

ZEEnit 650 P & 700 P Atomic Absorption Spectrometer



Technical Data

ZEEnit series

General

- Atomic absorption spectrometer series with world best Zeeman technology (3rd Generation) for trace analysis even in high matrix loaded samples
- Highest efficiency in routine analysis with hollow cathode lamps (Line-Source AAS) for flame, graphite furnace, hydride, and HydrEA application in One + One atomizer compartment
- Wide range of performance-enhancing accessories maximizing productivity, safety, and ease of use

Models

Application range	ZEEnit 650 P	ZEEnit 700 P
Graphite furnace	☑	☑
Zeeman and Deuterium background correction	☑	☑
Flame		☑
Emission mode		☑
Hydride and cold vapor technique	■	■
Solid AA	■	■

☑ included, ■ optional

Atomizer

One + One atomizer concept (only valid for ZEEnit 700P)

Design	Two atomizer compartments arranged side by side
Interchange	No change of atomizer, autosampler, and no alignment needed

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Flame

Burner	Coded Titanium burner head, 100 mm (air/acetylene), 50 mm (air/acetylene and nitrous oxide/acetylene) with automatic burner head recognition, stepless burner rotation (0-90°), and automatic height adjustment (4-15mm)
Nebulizer	Adjustable nebulizer with internal ceramic capillary and acid-resistant ceramic impact bead
Spray chamber	PPS spray chamber with flow spoiler for aqueous and organic solutions
Safety and handling	<ul style="list-style-type: none"> ▪ Multiple sensors monitoring burner head, siphon system, and gas management system (GMS) ▪ Automatic ignition and extinguishment of flame, incl. in case of power outage or gas pressure drops and emergency flushing with compressed air ▪ Nebulizer-Burner system with quick-lock for easy exchange

Graphite furnace

Function	<ul style="list-style-type: none"> ▪ Transversely heated graphite furnace atomizer (THGA) with Zeeman technology ▪ Stabilized Temperature Platform Furnace (STPF) for lowest interference and highest reproducibility ▪ Integrated autosampler operation and optional furnace USB camera ▪ Suitable for direct analysis of solid samples (solid AA)
Zeeman technology	<ul style="list-style-type: none"> ▪ Zeeman background correction by transversely arranged magnetic field up to 1 Tesla, programmable in intervals of 0.05 Tesla, measurement frequency up to 200 Hz ▪ Automatic magnetic field switching ON/OFF (2-field mode, best sensitivity) or ON_{max}/ON_{low} /OFF (3-field mode, signal attenuation) ▪ Free combinations of 2-field and 3-field mode (dynamic mode)
Furnace control	Temperature range from ambient temperature to 3,000 °C, programmable in intervals of 1 °C, heating rate up to 3,000 °C/s, self-check system
Graphite tube	Pyrolytically coated graphite (wall, PIN-platform, or solid) tubes, self-aligning, sample volume up to 50 µL, 40 mL for PIN-platform tubes

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Optical bench

Spectrometer type	Czerny Turner setup, encapsulated, focal length 279.7/252.6 mm, single-beam and/or double-beam mode (flame atomizer)
Monochromator	Holographic grating, rotatable (1800 lines/mm)
Slit width	0.2, 0.5, 0.8, 1.2 nm (automatic setting)
Wavelength range	185–900 nm
Wavelength reproducibility	0.005 nm
Background correction	<ul style="list-style-type: none"> ▪ Zeeman background correction by transversely arranged magnetic field ▪ Deuterium background correction by hollow cathode lamp (HCL)
Detector	Wide range photomultiplier tube (PMT)
Light source	8-fold HCL turret, lamp base compatible with standard HCL type, 4 slots available for super lamps
Instrumental sensitivity	Flame: (Cu 324 nm) 0.020 mg/L 1 %Abs using a 100 mm burner head (air/acetylene) Graphite furnace: (Pb 283 nm) 1.4 µg/L 1 %Abs (for 20 µL, peak area evaluation)

Gas Management System (GMS)

Gas type	Purity	Pressure	Settings	Atomizer technique	Usage
Acetylene	2.6	80 - 160 kPa	Steps in 5 L/h	Flame	Fuel gas
Nitrous oxide	2.5	400 - 600 kPa	Fixed	Flame	Oxidant
			3 Steps	Flame	Additional oxidant
Compressed Air	Free of oil, grease and particles	400 - 600 kPa	Fixed	Flame	Oxidant
			3 Steps	Flame	Additional oxidant
			1 Step	Graphite Furnace	Alternative gas
Argon	4.8	600 - 700 kPa	2 Steps	Graphite Furnace	Inert gas
			3 Steps	Hydride system	Carrier gas

Data system

Software	ASpect LS (Version 1.7 and higher) with optional 21 CFR Part 11 compliance, pre-configured analytical methods and reports, monitoring of quality parameters e.g. control charts and standards
Requirements	<ul style="list-style-type: none"> ▪ Operating system: PC – Windows 7, 8.1 or 10 (32-Bit or 64-Bit) ▪ PC: Graphic resolution 1,280 x 1,024 pixels or higher, mouse/trackball 2 USB 2.0 interface

