



## Automatic Back Purging Unit

# LSE-HD

Reliable and Efficient Cleaning  
for Differential Pressure Flow Meters

# Automatic Back Purging Unit LSE-HD



## ■ PRODUCT OVERVIEW

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Differential pressure (DP) flow meters use a primary element (e.g. orifice, venturi, or pitot tube) and a DP transmitter. The primary element generates positive and negative pressures, with the transmitter measuring their difference. Accuracy depends on keeping openings and impulse lines clear.

Clogging of the measurement openings reduces accuracy and reliability. Maintaining stable measurements requires keeping these openings clean. The solution to this problem is purging them with pressurized gas and blowing any contamination back into the process gas stream.

The LSE-HD Purging Unit automatically cleans flow meters periodically. Developed and proven over 20 years, it supports hundreds of applications.

## ■ Key Benefits

- accurate and reliable flow measurement
- extends the lifespan of the flow meter
- reduces maintenance downtime and increases accuracy
- compatible with any primary element for differential pressure flow measurement

## ■ Trust Our Experience

The LSE-HD has been successfully implemented in over 1,000 installations across various industries, applications and markets for more than 20 years. We are confident it can be the right solution for your needs as well. Contact us for references or inquiries to see if the LSE-HD is the perfect fit for your application.

## ■ Application Examples

Flow meters with integrated purging units deliver robust and accurate gas flow measurements across a wide range of industrial applications.

### ■ Power Boilers

Combustion flue gases carrying ash, soot, unburnt minerals or additives based on fuel type.

### ■ Cement Production

Hot gas flow to heat raw materials into clinker, producing ash and particles in the gas stream.

### ■ Coal Combustion

Primary air to blow pulverized coal; combustion gases carry fly ash and soot.

### ■ Metal Smelting & Refining

High-temperature ore processing produces off-gases with oxides and particles.

### ■ Mineral Processing

Crushing, grinding and heating create dust managed via collectors or emitted through stacks.

### ■ Textile Production

Air or steam in manufacturing carries airborne fibers or chemical residues.

### ■ Sulfur Recovery

H<sub>2</sub>S-rich gas forms sulfur and leaves reactor off-gases with residual sulfur particulates.

### ■ Chemical Production

Involves dust, solid catalysts or by-products from reactions or grinding.

### ■ Incineration

Waste burning produces ash, soot and unburned residues.

### ■ Mining & Quarrying

Dust arises from blasting, crushing and transport, carried by ventilation or air systems.

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## ■ REFERENCE INSTALLATIONS

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### ■ Flow Meter With Fully Automatic Back Purging for QAL1 Certified CEMS

Installed in a chemical plant this unit is equipped with the LSE-HD Purging Unit. It is housed inside a protective enclosure with insulation for low temperatures and equipped with a self-controlled heater. This unit periodically cleans the averaging pitot tube (SDF Sensor) and calibrates the DP transmitter, creating a virtually maintenance-free flow measuring solution. The entire control and flow calculation is done by the remotely installed QAL1 certified flow computer AccuMind®.

The AccuMind® even has a temperature control that prevents the SDF Sensor from being purged during periods of high gas temperature to avoid damaging the sensor.



### ■ Flow Meter With Back Purging Unit for Installation in Explosive Areas

All integrated equipment is certified for zone 1 in an oil & gas refinery for boiler stacks. The purging units are controlled remotely by the AccuMind® flow computer installed in the safe area.



## ■ WORKING PRINCIPLE

The LSE-HD Purging Unit blows pressurized instrument air into the primary element and clears **any** blocked openings by pushing clogging material back into the general process. A key feature of the LSE-HD is to clean the flow meter sequentially, i.e. cleaning high and low side individually instead of simultaneously. Otherwise, the instrument air would follow the path of least resistance without cleaning any stuck debris. This purging sequence is controlled by the central valve. The valve can either be actuated manually or electrically by an actuator.

For SDF Sensors a LSE-HD Purging Unit may be required at dust levels higher than 50 mg/m<sup>3</sup> while it is strongly recommended at dust levels above 150 mg/m<sup>3</sup>.

