

## FWE200DH

# Extractive scattered light dust measuring device

### Reliable dust measurement in wet gases

- Proven and reliable dust measurement in wet gases
- Economic operation due to very few consumable parts and very low installation effort
- Very low maintenance, since no parts come into contact with the aggressive gas
- Long service life due to the intelligent design



# Reliable dust measurement in wet gases

Particle measurement in a very wide range of application areas – from very small to average dust concentrations

Since drop formation interferes with the measurement of dust concentrations, measuring in wet exhaust gases, for example downstream from a flue gas desulfurization system, can be difficult. The FWE200DH extractive dust measuring system measures small to medium dust

concentrations accurately and very reliably. The gas is extracted via a sample probe and heated above the dew point. Any droplets in the gas are vaporized, making it impossible for them to falsify the measurement results.



**Compact measuring and control unit**

With compact scattered light measurement cell, thermocyclone for wet gas evaporation, an ejector for test gas transport and various interface modules available



**Backwash devices (option)**

Instrument-operated back purging to clean the gas sample probe or water back purging to remove residues created by the application from the entire system

**Remote control unit (option)**

For measured value and status display, data retrieval and remote control



**Gas sample probe**

For sampling and return of the test gas flow – available in various materials

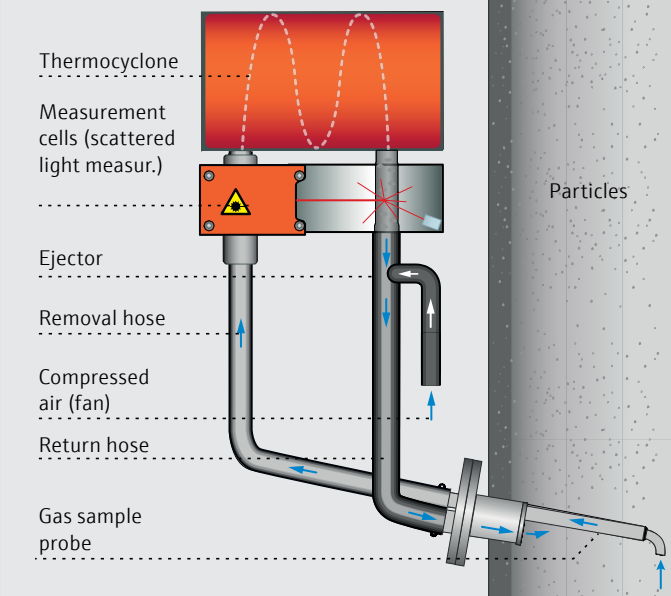


**Extraction and return hose**

Flexible hoses for gas extraction and return; heated versions also available as an option

**Controllable purge air unit**

For compressed air supply of the ejector over a flexible hose; can be equipped with optional purge air heater



**Principle of operation**

The FWE200DH operates as a bypass system. A partial gas flow is suctioned out of the gas duct via a test gas probe and heated in a thermocyclone so that water drops and aerosols vaporize. Afterwards, the test gas is fed into a measurement cell in which a laser beam illuminates the particles contained in the gas and thus generates scattered light. A sensitive receiver measures this scattered light extremely accurately. The scattered light intensity measured in this way is the basis for determining the dust concentration. Finally, the test gas is again fed back into the gas duct via the test gas probe.

# FWE200DH

## Reliable dust measurement in wet gases



### Product Description

The FWE200DH dust measuring device is designed to continuously measure dust concentrations in wet flue gas. The gas is extracted via a sampling probe and heated above dew point. Droplets in the gas are vaporized, making it impossible for them to falsify the measurement results. The

highly sensitive scattered light measurement principle enables accurate measurements even at very low dust concentrations.

The FWE200DH meets the requirements of EN 14181 and EN 15267.

### At a glance

- For very low to medium dust concentrations
- Gas sampling and return combined in one probe
- Contamination check
- Automated monitoring of zero and reference point
- Simple parameterization and convenient operation – optionally via an additional remote display
- Integrated system monitoring to detect the need for maintenance at an early stage

### Your benefits

- Proven and reliable dust measurement in wet gases
- Economic operation due to very few consumable parts and very low installation effort
- Very low maintenance, since no parts come into contact with the aggressive gas
- Long service life due to the intelligent design

### Fields of application

- Monitoring of wet gas scrubbing facilities
- Measurement in saturated gas downstream of desulfurization plants
- Determination of dust concentrations in wet exhaust air and in technological processes



### More Information online

For more information, enter the link or scan the QR code to get direct access to technical data, operating instructions, software, application examples, and much more.