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Accessories

Auto Sampler Range (for liquid samples, with round sample tray)

Models, Specifications	AS-F	AS-FD	AS-GF
ZEEnit 650 P			<input checked="" type="checkbox"/>
ZEEnit 700 P	■	■	<input checked="" type="checkbox"/>
HS 60 – flow injection hydride system	■	■	
Dimensions (W x D x H) in mm	340 x 460 x 350	340 x 460 x 350	250 x 380 x 550
Dilution unit	-	350 x 165 x 310	-
Weight	6.5 kg	10 kg	7.2 kg
Cannula			
▪ Fluid contact material	Pt/Rh	Pt/Rh	PFA-M
▪ Number of channels	1	2	1
▪ Internal diameters	0.6 mm	0.6/1.2 mm	0.65 mm
▪ Minimal pipetting volume (one step)	-	50 µL	1 µL
Tray options with number of positions (sample volume)	139 positions	139 positions	108 positions
	129 (15 mL) + 10 (50 mL)	129 (15 mL) + 10 (50 mL)	100 (1.5 mL) + 8 (5 mL)
	54 positions (50 mL)	54 positions (50 mL)	
Automatic cleaning and rinsing cycles	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Maximum dilution factor (single step)		500	800
Autocalibration from single/stock standards (automatic standard preparation)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Over-range dilution		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Automated standard addition calibration		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Spiking			<input checked="" type="checkbox"/>
Sample pre-concentration			<input checked="" type="checkbox"/>
Automatic dosing of modifiers, buffers, etc.			<input checked="" type="checkbox"/>

included, ■ optional

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Hydride systems

Models, Specifications	HS 50	HS 55	HS 60
Accessible elements	Arsenic (As), Selenium (Se), Mercury (Hg), Antimony (Sb), Bismuth (Bi), Tellurium (Te) and Tin (Sn)		
ZEEnit 650 P		■	■
ZEEnit 700 P	■	■	■
Heating regime of hydride cuvette	Flame	Electro thermal	Electro thermal
Reaction mode	Batch	Batch	Flow
Enrichment by gold trap		■	■
HydrEA mode		■*	■*
Autosampler			■
Size (W x D x H) in mm	270 x 190 x 210	360 x 280 x 370	360 x 240 x 370
Weight Net	2 kg	14 kg	14 kg

☑ included, ■ optional, *HydrEA upgrade kit is required

Other accessories

Accessory	Application	Function
Scraper for flame mode	Flame	Automatic cleaner of burner head for safe nitrous oxide operation
Segmented flow star SFS 6.0	Flame	Switching valve technology for stable flame conditions, injection mode and reduced carry over
Chiller	Graphite furnace	Water chiller with 2.5 L/min flow rate, free of sediments, 30 –40 °C temperature range

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solid AA – Accessory for Direct Analysis of Solids, Oils and Waxes

	solid SSA 6	solid SSA 600
Function	<ul style="list-style-type: none"> ▪ Hand-operated tool ▪ Sample platform submitted to graphite furnace manually (Manual weighing and sample preparation needed) 	<ul style="list-style-type: none"> ▪ Software-controlled autosampler with integrated liquid dosing unit (for chemical sample preparation and calibration from liquid standards) ▪ Fully automated sample handling from sample weighing to measurement integrated
Platform material	Pyrolytically coated graphite, trough dimension (W x D x H) 8 mm x 3.5 mm x 1.3 mm	
Number of platforms	-	42, upgradeable to 84
Micro balance	-	up to 10 g ± 0.001 mg
Typical sample weight	0.05 - 3 mg	0.05 - 3 mg
Dosing volume	-	2 - 50 µL
Size (W x D x H) in mm	-	270 x 600 x 380 for basic unit 90 x 270 x 270 for liquid dosing module
Net weight	-	16 kg for basic unit 3.5 kg for liquid dosing module

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Physical data (basic unit)

	ZEEnit 650 P	ZEEnit 700 P
Size (W x D x H) in mm	790 x 735 x 645	1180 x 735 x 650
Net weight	170 kg	225 kg
Supply voltage	230 V	
Frequency	50/60 Hz	
Fuse protection	35 A	
Power consumption (basic unit) Flame	250 VA	
Graphite furnace	2,100 VA	2,100 VA
Max. electrical load (incl. all accessories) for 1s	20,750 VA	20,750 VA
Ambient temperatures/ humidity	+10 °C to +35 °C / 90% (at +40 °C) non-condensing	
Exhaust rates	Minimum exhaust rates of 1 m ³ /min (graphite furnace) and 5 m ³ /min (flame)	
Technical standards and guidelines	Complies with standards for safety and electromagnetic compatibility for CE marking (LVD 2014/35/EU; EMC 2014/30/EU; RoHS 2011/65/EU), ISO 9001 compliant	

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