratio for N₂       > 1. 10¹³         Fore-vacuum max for Ar       25 hPa         Fore-vacuum max for H₂       15 hPa         Fore-vacuum max for N₂       30 hPa         Ultimate pressure according to PNEUROP       < 1 ⋅ 10⁻¹ hPa	Venting connection		G 1/8"		
Pumping speed for He       255 l/s         Pumping speed for N₂       260 l/s         Rotation speed ±2%       60,000 min⁻¹         Run-up time       3 - 3.5 min.         Gas throughput at full rotational speed for Ar       0.5 hPa l/s         Gas throughput at full rotational speed for H₂       10 hPa l/s         Gas throughput at full rotational speed for H₂       1.5 hPa l/s         Gas throughput at full rotational speed for N₂       1.5 hPa l/s         Compression ratio for Ar       > 1 ⋅ 10⁻³         Compression ratio for H₂       1 ⋅ 10⁻         Compression ratio for H₂       1 ⋅ 10⁻         Compression ratio for N₂       > 1 ⋅ 10¹³         Fore-vacuum max for Ar       25 hPa         Fore-vacuum max for H₂       15 hPa         Fore-vacuum max for H₂       15 hPa         Fore-vacuum max for H₂       30 hPa         Ultimate pressure according to PNEUROP       < 1 ⋅ 10⁻¹ hPa	Pumping speed for Ar		255 l/s		
Pumping speed for N₂	Pumping speed for H <sub>2</sub>	220 l/s			
Rotation speed ±2% 60,000 min¹¹ Run-up time 3 - 3.5 min. Gas throughput at full rotational speed for Ar 6.5 hPa l/s Gas throughput at full rotational speed for He Gas throughput at full rotational speed for He Gas throughput at full rotational speed for He Gas throughput at full rotational speed for Ne Gas throughput at full rotational speed for Ne Gas throughput at full rotational speed for Ne Sun Fall l/s Sun Fall	Pumping speed for He	255 l/s			
Run-up time 3 - 3.5 min.  Gas throughput at full rotational speed for Ar 0.5 hPa $l/s$ Gas throughput at full rotational speed for H₂ 10 hPa $l/s$ Gas throughput at full rotational speed for He 3.5 hPa $l/s$ Gas throughput at full rotational speed for He  Gas throughput at full rotational speed for N₂ 1.5 hPa $l/s$ Compression ratio for Ar $l = 1.10^{13}$ Compression ratio for H₂ 1 $l = 1.00^{7}$ Compression ratio for He 2.5 $l = 1.00^{7}$ Compression ratio for N₂ 1 $l = 1.00^{7}$ Fore-vacuum max for Ar 2.5 hPa  Fore-vacuum max for Ar 2.5 hPa  Fore-vacuum max for H₂ 1.5 hPa  Fore-vacuum max for H₂ 1.5 hPa  Fore-vacuum max for N₂ 30 hPa  Ultimate pressure according to PNEUROP $l = 1.00^{7}$ hPa $l = 1.00^{10}$ hPa $l = 1.00^{7}$ hPa  Weight 5.8 - 6.2 kg 7.8 - 8.2 kg 6.1 - 6.5 kg  Cooling method, standard Air  Cooling method, optional Water  Cooling water consumption 50 $l/h$ Cooling water temperature 15 - 35 °C  Interfaces RS-485, Remote  Protection category $l = 1.00^{10}$ hPa $l $	Pumping speed for N <sub>2</sub>	260 l/s			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Rotation speed ±2%	60,000 min <sup>-1</sup>			
Gas throughput at full rotational speed for H2 $10 \text{ hPa}$ l/sGas throughput at full rotational speed for He $3.5 \text{ hPa}$ l/sGas throughput at full rotational speed for N2 $1.5 \text{ hPa}$ l/sCompression ratio for Ar $> 1 \cdot 10^{7}$ Compression ratio for H2 $1 \cdot 10^{7}$ Compression ratio for He $2.5 \cdot 10^{9}$ Compression ratio for N2 $> 1 \cdot 10^{13}$ Fore-vacuum max for Ar $25 \text{ hPa}$ Fore-vacuum max for H2 $15 \text{ hPa}$ Fore-vacuum max for He $28 \text{ hPa}$ Fore-vacuum max for N2 $30 \text{ hPa}$ Ultimate pressure according to PNEUROP $< 1 \cdot 10^{-7} \text{ hPa}$ $< 1 \cdot 10^{-10} \text{ hPa}$ $< 1 \cdot 10^{-7} \text{ hPa}$ Weight $5.8 - 6.2 \text{ kg}$ $7.8 - 8.2 \text{ kg}$ $6.1 - 6.5 \text{ kg}$ Cooling method, standardAirCooling water consumption $50 \text{ l/h}$ Cooling water temperature $15 - 35 \text{ °C}$ InterfacesRS-485, RemoteProtection categoryIP54Permissible magnetic field max. $5.5 \text{ mT}$ Sound pressure level $\leq 50 \text{ dB (A)}$	Run-up time	3 – 3.5 min.			
