



# PASCAL

Two-stage rotary vane pumps for low and medium vacuum

## Two-stage rotary vane pumps for low and medium vacuum

Two-stage Pascal rotary vane pumps are the result of decades of experience in the design and industrial production of vacuum pumps. The number of pumps used worldwide exceeds 500,000 units.

Pumps of the Pascal series with a pumping speed between 5 and 22 m<sup>3</sup>/h are used in the most demanding applications in industry, analytics and research & development.

They are distinguished by their high quality and reliability. Four versions of oil-lubricated Pascal pumps allow for optimal adjustment to different requirements. The following versions are available:

- SD version for all vacuum applications with non-corrosive gases in the medium vacuum range
- I version for the requirements of instrumental analytics and high gas throughput
- C1 version for applications with aggressive or corrosive gases
- C2 version for harsh duty applications with the most aggressive pumping environment

All pumps from I, C1 and C2 series contain a forced lubrication system, that ensures highest reliability in processes with high gas throughput.

### Customer benefits

- High process reliability
- Worldwide application due to universal motor
- Easy process integration due to various operation fluids
- Low noise level, typically 49 dB for I version
- Low oil back streaming
- Low cost of ownership



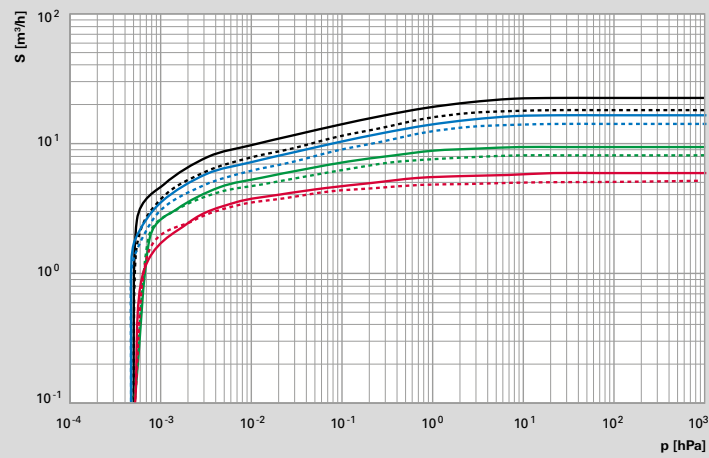
### Typical applications

- Electron microscopy
- Residual gas analysis
- Hard disk coating
- Wear protection
- CD, DVD, Blu-ray production
- Optical coatings
- Vacuum drying
- Space simulation
- Medical applications

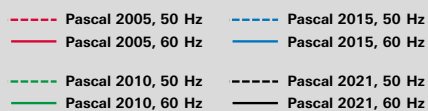
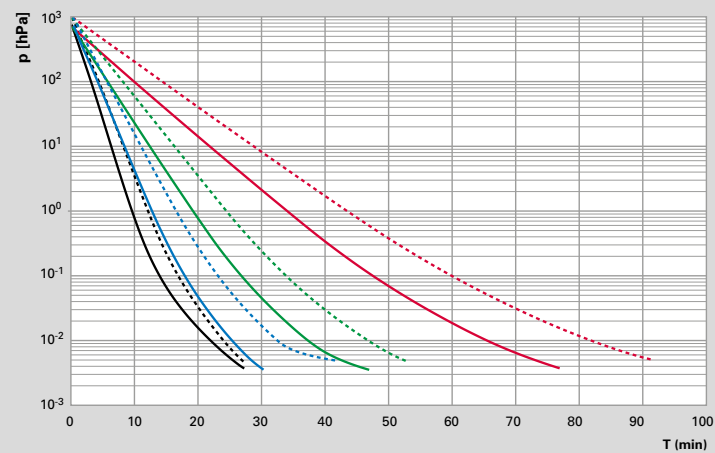
## Pumping speed and dimensions

### Pumping speed

Pascal 2005–2021

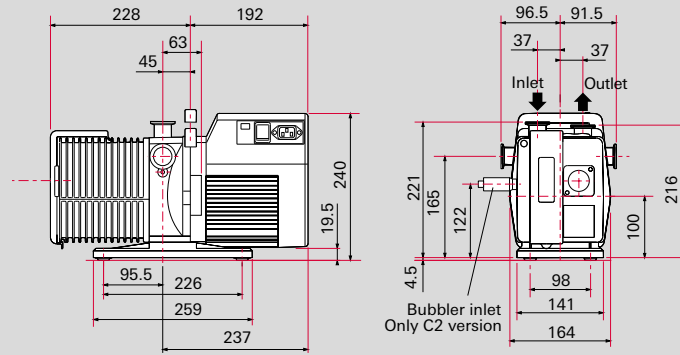


Pascal 2005–2021, inlet pressure drop (volume 500 l)

