Automation Partner of

inpeco
automation in healthcare

# Aptio Automation
## Technical Specifications

**SIEMENS**
**Healthineers**

# Start Planning Your Transformation to Increased Productivity

**Bring proven experience and efficiency to total laboratory automation. Aptio® Automation combines Siemens Healthineers workflow expertise with intelligent technologies in flexible, track-based solutions designed to drive laboratory productivity for years to come. By providing a full complement of pre- and post-analytical sample-processing modules along with comprehensive analytics, Aptio Automation is designed to address the needs of medium- to very-high-volume laboratories.**

**Please consult your local representative for a list of all Siemens Healthineers and third-party* intra-analytical instruments that can be connected to Aptio Automation.**

## Needs-based flexibility that includes open connectivity

For nearly two decades, Siemens Healthineers has successfully designed track-based automation solutions that effectively combine clinical disciplines, test methodologies, and analyzer capacities using our portfolio alone. We continue to offer an extensive diagnostics portfolio to meet your multidisciplinary testing and workload requirements for on-track chemistry, immunoassay, hematology, hemostasis, and plasma protein testing. Designed to be automation-ready, our instruments also allow direct front-loading of urgent and low-volume samples to meet your most critical deadlines.

By collaborating with Inpeco, a leader in clinical laboratory automation, we are now able to also promote an expanding range of diagnostics analyzers from other manufacturers* to address specialty testing needs. Please consult your local Siemens Healthineers representative for a current list of instruments and connectivity interfaces available for Aptio Automation in your area.

Technical specifications associated with Siemens Healthineers portfolio of automation-ready, multidisciplinary instruments are published separately. Consult third-party manufacturers and/or vendors for technical specifications associated with non-Siemens Healthineers instrumentation.

## End-to-end project management

Siemens Healthineers has successfully delivered multidisciplinary, track-based total laboratory automation solutions to customers in more than 50 countries since 1998. From start to finish, your automation project will be managed by a Siemens Healthineers project manager.

The process begins with a workflow analysis guided by our consultants experienced in Lean and Six Sigma practices to determine the specific system requirements based on laboratory needs. Your Aptio Automation configuration will be designed and validated by Siemens Healthineers before being custom-manufactured by Inpeco. Each component is tested prior to installation by your Siemens Healthineers implementation team, and the overall solution's functionality and performance is verified prior to analytical production. And we are committed to ongoing health checks to maintain or improve the solution's efficiency in years to come.

*Connectivity to third-party analyzers may not be available in all countries. Analyzer availability may vary by country, and connectivity will require manufacturer agreement. Please contact your local Siemens Healthineers representative for further information.
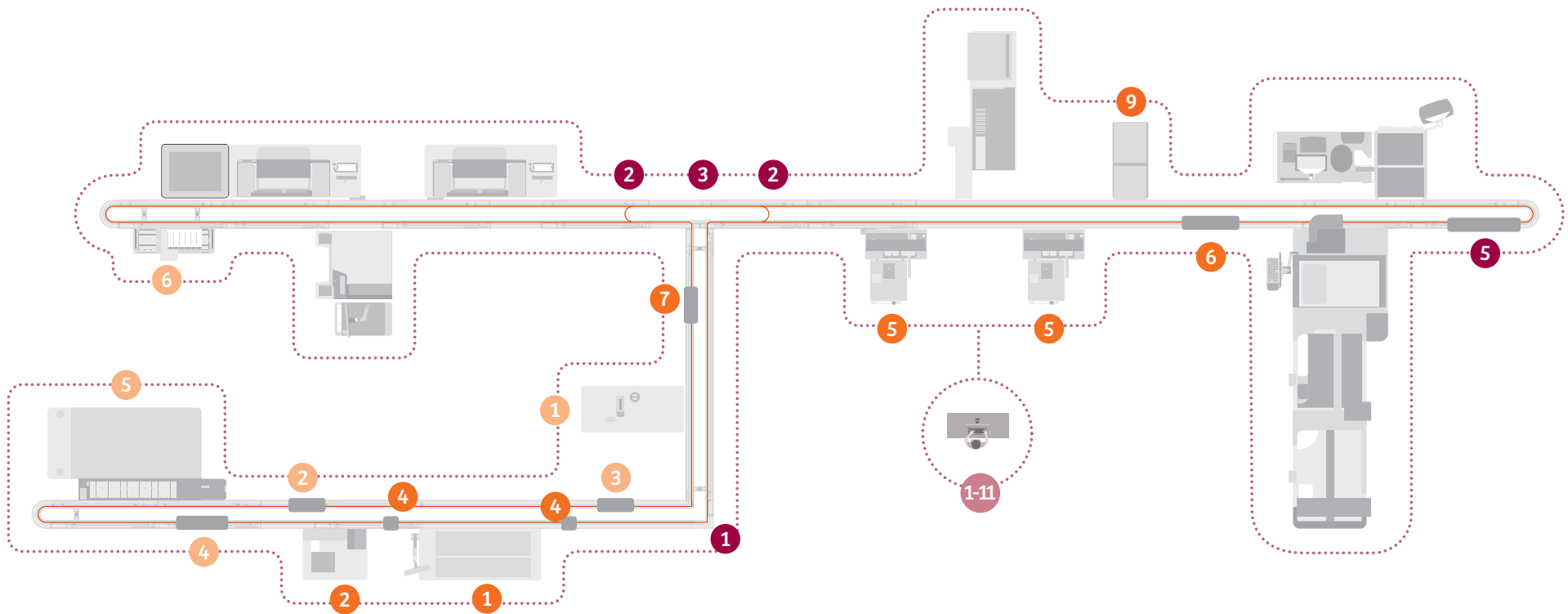
| Pre-analytical Modules | Choose the modules that make sense for your laboratory's workload, including multiples of individual components. | |
|---|---|---|
| | 1. Input/Output Module | 6. Decapper Module |
| | 2. Bulk Input Module† | 7. Sample Volume Detection Module§ |
| | 3. Rack Input Module (not shown) | 8. Sample Mixer Module (not shown) |
| | 4. Tube Inspection Module‡ | 9. Wide Belt Buffer Module |
| | 5. Centrifuge Module | |

