

NEW

SPN23

Models ^{*1}	SPCS-ONE-DL-23	SPCS-ONE-MT-23	SPCS-ONE-DR-23	SPCS-ONE-MD-23
Measuring principle	Laser scattering condensation particle counting (CPC)			
Measuring components and range	Number concentration of solid particles; 0 – 10000 up to 0 – 50000 particles/cm ³ (after internal dilution) ^{*2}			
CPC counting efficiency	50 ± 12% @ 23 nm, > 90% @ 41 nm			
Sample handling temperature	52 °C or less (Dilute sampling)		Maximum permissible temperature (Direct sampling) 350 °C ^{*3}	
Diluted sample temperature	Primary diluter (PND1): 191 °C ± 10 °C		Pre-classifier: 47 °C ± 5 °C	
	Evaporation tube (ET): 350 °C ± 10 °C		Primary diluter (PND1): 191 °C ± 10 °C	
	Secondary diluter (PND2): < 35°C (at inlet of CPC)		Evaporation tube (ET): 350 °C ± 10 °C Secondary diluter (PND2): < 35°C (at inlet of CPC)	
Dilution factors	Primary diluter (PND1): 10 to 200 ^{*2}		Diluter in DSU: 10	
	Secondary diluter (PND2): 15		Primary diluter (PND1): 10 to 200 ^{*2} Secondary diluter (PND2): 15	
Particle Concentration	0.95 < fr (30 nm) / fr(100 nm) < 1.3			
Reduction Factor (PCRF)	0.95 < fr (50 nm) / fr(100 nm) < 1.2			
Volatile particle removal unit	Evaporation Tube			
Volatile particle removal efficiency	> 99.0% (30 nm of particle size, and 10000 particles/cm ³ or more)			
Accuracy of dilution factor	Within ± 10 % of nominal dilution factor setting ^{*4}			
Operating environment	Without CLU (standard): Ambient temperature: 5 °C to 30 °C, Ambient humidity: 80 % or less as relative humidity, Altitude: 0 to 2000 m above sea level (Altitude: 0 to 2500 m above sea level with Altitude Simulation)			
	With CLU (optional): Ambient temperature: 5 °C to 45 °C, Ambient humidity: 80 % or less as relative humidity, Altitude: 0 to 2000 m above sea level (Altitude: 0 to 2500 m above sea level with Altitude Simulation)			
Power supply voltage and frequency	200/220/230/240 V AC (±10 %, max. 250 V), 50/60 Hz (±1.0 Hz), single phase (to be specified at ordering)			
Power requirements	Main unit: Max. 2.5 kVA		Main unit: Max. 2.7 kVA	
	Main unit and all optional units: Max. 4.7 kVA		Main unit and all optional units: Max. 4.6 kVA	
Dimensions ^{*5} / Mass	434(W) × 731(D) × 637(H) mm		434(W) × 845(D) × 637(H) mm	
	Approx. 123 kg		Approx. 149 kg	

