SECTION 27 52 13

PATIENT MONITORING EQUIPMENT

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\*\* NOTE TO SPECIFIER \*\* Hillrom, Welch Allyn Division; patient vitals monitoring products and management systems.  
This section is based on the products of Hillrom, Welch Allyn Division; health care industry products and solutions:  
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[ [Click Here](http://www.arcat.com/company/49149) ] for additional information.  
Hillrom is a leading worldwide manufacturer and provider of medical technologies and related services for the health care industry, including patient support systems, safe mobility and handling solutions, non-invasive therapeutic products for a variety of acute and chronic medical conditions, medical equipment rentals, surgical products and information technology solutions. Hillrom's comprehensive product and service offerings are used by health care providers across the health care continuum and around the world in hospitals, extended care facilities and home care settings to enhance the safety and quality of patient care.  
Hillrom: Enhancing outcomes for patients and their caregivers.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for the project.

* + 1. Vital signs devices.
    2. Continuous monitoring systems.
    3. Clinical surveillance systems.
  1. RELATED SECTIONS
     1. Section 11 73 00 - Patient Care Equipment.
     2. Section 11 73 00 - Patient Care Equipment.
     3. Section 11 72 00 - Examination and Treatment Equipment.
     4. Section 11 76 00 - Operating Room Equipment.
     5. Section 27 52 00 - Healthcare Communications and Monitoring Systems.
  2. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. Association for the Advancement of Medical Instrumentation (AAMI).
    2. American National Standards Institute (ANSI):
       1. ANSI/AAMI SP10 - Manual, Electronic, or Automated Sphygmomanometers.
    3. ASTM International (ASTM):
       1. ASTM D4332 - Standard Practice for Conditioning Containers, Packages, or Packaging Components for Testing.
    4. Australian and New Zealand Standard (AS/NZS):
       1. AS/NZS 3200.1.01 - Medical Electrical Equipment - Part 1.0: General Requirements for Safety - Parent Standard.
    5. Australian Therapeutic Goods Act: 2002 No. 236.
    6. Canadian Medical Devices (CMD):
       1. CMD Regulation: SOR/98-282.
    7. CSA Group (CSA):
       1. CAN/CSA C22.2 NO.601.1-M90 - Medical Electrical Equipment Part 1: General Requirements for Safety.
       2. CAN/CSA C22.2 No. 601.1.1 - Medical Electrical Equipment - Part 1: General Requirements for Safety - 1. Collateral Standard Safety Requirements Fort Medical Electrical Systems.
       3. CAN/CSA-C22.2 No.60601-1-2 - Medical Electrical Equipment - Part 1-2: General Requirements for Basic Safety and Essential Performance - Collateral Standard: Electromagnetic compatibility - Requirements and Tests (IEC 60601-1-2 with Canadian Deviations).
       4. CAN/CSA Z9919 - Medical Electrical Equipment Particular Requirements for the Basic Safety and Essential Performance of Pulse Oximeter Equipment for Medical Use.
    8. European Economic Community (EEC):
       1. EEC Medical Devices Directive: 93/42/EEC.
       2. EEC Medical Devices Directive 2007 Amendment: 2007/47/EC.
       3. EEC Packaging Directive: 94/62/EC.
       4. EEC Waste Electrical and Electronic Equipment Directive: 2002/96/EC.
       5. EEC Batteries and Accumulators Directive: 2006/66/EC.
    9. European Standards (EN):
       1. EN 1060-1 - Non-Invasive Sphygmomanometers. General requirements.
       2. EN 1060-3 - Non-Invasive Sphygmomanometers. Supplementary Requirements for Electro-Mechanical Blood Pressure Measuring Systems.
       3. EN 1060-4 - Non-invasive sphygmomanometers. Test procedures to determine the overall system accuracy of automated non-invasive sphygmomanometers.
       4. EN/IEC 60601-1 - Medical Electrical Equipment - Part 1: General requirements for basic safety and essential performance.
       5. EN/IEC 60601-1-2 - Medical Electrical Equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral Standard: Electromagnetic disturbances - Requirements and tests.
       6. EN/IEC 60601-1-4 - Medical Electrical Equipment - Part 1-4: General requirements for safety - Collateral Standard: Programmable electrical medical systems; Consolidated Edition.
       7. EN/IEC 60601-1-6 - Medical Electrical Equipment - Part 1-6: General requirements for basic safety and essential performance - Collateral standard: Usability.
       8. EN/IEC 60601-1-8 - Medical Electrical Equipment - Part 1-8: General requirements for basic safety and essential performance - Collateral Standard: General requirements, tests and guidance for alarm systems in medical electrical equipment and medical electrical systems.
       9. EN/IEC 60601-2-30 - Medical Electrical Equipment - Part 2-30: Particular requirements for the safety, including essential performance, of automatic cycling non-invasive blood pressure monitoring equipment.
       10. EN/IEC 60601-2-49 - Medical Electrical Equipment - Part 2-49: Particular requirements for the basic safety and essential performance of multifunction patient monitoring equipment.
       11. EN/IEC 62304 - Medical Device Software - Software Life Cycle Processes.
       12. EN/IEC 62366 - Medical Devices - Application of usability engineering to medical devices; Consolidate Edition.
       13. EN/ISO 9919 - Medical Electrical Equipment - Particular requirements for the basic safety and essential performance of pulse oximeter equipment for medical use.
       14. EN/ISO 13485 - Medical Devices - Quality management systems - Requirements for regulatory purposes.
       15. EN/ISO 14971 - Medical Devices - Application of risk management to medical devices.
       16. EN/ISO 21647 - Medical Electrical Equipment - Particular requirements for the basic safety and essential performance of respiratory gas monitors.
       17. EN/ISO 80601-2-56 - Medical Electrical Equipment - Part 2-56: Particular requirements for basic safety and essential performance of clinical thermometers for body temperature measurement.
       18. EN/ISO 80601-2-61 - Medical Electrical Equipment - Part 2-61: Particular requirements for basic safety and essential performance of pulse oximeter equipment.
    10. Federal Communications Commission (FCC):
        1. FCC Subpart 15C: - Intentional Radiators. The FCC definition is "A device that intentionally generates and emits radio frequency energy by radiation or induction."
    11. International Air Transport Association (IATA):
        1. IATA DGR Dangerous Goods Regulation.
    12. International Safe Transit Association (ISTA):
        1. ISTA 2A - Partial Simulation Performance Tests.
    13. National Fire Protection Association (NFPA).
    14. Underwriter's Laboratories (UL):
        1. UL 60601-1 - Medical Electrical Equipment, Part 1: General Requirements for Safety.
    15. United Nations Manual of Tests and Criteria: ST/SG/AC.10/11, Part III, Sub-Section 38.3.
    16. United States Food and Drug Administration
        1. USFDA 21 CFR Subchapter H - Medical Devices.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Source quality certificates.
        2. Pre-Installation Manual: Preparation instructions and recommendations.
        3. Installation Manual: Storage and handling requirements and recommendations.
        4. Installation Manual: Installation methods.
        5. Service Manual: Maintenance and operations data.
     3. Shop Drawings: Include system components, utility requirements and connections, relationship with adjacent construction. Include required clearances and access for servicing.
        1. Communications wire labeling schedules.
        2. Communications wiring diagrams.
        3. Plans and elevations of telecommunications room.
        4. Pathways.
        5. Access points.
        6. Grounding.
        7. MEP systems.
  2. QUALITY ASSURANCE
     1. Regulatory Requirements: Comply with requirements of authorities having jurisdiction and applicable codes at the location of the project.
     2. Manufacturer Qualifications: Minimum 5 years' experience manufacturing similar products.
     3. Installer Qualifications: Minimum 2 years' experience installing similar products.
  3. DELIVERY, STORAGE, AND HANDLING
     1. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
     2. Comply with manufacturer's recommendations. Handle materials to avoid damage.
  4. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
  5. WARRANTY
     1. Provide manufacturer's standard limited warranty.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Welch Allyn, a Division of Hillrom; 4341 State Street Road, Skaneateles Falls, NY 13153. ASD. Toll-Free: 800-535-6663; Email: [Aman.Agrawal@hillrom.com](mailto:Aman.Agrawal@hillrom.com); Web: [www.welchallyn.com](https://www.welchallyn.com)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required. Delete features not required.

