Aisys™ CS²

Digital.
Connected.

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From digital anaesthesia delivery to analytics.

Advancements in digital technology are driving a new era of brilliant machines to transform big data into meaningful insights through analytic applications. For anaesthesia, it all comes together in the Aisys CS^2 — a technologically sophisticated class of digital Carestation™.

The Aisys CS^2 is a fully digital anaesthesia system designed for seamless connectivity with your other medical devices and your network infrastructure. With hundreds of data points captured during each breath and easy-to-use, cloud-based applications to analyze data, it's more than an anaesthesia delivery system. It builds a more complete picture of patient care and processes.

The fully digital features of Aisys CS^2 help you deliver the most modern and outcomes oriented anaesthesia care. Through seamless connectivity, the data you collect from the Aisys CS^2 can inform the decisions you make to optimize care processes and better control costs.

Leveraging our 100-year expertise as the global leader in anaesthesia delivery, we redesigned the Aisys CS^2 user-interface and paired it with numerous intuitive workflow features. We also made it modular and upgradeable, so you can plan for the future while protecting your investment.

Low tidal volume

As low as 5 mL

Delivers tidal volumes as low as 5 ml in PCV mode.[1]

Responsive

250x per second

Monitors and responds to changes in the patient's airway pressure or respiratory efforts up to 250 times per second.

Precise delivery

Precision volume and pressure delivery to the patient wye, breath by breath, helps reduce the challenges in managing neonatal and pediatric patients.

Advanced ICU inspired.
Ventilation with a personal touch.

The ventilation engine in the Aisys CS^2 is built around the electromagnetic proportional flow valve that precisely controls delivered volumes and pressures similar to those found in ICU ventilators like our CARESCAPE™ R860. This helps you ventilate the most difficult patients, from neonates to large adults.

ICU flow valve technology provides digitally controlled flow valves for fast response times. The Aisys CS^2 ICU flow valve technology quickly achieves and maintains set pressures and volumes to maximize the time available for gas exchange helping you confidently deliver care to all your patients, even the smallest ones.

The lung protective ventilation features on the Aisys CS^2 arm you with the resources to configure automated lung ventilation maneuvers. These programmable steps can enhance your ventilation techniques allowing for increasing and decreasing PEEP levels during mechanical ventilation.

Vital capacity procedure

Automates the manual bag "squeeze and hold."

PEEP can be programmed at the end of the procedure to help sustain an open lung.[2,3,4]

Cycling procedure

Allows you to configure a lung ventilation maneuver.

Programmable steps allow for increasing and decreasing PEEP levels during mechanical ventilation.

Compliance trending

Displays compliance measurements in real time to help you assess the effectiveness of automated lung procedures.

Low flow.
High impact.

Concerns around the environmental impact of volatile anaesthetic agents[5], along with demands for increased efficiency in health expenditures have led to a renewed interest in promoting low-flow anaesthetic techniques to reduce the quantity of volatile anaesthetic agents used.[6] The Aisys CS[2] has been designed to help you confidently perform low-flow anaesthesia and reduce anaesthetic agent waste.

Our comprehensive low-flow toolkit includes automated delivery of oxygen and agent and fresh gas flow with End Tidal Control.
The pause gas feature makes temporarily stopping gas flow and suspending alarms, agent delivery and ventilation as easy as pushing a button.
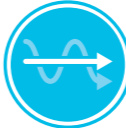
Et Control is not available in all markets. Et Control is not cleared or approved by the U.S. FDA. Not for sale in the United States.

End Tidal Control helps maintain the patient's end-tidal agent and oxygen targets, regardless of changes in hemodynamic and metabolic status. Published studies[7,8,9,10] and the experience of thousands of clinicians[11] show that Et Control is:

Vigilant

Et Control automates the delivery of anaesthetic agent, fresh gas mix and total flow to deliver consistent anaesthetic agent levels and maintain EtO2 at desired level. In a clinical study, Et Control maintained end-tidal concentration within 10 percent of the set target for 98 percent of the total steady state time.[7]

Simple

In clinical tests[12], a majority of clinicians reported that Et Control is easier to use compared with the conventional practice of using fresh gas flow and vaporizer settings. And a recent study observed that even for longer cases, Et Control required 52 percent fewer keystrokes per case than manual control.[7]

Efficient

Et Control can help reduce anaesthetic and costs throughout the case. A recent study showed that for cases of the same duration, the Et Control group used on average 40 - 55 percent less volatile anaesthetics than the manual control group.[7]

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ET Control

The desired anaesthetic gas concentration is set once by the anaesthesiologist and is adjusted automatically and securely by the device.
This creates for the anaesthesiologist capacity to care more for the patient.
We see this as an additional positive safety aspect for the patient and the clinician.

