

DIJ Pumps Water-Cooled



DIJ 20 with plug (right), DIJ 20 with fuse box (middle) and DIJ 630 with energy saving unit (EER) (right)

The Leybold oil diffusion pumps are ideal for all industrial high vacuum applications.

The DIJ series impresses with innovative and energy-efficiency construction.

Important features are a new heating conception; variable flange connections; fully equipped with fore line baffle and cold cap baffle; electrical connect variants and a powerful five stage nozzle system.

Advantages to the User

- Lowest operation costs by minimized energy consumption
- Stable throughput in the 10^{-2} to 10^{-3} mbar range (e.g. for sputtering or steel degassing)
- Flexible flange design
Flange variants:
 - ANSI / Inch flanges (with O-ring)
 - ISO-F or ISO-K flanges (with centering ring)
- Highest system uptime
- Smart temperature control ensures minimum load and longest lifetime for heaters and oil
- Unique baffle design
- Various electrical connection possibilities:
 - Three different connection variants available incl. energy control system (ECU)
- 4 + 1 stage system design:
 - The 4 diffusion pump stages provide excellent high-vacuum pumping speed
 - The additional jet-stage ensures stable throughput at pressures $> 10^{-3}$ mbar

Typical Applications

The diffusion pumps from the DIP range are used in coating systems, vacuum melting and drying systems as well as in vacuum furnaces in the area of metallurgy.