SPN10

Models ^{*1}	SPCS-ONE-DL-10	SPCS-ONE-MT-10	SPCS-ONE-DR-10	SPCS-ONE-MD-10
Measuring principle	Laser scattering condensation particle counting (CPC)			
Measuring components and range	Number concentration of solid particles; 0 – 50000 particles/cm ³ (after internal dilution) ^{*2}			
CPC counting efficiency	65 ± 15% @ 10 nm, > 90% @ 15 nm			
Sample handling temperature	52 °C or less (Dilute sampling)		Maximum permissible temperature (Direct sampling) 350 °C ^{*3}	
Diluted sample temperature	Primary diluter (PND1): 191 °C ± 10 °C		Pre-classifier: 47 °C ± 5 °C	
	Hot Catalytic Stripper (HCS): 350 °C ± 10 °C		Primary diluter (PND1): 191 °C ± 10 °C	
	Secondary diluter (PND2): < 35°C (at inlet of CPC)		Hot Catalytic Stripper (HCS): 350 °C ± 10 °C Secondary diluter (PND2): < 35°C (at inlet of CPC)	
Dilution factors	Primary diluter (PND1): 10 to 200 ^{*2}		Diluter in DSU: 10	
	Secondary diluter (PND2): 15		Primary diluter (PND1): 10 to 200 ^{*2} Secondary diluter (PND2): 15	
Particle Concentration	0.95 < fr (15 nm) / fr (100 nm) < 2.0			
Reduction Factor (PCRF)	0.95 < fr (30 nm) / fr (100 nm) < 1.3			
Volatile particle removal unit	Hot Catalytic Stripper			
Volatile particle removal efficiency	> 99.9%, for C ₅₀ (Count Median diameter > 50 nm, Mass density > 1 mg/m ³)			
Accuracy of dilution factor	Within ± 10 % of nominal dilution factor setting ^{*4}			
Operating environment	Without CLU (standard): Ambient temperature: 5 °C to 30 °C, Ambient humidity: 80 % or less as relative humidity, Altitude: 0 to 2000 m above sea level (Altitude: 0 to 2500 m above sea level with Altitude Simulation)			
	With CLU (optional): Ambient temperature: 5 °C to 45 °C, Ambient humidity: 80 % or less as relative humidity, Altitude: 0 to 2000 m above sea level (Altitude: 0 to 2500 m above sea level with Altitude Simulation)			
Power supply voltage and frequency	200/220/230/240 V AC (±10 %, max. 250 V), 50/60 Hz (±1.0 Hz), single phase (to be specified at ordering)			
Power requirements	Main unit: Max. 2.5 kVA		Main unit: Max. 2.7 kVA	
	Main unit and all optional units: Max. 4.7 kVA		Main unit and all optional units: Max. 4.7 kVA	
Dimensions ^{*5} / Mass	434 (W) × 731 (D) × 637 (H) mm		434 (W) × 910 (D) × 637 (H) mm	
	Approx. 123 kg		Approx. 144 kg	

*1 The abbreviation of each model is as follows; DL: Dilution, DR: Direct, MT: with Micro Tunnel, MD: with Micro Tunnel and Direct.
 *2 Dilution factor of the system should be determined so that the particle concentration after dilution fits into the measuring range.
 *3 Allowable range of gas temperature at sample probe inlet depends on the sampling condition, because it is limited as the temperature of diluter in DSU (350 °C or less).
 For detailed information, please contact HORIBA. *4 Accuracy of dilution factor check with span gas. *5 Without transfer tube, control unit and optional units.



SPCS-ONE

Solid Particle Counting System

Efficient, high-precision solid particle counting



- Ideal for certification testing and development applications
- Compact design with a wide range of product configurations and options.

⚠ Please read the operation manual before using this product to assure safe and proper handling of the product.

- The specifications, appearance or other aspects of products in this catalog are subject to change without notice.
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THE HORIBA GLOBAL NETWORK

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IMS The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System ISO45001. We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.

HORIBA
Automotive

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Automotive

Efficient, high-precision solid particle counting

The HORIBA SPCS-ONE series measures SPN23 (PN emissions down to 23 nm) or SPN10 (PN emissions down to 10 nm) from engine exhaust gas in real-time. The series can complete engine/vehicle certification testing for PN defined in the latest regulations, which requires complied dilution systems, along with R&D testing of engines and particulate filters by direct sampling without dilution.

