Flow Sensors

Series 220BR Insertion Style Flow Sensors

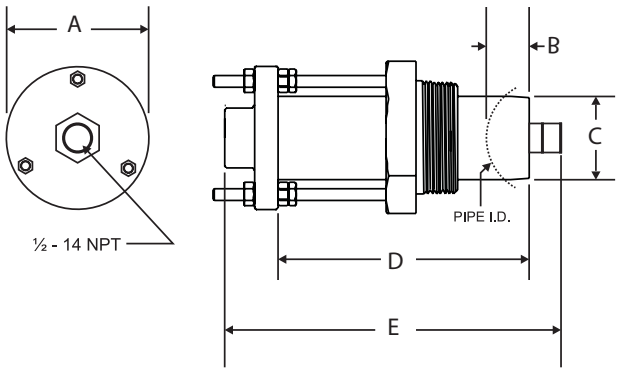
DESCRIPTION

The Data Industrial® Series 200 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 and is less prone to be fouled by waterborne debris. The forward curved shape coupled with the absence of magnetic drag provides improved operation and repeatability 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 Belden type 9320 2-conductor shielded cable.

MODEL 220BR (BRASS)

220BR sensors are used in most general flow measuring applications in metallic or non-metallic pipes. The sensor mounts in a 2 in. NPT pipe saddle or Threadolet® for installation in pipe sizes from 3 in. to more than 40 in. Positioning nuts on the three threaded retaining rods allow the sensor to be accurately positioned to a standard insertion depth of 1-1/2 in. into the pipe. When this insertion depth is maintained, and there are at least 10 upstream and 5 downstream diameters of straight uninterrupted flow, an accuracy of +/–1 percent of full scale can be obtained from flow velocities of 0.5…30 feet/second (± 4.0 percent of reading within calibration range).

DIMENSIONS



A	B	C	D	E
3 in.	1-1/2 in.	1-3/4 in.	5-1/4 in.	7-1/8 in.
76 mm	38 mm	44 mm	133 mm	181 mm

Figure 1: Dimensions for 220BR

SPECIFICATIONS

Wetted Materials for all Sensors	See *"Part Number Construction" on page 2*
Sensor Sleeve and Hex Adapter	Sleeve: Admiralty brass, UNS C44300
	Hex adapter: Lead-free brass, C89833
Temperature Ratings	Standard version: 221° F (105° C) continuous service
	High temperature version: 285° F (141° C) continuous service; 305° F (150° C) peak temperature (limited duration)
Pressure Ratings	**At 100° F** / **At 300° F (High Temperature Version Only)**
	400 psi / 325 psi
Recommended Design Flow Range	0.5…30 ft/sec (0.15…9.1 m/sec) Initial detection below 0.3 ft/sec (0.09 m/sec)
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	Supply voltage = 8V DC min. 35V DC max.
	Quiescent current = 600 uA (typical)
	OFF State (V_{High}) = Supply voltage – (600 µ ∗ Supply impedance)
	ON State (V_{Low}) = 1.2V DC @ 40 mA (15 Ω + 0.7V DC)
Output Frequency	3.2…200 Hz
Output Pulse Width	5 msec ±25%
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).
Certifications	CE certified

PART NUMBERING CONSTRUCTION

Standard Sensor

	Example: 2	20	BR	00	0	5	-	1	2	1	1
STYLE											
Standard Flow		20									
MATERIAL											
Brass			BR								
SIZE											
Insert Style for pipe sizes 3" and up				00							
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	20	BR	00	4	8	-	0	2	2	3
STYLE											
Standard Flow		20									
MATERIAL											
Brass			BR								
SIZE											
Insert Style for pipe sizes 3" and up				00							
ELECTRONICS HOUSING											
PEEK					4						
ELECTRONICS											
High Temperature						8					
O-RING											
Viton®								0			
SHAFT											
Tungsten Carbide (STANDARD)									2		
IMPELLER											
Tefzel®										2	
BEARING											
Teflon®											3

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