

MINITROL-PW

Totalizer/Ratemeter for Paddle or Pelton Wheel Turbine Flowmeters

Features

- Display Rate & Total
Flowrate Display = $\frac{\text{Input Frequency} + \text{Offset B}}{\text{Factor A}}$
- 30mV Magnetic Pickup Inputs (optional)
- RS422/RS232 Serial Communication (optional)
- NEMA 4X / IP65 Front Panel
- 4-20mA or 0-20mA Analog Output (optional)

DESCRIPTION:

The Minitrol-PW is a single input counter/ratemeter intended for use with low flow paddle or pelton wheel turbine flowmeters. Two scale factors are used to describe the flowmeter calibration characteristics. The two 5 AMP preset relay outputs can be programmed by the user to apply to the "A" total counter or the "A" ratemeter. The user can view the rate, total and grand total.

SPECIFICATIONS:

Electrical Specifications: See MINItrol-S

Dimensions: See MINItrol-S

K FACTOR/SCALING

The K-Factor is used to convert the input pulses to engineering units. The two 5 digit scale factors, with decimal keyed into any position, allow easy direct entry of any scaling factor from 0.0001 to 99999. Factor A is used to enter the linearized K-Factor and Factor B is used to enter the offset frequency.

LOW FLOW CUTOFF:

A low flow cutoff is provided to inhibit operation in low flow out of range regions.

RATEMETER

Accurate to 4 1/2 digits (± 1 display digit). The rate meter can be programmed to accept almost any number of pulses per unit of measurement and auto-range up to 5 digits of significant information. The display can be programmed to read in units per Second (SEC), Minute (MIN), Hour (Hour), or Day (DAY).

COUNTER

The two 6-digit totalizers can count at 10kHz speed. They share a 5-digit dividing scale factor. The totalizer performs as follows:

If Freq. In > Cutoff

$$\text{Total increment} = \frac{\text{Freq. Offset} \cdot \Delta \text{Time} + \text{Pulses In}}{\text{K Factor A} \quad \text{K Factor A}}$$

$$\text{Rate} = \frac{(\text{Freqin} + \text{Freq offset}) \cdot \text{time base}}{\text{K Factor A}}$$

Time base: Sec = 1, Min = 60, Hour = 3600, Day = 86400

If Freq. In < Cutoff

$$\begin{aligned} \text{Total Increment} &= 0 \\ \text{Rate} &= 0 \end{aligned}$$

Total B (grand total) increments with Total A.



THEORY OF OPERATION

Low flow, Pelton Wheel turbine flowmeters have a transfer characteristic which can best be represented by the following equation for frequencies above the minimum usable flowrate for the device:

$$\text{frequency} = \left(\frac{K_{\text{linearized}} \cdot \text{GPM}}{60} \right) - \text{Offset Frequency}$$

Where: $K_{\text{linearized}}$, and offset frequency are scaling constants determined during flow sensor calibration.

This transfer characteristic applies within the meter manufacturers published range. Below some minimum flow meter output frequency, the flow rate should be considered as 0 and the totalization inhibited. This is called the "cutoff" frequency.

Ordering Information

| | | | | |
|---------------------------|--|---|---|---|
| Example: | M RTPW | A | 3 | 1 |
| Series: | M RTPW = 6 digit counter / 5 digit ratemeter with presets and scaling. | | | |
| Operating Voltage: | A = 110 VAC \pm 15% or 12 to 15 VDC B = 220 VAC \pm 15% or 12 to 15 VDC C = 24 VAC \pm 15% or 12 to 15 VDC | | | |
| Count Inputs: | 3 = Standard, 4-30 VDC simultaneous inputs. 3M = Mag. Input, rate/total input only, 30mV input (Inhibit input, 4-30V) | | | |
| Options | 1= RS232 Communications 2= RS422 Communications A= Analog Output (4-20/0-20 mA) | | | |
| NOTE: | RS232/RS422 & Analog Output options can not be combined | | | |
| Accessories | Separate non keyboard panel order #34235 Separate keyboard panel - order #34234 NEMA4 wall mount enclosure available, see NEMAtrol Explosion proof enclosure available, see XHV Serial printer available, see P1000, P295 Ethernet Port Server available, see IEPS RS-422/485 to RS-232 Communication Adaptor available, see CA285 | | | |