[www.endress.com/fwe200dh](http://www.endress.com/fwe200dh)



# Technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

## FWE200DH measuring and control unit

Measurands	Scattered light intensity, dust concentration (according to gravimetric comparative measurements)
Suitability-tested measurands	Dust concentration
Measurement principles	Light scattering forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Measuring ranges	
Dust concentration	0 ... 5 mg/m <sup>3</sup> / 0 ... 500 mg/m <sup>3</sup> Measuring ranges freely selectable; higher measuring ranges on request
Certified measuring ranges	
Dust concentration	0 ... 7.5 mg/m <sup>3</sup> / 0 ... 10 mg/m <sup>3</sup> / 0 ... 15 mg/m <sup>3</sup> / 0 ... 50 mg/m <sup>3</sup> / 0 ... 100 mg/m <sup>3</sup> / 0 ... 500 mg/m <sup>3</sup>
Adjustment time (t <sub>90</sub> )	0,1 s ... 600 s Freely adjustable
Accuracy	± 2% of the measuring range limit value
Process temperature	
PVDF gas sample probe:	≤ +120 °C (+248 °F)
Stainless steel / Hastelloy gas sample probe:	≤ +220 °C (+428 °F) Designs for higher temperatures available on request
Process pressure	
With SLV7 2BH1100 purge air unit:	-20 hPa ... 20 hPa Other pressure ranges on request
Process gas speed	5 m/s ... 30 m/s
Process gas humidity	Max. 1% condensed water without water vapor
Ambient temperature	-20 °C ... +50 °C (-4 °F ... +122 °F)
Intake temperature for purge air:	-20 °C ... +45 °C (-4 °F ... +113 °F)
Conformities	Approved for system requiring permission 2001/80 / EC (13 <sup>th</sup> German Federal Immission Control Act (BImSchV)) 2000/76 / EG (17 <sup>th</sup> German Federal Immission Control Act (BImSchV)) 27.BImSchV German Technical Instructions on Air Quality Control (TA-Luft) EN 15267 EN 14181 U.S. EPA PS-11-compliant If options are used, it may be necessary to get agreement from local authorities
Electrical safety	CE
Enclosure rating	
Measuring and control unit	IP54
Control unit	IP65
Analog outputs	3 outputs: 0/2/4 ... 20 mA, +750 Ω; Galvanically separated
Analog inputs	6 inputs: 0 ... 20 mA; Not galvanically separated
Digital outputs	5 relay outputs (changeover contacts), volt-free: +48 V, 1 A

Digital inputs	8 inputs
Modbus	✓
Type of fieldbus integration	TCP (via optional interface module; only one module possible per MCU) RTU RS-485 (via optional interface module; only one module possible per MCU)
PROFIBUS DP	✓
Type of fieldbus integration	Via optional interface module; only one module possible per MCU
Ethernet	✓
Type of fieldbus integration	Via optional interface module; only one module possible per MCU
Function	Connection to SOPAS ET software or OPC server
Serial	✓
Type of fieldbus integration	RS-232
Function	Proprietary service interface
Display	LC display and status LED on control and remote control unit
Input	Function buttons
Operation	Menu-guided operation via control unit or SOPAS ET software
Dimensions (W x H x D)	
Measuring and control unit	813 mm x 722 mm x 286 mm (32.01" x 28.43" x 11.26"), (Details, see dimensional drawings)
Weight	
Measuring and control unit:	65 kg (143.3 lbs)
Sample probe:	≤ 15 kg (33.07 lbs)
Material in contact with media	PVDF, Hastelloy
Power supply	
Voltage	115 V / 230 V
Frequency	50 Hz / 60 Hz
Power consumption	FWE200DH measuring and control unit: 0.8 kW ... 1.7 kW Air heater: ≤ 1 kW Measured gas pipe, heated: ≤ 0.3 kW
Test functions	Automated self-test (zero point, contamination, drift) Contamination limit values: warning at 30%; fault at 40% Manual linearity test with reference filter
Options	FWE200DH mounting frame Air back purge Water back purge Measured gas pipe, heated Air heater