* 1. VITAL SIGNS DEVICES

\*\* NOTE TO SPECIFIER \*\* Delete paragraph is not required.

* + 1. Basis of Design: Welch Allyn, Connex ProBP 3400 Digital Blood Pressure Device as manufactured by Hillrom.
       1. Standards Compliance:
          1. EN/IEC 60601-1.
          2. EN/IEC 60601-1-2.
          3. EN/IEC 80601-2-30.
          4. EN 1060-1:1996 Specification for non-invasive sphygmomanometers - Part 1: General requirements.
          5. EN 1060-3:1997 Specification for non-invasive sphygmomanometers - Part 3: Supplementary requirements for electro-mechanical blood pressure measuring systems.
          6. FCC Subpart 15C.
       2. Physical Specifications:
          1. Accuracy: Meets or exceeds ANSI.AAMI SP10 standards for noninvasive blood pressure accuracy (plus or minus 5 mmHg mean error, 8 mmHg standard deviation). Blood pressure accuracy is validated for pressure measurement using the upper arm only.
          2. Cuff Pressure Range: 0 to 300 mmHg.
          3. Systolic Range: 60 to 250 mmHg.
          4. Diastolic Range: 30 to 160 mmHg.
          5. Mean Arterial Pressure (MAP) Range: 40 to 190 mmHg. MAP is a calculated reading that yields an approximate value.
          6. Pulse Rate Range: 35 to 199 bpm.
          7. Pulse Rate Accuracy: plus or minus 5.0 percent.
          8. Overpressure Cutoff: 300 mmHg.
          9. Operating Temperature: 50 to 104 degrees F (10 to 40 degrees C).
          10. Operating Altitude: Minus 557 to 16,000 ft (minus 170 to 4877 m).
          11. Storage Temperature: Minus 4 to 122 degrees F (minus 20 to 50 degrees C).
          12. Storage Humidity: 15 to 95 percent noncondensing.
       3. Mechanical Specifications:
          1. Height: 5.91 in (150 mm).
          2. Width: 3.15 in (80 mm.
          3. Depth: 2.20 in (56 mm).
          4. Weight: 0.99 lbs (450 g).
          5. Mounting:

Mobile stand.

Wall mount.

Desk mount.

* + - * 1. Portability: May be used as a handheld device.
      1. Electrical Specifications:
         1. Power Requirements:

Input: 100 to 240 VAC, 0.18A, 50 to 60 Hz.

Output: 5 VDC, 0.5A

* + - * 1. Degree of Protection: Type BF applied part
        2. Safety Classification: Class II
        3. Internally Powered: Battery, lithium-ion type, 3.7 V, 2100 mA, 7.8 W
        4. Protection against the ingress of water: IPX0
        5. Mode of operation: Continuous operation.
        6. Power transformer and wall plug.
        7. Battery Charger: USB-B connector.
      1. Liquid Crystal Display:
         1. Systolic and diastolic pressure.
         2. MAP.
         3. Pulse rate.
         4. Bluetooth radio status.
         5. USB connection.
         6. Date.
         7. Clock.
         8. Reading Number (memory hold up to 50 readings.
         9. Settings Menu.
         10. Review Menu.

\*\* NOTE TO SPECIFIER \*\* Delete cuff not required.

* + - 1. Cuffs, Small Child (Size 8): 4.7 to 6.3 in (120 to 160 mm).
      2. Cuffs, Child (Size 9): 5.9 to 8.3 in (150 to 210 mm).
      3. Cuffs, Small Adult (Size 10): 7.9 to 10.2 in (200 to 260 mm).
      4. Cuffs, Adult (Size 11): 9.8 to 13.4 in (250 to 340 mm).
      5. Cuffs, Adult Long (Size 11L): 9.8 to 13.4 in (250 to 340 mm).
      6. Cuffs, Large Adult (Size 12): 12.6 to 16.9 in (320 to 430 mm).
      7. Cuffs, Large Adult Long (Size 12L): 12.6 to 16.9 in (320 to 430 mm).
      8. Cuffs, Thigh (Size 13): 15.7 to 21.7 in (400 to 550 mm).

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if not required.

* + 1. Basis of Design: Connex Spot Monitor as Manufactured by Hillrom.
       1. Monitoring of noninvasive blood pressure, pulse rate, temperature, and blood oxygen levels (Sp02). Ability to manually enter patient observational data and additional vital signs. Automation of early warning scoring protocols for clinical decision support at the bedside.

\*\* NOTE TO SPECIFIER \*\* Delete models not required.

