Description

1.3.1 Motor Data

		WA(U) 251	WA(U) 501	WA(U) 1001	WA(U) 2001
Motor Type		AMPH 80Z BA2	AMPH 90L BA2	AMPH 112M AA2	AMPH 132M TA2
Motor Power 50/60Hz		1.1 kW	2.2 kW	4 kW	7.5 kW
Number of phases		3			
Number of pole pairs		1			
Nominal Frequency		50/60 Hz			
Nominal rotating speed 50Hz 60 Hz		2890 rpm 3490 rpm	2870 rpm 3490 rpm	2910 rpm 3520 rpm	2910 rpm 3510 rpm
Nominal voltage and nominal current 50 Hz					
	YY	200-240 V / 5 A	200-240 V / 8.6 A	200-240 V / 14.6 A	200-240 V / 26 A
	YY	200 V / 4.6 A (IE3) (Grade 2)	200 V / 8.6 A (IE3) (Grade 2)	200 V / 14.6 A (IE3) (Grade 2)	200 V / 26A (IE3) (Grade 2)
	Y	380-400 V / 2.3 A	380-400 V / 4.3 A	380-400 V / 7.3 A	380-400 V / 13.3 A
	Y	380-400 V / 2.5 A (IE3) (Grade 2)	380-400 V / 4.6 A (IE3) (Grade 2)	380-400 V / 7.3 A (IE3) (Grade 2)	380-400 V / 13.3 A (IE3) (Grade 2)
60 Hz	YY	200-240 V / 4.4 A	200-240 V / 8.2 A	200-240 V / 14 A	200-240 V / 25.4 A
	YY	208-240 V / 4.2 A	208-240 V / 7.8 A	208-240 V / 13.6 A	208-240 V / 24.4 A
	YY	230 V / 4 A (IE3)	230 V / 7.4 A (IE3)	230 V / 12.8 A (IE3)	230 V / 24.2 A (IE3)
	Y	380-480 V / 2.2 A	380-480 V 14.1 A	380-480 V / 7 A	380-480 V /12.7 A
	Y	416-480 V 12.1 A	416-480 V / 3.9 A	416-480 V / 6.8 A	416-480 V /12.2 A
	Y	460 V / 2 A (IE3)	460V / 3.7A (IE3)	460 V / 6.4 A (IE3)	460V / 12.1A (IE3)
Nominal Efficiency [%]					
50 Hz/400 V 50 Hz: 200/380-400 V (IEC 60034-2-1)	100% 100% 75% 50%	81.5 82.7 82.9 79.9	85.5 85.9 86.5 85.1	88.6 88.1 88.0 87.0	90.1 90.1 90.2 89.6
50 Hz: 380 V (GB/T 1032)	100% 75% 50%	82.7 82.9 79.9	85.9 86.5 85.1	88.1 88.0 87.0	90.1 90.2 89.6
60 Hz: 230/460 V (CSA 390)	100% 75% 50%	84.0 84.6 81.9	86.5 87.1 86.1	88.5 88.3 87.2	90.2 90.5 89.6
Max. ambient temperature		40 °C			
Type of protection		IP 55			
Max. installation height		1000 m			
Supplier		Lafert SpA / Via J.F.Kennedy / I-30027 San Doná di Piave (Venezia)			

1.4 Ordering data

Roots vacuum pump	WA/WAU 251	WA/WAU(H) 501	WA/WAU(H) 1001	WA/WAU(H) 2001
RUVAC WA	117 20	117 30	117 40	117 50
WA with horizontal flow	–	128 38	–	113 42
RUVAC WAU	117 21	117 31	117 41	117 51
WAU with horizontal flow	–	–	–	167 004
RUVAC WA, without motor	117 24	117 34	117 44	112 54
RUVAC WAU, without motor	155 011V	155 008	112 17	113 22
RUVAC WAU H, with ACE absorber	–	118 31	118 41 118 41A*	118 51 118 51A*
Mandatory Accessories				
Collar flange with retaining ring, DIN 2501 For connection to flange system DN ...ISO-K				
DN 63 ISO-K	267 47	267 47	–	–
DN 100 ISO-K	–	–	267 50	–
DN 160 ISO-K	–	–	–	267 51
Accessories				
RUVAC WS/WSU(H) seal kit	194 60	194 64	194 68	194 72
Flange adapter set, consisting of Flange adapter with screws, bolts, washers and nuts for ANSI flange	(3" ANSI)	(3" ANSI)	(4" ANSI)	(6" ANSI)
WA/WS pump	200 03 179	200 03 179	200 03 180	200 03 181
WAU/WSU pump	200 03 179	200 03 179	200 03 180	200 03 182
RUVAC WA US conversion kit, consisting of ANSI flanges 3 in., NEMA motor flange, coupling and installation components	155 013V	155 014V	155 015V	155 016V
ACE vibration absorber (DA valve)	–	200 03 251	200 03 252	100 22
Frequency converter RUVATRONIC	RT 5/251	RT 5/501	RT 5/1001	RT 5/2001
	500 001 381	500 001 382	500 001 383	500 001 384
Spare parts				
Shaft sealing ring replacement kit Kit WA/WAU	EK 110 002 661	EK 110 002 661	EK 110 002 662	EK 110 002 662
Major maintenance kit				
WA	EK 110 002 663	EK 110 002 664	EK 110 002 667	EK 110 002 669
WAU	EK 110 002 665	EK 110 002 666	EK 110 002 668	EK 110 002 670

*special models for single customers, order only possible after consultation with Leybold

Description

1.3 Technical Data

For ATEX applications, only the values for 50 Hz apply.

RUVAC WA/WAU		251	501	1001	2001
Nominal pumping speed at 50 Hz [1]	$m^3 \cdot h^{-1}$	253	505	1000	2050
Max. pumping speed at 50 Hz	$m^3 \cdot h^{-1}$	210	410	800	1850
Nominal pumping speed at 60 Hz [1]	$m^3 \cdot h^{-1}$	304	606	1200	2460
Max. pumping speed at 60 Hz	$m^3 \cdot h^{-1}$	251	530	1000	2100
■ with backing pump TRIVAC ■ with backing pump SOGEVAC		D 65 B	- SV 200	- SV 300	- SV 630 F
Ultimate partial pressure [2]	mbar	$< 2 \cdot 10^{-5}$	$< 8 \cdot 10^{-3}$	$< 8 \cdot 10^{-3}$	$< 8 \cdot 10^{-3}$
Ultimate total pressure [2]	mbar	$< 8 \cdot 10^{-4}$	$< 4 \cdot 10^{-2}$	$< 4 \cdot 10^{-2}$	$< 4 \cdot 10^{-2}$
Poss. cut-in pressure [2] – RUVAC WA	mbar	90	100	60	30
Maximum allowable pressure differential in continous operation[3]	mbar	80	80	80	50
Leak rate, integral	$mbar \cdot l \cdot s^{-1}$	$\leq 5 \cdot 10^{-4}$			
Permissible ambient temperatures	°C	12 - 40			
Main supply IEC motor[8]	YY/Y V	220-240/ 380-420	220-240/ 380-420	220-240/ 380-420	– 380-420
Temperature class		F	F	F	F
Motor power	kW	1.1	2.2	4.0	7.5
Nominal speed, 50/60 Hz	min^{-1}	3000 / 3600			
Max. permissible speed	min^{-1}	3600			
Motor protection category	IP	55			
Oil filling for the bearing chamber[4]		1. Filling [5] / 2. Filling	1. Filling [5] / 2. Filling	1. Filling [5] / 2. Filling	
vertical pumping action, approx.	l	0.5 / 0.4	0.9 / 0.8	2.0 / 1.8	4.2 / 3.6
horizontal pumping action, approx.	l	0.5 / 0.4	0.8 / 0.7	1.2 / 1.1	2.0 / 1.8
Oil filling of the shaft sealing ring housing	l	0.6	1.0	1.3	1.6
Connection flanges	DN	63 ISO - K	63 ISO - K	100 ISO - K	160 ISO - K
Weight WA / WAU	kg	85 / 89	128 /133	220 /225	400 / 406
Noise level [6]	dB (A)	< 64	< 67	< 75	< 80

[1] To DIN 28 400 and subsequent numbers

[2] With double-stage rotary vane vacuum pump TRIVAC, resp. single-stage rotary vane vacuum pump SOGEVAC (Type of backing pump look at max. pumping speed). When using 2-stage backing pumps the ultimate pressures will be correspondingly lower.

