

Semi wafer



Display



Solar cells

A4 Series

Energy-efficient dry multi-stage
Roots process pumps for all
semiconductor and coating applications.

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Roots process pumps for all
semiconductor and coating applications.



**Full corrosion resistance
for increased lifetime**

Your added value



**High Mean Time
Between Failures and
low cost of ownership**

Full range of green dry process pumps for harsh duty applications from 100 to 3,000 m³/h

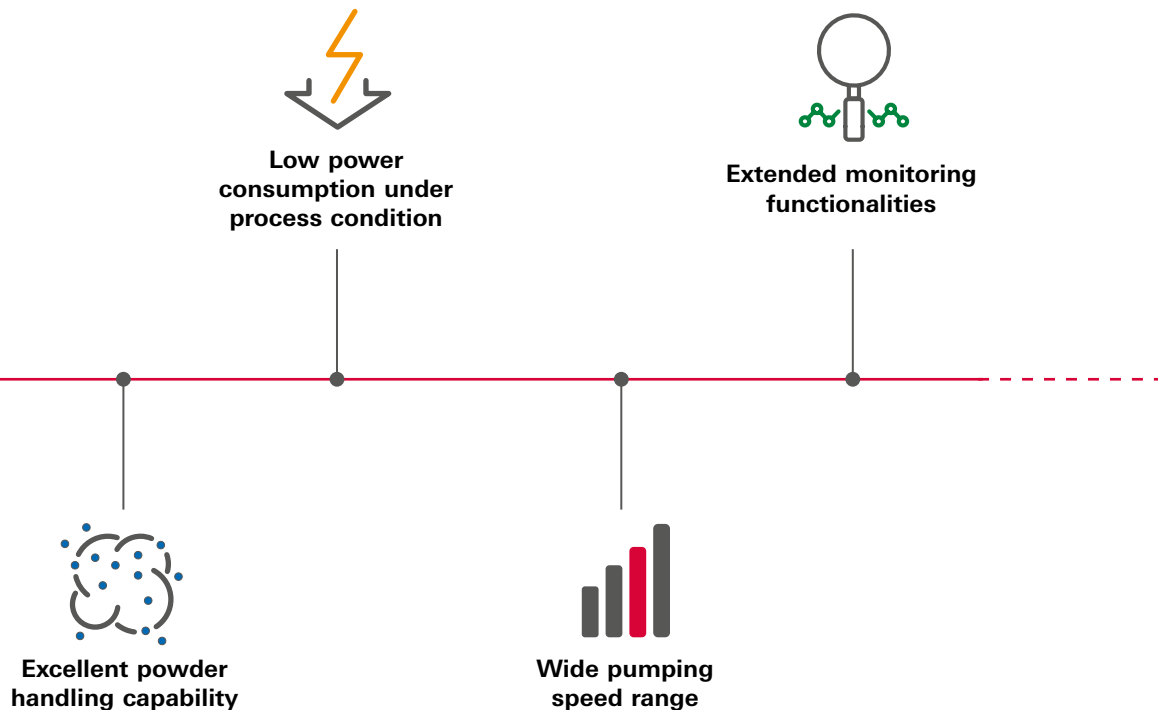
Harsh duty processes in semiconductor production always provide new challenges for vacuum pumps. Based on the proven and energy efficient multi-stage Roots technology, the A4 series offers a wide range of dry pump solutions, with different pumping speeds from 100 to 3,000 m³/h.

The new A 3004 pump extends the range as the high capacity solution for emerging deposition or etch applications.

New XN models feature Pfeiffer Vacuum' advanced materials for full corrosion resistance. Additionally, new integrated options are available, increasing pump health monitoring capabilities or extending pump service intervals. With an extended process lifetime – associated with a low power consumption – the A4 series pumps are counted among those with the lowest cost of ownership in the market.

A 3004: The energy saver Highest performance at the lowest operating cost of its class

The A 3004 pump sets a new standard in the 3,000 m³/h pumping speed category. Its optimized construction provides the best compression ratio under process flow operation, resulting in the lowest power consumption on the market. Additionally, the A 3004 features the highest pumping capacity above 30 slm inlet flow, providing a wider process window and margin even on the most advanced CVD applications.



Extended operating temperature range

The pumps are equipped with an extended temperature management covering low and high operating temperature to prevent by-product deposition or cracking within the pumping stages. Associated with high temperature precision bearings, this results in enhanced process reliability.

Full corrosion resistance

Launched several years ago, the A4X models use special materials to protect the rotors of the primary pumps from corrosion. This solution has already proven its efficiency in the field, greatly increasing pump lifetime.

