Leybold

Dry Compressing Vacuum Pumps

DIVAC
Diaphragm Vacuum Pumps

SCROLLVAC
Scroll Vacuum Pumps

ECODRY plus
Multi-Stage Roots Vacuum Pumps

LEYVAC / SCREWLINE / DRYVAC
Screw Vacuum Pumps

CLAWVAC
Claw Vacuum and Overpressure Pumps

Contents

Dry Compressing Vacuum Pumps

Global Versions

DIVAC Program Overview

This range of vacuum pumps was developed especially for laboratory operations and as backing pumps for (wide range) turbomolecular pumps. It satisfies the highest expectations in terms of precision, reliability and ease of use.

The DIVAC line of vacuum pumps is the logical continuation of diaphragm pump technology which has proven its quality in decades of service.

Laboratory Pumps

Through the laboratory pumps and the three different pumping speeds available for the same base pressure and through the modular design, the optimum pump system can be implemented for every application.

DIVAC L diaphragm pumps are suited for almost all requirements in the chemistry lab. They are basically corrosion and solvent resistant since their parts in contact with the pumped medium are made of PTFE (Teflon), FFPM (Kalrez) and PVDF (Solef).

Backing Pumps

The DIVAC T range of diaphragm pumps comprises backing pumps which are used in all applications requiring an especially low base pressure while having to maintain an oil-free vacuum.

The DIVAC T pumps have been specially developed as backing pumps for wide range high vacuum turbomolecular pumps. They meet the requirements for a dry vacuum and a long service life.

DIVAC T pumps may be used both free-standing and integrated in applications or certain devices, and for this reason they are used in the areas of mass spectrometry, analytical and in general applications.

Application Examples

Laboratory Pumps

- Vacuum filtration
- Vacuum distillation
- Vacuum drying
- To extract and transfer gases
- On rotary evaporators
- Gel drying

Backing Pumps

- Backing pump for wide range turbomolecular pumps
- Mass spectrometry
- Medicine technology
- Analytical technology
- General rough and medium vacuum applications

The customized Diaphragm Pump and the Accessories recommended for your Applications

Modular diaphragm pump system / Application	Evacuating small devices (e.g. desiccator)	Sublimation	Analysis preparation	Filtration	Distillation	Drying in the drying cabinet	Drying cabinets (2 cabinets with 1 pump)	Rotary evaporator	Backing pumps for wide range turbomolecular pumps	Mass spectrometry	Medical technology	Analytical technology	General applications in the rough and medium vacuum range
DIVAC 0.6 L	■	■	■	■	■								■
DIVAC 1.2 L	■	■	■	■	■			■					■
DIVAC 2.2 L	■	■	■	■	■	■	■	■					■
DIVAC 1.4 HV3C	■	■	■	■	■	■	■	■	■	■	■	■	■
DIVAC 0.8 T									■	■	■	■	■
DIVAC 0.8 TL									■	■	■	■	■
DIVAC 1.4 HV3									■	■	■	■	■
DIVAC 3.8 HV3									■	■	■	■	■
DIVAC 4.8 VT									■	■	■	■	■

Modular Diaphragm Pump System for the Chemical Laboratory

Advantages to the User

- Low base vacuum of 8 mbar (6 Torr) for two-stage and 2 mbar (1.5 Torr) for three-stage DIVAC
- All parts of the pump head in contact with the gas are resistant against aggressive media through the use of PTFE (Teflon), FFPM (Kalrez) and PVDF (Solef)
- Dry compressing, oil-free
- Water vapor tolerance
- Low maintenance costs and long service intervals through the use of high-quality components which are well-proven
- Simple maintenance by staff of the customer
- Low noise operation
- Portable, compact, small footprint
- Can be operated in any orientation
- Overheat protection for the vacuum pump by means of a thermal fuse
- Available in four pumping speed categories

Products

Diaphragm Vacuum Pumps for the Chemical Laboratory

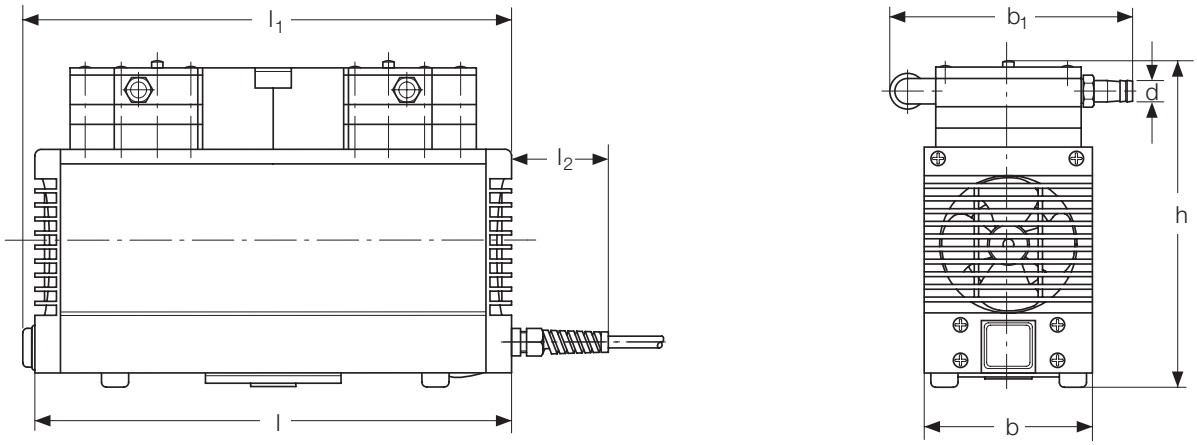
Dual-Stage Diaphragm Vacuum Pumps DIVAC 0.6 L, 1.2 L, 2.2 L

Dual-stage diaphragm vacuum pumps DIVAC 0.6 L, 1.2 L, 2.2 L

Typical Applications

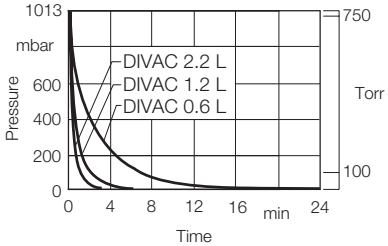
Vacuum generation for

- Rotary evaporators
- Drying chambers
- Filtration units
- Distillation configurations
- Gel dryers

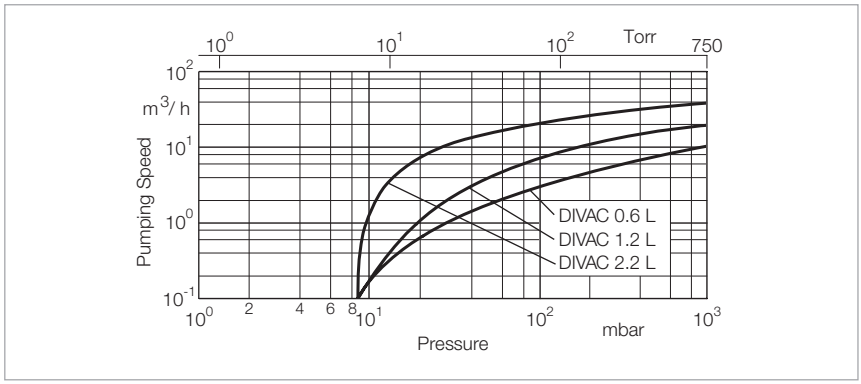


Type		b	b_1	⌀ d	(Turned out)	h	l	l_1	l_2
DIVAC 0.6 L	mm	98	140	10	G 1/8"	187	273	281	55
	in.	3.86	5.51	0.39	G 1/8"	7.36	10.75	11.06	2.17
DIVAC 1.2 L	mm	110	154	10	G 1/4"	207	304	312	59
	in.	4.33	6.06	0.39	G 1/4"	8.15	11.97	12.28	2.32
DIVAC 2.2 L	mm	122	166	10	G 1/4"	226	334	341	59
	in.	4.8	6.54	0.39	G 1/4"	8.9	13.15	13.43	2.32

Dimensional drawing for the DIVAC 0.6 L, 1.2 L, 2.2 L



Curves of pump-down time of a 10 l vessel



Curves of pumping capacity

Technical Data

	DIVAC 0.6 L	DIVAC 1.2 L	DIVAC 2.2 L
Max. pumping speed (atm.) m^3/h^{1} (cfm)	0.6 (0.4)	1.2 (0.7)	2.0 (1.2)
Ultimate pressure mbar (Torr)	≤ 8 (≤ 6)	≤ 8 (≤ 6)	≤ 8 (≤ 6)
Max. exhaust back pressure (absolute) mbar (Torr)	2000 (1500)	2000 (1500)	2000 (1500)
Pump heads	2	2	2
Connection			
Inlet (suction side)	Hose nozzle ID 10	Hose nozzle ID 10	Hose nozzle ID 10
Exhaust (delivery side)	Hose nozzle ID 10	Hose nozzle ID 10	Hose nozzle ID 10
Thread (suction and delivery side) G	G 1/8"	G 1/4"	G 1/4"
Noise level acc. to DIN 45 635 Part 13, approx. dB(A)	47	50	52
Permissible gas admission temperature, max. °C (°F)	+5 to +40 (+41 to +104)	+5 to +40 (+41 to +104)	+5 to +40 (+41 to +104)
Permissible ambient temperature, max. °C (°F)	+5 to +40 (+41 to +104)	+5 to +40 (+41 to +104)	+5 to +40 (+41 to +104)
Voltage / nominal frequency (1-ph. motor)			
Schuko plug V / Hz	230 ± 10% / 50	230 ± 10% / 50	230 ± 10% / 50
NEMA plug V / Hz	115 ± 10% / 60	115 ± 10% / 60	115 ± 10% / 60
NEMA plug V / Hz	100 ± 10% / 50/60	100 ± 10% / 50/60	100 ± 10% / 50/60
Protective class IP	44	44	44
Motor power [1] W	90	120	245
Current consumption [1] A	0.6	0.7	1.8
Motor speed			
50 Hz min^{-1}	1500	1500	1500
60 Hz min^{-1}	1800	1800	1800
Dimensions (W [1] x H [1] x D), approx. mm (in.)	281 x 140 x 187 (11.06 x 5.51 x 7.36)	312 x 154 x 207 (12.28 x 6.06 x 8.15)	341 x 166 x 226 (13.43 x 6.54 x 8.9)
Weight, approx. kg (lbs)	6.9 (15.2)	9.3 (20.5)	12.6 (27.8)
Material			
Pump head	PTFE (Teflon)	PTFE (Teflon)	PTFE (Teflon)
Structured diaphragm	PTFE coated	PTFE coated	PTFE coated
Valves	FFPM (Kalrez)	FFPM (Kalrez)	FFPM (Kalrez)
Nozzles	PVDF (Solef)	PVDF (Solef)	PVDF (Solef)

Ordering Information

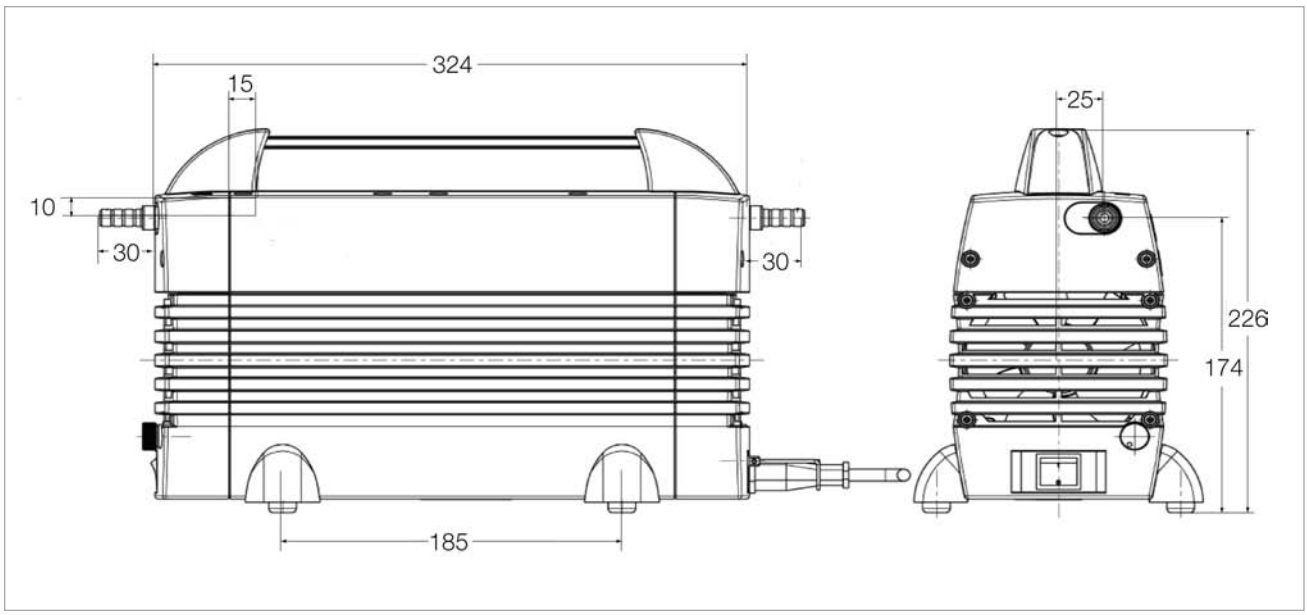
	DIVAC 0.6 L Part No.	DIVAC 1.2 L Part No.	DIVAC 2.2 L Part No.
Diaphragm vacuum pump 230 V, 50 Hz, with 2.3 m (8 ft) power cord and Schuko plug	**135 00**	**135 06**	**135 12**
Diaphragm vacuum pump 230 V, 50/60 Hz, with 2.3 m (8 ft) power cord and Schuko plug	**–**	**–**	**135 11**
Diaphragm vacuum pump 100 V, 50/60 Hz, with 2.3 m (8 ft) power cord and NEMA plug	**135 02**	**135 08**	**135 14**
Diaphragm vacuum pump 115 V, 60 Hz, with 2.3 m (8 ft) power cord and NEMA plug	**135 03**	**135 09**	**135 15**
Spare parts kit consisting of 2 diaphragms, 4 gasket rings, 4 valve plates	**EK 135 23**	**EK 135 24**	**EK 135 25**
Hose nozzle kit consisting of 2 hose nipples, piping	**–**	**200 65 006**	**200 65 007-**

[1] For 230 V, 50 Hz version

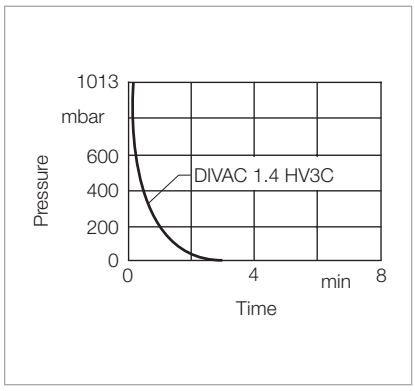
Three-Stage Diaphragm Vacuum Pumps DIVAC 1.4 HV3C

Three-stage diaphragm vacuum pump DIVAC 1.4 HV3C

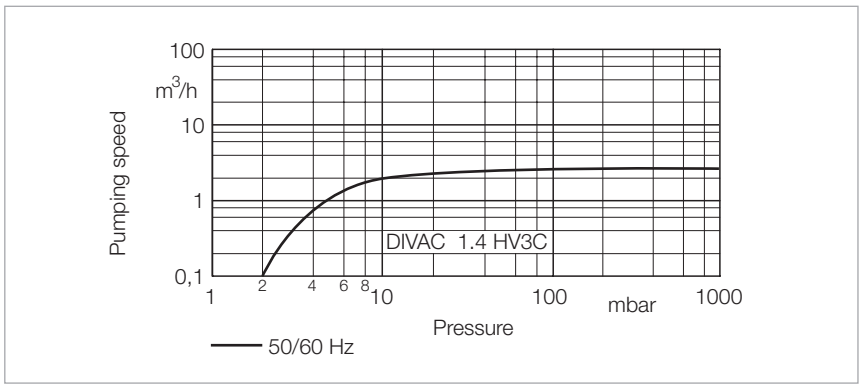
The DIVAC 1.4 HV3C is a three-stage diaphragm pump capable of resisting chemicals and offering an improved pumping performance. Its speed is infinitely variable from 700 to 1600 rpm so that the pumping speed of the pump can be easily adapted to differing requirements. The built-in textured diaphragm is made of EPDM and has been coated with PTFE. The valves are made of KALREZ® thereby ensuring excellent resistance also in connection with aggressive gases. Owing to the three-stage design, pressures of 2 mbar can be attained very easily.



Dimensional drawing for the DIVAC 1.4 HV3C



Curves of pump-down time of a 10 l vessel



Curves of pumping capacity

Technical Data

	DIVAC 1.4 HV3C
Max. pumping speed m^3/h (cfm)	1.3 (0.77)
Ultimate pressure mbar (Torr)	≤ 2.0 (≤ 1.5)
Max. exhaust back pressure (absolute) mbar (Torr)	1500 (1125)
Pump heads	3
Connection	
Inlet (suction side) DN	Hose nozzle ID 10
Exhaust (delivery side) DN	Hose nozzle ID 10
Thread (suction and delivery side) G	G 1/8"
Noise level acc. to DIN 45 635 Part 13, approx. dB(A)	48
Permissible gas admission temperature °C (°F)	+5 to +40 (+41 to +104)
Permissible ambient temperature °C (°F)	+5 to +40 (+41 to +104)
Voltage / nominal frequency V / Hz	90-230 / 50-60
Protective class IP	20
Motor power [1] W	135
at ultimate pressure W	35
Current consumption [1] A	1.3
Motor speed min^{-1}	700 to 1600
Dimensions (W x H x D), approx. mm (in.)	324 x 158 x 226 (12.76 x 6.22 x 8.90)
Weight, approx. kg (lbs)	8.6 (18.99)
Material	
Pump head	Ryton
Structured diaphragm	EPDM coated with PTFE
Valves	FFPM (Kalrez)
Nozzles	PTFE

Ordering Information

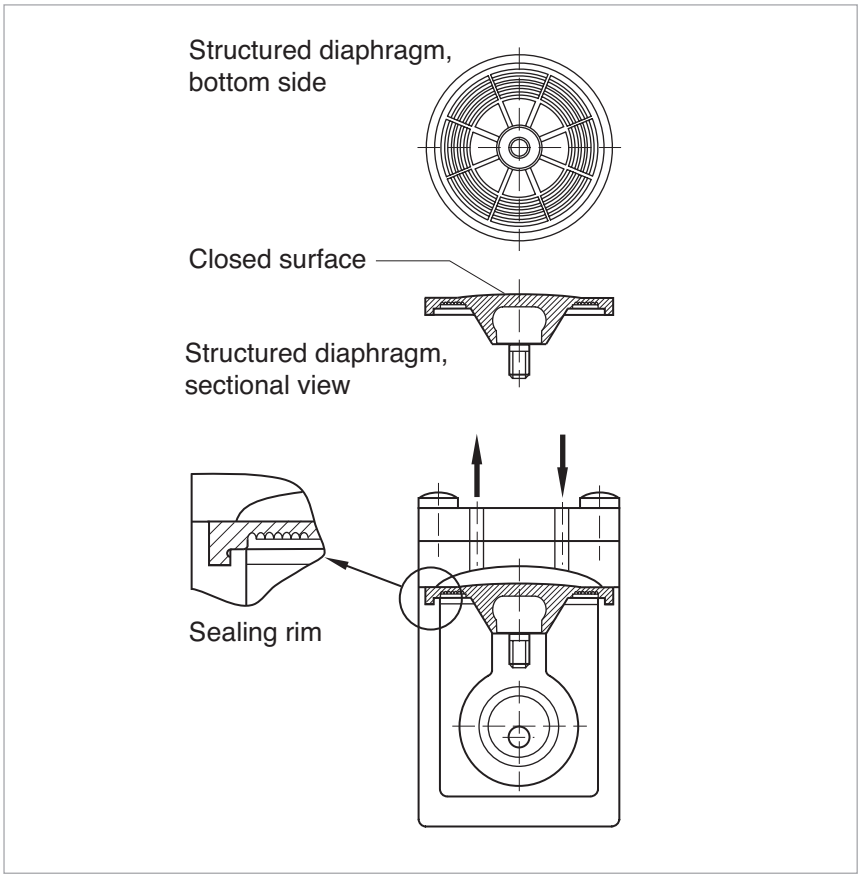
	DIVAC 1.4 HV3C Part No.
Diaphragm vacuum pump 90-230 V, 50-60 Hz, with 2.3 m (8 ft) power cord and Schuko plug	**135 20 V**
Accessories	
Exhaust silencer 1.4 with connection G 1/8"	**127 90 A**

[1] For 230 V, 50 Hz version

Dry Compressing Backing Pumps for Turbomolecular Pumps

DIVAC 0.8 T to 4.8 VT

Our dry compressing backing pumps from the DIVAC T series are now supplemented by the three-stage DIVAC 1.4 HV3 and the DIVAC 3.8 HV3. Like the proven DIVAC T series, these new models also ensure a forevacuum free of hydrocarbons. Owing to their three-stage design, they provide especially within the lower pressure ranges a higher pumping speed and are therefore even better suited as backing pumps for turbomolecular pumps. But they are also used as backing pumps operating in the rough and medium vacuum range to pump clean media.



