AutoCAT®2

PRODUCT SPECIFICATIONS

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
- Thermoelectric 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
• Displayed parameters: ECG source and gain state, alarm status with timer, ON BATTERY indication, operation mode selection, AP alarm parameter and limit, timing settings, helium tank level, arrhythmia detection, and timing status
• Operations status: Operational mode, trigger mode, helium 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)

ORDERING INFORMATION

ORDER NO.	DESCRIPTION
IAP-0400	**AutoCAT 2** 1 (IABP) System includes
	Proprietary timing software
	AutoPilot operational mode
IAP-0435	**AERO Series–AutoCAT 2**

The products above are also available in multiple languages. Contact Arrow for availability.

Note: Additional system specifications are available from Arrow upon request.

Specifications are subject to change without notice.

Caution: U.S. Federal law limits this device to sale by or on order of a physician.

U.S. Patent Nos. 6,258,035, 6,569,103, 6,887,206, and 5,913,814; additional patents pending.

REFERENCE: [1]Schreuder JJ, Castiglioni A, Donelli A, et al. Automatic intraaortic balloon pump timing using an intrabeat dicrotic notch prediction algorithm. Ann Thorac Surg. 2005;79:1017-1022.

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