McMILLAN COMPANY

FLO-SENSOR

For Liquid Service

TEFLON® Model 105

U.S.A. Patents No. 4,467,660 and 5,542,302

Other Patents Pending

Aug. 1996 Issue 1.3

Installation & Operating Instructions

Caution: It is recommended that this publication be read in its entirety before performing any operation. Failure to understand and follow these instructions could result in serious personal injury and/or damage to the equipment.

General Description

McMillan Model 105 liquid service flo-sensors are capable of measuring low flow rates (Model 105-3) up to medium and higher flow rates (105-8).

These sensors are suitable for a wide variety of industrial, commercial, and laboratory flow measurement applications.
Flow rate is uni-directional, and proper direction is indicated on the serial number nameplate.

The Model 105 series is similar to the 101T series but has additional flexibility to handle low viscosity corrosive fluids compatible with model 105 wetted materials: Teflon®, sapphire, and Kalrez® (gasket).

Model 105 uses a Pelton type turbine wheel to determine flow rate of the liquid. Rotation of the wheel is linear over a wide range of flow. Electro-optical signals proportional to the turbine wheel speed are converted to 0 to 5 volts D.C. analog signal and also to buffered square wave pulses.

® Teflon and Kalrez are registered by E.I. Dupont de Nemours & Co.

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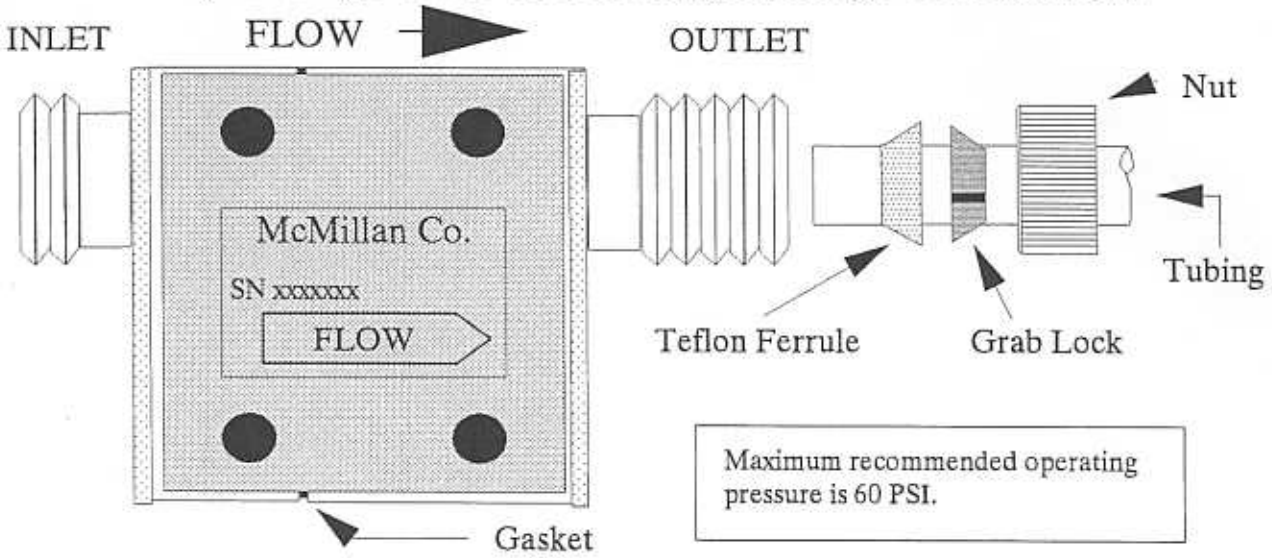
Installation & Operating Instructions - continued

Installation Details

All units are calibrated with water. Do not exceed the flow rate specified for prolonged times and DO NOT use gases for flushing out sensor or bearing life may be shortened. The flow must be in the direction indicated on the serial number nameplate. Preferred mounting orientation is with the serial number plate facing upward. PFA Teflon® fittings are provided. Be careful to install tubing to these carefully to avoid damage or leaking. Hand tighten !! DO NOT overtighten fittings. See detail below.