If particles are sticky and/or ionized purging may be necessary at much lower dust levels. A combination with our **PTFE coated SDF Sensors** is often the ideal solution, as it also protects the steel structure from condensing acids.

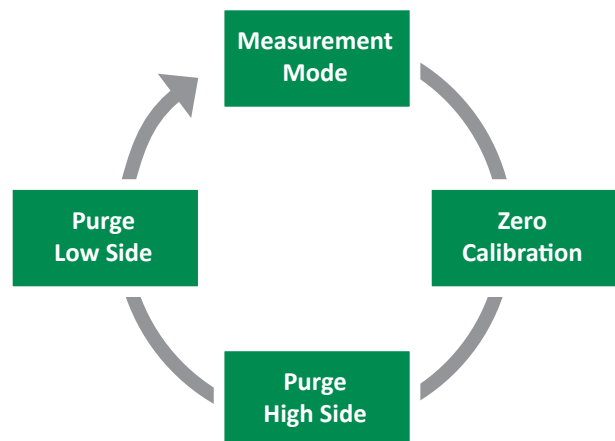
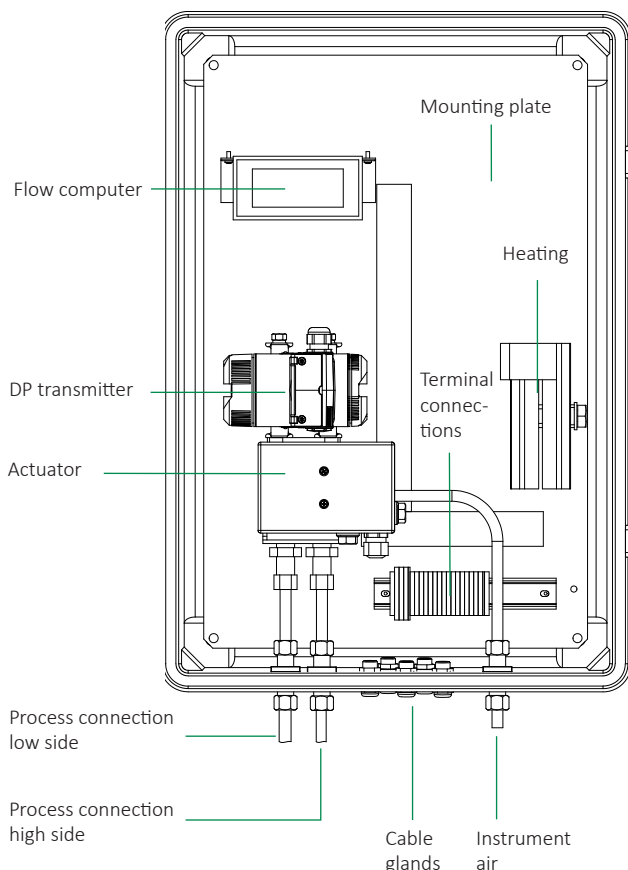
## ■ How Is Our System Different?

Many conventional systems on the market use an array of solenoid valves that open and close to control the purging cycle and air supply. However, we found that such a system has two fundamental design flaws:

1. Using an unnecessarily large number of individual valves introduces multiple points of failure. If one valve is damaged or untight, the whole unit will stop working, creating downtime and requiring maintenance.
2. The efficiency of the purging system is reduced due to increased pressure loss of multiple small-bore valves.

## ■ Control and Automation of the Purging Sequence

Automation of the LSE-HD Purging Unit using the AccuMind® flow computer enables virtually maintenance-free flow measurement. At fixed intervals, the AccuMind® not only purges the differential pressure transmitter, but also automatically corrects the zero-point error of the connected differential pressure transmitter in the same purging cycle. Alternatively, the customer can implement control and automation of the electric drive themselves. To do this, the drive's position signals must be processed to control the rotation of the drive by switching the power supply.