Diaphragm pump with structured diaphragm

The structured diaphragm with its sealed surface provides the basis for a long service life and a low base pressure.

Advantages to the User

- Dry compressing, free of oil and hydro-carbons
- Matched to the turbomolecular pumps from Leybold (SL 80 to TURBOVAC 450i)
- Low ultimate pressure
- ISO-KF flange at the intake port
- Fully equipped with cable, switch (ON/OFF) and plug
- Better performance and smaller size through the use of structured diaphragms
- Low vibration levels through dynamic mass balancing (in VT pumps)
- Lower maintenance costs and long maintenance intervals through the use of high-quality and well-proven components
- Simple maintenance
- Favourable price-to-performance ratio
- Can be operated in any position

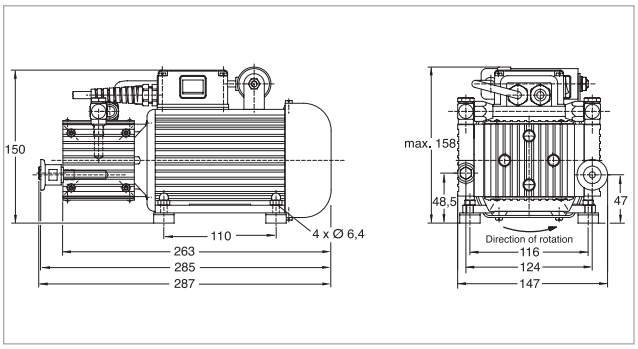
Typical Applications

- Backing pump for wide pressure range turbomolecular pumps
- Mass spectrometers
- Medical equipment
- Analyzes
- For laboratory applications also with corrosive media
- General use for rough and fine vacuum applications

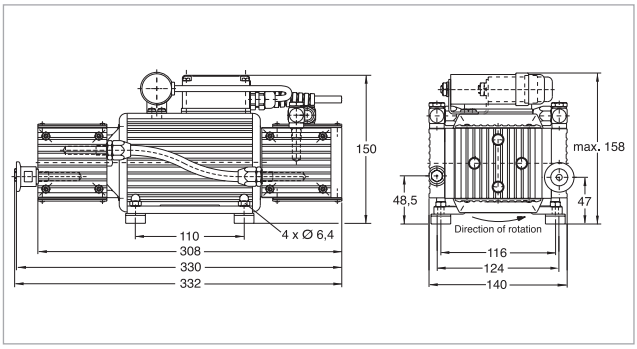
DIVAC 0.8 T and 0.8 LT

DIVAC 0.8 T

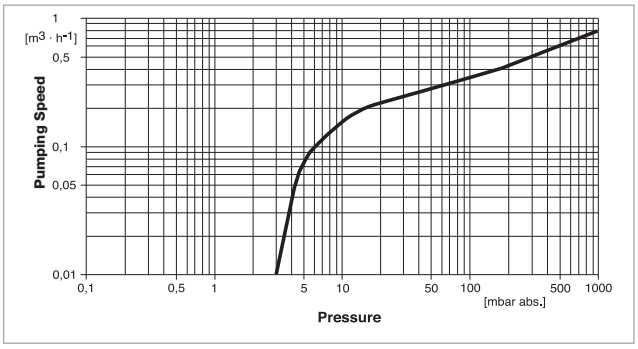
DIVAC 0.8 LT



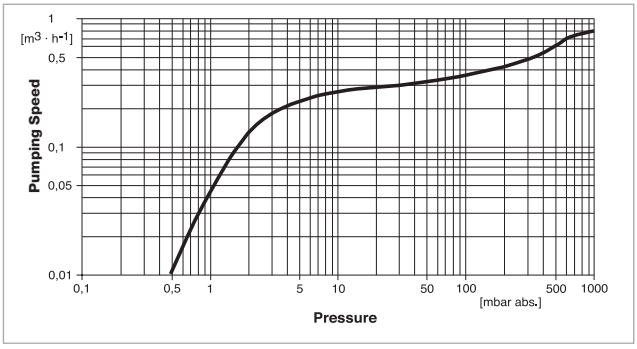
Dimensional drawing for the DIVAC 0.8 T



Dimensional drawing for the DIVAC 0.8 LT



Pumping speed curve of the DIVAC 0.8 T



Pumping speed curve of the DIVAC 0.8 LT

Technical Data

	DIVAC 0.8 T	DIVAC 0.8 LT
Max. pumping speed (atm.) m^3/h (cfm)	0.77 (0.45)	0.77 (0.45)
Ultimate pressure (absolute) mbar (Torr)	≤ 3.0 (≤ 2.25)	≤ 0.5 (≤ 0.38)
Max. exhaust back pressure (absolute) mbar (Torr)	2000 (1500)	2000 (1500)
Pump heads	2	4
Connection		
Inlet (suction side) DN	16 KF	16 KF
Exhaust (delivery side) DN	Silencer	Silencer
Thread (suction and delivery side)	G 1/8"	G 1/8"
Noise level acc. to DIN 45 635 Part 13, approx. dB(A)	49	53
Permissible gas admission temperature °C (°F)	+5 to +40 (+41 to +104)	+5 to +40 (+41 to +104)
Permissible ambient temperature °C (°F)	+5 to +40 (+41 to +104)	+5 to +40 (+41 to +104)
Voltage / nominal frequency (1-ph. motor)		
Schuko plug V / Hz	198-264 / 50/60	230 / 50 ± 10%
NEMA plug V / Hz	90-127 / 50/60	115 / 60 ± 10%
Protective class IP	44	44
Motor power W	50	80
Current consumption A	0.4	0.5
Nominal speed, approx. (50/60 Hz) min^{-1}	1500/1800	1500/1800
Dimensions (W x H x D), approx. mm (in.)	285 x 150 x 150 (11.22 x 5.9 x 5.9)	332 x 150 x 150 (13.07 x 5.9 x 5.9)
Weight, approx. kg (lbs)	5.9 (13.02)	7.5 (16.56)
Material		
Diaphragm	Neoprene	Neoprene
Valves	EPDM	EPDM
Pump head	Aluminum	Aluminum

Ordering Information

	DIVAC 0.8 T Part No.	DIVAC 0.8 LT Part No.
Diaphragm vacuum backing pumps for turbomolecular pumps including 1 m (3.5 ft) long mains cord, country-specific plug, silencer, rubber feet, as well as ON/OFF switch		
198-264 V / 50/60 Hz	**127 80**	**–**
230 V ± 10% / 50 Hz	**–**	**127 83**
Spare parts kit consisting of 2 diaphragms, 4 valves, 4 valve gaskets, 4 piping gaskets	**EK 127 95**	**EK 127 95 (2x)**
Exhaust silencer	**127 98**	**127 98**

T = For use in connection with **T**urbomolecular pumps

L = Very low ultimate pressure (**L**ow pressure)

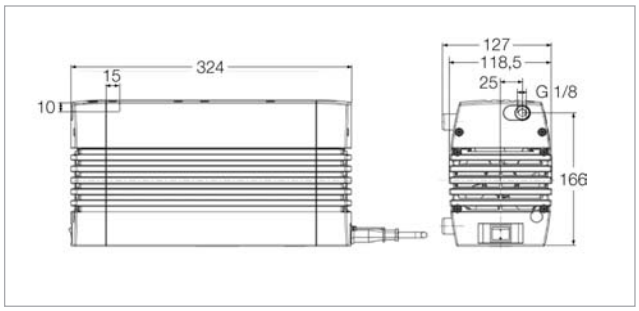
V = Low vibration levels (Low **V**ibration)

DIVAC 1.4 HV3 and 3.8 HV3

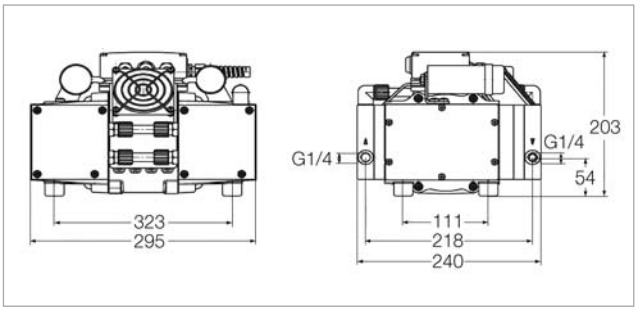
DIVAC 1.4 HV3

DIVAC 3.8 HV3

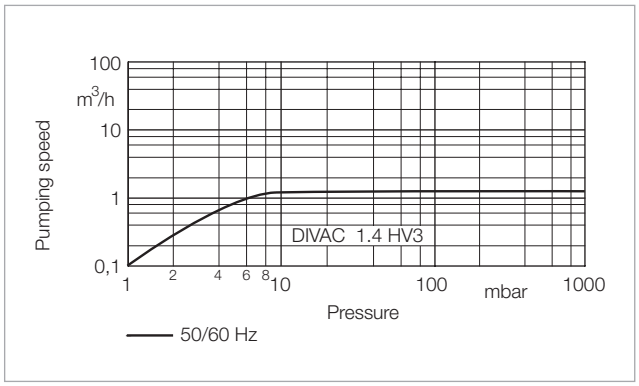
The three-stage DIVAC 1.4 HV3 and the DIVAC 3.8 HV3 provide especially in the lower pressure range a higher pumping speed compared to conventional diaphragm pumps. At the same time they are capable of attaining ultimate pressures below 2 mbar (1.5 Torr) and are thus very well suited as backing pumps for turbomolecular pumps. Owing to their compact design they are also suited for installation within pump systems.



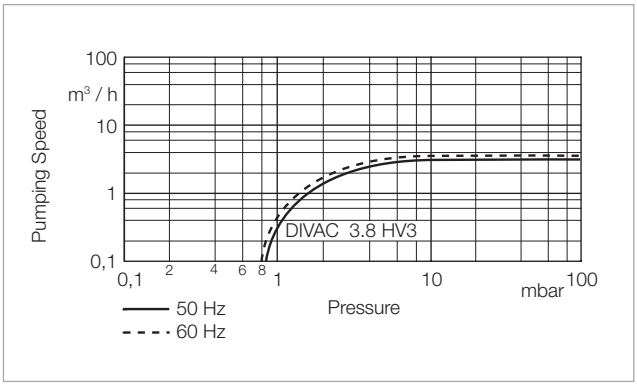
Dimensional drawing for the DIVAC 1.4 HV3



Dimensional drawing for the DIVAC 3.8 HV3



Pumping speed curve of the DIVAC 1.4 HV3



Pumping speed curve of the DIVAC 3.8 HV3

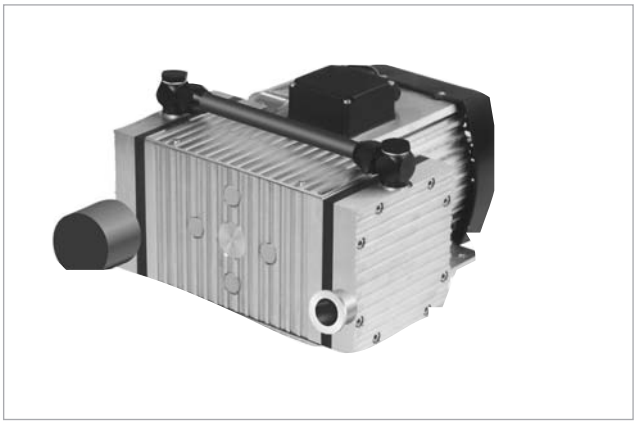
Technical Data

		DIVAC	
		1.4 HV3	3.8 HV3
Max. pumping speed			
50 Hz	m^3/h (cfm)	1.3 (0.77)	3.4 (2.00)
60 Hz	m^3/h (cfm)	–	3.8 (2.24)
Ultimate pressure	mbar (Torr)	≤ 1.5 (≤ 1.13)	≤ 1.0 (≤ 0.75)
Max. exhaust back pressure (absolute)	mbar (Torr)	1500 (1125)	1500 (1125)
Pump heads		3	3
Connection			
Inlet (suction side)		Hose nozzle ID 9	Hose nozzle ID 10
Exhaust (delivery side)		Hose nozzle ID 9	Hose nozzle ID 10
Thread (suction and delivery side)		G 1/8"	G 1/4"
Noise level acc. to DIN 45 635 Part 13, approx.	dB(A)	48	54
Permissible gas admission temperature, max.	°C (°F)	+5 to +40 (+41 to +104)	+5 to +40 (+41 to +104)
Permissible ambient temperature, max.	°C (°F)	+5 to +40 (+41 to +104)	+5 to +40 (+41 to +104)
Voltage / nominal frequency (1-ph. motor)			
Schuko plug	V / Hz	90-230 / 50-60	90-230 / 50-60
NEMA plug	V / Hz	–	115 / 50-60
Protective class	IP	20	20
Motor power	W	120	250
at ultimate pressure	W	35	190
Current consumption	A	1.3	1.7
Nominal speed, approx. (50/60 Hz)	min^{-1}	1500	1500/1800
Dimensions (W x H x D), approx.	mm (in.)	324 x 158 x 226 (12.76 x 6.22 x 8.90)	295 x 240 x 203 (11.61 x 9.45 x 7.99)
Weight, approx.	kg (lbs)	10.5 (23.18)	18.9 (41.72)
Material			
Pump head		Aluminum	Aluminum
Structured diaphragm		EPDM	EPDM
Valves		EPDM	EPDM
Nozzles		PA	PA

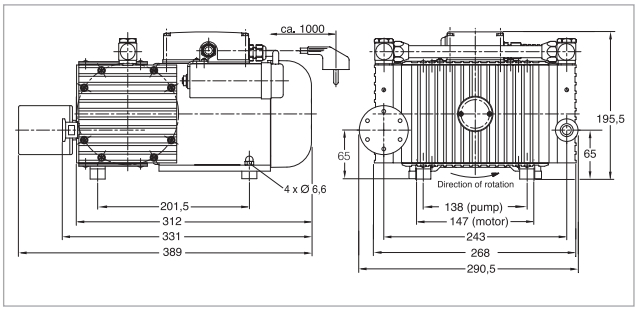
Ordering Information

	DIVAC	
	1.4 HV3	3.8 HV3
	Part No.	Part No.
Diaphragm vacuum backing pumps for turbomolecular pumps including 1 m (3.5 ft) long mains cord, country-specific plug, silencer, rubber feet, as well as ON/OFF switch		
90-230 V / 50-60 Hz	**127 90 V**	**–**
230 V / 50-60 Hz	**-**	**127 95 V**
115 V / 50-60 Hz	-	**127 96 V**
Exhaust silencer		
1.4 with connection G 1/8"	**127 90 A**	**–**
3.8 with connection G 1/4"	**–**	**127 95 A**
Spare parts kit	**EK057456**	**EK12768**

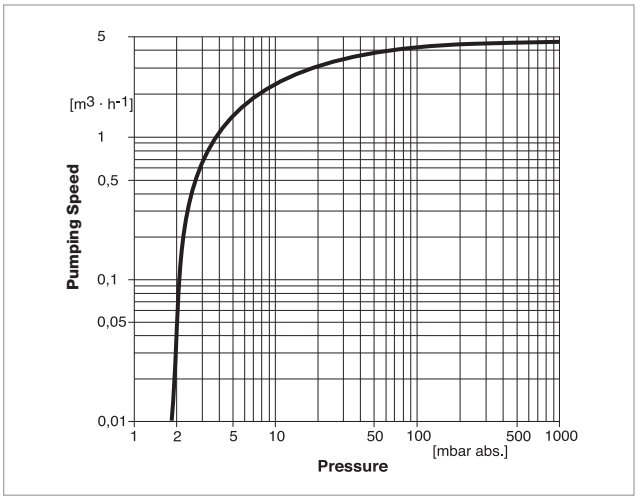
DIVAC 4.8 VT



DIVAC 4.8 VT



Dimensional drawing for the DIVAC 4.8 VT



Pumping speed curve of the DIVAC 4.8 VT

Technical Data

	DIVAC 4.8 VT
Max. pumping speed (atm.) m^3/h (cfm)	4.8 (2.83)
Ultimate pressure (absolute) mbar (Torr)	≤ 2 (≤ 1.5)
Max. exhaust back pressure (absolute) mbar (Torr)	2000 (1500)
Pump heads	2
Connection	
Inlet (suction side) DN	16 KF
Exhaust (delivery side) DN	Silencer
Thread (suction and delivery side) G	G 3/8"
Noise level acc. to DIN 45 635 Part 13, approx. dB(A)	55
Permissible gas admission temperature, max. °C (°F)	+5 to +40 (+41 to +104)
Permissible ambient temperature, max. °C (°F)	+5 to +40 (+41 to +104)
Voltage / nominal frequency (1-ph. motor)	
Schuko plug V / Hz	230 / 50 ± 10%
NEMA plug V / Hz	115 / 60 ± 10%
Protective class IP	54
Motor power W	350
Current consumption A	2.6
Nominal speed, approx. (50 Hz) min^{-1}	1500
Dimensions (W x H x D), approx. mm (in.)	324 x 273 x 220 (12.76 x 10.75 x 8.66)
Weight, approx. kg (lbs)	18.0 (39.74)
Material	
Diaphragm	EPDM
Valves	Viton
Pump head	Aluminum

Ordering Information

	DIVAC 4.8 VT Part No.
Diaphragm vacuum backing pumps for turbomolecular pumps including 1 m (3.5 ft) long mains cord, country-specific plug, silencer, rubber feet, as well as ON/OFF switch 230 V ± 10% / 50 Hz	**127 92**
Spare parts kit consisting of 2 diaphragms, 4 valves, 4 valve gaskets, 4 piping gaskets	**EK 127 97**
Exhaust silencer	**127 94**

T = For use in connection with **T**urbomolecular pumps
L = Very low ultimate pressure (**L**ow pressure)
V = Low vibration levels (Low **V**ibration)

Oil-free Scroll Vacuum Pumps SCROLLVAC 7 plus to 18 plus

Scroll vacuum pump SCROLLVAC 15 plus

Advantage for the User

- Flexibility for customer requirements
  - Four different pumping speeds available as required for the application
  - Single- and Three-phase configurations available
- High robustness for each application
  - ATEX certification **(Ex II 3 G c IIB T4)**
  - Variants for aggressive applications available (SCROLLVAC C plus)
  - High water vapour capacity
  - Electronic-free three-phase variant for reduced radiation sensitivity
- Better work environment and low environmental impact
  - quiet operation
- Simple operation
  - intelligent and easy to use controls
- No contamination and no oil to dispose of
  - hermetically sealed for a lubricant-free vacuum environment
- Low cost of ownership
  -lon gs ervice intervalan d lowp ower consumption from a single sided scroll arrangemen
- Maximised up-time
  - long service intervalls

Typical Applications

- General clean pumping applications
- Scanning Electron Microscopes - SEM
- Beam lines and high energy physics
- Research and development
- Backing turbomolecular pumps
- Centrifuges, ultra-high speed
- Chamber evacuation
- Chemical applications including gel dryers and solvent recovery

In 1905 the principle of the scroll compressor was developed by the Frenchman Leon Creux.

SCROLLVAC plus is the next generation in completely oil free, dry scroll pumps by offering increased pumping speeds, combined with lower ultimate pressures, lower power consumption and lower noise. Gas ballast allows for pumping of condensable vapours including, water, solvents, dilute acids and bases. SCROLLVAC plus pumps also feature the latest in tip seal technology giving significantly longer life between tip seal changes. Integrated inverter drive with auto sensing voltage input delivers optimised pumping performance globally.

