



IABP driving system

Corart BP3

A new Corart provides a convenient “form” appropriate to the environment.



■ Corart BP standard model

Many functions designed to support the operator are added to ensure enhanced convenience while maintaining conventional high functionality and responsiveness.

· Operating Room · Catheter Laboratories

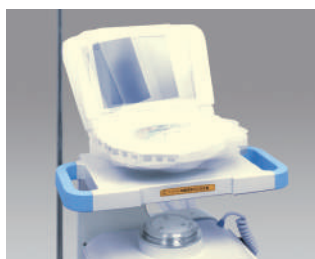


· Intensive Care Unit · Transfer



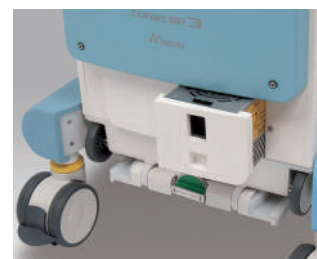
■ Signal tower

Three colored lights indicate the operation status and alarm occurrence. Driving status can be checked at a distance.



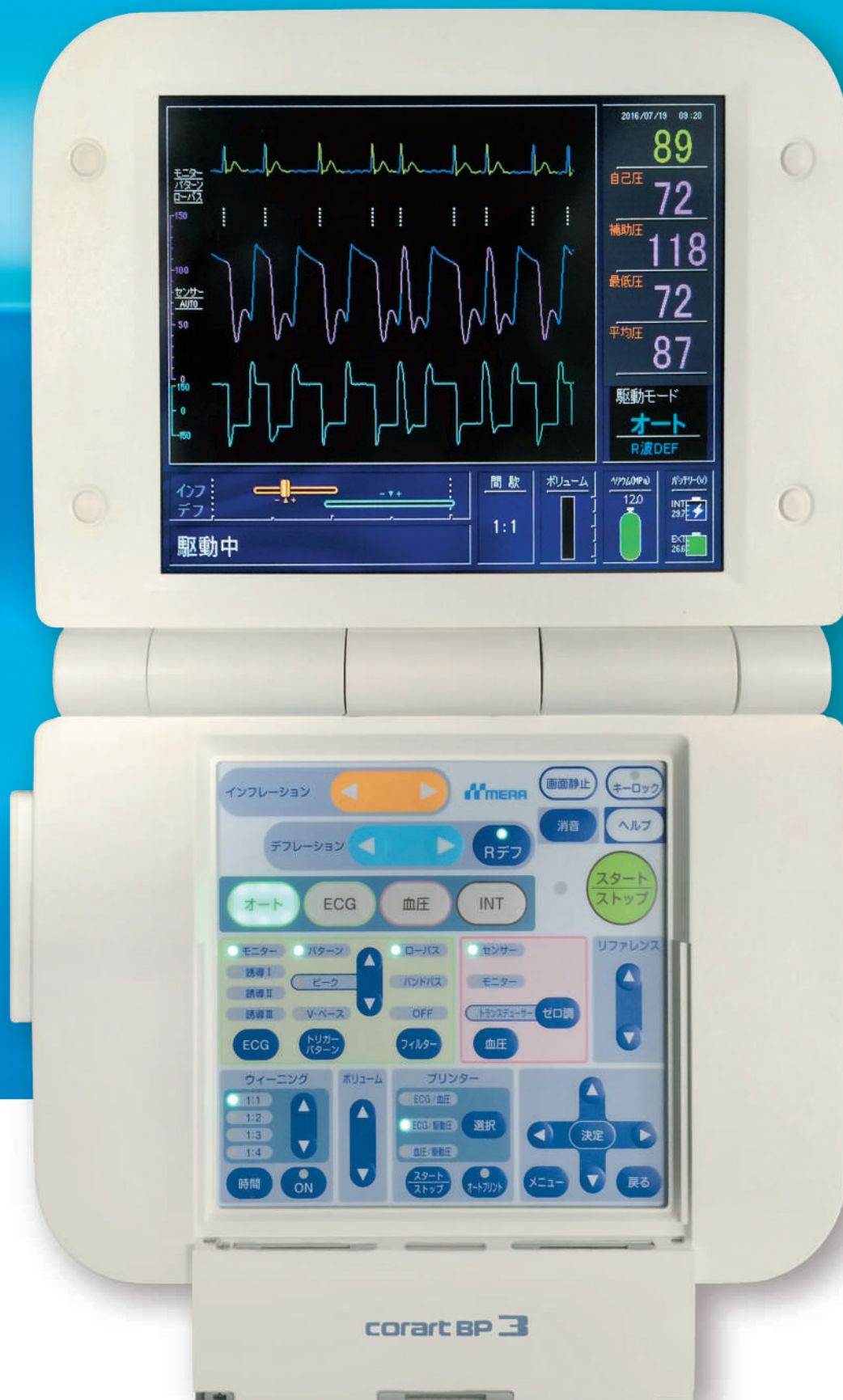
■ Turn and tilt

A display integrated within the control panel is removable and can be adjusted in angle by opening/closing and by rotation to contribute to improved operability and visibility.



