Badger Meter Europa

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Series 228

Metallic tee flow sensors

Features

- Flow sensor in T-type
- To be mounted in the pipe
- Easy flow measurement
- Rugged construction
- Reliable
- Various materials available

Description

The series 228 flow sensors feature a six bladed impeller design with a proprietary non-magnetic sensing mechanism. The forward swept impeller shape provides higher, more consistent torque than four bladed impeller designs and is less prone to be fouled by water borne debris. The forward curved shape coupled with the absence of magnetic drag provides improved operation and repeatability even at lower flow rates.

This is especially true where the impeller is exposed to metallic or rust particles found in steel or iron pipes. As the liquid flow turns the impeller, a low impedance square wave signal is transmitted with a frequency proportional to the flow rate. The signal can travel up to 600 m between the flow sensor and the display unit without the need for amplification. All sensors except irrigation versions are supplied with 6 m of 2-conductor 20 AWG shielded U.L. type PTLC 105°C cable.

Model 228B	Brass/bronze sensor mounted in a bronze tee.
Model 228CB	Brass/bronze sensor mounted in a cast iron tee.
Model 228CS	Stainless steel sensor mounted in a cast iron tee
Model 228SS	Stainless steel sensor mounted in a stainless steel tee

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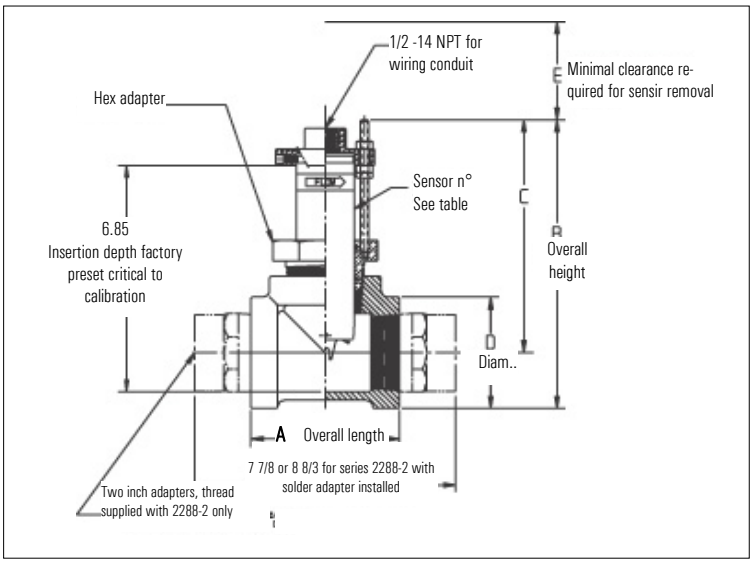

Note: Dimensions "B" and "C" may vary ±1/4 inch, depending upon make-up on pipe threads.

228CB-2.5	See matrix	71881T	2.5-8	4.88	9	7	4	6
2288-2.5	See matrix	71883T	2.5-8	4.75	8.78	7	3.56	6
228SS-2	See matrix	711338T	2-11.5	4.5	6.38	6.88	3	6
228CS-2	See matrix	71876T	2-11.5	4.5	8.57	6.88	3.38	6
228CB-2	See matrix	71876T	2-11.5	4.5	8.57	6.88	3.38	6
2288-2	See matrix	71879T	2-11.5	4.25	8.35	6.88	2.94	6
Complete series n°	Sensor n°	Tee n°	NPT	A	B	C	D	E

Technical data

Wetted materials (except tees)	See ordering matrix		
Sensor sleeve and hex adapter for 228BR and 228CB	Sleeve: Admiralty brass, UNS C44300; hex adapter: Valve bronze, UNS C83600		
Sensor sleeve and hex adapter for 228SS and 228CS	300 series stainless steel		
Tee for 228BR	Cast bronze, class 125 per ASME B16.15 and copper coupling		
Tee for 228SS	Cast 316 stainless, class 150		
Tee for 228CB and 227CS	Cast iron, class 125 per ASME B16.4		
Temperature ratings	Standard version: 105°C (221°F) continuous service Irrigation version: 66°C (150°F) continuous service High temperature version: 140.6°C (285°F) continuous service, 150°C (305°F) peak temperature (limited duration)		
Pressure		At 24°C	At 135°C
	228B	13 bar	11 bar
	228CB	12 bar	9 bar
	220SS	27 bar	22 bar
Recommended design flow range	0,15 to 9 m/sc		
Accuracy	± 1.0% of full scale over recommended design flow range.		
Repeatability	± 0.3% of full scale over recommended design flow range.		
Linearity	± 0.2% of full scale over recommended design flow range.		
Transducer excitation	Quiescent current 600 µA @ 8 VDC to 35 VDC max. Quiescent voltage (Vhigh) supply voltage –(600 µA*supply impedance) ON state (Vlow) max. 1.2 VDC @ 40 mA current limit (150 Ω+ 0.7 VDC)		
Electrical cable for standard sensor electronics	6 m of 2-conductor 20 AWG shielded U.L. type PTLC wire provided for connection to display or analog transmitter unit. Rated to 105°C. May be extended to a maximum of 600 m with similar cable and insulation appropriate for application.		
Electrical cable for IR sensor electronics	1,2 m of U.L. style 116666 copper solid AWG 18 wire with direct burial insulation. Rated to 105°C.		

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228 series metal tee sensors ordering matrix (2" to 2 1/2")

	Example: 2	28	BR	20	0	5	--	0	2	1	1
Style											
	Tee mounted insert sensor (2" and 2.5" only)	28									
Material											
	Brass/bronze		BR								
	Stainless steel (2" and 2.5" only)		SS								
	Tee – carbon steel sensor brass		CB								
	Tee – carbon steel sensor stainless steel		CS								
Size											
	2"			20							
	2.5"			25							
Electronics housing											
	PPS				0						
Electronics											
	Magnetic					2					
	FM/CSA approved					4					
	Standard					5					
	IR-irrigation					6					
O-ring											
	Viton®							0			
	EPDM							1			
	Buna N							8			
Shaft											
	Zirconia ceramic								0		
	Hastelloy C								1		
	Tungsten carbide								2		
	Titanium								3		
	Monel								5		
	316 stainless steel								6		
	Tantalum								7		
Impeller											
	Nylon									1	
	Tefzel®									2	
Bearing											
	Pennlon										1
	Tefzel®										2
	Teflon®										3

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