

## 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

Partnership for Life

## 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 SP2 Anaesthesia System with two station Selectatec backbar

## 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 101 with A200SP Absorber and AV800 Ventilator



Prima SP 102 with A200SP Absorber and AV-S Ventilator

Prima SP 101 with A200SP Absorber and AV-S Ventilator

## 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



#### 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)



#### 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



Prima SP 101R



**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



Prima SP2 Monitor Mounting Options

## System Modules

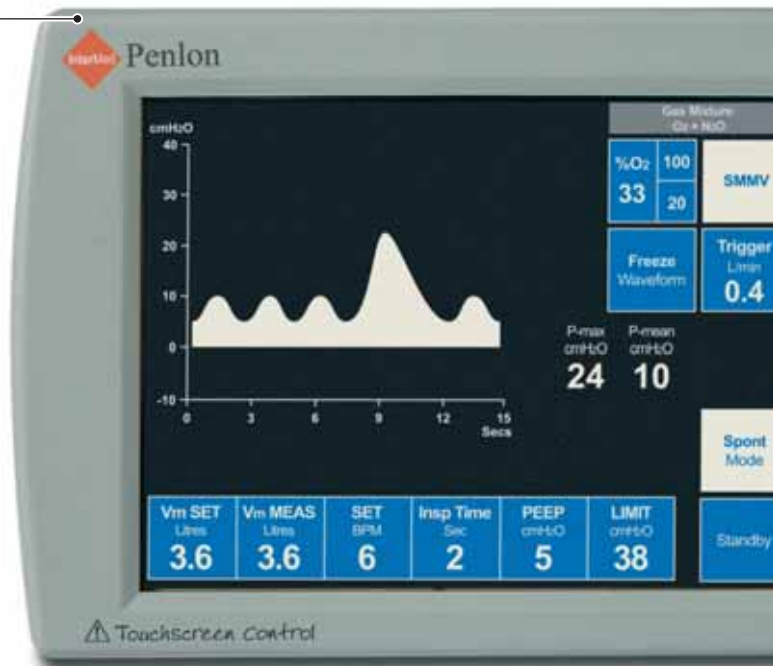
### Advanced technology, providing seamless integrated operation

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



## Ventilators



#### 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<sup>#</sup>
- ◆ Selectatec<sup>®</sup>, Drager Plug-In<sup>®</sup>, Cagemount, North American Drager
- ◆ Superb performance, particularly at low flows
- ◆ Halothane, Enflurane, Isoflurane, Sevoflurane
- ◆ Keyed Filler, Quik Fil<sup>®</sup>, or Pour Fill
- ◆ Low Body Weight

