Medical Air Systems

mAIR, cAIR and sAIR

BeaconMedæs®

Medical Air Systems

The BeaconMedæs mAIR, cAIR and sAIR Medical Air Systems are designed in accordance with HTM 02-01, ISO 7396-1 and European Pharmacopoeia standards. The system design is modular providing maximum flexibility for easy on-site installation. All systems are designed and manufactured according to the ISO 13485 quality management system.

Medical Air Applications

- Mechanical ventilation
- Anaesthesia
- Drug delivery via a nebuliser
- Testing medical devices
- Drying of medical devices

Surgical Air Applications

- Pneumatic surgical tools (drilling, sawing, etc)
- Pneumatic ceiling pendant operation
- Testing of medical devices
- High-speed high torque motors

Purity and Precision

The critical field of patient care requires ultra clean medical air delivered to operating theatres and hospital beds with absolute reliability. A hospital's medical air supply is a vital life support service, maintaining respiration of the critically ill during mechanical ventilation.

As such, within Europe, 'medicinal air' is classified as a drug, and the concentration of impurities therein must be carefully controlled to ensure compliance with the European Pharmacopoeia monograph. The dMED purification system has been independently certified by SGS Belgium NV (Société Générale de Surveillance) to provide medicinal air complying with the European Pharmacopoeia monograph.

Tailor Made

BeaconMedæs Medical Air Systems are composed of modular blocks, enabling you to select up to six compressors and match the volumetric medical air flow with the purification package of your choice.

Downstream pressures range from 4 to 10 bar as standard, with options including additional sensors for monitoring of contaminants in the medical air supply and the intelligent 'zero loss' EWD condensate drain for coalescing filters.

Optimizing Your System

Some applications may need or may benefit from additional options and more refined control and air treatment systems. To meet these needs, BeaconMedæs has developed options and easily integrated compatible equipment.

Unparalleled Efficiency

Medical air systems are packed with features to lower your cost of ownership (life cycle cost) and save energy. Microprocessor controlled off-load running of compressors reduces the number of starts that compressors must make, reducing wear, increasing reliability and lowering power consumption.

The 'zero loss' EWD condensate drains fitted to all air receivers further enhances the efficiency of the overall system.

Challenge Test		
Test	**European Pharmacopoeia**	**mAIR**
CO_2	< 500 ppm	411 ppm (1)
CO	< 5 ppm	< 1 ppm (2)
SO_2	< 1 ppm	0 ppm (3)
NO_x	< 2 ppm	< 1 ppm (4)
Water Vapor	< 67 ppm (6)	13.5 (5)
O_2	20,4 < X < 21,4 %	21,1
Taste and Odor	Taste and Odor free	Free

(1) with 700 ppm (at inlet)
(2) with 50 ppm (at inlet)
(3) with 5 ppm (at inlet)
(4) with 5 ppm (at inlet)
(5) Pressure dewpoint of -40,5 °C or -58,3 °C at atmospheric conditions (1013,25 hPa)
(6) dewpoint of -45,5 °C at atmospheric conditions (1013,25 hPa)

dMED Medical Air Purifier

The dMED (dual MED) is a duplexed purification package for converting a compressed air source into breathing quality air. The dMED has 7 stages of active purification:

1. Water separator - liquid water removal
2. Bulk aerosol filter - oil and water removal
3. Fine coalescing filter - oil and water removal
4. Desiccant dryer - water removal
5. Activated carbon - gaseous impurities removal
6. Catalyst - CO oxidation
7. Bacteria filter - bacteria/fine particles removal

PSA Desiccant Dryers

Generously sized desiccant towers are filled with a high efficiency adsorption media to ensure the required dew point is maintained at the highest periods of demand.

Changeover of the towers is carefully controlled with separate de-pressurisation and pressurisation cycles, maximising desiccant life and minimising dusting. Furthermore the intelligent controller will only run one dryer at the same time and keep the second dryer as a back-up, thereby saving on purge losses and reducing maintenance costs.

Carbon Monoxide Removal

Carbon monoxide concentrations in urban areas are closely related to motor traffic density and weather, varying greatly with time and distance from the source(s).

The European Pharmacopoeia monograph for medicinal air specifies a maximum concentration of 5 ppm for carbon monoxide.

The QDT HOC filter, downstream of the desiccant dryer contains a catalyst which oxidises carbon monoxide to give carbon dioxide. If you cannot be certain that background levels of carbon monoxide in the environment will never exceed 5 ppm, the dMED's QDT HOC component is the ultimate safety device, ensuring patient safety and consistent compliance with the European Pharmacopoeia.