Gas throughput at full rotational speed for He $3.5 \text{ hPa l/s}$ Gas throughput at full rotational speed for N₂ $1.5 \text{ hPa l/s}$ Compression ratio for Ar $> 1 \cdot 10^{7}$ Compression ratio for H₂ $1 \cdot 10^{7}$ Compression ratio for He $2.5 \cdot 10^{9}$ Compression ratio for N₂ $> 1 \cdot 10^{13}$ Fore-vacuum max for Ar $25 \text{ hPa}$ Fore-vacuum max for He $28 \text{ hPa}$ Fore-vacuum max for He $28 \text{ hPa}$ Fore-vacuum max for N₂ $30 \text{ hPa}$ Ultimate pressure according to PNEUROP $< 1 \cdot 10^{-7} \text{ hPa}$ $< 1 \cdot 10^{-10} \text{ hPa}$ $< 1 \cdot 10^{-7} \text{ hPa}$ Weight $5.8 - 6.2 \text{ kg}$ $7.8 - 8.2 \text{ kg}$ $6.1 - 6.5 \text{ kg}$ Cooling method, standardAirCooling water consumption $50 \text{ l/h}$ Cooling water temperature $15 - 35 \text{ °C}$ InterfacesRS-485, RemoteProtection categoryIP54Permissible magnetic field max. $≤ 50 \text{ dB (A)}$	Gas throughput at full rotational speed for Ar	0.5 hPa l/s			
Gas throughput at full rotational speed for N₂ $1.5 \text{ hPa}$ l/sCompression ratio for Ar $> 1 \cdot 10^{13}$ Compression ratio for H₂ $1 \cdot 10^7$ Compression ratio for He $2.5 \cdot 10^9$ Compression ratio for N₂ $> 1 \cdot 10^{13}$ Fore-vacuum max for Ar $25 \text{ hPa}$ Fore-vacuum max for H₂ $15 \text{ hPa}$ Fore-vacuum max for He $28 \text{ hPa}$ Fore-vacuum max for N₂ $30 \text{ hPa}$ Ultimate pressure according to PNEUROP $< 1 \cdot 10^{-7} \text{ hPa}$ $< 1 \cdot 10^{-10} \text{ hPa}$ $< 1 \cdot 10^{-7} \text{ hPa}$ Weight $5.8 - 6.2 \text{ kg}$ $7.8 - 8.2 \text{ kg}$ $6.1 - 6.5 \text{ kg}$ Cooling method, standardAirCooling water consumption $50 \text{ l/h}$ Cooling water temperature $15 - 35 \text{ °C}$ InterfacesRS-485, RemoteProtection categoryIP54Permissible magnetic field max. $5.5 \text{ mT}$ Sound pressure level $\le 50 \text{ dB (A)}$	Gas throughput at full rotational speed for H <sub>2</sub>	10 hPa l/s			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Gas throughput at full rotational speed for He	3.5 hPa l/s			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Gas throughput at full rotational speed for $N_2$	1.5 hPa l/s			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Compression ratio for Ar	> 1 · 10 <sup>13</sup>			
	Compression ratio for H <sub>2</sub>	1 · 10 <sup>7</sup>			
	Compression ratio for He	2.5 · 10 <sup>9</sup>			
	Compression ratio for N <sub>2</sub>	> 1 · 10 <sup>13</sup>			
	Fore-vacuum max for Ar	25 hPa			
Fore-vacuum max for N₂ $30 \text{ hPa}$ Ultimate pressure according to PNEUROP $< 1 \cdot 10^{-7} \text{ hPa}$ $< 1 \cdot 10^{-10} \text{ hPa}$ $< 1 \cdot 10^{-7} \text{ hPa}$ Weight $5.8 - 6.2 \text{ kg}$ $7.8 - 8.2 \text{ kg}$ $6.1 - 6.5 \text{ kg}$ Cooling method, standardAirCooling method, optionalWaterCooling water consumption $50 \text{ l/h}$ Cooling water temperature $15 - 35 \text{ °C}$ InterfacesRS-485, RemoteProtection categoryIP54Permissible magnetic field max. $5.5 \text{ mT}$ Sound pressure level $\le 50 \text{ dB (A)}$	Fore-vacuum max for H <sub>2</sub>	15 hPa			
