Prima SP and Prima SP2 Anaesthesia Systems

The Penlon Anaesthesia System Range provides the user with their choice of advanced, easy to use anaesthesia systems

- Advanced easy to use features
- Comprehensive specification
- Ultra low flow anaesthesia
- Up to six ventilation modes
- Absorber/ventilator interface
- Low life costs
- Extended range includes MRi System, Induction Machine, and Rail-mounted model
- ‘Life-Care’ or optional ‘Life-Care Plus’ Warranty and Customer Care scheme
Prima SP2 Anaesthesia System

Advanced technology, flexible specification, open architecture and easy to use

With its integrated design and superior build quality, each anaesthesia system is custom built to meet your requirements

- Seamless workstation integration
- Modular construction and GCX™ channel mounting provides open architecture for monitors and accessories
- Up to four gases
- Two or three station Selectatec backbar
- Lockable drawer and pull out writing tablet
- Low cost of ownership - two preventive maintenance services per year

Optional Features
- Dual oxygen, nitrous oxide, and air flowmeters
- Electrical outlets plus flowmeter and work surface lighting
- Oxygen auxiliary flowmeter

Balanced ultra low flow anaesthesia, plus patient safety with proven Mechanical AHD system

- 50 – 75 ml/min minimum oxygen flow
- 25 – 33% minimum Oxygen / Nitrous Oxide flow
Prima SP 101 and Prima SP 102 Anaesthesia System

Solution for restricted space and induction room applications

Multi-choice build specification including advanced patient support options

- High levels of workstation integration
- Modular construction and open architecture for monitors, ventilators and accessories
- One or two station Selectatec backbar

Optional Features

- Monitor shelf options:
  - Standard
  - Additional mid-shelf
  - Large screen
- High Common Gas Outlet (CGO)
- Left or right handed layout
- Up to four gases
**Prima SP MRi Anaesthesia System**

**Designed specifically for use in a MRi Facility**

Tested for attraction, stability of performance, and effect on image in close proximity to a Magnetic Resonance Imaging System*

- Cascade Oxygen, Nitrous Oxide and Air Flowmeters
- Mechanical AHD
- Two station Selectatec back bar
- Colour coded panels, and MRi status label
- The Nuffield 200 Ventilator is a pneumatically driven time-cycled ventilator with pre-set volume and flow rate for adult or paediatric patients
- The IDP Alarm is a self-contained battery powered alarm, providing audible and visual warning of ventilation failure, circuit disconnection during intermittent positive pressure ventilation, and an over-pressure alarm

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**IMPORTANT INFORMATION**

*Prima SP MRI Systems (equipped only with any of the devices listed below), are validated for use in proximity to the 100 millitesla (1000 Gauss) line generated by actively shielded 1.5T and 3T magnets, if used in compliance with user instructions.

Validation for use in proximity to a Magnetic Resonance Imaging System does not infer zero magnetism, but a level of magnetism within a specified magnetic field.

Please contact your Penlon representative for further information.

Users must, as a precautionary measure, make an individual check of MRI suitability of any device with their particular MRI facility before use.

**Devices tested for use with Prima SP MRI System**

- A200SP Absorber
- Sigma Delta Vaporizer
- Nuffield 200 Ventilator
- IDP Alarm
- AGSS Receiver
- SC760 Suction Controller (high suction)
- East Suction Controller (high suction)

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**Nuffield 200 Ventilator**

A pneumatically driven time-cycled ventilator with pre-set volume and flow rate for adult or paediatric patients

**Non-ferrous Drawers**

Robust drawers providing significantly less projectile threat than standard drawer units
Prima SP Rail and Wall Models
Small but beautifully engineered solution
Rail and Wall models take the specification of the compact anaesthetic machine to new heights

- Compact rail mounting, can be mounted on a pendant system
- Mechanical Anti-Hypoxic Device (AHD)
- Optional Cascade Flowmeter - Oxygen, Nitrous Oxide and Air
- Optional cylinder yokes (Wall machine only)
- Up to three gases
- Monitor shelf and work surface for flexible monitor mounting
- High Common Gas Outlet (CGO)
- Additional top shelf option
- Optional built-in Oxygen Monitor
- Complies with all appropriate International Standards

High Common Gas Outlet
Ergonomic functionality with built-in oxygen flush control button

Optional Oxygen Monitor
Continuous monitoring of oxygen concentration in the patient breathing system. User adjustable high- and low-level alarms

Up to three gases
Oxygen and Nitrous Oxide, plus choose Air or Carbon Dioxide as third gas option

