Dräger Atlan® A350/A350 XL Anaesthesia Workstation

The new platform offers flexibility for most spatial conditions. The high precision piston ventilator supports lung protective ventilation measures and a comprehensive set of parameters assist decision-making support. The Atlan A350/XL can be networked to communicate bi-directionally and securely with other networked devices to share data and information that can help to increase efficiency and reduce errors in anaesthesia.

D-5542-2022

Dräger. Technology for Life®

Dräger Atlan® A350/A350 XL

Benefits

Lung Protective Ventilation

The electronically controlled electrically driven piston ventilator technology of Atlan A350/XL anaesthesia machine helps to deploy lung protective ventilation measures that can be beneficial for perioperative lung function and may improve outcomes.

- Synchronised piston movement with the patient expiration flow reduces the expiratory resistance and can reduce work of breathing
- The set PEEP is maintained even in case of small leakage and during spontaneous breathing to reduce risk of atelectasis development
- High trigger sensitivity can detect even weak spontaneous breathing efforts of patients
- Fresh-gas decoupling ensures that changes to the fresh-gas flow have no influence on the applied tidal volume, ventilation pressures, and the accuracy of delivered VT even with very small VTs, e.g. down to 5 ml
- Features and functionalities optimise minimal- and low-flow application, which can contribute to improved humidity of anaesthetic gases, mucociliary clearance, maintenance of body temperature and reduced fluid loss. They include:
  - integrated active heating of breathing system to warm breathing gas and to reduce condensation
  - optimised breathing system architecture to enable fast changes in fresh-gas and agent concentrations
  - sample-gas recirculation to eliminate gas loss
- Lung recruitment maneuvers option* comprises one-step and multi-step recruitment methods, Insp./Exp. Hold function and reminder function to support recruitment manoeuvre deployment
- AutoFlow option ensures the delivery of the set tidal volume with the lowest required pressure to avoid pressure peaks and unintentional high tidal volumes
- Highly accurate APL valve with a nearly linear increase and decrease in pressure pattern

* this requires software 2.0 or higher

Decision Support

To support you and your staff make informed decisions, our Atlan A350/XL anaesthesia machine can be fitted with multiple options and combinations with other Dräger products.

- Advanced Gas Monitoring option*:
  - Indicator and trend for efficiency of fresh-gas setting and anaesthetic agent consumption (Econometer and Low Flow Wizard (with no trend)) to support intuitive and convenient application of minimal- and low-flow anaesthesia
  - Access to gas and oxygen consumption and anaesthetic agent uptake data to analyse the low- and minimal-flow practices
  - MV x CO_2 parameter to monitor the qualitative display of CO_2 elimination

- Advanced Ventilation Monitoring option:
  - Display of patient lung compliance with trend, P-V and V-Flow loops to assess the ventilation quality and adapt ventilation settings accordingly
- Compilation of relevant ventilation and haemodynamic patient data in one view display to assess therapeutic effects of lung recruitment manoeuvre**

Benefits

– Guidance for optimised and patient oriented anaesthetic agent delivery in combination with Dräger's SmartPilot® View ***

* only with integrated patient-gas measurement module
** only with Dräger Infinity® Acute Care System (IACS) patient monitoring
*** software requires Medical Grade PC

Infection Prevention and Control

Breaking the chain of infection and complying with your hospital's hygiene protocols is critical in today's clinical environment. For this reason, during the development phase of Atlan anaesthesia machines, we designed them with infection prevention regulations in mind to support hygiene measures in the OR.

– Tool-free and quick disassembly of breathing system with few parts to be compliant with infection prevention regulations
– Smooth and rounded surfaces ease cleaning/wipe disinfection
– Cable ducts and channels reduce number of potential contamination sources
– Compatible with original Dräger single-use consumables support hygiene standards
– Generated message* reminds personnel about the replacement of the RFID technology-based consumables (Infinity ID breathing circuit, Infinity ID WaterLock 2 water trap, Infinity ID flow sensors, Infinity ID CLIC absorber) when their maximum period of use are exceeded
– Compliant with ISO 17664

* with option Infinity ID Accessories Support

Workflow Efficiency

The design architecture of the Atlan A350/XL anaesthesia machines allows you flexibility to address customer tailored combinations as well as an ergonomic and user-friendly workplace for nearly every size of OR.