* + - 1. Model 7100 - NIBP, Optional SpO2 (Nonin), Optional Temp (Oral or Tympanic), USB, Ethernet.
      2. Model 7400 - NIBP, SpO2 (choice of Masimo or Nellcor) Optional Temp (Tympanic or Oral), USB, Ethernet, Upgradeable to WiFi (802.11 a/b/g/n).
      3. Model 7500 - NIBP, SpO2 (choice of Masimo or Nellcor) Optional Temp (Tympanic or Oral), USB, Ethernet, Integrated WiFi (802.11 a/b/g/n).
      4. Standards Compliance:
         1. ANSI/AAMI SP10.
         2. AS/NZS 3200.1.01.
         3. ASTM D 4332, E 1104
         4. CAN/CSA C22.2 NO.601.1.
         5. CAN/CSA-C22.2 NO.60601-1-2.
         6. CSA Z9919.
         7. EN 1060-1.
         8. EN 1060-3.
         9. EN 1060-4.
         10. EN/IEC 60601-1.
         11. EN/IEC 60601-1-2.
         12. EN/IEC 60601-1-6.
         13. EN/IEC 60601-1-8.
         14. EN/IEC 60601-2-30.
         15. EN/IEC 62304.
         16. EN/IEC 6236.
         17. EN/IEC 80601-2-30.
         18. EN/ISO 9919.
         19. EN/ISO 13485.
         20. EN/ISO 14971.
         21. EN/ISO 80601-2-56.
         22. EN/ISO 80601-2-61.
         23. ISTA 2A.
         24. UL 60601-1.
         25. USFDA 21 CFR Subchapter H - Medical Devices.
         26. Australian Therapeutic Goods Act: 2002 No. 236.
         27. EEC Medical Devices Directive: 93/42/EEC.
         28. EEC Medical Devices Directive 2007 Amendment: 2007/47/EC.
         29. EEC Packaging Directive: 94/62/EC.
         30. EEC Waste Electrical and Electronic Equipment Directive: 2002/96/EC.
         31. EEC Batteries and Accumulators Directive: 2006/66/EC.
         32. CMD Regulation: SOR/98-282.
         33. IATA DGR. - Dangerous Goods Regulation:
         34. United Nations Manual of Tests and Criteria: ST/SG/AC.10/11, Part III, Sub-Section 38.3.
      5. Physical Characteristics:
         1. Electrical rating: 100 to 240 VAC, 50 to 60 Hz, 0.8X to 1.5 A.
         2. Duty Cycle: Continuous operation.
         3. Protection Against Electric Shock: Class I internally powered.
         4. Degree of Protection Against Electric Shock, for Parts Applied to Patients: Type BF defibrillator proof IEC EN 60601-1.

Defibrillator recovery Time After Discharge: Less than or equal to 15 seconds.

* + - * 1. Flammable Anesthetics: Not suitable for use with flammable anesthetics.
        2. Degree of Protection by Enclosure from Harmful Ingress of Liquids: IPX1 protection against vertically falling drops of water.

\*\* NOTE TO SPECIFIER \*\* Delete chassis types not required.

* + - * 1. Standard Chassis:

Height: 6.3 in. (161 mm).

Width: 9.2 in. (234 mm).

Depth: 2.3 in. (5.8 mm).

Weight (including battery): 2.9 lb (1.3 kg).

* + - * 1. Extended Chassis with Braun:

Height: 6.5 in. (166 mm) with Braun.

Width: 11.7 in. (298 mm) with Braun.

Depth: 4.4 in. (110 mm) with Braun.

Weight (including battery): 3.7 lb (1.7 kg).

* + - * 1. Extended Chassis with SureTemp:

Height: 6.4 in. (166 mm) with SureTemp.

Width: 11.7 in. (298 mm) with SureTemp.

Depth: 4.2 in. (106 mm) with SureTemp.

Weight (including battery): 3.5 lb in. (1.6 kg).

* + - * 1. Graphical Display Resolution:

Dimensional Outline (W x H x D): 6.5 x 4.1 x 0.13 in (165 x 104 x 3 mm).

Active Area (W x H): 6.1 x 3.4 in. (154 x 86 mm).

Resolution: 800 x 480 pixels.

Pixel Arrangement: RGB (red, green, blue).

Pixel size (W x H): 0.0025 x 0.007 in (63.2 x 179 micrometers).

Luminance: 49.2 candles per sq ft (530 candles per sq m).

* + - * 1. Speaker Volume: 60 dB at 39.37 in (1000 mm) minimum Output sound pressure.
        2. Alarm and Pulse Tones: per IEC 60601-1-8.

Pulse Frequency (f0): 150 to 1000 Hz.

Number of Harmonic Components in 300 to 4000 Hz Range: Minimum of 4.

Effective Pulse Duration (td):

High Priority: 75 to 200 ms.

Medium and Low Priority: 125 to 250 ms.

Rise Time (tr): 10 to 20 percent of td.

Fall time 1(tf): tf les than ts minus tr.

* + - * 1. Relative Sound Pressure Level Range of Harmonic Components: From 53 to 80 dBa at the pulse frequency.
      1. Battery: 2 cell battery.
         1. Continuous Run Time:

Six Patients per hours - 41 patient cycles: 6.83 hours.

Eight Patients per hours - 54 patient cycles: 6.78 hours.

Eight Patients per hours - 55 patient cycles: 6.90 hours.

* + - * 1. Acute care continuous 10 minute cycles (Nellcor):

49 patient cycles - BP, temp, SpO2, no radio, no scanner: 8.22 hours.

41 patient cycles - BP, temp, SpO2, radio, scanner: 6.84 hours.

* + - * 1. Acute care continuous 10 minute cycles (Nonin):

50 patient cycles - BP, temp, SpO2, no radio, no scanner: 8.37 hours.

41 patient cycles - BP, temp, SpO2, radio, scanner: 6.96 hours.

* + - * 1. Acute care continuous 10 minute cycles (Masimo):

49 patient cycles - BP, temp, SpO2, no radio, no scanner: 8.29 hours.

41 patient cycles - BP, temp, SpO2, radio, scanner: 6.90 hours.

* + - 1. Nurse Call Connection: 25 VAC or 60 VDC maximum at 1A maximum.
      2. Non-Invasive Blood Pressure Analysis (NIBP):
         1. Cuff Pressure Range: Meets or exceeds IEC/ISO 80601-2-30 standards for cuff pressure range.
         2. Systolic Range:

Adult: 30 to 260 mmHg (StepBP, SureBP).

Pediatric: 30 to 260 mmHg (StepBP, SureBP).

Neonate: 20 to 120 mmHg (StepBP).

* + - * 1. Diastolic Range:

Adult: 20 to 220 mmHg (StepBP, SureBP).

Pediatric: 20 to 220 mmHg (StepBP, SureBP).

Neonate: 10 to 110 mmHg (StepBP).

* + - * 1. Cuff Inflation Target:

Adult:160 mmHg (StepBP).

Pediatric: 140 mmHg (StepBP).

Neonate: 90 mmHg (StepBP).

* + - * 1. Maximum Target Pressure:

Adult: 280 mmHg (StepBP, SureBP).

Pediatric: 280 mmHg (StepBP, SureBP).

Neonate: 130 mmHg (StepBP).

* + - * 1. Blood Pressure Determination Time: 15 seconds, 150 seconds maximum.
        2. Blood Pressure Accuracy: Meets or exceeds ANSI.AAMI SP10 standards for noninvasive blood pressure accuracy (plus or minus 5 mmHg mean error, 8 mmHg standard deviation).
        3. Mean Arterial Pressure (MAP) Range: The formula used to calculate MAP yields an approximate value.

Adult: 23 to 230 mmHg (StepBP, SureBP).

Pediatric: 23 to 230 mmHg (StepBP, SureBP).

Neonate: 13 to 110 mmHg (StepBP).

* + - * 1. Pulse rate range (using blood pressure determination).

Adult: 30 to 200 bpm (StepBP, SureBP).

Pediatric: 30 to 200 bpm (StepBP, SureBP).

Neonate: 35 to 220 bpm (StepBP).

