

## 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



Order from: **C A Briggs Company**  
622 Mary Street; Suite 101; Warminster, PA 18974  
Phone: 267-673-8117 - 800-352-6265; Fax: 267-673-8118  
[Sales@cabriggs.com](mailto:Sales@cabriggs.com) - [www.cabriggs.com](http://www.cabriggs.com)

KOBOLD Instruments, Inc.  
1801 Parkway View Drive  
Pittsburgh, PA 15205



## Paddle Wheel Flow Sensors DF Series

### 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

|                     |                                 |
|---------------------|---------------------------------|
| <b>Accuracy:</b>    | ± 2.5% of full scale            |
| <b>Media:</b>       | Water and low viscosity liquids |
| <b>Orientation:</b> | Universal                       |
| <b>Fittings:</b>    | 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 | 316L SS            | Brass, Nickel-plated | 316L SS            |
| Housing lid                     | Trogamid®            | Polysulfone         | PP                  | Polysulfone          | Polysulfone        | Brass, Nickel-plated | 316L SS            |
| Connection                      | Brass, Nickel-plated | 316-Ti SS           | PP                  | Brass, Nickel-plated | 316-Ti SS          | Brass, Nickel-plated | 316-Ti SS          |
| Locking pins                    | 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                            | 316L SS              | 316L SS             | Ceramic             | 316L SS              | 316L SS            | 316L SS              | 316L 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



**Special Features**

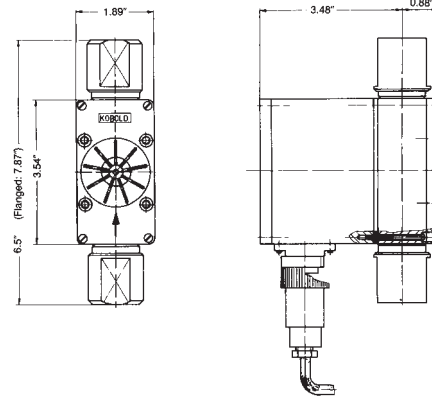
- For Transmission of Measured Flow
- Output: 0(4)–20 mA, 0-10 V<sub>DC</sub>, 0-5 V<sub>DC</sub>

**Specifications**

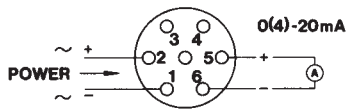
**Power Consumption:** 3.5 W max.  
**Power Supply:** 24 V<sub>DC</sub>, 24 V<sub>AC</sub>, 110 V<sub>AC</sub>, 230 V<sub>AC</sub> + 15% / -10%  
**Analog Output:** 0-20 mA, 4-20 mA, 0-5 V<sub>DC</sub> or 0-10 V<sub>DC</sub>  
**Max Load:** 500 Ω  
**Temperature Range:** -10...180 °F (145 °F for DF-71..)  
**Cable Connections:** (5 ft PVC-cable standard, Plug connection optional)  
 No. 1 Power (-)  
 No. 2 Power (+)  
 No. 5 Analog Output (+)  
 No. 6 Analog Output (-)



**Dimensions**



**Wiring Diagram**



**Order Details (Example: DF-7202BP04S1)**

| Range (Water) (GPM) | Stand. Conn. (NPT) | Dia. of Orifice (Inch) | Press. Drop Max. (PSI) | DF-MA Material Combination |           |           |           |           |           |           | Options (add suffix to order number) |   |                           |
|---------------------|--------------------|------------------------|------------------------|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|--------------------------------------|---|---------------------------|
|                     |                    |                        |                        | I                          | II        | II B      | III       | IV        | VI        | VII       | Suffix ".B.." Special Conn. (NPT)    | Suffix ".L.." Special Range GPH (Water) | Suffix ".P.."             |
| 0.02...0.14         | 1/8"               | 0.04                   | 10.2                   | DF-7101..                  | DF-7201.. | DF-7001.. | DF-7301.. | DF-7401.. | DF-7601.. | DF-7701.. | 1/4"                                 | 1 - 7                                   | Power Connector with Plug |
| 0.05...0.30         | 1/4"               | 0.08                   | 4.2                    | DF-7102..                  | DF-7202.. | DF-7002.. | DF-7302.. | DF-7402.. | DF-7602.. | DF-7702.. | 3/8"                                 | 3 - 25                                  |                           |
| 0.05...0.60         | 1/4"               | 0.08                   | 10.4                   | DF-7103..                  | DF-7203.. | DF-7003.. | DF-7303.. | DF-7403.. | DF-7603.. | DF-7703.. | 3/8"                                 | 3 - 36                                  |                           |
| 0.1...0.7           | 1/4"               | 0.11                   | 9.6                    | DF-7104..                  | DF-7204.. | DF-7004.. | DF-7304.. | DF-7404.. | DF-7604.. | DF-7704.. | 3/8"                                 | 6 - 42                                  |                           |
| 0.2...2.5           | 3/8"               | 0.19                   | 12.1                   | DF-7105..                  | DF-7205.. | DF-7005.. | DF-7305.. | DF-7405.. | DF-7605.. | DF-7705.. | 1/2"                                 | 12 - 150                                |                           |
| 0.4...5             | 1/2"               | 0.32                   | 2.9                    | DF-7106..                  | DF-7206.. | DF-7006.. | DF-7306.. | DF-7406.. | DF-7606.. | DF-7706.. | 3/4"                                 | -                                       |                           |
| 0.5...6             | 3/4"               | 0.32                   | 4.4                    | DF-7107..                  | DF-7207.. | DF-7007.. | DF-7307.. | DF-7407.. | DF-7607.. | DF-7707.. | 1"                                   | -                                       |                           |
| 0.5...12            | 3/4"               | 0.49                   | 4.4                    | DF-7108..                  | DF-7208.. | DF-7008.. | DF-7308.. | DF-7408.. | DF-7608.. | DF-7708.. | 1"                                   | -                                       |                           |
| 1...25              | 1-1/4"             | 0.59                   | 15.9                   | DF-7109..                  | DF-7209.. | DF-7009.. | DF-7309.. | DF-7409.. | DF-7609.. | DF-7709.. | 1-1/2"                               | -                                       |                           |
| 1.5...36            | 1-1/4"             | 0.73                   | 13.5                   | DF-7110..                  | DF-7210.. | DF-7010.. | DF-7310.. | DF-7410.. | DF-7610.. | DF-7710.. | 1-1/2"                               | -                                       |                           |

| Power Supply Options |                            |
|----------------------|----------------------------|
| Description          | Add Suffix to Model Number |
| Power Supply 24 VDC  | ..P01..                    |
| Power Supply 24 VAC  | ..P02..                    |
| Power Supply 110 VAC | ..P03..                    |
| Power Supply 230 VAC | ..P04..                    |

| Output Options       |                            |
|----------------------|----------------------------|
| Description          | Add Suffix to Model Number |
| 0-20 mA Output       | ..S1                       |
| 4-20 mA Output       | ..S2                       |
| 0-10 V <sub>DC</sub> | ..S3                       |
| 0-5 V <sub>DC</sub>  | ..S4                       |

Note: To place an order

1. Select the sensor order no.
2. Select the desired option suffixes
3. Specify the required power supply suffix
4. Specify the required output option suffix

No responsibility taken for errors; subject to change without prior notice.