– Scalability among workstation set-up addresses various customer needs and meets spatial conditions of different OR spaces:
  – Compact or large trolley, ceiling or wall variants supports good patient access, ergonomic working environment, and low turnaround times with customised workplaces
  – Comes with or w/o integrated patient-gas measurement module to offer flexibility and avoid redundant cost for clinics with gas bench monitors
– Standardised Dräger user interfaces, operating principles, nomenclature, and accessories across other Dräger anaesthesia devices and ventilators reduce training efforts, optimise fleet management and reduce risk of errors
– Graphically illustrated walk-through pre-test checklist enables easy and intuitive preparation of the machine for self-test
– Fully automated system self-test* (no user interaction needed) enhances operational efficiency and saves staff time for other tasks

Benefits

- Auto On** function enables an automatic system test and switching on of the tested device at a defined time that helps to reduce time for start-up
- Ex- and import of machine configuration via USB saves manual efforts and time**
- Large work surface, lockable drawer, and additional shelves (optional) for optimal working conditions and supply storage
- Workplace illumination improves readability during Minimally invasive surgery (MIS) cases
- Cable management channels reduce cable clutter, connection failures and cleaning efforts
- Improved manoeuvrability via combination with ceiling supply units simplifies positioning of machine in the OR
- Anaesthetic agent and gas consumption measurements help to analyse potential savings in agent and gas consumption
- Generates a message*** when the maximum period of use of the RFID technology-based accessories (Infinity ID breathing circuit, Infinity ID WaterLock 2 water trap, Infinity ID flow sensors, Infinity ID CLIC absorber) are exceeded to remind personnel about the required replacement of consumables
- Generates message* when the RFID technology-based Infinity ID breathing bag connector or breathing circuit is connected incorrectly and if the Infinity ID CLIC absorber is not firmly connected to avoid potential human errors
- Design flexibility enables different mounting positions of hardware components, e.g. patient monitors, IV pumps, IT hardware and shelves, etc., to offer customised workstation solutions

* variant with integrated O_2 monitoring requires weekly calibration of the O_2 cell. The pre-use checklist has to be performed by the user prior to the self-test.
** this requires software 2.0 or higher
*** with option Infinity ID Accessories Support

Cybersecurity

The Atlan A350/XL anaesthesia machine was designed with security in mind to combat dangerous and damaging cyber-attacks.

We implemented measures considering the NIST security best practices framework.

- **Identify:** Dedicated documents with security relevant information are provided for asset risk management (e.g. Software Bill of Material, MDS2 Form, comprehensive cybersecurity whitepaper).
- **Protect:**
  – A secure boot ensures the integrity of the software running on the device
  – Role-based authentication & authorisation prevents unauthorised access to critical settings and data
  – Hardened operating system by omitting all unnecessary software components and disabling all unused ports minimises attack surface
- **Detect:** Security relevant events are detected, logged in a tamper-proof security log file and IT-admin is notified via SNMP traps
- **Respond:** The system health monitor observes the system load carefully and reacts in case of suspected malicious events, i.e., disable network interface if load is unusually high.

Benefits

– **Recover:** The system can reboot into last good known state if security event is detected. Dräger service can restore hard- and software quickly, clinical configuration can be transferred from other devices via USB drive

Atlan was developed as to our secure development lifecycle encompassing:

– Threat analysis to identify vulnerabilities during the development phase
– Automatic code analysis along software development
– Independent 3rd party penetration testing to discover residual vulnerabilities
– Execution only of signed (trusted) code on the device
– Release of patches if relevant vulnerability was detected
– Continuous vulnerability monitoring along the lifecycle of the product

Interoperability*

Together with Dräger Infinity Acute Care System** and the Dräger Connectivity Converter CC300, the Atlan A350/XL anaesthesia machine comprises a workstation with functionalities to help you enhance the efficiency and error reduction in anaesthesia. Our anaesthesia workstation is also able to connect to networked hospital systems, and functions as a data source:

– Time and date synchronisation: Identical date and time setting on all connected machines to enable consistent and accurate documentation
– Data export and EMR Integration: Collection of high-quality and standardised data from the Atlan workstations which is directly integrated into the patient's electronic medical record system that reduces time spent on administrative tasks
– Cardiac bypass mode synchronisation: Activation of Cardiac bypass mode (CBM) on Atlan anaesthesia machine adapts alarm settings of all connected monitors simultaneously to allow patient monitoring without unnecessary alarms during extracorporeal oxygenation of the patient by heart-lung machine
– Day/Night mode synchronisation: Adapts the colours and luminance of all screens of the Atlan workstation simultaneously to the clinical scenario to reduce redundant and manual work steps
– Lung recruitment synchronisation*** provides contextual information on the Dräger IACS patient monitoring cockpit supports the evaluation of the effects after a lung recruitment manoeuvre is deployed
– Admission-Discharge-Transfer (ADT) data takeover: Imports available patient data (patient category, age, weight, and height) from the Electronic medical record (EMR) into Atlan workstation with the push of a button
– Mobile Patient Watch: Displays near real-time ventilation numeric parameters and gas analysis waveforms from connected Atlan anaesthesia workstations on a (remote) web-enabled mobile phone or desktop computer to enable remote clinical supervision

* based on ISO/IEEE 11073-Service-oriented Device Connectivity (SDC) principles
** with VG 7.1.1
*** this requires software 2.0 or higher and one- and multi-step lung recruitment option

Benefits

Data Analytics & Digital Services*

Networked Atlan anaesthesia machines together with Dräger Connect, an innovative cloud-enabled digital business platform for digital solutions and services, can aggregate and process data into valuable information to optimise workflow and cost management:

Gas Consumption Analytics: A comprehensive view of the total consumption of used medical and anaesthetic gases from your connected Atlan workstations per OR and in each OR block.

- Visualises the consumption and related costs per anaesthetic agent used in one department
- Indicates the average fresh-gas flow as well as anaesthetic gas consumption and patient uptake ratio
- Displays average costs per minute and intervention function as economic performance indicators
- Displays the applied flow rates to support the implementation of low and minimal flow practices
- Displays the calculated CO_2 equivalent based on consumed anaesthetic gases to evaluate the environmental impact

OR Companion: Checks the live status of the connected Atlan workstations to support an effective management of the ORs. Upgrade the solution with the Self-Test Tracker option to streamline staff workflows for the daily anaesthesia system test procedure, protect patients and achieve a high uptime of anaesthesia workstations.

Self-Test Tracker option:

- Enables remote check of the system test results of all Atlan workstations across departments to optimise and streamline workflows for nursing staff or biomedical engineers
- Provides a centralised overview of machine self-test results to inform staff about machine readiness, and together with the Auto On option of Atlan anaesthesia machine – which enables an automatic system test and switching on of the tested machine at a defined time – can help to reduce time for start-up and streamline staff workflows for the daily anaesthesia machines self-test procedure
- Acts as an assistance system and immediately provides staff with troubleshooting steps

Device Utilisation Analytics: Consolidate all relevant information on the utilisation of your networked Atlan workstations device fleet:

- Gain insights of the utilisation of your networked Atlan to check its performance and improve efficiency
- View real-time online network status and operational state of each device
- Save costs through utilisation analyses and optimisation of the devices fleet with fundamental data insights
- Provides a comprehensive data basis to support purchase decision making
- Improves the transparency of software status and updates to avoid security gaps
- Enables insights into your networked Atlan workstations fleet to support maximum performance and to avoid operational malfunctions

Connected Maintenance: Supports the uptime of your anaesthesia workstations - keeping them updated, safe and secure.

Benefits

- Help Ticket: Expert help about technical issues quickly by simply pressing a button at the device. Less onsite service, repair call avoidance, improved first-time fix rate, higher machine uptime
- Remote software distribution: Manages software updates efficiently and securely with minimal disruptions to clinical workflows
- Certificate Management: Medical devices and service tools kept safe and secure by automatic renewals

* Both are optional and subject to applicable/licence terms of use. Require compatible medical devices and additional IT infrastructure.