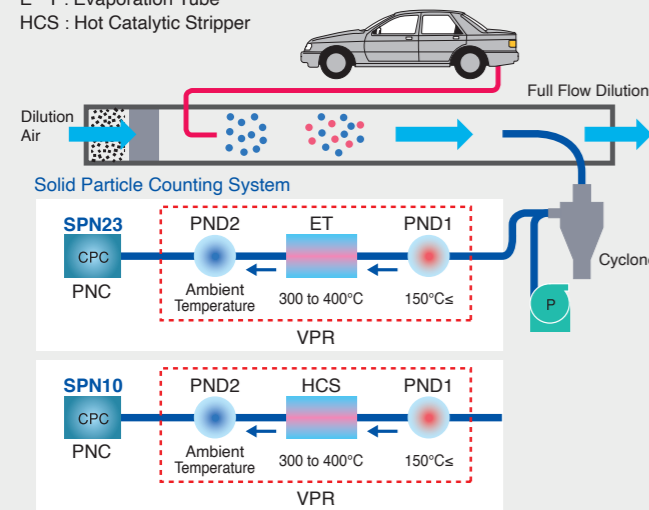
Ideal for certification and development applications

Compliant with regulations related to SPN10 and SPN23

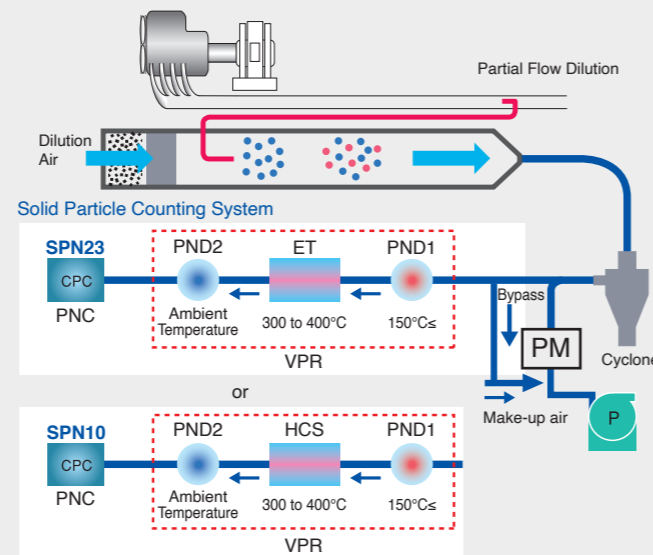
■ SPN10 and SPN23 detectors are equipped with systems required by regulations

□ For LDV Certification Tests

PNC : Particle Number Counter
PND : Particle Number Diluter
ET : Evaporation Tube
HCS : Hot Catalytic Stripper



□ For HD Engine Certification Tests (with a Partial Flow Dilution Tunnel)



■ Comply with the latest regulations in Europe, U.S., China, Japan, and other countries.

Measurement Application Examples

- Simultaneous PN measurements before and after GPF
- Development for Euro 7 and GB 7
- Brake dust measurement
- Development of various fuels (hydrogen engines, alternative fuels, etc.)
- Research and development of piston rings to reduce oil consumption

Enables more efficient and diverse testing

■ HORIBA ONE PLATFORM enables smarter testing

- Control multiple SPCS-ONE and other ONE series products from a single PC
- Efficient data processing by batch importing of various measurement data



