

HiPace™ Turbopumps



Innovation HiPace™

The new Dimension in Vacuum Technology!
Intelligent. Flexible. Efficient.

PFEIFFER VACUUM



HiPace™ Turbopumps

Innovation HiPace™

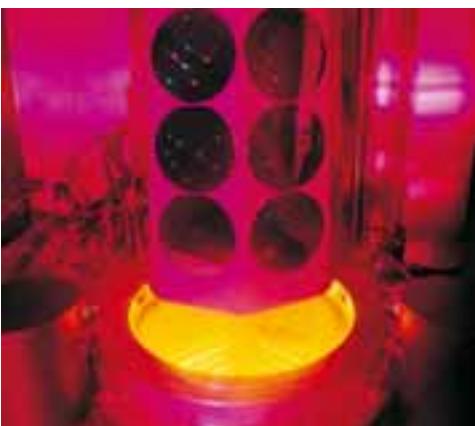
Ever wonder why all turbopumps are called turbopumps today? It's because Pfeiffer Vacuum coined that name when it invented this versatile, pace-setting class of vacuum pumps some 50 years ago: Marking a definitive milestone in vacuum technology!

And following the successful market launch of the "small" HiPace models offering pumping speeds of between

10 and 700 liters per second, we have now rounded out this latest generation of forward-looking pump technology with four new HiPace sizes. In addition to analytical, vacuum process and semiconductor technology, these pumps also cover the needs of coating, research & development and industrial applications.



Glass coating



Wafer fabrication



Photovoltaics

What is HiPace?

HiPace stands for a complete line of compact yet powerful turbopumps featuring pumping speeds that range from 10–2,000 liters per second. These models afford cost-effective yet flexible installation in any orientation. The proven bearing system affords unrivaled dependability. And their sophisticated rotor design makes for higher pumping speeds, higher backing pump compatibility and higher gas throughputs, as well as very good compression for light gases. In combination with reliable sensor capabilities, the HiPace line achieves the highest level of security in the market.

Where are the advantages?

The new, integrated drive electronics reduce the need for cumbersome and costly cabling. Moreover, a variety of drive versions – including Profibus or DeviceNet – are available without any increase in physical size. Innovative materials have enabled us to double the service life of these powerful drive systems. And we have also significantly reduced run-up time for the HiPace pumps, which means that they are able to go into service even faster: An invaluable advantage in manufacturing environments! We additionally provide you with expanded remote and sensor functionalities that allow you to analyze pump data, such as temperatures, for example. Improved diagnostics will assure maximum uptime through predictive maintenance and intelligent support for the service process.

Are there additional advantages?

With improvements to our proven and optimized bearing technology, we offer you both better product performance as well as longer service life than comparable competitive products. A sealing gas valve safeguards the bearings in all of the pumps in this series against particulate matter or reactive gases. This not only makes HiPace compact, it also makes it extremely rugged and suitable for industrial environments, which translates into optimal integration options. Time is money – so extended service intervals and easy, on-site bearing changes are advantages that speak for themselves.

And last but not least!

With the rigorously thorough engineering of the HiPace pumps, we are setting efficiency trends in the industry. As exemplified not just by the functional housings that make these pumps extremely light and broaden their range of applications. Their innovative rotor geometry that makes for low vibration operation is also setting new standards. And integral cooling makes sure that turbopump performance can be enhanced even more, without “overpacing” them.

HiPace – These turbos are picking up the pace! Intelligent. Flexible. Efficient.



HiPace™ 1200



HiPace™ 1500



HiPace™ 1800



HiPace™ 2300

Advantages at a glance

- ▶ Four sizes offering pumping speeds of from 1,000 to 2,000 l/s
- ▶ High pumping speeds for light gases (H_2 , He) and heavy gases (Ar, CF_4)
- ▶ High gas throughputs, even for heavy gases (Ar, CF_4)
- ▶ Installation orientation available from 0° to 90° and from 90° to 180°
- ▶ Corrosive gas versions (C-models) available
- ▶ Integrated sealing gas system with throttle and valve
- ▶ Integrated, powerful cooling
- ▶ Integrated TC 1200 drive unit for direct mains connection
- ▶ Standard interfaces: RS-485 and Remote, Profibus or DeviceNet optional
- ▶ Compatible with Semi S2
- ▶ Certified under UL, CSA and TÜV
- ▶ Suitable for industrial environments thanks to Protection Class IP 54
- ▶ The utmost in process suitability, resistant to particles
- ▶ Robust rotor bearing system
- ▶ Simple installation

HiPace™ Turbopumps

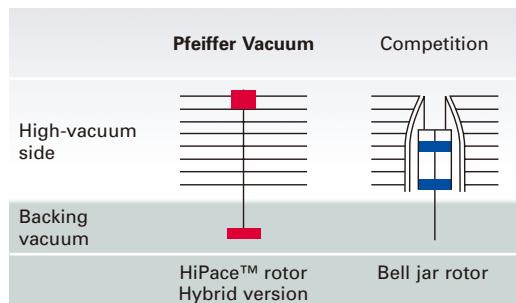
Series of pumps and applications at a glance

	Electronics and Semiconductor			Coating			Industry	Research & Development
● Recommended	PVD (Physical Vapor Deposition)	CVD (Chemical Vapor Deposition)	Plasma etching	Implantation – Source	Implantation – Beamline	MBE (Molecular Beam Epitaxy)	Harddisc coating	Solar cell fabrication (PECVD, CIS, CIGS...)
HiPace™ 1200	●			●				Glass coating (PVD)
HiPace™ 1200 C	●	●	●	●	●	●		CD/DVD/Blu-ray fabrication (PVD)
HiPace™ 1500	●			●				Optical coating (PVD)
HiPace™ 1500 C	●	●	●	●	●	●		Wear protection (PVD, CVD)
HiPace™ 1800	●			●				Film coating (PVD)
HiPace™ 1800 C	●	●	●	●	●	●		Electron beam welding
HiPace™ 2300	●			●				Heat treatment
HiPace™ 2300 C	●	●	●	●	●	●		Vacuum furnaces
								Fusion technology
								Plasma research
								Space simulation
								Elementary particle physics
								Bio technology