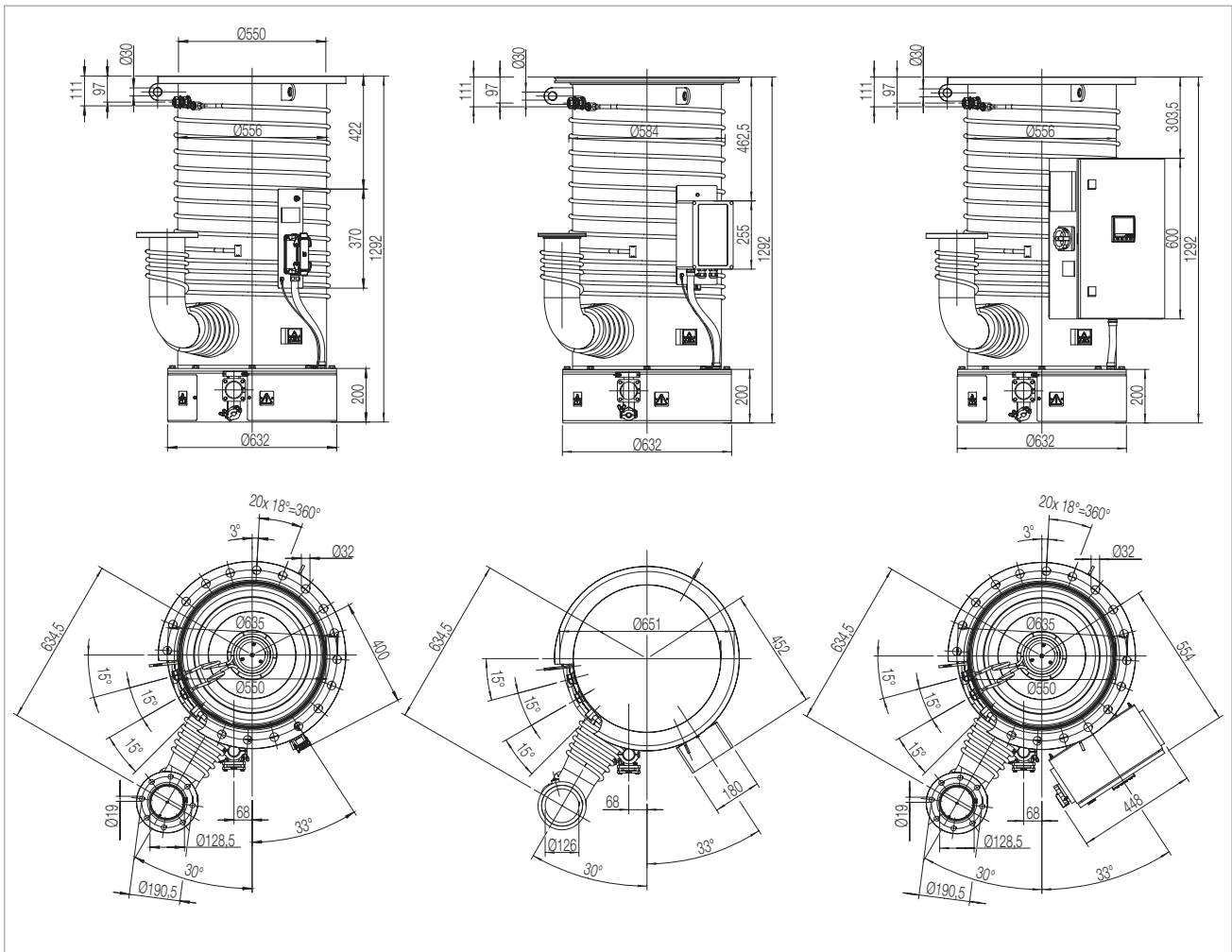
Supplied Equipment

All DIJ pumps are shipped from the factory without pump fluid installed.

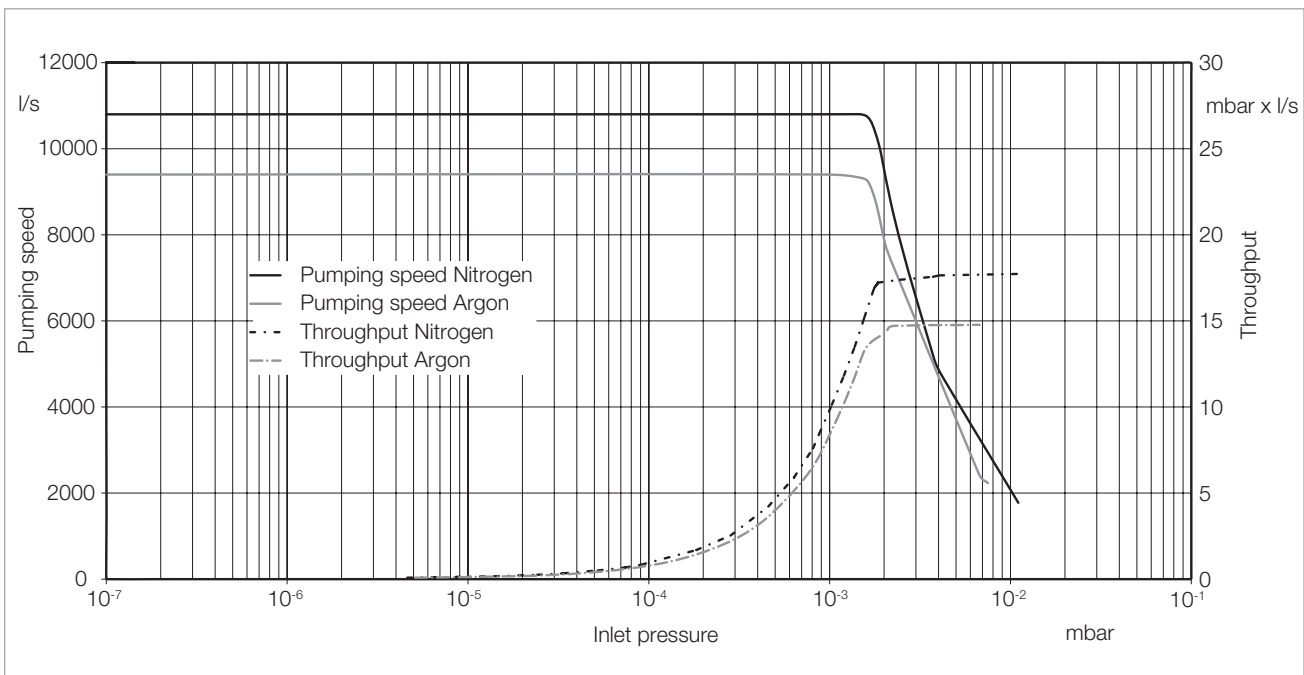
Included as standard equipment with the pump are

- centering ring with centering star, O-ring and outer ring for the high-vacuum flange,
- centering ring with insert for forevacuum baffle, O-ring and outer ring for the forevacuum flange.