[3] Applicable for ratio up to 1 : 10 between backing pump and Roots vacuum pump at 3000 rpm

[4] Authoriative, however, is the oil level at the oil-level glass

[5] After a complete disassembly

[6] At an operating pressure below < 10^{-1} mbar (< 0.75 x 10^{-1} Torr)

[8] Motor voltage and current may deviate depending on the type of motor. Please always note the information on the nameplate.

Description

1.3.1 Motor Data

		WA(U) 251	WA(U) 501	WA(U) 1001	WA(U) 2001
Motor Type		AMH 80Z BA2	AMH 90L BA2	AMH 112M AA2	AMH 1325 TA2
Motor Power 50/60Hz		1.1 kW	2.2 kW	4 kW	7.5 kW
Number of phases		3			
Number of pole pairs		1			
Nominal Frequency		50/60 Hz			
Nominal rotating speed 50Hz 60Hz		2900 rpm 3410 rpm	2910 rpm 3505 rpm	2910 rpm 3510 rpm	2940 rpm 3540 rpm
Nominal voltage 50 Hz					
	200-240 V	5.7 A	9.4 A	15.6 A	28 A
	200 V (IE2)	5.0 A	9.2 A	14.2 A	27.2 A
	380-400 V (IE2)	2.5 A	4.6 A	7.1 A	13.6 A
60 Hz	200-240 V	4.8 A	8.2 A	13.5 A	27 A
	208-240 V (EPAct)	4.4 A	7.8 A	12.6 A	24 A
	380-480 V	2.4 A	4.1 A	6.7 A	13.5 A
	416-480 V (EPAct)	2.2 A	3.9 A	6.3 A	12 A
Nominal Efficiency [%]					
50 Hz/400 V	100%	81.5	85.5	88.6	90.1
	75%	80.6	85.2	88.4	89.8
	50%	76.9	83.5	86.6	87.8
60 Hz/460 V	100%	82.5	86.3	88.4	89.5
	75%	81.0	84.9	87.3	88.6
	50%	76.7	81.5	84.2	85.6
Max. ambient temperature		40 °C			
Type of protection		IP 55			
Max. installation height		1000 m			
Supplier		Lafert SpA / Via J.F.Kennedy / I-30027 San Doná di Piave (Venezia)			

1.4 Ordering data

Roots vacuum pump	WA/WAU 251	WA/WAU(H) 501	WA/WAU(H) 1001	WA/WAU(H) 2001
RUVAC WA	117 20	117 30	117 40	117 50
WA with horizontal flow	–	128 38	–	113 42
RUVAC WAU	117 21	117 31	117 41	117 51
WAU with horizontal flow	–	–	–	167 004
RUVAC WA, ohne Motor	117 24	117 34	117 44	112 54
RUVAC WAU, ohne Motor	155 011V	155 008	112 17	113 22
RUVAC WAU H, mit ACE-Dämpfer	–	118 31	118 41	118 51
WAU H with ACE vibration absorber and LVO 210	–	–	–	167 022
Mandatory Accessories				
Collar flange with retaining ring, DIN 2501 For connection to flange system DN ...ISO-K				
DN 63 ISO-K	267 47	267 47	–	–
DN 100 ISO-K	–	–	267 50	–
DN 160 ISO-K	–	–	–	267 51
Accessories				
RUVAC WS/WSU(H) seal kit	194 60	194 64	194 68	194 72
Flange adapter set, consisting of Flange adapter with screws, bolts, washers and nuts for ANSI flange	(3" ANSI)	(3" ANSI)	(4" ANSI)	(6" ANSI)
WA/WS pump	200 03 179	200 03 179	200 03 180	200 03 181
WAU/WSU pump	200 03 179	200 03 179	200 03 180	200 03 182
RUVAC WA US conversion kit, consisting of ANSI flanges 3 in., NEMA motor flange, coupling and installation components	155 013V	155 014V	155 015V	155 016V
ACE vibration absorber (DA-Ventil)	–	200 03 251	200 03 252	100 22
Frequency converter RUVATRONIC	RT 5/251	RT 5/501	RT 5/1001	RT 5/2001
	500 001 381	500 001 382	500 001 383	500 001 384
Spare parts				
Shaft sealing ring replacement kit Kit WA/WAU	EK 110 002 661	EK 110 002 661	EK 110 002 662	EK 110 002 662
Major maintenance kit				
WA	EK 110 002 663	EK 110 002 664	EK 110 002 667	EK 110 002 669
WAU	EK 110 002 665	EK 110 002 666	EK 110 002 668	EK 110 002 670

Technical Data		WA/WAU 251 50 Hz	WA/WAU 251 60 Hz	WA/WAU(H) 501 50 Hz	WA/WAU(H) 501 60 Hz
Nominal pumping speed [1]	$m^3 \times h^{-1}$ (cfm)	253 (149)	304 (179)	505 (297.4)	606 (357)
Max. pumping speed	$m^3 \times h^{-1}$ (cfm)	210 (123.7)	251 (148)	410 (241)	530 (312)
with backing pump	TRIVAC	D 65 B	D 65 B	–	–
	SOGEVAC	–	–	SV 200	SV 200
Ultimate partial pressure [2]	mbar (Torr)	$< 2 \times 10^{-5}$ ($< 1.5 \times 10^{-5}$)	$< 2 \times 10^{-5}$ ($< 1.5 \times 10^{-5}$)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)
Ultimate total pressure [2]	mbar (Torr)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)
Permissible cut-in pressure [2] **RUVAC WA**	mbar (Torr)	90 (67.5)	60 (45.0)	100 (75.0)	80 (60.0)
Max. permissible pressure difference during continuous operation [3]	mbar (Torr)	80 (60.0)	80 (60.0)	80 (60.0)	80 (60.0)
Main supply					
IEC motor	Δ / Y V	220-240 / 380-420	220-277 / 380-480	220-240 / 380-420	220-277 / 380-480
NEMA motor (US version)	Δ / Y V	230 / 400	200-230 / 460	230 / 400	200-230 / 460
Thermal class		F	F	F	F
Motor power	kW (hp)	1.1 (1.5)	1.1 (1.5)	2.2 (3.0)	2.2 (3.0)
Nominal speed, approx. (50/60 Hz)	rpm	3000/3600	3000/3600	3000/3600	3000/3600
Max. permissible speed	rpm	3600	3600	3600	3600
Type of protection	IP	55	55	55	55
Oil filling for the bearing chamber [4]		1. Filling [5] / 2. Filling	1. Filling [5] / 2. Filling	1. Filling [5] / 2. Filling	1. Filling [5] / 2. Filling
vertical pumping action, approx.	l (qt)	0.65 (0.69) / 0.6 (0.63)	0.65 (0.69) / 0.6 (0.63)	0.9 (0.95) / 0.8 (0.85)	0.9 (0.95) / 0.8 (0.85)
horizontal pumping action, approx.	l (qt)	0.5 (0.53) / 0.45 (0.48)	0.5 (0.53) / 0.45 (0.48)	0.75 (0.79) / 0.7 (0.74)	0.75 (0.79) / 0.7 (0.74)
Oil filling of the shaft sealing ring housing	l (qt)	0.6 (0.63)	0.6 (0.63)	1.0 (1.06)	1.0 (1.06)
Connection flanges [6]	DN	63 ISO-K	63 ISO-K	63 ISO-K	63 ISO-K
	DN	3" ANSI	3" ANSI	3" ANSI	3" ANSI
Weight WA/WAU	kg (lbs)	85/89 (187.4/196.2)	85/89 (187.4/196.2)	128/133 (282.2/293.3)	128/133 (282.2/293.3)
Noise level [7]	dB(A)	< 64	< 64	< 67	< 67

