



DESCRIPTION

Series 201 turbine flow transducers measure flows of hydrocarbon fuels such as gasoline, kerosene, and other light transmitting, non-corrosive liquids of similar viscosity. Typical fuel flow applications include aircraft fuel monitoring systems; gasoline, and gas turbine engine test stands.



The transducers give linear signals on gasoline across a 100 to 1 flow range as low as 0.3 GPH. Pressure drops are very low compared to other turbine flow transducers and does not change in a blocked rotor condition. The transducer bearing system is rated for continuous operation at the middle of the linear flow and for intermittent flows in excess of the maximum of the linear flow.

The transducers produce a current pulse signal from an opto-electronic pickup with or without a preamplifier. When ordering with the preamplifier, the liquid to be measured must be specified. Both amplified and non-amplified models have three wire leads. Transducers are supplied with calibrated K-Factors.

PRINCIPLE OF OPERATION

Liquid enters the flow chamber tangentially, follows a helical flow path, and exits vertically, thereby venting any entrained vapor bubbles. The rotational velocity of the liquid is directly proportional to flow rate. A neutrally buoyant rotor spins with the liquid between V-jewel bearings. Rotor movement is sensed when notches in the rotor interrupt an infrared light beam between an LED and phototransistor.

The vapor venting design requires that the transducer be positioned with the electrical wires pointing up. Turbulence caused by valves or sharp elbows mounted close to the transducer inlet can affect linearity and should be minimized.

Model Number-	201A	201B	201C
Linear Flow Range.....	0.3-30 GPH	0.6-60 GPH	8-80 GPH
Linearity Across Flow Range.....	±2.5%	±1% (8-60 GPH) ±3% (0.6-60 GPH)	±2% (16-45 GPH) ±3% (4-45 GPH)
(% of Reading)		85,000	78,000
Average K-Factor (Pulses/Gal.)....	100,000		
Pressure Drop.....	0.6psi @ 15 GPH 2.4psi @ 30 GPH	1.2psi @ 30 GPH 4.8psi @ 60 GPH	1.5psi @ 40 GPH 6.0psi @ 80 GPH
Variability Between Measurements..	1/4%	1/4%	1/4%
Variability Between Transducers...	±2%	±2%	±2%
Working Pressure.....	200psi	200psi	200psi
Minimum Bursting Pressure.....	2000psi	2000psi	2000psi
Temperature Rating.....	-65° to 125°C	-65° to 125°C	-65° to 125°C
Life Expectancy.....	10,000hr.min.	10,000hr.min.	10,000hr.min.
Weight.....	5.33oz.	5.33oz.	5.33oz.

