Ready to save lives

Philips HeartStart XL+ Defibrillator/Monitor

PHILIPS

sense **and** simplicity

Ready to respond, revive,

Hospital cardiac emergencies are typically stressful and chaotic events. The last thing you want to worry about is whether your defibrillator is ready. Designed for Resuscitation Teams and Rapid Response Teams, the Philips HeartStart XL+ Defibrillator/Monitor contains meaningful innovations that can help you confidently and effectively respond to patients throughout the hospital.

The HeartStart XL+ has a similar user interface as other Philips defibrillator/monitors and Philips industry-leading AEDs. The HeartStart XL+ also uses similar alarms, as well as identical cables and accessories as the HeartStart MRx, and Philips patient monitors. This means enhanced ease of use and "plug and play" patient hand-off, as well as simplified inventory management and reduced costs.

The HeartStart XL+ is always ready to meet the needs of your organization. Because it is built on a scalable platform, you can choose the functions that best meet the needs of your staff today - from BLS responders to ALS clinicians - and in the future as your needs change.

Ready to respond – The HeartStart XL+ has a fast battery recharge time and a highly visible "ready-for use" indicator, as well as LEDs on the front of the device that signal power status, so clinicians can quickly see that HeartStart XL+ is ready.

Ready to revive – The easy-to-use HeartStart XL+ delivers Philips proven biphasic therapy for defibrillation and synchronized cardioversion, and is the only defibrillator that in AED mode can defibrillate any patient – adult, child, or infant – with no special pads or accessories required.

Ready to improve – The HeartStart XL+ and Philips data management solutions are designed to help support a culture of continuous improvement and excellence among hospitals.

improve

Ready to respond

- **Active ready-for-use visual indicator** flashes, signaling the unit has passed its most recent self-test and is ready.

- **Automated self-tests** run hourly, daily, and weekly to help simplify defibrillator shift checks and free up clinician time.

- **Automated External Defibrillator (AED) mode** is easy to use for virtually any responder. HeartStart XL+ automatically analyzes and charges for a potentially lifesaving shock within seconds, guiding the user with clear, concise voice and on-screen prompts.

- **HeartStart Adult/Child or Infant defibrillation pads** are designed for manual or AED mode, pacing, cardioversion, and monitoring. No special pads required for infant/child AED mode.

- **Green front panel lights** indicate AC and battery power. No need for staff to check that the AC power cord is connected or charge batteries separately.

- **Large multi-color display** for easy viewing of up to 3 waves, numeric values, and alarm limits in the parameter bar, as well as patient condition information.

- **Single therapy knob** similar to other Philips defibrillator/monitors to turn device on/off, as well as select mode and energy.

- **Defibrillation as easy as 1-2-3.**[1]
  1. Select energy.
  2. Press Charge button to charge the defibrillator.
  3. Press Shock button to deliver therapy.

- **Integrated strip chart recorder** (printer) documents ECG rhythm strips, clinical events, event summary reports, vital signs trending, operational checks, configuration, status logs, 3-lead and 5-lead ECG reports, and other device information. 50 mm standard paper used by all Philips defibrillators.

Ready to save lives

Ready to revive

The HeartStart XL+ is designed to be ready to help save the life of any patient. And the option of easily switching between AED mode and manual mode makes it possible for all levels of trained responders to use the HeartStart XL+.

- **Philips SMART Biphasic therapy** uses real-time impedance compensation technology to adjust and deliver personalized electric medicine for each patient on each shock. Philips biphasic therapy has been rigorously studied and is supported by substantial peer-reviewed, published data. It has been clinically proven to deliver high first shock efficacy for long-downtime SCA patients, as well as effectively defibrillate across the full spectrum of patients, including those considered "difficult-to-treat."[1-5]
- **Quick Shock in AED mode** and one of the fastest charge times to the standard adult dose in manual mode (3 seconds) help minimize interruptions to CPR and speed shock delivery.
- **Customizable energy settings and defibrillation protocols** that are consistent with the HeartStart MRx monitor/defibrillator in AED mode and HeartStart AEDs, as well as flexibility should protocols change in the future.
- **Patient monitoring measurements**, including 3- and 5-lead ECG, heart rate, SpO_2, and non-invasive blood pressure, provide continuity of care from the cardiac emergency to patient monitoring at the bedside in a single device. Measurements can be trended over time, as well as displayed and printed.

In addition to defibrillation, the HeartStart XL+ delivers effective synchronized cardioversion and noninvasive pacing.

- **Synchronized cardioversion** – Peer-reviewed evidence supports the effectiveness of Philips biphasic synchronized cardioversion capabilities, which are activated by the user with the push of a button.[1,6,7] At a glance, the user can see that the Sync mode is active, as indicated by a Sync label on the device display and a back lit Sync button.
- **Noninvasive pacing** – With rate and output controls visible on the front panel, the HeartStart XL+ makes it easy to train and perform transcutaneous pacing.

