

**DESCRIPTION**

Piezosonic is an advanced ultrasonic flow meter featuring ultra high energy excitation and titanium corrosion resistant transducers for the most demanding applications where it is crucial to maintain the longest service life without interruptions for sensors cleaning. The improved electronics make transducers resistant to acoustic interference and vibration.

The ultrasonic flow meter features a differential transit time technology and designed to measure flow and volume of homogeneous conductive and non-conductive liquids. It can be equipped with one or two measurement channels. The PIEZOSONIC ultrasonic flow meter is available in single beam or double beam versions and can be supplied with or without a flow sensor.

**SPECIFICATIONS**

Diameter range: 50...2000 mm  
Pressure: up to 2.5 MPa (up to 6.3 MPa optionally)  
Analogue output: 4...20 mA (passive,  $U_s = 12...30$  V)  
Frequency output: 0.5...2000 Hz (passive,  $U_s = 5...25$  V,  $I_{max} = 50$  mA)  
Digital output: RS-485 (Modbus RTU)  
Media temperature: -40...+150 °C  
Ambient temperature: 0...+50 °C  
Kinematic viscosity: 0.2...25 mm<sup>2</sup>/s  
Ingress protection: IP65, IP67, IP68

**APPLICATIONS**

Water treatment  
Water intake facilities  
Food and beverages

Pulp and paper  
Power generation

## TECHNICAL SPECIFICATIONS

### FLOW RATES

Diameter	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300
Min. flow rate, m <sup>3</sup> /h	0.47	0.8	1.2	1.87	4.24	7.5	11.8	17.0
Nom. flow rate, m <sup>3</sup> /h	36.5	62	93	145	328	582	915	1320
Max. flow rate, m <sup>3</sup> /h	73	124	186	290	656	1164	1830	2640

Flow rates for diameters from 300 mm:

$$Q_{\max} = 0.03 \cdot (\text{Diameter})^2$$

$$Q_{\text{norm}} = 0.5 \cdot Q_{\max}$$

$$Q_{\min} = 6.4 \cdot 10^{-3} \cdot Q_{\max}$$

### PERFORMANCE

Frequency/pulse output accuracy	±0.05 % FSO
4...20 mA output accuracy	±0.5 % FSO

Diameter	Beams configuration	Measurement accuracy of volume flow and volume, % FSO
DN50...DN80	diameter	±(1.2+0.2/v)
DN100...DN1600	diameter	±(1.0+0.2/v)
DN50...DN80	two chords	±(0.7+0.2/v)
DN100...DN1600	two chords	±(0.5+0.2/v)

Diameter	Beams configuration	Measurement accuracy of volume flow and volume, % FSO
DN50...DN300	diameter	±(2.5+0.2/v)
DN350...DN2000	diameter	±(2.0+0.2/v)
DN50...DN80	two chords	±(2.0+0.2/v)
DN100...DN350	two chords	±(1.5+0.2/v)
DN400...DN2000	two chords	±(1.0+0.2/v)

v – flow speed, m/s

### OPERATING CONDITIONS

Medium temperature	-40...+150 °C
Ambient temperature	0...+50 °C
Relative humidity without moisture condensation (max)	98 %
Atmosphere pressure	84...106.7 kPa
Pressure	max 2.5 MPa; 6.3 MPa (optionally)
Converter ingress protection	IP65
Flow sensor ingress protection	IP65 (IP67 and IP68 optionally)
Service life	10 years

### CONVERTER

Segments displayed	999999.999 m <sup>3</sup>
Last significant digit when displaying flow rate	0.001 m <sup>3</sup> /h
Last significant digit when displaying volume	0.01 m <sup>3</sup>
Height	200 mm
Width	200 mm
Depth	112 mm
Weight (max)	1.9 kg

### ELECTRICAL SPECIFICATIONS

Frequency output	0.5...2000 Hz
Current output	4...20 mA
AC voltage	220 V
Current frequency	50 Hz
Power consumption	15 VA
Max cable length between ultrasonic transmitter and converter	500 m <sub>+22 -33</sub>

## QUESTIONNAIRE

### PROCESS PARAMETERS

Medium				
Additives in the liquid	Yes		No	
Solid additives concentration, %				
Liquid temperature, °C	Min.		Nom.	Max.
Ambient temperature near installed flow sensor, °C	Min.		Nom.	Max.
Ambient temperature near installed flow converter, °C	Min.			Max.
Liquid pressure, MPa	Min.		Nom.	Max.
Liquid flow rate, m <sup>3</sup> /h	Min.		Nom.	Max.

