

Dry Compressing Vacuum Pumps

LEYVAC / SCREWLINE / DRYVAC
Screw Vacuum Pumps

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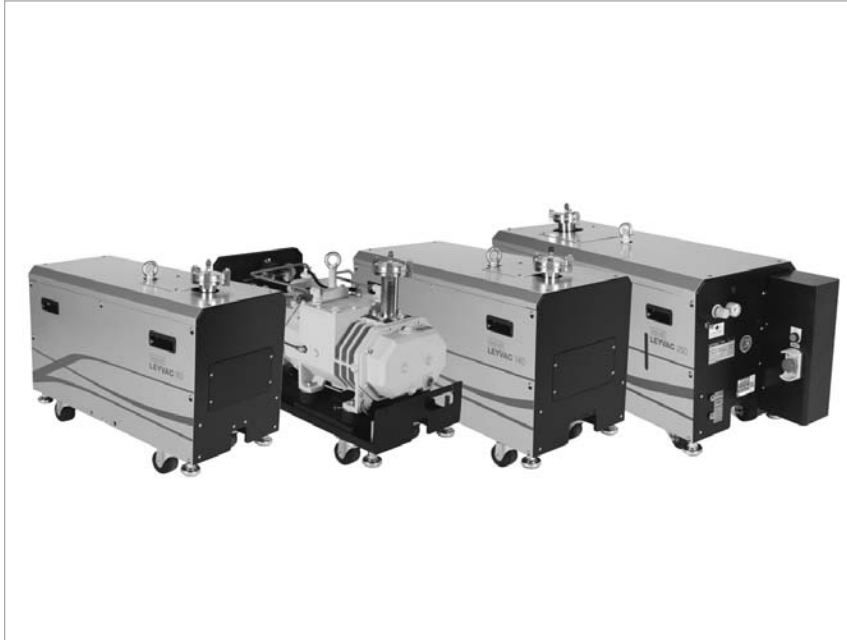
Applications for LEYVAC Pumps

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	■	■	■	■	■	■	■	■	■	■

Products

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

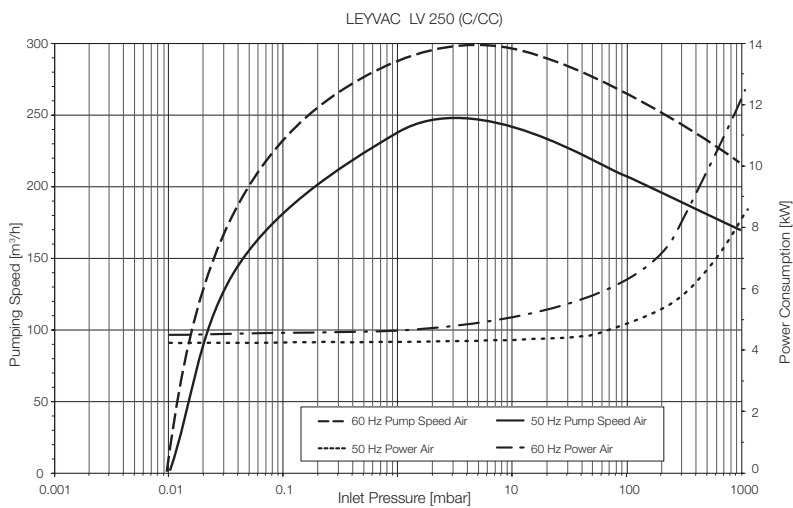
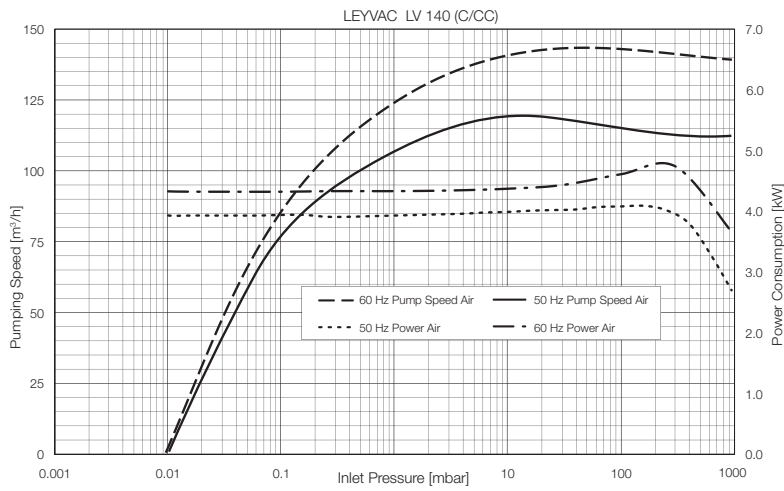
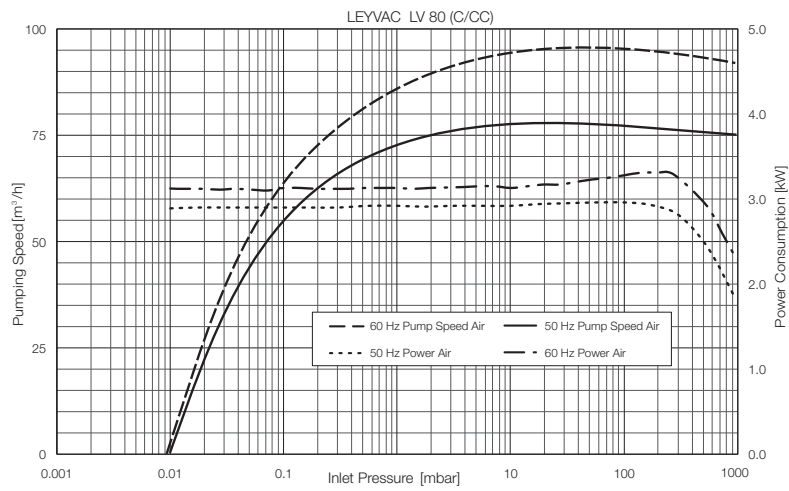
Typical Application

