

# Highly reliable medical vacuum

mVAC Medical Vacuum System







## mVAC medical vacuum system

The BeaconMedaes mVAC Medical Vacuum Systems consist of between two and six air-cooled, oil-lubricated rotary vane type vacuum pumps and a central controller with an intelligent graphical user interface. The pumps can work independently to satisfy the required vacuum flow.

mVAC systems are suitable for both continuous and frequent start/stop operation. They keep the vacuum level at the point of connection as low as or lower than -600 mbar(e) (-450 mm Hg) at all times. The mVAC system offers (multiple) backup supply in case of failure of individual functional components. It is installed, piped and wired as modular stacked components or as a tank-mounted unit.

mVAC systems provide a highly reliable medical vacuum (suction) for a variety of applications, mainly in operating theaters and intensive care, emergency and respiratory units. Specific applications include:

- Wound drainage
- Assisted wound closure
- Chest and lung drainage
- Collection of other bodily fluids
- Gastric emptying
- Cleaning endotracheal tubes
- Liposuction (lipoplasty)
- Removal of excess blood during surgery



## A reliable source of medical vacuum



### Ultra-reliable

A reliable source of medical vacuum is critical to patient safety. The carbon composite material of mVAC pumps will not break down or wear out like laminated blades. Specially designed channels on the surface of the rotor blade significantly improve oil circulation to further enhance reliability. And if the central controller should fail, every pump still has its own controller. Every mVAC system is subject to comprehensive QA controls and is fully tested prior to dispatch.

In the unlikely event of the central controller failing, pumps will run independently activated by means of a mechanical back up pressure sensor mounted on each vacuum pump. Ensuring the mVAC plant will continue to maintain the required level of vacuum.



### Energy efficient

BeaconMedaes always strives to provide solutions that are the most energy-efficient. In a multi-pump arrangement, the advanced Elektronikon® Graphic controller maximises energy efficiency by controlling the individual vacuum pumps and regulating the overall vacuum.



### Cost effective

The Elektronikon® control system gives you the means to effectively manage and optimise your mVAC system. Device status is monitored in real time, required services are delivered rapidly, breakdowns can be prevented and downtime shortened. In short, it provides all you need to keep operational costs to a minimum.



### Easy to install

All interconnection piping and copper connections are supplied as an integral part of the mVAC system maintain the required level of vacuum.



### Highly connective

Up to six vacuum pumps can be connected in one mVAC system to ensure that even a large hospital always has a reliable vacuum to meet all its needs. Furthermore, you can connect to extensive monitoring and status information to get the most out of your mVAC system.





## Quality components



### Vacuum pump

The quiet and vibration-free oil-lubricated rotary vane vacuum pumps offer high flow capacities. They are simple and economical to install and operate, have low starting and running torque and provide smooth, pulse-free vacuum. The vanes are constructed from composite material for a long lifetime of use (up to ten years under normal operating conditions) and low noise levels.

### Vacuum vessel

The vacuum vessel is a mandatory back-up in the rare occurrence that all vacuum pumps are down. It also acts as a buffer for peaks in the flow demand. The painted steel finish provides excellent durability with good resistance to oils, grease, etc. It dries to a hard film with hard abrasion and impact resistance.

### Motor

Optimally sized to suit the demands of frequent starts found in medical applications, each motor is air-cooled by an integral fan and protected by an overload fitted within its pump control panel.



### Oil separation filter

An efficient oil separation system automatically recirculates entrained oil droplets to prevent oil loss. The system is easily accessible for maintenance, while the separator elements are also easy to maintain via special access ports.



### Bacterial filter

The in-house developed high-efficiency bacterial filter elements have a penetration of less than 0.005% when measured to BS 3928:196 to minimise the likelihood of microbial contamination of the oil. Duplex filters are provided for redundancy. The pressure drop over the bacterial filters is continuously monitored by the central ES-VAC controller.



## Tank-mounted

Tank-mounted mVAC Systems are complete stand-alone assemblies with all components and filters mounted on a single horizontal vacuum galvanised vessel. This configuration provides a compact, low footprint unit specifically designed for ease of installation. The tank-mounted system vessels are hot-dip galvanised with a finish that extends vacuum vessel life by 300% over conventional untreated steel pressure vessels.