**SLV7-1 purge air unit, 2BH1100, 1-ph**

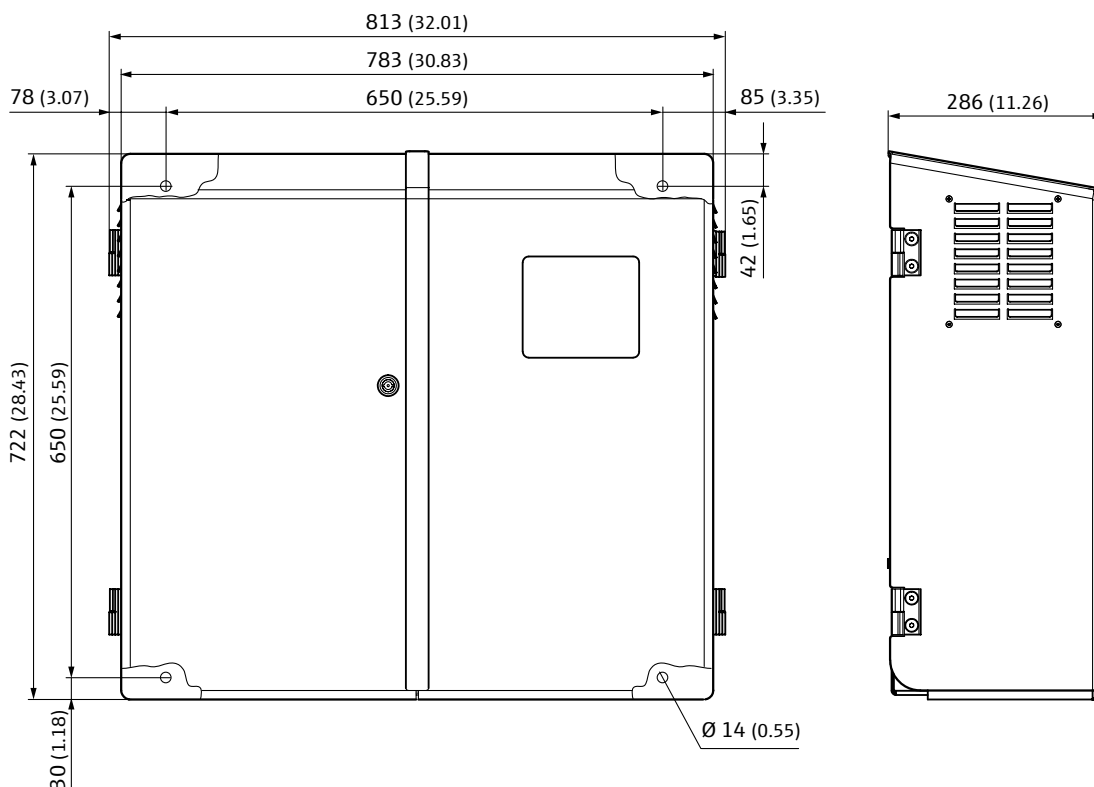
Gas flow	30 m <sup>3</sup> /h ... 40 m <sup>3</sup> /h
Ambient temperature	-20 °C ... +45 °C (-4 °F ... +122 °F) Intake temperature for purge air
Enclosure rating	IP54
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (21.65" x 21.65" x 10.16") (Details, see dimensional drawings)
Weight	16 kg (35.27 lbs)
Power supply	
Voltage	230 V / 115 V
Frequency	50 Hz / 60 Hz
Auxiliary gas connections	
Purge air	40 mm (1.57")
Test functions	Low-pressure monitor (switching point -35 hPa)
Integrated components	Two-stage air filter, type Europiclone, dust capacity 200 g (0.45 lbs)