1) To DIN 28 400 and subsequent numbers
2) With double-stage rotary vane vacuum pump TRIVAC, resp. single-stage rotary vane vacuum pump SOGEVAC (Type of backing pump look at max. pumping speed).
When using 2-stage backing pumps the ultimate pressures will be correspondingly lower
3) Applicable for ratio up to 1 : 10 between backing pump and Roots vacuum pump at 3000 rpm
4) Authoriative, however, is the oil level at the oil-level glass
5) After a complete disassembly
6) US models ANSI flanges
7) At an operating pressure below $< 10^{-1}$ mbar ($< 0.75 \times 10^{-1}$ Torr)

Technical Data		WA/WAU (H) 1001 50 Hz	WA/WAU (H) 1001 60 Hz	WA/WAU(H) 2001 50 Hz	WA/WAU(H) 2001 60 Hz
Nominal pumping speed [1]	$m^3 \times h^{-1}$ (cfm)	1000 (589)	1200 (707)	2050 (1207.5)	2460 (1449)
Max. pumping speed	$m^3 \times h^{-1}$ (cfm)	800 (470)	1000 (588)	1850 (1089)	2100 (1236)
with backing pump	SOGEVAC	SV 300	SV 300	SV 630 F	SV 630 F
Ultimate partial pressure [2]	mbar (Torr)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)
Ultimate total pressure [2]	mbar (Torr)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)
Permissible cut-in pressure [2] **RUVAC WA**	mbar (Torr)	60 (45.0)	45 (33.5)	30 (22.5)	25 (18.5)
Max. permissible pressure difference during continuous operation [3]	mbar (Torr)	80 (60.0)	80 (60.0)	50 (37.5)	50 (37.5)
Main supply					
IEC motor	Δ / Y V	220-240 / 380-420	220-277 / 380-480	380-420 / 655-725	440-480 / –
NEMA motor (US version)	Δ / Y V	230 / 400	200-230 / 460	400 / –	– / 460
Thermal class		F	F	F	F
Motor power	kW (hp)	4.0 (5.4)	4.0 (5.4)	7.5 (10.0)	7.5 (10.0)
Nominal speed, approx. (50/60 Hz)	rpm	3000/3600	3000/3600	3000/3600	3000/3600
Max. permissible speed	rpm	3600	3600	3600	3600
Type of protection	IP	55	55	55	55
Oil filling for the bearing chamber [4]		1. Filling [5] / 2. Filling	1. Filling [5] / 2. Filling	1. Filling [5] / 2. Filling	1. Filling [5] / 2. Filling
vertical pumping action, approx.	l (qt)	2.0 (2.11) / 1.8 (1.90)	2.0 (2.11) / 1.8 (1.90)	3.85 (4.07) / 3.6 (3.81)	3.85 (4.07) / 3.6 (3.81)
horizontal pumping action, approx.	l (qt)	1.2 (1.27) / 1.1 (1.16)	1.2 (1.27) / 1.1 (1.16)	2.65 (2.75) / 2.4 (2.54)	2.65 (2.75) / 2.4 (2.54)
Oil filling of the shaft sealing ring housing	l (qt)	1.3 (1.37)	1.3 (1.37)	1.6 (1.69)	1.6 (1.69)
Connection flanges [6]	DN	100 ISO-K	100 ISO-K	160 ISO-K	160 ISO-K
	DN	4" ANSI	4" ANSI	6" ANSI	6" ANSI
Weight WA/WAU	kg (lbs)	220/225 (485.1/496.1)	220/225 (485.1/496.1)	400/406 (882/895.2)	400/406 (882/895.2)
Noise level [7]	dB(A)	< 75	< 75	< 80	< 80

1) To DIN 28 400 and subsequent numbers
2) With single-stage rotary vane vacuum pump SOGEVAC (Type of backing pump look at max. pumping speed). When using 2-stage backing pumps the ultimate pressures will be correspondingly lower
3) Applicable for ratio up to 1 : 10 between backing pump and Roots vacuum pump at 3000 rpm
4) Authoriative, however, is the oil level at the oil-level glass
5) After a complete disassembly
6) US models ANSI flanges
7) At an operating pressure below $< 10^{-1}$ mbar ($< 0.75 \times 10^{-1}$ Torr)

Technical Data		RA 3001		RA 5001	
		50 Hz	60 Hz	50 Hz	60 Hz
Nominal pumping speed [1]	$m^3 \times h^{-1}$ (cfm)	3845 (2264)	4625 (2724	5450 (3210)	6560 (3864)
Max. pumping speed with backing pump	$m^3 \times h^{-1}$ (cfm) SOGEVAC	3200 (1883) SV 630 F	3850 (2266) SV 630 F	4300 (2531) SV 630 F	5200 (3061) SV 630 F
Ultimate partial pressure [2]	mbar (Torr)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)	$< 8 \times 10^{-3}$ ($< 6 \times 10^{-3}$)
Ultimate total pressure [2]	mbar (Torr)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)	$< 4 \times 10^{-2}$ ($< 3 \times 10^{-2}$)
Max. permissible pressure difference during continuous operation [3]	mbar (Torr)	53 (39.8)	53 (39.8)	53 (39.8)	53 (39.8)
for < 3 min.	mbar (Torr)	93 (69.8)	93 (69.8)	93 (69.8)	93 (69.8)
Main supply Δ / Y	V	380 / 660	440 / –	380 / 660	440 / –
Δ / Y	V	400 / 690	460 / –	400 / 690	460 / –
Δ / Y	V	415 / –	–	415 / –	–
Thermal class		F	F	F	F
Motor power	kW (hp)	11.0 (15.0)	12.5 (17.0)	15.0 (20.4)	17.0 (23.1)
Nominal speed, 50 Hz	rpm	3000/3600	3000/3600	3000/3600	3000/3600
Max. permissible speed	rpm	3600	3600	3600	3600
Type of protection	IP	55	55	55	55
Oil filling, approx.					
vertical pumping action	l (qt)	7.0 (7.4)	7.0 (7.4)	12.0 (12.7)	12.0 (12.7)
horizontal pumping action	l (qt)	3.5 (3.7)	3.5 (3.7)	5.4 (5.7)	5.4 (5.7)
Connection flange					
suction side [4, 5]	DN	200	200	200	200
pressure side [4, 5]	DN	200	200	200	200
Adapter flange package					
suction side	DN	250 ISO-K	250 ISO-K	250 ISO-K	250 ISO-K
pressure side	DN	160 ISO-K	160 ISO-K	160 ISO-K	160 ISO-K
Weight complete, approx.	kg (lbs)	580 (1278.9)	580 (1278.9)	770 (1697.9)	770 (1697.9)

