

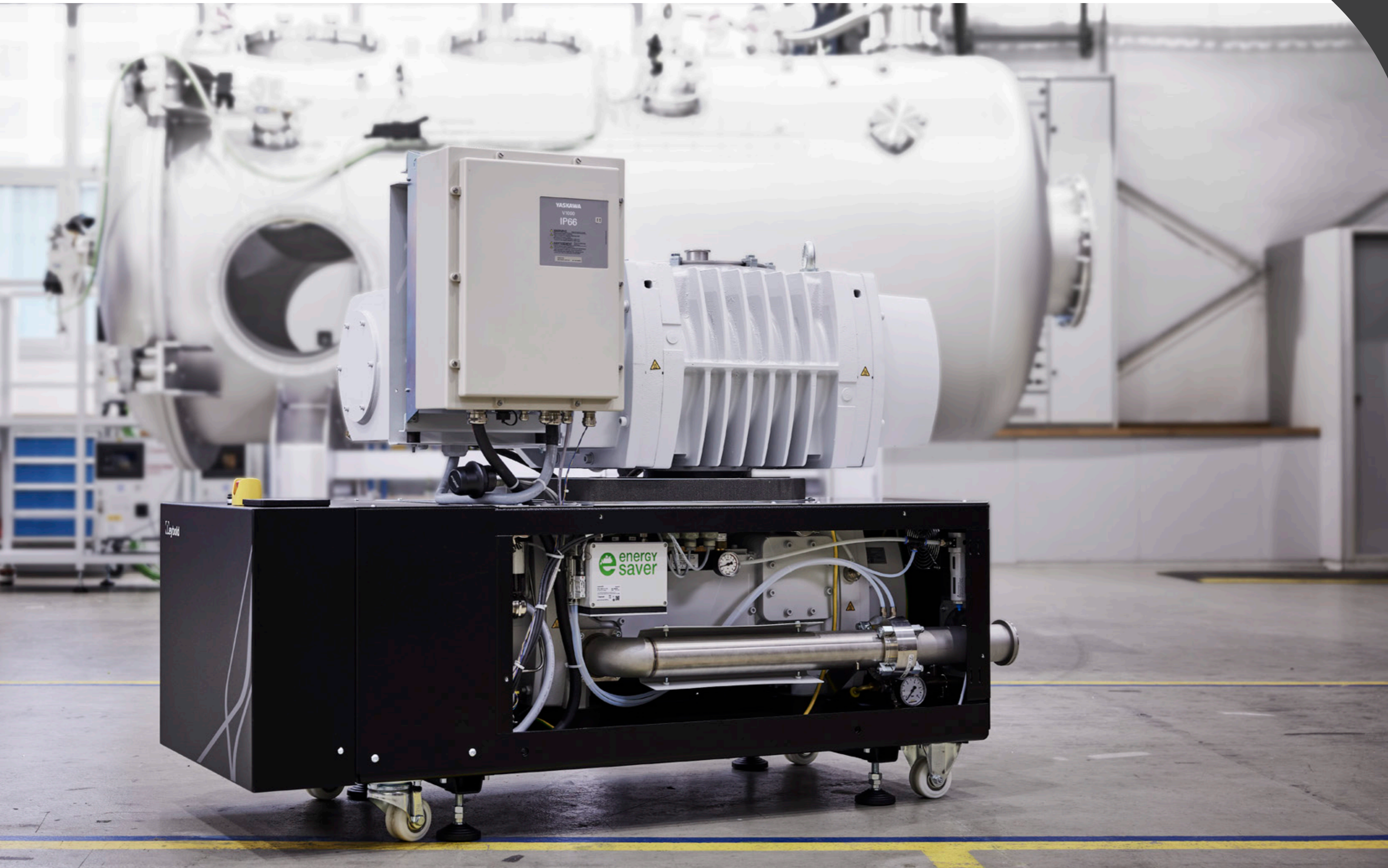
# Product overview 2023



Innovative vacuum pumps, systems and components for diverse applications









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## Oil sealed vacuum pumps

### SOGEVAC B, BI, D, DI

Single-stage rotary vane pumps

- ✓ **Effective investment, long service life**
- ✓ **No oil loss, low power consumption**

**Your expectations:**

- Industrial rough vacuum generator
- Favorable price-to-performance ratio
- High reliability
- ATEX or O<sub>2</sub> applications
- Low noise and clean operation

**Our solutions:**

- Pumping speed 10 to 840 m<sup>3</sup>/h
- Ultimate pressure ≤ 5 · 10<sup>-2</sup> mbar
- O<sub>2</sub>-compatible versions
- Separate standard product line for food and packaging applications
- Flexible pump design
- Quietest pumps on the market and oil loss below 1 ppm
- Certified according to ATEX directive 2014/34/EU
- Direct connection of RUVAC Roots pumps via adapter



### TRIVAC B, E, L and T

Dual-stage rotary vane pumps

- ✓ **A well-proven vacuum pump for long-term operation**
- ✓ **Extensive line of accessories**

**Your expectations:**

- Rugged vacuum generator
- High reliability
- Optional ATEX explosion protection

**Our solutions:**

- Pumping speeds
  - TRIVAC B: 4 to 65 m<sup>3</sup>/h
  - TRIVAC E: 2.5 m<sup>3</sup>/h
  - TRIVAC L: 42 to 79 m<sup>3</sup>/h
  - TRIVAC T: 4 to 30 m<sup>3</sup>/h
- Ultimate pressure
  - TRIVAC B: 10<sup>-4</sup> mbar
  - TRIVAC E: 3 x 10<sup>-3</sup> mbar
  - TRIVAC L: 6 x 10<sup>-3</sup> mbar
  - TRIVAC T: 5 x 10<sup>-3</sup> mbar
- For medium vacuum applications
- Economic OEM product range (TRIVAC T)
- Certified according to ATEX directive 2014/34/EU (TRIVAC B, L)
- Direct connection of RUVAC Roots pumps via adapter



### NEO D

Medium vacuum rotary vane pumps

- ✓ **No oil loss with integrated exhaust filter**
- ✓ **Effective upgrade**
- ✓ **Maintenance free up to three years in clean applications**

**Your expectations:**

- Medium vacuum pumps at affordable prices
- No oil loss at exhaust
- Longest possible maintenance intervals
- Monitoring options
- Broad portfolio, also for special requests

**Our solutions:**

- Pumping speed 16 to 76 m<sup>3</sup>/h, all sizes available for single or three-phase power supply
- Ultimate pressure ≤ 8 x 10<sup>-3</sup> mbar
- Integrated exhaust filtration. Oil loss below 1 ppm.
- Use of long-life oils and dynamic shaft seals
- Flexible pump design for retrofitting accessories or dedicated customer variants



### VACUBE

Complete rough vacuum solution with oil sealed screw pumps

- ✓ **Compact systems for vacuum generation on demand in industrial rough vacuum applications**
- ✓ **Efficient and productive with long maintenance intervals**

**Your expectations:**

- Industrial grade vacuum generator
- System solutions to cover varying vacuum demands
- Set point operation
- Easy operation

**Our solutions:**

- Highly efficient oil-sealed rotary screw technology
- Variable pumping speed, up to 4,980 m<sup>3</sup>/h
- Ultimate pressure of 0.35 mbar
- Integrated frequency converter for load-dependent speed control
- Sustainable power savings with on-demand vacuum generation
- Controller with intuitive menu navigation for configuration and control
- Small footprint
- Programmable operation modes
- Plug-and-play system set up
- Long maintenance intervals