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

#### Vaporizer Absorber 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<sup>†</sup>

<sup>†</sup> 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

Model :	Prima SP2	Prima SP 101	Prima SP 102	Prima SP MRi	Prima SP 101R
					
<b>Physical</b>					
Size (H x W x D)	1365 x 720 x 800 mm	1380 x 585 x 660 mm	1380 x 710 x 680 mm	1380 x 710 x 680 mm	590 x 585 x 430 mm
Weight	75 kg	70 kg	75 kg	75 kg	35 kg
Top Shelf	720 x 495 mm	585 x 340 mm	710 x 350 mm	710 x 350 mm	585 x 310 mm
Work Surface	640 x 290 mm	480 x 300 mm	580 x 300 mm	580 x 300 mm	N/A
Drawers (Maximum of three)	180 x 520 x 400 mm	140 x 340 x 330 mm	140 x 340 x 330 mm and 140 x 510 x 330 mm	140 x 340 x 330mm and 140 x 510 x 330 mm	N/A
Power Outlets (Optional)	4 x IEC, 13 Amp, FDA/CSA or European/Russian	3 x IEC, 13 Amp, FDA/CSA or European/Russian	4 x IEC, 13 Amp, FDA/CSA or European/Russian	4 x IEC, 13 Amp, FDA/CSA or European/Russian	N/A
Power Required	110/120 or 220/240 VAC	110/120 or 220/240 VAC	110/120 or 220/240 VAC	110/120 or 220/240 VAC	110/120 or 220/240 VAC
<b>Features</b>					
Vaporizers (Max.)	Three	One	Two	Two	One
Gases	Oxygen Nitrous Oxide Air Carbon Dioxide*	Oxygen Nitrous Oxide Air Carbon Dioxide*	Oxygen Nitrous Oxide Air Carbon Dioxide*	Oxygen Nitrous Oxide Air	Oxygen Nitrous Oxide Air Carbon Dioxide*
Cylinder Yokes	Four	Three	Four	Four	Two
Oxygen Fail Safe	Yes	Yes	Yes	Yes	Yes
Anti-Hypoxic Device	Mechanical	Mechanical	Mechanical	Mechanical	Mechanical
Integrated Absorber	A200SP (Optional)	A200SP (Optional)	A200SP (Optional)	A200SP	A100 (Optional)
Integrated Ventilator	AV-S (Optional)	AV-S (Optional)	AV-S (Optional)	Nuffield 200	AV900 (Optional)
Standards	Relevant to markets, including ASTM & CE	Relevant to markets, including ASTM & CE	Relevant to markets, including ASTM & CE	Relevant to markets, including ASTM & CE	Relevant to markets, including ASTM & CE

\*Not for available on US specification machines

## 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

Physical	
<b>Size</b>	- Control Unit Only - with Adult Bellows
	150 x 235 x 300 mm (H x W x D) 365 x 235 x 300 mm (H x W x D)
<b>Weight</b>	8.75 kg
<b>Bellows (Latex Free)</b>	50 to 1600 ml
<b>Bellows Covers</b>	Twist Lock to Base
<b>Power</b>	90 to 250 VAC, 47 to 63 Hz
Functional	
<b>Tidal Volume (Vt)</b>	50 to 1600 ml
<b>Rate (BPM)</b>	4 to 60 bpm
<b>I:E Ratio</b>	1:0.3 to 1:6
<b>Pressure Limit</b>	10 to 70 cmH <sub>2</sub> O
<b>Fresh Gas Compensation</b>	Automatic Tidal Volume Adjustment
<b>Ventilation Modes</b>	Off, Standby, Volume, Pressure, Spontaneous
<b>Pressure Control</b>	10 to 70 cmH <sub>2</sub> O
<b>Spontaneous Mode</b>	Active Volume/Pressure Alarms
Audio Visual Alarms	
<b>Alarm Mute</b>	30 Seconds
<b>Low Drive Gas Pressure</b>	Less than 235 kPa (34 psi)
<b>High Airway Pressure</b>	10 to 70 cmH <sub>2</sub> O adjustable
<b>High Continuous Pressure</b>	Above 30 cmH <sub>2</sub> O at start of cycle
<b>Low Pressure</b>	4 to 14 cmH <sub>2</sub> O PEEP Referenced
<b>Low Tidal Volume</b>	50% of Volume Set (Spirometry)
<b>Incorrect Rate or Ratio</b>	
<b>Mains Failure</b>	60 Minute Battery Back Up
<b>Low Battery</b>	5 Minutes Use
<b>Vent Inop.</b>	Internal or Battery Failure

### A200SP Absorber

Physical	
<b>Size (H x W x D)</b>	420 x 230 x 430 mm
<b>Weight (empty)</b>	15 kg
<b>Absorbent Capacity</b>	1.3 kg



