Environmental Monitoring Systems

Automatic dust sampling system for collecting particulate matter PM_{10} or $PM_{2.5}$ or PM_1

Types: PNS 16T-3.1 / PNS 16T-6.1 / PNS 18T-3.1 / PNS 18T-6.1

The dust collection system comprises a low-volume sampler unit (LVS) and a filter changer with an intake tube and sampling head (inlet) for collecting particulate matter from outdoor air. It functions as per EN 12341:2014 (PM_{10} and $PM_{2,5}$) specifications. The low-volume sampler and the filter changer are installed in a single housing made from stainless steel.

- Equivalent according to EN 12341:2014 (PM_{10} and $PM_{2.5}$)
- Dust sampling system for filters with a diameter of 47 mm
- Magazine with 16/18 filter cassettes
- Data storage on secure Digital (SD) card
- Data transmission via RS232 port using e.g. Bavaria-Hesse protocol
- Jacketing tube (using outdoor air to ventilate the tube connector) in accordance with EN 12341(5.1.3):2014
- Options
  - Regulated Peltier cooler for filter storage in accordance with *EN 12341(5.1.8):2014*
  - Active temperature control (heating, cooling), according to ambient air temperature
  - Data transmission using integrated GPRS modem

The sequential sampling systems in the PNS 16T series are used for continuous collection and monitoring of particulate matter without having to change filters manually. The system is made up from a Model LVS 3.1 or MVS 6.1 sampler unit, an automatic filter changer with 16 filter cassettes, an intake tube and a specimen sampling head installed in a single housing.

The filter changer housing is ventilated to prevent condensation and icing. Sampling heads such as the models TSP, PM_{10}, $PM_{2.5}$ and PM_1 and the like can be used.

The specimen sampling head is attached so as to be gas-tight at the 40 mm I.D. aluminum intake tube associated with the sampling system; the tube is polished and anodized on the inside. This helps to avoid losses due to particles being deposited on the interior walls as a result of turbulence-induced precipitation, for instance. A magazine with 16 filter cassettes is used in the filter changing unit.

The filter cassettes are affixed in the magazines individually by way of leaf springs. Spring action presses each cassette against the smooth upper wall of the cassette compartment so that no volatile matter can escape. This ensures that it will be possible to positively determine the quantities of dust even after several days of sampling.

The magazine is moved along the vertical axis, the filter cassettes along the horizontal axis, by way of precision-engineered recirculating ball spindles. The sampling position is opened by a spindle drive and kept closed by a strong spring.

Associated with each unit are two magazines with a total of 31 filter cassettes. When the magazine is changed, one filter cassette remains in the exposed position; that is why the replacement magazine may be fitted with only 15 filter cassettes. The 16th filter will not be loaded with fine dust, but is used as a filter for a comparison alternative to detect possible deposits of particles. The magazine serves at the same time as a carrying case. Cassettes for filters with a diameter of 47 or 50 mm may be used; customized cassettes (for ISSeP in Belgium or WINS in the USA, for instance) can be used after modification at the factory. The filter changer is delivered in its standard configuration with filter cassettes for 47 mm diameter filters and an intake tube 800 mm long. Intake tubes in other lengths, up to a maximum of 3500 mm, are available to match customer specifications.

The filter changer can be delivered with a Peltier cooling unit to ensure that the temperature of the filters installed will not exceed 23 °C during storage in the unit.

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Dust sampling system Type PNS 16T-3.1 / PNS 16T-6.1 / PNS 18T-3.1 / PNS 18T-6.1

Technical Data Type PNS 16/18T

Flow rate:

PNS 16T-3.1 (controlled):	1.0...3.5 m³/h (Nm³/h)
PNS 16T-6.1 (controlled):	1.5...5.5 m³/h (Nm³/h)
Accuracy:	< 2 %
Sampling time:	1 min...1000 h
Power supply:	230 V, 50/60 Hz

Power consumption

PNS16/18T-3.1:	Approx. 300 VA* / 420 VA
PNS16/18T-6.1:	Approx. 350 VA* / 470 VA
Filter diameter:	47 mm
Diameter of loaded filter surface:	41 mm
Dimensions with feet:	
Width	460 mm* / 520 mm
Height	1100 mm
Depth	260 mm