Prof Dr. med. Henry Weigt Heilbronn

Et Control: O2 + Air + AA; Flow is 6 l/min

Et O2	Min Flow	Et Sev	Et Control
Max	0.30	2.6	Gas Setup
Target %	l/min	Target %	

Until now, anaesthesia delivery systems have relied on a narrow pipeline to deliver connectivity needs.
The Aisys CS^2 is designed to bring your connectivity infrastructure up to market expectations with a high speed, dedicated network connection that gives it a plug-and-play usability and a richer data set than previously available.

Brilliant machines

Brilliant machines with intelligent features and IT integration that help enhance productivity.

Hundreds of data points.
One simple connection.

In an increasingly digital world, how our digital technologies connect to one another is just as important as the digital information that they create. Especially in technology-rich environments like hospitals.

With more and more digital medical devices capturing important information about patients, procedures and equipment performance, you need your technologies to be able to talk to one another and with your hospital infrastructure.
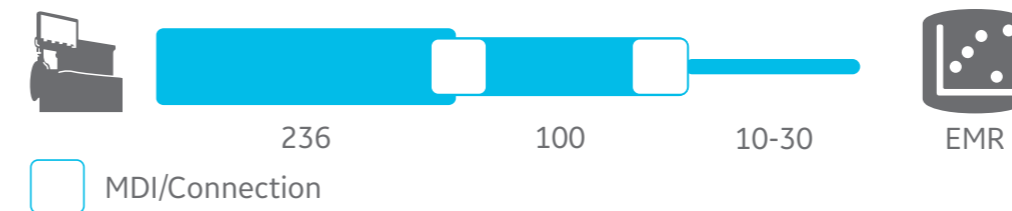
The Aisys CS^2 was designed to seamlessly connect with other medical devices and with your hospital's network. Using the industry standard HL7 protocol, it easily interfaces with your EMR, analytics platforms and care systems.
Real-time data transmission can be configured to send important physiological, machine and service data automatically to the cloud for analysis and storage.

Because Aisys CS^2 uses the HL7 protocol, it speaks directly to your EMR without the need for a third party device. This gives it a plug-and-play ability that allows you to effortlessly connect to your hospital network.
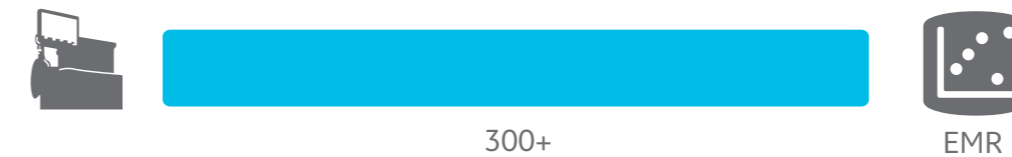
State of data flow in the past

236   100   10-30   EMR

MDI/Connection

Aisys CS^2 data flow

300+   EMR

Big data

Data from these machines are funneled into software applications that help reveal insights.

Cloud based

A cloud-based ecosystem of brilliant machines and data analytics help improve performance.

Reveal opportunities, drive outcomes.

The Aisys CS^2 captures hundreds of data points, Carestation Insights analytic platform shapes this data in meaningful patterns and knowledge.

So that you will be able to drive clinical, operational and economical outcomes.

Applications are easy-to-use dashboards that can easily be accessed on your computer or tablet and provide actionable data analysis.

There is an enormous opportunity to explore new ways of analysing this data to develop a detailed understanding of your patients and processes.

Carestation Insight is not a medical device
Aisys 11.x or Et Control are not available in all markets. Aisys 11.x or Et Control are not cleared or approved by the U.S. FDA. Not for sale in the United States.

Carestation Insights is an advanced analytic platform that helps make data driven decisions to deliver improved outcomes.

The advanced digital features built into the Aisys CS^2 were designed to work together to make your workflow easier. Each piece of hardware, software and technology fits together in harmony to elevate your Carestation to become the information hub of the operating suite.

Turn workflow
into careflow.

The Aisys CS^2 represents a convergence of our premium anaesthesia and patient monitoring. Monitoring and data management are seamlessly integrated through a user interface similar to that found in our CARESCAPE monitors. With time-saving quick pick choices, flat menus and tunneling alarms, the Aisys CS^2 can help you deliver precise care with a personal touch every day.

To help reduce alarm fatigue and avoid false alarms during mechanical ventilation, Aisys CS^2 features Auto Alarm Limits software to help clinicians manage CO2 limit alarms and MV/TV alarm limits on a case-by-case basis. Also included is a mechanism to apply upper and lower limits for MV, TV, RR and EtCO2.

