Atlas Copco

mVAC Medical Vacuum Systems
mVAC-250 – mVAC-9200

Sustainable Productivity

Atlas Copco

A reliable source of medical vacuum

Atlas Copco's mVAC Medical Vacuum Systems consist of 2 to 6 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 respirology units. Specific applications include:

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

Ultra-reliable

A reliable source of medical vacuum is critical to patient safety. The carbon composite material of Atlas Copco's mVAC pumps will not break down or wear out like laminated blades. And if the central controller should fail, every pump still has its own controller. Every mVAC system is subject to comprehensive Quality Assurance controls, is fully tested prior to dispatch and therefore ensures there will not be service interruptions even in extreme circumstances.

Highly connectable

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. Further, using AIRConnect™ Visualization you can connect to extensive monitoring and status information to get the most out of your mVAC system.

Cost-effective

Atlas Copco's unique Elektronikon® control system gives you the means to effectively manage and optimize 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

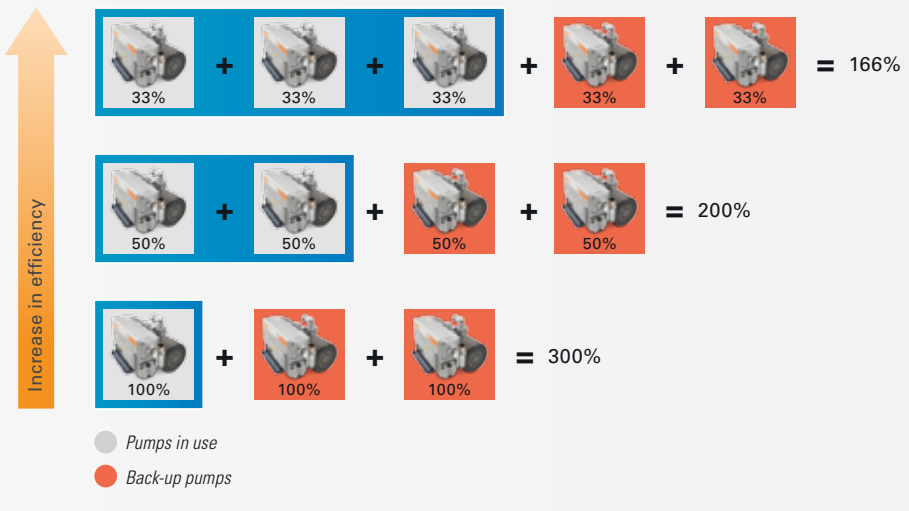
- All interconnection piping and copper connections are supplied as an integral part of the mVAC system.
- The "plug and play" approach makes installing even more easy.

Energy-efficient

At Atlas Copco we always strive to provide the most energy-efficient solutions. For the mVAC we have opted for a multi-pump arrangement to better match the flow demand. In this arrangement, the advanced Elektronikon® Graphic controller maximizes energy efficiency by controlling the individual vacuum pumps and regulating the overall vacuum. Even wear is ensured at all times.

mVAC redundancy scheme

Below scheme demonstrates 3 different pump set-ups for the same flow. As more pumps are provided, the energy decreases.



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

Quality components for a reliable vacuum

1 Vacuum pump

Atlas Copco's oil-lubricated rotary vane vacuum pumps offer high flow capacities. They are simple and economical to install and operate, and are quiet and vibration-free. They provide smooth, pulse-free vacuum and have low starting and running torque. 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.

2 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.

3 Bacterial filter

The high-efficiency bacterial filter elements have a penetration of less than 0.0001% when measured to BS 3928 to minimize 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.

7 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. Its hot-dipped galvanized finish extends vacuum vessel life by 300% over conventional untreated steel pressure vessels.

6 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. It is equipped with the 5.7-inch high-definition color display Elektronikon® Graphic+ module.

5 Pump controller

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

4 Tank-mounted variant

Tank-mounted mVACs are complete stand-alone assemblies with all components and filters mounted on a single horizontal vacuum vessel. This configuration provides a compact, low-footprint unit specifically designed for easy installation.