Mounting Options
Utilising the compact rail mounting, the system can be mounted on most pendant systems

Optional Cascade Flowmeter
For use in low-flow applications with Oxygen and Nitrous Oxide, plus Air, if specified as third gas option
Patient Monitor Integration
The perfect platform for patient monitoring, whichever system you use*
The modular design provides an open system for flexible monitor mounting

- GCX™ arm for monitor mount or monitor plus ventilator display mount (Prima SP2)
- Side monitor pole mount (Prima SP)
- Multiple shelving options
  - Standard monitor shelf
  - Secondary full width monitor shelf (Prima SP)
  - Large screen monitor shelf
  - Flat screen mounting
- Electrical Power Outlets (optional)
  - Four outlets (Prima SP2 and Prima SP 102)
  - Three outlets (Prima SP 101)
- Patient cable management system available

*Please contact the Penlon Sales Office or your local distributor for details of Penlon’s comprehensive range of patient monitors.
System Modules
Advanced technology, providing seamless integrated operation
Each device delivers reliable, proven performance within your anaesthesia system

**AV-S Ventilator**
An easy to use, multifunction anaesthesia ventilator, designed for all patient profiles

- Volume, PCV, PSV, SIMV and SMMV modes
- Comprehensive printer/data outputs for networking and interfacing to patient monitors
- Integrated Oxygen Monitor and Spirometry
- Inverse I:E Ratio capability
- Electronic PEEP
- Autoclavable Latex Free Bellows
- Oxygen or Air drive gas
- 30 minutes battery backup
- Selectable Dual Waveform Display:
  - Pressure v. Time
  - Volume v. Time
  - Pressure v. Volume (for ventilation analysis) plus waveform freeze facility
- Save and recall function for user specific settings
- Flexible specification
  - Stand-alone operation or seamless integration with Prima SP Workstation
  - Display mounting option
  - Multilingual display
- Adult and Paediatric default settings

**AV800 Ventilator**
A ventilator that combines excellent design, high specification, ease of use, and multi-mode function

- Volume, PCV and spontaneous monitoring
- Compliance compensation
- IEEE data output and data print-out facility
- Suitable for adult or paediatric use
- Oxygen or Air powered
- 60 minute battery backup
System Modules
Advanced technology, providing seamless integrated operation
Each device delivers reliable, proven performance within your anaesthesia system

Sigma Delta Vaporizer
The award winning Sigma Delta has evolved from a distinguished line of vaporizers of the highest quality and reliability into the world market leader

- Service Free
- Selectatec®, Drager Plug-In®, Cagemount, North American Drager
- Superb performance, particularly at low flows
- Halothane, Enflurane, Isoflurane, Sevoflurane
- Keyed Filler, Quik Fill® or Pour Fill
- Low Body Weight

# Presumes ten year product life requiring no preventive maintenance service. It is recommended that a service is carried out at ten years. Selectatec® is a Datex Ohmeda Trademark

A200SP Absorber
Combining advanced system integration, ease of use and high performance

- Absorber/Ventilator interface provides seamless ventilation mode switching
- Excellent ergonomics with multi-position mounting and adjustable breathing bag arm
- Optional heated circuit
- Protected, integrated spirometry sensors
- Quick release canister for loose or pre-packed absorbent
- Built-in oxygen monitor sensors
- Autoclavable†

† Covers, manometer and oxygen sensor are not autoclavable

Accessories
Expanding the capabilities of your system through a range of high quality accessories including suction controller range, sharps bin mounts, drip stands, AGSS receiver, patient cable management arm and more.
## Technical Specification
### Anaesthesia Systems