The MAC alarm feature enables higher automatic surveillance during volatile anaesthesia delivery.

Pause gas
One button temporarily stops all gas flows and suspends alarms, agent delivery and ventilation, allowing time to focus on the patient.

Auto alarm limits
Manage CO2 and MV/TV alarm limits on a case-by-case basis.

Apply upper and lower limits for MV, TV, RR and EtCO2.

Carestation convergence
Similar user interfaces and seamless hardware integrations give a sense of familiarity and overall peace of mind.

Quick pick choices
Programmable settings of O2 level, AA level and Fresh gas flow level guarantee faster display interactions.

Digital vaporization

Up to 2x the accuracy.

With the precision and accuracy offered on the Aisys CS², clinicians can be confident that the information displayed is actually measured — not estimated. Responsiveness to changes in the patient's status is measured in milliseconds and anaesthetic delivery accuracy exceeds published performance specifications of other electronic and conventional anaesthesia vaporizers. [13]

1. 15-inch touchscreen vent display

2. Central Brake

3. Digital vaporization:
   Aladin2 Cassettes

4. Metal work surface,
   bilevel illumination

5. Compact Advanced
   Breathing System

6. CARESCAPE Respiratory Module

7. CARESCAPE Monitor B650

8. Flexible mounting for EMR
   integration or navigator
   applications suite

9. InView patient rotating
   display arm for 360° view

The primary elements on the Aisys CS^2 — ventilator, vaporizer and gas delivery — are digitally controlled and measured, so you can integrate devices, therapies and information systems at the point of need. And with our suite of cloud-based analytics applications, Carestation Insights, you have access to over 300 data points to drive improved outcomes.
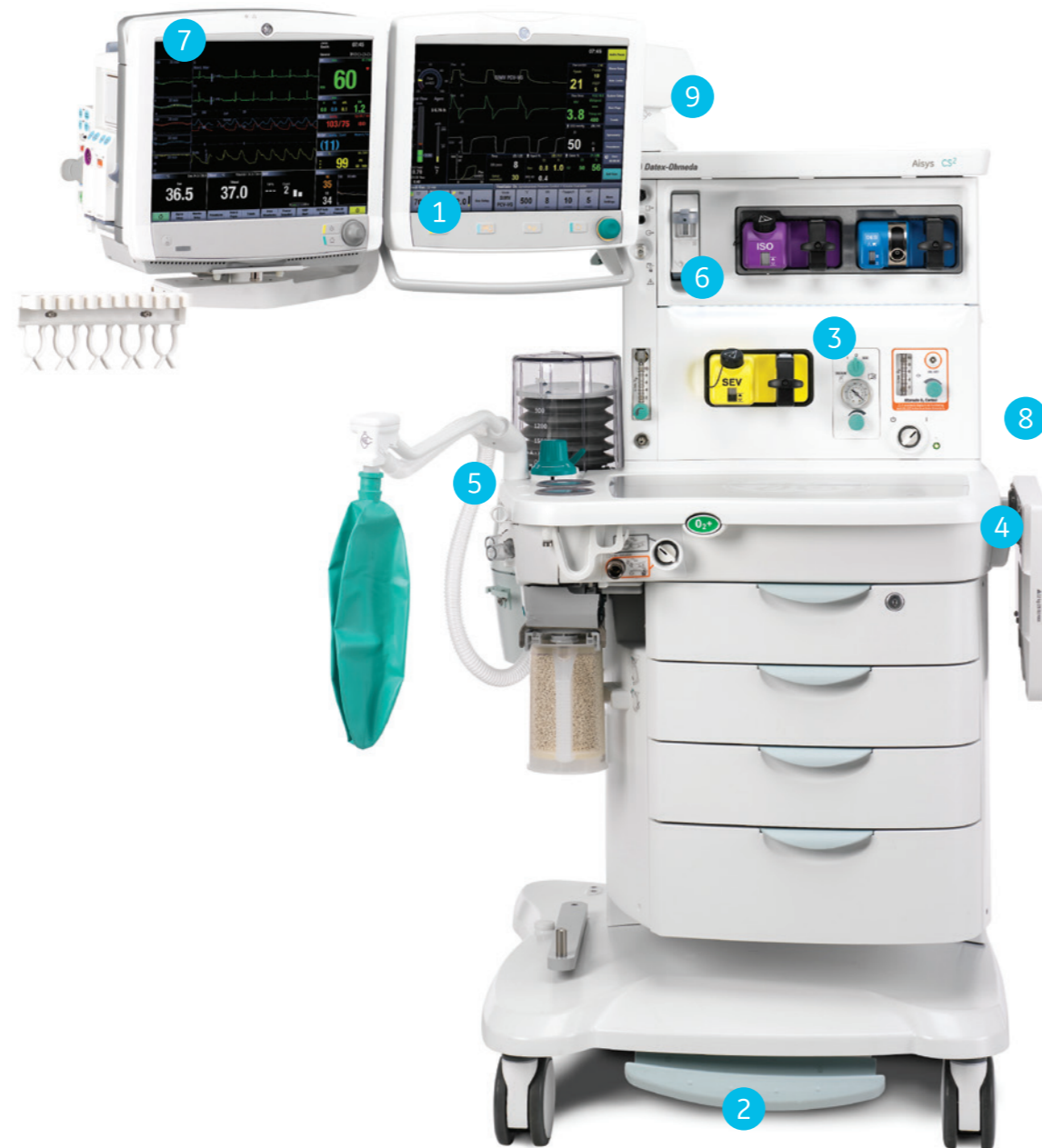
Safety in numbers.
Over a century of anaesthesia innovation.