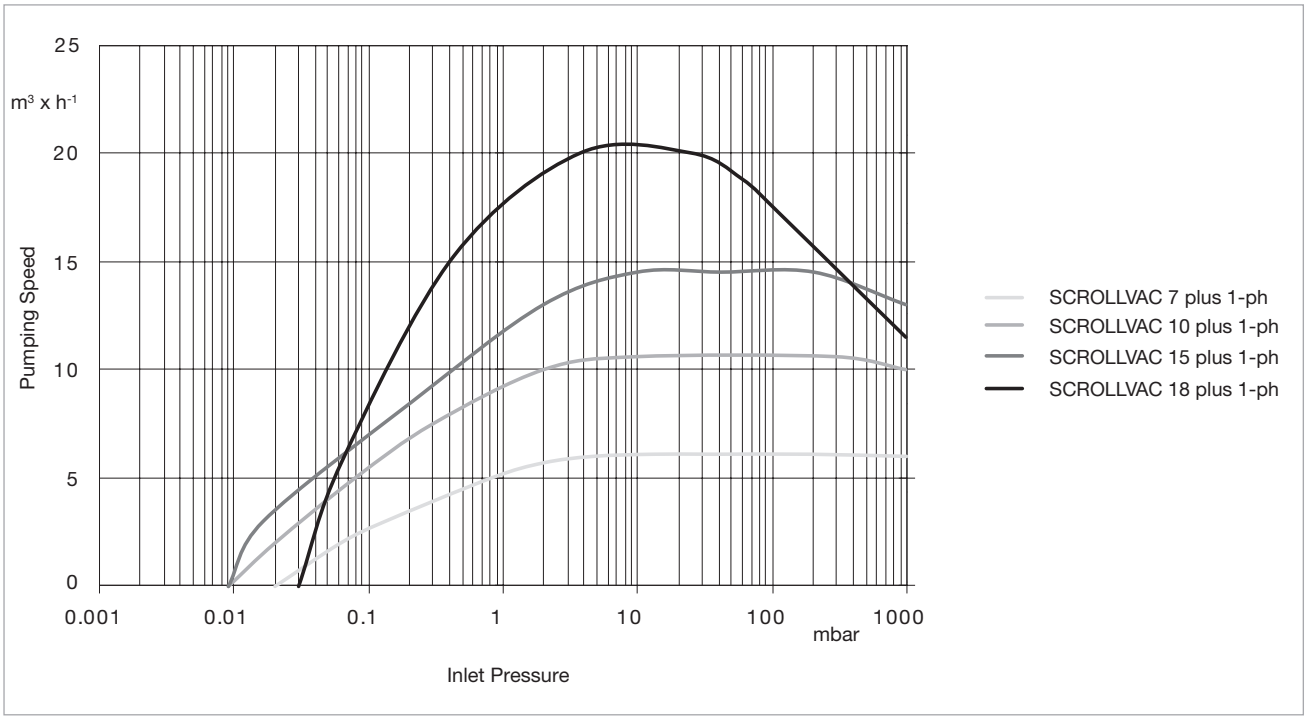
SCROLLVAC plus pumps are designed to be completely field serviceable.

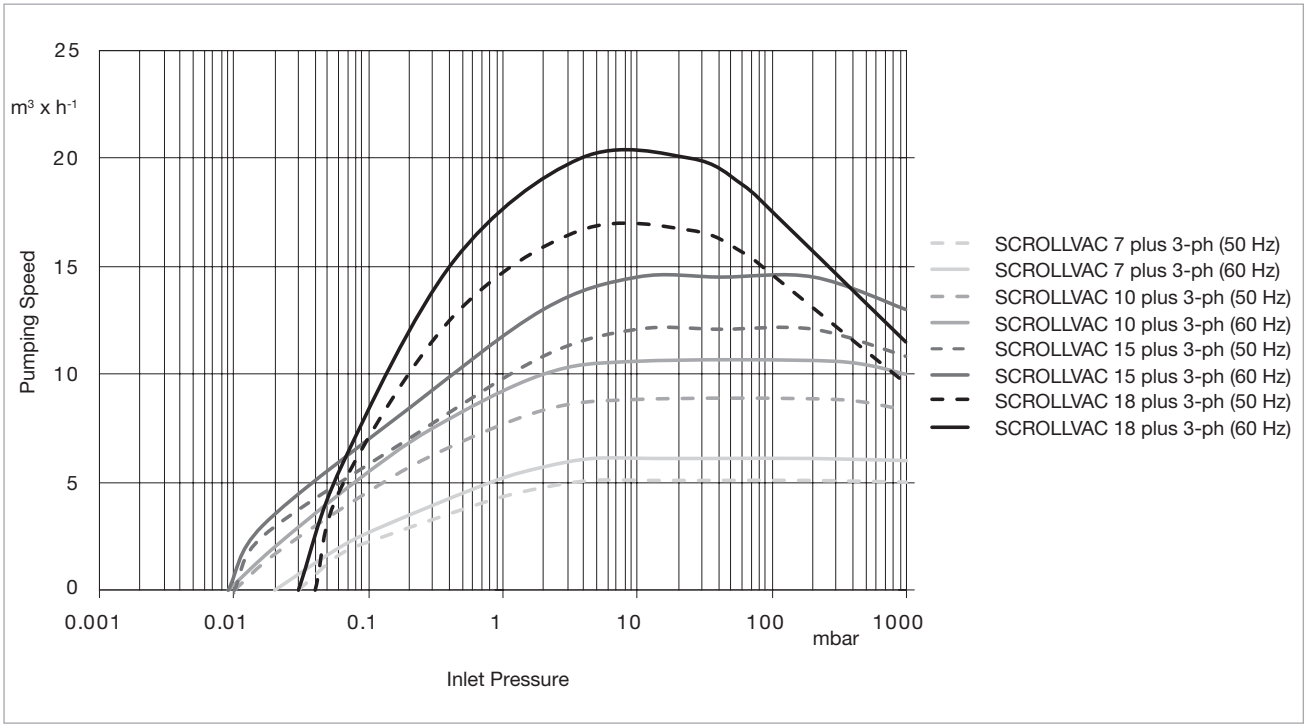
Service

Our wide portfolio of services is designed with you in mind: to help keep your process and equipment running in the most economical and environmentally efficient manner.

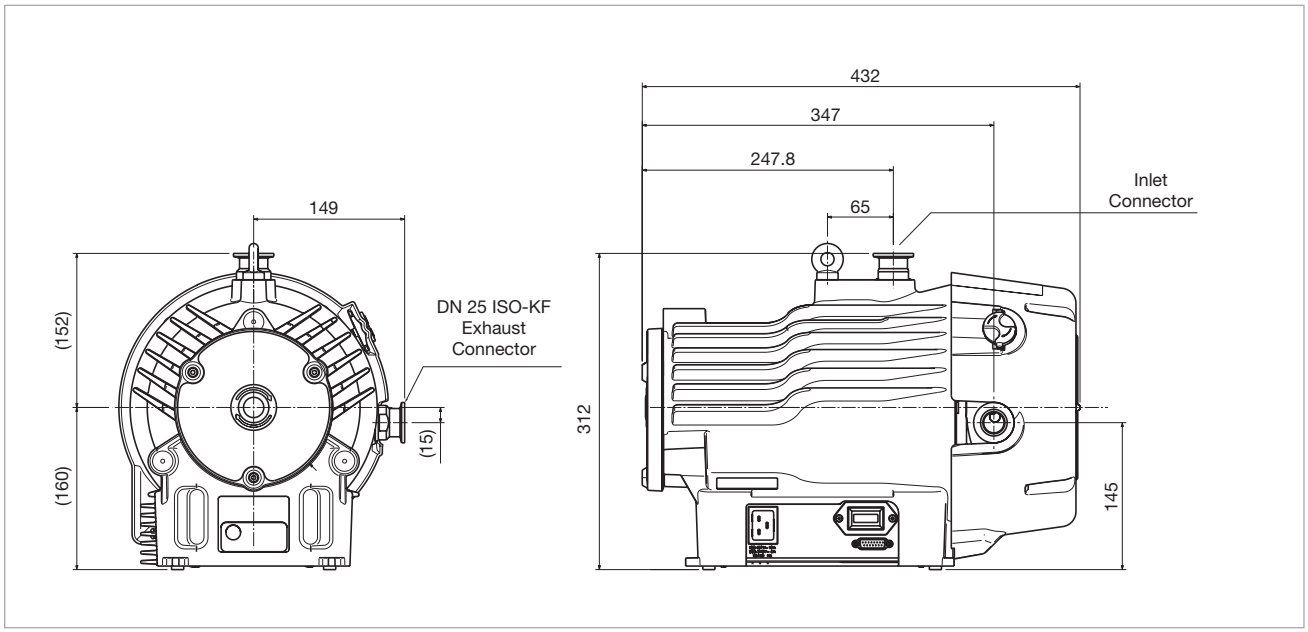
Service include:

- Overhaul and repair using genuine Leybold OEM parts
- OEM spares and kits available for cost-effective expansion and backups
- Remanufactured products available for cost-effective expansions and backups
- Global network of expert field service engineers available to respond quickly to unexpected equipment failures





Pumping speed curves for the SCROLLVAC plus - pumps



Dimensional drawing for the scroll vacuum pumps SCROLLVAC 7 plus to SCROLLVAC 18 plus (dimensions in mm)

Technical Data

		SCROLLVAC plus			
		7	10	15	18
Rotation speed	rpm	1740			
Max. pumping speed	m³/h	6.1	10.6	14.5	20.0
Ultimate vacuum (total pressure)	mbar (Torr)	2×10^{-3} (1.5×10^{-3})	9×10^{-3} (6.5×10^{-3})	9×10^{-3} (6.5×10^{-3})	3×10^{-2} (2.25×10^{-3})
Maximum water vapour pumping rate (with gas ballast)	g/h	100	140	280	220
Maximum continuous inlet pressure	mbar	200			
Mains voltage 1-ph	V	100-127, 200-240 (+/- 10%)			
Mains voltage 3-ph	V	200 / 380-415, 200-230 / 460			
Frequency	Hz	50/60			
Motor power (at ultimate pressure)	W	260	280	300	260
Power connector 1-ph		IEC EN60320 C19			
Weight	kg (lb)	26 (58)	25 (56)	26 (58)	25 (56)
Inlet flange		DN 25 ISO-KF			
Exhaust flange		DN 25 ISO-KF			
Noise level	dB(A)	55			
Leak tightness (Static)	mbar x l/s	1×10^{-6}			
Operating temperature range	°C (°F)	10 to 40 / 41 to 104			

Ordering Information

	SCROLLVAC plus 7	SCROLLVAC plus 10	SCROLLVAC plus 15	SCROLLVAC plus 18
	Part No.	**Part No.**	**Part No.**	**Part No.**
Oil-free scroll vacuum pump, Single-phase motor *				
Standard (with manual gas ballast)	**141007V10**	**141010V10**	**141015V10**	**141018V10**
C-Version (for aggressive applications)	**-**	**-**	**141015V12**	**141018V12**
Oil-free scroll vacuum pump, Three-phase motor *				
Standard (with manual gas ballast)	**-**	**141010V30**	**141015V30**	**141018V30**
C-Version (for aggressive applications)	**-**	**141010V32**	**141015V32**	**141018V32**
Accessories Mains cable (required for pump operation)				
Mains cable Europe CEE 7/7 (Schuko) – IEC-60320 C19 Length 2.0 m	**161810EU**			
Mains cable Great Britain BS 1363 – IEC-60320 C19 Length 2.0 m	**161810UK**			
Mains cable US 115 V: NEMA 5-15P – IEC-60320 C19 Length 3.0 m	**141103US**			
208/230 V: NEMA 6-15P – IEC-60320 C19 Length 2.5 m	**161810US**			
Optional accessories				
Gas ballast adaptor blank (H-conversion KIT)	**141100A01**			
Gas ballast adaptor for external gas line - no restriction (Quick connect 1/4 inch)	**141100A02**			
Gas ballast adaptor for external gas line - with fine restriction (Quick connect 1/4 inch)	**141100A03**			
Chemical resistance conversion kit (C-conversion KIT)	**141101A01**	**141101A01**	**141101A01**	**141101A02**
Vibration isolators	**141102A01**			
Silencer	**141102A02**			
Minor Service Kit				
Standard (with manual gas ballast)	**EK117141000**	**EK117141000**	**EK117141000**	**EK117141001**
C-Version (for aggressive applications)	**EK117141002**	**EK117141002**	**EK117141002**	**EK117141003**

* Other pump variants on request

Oil-free Scroll Vacuum Pumps SCROLLVAC SC 30 D to SC 60 D

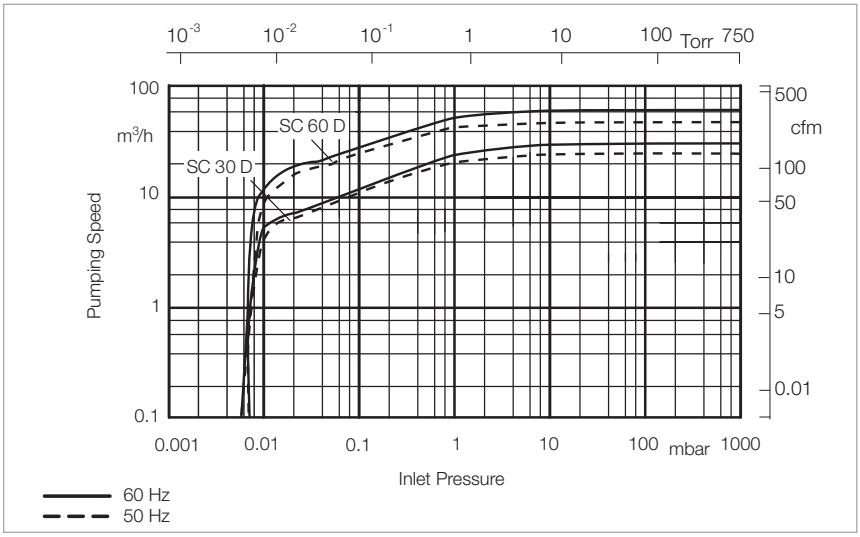
Scroll vacuum pump SCROLLVAC: SC 60 D (left), SC 30 D (right)

Advantage for the User

- Absolutely oil-free
- High effective pumping speed
- Low ultimate pressure
- Low noise level
- Low vibration operation
- Atmospheric inlet pressure allowable
- Low weight
- Air cooling
- Low power consumption
- Integrated operating hours counter

Typical Applications

- Electron beam welding
- Lasers
- Leak detection systems
- Accelerators / synchrotrons
- Surface analysis instruments
- Scanning electron microscopes
- Load lock
- Spectroscopy
- Lamp manufacturing
- As a backing pump for turbomolecular pump systems



Pumping speed curves for the scroll vacuum pumps SCROLLVAC SC - D

The pumps of the SCROLLVAC series expand the SCROLLVAC plus series to provide a higher suction capacity of 30 m^3/h and 60 m^3/h. Both versions are available with a three-phase motor, the 30 m^3/h version also with AC motors for 115 V and 230 V mains voltage.

On the basis of the scroll principle, the pump chamber of the pumps is oil-free, so the risk of contamination of the vacuum chamber with hydrocarbons can be ruled out.

The pumps of the SCROLLVAC series reach their maximum suction capacity of atmospheric pressure up to 1 mbar and reach final pressures of $< 1 \times 10^{-2}$ mbar, so that the pumps are ideally suited as backing pumps for turbomolecular vacuum pumps.

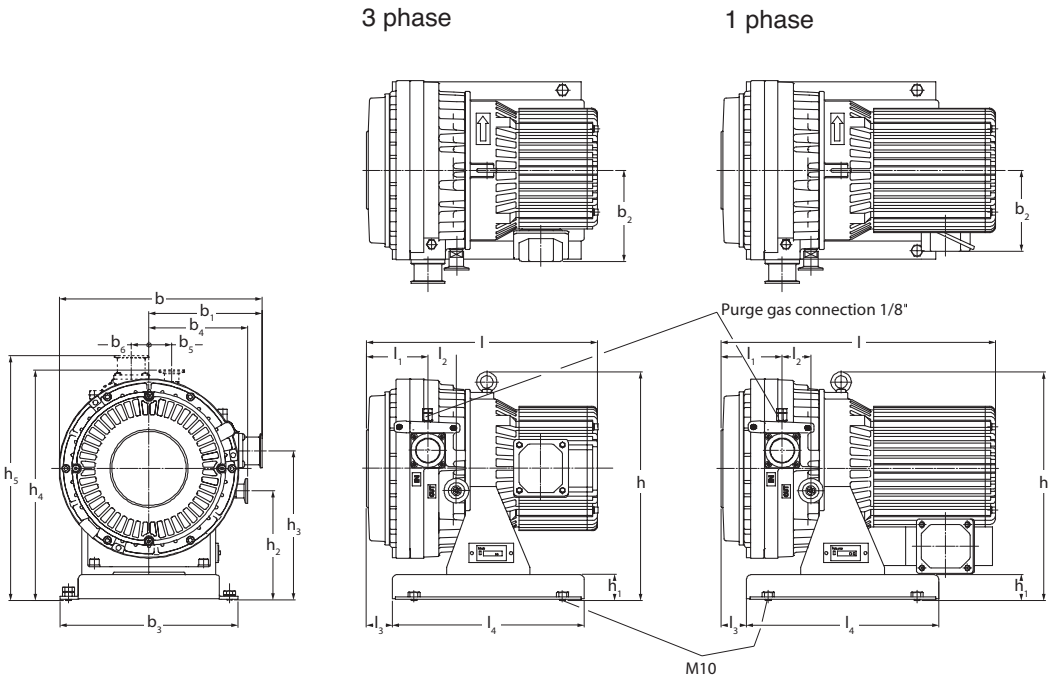
Maintenance Intervals

In order to maintain the performance of the pump, a standard maintenance is required after a certain number of operating hours.

For this we are offering complete maintenance kits

- Small maintenance kit (Minor Kit) after 8,000 h or at latest after an operating time of 12 months
- Large maintenance kit (Major Kit) after 16,000 hours or at latest after an operating time of 24 months

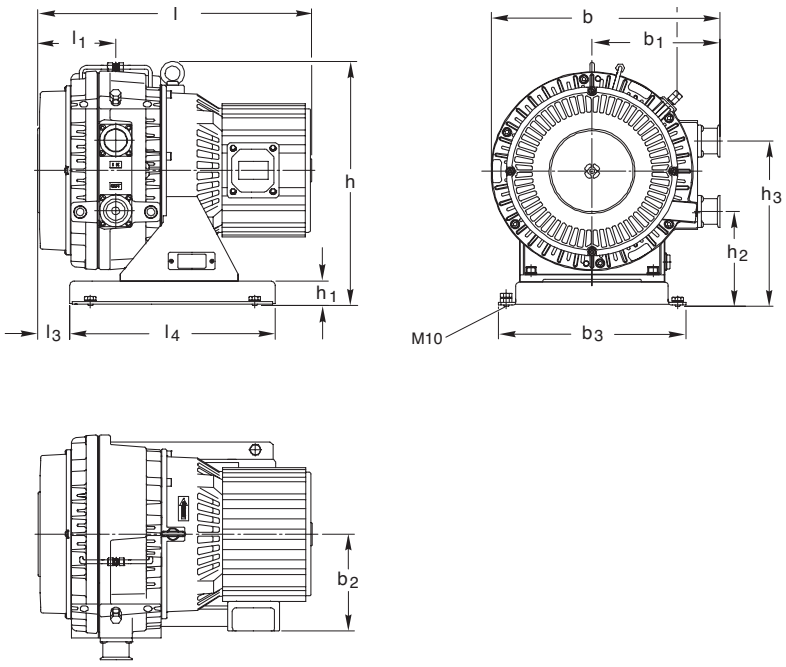
With the help of the integrated operating hours counter, the customer is always informed about the current runtime. Maintenance can be performed on-site by the customer with the maintenance packages available at Leybold.



Type		b	b_1	b_2	b_3	b_4	b_5	b_6	h	h_1	h_2	h_3	h_4	h_5	l	l_1	l_2	l_3	l_4
SC 30 D	mm	328	183	131 [1]	288	159	36	29	372	42	178	243	373	397	443 [2]	99	46	42	310
	in.	12.91	7.20	5.16 [1]	11.34	6.26	1.42	1.14	4.65	1.65	7.01	9.57	14.69	15.63	17.44 [2]	3.90	1.81	1.65	12.20
SC 60 D	mm	390	218	168	320	–	–	–	421	42	163	285	–	–	467	133	–	55	350
	in.	13.35	8.58	6.61	12.60	–	–	–	16.58	1.65	6.42	11.22	–	–	18.39	5.24	–	2.17	13.78

[1] 147 (5.79 in.) for 3~ version

[2] 372 (14.65 in.) for 3~ version



Dimensional drawing for the scroll vacuum pump SCROLLVAC SC 30 D (above) and SC 60 D (below)

Technical Data

		SCROLLVAC	
		SC 30 D	SC 60 D
Nominal pumping speed [1]			
50 Hz	m^3/h (cfm)	30 (17.7)	60 (35.4)
60 Hz	m^3/h (cfm)	36 (21.2)	72 (42.4)
Pumping speed [1]			
50 Hz	m^3/h (cfm)	26 (13.3)	52 (30.6)
60 Hz	m^3/h (cfm)	31 (18.3)	62 (36.5)
Attainable ultimate pressure	mbar (Torr)	≤ 0.01 (≤ 0.008)	
Leak rate	mbar l/s	1×10^{-6}	1×10^{-4}
Maximum inlet pressure		Atmosphere	
Permissible ambient temperature	°C (°F)	+5 to +40 (+41 to +104)	
Connections			
Inlet	DN	40	40
Exhaust	DN	25	40
Cooling		Air	
Water vapor capacity	g/h	1.04	
with purge, max.	l/min	10	
Protection class	IP	20	
Motor power	W (hp)	600 (0.82)	1400 (1.90)
Motor speed			
50 Hz	rpm	1450	1460
60 Hz	rpm	1730	1760
Motor voltage	1-ph. [2]	100 V / 50 Hz 100 - 115 V / 60 Hz 200 - 230 V / 50/60 Hz	-
Motor voltage	3-ph.	200 V, 380 - 415 V / 50 Hz 200 - 380 V, 460 V / / 60 Hz	200 V, 380 - 400 - 415 V / 50 Hz 200 - 220 - 230 V, 460 V / 60 Hz
Noise level at 1 m (3.5 ft), free field measurement	dB(A	≤ 62	≤ 67
Dimensions (W x H x D)	mm (in.)	443 x 328 x 372 (17.44 x 12.91 x 14.65)	467 x 390 x 421 (18.39 x 15.35 x16.57)
Weight			
Single-phase motor	kg (lbs)	44 (97.1)	-
Three-phase motor	kg (lbs)	38 (83.9)	60 (132.5)

[1] In accordance with DIN 28 400

[2] The Part No. for single-phase pumps will determine the voltage range at delivery

Ordering Information

		SCROLLVAC SC 30 D	SCROLLVAC SC 60 D
		Part No.	**Part No.**
Oil-free scroll vacuum pump			
Single-phase motor, with cable and plug			
Europe (Schuko plug, 230 V)		**133 002**	**-**
US / Japan (NEMA plug, 115 V)		**133 102**	**-**
Three-phase motor, without cable		**133 004**	**133 008**
Maintenance kits			
Small maintenance kit (after 8,000 h)	Minor Kit	**EK 870000498**	**EK 870000519**
Large maintenance kit (after 16,000 h)	Major Kit	**EK 870000501**	**EK 870000520**
Tool kit SC 30/60 D		**EK 870000503**	**EK 870000521**
Scroll profile gasket (Tip Seal)		**E 870000512**	**E 870000522**
Shaft installation kit (Pin Crank Kit)		**EK 870000509**	**EK 870000523**
Eccentric shaft		**EK 870000506**	**EK 870000534**

Applications for ECODRY plus Pumps

Pumps	ECODRY 40 plus	ECODRY 65 plus
Application		
Mass spectrometry	■	■
Electron microscopy	■	■
Vacuum drying	■	■
Particle accelerators / Synchrotron	■	■
Spectroscopy	■	■
Regeneration of cryo pumps	■	■
Backing pumps for turbomolecular pumps	■	■
Surface analysis	■	■

Products

ECODRY plus multi-stage Roots vacuum pumps

ECODRY 40 plus, ECODRY 65 plus

The ECODRY plus is a newly developed family of dry-compression multi-stage Roots vacuum pumps, which sets new standards in noise reduction. The pumps have been specially designed for use in quiet and clean environments, such as analysis and research laboratories.

