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Series DPL

Paddle Wheel Flow Sensor

Precautions

- **User's Responsibility for Safety:** KOBOLD manufactures a wide range of process sensors and technologies. While each of these technologies are designed to operate in a wide variety of applications, it is the user's responsibility to select a technology that is appropriate for the application, to install it properly, to perform tests of the installed system, and to maintain all components. The failure to do so could result in property damage or serious injury.
- **Proper Installation and Handling:** Use a proper sealant with all installations. Never overtighten the sensor within its fittings. Always check for leaks prior to system start-up.
- **Wiring and Electrical:** Because this is an electrically operated device, only properly trained personnel should install and maintain this product. A supply voltage of 5-16 VDC is used to power the transmitter. The sensor should never exceed a maximum of 16 VDC. Electrical wiring of the sensor should be performed in accordance with all applicable national, state and local codes.
- **Temperature and Pressure:** The DPL is designed for use in application temperatures from -40°F to 160°F. Operation outside these limitations will cause damage to the unit.
- **Infrared Technology**: to generate its electronic output, this sensor employs a paddle which breaks an infrared beam as fluid flows through the sensor body. This means that only translucent fluids which will pass light can be metered by the DPL.
- **Material Compatibility:** The DPL's process wetted parts are polypropylene, polysulfone. sapphire and either buna-N, EPDM or Viton depending on the model. Make sure that the DPL is chemically compatible with the application liquids. While the sensor's outer housing is liquid resistant when installed properly, it is not designed to be immersed. It should be mounted in such a way that it does not normally come into contact with fluid.
- **Flammable, Explosive and Hazardous Applications:** The DPL is not an explosion-proof design. It should not be used in applications where an explosion-proof design is required.
- **Make a Fail-Safe System:** Design a fail-safe system that accommodates the possibility of sensor or power failure. In critical applications, KOBOLD recommends the use of redundant backup systems and alarms in addition to the primary system.

Specifications

Accuracy:
- Standard: 5% of full scale
- Optional: 1.5% of full scale

Linearity: 1.5% of full scale

Wetted Parts:
- Body: Polypropylene, polysulfone, sapphire
- Seals: Standard: Buna-N; Optional: Viton or EPDM

Fittings:
- Standard: 1/2" BSP
- Optional: 1/2" Hose Barb

Max. Pressure: 145 PSIG

Temperature Range: -40°F to +160°F

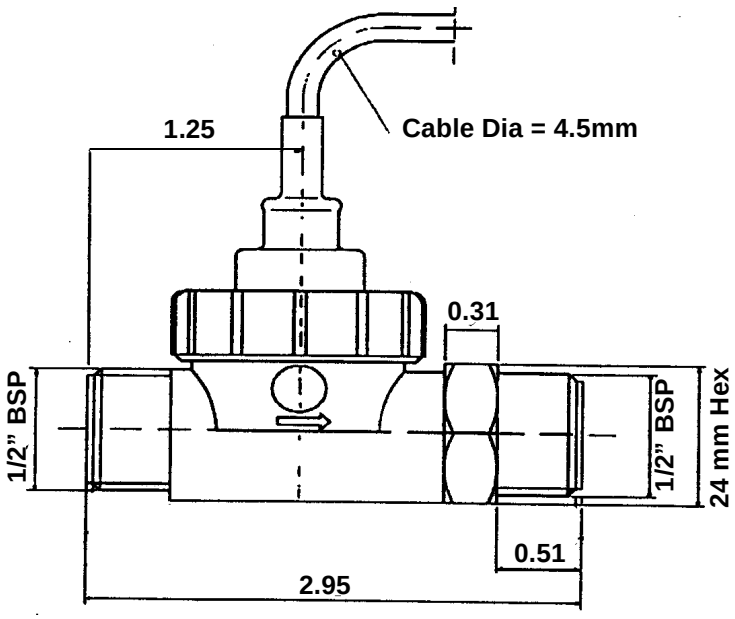
Filtration Requirements: 80 mesh for media with solids

Electrical:

Infrared Detector:
- Power Requirements: 5-16 VDC @7.5 mA Typ; 15 mA Max.
- Max. Output Loading: 18 mA Max.
- Internal Pull-up Resistor: 10K ohm

Infrared Emitter (LED):
- Max Current: 50 mA
- Recommended Current: 15 mA
- Current Limiting: Via user supplied external resistor