However, some applications such as conductor etch require high temperature operation to prevent deposition inside the pumps, further increasing the corrosion rate. For these most demanding applications, the XN coating technology has been developed, protecting all parts in contact with corrosive gas. Using XN technology, the pump lifetime has drastically improved – up to a factor 5 on some processes. This makes these dry pumps the optimum choice for the most corrosive CVD and etch processes.

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Intelligent

Equipped with a sophisticated monitoring system, the A4 series includes new functionalities to improve trouble shooting and monitor pump health in real time. A new optional water sensor detects the presence of water in the pump enclosure that may occur during pump lifetime, increasing safety of sub Fab operations. The new optional V-Box features dry pump vibration monitoring in real time. Correlated with other pump parameters, V-Box allows the detection of abnormal pump behavior.

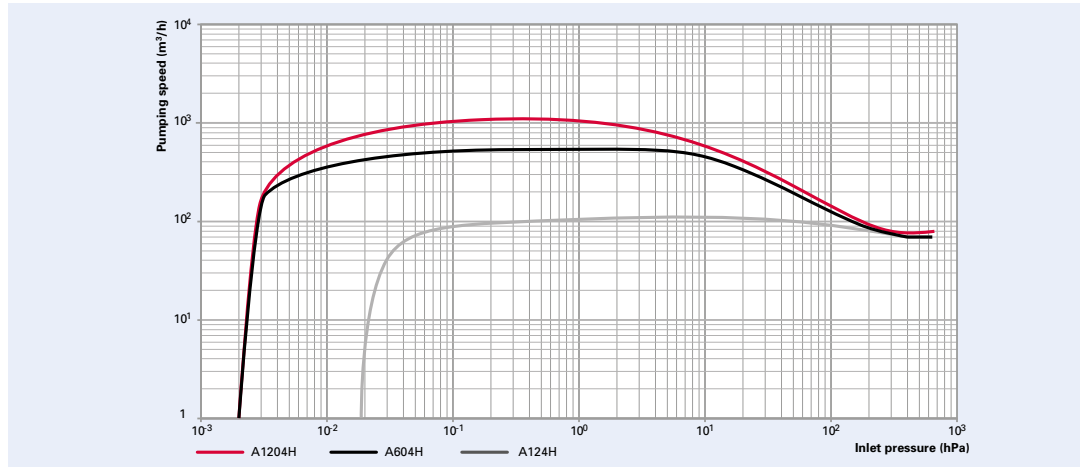
We can reduce the risk of exhaust line clogging and increase dilution below LEL on applications using flammable gas with our new I-HN option that features an integrated hot N₂ injection at the pump exhaust. Compared to conventional external systems installed on exhaust lines, I-HN is a zero footprint solution at lower operating costs. Idle modes is also available, reducing N₂ purge and/or power consumption up to 35% meaning operating costs are dramatically reduced.

Low maintenance

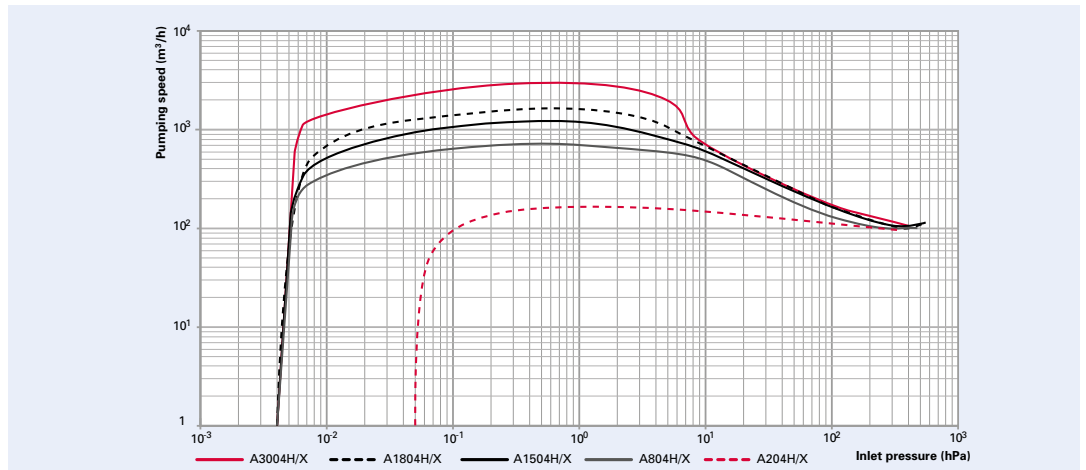
Through the improved particle tolerance, corrosion and condensation resistance, lifetime of the pumps is extended. Additionally, the XN technology drastically increases maintenance intervals, which means an additional reduction of operating costs. There is no required on-site routine maintenance.