- 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)

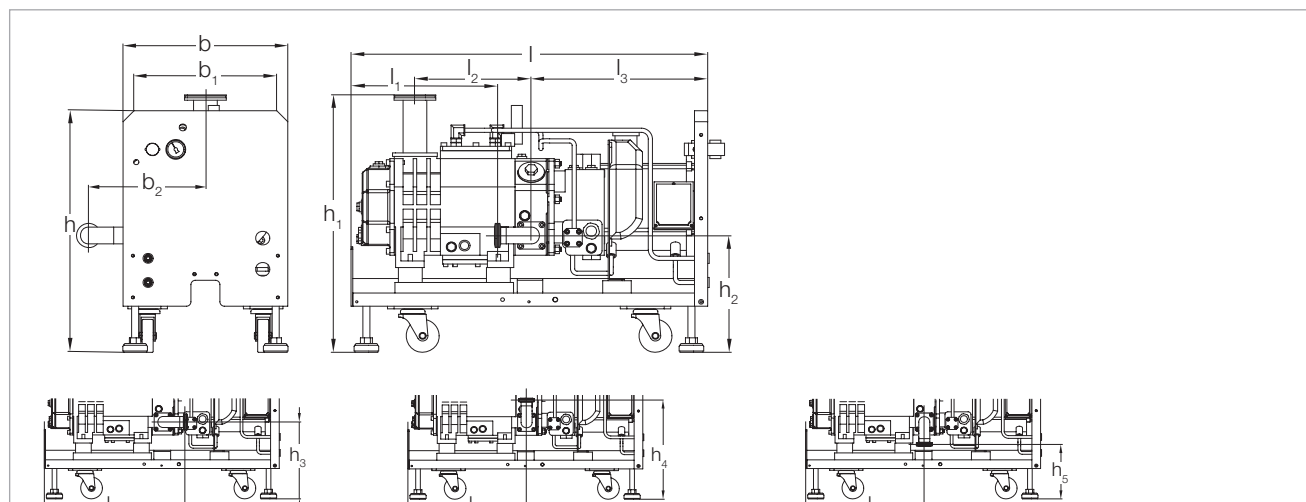
LV 140 (C/CC)

LV 250 (C/CC)

Nominal pumping speed without gas ballast at 50/60 Hz				
m ³ /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 (in.)	814 x 375 x 550 (32.05 x 14.76 x 21.65)	895 x 400 x 567 (35.24 x 15.75 x 22.32)	1051 x 425 x 537 (41.38 x 16.73 x 21.14)
LV ... CC	mm (in.)	984 x 375 x 550 (38.74 x 14.76 x 21.65)	1065 x 400 x 567 (41.93 x 15.75 x 22.32)	1224 x 425 x 537 (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)	LV 140 (C/CC)	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 additionally with casing (C version)	115080V40	115140V40	115250V40
additionally with casing and temperature monitoring (CC version)	115080V30	115140V30	115250V30
	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 24 V	115005A12 115005A13	115005A12 115005A13	115005A12 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

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

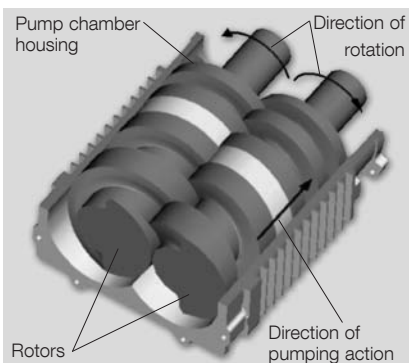


Screw Vacuum Pump SCREWLINE SP 630

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 con-

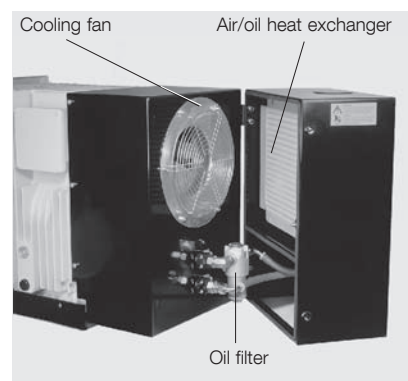
stantly acquired and processed. This enables the user to introduce preventive actions early enough so as to ensure trouble-free operation of his Screw Vacuum Pumps. The key current operating parameters can be read off from a local display. Moreover, connection to a PLC and remote monitoring is possible. 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.