Reliability

Highly reliable:

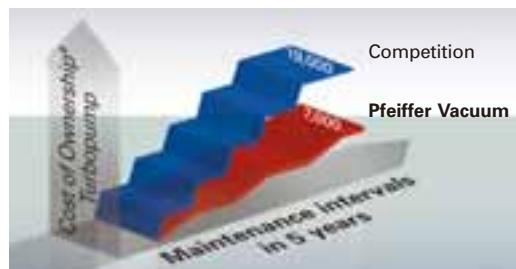
- ▶ Robust bearing system
- ▶ Extremely low vibration
- ▶ Highest operating reliability
- ▶ Minimum wear
- ▶ Mean time between failures
>> 200,000 hours



Cost of Ownership

Factors for minimum operating costs of Pfeiffer Vacuum turbos:

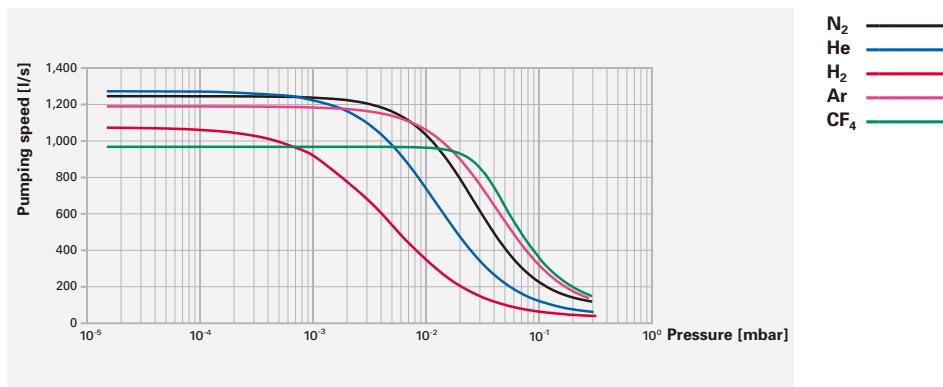
- ▶ Simple maintenance offers
- ▶ Highest uptime
- ▶ Flexible service concepts
- ▶ Long service intervals
- ▶ On-site bearing change capability



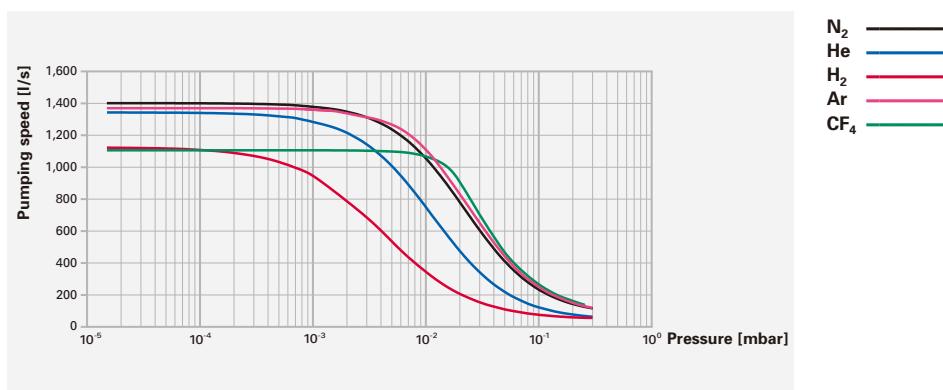
* approx. development of costs in € with use on an implanter