Ultimate pressure according to PNEUROP $< 1 \cdot 10^{-7} \text{ hPa}$ $< 1 \cdot 10^{-10} \text{ hPa}$ $< 1 \cdot 10^{-7} \text{ hPa}$ Weight $5.8 - 6.2 \text{ kg}$ $7.8 - 8.2 \text{ kg}$ $6.1 - 6.5 \text{ kg}$ Cooling method, standardAirCooling method, optionalWaterCooling water consumption $50 \text{ l/h}$ Cooling water temperature $15 - 35 \text{ °C}$ InterfacesRS-485, RemoteProtection categoryIP54Permissible magnetic field max. $5.5 \text{ mT}$ Sound pressure level $≤ 50 \text{ dB (A)}$	Fore-vacuum max for He	28 hPa			
Weight $5.8-6.2 \text{ kg}$ $7.8-8.2 \text{ kg}$ $6.1-6.5 \text{ kg}$ Cooling method, standardAirCooling method, optionalWaterCooling water consumption $50 \text{ l/h}$ Cooling water temperature $15-35 ^{\circ}\text{C}$ InterfacesRS-485, RemoteProtection categoryIP54Permissible magnetic field max. $5.5  \text{mT}$ Sound pressure level $≤ 50  \text{dB (A)}$	Fore-vacuum max for N <sub>2</sub>		30 hPa		
Cooling method, standard       Air         Cooling method, optional       Water         Cooling water consumption       50 l/h         Cooling water temperature       15 - 35 °C         Interfaces       RS-485, Remote         Protection category       IP54         Permissible magnetic field max.       5.5 mT         Sound pressure level       ≤ 50 dB (A)	Ultimate pressure according to PNEUROP	< 1 · 10 <sup>-7</sup> hPa	< 1 · 10 <sup>-10</sup> hPa	< 1 · 10 <sup>-7</sup> hPa	
Cooling method, optionalWaterCooling water consumption $50 \text{ l/h}$ Cooling water temperature $15 - 35 ^{\circ}\text{C}$ InterfacesRS-485, RemoteProtection categoryIP54Permissible magnetic field max. $5.5  \text{mT}$ Sound pressure level $\leq 50  \text{dB (A)}$	Weight	5.8 – 6.2 kg	7.8 – 8.2 kg	6.1 – 6.5 kg	
Cooling water consumption50 l/hCooling water temperature $15 - 35$ °CInterfacesRS-485, RemoteProtection categoryIP54Permissible magnetic field max. $5.5$ mTSound pressure level≤ 50 dB (A)	Cooling method, standard		Air		
Cooling water temperature $15 - 35$ °CInterfacesRS-485, RemoteProtection categoryIP54Permissible magnetic field max. $5.5$ mTSound pressure level≤ 50 dB (A)	Cooling method, optional	Water			
Interfaces       RS-485, Remote         Protection category       IP54         Permissible magnetic field max.       5.5 mT         Sound pressure level       ≤ 50 dB (A)	Cooling water consumption	50 l/h			
Protection category IP54  Permissible magnetic field max. 5.5 mT  Sound pressure level ≤ 50 dB (A)	Cooling water temperature	15 – 35 °C			
Permissible magnetic field max. 5.5 mT  Sound pressure level ≤ 50 dB (A)	Interfaces	RS-485, Remote			
Sound pressure level ≤ 50 dB (A)	Protection category	IP54			
	Permissible magnetic field max.	5.5 mT			
	Sound pressure level		≤ 50 dB (A)		
Mounting orientation in any orientation	Mounting orientation	in any orientation			
Operating voltage 24 V DC	Operating voltage		24 V DC		

#### Order numbers

HiPace 300 H	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F
with TC 110	PM P05 540	PM P05 541	PM P05 542
for TCP 350	PM P05 543	PM P05 544	PM P05 545

## **VACUUM SOLUTIONS FROM A SINGLE SOURCE**

Pfeiffer Vacuum stands for innovative and custom vacuum solutions worldwide, technological perfection, competent advice and reliable service.

### **COMPLETE RANGE OF PRODUCTS**

From a single component to complex systems:

We are the only supplier of vacuum technology that provides a complete product portfolio.

## **COMPETENCE IN THEORY AND PRACTICE**

Benefit from our know-how and our portfolio of training opportunities!
We support you with your plant layout and provide first-class on-site service worldwide.

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