HORIBA
Automotive Test Systems

Solid Particle Counting System

MEXA-2000SPCS series

Euro 5/6, Euro VI Compliant

ISO9001 JQA-0298
ISO14001 JQA-E-90039
IMS
HORIBA Group is operating Integrated Management System
OHSAS18001 JQA-OH0068

The Latest Solid Particle Counting

Solid Particle Counting System

MEXA-2000SPCS series

The HORIBA MEXA-2000SPCS series measures the number of solid particles from engine exhaust gas in real-time. The series can complete engine/vehicle certification testing in the latest regulations (Euro 5/6 and Euro VI), which requires complied dilution systems, along with R&D testing of engines and particulate filters by direct sampling without dilution.

- **Certification tests for Euro 5/6 and Euro VI**
  MEXA-2000 / 2200SPCS
- **Tests with a partial flow dilution tunnel connected**
  MEXA-2200 / 2300SPCS
- **R&D tests with high pressure direct sampling**
  MEXA-2100 / 2300SPCS

Line-ups

	Models	Categories	Regulations	Sampling methods *1	
Certification Tests	MEXA-2000SPCS MEXA-2100SPCS *2	LDV	Euro 5/6	Full Flow Tunnel	——
		HD Engine	Euro VI	Full Flow Tunnel	——
	MEXA-2200SPCS *3 MEXA-2300SPCS *2 *3	LDV	Euro 5/6	Full Flow Tunnel	——
		HD Engine	Euro VI	Full Flow Tunnel	Partial Flow Tunnel

*1: When ordering, please specify intended applications and expected sampling methods.
*2: Direct sample gas should be supplied to SPCS without pre-classifier or hatted probe.
*3: With high-accuracy sample return function for connecting to a partial flow tunnel. (R49 compliant)

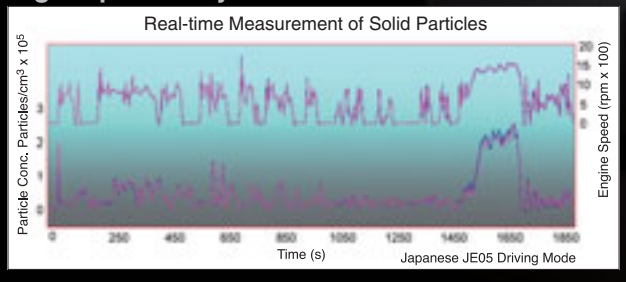
	Models	Categories	Sampling methods *1		
R&D, Performance Evaluation	MEXA-2000SPCS	LDV / HD Engine	Normal Pressure Direct Sampling *2	Full Flow Tunnel	——
	MEXA-2100SPCS		High Pressure Direct Sampling *3	Full Flow Tunnel	——
	MEXA-2200SPCS	LDV / HD Engine	Normal Pressure Direct Sampling *2	Full Flow Tunnel	Partial Flow Tunnel
	MEXA-2300SPCS		High Pressure Direct Sampling *3	Full Flow Tunnel	Partial Flow Tunnel

*1: When ordering, please specify intended applications and expected sampling methods.
*2: Direct sampling at a pressure less than 5 kPa is possible. Acceptable maximum concentration is limited to the same value as the full flow tunnel.
*3: A DSU predilution unit with pressure adjusting function realizes direct sampling for high pressure applications of up to 100 kPa.

■High accuracy dilution

Reliable diluter developed by HORIBA Group
→ Patent number: 7201071(US)

High repeatability of measurement



■High performance sampling system

The set DF *1 is not affected by changes in sample pressure in the CVS or sampling system.
The VPR *2 calibration factor (PCRF *3) can be used for many applications without specific calibration/correction of the diluters in VPR.

■Dedicated particle number counting

Fully integrated system for stand-alone operation with the comprehensive data logging functions.
Also available for operation with host CPU control using the AK-LAN host interface.

*1 DF: Dilution Factor
*2 VPR: Volatile Particle Remover
*3 PCRF: Particle Concentration Reduction Factor

System for LDVs and HD Engines

■Compact design

- Easy to install and transport in a laboratory
- Small footprint

MEXA-2000SPCS series
Portable Main unit

*The size of main unit can change depending on each customer's request.