Pumping speed

HiPace™ 1200

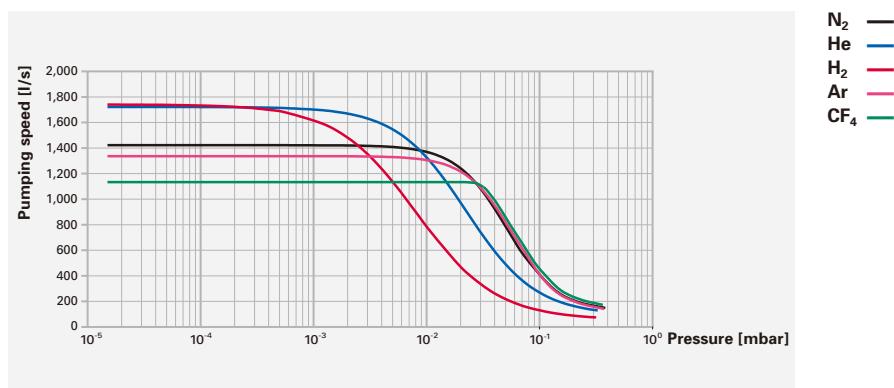


HiPace™ 1500

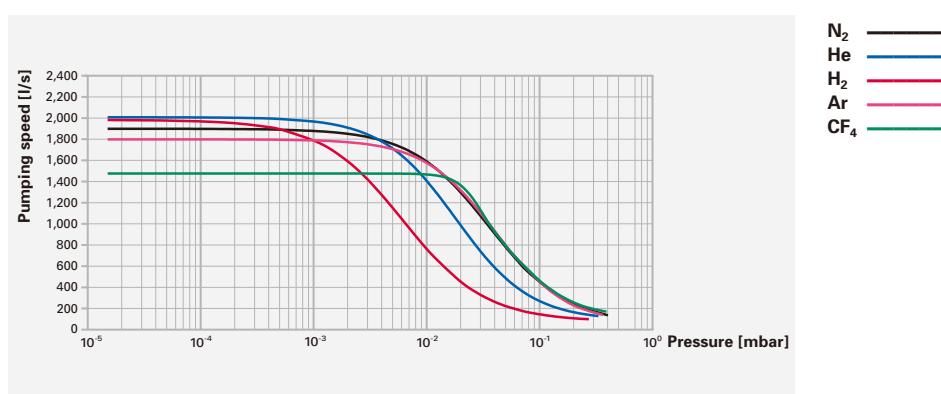


Pumping speed

HiPace™ 1800

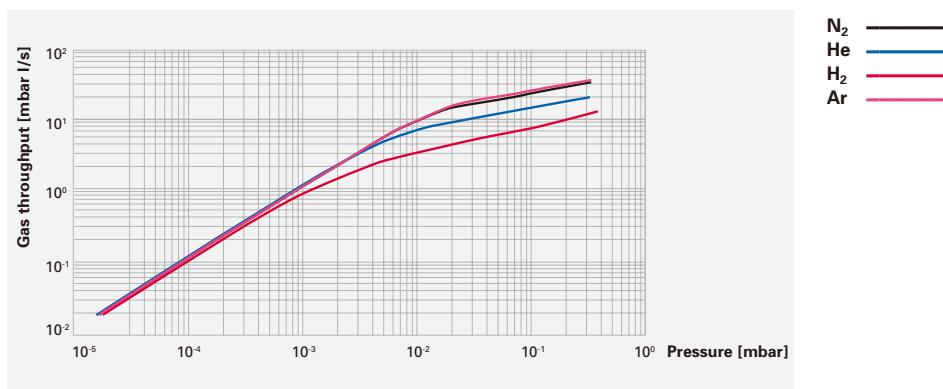


HiPace™ 2300

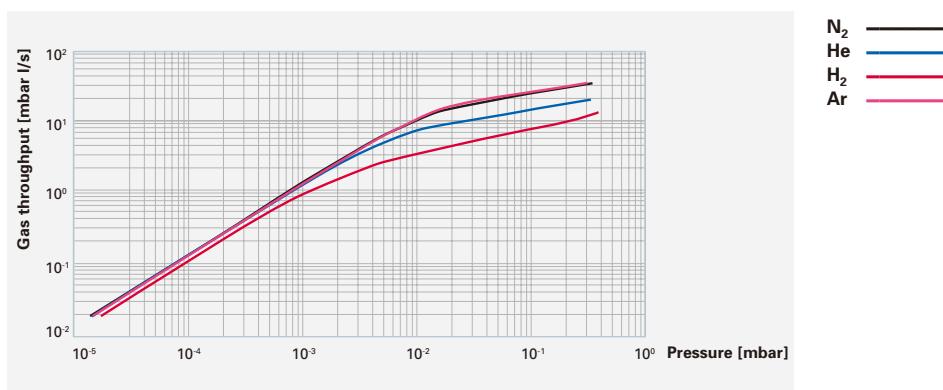


Gas throughput

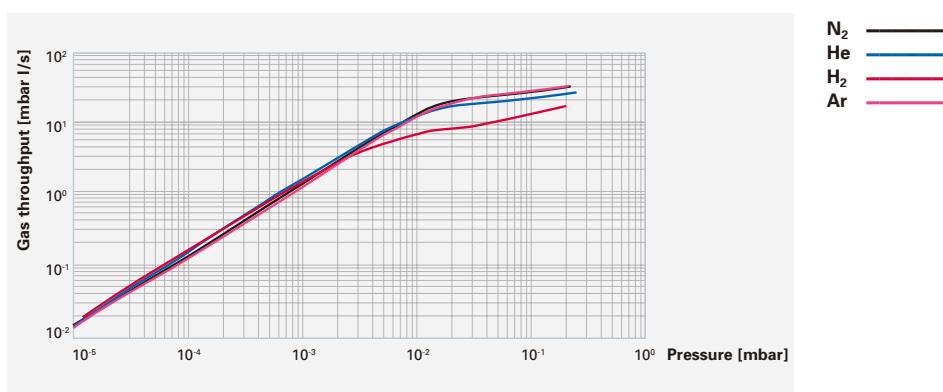
HiPace™ 1200



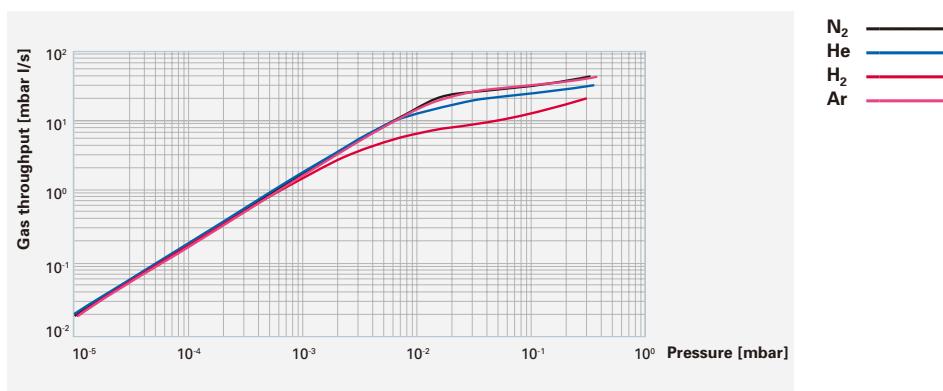
HiPace™ 1500



HiPace™ 1800



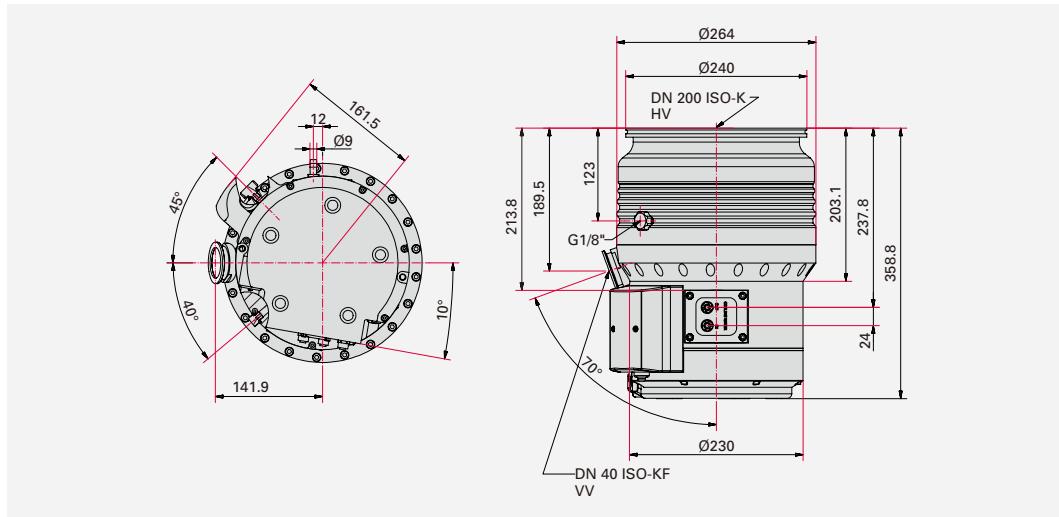
HiPace™ 2300



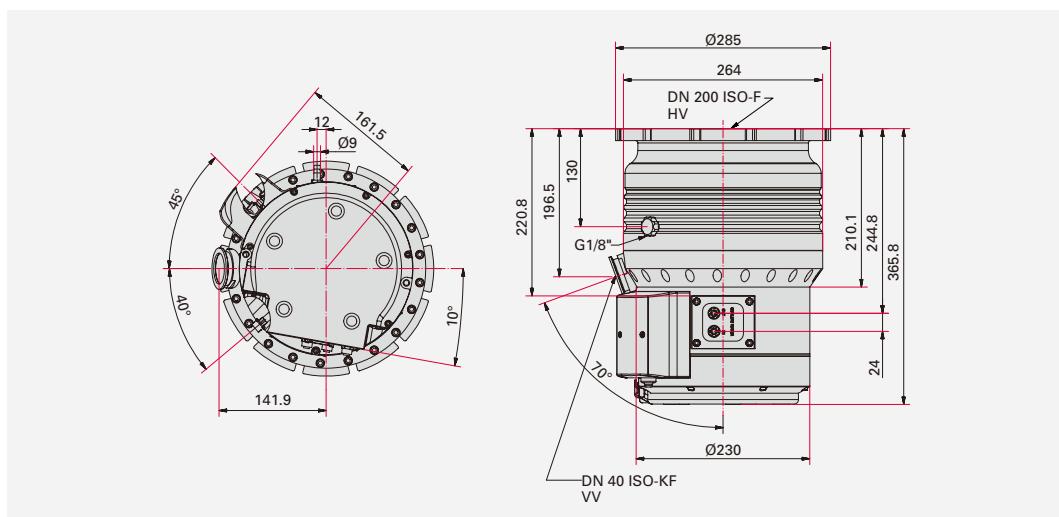
HiPace™ Turbopumps

Dimensions

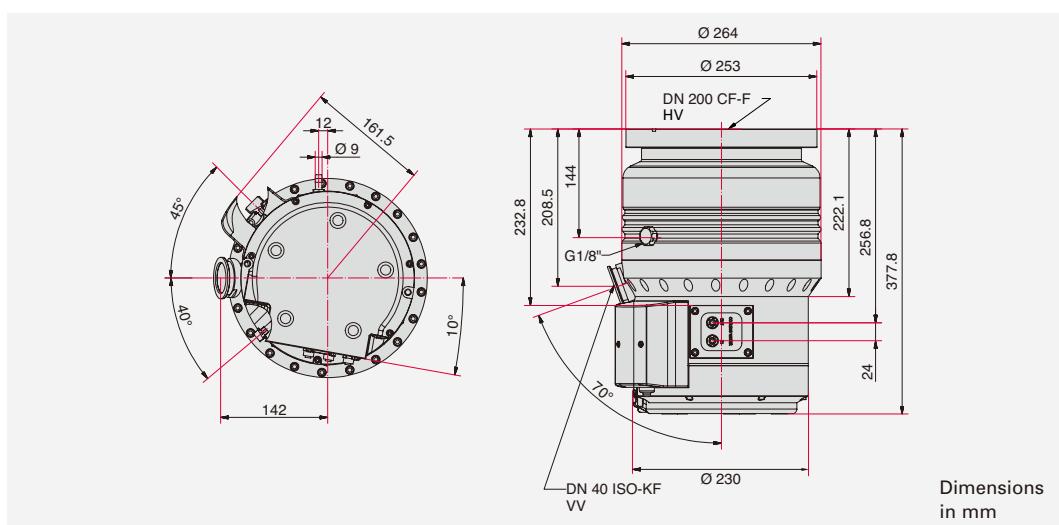
HiPace™ 1200,
DN 200 ISO-K



HiPace™ 1200,
DN 200 ISO-F



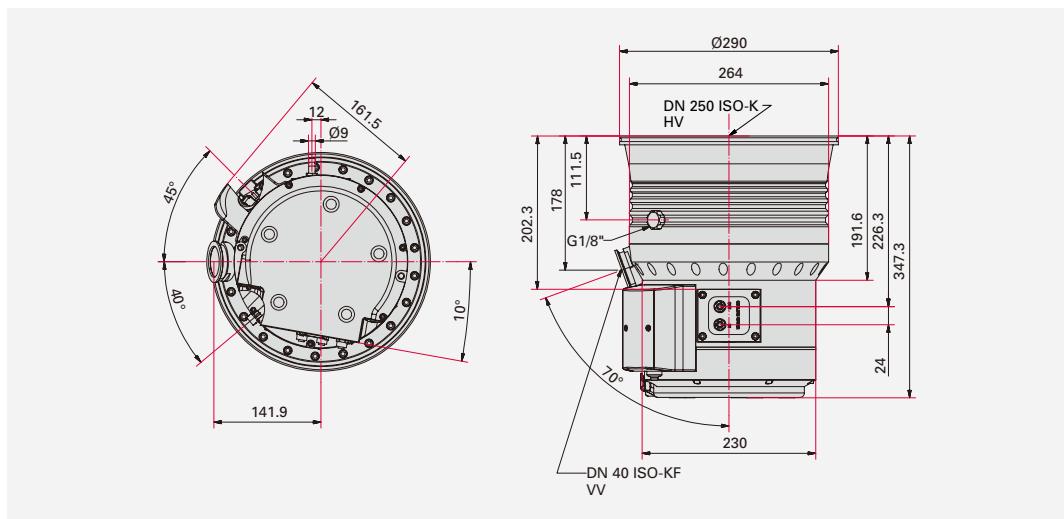
HiPace™ 1200,
DN 200 CF-F



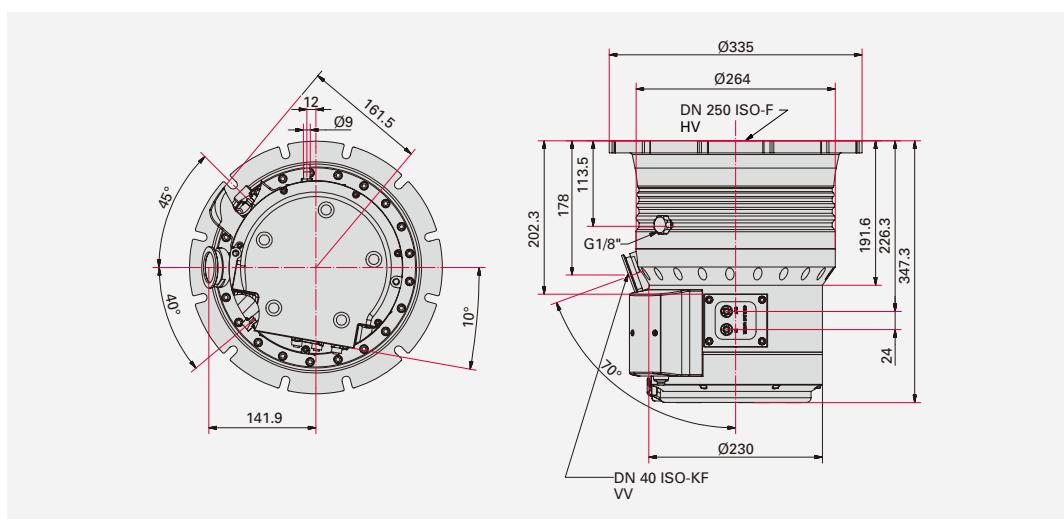
Dimensions
in mm

HV: High-vacuum / VV: Backing vacuum

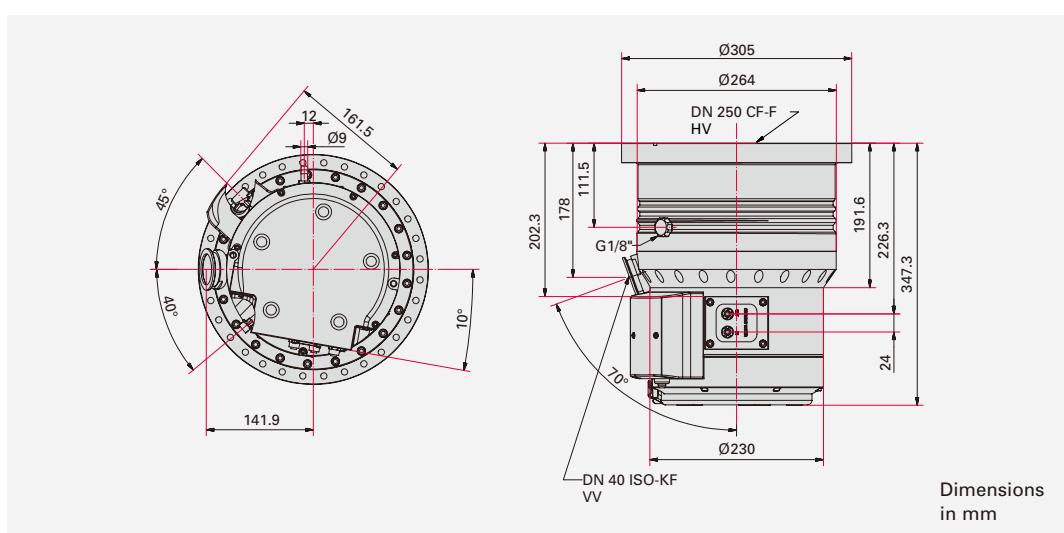
**HiPace™ 1500,
DN 250 ISO-K**



**HiPace™ 1500,
DN 250 ISO-F**



**HiPace™ 1500,
DN 250 CF-F**



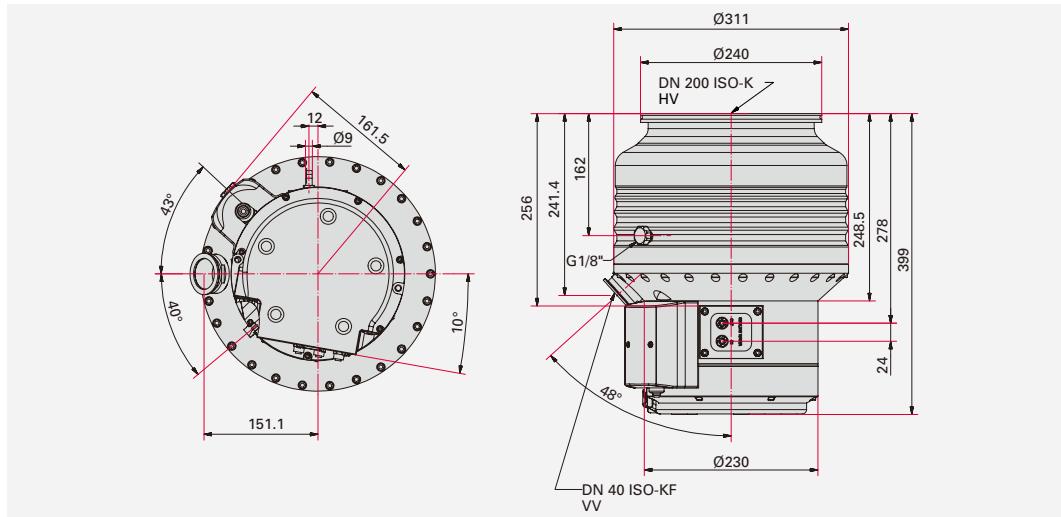
HV: High-vacuum / VV: Backing vacuum

Dimensions
in mm

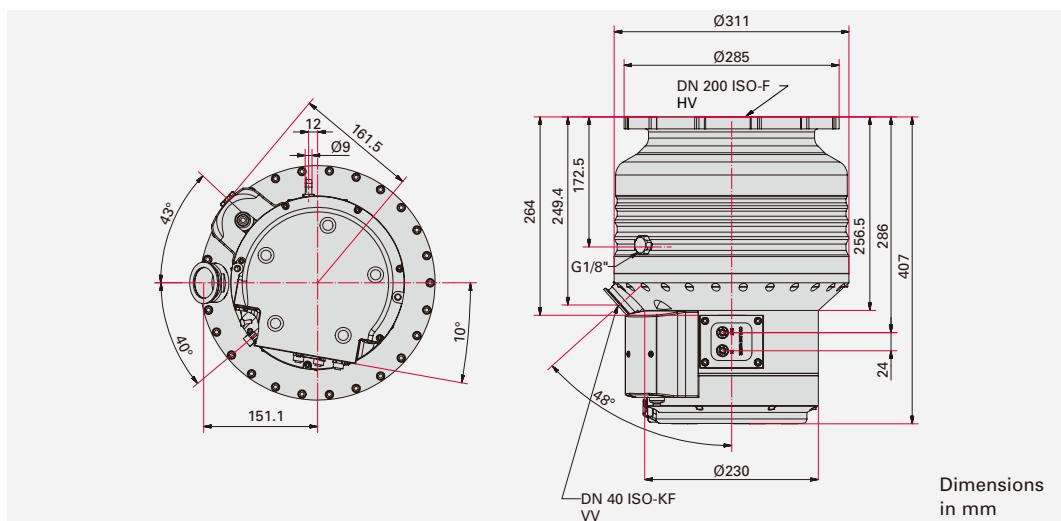
HiPace™ Turbopumps

Dimensions

HiPace™ 1800,
DN 200 ISO-K

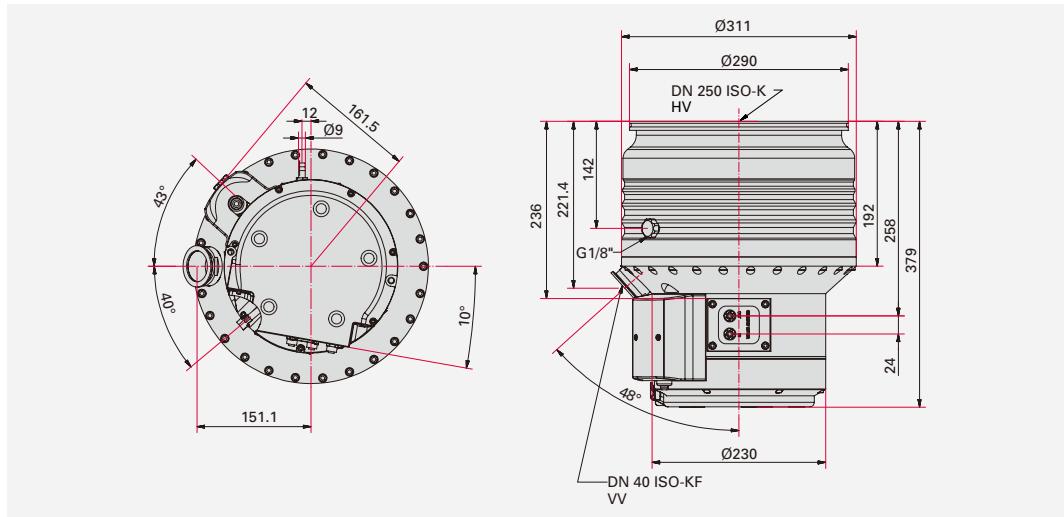