# Automatic Back Purging Unit LSE-HD

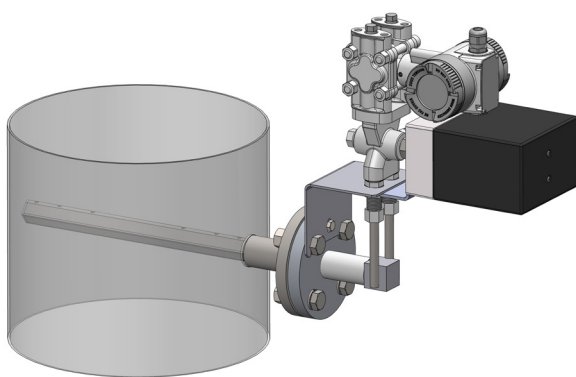


## ■ WORKING PRINCIPLE

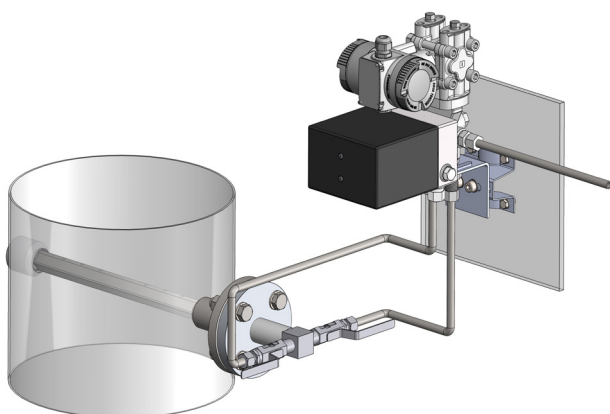
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### ■ Installation

If an LSE-HD Purging Unit with an SDF Sensor is used, the entire LSE-HD can be mounted directly on the sensor. This enables a compact design in which both devices are pre-assembled at the factory and no impulse lines need to be installed on site. The components only need to be electrically connected to the control system or the AccuMind® flow computer.



Alternatively, remote mounting is possible, where the LSE-HD is installed separately and connected to a pitot tube (or any differential pressure-based flow instrument) via pipes. This also allows for retrofitting and installations in complex spatial conditions.



### ■ Protective Enclosure

In principle, an LSE-HD is designed for outdoor use thanks to its protection class and design, and can be used there without hesitation in most cases. Only the AccuMind® must be installed in a protected area, such as a control room.

Optionally, the LSE-HD Purging Unit can be mounted in a glass fiber reinforced plastic enclosure. This protects the internal components from challenging environmental conditions, such as aggressive sea air or low temperatures. In the latter case, an insulated protective enclosure with heating is used.

The protective enclosure also makes it possible to place an AccuMind® computer directly in the LSE-HD.



### ■ Explosive Areas

Installations in areas with an explosive atmosphere are also possible thanks to an electric drive certified according to **ATEX II 2G Ex db IIC T6 Gb**. If an optional protective enclosure is used, the casing is antistatic, and an optional ex-protected heater can also be provided. In this case, the AccuMind® must be installed in the ex-protected area.

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# Automatic Back Purging Unit LSE-HD



## ■ TECHNICAL SPECIFICATIONS

### GENERAL

Compatible flow instruments	Pitot tube, orifice plate, nozzle, venturi
Maximum permissible purge temperature	400 °C for stainless steel flow instruments higher temperatures on request
Material of parts in contact with the medium	Stainless steel (1.4571/1.4404/316Ti/316L)
Ambient temperature	0 to 60 °C (0 to 50 °C with integrated AccuMind®)  –40 to 60 °C with heated protective enclosure (–40 to 50 °C with integrated AccuMind®)

### AUTOMATION AND CONNECTION

Electrical actuator	Standard: electric rotary actuator Optional: manual operation
Voltage	Standard: 230 V AC (optional: 24 V DC, 115 V AC)
Automation	AccuMind® flow computer (optional)
Purging frequency and duration	Approx. 100 seconds every 6 h (standard setting, interval can be selected, requires automation by AccuMind®)
Air consumption per purging cycle	Approx. 1,000 l at 8 bar

### INSTALLATION

Compact	Possible for SDF Sensors
Remote	Piping to differential pressure transmitter with 12 mm pipe (compression fitting)

### PROTECTIVE ENCLOSURE (OPTIONAL)

Dimensions	750 mm × 520 mm × 430 mm (H × B × T)
Material	Glass fiber reinforced plastic (GRP)
Degree of protection	IP65

