Leybold

# VARODRY

## Dry Screw Vacuum Pumps

Vacuum can be so ...

easy

reliable

efficient

dry

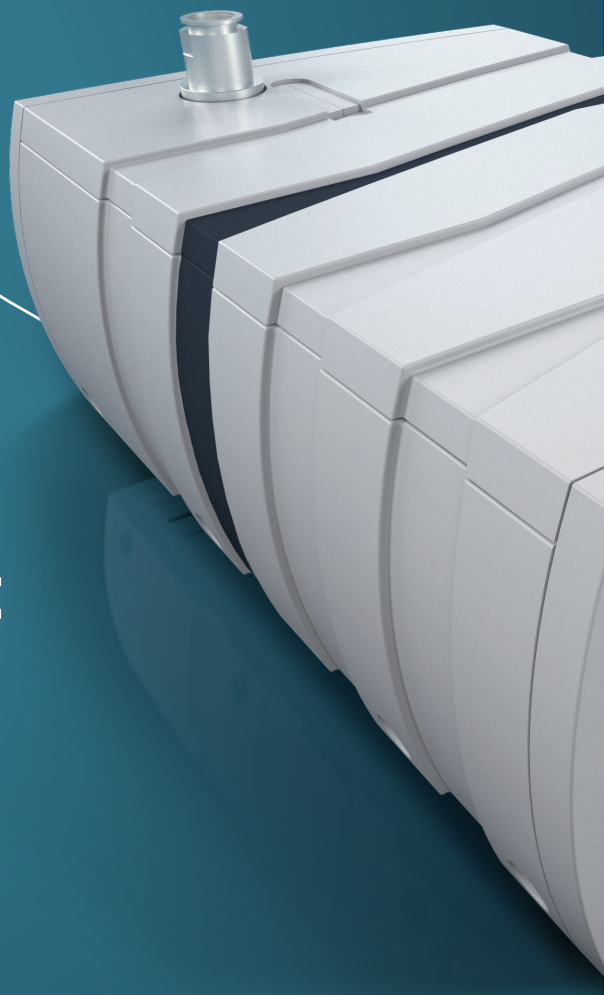
# VARODRY
## Dry Screw Vacuum Pumps

# Vacuum

## ...easy

**OPTIMIZED SIMPLICITY**

- Effortless installation - just connect to power and process
- Seemless control - via VSD or regulation valves
- Seamless integration/retrofitting - air cooled and easy accessibility



## ...efficient

**MINIMAL TOTAL COST OF OWNERSHIP**

- Low upfront investment
- Low power consumption
- Limited maintenance costs
- No costs for cooling water and compressed air

**MAXIMIZED PERFORMANCE**

- Competitive at all pressures and over the pump's entire life cycle
- Excellent vapor pumping capacity
- Quiet, low-pitch sound level

# can be so...


## ...dry

**100% CLEAN VACUUM**

- Completely oil-free
- No oil emissions or leaks

## ...reliable

**OPTIMIZED SYSTEM UPTIME**

- Robust pump design, specially designed for industrial applications
- Based on proven technology and an innovative belt drive
- Superior performance, even in humid and dusty applications
- Long life and extended service intervals

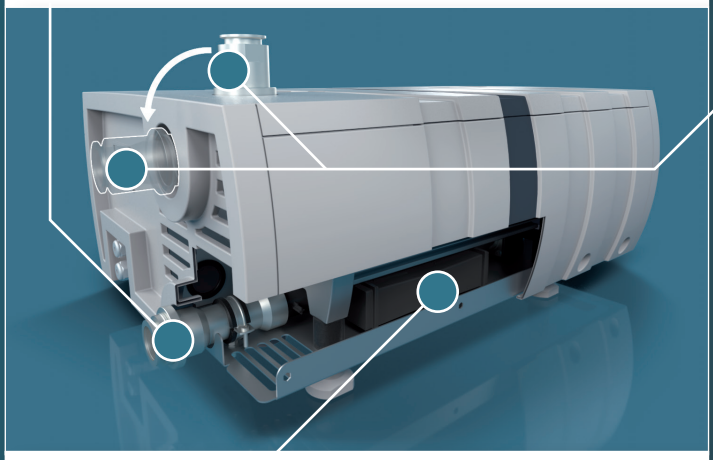
# Utilizing what today's technology has to offer