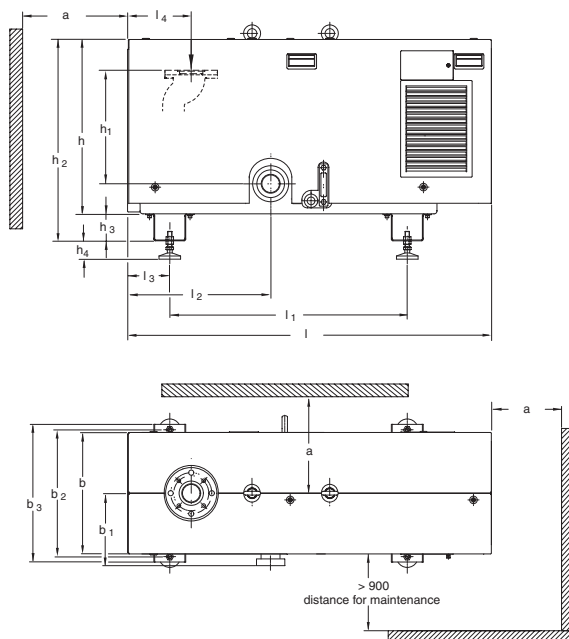
Oil/water cooling unit SP 630

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 m³/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

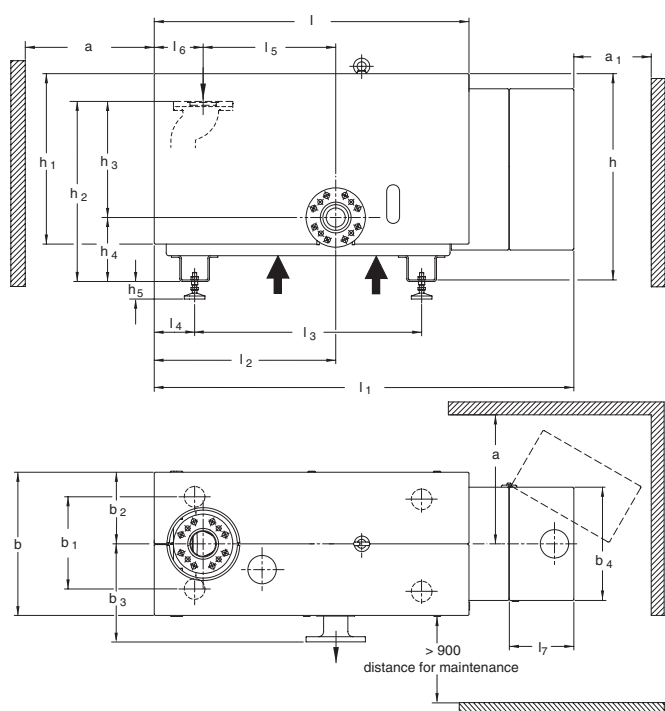


	a	b	b ₁	b ₂	b ₃
mm	> 500	450	268	470	510
in.	> 19.69	17.72	10.55	18.50	20.08

	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

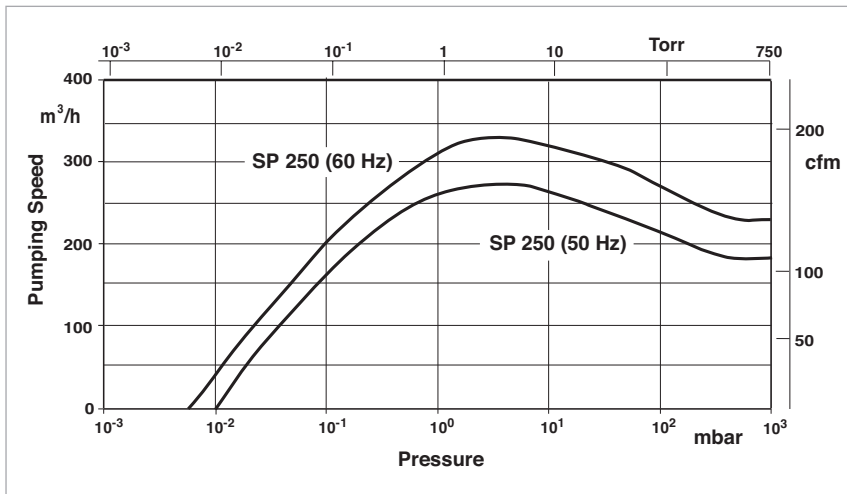


	a	a ₁	b	b ₁	b ₂	b ₃	b ₄
mm	> 500	> 300	555	470	276	380	439
in.	> 19.69	> 11.81	21.85	18.50	10.87	14.96	17.28