†Automated tube feed options available.
‡If selected, a Tube Inspection Module will be required for each Input Module on the track.
§Uncapped plasma and serum samples only.

| Post-analytical Modules | Eliminate labor-intensive, time-consuming work when distributing, storing, and/or disposing of samples. | |
|---|---|---|
| | 1. Aliquotter Module | 5. Storage Retrieval and Disposal Module |
| | 2. Aliquot Capper Module | 6. Rack Output Module |
| | 3. Sealer Module | 7. High-capacity Waste System** (not shown) |
| | 4. Desealer Module | |

**Under development. Not available for sale. Future availability is not guaranteed.

| Flexible Track Design Options | Customize a configuration to help maximize your use of space and staff. | |
|---|---|---|
| | 1. Track L (right or left turn) | 4. Automation Module Divert Lane (not shown) |
| | 2. Track U-Turn | 5. Generic Slot |
| | 3. Track T Intersection | |

| Integrated Sample Management Software | Apply patient-centric rules to automate workflows for increased productivity and consistent quality. | |
|---|---|---|
| | 1. Intelligent Routing: Test Prioritization, Tube Type, Sorting, Disposal | 6. One-click Sample Retrieval |
| | 2. STAT Prioritization | 7. Autoverification†† |
| | 3. Reflex Testing Criteria | 8. Algorithm-driven Testing†† |
| | 4. Integrated QC Management†† | 9. Exception Management |
| | 5. Add-on Test Management | 10. Instrument Status |
| | | 11. Module Status, and More |

††Some advanced functionality may be subject to LIS capabilities or will require CentraLink® Data Management System. Labs can also choose to incorporate Atellica™ PM 1.0 Software to further expand their process-management capabilities.

# Aptio Automation Module Specifications

## Pre-analytical modules

### Input/Output Module
Routine and STAT tube input, output, sort, and priority output

**Weight:** 642 lb (292 kg)
**Dimensions (mm):** 2340 L x 1515 H x 775 D
**Power Consumption:** 650 VA
**Max. Capacity:** 780 tubes, 15 racks, 48 positions (routine input, output, and sort); 5 racks, 12 positions (STAT input and priority output)
**Throughput (tubes/hour):** Up to 750 tubes during simultaneous input and output

### Bulk Input Module
High-speed tube input by bulk tube load

**Weight:** 315 lb (143 kg)
**Dimensions (mm):** 985 L x 1235 H x 790 D
**Power Consumption:** 160 VA
**Max. Capacity:** 700 tubes
**Throughput (tubes/hour):** Up to 1000

### Rack Input Module
High-speed tube input by rack

**Weight:** 231 lb (105 kg)
**Dimensions (mm):** 1225 L x 1260 H x 510 D
**Power Consumption:** 950 VA
**Max. Capacity:** 288 tubes
**Throughput (tubes/hour):** Up to 800

