

Prima SP and Prima SP2 Anesthesia Systems



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

- ◆ Advanced easy to use features
- ◆ Comprehensive specification
- ◆ Ultra low flow anesthesia
- ◆ 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 Anesthesia System

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

With its integrated design and superior build quality, each anesthesia 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 anesthesia, plus patient safety with proven Mechanical AHD system

- ◆ 50 – 75 ml/min minimum oxygen flow
- ◆ 25 – 33% minimum Oxygen / Nitrous Oxide flow



GCX Arm for Patient Monitor and Ventilator

Prima SP2 Anesthesia System with two station Selectatec backbar

Prima SP 101 and Prima SP 102 Anesthesia System

Solution for restricted space and Induction room applications

Multi-choice build specification including advanced patient support options

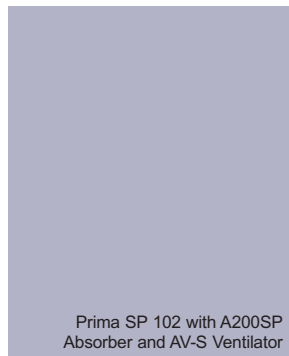
- ◆ High Levels of workstation integration
- ◆ Modular construction and open architecture for monitors, ventilators and accessories
- ◆ One or two station Selectatec backbar

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 Anesthesia 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
- ◆ Color-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 pediatric 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 pediatric 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 anesthetic 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

Utilizing 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 anesthesia system

AV-S Ventilator

An easy to use, multifunction anesthesia 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 Pediatric 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 pediatric 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 anesthesia 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 Fil®, 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

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†

† 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 Specifications

Anesthesia Systems

Model :	Prima SP2	Prima SP 101	Prima SP 102	Prima SP MRi	Prima SP 101R
					
Physical					
Size (H x W x D)	53.7 x 28.3 x 31.5 inch	54.3 x 23.0 x 26.0 inch	54.3 x 28.0 x 26.8 inch	54.3 x 28.0 x 26.8 inch	23.2 x 22.2 x 16.9 inch
Weight	165.3 lbs.	154.3 lbs.	165.3 lbs.	165.3 lbs.	77.2 lbs.
Top Shelf	25.2 x 19.5 inch	23.0 x 13.4 inch	28.0 x 13.8 inch	28.0 x 13.8 inch	33.8 x 12.2 inch
Work Surface	25.2 x 11.4 inch	18.9 x 11.8 inch	22.8 x 11.8 inch	22.8 x 11.8 inch	N/A
Drawers (Maximum of three)	5.9 x 20.5 x 15.7 inch	5.5 x 13.4 x 13.0 inch	5.5 x 13.4 x 13.0 inch and 5.5 x 20.0 x 13.0 inch	5.5 x 13.4 x 13.0 inch and 5.5 x 20.0 x 13.0 inch	N/A
Power Outlets (Optional)	4 x 5 Amp. FDA/CSA	2 x 5 Amp. FDA/CSA	4 x 5 Amp. FDA/CSA	4 x 5 Amp. FDA/CSA	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
Features					
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 U.S. 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		
Size	- Control Unit Only - with Adult Bellows	5.9 x 9.25 x 11.8 inch (H x W x D) 14.3 x 9.25 x 11.8 inch (H x W x D)
Weight		19.25 lbs.
Bellows (Latex Free)		50 to 1600 ml
Bellows Covers		Twist Lock to Base
Power		90 to 250 VAC, 47 to 63 Hz

Functional	
Tidal Volume (Vt)	50 to 1600 ml
Rate (BPM)	4 to 60 bpm
I:E Ratio	1:0.3 to 1:6
Pressure Limit	10 to 70 cmH ₂ O
Fresh Gas Compensation	Automatic Tidal Volume Adjustment
Ventilation Modes	Off, Standby, Volume, Pressure, Spontaneous
Pressure Control	10 to 70 cmH ₂ O
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 cmH ₂ O adjustable
High Continuous Pressure	Above 30 cmH ₂ O at start of cycle
Low Pressure	4 to 14 cmH ₂ O PEEP Referenced
Low Tidal Volume	50% of Volume Set (Spirometry)
Incorrect Rate or Ratio	
Mains Failure	60 Minute Battery Back Up
Low Battery	5 Minutes Use
Vent Inop.	Internal or Battery Failure

Physical	
Size (H x W x D)	16.5 x 9.0 x 16.9 inch
Weight (empty)	33 lbs.
Absorbent Capacity	2.86 lbs



Sigma Delta Vaporizer

Size	
Selectatec Compatible with Interlock (H x W x D)	9.5 x 4.7 x 7.5 inch
Drager Plug-In® Compatible with Interlock (H x W x D)	9.5 x 3.9 x 7.5 inch
Cagemount (H x W x D)	8.6 x 5.2 x 6.2 inch
Physical	
Weight	11 lbs.
Capacity	Volume at MAX mark: 250 ml nominal Volume at MIN mark: 35 ±10 ml
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)

Sigma Alpha Vaporizer

Physical	
Size (H x W x D)	9.8 x 4.7 x 8.6 inch
Weight	13.2 lbs.
Power	110 and 220/240 VAC, 50/60 Hz
Battery	12 V Ni-Mh
Power Consumption	25 W (50 W during warm up)
Mains Failure	Minimum of 5 Minutes Battery Backup
Display	65 mm LCD

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



Technical Specification

AV-S Ventilator

Physical		
Size	- Control Unit Only - with Adult Bellows	7.2 x 11.4 x 11.8 inch (H x W x D) 15.1 x 11.4 x 11.8 inch (H x W x D)
Screen		210 mm (8.4") TFT
Weight	- Control Unit Only - with Adult Bellows	16.75 lbs. 19.8 lbs.
Bellows (Latex Free)		20 to 1600 ml, Pediatric option 20 to 350 ml
Power		90 to 264 VAC, 47 to 63 Hz
Drive 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	10 to 100 cmH ₂ O
Fresh Gas Compensation	Automatic Tidal Volume Adjustment
Ventilation Modes	Off, Standby, Volume, Pressure Controlled, Spontaneous, SIMV, SMMV, and PSV (for use in anesthesia 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 Control	10 to 70 cmH ₂ O
Spontaneous Mode	Active Volume and Pressure Alarms, Patient Support Function - Automatic switch to Volume Cycle Mode if apnoea alarm is triggered
Electronic PEEP	4 to 20 cmH ₂ O
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)	0.5 to 5 Seconds
Support Pressure	3 to 20 cmH ₂ O (PEEP Referenced)

Alarms - Automatic	
Alarm Mute	30 Seconds
Low Drive Gas Pressure	Less than 235 kPa (34 psi)
High Continuous Airway Pressure	Above 30 cmH ₂ O at start of cycle
Low Pressure	4 to 14 cmH ₂ O 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	0 to 1600 ml
	- Maximum	20 to 1600 ml
Minute Volume	- Minimum	0 to 10 L
	- Maximum	0 to 30 L
Low and High O ₂ Concentration		18% to 105%
High Airway Pressure		10 to 80 cmH ₂ O Adjustable

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





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