■ Cassette-type external battery

In addition to the internal battery, removable cassette-type external batteries (nickel hydrogen batteries) can be replaced to support prolonged travel be checked at a distance.



Display and control panel

Single application of the driving unit to respond to various scenes.



An easy procedure allows you to remove the driving unit from the mount.

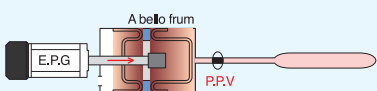
■ Corart BP3 transfer model

The driving unit can be used alone.

Due to its small size and light weight, the driving unit can be easily moved within hospitals. Additionally, because it can also be used with the display removed, it can be used without occupying a large area even in environments in which many pieces of equipment are concurrently used. Use of “AC/DC adapters” enables AC drive with the driving unit alone.

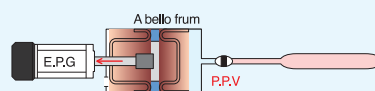
■ A new driving mechanism making a small, silent, lightweight feasible

● During balloon inflation



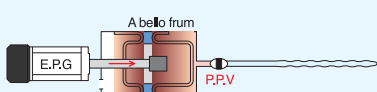
A pressure pre-load valve is opened during inflation to instantaneously inflate the balloon with accumulated pressure.

● During balloon inflation and preparation of deflation



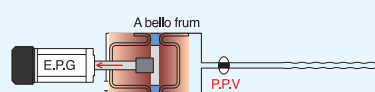
After balloon inflation, the pressure pre-load valve is closed and preparation is made to deflate the balloon by moving a bellows while keeping the balloon inflated.

● During balloon deflation and preparation of inflation



After balloon deflation, the pressure pre-load valve is closed and preparation is made to inflate the balloon while keeping the balloon deflated.

● During balloon deflation



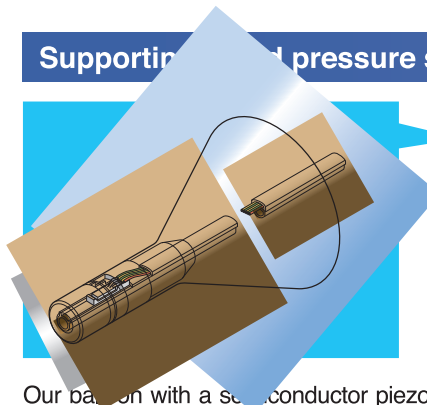
The pressure pre-load valve is opened during deflation to instantaneously deflate the balloon with accumulated pressure.

A new technology employing an electric-powered cylinder in the driving system provides a small and lightweight unit, and combined use of the Corart series' unique “pressure pre-load valve” ensures high responsiveness comparable to that of conventional products. In addition, driving noise is reduced compared with that of the compressor type, contributing to the reduction of the psychological burden on patients.

E.P.G. : An electric - powered glinder

P.P.V. : A pressure pre - load valve

Supporting blood pressure sensor balloons



A balloon with a built-in catheter tip blood pressure sensor that has a pressure receiver at the balloon tip



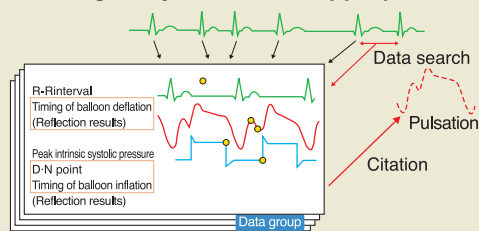
Blood pressure sensor signal output

Use of an optional low-output unit allows the direct output of blood pressure signals measured with the balloon using a built-in catheter tip blood pressure sensor to a biological information monitor. (Please contact us for detailed information, such as the method for connecting to your monitor.)