<table>
<thead>
<tr>
<th>Model</th>
<th>Prima SP2</th>
<th>Prima SP 101</th>
<th>Prima SP 102</th>
<th>Prima SP MRI</th>
<th>Prima SP 101R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size (H x W x D)</td>
<td>1385 x 720 x 800 mm</td>
<td>1380 x 585 x 660 mm</td>
<td>1380 x 710 x 680 mm</td>
<td>1380 x 710 x 680 mm</td>
<td>590 x 585 x 430 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>75 kg</td>
<td>70 kg</td>
<td>75 kg</td>
<td>75 kg</td>
<td>35 kg</td>
</tr>
<tr>
<td>Top Shelf</td>
<td>720 x 496 mm</td>
<td>585 x 340 mm</td>
<td>710 x 350 mm</td>
<td>710 x 350 mm</td>
<td>585 x 310 mm</td>
</tr>
<tr>
<td>Work Surface</td>
<td>840 x 290 mm</td>
<td>480 x 300 mm</td>
<td>580 x 300 mm</td>
<td>580 x 300 mm</td>
<td>N/A</td>
</tr>
<tr>
<td>Drawers (Maximum of three)</td>
<td>180 x 520 x 400 mm</td>
<td>140 x 340 x 330 mm</td>
<td>140 x 340 x 330 mm and 140 x 510 x 330 mm</td>
<td>140 x 340 x 330 mm and 140 x 510 x 330 mm</td>
<td>N/A</td>
</tr>
<tr>
<td>Power Outlets (Optional)</td>
<td>4 x IEC, 13 Amp, FDA/CSA or European/Russian</td>
<td>3 x IEC, 13 Amp, FDA/CSA or European/Russian</td>
<td>4 x IEC, 13 Amp, FDA/CSA or European/Russian</td>
<td>4 x IEC, 13 Amp, FDA/CSA or European/Russian</td>
<td>N/A</td>
</tr>
<tr>
<td>Power Required</td>
<td>110/120 or 220/240 VAC</td>
<td>110/120 or 220/240 VAC</td>
<td>110/120 or 220/240 VAC</td>
<td>110/120 or 220/240 VAC</td>
<td>110/120 or 220/240 VAC</td>
</tr>
<tr>
<td>Features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaporizers (Max.)</td>
<td>Three</td>
<td>One</td>
<td>Two</td>
<td>Two</td>
<td>One</td>
</tr>
<tr>
<td>Gases</td>
<td>Oxygen, Nitrous Oxide, Air, Carbon Dioxide</td>
<td>Oxygen, Nitrous Oxide, Air, Carbon Dioxide</td>
<td>Oxygen, Nitrous Oxide, Air, Carbon Dioxide</td>
<td>Oxygen, Nitrous Oxide, Air, Carbon Dioxide</td>
<td>Oxygen, Nitrous Oxide, Air, Carbon Dioxide</td>
</tr>
<tr>
<td>Cylinder Yokes</td>
<td>Four</td>
<td>Three</td>
<td>Four</td>
<td>Four</td>
<td>Two</td>
</tr>
<tr>
<td>Oxygen Fail Safe</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Anti-Hypoxic Device</td>
<td>Mechanical</td>
<td>Mechanical</td>
<td>Mechanical</td>
<td>Mechanical</td>
<td>Mechanical</td>
</tr>
<tr>
<td>Integrated Absorber</td>
<td>A200SP (Optional)</td>
<td>A200SP (Optional)</td>
<td>A200SP (Optional)</td>
<td>A200SP</td>
<td>A100 (Optional)</td>
</tr>
<tr>
<td>Integrated Ventilator</td>
<td>AV-S (Optional)</td>
<td>AV-S (Optional)</td>
<td>AV-S (Optional)</td>
<td>Nuffield 200</td>
<td>AV/900 (Optional)</td>
</tr>
<tr>
<td>Standards</td>
<td>Relevant to markets, including ASTM &amp; CE</td>
<td>Relevant to markets, including ASTM &amp; CE</td>
<td>Relevant to markets, including ASTM &amp; CE</td>
<td>Relevant to markets, including ASTM &amp; CE</td>
<td>Relevant to markets, including ASTM &amp; CE</td>
</tr>
</tbody>
</table>

*Not for available on US specification machines

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### Partnership for Life
Penlon’s philosophy embraces commitment to a successful, long term relationship with all our customers.

### Life-Care
Life-Care is designed to give our customers after-sales peace of mind. ‘Life-Care’ consists of our comprehensive standard warranty and after-sales support package. ‘Life-Care Plus’ allows customers to purchase additional services and warranties to meet their particular needs.

For further details, please contact your Penlon Sales or Service Representative.
Technical Specification

AV800 Ventilator

<table>
<thead>
<tr>
<th>Physical</th>
<th>Sigma Delta Vaporizer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td><strong>Size</strong></td>
</tr>
<tr>
<td>- Control Unit Only</td>
<td>242 x 120 x 190 mm</td>
</tr>
<tr>
<td>- with Adult Bellows</td>
<td>242 x 100 x 190 mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td><strong>Drager Plug-In® Compatible with Interlock (H x W x D)</strong></td>
</tr>
<tr>
<td>8.75 kg</td>
<td>219 x 133 x 158 mm</td>
</tr>
<tr>
<td><strong>Bellows (Latex Free)</strong></td>
<td><strong>Physical</strong></td>
</tr>
<tr>
<td>50 to 1600 ml</td>
<td><strong>Weight</strong></td>
</tr>
<tr>
<td><strong>Bellows Covers</strong></td>
<td>5 kg</td>
</tr>
<tr>
<td>Twist Lock to Base</td>
<td><strong>Capacity</strong></td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>Volume at MAX mark: 250 ml nominal</td>
</tr>
<tr>
<td>90 to 250 VAC, 47 to 63 Hz</td>
<td>Volume at MIN mark: 35 ± 10 ml</td>
</tr>
</tbody>
</table>

