

# **Stable High Vacuum**

Oil diffusion pumps DIP & DIJ

Oil vapor jet pumps OB



# Oil Diffusion Pumps Oil Vapor Jet Pumps

Oil diffusion pumps and oil vapor jet pumps from Leybold are ideally suited for industrial high vacuum applications.

They're characterized by superior vacuum performance data, and their rugged design makes them reliable components in medium and high vacuum systems.



## Design

**DIP** and **DIJ** oil diffusion pumps are high vacuum pumps with no moving components to wear out.

The pumping effect of these ejector pumps is created through the diffusion of the gases that are pumped into the vapor jet. Compared to other high vacuum pumps, the pumping speed compared to the surface area is very high.

The operating range of **DIP** oil diffusion pumps is between  $10^{-2}$  mbar and  $10^{-7}$  mbar.

The pumping speed depends on the model size selected between the pump range of 3,000 l/s to 50,000 l/s.

Oil diffusion pumps from the 5-stage **DIJ** series provide an improved gas throughput and stable high pressure in the range of  $>10^{-3}$  mbar.

The pumping speed ranges from 2,400 l/s to 33,000 l/s in an operating range of  $< 10^{-1}$  to  $10^{-7}$  mbar.

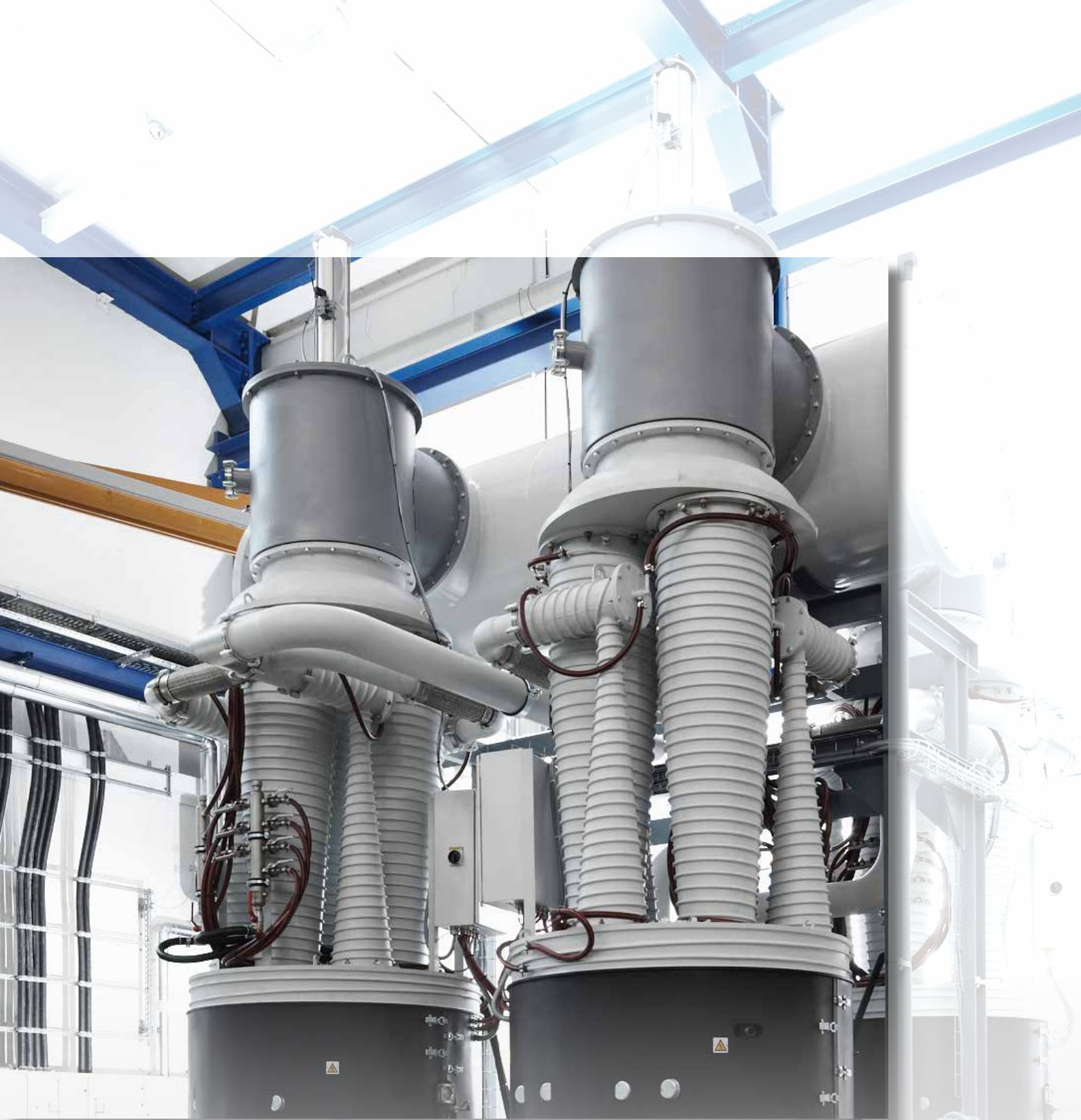
Additional design features further differentiate our DIP product range.