Ordering Information	RA 3001 50 / 60 Hz	RA 5001 50 / 60 Hz
Roots vacuum pump RUVAC RA with motor, coupling and lantern [6] **RUVAC RA, ATEX version**	**Part No. 119 50 upon request**	**Part No. 119 53 upon request**
Adapter flange package for suction and pressure side, including centering ring with integrated dirt sieve in the intake flange	Part No. 200 14 472	Part No. 200 14 472
Frequency inverter RUVATRONIC (see description in Section "General", paragraph "Accessories")	RT 5/3001 Part No. 500 001 385	RT 5/5001 Part No. 500 001 386

[1] To DIN 28 400 and subsequent numbers
[2] With single-stage rotary vane vacuum pumps SOGEVAC
[3] Valid for a ratio of 1 : 5 between backing pump and Roots vacuum pump
[4] According to DIN 2532
[5] Without adapter flange to ISO-K flange
[6] Without oil filling

Technical Data		RA 7001		RA 9001		RA 13000
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz
Nominal pumping speed [1]	$m^3 \times h^{-1}$ (cfm)	7337 (4321)	8819 (5194)	9567 (5635)	11484 (6762)	13000 (7657)
Max. pumping speed	$m^3 \times h^{-1}$ (cfm)	6100 (3590)	7200 (4238)	7500 (4414)	8900 (5239)	10000 (5890)
with backing pump	SOGEVAC	SV 1200	SV 1200	2 x SV 1200	2 x SV 1200	–
or	$m^3 \times h^{-1}$ (cfm)	–	–	–	–	2500 (1473)
Ultimate partial pressure [2]	mbar	$< 8 \times 10^{-3}$	$< 8 \times 10^{-3}$	$< 1 \times 10^{-2}$	$< 1 \times 10^{-2}$	$< 1 \times 10^{-2}$
	(Torr)	($< 6 \times 10^{-3}$)	($< 6 \times 10^{-3}$)	($< 7.5 \times 10^{-3}$)	($< 7.5 \times 10^{-3}$)	($< 7.5 \times 10^{-3}$)
Ultimate total pressure [2]	mbar	$< 4 \times 10^{-2}$	$< 4 \times 10^{-2}$	$< 5 \times 10^{-2}$	$< 5 \times 10^{-2}$	$< 5 \times 10^{-2}$
	(Torr)	($< 3 \times 10^{-2}$)	($< 3 \times 10^{-2}$)	($< 3.8 \times 10^{-2}$)	($< 3.8 \times 10^{-2}$)	($< 3.8 \times 10^{-2}$)
Max. permissible pressure difference during continuous operation [3]	mbar (Torr)	53 (39.8)	53 (39.8)	66 (49.5)	66 (49.5)	53 (39.8)
for < 3 min.	mbar (Torr)	93 (69.8)	93 (69.8)	133 (99.8)	133 (99.8)	93 (69.8)
Main supply Δ / Y	V	380 / 660	440 / –	380 / 660	440 / –	380 / 660
	V	400 / 690	460 / –	400 / 690	460 / –	400 / 690
	V	415 / –	–	415 / –	–	415 / –
Thermal class		F	F	F	F	F
Motor power	kW (hp)	18.5 (25.1)	21.0 (28.6)	22.0 (30.0)	25.0 (34.0)	30.0 (40.8)
Nominal speed, 50 Hz	rpm	3000/3600	3000/3600	1500/1800	1500/1800	2000
Max. permissible speed	rpm	3600	3600	1800	1800	2000
Type of protection	IP	55	55	55	55	55
Oil filling, approx.						
vertical pumping action	l (qt)	12.0 (12.7)	12.0 (12.7)	11.0 (11.6)	11.0 (11.6)	11.0 (11.6)
horizontal pumping action	l (qt)	5.4 (5.7)	5.4 (5.7)	7.6 (8.0)	7.6 (8.0)	7.6 (8.0)
Connection flange						
suction side [4, 5]	DN	250	250	300	300	300
pressure side [4, 5]	DN	250	250	300	300	300
Adapter flange package						
suction side	DN	250 ISO-K	250 ISO-K	320 ISO-K	320 ISO-K	320 ISO-K
pressure side	DN	250 ISO-K	250 ISO-K	250 ISO-K	250 ISO-K	250 ISO-K
Weight complete, approx.	kg (lbs)	840 (1852.2)	840 (1852.2)	1400 (3087.0)	1400 (3087.0	upon request

Ordering Information	RA 7001 50 / 60 Hz	RA 9001 50 / 60 Hz	RA 13000 50 Hz
Roots vacuum pump RUVAC RA with motor, coupling and lantern [6]	**Part No. 119 60 upon request**	**Part No. 119 63 upon request**	**upon request –**
Frequency inverter RUVATRONIC (see description in Section "General", paragraph "Accessories")	**RT 5/7001 Part No. 500 001 387**	**RT 5/9001 Part No. 500 001 388**	**RT 5/13000 Part No. 500 001 389**

[1] To DIN 28 400 and subsequent numbers
[2] With single-stage rotary vane vacuum pumps SOGEVAC
[3] Valid for a ratio of 1 : 5 between backing pump and Roots vacuum pump
[4] According to DIN 2532
[5] Without adapter flange to ISO-K flange
[6] Without oil filling

Technical Data

Ordering information

RUVAC		WH 700			WH(U) 2500				WH(U) 4400			WH(U) 7000		
		50 Hz	60 Hz	120 Hz*	50 Hz	60 Hz	80 Hz	100 Hz*	50 Hz	60 Hz	80 Hz	50 Hz	60 Hz	70 Hz
Nominal pumping speed acc. to DIN28426	$m^3 \cdot h^{-1}$	710	860	1730	2500	3000	4000	5000	4400	5280	7040	7000	8400	9800
Max. permissible pressure difference (Δp) in continuous operation	mbar	75	65	50	50-75	40-60	40-60	20	45	30	12	30	21	14
Nominal motor power	kW	2.2	2.6	3.5	6.5	7.5	–	–	11/18.5			11/18.5		
Mains voltage	V	200-480			380-530	340 - 530			400[1]	480[1]	FC	400[1]	460[1]	FC
Protection class acc. to EN 60529	IP	54			54				54			54		
Noise level acc. to DIN EN ISO 2151	dB(A)	< 56 [3]			< 63 [3]				< 63 [3]			< 63 [3]		
Cooling water connections		G 1/4“			G 1/4“				G 1/4“			G 1/4“		
Cooling water quantity	l/h	60 - 180			60 - 180				180 - 300			180 - 300		
Lubricant quantity	l	0.9			1.2				4.75			4.75		
Connection flanges (DIN 2501, ND 6) inlet/exhaust	ISO-K	DN 100 / 65			DN 250 / 100				DN 250 / 160			DN 320 / 160		
Weight with standard pump feet WH/WHU	kg	120			430				590 / 620			650 / 715		
Dimensions 2) (W x H x D)	mm	709 x 265 x 270			1076 x 570 x 354				1180 x 415 x 540			1430 x 415 x 540		

*) max. frequency

[1] 200 V optionally available for the 11 kW version

[2] for WH models in standard delivery condition with a vertical gas flow. Height information indicate flange distance without feet.

[3] at 50 Hz operation under ultimate pressure conditions. Higher rotational speeds and pressure levels over 10 mbar result in higher noise levels.