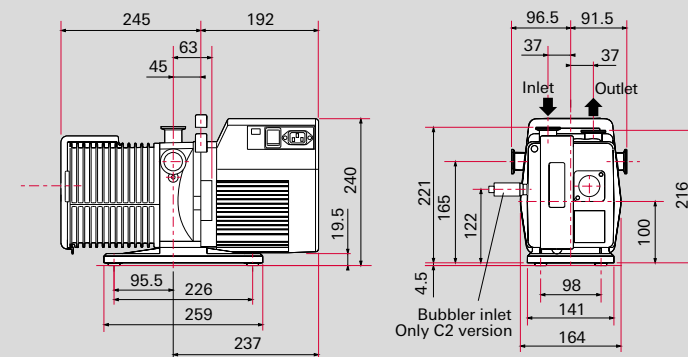


# Dimensions

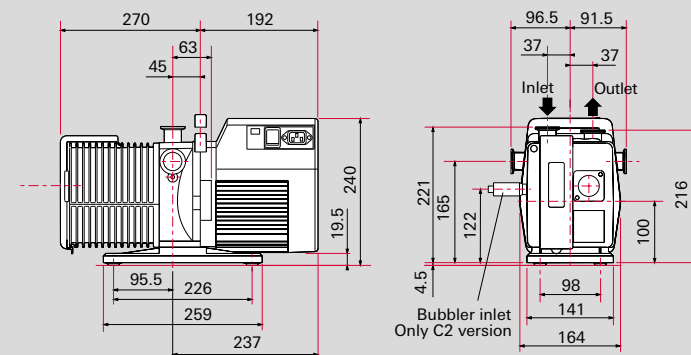
## Pascal 2005



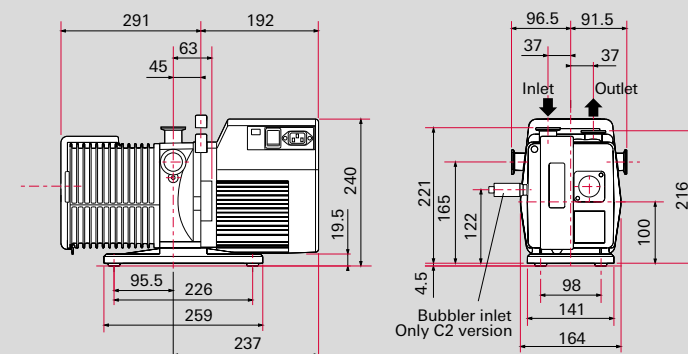
## Pascal 2010



## Pascal 2015



## Pascal 2021



Dimensions in mm

## Technical data, order numbers and accessories

### Technical data

	Pascal 2005	Pascal 2010	Pascal 2015	Pascal 2021
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Pumping speed at 50 Hz	5 m <sup>3</sup> /h	9 m <sup>3</sup> /h	14 m <sup>3</sup> /h	18 m <sup>3</sup> /h
Pumping speed at 60 Hz	6 m <sup>3</sup> /h	10.5 m <sup>3</sup> /h	16.5 m <sup>3</sup> /h	22 m <sup>3</sup> /h
Ultimate pressure without gas ballast	5 · 10 <sup>-4</sup> hPa	5 · 10 <sup>-4</sup> hPa	5 · 10 <sup>-4</sup> hPa	5 · 10 <sup>-4</sup> hPa
Ultimate pressure with gas ballast	10 <sup>-2</sup> hPa	10 <sup>-2</sup> hPa	10 <sup>-2</sup> hPa	10 <sup>-2</sup> hPa
Operating fluid filling	0.83	0.95	0.95	0.98
Protection category	IP43	IP43	IP43	IP43
Mains requirement 50 Hz	0.45 kW	0.45 kW	0.45 kW	0.45 kW
Mains requirement 60 Hz	0.55 kW	0.55 kW	0.55 kW	0.55 kW
Rotation speed at 50 Hz	1,500 rpm	1,500 rpm	1,500 rpm	1,500 rpm
Rotation speed at 60 Hz	1,800 rpm	1,800 rpm	1,800 rpm	1,800 rpm
Ambient temperature	12–45 °C	12–45 °C	12–45 °C	12–45 °C
Weight	25 kg	26 kg	27 kg	28 kg
Cooling method, standard	Air	Air	Air	Air

### Order numbers

Number of stages	Pumping speed	Series	Type of motor	Voltage <sup>1)</sup>	Cable (2 m long)	Oil <sup>2)</sup>
2: Two	05: 5 m <sup>3</sup> /h	AE: I series	M: 1 ph w. switch	L: Low voltage	A: USA	M: Mineral oil (A120)
	10: 10 m <sup>3</sup> /h	SD: SD series		H: High voltage	E: Europe	
	15: 15 m <sup>3</sup> /h	C1: C1 series	S: 1 ph w/o switch		K: UK	N: Without mineral oil
	21: 21 m <sup>3</sup> /h	C2: C2 series			J: Japan	
			T: 3 ph	S: Switzerland		