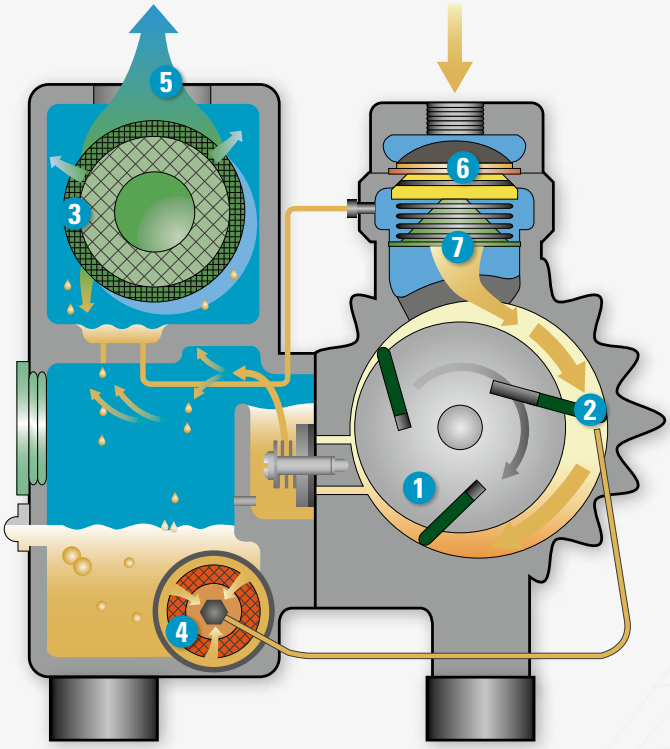
Simple operation for high reliability

The vacuum pump at the heart of the Atlas Copco mVAC system is an oil-lubricated rotary vane vacuum pump; one of the simplest and most reliable types of vacuum pump available.

Working principle

When the eccentrically installed rotor (1) rotates, the centrifugal force pushes vanes (2) towards the wall of the cylinder. The vanes create spaces, or chambers, between the rotor and cylinder. When a particular chamber connects with the inlet channel, air is sucked in. The sucked air is passing over a mesh filter (6) and non-return valve (7). This air is compressed by the next rotation and pushed into the oil-mist separator (3). The differential pressure causes oil to be constantly forced into the compression chambers. The compressed air is discharged through the air exhaust (5).

1. Rotor
2. Vanes
3. Oil-mist separator
4. Oil filter
5. Air exhaust
6. Mesh filter
7. Non-return valve



Measuring vacuum pressure

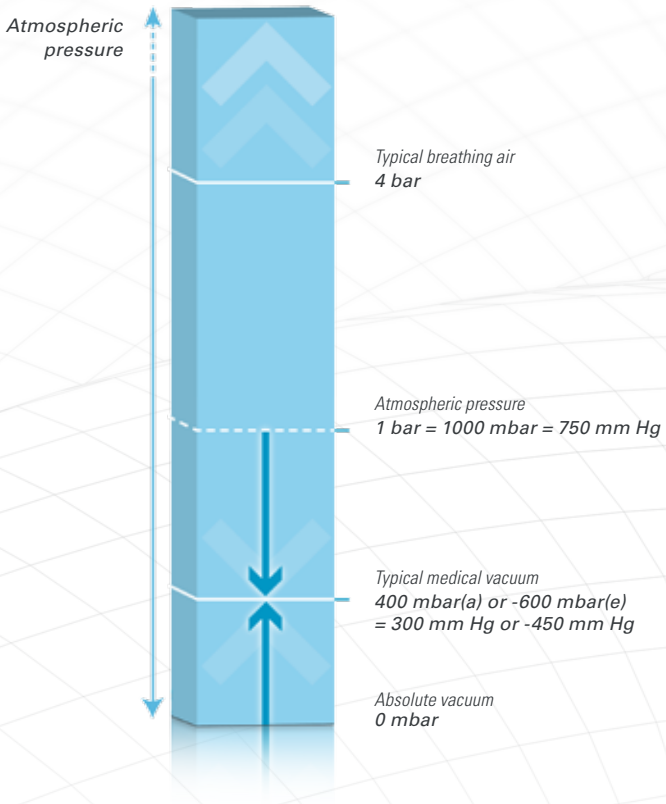
A vacuum is any pressure in a system that is less than the ambient atmospheric pressure. For medical applications the degree of vacuum is not very high. However, there are two ways of measuring a vacuum pressure:

- Bar(e) – the effective or gauge pressure – denotes how much the pressure is below local atmospheric pressure
- Bar(a) – absolute pressure – denotes how much the pressure is above absolute zero vacuum.

Atmospheric pressure at sea level is approximately 1 bar or 1000 mbar. For typical medical applications a vacuum of 600 mbar **below** atmospheric pressure is required, which is denoted as -600 mbar(e).

From the illustration it can be seen clearly that this value is also equivalent to 400 mbar **above** absolute zero vacuum. It can therefore also be denoted as 400 mbar(a).

