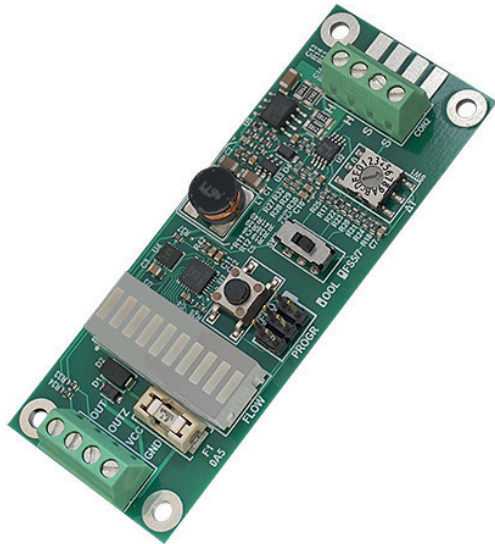# DATA SHEET

Flow module
Optimal for gas flow sensor evaluation
Suitable for gas and liquid flow sensors

Description

Performance features

- Compatible with FS5/7 flow sensors
- Compatible with OOL flow sensors
- Constant Temperature Anemometer (CTA)
- Programmable temperature difference between heater and temperature sensor
- LED bar indicates current flow
- Analog Wheatstone Bridge (direct output)
- Protected with user replaceable fuse
- Output with zero flow offset substraction

Areas of application

- Gas flow meters
- Liquid flow meters
- Gas flow detectors
- Liquid flow detectors
- Liquids presence detectors

Technical data

Flow module 0555 0001		
Operating measuring range	0...50 m/s	
Operating temperature range	-20...85 °C	
Temperature sensitivity	>0,5%/K (dependent on calibration)	
Acuracy	< 5% of the measured value (dependent on calibration)	
Supply voltage	FS5/7 sensors	6...9 V (typ. 9 V)
	OOL sensors	6...15 V (typ. 12 V)
Analog output, max. output voltage	VCC -2 V	
Warm-up time	<30 s	
Dimensions	(L x W x H) 80 x 31 x 15 mm	
Art.- no.	0555 0001	

Features

The Flow module is a universal board allowing the user to measure performance of gas and liquid flow sensors. It utilizes the constant temperature anemometer principle using an analog wheatstone bridge.

The module is designed to work with both FS5/7 and out of liquid flow sensors. The user can easily program the temperature difference between heater and temperature sensor using a rotary switch and subtract zero flow offset from output voltage using OUTZ output and ZERO button. The sensor (FS5/7 or OOL) can be screwed to the PCB by using terminal blocks or directly soldered to the exposed pads of the PCB. Additionally, the user can limit power dissipated in the heater using supply voltage. The Flow module is not temperature-compensated.

Technical changes reserved
0141 0316-13 20.01.2021

B+B Thermo-Technik GmbH | Heinrich-Hertz-Straße 4 | D-78166 Donaueschingen
Fon +49 771 83160 | Fax +49 771 831650 | info@bb-sensors.com | bb-sensors.com

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DATA SHEET

Flow module
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B|B SENSORS

Pin assignment

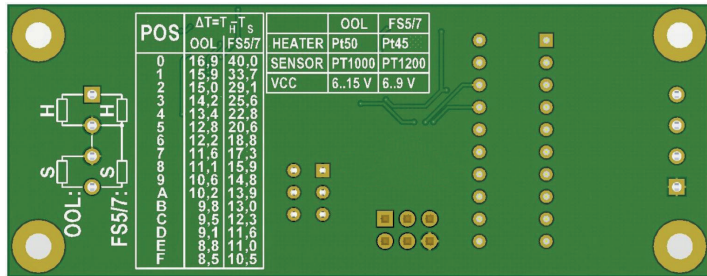| Pin	Assignment
GND	Negative supply voltage
VCC	Positive supply voltage
OUT	Output - Bridge's voltage
OUTZ	Output with zero flow offset substraction
H	Heater (inner = GND)
S	Sensor (inner = GND)