Operating principle

The multi-stage Roots pump is a further development of the tried-and-tested Roots pump principle. Two contactless rotating rotors turn in contrary motion within a single pump housing. The rotors do not come into contact with one another, or with the pump housing. Through their rotation, they convey the gas from the intake flange on the upper side to the outlet aperture on the underside of the suction chamber. In the multi-stage Roots pump ECODRY plus, there are eight pump chambers in succession along the same axis. The outlet apertures are connected to the respective intake aperture of the ensuing chamber via channels in the pump housing. The pump's operating range extends from the medium vacuum range to ambient pressure.

Short channels between the compression stages, combined with a high rotational speed of 12,600 rpm, make a compact construction with simultaneously high suction capacity possible. Lubrication takes place only in the shaft bearing regions. These are separated from the suction chamber by means of a wear-free sealing system, such that no lubricant can find its way into the suction chamber or into the vacuum chamber.

Low-noise operation

During the design phase, particular emphasis was placed on reducing the pumps' noise levels. The rotors' high manufacturing quality guarantees that the pumps will run with a low level of vibration, and consequently with a low level of noise, even at high inlet pressures. Efficient noise insulation is integrated within the pump housing, to shield the user from residual noise. The silencer integrated within the exhaust region further serves to minimize noise, even at high gas flow rates. These measures combine to achieve a noise level of less than 52 dB(A) – quieter than a normal conversation

Clean environment

Thanks to the oil-free suction chamber, no lubricant can enter the vacuum chamber or the area surrounding the pump from the interior of the pump. Furthermore, because the rotors operate contact-free, no abrasion debris are created in the form of particles, which could contaminate the vacuum chamber. In the case of the pump itself, this guarantees long-term stable operation with no deterioration in final pressure or suction capacity.

Ease of commissioning

The ECODRY plus models have a compact housing and are simple to operate. With integrated castors and their low weight, they can be easily rolled out of their packaging and on to their installation location. There is no need for elaborate power cabling, as the pumps can be connected directly to a single-phase electricity supply. The pumps are air-cooled, and therefore require no connection to a water supply for the purposes of cooling.

Maintenance-free operation

ECODRY plus features a friction-free operating principle, so their components are not exposed to wear in any way. The ECODRY plus's shaft bearings are designed for up to five years' operation. Maintenance measures such replacing seals or changing the oil are not required during that time.

High water vapour tolerance

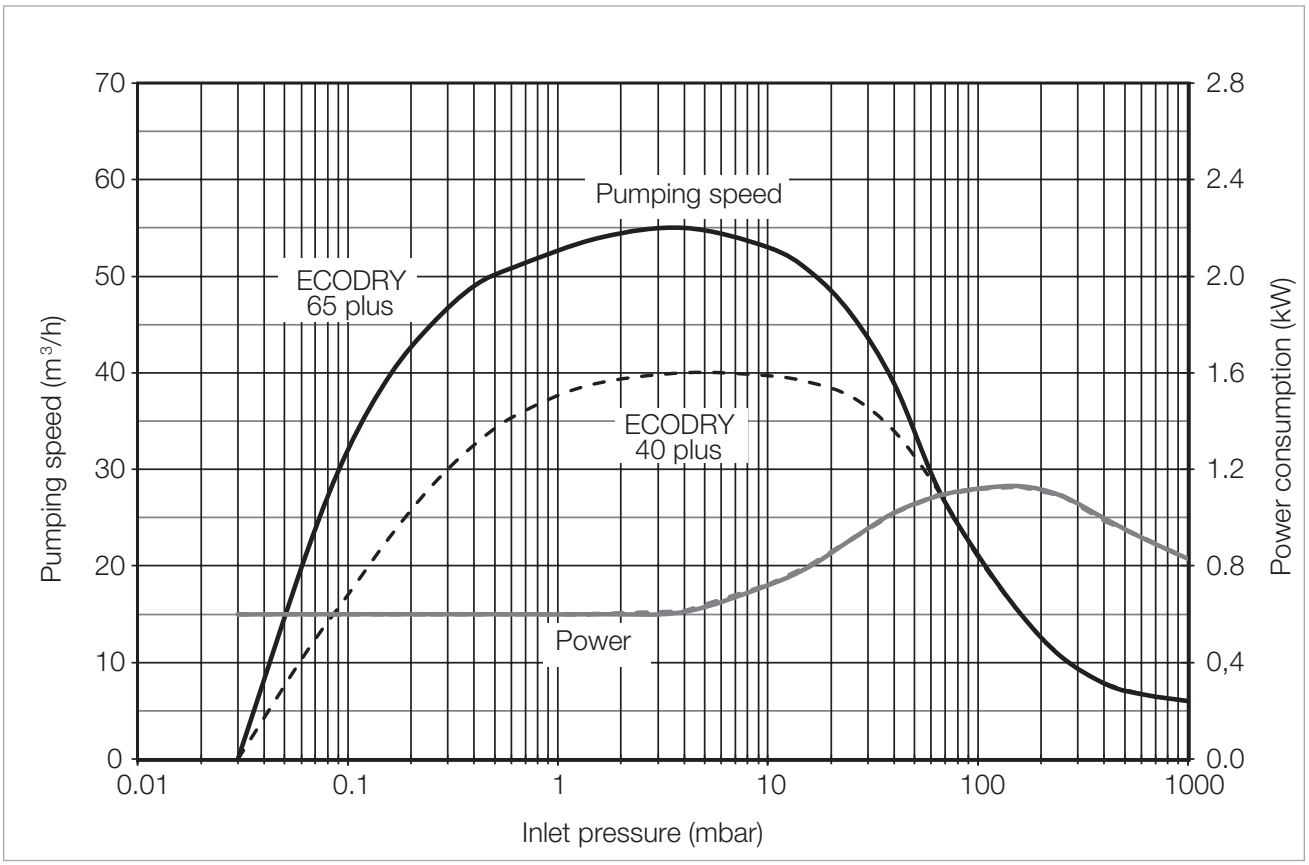
In drying applications, such as cryopump regeneration, or when pumping out vacuum chambers with large surface areas, high quantities of water vapour may accrue. Not every pump can handle this without difficulty, as condensation in the pump can lead to corrosion and pump failure. However, with its gas ballast valve open, the ECODRY plus can pump water vapour at rates of up to 500 g/h without internal condensation. Because the manually operated gas ballast inlet has an integrated silencer, the pump is quieter than any of its competitors in these applications also.

Benefits at a glance

- Quietest pump in its class – it won't disturb your work
- Clean vacuum generation with no contamination of workstation or vacuum chamber
- Many years of maintenance-free operation without deterioration of vacuum parameters

Typical applications

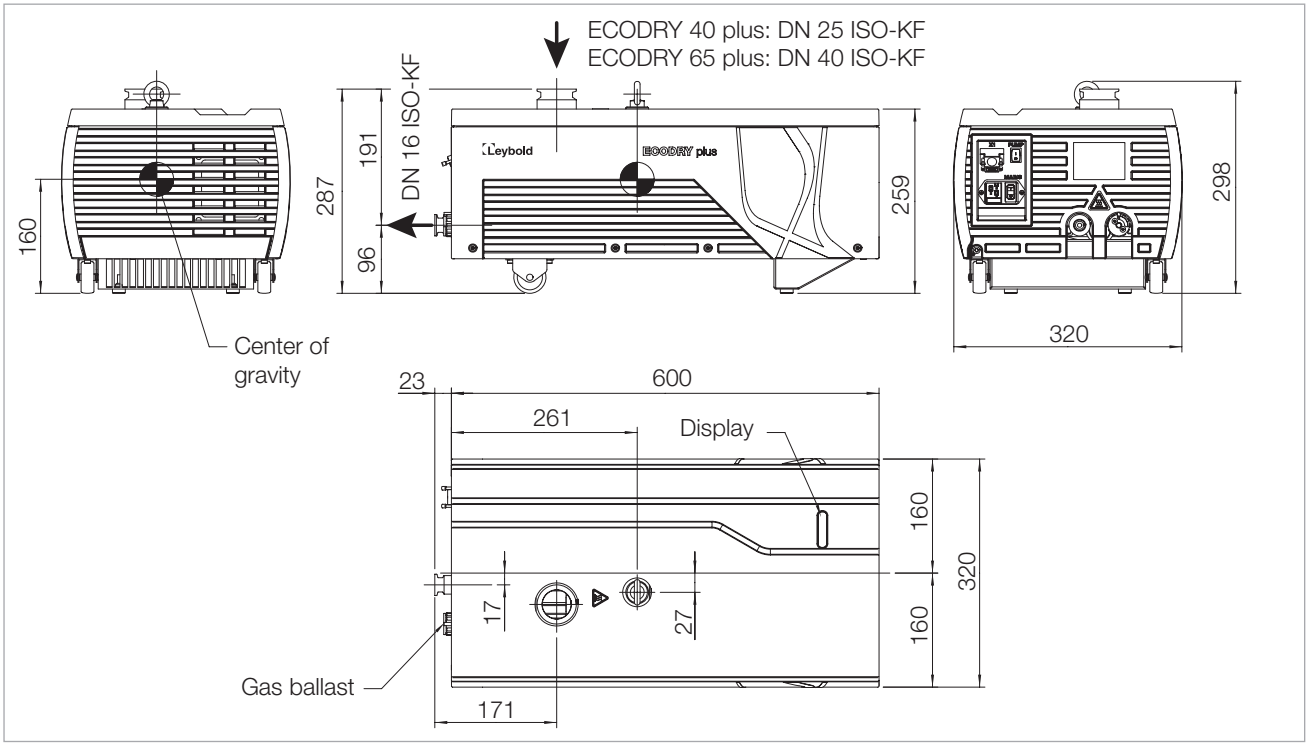
- Mass spectrometry
- Electron microscopy
- Backing pump for turbomolecular pumps
- Drying
- Accelerator/synchrotron
- Spectroscopy
- Regeneration of cryopumps
- Surface analysis



Pumping speed curves for the ECODRY plus - pumps

Technical Data

		ECODRY 40 plus	ECODRY 65 plus
Maximum pumping speed without gas ballast	m³/h	40	55
Ultimate pressure without gas ballast	mbar	< 0.03	< 0.03
Ultimate pressure with gas ballast	mbar	< 0.1	<0.1
Leak rate	mbar l/s	$< 10^{-5}$	$< 10^{-5}$
Water vapour tolerance with gas ballast	mbar	20	20
Water vapour capacity with gas ballast	g/h	300	500
Maximum permissible inlet pressure	mbar	1050	1050
Permissible ambient temperature	°C	+5 to +40	+5 to +40
Max. installation height (up to NHN)	m	2000	2000
Cooling		Air	Air
Mains voltage	V	200-240 +/- 10%	200-240 +/- 10%
Frequency	Hz	50/60	50/60
Phases		1-ph	1-ph
Max. power consumption	W	1200	1200
Power consumption at ultimate pressure	W	600	600
Plug connector for power supply		C 20 acc. to IEC 60320	C 20 acc. to IEC 60320
Rotational speed	rpm	12600	12600
Protection class	IP	42	42
Intake flange		DN 25 ISO-KF	DN 40 ISO-KF
Outlet flange		DN 16 ISO-KF	DN 16 ISO-KF
Weight, approx.	kg	43	43
Dimensions (L x W x H)	mm	623 x 320 x 298	623 x 320 x 298



Dimensional drawing for the ECODRY plus - pumps, all dimensions in mm

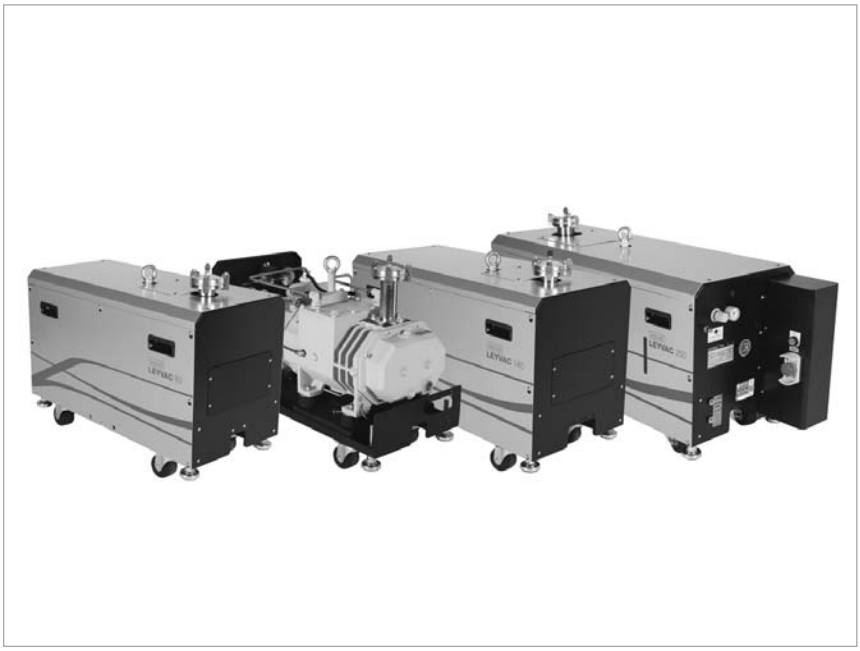
Ordering Information

	ECODRY 40 plus	ECODRY 65 plus
	Part No.	**Part No.**
Dry Compressing Vacuum Pump ECODRY plus	**161 040 V01**	**161 065 V01**
Accessories		
Mains cable (required for pump operation)		
Mains cable Europe CEE 7/7 (Schuko) – IEC-60320 C19 Length 2.0 m	**161 810 EU**	
Mains cable Great Britain BS 1363 – IEC-60320 C19 Length 2.0 m	**161 810 UK**	
Mains cable US NEMA 6-15P – IEC-60320 C19 Length 2.5 m	**161 810 US**	
Optional accessories		
Inlet screen DN 25 ISO-KF	**E41170206**	**-**
Inlet screen DN 40 ISO-KF	**-**	**E41170121**
Casing assembly mounting kit and earthquake protection	**161 831 A**	
RS485/USB connecting cable for X104 interface, 1.8 m	**161 820 USB**	
LEYASSIST software	**230 439 V01**	
Replacement control interface jumper	**161 823 A**	

Applications for LEYVAC Pumps

Dry compressing vacuum pumps	LEYVAC LV 80	LEYVAC LV 80 C	LEYVAC LV 80 CC	LEYVAC LV 140	LEYVAC LV 140 C	LEYVAC LV 140 CC	LEYVAC LV 250	LEYVAC LV 250 C	LEYVAC LV 250 CC
Applications									
Process industry									
Industrial furnaces	■	■	■	■	■	■	■	■	■
Degassing	■	■	■	■	■	■	■	■	■
Charging	■	■	■	■	■	■	■	■	■
Casting	■	■	■	■	■	■	■	■	■
Drying processes in general				■	■	■	■	■	■
Freeze drying	■	■	■	■	■	■	■	■	■
Packaging	■	■	■	■	■	■	■	■	■
Coating									
CVD coating	■	■	■	■	■	■	■	■	■
Plasma coating	■	■	■	■	■	■	■	■	■
Glass coating	■	■	■	■	■	■	■	■	■
Web coating	■	■	■	■	■	■	■	■	■
Solar									
CVD/PECVD	■	■	■	■	■	■	■	■	■
Crystal pulling and casting	■	■	■	■	■	■	■	■	■
Support functions									
Regeneration of cryo pumps	■	■	■	■	■	■	■	■	■
Forevacuum pumps for Turbomolecular pumps	■	■	■	■	■	■	■	■	■

LEYVAC
Excellent efficiency in every respect



LEYVAC LV 80, 140 and 250

Our LEYVAC dry vacuum pumps provide power combined with high performance.

This product line covers the pumping speed ranges from 80 to 300 m³/h and is especially suited to meet the special requirements of industrial processes and coating applications.
LEYVAC pumps and system combinations are rugged, reliable and durable, ready to cope with harsh process requirements.
The LEYVAC product line comprises the models LEYVAC LV 80, LV 140, LV 250 and their C or CC versions.
The new LEYVAC 250 significantly expands the performance spectrum of this product range with excellent energy efficiency characteristics.
The CC versions include an overtemperature safety shutdown facility.