**OB** vapor jet pumps are comprised of one or more four-stage nozzle systems and one or more jet stages. The pumping speed ranges from 6,000 to 18,000 l/s in an operating pressure range of  $10^{-1}$  to  $< 10^{-4}$  mbar.

“Your vacuum solution for pumping speeds ranging from 3,000 l/s to 50,000 l/s”.







High vacuum  
with higher efficiency

# DIP Oil Diffusion Pumps



## Advantages

Prolonged maintenance intervals, no wear and tear, high safety standards.

### Pumping speed

3,000 to 50,000 l/s

### Operating range

$< 10^{-2}$  to  $10^{-7}$  mbar

### Optimal pumping speed

in a pressure range of  $< 10^{-4}$  mbar

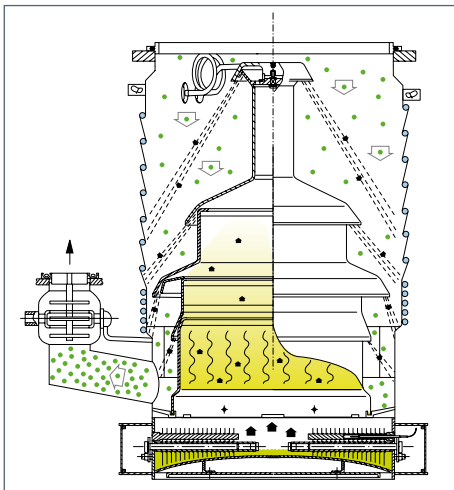
- Stable high vacuum
- High forevacuum tolerance
- High pumping speed

- Safe and economical
- CE-compliant electronics
- No wear caused by revolving parts
- Easy to operate
- Maintenance-friendly design for quick and easy replacement of heating elements
- A number of accessories available
- Flexible electrical wiring for worldwide use
- Innovative efficiency control (ROI  $< 2$  years)

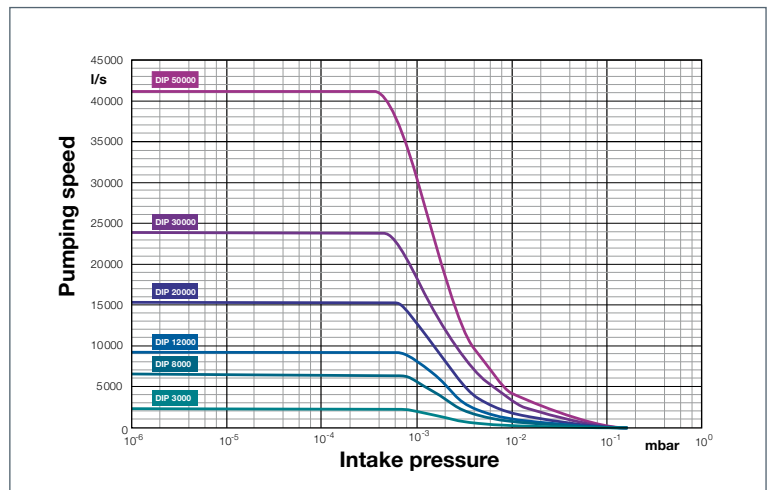
## Typical Applications

Oil diffusion pumps from the **DIP** and the **DIJ** series are well-suited for operation in:

