Flow Anesthesia Family
Experience the Flow

This document is intended to provide information to an international audience outside of the US.
Go with the Flow

No two operating rooms have the same demands. We understand. And we’ve developed the Flow family of anesthesia machines to reflect this reality.

**Three systems. One vision.**
Start using a Flow machine and you’ll quickly notice the attention to detail and thoughtful touches that result from our close collaboration with clinicians.

Compact convenience. Outstanding versatility. Decision support for safe and efficient lung-protective care. Automatic functions for time to focus on the patient. Whatever your clinical needs, our solutions focus on making daily work easier, more cost-efficient and safer for your patients.

Experience the Flow.
Designed to make every day flow

More than just a machine, your anesthesia system is the key to your workflow. Smart design features give you the best possible user experience.

**Easy to learn. Simple to use.**
All Flow models share the same user-friendly interface, which helps to reduce training demands and minimize the risk of errors. The clear and colorful touch display gives you one point of control for all functions. Tools are right where you want them, so you can work in an ergonomic and comfortable position.

**Pause for full control**
The pause button stops all gas and agent flows, alarms and ventilation allowing you to focus on the patient. End the pause, and everything resumes from where you left off.

**Automated system check**
The routine system check is made easier by an automated workflow that requires minimal manual interactions. The vaporizers are also included in the system check.
Electronic injection vaporizers for fast and precise agent delivery

Maintenance-free and lightweight, the vaporizers can be filled during use and have a capacity of 300 ml. Desflurane needs no heating time.

Flexible mountings

All Flow models feature stepless rails of maximized length. A selection of equipment arms allows you to personalize your Flow by adding monitors, extra tables and other accessories to suit your needs.

Convenient USB ports

The USB ports are on the front for easily accessible data transfer and charging. A dimmable LED lights up the workspace.

Adjustable height and pendant versions

For full flexibility, Flow-i is available in height-adjustable and pendant versions.

Optimized workspace

We know you need space, so we’ve maximized the work area and storage, with different drawer options depending on model.

No clutter

Cables and hoses are routed inside panel arms and behind the back covers, making cleaning easier and contributing to improved hygiene and safety.

“Modern, capable of all modes needed, good interfaces, easy to use.”

Dr. Keith Bailie, Royal Belfast Hospital for Sick Children, UK
Precise ventilation when you need it most

Ventilation performance is not only about modes. Most importantly, it’s about ensuring the power and precision needed to ventilate any patient.

Next-generation technology at the core
The Flow family was created by the engineers behind the world-class Servo ventilator platform. It is designed to deliver set tidal volumes regardless of compliance and resistance to handle the most complex cases – from neonates to bariatric patients.

The innovative technology inside Flow family ensures excellent ventilation performance and outstanding agent efficiency – we call it the Flow core technology.

Servo gas modules
The Servo gas modules enable ICU-quality ventilation. They deliver up to 200 l/min inspiratory flow and are capable of adjusting pressure and flow constantly within every breath, according to each patient’s needs.

Figure 1: The Flow Anesthesia Machine can deliver the set tidal volumes even when there is high abdominal and thoracic pressure, thus avoiding hypoventilation.²
**Volume Reflector rebreathing system**

Our patented Volume Reflector is a smart rebreathing system. In combination with Servo gas modules, it enables accurate tidal volumes down to 5 ml, providing better ventilation performance compared to bellows, turbine and piston-operated systems, see figure 1.

The rigid Volume Reflector is never empty, ensuring uninterrupted ventilation, and compensates effectively for any leakage. And because it’s oxygen driven, the risk of hypoxic mixtures becomes almost impossible. The Volume Reflector has a small system volume for fast wash-in and wash-out and a rebreathing fraction of 98%.

**Electronic injection vaporizers**

Electronic injection technology enables precise delivery of agents, primarily during the inspiratory phase, with minimal waste. The lightweight and maintenance-free vaporizers can be refilled and exchanged while the machine is running, and do not require annual calibration.

**A tiny miracle**

Read the story of how a premature infant weighing only 393 g (13.9 oz) was successfully anesthetized and ventilated using a Flow-i during major abdominal surgery. Today, she is a healthy little girl.

[www.getinge.com/393g](http://www.getinge.com/393g)
Our close collaboration with clinicians around the world has shaped the range of vital tools you’ll find in the Flow family. These include innovations to automate manual tasks, improve patient outcomes and take safety to new levels.
Low-flow anesthesia the safest\textsuperscript{1} way

Active inspired \(O_2\) Guard protects your patients

\(O_2\) Guard is designed to prevent hypoxia.\textsuperscript{1} This unique safety mechanism overrules the clinician’s settings and increases the flow of fresh gas and oxygen should the \(O_2\) level drop below 21%. Conventional guards will only trigger an alarm. The \(O_2\) Guard is a standard feature on all Flow models. Learn more at www.getinge.com/o2guard

»\(O_2\) Guard is the only commercially active inspired hypoxic guard available.«\textsuperscript{1}

Agent concentration in target organ – MAC Brain guides you

Due to pharmacokinetics there is a time delay in agent concentrations between the lungs and the target organ, the brain. The unique MAC Brain tool visualizes the difference to support better dosing and planning of agent delivery.