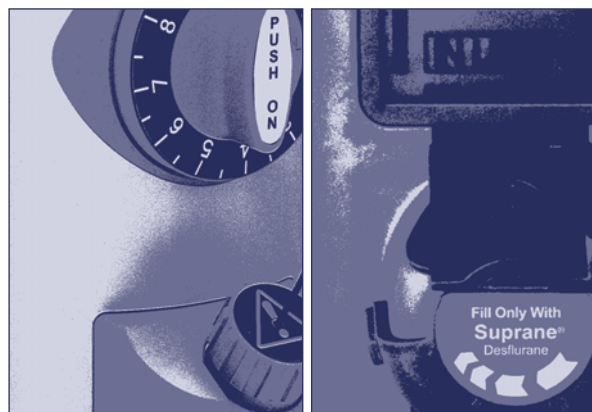
### Sigma Delta Vaporizer

Size	
<b>Selectatec Compatible with Interlock (H x W x D)</b>	242 x 120 x 190 mm
<b>Drager Plug-In® Compatible with Interlock (H x W x D)</b>	242 x 100 x 190 mm
<b>Cagemount (H x W x D)</b>	219 x 133 x 158 mm
Physical	
<b>Weight</b>	5 kg
<b>Capacity</b>	Volume at MAX mark: 250 ml nominal Volume at MIN mark: 35 ±10 ml
<b>Note</b> After draining, approximately 60 ±10 ml of liquid is retained by the wick	
<b>Flow Range</b>	0.2 to 15 litres / min
<b>Temperature Range</b>	Operating: 15 to 35°C (58 to 95°F)

### Sigma Alpha Vaporizer

Physical	
<b>Size (H x W x D)</b>	250 x 120 x 220 mm
<b>Weight</b>	6 kg
<b>Power</b>	110 and 220/240 VAC, 50/60 Hz
<b>Battery</b>	12 V Ni-Mh
<b>Power Consumption</b>	25 W (50 W during warm up)
<b>Mains Failure</b>	Minimum of 5 Minutes Battery Backup
<b>Display</b>	65 mm LCD

Performance	
<b>Concentration</b>	1 to 18%
<b>Operating Flow Range</b>	0.5 to 10 L/min
<b>Maximum Flow</b>	12 L/min
<b>Agent Capacity</b>	330 mL working volume, 70 mL refill indicator
Environmental	
<b>Operating Temperature</b>	18 to 30°C (64° to 86°F)
<b>Operating Humidity</b>	30 to 75% relative humidity (non-condensing)



# Technical Specification

## AV-S Ventilator

Physical	
<b>Size</b> - Control Unit Only - with Adult Bellows	185 x 290 x 300 mm (H x W x D) 385 x 290 x 300 mm (H x W x D)
<b>Screen</b>	210 mm (8.4") TFT
<b>Weight</b> - Control Unit Only - with Adult Bellows	7.6 kg 9.0 kg
<b>Bellows (Latex Free)</b>	20 to 1600 ml, Paediatric option 20 to 350 ml
<b>Power</b>	90 to 264 VAC, 47 to 63 Hz
<b>Drive Gas</b>	Oxygen or Air

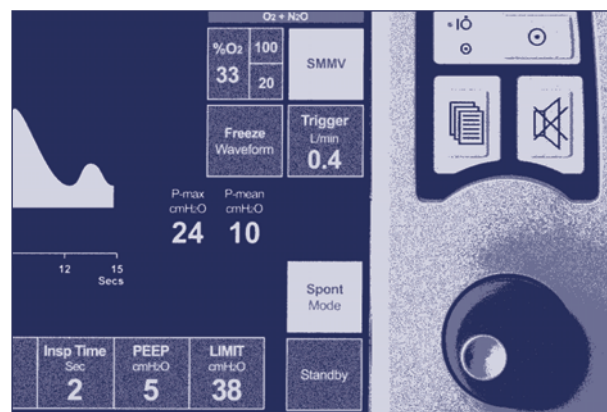
Functional	
<b>Tidal Volume (Vt)</b>	20 to 1600 ml
<b>Rate (BPM)</b>	4 to 100 bpm
<b>I:E Ratio</b>	1:0.2 to 1:8
<b>Pressure Limit</b>	10 to 100 cmH <sub>2</sub> O
<b>Fresh Gas Compensation</b>	Automatic Tidal Volume Adjustment
<b>Ventilation Modes</b>	Off, Standby, Volume, Pressure Controlled, Spontaneous, SIMV, SMMV, and PSV (for use in anaesthesia procedures only)
<b>Sigh Function (Volume Mode)</b>	Set tidal volume (Vt) x 1.5 is delivered at every 10 to 100 breaths (frequency is user Selectable)
<b>Pressure Control</b>	10 to 70 cmH <sub>2</sub> O
<b>Spontaneous Mode</b>	Active Volume and Pressure Alarms, Patient Support Function - Automatic switch to Volume Cycle Mode if apnoea alarm is triggered
<b>Electronic PEEP</b>	4 to 20 cmH <sub>2</sub> O
<b>Oxygen Monitor</b>	Fuel Cell type

