

**Product features**

- Ultrasonic flow measurement
- Analog output
- Huge measurement range DN15-DN50
- No moving parts, long lifetime
- Robust against dirt and magnetite
- Low differential pressure
- Fully calibrated and temperature / glycol compensated
- (Orientation) Position-independent

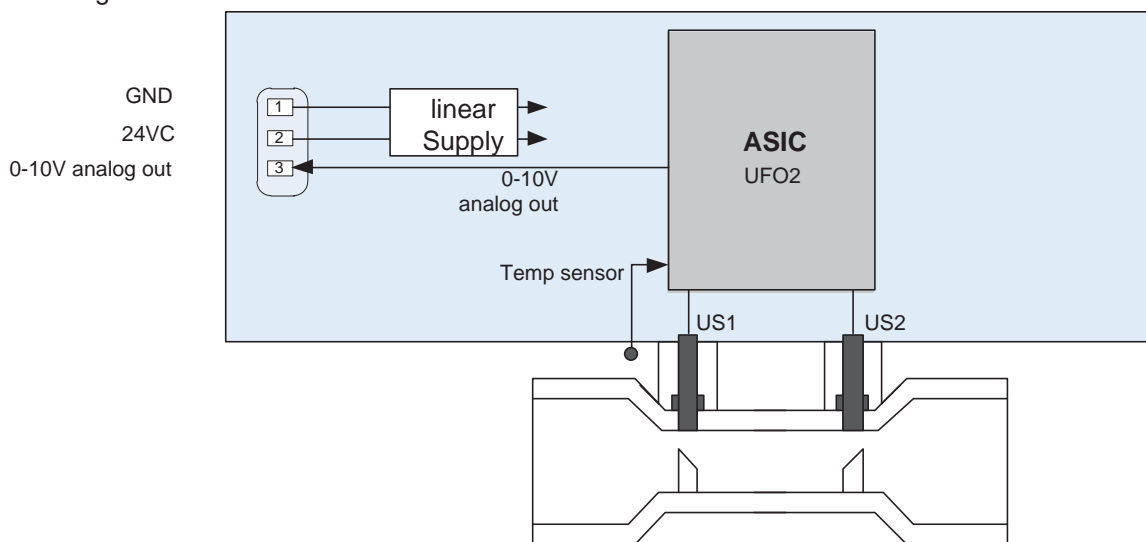


**Applications**

- HVAC applications in buildings
- Heating/cooling fluid flow control / monitoring

**Functional Description**

1.1 Block Diagram



The Ultrasonic Flow Sensor is constructed with a flow tube , two ultrasound transmitters and an electronic device. The electronic device is based on Application-Specific Integrated Circuit (ASIC) to perform the ultrasonic time-of-flight measurement between the two ultrasound transmitters. A temperature sensor is placed in the flow tube to compensate temperature effects.

1.2 Electrical Connection

FM can be directly connected to Belimo actuator with appropriate connector.



Connector		
BK	RD	WH
GND	24VAC/DC	0-10V out

### 1.3 Analog Output

The FM has an analog 0-10V output.

Voltage	Flow
0V	Sensor has no supply voltage
0.3V	Sensor has supply voltage but in error state
0.5V	0% of V'nom
10V	120% of V'nom

## Specifications

### 2.1 Sizes

Model	Size	V'min (l/s)	V'nom (l/s)	V'max (l/s)
FM015R-SZ	DN 15 ISO	0.088	0.35	0.420
FM020R-SZ	DN 20 ISO	0.163	0.650	0.780
FM025R-SZ	DN 25 ISO	0.288	1.150	1.380
FM032R-SZ	DN 32 ISO	0.450	1.800	2.160
FM040R-SZ	DN 40 ISO	0.625	2.500	3.000
FM050R-SZ	DN 50 ISO	1.200	4.800	5.760

### 2.2 Environmental Specifications

Parameter	min (°C)	max (°C)
Storage temperature	-40	80
Operational temperature	0	50
Temperature of medium	-20	120
Medium	Water, Water and Ethylene/Propylene Glycol Mixtures up to 60%	
Humidity	Air (5..95% RH) , non-condensing	

### 2.3 Sensor Specifications

Nominal Voltage	24V
Nominal Voltage Range	19.2 - 28.8 V AC 21.8 - 28.8 V DC
Supply Current	10m A
Power Consumption	0.5W , 1VA
Start-up time	1s
Reaction time	0.1s
Accuracy in water	@ 25°C w / 5X D inlet length
Range 0... 25% of V'nom	±0.5 % V'nom
Range 25% ...120% of V'nom	±2 %
Resolution of analog output	1.25 mV
Max. load on analog output	1 mA
Measurement Range	> 1:100
Medium over pressure	max 1600 Kpa
Protection Class	Class 2 supply
Enclosure	Type 1, NEMA 1

### 2.4 Pressure Loss

Size	V'nom (l/s)	Pressure loss @ V'nom (Kpa)
DN 15	0.35	8.6
DN 20	0.65	8.6
DN 25	1.15	6.0
DN 32	1.80	4.2
DN 40	2.50	4.8
DN 50	4.80	10.5