# Dräger Atlan A350/A350 XL
# Anaesthesia Machines

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 securely with other networked devices to share data and information that can help to increase efficiency and reduce errors in anaesthesia.

Dräger

Technology for Life

# Highlights

## 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.

- High precision piston ventilator enables accurate tidal volume delivery down to 5 ml (in VC mode)*
- 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 seperates the ventilation from the fresh-gas flow and the $O_2$ flush so changes to the fresh-gas flow have no influence on the applied tidal volume and the ventilation pressures
- Features optimise low- and minimal-flow application, which can contribute to improved humidity of anaesthetic gases, mucociliary clearance, maintenance of body temperature and reduced fluid loss. They include:
  – built-in breathing system warmer 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 maneuver option** comprises One-step and Multi-step recruitment methods, Insp./Exp. Hold function and reminder function to support recruitment maneuver 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

* With option Advanced neonatal support

** 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 low- and minimal-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 maneuver**
- 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.

- 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 system test
- Fully automated system test* (no user interaction needed) enhances operational efficiency and saves staff time for other tasks
- Auto On** function enables an automatic system test and switching on of the tested machine at a defined time that helps to reduce time for start-up
- Ex- and import of machine configuration via USB mass storage device 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 O2 monitoring requires weekly calibration of the O2 cell. The pre-use checklist has to be performed by the user prior to the system 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
- **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

The Atlan A350/XL interoperates with other Dräger solutions as an advanced workstation to enahnce patient care and workflows. The Atlan A350/XL workstation can be networked to communicate securely with hospital information systems, other networked machines to share data and information that can help to increase efficiency and reduce errors in anaesthesia.

- 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 deactivates all alarm monitoring (including arrythmia alarms) and the alarm bar of the connected Dräger patient monitoring during extracorporeal oxygenation of the patient by a heart-lung machine
- Analysis Tool page of the Dräger IACS provides contextual information to assess the effects after a lung recruitment maneuver is performed
- 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**

* Requires Dräger Conncectivity Converter hardware and is based on ISO/IEEE 11073-Serviceoriented Device Connectivity (SDC) principles

** Optional and subject to applicable/licence terms of use. Requires compatible medical devices and additional IT infrastructure

## Data Analytics & Digital Services*

Networked Atlan anaesthesia machines together with My Dräger, 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 system 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 system 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 to increase the uptime of your anaesthesia workstations - keeping them updated, safe and secure.

- Help Ticket: Delivers fast expert help for technical issues and a higher first-time fix-rate by sending technical device data information with a click of a button
- 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

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

** Requires Connectivity Package for establishing the connectivity between devices and Dräger digital services.

## 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 system 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*** system 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 system test.

## Taking responsibility for creating sustainable products

Our technology protects people and the environment. Protecting the environment is therefore not just our duty, but also an opportunity for us to gain a competitive advantage through environmentally friendly products and by conserving resources. For this reason, we make sure that our day-to-day activities, in all areas of the company, protect the environment rather than damage it. We are committed to the United Nations' climate action goals. We handle resources responsibly and work systematically to reduce our carbon footprint. What is more, Dräger products and services help our customers all over the world live up to their responsibility to protect people and the environment.
Learn more:
https://www.draeger.com/en_sa/About-Draeger/Sustainability

# Specifications

### Lung Protective Ventilation

| | |
|---|---|
| Operational Application | Integrated anesthesia workstation for all patients |
| Patient categories | Adults, pediatrics, neonates |
| Fresh gas decoupling | ✓ |
| Ventilator technology | E-Vent - Uncompromised ventilation quality helps to reduce lung complications and the length of stay |
| APL-Technology / Precise manual ventilaton | Dräger APL-Valve |
| Breathing gas warmer | Standard |
| Low- and minimal flow setting support | Visual filling level of bag; Econometer; Low flow wizard |

### Ventilation Modes

| | |
|---|---|
| Man/Spon | ✓ |
| CPAP in Man/Spon | × |
| Volume Controlled (VC) | ✓ |
| VC Synchronized + PS | ✓ |
| Pressure Controlled (PC) | ✓ |
| PC Synchronized + PS | ✓ |
| Pressure Support | ✓ |
| Volume Controlled AutoFlow | ✓ |
| APRV | × |

### Features

| | |
|---|---|
| Screen Display | 15.3" touch-screen with storable view and profiles, smart alarm managment with extensive support system |
| Vaporizers capability | Smooth and rounded surfaces ease frequent cleaning/wipe disinfection |
| Device self test | Automatic self test |
| LOOPS (p/V-loop and flow/V-loop) | Yes |
| Smart Pilot View | Yes |
| Patient gas module | in/ex O2, N2O, CO2, Agent (option with xGM patient gas module) |

### Technical Data

| | |
|---|---|
| Device versions | Trolley version, wall version & ceiling version |
| Breathing system | integrated; Decision support tools to enhance informed decision making in complex situation |
| Fresh-gas mixer | electronic gas mixer with automatic fresh-gas composition control |
| Gases | O2, Air, N2O |
| RFID Technology | ✓ |

| | |
|---|---|
| Serial interfaces | 2 x serial ports (RS232) (MEDIBUS.X protocol), 1 x USB port, 1 x LAN |

## Safety Concept

| | |
|---|---|
| Emergency ventilation in case of total gas supply failure | ✓ |
| Typical battery run-time in case of power supply failure | typically 120 min |
| Emergency start-up procedure | ✓ |

# Accessories

## Accessory Sets (Set2Go & Pack2Go)

- Customizable sets of single-patient-use accessories for various clinical tasks.
- Streamlines hospital workflows, reducing staff stress and costs.
- Includes accessories for invasive and non-invasive ventilation, and anesthesia.
- Simplifies ordering and inventory management with standardized sets.