HiPace™ 1800,
DN 200 ISO-F

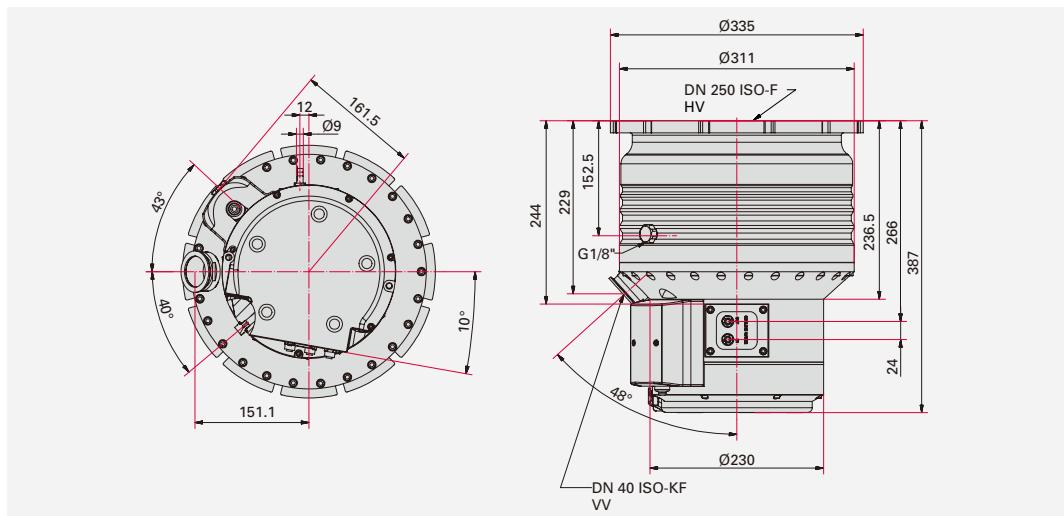


HV: High-vacuum / VV: Backing vacuum

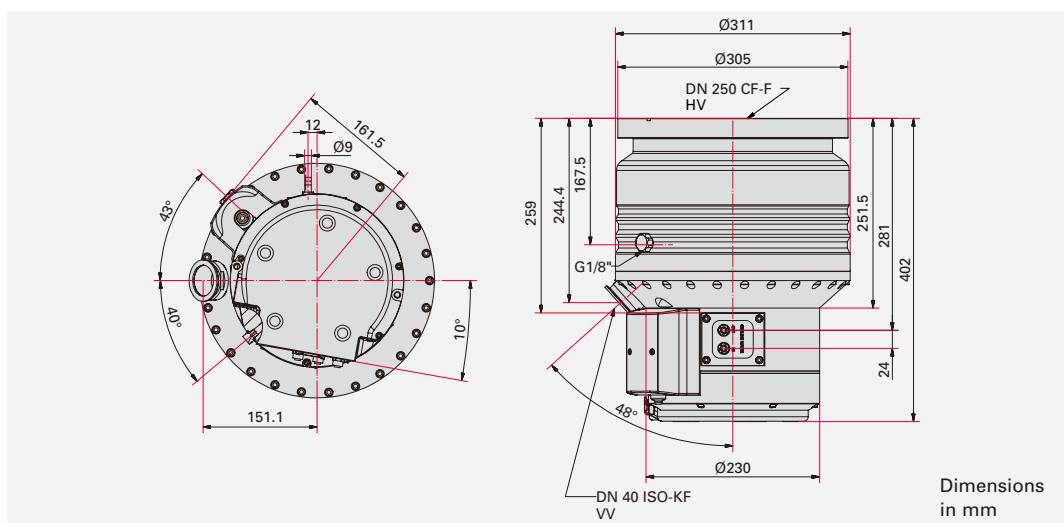
**HiPace™ 2300,
DN 250 ISO-K**



**HiPace™ 2300,
DN 250 ISO-F**



**HiPace™ 2300,
DN 250 CF-F**



Dimensions
in mm

HV: High-vacuum / VV: Backing vacuum

HiPace™ Turbopumps

Order numbers – Accessories

Pump model	HiPace™ 1200	HiPace™ 1200	HiPace™ 1200	HiPace™ 1500
Flange	ISO-K	ISO-F	CF-F	ISO-K
Nominal diameter	DN 200	DN 200	DN 200	DN 250
Control and display units				
DCU 002	PM 061 348-T	PM 061 348-T	PM 061 348-T	PM 061 348-T
HPU 001	PM 051 510-T	PM 051 510-T	PM 051 510-T	PM 051 510-T
Accessories for HPU (power supply, software and PC cable)	PM 061 005-T	PM 061 005-T	PM 061 005-T	PM 061 005-T
Mains cable, 3 m				
with Euro-style safety plug (230 V AC)	P 4564 309 HA			
with UL plug (115 V AC)	PM 061 187-X	PM 061 187-X	PM 061 187-X	PM 061 187-X
with UL plug (208 V AC)	P 4564 309 HB			
Venting accessories				
Venting valve, G1/8"; with cable, M12 plug	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291
Air drier TTV 001	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121
