

2 Technical data

Note: To comply with EN 61010 and CSA standards, the pump must be installed and used indoors, and within the operating conditions specified in Table 1 below.

2.1 Operating and storage conditions

Table 1 - Operating and storage conditions

Parameter	Reference data
Ambient temperature range (operation)	12 to 40°C
Ambient temperature range (storage)	-30 to 70°C
Normal surface temperature of the pump-body *	50 to 70°C
Maximum humidity (operation)	90% RH
Maximum altitude (operation)	2000 m
Pollution degree	2
Installation category	II

* At ultimate vacuum, with ambient temperature of 20°C.

2.2 Performance

2.2.1 General

Note: In Table 2 and Table 3, total pressures have been measured by a capacitance diaphragm gauge on a vacuum chamber without a cold trap, as specified by Pneurop Standard 6602 (1979).

Table 2 - General performance data

Parameter	Reference data			
High Vacuum mode ◆ performance	See Table 3			
High Throughput mode ◆ performance	See Table 4			
Suckback protection	1 x 10 ⁻⁵ mbar l s ⁻¹ , 1 x 10 ⁻³ Pa l s ⁻¹			
Maximum initial pressure rise with no gas-ballast flow	1 x 10 ⁻¹ mbar, 10 Pa			
	RV3	RV5	RV8	RV12
Maximum displacement: m ³ h ⁻¹				
50 Hz electrical supply	3.7	5.8	9.7	14.2
60 Hz electrical supply	4.5	5.0	11.7	17.0
Maximum pumping speed (Pneurop 6602, 1979): m ³ h ⁻¹				
50 Hz electrical supply	3.3	5.1	8.5	12.0
60 Hz electrical supply	3.9	6.2	10.0	14.2
Maximum permitted inlet pressure and gas-ballast inlet pressure				
bar gauge	0.5	0.5	0.5	0.5
Pa	1.5 x 10 ⁵	1.5 x 10 ⁵	1.5 x 10 ⁵	1.5 x 10 ⁵
Maximum permitted outlet pressure				
bar gauge	0.2	0.2	0.2	0.2
Pa	0.2 x 10 ⁵	0.2 x 10 ⁵	0.2 x 10 ⁵	0.2 x 10 ⁵



Table 3 - Performance data: High Vacuum mode

HIGH VACUUM MODE ♦										
Parameter	Units	RV3		RV5		RV8		RV12		
		1-phase	3-phase	1-phase	3-phase	1-phase	3-phase	1-phase	3-phase	
Gas-ballast control closed (position '0')	Ultimate total pressure	mbar	2 x 10 ⁻³		2 x 10 ⁻³		2 x 10 ⁻³		2 x 10 ⁻³	
		Pa	2 x 10 ⁻¹		2 x 10 ⁻¹		2 x 10 ⁻¹		2 x 10 ⁻¹	
Gas-ballast control low flow (position 'I')	Ultimate total pressure	mbar	3 x 10 ⁻²		3 x 10 ⁻²		3 x 10 ⁻²		3 x 10 ⁻²	
		Pa	3		3		3		3	
Gas-ballast flow	I min ⁻¹	5		5		5		5		
Maximum water vapour pumping rate	kg h ⁻¹	0.06	0.04	0.06	0.04	0.06	0.04	0.06	0.04	
Maximum water vapour inlet pressure	mbar	27	18	16	11	10	7	7	5	
	Pa	2.7 x 10 ³	1.8 x 10 ³	1.6 x 10 ³	1.1 x 10 ³	1 x 10 ³	7 x 10 ²	7 x 10 ²	5 x 10 ²	
Gas-ballast control high flow (position 'II')	Ultimate total pressure	mbar	1.2 x 10 ⁻¹		1 x 10 ⁻¹		6 x 10 ⁻²		6 x 10 ⁻²	
		Pa	1.2 x 10 ¹		1 x 10 ¹		6		6	
Gas-ballast flow	I min ⁻¹	14		14		16		16		
Maximum water vapour pumping rate	kg h ⁻¹	0.22	0.12	0.22	0.12	0.22	0.20	0.29	0.25	
Maximum water vapour inlet pressure	mbar	80	54	50	32	38	34	32	28	
	Pa	8 x 10 ³	5.4 x 10 ³	5 x 10 ³	3.2 x 10 ³	3.8 x 10 ³	3.4 x 10 ³	3.2 x 10 ³	2.8 x 10 ³	