## Order information

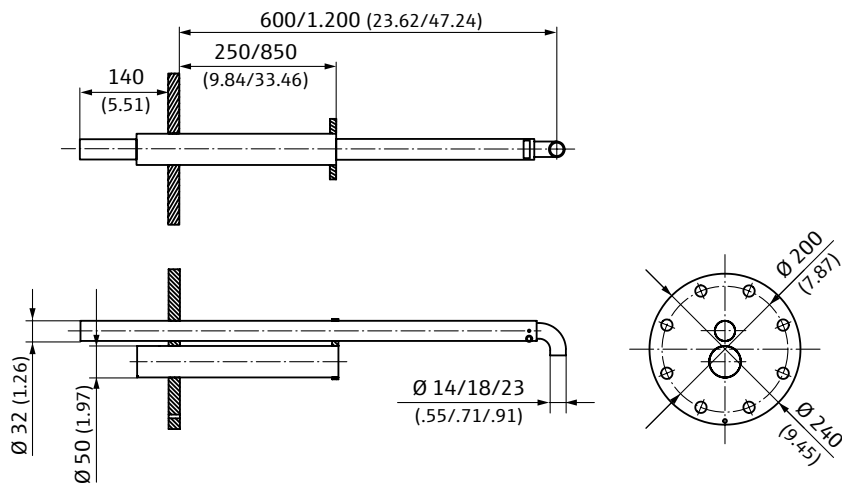
Our regional sales organization will be glad to advise you on which device configuration is best for you.

## Dimensional drawings

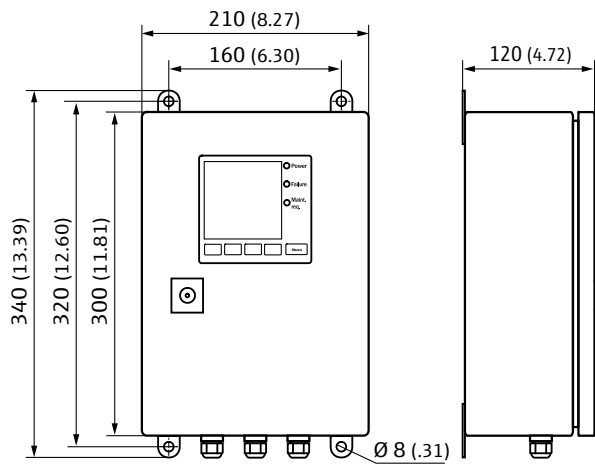
FWE200DH measuring and control unit (dimensions in mm (inch))



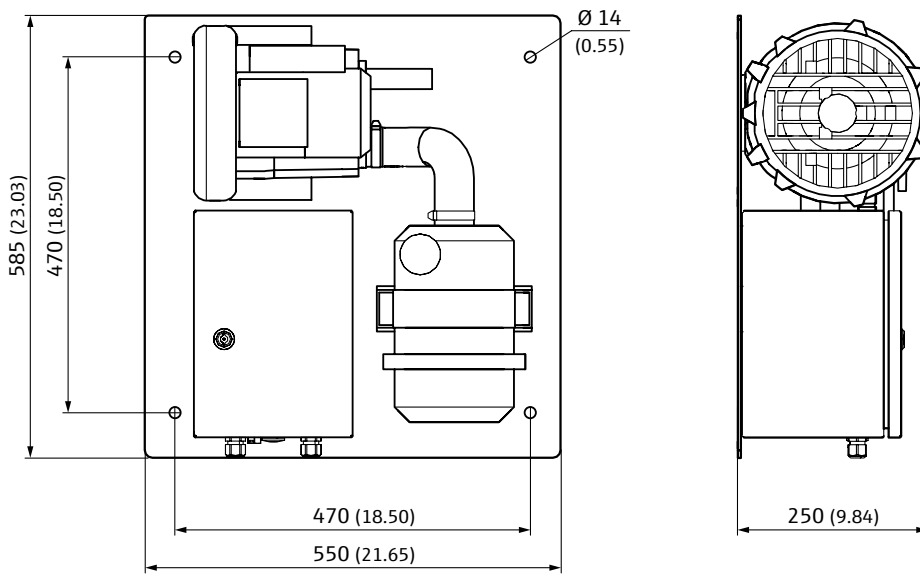
### Sample probe (dimensions in mm (inch))