Heating accessories				
Heating jacket 230 V AC, Euro-style safety plug, M12 plug	–	–	PM 061 560-T	–
Heating jacket 208 V AC, UL plug, M12 plug	–	–	PM 061 561-T	–
Heating jacket 115 V AC, UL plug, M12 plug	–	–	PM 061 562-T	–
Backing pump control				
5 A relay box, single-phase (diaphragm pump), M12 plug	PM 061 374-T	PM 061 374-T	PM 061 374-T	PM 061 374-T
20 A mechanical relay box, single-phase (rotary vane pump), M12 plug	PM 061 375-T	PM 061 375-T	PM 061 375-T	PM 061 375-T
Backing vacuum safety valve TVV 001; 230 V AC	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205
Backing vacuum safety valve TVV 001; 115 V AC	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206
General accessories				
Sealing gas throttle	PM Z01 318	PM Z01 318	PM Z01 318	PM Z01 318
Coated centering ring	PM 016 220-U	PM 016 220-U	–	PM 016 225-U
Coated centering ring with protection screen	PM 016 222-U	PM 016 222-U	–	PM 016 227-U
Protection screen	–	–	PM 016 342	–
Coated centering ring with splinter shield	PM 016 221-U	PM 016 221-U	–	PM 016 226-U
Splinter shield	–	–	PM 016 321	–
Vibration damper	PM 006 668-X	–	PM 006 669-X	PM 006 670-X
USB/RS-485 converter	PM 061 207-T	PM 061 207-T	PM 061 207-T	PM 061 207-T
