BATCH CONTROLLER WITH TWO STAGE VALVE CONTROL

DPF-310 Series

2 YEAR WARRANTY

DPF-311 shown smaller than actual size.

63.5 x 187.3 mm (2.5 x 7.375") panel cutout

- **Start/Stop Buttons**
- **Separate 8-Digit K-Factors for Rate and Total**
- **Pulse or Analog Input Models Available**
- **Displays Rate, Total and Grand Total**
- **Security Lockout**
- **2 Set Points for 2-Stage Valve Control**
- **NEMA 4X (IP65) Front Panel**

Featuring 8 digits of bright, 14 mm (0.55"), alpha-numeric display, the DPF-310 Series can accept up to 20,000 pulses per second of digital count. The analog input version accepts 4 to 20 mA signal and it uses a highly linear integrator (V to F converter) to generate 0 to 10 kHz digital pulses. The standard unit has 2 separate, 8-digit, floating decimal, "K" factors to convert the inputs to meaningful total and rate data. An optional 16-point K-factor can linearize flow from non-linear meter outputs. The user, with the push of a button, can toggle back and forth to view the total of the batch, the rate of flow or the grand total of flow.

The DPF-310 Series may be thought of as two separate counters and a ratemeter. The "batching" counter counts to prewarn and preset numbers entered by the user and enables separate control outputs. The "totalizing" counter gives a cumulative reading or grand total. Finally, the ratemeter counts the number of pulses per second and, with its scaling feature, can provide gallons per minute or any other rate measurement without the totalizer losing counts. At any time, the user may view the total, the grand total or the rate while never interrupting the counting process. Setup is done through the front panel and the menu driven software in the unit. Start-stop control can be activated via the front panel buttons or remote inputs (on some models). The unit operates from either 110 Vac/12 to 27 Vdc, or optional 220 Vac/12 to 27 Vdc. If AC power is used, 2 built-in regulated 12 Vdc @ 100 mA power supplies are offered. They can be connected to provide 12 Vdc and -12 Vdc or 24 Vdc to drive external devices. CMOS logic is used to provide high noise immunity and low power consumption with EEPROM to hold data a minimum of 10 years if power is interrupted.

SPECIFICATIONS

Display: 8-digit, 14 mm (0.55") high, 15 segment, red orange, LED
Input Power (Internally Fused):
110 Vac ±15% or 12 to 27 Vdc
220 Vac ±15% or 12 to 27 Vdc ("-220V" Vac option)
Current: Maximum 280 mA dc or 5.3 VA at rated ac voltage
Output Power (On AC Powered Units Only):
12 Vdc @ 100 mA separate isolated 12 Vdc @ 100 mA to allow 12 Vdc or 24 Vdc regulated ±5% worst case (DC outputs are supplied with re-settable fuses)
Temperature:
Operating: 0 to 54°C (32 to 130°F)
Storage: -40 to 93°C (-40 to 200°F)
Humidity: 0 to 90% non-condensing
Approvals: CE approved
Memory: EEPROM stores all program and total data for minimum of 10 years if power is lost
Pulse Inputs (DPF-311): Standard, high impedance pulse input
Low: Open or 0 to 1 Vdc
High: 3 to 30 Vdc, 10 kΩ impedance, 20 kHz maximum input speed (minimum on/off 25 msec) or field changeable to: 4.7 kΩ input pull up resistors to 5 Vdc on input for pulsing with contact to ground or NPN open collector transistor
Analog Inputs (DPF-312): The current loop input is converted to a highly linear 0 to 10 kHz frequency. This frequency can then be scaled by the 8-digit K-factors to total or display rate in separate engineering units
Accuracy Over Full Temperature Range
Zero Error: 0.175% full scale maximum
Overall Error: 0.5% full scale maximum
DPF-312: 4 to 20 mA, 250 Ω impedance
Reset
Front Push Button: "CLR" resets displayed number and control output

Remote Start and Stop/Reset Inputs (Not available on DPF-312-A or models with the "-LIN" option): A 4 to 30 Vdc positive pulse will activate these inputs. Pin 10 is the START input and when activated, the unit will "start". Pin 5 is the STOP/RESET input. When activated, the unit will "stop" (if unit is started and the batch is not complete). When the unit is stopped or the batch is complete, activating this input will reset the total. If pin 5 is held high (4 to 30 Vdc), the display will flash "STOPPED" and any start inputs will be inhibited. Stop always over-rides start input.

Control Outputs

SPDT Relay Version:
10 A 120/240 Vac or 28 Vdc (resistive)

Analog Output ("A" Models)

Current Outputs: A sinking driver generates a corresponding linear current through the external devices, updating with each update of the rate. Accuracy is ±0.5% FS worst case. Compliance voltage must be 3 to 24 Vdc, non inductive. (The DPF-310 Series can provide the DC source as long as the drop across all devices being driven does not exceed 21V)

Security: The DPF-310 Series has a missing pulse detector. The user selects the amount of time (1 to 99 sec) that the unit will "wait" for input pulses. If the unit doesn't receive pulses within the selected time, the unit displays "SECURITY" and both relays drop out. (00 disables the security feature; entering the lockout code returns the unit to the run mode)

Presets: The user may enter two numbers to set up the batch totalizer, preset and prewarn. The prewarn is a number set a certain number of counts before the preset number. For instance, you may want one hundred gallons in a particular batch. You may also want a valve to close and slow down flow 25 gallons before the end. Your preset is 100, your prewarn is 25. When the start is activated, the relays energize simultaneously to start flow. When the totalizer reaches 75, the prewarn relay drops out. When the totalizer reaches 100 the preset relay drops out. The preset values can be viewed or changed via the menu (when stopped).

