## Technical Bulletin: 81



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## Series 200 Flow Sensor Enhancement (Part Number Changes)

Starting in late September 2000 Data Industrial discontinued earlier electronics versions of the 200 Series flow sensors in favor of new advanced circuitry. This circuitry produces an output that is backward compatible with all earlier versions of this series. The new circuitry has many advanced features that enhance greatly the reliability, signal stability, and protection features of this product. This part number change has no effect on dimensions or any outward appearance. Only the Part Number (usually located on the Cable) has changed.

Because the new electronics can be used in applications where the older versions can not, new part numbers have been issued. The following are some of the common part numbers that changed.

Old #	New #	Description
22xBRxxxx0-xxxx	22xBRxxxx5-xxxx	Brass Flow Sensor
22xSSxxxx0-xxxx	22xSSxxxx5-xxxx	Stainless Steel Flow Sensor
22xBRxxxx1-xxxx	22xBRxxxx6-xxxx	Irrigation Brass Flow Sensor
22xSSxxxx1-xxxx	22xSSxxxx6-xxxx	Irrigation Stainless Steel Flow Sensor
813009-xxxx	813124-xxxx	Replacement 220B Sleeve Assembly
813131-xxxx	813124-xxxx	Replacement IR Series 220B Sleeve Assembly
813025-xxxx	813144-xxxx	Replacement 225/226B Sleeve Assembly
813138-xxxx	813138-xxxx	Replacement IR Series 225/226B Sleeve Assembly
813001-xxxx	813107-xxxx	Replacement Series 250B/228PV Insert Assembly
813128-xxxx	813141-xxxx	Replacement IR Series 250B/228PV Insert Assembly

Advanced features include:

- 1. Superior reliability of advanced Surface Mount Technology.
- 2. Designed to meet CE, transient and EMI emission and susceptibility standards
- 3. Enhanced current limiting circuitry offers protection from mis-wiring or energy transients.
- 4. Simplicity of the equivalent circuit makes interfacing with non-Data Industrial input devices such as PLC's (Programmable Logic Controllers), Data Loggers, etc. is much easier. In fact, many industrial PLC models include an internal 24VDC Power Supply, allowing direct sensor interface into high speed pulse inputs often with no additional external components.

The signal across our sensor will be as follows.

- V <sub>HIGH</sub> = Input device's OPEN CIRCUIT VOLTAGE less IR drop from devices source impedance with sensor's 600uA leakage current. 8VDC Minimum - 35VDC Maximum
- $V_{LOW} = Input device's SHORT CIRCUIT CUR RENT, through sensor's 15\Omega + 1 Diode$ Drop (0.6VDC)Maximum = 1.2VDC @40mA limit



V  $_{\rm HIGH}$  and V  $_{\rm LOW}$  will be a function of the Flow Monitor/Transmitter input circuitry as stated above.

When interfacing with non-Data Industrial devices, care must be taken to insure that the input threshold levels of the device are reliably crossed, and that the 5ms pulse width is long enough to be recognized by device's circuitry.

## see other side for Data Industrial interface wiring recommendations



The Current Limiting Resistor should be selected such that V  $_{HIGH}$  will cross the PLC's V  $_{IN}$  Logic 1 threshold level, and V  $_{LOW}$  will cross it's V  $_{IN}$  Logic 0 threshold level.

For example: If using a 24VDC Power supply, a  $2K\Omega$  resistor, and a PLC with a  $10K\Omega$  input impedance.

V <sub>HIGH</sub> would be Supply Voltage - (Sensor Current + PLC Current) \* 2K = 24VDC - (2.0 + 0.6mA) \* 2K = 18.8VDC.

V <sub>LOW</sub> would be ((Sensor Current) \* Sensor Impedance) + Internal Diode =  $((24VDC/2.015K) * 15\Omega) + 0.6VDC = 0.778VDC$ 

In this example PLC absolute trigger threshold levels would have to be no less than 18.8VDC for a Logic 1, and no more that 0.18VDC (Absolute) for a Logic 0. If the thresholds are to be reliably crossed, allowance for system tolerances must also be taken into account. Careful review of the subject PLC specifications are required to determine the allowances required.

## **CURRENT DETECTING (PLC with Current Pulse input only)**



For example, if our sensor was connected to an opto-isolator type PLC input, with a input impedance of 3K plus one 1.2V Photo-Diode drop, then the absolute trigger thresholds would have to be no less than 600uA for a Logic 0, or more than (24VDC-1.2VDC-0.6)/3K = 7.4mA for a Logic 1. If the thresholds are to be reliably crossed, allowance for system tolerances must also be taken into account. Again, careful review of the PLC specifications are required to determine the allowances for component and system variables.