Ordering Information*

RUVAC	WH 700	WH(U) 2500	WH(U) 4400	WH(U) 7000
Equipment configuration	**P/N**	**P/N**	**P/N**	**P/N**
WH models with standard oil LVO 210	155 205V	155 252V	155 150	155 160
WH models with PFPE oil LVO 400 [4]	155 207V	155 250V	155 155	155 165
WHU models with standard oil LVO 210 and integrated bypass line	-	-	155 158V	155 162
WHU models with PFPE oil LVO 400 and integrated bypass line	-	155 280V	155 153	-
Accessories				
External gear box evacuation kit	-	internal	155 183V	155 183V
Frequency converter for 400 V	155 117V	internal	155 191V	155 191V

* Selection from the product range. Further model versions, motor tensions and accessories, like frequency converters or oil fillings upon request.

[4] discharge flange at the gear side

Oil fillings: LEYBONOL LVO 210 ester oil, LEYBONOL LVO 400 PFPE

For detailed information on our full scope of RUVAC pumps, please refer to our general catalog.
Visit our webshop www.leyboldproducts.com.

Please contact us for more technical details on the entire WH / WHU series.

Leybold

Pioneering products. Passionately applied.

Technical Data
Ordering information

RUVAC		WH 700 / WH 702			WHU) 4400			WHU) 7000		
		50 Hz	60 Hz	120 Hz*	50 Hz	60 Hz	80 Hz	50 Hz	60 Hz	70 Hz
Nominal pumping speed acc. to DIN28426	$m^3 \cdot h^{-1}$	710	860	1730	4400	5280	7040	7000	8400	9800
Max. permissible pressure difference dp) in continuous operation	mbar	75	65	50	45	30	12	30	21	14
Nominal motor power consumption	kW	2.2	2.6	3.5		11/18.5			11/18.5	
Mains voltage	V		200-480		400 [1]	480 [1]	FC	400 [1]	460 [1]	FC
Protection class acc. to EN 60529	IP		54			54			54	
Noise level acc. to DIN EN ISO 2151	dBA)		< 56 [3]			< 63 [3]			< 63 [3]	
Cooling water connections			G 1/4“			G 1/4“			G 1/4“	
Cooling water quantity	l/h		60 - 180			180 - 300			180 - 300	
Lubricant quantity	l		0.9			4.75			4.75	
Connection flanges DIN 2501, ND 6) inlet/exhaust	ISO-K		100 / 65			250 / 160			320 / 160	
Weight with standard pump feet WH/WHU	kg		120			590 / 620			650 / 715	
Dimensions [2] W x H x D)	mm		709 x 265 x 270			1180 x 415 x 540			1430 x 415 x 540	

*) max. frequency
[1] 200 V optionally available for the 11 kW version
[2] for WH models in standard delivery condition with a vertical gas flow, height information flange distance without feet
[3] at 50Hz operation under ultimate pressure conditions. Higher rotational speeds and pressure levels over 10 mbar result in higher noise levels.

Ordering Information*

RUVAC	WH 700	WH 702	WH 4400	WHU 4400	WH 7000	WHU 7000
Equipment configuration	**P/N**	**P/N**	**P/N**	**P/N**	**P/N**	**P/N**
with 3,5 kW motor, 400 V/50 Hz 460 V/60 Hz) [4]	155 205V	–	–	–	–	–
with 2,2 kW motor, 400 V/50 Hz 460 V/60 Hz) [4] and integrated frequency converter	–	155 105	–	–	–	–
with 11 kW motor, 400 V/50 Hz 460 V/60 Hz) [4]	–	–	155 150	–	155 160	–
with 18,5 kW motor, 400 V/50 Hz 460 V/60 Hz) [4] and integrated bypass line	–	–	–	155 158V	–	155 162
Accessories						
Set of pump feet [5] for WHU) 4400/7000	–	–	155 180		155 180	
Set of pump feet [5] horizontal, for WHU) 4400/7000	–	–	155 181V		155 181V	

* Selection from the product range. Further model versions, motor tensions and accessories, like frequency converters or oil fillings upon request.
[4] models filled with diester oil GS 555)
[5] standard delivery condition with vibration absorbers

Please contact us for more technical details on the entire RUVAC WH / WHU series.

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Description

1.3 Technical Data

RUVAC WH/WHU 2500		50 Hz	60 Hz	80 Hz	100 Hz	Tolerance
Nominal pumping speed acc. to DIN 28426	$m^3 \cdot h^{-1}$	2500	3000	4000	5000	
Max. effective pumping speed with SP 630 backing pump	$m^3 \cdot h^{-1}$	2200	2500	3200	3900	± 5 %
Max. permissible pressure difference						
WH for continuous operation[1]	mbar	50-75	40-60	30-40	20	
WHU for short cycle operation < 2 minutes	mbar	90	90			
Leak rate	$mbar \cdot l \cdot s^{-1}$		$1x10^{-5}$			
Permissible ambient temperature[2]	°C		10 - 50			
Storage temperature	°C		-10 to + 60			
Contamination grade			2			
Overvoltage category			3			
Nominal voltage						
WH with frequency converter	V	380 - 460	380 - 460			± 10%
	V	200 - 240	200 - 240			
WH/WHU with direct mains power connection	V	400	400 - 460			± 10%
		200	210			
Nominal power rating						
WH with frequency converter	kW	11	11	11	11	± 0,8 kW
WH/WHU with direct mains power connection	kW	6.2	7.4	–	–	
Nominal current						
WH with frequency converter	A	20 (41)	17 (41)		for 400/460 V (200/210 V)	
WH/WHU with direct mains power connection	A	11.6 (23.2)	11.6 (25)			
Idle power consumption	kW	1.1	1.3	1.5	1.7	± 0.3 kW
Motor efficiency class calculated and configured acc. to EN 60034-30			IE2 / IE3[6]			
Mains fusing/characteristic[3]	A		32 /C (50 /C)		for 400/460 V (200/210 V)	
Short-circuit interrupting capacity	kA		< 25			
Nominal speed	rpm	3000	3600	4800	6000	
Max. permissible speed[4]						
WHU	rpm		3600			
WH without frequency converter	rpm		4800			
WH with frequency converter	rpm		6000			
Protection class acc. to EN 60529						
with internal frequency converter			IP 54			
with external or no frequency converter			IP 55			
Cooling water			see Section 3.3			
Lubricant filling	l		1.2			
Connecting flange inlet/discharge	DN		250 ISO-K / 100 ISO-K			

Description

RUVAC WH/WHU		4400	4400	4400	7000	7000	7000
		50 Hz	60 Hz	80 Hz	50 Hz	60 Hz	70 Hz
Nominal pumping speed acc. to DIN 28426	$m^3 \cdot h^{-1}$	4400	5280	7040	7000	8400	9800
Max. effective pumping speed with SP 630 backing pump (+ RUVAC WS 2001)	$m^3 \cdot h^{-1}$	3300 (3700)	3900 (4400)	4800 (5800)	4700 (5700)	5300 (6800)	5800 (7800)
Max. permissible pressure difference							
WH for continuous operation[1]	mbar	30 - 45	20 - 30	8 - 12	20 - 30	14 - 21	11 - 14
WHU for short cycle operation < 2 minutes	mbar	90	90	–	70	70	–
Leak rate	mbar l· s^{-1}	$1x10^{-5}$					
Permissible ambient temperature	°C	10 - 40[4]					
Storage temperature	°C	-10 to + 60					
Mains voltage	V	400 (200)[2]	460 (210)[2]	FC	400 (200)[2]	460 (210)[2]	FC
Rated power consumption	kW	11 / 18.5					
Nominal current for 400/460 V (200/210 V)	A						
with 11 kW motor		20 (41)	17 (41)		20 (41)	17 (41)	
with 18.5 kW motor		35	29		35	29	
Idle power consumption	kW	0.7	0.8	1.0	0.9	1.0	1.2
Nominal speed	rpm	3000	3600	4800	3000	3600	4200
Max. permissible speed[3]	rpm	4800	4800	4800	4200	4200	4200
Motor efficiency class calculated and configured acc. to EN 60034-30		IE2 / IE3[6]					
Protection class acc. to EN 60529		IP 55					
Cooling water		see Section 3.3					
Lubricant filling (vertical/horizontal)	l	4.75 / 1.8					
Connecting flange							
Intake	DN	250 ISO-K	250 ISO-K	250 ISO-K	320 ISO-K	320 ISO-K	320 ISO-K
Discharge	DN	160 ISO-K					