K-Factor: In the standard unit a fixed K-factor is used to convert the input pulses or frequency generated internally by the analog input to engineering units. The 8-digit K-factor dividers, with decimal keyed into any position, allow easy direct entry of any K-factor greater than 0.0001 to 99,999,999. Separate K-factors may be entered for the total and rate section. Thus, you may batch and total in gallons and display rate in liters per hour. The maximum factored count speed is 20,000 Hz.
The maximum factored rate is 7-digits.

16-Point Linearization ("-LIN" option): This variable K-factor option makes flow systems more accurate and often extends their usable range by allowing users to dial in different K-factors for different flow rates. It works with either pulse input or standard analog current loop. It is recommended for flow meters whose K-factors change with different rates of flow. This option can also be used to display static volume in irregular shaped vessels by interfacing level or pressure transducers to the analog input. From 3 to 16 points of frequency from 0 to 10,000 Hz and K-factors greater than 0.0001 to 999,999 are dialed in at set up. The 16 point linearization option uses 8 digit floating math to interpolate between settings. Rate per second, per minute or per hour programmability eliminates the need to calculate separate K-factors for total and rate.

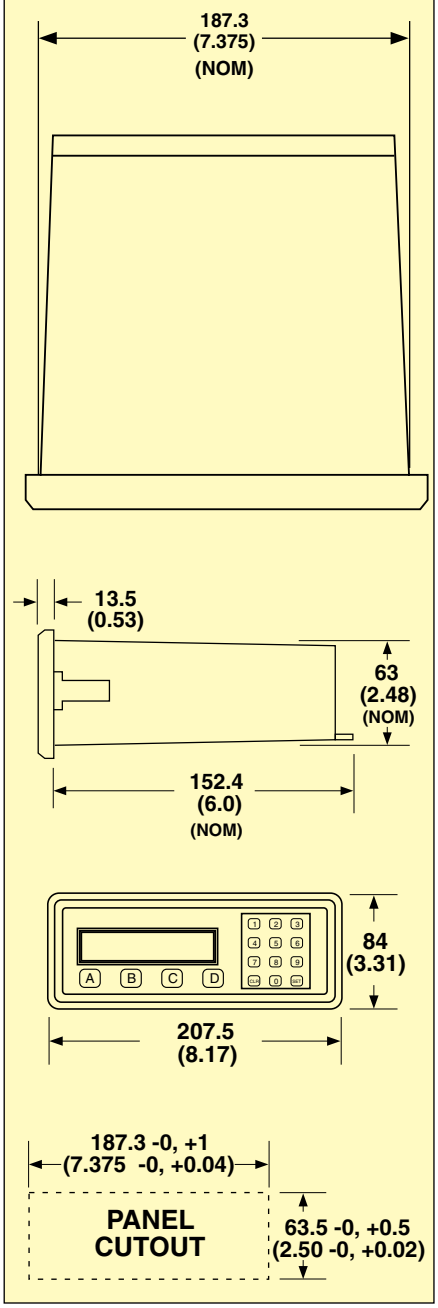
Totalizer: Each of the total and grand total counters have 8 digits. In the set-up mode choose "R0" (reset to zero) for count up operation or "SP" (set to preset) for count down operation. While viewing the total the display can be made to flash the grand total by pressing "ENT". Activating "CLR" while the grand total is flashing, resets the grand total counter.

Ratemeter: Accurate to 5½ digits (1 display digit). The rate meter can be programmed to accept almost any number of pulses per unit of measurement, sample from 2 to 24 seconds maximum, and autorange up to 6 digits of significant information. The rate meter with a "K" factor of 1 displays the rate of pulses per second. Simply dial in the proper "K" factor to display in minutes, hours or other units of measurement. (See 16-Point Linearization above) Press the "C" button while the unit is displaying the batch to display the rate; "R" is displayed on the left side of the display.

Weight: This feature is used to provide a weighted averaging of the rate data being received. Higher settings provide more averaging for a more stable display, derived from the equation:
(Old Data x "Weight") +
New Data ("Weight" +1)

Lockout: Unauthorized front panel changes can be prevented by entering a user selected four digit code.

Dimensions: mm (inch)



To Order

Model No.	Description
DPF-311	Batch controller, pulse input
DPF-311-A	Batch controller, pulse input, analog output
DPF-312	Batch controller, analog input
DPF-312-A	Batch controller, analog input, analog output

Comes complete with operator's manual.
*For 16-point linearization add suffix **"-LIN"** to model number consult Flow Engineer for price.*
*For 220 Vac power add suffix **"-220V"** to model number, no additional charge.*

***Ordering Examples: DPF-311,** batch controller, pulse input.*
***DPF-312,** batch controller, analog input.*