The high-vacuum and forevacuum flanges are closed with shipping flanges and claws. The insides of the pumps have been cleaned; they are evacuated prior to shipment.



Dimensional drawings for DIJ 20 with plug, (left), DIJ 20 with ESU (middle) and DIJ 630 with junction box (EER) (right)



Pumping speed overview for nitrogen and argon

Technical Data

		DIJ 10	DIJ 320	DIJ 16	DIJ 500	DIJ 20	DIJ 630	DIJ 35	DIJ 1000
High vacuum connection	DN	10" ANSI	320 ISO-K	16"ANSI	500 ISO-K	20" ANSI	630 ISO-K	35" ANSI	1000 ISO-F
Forevacuum connection	DN	2" ANSI	63 ISO-K	3"ANSI	100 ISO-K	4" ANSI	160 ISO-K	6" ANSI	200 ISO-K
Pumping speed ¹⁾ for Nitrogen < 10 ⁻⁴ mbar		2 800		6 800		10 800		28 000	
Working range	mbar	< 10 ⁻² to 10 ⁻⁷		< 10 ⁻² to 10 ⁻⁷		< 10 ⁻² to 10 ⁻⁷		< 10 ⁻² to 10 ⁻⁷	
Ultimate total pressure ²⁾	mbar	< 5 x 10 ⁻⁷		< 5 x 10 ⁻⁷		< 5 x 10 ⁻⁷		< 5 x 10 ⁻⁷	
Max. permissible forevacuum pressure	mbar	5 x 10 ⁻¹		5 x 10 ⁻¹		5 x 10 ⁻¹		5 x 10 ⁻¹	
Pump fluid fill, min. / max.	l	1.0 / 1.4		1.7 / 3.4		5.0 / 7.0		12.0 / 18.0	
Mains voltage	V	1 ~ 230 /N/PE		3 ~ 400 /N/PE		3 ~ 400 /N/PE		3 ~ 400 /N/PE	
depending on variant, 50 / 60 Hz	V	1 ~ 230 /N/PE		3 ~ 460 /N/PE		3 ~ 460 /N/PE		3 ~ 460 /N/PE	
Heating power	kW	2.4		3.6		10.8		21.6	
Number of heating cartridges		2		3		9		18	
Warm up period	min	< 25		< 25		< 25		< 30	
Coolant (minimum) ²⁾									
for the pump	l/h	160		290		600		1 200	
for the cold cap baffle	l/h	20		50		80		150	
Number of cooling circuits (including cold cap baffle)		2		2		2		2	
Coolant connection									
for the pump	G	3/8"		1/2"		1/2"		1/2"	
for the cold cap baffle	G	1/4"		3/8"		3/8"		3/8"	
Weight, approx.	kg	45		110		208		720	
Recom. forevacuum pumps ³⁾									
at working pressure > 10 ⁻⁴ mbar									
oil-sealed		SV 100 B & W 501		SV 200 & W 501		SV 300 B & W 1001		SV 630 B & W 2001	
dry-compressing		-		DV 450 & W 501		DV 450 & W 1001		DV 650 & W 2001	
at working pressure < 10 ⁻⁴ mbar									
oil-sealed		D 25 B		D 65 B & W 251		SV 100 B & W 501		SV 300 B & W 1001	
dry-compressing		ECODRY plus 60		ECODRY plus 60 & W 251		-		DV 450 & W 1001	
Recom. supporting pump ³⁾		TRIVAC D 25 B		TRIVAC D 40 B		TRIVAC D 65 B		TRIVAC D 65 B	

1) Measured as per DIN 28 427 using DC 704 normal as the pump fluid.

2) The coolant water volume is referenced to $\Delta T = 10$ K. The discharge temperature should not exceed 30 °C.

