Daviteq ULP Air/Gas Ultra-low Pressure Digital Sensor

1. Overview

Daviteq ULP Sensor is the digital, ultra-low pressure sensor offering state-of-the-art MEMS pressure transducer technology and CMOS mixed signal processing technology to produce a digital, fully conditioned, multi-order pressure and temperature compensated sensor. It is available in a gauge and a differential pressure configuration.

The total error band after autozero is less than 1%FS.

This ULP sensor module will be integrated with a transmitter module to give a suitable output like RS485 ModbusRTU, 4-20mA, 0-10V, Sub-GHz wireless, LoRaWAN, Sigfox, NBIoT...It is also powered by that transmitter.

Typical Applications of this Ultra-low Pressure Sensor:

- Gas Flow Instrumentation
- Air Flow Measurement
- HVAC / VAV
- Pressure Monitoring
- Negative Pressure Room Monitor
- Positive Pressure Room Monitor
- Filter Clogging Monitor
- Safety Cabinets

2. Detail measurement principle and its specification

ULP can measure gauge pressure or differential pressure, please refer to below specification.

Type	Min Pressure (Pa)	Max Pressure (Pa)	Total Error Band * (% FS)
ULP-G300	0	+300	+/- 1.0
ULP-G600	0	+600	+/- 1.0
ULP-D125	-125	+125	+/- 1.25
ULP-D250	-250	+250	+/- 1.0

Common specification

Operating Temperature	-20 .. + 85 oC
Compensation Temperature	-20 .. + 85 oC
Max allowable static pressure	7 Kpa
Burst static pressure	20 Kpa
Process connection	6mm tube quick fittings
Electrical Connector	Integral PG9 connector or M12-M connector (for remote version)
Housing Material	Engineering Plastic
Process connection	6mm tube quick fittings
Working Humidity	0 .. 100%RH
IP Rating	IP67

3. Calibration of the Daviteq AFD Air/Gas Flow Sensor

The Daviteq ULP pressure sensor is calibrated at the factory.

The customer is recommended to re-calibrate the sensor every 12 months by the Ultra-low pressure calibrator or by a 3rd-party.

> Notes:
> * The calibration and configuration can only be done when the ULP module is used with a transmitter like Sub-GHz (WS433-M12F-AFD) or LoRaWAN (WSLRW-M12F-AFD) or Sigfox (WSSFC-M12F-AFD, or ModbusRTU
> * After that, use the **offline tool** or downlink to configure A & B to the device.

4. Application notes for the Daviteq ULP Ultra-low Pressure Sensor

The Daviteq ULP Ultra-low Pressure Sensor together with a transmitter to be used in the following cases:

- Gas Flow Instrumentation
- Air Flow Measurement
- HVAC / VAV
- Pressure Monitoring
- Negative Pressure Room Monitor
- Positive Pressure Room Monitor
- Filter Clogging Monitor
- Safety Cabinets

5. Installation

5.1 Mounting Direction

The sensor can be mounted in any direction. After fixing, please perform the zero calibration to get a correct reading.

5.2 Connect tubing

Use the 6mm OD plastic tubes to connect to the H and L pressure ports of the sensor.

5.3 Mounting Position

- The mounting position must be chosen such that access to the Device is always possible;
- Please take note of the specification of the ULP sensor and its transmitter to ensure the complete set of devices is suitable for the process and environment of the installation.

6. Troubleshooting for the ULP Sensor

No.	Phenomena		Reason	Solutions
1	The pressure value is always very small or zero.	1.1	The tubes are bending or breaking	Check the tubes and connection
		1.2	The connection between the sensor and transmitter is not firm	Check the electrical connection of the sensor module
		1.3	The pressure sensor got a problem or the transmitter got a problem.	Please consult the manufacturer for a warranty or replacement.
2	From system: HW_Error = 1	2.1	The lost connection between the sensor and the transmitter	Check the electrical connection of the sensor module
		2.2	The sensor module got a problem.	Please consult the manufacturer for a warranty or replacement.

7. Maintenance of the ULP Sensor

- There are no moving parts or consumed parts in the ULP Sensor. Therefore there is no need to do maintenance.
- However, the pressure sensor will drift over time. We do recommend customer to re-calibrate it every 12 months.

8. Default configuration

This ULP Sensor has the default configuration. The user can change the configuration on the transmitter so that the complete device (sensor + transmitter) delivers the proper output values. Below are some configuration parameters stored in the transmitter's flash memory.

Description	Unit	Default	Format	Property	Comment
CONSTANT_A		1	Float	R/W	Constant a for scaling pressure value (in Pa)
CONSTANT_B		0	Float	R/W	Constant b for scaling pressure value (in Pa)
HIGH_CUT		1E+09	Float	R/W	High cut value for scaled value
LOW_CUT		0	Float	R/W	Low cut value for scaled value
SENSOR_BOOT_TIME	mS	200	Uint32	R/W	Boot time of sensor/input, in ms
TEMPERATURE_OFFSET	oC	0	int16	R/W	Offset adjustment for measured temperature value

END.

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