Order number	2	05	AE	M	L	A	M
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### Example: 205AEMLAM

<sup>1)</sup>

1 ph (M, S); L (Low voltage)	90–132 V, 50 Hz;	90–132 V, 60 Hz
1 ph (M, S); H (High voltage)	180–254 V, 50 Hz;	180–254 V, 60 Hz
3 ph (T); L (Low voltage)	170–254 V, 50 Hz;	170–300 V, 60 Hz
3 ph (T); H (High voltage)	342–460 V, 50 Hz;	342–520 V, 60 Hz

<sup>2)</sup> For C2 series, Code N is the only choice: the pump is prepared with A113 synthetic fluid, oil has to be ordered separately

Oil types	Description	Achievable ultimate pressure	Applications	Size	Order number USA	Other countries
A120	General purpose mineral oil, all-purpose oil for 50 Hz	$< 3 \cdot 10^{-3}$ hPa	Air, non-corrosive gases, noble gases; high viscosity	2 liters 5 x 2 liters 56 liters		068099 068844 010991
A113	Perfluoropolyether synthetic oil	$< 5 \cdot 10^{-3}$ hPa	Oxygen, ozone, halogens, organic and inorganic solvents, high resistance to corrosive gases, suitable for plasma etching, non-flammable	1 kg 2 kg 8 kg 0.5 liter 2.5 liters	98703 98704 98705	064657 064659
A119	General purpose mineral oil, all-purpose oil for 60 Hz	$< 3 \cdot 10^{-3}$ hPa	Air, non-corrosive gases, noble gases; low viscosity, therefore good start-up properties at low temperatures	1 liter 1 gallon 55 gallons	98101 98102 98103	103855
A121	Double-distilled mineral synthetic oil with antioxidant additive	$< 3 \cdot 10^{-3}$ hPa	Cyclic pumping at atmospheric pressure, for high temperatures and pressures, resistant to acidic and organic vapors; not suitable for plasma etching	1 liter	14128	102724
A102	Mineral oil with anti-emulsifier	$< 3 \cdot 10^{-2}$ hPa	Oil and water separation (anti-emulsion), water vapor drying and pumping, freeze-drying	2 liters 5 x 2 liters 56 liters	010996	010996 068853 010987
A111	Additivated hydro-carbon anti-emulsion mineral oil	$< 1 \cdot 10^{-2}$ hPa	Gas circulation and gas return; oxidation-sensitive (not suitable for frequent cycles at atmospheric pressure), high pressure, high temperature	1 liter 2 liters 5 x 2 liters	064656	064655 068854
A200	Temperature-stable, mineral synthetic oil, double distilled	$< 2 \cdot 10^{-3}$ hPa	Resistant to corrosive gases and ionizing plasma; low backstreaming	1 liter 1 gallon 55 gallons 3.8 liters 19 liters	98201 98202 98203	068694 068695 068696
A300	Double-distilled white mineral oil without additives, CAS Nr 8042-47-5	$< 5 \cdot 10^{-3}$ hPa	High resistance to corrosive gases and ionizing plasma; resistant to halogens and Lewis acids; low backstreaming	1 liter 1 gallon 55 gallons 3.8 liters 19 liters	98301 98302 98303	068890 068891 068892

A200 & A300: Low viscosity, good start up properties at low temperatures

### Ordering information maintenance kits

Model	Major kit	Minor kit	Shaft seal kit
2005 I	103906	103912	65612
2010 I	103907	103912	65612
2015 I	103908	103912	65612
2021 I	103909	103912	65612
2005 SD	103902	103911	65875
2010 SD	103903	103911	65875
2015 SD	103904	103911	65875
2021 SD	103905	103911	65875
2005 C1	104976	104975	65612
2010 C1	104977	104975	65612
2015 C1	104978	104975	65612
2021 C1	104979	104975	65612
2010 C2	104614	104975	65612
2015 C2	104615	104975	65612
2021 C2	104616	104975	65612
1005 SD	104622	103911	65875
1015 SD	104643	105515	65875

In order to simplify maintenance performed on-site, Pfeiffer Vacuum offers maintenance kits including interchangeable components:

- Minor kit includes all necessary seals (shaft seals, o-rings, valves...).
- Major kit includes minor kit plus vanes, springs, plugs...
- Shaft seal kit includes lip seals necessary for fast periodic renewal of external shaft sealing.
- Shaft sleeves of 5 – 21 m<sup>3</sup>/h pumps are not included in the kits. These Cr<sub>2</sub>O<sub>3</sub> coated sleeves are very resistant and do not require replacement.
- If the sleeve shows signs of wear, it needs to be ordered separately with the following part number: **Order number 065823.**

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

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

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