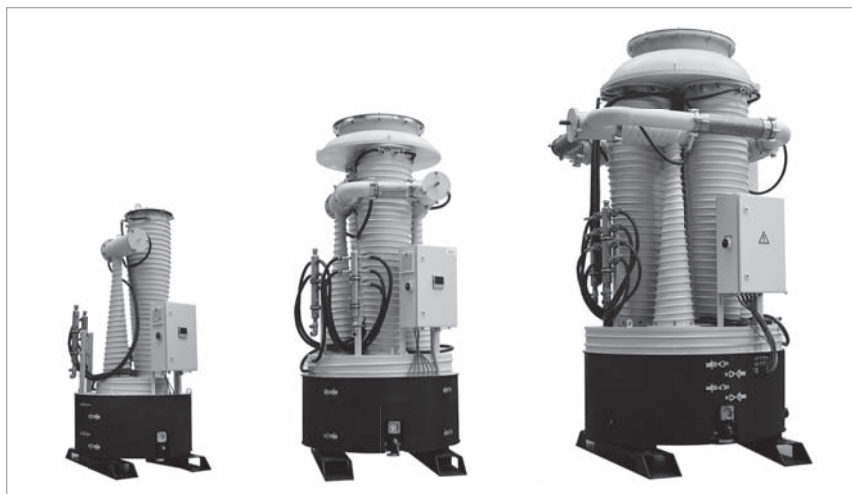
3) Single- and two-stage rotary vane pumps (TRIVAC; SOGEVAC), or dry-compressing pumps (ECODRY plus ;DRYVAC) from our line of forevacuum pumps in conjunction with roots pumps (RUVAC) in pumping systems.

Ordering Information

	DIJ 10	DIJ 320	DIJ 16	DIJ 500	DIJ 20	DIJ 630	DIJ 35	DIJ 1000
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
with plug 400V / 50/60 Hz / 3ph PN/Y	22213V000	22214V000	22223V000	22224V000	22227V000	22228V000	22243V000	22244V000
with plug 460V / 50/60 Hz / 3ph PN/Y	22213V001	22214V001	22223V001	22224V001	22227V001	22228V001	22243V001	22244V001
with fuse box 400V / 50/60 Hz / 3ph PN/Y	22213V005	22214V005	22223V005	22224V005	22227V005	22228V005	22243V005	22244V005
with fuse box 460V / 50/60 Hz / 3ph PN/Y	22213V006	22214V006	22223V006	22224V006	22227V006	22228V006	22243V006	22244V006
with energy saving unit (EER) 400V / 50/60 Hz / 3ph PN/Y	-	-	-	-	22227V009	22228V009	22243V009	22244V009
with energy saving unit (EER) 460V / 50/60 Hz / 3ph PN/Y	-	-	-	-	22227V010	22228V010	22243V010	22244V010
Accessories								
Water flow monitor	500006623	500006623	500006623	500006623	500006623	500006623	500006623	500006623
Over-temperature protection switch	122 84	122 84	122 84	122 84	122 84	122 84	122 84	122 84
Astrotorus baffle	227 51	227 50	227 61	227 60	227 71	227 70	227 81	227 80
Right angle valve	504138V008	504138V002	504138V008	504138V002	504138V008	504138V002	504138V008	504138V002
Pump fluid ¹⁾	see Catalog Part "Oils / Greases / Lubricants LEYBONOL"							

1) Oil must be purchased separately

Oil Booster OB 6000 to OB 18000



Oil Booster OB 6000 (left), OB 12000 (middle) and OB 18000 (right)

The design of the oil booster pumps from Leybold is well proven in industrial high vacuum applications. They excel above all through excellent vacuum performance data and are, owing to their rugged design a reliable component in many medium and high vacuum units.

The water cooled oil booster pump was developed in particular for applications in the rough and medium vacuum range. The pumps from the OB line from Leybold deliver when properly deployed, a maximum pumping speed at high gas throughputs.