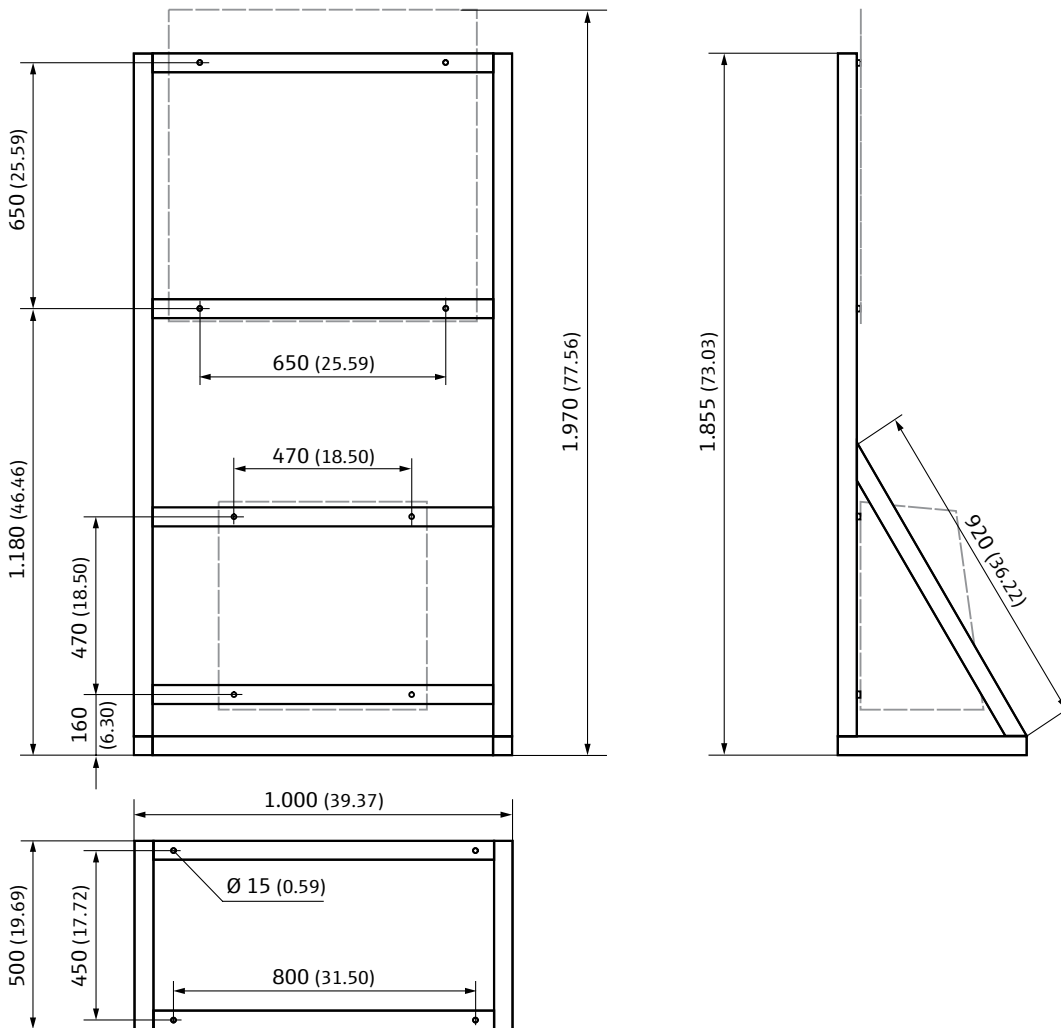
### FWE200DH remote control unit (dimensions in mm (inch))



SLV7-1 purge air unit, 2BH1100, 1-ph (dimensions in mm (inch))



FWE200DH mounting frame (dimensions in mm (inch))



# Accessories

## Lens cloths

Brief description	Part no.
Cloth for cleaning the front screen	4003353

## Test and monitoring tools

Brief description	Part no.
Control filter set FWE200DH consists of: scattered light filters with approx. 0%, 20%, 40%, 60%, 80%, filter holder, lens cloth, case with insert	2077639

## Flanges

### Weld-in flange

Brief description	Hole circle diameter	Part no.
Flange with tube, internal diameter 139 mm (5.47"), nominal length 200 mm (7.87"), structural steel 1.0037	200 mm (7.87")	7047616
Flange with tube, internal diameter 139 mm (5.47"), nominal length 200 mm (7.87"), stainless steel 1.4571	200 mm (7.87")	7047641

## Device protection (mechanical)

### Protective housing and tubes

Brief description	Part no.
Weather hood for external fan unit, aluminum, painted	2084180



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