## Intake connection

- Horizontal or vertical orientation
- G-thread as standard
- Low position enables condensate drainage

## Exhaust connection

- G-thread as standard
- ISO-KF or NPT thread as accessory
- At lowest position, enabling condensate drainage



## Built-in exhaust silencer

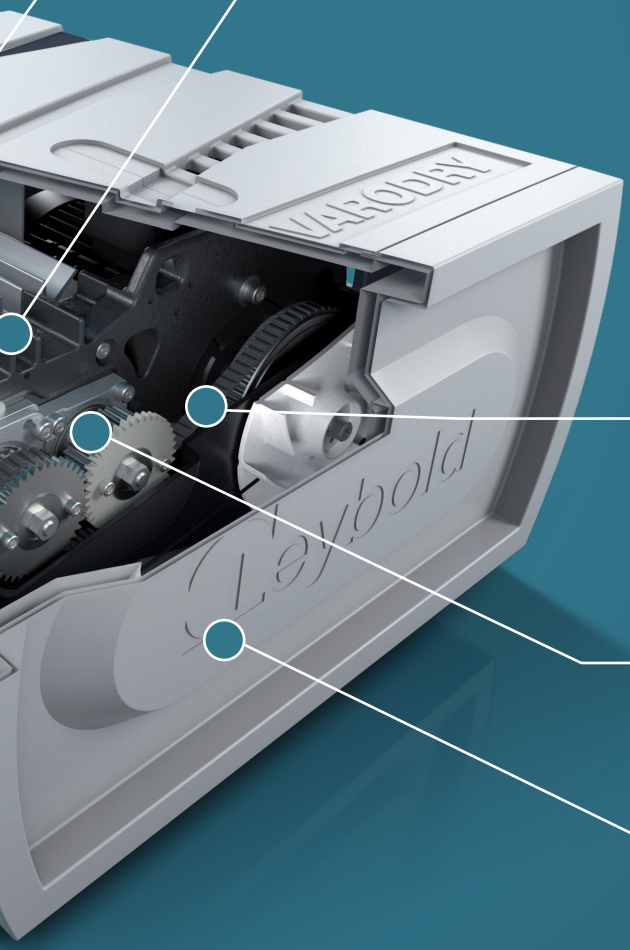
- Low noise emission
- Drainable design

## Anodized variable pitch rotor

- A benchmark for for efficiency and robustness
- Low power demand in its class

## Shaft seal / bearing protection

- "Self-cleaning" seal design
- Optional purge-gas system available
- No need for seal purge in most industrial applications

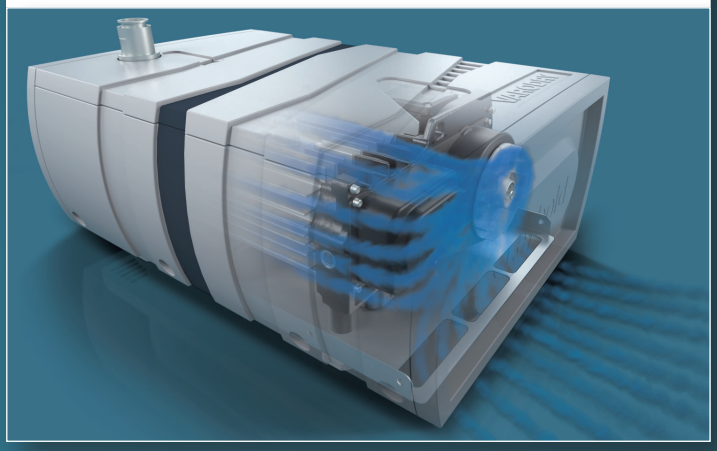



## Gas-Ballast

- High vapor tolerance
- Supports dust handling

## Air-cooled design

- Low cost of operation
- Easy integration into mobile systems



## Innovative belt-drive

- Provides synchronization and transmission
- Based on proven, long-life technology
- Easy to maintain via the partially removable enclosure
- No need for gear lubrication