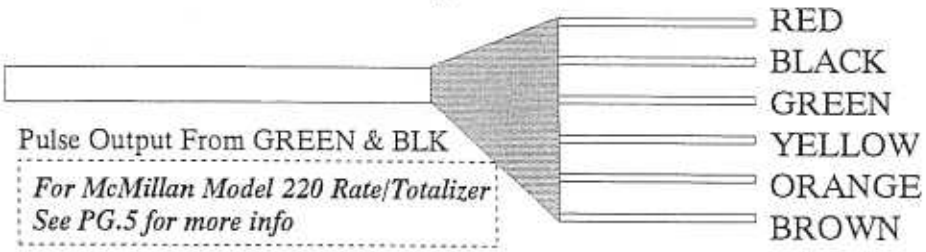
Maximum recommended operating pressure is 60 PSI.

Electrical Connection Details

CAUTION : DO NOT LET WIRES touch each other, tape all connections!

REGULATED Power Supply is needed.
McMillan P/N 105-10-08 is recommended.

Connect +12 volts to RED, Power (-) to BLK



Pulse Output From GREEN & BLK

For McMillan Model 220 Rate/Totalizer
See PG.5 for more info

Regular Analog 0 to 5 volts Output from ORG with BROWN as Ground

To + 12 Volts
Power Ground
Pulse Output
Filtered D.C. Out
0 to 5v Output
Signal Ground

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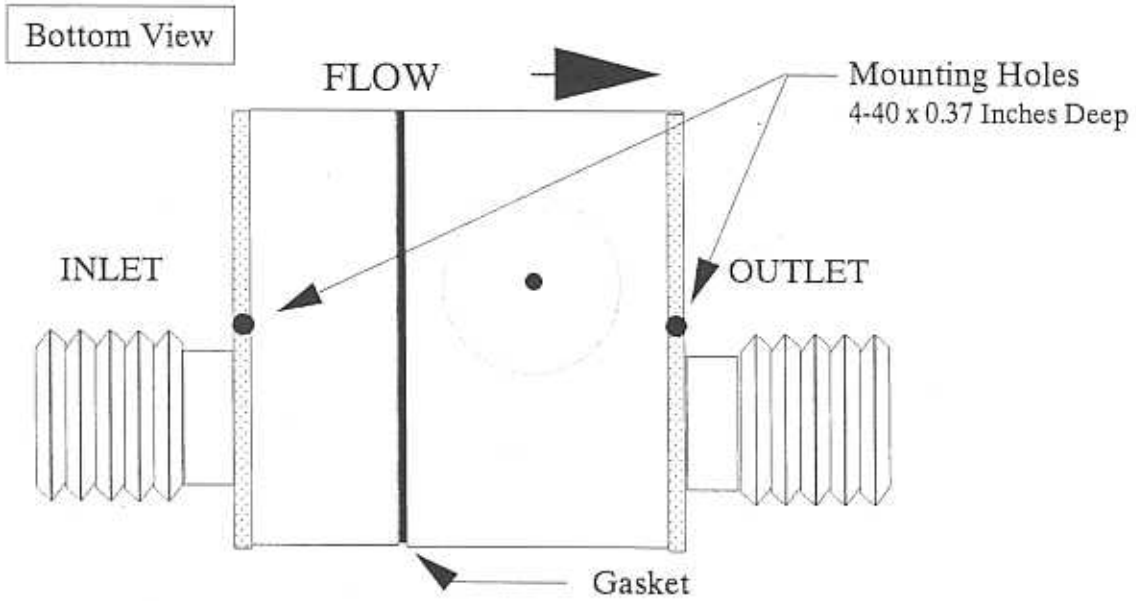
Installation & Operating Instructions - continued

Installation Details

Two 4-40 threaded holes are provided on lower side of Model 105 for mounting.



Approx. 2.13 Inches between mounting hole centers

Compression forces on the gasket must be maintained between mounting brackets.

FLOW RANGES

Model No.	ml/min	gallons/hr	Max. △P (PSI) typical
105-3	15 - 100		10-15
105-5	50 - 500		8-10
105-6	60 - 1000		5-7
105-7	100 - 2000		5
105-8	200 - 5000		10
105-5G		1 - 10	15
105-8G		4 - 100	15

Flow ranges are specified for an equivalent flow of water at 23 °C.

NOTE:
Maximum differential pressure occurs at maximum rated flow using water at 23°C. At 50% of rated flow △P is 0.25 times value, and at 20% of rated flow is 0.04 times value.

