NEONATAL VENTILATION
SERVO-n
BREATHE, SLEEP, GROW

MAQUET
GETINGE GROUP

THEY DESERVE OUR BEST
FROM THE BEGINNING

Newborns should not have to start their lives battling for it. But some will, and the best we can do is help create an ideal environment for them to relax, sleep and grow – while minimizing as many risks as possible to their physical and mental development.

SERVO-n™ has been purposely created to help you provide vulnerable neonates with the support they need while protecting the lungs, brain and other developing organs.

SERVO-n offers Neurally Adjusted Ventilatory Assist (NAVA®), a mode with the capability to truly match assistance to the irregular breathing pattern of neonates. Every breath the baby gets is the breath they need, as determined by their own physiology.[1-8]

Starting life in the NICU means the baby will have some catching up to do. Help them breathe, sleep and grow with SERVO-n.

BREATHE – Synchrony with the baby's irregular breathing pattern reduces work of breathing, lowers peak pressures and FiO_2[9-11], and potentially reduces the need for sedatives[12]

SLEEP – More comfortable breathing[1,13] means better opportunities for sleep

GROW – Improved comfort and reduced work of breathing may allow the baby to focus energy on growth and maturation of lungs and brain[8,14]

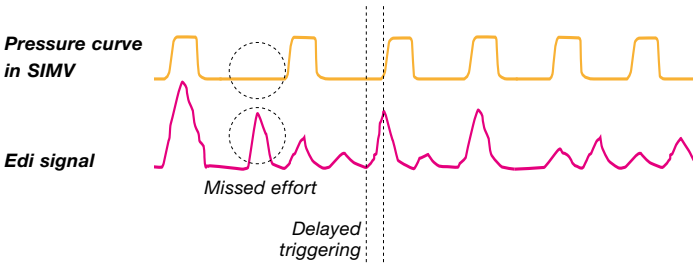
A BETTER PICTURE OF BREATHING EFFORT

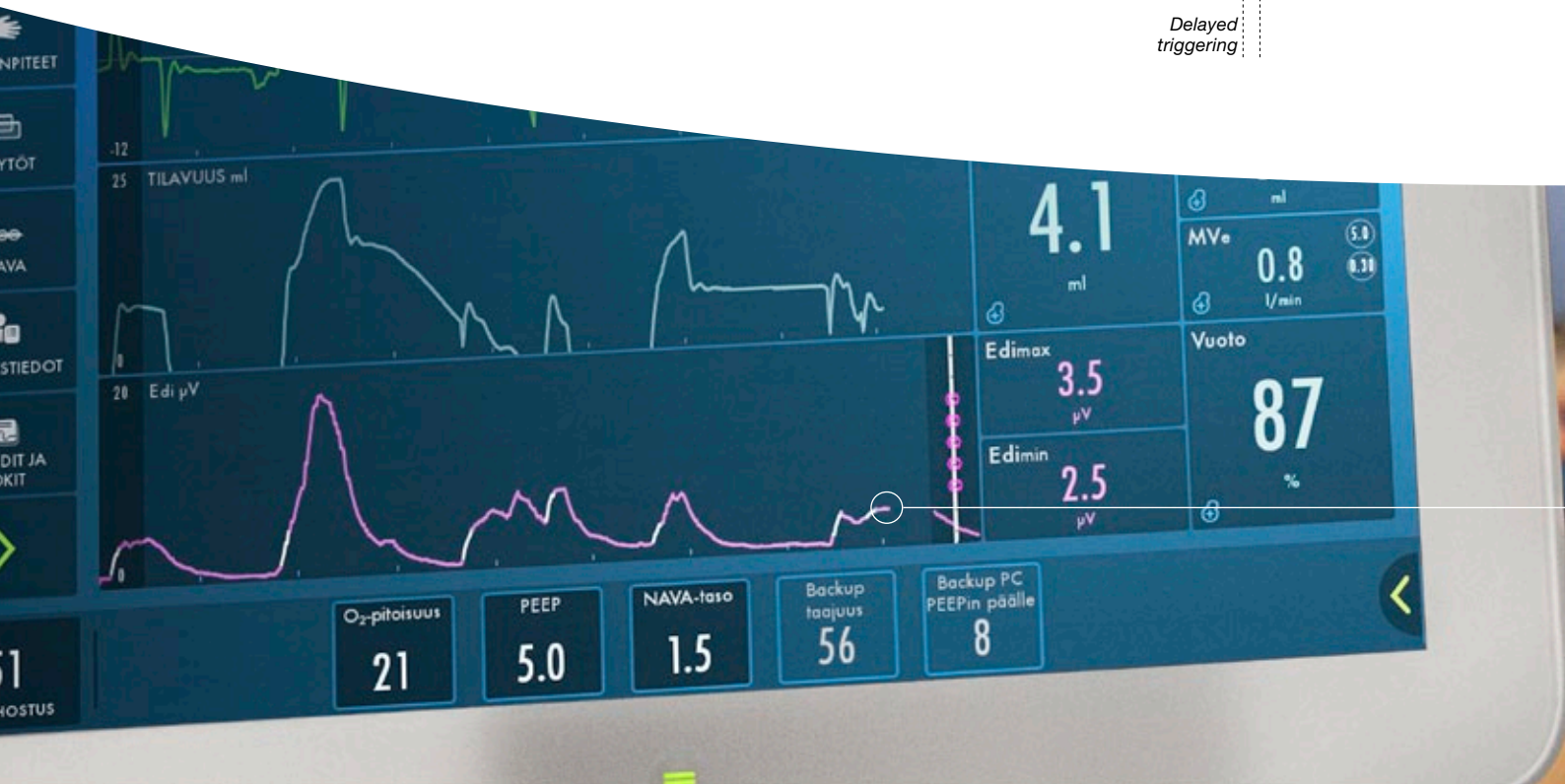
Rapid respiratory rates, small tidal volumes, irregular breathing pattern, short inspiratory times with substantial leakage. Ventilating neonates comes with its own set of challenges, especially when missed efforts are difficult to detect from pressure and flow waveforms[15]. The baby's struggle is important to understand and act on, as it deflects precious energy away from growth and maturation.