## Dry compressing vacuum pumps

### ECODRY plus

Dry compressing multi-stage roots pumps

#### ECODRY 25, 35, 45 and 70 plus

- ✓ **High performing compact vacuum pumps for clean applications**

**Your expectations:**

- Small – Compact, light weight design allows for easy handling
- Fast – High-speed from high pressures down to low ultimate pressures
- Smart – Gauge and valve control
- Green – Low energy consumption and even less with the Eco-mode
- Maintenance-free pump

**Our solutions:**

- Each pump in the platform comes with the same compact dimensions and a low weight of less than 30kg
- Pumping speed 25/35/45/70 m<sup>3</sup>/h with high pumping speed at atmospheric pressure
- Adaptive speed control via a Leybold vacuum gauge
- Air-cooled pump
- Oil and particle-free operation

#### ECODRY 40 and 65 plus

- ✓ **Vacuum pumps with low noise emission for clean applications**

**Your expectations:**

- Clean and noise-free environment
- Easy handling
- High energy-efficiency
- Maintenance-free pump
- Application expertise in challenging R&D applications

**Our solutions:**

- Two pumping speed variants with ECODRY 45 and 60 plus
- Lowest noise level in class
- Excellent pumping performance for light gas applications
- Best-in-class water vapor tolerance
- Remote operation with external drive option
- Air-cooled pump
- Oil and particle-free operation



### CLAWVAC

Oil free claw pumps

- ✓ **Compact rough vacuum pump for demanding industrial applications including handling of particle and vapor contaminated gases**
- ✓ **Trouble-free and inexpensive**



**Your expectations:**

- Robust, oil-free vacuum pump for rough vacuum generation
- Long maintenance intervals

**Our solutions:**

- Pumping speed 65 - 1000 m<sup>3</sup>/h
- No oil migration into process, no environmental oil contamination
- Extremely efficient air cooling, low heat emission, no cooling water required
- Corrosion-resistant pump chamber and claws (stainless steel claws for sizes 65 to 300)
- Easy onsite cleaning
- Up to 50% energy savings via operation with variable speed drive
- A special oxygen variant is available that can handle up to 100% O<sub>2</sub>

### CLAWVAC System

Rough vacuum systems

- ✓ **The new benchmark in rough vacuum systems**
- ✓ **CLAWVAC systems are ideal for applications requiring a high level of redundancy and robustness, controlled in a smart way**

**Your expectations:**

- High, oil-free vacuum demand for all pressures
- Robust, redundant solution
- Long maintenance intervals

**Our solutions:**

- Varying pumping speed, up to 1,144 m<sup>3</sup>/h
- Ultimate pressure of 150 mbar
- Redundant smart controls
- Corrosion resistant pumping chamber with stainless steel claws
- Simple and easy to clean on-site
- No oil migration into the process, no environmental oil contamination





## Dry compressing vacuum pumps

### VARODRY VDi+ Systems

Smart pump down systems with integrated controller

- ✓ Intelligent pump systems with a little extra performance
- ✓ Easy maintenance
- ✓ Smart control

**Your expectations:**

- Adaptable to various process needs
- Low total cost of ownership and small footprint
- Robust, adjustable performance
- Energy efficient

**Our solutions:**

- Special software features for advanced application needs
- Low maintenance costs due to low spare part needs
- Performance on demand via intelligent software functions
- Extra Roots to boost pump down
- Additional energy savings with the energy saver kit



### VARODRY

Dry compressing screw pumps

- ✓ Compact, rugged oil-free vacuum pumps for general industrial applications

**Your expectations:**

- Industrial vacuum generator
- Low investment and operating costs
- High reliability and long system uptimes

**Our solutions:**

- Pumping speed 65, 100, 160 and 200 m³/h
- Ultimate pressure  $\leq 1 \cdot 10^{-2}$  mbar
- Fully air-cooled design, no need for water cooling
- Minimal maintenance demands
- Most robust pump design
- HD/O<sub>2</sub> variant can handle up to 100% O<sub>2</sub> and harsher applications
- OEM variant with reduced footprint for optimal system integration



### SCROLLVAC plus

Oil-free scroll pumps

- ✓ Dry, universal solution, low operating costs

**Your expectations:**

- Oil-free vacuum pump
- Quiet operation with low vibration
- Long maintenance intervals

**Our solutions:**

- Four speed variants SCROLLVAC 7, 10, 15 and 18 plus
- Single and triple phase available
- Robust, low-maintenance design





## Dry compressing vacuum pumps

### LEYVAC

Dry compressing screw pumps

- ✓ **Rugged vacuum pumps for industrial applications and high process throughputs**
- ✓ **Hermetically-sealed design for safe handling of hazardous gases**

**Your expectations:**

- Industrial vacuum generator
- Long system uptimes
- High pumping speed at atmospheric pressure

**Our solutions:**

- Pumping speed 80 to 160 m<sup>3</sup>/h
- Ultimate pressure  $\leq 1 \cdot 10^{-2}$  mbar
- Hermetically-sealed pump
- Direct connection of RUVAC Roots pumps via adapter



### DRYVAC

Dry compressing screw pumps

- ✓ **Rugged, compact vacuum solutions with smart monitoring and control system for coating, photovoltaic and process industry applications**

**Your expectations:**

- Maximum system availability
- Low cost of ownership
- Minimal footprint
- Self protection of the pump and easy communication

**Our solutions:**

- Pumping speed from 200 to 1,600 m<sup>3</sup>/h
- Guarantees highest uptimes through a robust and high-performing design
- Proven in harsh applications
- Higher production yield and long-term stable pumping speed
- Benchmarking energy savings via a sophisticated rotor design
- Easy installation due to its compact design
- Quiet - less noise load at production
- Onboard intelligence - easy control and self monitoring via a integrated FC
- Dry solution for every application
- Direct connection of RUVAC Roots pumps via an adapter
- DRYVAC FRAM version for daily wash down and higher food safety

### DRYVAC FP-r wash down version

Dry compressing screw pumps for food & packaging applications

- ✓ **The hygienic pump can be installed in proximity of your production line, increasing your packaging and bottling performance. You can wash down the DV 650/800 FP-r pumps along with your other production equipment.**

**Your expectations:**

- High and long-term stable pumping speed
- Low energy consumption
- Low heat dissipation to the food area
- Minimal footprint
- Daily wash down ready

**Our solutions:**

- Compact, water-cooled and silent dry screw pump
- Pumping speed 650 and 800 m<sup>3</sup>/h
- PFPE versions for MAP of red meat with oxygen
- Three inlet ports available, allowing for flexible installation and connection
- External frequency converter for easy networking and control
- Optional integrated, easy-to-clean stainless steel silencer
- Optional Energy-saver allows up to 50% energy savings at low pressure



DRYVAC FP-r wash down version

### SCREWLINE

Dry compressing screw pumps

- ✓ **Extremely robust for the harshest industrial applications, simple on-site maintenance**

**Your expectations:**

- High pumping speed
- Easy to clean
- Air-cooled
- ATEX explosion protection (Cat. 2i)

**Our solutions:**

- Pumping speed 630 m<sup>3</sup>/h
- Ultimate pressure  $\leq 1 \cdot 10^{-2}$  mbar
- Expandable to pump systems through the addition of Roots pumps
- Monitoring system
- Easy to disassemble pump chamber for quick cleaning
- Certified according to ATEX directive 2014/34/EU
- Direct connection of RUVAC Roots pumps via an adapter



### DRYVAC Energy Saver

Power saving unit for DRYVAC and DRYVAC system

- ✓ **Quick ROI (approx. one year) with power savings of up to 50%**

**Your expectations:**

- Cost savings through reduction of energy consumption
- Improved ultimate pressure