Specifications subject to change without notice.

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Installation & Operating Instructions - continued pg. 4

More Installation Details

Be sure fluid lines are clean before connection to Flo-sensor.
A 7 micron filter placed BEFORE the Flo-sensor is recommended for protection.
DO NOT EXCEED MAXIMUM PRESSURE - See Specifications Below.
Do not dissassemble the Flo-sensor - damage & improper operation may occur.
Avoid dropping the Flo-sensor to insure longest life of sapphire bearings.
Entrapped air (or gases) in the liquid lines will cause measurement errors.
Be sure all gas is purged from measurement lines.

Specifications - Model 105

Specifications subject to change without notice.

Output Signals : 0 - 5 volts DC (Orange is regular response)
(Yellow is filtered 0 - 5 volts DC for less noise)
Load resistance should be 2.5K ohms or higher
Green is Square wave pulses typically 7.5 volts peak
Typical pulses per second at max. flow :

105-3 230 PPS	**105-7 375 PPS**	**105-5G 470 PPS**
105-5 325 PPS	**105-8 500 PPS**	**105-8G 600 PPS**
105-6 370 PPS	**See individual test report for exact PPS**	

Power required : 12.5 volts D.C. +/- 2 volts regulated , at less than 15 mA
Pressure Rating : 60 psig maximum operation
Dimensions : 2.16 " x 2.32 " x 1.87 " (without fittings)
Electrical Cable : 6 wire flexible color-coded - approx. 30" long , wire ends
Fittings : PFA Teflon® included , most are 1/4" tube O.D.
105-3 is 1/8" tube O.D., 105-8 is 3/8" tube O.D.
Temperature Rating : 2 to 50 °C
Temperature Sensitivity : +/- 0.2 % per °C
Accuracy : +/- 3% F.S. standard (F.S. is of full scale)
Linearity : +/- 3% F.S. standard
Repeatability : +/- 0.5% F.S. from 20% to 100% of max. rated flow
Wetted Sensor Materials : PTFE Teflon® ,sapphire, Kalrez®
Applicable Liquids : Many low viscosity liquids compatible with Model 105 materials

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Maintenance :

Calibration : Factory calibration is done using water. To make minor changes in calibration to 0 - 5V Output ONLY - There is a 3/4 turn pot inside black top cover (left side near cable).
To open top cover, remove 4 flat head screws carefully; lift top cover up only about 1/2 inch to locate trimpot. Turn with small flat blade screwdriver (1/8 inch) in VERY small increments.
After adjustment - replace top cover carefully, and 4 screws.

Do not open or tamper with the Flo-sensor - other than removal of black top cover to make calibration adjustments - evidence of tampering may void factory warranty. If problems arise with operation of Flo-sensor the complete unit should be returned to the factory for servicing.
Please contact : Customer Service Department

McMillan Company **P.O. Box 1340** **Georgetown, Texas 78627-1340**

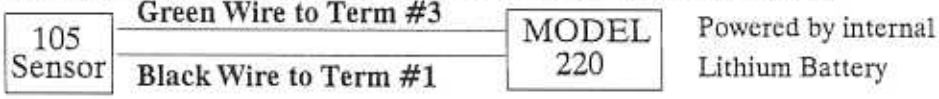
Options :

Regulated 12VDC power supply

McMillan P/N 105-10-08 (for 115v operation)
McMillan P/N 105-10-18 (for 230v operation)

McMillan Model 220 Rate/Totalizer Meter for digital display of output

Programmable to display user desired unit of measure (Rate & Totals)



Powered by internal Lithium Battery

GUARANTEES :

If at any time within one year after shipment, but not thereafter, it is proved that any part of the equipment furnished by us was defective when shipped by us, we will replace or repair the same free of charge, F.O.B. our factory. Notice of this claim must be made to us within one year after delivery. Our liability is limited to replacement of such defective parts or equipment. There are no guarantees or warranty expressed or implied other than those herein specifically mentioned.
McMillan Company shall herein not in any event be liable for any consequential damages, secondary charges, expenses for erection or disconnecting, or losses resulting from any alleged defect in the apparatus.
It is understood that corrosion or erosion of materials is not covered by our guarantee.

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