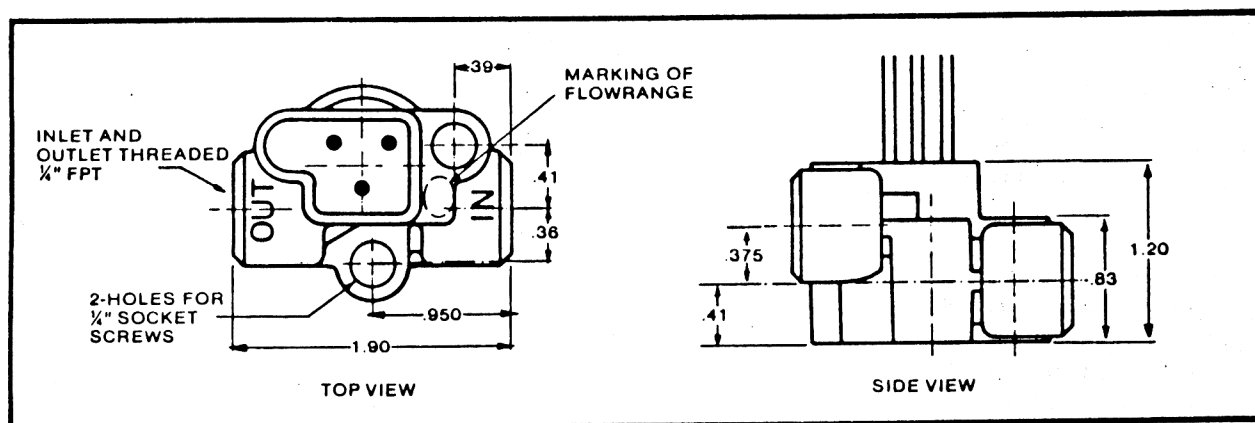
Material Specifications

Flow Transducer Body

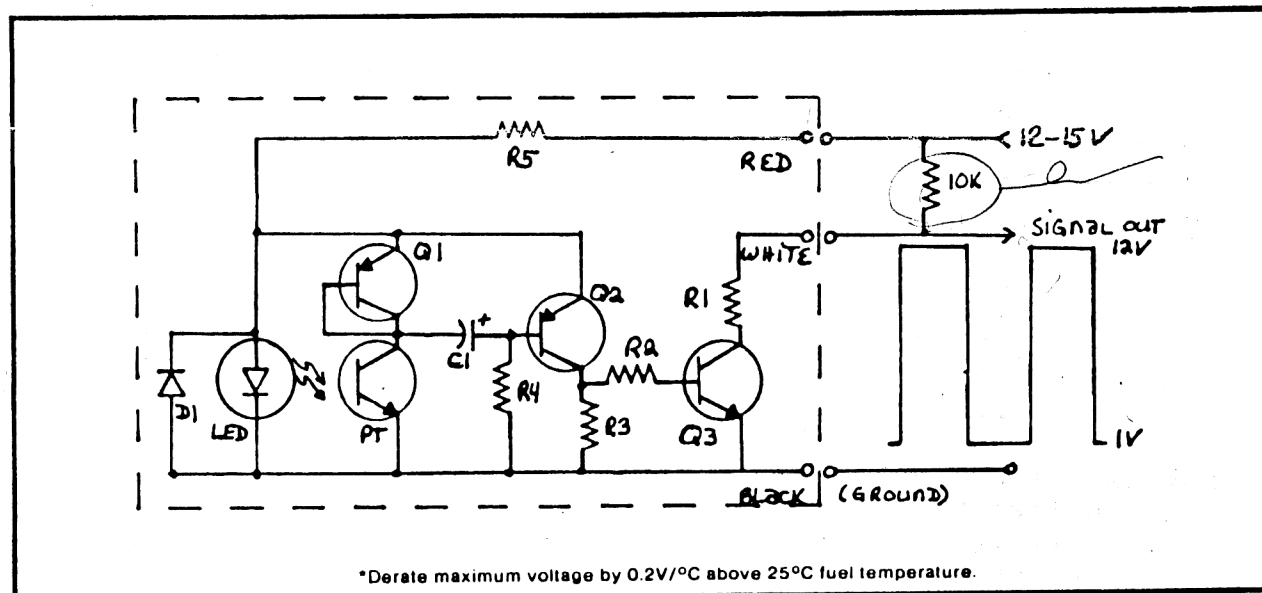
Die cast zinc, cadmium plated,
dichromate finish

V-Bearings	Sapphire
Rotor	Nylon 6/12
Rotor Pivot	Stainless Steel, Carpenter 420
Phototransistor	SD 1440
Light Emitting Diode	SE 1450
Connectors	22 Gauge Wire Leads (3)

Dimensions *In inches*



Suggested Pulse Shaping Circuits *Dotted line signifies Flow Transducer*





SERIES 200 FLOW TRANSDUCER APPLICATION NOTES

1. A screen or filter should be installed upstream of the flow transducer to screen out debris which could affect rotor movement or settle in V-bearings. As turbulence upstream of the transducer affects its performance there should be a reasonable length of straight line between the transducer inlet and the first valve, elbow, or other turbulence producing device.
2. Install flow transducer with wire leads (or tabs) pointed UP to vent bubbles and insure that rotor is totally immersed in liquid. For maximum accuracy at low flow rates the transducer should be mounted on a horizontal surface.
3. Power supply: 12 VDC at 100 mA filtered and regulated.
4. Specified linear flow ranges for Series 200 flow transducers apply to liquids with kinematic viscosities equal to or less than #2 diesel oil.
5. Series 200 flow transducers are designed to measure steady state flows. Indicated accuracies and pulse counts were obtained on a gravity fed flow stand and are reproducible in flow systems using rotary or gear pumps.