Visual support when lowering the flows

The VRI (Volume Reflector Indicator) is a useful visual guide that enables you to optimize the rebreathing fraction and thus save anesthetic agent. The tool makes it simple to set the optimal Fresh Gas Flow (FGF) and volume ratio. Agent consumption can easily be monitored via the interface.
Automatic Gas Control makes low flow easier

Automatic Gas Control (AGC) makes it simpler and safer to deliver low-flow anesthesia with high precision. Just specify the target end-tidal anesthetic agent level and the speed required and AGC does the rest.

Once the target is reached, the system automatically reduces fresh gas flow and anesthesia agent delivery to minimal levels. Now you have precise control combined with improved patient comfort and reduced risk of error.

“Automatic gas control on the Maquet Flow-i reduces sevoflurane consumption by, on average, one third in pediatric anesthesia.”\(^9\)

Cost saving per year

€106,000

since the change to Flow-i with AGC*
More time for your patients
Parameters can be preset before the patient arrives at the OR, freeing up time during the busy induction phase. AGC also eliminates the many adjustments demanded when using a manual approach – over 200 adjustments can be reduced to zero.6

Significant cost savings
AGC enables a major reduction in consumption of expensive anesthetic agents. In 2015, Maria Middelare hospital in Belgium changed to Flow-i with AGC. The following year, the net agent consumption was 42% lower compared to previous year. For the hospital, this has resulted in savings of over €106,000 per year in anesthetic agent expenses.7*

More efficient delivery
A unique real-time EtAA speed control and prediction tool makes it easy to determine time to end-tidal target, enabling more efficient gas delivery. It also helps to avoid inadequate depth of anesthesia.

Reduced environmental footprint
Greenhouse gases, such as anesthetic agents, are main drivers of climate change. The anesthesia practice in a midsize hospital has an environmental effect comparable to that of up to 1,200 cars per year.8 Using AGC anesthetists can confidently run lower gas flows to reduce the agent consumption, which in turn will reduce the climate footprint.

Unique speed selection tool to help plan OR procedures
Complex becomes routine
- easy steps to lung recruitment

Lung-protective ventilation can make a big difference to reduce treatment-related complications and improve patient outcome. And it is simpler than you may think.

90% affected by atelectasis
Whenever a patient is anesthetized, there is a risk of postoperative complications caused by a collapse of the alveoli. In fact, atelectasis affects over 90% of patients undergoing surgery, regardless of gender, age, health condition or length of surgery.

Far from being only a short-time side effect, atelectasis has been shown to persist in patients’ lungs long after they leave the operating room. Patients run the risk of inflammatory response, and the hospital’s costs can be increased unnecessarily.

Gentle steps against atelectasis
Lung recruitment maneuvers have become the tool of choice to counter atelectasis, to improve oxygenation and help to prevent postoperative complications. What once was considered complex and time consuming is now seamlessly integrated into your workflow.
The Recruitment Maneuver (RM) tool allows you to select between automatic or manual maneuver. Whichever you choose, the recruitment will be stepwise, with the aim of gently opening the alveoli.

In the automatic RM, pressure is increased stepwise for a time period set by you. EIP, PEEP and Cdyn are displayed breath by breath in real time, making it easy to assess your patients’ compliance changes and identify the optimal lowest PEEP to keep the lungs open.

Trends are stored, which means you can tailor the settings for each patient and also perform lung recruitment manually.

How it works
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»It’s simple, it’s safe and it’s efficient, and it gives really good feedback in terms of the advantages conferring on the patient.«

Dr. Martin Shields, Belfast, UK
Minimizing your long-term costs
The purchase price is just one part of the total cost of owning an anesthesia machine over time, so we have designed the Flow family machines to minimize cost of ownership. From an intuitive interface that optimizes workflows and minimizes staff training time, to innovations that significantly reduce consumption of anesthetic agents.

Getinge Care: protecting your investment
Optimizing uptime is an excellent way to boost productivity and reduce costs. A Getinge Care service plan ensures your equipment always performs to its full potential, allowing you to focus on saving lives.

Smart fleet management reduces risks
We make it easy to manage a large fleet of Flow machines. They all share the same user-friendly interface, and they have many components in common, such as the Volume Reflector and vaporizers. Getinge Online gives you fleet overview and can be accessed from any device.