* + - * 1. Pulse Rate Accuracy: Using blood pressure determination, plus or minus 5.0 percent (plus or minus 3 bpm).
        2. Overpressure Cutoff:

Adult: 300 mmHg, plus or minus 15 mmHg.

Pediatric: 300 mmHg, plus or minus mmHg.

Neonate: 150 mmHg maximum.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. SureTemp Plus Temperature Module:
         1. Temperature range: 80 to 110 degrees F (26.7 to 43.3 degrees C).
         2. Calibration accuracy: Plus or minus 0.2 degrees F (plus or minus 0.1 degrees C) direct mode.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Braun ThermoScan PRO 6000 Thermometer:
         1. Temperature range: 68 to 108 degrees F (20 to 42.2 degrees C).
         2. Calibration accuracy: 95.9 to 107.6 degrees F (35.5 to 42 degrees C).

Plus or minus 0.4 degrees F (plus or minus 0.2 degrees C).

Plus or minus 0.5 degrees F (plus or minus 0.25 degrees C) for temperatures outside of this range.

* + - * 1. Display Resolution: 0.1 degrees F.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sp02 Monitors:
         1. Performance Measurement Range: 1 to 100 percent
         2. No Motion:

60 to 80 plus or minus 3 percent; adults, pediatrics, infants.

70 to 100 plus or minus 2 percent; adults, pediatrics, infants; plus or minus 3 percent, neonates.

* + - * 1. Motion: 70 to 100 plus or minus 3 percent; adults, pediatrics, infants, and neonates.
        2. Low Perfusion: 70 to 100 plus or minus 2 percent; adults, pediatrics, infants, and neonates.
        3. Perfusion 0.02 to 20 percent.
        4. Pulse Rate, No Motion: 25 to 240 plus or minus 3 bpm, adults, pediatrics, infants, and neonates.
        5. Pulse Rate, Motion: 25 to 240 plus or minus 5 bpm, adults, pediatrics, infants, and neonates.
        6. Pulse Rate, Low Perfusion: 25 to 240 plus or minus 3 bpm, adults, pediatrics, infants, and neonates.
        7. Sensor Accuracy:

Pulse Rate: 25 to 240 beats per minute.

No motion: Plus or minus 3 digits.

Motion: Plus or minus 5 digits.

\*\* NOTE TO SPECIFIER \*\* Saturation accuracy varies by sensor type. Refer to the sensor Directions for use for additional accuracy information.

Saturation: 60 to 70 percent; Adults, neonates, plus or minus 3 digits.

* + - 1. Environmental:
         1. Operating Temperature: 50 to 104 degrees F (10 to 40 degrees C).
         2. Operating Altitude: Minus 1250 to 10,000 ft. (minus 381 to 3,048 m).
         3. Operating Humidity: 15 to 90 percent noncondensing.
         4. Storage Temperature: Minus 4 to 122 degrees F (Minus 20 to 50 degrees C).
         5. Storage Humidity: 15 to 95 percent noncondensing.
      2. Monitor Radio: The monitor's radio operates on 802.11 networks.
         1. Wireless network interface: IEEE 802.11 a/b/g/n (WifFi).
         2. Frequency:

2.4 GHz frequency bands: 2.4 to 2.483 GHz.

5 GHz frequency bands: 5.15 to 5.35 GHz, 5.725 to 5.825 Ghz.

* + - * 1. Channels :

2.4 GHz: Up to 14 (3 non-overlapping); country dependent.

5 GHz: Up to 23 non-overlapping; country-dependent.

* + - * 1. Authentication and Encryption: Wireless Equivalent Privacy (WEP, RC4 Algorithm); Wi-Fi Protected Access (WPA); IEEE 802.11i (WPA2); TKIP, RC4 Algorithm; AES, Rijndael Algorithm; Encryption Key Provisioning; Static (40- bit and 128-bit lengths); PSK; Dynamic; EAP-FAST; EAP-TLS; EAP-TTLS; PEAP-GTC 1 PEAPMSCHAPv2; PEAP-TLS.
        2. Antenna: Ethertronics WLAN\_1000146.
        3. Wireless Data Rates:

802.11a (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 Mbps.

802.11b (DSSS, CCK): 1, 2, 5.5, 11 Mbps.

802.11g (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 Mbps.

802.11n (OFDM, HT20, MCS 0-7): 6.5,13,19.5, 26, 39,52, 58.5, 72.2 Mbps.

* + - * 1. Agency Approvals:

US: FCC Part 15.247 Subpart C, FCC Part 15.407 Subpart E.

Europe: EN 300 328 (EDR) (v1.8.1), EN 300 328 (LE) (v1.8.1), EN 301 489-1 (v1.9.2), EN 301 489-17 (v2.2.1), EN 301 489-17 (v2.2.1), EN 62311:2008, EN 60950-1.

Canada: (IC) RSS-210 standard. IC 3147A-WB45NBT based on FCC testing.

Singapore: Complies with IDS standard.

* + - * 1. Protocols: UDP, DHCP, and TCP/IP.
        2. Data transfer protocols: UDP, and TCP/IP.
        3. Output power: 39.81mW typical, country-dependent.
        4. Ancillary IEEE standards: 802.11d, 802.11e, 802.11h, 802.11i, 802.1X.

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if not required.

* + 1. Basis of Design: Connex Vital Signs Monitor.
       1. Monitoring of noninvasive blood pressure, pulse rate, temperature, and blood oxygen levels (Sp02). Ability to manually enter patient observational data and additional vital signs. Automation of early warning scoring protocols for clinical decision support at the bedside. Options for continuous respiration monitoring via etCO2 capnography and acoustic respiration (RRa).

\*\* NOTE TO SPECIFIER \*\* Delete model not required or retain both if both required. etCO2 and RRa cannot be combined in the same device.

* + - 1. Model 6700 - NIBP, SpO2 (choice of Masimo or Nellcor) Optional Temp (Tympanic or Oral) USB, Ethernet, Printer (optional), etCO2 (optional), RRa (optional),Upgradable to WiFi (802.11 a/b/g/n)
      2. Model 6800 - NIBP, SpO2 (choice of Masimo or Nellcor) Optional Temp (Tympanic or Oral) USB, Ethernet, Printer (optional), etCO2 (optional), RRa (optional), Integrated WiFi (802.11 a/b/g/n).

\*\* NOTE TO SPECIFIER \*\* Thermometry is optional. Delete one or both.

* + - 1. Thermometry: SureTemp Plus Oral/ Axillary thermometry. (optional, an account will choose either ear or oral Therm)
      2. Thermometry: Braun ThermoScan PRO 4000 ear thermometry. (optional, an account will choose wither ear or oral Therm)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following.

* + - 1. Sensors: Masimo SpO2 algorithms, both sensors and signal processing (optional, account preference).
      2. Sensors: Nellcor SpO2 algorithms, both sensors and signal processing (optional, account preference).

\*\* NOTE TO SPECIFIER \*\* etCO2 is optional. Delete if not required.

* + - 1. etCO2 Monitoring:
         1. CO2 Accuracy:

0 to 38 mmHg: Plus or minus 2 mmHg.