Note that because the measuring reference point for bar(a) is fixed (absolute zero vacuum) while for bar(e) it is variable (atmospheric air pressure), a slight discrepancy can be obtained between the two values. It is therefore important to understand which type of reference is required before selecting a pressure instrument for measuring the vacuum.



Medically certified

The medical sector is more tightly regulated than ever before. Atlas Copco's 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:

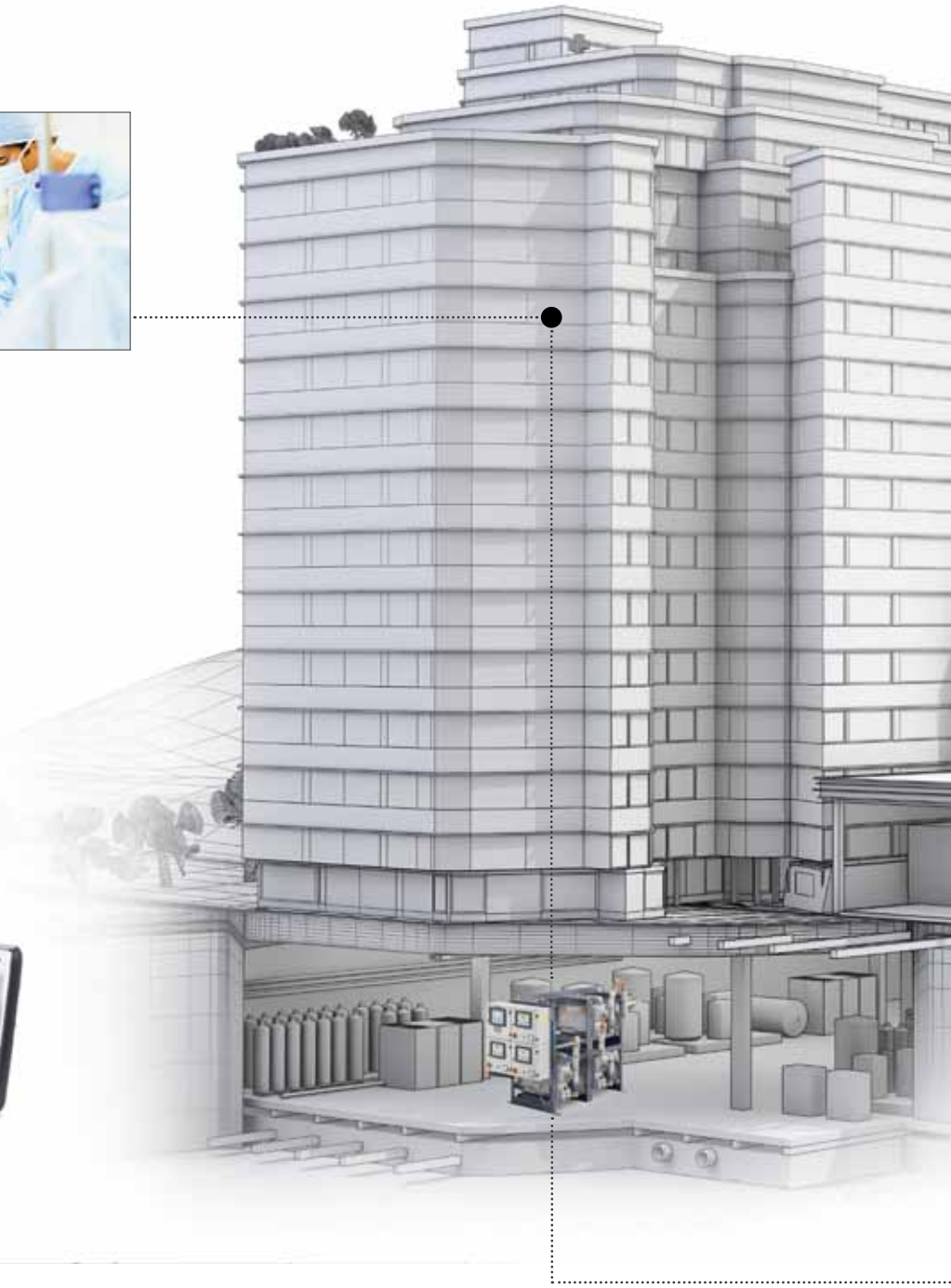
- Medical Device Directive MDD 93/42/EEC
- EN ISO 7396-1
- ISO 14971
- Health Technical Memorandums HTM 02-01 and HTM 2022

Furthermore, they are designed and manufactured according to ISO 9001, ISO 14001 and the ISO 13485:2003 quality management system.