**Our solutions:**

- Power savings up to 50% at inlet pressures of  $< 5$  mbar
- Ultimate pressure improvements by one decade
- For all pumps and systems with LEYBONOL LVO 210
- To be used in applications with non-flammable gases or oxygen concentrations of  $\leq 21\%$





## Dry compressing vacuum pumps

### NOVADRY

Dry compressing screw pumps

- ✓ **Robust 100% oil-free, air-cooled design with simple on-site maintenance**
- ✓ **Specially designed for use in sensitive applications, such as food processing and packaging**

**Your expectations:**

- Zero oil emissions to avoid oil contamination of products
- Lowest maintenance demand
- Simple plug-and-play installation without complicated controls and need for utilities
- Lowest cost of ownership
- No need for expensive PFPE

**Our solutions:**

- 100% oil-free design
- Fully air-cooled design following hygienic principles
- Standard pump released for "Modified Atmosphere Packaging" (MAP) with O<sub>2</sub>
- Maximum robustness and extended uptimes
- Low noise level
- Low operating cost



### NOVADRY NDi System

Smart central vacuum systems with integrated controllers

- ✓ **Intelligent pump systems with vacuum on demand**
- ✓ **Easy maintenance**
- ✓ **Smart control**

**Your expectations:**

- 100% oil free for clean exhaust
- Robust dry screw – at any working pressure
- Plug & Pump – air cooled and ready-to-go

**Our solutions:**

- Strong performance down to 1 mbar ultimate pressure
- No oil changes or oil filter changes for low maintenance
- High performance at any working pressure
- Gas ballast & self draining design
- Smart control with our VAControl software



### Hygienic Enclosure

Enables wash down cleaning of pumps installed inside food processing areas

- ✓ **Protects pump from contamination (e.g., during food processing) or aggressive wash-down agents**
- ✓ **Standardized design, available for all Leybold industrial food pumps**

**Your expectations:**

- Full hygienic operation of vacuum pumps inside the food processing area
- No pump corrosion with aggressive cleaning agents
- Cost effective solution that avoids pumping speed losses over long pips
- No pump overheating due to unqualified enclosure design
- Easy integration

**Our solutions:**

- Corrosion-resistant stainless-steel materials - resistant against aggressive wash down cleaning agents
- Hygienic design with lanted surfaces – no accumulation of wash down liquids at the surface
- Prevents contact of pump surfaces with food or wash down cleaning agents
- Qualified design preventing pump overheating by enclosure
- Fast & easy onsite assembly





## Rough vacuum electronics

### Multi-VAControl

Smart rough vacuum control

- ✔ **Multi-VAControl creates an interconnected system of multiple pumps, ideally with variable speed driven pumps but also fixed speed or even competitor pumps can be controlled**

**Your expectations:**

- Cost optimizations via energy savings
- An intelligent pump control with extensive communication features
- A solution that's easy to use and install

**Our solutions:**

- Modes for optimizing energy usage, maintenance intervals or the best of both
- Direct communication via various methods I/O, field busses
- Plug-and-play set-up



### ELEC CAB / VAControl Cab

Smart power supply and vacuum control

- ✔ **VAControl Cab is a complete solution for upgrading your favorite vacuum pump(s) and electrical control(s) to intelligent version**

**Your expectations:**

- Cost optimization via energy savings
- Improved uptimes
- A solution easy to use and install

**Our solutions:**

- A complete solution, including components for electrical control
- Integrated variable speed drive for load dependent speed control
- Sustainable power savings via on-demand vacuum generation
- Intelligent control principles to maximize your redundancies
- A controller with intuitive menu navigation for configuration and control
- Programmable operation modes
- Plug-and-play system set-up



## Roots pumps

### RUVAC WA(U)/WS(U)

Roots blowers

- ✔ **Long-lasting and reliable**
- ✔ **Easy connection to any fore vacuum pump**

**Your expectations:**

- Pumping speed increase at low pressures
- Easy to use
- Oil-free gas pumping
- ATEX explosion protection

**Our solutions:**

- Pumping speed range from 250 to 4,000 m³/h
- Reliable and robust
- Available with flanged motor or hermetically-sealed drive motor
- Suitable for 100% O<sub>2</sub> applications
- Certified according to ATEX directive 2014/34/EU



### RUVAC WH(U)

Roots blowers

- ✔ **An innovative, efficient and cost-effective product line for use in modern process industry applications**

**Your expectations:**

- Flexible pumping speed through frequency converter operation
- Rapid pump down times
- Compact design
- Oil-free pumping of gases
- System compatibility
- Low current consumption

**Our solutions:**

- Pumping speed from 720 to 9,800 m³/h (with frequency converter)
- Excellent performance and consumption specifications
- Hermetically-sealed drive motor
- Small footprint
- Innovative bypass valve
- Certified according to ATEX directive 2014/34/EU and partially certified according to ATEX Cat 2i
- Direct connection of large fore vacuum pumps via an adapter





## Fluid entrainment pumps

### Oil Booster OB

Oil vapor jet pumps

- ✓ **Robust oil booster pumps with high pumping speed and gas-throughput for harsh process industry applications**

**Your expectations:**

- High vacuum
- Very high critical backing pressure capability
- High pumping speed
- Safe and economic design
- High energy efficiency requirements

**Our solutions:**

- Pumping speed: 6,000 l/s
- Operating range:  $<10^{-1}$  to  $10^{-4}$  mbar
- High gas-throughput
- Stable pumping speed in low pressure ranges
- Small footprint
- Reduction of CO<sub>2</sub> footprint and energy savings via our innovative Energy Efficiency Controller



### DIP

Oil diffusion pumps

- ✓ **High performing oil diffusion pumps for high vacuum applications, where high pumping speeds are needed**

**Your expectations:**

- Stable high vacuum
- High pumping speed
- Safe and economic design
- High reliability in industrial high vacuum applications

**Our solutions:**

- Pumping speed from 3,000 to 50,000 l/s
- Operating range:  $<10^{-1}$  to  $10^{-7}$  mbar
- Innovative direct heater concept for improved heat-up times
- Reduction of CO<sub>2</sub> footprint and energy savings via our innovative Energy Efficiency Controller

### Big valve

Stainless steel valve for high vacuum

- ✓ **Long lifetime, easy service and maintenance**

**Your expectations:**

- Membrane-sealed
- Low leak rate

**Our solutions:**

- Long lifetime, high cycle rate (> 50,000)
- High conduction
- Bypass and measurement flange included
- FPM o-ring sealed
- One plug, position indicators and connected pilot valve



### Energy Efficiency Control (EEC)

Control unit for oil diffusion pumps and OB pumps

- ✓ **Quick ROI (< 2 years) with power savings of up to 30%**
- ✓ **Easy and convenient to use**
- ✓ **Optimized power and oil-based power consumption**

**Your expectations:**

- Cost savings through reduction of energy consumption
- Easy to use
- PLC-controlled

**Our solutions:**

- Power savings of up to 30%
- Improved service life for the oil and heating cartridges
- Simple visual monitoring of parameters through a graphical user interface
- Equipped with USB interface and Ethernet





## Turbomolecular pumps

### TURBOVAC i/iX

Turbomolecular pumps with hybrid bearing technology

- ✓ **Innovative and flexible product range with outstanding performance data and integrated electronics**

**Your expectations:**

- Clean high and ultra-high vacuum generation
- Long service life
- Ease of installation and operation
- Reliable usage under the most varied applications and operation conditions

**Our solutions:**

- Pumping speed up to 1.450 l/s
- Oil free hybrid bearings (mechanical/permanent magnetic)
- Installation in any orientation
- Integrated electronics including a variety of options for communication and control of accessory components
- TURBO.CONTROL i display unit (optionally as rack version or benchtop unit) to control and monitor the pump including connection facility for two pressure gauges available as accessory