### EXPLOSION PROTECTION (OPTIONAL)

ATEX approval of actuator	ATEX II 2G Ex db IIC T6 Gb (24 V)
Housing	Antistatic

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## ■ TYPE CODE LSE-HD

DRIVE AND CONTROL						
MH						Manually with hand lever
AO						Electric actuator, without controller, supply voltage 230 V AC
AOD						Electric actuator, without controller, supply voltage 24 V DC
AIA						Electric actuator, controlled by internal flow computer, supply voltage 230 V AC
AID						Electric actuator, controlled by internal flow computer, supply voltage 24 V DC
AEA						Electric actuator, controlled by external flow computer, supply voltage 230 V AC
AED						Electric actuator, controlled by external flow computer, supply voltage 24 V DC
AOEX						Electric actuator (ATEX Ex d), with terminal box (ATEX Ex e) Without controller, supply voltage 24 V DC
AEAEX						Electric actuator (ATEX Ex d), with terminal box (ATEX Ex e), Controlled by external flow computer, supply voltage 230 V AC (24 V DC PSU unit for actuator included; flow computer and PSU are not ATEX certified; both must be installed remotely in safe area)
SPECIAL MODE						
	0					Without
	Z					AccuFlo®Zero functionality for automatic zero-point calibration, on standard HART-capable transmitters
ENCLOSURE						
	00					Without enclosure, without mounting plate
	OP					Without enclosure, installed on mounting plate
	S0					Protective enclosure without window
	SF					Protective enclosure with window (acrylic glas)
HEATING						
	0					Without heater
	H					Internal electrical heater 500 W, only possible with 230 V version
	HEX					Internal electric heater 250 W (ATEX)
MOUNTING						
	MFU					Mounted directly to SDF Sensor (special mounting device for multiway position tap required), no protective enclosure
	D					Mounted directly to SDF Sensor (special mounting device for multiway position tap required) with protective enclosure
	W					Wall rack (pair)
	R					Tube clamp for 2" tube (pair)
	WU					Wall mount for version without enclosure
	RU					Pipe mount for version without enclosure
OPTIONS						
	AR					Arctic GRP model with thermal insulation lining (recommended for heated protective enclosures)
	AN					Antistatic (GO) version (for use in ATEX zone)
	QAL					Incl. QAL1 certificate
	UPGR1					Upgrade for SDF Sensor with MFU-UE (without multiway position tap) (only compatible with SDF sensors with MFU-UE)
	UPGR2					Without AccuMind® (can only be selected if AccuMind® is quoted separately, QAL-option has to be selected with AccuMind®)

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## ■ FLOW MEASUREMENT SOLUTIONS

Our company has over 30 years of experience developing, manufacturing, testing, selling and servicing precision flow measurement equipment based on differential pressure technology.

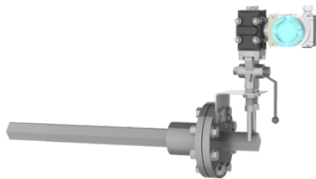
We provide solutions for industries such as steel, aluminum, oil, gas and power generation. Our flow measurement equipment delivers robust performance, even with dirty, toxic and corrosive media, and under extreme temperatures and pressures for steam, gas and liquids like water and oil.

**Certified for ATEX/IECEx, SIL and QAL1**, our products meet demanding requirements in emissions monitoring, process control and steam custody transfer. Distributed globally through authorized partners, we ensure quality with in-house manufacturing tailored to our customers' needs.



### SDF Sensor

Averaging pitot tube sensor for gases, steam and liquids



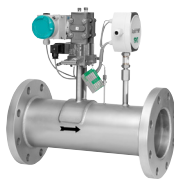
### AccuFlo® QAL

QAL1/MCERTS Flow Meter for Continuous Emission Monitoring Systems



### AccuMind®

Universal flow computer for gas, steam and liquids



### AccuFlo® HMP

High accuracy calibrated flow meter requiring very short straight inlet and outlet runs for large turn-down ratios



Deutsche  
Akkreditierungsstelle  
D-K-21982-01-00

### Calibration

ISO 17025 and DAkkS accredited water flow calibration laboratory for sizes up to DN 300 / 12"



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