SPECIFICATIONS

Atomic Absorption

PinAAcle 900
AA Spectrometers

The PinAAcle™ 900 series is a family of fully-integrated benchtop atomic absorption (AA) spectrometers, consisting of four models – PinAAcle 900F (Flame), PinAAcle 900Z (THGA), PinAAcle 900H (Flame/HGA), and PinAAcle 900T (Flame/THGA).

System Design

PinAAcle 900H/900T Systems	The 900H (Flame/HGA) and 900T (Flame/THGA) systems incorporate a true double-beam flame spectrometer and graphite furnace atomizer on a single instrument.
PinAAcle 900Z System	The 900Z (THGA) system incorporates the spectrometer and the THGA components only on a single instrument.
PinAAcle 900F System	The 900F (Flame) system incorporates the spectrometer and the flame components only on a single instrument.
Monochromator	Littrow design with motorized drive for automatic wavelength selection and peaking. Wavelength range: 184-900 nm Diffraction grating: 1800 lines/mm blazed at 236 nm and 597 nm Grating area: 64 x 72 mm Reciprocal linear dispersion: 1.6 nm/mm (nominal) Focal length: 267 mm
Spectral Bandwidths	User selectable automatic slit widths of 0.2, 0.7 and 2.0 nm at their optimized slit height.
Detector	Wide-range segmented solid-state detector, including a built-in low-noise CMOS charge amplifier array.
Automatic Lamp Selection	8-lamp mount with built-in power supplies for PerkinElmer® cableless Lumina™ hollow cathode and patented electrodeless discharge lamps. Computer-controlled lamp selection and alignment via WinLab32™ for AA software. Lamp elements and recommended operating currents are automatically recognized and set when using Lumina hollow cathode lamps.

PerkinElmer®
For the Better

Background Correction

Deuterium Arc Lamp – PinAAcle 900F/900H Systems	Built-in continuum source double-beam background correction using a high-intensity deuterium arc lamp.
Zeeman-effect Background Correction – PinAAcle 900Z/ 900T Systems	Longitudinal AC Zeeman-effect background correction using a modulated 0.8 Tesla magnetic field oriented longitudinal to the optical path. The magnet is automatically switched on during the atomization step only. Rollover detection is built-in.

Flame Atomizer

Gas Controls	Fully computer-controlled with oxidant and fuel monitoring. Keyboard-activated remote ignition system with air-acetylene. Acetylene flow is automatically adjusted prior to the oxidant change when switching to or from nitrous oxide-acetylene operation.
Safety Functions	Interlocks prevent ignition if the proper burner head, the nebulizer/end cap, or the burner drain system is not correctly installed; the liquid level in the drain vessel is incorrect; or gas pressures are too low. Interlocks also will automatically shut down burner gases if a flame is not detected, or if any of the other interlock functions are activated. Provision is included for safe shutdown from all operating modes in the event of a power failure.
Sample Introduction System	Modular sample introduction system consisting of the quick-change spray chamber, burner head and nebulizer units. Alignment of the flame in the light beam is fully automatic, using a motorized burner mount for vertical and horizontal burner adjustment and automatic software-controlled self-optimization of the burner position. The optimization of the operating flame condition is also fully automatic and software-controlled. The introduction system is equipped with a high-strength inert mixing chamber, angled to ensure proper drainage. There is a choice of high sensitivity corrosion-resistant plastic nebulizer or durable stainless steel nebulizer. The standard is all-titanium, 10-cm, single-slot burner head for air-acetylene operation.

Graphite Furnace Atomizer

PinAAcle 900H System	Built-in fully computer-controlled Heated Graphite Atomizer (HGA®), with built-in integrated platform for ease-of-use for all the elements.
PinAAcle 900T/900Z System	Built-in fully computer-controlled Transversely Heated Graphite Atomizer (THGA) – the graphite tube is transversely heated, providing a uniform temperature profile over the entire tube.
PinAAcle 900H/T/Z Furnace Systems	An external protective gas stream around the graphite tube prevents the entrance of outside air to maximize tube life. An internal purge gas goes through the graphite tube to remove the volatilized matrix vapors during drying and thermal pretreatment. The two gas streams are computer-controlled independently. Pneumatic opening and closing of the furnace for easy tube change.

Common Furnace Features	Analytical programs with up to 12 steps can be set up. Each step can be programmed with the following parameters:
Temperature	Ambient up to 2600 °C (up to 3000 °C with PinAAcle 900H) in steps of 10 °C
Ramp Time	0 to 99 sec in steps of 1 sec
Hold Time	0 to 99 sec in steps of 1 sec
Internal Gas Flow	0 mL/min (gas stop), 50 mL/min (mini-flow), 250 mL/min (full flow); can be switched over to another type of gas (alternate gas).
Furnace Opening and Closing	Pneumatically-operated by software command.
Required Inert Gas	Argon – inlet pressure 300 kPa (3 bar) minimum. Maximum gas consumption is 700 mL/min.
Water Coolant	A circulatory cooling system is recommended and can be chosen for the PinAAcle 900T, 900Z and 900H systems. When operating the 900T/Z/H furnace systems without the circulatory cooling system, cooling water meeting the following specifications should be used: sediment-free drinking water; 20-40 °C; flow rate not less than 2 L/min; pressure between 2.5 and 4.5 bar; pH between 6.5 and 7.5; hardness not greater than 6°dH or 100 ppm.