- Industrial applications
- Vacuum coating
- Metallurgy
- Vacuum furnaces
- Vacuum drying
- Space simulation
- Research and development
- Mechanical engineering



DIP oil diffusion pumps - operating principle



Vacuum performance of DIP oil diffusion pumps

# DIJ Oil Diffusion Pumps



## Advantages

DIJ oil diffusion pumps require little maintenance - no wear caused by revolving parts. Easy operation.

The DIJ series never fails to impress with its innovative and highly energy-efficient construction.

Important features include a new heating concept, a powerful 5-stage nozzle system, variable flange connections, and a multitude of electrical connection options. DIJ pumps come fully equipped with fore line baffles and cold cap baffles.

### Pumping speed

2,800 to 33,000 l/s

### Operating range

$< 10^{-1}$  to  $10^{-7}$  mbar

### Optimal pumping speed

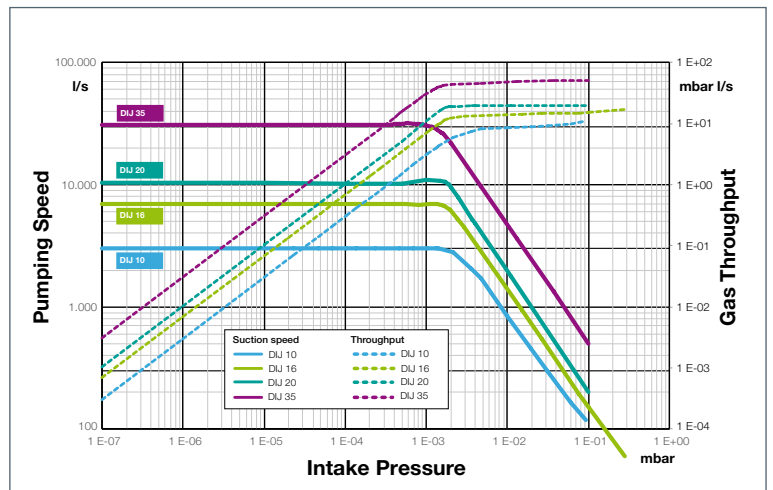
in a pressure range of  $< 10^{-4}$  mbar

- High and stable throughput at pressures of  $> 10^{-3}$  mbar
- High forevacuum tolerance
- High pumping speed

- Safe and economical
- CE compliant electronics
- The most innovative heating concept
- Five-stage system design
- Choice of flange variants
- Unique baffle design to prevent oil from backstreaming
- Various electrical connection options
- A wide range of accessories available
- Innovative ECO Energy control unit

“Leybold’s DIP and DIJ oil diffusion pumps are rugged, provide a long service life and excel through an optimized user interface”.

“The DIJ five-stage system design provides excellent performance data. Four diffusion pump stages for the highest suction speed and one ejector stage for high forevacuum stability and throughput at pressures of  $> 10^{-3}$  mbar”.



Vacuum performance of DIJ oil diffusion pumps



# OB Oil Vapor Jet Pumps



## Advantages

OB oil vapor jet pumps are equipped with one or several four stage nozzle systems and a jet stage.

**Pumping speed:** 6,000 to 18,000 l/s

**Operating range:**  $10^{-1}$  to  $< 10^{-4}$  mbar

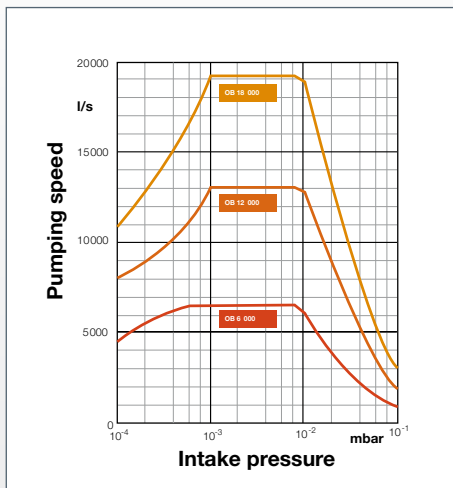
**Optimal pumping speed**  
in a pressure range of 1 to  $10^{-3}$  mbar