Reliable calibration with short downtime^{*1}

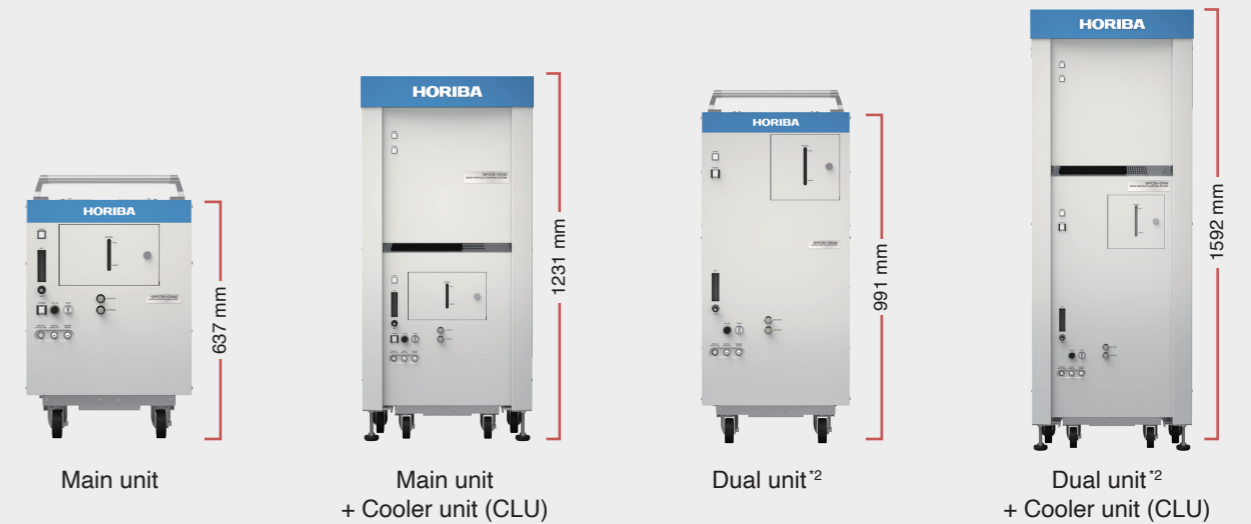
■ ISO/IEC17025 accredited calibration offered in regions across the world^{*1}

■ Accredited calibration is available at the same time as maintenance, adjustment and other services.

^{*1} Available models vary by region. Please contact us for details.

Compact and portable design

- Easy to install and transport in a laboratory
- No need to move PCs when SPCS-ONE is used in different laboratories



Various product configurations

■ Extensive lineup to meet your application needs

- Select from SPN23 only / SPN10 only / SPN23 and SPN10 simultaneous measurement^{*2}
- Select the sampling method that best suits your application requirements

Models ^{*3}	Sampling methods		
	Full Flow Tunnel Certification applications using CVS	Partial Flow Tunnel Certification applications using Partial flow tunnel	Direct Sampling Development applications directly under the engine
SPCS-ONE-DL series	○	×	×
SPCS-ONE-MT series	○	○	×
SPCS-ONE-DR series	○	×	○
SPCS-ONE-MD series	○	○	○

^{*2} In case of simultaneous measurement of SPN23 and SPN10, volatile particle removal unit can be selected between evaporation tube (ET) or hot catalytic stripper (HCS); cannot be used together. Please contact us for details.

^{*3} The abbreviation of each model is as follows ; DL : Dilution, DR : Direct, MT : with Micro Tunnel, MD : with Micro Tunnel and Direct.

■ Optional units for various measurement applications

Optional unit	Applications and Functions	Dimensions(W×D×H) / Mass
Cooler Unit (CLU)	For high temperature test (up to 45°C)	For Main Unit 570 × 854 × 1231 mm Approx. 160 kg (*for main unit) For Dual unit 570 × 854 × 1592 mm Approx. 170 kg
CPC Sample Flow Checker (CFC)	Automates CPC sample flow checks required for monthly regulatory inspections	170 × 245 × 60 mm Approx. 2 kg
Selector Cyclone Unit (SCU)	2 lines can be switched, cyclone mountable	360 × 560 × 458 mm Approx. 40 kg
Cyclone Unit (CYU)	External cyclone ^{*4}	290 × 146 × 236 mm Approx. 4 kg ^{*5}
Sample Return Unit (SRU)	Sample return to full tunnel ^{*4}	303 × 588 × 469 mm Approx. 44 kg
Dilution Factor Checker (DFC)	Dilution factor check and flow rate calibration	430 × 550 × 320 mm Approx. 38 kg ^{*6} With optional cabinet 570 × 854 × 1041 mm Approx. 130 kg
Linearity Check Unit ^{*6} (LCU)	Generating solid particles for linearity check and penetration efficiency check	350 × 690 × 699 mm Approx. 35 kg

^{*4} Proposed when required for regulatory compliance.

^{*5} Dimensions depend on customer specifications.

^{*6} Stand alone