Table 4 - Performance data: High Throughput mode

HIGH THROUGHPUT MODE ♠										
Parameter	Units	RV3		RV5		RV8		RV12		
		1-phase	3-phase	1-phase	3-phase	1-phase	3-phase	1-phase	3-phase	
Gas-ballast control closed (position '0')	Ultimate total pressure	mbar	3×10^{-2}		3×10^{-2}		3×10^{-2}		3×10^{-2}	
		Pa	3		3		3		3	
Gas-ballast control low flow (position 'I')	Ultimate total pressure	mbar	6×10^{-2}		6×10^{-2}		4×10^{-2}		4×10^{-2}	
		Pa	6		6		4		4	
Gas-ballast flow	I min ⁻¹	5		5		5		5		
Maximum water vapour pumping rate	kg h ⁻¹	0.06	0.04	0.06	0.04	0.06	0.04	0.06	0.04	
Maximum water vapour inlet pressure	mbar	27	18	16	11	10	7	7	5	
	Pa	2.7×10^3	1.8×10^3	1.6×10^3	1.1×10^3	1×10^3	7×10^2	7×10^2	5×10^2	
Gas-ballast control high flow (position 'II')	Ultimate total pressure	mbar	1.2×10^{-1}		1×10^{-1}		6×10^{-2}		6×10^{-2}	
		Pa	1.2×10^1		1×10^1		6		6	
Gas-ballast flow	I min ⁻¹	14		14		16		16		
Maximum water vapour pumping rate	kg h ⁻¹	0.22	0.12	0.22	0.12	0.22	0.20	0.29	0.25	
Maximum water vapour inlet pressure	mbar	80	54	50	32	38	34	32	28	
	Pa	8×10^3	5.4×10^3	5×10^3	3.2×10^3	3.8×10^3	3.4×10^3	3.2×10^3	2.8×10^3	

Table 5 - Performance characteristics

MODE SELECTOR POSITION	GAS BALLAST CONTROL					
	Closed (position '0')		Low flow (position 'I')		High flow (position 'II')	
High Vacuum mode 	Ultimate total pressure		Ultimate total pressure		Ultimate total pressure	
	mbar	Pa	mbar	Pa	mbar	Pa
	2×10^{-3}	2×10^{-1}	3×10^{-2}	3	1.2×10^{-1} (RV3) 1.0×10^{-1} (RV5) 6×10^{-2} (RV8/12)	1.2×10^1 (RV3) 1.0×10^1 (RV5) 6.0 (RV8/12)
	Use for the best ultimate pressure		Maximum water vapour pumping rate		Maximum water vapour pumping rate	
			1-phase pumps	3-phase pumps	1-phase pumps	3-phase pumps
			0.06 kg h ⁻¹	0.04 kg h ⁻¹	0.22 kg h ⁻¹ (RV3/5/8) 0.29 kg h ⁻¹ (RV12)	0.12 kg h ⁻¹ (RV3/5) 0.20 kg h ⁻¹ (RV8) 0.25 kg h ⁻¹ (RV12)
High Throughput mode 	Ultimate total pressure		Ultimate total pressure		Ultimate total pressure	
	mbar	Pa	mbar	Pa	mbar	Pa
	3×10^{-2}	3	6×10^{-2} (RV3/5) 4×10^{-2} (RV8/12)	6 (RV3/5) 4 (RV8/12)	1.2×10^{-1} (RV3) 1.0×10^{-1} (RV5) 6×10^{-2} (RV8/12)	1.2×10^1 (RV3) 1.0×10^1 (RV5) 6.0 (RV8/12)
	Use for continuous inlet pressure above 50 mbar/5 x 10 ³ Pa		Maximum water vapour pumping rate		Maximum water vapour pumping rate	
			1-phase pumps	3-phase pumps	1-phase pumps	3-phase pumps
			0.06 kg h ⁻¹	0.04 kg h ⁻¹	0.22 kg h ⁻¹ (RV3/5/8) 0.29 kg h ⁻¹ (RV12)	0.12 kg h ⁻¹ (RV3/5) 0.20 kg h ⁻¹ (RV8) 0.25 kg h ⁻¹ (RV12)