### Tube Inspection Module
Detects and manages mismatches between tube type and test request[‡]

**Weight:** N/A
**Dimensions (mm):** Incorporated module
**Power Consumption:** 150 VA
**Throughput (tubes/hour):** Up to 1000

### Centrifuge Module

**Weight:** 919 lb (417 kg)
**Dimensions (mm):** 945 L x 1510 H x 1155 D
**Power Consumption:** 2950 VA
**Max. Capacity:** 80 tubes
**Throughput (tubes/hour):** Up to 300 with 10-min spin

### Decapper Module

**Weight:** 13 lb (6 kg)
**Dimensions (mm):** 510 L x 1100 H x 120 D
**Power Consumption:** 192 VA
**Max. Capacity:** 2000 waste caps
**Throughput (tubes/hour):** Up to 800

### Sample Volume Detection Module

**Weight:** N/A
**Dimensions (mm):** Incorporated module
**Power Consumption:** 200 VA
**Max. Capacity:** N/A
**Throughput (tubes/hour):** Up to 500

### Sample Mixer Module

**Weight:** N/A
**Dimensions (mm):** Incorporated module
**Power Consumption:** 625 VA
**Max. Capacity:** Four tubes
**Throughput (tubes/hour):** Up to 700[‡]

### Wide Belt Buffer Module (240)

**Weight:** 176 lb (80 kg)
**Dimensions (mm):** 535 L x 1045 H x 1200 D
**Power Consumption:** 300 VA
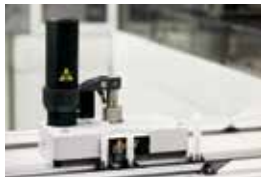**Max. Capacity:** 240 tubes

### Wide Belt Buffer Module (600)

**Weight:** 267 lb (121 kg)
**Dimensions (mm):** 1230 L x 1045 H x 1075 D
**Power Consumption:** 300 VA
**Max. Capacity:** 600 tubes

# Flexible track design options

### Track
**Weight:** Variable
**Dimensions (mm):** Variable
**Power Consumption:** Variable
**Throughput (tubes/hour):** Up to 3600

### Track L-Turn
(Right or left turn)
**Weight:** 227 lb (103 kg)
**Dimensions (mm):** 856 L x 1045 H x 875 D

### Track U-Turn
Provides shortcuts for improved workflow
**Weight:** N/A
**Dimensions (mm):** Incorporated module

### Track T-Intersection
Enables spur configurations
**Weight:** N/A
**Dimensions (mm):** 975 L x 1045 H x 350 D

### Automation Module Divert Lane
Prevents congestion of samples that do not require module management
**Weight:** Variable
**Dimensions (mm):** 1000–2300 L

### Track Head
**Weight:** N/A
**Dimensions (mm):** 430 L x 885 H x 196 D

## Post-analytical modules

### Aliquotter Module
**Weight:** 460 lb (209 kg)
**Dimensions (mm):** 705 L x 1475 H x 1590 D
**Power Consumption:** 500 VA
**Max. Capacity:** Four secondary tubes per primary tube
**Throughput (tubes/hour):** Up to 400§§

### Aliquot Capper Module
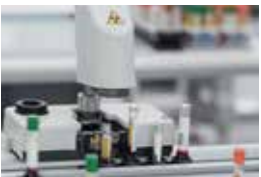Screw-type recapper for daughter aliquot tubes
**Weight:** N/A
**Dimensions (mm):** 860 L x 1055 H x 120 D
**Power Consumption:** 60 VA
**Max. Capacity:** 1000 caps
**Throughput (tubes/hour):** Up to 400

### Tube Sealer Module
(mandatory with RSM)
**Weight:** N/A
**Dimensions (mm):** 860 L x 1155 H x 120 D
**Power Consumption:** 180 VA
**Max. Capacity:** 16,000 or 19,000 seals/cartridge
**Throughput (tubes/hour):** Up to 800

### Tube Desealer Module
Automatic tube desealing for rerun, reflex, and add-on testing
**Weight:** N/A
**Dimensions (mm):** 510 L x 1100 H x 120 D
**Power Consumption:** 60 VA
**Max. Capacity:** N/A
**Throughput (tubes/hour):** Up to 200

### Refrigerated Storage Module (15,000)
Automatic storage, retrieval, and disposal of sealed tubes
**Weight:** 2965 lb (1345 kg)
**Dimensions (mm):** 2460 L x 2485 H x 1405 D
**Power Consumption:** 3250 VA
**Max. Capacity:** 15,360 tubes
**Throughput (tubes/hour):** Up to 800