Furnace Autosampler

Furnace Autosampler	Sampler Table: Installed in front of the furnace unit. Removable sample tray with 88 and 148 sampling positions for sample and reference solutions and 1 overflow container for pipette washing. Minimum sample requirement: Ca. 0.1 mL.
Dispensable Volume	Sample and Reagent: 1-99 µL, selectable in increments of 1 µL. Max. dispensable volume is 99 µL (sample volume + reagent volume). Flushing volume is fixed at 1.3 mL.
Electronics	The autosampler is powered from the spectrometer and is software-controlled.

Data System

Data Control System	Complete PC control using WinLab32 for AA software operating under Microsoft® Windows® 7. Provides complete control of the instrument and its major accessories plus data handling and storage.
Data Handling	Instrument readings linear in absorbance (-0.500 A to +2.000 A), concentration or emission intensity with continuously variable scale expansion from 0.01 to 100 times. Integration times operator-selectable from 0.1 to 120 sec in increments of 0.1 sec. Reading modes include time-averaged integration, non-averaged integration (peak area), and peak-height measurement. Includes built-in statistics. Up to thirty (30) standards and a choice of proven calibration equations. Reslope of the analytical curve using a single operator-selected calibration standard. Built-in Ethernet interface for computer connection and use of optional accessories. Data collection time of up to 20 mins.

Minimum PC Configuration

Lenovo® ThinkCentre® M81 Windows® 7 (64-bit), Tower

- Model: Lenovo® ThinkCentre® M81, 3.1 GHz Intel® Core i5-2400, Intel® Q65 chipset, 6MB cache
- Chassis: Tower
- Factory Installed Operating System: Microsoft® Windows® 7 Ultimate – 64 bit
- Memory: 4 GB, Non-ECC, 1066 MHz, DDR3, 2 x 2GB, Four DIMM slots
- Hard Drive: 1000 GB SATA, 7200 RPM
- Networking: Integrated Gigabit Ethernet
- External I/O Ports: 8 USB 2.0 (2 front, 6 rear), 1 Ethernet (RJ45), 2 serial (9-pin), 1 VGA (DB-15, Display Port) out
- Expansion Slots:
- Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max)
- Slot 2: half-length, full-height, PCIe x1
- Slot 3: half-length, full-height, 32-bit PCI 2.3
- Slot 4: half-length, full-height, 32-bit PCI 2.3
- Removable Media: DVD+/-RW SATA
- Video: Integrated video, Intel® GMA4500
- Mouse: Lenovo® USB optical mouse with scroll
- Keyboard: Lenovo® USB Keyboard
- Audio: Integrated High Definition Audio

Includes Operating System and its power cord

Physical Data – Instruments

Dimensions and Weight (without controller and cooling system)

Model	Width	Height	Depth	Weight
PinAAcle 900T	95 cm (37.5 in.)	73 cm (29 in.)	68 cm (27 in.)	141 kg (311 lb)
PinAAcle 900H	95 cm (37.5 in.)	73 cm (29 in.)	68 cm (27 in.)	114 kg (251 lb)
PinAAcle 900Z	95 cm (37.5 in.)	73 cm (29 in.)	68 cm (27 in.)	126 kg (278 lb)
PinAAcle 900F	95 cm (37.5 in.)	73 cm (29 in.)	68 cm (27 in.)	94 kg (207 lb)

System Power Requirements

230V (±10%), 50/60 Hz (±1%), single phase alternating current
PinAAcle 900F: 800 VA (maximum)
PinAAcle 900Z, 900H and 900T: 10100 VA (maximum)

Electrical Protection

As defined in EN 61010-1; Insulation Class I; Installation Category II; Pollution Degree 2.

Certification

Designed and tested to be in compliance with the legal requirements for laboratory instruments. The instrument is developed and produced in compliance with ISO 9001 and ISO 13485. WinLab32 for AA software provides required control parameters for GLP and instrument performance validation.

Safety Standards

EN 61010-1, EN 61010-2-061, CSA C22.2 No. 1010.1, CSA C22.2 No. 1010.2.061. The instruments bear the CE Mark and the CSA/NRTL Certification Mark.

EMC Standards

EN 61326, EN 55011, EN 61000-3-2, EN 61000-3-3.

Environmental Requirements

Ambient temperature: +10 °C to +35 °C. Relative humidity: 20 to 80% non-condensing.

Physical Data – Cooling System

Cooling System	Self-priming recirculating system with fan-assisted heat exchanger for constant cooling of the graphite furnace. Water temperature during operation approx. 36 °C; water flow 2.5 L/min.
Power Requirements	230V (±10%), 50/60 Hz (±1%); approx. 140 VA maximum power consumption
Dimensions (W x H x D)	20 x 37.5 x 50 cm (8 x 14.8 x 20 in.)
Weight	18 kg (40 lb) with coolant
Certification	Designed and tested to be in compliance with the legal requirements for cooling systems.

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