Advantages to the User

- Dry pump technology
- No contact of the process gases with oil
- Shortest pumpdown times through high pumping speed for air already starting at atmospheric pressure
- Hermetically tight
  - No shaft seals
  - No oil leakage
  - Safe pumping of toxic gases
- High reliability
  - Long service intervals (up to 5 years)
  - High uptime
  - Robust and durable design
- One motor solution
  - Multi-voltage, dual frequency motor operable at 200 V - 460 V and 50/60 Hz
- Easy and modular
  - Direct coupling of roots booster pumps without frames for models RUVAC WH 700 and WA(U)/ WS(U) 251-1001

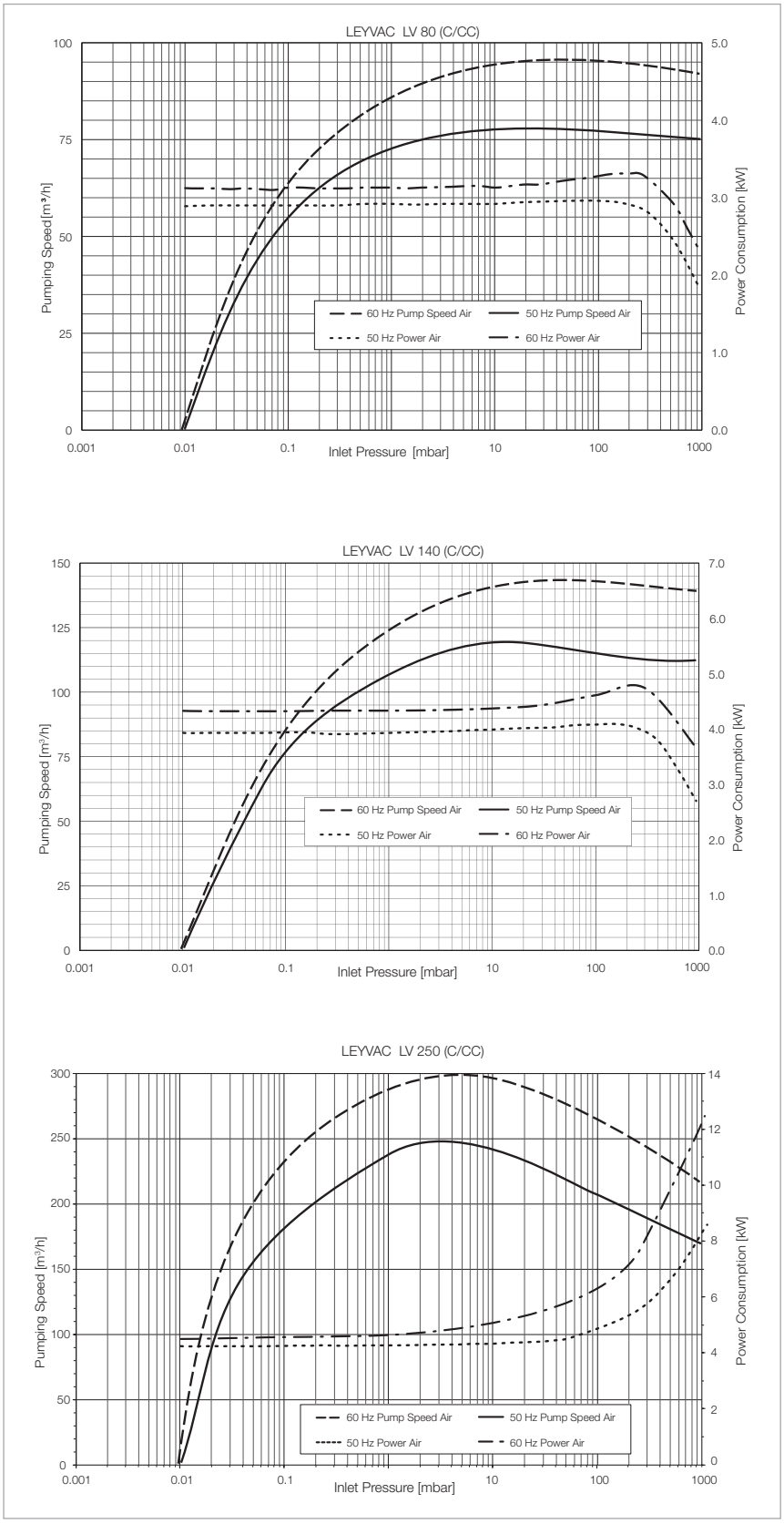
Typical Application

- Process industry
  - Industrial furnaces
  - Degassing
  - Charging
  - Casting
  - Drying processes
  - Freeze drying
  - Electron beam welding
  - Packaging
- Coating
  - PVD/CVD coating
  - Wear resistant coating
  - Optical coating
  - Web coating
  - Load locks/transfer chambers
- Solar
  - CVD/PECVD
  - Crystal pulling and casting
- Support functions
  - Regeneration of cryo pumps
  - Forevacuum pumps for turbomolecular pumps

Performance Details at a Glance

LEYVAC dry vacuum pumps provide **optimized**

- System uptime
  - Robust design based on the proven RUVAC and DRYVAC technology
  - Most effective cooling system
  - Thermal protection on board (for CC versions)
  - Tolerant to pressure shocks
  - Long intervals for bearing exchange
- Process safety
  - designed for harsh applications
- Performance data
  - High pumping speed already at high intake pressures
  - Good pumping speed also for lighter gases (with purge)
- Environmental properties
  - Low noise and low heat emission
- Price-to-performance ratio
  - Low investment costs
  - Small, price optimized pumping systems



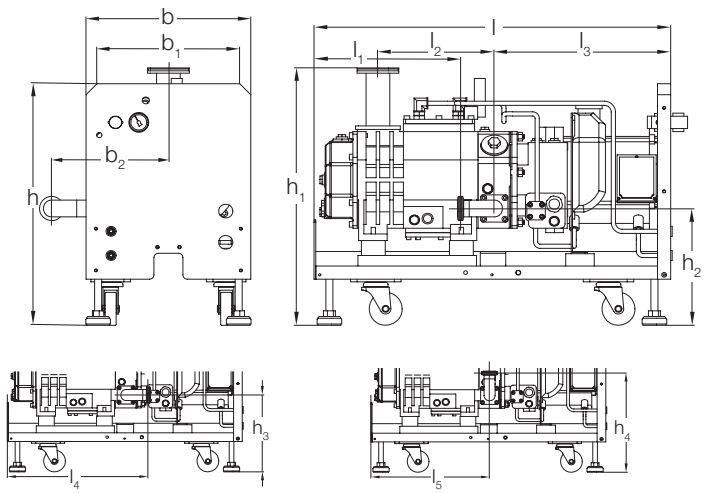
Pumping speed curves of the LEYVAC LV 80 (C/CC), LEYVAC LV 140 (C/CC) and LEYVAC LV 250 (C/CC)

Technical Data

		LEYVAC		
		LV 80 (C/CC)	LV 140 (C/CC)	LV 250 (C/CC)
Nominal pumping speed without gas ballast at 50/60 Hz				
	m³/h (cfm)	80/96 (47.1/56.5)	125/145 (73.6/85.3)	250/300 (147.1/176.6)
Ultimate pressure with seal and rotor purge	mbar (Torr)	1 x 10-2 (0.75 x 10-2)	1 x 10-2 (0.75 x 10-2)	1 x 10-2 (0.75 x 10-2)
Power consumption at ultimate pressure and 50/60 Hz operation	kW (hp)	2.9/3.2 (3.9/4.3)	3.9/4.3 (5.2/5.8)	4.2/4.7 (5.6/6.3)
Weight, approx.				
LV ...	kg (lbs)	280 (617)	300 (661)	330 (728)
LV ... C/CC	kg (lbs)	300 (661)	320 (705)	350 (772)
Noise level [1]	dB(A)	< 65	< 65	< 72
Connection flange				
Intake	DN	63 ISO-K	63 ISO-K	63 ISO-K
Discharge	DN	40 ISO-KF	40 ISO-KF	40 ISO-KF
Mains voltage (± 10%)				
LV ...	V	200 - 460	200 - 460	200 - 460
LV ... C (with housing)	V	200 - 460	200 - 460	200 - 460
LV ... CC (with housing and Temperature monitoring)	V	380 - 460	380 - 460	380 - 460
Nominal power at 50/60 Hz	kW (hp)	4.1 (5.5)	5.5 (7.4)	8.0 (10.7)
Nominal current consumption 50/60 Hz at 400 V	A	6	8	16
Cooling		water/glycol	water/glycol	water/glycol
Cooling water temperature	°C (°F)	+15 to +30 (+59 to +86)	+15 to +30 (+59 to +86)	+15 to +30 (+59 to +86)
Min. cooling water throughput	l/min	3	3	3
Water vapor tolerance (with gas ballast)				
80 slm 50/60 Hz	mbar (Torr)	20/30	125/160	-/-
150 slm 50/60 Hz [2]	mbar (Torr)	-/-	-/-	30/37
Water vapor capacity (with gas ballast)				
80 slm 50/60 Hz	kg/h	1.24/2.3	11.5/18.0	-/-
150 slm 50/60 Hz [2]	kg/h	-/-	-/-	6.3/6.5
Permissible ambient temperature	°C (°F)	+5 to +45 (+41 to +113)	+5 to +45 (+41 to +113)	+5 to +45 (+41 to +113)
Protection class EN 60529	IP	54	54	54
Dimensions (W x H x D)				
LV ... and LV ... C	mm	814 x 375 x 550	895 x 400 x 567	1051 x 425 x 537
	(in.)	(32.05 x 14.76 x 21.65)	(35.24 x 15.75 x 22.32)	(41.38 x 16.73 x 21.14)
LV ... CC	mm	984 x 375 x 550	1065 x 400 x 567	1224 x 425 x 537
	(in.)	(38.74 x 14.76 x 21.65)	(41.93 x 15.75 x 22.32)	(48.19 x 16.73 x 21.14)

[1] At ultimate pressure and with rigid exhaust line DIN EN ISO 2151

[2] 2nd case: with 24 V gas ballast kit 115005A13 fitted to port 2, standard purge also opened



Type		b	b_1	b_2	h	h_1	h_2	h_3	h_4	h_5	l (CC version)	l_1	l_2	l_3	l_4	l_5
LV 80 (C)	mm	375	320	266	550	576	266	266	341	191	814 (984)	335	265	402	485	410
	in.	14.76	12.60	10.47	21.65	22.68	10.47	10.47	13.43	7.52	32.05 (38.74)	13.19	10.43	15.83	19.09	16.14
LV 140 (C)	mm	400	350	285	567	597	257	257	332	182	895 (1065)	364	297	453	514	439
	in.	15.75	13.78	11.22	22.32	23.50	10.12	10.12	13.07	7.17	35.24 (41.93)	14.33	11.69	17.84	20.24	17.28
LV 250 (C)	mm	425	375	285	537	570	230	230	305	155	1051 (1224)	512	420	464	662	587
	in.	16.73	14.76	11.22	21.14	22.44	9.06	9.06	12.01	6.01	41.38 (48.19)	20.16	16.54	18.27	26.06	21.93

Dimensional drawing for the LEYVAC LV 80/C and LV 140/C; below for exhaust connection

Ordering Information

	LEYVAC LV 80 (C/CC)	LEYVAC LV 140 (C/CC)	LEYVAC LV 250 (C/CC)
	Part No.	**Part No.**	**Part No.**
Dry compressing vacuum pump LEYVAC			
including LEYBONOL LVO 410 lubricant, base plate, castors, temperature switch, shaft seal and rotor purge	**115080V15**	**115140V15**	**115250V15**
including LEYBONOL LVO 410 lubricant	**115080V40**	**115140V40**	**115250V40**
additionally with casing (C version)	**115080V30**	**115140V30**	**115250V30**
additionally with casing and temperature monitoring (CC version)	**115080V35**	**115140V35**	**115250V35**
Accessories			
Non-return ball valve	**115005A01**	**115005A01**	**115005A01**
Non-return valve, spring-loaded	**115005A02**	**115005A02**	**–**
Roots pump adapter for RUVAC WS/WSU 251/501 and WH 700	**115005A03**	**115005A03**	**115005A05**
Adapter ring for RUVAC WA(U)/WS(U)1001	**–**	**115005A04 and 115005A03**	**115005A06 and 115005A05**
Exhaust pressure sensor			
LV 80	**115005A10**	**–**	**–**
LV 140	**–**	**115005A11**	**–**
LV 250	**–**	**–**	**115005A09**
Gas ballast kit			
manually operated	**115005A12**	**115005A12**	**115005A12**
24 V	**115005A13**	**115005A13**	**115005A13**
Silencer			
standard (with integrated non-return valve)	**115005A20**	**115005A20**	**-**
serviceable	**115005A22**	**115005A22**	**115005A22**
emptyable	**115005A23**	**115005A23**	**-**
High-performance silencer	**115005A21**	**115005A21**	**115005A21**
Elbow for silencer, emptyable	**115005A26**	**115005A26**	**115005A26**
Inlet screen	**115005A28**	**115005A28**	**115005A28**
External frequency converter (including mains filter) for			
LEYVAC LV 80 (400 V)	**115005A30**	**–**	**–**
LEYVAC LV 80 (200 V)	**115005V31**	**–**	**–**
LEYVAC LV 140 (400 V)	**–**	**115005A35**	**–**
LEYVAC LV 140 (200 V)	**–**	**115005V36**	**–**
LEYVAC LV 250 (400 V)	**–**	**–**	**115005A40**
Profibus module [1)]	**155212V**	**155212V**	**155212V**
Relais module (digital output) [1)]	**112005A01**	**112005A01**	**112005A01**
Ethernet interface module [1)]	**112005A02**	**112005A02**	**112005A02**
ProfiNet module [1)]	**112005A35**	**112005A35**	**112005A35**
EtherCAT module [1)]	**112005A36**	**112005A36**	**112005A36**

[1)] For optional, external frequency converter

Notes

Applications for SCREWLINE Pumps

Dry Compressing Scroll Vacuum Pumps	SCREWLINE SP 250 (ATEX)	SCREWLINE 630 (F) ATEX
Application		
Food processing	■	■
Vacuum coating	■	■
Lamination	■	■
Loadlock chambers	■	■
Mechanical engineering	■	■
Automotive industry	■	■
Metallurgy/Furnaces	■	■
Crystal pulling	■	■
Degassing	■	■
Electrical engineering	■	■
Energy technology	■	■
Welding technology	■	■
Lamps/Tubes manufacture	■	■
Cooling and air conditioning	■	■
Chemistry/Pharmaceuticals	■	■
Chemical research laboratories	■	■
Vacuum drying	■	■
Freeze drying systems	■	■
Environmental engineering	■	■
Packaging	■	■
Medical technology	■	■
Analytical engineering	■	■
Research and development	■	■
Space simulation	■	■
Backing pump for HV-Systems	■	■

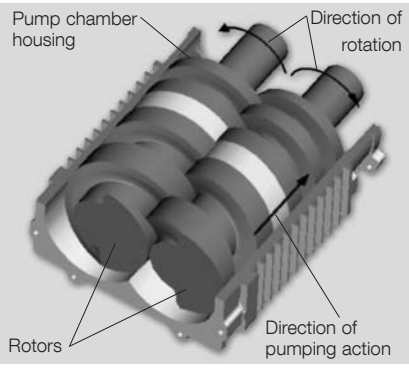
Products

Screw Vacuum Pump SCREWLINE SP 630

The Screw Vacuum Pumps SCREWLINE were developed in view of the special requirements of industrial applications. The innovative design allows these pumps to be used whenever reliable, compact and low maintenance vacuum solutions are required.

Principle of Operation

Screw Vacuum Pumps are dry compressing backing pumps, the operation of which is based on the screw principle. The pumping chamber of the pump is formed by two synchronised positive displacement rotors and the housing enclosing these. Since the rotors rotate in opposite directions, the chambers move steadily from the intake to the exhaust side of the pumps thereby resulting in a smooth pumping action (see figure below). Since with a single Screw Vacuum Pump rotor pair a multistage compression process is implemented, the component count in the pumping path is very low. In this way maintenance and servicing work is much simplified.



Principle of operation of the SCREWLINE Line

Properties

The direct pumping path without multiple deflections for the medium make the Screw Vacuum Pumps highly insensitive to foreign materials. This ensures a high uptime in industrial processes.

The two non-contacting shaft-seals are practically wear-free, which allows for very long maintenance intervals. Shaft seal purge is usually required in industrial applications. SCREWLINE pumps are equipped with a purge gas supply unit.

Because of the cantilevered bearing arrangement for the Screw Vacuum Pump rotors, a potential source of failure (i.e. a bearing on the intake side) is entirely eliminated. On the one hand, no lubricants from the bearings can enter into the vacuum process, and the other hand also an impairment of the bearing by aggressive process media can be excluded.

A further benefit of the cantilevered bearing arrangement is the easy accessibility of the pump chamber. This innovative design feature allows the removal of the pump housing without time-consuming and costly disassembly of the bearings. Thus on-site cleaning of all surfaces in contact with the medium is possible. In particular, if the processes involved considerable amounts of contaminants this is a significant advantage which ensures a long uptime.

The low exhaust temperature is an important advantage of the Screw Vacuum Pumps. Owing to the design of the screw rotors, a temperature of maximum 100 °C (212 °F) is attained inside the pump. Thus deposits of many substances are avoided which react at high temperatures. This makes the pump unique and many customers, above all from the field of coating, value this highly.
Should deposits form in spite of this, then the easy to disassemble housing facilitates rapid cleaning.

Besides the integrated oil cooling arrangement for the rotors, the Screw Vacuum Pumps are air-cooled from the outside. Here rotor and housings are thermally linked via the oil cooler. Thus, Screw Vacuum Pumps adapt themselves ideally to the ambient conditions under changing operating situations.

Oil/water cooling unit SP 630 F

A water-cooled version is offered as Screw Vacuum Pumps SP 630 F. This product version is intended for operation in air-conditioned rooms.

The Screw Pumps portfolio is completed through ATEX-certified variants.

Moreover, the Screw Vacuum Pumps portfolio also includes pump versions suited for pumping pure oxygen (O_2).

Maintenance and Monitoring

During the development of the Screw Vacuum Pumps, special emphasis was placed on a particularly simple maintenance concept. This has been implemented through the cantilevered bearing arrangement, with all maintenance components and controls having been located on the so-called service side for easy accessibility. Thus, the space requirement which needs to be taken into account during planning has been optimized. The lower space requirement gives the user more flexibility during installation of the pump.

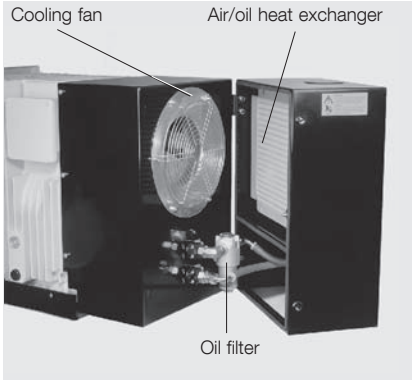
The monitoring system SP-GUARD was developed especially for constant real-time monitoring of the operational status of the Screw Vacuum Pumps. The operating parameters are constantly acquired and processed. This enables the user to introduce preventive actions early enough so as to ensure trouble-free operation of his Screw Vacuum Pumps. The key current operating parameters can be read off from a local display. Moreover, connection to a PLC and remote monitoring is possible. Maintenance of the Screw Vacuum Pumps will generally be limited to a regular visual inspection of the pump and the annual change of gear oil and oil filter. The oil fill ports as well as the filters are readily accessible and can be easily exchanged.

With the aid of a flushing kit (optional) it is possible to clean the pump chamber, while the pump is operating without process. Deposits due to the process can thus be removed effectively and quickly without the need of having to disassemble the housing.

Also, cleaning of the air/oil heat exchanger can be done simply on-site by blowing out the heat exchanger with compressed air.

Accessories

Screw Vacuum Pumps offer to the user a high degree of flexibility. Inlet and exhaust connections are made through universal flanges, respectively clamped flanges, permit simple integration within the system. Through the accessories which are available, the pump can be optimally adapted to the individual requirements of differing applications.



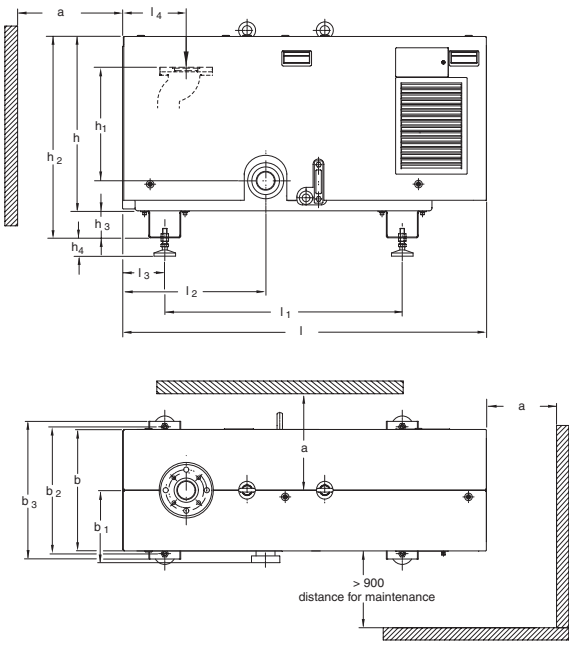
Oil/water cooling unit SP 630

Advantages to the User

- Utmost reliability
  - Protection of the pump through monitoring vital parameters by means of the SP-GUARD
  - Minimum downtimes owing to rapid cleaning of the pump chamber (in less than one hour)
  - Avoidance of deposits through low internal temperatures
- Minimum operating costs
  - The only directly air cooled screw vacuum pump on the market. No need for cooling water
  - No seal gas needed for standard applications
- No oil in the pump chamber. Thus no need for disposing of contaminated oil
  - Gear oil change only every two years
- Utmost flexibility
  - Direct adaptation of RUVAC pumps for increased pumping speed up to approximately 7000 m^3/h
  - Multi-flange for all commonly used pipe connections
  - Flushing kit for constant cleaning of the pump chamber
  - Silencing hoods for a further reduction of noise emissions

Typical Applications

- Industrial furnaces
- Coating technology
- Load lock chambers
- Metallurgical systems
- Food processing
- Drying processes
- Degassing
- Research and development
- Lamps and tubes manufacture
- Automotive industry
- Packaging industry
- Space simulation
- Electrical engineering
- Energy research