Certified quality

Advanced control, monitoring, and visualization

Get the most out of your mVAC system with our next-generation Elektronikon® control and monitoring system and AIRConnect™ Visualization and Notification package. Elektronikon® controls every single pump and regulates system pressure to push energy efficiency to new levels. AIRConnect™ gives you immediate access to valuable information such as system status, alarms, trends and historical data. Controlling and monitoring your system has never been easier.



Real-time monitoring on your desktop

Simple and easy to install, the AIRConnect™ monitoring device collects data from all the pumps in the mVAC system. Through a website integrated within the Elektronikon® module, all data is visualized in real time, offering you immediate clarification. As these real-time visualization pages are accessed through the hospital's LAN, total data security is assured.

Increased clarity

AIRConnect™ provides a host of functions to increase system transparency:

- Logging and trending for an accurate performance status of your system.
- Desktop event notification to avoid constant status checking.
- E-mail and SMS event notification for additional convenience.

ES-VAC central controller

for control of the overall mVAC system

- User-friendly: 5.7-inch high-definition color display with clear pictograms and LED indicators.
- Internet-based pump visualization using a simple Ethernet connection.
- Increased reliability: new, user-friendly, multilingual user interface and durable keyboard.
- Automatic restart after voltage failure.
- Graphical indication ServicePlan.
- Remote monitoring and connectivity functions.

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).

Pump controller

for control of individual vacuum pumps

- Easy to use: intuitive navigation system with clear pictograms and LED indicators.
- Visualization through web browser using a simple Ethernet connection.
- Easily upgradeable.
- Ultra-reliable: highly durable keyboard.
- Automatic restart after voltage failure.
- If the central controller should fail, every single pump has its own pump controller.

Technical specifications

mVAC 250-8000

HTM 2022 - 50 Hz								
MODEL TYPE	System FAA @ -600 mbar(e) referred to 0 bar(e), 20°C	System flow (referred to suction pressure)	Number of pumps	Pump power	Dimensions* (filters included)	Weight** (filters included)	Number of vessels	Total vessel capacity
	l/min	m³/h		kW	LxWxH (mm)	Kg		L
mVAC-250-DH	250	40	2	1.1	2040x980x1650	540	1	500
mVAC-500-TH	500	79	3	1.1	2300x980x1650	650	1	500
mVAC-660-TH	660	105	3	1.5	2400x980x1900	800	1	1000
mVAC-1000-TH	1000	159	3	2.2	2400x980x1900	860	1	1000
mVAC-1500-Q	1500	238	4	2.2	1830x980x1700	750	1	1500
mVAC-2560-T	2560	406	3	5.5	2600x1200x1600	1365	2	3000
mVAC-3840-Q	3840	609	4	5.5	2600x1200x1990	1700	2	4000
mVAC-4950-Q	4950	786	4	7.5	3400x1250x1700	1800	3	6000
mVAC-6000-P	6000	952	5	7.5	4100x1250x1700	2050	3	6000
mVAC-6600-P	6600	1047	5	7.5	4100x1250x1700	2050	4	8000
mVAC-8000-H	8000	1270	6	7.5	4100x1250x1990	2360	4	8000

mVAC 300-9200

HTM 2022 - 60 Hz								
MODEL TYPE	System FAA @ -600 mbar(e) referred to 0 bar(e), 20°C	System flow (referred to suction pressure)	Number of pumps	Pump power	Dimensions* (filters included)	Weight** (filters included)	Number of vessels	Total vessel capacity
	l/min	m³/h		kW	LxWxH (mm)	Kg		L
mVAC-300-DH	300	48	2	1.5	2040x980x1650	540	1	500
mVAC-500-TH	500	79	3	1.5	2300x980x1650	650	1	500
mVAC-800-TH	800	127	3	2.2	2400x980x1900	800	1	1000
mVAC-1200-T	1200	190	3	3.0	1910x980x1700	610	1	1500
mVAC-1860-Q	1860	295	4	3.0	2200x1200x1700	1050	1	2000
mVAC-3000-T	3000	476	3	7.5	2600x1200x1600	1365	2	3000
mVAC-4500-Q	4500	714	4	7.5	3400x1250x1990	1825	3	4500
mVAC-5850-Q	5850	928	4	9.2	3400x1250x1990	1800	3	6000
mVAC-7800-P	7800	1238	5	9.2	4100x1250x1990	2160	4	8000
mVAC-9200-H	9200	1460	6	9.2	4100x1250x1990	2360	5	10000