- Stable pumping speed in low pressure ranges
- Very high forevacuum tolerance
- Highly reliable
- Compact design with central supply connections
- Easy to operate
- Prolonged maintenance intervals
- Easy heating element replacement
- Central electronics

## Typical Applications

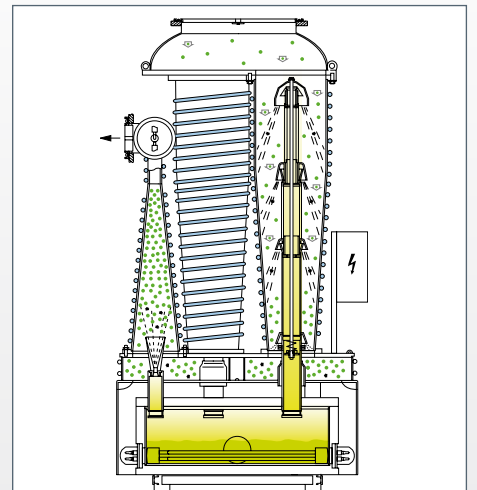
Oil vapor jet pumps excel in steel production processes including:

- Vacuum Induction Melting (VIM)
- Vacuum Induction Degassing (VID)



Vacuum performance of OB vapor jet pumps

“OB vapor jet pumps are the rugged endurance runners for your vacuum requirements”.



OB oil vapor jet pumps - operating principle

# Accessories

## for Oil Diffusion and Oil Vapor Jet Pumps



### ECO power efficiency control

Oil diffusion pumps require a certain minimum oil temperature for optimal operation.

The ECO power efficiency control unit for diffusion and oil vapor jet pumps ensure optimum power consumption conditions which are perfectly adapted to current heating demands.

- Cost reductions through energy savings (up to 30%)
- Increased service life of oil and heating cartridges
- Retrofit kit available for pumps already installed

“This innovative PLC-controlled power efficiency control unit significantly lowers power consumption without any loss of power.”.

“The matching pump fluid influences the performance and pumping speed of oil diffusion pumps. LEYBONOL pump fluids meet high vacuum requirements”.

### Right-angle valves

Range of right-angle valves in sizes from DN 250 ISO-K to DN 1000 ISO-F for oil diffusion pumps.

- Pneumatic or electropneumatic
- Fast opening and closing
- Position indicator (optical/electrical)
- Protection class IP 50
- Installation in any orientation, no restrictions to flow direction

### LEYBONOL pump fluids

LEYBONOL pump fluids for oil diffusion pumps exhibit a low vapor pressure at room temperature and resist thermal decomposition and oxidization. They allow for high pumping speeds over a wide range of pressures.

Surface tension of the pump fluids is high in order to reduce “creep” of oil films. They’re chemically inert, exhibit a high flash point and the evaporation heat is low.

- High-quality, reliable lubricants for a long service life for the oil and the pump
- Consistently high quality guaranteed
- Excellent vacuum performance data

### Accessories

- Astrotorus baffle
- Water flow monitor
- Overtemperature protection switch
- Contact thermometer
- Resistance thermometer (Pt 100 sensor)
- Pump insulation

For detailed information on our full range of accessories please refer to our general catalogue.