### TURBOVAC iR

Turbomolecular pumps with remote drive

- ✓ **Especially designed for challenging R&D applications**

**Your expectations:**

- Remote electronics
- Radiation resistance

**Our solutions:**

- Oil-free, robust turbomolecular pump
- Installation in any orientation
- Remote electronics including a variety of options for communication



### TURBOVAC MAGiNTEGRA

Turbomolecular pumps, magnetically levitated

- ✓ **Most compact product line for industrial applications**
- ✓ **On-board frequency converter and power supply**
- ✓ **Easy and space-saving system integration**

**Your expectations:**

- Clean high and ultra-high vacuum generation
- Suitable for industrial use, like PVD and coating processes, display and glass coating
- Insensitivity to particles or deposits
- Low maintenance requirements

**Our solutions:**

- Pumping speed up to 2,200 l/s
- High pumping speed and high compression ratios for all gases
- Holweck stage incorporated
- Resistant to particles and deposits
- Insensitive to shock-venting
- Monitoring and self-protection functions
- Maintenance-free in most applications





## Cryogenic systems

### COOLVAC cryo pump COOLPAK helium compressor

Cryogenic systems

- ✓ High water vapor pumping capability
- ✓ Long maintenance intervals
- ✓ Installation in any orientation
- ✓ Boost (fast cool down), customized or economical mode

#### Your expectations:

- Hydrocarbon-free vacuum
- High and ultra-high vacuum generation

#### Our solutions:

- Pumping speed up to 60,000 l/sec
- DN ISO-K, ISO-F, CF and ANSI flange variants with vertical or horizontal orientation
- Two variants for manual and for fully automatic system control and regeneration available
- Pump controller mounted on pump for fully automatically controlled iSL version for easy process and network system integration



### COOLPOWER refrigerator

Cooling systems

- ✓ Gas refrigerating machines for cryogenic temperature generation based on the Gifford-McMahon principle
- ✓ Designed for cooling superconductors (magnets, samples and sensors) for medical applications and research

#### Your expectations:

- High refrigerating capacity
- Small footprint
- Long maintenance-free operating time
- Low vibrations

#### Our solutions:

- Ultimate temperatures: two-stage models down to 8 K  
single-stage models down to 25 K
- High refrigerating capacity from the smallest volume:
  - up to 18 W @ 20 K and up to 110 W @ 80 K for double stage coolers
  - up to 250 W @ 80 K for single stage coolers possible
- Resistant to particles and deposits
- Simple operation by key-press
- High reliability



## Ion pumps

### TiTan ion pump, NEG pump and TSPs

Pump systems for ultra-high vacuum

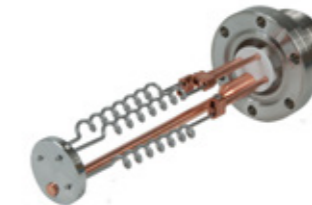
- ✓ A full range of vibration-free and maintenance-free TiTan ion pumps, titanium sublimation pumps (TSP) and non-evaporable getter (NEG) pumps to achieve ultimate pressures in the ultra-high vacuum

#### Your expectations:

- High pumping speed at ultra-high vacuum
- Hydrocarbon-free vacuum
- Long operating time
- Complete solutions

#### Our solutions:

- Pumping speed from 0.2 to 1,200 l/s
- Ultimate pressure <math> < 1 \times 10^{-11}</math> mbar
- Various TiTan pump elements for different requirements available:
  - TiTan CV with titanium cathodes for pumping air and reactive gases
  - TiTan DI for pumping air and reactive gases, noble-gas stable (titanium and tantalum cathodes)
  - TiTan TR - classic triode for higher pumping speed in high pressure ranges, noble gas stable
  - A broad variety of NEG pumps and TSPs for either separate use or integrated into TiTan ion pumps
- TiTan, NEG and TSP components are bakeable up to 450 °C
- Wide range of accessories
- DIGITEL controller models for operation of ion pumps, TSPs and NEG in diverse applications and configurations
- HV cables are available to connect your controller and ion pump





## Vacuum gauges, vacuum controllers

### Measuring instruments

Vacuum pressure gauges

- ✓ **Reliable monitoring and control for all vacuum processes**

**Your expectations:**

- Gauge systems for every application
- Precise pressure measurement of gases and vapors
- Reproducibility across a wide pressure range

**Our solutions:**

- Measurement with active and passive sensors in a pressure range from  $10^{-12}$  to 2,000 mbar for every application
- Intuitive operation and flexible data retrieval
- Pressure switches and pressure control instruments
- Handheld versions for easy and reliable pressure measurements
- DAkkS or factory calibration of vacuum gauges in the pressure range from  $10^{-8}$  to 1,000 mbar system integration



### GRAPHIX

Vacuum controllers

- ✓ **Universal controllers for the connection of active vacuum sensors for direct pressure measurements in the range of  $10^{-10}$  mbar to 2,000 mbar**

**Your expectations:**

- Operation and control of the entire vacuum system
- Simple handling and operation (plug & play)
- Fast process data accumulation and transfer via USB to PC

**Our solutions:**

- Monitoring and control of the entire vacuum process
- Product range with 1, 2 or 3 measurement channels
- 3.5" TFT touchscreen display with intuitive user interface
- Easy to read curve or bar graph display
- Internal and external data-logging (USB port on the front) for configuration and real-time measurement data
- Readout selectable between mbar, Torr, Micron, Pascal, Psi
- Option to connect active vacuum gauges from various brands



## Leak detectors

### PHOENIX 4

Leak detectors

- ✓ **The PHOENIX 4 product range sets new standards in helium leak detection**
- ✓ **Our product portfolio provides the perfect matching unit for every application**

**Your expectations:**

- Non-destructive components testing for quality assurance
- Reliable technology
- Highest measurement reliability and accuracy
- Professional consulting and support

**Our solutions:**

- Suitable for mobile or stationary vacuum and sniffer operation
- Quick start-up, high measurement accuracy
- Internal data logging and simple external data acquisition via USB
- Intuitive HMI with simple controls, menu structure and user friendly multicolored touchscreen
- Integrated webservice featuring easy login via Wi-Fi for remote control with any internet-enabled smartphone or tablet

### PHOENIX Cart

Mobile leak testing systems

- ✓ **The PHOENIX 4 carts offer a wide range of pre-designed combinations, fully assembled and leak-checked**
- ✓ **Plug in & ready to start: Leak detection to-go**

**Your expectations:**

- Mobile leak detection
- Ready-to-go solution
- Find leaks in the worst conditions
- Safety and performance

**Our solutions:**

- Pre-assembled system
- Fully customizable
- Best performance
- High reliability



### PHOENIX MOBILIS & PHOENIX MOBILIS MAG

- ✓ **Handheld multiple gas leak detectors**

**Your expectations:**

- Fast, accurate and high sensitive leak detection
- Ease of use and high flexibility
- Reliability
- Durable and robust

**Our solution for PHOENIX MOBILIS**

Ideal for standard industrial environments and quick checks in laboratories

- Multiple gas leak detector
- Portable and handheld
- Light weight
- Peace of mind: 2-year warranty

**Our solution for PHOENIX MOBILIS MAG**

Ideal for leak detection in magnetic fields environments

- All features of the standard PHOENIX MOBILIS combined with magnetic protection





## Residual gas analyzers

### LEYSPEC

Residual gas analyzers

- ✓ **All-in-one devices with integrated control and display for demanding test procedures and residual gas analysis in high vacuum systems, general gas analysis in research and industry or for environmental tracking**