Our balloon with a semiconductor piezoelectric sensor in the built-in catheter tip can be used in combination with the monitor. Calibration can be automatically performed even in blood vessels after insertion and accuracy is enhanced to accommodate environments with lower pressure pulse values than before. Combined use allows you to use sensor auto mode and auto volume weaning, which automatically determine assist timing.

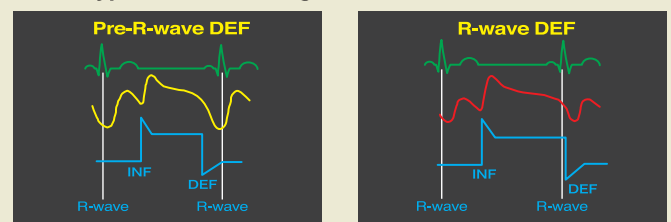
Sensor auto mode

Following arrhythmia at the appropriate timing



Data with corrections to accumulated assist results and similar data are referenced/cited from the accumulated data at the instance of triggering to automatically adjust timing. More assist events lead to higher timing accuracy to enable any arrhythmia events to be followed.

Two types of DEF timing available



The Pre-R-wave DEF mode, in which a balloon is deflated to ensure the diastolic blood pressure is reduced before an R-wave is detected, and the R-wave DEF mode, in which a balloon is deflated to ensure the systolic blood pressure in the next pulse is reduced after an R-wave is detected, are available. In either mode, a function for fine adjustment of the timing is also available.

Auto-volume weaning function

In the auto mode, intermittent weaning, in which the assist ratio is gradually reduced, and auto-volume weaning, in which the rate of balloon inflation is gradually decreased over time, are available. The setting time can be selected from 48, 24, 12, 6 and 3 hours, and therefore weaning appropriate to the patient's condition can be achieved. A safety function is also provided to restore the balloon inflation rate to 100% in case of an alarm indicating a drop in blood pressure during auto-volume weaning.

Signal auto-selection function and trigger backup

- In case of a synchronization failure in ECG signals, a new "AUTO" function for automatic recovery is provided. Recovery from a synchronization failure is ensured in the order of "Lead II, Lead I, Lead III and monitor."
- For blood pressure signals, a new "AUTO" function to automatically determine trigger level thresholds is also provided.
- The conventional backup function between ECG signals and blood pressure signals is also retained.

Enhanced safety function

- A secure design of the stand-by switch to avoid unintended OFF operation due to an impact or interference
- Prevention of false operations with the key lock function
- Four levels of alarm sound loudness and sound quality available

The history of alarms and history of drives are stored in the unit.

- The history alarms (the 30 most recent alarms) can be presented on the display and printed.
- Waveform data during the occurrence of high-priority alarms for the past 30 days are stored and can be printed post hoc.

Operation inspection for higher safety

- Training kit able to simulate clinical use (option)
- A leakage inspection function with a test adaptor and a battery discharge check function are newly added.

Evolution of the Corart series



Corart BP1

1991

- Sensor auto mode
- Combined use with our sensor balloon allows automatic adjustment of INF and DEF timing and automatic zero point adjustment of blood pressure.



Corart BP1-V

1998

- BP1 with a ventricular assist device driving function



Corart BP21

2001

- Trigger backup mode
- Colored presentation on the display
- Tilt and turn mechanism
- Substantial weight saving Sensor blood pressure waveform can be output to an external monitor.



Corart BP21

2004

- Business succeeded from Aisin Seiki Co., Ltd. to Senko Medical Instrument Mfg. Co., Ltd.
- "Pre-R-wave DEF function" added to sensor auto mode.



Corart BP21-T

2009

- Functions and features of the Corart series succeeded.
- Introduction of a new turbo driving function resulting in substantially improved responsiveness.