# Technical Data

## Ordering Information

Oil diffusion pumps DIP		DIP 3000	DIP 8000	DIP 12000	DIP 20000	DIP 30000	DIP 50000
High vacuum connection	DN	250 ISO-K	400 ISO-K	500 ISO-K	630 ISO-F	800 ISO-F	1000 ISO-F
Forevacuum connection	DN	63 ISO-K	63 ISO-K	100 ISO-K	100 ISO-K	160 ISO-K	160 ISO-K
Nominal pumping speed <sup>1)</sup>	l/s	3,000	8,000	12,000	20,000	30,000	50,000
Ultimate total pressure <sup>1)</sup>	mbar	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$
Heating power	kW	2.4	4.8	7.2	12	18	24
<b>Ordering information</b>	<b>P/N</b>	<b>DIP 3000</b>	<b>DIP 8000</b>	<b>DIP 12000</b>	<b>DIP 20000</b>	<b>DIP 30000</b>	<b>DIP 50000</b>
<b>DIP</b> with standard fuse box 400 V		222 10	222 20	222 25	222 30	222 35	22240
<b>DIP</b> with power efficiency controller EU 400 V		–	–	–	22230V001	22235V001	22240V001
<b>DIP</b> with industrial connector plug 400 V		–	–	22225V003	22230V006	22235V006	22240V006
<b>DIP</b> with isolation and plug 400 V		–	–	22225V005	22230V008	22235V013	22240V012

Oil diffusion pumps DIJ		DIJ 10 and DIJ 320		DIJ16 and DIJ 500		DIJ 20 and DIJ 630		DIJ 35 and DIJ 1000	
High vacuum connection	DN / ANSI	320 ISO-K / 10" ANSI		500 ISO-K / 16" ANSI		630 ISO-K / 20" ANSI		1000 ISO-F / 35" ANSI	
Forevacuum connection	DN / ANSI	63 ISO-K / 2" ANSI		100 ISO-K / 3" ANSI		160 ISO-K / 4" ANSI		200 ISO-K / 6" ANSI	
Nominal pumping speed <sup>1)</sup>	l/s	3,650		6,000		10,800		33,000	
Gas throughput	mbar l/s	10		18		17		45	
Ultimate total pressure <sup>1)</sup>	mbar	$< 5 \cdot 10^{-7}$		$< 5 \cdot 10^{-7}$		$< 5 \cdot 10^{-7}$		$< 5 \cdot 10^{-7}$	
Heating power	kW	2.4		3.6		10.8		21.6	
<b>Ordering information</b>	<b>P/N</b>	<b>DIJ 10</b>	<b>DIJ 16</b>	<b>DIJ 20</b>	<b>DIJ 35</b>	<b>DIJ 320</b>	<b>DIJ 500</b>	<b>DIJ 630</b>	<b>DIJ 1000</b>
<b>DIJ</b> with plug 400 V		22213V000	22223V000	22227V000	22243V000	22214V000	22224V000	22228V000	22244V000
<b>DIJ</b> with external EEC 400 V		–	–	22227V002	22243V002	–	–	22228V002	22244V002
<b>DIJ</b> with fuse box 400 V		22213V005	22223V005	22227V005	22243V005	22214V005	22224V005	22228V005	22244V005
EEC 400 V		–	–	22227V009	22243V009	–	–	22228V009	22244V009

Vapor jet pumps OB		OB 6000	OB 12000	OB 18000
High vacuum connection	ISO-K (F)	500	630	630
Forevacuum connection	ISO-K	160	160	160
Nominal pumping speed <sup>1)</sup>	l/s	6,000	12,000	18,000
Ultimate total pressure <sup>1)</sup>	mbar	$< 6.6 \cdot 10^{-6}$	$< 6.6 \cdot 10^{-6}$	$< 6.6 \cdot 10^{-6}$
Heating power	kW	8	24	36
<b>Ordering information</b>	<b>P/N</b>	<b>OB 6000</b>	<b>OB 12000</b>	<b>OB 18000</b>
<b>OB</b> with standard fuse box		503750V001	503654V001	503508V002
<b>OB</b> with EEC		503750V002	503654V002	503508V003
<b>OB</b> with EEC, flow controller and temperature switch 400 V		503750V003	503654V003	503508V004
<b>OB</b> with standard fuse box 400 V, 500 ISO-K		503750V005	503654V005	503508V006

<sup>1)</sup> in accordance with ISO/R 1000, DIN 28 400 with LVO 540 as the pump fluid  
For detailed information please refer to our general catalogue.



Pioneering products. Passionately applied.