#### Your expectations:

- Most accurate residual gas analysis
- Easy operation
- Bake out possibility for high and ultra-high vacuum applications

#### Our solutions:

- High sensitivity residual gas analysis allowing the detection of smallest traces of contaminants or process gases
- Product range with solutions for 100, 200 or 300 amu
- Simple residual gas analysis is possible even without connection to a computer
- Intuitive operated LEYSPEC software, integrated display
- Key gases can be displayed at the push of a button, a spare display channel for additional gases is available
- Preinstalled functions, like helium leak test, warnings and error levels for selectable gases, degassing function after start or venting
- Compact in size and mountable in any orientation for enhanced flexibility
- Bake out temperatures of up to 300°C for operation in harsh environments

### LEYSPEC Cart

Mobile residual gas analyzer systems

- ✓ **Mobile visibility**
- ✓ **Fully integrated differential pumping system**
- ✓ **Easy handling**
- ✓ **Maximum flexibility**

#### Your expectations:

- Mobile gas analysis system
- Complete independent pumping system
- Easily adaptable to a wide range of measurement tasks
- Operable at various pressures
- Rapid operational readiness

#### Our solutions:

- Independent pumping system with SCROLLVAC 7 plus and TURBOVAC 350i
- Integrated process control for quick and easy operation
- Easy and intuitive software for LEYSPEC RGA
- Completely integrated in an independently movable cart
- UHV needle valve for flexible operation at different pressure levels up to atmosphere



## Valves and components

### LEYCON

Valves in different design types and driving modes

- ✓ **Reliable valve technology, widely used in a broad range of applications**

#### Your expectations:

- Reliable leak tightness
- High number of actuations
- Simple to fit and remove
- Delivery from a single source

#### Our solutions:

- Manually actuated valves
- Valves with electromagnetic/electropneumatic drive
- Gate valves
- All-metal valves for UHV systems
- SECUVAC safety valves
- Special valves, such as vacuum lock and sealing valves, venting valves, leak valves



### Flanges

Connection components

- ✓ **Well proven and widely used technology**
- ✓ **Almost any connection possible**

#### Your expectations:

- Simple to fit and remove
- Reliable leak tightness
- High class materials, top quality
- Delivery from a single source

#### Our solutions:

- ISO-KF small flanges in sizes DN 10 to DN 50
- ISO-K flanges in sizes DN 63 to DN 630
- CF flanges in sizes DN 16 to DN 250





## Systems + Solutions

### Customer first – competence for tailor-made worldwide solutions

The Systems + Solutions business, unit with its **global setup, delivers tailor-made solutions** to meet the customer's demands. Listening carefully to the customer, the core function of our organization is to meet the customer's expectations by identifying and **providing the best vacuum concept**. Our portfolio varies from standard to customized and specialized vacuum systems and solutions. **We address a wide range of vacuum applications and markets** including integration with specific production environments.

Working in close collaboration with sales, we support integrated application development, engineering and design. Production sites in North Americas, Europe and China ensure a close proximity to our customers with local assembly and testing capabilities as well as efficient order execution. **This makes our team a true global player and a reliable partner in the field of vacuum systems.**





## Systems + Solutions

### Special systems

Vacuum solutions and systems tailor-made for your application

- ✓ **A few applications at a glance from the leading worldwide supplier**
- ✓ **Benefit from our experience since 1850**

#### Your expectations:

- Comprehensive consulting service
- Customer-specific application support
- Design and manufacturing of custom vacuum solutions
- High flexibility and reliability
- Efficient solutions

#### Our solutions:

- System solutions - tailor-made concepts based on customer specifications
- Integrated fore vacuum and high vacuum pump systems for custom requirements
- Worldwide engineering, production and service centers
- Global project coordination
- Custom software programming and customization
- Constant product improvements and innovations
- On-site setup and training

### Steel degassing

- Vacuum systems for efficient steel degassing
- Highest vacuum up-time by high redundancy
- Easy to install - on-site installation available
- Minor pressure increase only in the event that one module or one pump is off
- Users can help themselves, and single pumps can be exchanged in a short time
- Lowest power consumption by optimized system design
- Lowest space requirement
- Easy option for subsequent extensions
- In the event of a pump failure at multi-module installations, only one module will be switched off. The residual modules will finish the process!



### Hyperloop

- Three-stage pump system with a total of 12
- RUVAC WH and DRYVAC pumps completely inside a 12 m (40ft) shipping container.
- The container has a fully-accessible long side, which makes it possible to insert this complex system with only minor effort.
- The inlet and outlet flanges are installed in the container wall, so the customer only needs to mount the pipework to the container for it to be ready to operate.
- The container is self-supplied with compressed air, cooling water and air-conditioning. The only needed external supply is for electrical power.
- Implementation of several advanced solutions for easy accessibility and fast assembly, to be prepared for future projects with vacuum containers.



### Vacuum Housing

Vacuum pump system consisting of nine modules connected in parallel, each module consisting of:

- WS 2001 FU Roots Pump with water-cooled motor as well as electronic frequency converter for speeds up to 6,000 RPM and Roots pump adapter
- SCREWLINE SP 630 with SP-Guard for monitoring of important operating parameters
- DN 500 Intake Manifold
- Weather protection roof for outdoor installation
- Electrical controller with PLC for speed control
- System control via a touch panel
- Data communication with the customer's system controller of the customer's system controller through the ProfiBus interface



### PET extruder degassing

- Modern vacuum solutions for extruder degassing
- Stable, non-fluctuating vacuum supply
- Vacuum level is independent of climate or water temperature
- Pressure at venting/degassing dome can be regulated
- Minimized maintenance and service demands
- Maintenance is reduced to a regular cleaning in parallel with dye cleaning
- Full maintenance (incl. pump cleaning) can be executed by trained users

- Safe system design, even for expected misuse as worst-case pumps and system components build up layers
- The easy maintenance concept enables users to service themselves, independent of external service
- Flexible usage, also for other polymers as well with multi-purpose extrusion systems





## Systems + Solutions

### EXTRUVAC CP

Vacuum solutions for every application

- ✓ **Vacuum pumping systems used for processing plastics should be capable of handling solids and liquids in a reliable and efficient way, providing vacuum on demand while ensuring control and reducing the environmental impact with a low cost of ownership.**

#### Your expectations:

- Low cost of ownership
- Vacuum solutions for controlling and reducing environmental pollution
- Designed for safety, quality, reliability and cost-effectiveness
- 'Plug and Play' systems with minimum setup or configurable options adapted to specific chemical processes

#### Our solutions:

- Automatic and manual control options - easy integration with your system
- Proven dry technology
- Kinder to the environment: dry pumps do not generate contaminated oil or water
- Rough to high vacuum pumping technologies for corrosion-free operation with robust liquid and solids handling
- Increased productivity between service intervals
- Affordable systems with low cost of ownerships
- Low installation, operation, service and maintenance costs



### RUTA System

Multistage fore vacuum systems

- ✓ **Reliable process engineering solutions since 1850 with experience in designing customized vacuum systems and custom controls**

#### Your expectations:

- Professional consulting
- Design and delivery of demand-oriented and optimized vacuum systems
- Reliable engineering solutions

#### Our solutions:

- Custom designed fore vacuum pump systems
- Oil-sealed/dry compressing
- Pumping speed and ultimate pressures adapted to the processes
- Additional high vacuum stages facilitate operating pressures down to  $10^{-7}$  mbar