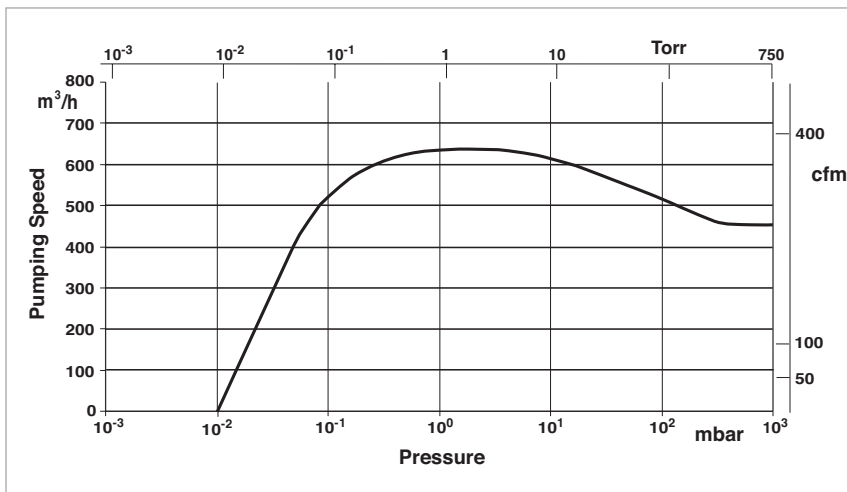
	h	h ₁	h ₂	h ₃	h ₄	h ₅	l
mm	806	636	698	450	248	68	1220
in.	31.73	25.04	27.48	17.72	9.76	2.68	48.03

	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	m ³ /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		$p_{ex} = p_{amb} + 200 \text{ mbar (150 Torr)}$ $- 50 \text{ mbar (37 Torr)}$	$p_{ex} = p_{amb} + 200 \text{ mbar (150 Torr)}$ $- 50 \text{ mbar (37 Torr)}$
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. $p_{ex} = p_{amb} + 200 \text{ mbar}$
– 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.

SCREWLINE SP 630

Technical Data

50 Hz

60 Hz

Effective pumping speed	m ³ /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		$p_{ex} = p_{amb} + 200 \text{ mbar (150 Torr)}$ $- 50 \text{ mbar (37 Torr)}$	$p_{ex} = p_{amb} + 200 \text{ mbar (150 Torr)}$ $- 50 \text{ mbar (37 Torr)}$
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

SCREWLINE SP 630 F

Additional Technical Data

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

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on the Internet under "www.leybold.com" under Download Documents in the area Documentation.

Ordering Information**SP 630 O₂**

	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

SCREWLINE SP 630 Standard / SP 630 F Standard

Accessories

50 Hz / 60 Hz

	Part No.
Exhaust silencer	119 001
Serviceable silencer	119 004V
Roots pump adapter for RUVAC 1001 ¹⁾	500 003 173
for RUVAC 2001	119 021
for RUVAC WH(U) 2500 ¹⁾	155222V
for RUVAC WH 4400 ¹⁾	119 024V
Dust filter ²⁾	951 72
Elbow 90° (DN 100 ISO-K)	887 26
Clamping screws for DN 63-250 ISO-K	267 01
Centering ring for DN 100 ISO-K	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	EK 110 000 792
from serial number 31000197911	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

General

Applications for DRYVAC Pumps

Pumps	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
Applications								
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	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
LEYBONOL Oils								
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

	LVO 210	LVO 410
Applications		
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

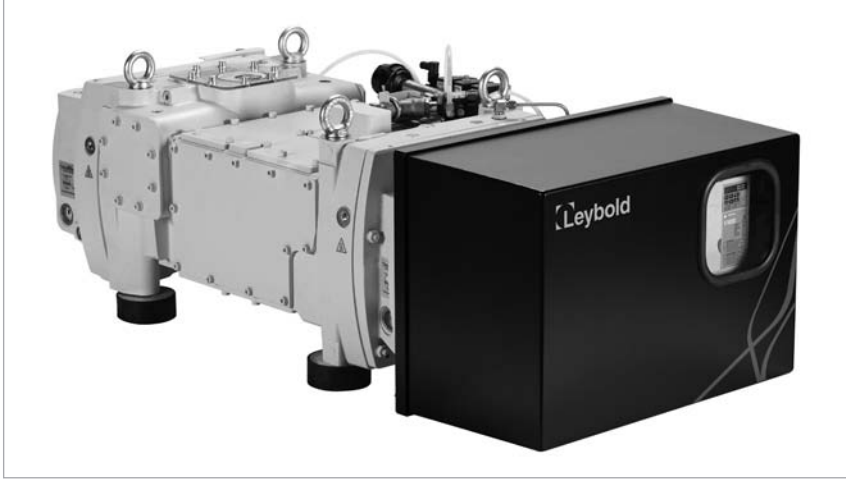
● = Possible

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Products

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 required, 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 I T2