Interfaces

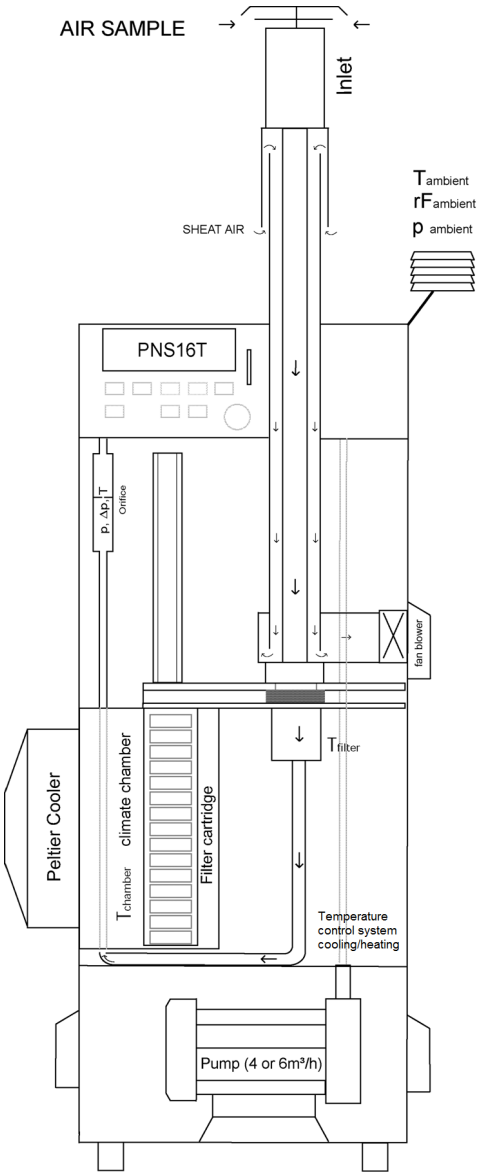
Serial Interface RS232:	2
SD-drive:	1
GPRS (optional):	1

Weight

PNS 16T-3.1:	Approx. 42 kg* / 48 kg
PNS 16T-6.1:	Approx. 42.5 kg* / 48.5 kg

Noise level according to EN 3744:2010 (distance 8 m):	< 36 dB(A)
Operating temperature range:	-30 … +50 °C
Operating humidity range:	0 … 100 % rH
IP classification:	IP 55

*without cooling unit



Scope of delivery:

Basic device PNS 16T with integrated Low-volume sampler LVS 3.1 or MVS 6.1, mechanical changer for filters, jacketing tube diameter 80 mm, suction tube diameter 40 mm, 2 filter cartridges with total 31 filter cassettes, 2 x SD-card for data storage (minimum 128 MB, 1 x transmission cable, 1 x USB SD card reader, calibration protocol, key and instruction manual, housing made from stainless steel

Ordering Information:

D120003	PNS 16T-3.1
D120009	PNS 16T-3.1 with cooling unit 50 W
D120018	PNS 16T-3.1 with cooling unit 100 W
D120004	PNS 16T-6.1
D120010	PNS 16T-6.1 with cooling unit 50 W
D120019	PNS 16T-6.1 with cooling unit 100 W
D120059	PNS 18T-3.1
D120050	PNS 18T-3.1 with cooling unit 50 W
D120060	PNS 18T-3.1 with cooling unit 100 W
D120061	PNS 18T-6.1
D120052	PNS 18T-3.1 with cooling unit 50 W
D120062	PNS 18T-3.1 with cooling unit 100 W

Accessories:

D100868	Inlet for PM_{10} according EN12341:2014, flowrate 2.3 m³/h
D100870	Inlet for $PM_{2.5}$ according EN12341:2014, Flowrate 2.3 m³/h
D100871	Inlet for PM_1, flow rate 2.3 m³/h
D100964	Inlet for TSP, flow rate 1.6 m³/h
D100929	Cassette opener
D100930	Calibration adapter

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