Flow Instruments
RATEMETERS/TOTALIZERS

DRT (Dual rate/totalizer)

2 Separate Rate/Total Displays with Combination Function

Features

- Displays A,B,&C Rate & A,B,&C Total
- Separate Scaling Factors For A & B Inputs
- "C" Displays A+B, A-B, A÷B, & A÷A+B
- RS422/RS232 Serial Communication
- Modbus RTU RS422/RS485/RS232
- Pulse Input - 10 kHz Max.
- Security Lockout
- NEMA 4X / IP65 Front Panel
- 30mV Magnetic Pickup Inputs

DESCRIPTION:

The DRT (Dual Rate Totalizer) is a dual 5 digit Ratemeter 6 digit Totalizer in a 1/8 DIN package. User selects 1 of 6 displays to show A, B or C rate and A, B or C total. Inputs A and B have separate scaling to read in engineering units.

A 4-20mA (0-20mA) output of the C rate or total is optional.

The user can press the VIEW button to see 6 separate items total A, total B, total C, rate A, rate B, rate C. Negative values are displayed with a negative symbol (- 12345). For the C value, the user can choose from the following combination of A&B inputs: TOTAL; with a choice of A+B or A-B; RATIO with choice of A÷B(x100) to show percent of A to B quantity or A÷[A+B(x100)] to show percent of A to total quantity.

Two independent presets are standard. User selects whether output A is activated by total or rate value of input A or selected C. Output B can be activated by total or rate value of input B or selected C. Outputs activated by A or B total can be set to latch or autorecycle with an adjustable output duration from 00.1 to 99.9 sec. For rate, ratio, or C total outputs pull in when value is equal or above the preset and drop out when value is below the preset minus the selected 0 to 999 hysteresis.

SPECIFICATIONS:

DISPLAY:

6 digit, 0.55" High LED

INPUT POWER:

110 VAC ± 15% or 12 to 15 VDC

220 VAC ± 15% or 12 to 15 VDC

24VAC ± 15% or 12 to 15 VDC

CURRENT:

250 mA DC max. or 6.5 VA (6.5W) AC

OUTPUT POWER: (AC powered units only)

+12 VDC @ 50 mA, unregulated -10 + 50%

TEMPERATURE:

Operating: +32°F (0°C) to +130 F (+54°C)

Storage: -40 F (-40°C) to +200°F (93°C)

HUMIDITY: 0-90% Noncondensing



- 4-20mA or 0-20mA Analog Output
- CSA Listed

MEMORY:

EEPROM stores data for 10 years if power is lost.

INPUTS:

3: High Impedance DC pulse input 4-30 VDC (high), Open or 0-1 VDC (low), 10 KΩ imp. 10 kHz max. speed. Accepts simultaneous inputs.

3M: Mag. Input, Input A only, accepts 30mV input (50 V max. P/P) signals 10 KΩ imp. 5 kHz max. (Input B, 4-30V)

3MB: Mag. Input, Inputs A & B, accepts 30mV input (50 V max. P/P) signals 10 KΩ imp. 5 kHz max.

RESET:

Front Panel: Resets displayed value and control output

Remote: 4-30 VDC negative edge resets all counters, "A" counter or "B" counter (user selectable).

K FACTOR/SCALING

The DRT has two separate K-Factors that are used to convert the input pulses to engineering units. The 5 digit K-Factor dividers, with decimal keyed into any position, allow easy direct entry of any K-Factor from 0.0001 to 99999. Separate factors may be entered for the 2 separate input channels.

CONTROL OUTPUTS:

Relays:

2 each N.O. Relay; 5 Amps 120/240 VAC or 28 VDC.

(N.C. relay contacts and NPN transistor output available with solder jumpers. Transistor output is internally pulled up to 10 VDC through relay coil, sinks from 10 VDC to .5 V @ 100 mA)

Analog Output:

An optional 4-20mA (0-20mA) output is available for the DRT. The output can be programmed to track rate or total of the C display. This feature is available by adding suffix A to the part number. Connections are via a 2 terminal pluggable screw connector. Programming is accomplished by using the front panel in conjunction with rear dip switches.

Accuracy: 50uA worst case.

Compliance Voltage: 3 to 30 VDC non inductive.

Approvals: CSA File# LR91109-7, CE Compliant