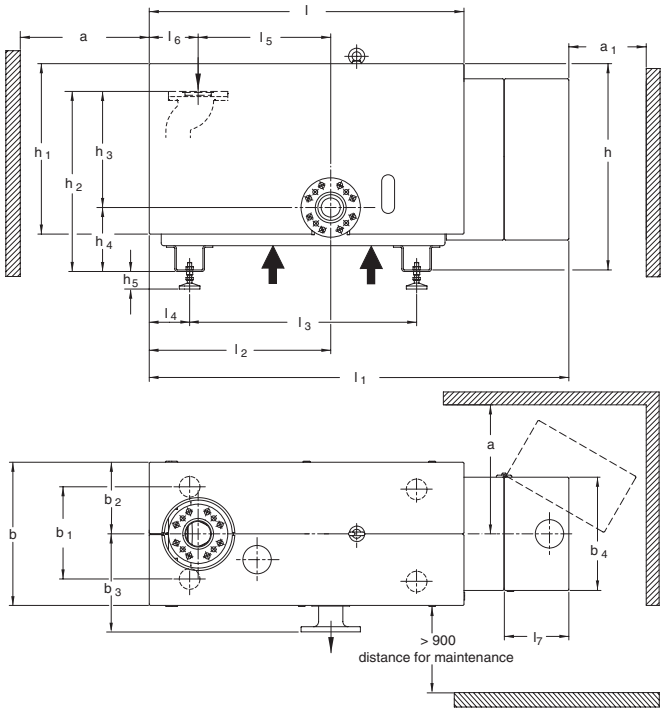


	a	b	b_1	b_2	b_3
mm	> 500	450	268	470	510
in.	> 19.69	17.72	10.55	18.50	20.08

	h	h_1	h_2	h_3	h_4
mm	646	385	746	100	68 - 75
in.	25.43	15.16	29.37	3.94	2.68 - 2.95

	l	l_1	l_2	l_3	l_4
mm	1348	880	529	156	236
in.	53.08	34.65	20.83	6.14	9.29

Dimensional drawing for the SCREWLINE SP 250

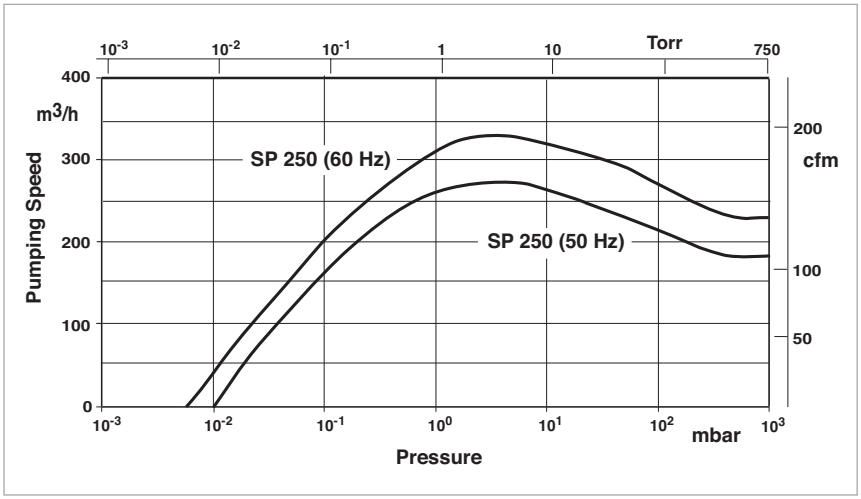


	a	a_1	b	b_1	b_2	b_3	b_4
mm	> 500	> 300	555	470	276	380	439
in.	> 19.69	> 11.81	21.85	18.50	10.87	14.96	17.28

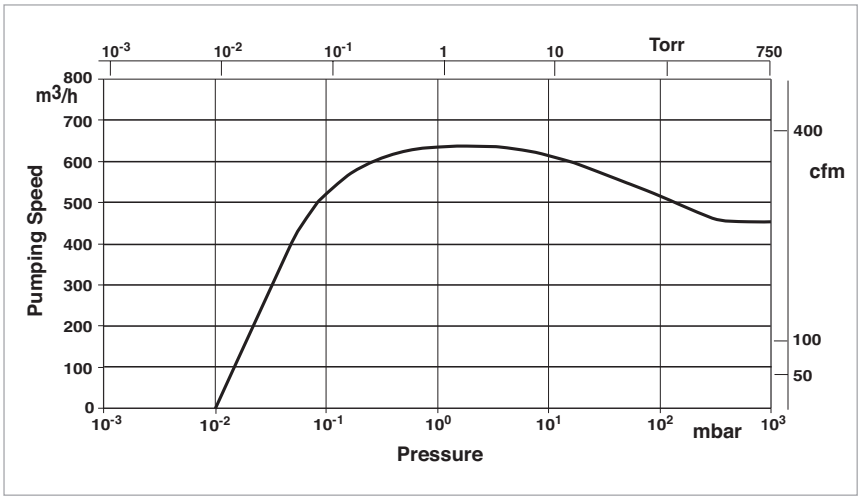
	h	h_1	h_2	h_3	h_4	h_5	l
mm	806	636	698	450	248	68	1220
in.	31.73	25.04	27.48	17.72	9.76	2.68	48.03

	l_1	l_2	l_3	l_4	l_5	l_6	l_7
mm	1626	703	880	157	514	189	250
in.	64.02	27.68	34.65	6.18	20.24	7.44	9.84

Dimensional drawing for the SCREWLINE SP 630



Effective pumping speed of the SCREWLINE SP 250 for air, without gas ballast (50/60 Hz)



Effective pumping speed of the SCREWLINE SP 630 for air, without gas ballast

Technical Data

SCREWLINE SP 250

	50 Hz	60 Hz
Effective pumping speed m³/h (cfm)	270 (157)	330 (194)
Ultimate pressure, total mbar (Torr)	≤ 0.01 (≤ 0.0075)	≤ 0.005 (≤ 0.0038)
Permissible intake pressure, max. mbar (Torr)	1030 (773)	1030 (773)
Maximum exhaust pressure with reference to the ambient pressure	$p_{ex} = p_{amb}$ + 200 mbar (150 Torr) – 50 mbar (37 Torr)	$p_{ex} = p_{amb}$ + 200 mbar (150 Torr) – 50 mbar (37 Torr)
Permissible ambient temperature °C (°F)	+10 to +40 (+50 to +104)	+10 to +40 (+50 to +104)
Water vapour tolerance (with gas ballast) mbar (Torr)	60 (45)	75 (56)
Water vapour capacity (with gas ballast) kg/h (gal/h)	10 (2.7)	18 (4.9)
Installation location	up to 3000 metres (9.800 feet) (above sea level)	up to 3000 metres (9.800 feet) (above sea level)
Cooling	Air	Air
Power supply at operating voltage ΔΔ Δ	32.0 A / 200 V (cos phi 0.88) 16.0 A / 400 V (cos phi 0.88)	31.5 A / 210 V (cos phi 0.88) 15.5 A / 460 V (cos phi 0.88)
Nominal power kW (HP)	7.5 (10.0)	7.5 (10.0)
Power consumption at ultimate pressure kW (HP) kW (HP)	5.9 (8.0) at 3-ph. 200 V / 400 V 6.5 (8.8) at 3-ph. 500 V	7.2 (9.8) at 3-ph. 200 V / 400 V –
Energy efficiency class	IE 2	IE 2
Motor rotational speed rpm	2920	3505
Type of protection IP	55	55
Thermal protection class	F	F
Lubricant filling (LVO 210) l	7	7
Intake flange, standard Clamping flange Bolt flange Bolt flange	ISO 1609-1986 (E)-63 (DN 63 ISO-K) [1] ASME B 16.5 NPS 3 class 150 EN 1092-2-PN 6 - DN 65	ISO 1609-1986 (E)-63 (DN 63 ISO-K) [1] ASME B 16.5 NPS 3 class 150 EN 1092-2-PN 6 - DN 65
Exhaust flange, standard Clamping flange	ISO 1609-1986 (E)-63 (DN 63 ISO-K)	ISO 1609-1986 (E)-63 (DN 63 ISO-K)
Exhaust flange, optional Clamping flange Bolt flange Bolt flange Bolt flange	ISO 1609-1986 (E)-63 (DN 63 ISO-K) [1] ASME B 16.5 NPS 3 class 150 EN 1092-2-PN 16 - DN 65 EN 1092-2-PN 6 - DN 65	ISO 1609-1986 (E)-63 (DN 63 ISO-K) [1] ASME B 16.5 NPS 3 class 150 EN 1092-2-PN 16 - DN 65 EN 1092-2-PN 6 - DN 65
Materials (components in contact with the gas)	Aluminum, aluminum anodic oxidised, C steel, CrNi steel, grey cast-iron, FPM (FKM) ((Viton))	Aluminum, aluminum anodic oxidised, C steel, CrNi steel, grey cast-iron, FPM (FKM) ((Viton))
Weight, approx. kg (lbs)	450 (992)	450 (992)
Dimensions (W x D x H) mm (in.)	1350 x 530 x 880 (53.1 x 20.9 x 34.6)	1350 x 530 x 880 (53.1 x 20.9 x 34.6)
Noise level [2] dB(A)	67	72

[1] This flange is required when ISO-K flanges are to be connected (Part No. 267 47)

[2] With connected exhaust gas line at ultimate pressure

Ordering Information

SCREWLINE SP 250

	Standard	ATEX	O_2
	Part No.	Part No.	Part No.
Screw Vacuum Pump SP 250 (50/60 Hz) with manual gas ballast and purge gas unit	115 001 [1]	–	–
with purge gas unit, castors and manual gas ballast valve	115 006 [1]	–	–
with electromagnetic gas ballast and purge gas unit Category 3GD IIC 160 °C (320 °F) inside	–	115 003 [1, 2]	–
with electromagnetic gas ballast Purge vent vit, FFPM gaskets and purge gas unit Category 2G3D b IIC 135 °C (275 °F) inside/ Category 3GD Ex nA IIC 160 °C (320 °F) outside	–	115 012V11 [1]	–
with electromagnetic gas ballast and purge gas unit SP-GUARD	–	–	115 019 [1, 3]
Accessories			
Exhaust silencer	119 002	119 002	119 002
Serviceable silencer	119 003V	119 003V	119 003V
Exhaust non-return valve (DN 65 PN 6)	119 011	–	–
Solenoid gas ballast kit, 24 V [4]	119 054V	–	–
Adaptor for RUVAC 501/1001	119 022	119 022	119 022
Purge gas retrofit kit	119 031	–	–
Inlet filter adapter DN 63 ISO-K	119 019	119 019	–
Dust filter	951 68	–	–
Purge vent kit	119 061V	119 061V	119 061V
Oil change kit	EK 110 000 820	EK 110 000 820	EK 110 000 820
Screw inspection kit	EK 110 000 821	EK 110 000 821 [5]	EK 110 000 821
Purge gas connection servicing kit	EK 110 000 834	EK 110 000 834	EK 110 000 834
Filter for gas ballast	E 110 000 980	E 110 000 980	E 110 000 980
Filter for purge gas valve unit	E 110 000 850	E 110 000 850	E 110 000 850
Absorbing felt	E 110 002 435	E 110 002 435	E 110 002 435
Silencer service kit	EK 500 003 476	EK 500 003 476	EK 500 003 476
Seal kit non-return valve SP 250	EK 110 000 828	EK 110 000 828	EK 110 000 828
Seal kit RUVAC adaptor SP 250	EK 110 000 835	EK 110 000 835	EK 110 000 835
Vibration element RUVAC adaptor SP 250	ES 110 000 2677	ES 110 000 2677	ES 110 000 2677

[1] All pumps are equipped as standard with an SP-GUARD

[2] Only ATEX Category 3i (Directive 94/9/EG)

[3] T4 with max. $p_{ex} = p_{amb}$ + 200 mbar / - 50 mbar

[4] This accessory item can only be used beginning with SN (serial number) 31000530865

[5] Only for Part No.

For all enquiries and orders relating to category 1 and 2 ATEX products please exclusively use our ATEX questionnaire. You can find this questionnaire at the end of the full-line catalog together with the fax forms or on the Internet under "www.leybold.com" under Download Documents in the area Documentation.

Technical Data

	SCREWLINE SP 630	
	50 Hz	60 Hz
Effective pumping speed m³/h (cfm)	630 (371)	630 (371)
Ultimate total pressure mbar (Torr)	≤ 0.01 (≤ 0.0075)	≤ 0.01 (≤ 0.0075)
Intake pressure limits, max. mbar (Torr)	1030 (773)	1030 (773)
Maximum exhaust pressure with reference to the ambient pressure	$p_{ex} = p_{amb}$ + 200 mbar (150 Torr) – 50 mbar (37 Torr)	$p_{ex} = p_{amb}$ + 200 mbar (150 Torr) – 50 mbar (37 Torr)
Permissible ambient temperature °C (°F)	+10 to +40 (+50 to +104)	+10 to +40 (+50 to +104)
Water vapour tolerance (with gas ballast) mbar (Torr)	40 (30)	40 (30)
Water vapour capacity (with gas ballast) kg/h (gal/h)	14 (3.7)	14 (3.7)
Installation location	up to 3000 metres (9.800 feet) (above sea level)	up to 3000 metres (9.800 feet) (above sea level)
Cooling	Air	Air
Power supply ΔΔ Δ Y [1]	56 A / 200 V 28 A / 400 V 16 A / 690 V	52 A / 210 V 24 A / 460 V –
cos φ	0.89	0.90
Nominal power kW (HP)	15 (20)	15 (20)
Power consumption at ultimate pressure kW (HP)	< 11 (< 15)	< 11 (< 15)
Energy efficiency class	IE 2	IE 2
Motor rotational speed rpm	2930	3530
Type of protection IP	55	55
Thermal protection class	F	F
Lubricant filling (LVO 210) l	13	13
Intake flange and exhaust flange compatible with bolt flanges	EN 1092-2 - PN 6 - DN 100 EN 1092-2 - PN 16 - DN 100 ISO 1609-1986 (E)-100 (DN 100 ISO-K) [2] ASME B 16.5 NPS4 class 150	EN 1092-2 - PN 6 - DN 100 EN 1092-2 - PN 16 - DN 100 ISO 1609-1986 (E)-100 (DN 100 ISO-K) [2] ASME B 16.5 NPS4 class 150
Materials (components in contact with the gas)	Aluminum, aluminum anodic oxidised, C steel, CrNi steel, grey cast-iron, FPM (FKM) ((Viton))	Aluminum, aluminum anodic oxidised, C steel, CrNi steel, grey cast-iron, FPM (FKM) ((Viton))
Weight, approx. kg (lbs)	530 (1166)	530 (1166)
Dimensions (W x D x H) mm (in.)	1630 x 660 x 880 (64 x 26 x 35)	1630 x 660 x 880 (64 x 26 x 35)
Noise level [3] dB(A)	73	75

[1] 690 V upon request

[2] This flange is required when ISO-K flanges are to be connected (Part No. 267 50)

[3] With connected exhaust gas line at ultimate pressure

Additional Technical Data

	SCREWLINE SP 630 F	
	50 Hz	60 Hz
Cooling	Water	Water
Water connection G	1/2" ISO 228-1	1/2" ISO 228-1
Water temperature °C (°F)	+5 to +35 (+41 to +95)	+5 to +35 (+41 to +95)
Minimum water feed pressure bar (psi, gauge)	2 (15)	2 (15)
Nominal flow at a water feed temperature of 25° C (77 °F) l/min (gal/min)	12 (3)	12 (3)
Noise level [1] dB(A)	71	71

[1] With connected exhaust gas line at ultimate pressure

Ordering Information

SCREWLINE SP 630 Standard / SP 630 F Standard

	50 Hz	60 Hz
	Part No.	Part No.
Screw Vacuum Pump SP 630 air cooled, with manual gas ballast	117 007	117 008
Screw Vacuum Pump SP 630 F water cooled, with adapter for RUVAC 2001 and electromagnetic gas ballast	117 105	117 106
with manual gas ballast	117 107	117 108
with purge gas kit and manual gas ballast	117 113	117 114
Screw Vacuum Pump SP 630 water cooled, with castors, purge gas kit and electromagnetic gas ballast	117 117	117 118

All pumps are equipped as standard with an SP-GUARD

Ordering Information

SCREWLINE SP 630 ATEX / SP 630 F ATEX

	50 Hz	60 Hz
	Part No.	Part No.
Screw Vacuum Pump SP 630 with purge gas kit manual gas ballast and air cooled, Category 3G IIC (160 °C (320 °F)) inside	117 017	117 018
with purge gas kit 24 V gas ballast and water cooled, Category 3G IIC (160 °C (320 °F)) inside	117 115	117 116
Screw Vacuum Pump SP 630 F water cooled Category 2G3D IIC (160 °C (320 °F)) Category 3G IIC T3 (160 °C (320 °F)) with purge gas monitor, adapter for RUVAC 2001 and electromagnetic gas ballast	117 111V11	117 112V11

All pumps are equipped as standard with an SP-GUARD

For all enquiries and orders relating to category 1 and 2 ATEX products please exclusively use our ATEX questionnaire.
You can find this questionnaire at the end of the full-line catalog together with the fax forms or
on the Internet under "www.leybold.com" under Download Documents in the area Documentation.

Ordering Information

SP 630 O_2

	50 Hz	60 Hz
	Part No.	Part No.
Screw Vacuum Pump SP 630 with purge gas monitor and electromagnetic gas ballast	117 039	117 040

All pumps are equipped as standard with an SP-GUARD

Ordering Information

Accessories

SCREWLINE SP 630 Standard / SP 630 F Standard

50 Hz / 60 Hz

	Part No.
Exhaust silencer	**119 001**
Serviceable silencer	**119 004V**
Roots pump adapter for RUVAC 1001 [1] for RUVAC 2001 for RUVAC WH(U) 2500 [1] for RUVAC WH 4400 [1]	 **500 003 173** **119 021** **155222V** **119 024V**
Dust filter [2] Elbow 90° (DN 100 ISO-K) Clamping screws for DN 63-250 ISO-K Centering ring for DN 100 ISO-K	**951 72** **887 26** **267 01** **268 06**
Purge vent Kit	**119 060V**
Inlet filter adapter DN 100 ISO-K	**119 020**
Solenoid gas ballast kit, 24 V from serial number 31000530865	 **119 054V**
Non-return valve (DN 100 PN 6)	**119 010**
Purge gas retrofit kit [3]	**119 030**
Maintenance kit, level 1 (oil change kit) up to serial number 31000197911 from serial number 31000197911	 **EK 110 000 792** **EK 110 000 832**
Maintenance kit, level 2 (rotor inspection kit)	**EK 110 000 793**
Purge gas connection servicing kit	**EK 110 000 827**
Filter for gas ballast	**E 110 000 980**
Filter for purge gas valve unit	**E 110 000 850**
Water filter maintenance kit for SP 630 F	**EK 110 000 813**
Silencer service kit	**EK 500 003 475**
Seal kit for SP 630 check valve	**EK 110 000 815**

[1] Must mount to adapter Part No. 119 021

[2] For information on the dust filter please refer to the Catalog Part “Oil sealed Vacuum Pumps”, Section “SOGEVAC”, Chapter “Accessories”

[3] Not for ATEX pumps and pumps which comprise this already

Notes

Applications for DRYVAC Pumps

Pumps / Applications	DRYVAC DV 450	DRYVAC DV 450 S	DRYVAC DV 450 C	DRYVAC DV 650	DRYVAC DV 650 S	DRYVAC DV 650 C	DRYVAC DV 1200	DRYVAC DV 1200 -i
Automotive industry	■			■			■	
Electrical engineering	■			■			■	
Energy technology			■	■		■	■	
Degassing	■			■			■	
Research and development	■		■	■		■	■	■
Freeze drying	■		■	■		■	■	
Industrial gases	■		■	■		■	■	
Refrigeration and air conditioning	■			■			■	
Crystal pulling/casting	■		■	■		■	■	
Lamination	■			■		■	■	
Leak testing machines	■	■		■	■		■	■
Loadlock chambers		■			■			■
Metallurgy/Furnaces	■			■			■	
Plasma cleaning or activation	■		■	■		■	■	
Welding technology	■	■		■	■		■	■
Sterilization			■			■		
Vacuum coating			■			■		■
Vacuum drying	■	■		■	■		■	■
Packaging	■			■			■	■
Space simulation	■			■			■	■
Wind turbines	■			■			■	
Backing pump for highvacuum systems	■			■			■	■

Oil for DRYVAC pumps for different pump types

Pumps / LEYBONOL Oils	DRYVAC DV 450	DRYVAC DV 450 S	DRYVAC DV 450 C	DRYVAC DV 650	DRYVAC DV 650 S	DRYVAC DV 650 C	DRYVAC DV 1200	DRYVAC DV 1200 -i
LVO 210	■	■		■	■		■	■
LVO 410		■	■		■	■		■

■ = Standard

The table only lists general applications. Your specific requirements might be subject to deeper analysis.
For further questions, please contact our technical Sales support.

For information on oil specifications please refer to Catalog Part "Oils / Greases / Lubricants LEYBONOL®".