## Innovative bearing technology

- Highly robust bearing design
- Life-time grease lubrication
- No need for oil exchange

## Enclosure

- Integrated noise dampening
- Can be partially removed for convenient pump access
- Clean and sleek design

# VARODRY

## easy - efficient - reliable - dry

## Eliminate process inefficiencies caused by vacuum.


**The new VARODRY vacuum pump series is designed and produced specifically for industrial processes by Leybold in Germany. Give yourself one less headache. With VARODRY, vacuum can be easy, efficient, reliable and dry.**

*"Our motivation was to develop a highly energy-efficient industrial dry pump."*

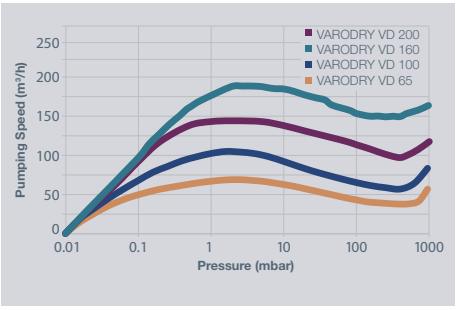
*Dirk Schiller, Head of Engineering*

### Efficient pumping

The **VARODRY** rotor design is optimized to provide a high level of efficiency.

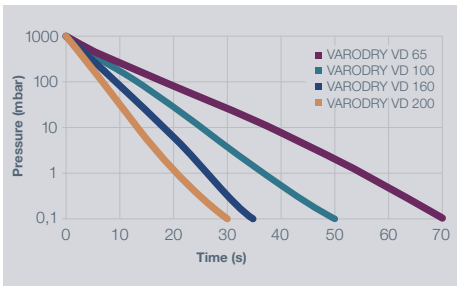
### Pumping speed

The **VARODRY** provides a competitive pumping speed over the entire pressure range and a low end-pressure of < 0.01 mbar. It can operate continuously at any inlet pressure.




### Pump-down time (100 l chamber)

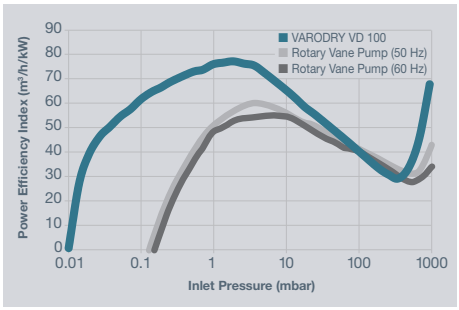
The **VARODRY** provides a fast pump-down down to the $10^{-2}$ mbar range.




*+/-10% tolerance; measurements at operation temperature for a 100l chamber with DN40 pipe and angle valve.

### Power efficiency index

The effective pumping speed generated per consumed power is a market benchmark for industrial dry pumps.




### The VARODRY is optimized for the challenges faced in many industrial applications:

- **Repeated and fast cycling:**
The **VARODRY** offers a very quick pump down. The pump tolerates atmospheric pressure shocks and repeated evacuation cycles.

- **Dust / particle handling:**
The rotor screw principle and anodization offers a high level of performance for handling fine, dry dust particles. For large amounts of dust, a wide filter portfolio is available.

- **Vapor handling:**
Due to its optimized temperature profile and the built-in gas-ballast, the **VARODRY** offers a high vapor tolerance, thus avoiding internal condensation.

- **Reactive gas handling:**
Vapors (e.g. hydrocarbons) often tend to react in hot, dry pumps and built-up internal coatings which can cause pumps to seize up – the internal temperature profile virtually eliminates this risk.

- **Liquid handling:**
The **VARODRY** can handle droplets and even liquid slugs as the liquids can flow freely out of the pump.