Advantages for the User

- Very high pumping speed from a small sized pump
- Pump sizes 6000, 12,000 and 18,000 m³ per hour
- Simple to operate
- Rugged and long life
- Selectable flange connections (OB 12,000 and 18,000 only)
- Small manageable amount of spare parts
- Pump components (e.g. heating elements, diffusion corpus, jet corpus) are similar for all OB sizes and can be exchanged easily
- Modern electronic pump monitoring (PLC controlled)
- High efficiency due to direct heating
- Optimized heating design for long oil change intervals

Typical Applications

- Vacuum Induction Melting (VIM) or Vacuum Induction Degassing (VID) of special alloys are utmost important process steps in the metallurgy.
- Depending on the required steel-quality, the required process pressure in such applications is particularly low.
- Secondary metallurgy processes are becoming more popular thanks to the greater demand for better steels e.g. in the automotive, construction and rail markets.

Supplied Equipment

The OB pumps are plug-and-play but are delivered without pump fluid.

The pump chamber is free of oil and has been cleaned.

The inside volume is evacuated. The high vacuum and forevacuum flanges are equipped with sealing and centering rings as well as shipping flanges.

Moreover, the electric circuit breaker box and the cooling water manifold have been installed for immediate connection.

The included Pt100 temperature sensor ensures safe oil temperature monitoring.

The installed overtemperature protection switch monitors and ensures safe operation of the pump.

Technical Data

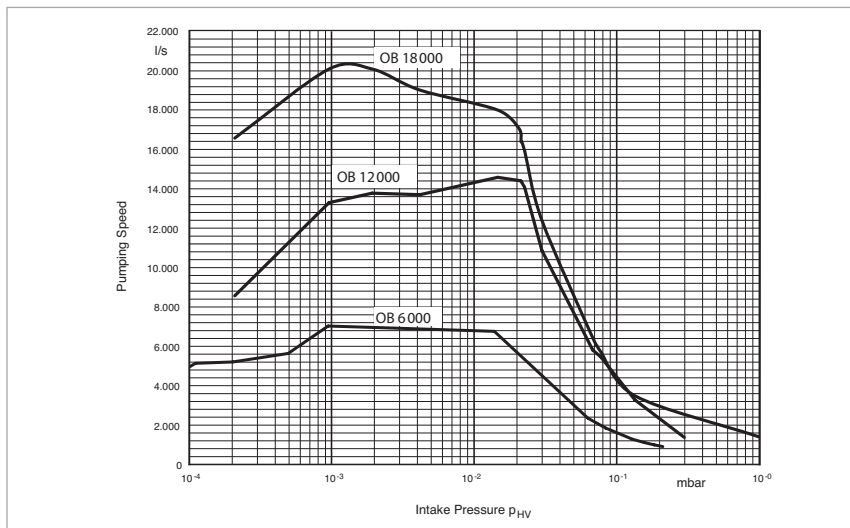
Oil Booster

		OB 6000	OB 12000	OB 18000
Pumping speed for air below 1.0×10^{-3} mbar (7.5×10^{-3} Torr)	mbar x l/s	6.000	12.000	18.000
High vacuum connection standard	DN	400 ISO-K	630 ISO-F	630 ISO-F
optional	DN	400 ISO-K / ASA 16 / ASA 18	500 ISO-K / 800 ISO-F / ASA 16 / ASA 20	800 ISO-F / 1000 ISO-F / ASA 32 / ASA 35
Fore vacuum connection (standard)	DN	160 ISO-K	160 ISO-K	160 ISO-K
Operating range	mbar (Torr)	1 to 10^{-6} (0.75 to 10^{-6})	1 to 10^{-6} (0.75 to 10^{-6})	1 to 10^{-6} (0.75 to 10^{-6})
Ultimate total pressure	mbar (Torr)	5×10^{-6} (< 3.75×10^{-6})	5×10^{-6} (< 3.75×10^{-6})	5×10^{-6} (< 3.75×10^{-6})
Pump fluid filling	l (qts)	45 (47.6)	60 (63.4)	90 (95.1)
Mains connection				
Standard EURO, 50/60 Hz	V	400 ~ 3 Ph Y	400 ~ 3 Ph Y	400 ~ 3 Ph Y
Standard Americas, 50/60 Hz	V	460 ~ 3 Ph Y	460 ~ 3 Ph Y	460 ~ 3 Ph Y
Special, 50/60 Hz	V	230 ~ 3 Ph Δ	230 ~ 3 Ph Δ	230 ~ 3 Ph Δ
Weight	kg (lbs)	450 (992)	850 (1874)	1400 (3086)
Cooling water consumption	l/h (gal/min)	700 (3.1)	800 (3.5)	1360 (6.0)
connection	G	1"	1"	1"