Fuel systems with diaphragm fuel pumps and carburetors produce pulsating fuel flows. For accurate results on these systems use the Series 264PB-15 flow transducer which has an integral pulsation isolator/response equalizer.
6. Series 200 flow transducers are compatible with Series 3000 Electronic Readouts (analog outputs, totalizers and batch dispensers).
7. Series 200 flow transducers are zinc; as such they are suitable for use with hydrocarbons and some other organic liquids. Series 200 transducers are not suitable for water or most chemicals; for such liquids use Series 300 flow transducer.
8. In the model 201, the internal pre-amplifier has been adjusted to give a square wave output when a fluid is used with the same infra-red optical properties as gasoline. A model 201 will work on gasoline but may not give any signal when used on air. A model 203 will give an output signal on any transparent fluid because it has no pre-amplifier.
9. The transducers are rated for continuous operation at the middle of their flow range. Continuous operation at full flow will cause excessive pivot wear; however, they may be temporarily overranged by a factor of 2 to 3 without damage.

May, 1980



FloScan Instrument Company, Inc. 3016 N.E. Blakeley Street, Seattle, Washington 98105
Telephone: (206) 524-6625 TWX: 910-444 4059 FloScan Sea

CERTIFICATE OF COMPLIANCE

To: H.D. Neubert & Assoc

Part No.: 201-015-00
2 Units

We certify that the articles and/or services above listed shipped herewithunder your purchase order mentioned above have been inspected and are in full accordance with the requirements of said purchase order and the drawings and specifications applicable to that order.

Where materials and/or services incorporated in any of the items listed above have been procured by us from vendors we certify that test reports and/or suitable evidence of compliance with the requirements of the above mentioned purchase order have been obtained by us and are available from our files.

FloScan Instrument Co., Inc.

FloScan Price List

FLOW SENSOR PRICE LIST

Shipments FOB, Seattle

<u>FloScan P/N</u>		<u>Description</u>	<u>1-24</u>	<u>25-99</u>	<u>100-499</u>	<u>500-999</u>	<u>1000-2999</u>
<u>SERIES 100 FLOW SENSORS</u>							
100A	100-034-06	1.5-15 GPH, 53x bulb/Pt Zinc	\$ 65.55	49.15	-consult factory for OEM prices-		
100B	100-034-07	2.5-25 GPH, 53x bulb/Pt Zinc					
100C	100-034-08	5.0-50 GPH, 53x bulb/Pt Zinc					
100A-S	100-034-10	1.5-15 GPH, Solid State Zinc	\$ 114.70	86.30	74.30	63.35	57.90
100B-S	100-034-12	2.5-25 GPH, Solid State Zinc					
100C-S	100-034-11	5.0-50 GPH, Solid State Zinc					
<u>SERIES 200 FLOW SENSORS</u>							
201A-18	201-015-00	0.3-30 GPH, Zinc/Cad. Plated/Dichr. fin.	\$ 136.50	102.65	88.45	74.30	68.80
201B-18	201-014-00	0.6-60 GPH, Zinc/Cad. Plated/Dichr. fin.					
201C-18	201-017-00	8-80 GPH, Zinc/Cad. Plated/Dichr. fin.					
201A-9	201-018-00	2-30 GPH, Zinc/Clear Chem. finish	\$ 142.00	-consult factory for OEM prices-			
201B-9	201-019-00	3-60 GPH, Zinc/Clear Chem. finish					
201C-9	201-020-00	8-80 GPH, Zinc/Clear Chem. finish					
225AA	225-900-00	0.1-2 GPH, Aluminum Clear Chem. fin.					
231	231-009-01	3-90 GPH, Aluminum/Clear Chem. fin.	\$ 187.85	140.90	122.30	103.75	93.95
<u>SERIES 264/265 FLOW SENSORS</u>							
264PB-15A	264-905-00	0.5-25 GPH, Aluminum/5V	\$ 180.20	-consult factory for OEM prices-			
264PB-5A	264-905-01	0.5-25 GPH, Aluminum/12V	\$ 180.20	-consult factory for OEM prices-			
264PB-15Z	264-905-04	0.5-25 GPH, Zinc/12V	\$ 163.80	-consult factory for OEM prices-			
265	265-001-00	Diesel application, Aluminum 12V	\$ 175.85	-consult factory for OEM prices-			
<u>SERIES 300 FLOW SENSORS</u>							
311-1	311-100-01	2-30 GPH, Ryton/Polyprop/316SS/Carb. Piv	\$ 207.50	156.20	103.75	93.95	83.00
311-2	311-100-02	12-120 GPH, Ryton/Polyprop/316SS/Carb. Piv					
311-3	311-100-03	30-300 GPH, Ryton/Polyprop/316SS/Carb. Piv					

EFFECTIVE 6/15/88

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