Energy Efficient

At BeaconMedæs, we strive to provide the most energy-efficient solutions. Energy consumption is mainly linked to the purge of air during the regeneration of the dessicant. By providing the most efficient regeneration process and the optional Purge saver function, the purge of air is reduced to a minimum.

Purge Saver

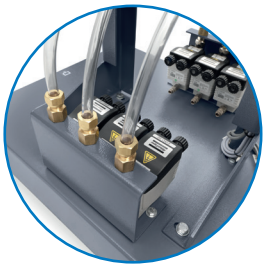
Maintaining a consistently low dew point is critical to patient safety, and to the operation of air driven surgical tools. The dMED incorporates state-of-the-art energy management control with built-in purge control as an option. This purge control makes the dryers more efficient, leading to energy savings on purge losses of up to 90%, depending on installation and usage.

The principle is simple. Although the time for a saturated tower to regenerate remains constant, the switching from one tower to the other is delayed if the PDP level in the active tower is adequate. This is controlled via the PDP sensor. As soon as the minimum level PDP in the active tower is reached, the dryer cycle that was on hold will resume by switching to the dry tower.

Key Benefits

- Increased reliability
- High flow performance
- Easy to install, easy to maintain
- Robust design simplifies manoeuvrability
- Purge control option for up to 90% energy savings
- High precision filters increase the lifetime of the dryer

Options



EWD Drain on Filters
Reduces environmental impact.

QDT HOC Filter
Guarantees EurPh air quality even in the most polluted of environments.

Purge Saver
Increase efficiency with dewpoint sensing switching - the dryer will only switch towers when the desiccant is saturated.

Filter Monitoring
Voltage free contacts provide 'plant fault' alarm if pressure drop limit is reached (i.e. blockage).

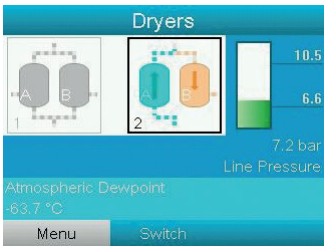
QDT Saturation Indicator
Additional indicator to indicate any oil carry over to the HOC filter for increased safety.

CO/CO_2 Sensors
Additional monitoring and alarms for increased safety.

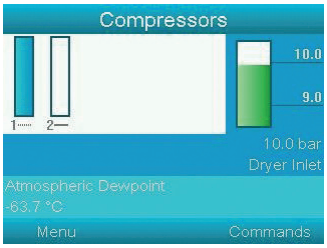
Advanced Control and Monitoring

Get the most out of your medical air system with our next-generation Elektronikon® Mk5 Graphic controller. The Elektronikon® regulates system pressure to push energy efficiency to new levels and offers one central point of control for your whole medical air plant, while the built-in web browser gives you access to valuable information.

Controlling and monitoring your system has never been easier.



Dryer Status



Compressor Status

Intelligent Central Controller

A proper managed air plant will save energy, reduce maintenance, decrease downtime, increase reliability and improve product quality. The ES-MED central controller is the most efficient way to monitor and control multiple compressors and air purifiers simultaneously.

- User-friendly 5.7” high-definition color display with clear pictograms and LED indicators
- Access to real time status from any computer connected to the hospital’s LAN
- Most critical alarms are available as voltage-free contacts for connection to the Building Management System (BMS)
- Automatic restart after voltage failure
- Easy readout of the CO and CO2 sensors (if fitted)
- Service warning indications for desiccant, catalyst filters and water drains

G MED Medical Compressor

Ensuring a long and trouble-free life at the lowest operating cost, each G MED compressor contains the latest generation of innovative oil-injected screw element. Moreover the G MED has been specifically modified for medical applications.

Guaranteed air supply

The G MED is designed to meet the latest medical standards ISO 7396-1 and HTM02-01. Even in case of a single fault condition, the air demand is always assured.

- Modified controller software to increase reliability in conjunction with ES-MED Central Controller
- Main switch, amp meter and LAN/local switch for increased control and ease of use
- Temperature sensor and pressure switch for additional safety according to medical requirements
- Easy, plug & play installation via external CAN connectors

40% LESS
FLOOR SPACE

Small footprint

Space in hospitals comes at a premium. Therefore plant rooms tend to be small in size. On the other hand, multiple compressors are essential to meet the redundancy requirements specified in medical standards. The compact design of the G MED matches perfectly with the layout of hospital plant rooms.

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