We also offer an extensive range of readily available consumables. These are designed for the highest possible level of patient safety and outstanding ease of use.

Extensive training programs
Keeping skills updated improves patient outcomes, reduces risks and boosts productivity. We tailor training to meet your needs, which includes e-learning in addition to hands-on training courses.
Optimized equipment with Getinge Online
Getinge Online gives you access to real-time information about your Flow machines, e.g. agent consumption, running hours, next preventive maintenance. Through the portal a service technician can resolve most issues remotely, saving time and costs.

Connectivity between devices with MSync
MSync makes it easy to connect the Flow machine to patient monitor, HIS and patient data management system. Patient data is transferred via HL7 (MSync) in real time to support decision-making.
Flow-i at a glance
Advanced anesthesia for all situations

15” tiltable touch screen
Flexible and intuitive to use

Open architecture
Customize to match your needs

Rotatable arm
With integrated LED light

Excellent ventilation performance
Treating any patient category

Decision support options
Automatic Gas Control (AGC) and Lung recruitment (RM)

Electronic vaporizers in double slots
Precise and cost-efficient

Multipurpose rails
Extensive mounting options

Designed around your needs

- **Flow-i C20** gives you extra storage, with a choice of two or three drawers
- **Flow-i C30** is height-adjustable, adapting perfectly to your working position
- **Flow-i C40** is ceiling mounted, with a two-part circulating radius for a wide spatial range
Flow-e at a glance
Smart workspace for flexible performance

15” tiltable and rotatable touch screen
Flexible and intuitive to use

USB ports and LED light
Data transfer and charging easily accessible. Three-step dimmable LED lights up the workspace

Open architecture
Customize to match your needs

Large and flexible workspaces
Practical for your everyday needs

Electronic vaporizers in double slots
Precise and cost-efficient

Smart cable and hose management
Less clutter, easier cleaning and improved mobility

Central 4-wheel brake and cable pushers
Enhances device mobility

5 multipurpose rails, 278 cm in total
Extensive mounting options

4 drawers, one large and three smaller
Vast storage possibilities. Slots for spare vaporizers and an optional lockable compartment
Flow-c at a glance
Compact solution for a streamlined workflow

15° tiltable and rotatable touch screen
Flexible and intuitive to use

USB ports and LED light
Data transfer and charging easily accessible. Three-step dimmable LED lights up the workspace

Open architecture
Customize to match your needs

Flexible workspaces
Practical for your everyday needs

Electronic vaporizer
Precise and cost-efficient

Smart cable and hose management
Less clutter, easier cleaning and improved mobility

Central 4-wheel brake and cable pushers
Enhances device mobility

215 cm multipurpose rails
Extensive mounting options
<table>
<thead>
<tr>
<th></th>
<th>Flow-i</th>
<th>Flow-e</th>
<th>Flow-c</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ventilation</strong></td>
<td></td>
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<tr>
<td>Ventilator: Flow core technology</td>
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<td>✓</td>
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<tr>
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<td>50–1600 ml*</td>
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<td>0–80 cmH₂O*</td>
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<td>0.1 l/min</td>
<td>0.1 l/min</td>
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<td></td>
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<tr>
<td>O₂Guard</td>
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<td>MAC Brain</td>
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<tr>
<td>AGC</td>
<td>Option</td>
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<td>VRI (Volume Reflector Indicator)</td>
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<td>Pause function</td>
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<td>Dimmable, 3 steps</td>
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<td>1 data+power supply</td>
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<td>–</td>
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<tr>
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<td>215 cm</td>
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<tr>
<td>Wheels</td>
<td>Individual brakes</td>
<td>Central brake and cable pushers</td>
<td>Central brake and cable pushers</td>
</tr>
<tr>
<td><strong>Ease of use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simple cleaning - only 7 parts to disassemble</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>The Flow intuitive user interface</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SCO with few interactions</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td><strong>Other</strong></td>
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<td></td>
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<tr>
<td>Gas backup (option)</td>
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<td>1+1</td>
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<tr>
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<tr>
<td>Active vaporizer slots</td>
<td>2</td>
<td>2</td>
<td>1</td>
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References

   Hypoxic guard systems – how safe are they? and interview with Dr Jan Hendrickx, Aalst Belgium, MX-6295, Rev-G3.
2. Data from benchmarking test, data on file.

Getinge is a global provider of innovative solutions for operating rooms, intensive care units, sterilization departments and for life science companies and institutions. Based on our firsthand experience and close partnerships with clinical experts, healthcare professionals and medtech specialists, we are improving the everyday life for people – today and tomorrow.

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