Oil for DRYVAC pumps for different fields of application

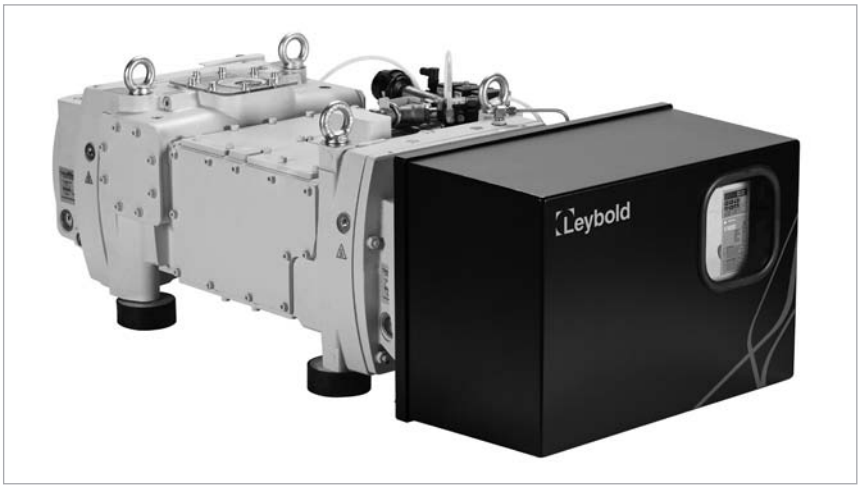
LEYBONOL Oils Applications	LVO 210	LVO 410
Automotive industry	■	
Electrical engineering	■	
Energy technology	■	
Degassing	■	
Research and development	■	
Freeze drying	■	
Industrial gases	■	
Refrigeration and air conditioning	■	
Crystal pulling/casting	■	
Lamination	■	
Leak testing machines	■	
Loadlock chambers	■	
Metallurgy/Furnaces	■	
Plasma cleaning or activation	●	■
Welding technology	■	
Sterilization	■	
Vacuum coating	■	
Vacuum drying	■	
Packaging	■	
Space simulation	■	
Wind turbines	■	
Backing pump for highvacuum systems	■	
Oxygen processes		■
PECVD		■

■ = Standard
● = Possible

The table only lists general applications. Your specific requirements might be subject to deeper analysis. For further questions, please contact our technical Sales support.

For information on oil specifications please refer to Catalog Part "Oils / Greases / Lubricants LEYBONOL®".

DRYVAC
DV 450 to DV 1200 -i



DRYVAC DV 650

DRYVAC DV 1200 -i

DRYVAC – The benchmark in industrial vacuum processes

The DRYVAC dry screw pumps provide high pumping speeds down to the lowest vacuum pressure levels required in industrial processes. The pumps provide continuous production output in your stressful environment minimizing the risk of contamination thanks to modern oil-free technology.

If you already own a mechanical booster, consider that dry pumps have the same low level of requirement in terms of maintenance and service.

All DRYVAC variants are water cooled, very compact and easy to combine into systems, in particular with the well-proven Roots pumps of the RUVAC WH series.

Concerning basic and full blown plug & play system combination of DRYVAC and RUVAC please refer the chapter DRYVAC SYSTEMS DS.

DRYVAC Versions

The DRYVAC-i versions and DS-i-Systems (see chapter DRYVAC Systems DS) expand the DRYVAC by an on board controller with a touch screen display and a user interface allowing plug&play operation and configuration. Different interfaces are available: 24 V I/O, Profibus, Ethernet IP

DRYVAC 450/650 with external variable speed drive (FC) are available on request. These are named DV – r

The DRYVAC DV 650 200 V comes with an external variable speed drive (FC) as standard.

All DRYVAC DV 1200 come on a base plate with casters, adjustable feet and enclosure.

All DRYVAC S and C and DV 1200 versions comprise a water cooling unit which includes water distributions, a pressure reducer and an overpressure safety valve.

.

Features and Benefits

Maintenance

- Minimal maintenance requirements lead to lowest cost of ownership
- Extended periods between user intervention
- Lower consumable costs

Performance

- Very stable pumping speed gives repeatability to processes
- Continuous pumping at atmosphere
- Ability to handle dust, vapors and process by-products
- Dry eliminates back-streaming, thus protecting reactive alloys from contamination

Design

- Superior and compact design
- Energy-efficient (benchmark in 650 class)
- Integrated variable speed drive cannot be harmed by industrial cooling water or dust
- Flexible to use (three inlet ports and low height)

Safety

- Low noise levels
- No hazardous oil vapors

The best DRYVAC for every application

For industrial processes of all kinds, where rapid pumping down and short cycling (e.g. load locks) is requires the DRYVAC Industrial is the best solution.

The DRYVAC DV industrial versions (with **lubricant LVO 210, synthetic oil**) deliver an excellent pumping speed also in processes with pressures exceeding 100 mbar. They are suited for short cycle operation or for evacuation of large vacuum chambers.

The DRYVAC DV pumps are furthermore equipped with all features necessary for process industry applications (Purge gas unit including rotor purge or gas ballast for example).

In application with high oxygen concentrations, corrosive gasses or harsh PECVD processes pumps with **lubricant LVO 410 (PFPE)** are required. In these applications the DRYVAC DV C models are the right choice

Typical Applications

- Metallurgy
- Coating
- Drying
- Solar
- Vacuum chamber evacuation
- Load lock

Certifications

DRYVAC vacuum pumps are certified to NRTL and CSA according to UL 61010-1

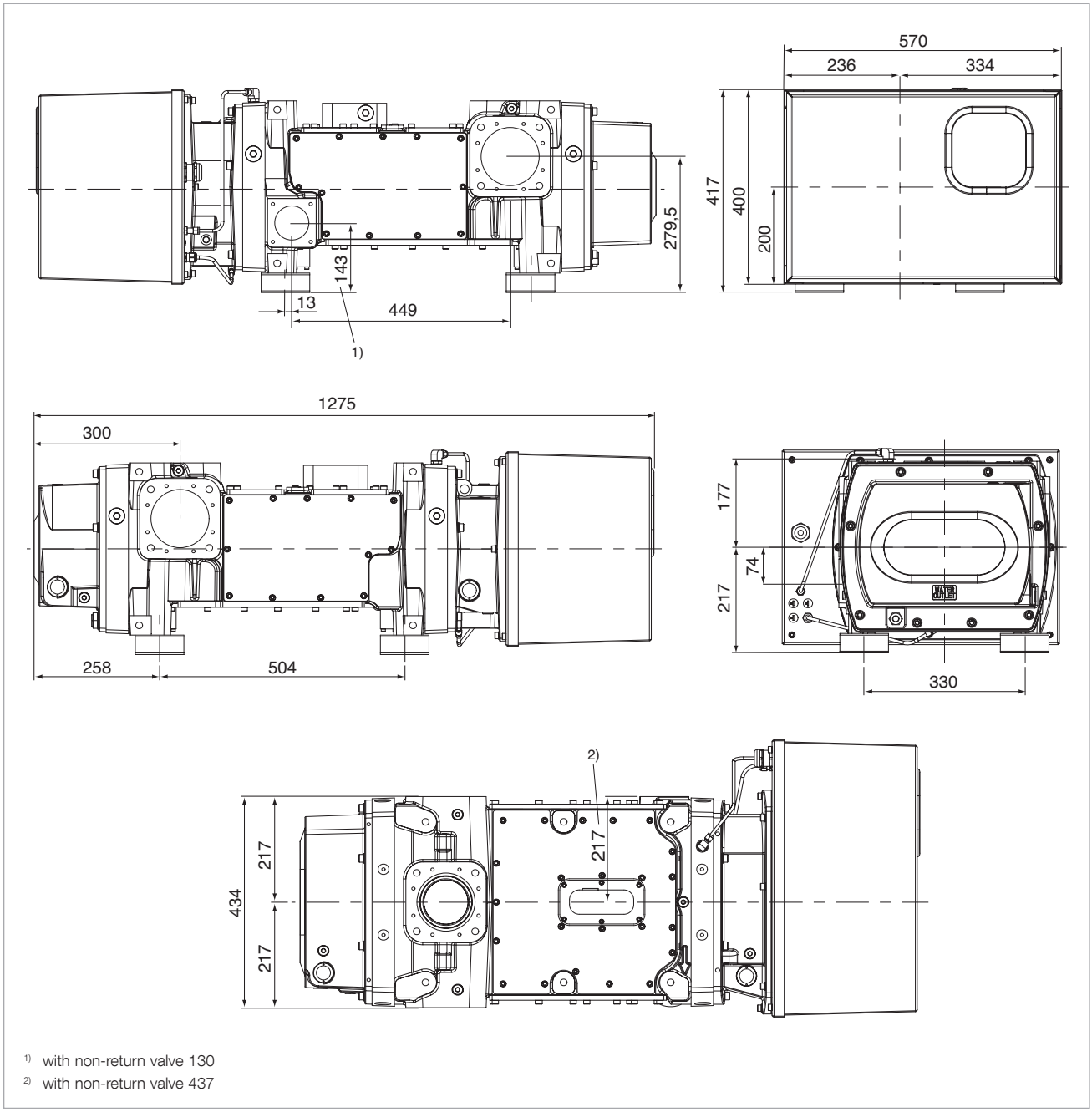
The DRYVAC series

comprises the models

DRYVAC DV 450
DRYVAC DV 650
DRYVAC DV 650 Atex Cat. 2 l T2
DRYVAC DV 1200
DRYVAC DV 1200 S-i
DRYVAC DV 1200 Atex Cat. 2 l T2

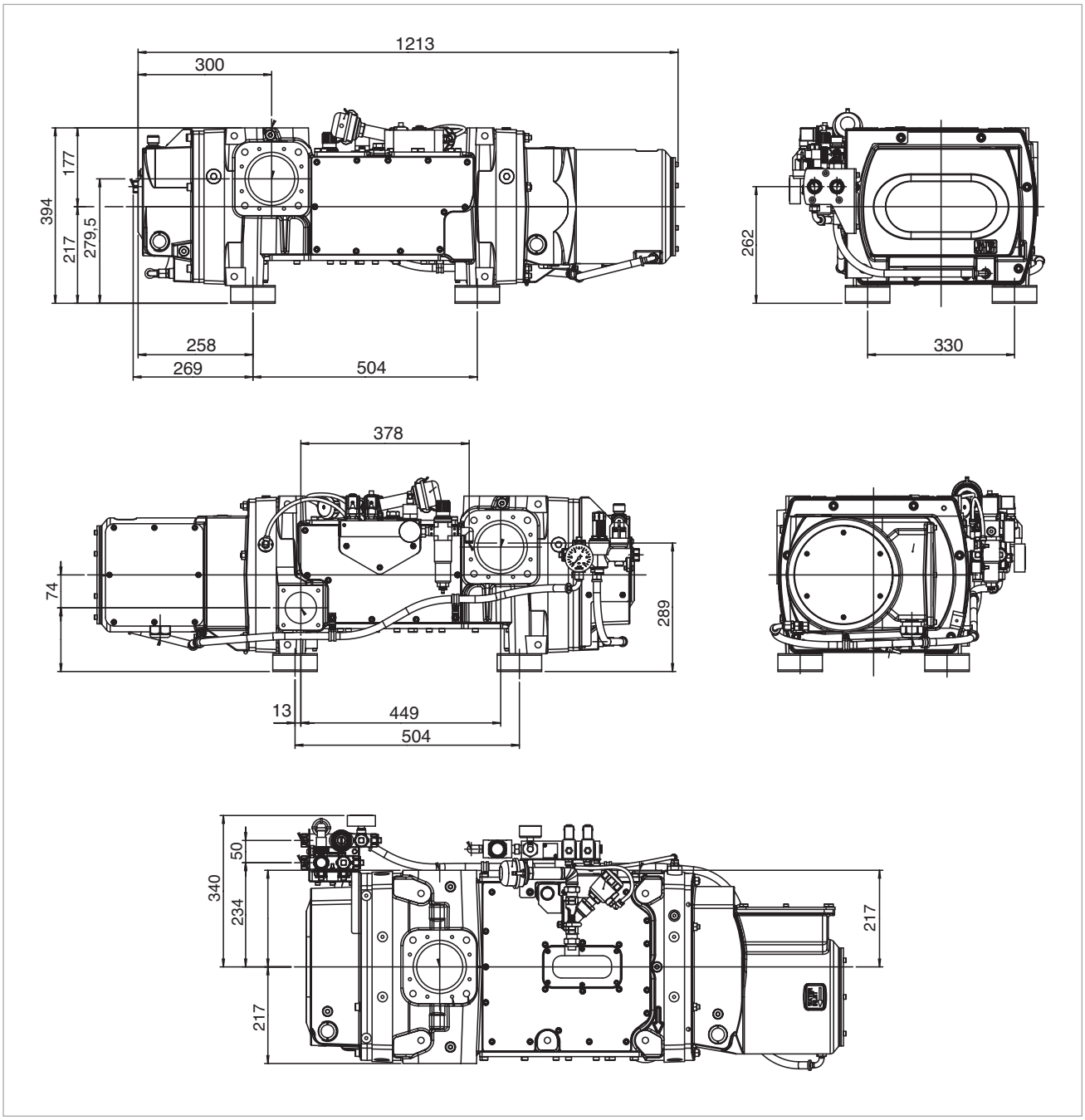
and allows for numerous combinations with Roots pumps from the RUVAC series.

DRYVAC DS Systems with Roots Blowers RUVAC WAU 2001, WH 2500 , WH 4400

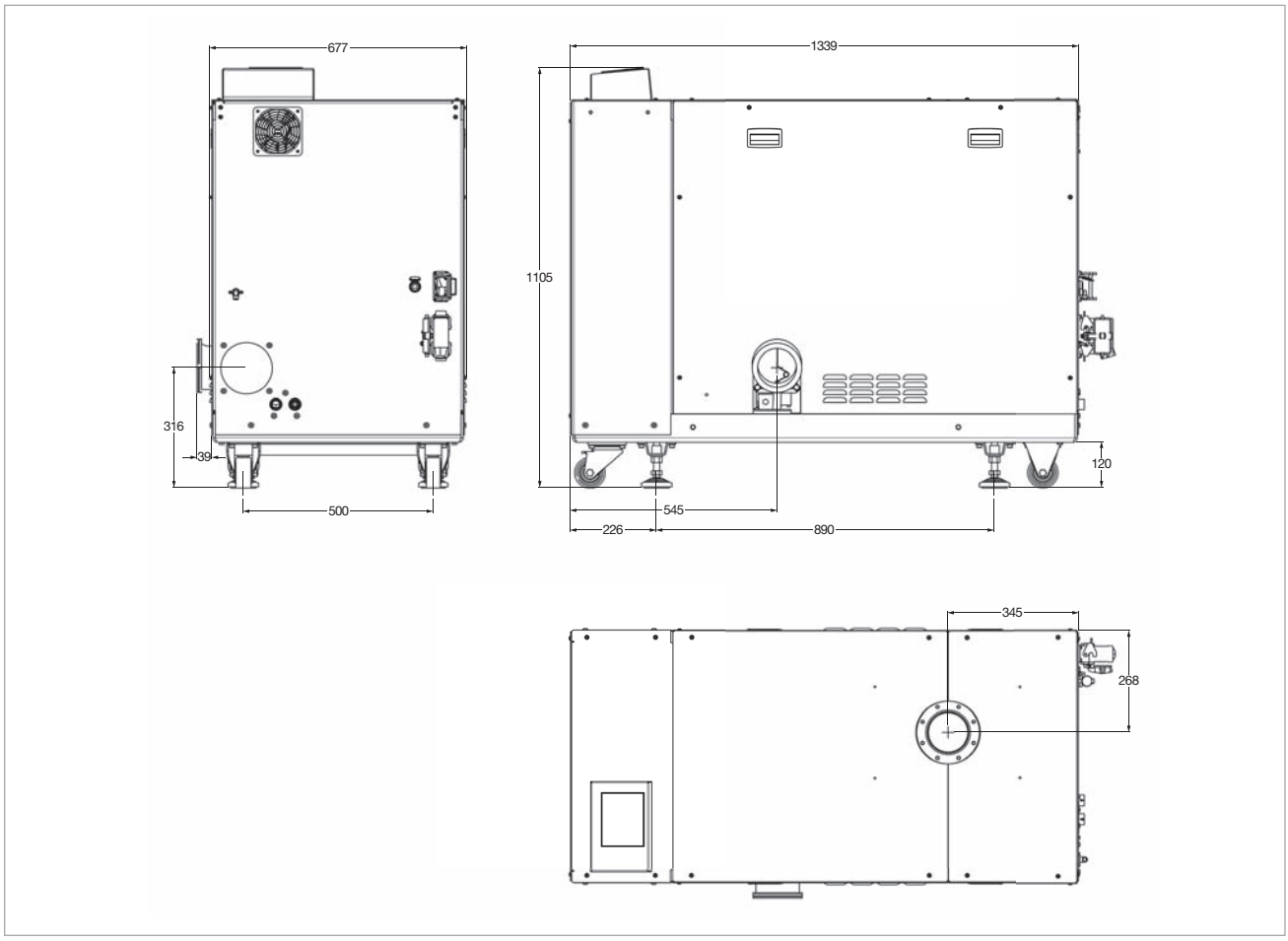


1) with non-return valve 130
2) with non-return valve 437

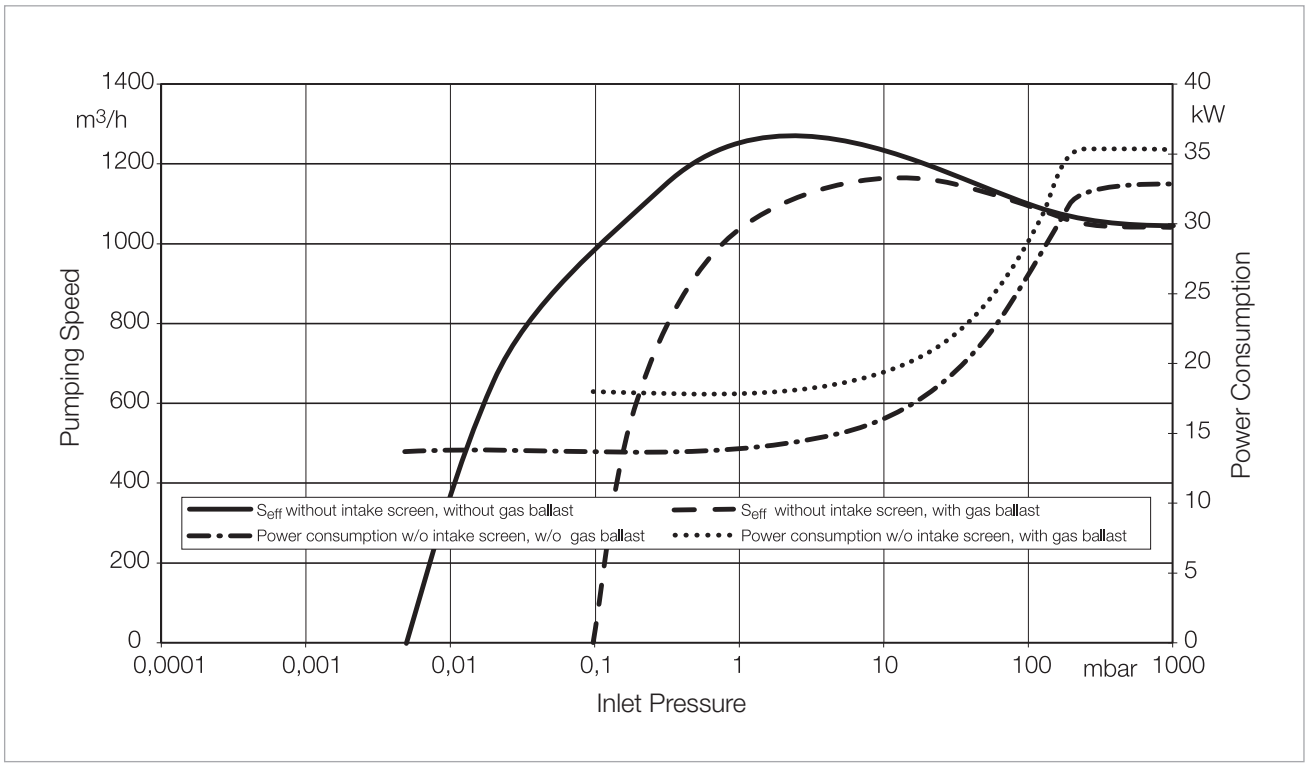
Dimensional drawing for the DRYVAC DV 450 and DV 650



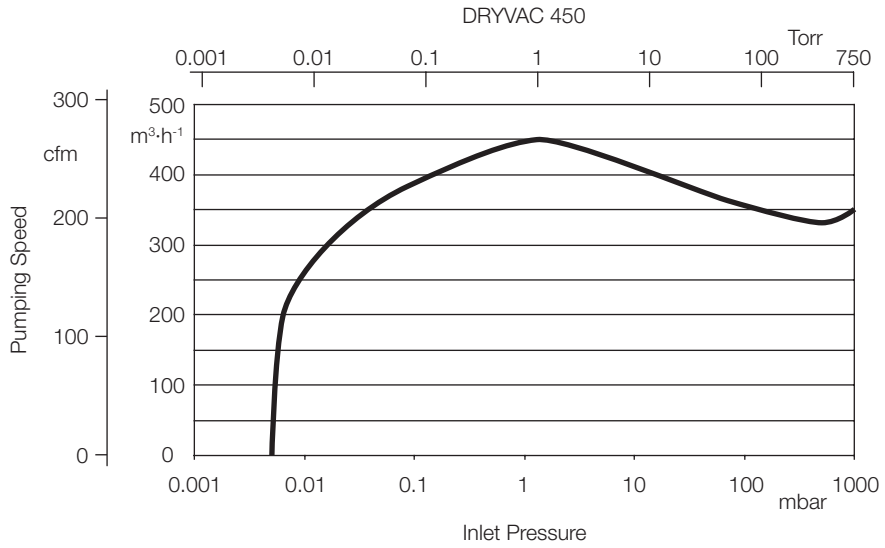
Dimensional drawing for the DRYVAC DV 450-r and DV 650-r