### DRYVAC System

Dry compressing pump systems

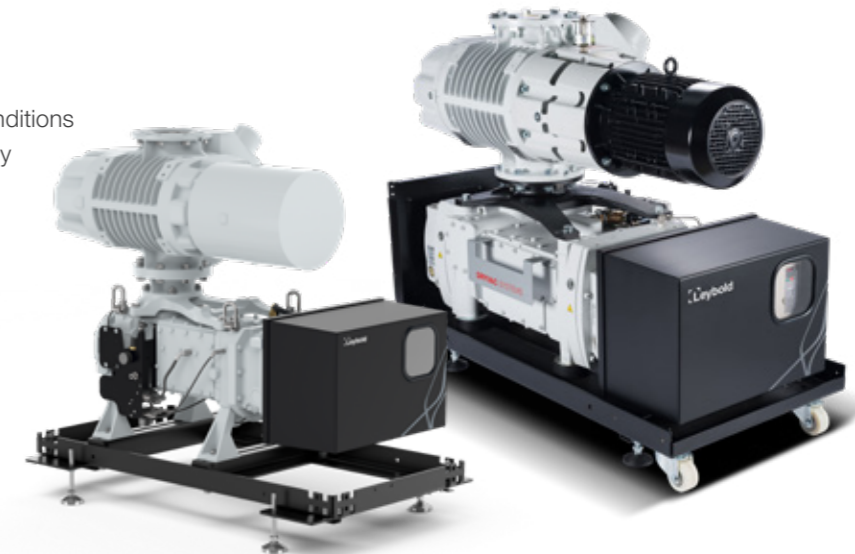
- ✓ **Leybold has refined its DRYVAC vacuum pump systems, making them adaptable to a variety of applications**
- ✓ **Basic and smart system configuration**

#### Your expectations:

- Maximum system availability
- Reliable engineering solutions
- Minimal footprint
- Self-protecting of the pump and easy communication

#### Our solutions:

- Extremely compact design provides more space in production areas
- Very low noise level improves working environment conditions
- Significant cost reductions due to high energy efficiency
- Clean technology with no oil emissions
- Optimized for fast cycle / load lock applications
- Fastest pump down times via high throughput pump mechanisms
- High pumping speeds for dry and booster pumps
- Pumping speeds from 2,000 m<sup>3</sup>/h up to 9,800 m<sup>3</sup>/h
- Integrated smart monitoring of major parameters
- Standard Digital I/O interface and Profibus (optional) for the entire product family



### DRYVAC PowerBoost

Dry compressing pump systems

- ✓ **Its design has been specifically optimized for fast load lock pump-downs**
- ✓ **It's equipped with an automatic cycle detection system**

#### Your expectations:

- Fast pump-down times
- High energy efficiency
- Low cost of ownership and investment
- Minimal footprint

#### Our solutions:

- Integrated frequency converters
- Micro-controllers with touchscreen
- Digital I/O communication interfaces (DC37-P)
- Harting connections (power supply)
- Housings, castors and adjustable feet
- The system is water-cooled and lubricated with synthetic oil





## Systems + Solutions

### SOGEVAC / NEO D System

Oil sealed standard vacuum systems

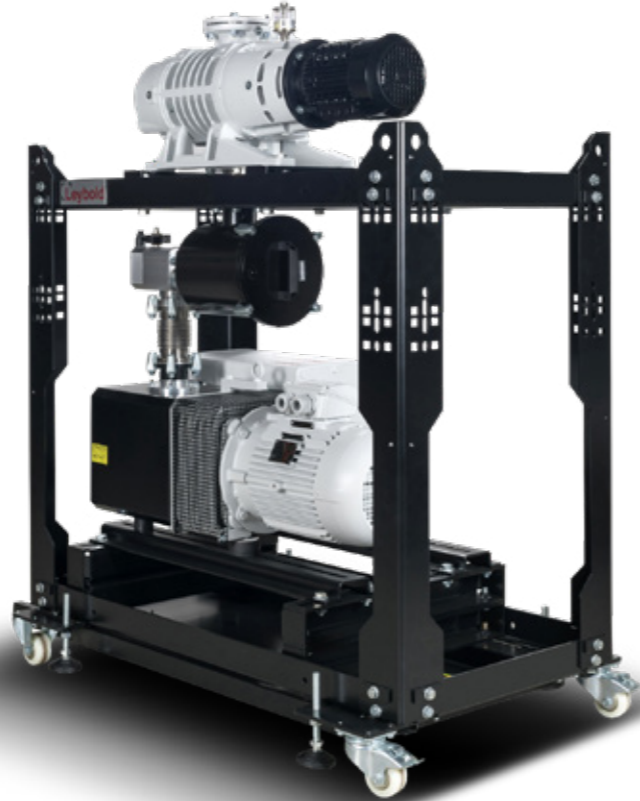
- ✓ **Combination of dry compressing roots pumps and oil-sealed rotary vane pumps**
- ✓ **Vacuum systems built using oil-sealed SOGEVAC pumps deliver an excellent cost vs. performance ratio for a wide range of industrial applications**

**Your expectations:**

- Comprehensive consulting service
- Customer-specific application support
- Design and manufacturing of custom vacuum solutions
- High flexibility and reliability
- Efficient solutions

**Our solutions:**

- System solutions - tailor-made concepts based on customer specifications
- Engineering, production and service centers around the world
- Global project coordination
- Continuous product improvements and innovations
- On-site setup and training



### TURBOLAB and TURBOLAB Core

High vacuum pump systems

- ✓ **Plug-and-play high vacuum pump systems based on time-proven components**
- ✓ **Various configurations available to meet individual vacuum demands**

**Your expectations:**

- High vacuum pump systems for industry and research
- Oil-sealed or dry compressing fore vacuum pumps for a hydro-carbon-free vacuum possible
- Compact and user-friendly solution

**Our solutions:**

- Pumping speed of 78 - 400 l/s provided by the TURBOVAC i pump range
- Ultimate vacuum down to  $10^{-10}$  mbar
- Completely preassembled units with turbomolecular pump, TPU display power unit, frequency converter and fore vacuum pump
- Easy to relocate pumps out and away from the frame
- Backlight display in the innovative TPU power unit
- Covering many applications with a full line of high vacuum and wet or dry fore vacuum pumps
- Integrated data logger and webserver for system control, monitoring and configuration
- Connection of up to six accessories and two gauges
- Benchmark design, reliability and functionality



### CVS

Central vacuum stations

- ✓ **Modular systems for improved operational reliability in frequently varying vacuum consumptions**
- ✓ **Delivery of tested, turnkey and ready-to-operate units**

**Your expectations:**

- Industrial grade vacuum pump equipped
- For meeting the demands of numerous small vacuum consumers individually and simultaneously
- Excellent vacuum performance data
- Modular design for adapting to specific processes

**Our solutions:**

- Typically consisting of SOGEVAC pump(s), a buffer vessel, an electrical cabinet with controller and all connecting components
- Pumping speeds of 25 to 840 m<sup>3</sup>/h
- Ultimate pressure ≤ 0.5 mbar
- Vessel volumes of 60, 160, 300, 500 or 1,000 liters
- Electric power from 0.8 to 18.9 kW
- Basic or full-featured controls
- Low cost of ownership



### CS Calibration System

Custom vacuum calibration systems

- ✓ **Process reliability via regular checks, adjustments and recalibration of vacuum gauges and sensors**

**Your expectations:**

- Vacuum gauge checking
- Precise calibration of vacuum gauges in accordance with DAkkS (a national accreditation body for the Federal Republic of Germany)
- Ensuring reproducible parameters

**Our solutions:**

- Universal calibration systems with a special vacuum chamber, turbomolecular pump system, vacuum gauges and additional components depending on the calibration pressure





## Systems + Solutions

### UNIVEX

Experimentation and coating systems

- ✓ Easy operation and accessibility of vacuum chambers
- ✓ Manual or automatic process control and documentation

