

D53 DUST MONITOR

Real-time dust monitoring for humid industrial sites.

High-scan laser particulate sensing, heated sample conditioning, and local LED alarm visibility in one rugged fixed monitor.

Designed for PM1, PM2.5, PM4, and PM10 monitoring where dust exposure, process visibility, and control-room integration matter.



<60 s

Typical response time

IP65

Rugged enclosure rating

Edge AI & ML

Classification on the device

PURPOSE

Built for continuous fixed-area dust visibility.

The D53 helps teams identify dust events early, track exposure trends, and connect dust readings into plant systems.

PM Fraction Monitoring

Laser particle sensing provides PM1, PM2.5, PM4, and PM10 readings for fine, respirable, and inhalable dust context.

Heated Sample Chamber

Sample humidity control keeps the dust stream more stable and reduces moisture-related measurement bias.

Local LED Ring

Status LEDs and a visual LED ring support local alarm awareness for nearby personnel and maintenance teams.

Industrial Integration

RS-485, Modbus RTU/TCP, CSV exports, and gateway options support SCADA, historian, and control-room workflows.

Rugged Deployment

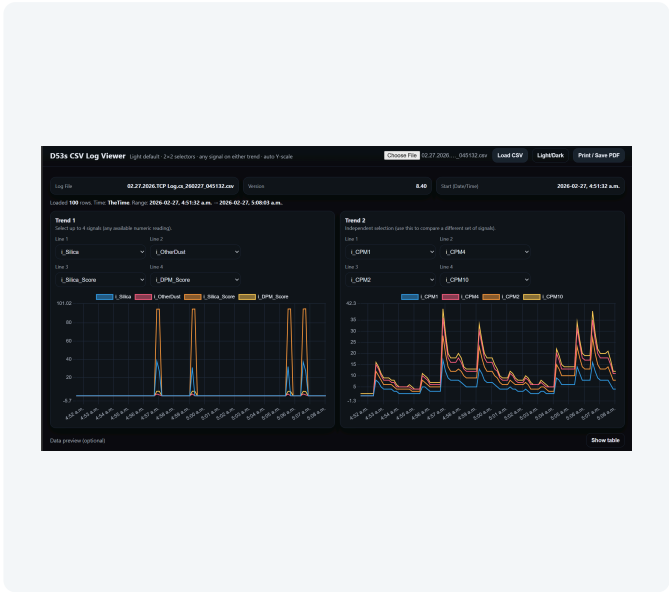
GRP enclosure, side mounting holes or hanging bracket, and IP65 protection suit harsh plant and mining environments.

Intrinsically Safe Option

The D53 Ex ia variant is certified for use in South Africa under MASC M/26-8072X. International IECEx certification is pending.



D53 face plate and local indication.



Reporting and dashboard data for review and trend tracking.

Advanced dust and air quality monitoring.

A practical safety and operational tool for continuous airborne dust visibility.

Why Measure Airborne Dust

Airborne dust particulates pose serious health and safety risks in industrial environments. Prolonged exposure to PM1, PM2.5, PM4, and PM10 can contribute to chronic respiratory disease, cancer, cardiovascular damage, and other life-threatening illnesses.

The M3SH D53 helps operations identify unhealthy airborne conditions early and respond quickly. It provides continuous real-time monitoring of particulate levels and surrounding environmental conditions, improving visibility of exposure risks and helping protect both workers and processes.

Applications

- Underground mining
- Surface mining
- Manufacturing
- Heavy industry
- Construction
- Tunneling
- Stockpile domes
- Conveyors



Example field installation for fixed-area monitoring.

What You Get

Capability	Benefit
Real-time PM1, PM2.5, PM4, PM10	Live visibility of changing airborne dust conditions.
Harsh-environment platform	Advanced particulate monitoring for demanding applications.
Live alarms and trend data	Enables faster response to elevated dust events.
SCADA, PLC, and connected systems	Open integration with site monitoring and control systems.
Fixed or mobile deployment	Practical deployment in mining, plants, and bulk handling facilities.

Reliable And Easy To Maintain

Response time is typically less than 60 seconds, with PM10 detection limits from 0.01 to 1000 mg/m3 and particle sensor range from 0.30 μm to 10 μm . The monitor supports configurable ventilation or dust suppression activation, site-specific interfacing, remote connections, and a built-in heated chamber for improved performance in varied conditions.