Specifications

| Size | |
|--|---|
| When loaded on the cart | H:1140×W:546×D:350 |
| Main unit | H:840×W:373×D:271 |
| Display unit | H:277×W:314×D:236 |
| Weight | |
| Main unit | 27 kg (including 3 kg of the display unit) |
| Cart | 29 kg |
| External battery | 1.6 kg |
| Total weight | 57.6kg |
| Power supply | |
| AV Power supply | 100 V |
| Rated current | 3 A |
| Power input | 300 VA |
| Battery type | Nickel hydrogen storage battery |
| Battery operating time | External: 60 minutes Internal: 60 minutes (factory default settings) When AC power is not supplied, it switches to battery power. When the external battery is run down, it automatically switches to the internal battery. |
| Charge time | Maximum of six hours (the internal battery is charged first, followed by the external battery.) |
| Driving system | |
| Driving method | Cylinder type |
| Drivable balloon volume | 5-40 mL |
| Water droplet removal | Forced water discharge at intervals of two hours |
| Driving gas | High-purity helium gas |
| Container | 95-mL cartridge |
| Cartridge duration | Approx. one month (following continuous driving from the Full status) |
| Image display function | |
| Method | 10.4 inch TFT color liquid crystal |
| Brightness adjustment | Four levels of brightness available |
| Waveform displayed | ECG, blood pressure and driving pressure (balloon inflation period displayed in different colors on synchronous waveforms) |
| Sweep rate | 25 or 50 mm/sec, resting |
| Message | Alarm = three types (high priority, intermediate priority, low priority) |
| Items displayed | |
| Drive status (driving, drive stopped, alarms, etc.) | |
| Heart rate | |
| Blood pressure values: intrinsic pressure, pressure support, minimum pressure, mean pressure | |
| Driving mode | |
| Input signal | |
| Trigger method, ECG filter, blood pressure trigger level | |
| Trigger point | |
| Remaining capacity of helium cartridges | |
| Remaining capacity of batteries (internal and external) | |
| Balloon volume | |
| Support ratio, volume weaning time | |
| Balloon inflation/deflation timing bar | |
| Information | Support message during operation (such as invalid key operations) |
| Help | Causes and actions in case of alarm occurrence |
| Menu | Switching of child mode and back-up mode, cumulative number of operating hours, etc. |

| Input signal | | |
|------------------------------------|---|--|
| ECG | Monitor | 1 V/mL (stereophone jack) |
| | Skin electrode | 1 mV standard Three leads (I, II, III) |
| | Signal auto-selection function available | |
| Blood pressure | Catheter tip sensor | 5 μV/V/mmHg |
| | Transducer | 5μV/V/mmHg |
| | Monitor | 1 V/100 mmHg (Stereophone jack) |
| Output signal | | |
| ECG | 1V/mV | |
| Blood pressure | 1 V/100 mmHg | |
| Driving mode | | |
| Auto | The system automatically determines the timing of balloon inflation and deflation using ECGs and a balloon with a catheter tip sensor. | |
| ECG | Synchronization range | 31-215 bpm |
| | Synchronous signal | Monitor, skin electrodes (I, II, III) |
| | Synchronous mode | Pattern, peak, V pace |
| | Filter | Low-pass, band-pass |
| Blood pressure | Synchronization range | 31-215 bpm |
| | Synchronous signal | Catheter tip sensor, monitor, transducer |
| | Synchronization points | 7 to 30 mmHg (either automatic or manual) |
| Internal | Selected rate | 60 to 120 bpm (at intervals of 5 bpm) |
| Weaning functions | | |
| Intermittent support setting | Any of the following: 1:1, 1:2, 1:3, 1:4 | |
| Volume settings | Modification can be made in a multi-step manner, from 0% to 100%. | |
| Automatic volume setting | The balloon volume is adjusted in a range from 100% to 0% at a selected time point (48 hours, 24 hours, 12 hours, 6 hours, 3 hours or 1 minute) (available only in auto mode) | |
| Safety functions | | |
| Alarm | Sound volume | Four levels of brightness available |
| | Sound deadening | Two minutes or until the occurrence of a new alarm |
| | Type | Alarm (high priority, intermediate priority, low priority) Information function (displayed in Japanese) |
| Gas leak detection | 5 cc/hr | |
| Backup function | When ECG synchronized signals disappear, synchronous driving is automatically performed with blood pressure signals (vice versa) | |
| Printer | | |
| Model | Thermal printer | |
| Recording paper to be used | 58-mm wide thermo-sensitive recording paper | |
| Information to be recorded | Two of the following: ECG, blood pressure, driving pressure Date and time, blood pressure values, heart rate driven mode, alarm name, history data | |
| Auto printing function | In case of an alarm, the above information is automatically printed (either ON or OFF is available) | |
| Other | | |
| Communication function | USB terminal | |
| Child mode | Low-volume balloon pulsation mode | |
| Options | | |
| IABP operation training kit | | |
| Pole | | |
| Signal tower | | |
| AC/DC adapter for the driving unit | | |
| Bed connection kit | | |

Marketing Authorization Holder
Senko Medical Instrument Mfg. Co., Ltd.

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Note
Prior to practical use, carefully read the package insert or instructions.
■ It should be noted that, because we always make efforts for research and improvement, any part of the appearance or specifications may be modified without notice.