Interface cable RS-485, 3 m, M12	PM 061 283-T	PM 061 283-T	PM 061 283-T	PM 061 283-T
Y-Connector M12 (RS-485-Interface)	P 4723 010	P 4723 010	P 4723 010	P 4723 010
Y-Connector M12 (accessory) only for TC 400/1201	P 4723 012	P 4723 012	P 4723 012	P 4723 012
Coated centering ring				
Coated centering ring				
with bracket screws	PM 016 390-T	–	–	PM 016 395-T
with protection screen, bracket screws	PM 016 392-T	–	–	PM 016 397-T
with splinter shield, bracket screws	PM 016 391-T	–	–	PM 016 396-T
with set of hexagon screws	–	PM 016 470-T	–	–
with protection screen, set of hexagon screws	–	PM 016 472-T	–	–
with splinter shield, set of hexagon screws	–	PM 016 471-T	–	–
with stud screws	–	PM 016 475-T	–	–
with protection screen, stud screws	–	PM 016 477-T	–	–
with splinter shield, stud screws	–	PM 016 476-T	–	–
Set of hexagon screws for CF-F flanges	–	–	PM 016 687-T	–
Set of stud screws for CF-F flanges	–	–	PM 016 688-T	–

HiPace™ 1500	HiPace™ 1500	HiPace™ 1800	HiPace™ 1800	HiPace™ 2300	HiPace™ 2300	HiPace™ 2300
ISO-F	CF-F	ISO-K	ISO-F	ISO-K	ISO-F	CF-F
DN 250	DN 250	DN 200	DN 200	DN 250	DN 250	DN 250
PM 061 348-T						
PM 051 510-T						