Ordering Information

Oil Booster

	OB 6000	OB 12000	OB 18000
	Part No.	Part No.	Part No.
Oil diffusion pump			
Standard EURO	503750V001	503654V001	503508V001
Standard US	503750V006	503654V006	503508V006
with control unit			
EURO version	503750V002	503654V002	503508V002
US version	503750V005	503654V005	503508V005
with control unit and waterflow/ -temperature monitoring			
EURO version (400 V)	503750V003	503654V003	503508V003
US version (460 V)	503750V004	503654V004	503508V004
Pump fluid	see Catalog Part "Oils / Greases / Lubricants LEYBONOL"		



Pumping speed curves of the Oil Booster OB 6000 to OB 18000 as a function of the intake pressure

LEYBOJET 630

Water-Cooled



LEYBOJET 630

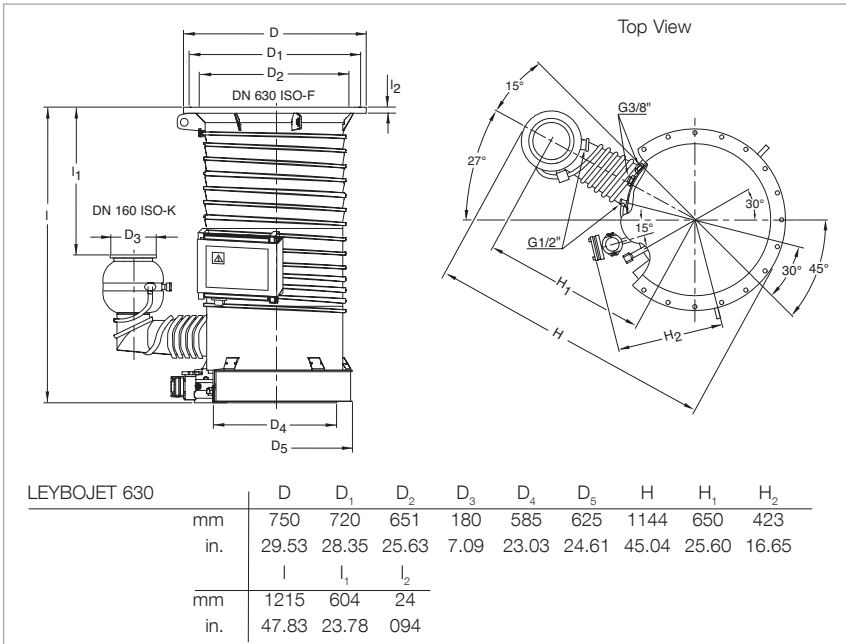
The oil diffusion pumps from Leybold are well proven in industrial high vacuum applications.

They excel through their excellent vacuum performance data and owing to their rugged design are a reliable component in many medium and high vacuum systems.

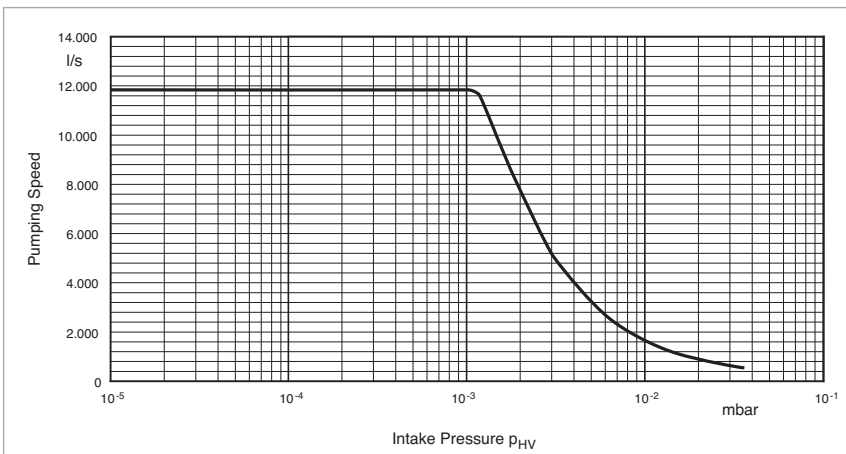
The water-cooled LEYBOJET 630 was developed especially with the medium vacuum in mind.