## Anaesthesia Masks

- Disposable masks with teardrop or round shape for anatomical fit.
- Non-slip ridges and flexible body for easy grip.
- Available in scented versions for patient comfort.
- Sizes range from infants to adults, BPA and PVC-free.

## Breathing Circuits

- Disposable circuits designed for single-patient use to prevent cross-contamination.
- Available in adult, pediatric, and neonatal sizes.
- Made from biocompatible, PVC-free materials.
- Includes flexible, coaxial, and heated circuit options.


## CareStar® Plus Electrostatic Filters

- High-performing electrostatic filtration medium.
- Protects against microorganisms in inspired and exhaled air.
- Cost-efficient solution for infection control.
- Suitable for OR, ICU, and other settings.

## Dräger Vapor 3000 and D-Vapor 3000

- Delivers precise agent delivery, safety, robustness, quality, and durability
- Compatible with Perseus A500, contributing to improved workflow efficiency

## Drägersorb 800+

- Uniform $CO_2$ absorption with minimal dust generation.
- Compatible with all halogenated inhalation anesthetic agents.
- Color change indicator for Easy replacement.


## SafeStar® Plus Mechanical Filters

- Hydrophobic filter membrane prevents fluid passage.
- High bacterial and viral filtration efficiency.
- Reduces risk of cross-infection during mechanical ventilation.
- Suitable for OR, ICU, and other settings.

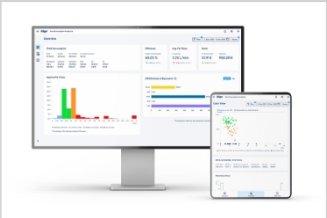

## TwinStar® Plus Filter/HME

- High-performing filters for humidification and infection control.
- Electrostatic and mechanical options available.
- TwinStar Plus combines filter and HME benefits.
- Suitable for OR, ICU, and other mechanical ventilation settings.

# Software

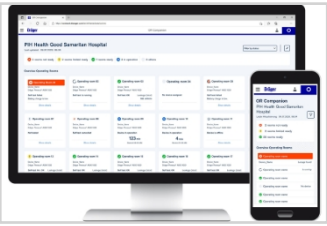
## Dräger Device Utilization Analytics

- Improves fleet management capabilities
- Enhances security, performance, and uptime of networked devices
- Provides insights into most and least used devices
- Supports balancing device usage for long life and performance
- Enables benchmarking of device performance over time



## Dräger Gas Consumption Analytics

- Assists to reduce consumption of volatile anaesthetics
- Provides clinical, environmental and economical insights from agent consumption
- Creates transparency on consumption uptake, efficiency and costs
- Supports to implement patient-protecting low and minimal-flow practices



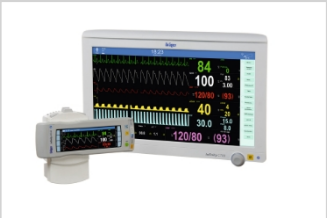
## Dräger OR Companion

- Provides workflow support for managing operating rooms
- Displays status of connected Dräger anaesthesia machines
- Streamlines the daily device check process with system test insights
- Documents system test history for compliance with guidelines
- Delivers troubleshooting support for system test failures

# Connective Products

## 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.



## Infinity® Acute Care System

- C500 and C700 integrates physiological monitoring with a medical-grade workstation for real-time vital signs and clinical data management.
- Customize monitoring display based on your department and patient acuity
- Access your hospital web-based clinical applications using configurable tabs without obscuring active monitoring

## Infinity® M540

- Designed for intra-hospital transport and the flexibility for advanced critical care
- Single handed undocking and docking helps to ensure fast transport to Pick and Go
- Stores up to 72 hours of trends and events, accessible upon docking. Storage expands to 96 hours with the C500 or C700.
- When using during transport with integrated measurements, M540 can

## The Vista 120 Portfolio

- 15" TFT touchscreen with configurable layout displaying up to 13 waveforms.
- Numeric values include ECG, SpO2, NIBP, respiration, and dual temperature.
- Stores up to 150 hours of trend data and 1,200 NIBP measurements.
- Seamless connectivity with Dräger therapy devices for integrated workstation functionality.


## Vista 300

- 15" TFT touchscreen with high resolution for clear visibility.
- Configurable layout displaying up to 13 waveforms.
- Numeric values include Hear Rate, SpO2, NIBP, respiration, and dual temperature.
- Seamless connectivity with Dräger devices for integrated workstation functionality.
- Compatible with the Vista Patient Monitoring System

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