Pumping speed

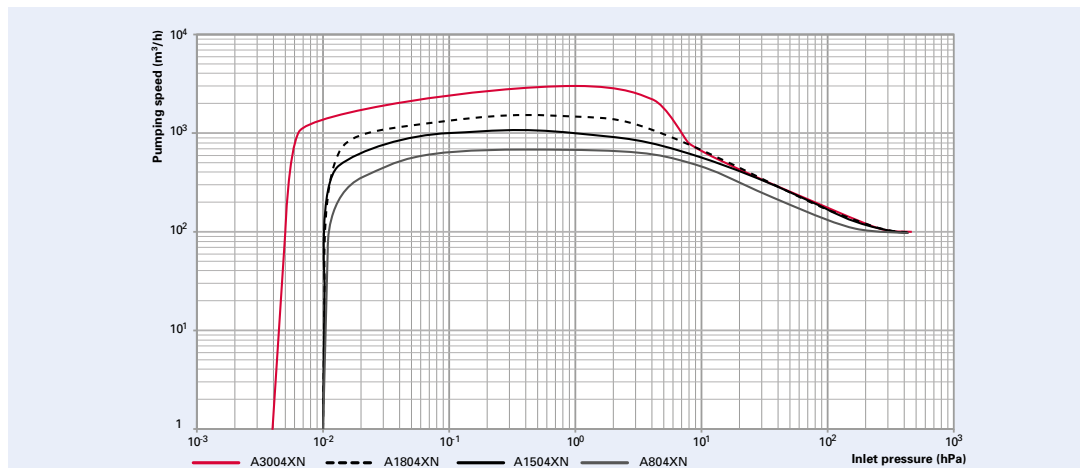
A 124 H, A 604 H, A 1204 H
For non-critical applications