Studies show neonates spend almost 1/3 of the time in asynchronous ventilation.[16] The standard response is sedatives or muscle relaxants in an effort to have the baby conform to the machine's settings – a strategy that can suppress respiratory drive and unnecessarily prolong invasive (and asynchronous) ventilation.

With SERVO-n, caregivers can monitor the baby's Edi signal in any mode of ventilation, see below. This valuable vital sign, an EMG of the diaphragm obtained using a specially designed naso-gastric feeding tube, shows previously inaccessible information about the baby's central respiratory drive continuously on screen.

The baby can now advise the clinician about what they need, in both time and proportion, breath by breath.[17]





THE MORE YOU KNOW
THE BETTER THEY DO

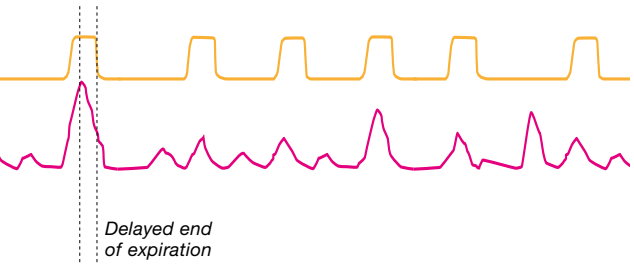
In conventional ventilation, measuring blood gases is standard practice for ensuring adequate oxygenation.

The Edi signal is a valuable diagnostic tool for understanding the neonate's breathing efforts, and ensuring the level of assist that's best for them at any given time, in any mode of ventilation.