Safety Mechanisms

Our Atlan A350/XL machines offer you a wide range of functionalities to help make the anaesthesia process safer for both your patients and clinical staff.

- Backup manual mode (in case of ventilator, touch screen, or gas mixer failure) to allow manual ventilation while maintaining gas and ventilation monitoring as well as O_2 and anaesthetic agent delivery to continue anaesthesia at any time
- Generates message* when the RFID technology-based Infinity ID breathing bag connector or breathing circuit is connected incorrectly and if the Infinity ID CLIC absorber is not firmly connected to avoid potential human errors
- Intuitive start in emergency case to reduce waiting time in critical situations
- O_2 real gas test** checks to ensure oxygen is the delivered gas during the self-test
- Automatic xMAC monitoring** to alarm in case of an unintentional drop in concentration of volatile anaesthetics to avoid awareness
- In case of central gas supply failure and absence of spare gas cylinders, the mechanical ventilation of the patient can be continued with ambient air
- Automatic and time-controlled*** self-test, which includes all relevant components to ensure a safe-to-operate machine so as to enhance patient and personnel safety

* with option Infinity ID Accessories Support
** only with integrated patient-gas measurement module
*** this requires software 2.0 or higher and Auto On option. The pre-use checklist has to be performed by the user prior to the self-test.

System Components

D-28736-2015

Dräger Vapor® 2000 and D-Vapor®

As all other Dräger vaporisers, the Dräger Vapor 2000 series and D-Vapor deliver remarkable performance when it comes to precise agent delivery, safety, robustness, quality, and durability which may result in improved workflow efficiency, staff satisfaction, and clinical outcome.

D-30739-2017

Infinity® Acute Care System

Transform your clinical workflow with Infinity® Acute Care System. Its multiparameter monitor integrates with its networked medical-grade workstation, giving you real-time vital signs, access to clinical hospital systems and data management applications for a comprehensive range of patient information and powerful analysis tools at the point-of-care.

D-45302-2021

Dräger SmartPilot® View

The software visualises the complex synergies of anaesthetic drugs and predicts their effects based on pharmacodynamic modelling for both the current status and the prospective course of general anaesthesia. SmartPilot View turns abstract device data into comprehensive visual information to support the decision on more precise and patient-optimised titration of anaesthetic drugs.

D-6829-2014

Vista 120

Hospitals around the world share a common challenge – to provide the best possible care in locations with growing populations, stricter financial regulations and caregivers that are increasingly overloaded. The Vista 120 was engineered to meet your clinical needs and stay within your budget, allowing you to deliver efficient and high-quality patient care.

Accessories

D-14586-2009

Infinity® ID-accessories

Each and every Infinity® ID-accessory has been designed to offer additional functionality, which can help you simplify routine tasks, streamline workflow and increase safety levels.

D-32542-2011

Disposable Breathing Circuits

Reliable, convenient and designed for safety. Because the breathing circuit is the direct interface to the patient, the integrity of your entire anesthesia or ventilation system depends on it. With Dräger's portfolio of disposable breathing circuits, you can rest assured that each product is carefully designed to work as part of a complete solution.

D-14348-2017

WaterLock 2

Protects your patient, protects your gas measurement systems. Designed to give you reliable gas measurements, the Dräger WaterLock 2 helps you to effectively filter humid and contaminated exhaled air thanks to our advanced membrane technology. Keeping your patients and investments safe from water, bacteria, and potential viruses.

D-6414-2018

Drägersorb 800+ – Soda Lime

Click and connect with 100% reliability. As one of the leading manufacturers of anaesthesia equipment, we believe in leading the way to producing high-quality soda lime that ensures your patients' and staff's safety to the highest degree. Drägersorb is more than just a formula, it is absorption efficiency — you can trust.

Related Products

D-3390-2019

Dräger Atlan® A300/A350 Ceiling and Wall

Imagine the flexibility to have one anaesthesia device platform with high-class safety in every OR. The comprehensive set of clinical features and proven ventilation quality makes Atlan the ideal anaesthesia workstation for all patients and surgical procedures. The platform design gives full flexibility for most spatial conditions. This flexibility is completed with dedicated Atlan variants mounted to a ceiling supply unit or a wall mount.