From Thomas Edison's first commercially viable light bulb to our first fully digital anaesthesia Carestation, we've continued to redefine what's possible.

Today, we provide anaesthesia technologies in nearly every country in the world, collaborating closely with clinicians like you to impact the lives of your patients.

OVER **100**
years in anaesthesia

OVER **100**
currently active patents[14]

OVER **100**
thousand units
sold worldwide[15]

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GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality and more affordable healthcare around the world.
GE works on things that matter - great people and technologies taking on tough challenges. From medical imaging, software & IT, patient monitoring and diagnostics to drug discovery, biopharmaceutical manufacturing technologies and performance improvement solutions, GE Healthcare helps medical professionals deliver great healthcare to their patients.

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GE imagination at work

Carestation Insights is not a medical device.

1 GE benchmark study. Actual results may vary and are dependent on the patient. DOC0933949

2 Tusman G, Bohm SH, Tempra A, *et al.* Effects of recruitment maneuver on atelectasis in anesthetized children. Anesthesiology. Jan 2003;98(1):14-22.

3 Reinius, H., Jonsson, L., Gustafsson, S., Sundbom, M., Duvernoy, O., Pelosi, P.,... Freden, F. (2009). Prevention of atelectasis in morbidly obese patients during general anesthesia and paralysis: a computerized tomography study. Anesthesiology, 111(5), 979-987.

4 Trial of Intraoperative Low-Tidal-Volume Ventilation in Abdominal Surgery Futier *et Al*. N Engl J Med 369;5 NEJM.428 org August 1, 2013

5 NHS Institute for Innovation and Improvement. The Productive Operating Theatre.
    http://www.institute.nhs.uk/images//documents/Quality_and_value/Productive%20Operating%20Theatre/Finance%20leaflet.pdf;

6 Sherman, J., Le, C., Lamers, V., & Eckelman, M. (2012). Life cycle greenhouse gas emissions of anesthetic drugs. Anesth Analg, 114(5), 1086-1090.

7 Singaravelu, S., & Barclay, P. (2013). Automated control of end-tidal inhalation anaethetic concentration using the GE Aisys Carestation™

8 Lucangelo *et Al*. End-tidal versus manually-controlled low-flow anaesthesia
    J Clin Monit Comput DOI 10.1007/s10877-013-9516-8.

9 Using Automated End-Tidal Control in Routine Clinical Practice Influences Fresh Gas Flow Rates and Demonstrates Inhalational Kinetics,Kennedy R, French R. Anaesth Intens Care. 2014; 42:65–72.

10 Tay, S., Weinberg, L., Peyton, P., Story, D., & Briedis, J. (2013). Financial and environmental costs of manual versus automated control of end-tidal gas concentrations. Anaesth Intensive Care, 41(1), 95-101.

11 Estimated based on the number of anesthesia machines with preinstalled EtC capabilities and EtC upgrade kits shipped since 2010, based on GE shipping data.

12 Per DOC0668882 GE Healthcare 2009 clinical trials at Helsinki University and Kiel University.

13 DOC1426375 GE internal analysis of published industry standards and vaporizer data product performance specifications comparing GE Aladin2 Cassettes to Draeger Vapor2000 (conventional), FLOW-I (digital), Blease Datum L series Anesthesia Vaporizer (conventional), GE Tec 6 Plus and Tec 7 Vaporizers (conventional). Comparison shows that the Aladin 2 is up to 2 times (200%) as accurate as other vaporizers (Draeger Vapor 2000, Blease Datum, Penlon Sigma Elite).

14 As of May 2012, active GE Healthcare anesthesia and respiratory patents issued in the United States.

15 Anesthesia machine shipments over the past 25 years based on GE shipping data.