



Badger Meter

Analog Flow Transmitter (4-20 mA)

Models PFT-420, PFT-420/2, FT-420B & RST-420

DESCRIPTION

The models PFT-420, PFT-420/2, FT-420B and RST-420 are versatile analog flow transmitters for use with the complete line of Badger Meter flow meters. The PFT housings are plastic. The FT housing is cast bronze. These solid-state units produce a 4...20 mA DC output signal through a two-wire design. They also provide a digital pulse output. The outputs are isolated from power supply negative.

The 4...20 mA output signal is directly proportional to the rate of flow through the meter. The signal has excellent linearity, accuracy and repeatability.

OPERATION

The input pulses generated by the reed switch sensor located within the transmitter assembly are converted to a standard 4...20 mA control signal. This signal is proportional to the flow of fluid passing through the flow meter. The input pulses are also converted to a square wave signal that is available as an open collector transistor. This digital pulse output is compatible with most totalizers and batch controllers. Power for the device can be obtained from a 10...36V DC control loop.

APPLICATIONS

These flow transmitters will precisely condition and transmit flow meter signals for process control in the chemical, food and beverage, water conditioning, pharmaceutical and any other industry where measurement and control of fluid flow is required. The transmitter outputs are compatible with most process controllers, totalizers and flow indication devices, such as chart recorders and other data logging devices.

FEATURES

- Solid-state circuitry, long life, high reliability
- NEMA 4X rating (PFT style housing)

CALIBRATION

The factory calibrates this transmitter to the customer specifications provided at the time of order placement. Recalibration generally is not necessary. However, if a particular flow rate is required, use the following recalibration example:

This product is not intended for use in hazardous locations.

First, move the cover. Connect a milliammeter in series with the red lead. Connect a rate indicator or suitable counter to the pulse output. Establish the maximum rate of flow in the system, and determine the number of pulses received per minute. Refer to the meter factor chart found in the flowmeter's Installation and Operation Manual. Divide the pulses per minute by pulses per US gallon for your particular meter. Using a small screwdriver, adjust the span so the milliammeter registers 20 mA.

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Example

You have a 2" turbo meter and the pulse counter registers 2000 pulses/minute at full flow. A 2" turbo meter has a K-factor of 17.360 pulses per US gallon. $2000/17.360 = 115.2$ gpm. Adjust the span for a reading of 20 mA.

K-FACTOR CHART FOR PFT-420, FT-420B

Size	Model	Max. US GPM	Pulses/US Gallon
1/2"	OP	6	222.960
1"	OP	30	76.640
2"	OP	100	20.600
5/8"	25 RCDL	25	198.340
3/4"	35 RCDL	35	126.671
1"	40 RCDL	40	89.781
1"	70 RCDL	70	46.751

K-FACTOR CHART FOR PFT-420/2

Size	Model	Max. US GPM	Pulses/US Gallon
2"	Ind. Turbo	160	17.360
3"	Ind. Turbo	350	12.400
4"	Ind. Turbo	1000	2.560
6"	Ind. Turbo	2000	1.080

K-FACTOR CHART FOR RST-420

Size	Model	Max. US GPM	Pulses/US Gallon
1-1/2"	120 RCDL	120	23.867
2"	170 RCDL	170	14.565

SPECIFICATIONS

Electrical

Supply Voltage	10...36V DC
Pulse Input	
Circuit Interface	Schmitt Trigger
Switch Closure	40...60% duty cycle @ 100 Hz
Digital Output	
Opto-isolator	Open collector transistor
Max. Voltage	80V DC
Max. Power	200 mW
Pulse Width	1 ms (± 0.1 ms)
Pulse Rate	Input rate
Analog Output	
	Two-wire signal/power
Max. Voltage	10...36V DC supply
Current	4...20 mA
Max. Load Resistance (Ohms)	= 50 + [50 x (VDC-10)]

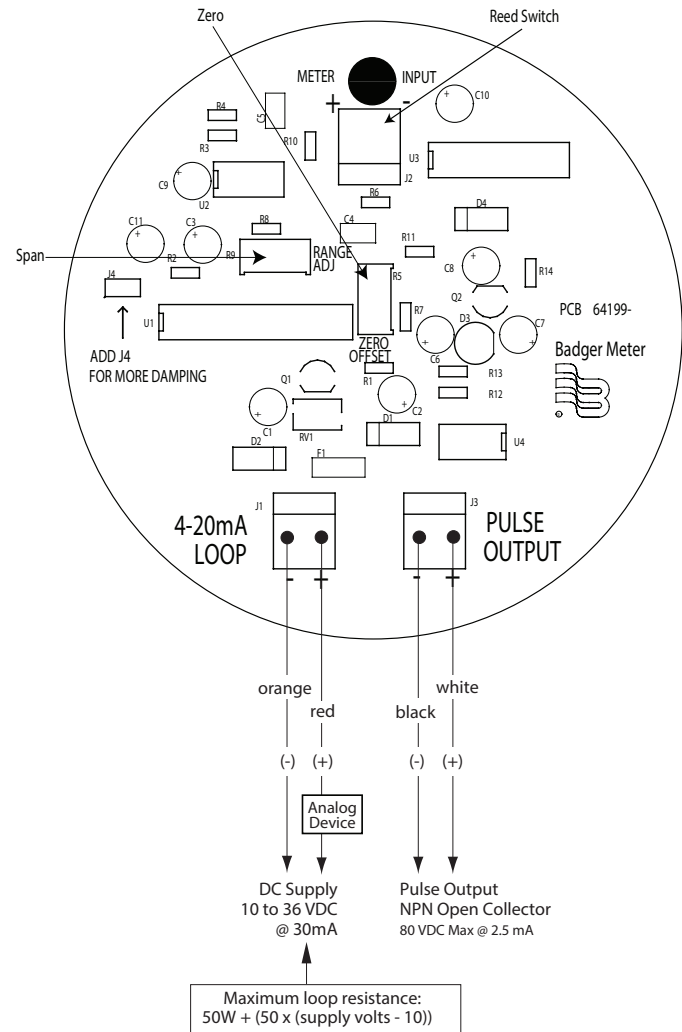
Environmental

Operating Temperature	- 40...185° F (- 40...85° C)
Humidity	5...100% non-condensing
Enclosures	Bronze: NEMA 4X Plastic: NEMA 4X

Performance

Analog Output	2-wire (signal/power) circuit interface with reversed-polarity protection
Accuracy	Within 0.5% of point (10:1 range)
Repeatability	Within 0.2% of point
Max. Ripple	0.1 mA @ 10% of span calibration
Response	3 sec. to within 95% of total change
Operational Drift	Less than 10 µamps
Thermal Drift	Less than 1 µamp per °C
Over Voltage Protection	Resettable fuse 100 mA
Span Adjustment	7...24 mA
Zero Adjustment	3...9 mA
Zero Stability	3.97...4.03 mA

TRANSMITTER SELECTION GUIDE



NOTE: Wire colors indicated are for Part # 85552 only.

Meter Type	Bronze	Standard (Plastic)
Industrial Turbo	—	PFT-420/2
RCDL 25, 35, 40, 70	FT-420B	PFT-420
RCDL 120, 170	—	RST-420

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