



Out of Liquid Demo Module

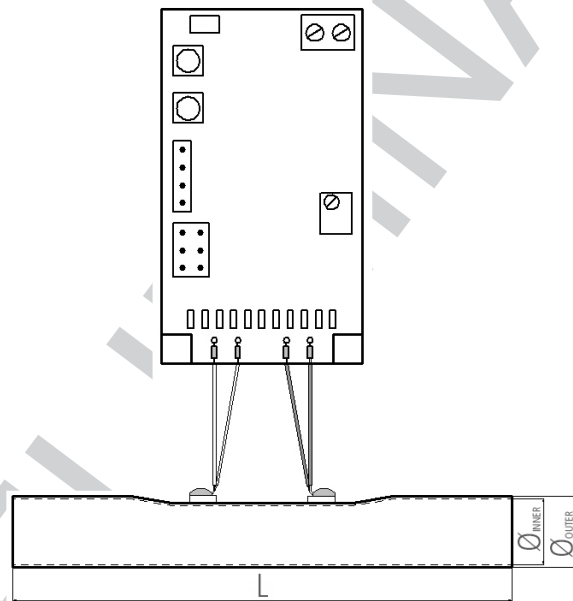
Thermal Mass Flow Demo Module

Optimal for various "Out of Liquid" flow applications

Benefits & Characteristics

- Single supply 5 V_{DC}
- Suitable for aggressive liquids
- No contact between sensor and liquid
- Adjustable by customer

Illustration¹⁾



¹⁾ For actual size, see dimensions

Technical Data

Tube dimensions (L x Ø _{OUTER} x Ø _{INNER}) in mm):	40 x 4 x (3.8)
PCB dimensions (L x W x H in mm):	25 x 58 x 12
Operating measuring range:	0 ml/min to 3000 ml/min (4 m/s)
Response time (t ₉₀):	< 300 ms (at step from 0 to 1000 ml/min)
Warm-up time:	< 30 s
Connection (PCB to tube):	Cu/Ag-wire, PTFE insulated, AWG 30/19, 50 mm
Heater:	R _H (0 °C) = 50 Ω ± 1 %
Temperature sensor:	R _S (0 °C) = 1000 Ω ± 1 %
Connection (module):	Screw terminal
Supply voltage:	5 V _{DC} ± 5 %
Current consumption:	1.5 A (maximal)



