

### DESCRIPTION

The Data Industrial 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 feet between the flow sensor and the display unit without the need for amplification. All sensors, except irrigation versions, are supplied with 20 feet of 2-conductor 20 AWG shielded UL type PTLC 221° F (105° C) cable.

### MATERIALS

The tee-mounted flow sensors consist of a standard 220BR or 220SS mounted in a 2 inch or 2.5 inch tee.

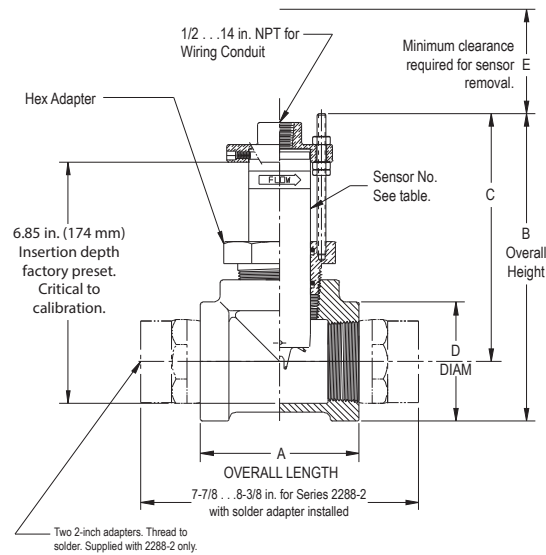
<b>Model 228BR</b>	Brass/bronze sensor mounted in a bronze tee
<b>Model 228SS</b>	Stainless steel sensor mounted in a stainless steel tee
<b>Model 228CB</b>	Brass/bronze sensor mounted in a cast iron tee



### SPECIFICATIONS

<b>Wetted Materials (except tees)</b>	See ordering matrix	
<b>Sensor Sleeve and Hex Adapter for 228BR, 228CB</b>	<i>Sleeve</i>	Admiralty brass, UNS C44300
	<i>Hex Adapter</i>	Valve bronze, UNS C83600
<b>Sensor Sleeve and Hex Adapter for 228SS</b>	Series 300 stainless steel	
<b>Tee for 228BR</b>	Cast bronze, Class 125 per ASME B16.4	
<b>Tee for 228SS</b>	Cast 316 stainless, Class 150	
<b>Tee for 228CB</b>	Cast iron, Class 125 per ASME B16.4	
<b>Temperature Ratings</b>	<i>Standard Version</i>	221° F (105° C) continuous service
	<i>Irrigation Version</i>	150° F (66° C) continuous service
<b>Pressure at 100° F</b>	<b>228B:</b> 200 psi; <b>228CB:</b> 175 psi; <b>228SS:</b> 300 psi	
<b>Recommended Design Flow Range</b>	0.5...30 ft/sec for 228	
<b>Accuracy</b>	±1.0% of full scale over recommended design flow range	
<b>Repeatability</b>	±0.3% of full scale over recommended design flow range for 228	
<b>Linearity</b>	±0.2% of full scale over recommended design flow range for 228	
<b>Transducer Excitation</b>	<i>Quiescent Current</i>	600µA at 8V DC to 35V DC max.
	<i>Quiescent Voltage</i>	(V <sub>High</sub> )
	<i>Supply Voltage</i>	600µA * supply impedance
	<i>ON State (V<sub>Low</sub>) Max.</i>	1.2V DC at 40 mA current limit (15 Ω + 0.7V DC)
<b>Electrical Cable for Standard Sensor Electronics</b>	20 feet 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 feet with similar cable and insulation appropriate for application.	
<b>Electrical Cable for IR Sensor Electronics</b>	48 inches of UL Style 116666 copper solid AWG 18 wire with direct burial insulation. Rated to 221° F (105° C).	

## DIMENSIONS



Series No. Complete	Sensor No.	Tee No.	NPT	A	B*	C*	D	E
228CB-2.5	See matrix	71881T	2.5-8	4.98 in. (126 mm)	9 in. (229 mm)	7 in. (178 mm)	4 in. (101 mm)	6 in. (152 mm)
228BR-2.5		71883T	2.5-8	4.75 (121 mm)	8.78 (223 mm)	7 in. (178 mm)	3.56 (90 mm)	6 in. (152 mm)
2288SS-2		711338T	2.11-8	4.5 (114 mm)	5.38 (137 mm)	5.88 (149 mm)	3 in. (76 mm)	6 in. (152 mm)
228CB-2		71876T	2.11-8	4.5 (114 mm)	5.38 (137 mm)	5.88 (149 mm)	3 in. (76 mm)	6 in. (152 mm)
228BR-2		71879T	2.11-8	4.25 (108 mm)	8.35 (212 mm)	5.88 (149 mm)	2.94 in. (75 mm)	6 in. (152 mm)

\* Dimensions may vary  $\pm 0.25$  in., depending on makeup of pipe threads.

## PART NUMBER MATRIX

Example: 2   28   BR   20   0   5   -   1   2   1   1   1	
<b>STYLE</b>	Tee Mounted Insert Sensor   28
<b>MATERIAL</b>	Brass (2" and 2.5" Only)   BR Stainless Steel (2" Only)   SS Carbon Steel Tee, Brass Sensor   CB
<b>SIZE</b>	2"   20 2.5"   25
<b>ELECTRONICS HOUSING</b>	PPS   0
<b>ELECTRONICS</b>	CSA Approved   4 Standard Flow (STANDARD)   5 IR-Irrigation   6 High Temperature   8
<b>O-RING</b>	Viton®   0 EPDM (STANDARD)   1 Buna N   8
<b>SHAFT</b>	Zirconia Ceramic   0 Tungsten Carbide (STANDARD)   2 316 Stainless Steel   6
<b>IMPELLER</b>	Nylon (STANDARD)   1 Tefzel®   2
<b>BEARING</b>	UHMWPE (STANDARD)   1 Tefzel®   2 Teflon®   3

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