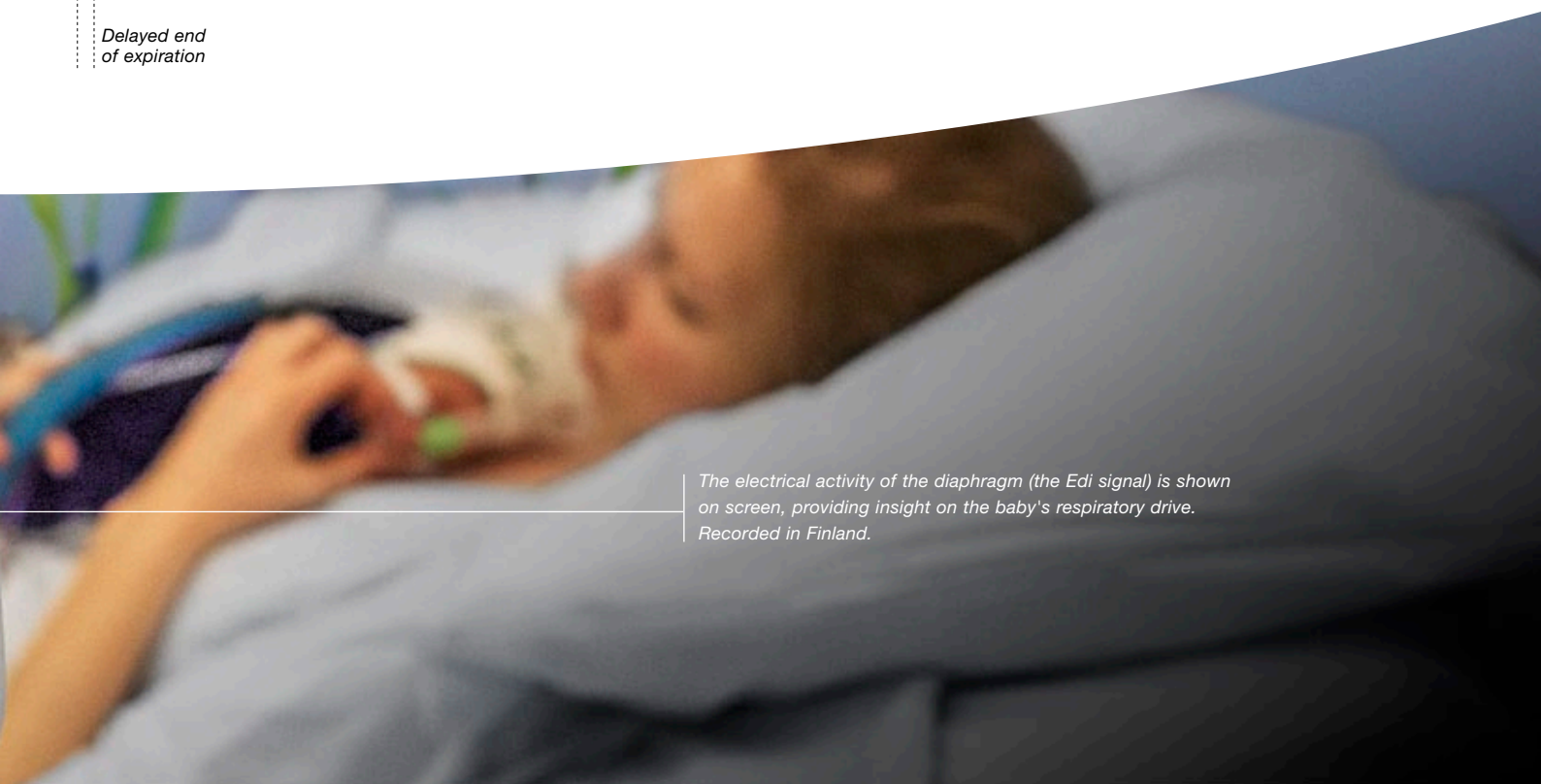
Using Edi monitoring with any mode can help identify the wasted efforts that characterise asynchrony. Wasted efforts and other types of asynchrony are immediately detected and displayed, enabling earlier and more relevant intervention.

The Edi signal provides ongoing information about the respiratory drive that can also give clinicians a better understanding of when to let the neonate start breathing spontaneously. The same information may also help prevent or delay the need for intubation, and the resulting stress and sleep loss that can compromise the neonate's progress. And it can help determine the point of extubation as early as possible.

Edi monitoring may even be valuable in sedation management[12], and used to accurately monitor and trend central apneas.[1,18]



The breathing pattern of neonates is variable. Previously undetected asynchrony, such as wasted efforts and delayed triggering, are now clearly visible with the Edi signal in all modes of ventilation.



The electrical activity of the diaphragm (the Edi signal) is shown on screen, providing insight on the baby's respiratory drive. Recorded in Finland.