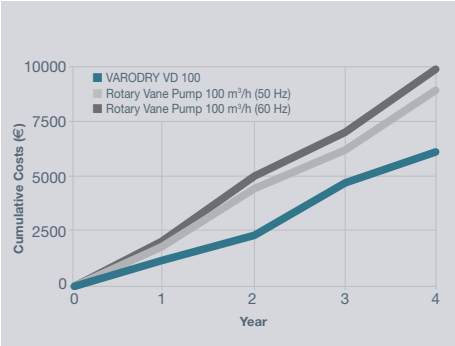
# Simple parts, less maintenance

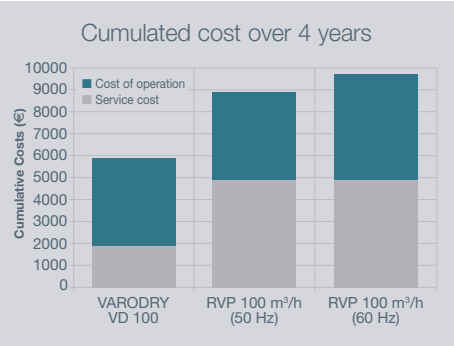
## **VARODRY** improves the efficiency of your machines.

### Operational costs

**VARODRY** is fully air cooled and oil free, which causes the **VARODRY** to consume electricity only. You'll never experience any extra costs for cooling water supplies or oil/oil filter exchange and disposal. Additionally, its low power consumption offers you significant energy savings.
Savings on the total cost of ownership realized by **VARODRY** apply to a wide range of demanding applications, especially since standard pumps require a high level of maintenance.

### Total Cost of Ownership Example: Composites (wind power plant)




**Compared to an oil-sealed rotary vane pump, the VARODRY VD 100 saves > 650 EUR in operational costs per year!**

## *"**VARODRY** – the easy, efficient, reliable and dry solution for your processes"*

*Uwe Zöllig, Business Development Manager Industrial Vacuum*

### User Maintenance

You can easily change the belt in less than 30 minutes. The partially-removable enclosure makes this especially convenient. The belt exchange interval depends on the individual application, but is typically one year. Belt exchange kits and maintenance tools are available.

Additionally, we offer solutions for multiple pump control via **Multi-VAControl**. Standardized combinations with **RUVAC** root blowers are also available.

### The VARODRY reduces your maintenance and service requirements

With only two replaceable parts (belt and bearings), keeping your pump running at peak performance requires minimal effort. At the same time, your facility's uptime will be greatly improved.

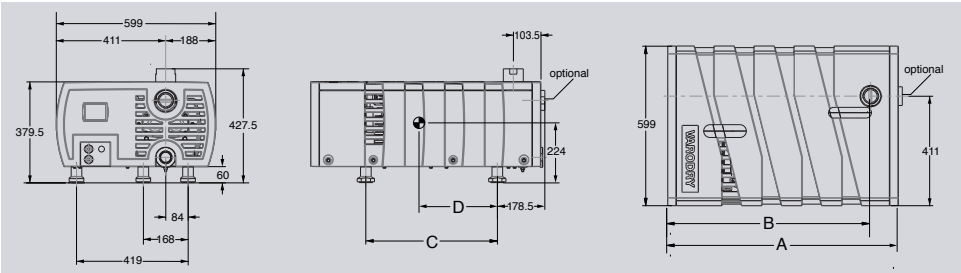
### Leybold Service

The bearings can be changed on site by trained service technicians. The typical lifetime of a bearing is three years. Complete pump overhauls can be performed in one of the many Leybold Global Service hubs.

To ensure optimal factory uptime, Leybold offers an expedited "pump exchange". Our back-up supplies offer flat pump exchange rates, to keep your production running at all times.