39 to 150 mmHg: Plus or minus (5 percent of reading plus 0.08 percent for every 1 mmHg above 38 mmHg).

* + - * 1. Flow Rate: 50 ml per min (greater than 42.5 and less than 65 ml per min), flow measured by volume.
        2. Initialization Time: 40 seconds (typical, includes power-up and initialization time).
        3. System Response Time: 3.2 seconds (typical, includes module response time and host monitor system response time)
        4. Compensation:

The CO2 module is equipped with a barometric pressure transducer and compensation is triggered at startup or during other events (significant changes in temperature, ambient pressure, etc.).

BTPS (standard correction used by Microstream capnography during all measurement procedures for body temperature, pressure, and saturation).

* + - * 1. Cyclical Pressure: Less than 10 kPa (100 cmH2O); module operates within specification with overpressure up to 100 cmH2O.
        2. Sampled Gas Return/Disposal: Sampled gases are not returned to the breathing circuit. Exhaled gas is exhausted from the monitor's exhaust port. Dispose of sampled gases according to facility requirements or local regulations.
        3. Calibration Interval:

Initial: After 1200 operating hours.

Subsequent: After 4000 operating hours or annually (whichever comes first).

* + - * 1. Periodic Service: After 30,000 operating hours.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. etCO2:

Units of Measure: mmHg, kPa; user-selectable.

Display Range: 0 to 150 mmHg (0.0 to 20.0 kPa).

Resolution: 1 mmHg, 0.1 kPa.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. FiCO2:

Units of Measure: mmHg, kPa; user-selectable.

Display Range: 0 to 150 mmHg (0.0 to 20.0 kPa).

Resolution: 1 mmHg, 0.1 kPa.

* + - * 1. IPI: Display Range: 1 to 10.
        2. Respiration Rate (RR):

Unit of Measure: breaths per minute.

Display Range: 0 to 150 breaths per minute.

Accuracy:

0 to 70 breaths per minute: plus or minus 1 breath per minute.

71 to 120 breaths per minute: plus or minus 2 breaths per minute.

121 to 150 breaths per minute: plus or minus 3 breaths per minute.

Resolution 1 breath per minute.

\*\* NOTE TO SPECIFIER \*\* Masimo Acoustic Respiration Monitoring (RRa) is Optional. Delete if not required.

* + - 1. Respiration Acoustic Monitoring (RRa): Measured in breaths per minute.
         1. Body Weight: Adult, greater than 66 pounds (30 kilograms).
         2. Measurement Range: 0 to 70 breaths per minute.
         3. Accuracy: 4 to 70 plus or minus 1 breath per minute for adults.
         4. Resolution 1 breath per minute.

\*\* NOTE TO SPECIFIER \*\* Optional. Delete if not required.

* + - 1. NIBP interval monitoring mode, including customizable interval programs.
      2. Adult, pediatric, neonatal blood pressure modes.
      3. Masimo noninvasive continuous monitoring of total hemoglobin.
      4. Manual measurements entry (weight, height, respiration rate, pain) and documentation of modifiers, like body position and O2 therapy.
      5. Programmable visual and audible alarms for BP, SpO2, temperature, and pulse.
      6. Large color touchscreen simplifies training and operation.

\*\* NOTE TO SPECIFIER \*\* Optional delete if not required.

* + - 1. Bar code scanning.

\*\* NOTE TO SPECIFIER \*\* Optional delete if not required.

* + - 1. Interface to select digital weight scales.
      2. 400-reading memory.
      3. USB, Ethernet, and wireless connectivity.
      4. Up to four USB accessory ports.

\*\* NOTE TO SPECIFIER \*\* Optional delete if not required.

* + - 1. Integrated printer.
      2. Lithium-ion battery for mobile operation.
      3. Nurse call interface.
      4. PartnerConnect ready for software-driven repairs and upgrades.
      5. Accessories:

\*\* NOTE TO SPECIFIER \*\* Delete accessories not required.

* + - * 1. Accessory Cable Management mobile stand with basket.
        2. Wall mount with basket.
        3. GCX wall mount with channel.
        4. Braun PRO 4000 Dock with Thermometer.
        5. Nurse call cable.
        6. 2D barcode scanner kit-scanner, mounting bracket, hardware.
        7. Medical 2D barcode scanner with coiled USB.

\*\* NOTE TO SPECIFIER \*\* Use with economy mobile stand with basket only. Delete if not required.

* + - * 1. Mounting arm for barcode scanner.
        2. Wireless radio kit. Internal 802.11 a/b/g.
        3. USB cable for wired connectivity.
        4. Patch cable: 60 in (1524 mm).

\*\* NOTE TO SPECIFIER \*\* Delete one of the two subparagraphs below.

* + - * 1. One-year service contract, NIBP and temperature.
        2. One-year service contract, NIBP, temperature, SpO2.
        3. In-service CD.
      1. Physical Characteristics:
         1. Height: 10 in. (254 mm).
         2. Width: 11 in. (279 mm).
         3. Depth: 6 in. (152 mm).
         4. Weight (including battery): 9.5 lb. (4.3 kg).
         5. Graphical Display Area (W x H): 8 x 4 in (203 x 102 mm).
         6. Resolution: 1024 x 600 pixels.
         7. Speaker volume: Output sound pressure: 67 dB at 39.37 in (1000 mm).

\*\* NOTE TO SPECIFIER \*\* Delete battery type not required.

* + - 1. Battery: 6-cell battery.
         1. Rating: 11.1 V, 3.80 A (42 W).
         2. Composition: Lithium-ion.
         3. Charge Time: 2 hours 7 minutes to 80 percent capacity, and 3 hours to 100 percent capacity.
         4. Battery Life: 4.3 hours.
      2. Battery: 9-cell battery.
         1. Rating: 10.8 V, 6.75 A (73 W).
         2. Composition: Lithium-ion.
         3. Charge Time: 2 hours 25 minutes to 80 percent capacity, and 4 hours to 100 percent capacity.
         4. Battery life: 7.8 hours.
      3. Nurse Call Connection: 25 VAC or 60 VDC maximum at 1 A maximum.
      4. Non-Invasive Blood Pressure analysis:
         1. Systolic Range:

Adult: 30 to 260 mmHg (StepBP, SureBP).

Pediatric: 30 to 260 mmHg (StepBP, SureBP).

Neonate: 20 to 120 mmHg (StepBP).

* + - * 1. Diastolic Range:

Adult: 20 to 220 mmHg (StepBP, SureBP).

Pediatric: 20 to 220 mmHg (StepBP, SureBP).

Neonate: 10 to 110 mmHg (StepBP).

* + - * 1. Cuff Inflation Target:

Adult: 160 mmHg (StepBP).

Pediatric: 120 mmHg (StepBP).

Neonate: 90 mmHg (StepBP).

* + - * 1. Maximum Target Pressure:

Adult: 280 mmHg (StepBP, SureBP).

Pediatric: 280 mmHg (StepBP, SureBP).

Neonate: 130 mmHg (StepBP).