A 204 H/X, A 804 H/X, A 1504 H/X, A 1804 H/X, A 3004 H/X
For harsh applications



A 804 XN, A 1504 XN, A 1804 XN, A 3004 XN
For very corrosive applications

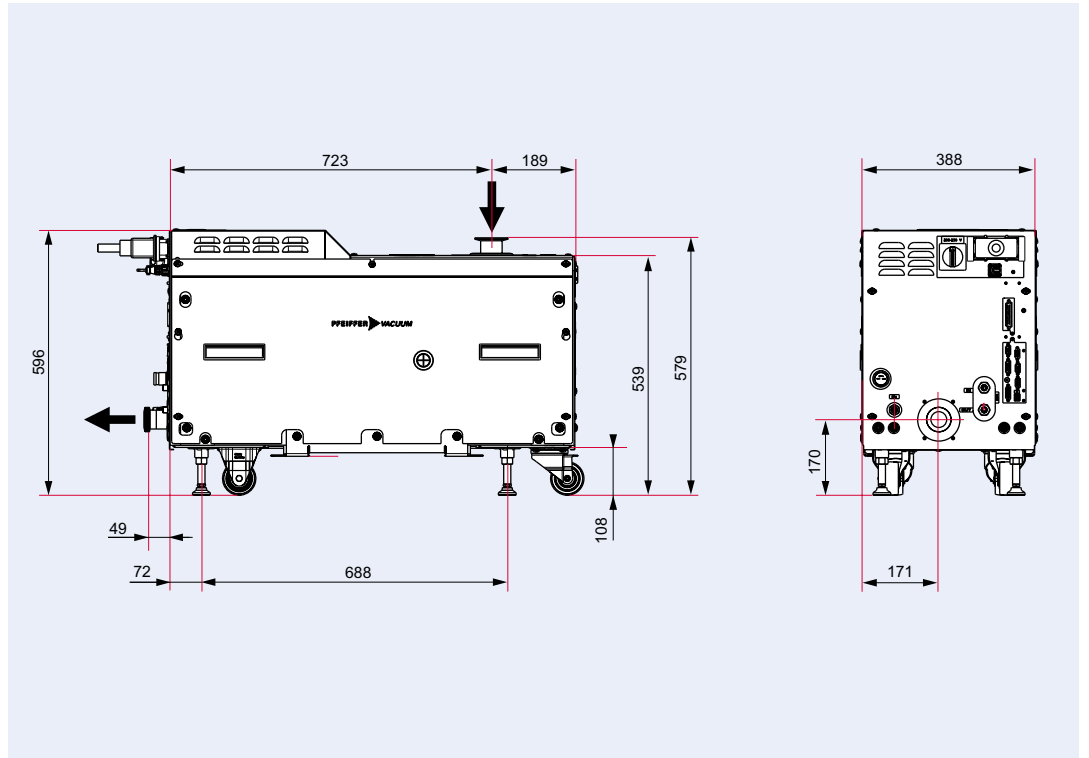


A4 Series

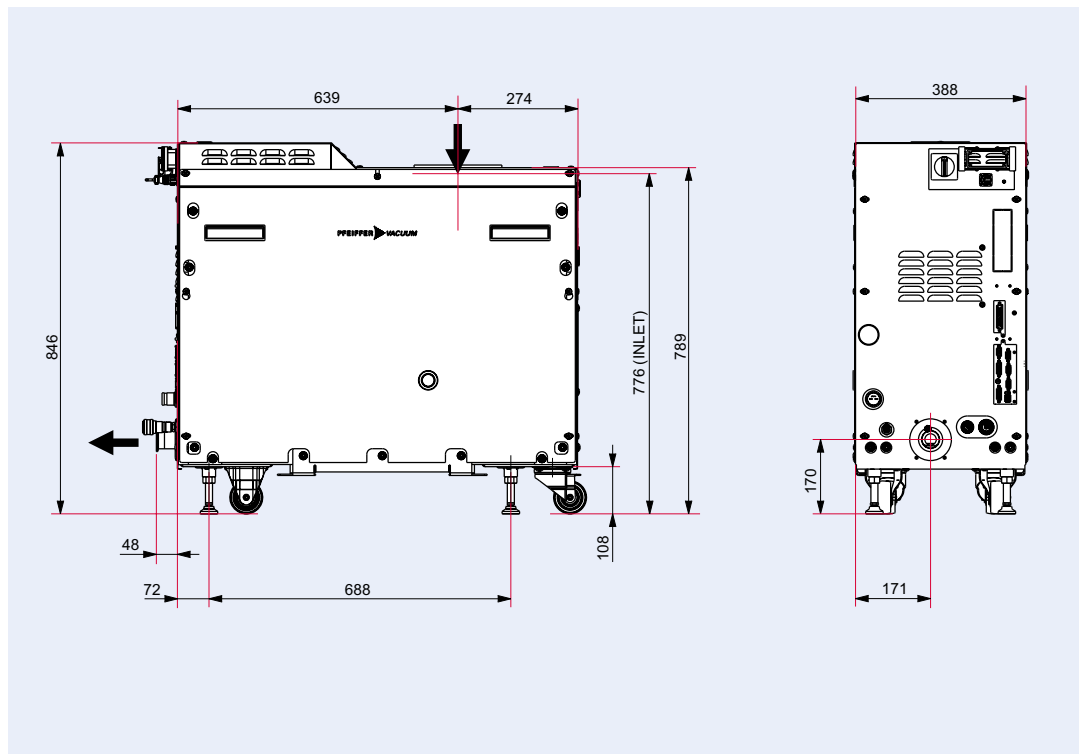
Dimensional drawings

Dimensions

A 124 H, A 204 H/X

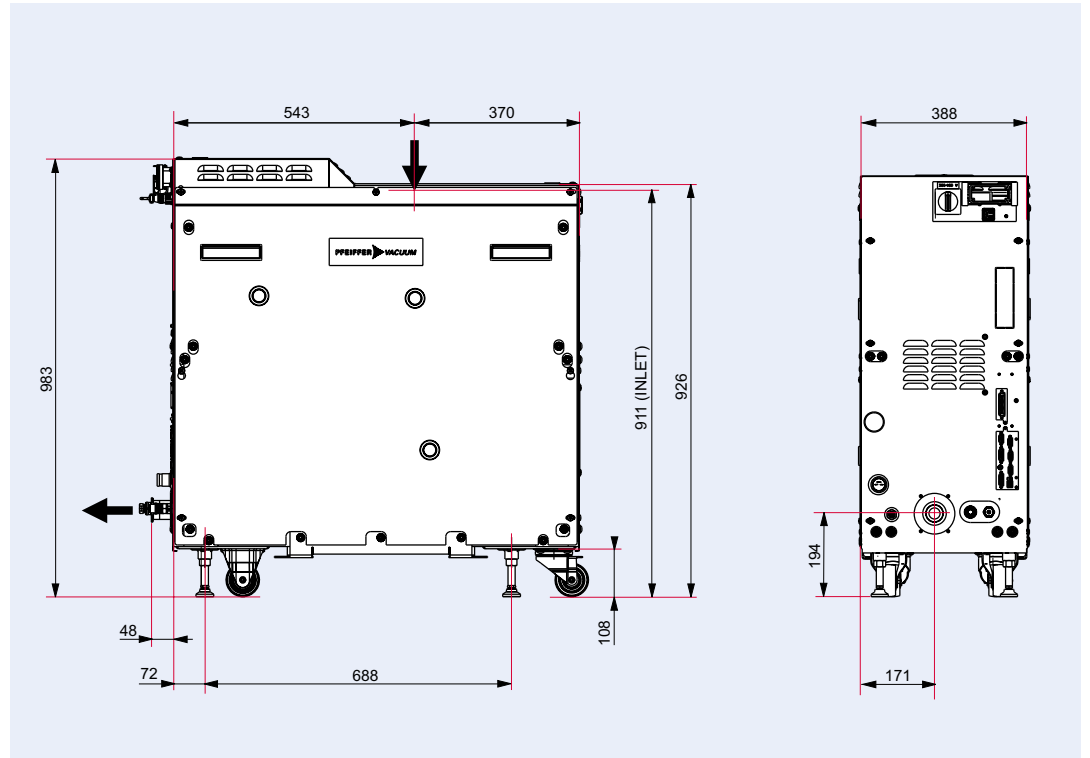


A 604 H, A 804 H/X/XN

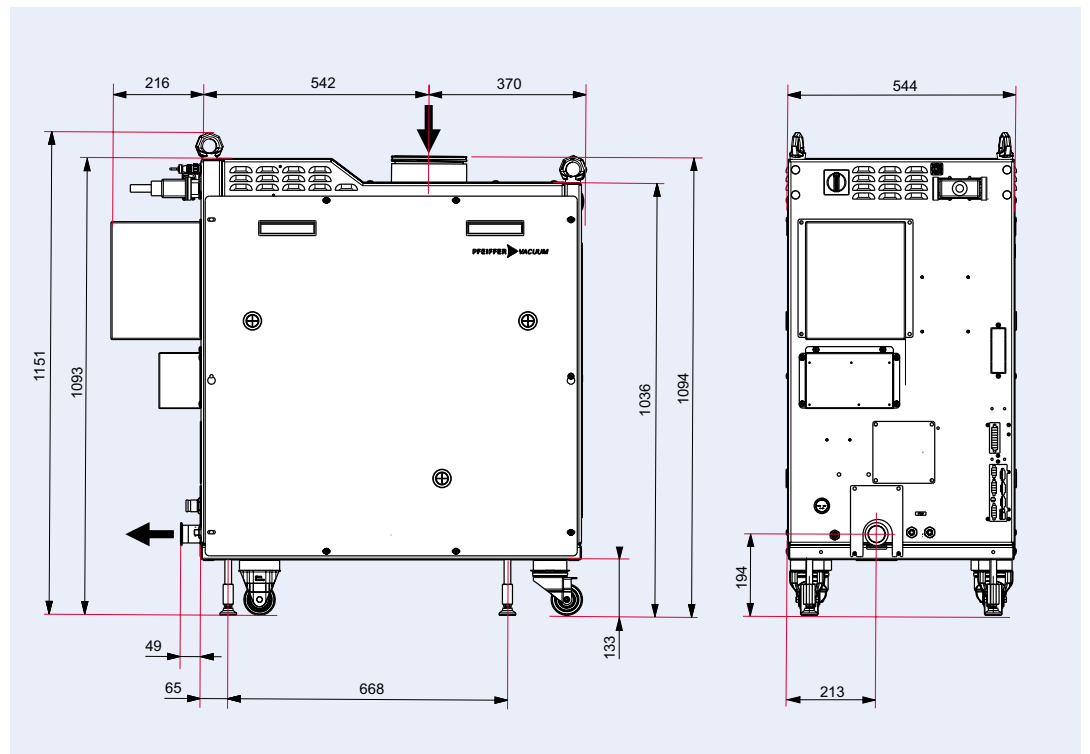


Dimensions in mm

A 1204 H, A 1504 H/X/XN, A 1804 H/X/XN



A 3004 H/X/XN



Dimensions in mm

A4 Series

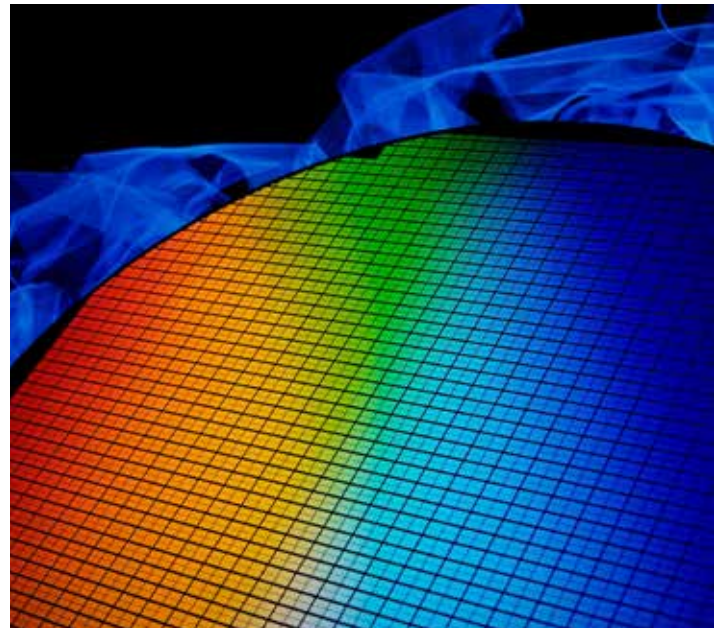
Technical data

Characteristics	Units	A124H	A204H / A204X
Maximum peak pumping speed N ₂ at 50 Hz	m ³ /h	95	130
Maximum peak pumping speed N ₂ at 60 Hz	m ³ /h	110	160
Maximum ultimate pressure (No Purge) at 50 Hz	hPa	5 · 10 ⁻²	2 · 10 ⁻¹
Maximum ultimate pressure (No Purge) at 60 Hz	hPa	2 · 10 ⁻²	5 · 10 ⁻²
Maximum ultimate pressure (50 SLM Purge) at 50 Hz	hPa	3 · 10 ⁻¹	7 · 10 ⁻¹