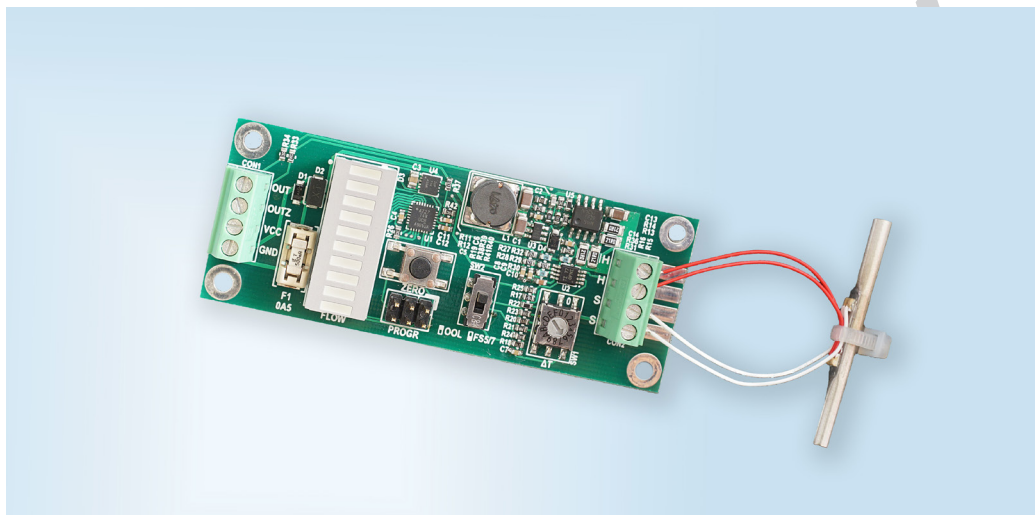
Analogue output, non linear

$0 V_{DC}$ to $< 5.0 V_{DC}$

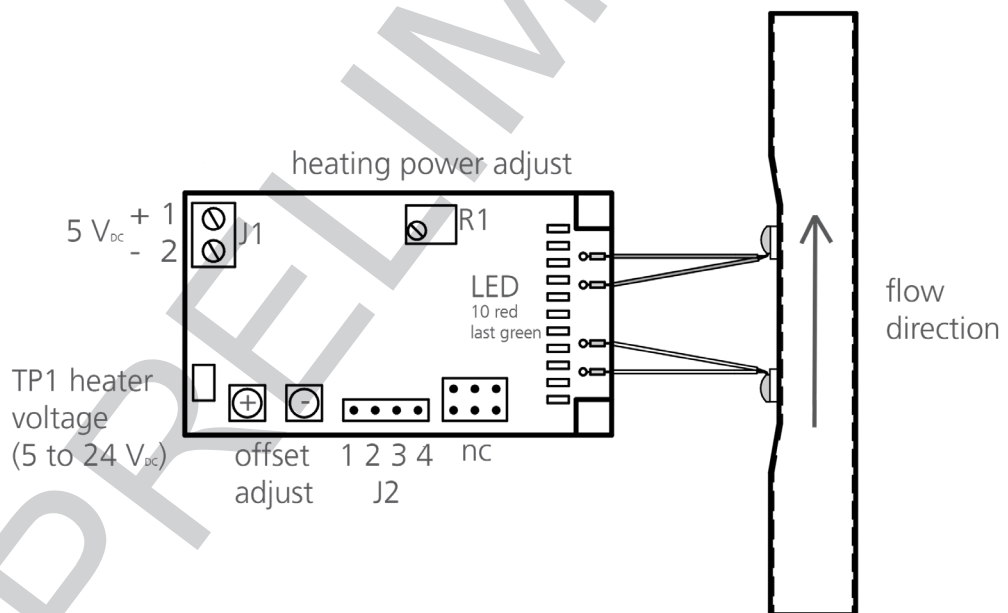
Tube material:

Stainless steel

Product image



Adjustment Procedure (if necessary)



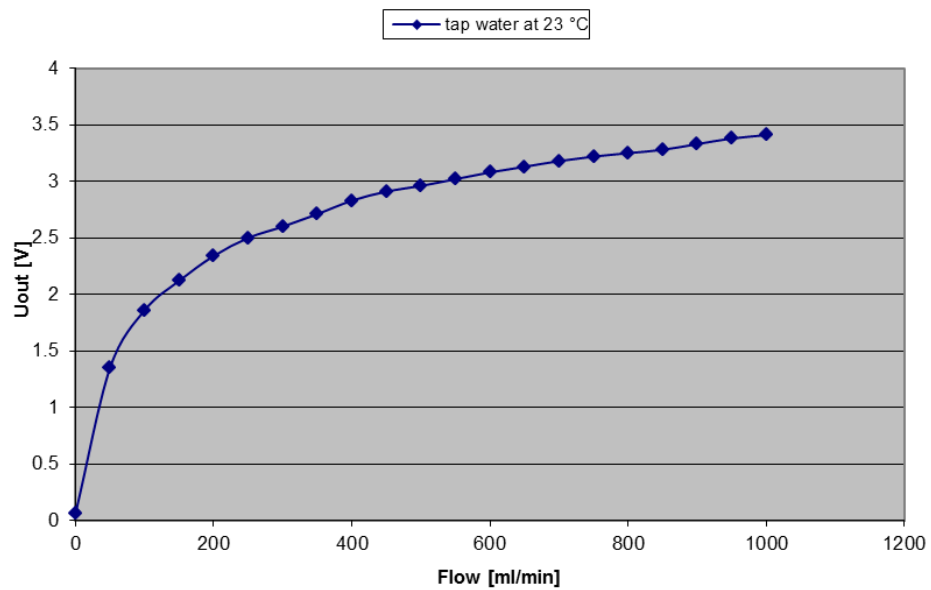
J1	
Pin 1	Pin 2
$V_{DD} = 5.0 V_{DC}$ (regulated) minimum 1.5 A	
	GND

J2			
Pin 1	Pin 2	Pin 3	Pin 4
GND	analog out (non-linear flow signal 0 to $< 5 V_{DC}$)		



1. Power up the module
2. Start pump to fill up the system (tube) with liquid
3. Wait until output signal is stable (about 30 s)
4. Adjust potentiometer R1 to a heater voltage of about 8 to 10 V_{DC} at TP1
5. Apply a known flow (for example 200 ml/min)
6. Measure analog output voltage at J2 Pin2 (should be in the range of 2.0 to 2.5 V_{DC} at 200 ml/min)
7. Adjust R1 for desired output voltage
8. Stop flow
9. Check if analog output voltage at J2 Pin2 is $< 0.1 V_{DC}$
10. If not, push the offset buttons repeatedly to adjust output voltage and LED's so only the green LED is ON and voltage is below $0.1 V_{DC}$
11. Apply flow again and check output voltage
12. This output signal is the non-linearized flow signal

Typical Flow Curve (water)





Order Information

	OOL Demo Unit V2.0
Order code	On request
<i>Former order code</i>	160.00005
	P1K0/050.232.2K.C.050.M.U.S
Order code	104171
<i>Former order code</i>	310.00953

Additional Documents

Data Sheet:	Document name: DFOOL_E
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PRELIMINARY