PM 061 005-T						
P 4564 309 HA						
PM 061 187-X						
P 4564 309 HB						
PM Z01 291						
PM Z00 121						
–	PM 061 560-T	–	–	–	–	PM 061 563-T
–	PM 061 561-T	–	–	–	–	PM 061 564-T
–	PM 061 562-T	–	–	–	–	PM 061 565-T
PM 061 374-T						
PM 061 375-T						
PM Z01 205						
PM Z01 206						
PM Z01 318						
PM 016 225-U	–	PM 016 220-U	PM 016 220-U	PM 016 225-U	PM 016 225-U	–
PM 016 227-U	–	PM 016 222-U	PM 016 222-U	PM 016 227-U	PM 016 227-U	–
–	PM 016 345	–	–	–	–	PM 016 345
PM 016 226-U	–	PM 016 221-U	PM 016 221-U	PM 016 226-U	PM 016 226-U	–
–	PM 016 324	–	–	–	–	PM 016 324
–	PM 006 671-X	PM 006 668-X	–	PM 006 670-X	–	PM 006 671-X
PM 061 207-T						
PM 061 283-T						
P 4723 010						
P 4723 012						
–	–	PM 016 410-T	–	PM 016 415-T	–	–
–	–	PM 016 412-T	–	PM 016 417-T	–	–
–	–	PM 016 411-T	–	PM 016 416-T	–	–
PM 016 480-T	–	–	PM 016 470-T	–	PM 016 480-T	–
PM 016 482-T	–	–	PM 016 472-T	–	PM 016 482-T	–
PM 016 481-T	–	–	PM 016 471-T	–	PM 016 481-T	–
PM 016 485-T	–	–	PM 016 475-T	–	PM 016 485-T	–
PM 016 487-T	–	–	PM 016 477-T	–	PM 016 487-T	–
PM 016 486-T	–	–	PM 016 476-T	–	PM 016 486-T	–
–	PM 016 694-T	–	–	–	–	PM 016 694-T
–	PM 016 695-T	–	–	–	–	PM 016 695-T