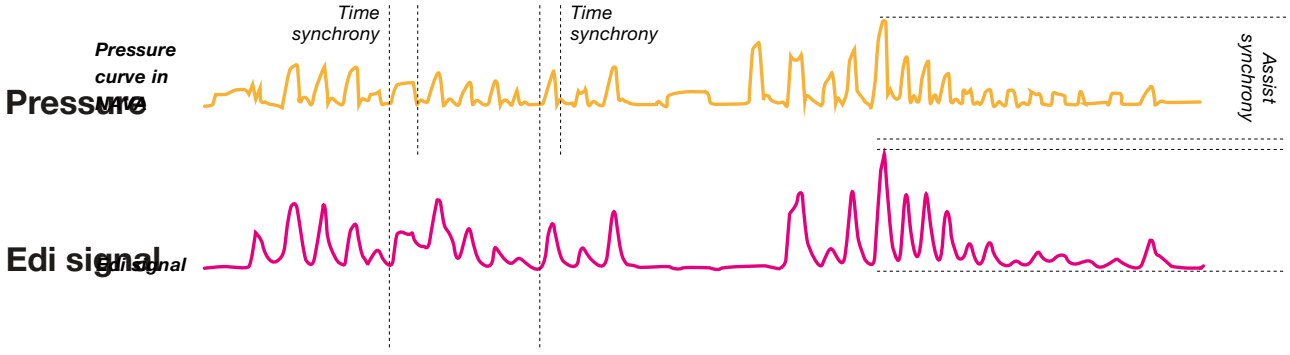
THE RIGHT BREATH
RIGHT WHEN THEY NEED IT

SERVO-n with NAVA gives clinicians a whole new possibility: a neurally controlled ventilation mode that supports even premature babies in breathing spontaneously as long as possible. The Edi signal is the trigger when in NAVA (Neurally Adjusted Ventilatory Assist) mode, matching assist to the baby's physiological request.

NAVA synchronizes support with the neonate's own respiratory drive – what the baby asks for, the baby gets.[1-8] He or she determines pressure, volume and timing for each breath, not the ventilator. SERVO-n switches from NAVA to backup ventilation if the neonate experiences apnea, providing support until it detects a respiratory signal again. This means the baby struggles less for air, and fewer disturbances from stressful alarms.[1,13]

Studies show that patients supported in NAVA spend 91% of their time in synchrony, compared to 67% with pressure-triggered and 69% with flow-triggered ventilation.[16,17] The difference this improvement can make has been documented in more than 30 studies in neonatal and pediatric patients.[19]

With NIV NAVA, leakage is automatically compensated for, ensuring assistance is always matched to the baby's physiological demands[1,3]. This lowers the risk for over- or under-assist that can compromise their rest or possibly affect their maturation. It is the next step from Nasal CPAP where needed, and can help delay or avoid the need for intubation or re-intubation.



NAVA ventilation matches assist to the irregular breathing of neonates and senses and controls apneas and sighs with normal breathing, providing added comfort for babies.

New to NAVA? Learn the basics from the NIV NAVA & NAVA Neonatal Study Guide

READY FOR THE REALITY OF NICU

There are times when you might want or need to take more control of ventilation. SERVO-n is optimized with a range of therapy options that provide safe, baby-friendly ventilation whatever the situation.

SERVO-n is sensitive, fast and accurate in all modes of ventilation. It also supports neonates strong enough to trigger the ventilator in conventional support modes.

NEONATE-FRIENDLY
IN ANY MODE

SERVO-n provides a number of advantages in conventional ventilation.

Accurate ventilation is always assured thanks to automatic leakage compensation and the Y sensor – even with the unpredictable leakage due to uncuffed endotracheal tubes. The Y sensor and internal sensors cooperate to trigger, measure and deliver the pressures and tidal volumes you have set, down to 2 ml. If Y sensor measurements become unreliable, SERVO-n notifies you immediately.

Self-adjusting ventilation is another important feature of SERVO-n. PRVC with leakage compensation provides a guaranteed tidal volume delivery, even with changing lung mechanics and uncuffed endotracheal tubes. AUTOMODE® supports smooth and safe patient transitions between controlled and supported ventilation, and seamless shifts between triggered and controlled breaths during irregular breathing – all without alarms and with an adjustable apnea time.