SIMV, SMMV, PSV	
<b>Trigger</b>	0.7 to 4 L/min (PEEP Referenced)
<b>Trigger Window</b>	60% of Expiratory Time
<b>Tidal Volume (Vt)</b>	As Volume Mode
<b>Minute Volume (Vm)</b>	As Volume Mode
<b>Inspiratory Time (Ti)</b>	0.5 to 5 Seconds
<b>Support Pressure</b>	3 to 20 cmH <sub>2</sub> O (PEEP Referenced)

Alarms - Automatic	
<b>Alarm Mute</b>	30 Seconds
<b>Low Drive Gas Pressure</b>	Less than 235 kPa (34 psi)
<b>High Continuous Airway Pressure</b>	Above 30 cmH <sub>2</sub> O at start of cycle
<b>Low Pressure</b>	4 to 14 cmH <sub>2</sub> O PEEP Referenced
<b>Low Tidal Volume</b>	50% of Volume Set (Spirometry)
<b>Incorrect Rate or Ratio</b>	
<b>Mains Failure</b>	30 Minutes Battery Backup
<b>Low Battery</b>	5 Minutes Use
<b>Vent Inop</b>	Internal or Battery Failure
<b>Apnoea</b>	Flow Referenced

Alarms - Optional User Set	
<b>Tidal Volume</b> - Minimum	0 to 1600 ml
- Maximum	20 to 1600 ml
<b>Minute Volume</b> - Minimum	0 to 10 L
- Maximum	0 to 30 L
<b>Low and High O<sub>2</sub> Concentration</b>	18% to 105%
<b>High Airway Pressure</b>	10 to 80 cmH <sub>2</sub> O Adjustable

Default Settings	Adult	Paediatric
<b>VOLUME</b>		
• Tidal Volume (Vt)	600 ml	150 ml
• Rate (BPM)	10	15
• I:E Ratio	1:2	1:2
• Pmax	38 cmH <sub>2</sub> O	38 cmH <sub>2</sub> O
<b>PRESSURE</b>		
• Tidal Volume (Vt)	600 ml	150 ml
• Rate (BPM)	10	15
• I:E Ratio	1:2	1:2
• P-Target	10 cmH <sub>2</sub> O	10 cmH <sub>2</sub> O
<b>SIMV</b>		
• Tidal Volume (Vt)	600 ml	200 ml
• Rate (BPM)	6	10
• Inspiratory Time	2 Seconds	1 Second
• Trigger	-1 cmH <sub>2</sub> O	-1 cmH <sub>2</sub> O
<b>SMMV</b>		
• Minute Volume (Vm)	3.6 L	2 L
• Rate (BPM)	6	10
• Inspiratory Time	2 Seconds	1 Second
• Trigger	-1 cmH <sub>2</sub> O	-1 cmH <sub>2</sub> O
<b>PSV</b>		
• Support Pressure	10 cmH <sub>2</sub> O	10 cmH <sub>2</sub> O
• Inspiratory Time	2 Seconds	1 Second





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