Description

Maximum permissible differential pressures for the RUVAC WH in mbar

WH 2500

Operation at	50 Hz			60 Hz			80 Hz			100 Hz		
Pump ratio	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15
Continuous operation	75/55*	60/55*	50	60/55*	50/55*	40/50*	40	35	30	20	20	20
Duty cycle 50%	75/55*	75/55*	70/55*	75/55*	70/55*	55	55	45	40	25	25	25
Pumpdown from atmosphere (< 2 min) WHU	90	90	–	90	90	–	–	–	–	–	–	–

* Operation without frequency converter / with Leybold frequency converter

WH 4400

Operation at	50 Hz			60 Hz			80 Hz		
Pump ratio	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15
Continuous operation	45	38	30	30	25	20	12	10	8
Duty cycle 50%	75	63	50	57	47	38	18	15	12
Pumpdown from atmosphere (< 2 min) WHU	90	90	–	90	90	–	–	–	–

WH 7000

Operation at	50 Hz			60 Hz			70 Hz		
Pump ratio	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15	1:1 - 1:4	1:5 - 1:8	1:9 - 1:15
Continuous operation	30	25	20	21	17	14	14	12	11
Duty cycle 50%	45	37	30	31	25	21	21	18	16
Pumpdown from atmosphere (< 2 min) WHU	70	70	–	70	70	–	–	–	–

Remarks

Cycle times exceeding 40 minutes are considered as continuous operation.

Short cycle operation below 2 minutes must only be implemented using a WHU pump; in the case of longer pumpdown times we recommend a WH pump in combination with a frequency converter.

For precise determination of the starting differential pressure in connection with frequency converter operation please consult us.

NOTICE

Do not allow the WHU pumps to operate for longer periods of time at high pressures. The bypass line has been optimised for rapid pumpdowns and has not been designed to protect the pump at higher pressures!

Description

RUVAC WH(U) 4400

P/N	Type	Pressure balance valve	Motor power	Mains voltage 50 Hz	Mains voltage 60 Hz	Type of oil	
155 150	WH 4400	no	11 kW	400 V	460 V	LVO 210	
155 150A*	WH 4400	no	11 kW	400 V	460 V	LVO 210	
155 151V	WH 4400	no	11 kW	200 V	210 V	LVO 210	
155 153	WHU 4400 PFPE	yes	18.5 kW	400 V	460 V	PFPE LVO 400	
155 154V	WH 4400	no	18.5 kW	400V	460 V	LVO 210	purge gas
155 155	WH 4400 PFPE	no	11 kW	400 V	460 V	PFPE LVO 400	
155 156	WH 4400PFPE	no	11 kW	200 V	210 V	PFPE LVO 400	
155 158V	WHU 4400	yes	18.5 kW	400 V	460 V	LVO 210	
155 158VA*	WHU 4400	yes	18.5 kW	400 V	460 V	LVO 210	
7850012V*	WH 4400	no	11 kW	200 V	210 V	PFPE LVO 400	
7850013V*	WH 4400	no	11 kW	400 V	460 V	PFPE LVO 400	

RUVAC WH(U) 7000

P/N	Type	Pressure balance valve	Motor power	Mains voltage 50 Hz	Mains voltage 60 Hz	Type of oil	
155 160	WH 7000	no	11 kW	400 V	460 V	LVO 210	
155 160A*	WH 7000	no	11 kW	400 V	460 V	LVO 210	
155 161V	WH 7000	no	11 kW	200V	200 V	LVO 210	
155 162	WHU 7000	yes	18.5 kW	400 V	460 V	LVO 210	
155 163V	WH 7000	no	18.5 kW	400V	460 V	LVO 210	sealed pistons purge gas
155 164V	WH 7000 PFPE	no	11 kW	200 V	210 V	PFPE LVO 400	
155 165	WH 7000 PFPE	no	11 kW	400 V	460 V	PFPE LVO 400	
155 167	WH 7000	no	18.5 kW	400 V	460 V	LVO 210	
155 169V	WH 7000	no	18.5 kW	400 V	460 V	PFPE LVO 400	sealed pistons purge gas
7850014V*	WH 7000	no	11 kW	200V	210 V	PFPE LVO 400	
7850015V*	WH 7000	no	11 kW	400 V	460 V	PFPE LVO 400	

All WH(U) 4400/7000 pump versions can be operated with a frequency converter..

*special models for single customers, order only possible after consultation with Leybold

Setup data for Leybold frequency converter =
recommended or mandatory settings for freely selectable frequency converters

for RUVAC WH	2500	4400/7000 11 kW @ 50 Hz	4400/7000 18.5 kW @ 50 Hz
Maximum voltage	360 V	400 V	400 V
Base frequency (this is **not** the maximum frequency for the pump)	120 Hz	50 Hz	50 Hz
Base voltage	360 V	400 V	400 V
Nominal motor current	27 A	20 A	31 A
Number of motor poles	2	2	2
Motor outside conductor to outside conductor resistance	0.34 Ohm	0.72 Ohm	0.55 Ohm
Nominal motor output power	14.5 kW	11 kW	18.5 kW
Warning temperature Pt 1000	80 °C	–	–
Maximum pump temperature Pt 1000	90 °C	–	–
Maximum motor temperature PTC	110 °C (only for WH(U) 2500 with direct mains power connection	80 °C	80 °C

In the case of FC operation considerable electromagnetic interference occurs. Here the limits specified in the pertinent standards and guidelines need to be complied with under all circumstances by the installer. In order to reduce the level of electromagnetic interference, shielded motor cables, shielded cable feedthroughs, mains filters and EMC compliant ground connections are required between frequency converter and pump.

In order to protect the pump, current limits in the frequency converter as a function of the frequency must be taken into account.

Operation of the frequency converter requires the corresponding mains filter.

Note for maximum speeds that in the case of increased speeds and the available maximum power, the maximum permissible pressure difference cannot be attained.