Technical data

Pump model	Unit	HiPace™ 1200	HiPace™ 1500	HiPace™ 1800	HiPace™ 2300
Nominal connection diameter					
Inlet		DN 200	DN 250	DN 200	DN 250
Outlet		DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Venting connection		G 1/8"	G 1/8"	G 1/8"	G 1/8"
Pumping speed for:					
Nitrogen (N ₂)	l/s	1,250	1,450	1,450	1,900
Helium (He)	l/s	1,300	1,350	1,650	2,050
Hydrogen (H ₂)	l/s	1,100	1,150	1,700	1,850
Argon (Ar)	l/s	1,200	1,400	1,370	1,850
Tetrafluoromethane (CF ₄)	l/s	950	1,100	1,050	1,450
Nominal rotation speed	1/min	37,800	37,800	31,500	31,500
Run-up time	min	2.5	2.5	4	4
Max. gas throughput at rated speed for:					
Nitrogen (N ₂)	mbar l/s (sccm)	20 (1,096)	20 (1,096)	20 (1,096)	20 (1,096)
Helium (He)	mbar l/s (sccm)	> 30 (1,644)	> 30 (1,644)	20 (1,096)	20 (1,096)
Hydrogen (H ₂)	mbar l/s (sccm)	> 30 (1,644)	> 30 (1,644)	> 30 (1,644)	> 30 (1,644)
Argon (Ar)	mbar l/s (sccm)	11 (603)	11 (603)	16 (877)	16 (877)
Tetrafluoromethane (CF ₄)	mbar l/s (sccm)	12 (657)	12 (657)	14 (767)	14 (767)
Compression ratio for:					
Nitrogen (N ₂)		> 10 ⁸	> 10 ⁸	> 10 ⁸	> 10 ⁸
Helium (He)		2 · 10 ⁵	2 · 10 ⁵	3 · 10 ⁵	3 · 10 ⁵
Hydrogen (H ₂)		6 · 10 ³	6 · 10 ³	2 · 10 ⁴	2 · 10 ⁴
Argon (Ar)		> 10 ⁸	> 10 ⁸	> 10 ⁸	> 10 ⁸
Tetrafluoromethane (CF ₄)		> 10 ⁸	> 10 ⁸	> 10 ⁸	> 10 ⁸
Max. backing vacuum pressure for:					
Nitrogen (N ₂)	mbar	2	2	1.8	1.8
Ultimate pressure with OnTool DryPump™¹⁾	mbar	< 10 ⁻⁷	< 10 ⁻⁷	< 10 ⁻⁷	< 10 ⁻⁷
Cooling, standard		Water	Water	Water	Water
Cooling water consumption²⁾	l/h	100	100	100	100
Cooling water temperature	°C	15 – 35	15 – 35	15 – 35	15 – 35
Weight	kg	27 – 40	29 – 41	33 – 34	34 – 47

¹⁾ Pump housing not suitable for bake-out; equipped with elastomer seal

²⁾ At maximum throughput and a cooling water temperature of 25°C

Order numbers – Pumps

Orientation of flange	Corrosive-gas version	Flange	Type of pump, Nominal diameter, Drive			
			HiPace™ 1200 DN 200 TC 1200	HiPace™ 1500 DN 250 TC 1200	HiPace™ 1800 DN 200 TC 1200	HiPace™ 2300 DN 250 TC 1200
up (0°–90°)	no	ISO-K	PM P03 910	PM P04 060	PM P04 070	PM P03 920
		ISO-F	PM P03 911	PM P04 061	PM P04 071	PM P03 921
		CF-F	PM P03 912	PM P04 062	–	PM P03 922
		ISO-K	PM P03 913	PM P04 063	PM P04 073	PM P03 923
		ISO-F	PM P03 914	PM P04 064	PM P04 074	PM P03 924
		CF-F	PM P03 915	PM P04 065	–	PM P03 925
upside down (90°–180°)	yes	ISO-K	PM P03 916	PM P04 066	PM P04 076	PM P03 926
		ISO-F	PM P03 917	PM P04 067	PM P04 077	PM P03 927
		CF-F	PM P04 190	PM P04 192	–	PM P04 194
		ISO-K	PM P03 918	PM P04 068	PM P04 078	PM P03 928
		ISO-F	PM P03 919	PM P04 069	PM P04 079	PM P03 929
		CF-F	PM P04 191	PM P04 193	–	PM P04 195



Typical installation on a PVD system (Classic 580)



†Technical data on page 14

Leading innovations. Too fast to be copied.

Pfeiffer Vacuum – A name that stands for reliable high-tech products and innovative solutions that support our customers in their applications and pave the way to their success.

Our vacuum technology developments always keep us a step ahead!

All data subject to change without prior notice. PT 0129 PE (November 2008/20)



Sales, service and consulting

- ▶ Worldwide on-site service
- ▶ Comprehensive in-factory and on-site training programs
- ▶ Modular service concept ranging from spare parts to maintenance contracts

PFEIFFER VACUUM

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