DRYVAC DV 1200

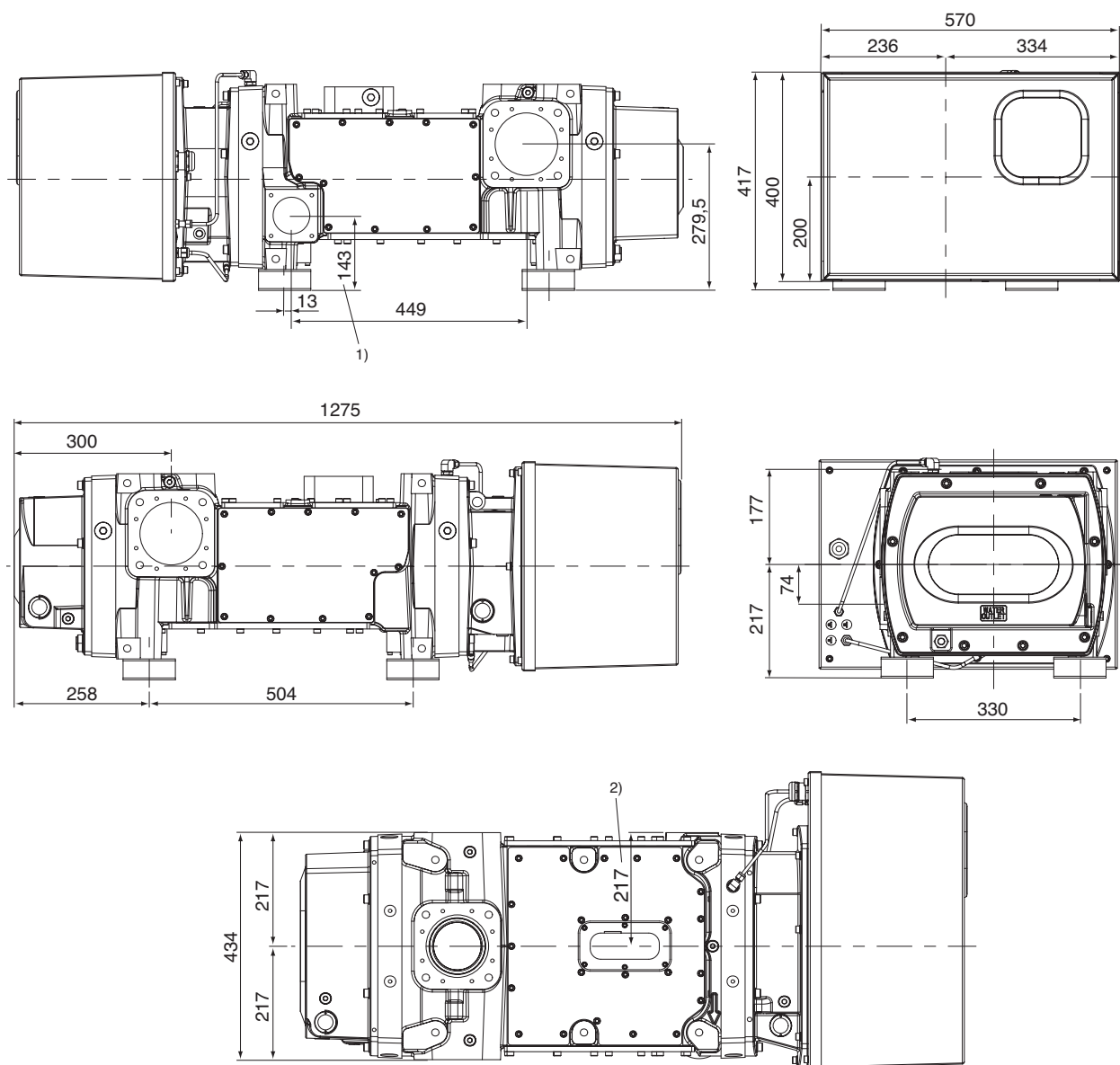
DRYVAC DV 1200 S-i

DRYVAC DV 1200 Atex Cat. 2 I T2

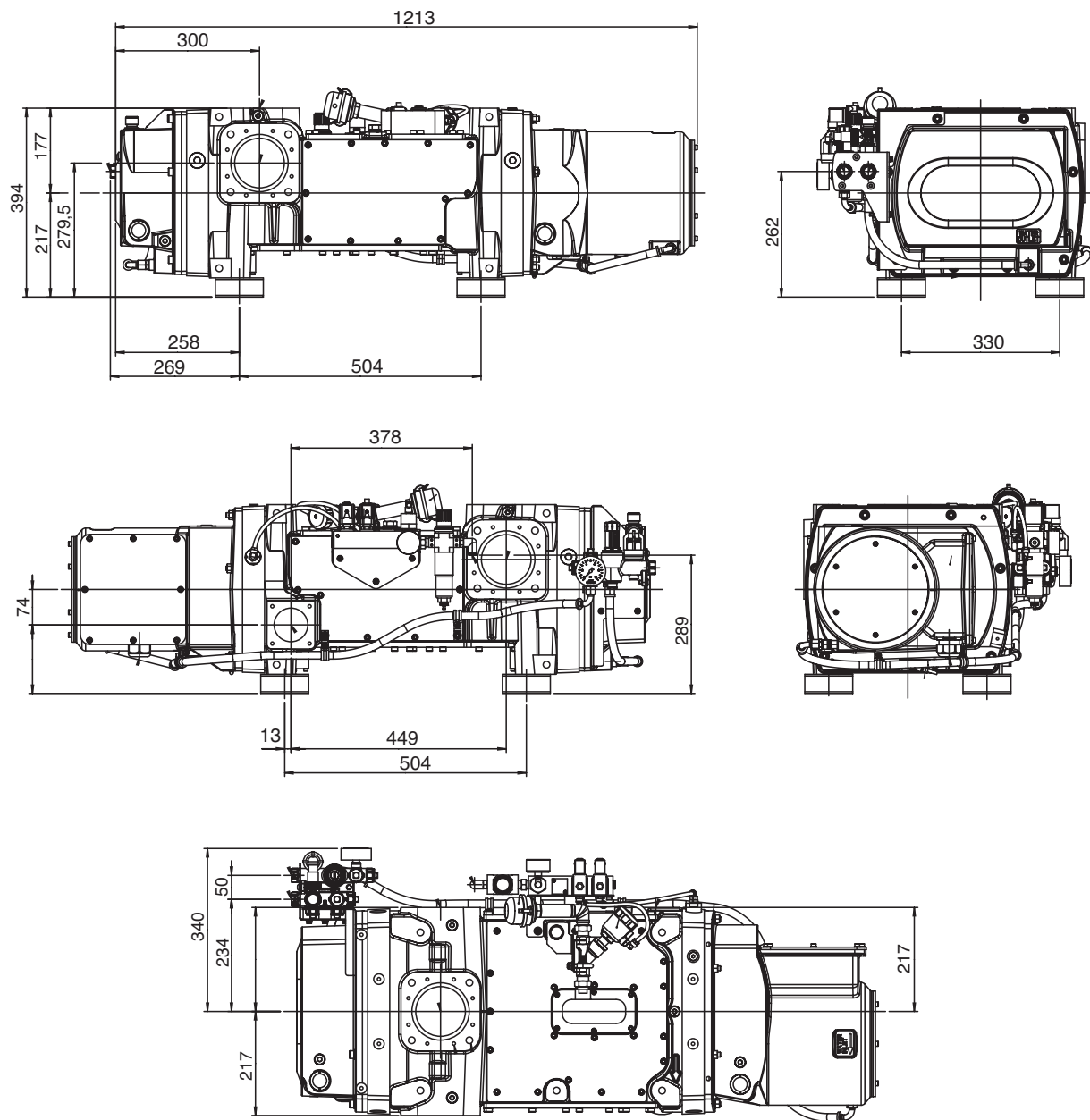
