

# Paddle Wheel Flow Sensors for Low Viscosity Liquids



measuring  
•  
monitoring  
•  
analyzing

DF



- Body Material Options: Brass, Stainless, Trogamid®, Polysulfone, or Polypropylene
- Easy to Install, No Straight Runs Required
- Robust and Reliable
- 7 Different Material Combinations Available
- Electronic Options: Frequency, Analog, Relay, Totalizer, and/or Batch Controllers with Digital Displays



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ARGENTINA, AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECH REPUBLIC, EGYPT, FRANCE, GERMANY, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, ROMANIA, SINGAPORE, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, UNITED KINGDOM, USA, VIETNAM

KOBOLD Instruments, Inc.  
1801 Parkway View Drive  
Pittsburgh, PA 15205  
Main Office:  
1.800.998.1020  
1.412.788.4890  
info@koboldusa.com  
www.koboldusa.com

**Description**

The main feature of the DF flow sensors is the incorporation of a multipole magnet ring embedded into the paddlewheel. As the paddle wheel rotates, the magnets, hermetically separated from the liquid media, induce a DC signal into a Hall-Effect sensor mounted on the device housing. Since the DC signal frequency is proportional to paddlewheel rotation, an accurate flow rate reading is possible.

The DF sensors, when coupled with the appropriate KOBOLD electronics unit, can offer the user a number of features useful in the measurement and control of low viscosity liquid flow. These features include a frequency output, analog output, adjustable switches, digital displays with integrated batch controllers, or totalizers.

**Specifications**

- Accuracy:** ± 2.5% of full scale
- Media:** Water and low viscosity liquids
- Orientation:** Universal
- Fittings:** 1/8" NPT ... 1-1/2" NPT



**Material Combination**

Material Combination	Standard					High Pressure Design	
	I	II	II B <sup>1)</sup>	III	IV	VI <sup>1)</sup>	VII <sup>1)</sup>
Order Code	A	B	C <sup>1)</sup>	D	E	G <sup>1)</sup>	H <sup>1)</sup>
Connecting type	Female thread	Female thread	Female thread	Female thread	Female thread	Female thread	Female thread
Housing	Trogamid®	Polysulfone	PP	Brass, Nickel-plated	SS	Brass, Nickel-plated	SS
Housing lid	Trogamid®	Polysulfone	PP	Polysulfone	Polysulfone	Brass, Nickel-plated	SS
Connection	Brass, Nickel-plated	SS	PP	Brass, Nickel-plated	SS	Brass, Nickel-plated	SS
Locking pins	Brass <sup>3)</sup>	Brass <sup>3)</sup>	Brass <sup>3)</sup>	Brass <sup>3)</sup>	Brass <sup>3)</sup>	-	-
O-rings	NBR	FKM	FKM	NBR	FKM	NBR	FKM
Paddle wheel	POM	PTFE	PTFE	POM	PTFE	POM	PTFE
Axle	SS	SS	Ceramic	SS	SS	SS	SS
Axle bushing	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE
Orifice	PTFE <sup>2)</sup>	PTFE <sup>2)</sup>	PTFE <sup>2)</sup>	PTFE <sup>2)</sup>	PTFE <sup>2)</sup>	PTFE <sup>2)</sup>	PTFE <sup>2)</sup>
Max. operating pressure [PSI]	145	145	85	230	230	1450	1450
Max. operating temperature [°F]	145	180	180	180	180	180	180

<sup>1)</sup> Fittings are not rotatable <sup>2)</sup> For Model DF.01 Stainless Steel Orifice <sup>3)</sup> Non-wetted



**Description**

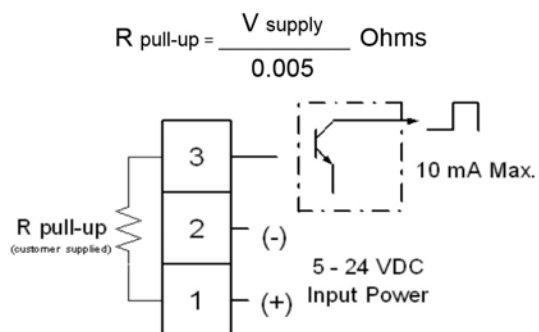
The KOBOLD DF Flow Sensor is used in applications where flow measurement is desired and flow rate data is to be transmitted as a pulse rate output. The DF Flow Sensor contains a flow transducer which transmits a pulse signal. The output signal is linearly proportional to the flow and is transmitted by a bipolar transistor operating in an open collector configuration (max. 10 mA sinking capability). A user-supplied, pull-up resistor is required to produce a signal output.

**Specifications**

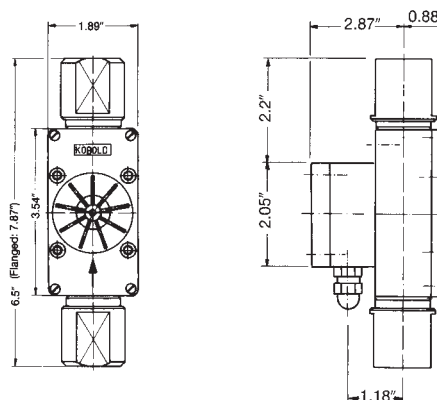
**Power Supply:** 5 to 24 V<sub>DC</sub>  
**Signal Output:** NPN - Open Collector  
 10 mA max.  
**Temperature Range:** -4...176 °F  
 (140 °F for DF-01..)  
**Protection:** IP 65  
**Accuracy:** ± 2.5% of F.S.



**Wiring Diagram**



**Dimensions**



**Order Details** (Example: DF-0402B)

Range (Water) (GPM)	Stand. Conn. (NPT)	Dia. of Orifice (Inch)	Press. Drop Max. (PSI)	DF Flow Sensor Material Combination							Options (add suffix to order number)	
				I	II	II B	III	IV	VI	VII	Suffix "...B" Special Conn. (NPT)	Suffix "...HNP"
0.02...0.14	1/8"	0.04	10.2	DF-0101	DF-0201	DF-0001	DF-0301	DF-0401	DF-0601	DF-0701	1/4"	5 point Calibration Cert
0.05...0.30	1/4"	0.08	4.2	DF-0102	DF-0202	DF-0002	DF-0302	DF-0402	DF-0602	DF-0702	3/8"	
0.05...0.60	1/4"	0.08	10.4	DF-0103	DF-0203	DF-0003	DF-0303	DF-0403	DF-0603	DF-0703	3/8"	
0.1...0.7	1/4"	0.11	9.6	DF-0104	DF-0204	DF-0004	DF-0304	DF-0404	DF-0604	DF-0704	3/8"	
0.2...2.5	3/8"	0.19	12.1	DF-0105	DF-0205	DF-0005	DF-0305	DF-0405	DF-0605	DF-0705	1/2"	
0.4...5	1/2"	0.32	2.9	DF-0106	DF-0206	DF-0006	DF-0306	DF-0406	DF-0606	DF-0706	3/4"	
0.5...6	3/4"	0.32	4.4	DF-0107	DF-0207	DF-0007	DF-0307	DF-0407	DF-0607	DF-0707	1"	
0.5...12	3/4"	0.49	4.4	DF-0108	DF-0208	DF-0008	DF-0308	DF-0408	DF-0608	DF-0708	1"	
1...25	1-1/4"	0.59	15.9	DF-0109	DF-0209	DF-0009	DF-0309	DF-0409	DF-0609	DF-0709	1-1/2"	
1.5...36	1-1/4"	0.73	13.5	DF-0110	DF-0210	DF-0010	DF-0310	DF-0410	DF-0610	DF-0710	1-1/2"	