Advantages for the User

- High and stable pumping speed well into medium vacuum range
- Low ultimate pressure
- Low oil backstreaming due to integrated water-cooled cold cap baffle
- High forevacuum tolerance
- Each heating cartridge is protected by a separate circuit breaker
- In maintaining the well proven heating system - heating insert with thermally conducting panels and heating cartridges - the LEYBOJET 630 is now equipped with an additional ejector nozzle for the purpose of obtaining a stable pumping speed well into the medium vacuum range



Dimensional drawing for the LEYBOJET 630



Pumping speed curve of the LEYBOJET 630 as a function of the intake pressure

Typical Applications

The principal areas of application of the LEYBOJET 630 are modern sputtering processes as well as vacuum melting and drying plants.

Supplied Equipment

The LEYBOJET 630 are supplied ready for connection but without the filling of pump fluid.

The inside of the pump is cleaned before delivery to such an extent that it is free of oil. The inside is evacuated. High and forevacuum flanges are equipped with gaskets, centering rings, shipping flanges, and clamping components.

Technical Data

LEYBOJET 630

High vacuum connection	DN	630 ISO-F
Forevacuum connection	DN	160 ISO-K
Pumping speed for air ¹⁾		
at 1 x 10 ⁻² mbar	l/s	1 700
at 1 x 10 ⁻³ mbar	l/s	12 000
< 1 x 10 ⁻⁴ mbar	l/s	12 000
Operating range	mbar (Torr)	< 10 ⁻² (< 0.75 x 10 ⁻²)
Ultimate total pressure ¹⁾	mbar (Torr)	< 5 x 10 ⁻⁷ (< 3.75 x 10 ⁻⁷)
Max. permissible forevacuum pressure	mbar (Torr)	6 x 10 ⁻¹ (4.5 x 10 ⁻¹)
Pump fluid filling, min. / max.	l (qts)	5.0 / 8.0 (5.3 / 8.5)
Mains connection 50/60 Hz	V	400, 3 Ph
Heating power	kW	10.8
Number of heating cartridges		9
Heating up time	min	< 30
Cooling water		
min. throughput ²⁾	l/h (gal/min)	500 (2.2)
connection	G	1/2"
Number of cooling circuits (including cold cap baffle)		2
Cooling water connection		
for pump	G (BPS)	1/2"
for cold cap baffle	G (BPS)	3/8"
Weight, approx.	kg (lbs)	145 (320)
Recommended backing pump ³⁾		
at operating pressures		
> 10 ⁻⁴ mbar (> 0.75 x 10 ⁻⁴ Torr)		SV 200 + W 501
at operating pressures		
< 10 ⁻⁴ mbar (< 0.75 x 10 ⁻⁴ Torr)		TRIVAC D 65 B + W 251

Ordering Information

LEYBOJET 630

	Part No.
Oil diffusion pump LEYBOJET 630	502 180
Astrotorus baffle	227 70
Water flow monitor	500006623
Over-temperature protection switch	122 84
Contact thermometer	218 81
Resistance thermometer Pt100 sensor	200 02 958
Pump fluid ⁴⁾	see Catalog Part "Oils / Greases / Lubricants LEYBONOL"

¹⁾ Measured to DIN 28 427 with LEYBONOL LVO 500 as the pump fluid

²⁾ The required quantity of cooling water refers to $\Delta T = 10 \text{ }^\circ\text{C}$ (50 $^\circ\text{F}$). The discharge temperature should not exceed 30 $^\circ\text{C}$ (86 $^\circ\text{F}$)

³⁾ Single- or two-stage rotary vane vacuum pump (TRIVAC; SOGEVAC) from our range of forevacuum pumps jointly with Roots vacuum pumps (RUVAC) in pump systems

⁴⁾ Oil must be purchased separately