#### Your expectations:

- Flexible laboratory systems for vacuum coating
- Systems for university and industrial research
- Results transferable to large scale systems or serial production
- High level of reproducibility

#### Our solutions:

- Multi-purpose systems for the production of functional layers
- Modular system configuration, a wide range of accessories
- Customized system solutions
- Variable chamber sizes





## Systems + Solutions

### UNIVEX S

Space simulation systems

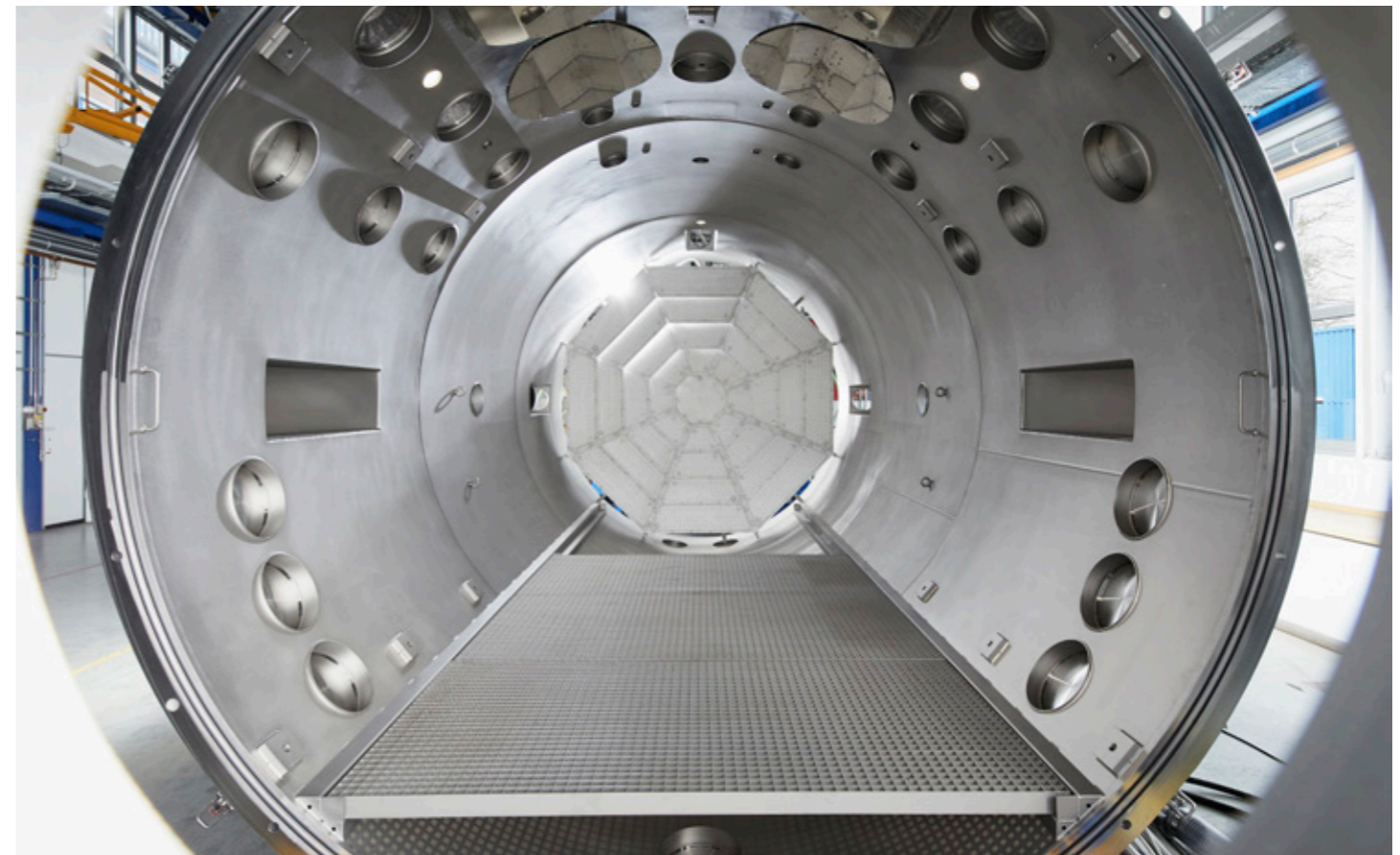
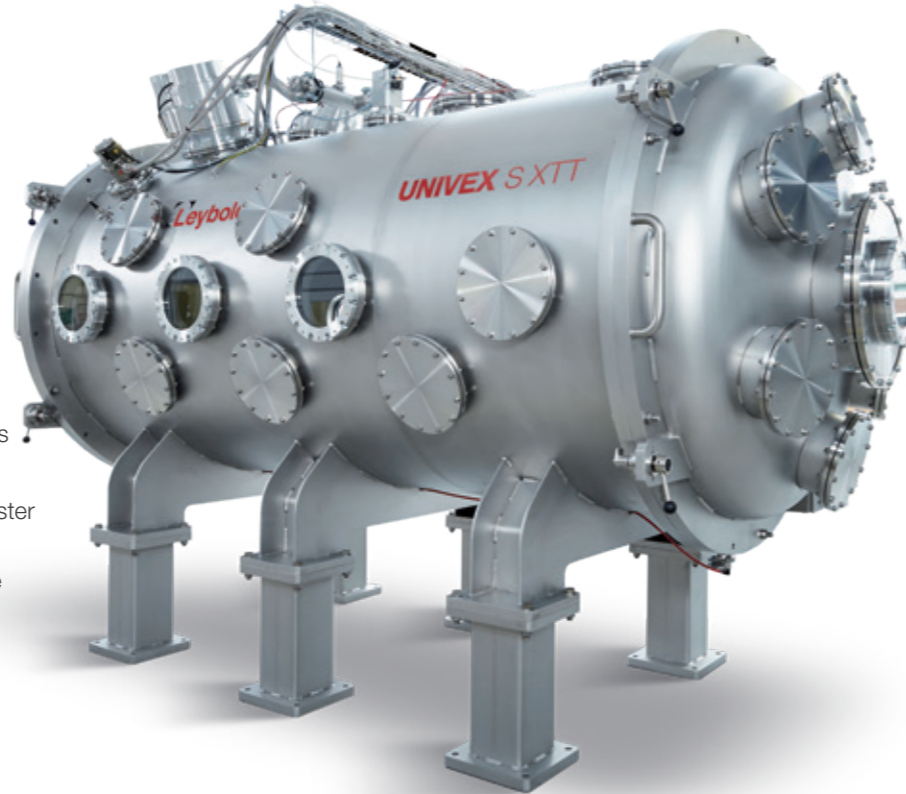
- ✓ Flexible solutions for various space applications
- ✓ Highest reliability for uninterrupted test cycles

#### Your expectations:

- Most accurate simulation of space conditions
- Equipment reliability for uninterrupted test cycles
- Configurable/extendable equipment platform
- Universal usability in the R&D and space industries

#### Our solutions:

- An extensive portfolio for thermal cycling, ion thruster testing, MLI-blanket baking etc.
- Optimized layout in terms of vacuum performance and temperatures
- Automatic process control and data logging
- Platform design with wide range of accessories
- Customized configurations for intensive use





## Service

## Easy, competent, reliable



### We are where you are

With our comprehensive range of innovative service solutions, we offer excellent support for your Leybold vacuum pumps and we are committed to:

- **Providing you with a reliable, first-class service throughout your pump's life cycle, no matter where in the world it is installed**
- **Maximizing your pump's uptime and ensuring it gets the best possible service**
- **Offering you specialist support with preventive maintenance and repairs**

Read on to find out more about our complete range of vacuum pump services and how our specialists can help you. The rewards are high uptimes, low running costs and longer lifecycles.