Front side

Back side

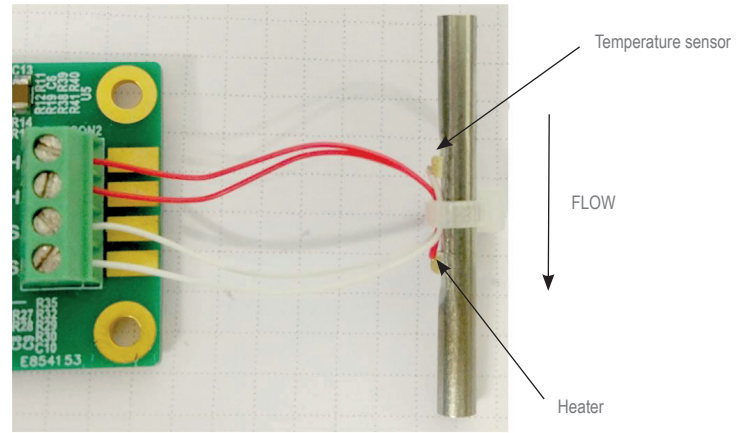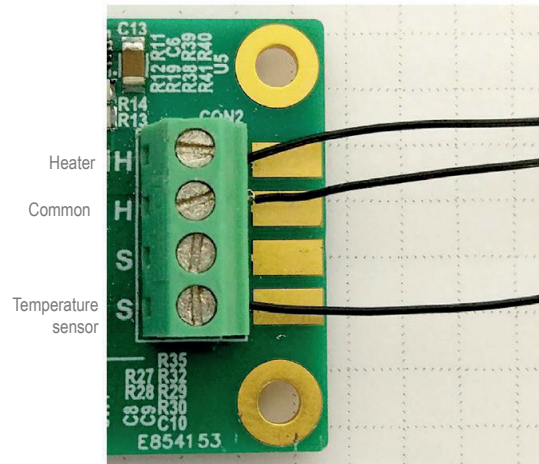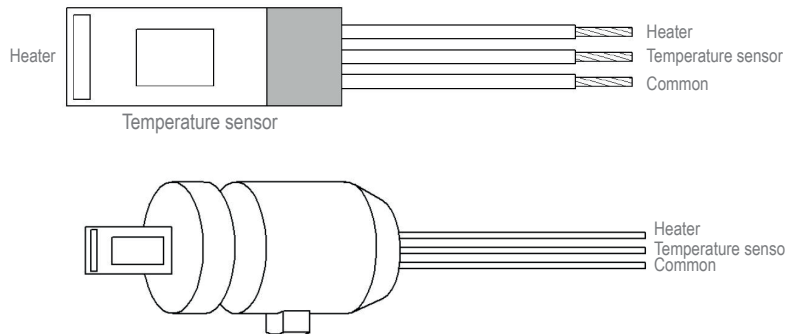| POS	ΔT=T$_H$T$_S$		OOL	FS5/7
	OOL	FS5/7	HEATER	Pt50	Pt45
0	16,9	40,0	SENSOR	PT1000	PT1200
1	15,9	33,7	VCC	6..15 V	6..9 V
2	15,0	29,1			
3	14,2	25,6			
4	13,4	22,8			
5	12,8	20,6			
6	12,2	18,8			
7	11,6	17,3			
8	11,1	15,9			
9	10,6	14,8			
A	10,2	13,9			
B	9,8	13,0			
C	9,5	12,3			
D	9,1	11,6			
E	8,8	11,0			
F	8,5	10,5			

How to connect

- For OOL sensor move switch to "OOL" position, for FS5 or FS7 sensor to "FS5/7" position.
- Connect the sensor to CON2 terminals according to the diagram on back of PCB: Heater to terminals "H", temperature sensor to terminals "S" (screw or solder them directly to pads). For FS5 or FS7 sensor please connect sensor's common wire to one of the middle terminals of CON2
- Select desired difference of temperatures between heater and temperature sensor using ΔT switch and the table on back of the PCB.
- Connect power supply to CON1: positive to "VCC", negative to "GND". For OOL sensor no more than +15 V, for FS5/7 no more than +9 V.
- Connect voltmeter to CON1: positive to "OUT" or "OUTZ", negative to "GND".
- Switch on power supply.

- For zero flow press "ZERO" button in order to subtract zero flow offset from LED bar and "OUTZ" output, note that "OUT" output will remain unaffected.
- The OOL sensor is directional, flow's direction should be: from temperature sensor to heater.