Permissible frequencies

RUVAC	WH 2500	WH 4400	WH 7000
Minimum frequency	20 Hz	20 Hz	20 Hz
Maximum frequency	100 Hz*	80 Hz	70 Hz

* only permissible using the internal or the external frequency converter supplied by Leybold, otherwise max. 80 Hz

Technical Data
Ordering Information

RUVAC WA/WAU / WS/WSU		251	501	1001	2001
Nominal pumping speed (50 Hz)	$m^3 \cdot h^{-1}$	253	505	1000	2050
Rotational speed (50/60 Hz)	min^{-1}	3000/3600	3000/3600	3000/3600	3000/3600
Motor power	kW	≤ 1.1	≤ 2.2	≤ 4.0	7.5
Max. permissible pressure difference [1]	mbar	80	80	80	50
Connection flanges		DN 63 PN6	DN 63 PN6	DN 100 PN6	DN 160 PN6

[1] Integrated bypass valve adjusts for any intake pressure

Ordering information

RUVAC WA/WAU / WS/WSU	251	501	1001	2001
Model	**Cat. No.**	**Cat. No.**	**Cat. No.**	**Cat. No.**
WA/WAU, LVO 100	11720 / 11721	11730 / 11731	11740 / 11741	11750 / 11751
WA/WAU without motor, LVO 100	11724 / -	11734 /155008	11744 / 11217	11254 / 11322
WAU..H with ACE damper, LVO 100	–	11831	11841	11851
WS/WSU, LVO 100	11722 / 11723	11732 / 11733	11742 / 11743	11752 / 11753
WS/WSU, LVO 400	11727 / 11728	11737 / 11738	11747 / –	11757 / 20003123
WS, LVO 400, max. 100 Hz	–	–	–	15095
WS/WSU, LVO 210, max. 100 Hz	–	–	–	167007 / 15098
WSU..H with ACE damper, LVO 100	–	11833	11843	11853
WSU..H with ACE damper, LVO 400	–	–	15047	167129V
Accessories				
Frequency converter RUVATRONIC	RT 5/251 500001381	RT 5/501 500001382	RT 5/1001 500001383	RT 5/2001 500001384
Collar flange for connection to ISO-K flange	26747	26747	26750	26751

Oil fillings: LEYBONOL LVO 100 mineral oil, LEYBONOL LVO 400 PFPE

For detailed information on our full scope of RUVAC pumps, please refer to our general catalog.
Visit our webshop www.leyboldproducts.com.

Please contact us for more technical details on the entire RUVAC WA/WAU, WS/WSU series.

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RUVAC WA/WAU / WS/WSU		251	501	1001	2001
Nominal pumping speed (50 Hz)	$m^3 \cdot h^{-1}$	253	505	1000	2050
Rotational speed (50/60 Hz)	min^{-1}	3000/3600	3000/3600	3000/3600	3000/3600
Motor power	kW	≤ 1.1	≤ 2.2	≤ 4.0	7.5
Max. permissible pressure difference [1]	mbar	80	80	80	50
Connection flanges		DN 63 PN6	DN 63 PN6	DN 100 PN6	DN 160 PN6

[1] Integrated bypass valve adjusts for any intake pressure

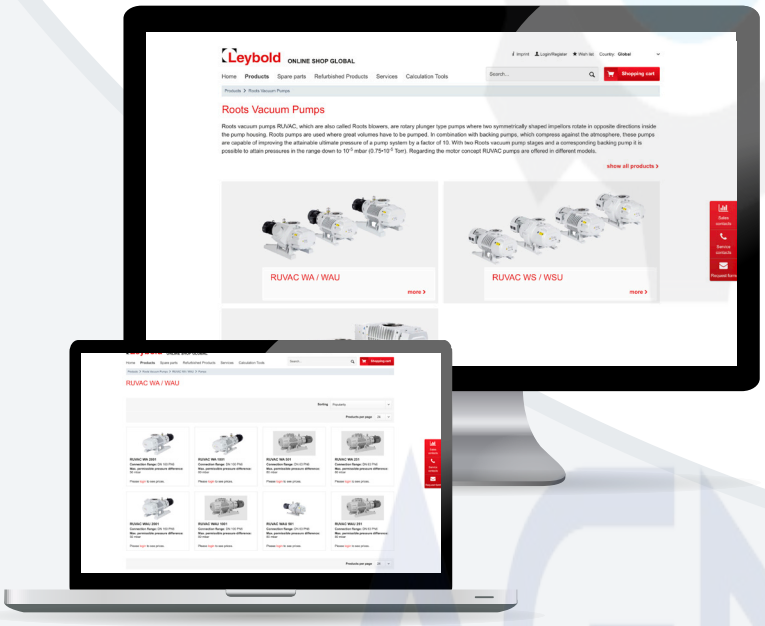
Ordering information

RUVAC WA/WAU / WS/WSU	251	501	1001	2001
Model	Cat. No.	Cat. No.	Cat. No.	Cat. No.
WA/WAU, LVO 130	11720 / 11721	11730 / 11731	11740 / 11741	11750 / 11751
WA/WAU without motor, LVO 130	11724 / 155011V	11734 /155008	11744 / 11217	11254 / 11322
WAU..H with ACE damper, LVO 130	–	11831	11841	11851
WS/WSU, LVO 130	11722 / 11723	11732 / 11733	11742 / 11743	11752 / 11753
WS/WSU, LVO 400	11727 / 11728	11737 / 11738	11747 / –	15095 / –
WS/WSU, LVO 210	–	–	–	167007 / 15096
WSU..H with ACE damper, LVO 130	–	11833	11843	11853
WSU..H with ACE damper, LVO 400	–	11375	15047	167129V
WSU...H with ACE damper, LVO 210	–	–	167097	167044
Accessories				
Frequency converter LEYTRONIC	–	–	14111000A001DGN/ 14111000A002DGN	14111000A004DGN/ 14111000A003DGN

Oil fillings: LEYBONOL LVO 130 mineral oil, LEYBONOL LVO 210 synthetic oil or LEYBONOL LVO 400 PFPE

For detailed information on our full line of RUVAC pumps, please refer to our general catalog.

Please contact us for more technical details on the entire RUVAC WA/WAU, WS/WSU series.



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1.3 Technical Data

RUVAC WS/WSU		251 50 Hz 60 Hz	501 50 Hz 60 Hz	1001 50 Hz 60 Hz	2001 50 Hz 60 Hz
Nominal pumping speed [1) 2)]	$m^3 . h^{-1}$	253 304	505 606	1000 1200	2050 2460
Max. pumping speed ■ with backing pump TRIVAC ■ with backing pump SOGEVAC	$m^3 . h^{-1}$	210 251 D 65 B -	410 530 - SV 200	800 1000 - SV 300	1850 2100 - SV 630 F
Ultimate partial pressure [3)]	mbar	$< 2 \times 10^{-5}$	$< 8 \times 10^{-3}$	$< 8 \times 10^{-3}$	$< 8 \times 10^{-3}$
Ultimate total pressure [3)]	mbar	$< 8 \times 10^{-4}$	$< 4 \times 10^{-2}$	$< 4 \times 10^{-2}$	$< 4 \times 10^{-2}$
Possible cut-in pressure – RUVAC WS		see Section 4.1			
Maximum allowable pressure differential in continuous operation[4)]	mbar	80	80	80	50
Nominal current	A	0.35	0.30	0.35	0.35
Leaktightness	$mbar \cdot l \cdot s^{-1}$	$\leq 1 . 10^{-4}$			
Maximum humidity		90%			
Permissible ambient temperatures	°C	12 - 40			
Permissible voltage at the motor's fan	AC	230 V / 50/60 Hz and 265 V / 50 (60) Hz			
Mains voltage at the Motor, 50 Hz	D/Y V D/Y V	200/- 230/400			
Mains voltage at the Motor, 60 Hz	D/Y V D/Y V	200-208/- 265/460			
Temperature class		F	F	F	F
Motor power, 50/60 Hz	kW	1.1/1.4	2.2/2.4	4.0/4.4	7.5/8.5
Nominal speed, 50/60 Hz	min^{-1}	3000/3600	3000/3600	3000/3600	3000/3600
Max. permissible speed	min^{-1}	6000	6000	6000	4200 [5)]
Min. permissible speed[9)]	min^{-1}	1200	1200	1200	1200
Motor protection category	IP	20	20	20	20
Lubricant filling 6)		1. Filling[7)] / 2. Filling	1. Filling[7)] / 2. Filling	1. Filling[7)] / 2. Filling	1. Filling[7)] / 2. Filling
■ PFPE - vertical flow	l	0.6 / 0.55	0.85 / 0.75	1.85 / 1.65	3.0 / 2.7
- horizontal flow	l	0.5 / 0.45	0.75 / 0.7	1.1 / 1.0	2.1 / 1.9
■ other types of oil - vertical flow	l	0.65 / 0.6	0.9 / 0.8	2.0 / 1.8	3.85 / 3.6
- horizontal flow	l	0.5 / 0.45	0.75 / 0.7	1.2 / 1.1	2.6 / 2.4
Weight WS / WSU	kg	90 / 95	130 / 135	228 / 233	458 / 465
Connection flanges	DN	63 ISO - K	63 ISO - K	100 ISO - K	160 ISO - K
Noise level [8)]	dB (A)	< 63	< 63	< 68	< 72