* + - * 1. Blood pressure determination time typical: 15 seconds (SureBP).
        2. Accuracy meets or exceeds ANSI.AAMI SP10.

\*\* NOTE TO SPECIFIER \*\* Delete temperature subparagraph not required.

* + - 1. Temperature: SureTemp range, 80 to 110 degrees F (26.7 to 43.3 degrees C).
      2. Temperature: Braun range, 68 to 108 degrees F (20.0 to 42.2 degrees C).
      3. SpO2 Performance Range: 1 to 100 percent.
      4. Total Hemoglobin (SpHb): Saturation range, 0 to 25 g/dl.
      5. Environmental:
         1. Operating temperature: 50 to 104 degrees F (10 to 40 degrees C).
         2. Operating altitude: Minus 557 to 10,000 ft. (minus 170 to 3,048 m).
         3. Operating humidity: 15 to 95 percent noncondensing.
         4. Storage temperature: Minus 4 to 122 degrees F (minus 20 to 50 degrees C).
         5. Storage humidity: 15 to 95 percent noncondensing.
      6. Monitor Radio Wireless Network Interface: IEEE 802.11 a/b/g.
      7. Security, Encryption, and Authentication: WEP: 64 and 128, WPA2/AES: PSK or 802.1x authentication including EAP-TLS, EAP-TTLS and EAP-PEAP.

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if not required.

* + 1. Basis of Design: Connex Integrated Wall System.
       1. Integrated, wall-mounted system combining physical assessment tools (otoscope and ophthalmoscope) with electronic vital signs monitoring. Monitoring of noninvasive blood pressure, pulse rate, temperature, and blood oxygen levels (Sp02). Ability to manually enter patient observational data and additional vital signs.

\*\* NOTE TO SPECIFIER \*\* Delete model not required, or retain both if both required.

* + - 1. Model 8400 - NIBP, SpO2 (choice of Masimo or Nellcor) Optional Temp (Tympanic or Oral), Otoscope, Ophthalmoscope (coaxial or PanOptic) USB, Ethernet, Upgradeable to WiFi (802.11 a/b/g).
      2. Model 8500 - NIBP, SpO2 (choice of Masimo or Nellcor) Optional Temp (Tympanic or Oral), Otoscope, Ophthalmoscope (coaxial or PanOptic) USB, Ethernet, Integrated WiFi (802.11 a/b/g).
      3. Standards Compliance:
         1. ANSI/AAMI SP10.
         2. AS/NZS 3200.1.01.
         3. ASTM D 4332, E 1104.
         4. CAN/CSA C22.2 NO.601.1.1.
         5. CAN/CSA-C22.2 NO.60601-1-2,
         6. CSA Z9919.
         7. EN 1060-1.
         8. EN 1060-3.
         9. EN 1060-4.
         10. EN/IEC 60601-1.
         11. EN/IEC 60601-1-2.
         12. EN/IEC 60601-1-4.
         13. EN/IEC 60601-1-6.
         14. EN/IEC 60601-1-8.
         15. EN/IEC 60601-2-30.
         16. EN/IEC 60601-2-49.
         17. EN/IEC 62304.
         18. EN/ISO 9919.
         19. EN/ISO 13485.
         20. EN/ISO 14971.
         21. ISTA 2A.
         22. UL 60601-11.
      4. SureBP 15-second NIBP and pulse rate.
      5. Adult, pediatric, neonatal blood pressure modes.
      6. Spot check, monitoring and triage modes.

\*\* NOTE TO SPECIFIER \*\* Thermometry is optional. Delete one or both.

* + - 1. SureTemp Plus ear thermometry. (optional, account preference).
      2. Braun ThermoScan PRO 4000 ear thermometry. (Optional, account preference).

\*\* NOTE TO SPECIFIER \*\* Delete one of the two following subparagraphs.

* + - 1. Masimo SpO2 algorithms, both sensors and signal processing. (Optional, account preference).
      2. Nellcor SpO2 algorithms, both sensors and signal processing. (Optional, account preference).
      3. Programmable visual and audible alarms for BP, SpO2, temperature, and pulse.
      4. PartnerConnect service software-ready for software-driven repairs and upgrades.
      5. 4 USB accessory ports.

\*\* NOTE TO SPECIFIER \*\* Optional. Delete if not required.

* + - 1. Masimo noninvasive continuous monitoring of total hemoglobin.

\*\* NOTE TO SPECIFIER \*\* Optional. Delete if not required.

* + - 1. Bar code scanning.

\*\* NOTE TO SPECIFIER \*\* Optional. Delete if not required.

* + - 1. Interface to select digital weight scales.
      2. Manual measurements entry (weight, height, respiration rate, pain) and documentation of modifiers, like body position and O2 therapy.
      3. Large color touchscreen simplifies training and operation.
      4. Complete error messages for easy troubleshooting.
      5. Fully customizable USB configuration cloning.
      6. Integrated 3.5 V handles for physical assessment instruments.
      7. Integrated ear speculum dispenser.
      8. Physical Characteristics:
         1. Height 10.56 in. (268 mm).

\*\* NOTE TO SPECIFIER \*\* Delete width not required.

* + - * 1. Width 37.80 in. (960 mm).
        2. Width with Braun thermometer 39.92 (1014 mm).

\*\* NOTE TO SPECIFIER \*\* Delete depth not required.

* + - * 1. Depth 4.92 in. (124 mm).
        2. Depth with Braun thermometer 7.51 (191 mm).
        3. Weight (including battery): 14.1 lb. (6.4 kg).
        4. Power Cord Length: 96 in (2438 mm).
        5. Graphical Display Area (W x H): 8 x 4 in (203 x 102 mm).
        6. Speaker volume: Output sound pressure: 57 dB at 39.37 in (1000 mm).
      1. Battery Composition: Lithium-ion.
      2. Nurse Call Connection: 25 VAC or 60 VDC maximum at 1 A maximum.
      3. Non-Invasive Blood Pressure Analysis:
         1. Systolic Range:

Adult: 30 to 260 mmHg (StepBP, SureBP).

Pediatric: 30 to 260 mmHg (StepBP, SureBP).

Neonate: 20 to 120 mmHg (StepBP).

* + - * 1. Diastolic Range:

Adult: 20 to 220 mmHg (StepBP, SureBP).

Pediatric: 20 to 220 mmHg (StepBP, SureBP).

Neonate: 10 to 110 mmHg (StepBP).

* + - * 1. Blood pressure determination time typical: 15 seconds (SureBP).
        2. Accuracy meets or exceeds ANSI.AAMI SP10.

\*\* NOTE TO SPECIFIER \*\* Delete temperature subparagraph not required.