### Refrigerated Storage Module (9000)
Automatic storage, retrieval, and disposal of sealed tubes
**Weight:** 2255 lb (1023 kg)
**Dimensions (mm):** 2460 L x 2175 H x 1405 D
**Power Consumption:** 3250 VA
**Max. Capacity:** 9216 tubes
**Throughput (tubes/hour):** Up to 800

### Rack Output Module
High-speed tube output by rack
**Weight:** 225 lb (102 kg)
**Dimensions (mm):** 1225 L x 1260 H x 510 D
**Power Consumption:** 950 VA
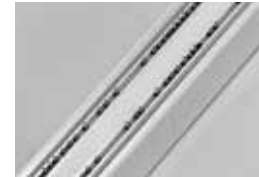**Max. Capacity:** 288 tubes
**Throughput (tubes/hour):** Up to 800
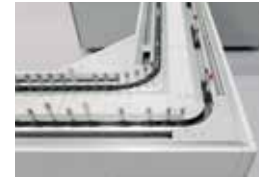
### High-capacity Waste System
Bulk tube disposal

Under development. Not available for sale. Future availability is not guaranteed.

‡‡Throughput based on four cycles with wait time for UP position set at 300 ms.
§§Based on 80 primary tubes, 4 secondary tubes per primary tube, dispensing 200 μL in each secondary tube. Secondary tube: 93 * 13 mm, 3 mL max. fill.

Note: Weight has been measured for all modules without samples or consumables. Some modules are incorporated into the track, and weight may vary by configuration. Maximum physical dimensions have been determined from a combination of 2-D drawings (length and width) and by measuring the actual height. Throughput claims have been obtained during testing, under optimal conditions.

# Aptio Automation
# Built-in IT Components

## IT specifications

1. Operating system:
   Ubuntu Server 12.04 LTS, 64-bit

2. Hardware: Dell server with hardware RAID controller in one of four sizes (see table). The server's RAID disk controller must be a hardware controller, not a software controller. Do not install data-management software on a server equipped with anything other than a hardware RAID controller.

3. Keyboard

4. Monitor

5. Firewall: Cisco 819 Integrated Service Router in hardened factor form

6. Serial device server: Moxa NPORT 5110 (serial-to-Ethernet converter, one device for each instrument serial port to be configured as communication channel)

### Server details: Size 1, 2, 3, and 4***

| Product Features | Server Size 1 (up to 8 analyzers) | Server Size 2 (from 9 to 14 analyzers) | Server Size 3 (from 15 to 20 analyzers) | Server Size 4 (from 21 to 30 analyzers) |
|---|---|---|---|---|
| Type | Rack | Rack | Rack | Rack |
| Manufacturer | Dell | Dell | Dell | Dell |
| Model | PowerEdge R630 | PowerEdge R630 | PowerEdge R630 | PowerEdge R630 |
| Processor | Intel Xeon E5-2620 v3 6 Core @ 2.40 GHz | Intel Xeon E5-2620 v3 6 Core @ 2.40 GHz | Intel Xeon E5-2620 v3 6 Core @ 2.40 GHz | Intel Xeon E5-2680 v3 12 Core @ 2.50 GHz |
| Number of Processors | 1 | 1 | 2 | 2 |
| Memory | 32 GB DDR4 | 64 GB DDR4 | 96 GB DDR4 | 128 GB DDR4 |
| Internal Storage | 3 x 300 GB SAS HDDs | 6 x 300 GB SAS HDDs | 8 x 300 GB SAS HDDs | 8 x 600 GB SAS HDDs |
| Network Interfaces | 4 x 1 GB Ethernet Ports | 4 x 1 GB Ethernet Ports | 4 x 1 GB Ethernet Ports | 4 x 1 GB Ethernet Ports |
| RAID Controller | HW RAID 1 GB NV Cache (RAID 0, RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, RAID 60) | HW RAID 1 GB NV Cache (RAID 0, RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, RAID 60) | HW RAID 1 GB NV Cache (RAID 0, RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, RAID 60) | HW RAID 1 GB NV Cache (RAID 0, RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, RAID 60) |
| Power Supply | Dual Redundant 495 W | Dual Redundant 495 W | Dual Redundant 495 W | Dual Redundant 750W |
| Optical Drive | DVD-ROM SATA | DVD-ROM SATA | DVD-ROM SATA | DVD-ROM SATA |
| Ports | USB (2 Front, 4 Rear, 1 Internal) 1 Serial and Video | USB (2 Front, 4 Rear, 1 Internal) 1 Serial and Video | USB (2 Front, 4 Rear, 1 Internal) 1 Serial and Video | USB (2 Front, 4 Rear, 1 Internal) 1 Serial and Video |
| Remote Management | iDRAC8 Enterprise | iDRAC8 Enterprise | iDRAC8 Enterprise | iDRAC8 Enterprise |
| Support | 3 Years Next Business Day On-site | 3 Years 4 Hours Mission Critical On-site | 3 Years 4 Hours Mission Critical On-site | 3 Years 4 Hours Mission Critical On-site |