Protective ventilation is facilitated in many ways. Tidal Volume per body weight (VTi/kg) is calculated automatically, making the setting and monitoring of tidal volumes to safe levels and according to treatment protocols easier. Tidal volume limitation with corresponding alarm restricts volume delivery to the set level and alerts you if necessary. This may be valuable when there is a significant risk of volutrauma after surfactant administration to neonates ventilated in pressure modes. O_2 boost lets you safely support patient oxygenation during events, while avoiding over-oxygenation. Boost levels can be set to the value you prefer.

EASY TO WORK WITH
EASY TO APPRECIATE

The neonatal intensive care unit is an extraordinary environment, because of the long-term needs of patients, parents and caregivers alike. The right ventilator here is one that feels like it belongs in every way, from ease of use to aesthetic details. It adds a sense of control, comfort and calm, and builds confidence in both parents and caregivers.

MORE WAYS
TO CARE

SERVO-n makes setting up, monitoring and operating surprisingly simple and intuitive.

With SERVO-n, you're never more than a touch away from onscreen help and suggestions based on current use. When changes are needed, illustrations and workflows guide you through the task. And the SAFETY SCALE™ tool helps you tailor settings in a quick, intuitive and safe way.

The media library allows you to record actual events as they are happening so you can review them bedside or elsewhere. This provides the clinical team with unique opportunities for learning, training and research.

To support different clinical situations, the information in SERVO-n can be presented in a variety of views. In addition to the bedside views you are used to, we have created a distance view to help you monitor the most important information from across the room. During certain times, the family view displays values in a friendlier and more calming way. This allows the parents to focus on the baby, not the ventilator.

To create a more quiet and less stressful environment, every alarm was assessed to provide only the alerts that were necessary. The alarm management in SERVO-n gives you more options for their control and provides recommendations to correctly address each one.

SERVO-n is also light, flexible and easy to move to either side of the incubator and warming bed, or for better positioning during kangaroo care.

ACCESSORIZED
JUST FOR THEM

Consumables and accessories such as patient interfaces are optimized for the needs of sensitive neonates and designed to keep your SERVO-n performing at its best.

The Miniflow® system is a complete system for providing NIV NAVA and Nasal CPAP.

Miniflow is designed with minimal dead space, and comes with a unique and flexible connection that makes it easy to switch between prongs and masks. Interfaces are made of soft material, and their angle is adjustable between 45° and 60° for an optimum fit.

For the sake of the baby's comfort, the noise level is low and the Miniflow adapter weighs only 10 g.