** When available, horizontal vessels are included.*
*** Packaging included, vertical vessels excluded.*

Additional options

AirConnect™ Visualization and Notification package
Customized software setting for different norms (HTM / ISO / AS)
Oil level switch
Synthetic oil
Painted vessels

mVAC 250-6600

HTM 02-01 / ISO 7396-1 50 Hz								
MODEL TYPE	System FAA @ -600 mbar(e) referred to 0 bar(e), 20°C	System flow (referred to suction pressure)	Number of pumps	Pump power	Dimensions* (filters included)	Weight** (filters included)	Number of vessels	Total vessel capacity
	l/min	m³/h		kW	LxWxH (mm)	Kg		L
mVAC-250-TH	250	40	3	1.1	2300x980x1650	650	1	500
mVAC-330-TH	330	52	3	1.5	2300x980x1650	690	1	500
mVAC-500-TH	500	79	3	2.2	2400x980x1650	750	1	500
mVAC-660-Q	660	105	4	1.5	1910x980x1430	660	2	1000
mVAC-1000-Q	1000	159	4	2.2	1910x980x1700	740	2	1000
mVAC-1280-T	1280	203	3	5.5	2200x1100x1450	1025	3	1500
mVAC-2560-Q	2560	406	4	5.5	2600x1200x1700	1625	2	3000
mVAC-3300-Q	3300	524	4	7.5	2600x1200x1700	1625	2	4000
mVAC-3840-P	3840	609	5	5.5	3300x1200x1990	1950	2	4000
mVAC-4950-P	4950	786	5	7.5	4100x1250x1700	2050	3	6000
mVAC-6000-H	6000	952	6	7.5	4100x1250x1700	2250	3	6000
mVAC-6600-H	6600	1047	6	7.5	4100x1250x1700	2250	4	8000

mVAC 300-7800

HTM 02-01 / ISO 7396-1 60 Hz								
MODEL TYPE	System FAA @ -600 mbar(e) referred to 0 bar(e), 20°C	System flow (referred to suction pressure)	Number of pumps	Pump power	Dimensions* (filters included)	Weight** (filters included)	Number of vessels	Total vessel capacity
	l/min	m³/h		kW	LxWxH (mm)	Kg		L
mVAC-300-TH	300	48	3	1.5	2300x980x1650	650	1	500
mVAC-400-TH	400	63	3	2.2	2300x980x1650	690	1	500
mVAC-620-T	620	98	3	3.0	1910x980x1430	750	2	1000
mVAC-800-Q	800	127	4	2.2	1910x980x1700	660	2	1000
mVAC-1200-Q	1200	190	4	3	1910x980x1430	740	2	2000
mVAC-1500-T	1500	238	3	7.5	2200x1100x1450	1025	2	2000
mVAC-3000-Q	3000	476	4	7.5	2600x1200x1700	1640	2	3000
mVAC-3900-Q	3900	619	4	9.2	2600x1200x1990	1700	2	4000
mVAC-4500-P	4500	714	5	7.5	4100x1250x1990	2075	3	4500
mVAC-5850-P	5850	928	5	9.2	4100x1250x1700	2050	3	6000
mVAC-7800-H	7800	1238	6	9.2	4100x1250x1990	2360	4	8000

** When available, horizontal vessels are included.*
*** Packaging included, vertical vessels excluded.*

mVAC-500-TH

mVAC-1280-T

mVAC-6000-H

Driven by innovation

With more than 135 years of innovation and experience, Atlas Copco will deliver the products and services to help maximize your company's efficiency and productivity. As an industry leader, we are dedicated to offering high air quality at the lowest possible cost of ownership. Through continuous innovation, we strive to safeguard your bottom line and bring you peace of mind.

Building on interaction

As part of our long-term relationship with our customers, we have accumulated extensive knowledge of a wide diversity of processes, needs and objectives. This gives us the flexibility to adapt and efficiently produce customized compressed air solutions that meet and exceed your expectations.

A committed business partner

Our commitment to you does not simply end when your Atlas Copco products have been delivered and installed. We have an extensive range of aftermarket services to offer you continued support, whenever you need it. With a presence in over 170 countries, we can deliver high-quality customer service anytime, anywhere. Our highly skilled technicians are available 24/7 to answer any queries you may have. And all of this is backed by an efficient logistics organization, ensuring fast delivery of genuine spare parts when you need them. With Atlas Copco you can rest assured that your superior productivity will always be our first concern!

Atlas Copco

www.atlascopco.com