MEXA-2000SPCS series
Portable Main unit + Cooler unit (CLU)

The main unit and CLU can be supplied in an optional 19-inch cabinet.

■Various optional units

The combination of the main unit and optional units allows a wide range of applications and sampling configurations.

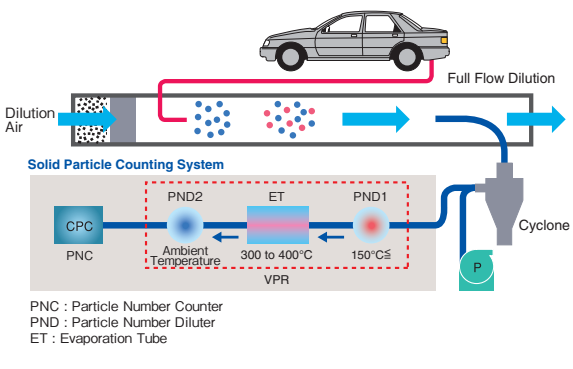
Purpose	Optional Units	Functions	2000	2100	2200	2300
Measurement	Cyclone Unit (CYU) *1	External Cyclone	○	Built-in	○	Built-in
	Sample Return Unit (SRU)	Returning sample to CVS	○	×	×	×
	Cooler Unit (CLU) *2	Cooling detector (CPC) for high temperature conditions	○	○	○	○
Performance Check	Dilution Factor Checker (DFC)	Dilution factor check and flow rate calibration	○	○	○	○
	Linearity Check Unit (LCU)	Generating solid particles for linearity check and penetration efficiency check	○	○	○	○
	Volatile-particle Generation Unit (VGU)	Generating particles for removal efficiency check of evaporation tube	○	○	○	○

*1: For MEXA-2000/2200SPCS, select a hatted probe or an external cyclone unit set at full flow tunnel side.
*2: Mounted in an optional 19-inch cabinet with main unit.

For Certification Tests

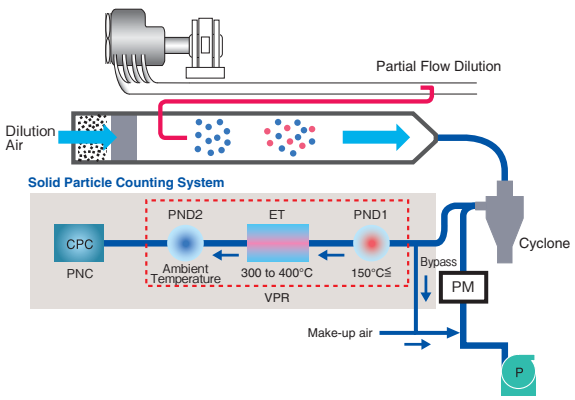
MEXA-2000/2200SPCS conforms to the requirements of UN/ECE R83 and UN/ECE R49, adopting the method recommended by the Particle Measurement Program (PMP) of the Working Party on Pollution and Energy (GRPE) under the auspices of United Nations Economic Commission for Europe (UN ECE).

■Euro 5/6 (UN/ECE Regulation No. 83)



PNC : Particle Number Counter
PND : Particle Number Diluter
ET : Evaporation Tube

■Euro VI (UN/ECE Regulation No. 49)
When connected to partial flow dilution tunnel