D-26017-2020

Dräger Ambia®

Adapt acute care workstations ideally to your specific needs with our Ambia® ceiling-mounted supply unit. With its numerous accessories and wide range of variation options, the Ambia ensures you maximum flexibility at the workplace. This not only helps to improve hospital workflows, but also increases the well-being of staff and patients alike.

D-17428-2014

Dräger Polaris® 600

Our OR light is state of the art: The Dräger Polaris® 600 makes your working day a lot easier – with intuitive controls and versatile configuration options. The future-proof system concept remains true to the philosophy of the product family providing you with simply good light.

D-23101-2020

Dräger PulmoVista® 500

Making ventilation visible. Put the power of Electrical Impedance Tomography (EIT) to work for you and your patients. With the PulmoVista® 500, you can visualise regional ventilation distribution within the lungs – non-invasive, in real time and directly at bedside.

Related Products

D-32436-2011

DrägerService® – Because quality counts

At Dräger, we do not just develop medical devices and solutions, we manufacture them as well. That is why we are highly familiar with all the functions, specifications, and technical details. We can offer you fast uncomplicated, and reliable service that fits your individual needs.

D-43770-2015-pi-en.indd

ServiceConnect®

Dräger ServiceConnect® is the state-of-art service management web tool for Dräger Installed Base.

Technical Data

Operating characteristics (Trolley variant)	
Atlan is available in two trolley variants, variant with small trolley for environments of use with constricted space, variant with large trolley for normal OR environments with adequate space.	
Weight of the compact variant	Approx. 135 kg (298 lbs), basic setup
Weight of the large variant	Approx. 160 kg (353 lbs), basic setup
Dimensions of the compact variant (may deviate with hardware options)	(W x H x D) 74.5 cm x 140.3 cm x 69.2 cm (29.3 in x 55.2 in x 27.2 in)
Dimensions of the large variant (may deviate with hardware options)	(W x H x D) 93.3 cm x 140.3 cm x 72.4 cm (36.7 in x 55.2 in x 28.5 in)
Dimensions of the work surface of the compact variant	(W x D) 47 cm x 38 cm (18.5 in x 15.0 in)
Dimensions of the work surface of the large variant	(W x D) 71 cm x 38 cm (28.0 in x 15.0 in)
Storage space and work surface	1 lockable drawer, size (W x H x D) 37.9 cm x 15.4 cm x 36.4 cm (14.9 in x 6.06 in x 14.3 in), volume approx. 20 litres, large version with 2 additional drawers
	Work surface extension, foldable (W x D) 30 cm x 42.5 cm (11.8 in x 16.7 in), option
	Side shelves (option)
Additional pull-out writing tray	(W x D) 34 cm x 25 cm (13.39 in x 9.65 in), option with large variant
Material of the main housing parts	ABS
Power consumption	<95 W, during mechanical ventilation, maximum 400 W
Mains voltage	100 to 240 V AC at 50/60 Hz
Internal battery backup time	At least 45 min, typically 120 min (with fully charged battery)
Data interfaces	2 x serial ports (RS232) (MEDIBUS.X protocol), 1 x USB port, 1 x LAN
Connectivity, interoperability	Support of Data Analytics and Digital Services via Dräger Connect; compatible with Dräger Connectivity Converter CC300 to comply with ISO/IEEE 11073 SDC interoperability principles
Auxiliary power socket (option)	4 country-specific power sockets, individually fused with 2 fuses per socket
Intended patient population	Adults, paediatric patients, and neonates

Gas supply	
Available as a 2-gas version (O_2/AIR) or a 3-gas version (O_2/AIR/N_2O), electronic measurement and monitoring of supply pressures for all gas connections (central gas supply, and gas cylinders when using optional Dräger pressure reducer)	
Central gas supply, supply pressure for O_2, AIR, N_2O	2.7 to 6.9 kPa x 100 (39 to 100 psi)
Gas supply with gas cylinders (O_2, AIR, N_2O)	1 or 2 standing gas cylinders (option)
	2 or 3 suspended gas cylinders with pin-index connector (option)
	Park holder for 1 additional standing gas cylinder (option)