HeartStart XL+ simplifies infant/child defibrillation

In AED mode, the HeartStart XL+ is the only defibrillator/monitor that can defibrillate any patient, of any weight without the need for special accessories, which can help save valuable time when responding to an emergency. Press the Patient Category button to Infant/Child to quickly and automatically decrease the defibrillation energy.


Patient category button that is close to the AED position on the control dial. The display will also show Infant/Child < 8 years old.

Ready to improve

The HeartStart XL+ and Philips data management solutions are designed to help support a culture of continuous improvement and excellence within your hospital.

Event Summaries can be copied to a standard USB drive for easy transfer to **HeartStart Event Review Pro**, Philips data management program. HeartStart Event Review Pro captures and stores an entire code for post-event review by the Resuscitation Team or Rapid Response Team. Post-resuscitation reports can be easily shared with other clinicians as needed.
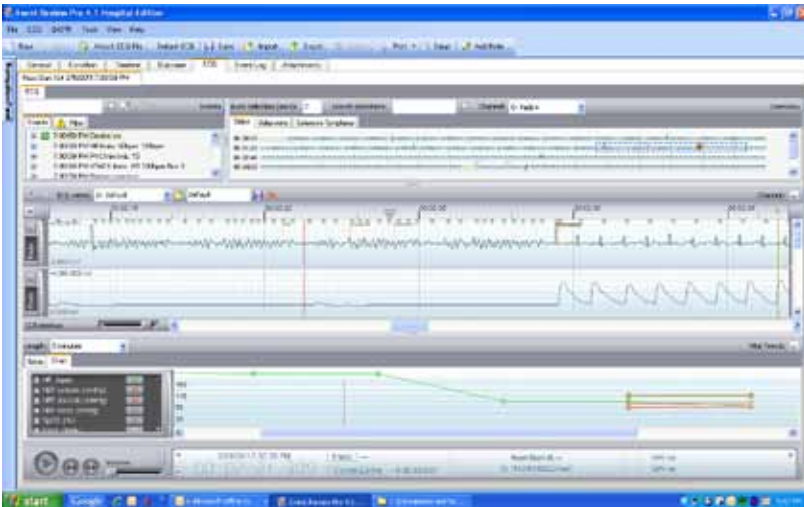
HeartStart Event Review Pro provides a robust, insightful view of a resuscitation event, along with built-in, easy-to-use navigation to pinpoint key areas in a specific patient's code event for retrospective review.

Education and training solutions

Philips has created a variety of education and training solutions using sound instructional design principles to help ensure competent device operation, as well as assist with your training and implementation needs in a cost-effective manner.

Interactive web-based training
Use the free, self-paced, interactive, web-based training program to learn device features, simulate hands-on procedures, and test your understanding.

Instructor toolkit
An Instructor Guide, User Training Workbook, and Skills Checklist combine to help you deliver live HeartStart XL+ education in an effective and efficient manner. These tools also can help facilitate refresher training.

Instructor-based training
Customized on-site, instructor-based training delivered by Philips clinical educators in a realistic critical care context is also available.

Instructional video
View the video to get an overview of important device features and related device functionality. Available on the web and in a DVD format.

Application notes
Application notes explain the theory behind Philips therapeutic and monitoring technologies, as well as provide support for their clinical efficacy and intended interpretation.

Standardize with Philips

Ease-of-use is the hallmark of the Philips family of defibrillators, including the HeartStart XL+, the HeartStart MRx, and HeartStart AEDs. Standardizing with Philips can make training and delivery of care more efficient and give users confidence.

- All Philips defibrillators have similar user interfaces and AED prompts.
- The HeartStart XL+ and the HeartStart MRx use the same ready-for-use indicator.
- The HeartStart XL+ uses the same ECG algorithm and alarms as those in Philips bedside patient monitors.
- The HeartStart XL+ in AED mode uses the same SMART Analysis algorithm as Philips industry-leading AEDs.

Standardizing with Philips can help streamline patient hand-off by eliminating re-cabling, simplifying inventory management, and reducing inventory costs.

- The HeartStart XL+ has the same ports as Philips patient monitors, so no time is wasted re-cabling the patient.
- The HeartStart XL+ supplies and accessories are compatible with earlier generation Philips monitor/ defibrillators.
- The HeartStart XL+ patient monitoring cables and sensors are the same ones used with Philips patient monitors.

HeartStart defibrillation pads and paddles

HeartStart multifunction defibrillation pads come in Adult/Child, Infant, and specialty choices to fit the needs of a variety of departments, clinicians, patients, and therapies.

If external paddles are preferred, the HeartStart XL+ can be equipped with a set of external paddles with unique Paddle Contact Indicators. The new external paddles have flashing shock buttons on each paddle that are the same as the shock button on the front panels of the HeartStart XL+ and the HeartStart MRx. For open-heart and other intrathoracic procedures, the HeartStart XL+ can be used with Philips sterilizable switched or switchless internal defibrillation paddles.

