

DESCRIPTION

The Series 228 flow sensors from Badger Meter® 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 2000 ft between the flow sensor and the display unit without the need for amplification.

All sensors, except irrigation versions, are supplied with 20 ft of 2-conductor 20 AWG shielded UL type PTLC 221° F (105° C) cable.

MATERIALS

The 228CB tee-mounted flow sensor consists of a 220 brass/bronze sensor mounted in a 2 in. or 2.5 in. cast iron tee.



SPECIFICATIONS

Wetted Materials (except tees)	See "Part Number Construction" on page 3	
Sensor Sleeve and Hex Adapter	<i>Sleeve</i>	Admiralty brass, UNS C44300
	<i>Hex Adapter</i>	Lead-free brass, C89833
Tee for 228CB	Cast iron, Class 125 per ASME B16.4	
Temperature Ratings	<i>Standard Version</i>	221° F (105° C) continuous service
	<i>Irrigation Version</i>	150° F (66° C) continuous service
Pressure Ratings	Temperature (F)	Pressure (psi)
	-20...150	175
	200	165
	250	150
	300	140
Recommended Design Flow Range	0.5...30 ft/sec for 228	
Accuracy	±1.0% of full scale over recommended design flow range	
Repeatability	±0.3% of full scale over recommended design flow range for 228	
Linearity	±0.2% of full scale over recommended design flow range for 228	
Transducer Excitation	Supply voltage = 8V DC min. 35V DC max.	
	Quiescent current = 600 µA (typical)	
	OFF State (V_{High}) = Supply voltage - (600 µA × Supply impedance)	
	ON State (V_{Low}) = 1.2V DC @ 40 mA (15 Ω + 0.7V DC)	
Electrical Cable for Standard Sensor Electronics	20 ft (6 m) of 2-conductor 20 AWG shielded UL type PTLC wire provided for connection to display or analog transmitter unit. Rated to 221° F (105° C). May be extended to a maximum of 2000 ft (610 m) with similar cable and insulation appropriate for application.	
Electrical Cable for IR Sensor Electronics	48 in. (122 cm) of UL Style 116666 copper solid AWG 18 wire with direct burial insulation. Rated to 221° F (105° C).	

DIMENSIONS

Standard 228CB Sensor

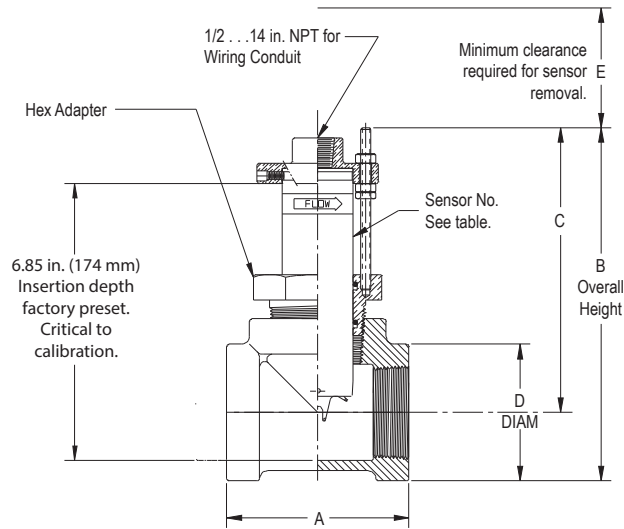


Figure 1: Standard 228CB flow sensor

Series No.	Tee No.	NPT Threads per inch	A	B *	C *	D	E
228CB-2	71876T	2...11.5	4.50 in. (114.30 mm)	8.52 in. (216.41 mm)	6.88 in. (174.75 mm)	3.28 in. (83.31 mm)	6 in. (152.4 mm)
228CB-2.5	71881T	2.5...8	4.80 in. (121.92 mm)	9.16 in. (232.66 mm)	7.23 in. (183.64 mm)	3.86 in. (98.04 mm)	6 in. (152.4 mm)

* Dimensions (B, C) may vary ± 0.25 in., depending on the makeup of the pipe threads.

High Temperature 228CB Sensor

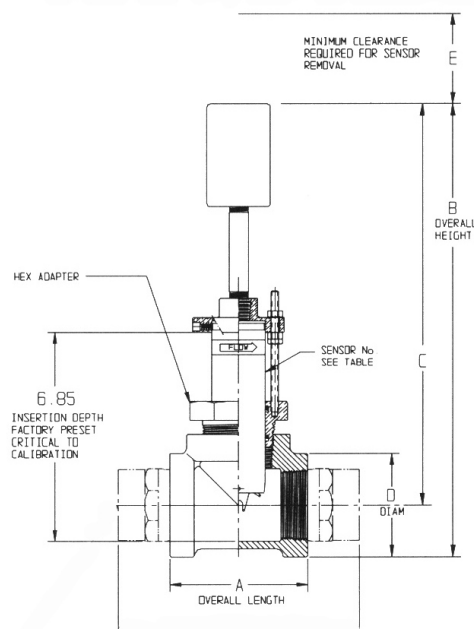


Figure 2: High temperature 228CB flow sensor

Series No.	Tee No.	NPT Threads per inch	A	B *	C *	D	E
228CB-2	71876T	2...11.5	4.50 in. (114.30 mm)	18.14 in. (460.76 mm)	16.50 in. (419.10 mm)	3.28 in. (83.31 mm)	6 in. (152.4 mm)
228CB-2.5	71881T	2.5...8	4.80 in. (121.92 mm)	18.18 in. (461.77 mm)	16.25 in. (412.75 mm)	3.86 in. (98.04 mm)	6 in. (152.4 mm)

* Dimensions (B, C) may vary ± 0.25 in., depending on the makeup of the pipe thread.

PART NUMBER CONSTRUCTION

Standard Sensor

Example:		2	28	CB	20	0	5	-	1	2	1	1
STYLE												
Tee Mounted Insert Sensor		28										
MATERIAL												
Tee - Carbon Steel, Sensor - Brass (2" and 2.5" Only)		CB										
SIZE												
2"		20										
2.5"		25										
ELECTRONICS HOUSING												
PPS		0										
ELECTRONICS												
Standard Flow (STANDARD)		5										
IR-Irrigation		6										
O-RING												
Viton®		0										
EPDM (STANDARD)		1										
Buna N		8										
SHAFT												
Zirconia Ceramic		0										
Tungsten Carbide (STANDARD)		2										
316 Stainless Steel		6										
IMPELLER												
Nylon (STANDARD)		1										
Tefzel®		2										
BEARING												
UHMWPE (STANDARD)		1										
Tefzel®		2										
Teflon®		3										

High Temperature Sensor

Example:		2	28	CB	20	4	8	-	0	2	2	3
STYLE												
Tee Mounted Insert Sensor		28										
MATERIAL												
Tee - Carbon Steel, Sensor - Brass (2" and 2.5" Only)		CB										
SIZE												
2"		20										
2.5"		25										
ELECTRONICS HOUSING												
PEEK		4										
ELECTRONICS												
High Temperature		8										
O-RING												
Viton®		0										
SHAFT												
Tungsten Carbide (STANDARD)		2										
IMPELLER												
Tefzel®		2										
BEARING												
Teflon®		3										

Control. Manage. Optimize.

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