All-in-one system equipped with a calibration unit

MEXA-1000SPCS

MEXA-2000SPCS

MEXA-2000SPCS series

Outlines

Models	MEXA-2000SPCS	MEXA-2100SPCS	MEXA-2200SPCS	MEXA-2300SPCS
Conformed standards	UN/ECE Regulation No. 83 (Rev. 4) UN/ECE Regulation No. 49 (Rev. 6) *1	—	UN/ECE Regulation No. 83 (Rev. 4) UN/ECE Regulation No. 49 (Rev. 6)	— *2
Measuring principle	Laser scattering condensation particle counting (CPC)			
Lower particle size limit	Counting efficiency of 23 nm particles: 50 % ±12 %, Counting efficiency of 41 nm particles: 90 % or more			
Measuring components and range	Number concentration of solid particles; 0 – 10000 up to 0 – 50000 particles/cm^3 (after internal dilution) *3			
Sample handling temperature	52 °C or less (Dilute sampling)	Maximum permissive temperature (Direct sampling) 350 °C *4	52 °C or less (Dilute sampling)	Maximum permissive temperature (Direct sampling) 350 °C *4
Diluted sample temperature	Primary diluter (PND1): 191 °C ± 10 °C Evaporation tube (ET): 350 °C ± 10 °C Secondary diluter (PND2): 35 °C or less	Pre-classifier: 47 °C ± 5 °C Primary diluter (PND1): 191 °C ± 10 °C Evaporation tube (ET): 350 °C ± 10 °C Secondary diluter (PND2): 35 °C or less	Primary diluter (PND1): 191 °C ± 10 °C Evaporation tube (ET): 350 °C ± 10 °C Secondary diluter (PND2): 35 °C or less	Pre-classifier: 47 °C ± 5 °C Primary diluter (PND1): 191 °C ± 10 °C Evaporation tube (ET): 350 °C ± 10 °C Secondary diluter (PND2): 35 °C or less
Dilution factors in diluters	Primary diluter (PND1): 10 to 200 *3 Secondary diluter (PND2): 15	Diluter in DSU: 10 Primary diluter (PND1): 10 to 200 *3 Secondary diluter (PND2): 15	Primary diluter (PND1): 10 to 200 *3 Secondary diluter (PND2): 15	Diluter in DSU: 10 Primary diluter (PND1): 10 to 200 *3 Secondary diluter (PND2): 15
PCRF	0.95 < fr(30 nm) / fr(100 nm) < 1.3, 0.95 < fr(50 nm) / fr(100 nm) < 1.2			
Volatile particle removal efficiency	99% or more, for C_{40} (30 nm of particle size, and 10000 particles/cm^3 or more)			
Accuracy of dilution factor	Within ± 10 % of nominal dilution factor setting (for VPR total dilution factor of 150 to 3000, gas based)			
Operating environment	Without CLU (standard): Ambient temperature: 5 °C to 30 °C, Ambient humidity: 80 % or less as relative humidity With CLU (optional): Ambient temperature: 5 °C to 45 °C, Ambient humidity: 80 % or less as relative humidity			
Power supply voltage and frequency	200/220/230/240 V AC (±10 %, max. 250 V), 50/60Hz (±1.0 Hz), single phase (to be specified at ordering)			
Power requirements	Main unit: Max. 2.3 kVA Main unit and all optional units: Max. 4.5 kVA	Main unit: Max. 2.5 kVA Main unit and all optional units: Max. 4.4 kVA	Main unit: Max. 2.4 kVA Main unit and all optional units: Max. 4.3 kVA	Main unit: Max. 2.6 kVA Main unit and all optional units: Max. 4.5 kVA
Dimensions (excluding any projections)/Mass				
Main unit (without transfer tube, control unit and optional units)	434(W)×731(D)×637(H) mm Approx. 115 kg	434(W)×845(D)×637(H) mm Approx. 120 kg	434(W)×910(D)×637(H) mm Approx. 140kg	434(W)×910(D)×637(H) mm Approx. 145 kg
Optional units *5	CYU: Approx. 290(W)×146(D)× 236(H) mm Approx. 4 kg SRU: Approx. 300(W)×550(D)× 450(H) mm Approx. 35 kg CLU: Approx. 570(W)×850(D)×1227(H) mm Approx. 80 kg (for CLU and optional cabinet) DFC: Approx. 464(W)×550(D)× 320(H) mm Approx. 38 kg LCU: Approx. 350(W)×690(D)× 670(H) mm Approx. 35 kg VGU: Approx. 550(W)×300(D)× 450(H) mm Approx. 20 kg			

*1:Only for full flow tunnel.
*2: MEXA-2300SPCS can be used in the measurement method according to the regulation. For detailed information, please contact HORIBA.
*3: Dilution factor of the system should be determined so that the particle concentration after dilution fits into the measuring range.
*4: 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.
*5: The dimensions depend on customers.

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

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