Wiring for OOL Sensor

Temperature sensor

FLOW

Heater

Wiring for FS5/FS7 Sensor

Heater

Temperature sensor

Heater
Temperature sensor
Common

Heater
Temperature sensor
Common

Heater

Common

Temperature sensor

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Fon +49 771 83160 | Fax +49 771 831650 | info@bb-sensors.com | bb-sensors.com

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DATA SHEET

B|B SENSORS

Flow module
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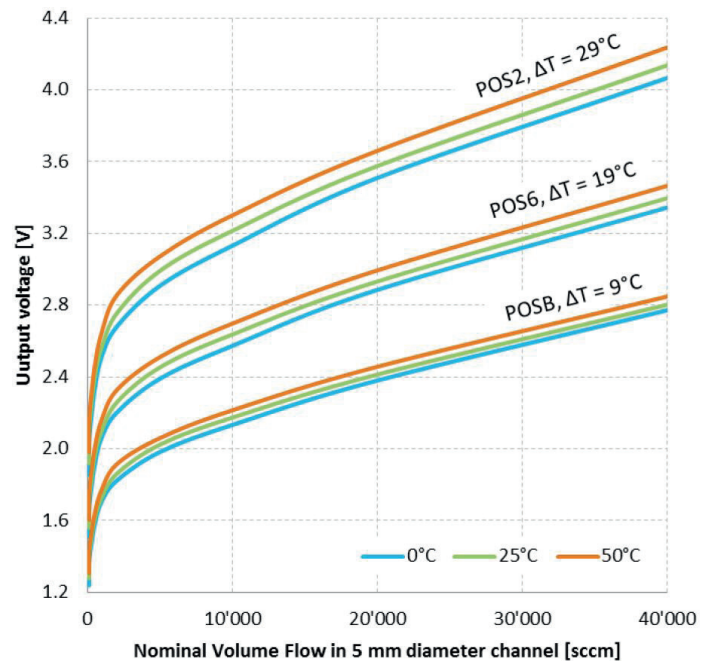## Suitable for gas and liquid flow sensors

How it works

- The PCB measures flow using the Constant Temperature Anemometer (CTA) principle.
- During normal operation CTA will always keep the temperature of the heater (T_H) above the temperature of the sensor (T_S) by a constant, pre-defined value $\Delta T = T_H - T_S$
- The CTA is made using an analog Wheatstone Bridge with simplified diagram:
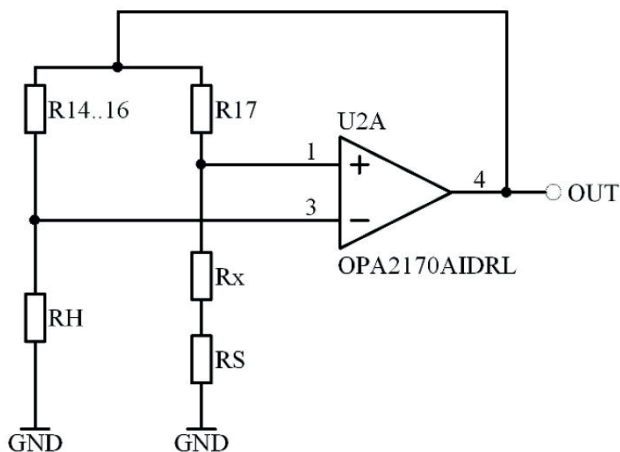
- PCB's output voltage "OUT" is connected to the bridge
- Additionally, the PCB has the "OUTZ" output allowing the user to measure flow without zero flow offset (zero flow = zero volts).
- Maximum power dissipated in the sensor / maximum "OUT" voltage can be limited using supply voltage: $U_{OUT}(max) = VCC - 2V$. Maximum VCC current should not exceed 0.4 A.
- The PCB is protected using 0.5 A fuse F1, if PCB does not respond please check the fuse.
- The total value of R14..16 sensors is 21 Ω, for OOL sensor R17 = 420 Ω while for FS5/7 sensor R17 = 560 Ω
- Please note that the Flow Demo Board ist not temperature-compensated.

Typical characteristics

FS7 Sensor

OOL Sensor