**Note:** After draining, approximately 60 ± 10 ml of liquid is retained by the wick

**Flow Range:** 0.2 to 15 litres / min

**Temperature Range:** Operating: 15 to 35°C (58 to 95°F)

**A200SP Absorber**

<table>
<thead>
<tr>
<th>Physical</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td><strong>420 x 230 x 430 mm</strong></td>
</tr>
<tr>
<td><strong>Weight (empty)</strong></td>
<td><strong>15 kg</strong></td>
</tr>
<tr>
<td><strong>Absorbent Capacity</strong></td>
<td><strong>1.3 kg</strong></td>
</tr>
</tbody>
</table>

**Physical**

- **Size:** 420 x 230 x 430 mm
- **Weight:** 15 kg
- **Absorbent Capacity:** 1.3 kg

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**Functional**

- **Tidal Volume (Vt):** 50 to 1600 ml
- **Rate (BPM):** 4 to 60 bpm
- **I:E Ratio:** 1.0 to 1.6
- **Pressure Limit:** 10 to 70 cmH2O
- **Fresh Gas Compensation:** Automatic Tidal Volume Adjustment
- **Ventilation Modes:** Off, Standby, Volume, Pressure, Spontaneous
- **Pressure Control:** 10 to 70 cmH2O
- **Spontaneous Mode:** Active Volume/Pressure Alarms

**Audio Visual Alarms**

- **Alarm Mute:** 30 Seconds
- **Low Drive Gas Pressure:** Less than 235 kPa (34 psi)
- **High Airway Pressure:** 10 to 70 cmH2O adjustable
- **High Continuous Pressure:** Above 30 cmH2O at start of cycle
- **Low Pressure:** 4 to 14 cmH2O PEEP Referenced
- **Low Tidal Volume:** 50% of Volume Set (Spirometry)
- **Incorrect Rate or Ratio:** 60 Minute Battery Back Up
- **Mains Failure:** 5 Minutes Use
- **Low Battery:** Internal or Battery Failure

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**Quality Products • Flexible Specification • Customer Care • Partnership fo**
Technical Specification
AV-S Ventilator

Physical
- **Size**
  - Control Unit Only: 185 x 290 x 300 mm (H x W x D)
  - with Adult Bellows: 385 x 290 x 300 mm (H x W x D)
- **Screen**
  210 mm (8.4") TFT
- **Weight**
  - Control Unit Only: 7.6 kg
  - with Adult Bellows: 9.0 kg
- **Bellows (Latex Free)**
  20 to 1600 ml, Paediatric option 20 to 350 ml
- **Power**
  90 to 254 VAC, 47 to 63 Hz

**Driving Gas**
- Oxygen or Air

**Functional**
- **Tidal Volume (Vt)**
  20 to 1600 ml
- **Rate (BPM)**
  4 to 100 bpm
- **I:E Ratio**
  1.0:2 to 1:8
- **Pressure Limit (Volume Control Mode)**
  10 to 80 cmH2O
- **Fresh Gas Compensation**
  Automatic Tidal Volume Adjustment
- **Ventilation Modes**
  Off, Standby, Volume, Pressure Controlled, Spontaneous, SIMV, SMMV, and PSV
  (for use in anaesthesia procedures only)
- **Sigh Function (Volume Mode)**
  Set tidal volume (Vt) x 1.5 is delivered at every 10 to 100 breaths (frequency is user Selectable)
- **Pressure Range (Pressure Control Mode)**
  5 to 70 cmH2O
- **Spontaneous Mode**
  Active Volume and Pressure Alarms
- **Electronic PEEP**
  4 to 20 cmH2O (or 4 to 30 cmH2O optional)
- **Oxygen Monitor**
  Fuel Cell type