## Service



### SERVICE AGREEMENTS

Our full range of service agreements are designed to ensure the lower total cost of ownership of your pumps, maximizing their performance and uptime. From preventive maintenance agreements to warranty extensions, we offer you customized solutions that let you focus fully on your production by providing a perfect match to your needs.



### VACUUM GAUGE CALIBRATION

Profitability and credibility of process are two of the most important aspects of production. Accurate gauge calibration is necessary to maintain both. We offer application-specific gauge calibration that comprises three levels: Certified, Factory, and Alignment. Choose the level that suits your application and avail of a range of benefits.



### SERVICE TECHNOLOGY CENTER

Fully equipped to handle pumps from every kind of application, even the harshest, our service technology centers are ready to service your pumps. From preventive maintenance to repair, we offer transparent fixed-price solutions and the capability to do anything your pump requires.



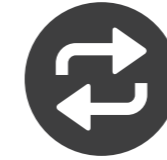
### SPARE PARTS AND KITS

Our genuine spare parts fit your vacuum pump perfectly to ensure high reliability, performance, and a long service life. To ease your workflow and ensure you have everything you need for your pump, we put together spare parts kits for specific maintenance activities.



### FIELD SERVICE

Our team of vacuum pump experts come to your site to perform maintenance on your pumps, whether it is routine service or troubleshooting. Competent, reliable and there for you, they know what your pumps need to perform flawlessly at their best.



### CERTIFIED AND EXCHANGE

Our certified and exchange stock is always available in an emergency and to ensure your manufacturing continues as smoothly as possible with a minimum of downtime. All pumps come with a 12-month warranty and are rebuilt and tested to industry standards to ensure that they deliver OEM performance.



### LEYBONOL VACUUM PUMP OIL

LEYBONOL has been specially formulated to achieve high performance for your pump. The premium quality of LEYBONOL ensures long oil exchange intervals and reduces power consumption as well as wear and maintenance costs. Our certified oils keep your production running and extend your pump life expectancy.



### GENIUS INSTANT INSIGHTS™

Our connectivity solution offers you 24/7 remote mobile access to your vacuum pumps. Alarms on failures, service maintenance, insights on up-time and energy consumption are all transparent on the GENIUS Portal. With GENIUS you can set up real time notifications about important events coming from the vacuum system, giving you the opportunity to avoid costly downtime and production losses – it has never been so convenient and easy to have a healthy and reliable vacuum pump installation.

You can find the correct oil for your pump using the Oil finder:





## Service

### Health Check PRO

Our approach to keep your vacuum pumps always in best shape. With Health Check PRO, we perform regular assessment to the pumps, it consists of non-invasive inspection of parts, connections, damages and vibration measurement, Health Check PRO allows customers to identify early deviations on pumps condition that could lead to major failure and jeopardize production output, moreover, customer will get detailed report with all recommendations needed to act preventively.



**For effectiveness, Health Check PRO visits should take place twice per year, during normal service intervals.**

More scenarios where you can benefit from Health Check PRO:

- Pumps with long interval between maintenances
- Pumps running in harsh applications
- After long standstill period
- Back up pumps
- When looking for condition-based maintenance



## Vacuum academy

### Vacuum academy

Vacuum technology seminars

- ✓ Qualified training of your staff through practical knowledge transfer
- ✓ Provides best possible performance and equipment uptime

**Your expectations:**

- Understand vacuum technology
- Get practical and hands-on training

**Our solutions:**

- Systematic training covering the entire spectrum of vacuum technology
- Vacuum basic seminar for technicians and engineers
- Leak detection – Basic and Advanced seminars
- Practical seminars on request
- Customer specific seminars – tailored to your individual needs





## Controllers and calculation tools

### Controllers

Innovative pump and system management

- ✔ **Tailor-made controllers and control systems adapted to customer and process requirements for optimum performance and user convenience**

#### Your expectations:

- Customer specific system interfaces
- Simple to complex visualization
- Power distribution integrated within the system
- Convenient control of all system components

#### Our solutions:

- Control and data acquisition of system parameters via digital I/O interfaces or bus systems, Ethernet, Profibus, RS 232, WiFi, GSM, for example
- Implementation of custom software programming
- Simple digital display via touch panel up to visualization on mobile devices (via apps)



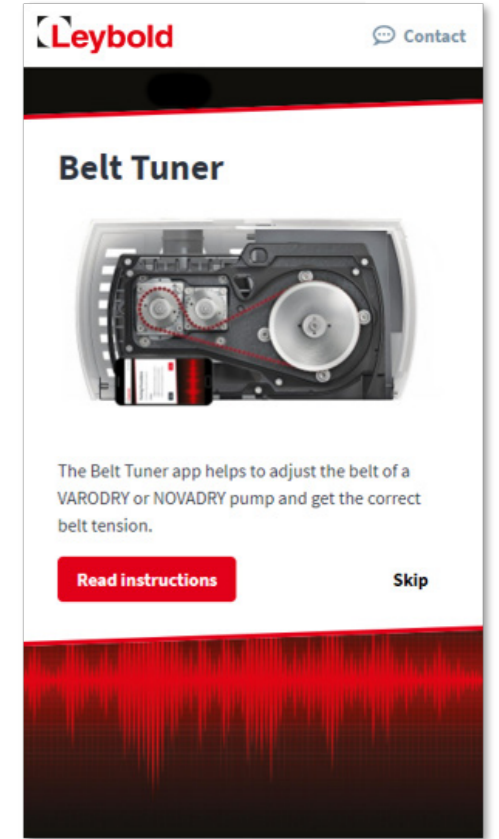
### Belt-Tuner app

A smart tool that helps you to adjust the belt of your VARODRY & NOVADRY

- ✔ **Own solution further strengthens and empowers Leybold brand**
- ✔ **VARODRY & NOVADRY pumps require a regular belt check & replacement for maintenance**
- ✔ **Current tool being phased-out and reflects dependency of our supplier**

#### Our solutions:

- Customers always carry a smartphone with them
- Perfect adjustment à no one knows the belt drive and its properties better than us
- Cost effective solution: no expensive devices required
- Handy and straight-forward



### LEYCALC

Smart online vacuum system calculation tool

- ✔ **New online tool to help with modeling vacuum systems for various applications, selection and implementation of vacuum pumps and measurement equipment**
- ✔ **With this new web-based tool, users can select and compile their vacuum solutions online**

#### Your expectations:

- Vacuum system calculation tool able to simulate typical vacuum installations
- Easy to use
- Trustworthy results as basis for decision making

#### Our solutions:

- We make our expert tools available for our customers
- Simple handling, intuitive navigation
- Further access to our expert network on demand, e.g for simulation of complex systems
- Proven calculation results, based on Leybold's long time practical experience



### Sound analyzer app

Immediate feedback on your pump's status

- ✔ **Lay back and analyze your pump's status with a simple sound file**
- ✔ **Check out our new sound analyzer app for our NOVADRY and VARODRY pumps**

#### Our solutions:

- No downloads or installations required
- Perform the sound analysis with five clicks at sound.leybold.com
- Condition of the bearings, gears and hence the belt can be recorded
- Results available within ten seconds
- Direct contact to our service & support team





## Online shop

### leyboldproducts.com

- ✔ Shop vacuum technology online
- ✔ Available in more than 12 countries worldwide

#### Your expectations:

- Easy order process
- Secure payment options
- Large product range, fast delivery

#### Our solutions:

- Purchase low-consultation vacuum components like fittings, measuring instruments, pumps, spare parts, vacuum oils, lubricants.
- Payment by invoice, credit card or pre-payment
- Order online 24 hours a day

