

Berlin Heart EXCOR® Active



Pump Settings



Rate: The rate of the pump

Diastolic Pressure: The pump's suction pressure (Usually -20 to -70 mmHg)

Systolic Pressure: The pump's ejection pressure (Avg: LVAD=180–250 mmHg, RVAD= 80–150 mmHg)

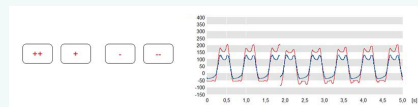
% Systole: Time the pump spends ejecting blood (Usually >30% and <50%)

Flow: Blood flow monitored by the flow sensor in the cannula (L/min)

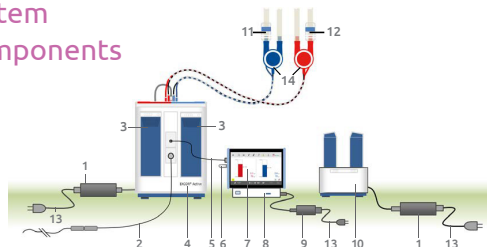
Flow Alarm Threshold: The driving unit will emit an alarm if the flow drops below this value

Automatic Mode: The systolic and diastolic settings change to achieve the least amount of pressure needed to fill or eject the pump. Optimize the settings by using + or – symbol.

Manual Mode: All settings remain the same unless changed by the clinician—mode primarily used when chest is open.



System Components



1. Power supply
2. Adapter for external alarm (nurse call)
3. Batteries
4. Driving Unit
5. USB Cable
6. USB stick
7. Panel PC
8. Docking station
9. Panel PC Power supply unit
10. Battery charging unit
11. Flow sensor (R)
12. Flow sensor (L)
13. Power cable
14. Applied parts: blood pumps (defibrillation protected, cardiac floating)

Flow Sensor



The flow sensor measures the amount of blood flow inside the cannula. **Warning:** Flow probe is sensitive to warm environments so if covered, it can cause a T5 alarm.

Panel PC



The panel PC connects to the driver, stores all the settings, and communicates alarms. Clinicians can log in expert or medical mode to make settings adjustments, download data, and monitor parameters.



Operation Panel

1. Display
2. Maintenance LED
3. Battery LED
4. System LED
5. Button – audio pause, paging through views
6. Driving tube connector
7. Flow sensor connector
8. Seal plug
9. Power connector (with seal cap)

Optimizing Pump Function

		CVP (Central Venous Pressure)	C.O. (Cardiac Output)	Patient Treatments	
POOR FILL 	CAUSES	Hypovolemia	↓	Give Fluid Evaluate Further Surgical Drainage +/- Nitric Oxide & Inotropes	PUMP FIXES Decrease Rate Increase Diastolic Pressure Decrease % Systole
		Inflow Cannula Obstruction	↑		
		Tamponade	↑		
		Right Heart Failure	↑		
POOR EJECT 	CAUSES	Hypertension	↑	Reduce Afterload Evaluate Further Pain Control/Sedation	PUMP FIXES Increase Systolic Pressure Increase % Systole
		Outflow Cannula Obstruction	↑		
		Agitation	↑		

Power Sources

General Power:

Batteries: Two batteries should last 6–13 hours depending on settings. It takes 3–4 hours to charge batteries in the docking station.

**Do NOT remove both batteries at one time while driver is supporting a patient*

Power Outlet: Plug in while the patient is in bed. While plugged in, driver batteries should charge.

Emergency Power: Internal Back Up

Battery: Can power Driver for 30 minutes

Manual Pump: Pump at a speed of 60–80 BPM (per IFU)



Active Driver Accessories

Caddy: The driver can be removed from the caddy but it must remain upright at all times on a stable even surface.



Accessory Bag: Holds an extra set of batteries, the hand pump, and a tire pump.



Alarm Levels

Low, medium, and high alarms have different audio and visual cues and require user to press silence button to acknowledge alarm

S4 Alarm: Occurs if driver system is defective—may require the active driver to be replaced

- Contact your Berlin Heart representative to troubleshoot
- Prepare to switch driving unit

Alarm Types

Temperature: Temperature is too high or too low

Hemodynamics: Patient is receiving insufficient amount of support

System: Driving unit is not functioning properly

Power: Power supply is not functioning properly

Potential Emergencies

Power Failure: (Manual Pump)

- Switch driving tubes from the driver to the manual pump according to the color code
 - Operate manual pump rhythmically with approximately 60–80 BPM
 - Make sure membrane is moving completely
- Switching Driver:** Contact the Berlin Heart Rep for assistance.

- Place batteries into the replacement driver, ensure pump turns on and

immediately starts pumping

- Confirm settings
- Switch driving tubes to the replacement driver
- Switch flow sensor to the replacement driver
- Watch for hemodynamic changes



CPR: Chest compressions and defibrillation/cardioversion can be used if needed

Membrane Rupture



- Watch for change in membrane movement on air or blood side
- Watch for a dark area or air bubbles on the blood side
- Watch for hemodynamic changes or heart failure signs and symptoms
- Treat heart failure
- Perform emergency pump exchange

Clinical Emergency Hotline:
1-800-826-9466

Scan QR code for **Berlin Heart Algorithms & Emergency Care**