Maximum ultimate pressure (50 SLM Purge) at 60 Hz	hPa	1 · 10 ⁻¹	2 · 10 ⁻¹
Maximum continuous inlet flow at full rotational speed	slm	80	150
Power supply	V		
Power consumption at ultimate pressure, no exhaust heater at 50 Hz	kW	1.3	1.6
Power consumption at ultimate pressure, no exhaust heater at 60 Hz	kW	1.5	1.8
Maximum exhaust overpressure	hPa		
Cooling water flow ¹⁾	l/mn	2.3–3	2.3–4
Cooling water temperature ¹⁾	°C		
Water connect			
N ₂ purge flow	Slm		
Operating temperature	°C		
Inlet flange	ISO-K	DN 50	DN 50
Exhaust flange	ISO-KF		
Dimensions			
Length (to exhaust flange)	mm	961	961
Width	mm	388	388
Height (to inlet flange)	mm	579	579
Weight	kg	240	250
Maximum vibration level at pump inlet flange	g / mm/s		
Maximum noise level (at ultimate pressure)	dB(A)	< 65	< 68

¹⁾ Subject to pump T° setting



Solar cells



Semi wafer

A604H	A804H / A804X	A1204H	A1504H / A1504X	A1804H / A1804X	A3004H / A3004X