1) To DIN 28 400 and subsequent numbers
2) In the case of deviating frequencies, please contact us
3) With double-stage rotary vane vacuum pump TRIVAC, resp. single-stage rotary vane vacuum pump SOGEVAC (Type of backing pump look at max. pumping speed). When using 2-stage backing pumps the ultimate pressures will be correspondingly lower
4) Applicable for ratio up to 1 : 4 between backing pump and Roots vacuum pump at 3000 rpm
5) Upon request also available with a max. speed of 6000 rpm (see table "differential pressures" in Section 1.3.2 and part nos. for 100 Hz versions of the WS(U) 2001
6) Authoritative, however, is the oil level at the oil-level glass, see Fig. 3.2 to 3.5
7) After a complete disassembly

Maximum permissible differential pressures for the RUVAC WS in mbar

WS 251 & WS 501

Operation at	50 Hz			60 Hz			80 Hz			100 Hz		
Pump ratio	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15
Continuous operation	80	63	53	57	46	38	34	28	23	28	23	19
Duty cycle 50%	103	93	79	81	67	57	50	40	34	43	34	28
Duty cycle 25%	103	103	103	84	84	84	58	58	53	47	47	43
Pumpdown from atmosphere (< 2 min)	103	103	103	84	84	84	58	58	58	47	47	47

WS 1001

Operation at	50 Hz			60 Hz			80 Hz			100 Hz		
Pump ratio	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15
Continuous operation	80	62	50	44	34	27	17	13	11	7	5	4
Duty cycle 50%	94	92	75	63	48	40	25	20	16	10	8	6
Duty cycle 25%	94	94	94	78	74	62	37	30	25	16	13	11
Pumpdown from atmosphere (< 2 min)	94	94	94	78	78	78	48	48	48	32	32	32

WS 2001

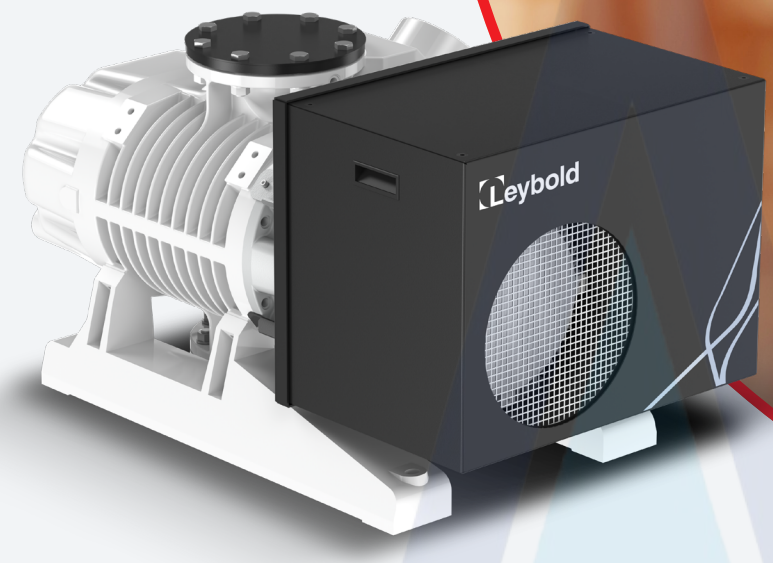
Operation at	50 Hz			60 Hz			80 Hz			100 Hz		
Pump ratio	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15	1:1 - 1:4	1:5 - 1:7	1:8 - 1:15
Continuous operation	50	37	30	34	26	21	16	12	10	4	3	2
Duty cycle 50%	75	56	45	50	39	32	20	15	13	5	4	4
Duty cycle 25%	80	80	69	67	60	48	28	22	18	6	5	4
Pumpdown from atmosphere (< 2 min)	80	80	80	67	67	67	50	50	50	40	40	40

Description

1.4.2 Accessories

Roots pump	WS/WSU 251	WS/WSU(H) 501	WS/WSU(H) 1001	WS/WSU(H) 2001
Mandatory Accessories				
Collar flange with retaining ring, DIN 2501 For connection to flange system DN ... ISO-K DN 63 ISO-K DN 100 ISO-K DN 160 ISO-K	 267 47 – –	 267 47 – –	 – 267 50 –	 – – 267 51
Accessories				
Flange adapter set, consisting of Flange adapter with screws, bolts, washers and nuts for ANSI flange WA/WS pump WAU/WSU pump	(3" ANSI) 200 03 179 200 03 179	(3" ANSI) 200 03 179 200 03 179	(4" ANSI) 200 03 180 200 03 180	(6" ANSI) 200 03 181 200 03 182
Frequency converter LEYTRONIC	14111000A008DGN	14111000A006DGN	14111000A002DGN	14111000A003DGN
Oil pressure switches (for WS-PFPE-models only)	194 82			
Oil drain facility (M 16 x 1.5) with right-angled drain coupling	200 14 271			
Pressure switch PS 115 (stainless steel), adjustable	160 04			
Pressure switch adjustment	160 05			
Accessories for mounting PS 115 Adapter Right-angle bend DN 16 KF Centering ring DN 16 KF, 2 x Clamping ring DN 16 KF, 2 x	 168 40 184 36 183 26 183 41			
Contact amplifier SV 110, 230 V	160 78			
Mineral oil LVO 100, 1 l 5 l 20 l 208 l	L10001 L10005 L10020 L10099			
Ester oil LVO 210, 1 l 5 l 20 l 208 l	L21001 L21005 L21020 L21099			
PFPE LVO 400, 0.75 l 1 l	L40000 L40001			
Spare parts				
Major maintenance kit WS WSU	 EK 110 002 671 EK 110 002 675	 EK 110 002 672 EK 110 002 676	 EK 110 002 673 EK 110 002 677	 EK 110 002 674 EK 110 002 678
RUVAC WS/WSU(H) Seal kit	194 62	194 66	194 70	194 74

Le ld



RUVAC WSU 3001

The new booster with frequency converter

The RUVAC WSU 3001 is an upgraded product based on WSU 2001 in combination with a GA500 Invertor. Through the extension the pump has a better protection control. An overload can be automatically avoided through the reduction of the frequency.

Performance driven
for 48.5% more pumping speed compared to WSU 2001

Plug & Go
Easy for electrical connection – only power for FC and motor fan is needed

Extended uptime
Alarm or stop signal when over-temperature is detected

Technical data

		RUVAC WSU 3001
Normal pumping speed	m^3/h	3000
Ultimate pressure	mbar	<0.04
Motor Power	kW	7.5
Noise level	dB (A)	<72
Inlet/outlet connection	ISO-K	DN160
Net weight	kg	475
Voltage (invertor)	V	380 ~ 460
Oil		LVO 211
Oder Information	PN	12273000V01

Typical Applications

- **Solar lamination**
- **Coating**
- **Drying for Li-battery**
- **Heat treatment**
- **Oil purifier**
- **Food packaging**
- **Freeze drying**