* + - 1. Temperature: SureTemp range, 80 to 110 degrees F (26.7 to 43.3 degrees C).
         1. Probe Cord Length: 108 in (2743 mm).
      2. Temperature: Braun range, 68 to 108 degrees F (20.0 to 42.2 degrees C).
      3. SpO2 Performance Range: 1 to 100 percent.
         1. SpO2 Cable Length: 120 in (3048 mm).
      4. Environmental:
         1. Operating temperature: 50 to 104 degrees F (10 to 40 degrees C).
         2. Operating altitude: Minus 557 to 10,000 ft. (minus 170 to 3,048 m).
         3. Operating humidity: 15 to 95 percent noncondensing.
      5. Handle Output: 3.00 to 3.90 V, 0.70 to 1.50 A.
         1. Power Cord Length: 144 in (3658 mm).
      6. Electrical Rating: 100 to 240 VAC, 50 to 60 Hz, 0.8 to 1.5 A.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. CONTINUOUS MONITORING SYSTEMS
     1. Basis of Design: Connex Vital Signs Monitor with ETCo2.
        1. Monitors capable of supporting a combination of NIBP, SpO2, SpHb, pulse rate, and temperature.
           1. Model 6400: Includes nurse call, ethernet, and USB connectivity.

Radio.

* + - 1. Standards Compliance:
         1. ANSI/AAMI SP10.
         2. AS/NZS 3200.1.0.
         3. ASTM D 4332, E 1104.
         4. CAN/CSA C22.2 NO.601.1.
         5. CAN/CSA-C22.2 NO.60601-1-2.
         6. CSA Z9919.
         7. EN 1060-1.
         8. EN 1060-3.
         9. EN 1060-4.
         10. EN/IEC 60601-1.
         11. EN/IEC 60601-1-2.
         12. EN/IEC 60601-1-4.
         13. EN/IEC 60601-1-6.
         14. EN/IEC 60601-1-8.
         15. EN/IEC 60601-2-30.
         16. EN/IEC 60601-2-49.
         17. EN/IEC 62304.
         18. EN/IEC 62366.
         19. EN/ISO 9919.
         20. EN/ISO 13485.
         21. EN/ISO 14971.
         22. EN/ISO 21647.
         23. ISTA 2A.
         24. UL 60601-1.
         25. USFDA 21 CFR Subchapter H - Medical Devices.
         26. Australian Therapeutic Goods Act: 2002 No. 236.
         27. EEC Medical Devices Directive: 93/42/EEC.
         28. EEC Medical Devices Directive 2007 Amendment: 2007/47/EC.
         29. EEC Packaging Directive: 94/62/EC.
         30. EEC Waste Electrical and Electronic Equipment Directive: 2002/96/EC.
         31. EEC Batteries and Accumulators Directive: 2006/66/EC.
         32. CMD Regulation: SOR/98-282.
         33. IATA DGR. - Dangerous Goods Regulation.
         34. United Nations Manual of Tests and Criteria: ST/SG/AC.10/11, Part III, Sub-Section 38.3.
      2. Physical Characteristics:
         1. Electrical rating: 100 to 240 VAC, 50 to 60 Hz, 0.8X to 1.5 A.
         2. Duty Cycle: Continuous operation.
         3. Protection Against Electric Shock: Class I internally powered.
         4. Degree of Protection Against Electric Shock, for Parts Applied to Patients: Type BF defibrillator proof IEC EN 60601-1.

Defibrillator recovery Time After Discharge: Less than or equal to 10 seconds.

* + - * 1. Flammable Anesthetics: Not suitable for use with flammable anesthetics.
        2. Degree of Protection by Enclosure from Harmful Ingress of Liquids: IPX0. Non-protected according to EN/IEC 60529; Pulse oximeter equipment complies with ISO 9919 Cl. 44.6 Ingress of liquids tests and EN/IEC 60601-1, 60601-2-30, 60601-2-49 Cl. 44.3 Spillage tests.

\*\* NOTE TO SPECIFIER \*\* Delete chassis type not required.

* + - * 1. Standard Chassis:

Height: 10 in. (254 mm).

Width: 11 in. (279 mm).

Depth: 6 in. (152 mm).

Weight (including battery): 9.5 lb (4.3 kg).

* + - * 1. Extended Chassis:

Height: 10 in. (254 mm).

Width: 11.38 in. (289 mm).

Depth: 7.5 in. (191 mm).

Weight (including battery): 10.4 lb (4.7 kg).

* + - 1. Graphical Display Resolution:
         1. Display Area: (H x V): 9 8 x 4 in(195 x 113 mm).
         2. Pixels: 1024 (H) x 600 (V).
         3. Pixel Arrangement: RGB (red, green, blue).
         4. Color Depth: 16 bits per pixel.
      2. Speaker Volume: 67 dB at 39.37 in (1000 mm) output sound pressure.
      3. Alarm and Pulse Tones: per IEC 60601-1-8.
         1. Pulse Frequency (f0): 150 to 1000 Hz.
         2. Number of Harmonic Components in 300 to 4000 Hz Range: Minimum of 4.
         3. Effective Pulse Duration (td):

High Priority: 75 to 200 ms.

Medium and Low Priority: 125 to 250 ms.

* + - * 1. RiseTime (tr): 10 to 20 percent of td.
        2. Fall time 1(tf): tf les than ts minus tr.
      1. Relative Sound Pressure Level Range of Harmonic Components: Within 15 dB above or below the amplitude at the pulse frequency.

\*\* NOTE TO SPECIFIER \*\* Delete battery type not required.

* + - 1. Battery Specifications: 6 cell.
         1. Rating: 11.1 V 3.80A (42W).
         2. Composition: Lithium-ion.
         3. Charge Time: 2 hr 7 m to 80 percent capacity, 3 hr to 100 percent capacity.
         4. Patient Exams per Charge: 26.
         5. Age to 70 Percent Capacity: 300.
         6. Operating Time per Charge for Continuous Monitoring: Do not use.
      2. Battery Specifications: 9 cell.
         1. Rating: 10.8 V 6.75A (73 W).
         2. Composition: Lithium-ion.
         3. Charge Time: 2 hr 25 m to 80 percent capacity, 4 hr to 100 percent capacity.
         4. Patient Exams per Charge: 47.
         5. Age to 70 Percent Capacity: 300.
         6. Operating Time per Charge for Continuous Monitoring: 2 hr (only if clinician remains in the room).
      3. Ethernet Connection: Communicates using 10 base-T and 100 base T.
      4. Nurse Call Connection: 25 VAC or 60 VDC maximum at 1A maximum.
      5. Non-Invasive Blood Pressure Analysis (NIBP):
         1. Cuff Pressure Range: Meets or exceeds IEC/ISO 80601-2-30 standards for cuff pressure range.
         2. Systolic Range:

Adult: 30 to 260 mmHg (StepBP, SureBP).

Pediatric: 30 to 260 mmHg (StepBP, SureBP).

Neonate: 20 to 120 mmHg (StepBP).

* + - * 1. Diastolic Range:

Adult: 20 to 220 mmHg (StepBP, SureBP).

Pediatric: 20 to 220 mmHg (StepBP, SureBP).

Neonate: 10 to 110 mmHg (StepBP).

* + - * 1. Cuff Inflation Target:

Adult:160 mmHg (StepBP).

Pediatric: 140 mmHg (StepBP).

Neonate: 90 mmHg (StepBP).