and allows for numerous combinations with Roots pumps from the RUVAC series.



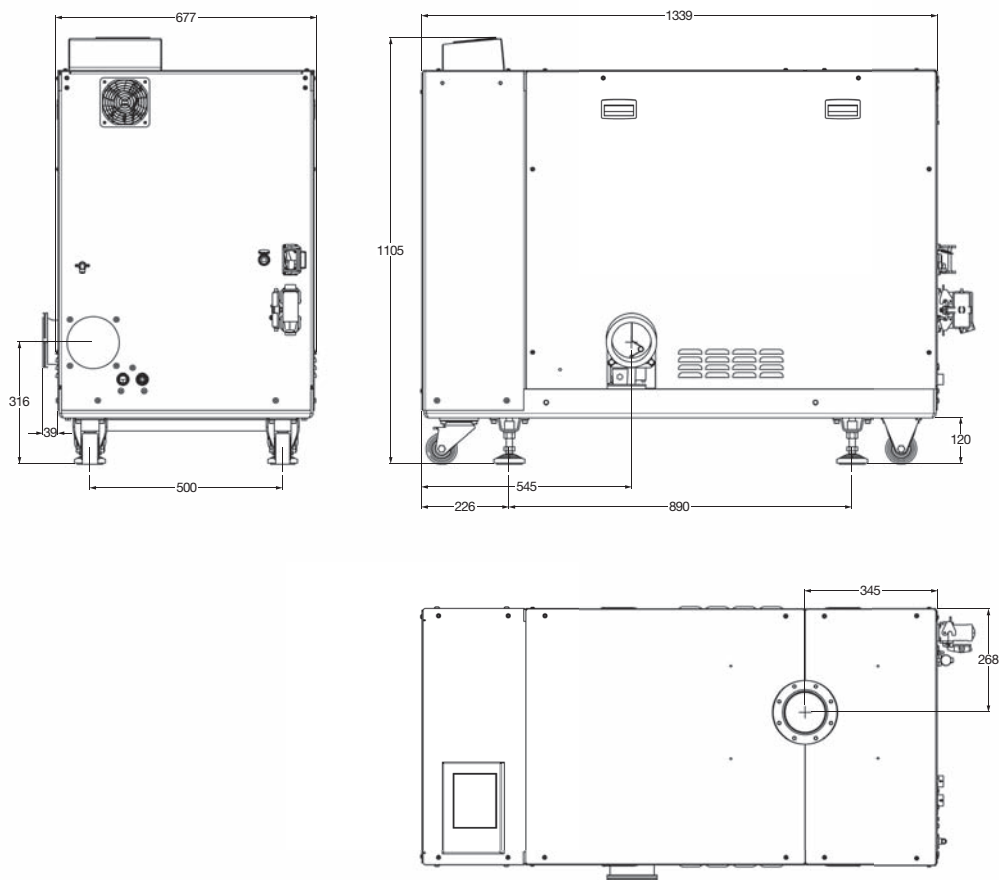
DRYVAC DS Systems with Roots Blowers RUVAC WAU 2001, WH 2500, WH 4400