HeartStart XL+ Defibrillator/Monitor specifications

Physical dimensions

Size	9″ high x 11.6″ wide x 10.9″ deep (23 cm x 29.6 cm x 27.9 cm)
Weight	14.7 lbs (6.6 kg), includes one battery, one new roll of paper, one pads cable. Incremental weight of external standard paddles and paddle tray is less than 3 lbs (1.3 kg)
Standard operator position	Within one meter (3 feet) of the device

Power supply

Type	Rechargeable lithium ion battery; AC power using a protectively grounded outlet

Defibrillator

Waveform	Biphasic Truncated Exponential. Waveform parameters adjusted as a function of patient impedance
Shock delivery	Via multifunction electrode pads or paddles
Shock series	Configurable energy escalation in a series
Leads off sensing and PCI sensing for pads/paddles	Apply 500nA rms (571Hz); 200uA rms (32KHz)
Charge time	• 3 seconds to the recommended adult energy level (150 Joules) with a new fully-charged battery installed • Less than 5 seconds to the selected energy level (up to 200 Joules) with a new fully charged battery installed • Less than 15 seconds to the selected energy level while connected to AC power only • The device powers on in manual defibrillation mode ready to deliver shock in less than 8 seconds plus applicable charge time, assuming an immediate selection of an energy and initiation of a charge, even at 90V AC and after 15 maximum energy discharges • The device powers on in AED mode ready to deliver shock in less than 17 seconds plus applicable charge time
Patient impedance range	Minimum: 25 ohm (external defibrillation); 15 ohm (internal defibrillation); Maximum: 250 ohm. Actual functional range may exceed these values

Printer

Continuous ECG strip	The Print button starts and stops the strip. The printer can be configured to be run real time or with a 10-second delay. The strip prints the primary ECG lead and a second wave with event annotations and measurements
Auto printing	The printer can be configured to automatically print on Mark Events, Charge, Shock and Alarm
Reports	The following can be printed: Event Summary (Long or Short), Vital Signs Trends, Operational Check, Configuration, Status Log, Device Information
Speed	25 mm/s with an accuracy of ±5%
Amplitude accuracy	5% for offset voltages of ± 300 mV at 5Hz
Paper size	50 mm wide x 30 m long

Battery

Type	Rechargeable, lithium ion; see battery label for capacity information
Dimensions	1″ high x 4.5″ wide x 5.7″ long (23.6 mm high x 116 mm wide x 146 mm long)
Weight	Approximately 1.5 lbs (.68kg)
Charge time, device off	With the temperature between 0-35° C (32-95° F), less than 3 hours to 100% capacity; less than 2 hours to 80% capacity
Life	Approximately 3 years
Capacity	With a new fully charged battery, at 20 °C (68 °F), one of the following: At least 3 hours of monitoring (ECG and SpO$_2$ monitored continuously and NBP sampled every 15 minutes) followed by 20 full-energy charge/shocks; OR at least two hours of pacing (180ppm at 140mA with 40 msec pulse width) while monitoring (ECG and SpO$_2$ monitored continuously and NBP sampled every 15 minutes) followed by 20 full-energy charge/shocks; OR at least 175 full energy charge/shocks
Battery indicators	Battery gauge on battery, capacity indicator on display, power indicators on front of device; flashing RFU indicator, chirp and Low Battery messages on the display for low battery condition. When a low battery message first appears there is still enough energy for at least 10 minutes of monitoring and 6 maximum energy discharges
Battery storage	Storing the battery for extended periods at temperatures above 40° C (104° F) reduces battery capacity and degrades battery life

Display

Size	Approximately 6.5 in (16.5 cm) diagonal viewing area
Type	Color TFT LCD
Resolution	640 x 480 pixels (VGA) with 32 brightness levels per color
Sweep speed	20 mm/s nominal (stationary trace; sweeping erase bar) for ECG and SpO$_2$
Wave viewing time	5.2 sec

Environmental

Temperature	0°C to 45°C (32°F to 113°F) operating; 20°C to 70°C (-4°F to 158°F) storage
Humidity	Up to 95% relative humidity
Atmospheric pressure range	Operating and storage - 1014 mbar to 572 mbar (0 to 15,000 ft; 0 to 4,500 m)
Shock – operating	Half-sine waveform, duration ≤11 ms, acceleration ≥ 15.3 G, 3 shocks per face
Shock – non-operating	Trapezoidal waveform, acceleration 30G, velocity change 7.42 m/s ±10% 1 shock per face
Water/solids ingress resistance	Meets Ingress Protection level IP21
EMC	Complies with the requirements of standard EN 60601-1-2:2002
Safety	Meets UL 60601-1 (1st edition), EN 60601-2-4:2003, EN 60601-1:1990
Mode of operation	Continuous
AC Line powered	100-240 VAC, 50 or 60 Hz, 1-0.46A, Class I Equipment
Battery powered	Minimum 14.4 V, rechargeable lithium ion