**SIMV, SMMV, PSV**
- **Trigger**
  0.7 to 4 L/min (PEEP Referenced)
- **Trigger Window**
  60% of Expiratory Time
- **Tidal Volume (Vt)**
  As Volume Mode
- **Minute Volume (Vm)**
  As Volume Mode
- **Inspiratory Time (Ti)**
  0.3 to 5.0 seconds
- **Support Pressure**
  3 to 20 cmH2O (PEEP Referenced)
- **SIMV**
  - Tidal Volume (Vt): 600 ml
  - Rate (BPM): 10
  - I:E Ratio: 1.2
  - Pmax: 38 cmH2O
- **SMMV**
  - Tidal Volume (Vt): 600 ml
  - Rate (BPM): 10
  - I:E Ratio: 1.2
  - P-Target: 10 cmH2O
- **PSV**
  - Support Pressure: 10 cmH2O
  - Inspiratory Time: 2 Seconds

**Alarms**
- **Alarms - Automatic**
  - Alarm Mute: 30 Seconds
  - Low Drive Gas Pressure: Less than 235 kPa (34 psi)
  - High Continuous Airway Pressure: Above 30 cmH2O at start of cycle (or PEEP +10 cmH2O)
  - Low Pressure: 4 to 14 cmH2O PEEP Referenced
  - Low Tidal Volume: 50% of Volume Set (Spirometry)
  - Incorrect Rate or Ratio
  - Mains Failure: 30 Minutes Battery Backup
  - Low Battery: 5 Minutes Use
  - Vent Inop: Internal or Battery Failure
  - Apnoea: Flow Referenced

**Alarms - Optional User Set**
- **Tidal Volume**
  - Minimum: 10 to 1600 ml
  - Maximum: 20 to 2400 ml
- **Minute Volume**
  - Minimum: 0 to 50 L
  - Maximum: 1 to 75 L
- **Low and High O2 Concentration**
  18% to 105%
- **High Airway Pressure**
  10 to 80 cmH2O Adjustable

**Default Settings**
- **Adult**
  - VOLUME
    - Tidal Volume (Vt): 600 ml
    - Rate (BPM): 10
    - I:E Ratio: 1.2
    - Pmax: 38 cmH2O
  - PRESSURE
    - Tidal Volume (Vt): 600 ml
    - Rate (BPM): 10
    - I:E Ratio: 1.2
    - P-Target: 10 cmH2O
  - SIMV
    - Tidal Volume (Vt): 600 ml
    - Rate (BPM): 10
    - Inspiratory Time: 2 Seconds
    - Trigger: -1 cmH2O
  - SMMV
    - Tidal Volume (Vt): 200 ml
    - Rate (BPM): 10
    - Inspiratory Time: 1 Second
  - PSV
    - Support Pressure: 10 cmH2O

**Physical**
- **Screen**
  210 mm (8.4") TFT
- **Weight**
  7.6 kg (Control Unit Only)
- **Power**
  90 to 254 VAC, 47 to 63 Hz

**Power**
- 90 to 264 VAC, 47 to 63 Hz

**Drive Gas**
- Oxygen or Air

**Default Settings**
- **Adult**
  - VOLUME
    - Tidal Volume (Vt): 600 ml
    - Rate (BPM): 10
    - I:E Ratio: 1.2
    - Pmax: 38 cmH2O
  - PRESSURE
    - Tidal Volume (Vt): 600 ml
    - Rate (BPM): 10
    - I:E Ratio: 1.2
    - P-Target: 10 cmH2O
  - SIMV
    - Tidal Volume (Vt): 600 ml
    - Rate (BPM): 10
    - Inspiratory Time: 2 Seconds
    - Trigger: -1 cmH2O
  - SMMV
    - Tidal Volume (Vt): 200 ml
    - Rate (BPM): 10
    - Inspiratory Time: 1 Second
  - PSV
    - Support Pressure: 10 cmH2O

**Default Settings**
- **Paediatric**
  - VOLUME
    - Tidal Volume (Vt): 150 ml
    - Rate (BPM): 15
    - I:E Ratio: 1.2
    - Pmax: 38 cmH2O
  - PRESSURE
    - Tidal Volume (Vt): 150 ml
    - Rate (BPM): 15
    - I:E Ratio: 1.2
    - P-Target: 10 cmH2O
  - SIMV
    - Tidal Volume (Vt): 200 ml
    - Rate (BPM): 10
    - Inspiratory Time: 1 Second
    - Trigger: -1 cmH2O
  - SMMV
    - Tidal Volume (Vt): 150 ml
    - Rate (BPM): 10
    - Inspiratory Time: 1 Second
  - PSV
    - Support Pressure: 10 cmH2O