480	600	1.050	1.100	1.650	–
560	700	1.150	1.200	1.700	3.000
$3 \cdot 10^{-3}$	$8 \cdot 10^{-3}$	$3 \cdot 10^{-3}$	$8 \cdot 10^{-3}$	$8 \cdot 10^{-3}$	–
$2 \cdot 10^{-3}$	$4 \cdot 10^{-3}$	$2 \cdot 10^{-3}$	$4 \cdot 10^{-3}$	$4 \cdot 10^{-3}$	$4 \cdot 10^{-3}$
$1 \cdot 10^{-2}$	$2 \cdot 10^{-2}$	$1 \cdot 10^{-2}$	$2 \cdot 10^{-2}$	$2 \cdot 10^{-2}$	–
$6 \cdot 10^{-3}$	$9 \cdot 10^{-3}$	$6 \cdot 10^{-3}$	$9 \cdot 10^{-3}$	$9 \cdot 10^{-3}$	$9 \cdot 10^{-3}$
60	100	55	100	70	100
200–230 V / 380–480 V – 3 phases $\pm 10\%$ –50/60 Hz					
1.8	2.1	2.1	2.4	2.4	–
2.0	2.3	2.3	2.6	2.6	2.6
	1200				
2.5–4	2.5–5	2.5–4	2.5–5	2.5–5	2.5–5
	10 to 35				
	1/4 or 3/8 NPT				
	10 to 120				
	5 to 40				
DN 100	DN 100	DN 160	DN 160	DN 160	DN 160
	DN 40				
961	961	961	961	961	961
388	388	388	388	388	544
776	776	911	911	911	1094
370	380	530	540	540	800
	< 0.1 / 1.5				
< 68	< 68	< 69	< 69	< 69	< 72