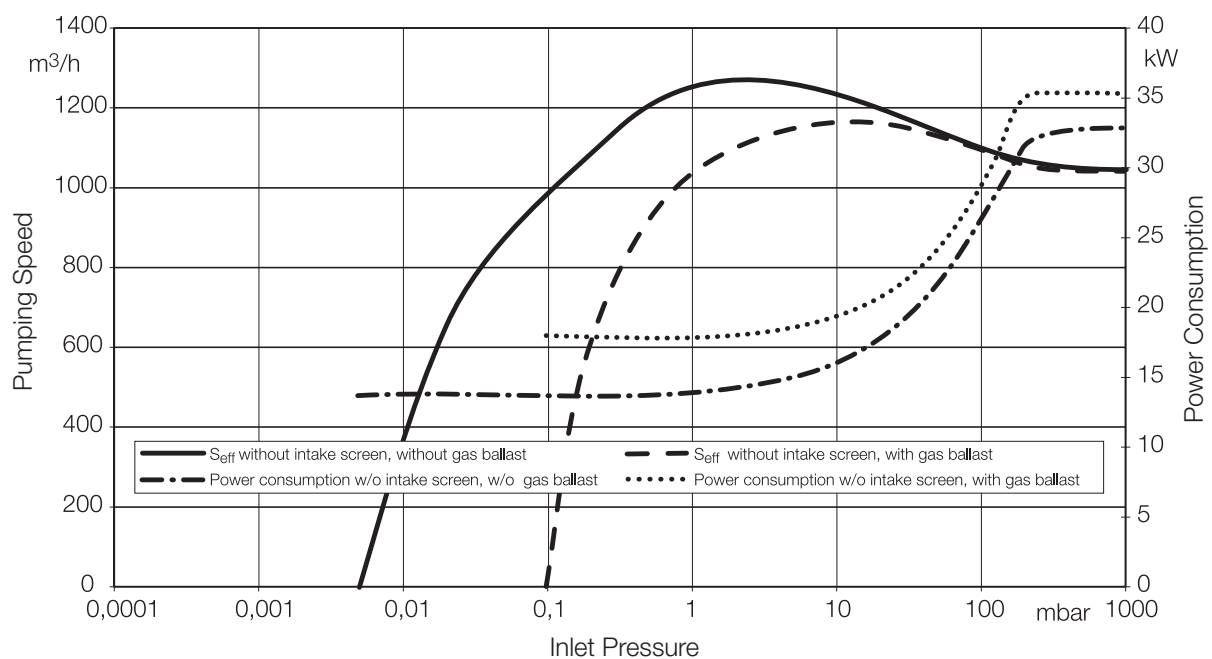
Dimensional drawing for the DRYVAC DV 450 and DV 650, all dimensions in mm



