**DESIGN**
- Microprocessor-based system architecture
- Modular system consisting of display/control module and pneumatic drive unit
- Proprietary deflation timing management

**ELECTRICAL**
- AC requirements: 90–264 VAC 47–63 Hz
- Typical power consumption: 245 watts
- Maximum power consumption: 420 watts
- Battery operating time: 90 minutes minimum with full charge
- 180 minutes with optional second battery
- Typical battery recharging time: 80% in 4 hours from full discharge
- Recharge to 80% indicated by yellow light

**MECHANICAL DIMENSIONS**
- Control module with monitor:
  - 10" high (25.4 cm) x 13.75" wide (35 cm) x 2" deep (5 cm)
- Pneumatic drive unit:
  - 31.5" high (80 cm) x 13.5" wide (34.3 cm) x 21" deep (53.3 cm)

**MECHANICAL WEIGHT**
- Control module:
  - 5 lbs (2.3 kg)
- Pneumatic unit for AutoCAT2:
  - 94 lbs (41.7 kg)
- Total weight for AutoCAT2:
  - 99 lbs (44.0 kg)
- Total weight for AERO® Series:
  - 90 lbs (40.0 kg)

**PNEUMATICS**
- Drive system: Stepper motor-driven bellows
- Drive gas: USP-grade helium
- Helium tank:
  - Disposable canister (500 psi)
  - Refillable cylinder (2000 psi)—US Approval
  - Refillable cylinder (2900 psi)—EU Approval
- Pumping volume:
  - 0.5cc to 50cc, adjustable in 0.5cc increments
- Counterpulsation rate: 40 to 200 pulsations/minute
- Assist ratio options

**CONDENSATION REMOVAL**
- Thermodlectric system removes moisture continuously from pneumatic system without interrupting counterpulsation

**SYSTEM MODES**
- **AutoPilot**: 
  - Automatically selects ECG/AP signal, sources, trigger mode, and timing method as well as timing settings
  - Automatically changes settings to optimize assist
  - Proprietary software sets timing to correspond to individual patient needs
- **Operator**: 
  - Allows user control of most pump functions

**TRIGGER MODES**
- **ECG (PATTERN, PEAK, AFIB)**: 
  - Microprocessor-based R-waveform trigger detection algorithms
- **Pacer (VPACE, APACE)**: 
  - Low level (skin) ECG input
    - Pulse width 0.1 to 0.5 ms and pulse amplitude => +5 to +700 mV
    - Pulse width => 0.5 to 2 ms and pulse amplitude => +2 to +700 mV
  - High level (monitor) input
    - Pulse width 0.1 to 2 ms and pulse amplitude => 1 V
  - AV pacer detection is <250 msec between pacer pulses
- **Arterial pressure (AP)**: 
  - Microprocessor-based waveform trigger detection algorithm
- **Internal**: 
  - Default to 80 bpm; adjustable 40 to 120 bpm
- **Filtering**: 
  - Diathermy, 30 Hz low pass

**GENERAL TRIGGER SELECTION CRITERIA (AUTOPILOT MODE)**
- **ECG TRIGGER MODES**: 
  - **PATTERN**: HR <130 bpm no arrhythmia
  - **PEAK**: HR >130 bpm or arrhythmia detected and arrhythmia timing OFF*
  - **AFIB**: Any HR with arrhythmia detected*
  - **VPACE**: Single or dual pacer (<250 msec apart) and no QRS or waveform detected
  - **APACE**: Single pacer with R-wave >100 msec later. Transition only

**AP TRIGGER MODE**: 
- No ECG signal or noisy ECG signal

*Based upon deflation timing management.
INFLATION/DEFLATION TIMING METHODS

**INFLATION TIMING METHODS:**
- Predictive: AP waveform analysis to set inflation
- Weissler: ECG only, inflation timing based on systolic time intervals

**DEFLATION TIMING METHODS:**
- R-wave: Real-time deflation on R-wave
- Predictive: Deflation set to occur just prior to next systolic rise
- Weissler: ECG only, deflation timing based on diastolic intervals

**MANUAL:**
- User set inflation and deflation timing in Operator Mode

**INFLATION/DEFLATION TIMING LIMITS (OPERATOR MODE)**
- **ECG**: Inflation, 20%–80% of R-R interval  
  Deflation, 30%–120% of R-R interval
- **AP**: Inflation, 0–35% of peak systole-peak systole interval  
  Deflation, 35%–75% of peak systole-peak systole interval
- **AFIB Trigger Mode**: Inflation 80 to 430 ms after R-wave trigger event  
  Deflation on R-wave

**DISPLAY**
- **Type**: Color LCD flat screen
- **Channels**: Three-channel multicolor waveforms
  - ECG: Green trace with white highlight on assisted portion
  - AP: Red trace calibrated for direct reading of AP, white highlight on assisted portions when in Operator Mode
  - Balloon pressure: Blue trace calibrated in mm Hg and displayed continuously
- **Timing reference display**: Numerical timing settings in both operating modes as well as a bar graph displaying inflate/deflate events in Operator Mode
- **Cursor**: Measurement of AP and balloon pressure waveforms

**ALPHANUMERIC DATA**
- **Patient hemodynamics**: Heart rate, AP—systolic, augmented, diastolic, and mean arterial. When in 1:2 or lower assist ratio the assisted values are displayed in white and the unassisted values are displayed in yellow
- **Display parameters**: ECG source and gain state, alarm status with timer, ON BATTERY indication, operation mode selection, AP alarm parameter and limit, timing settings, heliun tank level, arrhythmia detection, and timing status
- **Operations status**: Operational mode, trigger mode, heliun tank gauge, alarm/battery charge status, balloon volume
- **Diagnostic alarm/help messages**: Preprogrammed troubleshooting prompts/help

**STRIP CHART RECORDER**
- **Recorder**: Dual-channel dot matrix: Dot density 400 dots/inch, 25 mm/s
- **Waveforms**: ECG, AP, or balloon pressure (one or two recorded)
- **Alphanumeric**: Operational mode, trigger mode, ECG lead/source, AP source, AP alarm status, timing settings, assist ratio, balloon volume, timing method, arrhythmia status, alarm condition, date, time, patient hemodynamics

**DISPLAY FREEZE**
- Freezes approximately 7 seconds of patient data on screen

**PATIENT SIGNAL INPUTS**
- **ECG**: 5 lead skin cable (I, II, III, aVR, aVL, aVF and V)  
  High level monitor input (0 to 5 V)
- **AP**: AP transducer (Spectramed or equivalent), 50 mV/V/cm Hg  
  High-level monitor input (1 V = 100 mm Hg)