Dimensions



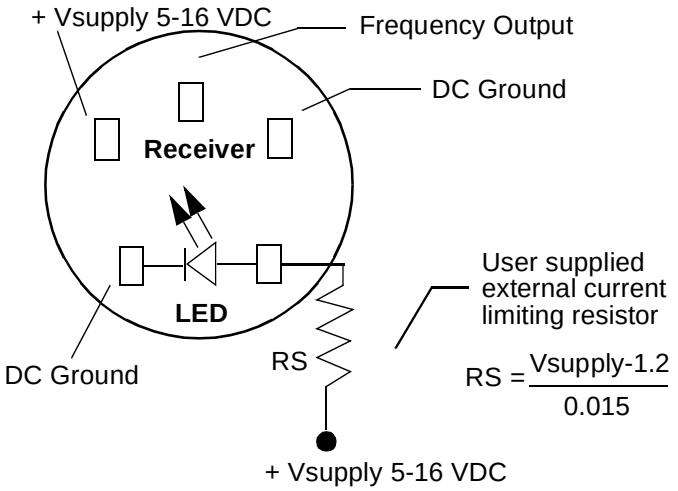
All dimensions in inches unless otherwise noted

Part Number Decoding

Range GPH	Maximum DP (PSI)	Frequency At Max. Flow (HZ)	Model Number	Option Suffixes			
				O-rings	Wiring	Fittings	Accuracy
0.4-8.0	11	272	DPL-1005	-V: Viton	-K: 6 ft PVC Cable	-S: Hose Barbs	-C: Calibration for 1-1/2% accuracy
0.8-28	11	471	DPL-1018	-E: EPDM	-F2 1/2 frequency		
3.0-95	10	528	DPL-1060		-F4 1/4 frequency		
6.0-190	15	300	DPL-1120		-F8: 1/8 frequency		
16-400	19	399	DPL-1250				

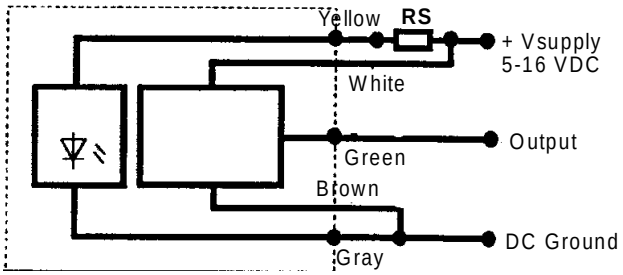
Electrical Connections

OEM Version Without Cable



Note: All connections are made to the IC pins inside screw-off lid of the DPL

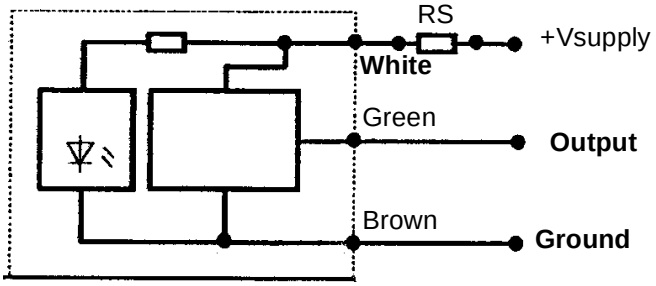
Suffix -K



User supplied external current limiting resistor

$$RS = \frac{Vsupply-1.2}{0.015}$$

Suffix -F



Mechanical Installation

Piping Preparation: Piping should be rigidly supported at both the inlet and outlet of the sensor to prevent potential damage due to excessive stress on the sensor fittings. In order to ensure that the fluid flow profile is fully developed and symmetrical, a minimum straight piping run of 10 pipe diameters upstream and 5 diameters downstream of the sensor are required. The straight runs should be free of tees, elbows, valves, reducers and other disturbances.

Pumps: All pumps cause pulsations in the fluid. Centrifugal pumps cause the least amount of pulsations in the fluid and positive displacement or reciprocating pumps cause the most. In order to minimize the effect of these pulsations on sensor accuracy, the sensor should be located as far away from the pump as possible. A pulsation dampener or accumulator may be used to dampen pulsations if required. If the fluid pulsations cannot be reduced to an acceptable level, a field calibration to determine the new K-factor for the sensor installed in a pulsating system may be required.

Viscosity: All flow range and calibration data provided with this sensor are for water. All turbine type transducers are affected by viscosity. higher viscosities tend to make the turbine wheel turn slower for a given flow rate. This results in a lower K-factor for the sensor when it is used with a viscous media (i.e. viscosity > 10 cSt.) and the calibration data provided for water flow is no longer valid. If the sensor is to be used with viscous media, a field calibration is required to determine the new K-factor for the sensor.

Field calibration: A simple field calibration can be performed to determine the new K-factor for the sensor when it is to be used in a manner in which the above specified calibration information does not apply (i.e. use with viscous or pulsating media, insufficient straight run etc.). With the sensor installed in the system, dispense a known quantity of the fluid to be measured while using a pulse counter to count the number of pulses generated by the sensor during the dispense. This information can be used to determine the new K-factor specific to your system and fluid.