### FLOW METER TECHNICAL SPECIFICATIONS

Channels	One		Two	
Beams	One		Two	
Version	With flow sensor		Without flow sensor	
Flow sensor diameter (The diameter difference for two-channel version should be less than 50% ), mm	1 channel		2 channels (if applicable)	
Pipeline material	Mild steel		Stainless steel	
Ingress protection	IP65	IP67	IP68	
Cable length between ultrasonic transmitter and converter. Sum up all the lengths from each ultrasonic transmitter. The same length is used for each pair of transmitters.	1 channel		2 channels	

### OPTIONAL ACCESSORIES NEEDED

Mating flanges	Yes		No	
Seals, bolts, nuts.	Yes		No	

### ADDITIONAL INFORMATION

Quantity needed				
Notes				

### CONTACT INFORMATION

Company name				
City				
Phone				
e-mail				
Name	Position			
End customer				

## ORDERING CODE

	PIEZOSONIC	-XX	-XXXX	-XX	-XXXX	-XX	-XX	-XX	-XXXX
<b>VERSION</b>									
Single channel, one beam, 2X ultrasonic transmitters		11							
Single channel, two beams, 4X ultrasonic transmitters		12							
Double channel, one beam per channel, 4X ultrasonic transmitters		22							
<b>PRESSURE</b>									
		1.0 MPa	PN10						
		1.6 MPa	PN16						
		2.5 MPa	PN25						
<b>FLOW SENSOR</b>									
		Without flow sensor, LV version converter, mointing kit(s)		LV					
		Without flow sensor, HV version converter, mointing kit(s)		HV					
		With flow sensor (DN50...DN2000)		DN					
<b>FLOW SENSOR DIAMETER (for double channel version use XXXX/XXXX format)</b>									
		Without flow sensor		XXXX					
<b>Flange flow sensors, flow path material - stainless steel, flanges – mild steel</b>									
		DN50		0050					
		DN65		0065					
		DN80		0080					
		DN100		0100					
		DN150		0150					
		DN200		0200					
		DN250		0250					
		DN300		0300					
<b>Flange flow sensors, flow path material - mild steel, flanges – mild steel</b>									
		DN125		0125					
		DN150		0150					
		DN200		0200					
		DN250		0250					
		DN300		0300					
		DN350		0350					
		DN400		0400					
		DN500		0500					
		DN600		0600					
		DN700		0700					
		DN800		0800					
		DN900		0900					
		DN1000		1000					
		DN1200		1200					
		DN1400		1400					
		DN1600		1600					
		DN2000		2000					

## ORDERING CODE (continued)

PIEZOSONIC	-XX	-XXXX	-XX	-XXXX	-XX	-XX	-XX	-XXXX
<b>FLOW PATH MATERIAL (in case of two flow sensors use XX/XX format)</b>								
			Stainless steel		SS			
			Mild steel		MS			
			Other (specify when ordering)		XX			
<b>FLANGES MATERIAL (in case of two flow sensors use XX/XX format)</b>								
			Mild steel		MS			
			Other (specify when ordering)		XX			
<b>ULTRASONIC TRANSMITTERS ELECTRICAL CONNECTION</b>								
					DIN 43650C (IP65)		65	
					M12x1 (IP67)		67	
					Cable gland (IP68)		68	
<b>CABLE LENGTH (Sum up all the lengths from each ultrasonic transmitter. The same length is used for each pair of transmitters, for two different beams use XXXXX/XXXXX format)</b>								
						Without cable		00000
					20...2000 m (Max 4x500=2000 m), e. g. 0020R means 20 m			XXXXXR

Example: PIEZOSONIC-11-PN16-DN-0100-MS-MS-65-0020R