DESIGNED TO GROW
WITH YOU

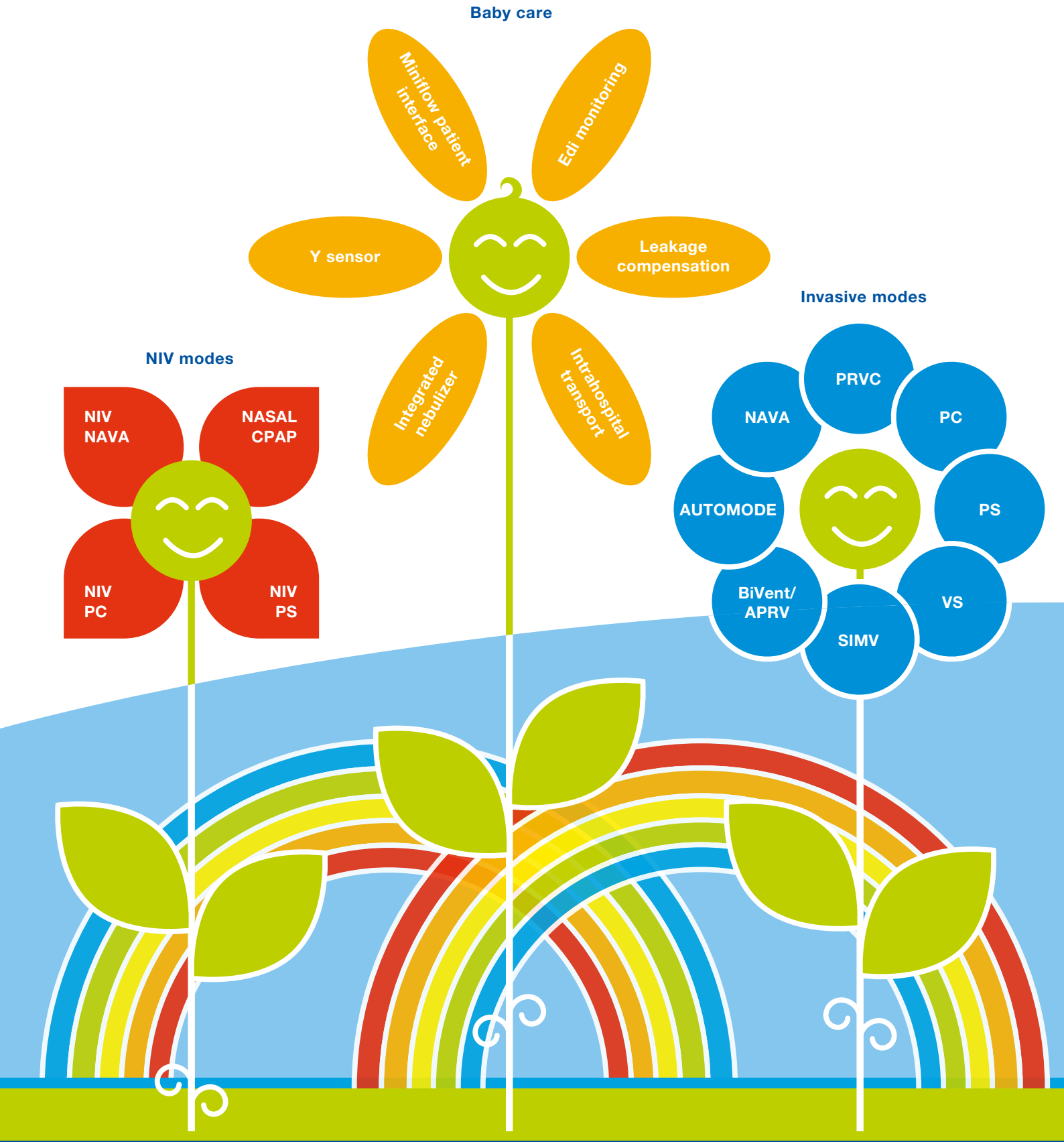
SERVO-n is a modular system, which means that as future functionality becomes available, you can upgrade easily and cost-effectively. Interchangeable hardware modules and components means the same feature can be used at different times on mixed SERVO ventilator fleets, lowering overall costs.

Your investment is further protected with MAQUET MCare® Portal, which lets you monitor and assess your fleet through one convenient hub while continuously providing access to the latest news and documentation.

SERVO-n was developed to be not only easy to use, but easy to learn and take full advantage of. Intuitive screens and help menus, recommendations and prompts facilitate quick learning and adoption for all members of the clinical team. Bedside training as well as online or classroom training, where the SERVO-n can be connected to an external screen, is always available.

MCare scalable services provide options to address the various needs of different organizations. Whichever you choose, it will add value from day one and ensure that your system operates at peak performance throughout its lifecycle.

SERVO-n
FOR NEONATAL AND PEDIATRIC PATIENTS



MAQUET
– THE GOLD STANDARD

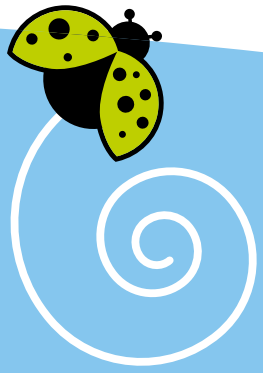
Leading the way: MAQUET is a premier international provider of medical technology solutions. Focused on the OR, ICU and NICU, we are committed to developing solutions that improve patient care.

MAQUET draws on many years' experience in supplying state-of-the-art ventilator systems. Since the introduction of the first SERVO ventilator in 1971, we have delivered more than 100,000 units and SERVO has become a world-renowned ventilation brand.

SERVO-n is an achievement we are particularly proud of, as it offers an unprecedented standard of care centered completely around the needs of the most vulnerable patients we know – neonates.

SERVO-n offers all of the assistance options neonates need, while helping you protect the lungs, brain and other developing organs. SERVO-n is both a powerful tool and a calming influence, dedicated exclusively to neonate comfort and support.

MAQUET – The Gold Standard



Discover all the ways SERVO-n can help neonates breathe, sleep and grow. Contact your MAQUET representative, or visit www.criticalcarenews.com/NICU

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Order No. MX-5946 • Printed in Sweden • Rev. 01 English.