Characteristics	Units	A804 XN ²⁾	A1504 XN	A1804 XN	A3004 XN ²⁾
Maximum peak pumping speed N ₂ at 60 Hz	m ³ /h	600	1.100	1.600	2.900
Maximum ultimate pressure (No Purge) at 60 Hz	hPa	$1.45 \cdot 10^{-2}$	$1.45 \cdot 10^{-2}$	$1.45 \cdot 10^{-2}$	$4 \cdot 10^{-3}$
Maximum ultimate pressure (50 SLM Purge) at 60 Hz	hPa	$2.4 \cdot 10^{-2}$	$2.4 \cdot 10^{-2}$	$2.4 \cdot 10^{-2}$	$9 \cdot 10^{-3}$
Maximum continuous inlet flow at full rotational speed	slm	75	75	55	75
Power supply	V	200–230 V / 380–480 V - 3 phases $\pm 10\%$ –50/60 Hz			
Power consumption at ultimate pressure, no exhaust heater at 60 Hz	kW	2.4	2.7	2.8	2.7
Maximum exhaust overpressure	hPa	1200			
Cooling water flow ³⁾	l/mn	2.5 - 5	2.5 - 5	2.5 - 5	2.5 - 5
Cooling water temperature ³⁾	°C	10 to 35			
Water connect		1/4 or 3/8 NPT			
N ₂ purge flow	slm	10 to 80			
Operating temperature	°C	5 to 40			
Inlet flange	ISO-K	DN 100	DN 160	DN 160	DN 160
Exhaust flange	ISO-KF	DN 40			
Dimensions Length (to exhaust flange)	mm	961	961	961	961
Width	mm	388	388	388	544
Height (to inlet flange)	mm	776	911	911	1094
Weight	kg	380	540	540	800
Maximum vibration level at pump inlet flange	g / mm/s	< 0.1 / 1.5			
Maximum noise level (at ultimate pressure)	dB(A)	< 68	< 69	< 69	< 72

²⁾ Provisional

³⁾ Subject to pump T° setting

A4 Series

Order number guide and matrix

Order number guide A4 series

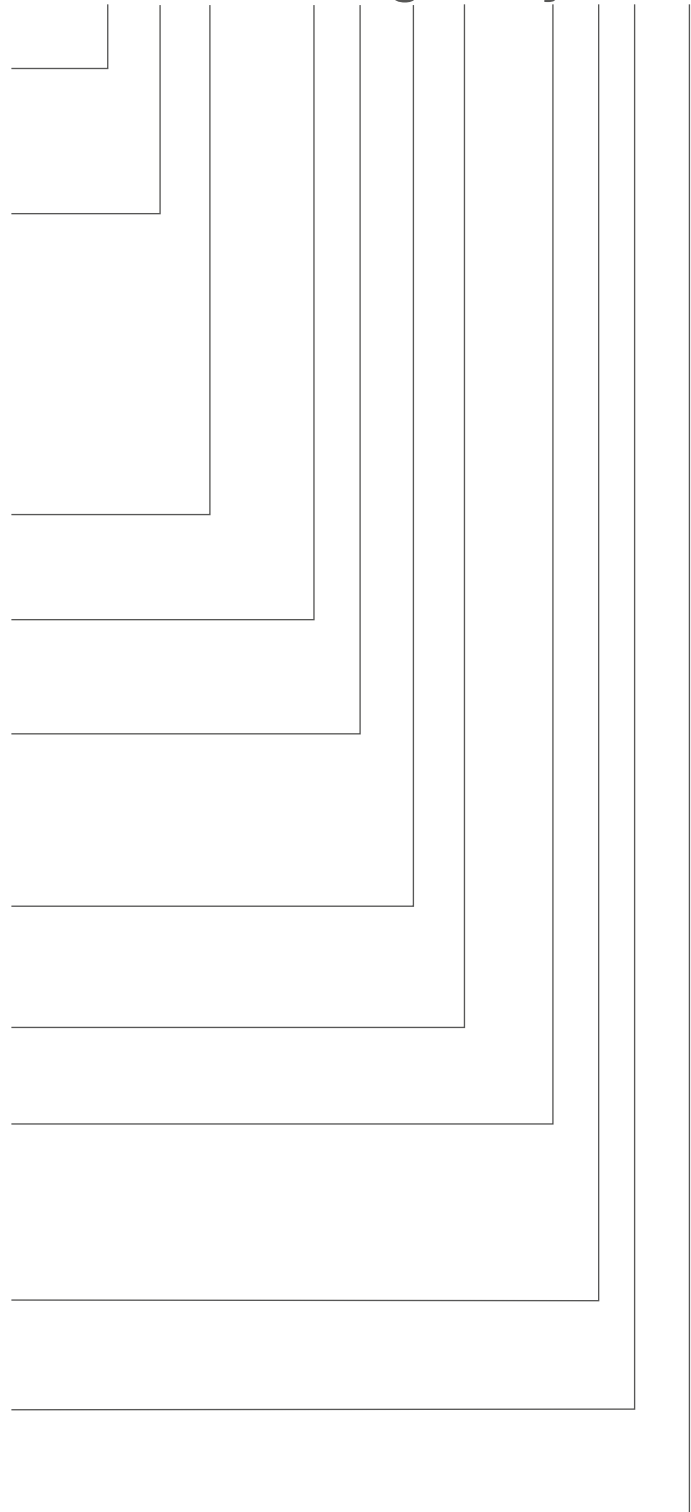
F4		a	b	c	C	e	f	g	h	1	j	k	l	m
Product range	Version	Pump model	Application ¹⁾	Reserved	Functional block temperature management	Roots blower temperature management	Voltage	Water / N ₂ connection	Reserved	Inlet flange connection	Rootsblower by-pass	N ₂ purge line	Options ²⁾	
F4	H or X	A	4	C	S	0	1, 6	2, 6	1	1	0	1	0, 2	
		A	7	C	S, L	0	1, 6	2, 6	1	1	0	1	0, 2	
		B	4	C	S	S	1, 6	2, 6	1	0, 2	1	1	0, 2, 3, A	
		B	7	C	S, L	S	1, 6	2, 6	1	0, 2	1	1	0, 2, 3, A	
		C	4	C	S	S	1, 6	2, 6	1	0, 2, 3	1	1	0, 2, 3, A	
		C	7	C	S, L	S, L, H	1, 6	2, 6	1	0, 2, 3	1	1	0, 2, 3, A	
		D	4	C	S	S	1, 6	2, 6	1	0, 2, 3	1	1	0, 2, 3, A	
		D	7	C	S, L	S, L, H	1, 6	2, 6	1	0, 2, 3	1	1	0, 2, 3, A	
		I	4	C	S	S, H	1, 6	2, 6	1	2, 3	1	1	0, 3, A	
		I	7	C	L	S, L	1, 6	2, 6	1	2, 3	1	1	0, 3, A	
		I	7	C	S	S, H	1, 6	2, 6	1	2, 3	1	1	0, 3, A	
		N	B	4	C	S	S	1, 6	2, 6	1	0, 2	1	4	0, 2, 3, A
	B		7	C	S	S	1, 6	2, 6	1	0, 2	1	4	0, 2, 3, A	
	C		4	C	S	S, H	1, 6	2, 6	1	0, 2, 3	1	4	0, 2, 3, A	
	C		7	C	S	S, H	1, 6	2, 6	1	0, 2, 3	1	4	0, 2, 3, A	
	D		4	C	S	S, H	1, 6	2, 6	1	0, 2, 3	1	4	0, 2, 3, A	
	D		7	C	S	S, H	1, 6	2, 6	1	0, 2, 3	1	4	0, 2, 3, A	
	I		4	C	S	S, L, H	1, 6	2, 6	1	2, 3	1	1, 4	0, 3, A	
	I		7	C	S	S, L, H	1, 6	2, 6	1	2, 3	1	1, 4	0, 3, A	
	H	E	4	C	L	0	1, 6	2, 6	1	1	0	1	0	
		E	7	C	L	0	1, 6	2, 6	1	1	0	1	0	
		F	4	C	L	S	1, 6	2, 6	1	0, 2	1	1	0, 3	
		F	7	C	L	S	1, 6	2, 6	1	0, 2	1	1	0, 3	
		G	7	C	L	S, H	1, 6	2, 6	1	0, 2, 3	1	1	0, 2, 3	