***Please consult Siemens Healthineers for IT requirements needed to support Aptio Automation solutions that connect more than 30 analyzers.

# Aptio Automation Environmental Specifications

## Installation

Aptio Automation installation is managed by a Siemens Healthineers project manager and installation team. The team determines the specific system requirements based on the laboratory needs. The final configuration is fully tested to ensure functionality.

## Preventive maintenance frequency

There are four Siemens Healthineers preventive maintenance visits per year for Aptio Automation; multiple pieces of equipment can be serviced during each visit.

## Electrical requirements

Aptio Automation, including its modules, has a single dedicated power connection. This connection must be hardwired with a main disconnect device convenient to the system. Each analyzer connected to Aptio Automation requires a separate power supply; refer to each analyzer's specifications for power requirements.

### Current/operating power requirements

| Main Line Requirements | | Value |
|---|---|---|
| Frequency | | 50/60 Hz |
| Voltage Fluctuations | | Up to ±10% |
| Main Line Voltages | System Size | VA |
| Single Phase 230 V Nominal | Small | 3680 |
| Single Phase 230 V Nominal | Medium | 9200 |
| Three Phase 400 V Nominal | Large | 3N-27600 |

### Operating environment

**Room temperature**
Range: 60–86°F (16–30°C)

**Relative humidity**
Maximum: 80% at 86°F (30°C)

**Average thermal output**
The average thermal output is calculated when the final configuration is determined.

## Compressed air

Aptio Automation requires an external source of compressed air. The flow rate requirement is calculated based on the final configuration. A shutoff valve and pressure gauge must be installed near Aptio Automation.

## Code compliance

### Electromechanical safety

The system meets the code compliance requirements of the standards listed in this section. It is marked for electromechanical safety compliance in North America and the European Union as follows:

- IEC 61010-1 (Edition 2)
- UL 61010-1 (Edition 2)
- IEC 61010-2-051 (Edition2)
- IEC 61010-2-081 (Edition 1; A1:2003)
- IEC 61010-2-101 (Edition 1)
- CSA C22.2 No. 61010-1-04
- CSA C22.2 No. 61010-2-051-04
- CSA C22.2 No. 61010-2-081-04
- CSA C22.2 No. 61010-2-101-04

**Electromagnetic compatibility (EMC)**
The system complies with the emission and immunity requirements of IEC 55011:2007 + A2:2007 for Group 1 Class A products.

**Intentional radiator**
The system contains a radio frequency identification system for tracking sample carriers, which is an intentional radiator. The system has been tested, meets the requirements, and is licensed according to the requirements of Part 15 of the U.S. Federal Communication Commission (FCC) regulations. The system has been tested and meets the applicable requirements of EST:EN 300 330.2 V1.5.1 (2010-02) and ESTi:EN 301 489 3 V1.6.1 (2013-08).

**Laser radiation**
Some modules contain Class 1 and Class 2 laser devices. Modules containing laser devices meet the requirements of IEC 60825-1 and U.S. Food and Drug Administration regulations 21 CFR 1040. Opaque barriers prevent Class 2 laser radiation from leaving the system. The system is appropriately labeled and includes the following warning in required areas: Do not stare into beam.

## Acceptable tube types

The following tube types are compatible with Aptio Automation:

- VACUETTE, Greiner Bio-One: 13 x 100, 16 x 100, 13 x 75
- VACUTAINER HEMOGARD Tube Closure, BD (Becton, Dickinson and Company): 13 x 100, 16 x 100, 13 x 75
- S-MONOVETTE, Sarstedt: 13 x 100, 13 x 75, 16 x 100, 16 x 75
- VENOSAFE, Terumo: 13 x 100, 16 x 100, 13 x 75
- KIMA, Vacutest: 13 x 100, 16 x 100, 13 x 75

(Nominal measurements D x H, mm)

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Product availability may vary from country to country and is subject to varying regulatory requirements. Please contact your local representative for availability.