## Floor mounted

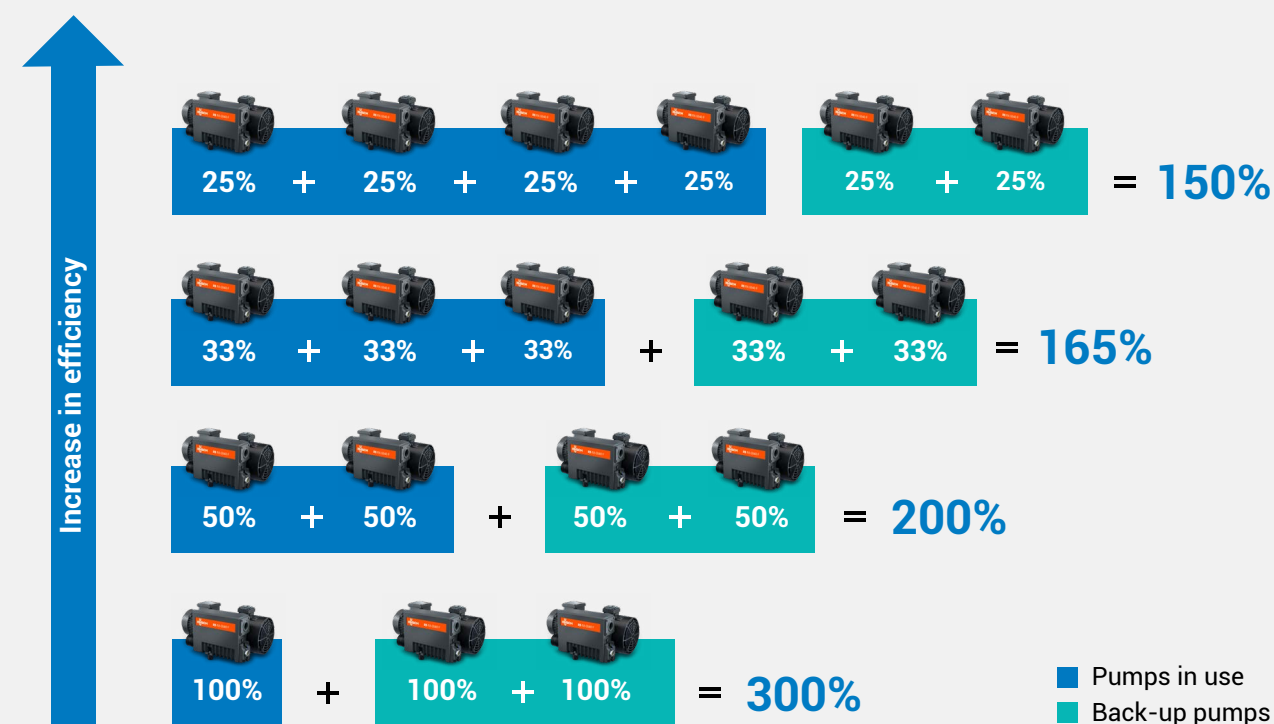
Experience complete freedom in your configurations with our floor mounted mVAC. The pumps, filter frame and vessels are all delivered as individual components complete with copper stub pipe connections, allowing them to be positioned in any required layout to fit the plant room. This way you can make optimal use of the available space at hand. The controller incorporates both the central controller and individual pump controllers. Your local installer can connect everything together for full flexibility.



## Pump redundancy

mVAC Medical Vacuum Systems complying with HTM 02-01 and ISO 7396-1 are provided with at least two standby pumps (i.e. the design flow of a system with three pumps is provided by a single pump.) mVAC systems complying with HTM 2022 are provided with at least one standby pump (i.e. the design flow of a system with two pumps is provided by a single pump.)

It can be shown that as more pumps are provided, the consumed energy decreases. By using a larger number of small pumps an energy saving can be achieved. We have pre-determined our plant package using the optimum arrangement of pumps, between 3 and 6, so you don't need to worry about anything other than the flow capacity and footprint.



# Increased connectivity

Get the most out of your mVAC system with our next-generation Elektronikon® control and monitoring system. Elektronikon® controls every single pump and regulates system pressure to push energy efficiency to new levels. Controlling and monitoring your system has never been easier.

## ES-VAC central controller

Developed specifically for medical vacuum applications, the ES-VAC Central Controller is an intelligent microprocessor-based control system dedicated to controlling up to six vacuum pumps in an mVAC system. The advanced ES-VAC controller protects the mVAC system and offers the possibility to repeat the most important alarms (e.g. plant emergency, pressure fault, plant fault) through voltage-free contacts. It can connect to a hospital's Building Management System (BMS).

- User-friendly: 5.7-inch high-definition colour display Elektronikon Graphic + module with clear pictograms and LED indicators
- Internet-based pump visualisation using a simple Ethernet connection
- User-friendly, multilingual user interface and durable keyboard for increased reliability
- Automatic restart after voltage failure
- Graphical indication Service Plan
- Remote monitoring and connectivity functions



## Pump controller

Each individual pump is equipped with a standard Elektronikon® controller that is linked to the advanced ES-VAC central controller.

- Easy to use intuitive navigation system with clear pictograms and LED indicators
- Ultra-reliable and highly durable keyboard
- Automatic restart after voltage failure
- If the central controller should fail, every single pump has its own pump controller



# Medically certified

The medical sector is more tightly regulated than ever before. mVAC Medical Vacuum Systems are pre-certified to simplify your certification process on installation. They surpass the requirements of the most demanding standards and regulations such as:

- Medical Device Directive MDD 93/42/EEC
- EN ISO 7396-1 and ISO 14971
- Health Technical Memorandums HTM 02-01 and HTM 2022



Life is in the details.®