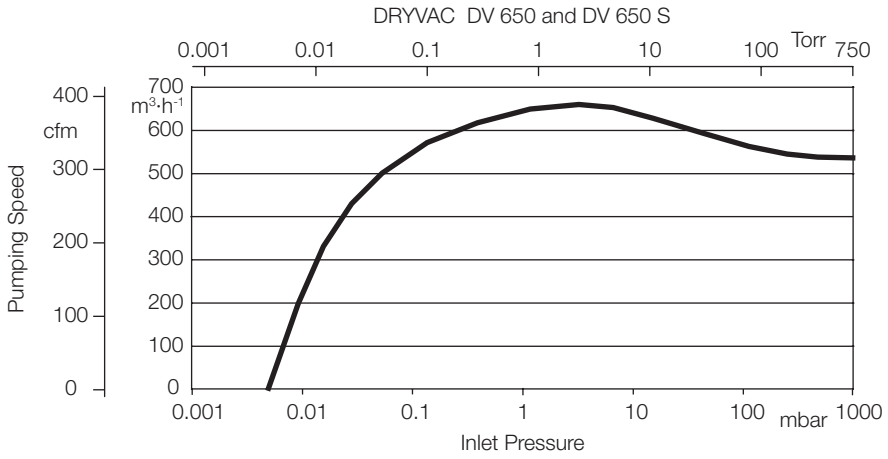


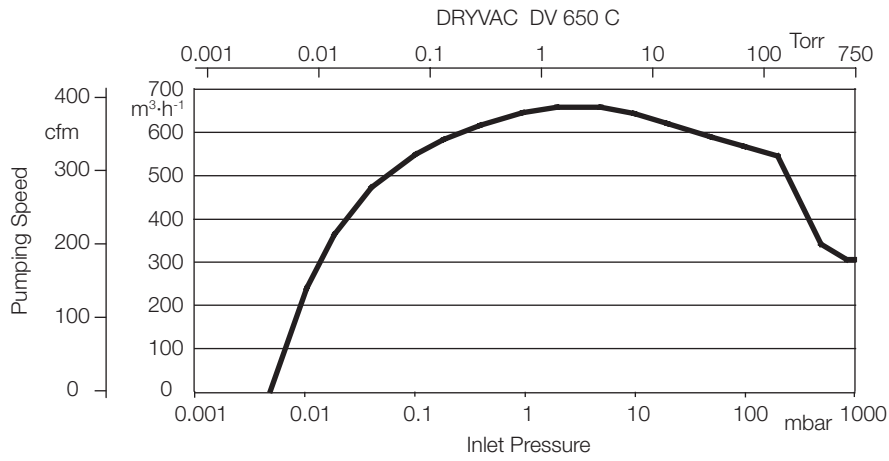
Dimensional drawing for the DRYVAC DV 1200 S-i



Pumping speed curves of the DRYVAC DV 1200 and DV 1200 S-i







Pumping speed curves of the DRYVAC DV 450, DV 650 (S) and DRYVAC DV 650 C

Technical Data

		DRYVAC DV			
		450	650	1200-i	1200
Nominal pumping speed	m^3/h (cfm)	450 (265)	650 (383)	1250 (736)	1250 (736)
Max. effective pumping speed	m^3/h (cfm)	450 (265)	650 (383)	1250 (736)	1250 (736)
Ultimate pressure	mbar (Torr)	5×10^{-3} (4×10^{-3})	5×10^{-3} (4×10^{-3})	5×10^{-3} (4×10^{-3})	5×10^{-3} (4×10^{-3})
Permissible ambient temperature	°C (°F)	+5 to +50 (+41 to +122)	+5 to +50 (+41 to +122)	+5 to +40 (+41 to +122)	+5 to +50 (+41 to +122)
Water vapour tolerance with > 20 slm purge gas or gas ballast	 mbar (Torr)	 60 (45)	 60 (45)	 - -	 - -
with > 40 slm purge gas or gas ballast	mbar (Torr)	- -	- -	60 (45)	60 (45)
Water vapour capacity	kg/h	15	25	50	50
Noise level at ultimate pressure with silencer with permanent exhaust line	 dB(A) dB(A)	 67 65	 67 65	 67 65	 67 65
Power consumption at ultimate pressure	kW	4.7	6.6	14	14
Cooling		water	water	water/air	water
Electrical connection		380-460 V, 50/60 Hz	380-460 V, 50/60 Hz	380-460 V, 50/60 Hz	380-460 V, 50/60 Hz
Phases		3-ph.	3-ph.	3-ph.	3-ph.
Nominal power at 400 V	kW	11	15	30	30
Nominal current at 400 V	A	24	31	62	62
Intake connection	DN	100 ISO-K PN6 (1x at the top, 2x at the side)	100 ISO-K PN6 (1x at the top, 2x at the side)	100 ISO-K	100 ISO-K
Exhaust side connection	DN	63 ISO-K	63 ISO-K	100 ISO-K	100 ISO-K
Protection class EN 60529	IP	54	54	20	54
Weight	kg (lbs)	620 (1367)	589 (1280)	1400 (3091)	1400 (3091)
Dimensions (W x D x H)	mm (in.)	1280 x 570 x 420 (50.4 x 22.4 x 16.5)	1280 x 570 x 420 (50.4 x 22.4 x 16.5)	1339 x 677 x 1105 (53.9 x 26.7 x 43.5)	1339 x 677 x 1105 (53.9 x 26.7 x 43.5)
Cooling water connection Threads, female	 G	 1/2	 1/2	 1/2	 1/2
Cooling water temperature with gear oil LEYBONOL LVO 210 with gear oil LEYBONOL LVO 410	 °C (°F) °C (°F)	 5 to 35 (41 to 95) 5 to 25 (41 to 77)	 5 to 35 (41 to 95) 5 to 25 (41 to 77)	 5 to 35 (41 to 95) 5 to 25 (41 to 77)	 5 to 35 (41 to 95) 5 to 25 (41 to 77)
Cooling water throughput, nominal	l/min (US gallon/min)	6.0 (1.6)	7.5 (2.0)	15.0 (4.0)	15.0 (4.0)
Purge gas connection (plugged connection)		D10	D10	D10	D10

Ordering Information

	DRYVAC DV			
	450	650	1200-i	1200
	Part No.	Part No.	Part No.	Part No.
DRYVAC LVO 210 (Industrial)				
Double purge and air- gasballast				
200 V	112045V19-1	112065V19-1	-	-
400 V	112045V15-1	112065V15-1	-	112120V17-1
DRYVAC LVO 210 (Industrial)				
Triple purge, 400 V	-	112065V17-1	112120V50-1	-
DRYVAC LVO 210 (Industrial)				
Load lock, 400 V	112045V09-1	112065V09-1	-	-
DRYVAC LVO 210				
ATEX, 400 V	-	112065V11-1	-	112120V11-1
DRYVAC LVO 410 (PFPE) S				
Single purge				
200 V	112045V29-1	-	-	-
400 V	112045V20-1	112065V20-1	112120V40-1	-
DRYVAC LVO 410 (PFPE) C				
Triple purge, 400 V	112045V30-1	112065V30-1	-	-
Accessories				
Profibus module for DRYVAC DV / DV-r	155212V			
ProfiNet module for DRYVAC DV / DV-r	112005A35			
EtherCAT module for DRYVAC DV / DV-r	112005A36			
Relay module (digital output) for DRYVAC DV	112005A01			
Ethernet module (Dual port) for DRYVAC DV	112005A02			
LEYASSIST Windows Software [2]	230439V01			
RS232 adapter for FC DRYVAC RUVAC WH	155224V			
Adapter USB - RS232	800110V0103			
Interface kit 24 Volt I/O for DRYVAC DV / DV-i	112005A22			
Adapter DRYVAC for DV 450/650				
RUVAC WH 700	112005A03			
RUVAC WS(U) 1001	112005A04			
RUVAC WS(U) 2001	112005A05			
RUVAC WH(U) 2500	112005A07			
RUVAC WH(U) 4400/7000	112005A10			
Cooling water unit				
DRYVAC 450/650	112005A12			
DRYVAC 450/650-r	112005A13			
Non-return valve DRYVAC, DN 63 ISO-K [1]	112005A15			
Gas ballast kit DRYVAC, 24 V electro-pneumatic	112005A17			
Silencer				
DN 63 ISO-K for DRYVAC DV 450/650 and SCREWLINE SP 250	119002			
DN 100 ISO-K for DRYVAC 1200 and SCREWLINE SP 630	119001			
Serviceable silencer				
DN 63 ISO-K for DRYVAC DV 450/650 and SCREWLINE SP 250	119003V			
DN 100 ISO-K for DRYVAC 1200 and SCREWLINE SP 630	119004V			
External display (not for 1200-i)	155213V			
Harting plug DRYVAC S-i/C-i	112005A20			
Set of nozzles for DRYVAC purge gas	112005A30			
Permanent inlet purge kit	112005A32			

[1] Already integrated in all -i versions

[2] Operating, configuration and analysis software for DRYVAC and other Leybold products

Products

Dry Vacuum Claw Pumps CLAWVAC CP 65 to CP 300
Over-Pressure Claw Pumps CLAWVAC OP 150 to OP 300

Claw vacuum pumps CLAWVAC CP 150 and CP 300

In the CLAWVAC, a claw rotor pair rotates completely contactless and wearfree in the cylinder. The CLAWVAC differentiates itself from conventional claw pumps mainly through its material selection. Stainless steel rotors as well as the corrosion-resistant coated vacuum chamber also prove themselves under very harsh process conditions and contribute to a reliable operation.

The systems offer great advantages for a wide range of rough vacuum and over-pressure applications.

The pumps design enables extreme robustness, especially for challenging applications which include handling of particle or vapor contaminated gases.

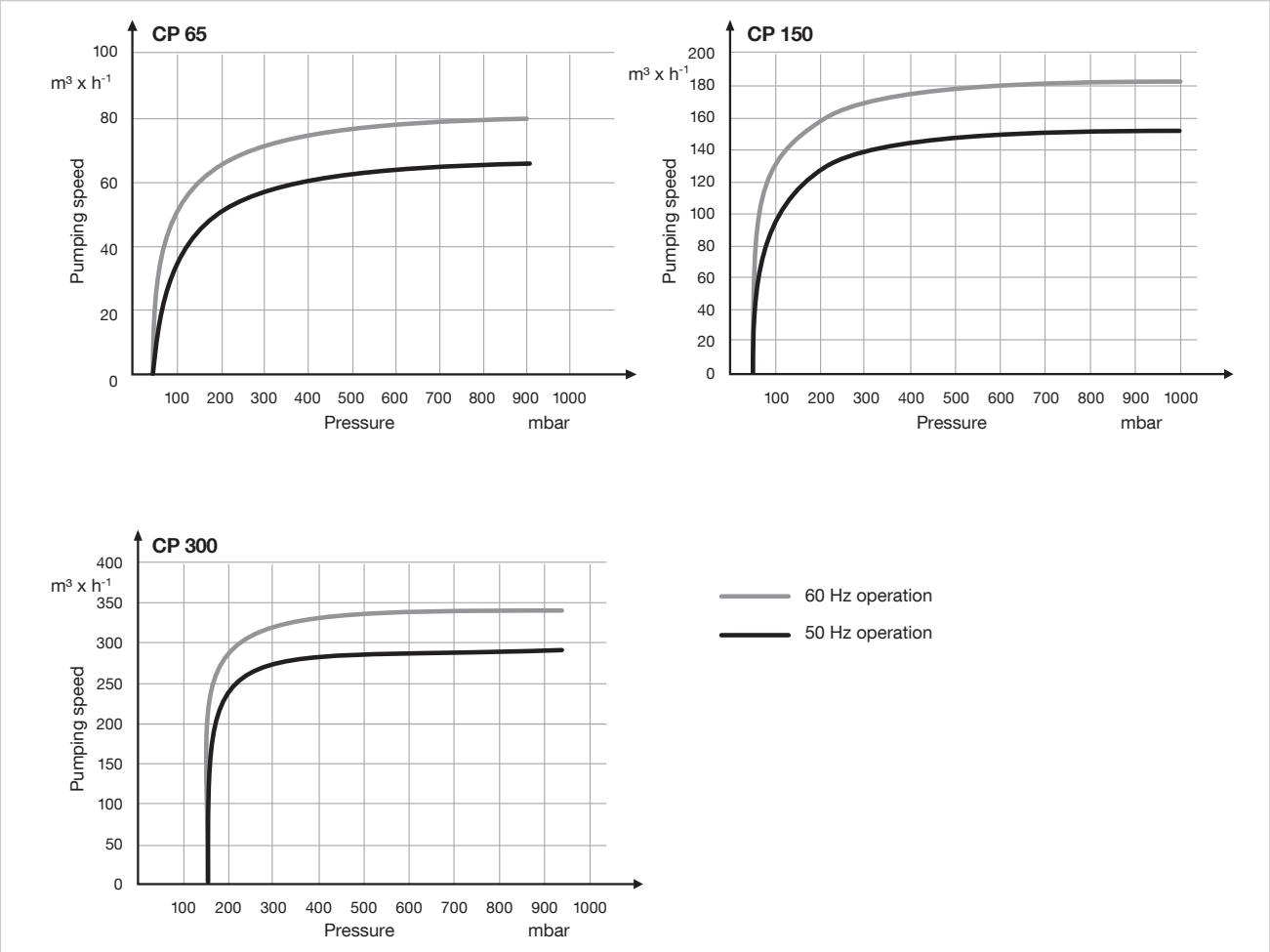
Advantage to the User

- **Oil free compression room**
  - No oil migration into process
  - No oil contamination
- **Air cooled**
  - Extremely efficient air cooling for lowest operation temperature
  - No demand for expensive cooling water
  - Performance independent from water temperature
- **Flexible**
  - Variable speed drive (VSD) compatible
  - Compact design with small footprint
  - Cool running
- **Environment friendly**
  - Market leading low noise level
  - Lowest power consumption
  - Up to 50% energy saving by operation with VSD
- **Safe operation**
  - Continuous operation at any inlet pressure without overheating
  - Most robust bearing and seal design

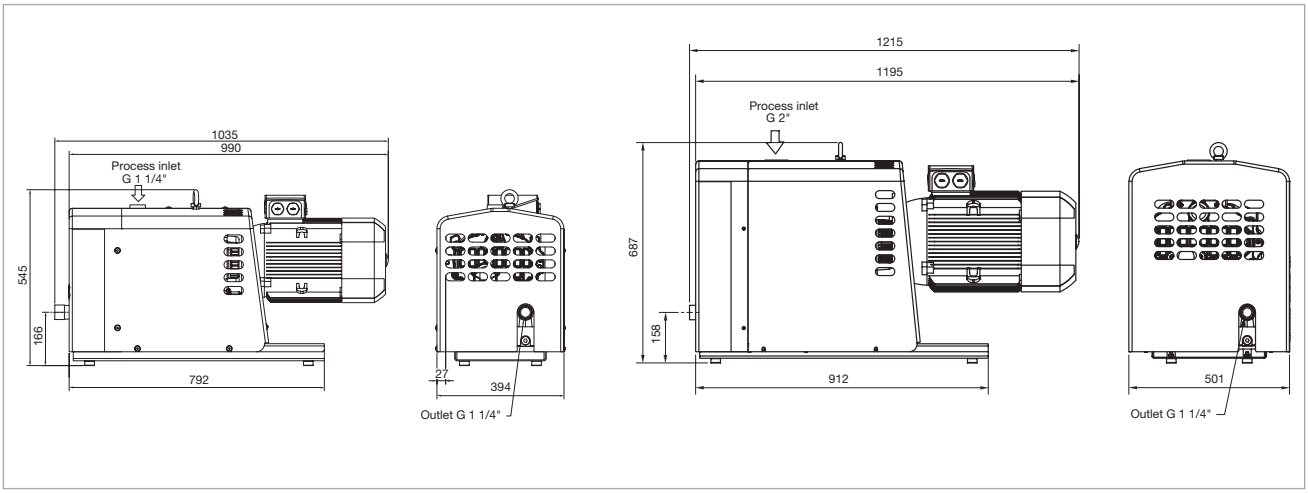
Typical Applications

- **Food Processing**
  - Bottling
  - Dairy products (e.g. milking)
  - Vacuum conveying (e.g. in slaughterhouse)
  - Beverage production
- **Food Packaging**
  - Thermoforming of foil container
  - Tray sealing
  - Modified Atmosphere Packaging (MAP)
- **Woodworking**
  - Holding & lifting
  - CNC router
  - Drying & impregnation
- **Material Transport & Holding**
  - Print & paper (press & post-press)
  - Vacuum conveying
  - Vacuum clamping
- **Degassing**
  - Li-battery slurry
  - Ceramics & bricks
- **Thermoforming**
  - Deep drawing of bath tubs
- **Plastic Industry**
  - Composite manufacturing
  - Granulate conveying
  - Extruder degassing (e.g. PP, PE, PS)
  - Gluing
- **Environmental Engineering**
  - Sewage degassing
  - Biogas production
  - Soil remediation

Corrosion resistant stainless steel claws and coated pumping chamber



Pumping speed characteristics CP 65, CP 150 and CP 300 right



Dimensional drawing - CP 65 and CP / OP 150 left, CP / OP 300 right (dimensions in mm)

Technical Data

			CLAWVAC		
			CP 65	CP 150	CP 300
Pumping speed	50 Hz	m^3/h	65	150	300
	60 Hz	m^3/h	79	184	347
Ultimate vacuum		mbar / Torr	50 / 37.5	50 / 37.5	140 / 105
Continuous operation range		mbar / Torr	50 - 1000 / 37.5 - 750	50 - 1000 / 37.5 - 750	140 - 1000 / 105 - 750
Permissible ambient temperature range		°C / °F	0 - 40 / 32 - 104		
Connections			Inlet: G 1 1/4“ or NPT Outlet: G 1 1/4“ or NPT	Inlet: G 1 1/4“ or NPT Outlet: G 1 1/4“ or NPT	Inlet: G 2“ or NPT Outlet: G 1 1/4“ or NPT
Motor size	50 Hz	kW	1.8	4.0	6.2
	60 Hz	kW	2.2	3.7	7.5
Operation range		Hz	20 - 60		
Noise level (50 Hz / 60 Hz)		dB(A)	66 / 77	75 / 80	77 / 84
Weight		kg	120	160	252
Motor protection class		IP	55		

Ordering Information

	CLAWVAC		
	CP 65	CP 150	CP 300
	Part. No.	Part. No.	Part. No.
230 V 50 Hz 3Ph	**178065V01**	**178150V01**	**178300V01**
380 V 60 Hz 3Ph	**178065V02**	**178150V02**	**178300V02**
400 V 50 Hz 3Ph	**178065V03**	**178150V03**	**178300V03**
575 V 60 Hz 3Ph	**178065V04**	**178150V04**	**178300V04**
200 V 60 Hz 3Ph	**178065V05**	**178150V05**	**178300V05**
460 V 60 Hz 3Ph	**178065V06**	**178150V06**	**178300V06**
230/460 V 60 Hz 3Ph	**178065V07**	**178150V07**	**178300V07**
200 V 50 Hz 3Ph	**178065V08**	**178150V08**	**178300V08**
230 V 60 Hz 3Ph	**178065V09**	**178150V09**	**178300V09**
500 V 50 Hz 3Ph	**178065V10**	**178150V10**	**178300V10**

Technical Data

CLAWVAC

			OP 150	OP 300
Max. volume flow	50 Hz	l/s	30.2	66
	60 Hz	l/s	40	82
Max. over-pressure		bar(g) / psi	2.5 / 36	
Permissible ambient temperature range		°C / °F	0 - 40 / 32 - 104	
Connections			Inlet: G 1 1/4“ or NPT Outlet: G 1 1/4“ or NPT	Inlet: G 2“ or NPT Outlet: G 1 1/4“ or NPT
Motor size	50 Hz / 60 Hz	kW	14	6.2
Operation range		Hz	20 - 60	
Noise level (50 Hz / 60 Hz)		dB(A)	75 / 80	77 / 82
Weight		kg	160	252
Motor protection class		IP	55	

Ordering Information

CLAWVAC

	OP 150	OP 300
	Part. No.	Part. No.
230 V 50 Hz 3Ph	**178150P01**	**178300P01**
380 V 60 Hz 3Ph	**178150P02**	**178300P02**
400 V 50 Hz 3Ph	**178150P03**	**178300P03**
575 V 60 Hz 3Ph	**178150P04**	**178300P04**
200 V 60 Hz 3Ph	**178150P05**	**178300P05**
460 V 60 Hz 3Ph	**178150P06**	**178300P06**
230/460 V 60 Hz 3Ph	**178150P07**	**178300P07**
200 V 50 Hz 3Ph	**178150P08**	**178300P08**
230 V 60 Hz 3Ph	**178150P09**	**178300P09**
500 V 50 Hz 3Ph	**178150P10**	**178300P10**