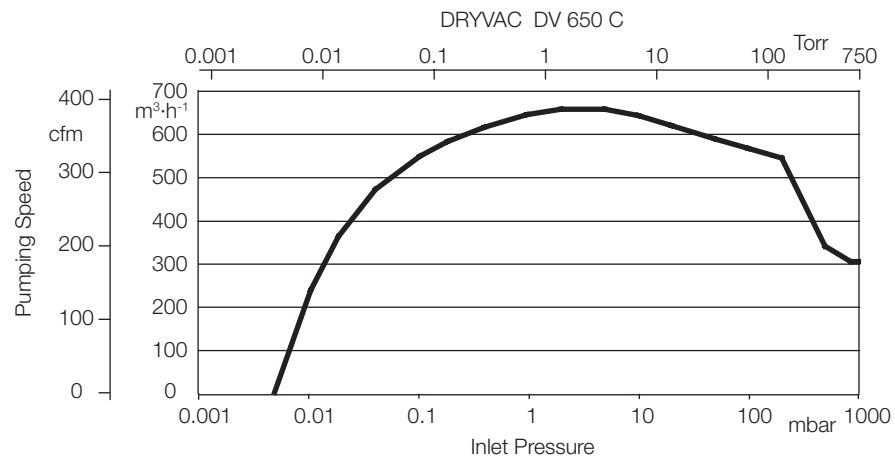
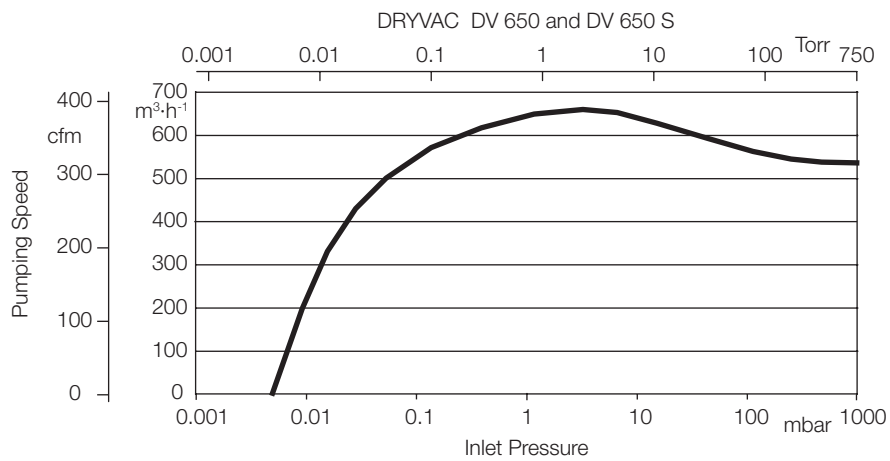
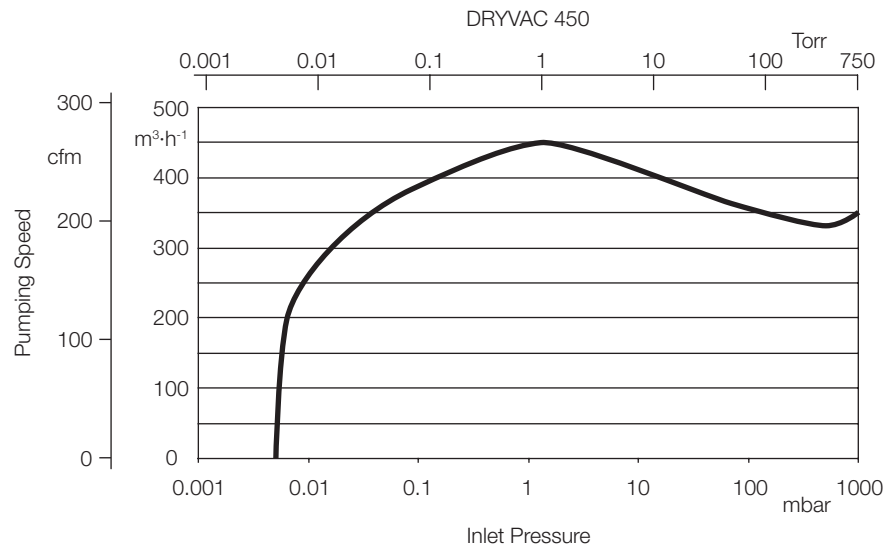
Dimensional drawing for the DRYVAC DV 450-r and DV 650-r, all dimensions in mm



Dimensional drawing for the DRYVAC DV 1200 S-i, all dimensions in mm



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 x 10 ⁻³ (4 x 10 ⁻³)	5 x 10 ⁻³ (4 x 10 ⁻³)	5 x 10 ⁻³ (4 x 10 ⁻³)	5 x 10 ⁻³ (4 x 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	dB(A)	67	67	67	67
with permanent exhaust line	dB(A)	65	65	65	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	°C (°F)	5 to 35 (41 to 95)	5 to 35 (41 to 95)	5 to 35 (41 to 95)	5 to 35 (41 to 95)
with gear oil LEYBONOL LVO 410	°C (°F)	5 to 25 (41 to 77)	5 to 25 (41 to 77)	5 to 25 (41 to 77)	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 400 V	112045V19-1 112045V15-1	112065V19-1 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 400 V	112045V29-1 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 RUVAC WS(U) 1001 RUVAC WS(U) 2001 RUVAC WH(U) 2500 RUVAC WH(U) 4400/7000	112005A03 112005A04 112005A05 112005A07 112005A10			
Cooling water unit DRYVAC 450/650 DRYVAC 450/650-r	112005A12 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 DN 100 ISO-K for DRYVAC 1200 and SCREWLINE SP 630	119002 119001			
Serviceable silencer DN 63 ISO-K for DRYVAC DV 450/650 and SCREWLINE SP 250 DN 100 ISO-K for DRYVAC 1200 and SCREWLINE SP 630	119003V 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