# Technical Data
## Ordering Information

### Dimensions




| VARODRY Type | A | B | C | D |
|---|---|---|---|---|
| VD 65 | 773 | 670 | 402 | 253 |
| VD 100 | 865 | 762 | 494 | 294 |
| VD 160 / VD 200 | 1060 | 957 | 647 | 270 |

### Technical Data

| VARODRY | | | VD 65 | VD 100 | VD 160* | VD 200* |
|---|---|---|---|---|---|---|
| Max. pumping speed | | $m^3/h$ | 65 | 105 | 150 | 200 |
| Ultimate pressure | without gas ballast | mbar | < 0.01 | | | |
| | with gas ballast | mbar | < 0.1 | | | |
| Max. permissible inlet pressure | | mbar | 1050 | | | |
| Max. permissible outlet pressure (rel. to ambient) | | mbar | 200 | | | |
| Water vapor tolerance | with gas ballast | mbar | 60 | | | |
| Water vapor capacity | with gas ballast | kg/h | 1.9 | 2.9 | 5.2 | 6.9 |
| Noise level (with built-in silencer) at ultimate pressure (50 / 60 Hz)** | | dB(A) | 64 / 67 | 64 / 67 | 65 / 69 | 65 / 69 |
| Permissible ambient temperature | | °C | 0 to +40 | | | |
| Rated motor power | | kW | 1.5 | 2.2 | 3.0 | 4.0 |
| Protection class | | | IP55 | | IP55 | |
| Inlet / outlet connection | | | G 2“ (In) / G 1 1/2“ (Out) | | | |
| Weight, approx. | | kg | 90 | 100 | 130 | 130 |

| Ordering Information | | VD 65 | VD 100 | VD 160* | VD 200* |
|---|---|---|---|---|---|
| VARODRY, 50 Hz, 200/400 V, +/- 10%, 3ph | | 111065V10 | 111100V10 | 111160V10 | 111200V10 |
| VARODRY, 50 Hz, 200/400 V, +/- 10%, 3ph, with purge gas module | | 111065V15 | 111100V15 | 111160V15 | 111200V15 |
| VARODRY, 60 Hz, 230/460 V, +/- 10%, 3ph | | 111065V11 | 111100V11 | 111160V11 | 111200V11 |
| VARODRY, 60 Hz, 230/460 V, +/- 10%, 3ph, with purge gas module | | 111065V16 | 111100V16 | 111160V16 | 111200V16 |
| VARODRY, 60 Hz, 200/380 V, +/- 10 %, 3ph | | 111065V21 | 111100V21 | 111160V21 | 111200V21 |
| VARODRY, 60 Hz, 200/380 V, +/- 10 %, 3ph, with purge gas module | | 111065V26 | 111100V26 | 111160V26 | 111200V26 |
| **Accessories** | | | | | |
| Inlet non return valve G 2“ (for inlet pressures > 1 mbar) | | 111005A15 | | | |
| Inlet Adapter | DN 40 ISO-KF, 20 mm | 111005A20 | | | |
| | G 1 1/4“, 10 mm | 111005A21 | | | |
| | NPT 1 1/4 -11.5, 10 mm | 111005A22 | | | |
| | NPT 2-11.5, 35 mm | 111005A23 | | | |
| Exhaust Adapter | DN 63 ISO-K, 27 mm | 111005A24 | | | |
| | DN 40 ISO-KF, 20 mm | 111005A30 | | | |
| | NPT 1 1/2-11.5, 30 mm | 111005A31 | | | |
| Casters (only for VARODRY) | | 111005A50 | | | |
| Flushing Kit | | 111005A00 | | | |
| Soft Starter VD/ND, ≥ 11A, 110-230 V AC | | | | 111005A65 | |
| Soft Starter VD/ND, ≥ 11A, 24 V DC | | | | 111005A66 | |
| Soft Starter VD/ND, ≥ 19A, 110-230 V AC | | | | 111005A67 | |
| Soft Starter VD/ND, ≥ 19A, 24 V DC | | | | 111005A68 | |
| Replacement timing belt 50 Hz versions | | EK6528531 | | | |
| Replacement timing belt 60 Hz versions | | EK6528533 | | | |
| Belt replacement tool kit | | EK6530942 | | | |

*Soft starter mandatory
**According to DIN EN ISO 2151

Leybold

**Pioneering products. Passionately applied.**