**Order number matrix
A4 series**

Order number

F4 a b c C e f g h 1 j k l m

Version	a
Harsh	H
Corrosive	X
Very corrosive – Full Ni coated	N
Pump model	b
A 204	A
A 804	B
A 1504	C
A 1804	D
A 124	E
A 604	F
A 1204	G
A 3004	I
Application¹⁾	c
Large volume ¹⁾	4
Standard	7
Functional block temperature management	e
Standard version	S
Cold version	L
Roots blower temperature management	f
Standard version	S
Cold version	L
Hot version	H
NA (no Roots)	0
Voltage	g
Low voltage 60 Hz	1
High voltage 60 Hz	6
Water / N₂ connection	h
FSS QC 1/4" NPT / QC 1/8 NPT	2
FSS QC 3/8" NPT / QC 1/8 NPT	6
Inlet flange connection	j
Without	0
DN 50 ISO-KF	1
DN 100 ISO-KF	2
DN 160 ISO-KF	3
Roots blower by-pass	k
NA (no Roots)	0
With standard by-pass	1
N₂ purge line	l
H line	1
XN line	4
Options²⁾	m
Standard	0
Water sensor	2
I-HN	3
V-Box	A



¹⁾ Large volume version: A 124 and A 604: max. 5 m³ chamber volume. A 204, A 804, A 1504, A1804, A 3004: max. 50 m³ chamber volume

²⁾ I-HN option requires specific exhaust line configuration – Please consult Pfeiffer Vacuum SAS, France

Your Success. Our Passion.

We give our best for you every day –
worldwide!

Are you looking for your
optimized vacuum solution?
Please contact us:

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All information is subject to change without prior notice. PM 0004 PEN (March 2023/PoD)

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