The self-cleaning/purge design reduces maintenance and cleaning. The DPS series supports 5-year sensor life, up to 2 years between calibrations, bump-test kit availability, and compact wireless connection options.

Core specifications.

Communications

Area	Capability
Standard wired	RS485 and PoE
Optional	Private 5G wireless
Protocols	Modbus RTU/TCP, Modbus TCP/IP, EtherNet/IP
SCADA	DAQFactory and register map for customer DCS/PLC/SCADA integration

Accuracy And Service

Measure	Value
Accuracy	+/- (5 ug/m3 + 5% of measured value) at 0-100 ug/m3; +/-10% at 100-1,000 ug/m3
Repeatability	+/-2 ug/m3 + 2% of measured value
Filter/screening	Impactor + heated drying
Consumables	Dust inlet filters; heaters are non-consumable

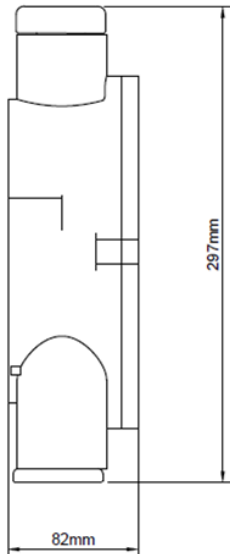
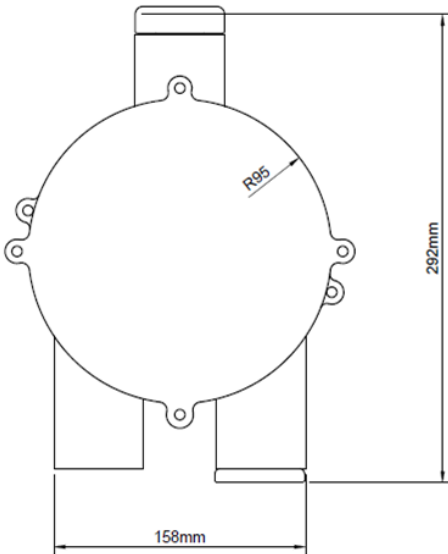
Core Specifications

Item	D53 Dust Monitor
Product name	Dust Monitor - High Humidity
Operating temperature	-20 to +50 C
Storage temperature	-40 to +85 C
Power supply	9 to 48 VDC standard; 115 to 230 VAC optional
Power consumption	<18 W typical
Response time	<60 s typical
Sample rate	2 l/min
Start-up time	60 sec
Display	3.9 inch TFT; status LEDs + LED ring
Warranty	1-year limited warranty

Dimensions And Weight

Item	D53
Dimensions	L 298 mm x W 196 mm x H 82 mm
Weight	~3.24 kg

Construction	Mounting
Reinforced thermoset GRP; IP65	Side mounting holes or hanging bracket / roof bolt



Ready for control-room data.

Built for local monitoring, networked reporting, and industrial data systems.

Area	Capability
Standard wired connection	RS485 and PoE
Standard protocols	Modbus RTU/TCP, Modbus TCP/IP, EtherNet/IP
Optional physical connections	Private 5G wireless
Data exports	CSV files every 24 h from 4 s logging; user download anytime; 8 GB industrial SD stores approx. 2 years; Modbus registers.
SCADA/historian integration	DAQFactory and register map for customer DCS/PLC/SCADA integration
Diagnostics	Device status, heaters/fans - TBC
Firmware update	OTA firmware where supported

Intrinsic Safety Certification

South Africa: Ex ia I Ma - IA Certificate MASC M/26-8072X. The installation is subject to SANS 60079-25 loop approval and the certificate's conditions of safe use.

Global markets: IECEx certification is pending, with approval expected in Q4 2026. Do not use the South African certificate for international certification purposes.

Product selection: Use D53 for real-time PM dust monitoring in humid or harsh environments. Use D53s where silica differentiation using multi-sensor fusion and AI/ML is required.

Feature	D53	D53s
Main role	High-humidity dust monitoring	Silica differentiation and dust monitoring
PM outputs	PM1, PM2.5, PM4, PM10	PM1, PM2.5, PM4, PM10
Silica classification	No	Yes, via sensor fusion
Sample conditioning	Heated/dried chamber below 40% RH	Heated/dried chamber below 40% RH
Typical use	Dust exposure and humid-site monitoring	Silica-regulated and mixed-risk sites



D53 Dust Monitor

Real-time PM monitoring with heated sample conditioning for humid mining, manufacturing, and construction environments.

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