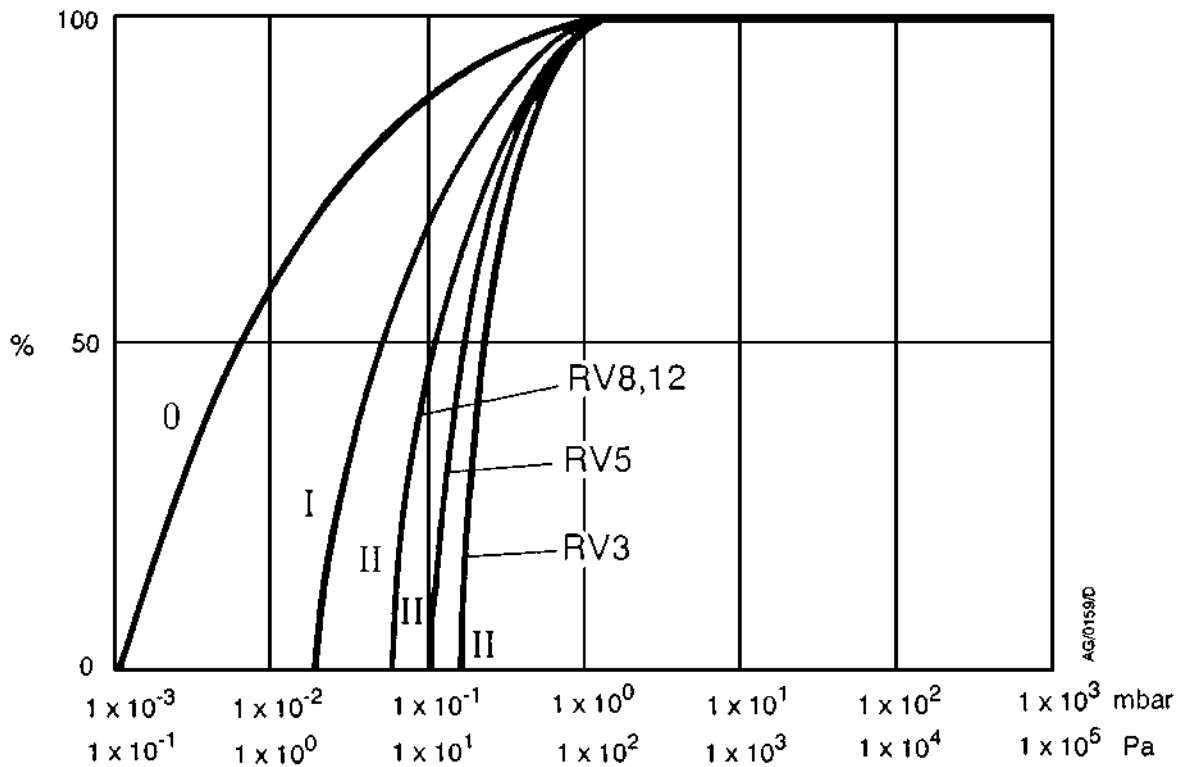
2.2.2 Performance characteristics

Note: The performance characteristics described below are for use with hydrocarbon oil.

The positions of the mode selector and the gas-ballast control define the performance characteristics of the pump. These performance characteristics are listed fully in Table 3 and Table 4.

Table 5 gives the ultimate vacuum and maximum water vapour inlet pressure for each of the six possible combinations of control positions. The curves 0, I, and II in Figure 2 show the relationship between inlet pressure and pumping speed for High Vacuum mode.

Figure 2 - Performance characteristics in High Vacuum mode (pumping speed against inlet pressure)



2.3 Mechanical data

Table 6 - Mechanical data

Parameter	Reference data			
Dimensions	See Figure 3			
Degree of protection (IEC 34-5: 1981)				
Single-phase pumps	IP44			
Three-phase pumps	IP54			
Maximum tilt angle	10°			
Motor rotational speed				
50 Hz electrical supply	1470 r min ⁻¹			
60 Hz electrical supply	1760 r min ⁻¹			
Maximum mass	RV3	RV5	RV8	RV12
Pumps with motor, without oil	25.0 kg	25.0 kg	28.0 kg	29.0 kg
Bareshaft pumps	14.0 kg	14.0 kg	16.5 kg	17.5 kg

2.4 Noise and vibration data

Table 7 - Noise and vibration data

Parameter	Reference data
Sound pressure*	
Single-phase pumps	48 dB (A)
Three-phase pumps	50 dB (A)
Vibration severity†	
Single-phase pumps	Class 1C
Three-phase pumps	Class 1C

* Measured at ultimate vacuum 1 metre from the end of the pump to ISO 11201, High Vacuum mode ♣, 50 Hz operation.

† Measured at the inlet port to ISO 2372 (1974)

2.5 Lubrication data

Note: Edwards Material Safety Data sheets for the rotary pump oils are available on request.

Table 8 - Lubrication data

Parameter	Reference data			
Recommended oil*				
Hydrocarbon-prepared pumps	Edwards Ultragrade 19			
PFPE-prepared pumps	Krytox 1506 or Fomblin 06/6			
Oil capacity	RV3	RV5	RV8	RV12
Maximum	0.70 litres	0.70 litres	0.75 litres	1.00 litres
Minimum	0.42 litres	0.42 litres	0.45 litres	0.65 litres

* To operate the pump when the ambient temperature is outside the limits specified in Section 2.1, or to optimise the pump performance when pumping condensable vapours, a different oil may be needed.