Fresh-gas delivery	
Gas mixer technology	Electronically controlled gas mixer with manual emergency O_2 delivery
Fresh-gas flow (FG flow)	Off; 0.2 to 15 L/min
O_2 concentration (FG O_2)	21 to 100 Vol% (carrier gas: AIR); 25 to 100 Vol% (carrier gas: N_2O), N_2O cut off when the pressure of O_2 drops; configurable minimal O_2 flow
O_2 flush	25 to 75 L/min at 2.7 to 6.9 kPa x 100 (39 to 100 psi; 0.27 to 0.69 MPa) supply pressure
Flow for O_2 insufflation (Aux. O_2)	Off to 20 L/min Flow for O_2 insufflation (Aux. O_2) can also pass through the vaporiser when switched to "Add. O_2"

Technical Data

Ventilator and setting parameters	
Electronically driven piston ventilator (E-Vent plus), fresh-gas decoupled, ventilation without drive gas i.e. no medical gases are consumed in operating the ventilator (regardless of gas supply). Adaptive piston control for optimised gas exchange times and fresh-gas utilisation, piston volume automatically adjusted according to patient category setting and ventilation parameters.	
Standard ventilation modes	Manual/Spontaneous (Man/Spon)
	Volume-controlled: time controlled (VC-CMV)
	Pressure-controlled: time controlled (PC-CMV)
Optional ventilation modes	Volume controlled with AutoFlow (VC-CMV / AutoFlow)
	Volume-controlled, synchronised, with pressure support (VC-SIMV / PS)
	Pressure-controlled, synchronised, with pressure support (PC-SIMV / PS)
	AutoFlow, synchronised, with pressure support (VC-SIMV / PS / AutoFlow)
	Pressure-support ventilation (CPAP/PSV, with adjustable RR for backup ventilation)
	External fresh-gas outlet for use with non-rebreathing systems
Respiratory rate (RR)	3 to 100 /min
Inspiratory time (Ti)	0.2 to 10.0 s (resulting ratio I:E 1:49 to 49:1)
Ratio of inspiratory time to expiratory time (I:E)	4:1 to 1:10 (setting parameter I:E)
Tidal volume (VT) at VC modes (setting parameter)	10 to 1500 mL
	5 to 1500 mL with option for “Advanced neonatal support”
Tidal volume monitoring, lowest detectable VT	≤ 10 mL for the "paediatric patients" and "Neonates" patient categories
	≤ 20 mL for the "Adults" patient category
	≤ 3 mL with option for "Advanced neonatal support"
Trigger threshold (Trigger)	0.3 to 15 L/min
Peak inspiratory flow	180 - 220 L/min
Inspiratory pressure (Pinsp)	PEEP +5 to 80 hPa (cmH_2O)
	(7 to 80 hPa (cmH_2O) when PEEP = Off)
Pressure limitation (Pmax)	PEEP +5 to 80 hPa (cmH_2O)
	(7 to 80 hPa (cmH_2O) when PEEP = Off)
Pressure support above PEEP (ΔPsupp)	Off, 3 to (80 - PEEP) hPa (cmH_2O)

Breathing system	
Heated breathing system for low-flow and minimum-flow applications, disassembly without tools, design optimised for easy and effective hygienic reprocessing. All patient-gas leading components are autoclavable.	
Total volume without CO_2 absorber	2.18 L when applying the maximum VT of 1500 mL, typically lower volume acc. to patient category setting and ventilation parameters
Absorber volume	1.2 L with disposable CO_2 absorber CLIC, 1.4 L with reusable CO_2 absorber canister
Reprocessing	Cleaning, disinfection, replaceable without tools, less than 13 reprocessing relevant components (depends on the machine configuration)