* + - * 1. Maximum Target Pressure:

Adult: 280 mmHg (StepBP, SureBP).

Pediatric: 280 mmHg (StepBP, SureBP).

Neonate: 130 mmHg (StepBP).

* + - * 1. Blood Pressure Determination Time: 15 seconds, 150 seconds maximum.
        2. Blood Pressure Accuracy: Meets or exceeds ANSI.AAMI SP10 standards for noninvasive blood pressure accuracy (plus or minus 5 mmHg mean error, 8 mmHg standard deviation).
        3. Mean Arterial Pressure (MAP) Range: The formula used to calculate MAP yields an approximate value.

Adult: 23 to 230 mmHg (StepBP, SureBP).

Pediatric: 23 to 230 mmHg (StepBP, SureBP).

Neonate: 13 to 110 mmHg (StepBP).

* + - * 1. Pulse rate range (using blood pressure determination).

Adult: 30 to 200 bpm (StepBP, SureBP).

Pediatric: 30 to 200 bpm (StepBP, SureBP).

Neonate: 35 to 220 bpm (StepBP).

* + - * 1. Pulse Rate Accuracy: Using blood pressure determination, plus or minus 5.0 percent (plus or minus 3 bpm).
        2. Overpressure Cutoff:

Adult: 300 mmHg, plus or minus 15 mmHg.

Pediatric: 300 mmHg, plus or minus mmHg.

Neonate: 150 mmHg maximum.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. SureTemp Plus Temperature Module:
         1. Temperature range: 80 to 110 degrees F (26.7 to 43.3 degrees C).
         2. Calibration accuracy: Plus or minus 0.2 degrees F (plus or minus 0.1 degrees C) direct mode.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Braun ThermoScan PRO 4000 Thermometer:
         1. Temperature range: 68 to 108 degrees F (20 to 42.2 degrees C).
         2. Calibration accuracy: 95.9 to 107.6 degrees F (35.5 to 42 degrees C).

Plus or minus 0.4 degrees F (plus or minus 0.2 degrees C).

Plus or minus 0.5 degrees F (plus or minus 0.25 degrees C) for temperatures outside of this range.

* + - * 1. Display Resolution: 0.1 degrees F or degrees C.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. SpO2 Monitoring: Nelcor.
         1. Measurement Range:1 to 100 percent.
         2. Saturation Accuracy:

Module:

Plus or minus 3 digits.

70 to 100 percent.

Adult, Pediatrics: Plus or minus 2 digits.

Neonate: Plus or minus 3 digits.

Low Perfusion: 0.02 to 20 percent, plus or minus 2 digits.

Sensors: 60 to 80 percent.

MAX-AI, MAX-PI, and MAX-II: Plus or minus 3 digits.

Sensors: 70 to 100 percent.

DS-100A: Plus or minus 3 digits.

D-YS: Infants, pediatrics, and adults; plus or minus 3 digits.

D-YS: Neonates; plus or minus 4 digits.

D-YSE: Plus or minus 4 digits.

D-YSPD: Plus or minus 4 digits.

MAX-AI, MAXPI, MAX-II: Plus or minus 2 digits.

OXI-A/N: Adults; plus or minus 3 digits.

OXI-A/N: Neonates; plus or minus 4 digits.

OXI-P/I: Plus or minus 3 digits.

Pulse Rate:

Measurement Range: 20 to 250 beats per minute.

Accuracy: Plus or minus 3 digits.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. SpO2 monitoring: Masimo.
         1. Measurement Range:1 to 100 percent.
         2. Saturation Accuracy:

Sensors: 70 to 100 percent.

No Motion:

Plus or minus 2 percent for adults, infants, and pediatrics.

Plus or minus 3 percent for neonates.

Motion: Plus or minus 3 percent for adults, infants, pediatrics, and neonates.

Low Perfusion: Plus or minus 2 percent for adults, infants, pediatrics, and neonates.

Resolution: 1 percent.

* + - * 1. Perfusion Index Measurement Range: 0.1 to 20.0 percent.
        2. Pulse rate:

Measurement Range: 25 to 240 beats per minute.

Accuracy:

No Motion: Plus or minus 3 bpm for adults, infants, pediatrics, and neonates.

Motion: Plus or minus 5 bpm for adults, infants, pediatrics, and neonates.

Low Perfusion: Plus or minus 3 bpm for adults, infants, pediatrics, and neonates.

Resolution: 1 beat per minute.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. CLINICAL SURVEILANCE SYSTEMS
     1. Basis of Design: Welch Allyn, Connex Clinical Surveillance System as manufactured by Hillrom.
        1. Electronic Vitals Documentation: Patient vitals are sent from the bedside to the electronic medical record (EMR), giving clinicians immediate access to accurate patient vitals information anytime, anywhere.
        2. Respiratory Monitoring: Continuous monitoring of a patient's comprehensive respiratory and vital sign status helps clinicians respond earlier to signs of respiratory distress or deterioration. Choose from leading industry technologies:
           1. Covidien Microstream Capnography (CO2 ) measures breath-to-breath ventilatory status.
           2. Masimo Acoustic Respiratory Monitoring (RRa) noninvasively and continuously assesses patient respiration rate.
           3. Continuous pulse oximetry (SpO2) alerts clinicians to desaturation patterns indicative of repetitive reductions in airflow.
           4. Provides alarms to quickly recognize respiratory distress.
        3. Connex Central Station: Provides clinicians with comprehensive status of all monitored patients at a glance, for improved patient safety and clinical decision-making.
           1. Intermittent vitals and continuous monitoring data are automatically documented into the patient chart.
           2. Provides alerts at the central station, and connections to communications integration software so alarms can be sent directly to clinicians where and when they need it.
           3. Visual and audible indications and optional hallway displays allow staff to view patient status while away from the bedside.
           4. Designed for the med/surg environment to help to reduce nuisance alarms.
        4. Connex Service Dashboard: Enables clinical engineering staff to proactively manage and troubleshoot in real-time all Connex Vital Signs Monitors and Central Stations on your hospital network.
           1. Helps schedule required maintenance to ensure device availability with maximum up-time and that the latest firmware is installed
           2. Enhances troubleshooting and installation assistance from the Technical Support Center and your IT, biomed department
           3. Enhances learning through troubleshooting and quick issue resolution via data-sharing and debugging capabilities.

1. EXECUTION
   1. EXAMINATION
      1. Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify conditions that may be detrimental to proper or timely completion.
      2. Do not proceed until unsatisfactory conditions have been corrected.
   2. INSTALLATION
      1. General: Install per manufacturer's written instructions and in proper relationship with adjacent construction.
      2. Testing: Test per manufacturer's written instructions. Adjust until satisfactory results are obtained. If satisfactory results cannot be obtained, replace unit at no additional cost to the Owner.
   3. CLEANING AND PROTECTION
      1. Protect from damage during construction operations. Promptly repair any damaged surfaces. Remove and replace work which cannot be satisfactorily repaired.
      2. Clean products, prior to Substantial Completion, using materials recommended by the manufacturer.

END OF SECTION