Anaesthetic gas scavenging system (AGS)	
Available as active or passive anaesthetic gas scavenging system for operation with or without adequate scavanging system infrastructure; detection of excessive suction flows, with connector for sample gas disposal when using third-party patient gas measurement modules.	
Active AGS	For connection to an anaesthetic gas scavenging system
	With a control valve (option) or an ejector (option)
Passive AGS	For connection to a disposal system with low or no suction flow

Technical Data

	With overpressure valve and underpressure valve
Displays and monitoring systems	
Main screen	15.3" (38.9 cm) TFT LCD touchscreen, configurable screen contents, smart alarm management with extensive support system
Screen configuration	Depending on the machine configuration, simultaneous display of 2, 3 or 4 real-time colour-adjustable waveforms for: airway pressure, inspiratory and expiratory flow, CO_2, O_2, and anaesthetic agents; display of colour coded virtual flow tubes for O_2, AIR, N_2O; tabular trends; quick access to 3 configurable views
Device status display	Front Panel with LC display of airway pressure, supply status of battery and gases (central and cylinder supply)
Advanced trend display (option)	Display of graphical trends or mini-trends simultaneously with realtime waveforms and loops; additional data export functions via USB storage device
Ventilation monitoring	Minute volume (MV) and tidal volume (VT and ΔVT); respiratory rate (frequency); peak inspiratory pressure (PIP), plateau pressure (Pplat), mean airway pressure (Pmean), PEEP; dynamic compliance (Cdyn), resistance (R), elastance (E), external pressure gauge (optional) for indicating the pressure in the internal breathing system
Advanced ventilation monitoring (option)	Bar diagram display of volume and tidal volume, simultaneous display of 2 loops: Volume-pressure and flow-volume, reference loops can be saved
Gas monitoring	
Available as variant with oxygen cell for inspiratory O_2 monitoring or with integrated patient-gas measurement module (PGM)	
Variant with inspiratory O_2 monitoring	O_2 sensor cell with 2 years guaranteed minimum life span and with life span monitoring, electrochemical measurement principle
Variant with patient-gas measurement module (PGM)	Inspiratory and expiratory gas concentration of O_2, N_2O, CO_2 and anaesthetic agents, automatic identification of isoflurane, sevoflurane, desflurane, halothane, enflurane, detection of anaesthetic gas mixtures, age-corrected xMAC display; sample gas returned to the breathing circuit
Advanced gas monitoring (option by PGM module)	Econometer for displaying fresh-gas efficiency (optionally including trend and/or in the form of low-flow wizard), determination of consumption and uptake (determination of uptake only for anaesthetics), fresh-gas and anaesthetics per case and since last zeroing

Safety functions

- The integrated device checklist and illustrated step-by-step instructions for daily machine preparation help to comply with national guidelines, such as DGAI (Germany), ASA/APSF (USA), AAGBI (UK)
- Man/Spon ventilation with dosing of O_2 and anaesthetic agents possible even when switched off (emergency start-up)
- Backup manual mode allows the direct change to manual ventilation while maintaining gas and ventilation monitoring; O_2 and anaesthetic agents from the vaporisers can be continuously delivered
- Mechanical ventilation with ambient air in case of complete failure of the gas supply, the change to intravenous anaesthetic agents is required
- Real-gas O_2 test integrated in automatic machine self-test (requires integrated PGM)

Comfort functions and other features

- Fully* automatic self-test including calibration of all relevant sensors and checkimg all valves in the breathing system; normally no user action necessary after start of test; optional timer-based self-test (Auto On function, requires software 2.0 or higher)

Technical Data

- Autoset function for adjusting alarm limits
- Cardiac bypass mode to avoid unnecessary alarms when using the heart-lung machine
- Breathing bag as an indicator of fresh-gas deficiency and leaks
- Pause mode for short-term interruptions of ventilation and fresh-gas flow
- Data storage on USB storage device (alarm history, self-test results, screen shots, trends and machine configurations
- Time-saving transfer of default settings and configurations to other Atlan machines via USB storage device
- Integrated, dimmable illumination of working and documentation surfaces
- Central brake (option), smooth running dual wheel castors with cable deflectors (option)
- Free, six-week trial version of all available software options. Trial period expires automatically.

* variant with integrated O_2 monitoring requires weekly calibration of the O_2 cell

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