

# PD6210 / PD6310

ProVu® Dual-Line 6-Digit Batch Controllers

**PROVU®**  
SERIES



**SUPER-BRIGHT LEDs**  
Our Brightest Display Ever

**MeterView Pro**  
USB Install



**BATCH CONTROL**

## COMMON BATCH CONTROLLER FEATURES

- Start / Pause / Stop, Change Batch with Front Panel Buttons
- Display Batch Total, Rate, Grand Total, Count or Preset
- Single or Multi-Stage Batch Control (Up to 8 Relays)
- Automatic Overrun Correction
- Rate in Units per Second, Minute, Hour, or Day
- Automatic or Manual Batch Control
- Low or High Flow Alarms while Batching
- 9 Digit Grand Total with Overflow Feature
- Count Up or Down with Each Batch

## COMMON ProVu® METER FEATURES

- NEMA 4X, IP65 Front
- Input Power Options Include 85-265 VAC or 12-24 VDC
- Dual-Line 6-Digit Display, 0.60" & 0.46"
- Programmable Displays & Function Keys
- Optional SunBright Display Models for Outdoor Applications
- 2 or 4 Relays + Isolated 4-20 mA Output Options
- External 4-Relay & Digital I/O Expansion Modules
- RS-232, & RS-485 Serial Communications
- On-Board Digital Input
- Modbus® RTU Communication Protocol Standard
- Onboard USB and MeterView® Pro Programming Software

## ANALOG INPUTS

- 0-20 mA, 4-20 mA, 0-5 V, 1-5 V, and  $\pm 10$  V Inputs

## PULSE INPUTS

- Pulse, Open Collector, NPN, PNP, TTL, Switch

**PRECISION  
DIGITAL**

# PD6210 / PD6310 ProVu® Batch Controllers



UV Resistant  
Sunlight Readable Models



Front Panel  
NEMA 4X Rated



## INTUITIVE BATCH CONTROL

The front panel has intuitive buttons and displays that make operating the batch controller clear and easy right out of the box. START, BATCH, and STOP buttons come setup by default for batch controller operation. The START button is used to begin a batching process. The BATCH button is used to quickly access the preset value. The STOP button can be pressed once to pause a batch, or twice to cancel a batch in progress. The upper and lower displays can be easily configured for your application need. The STOP button may be used to easily cycle the lower display information while the batch is stopped.

## Easily Choose Your Display Information



### Batch Total & Preset

The preset on the lower display provides even quicker access to the preset menu just by using the arrow keys to change the value.



### Batch Total & Rate

The rate on the lower display may be alternated with units for variable flow batching systems. Rate alarms may also be used during the batch process.



### Batch Total & Batch Count

The batch count on the lower display, tracks completed batches. The count may be set back to 0 with the reset menu.



### Batch Total & Grand Total

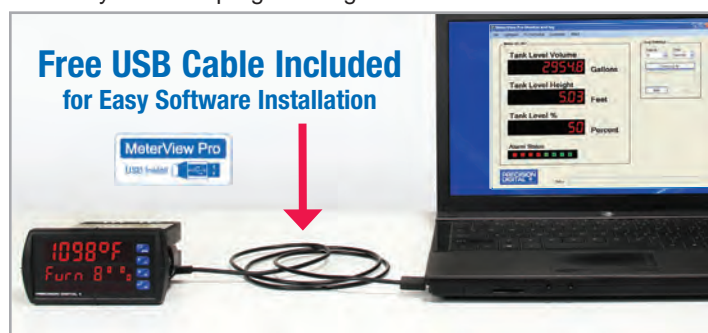
A grand total with overflow digits for up to a 9 digit total may be displayed in the lower display, with password protection and non-resettable programmable features.

## Super-Bright LEDs make Standard and SunBright Display Models Even Brighter

The ProVu's standard and SunBright display models feature extraordinarily bright LED displays. They are perfect for indoor and outdoor applications where visibility may be impaired by smoke, fog, dust, or distance. The intensity on the SunBright model display is so high it can be read even in the brightest sunlight.

## Free USB Programming Software & Cable

The ProVu® comes preloaded with free **MeterView® Pro** programming software that connects and installs directly to your PC with a standard USB cable, also provided free with each instrument. This eliminates the need to insert CDs, install drivers, or download software from the internet. The software will allow you to configure, monitor, and datalog a ProVu® PD6210/6310 using your PC. Just simply connect the meter to your PC with the USB cable and within minutes you will be programming it.



## Clearly Labeled Displays

The upper display alternates the display to show the controller state when in pause or stop mode. When displaying rate, grand total, batch count, or preset, the lower display alternates between the display value and the function or unit of measure.



Batch Total & Preset



Alternating Display

# PD6210 / PD6310 PROVu® Batch Controllers

## Clearly Labeled Displays

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Batch Total & Preset

Alternating Display

## Grand Total Displays Up to 9 Digits

These batch controllers can display up to nine digits of total flow with the grand total feature. In the diagrams below, the batch controller is displaying 532,831,470 by toggling between a display of "oF 532" and "831470". Notice the (GT with arrow ▲ symbol) is lit up indicating the display is in a grand total overflow mode.



## Easy to Use

The user friendly dual-line display makes the PROVu easy to set up & program. No jumpers to set for input selection. All setup & programming are done via the front panel.



Input Setup

Display Setup

## BATCH CONTROLLER CAPABILITIES

A PROVu batch controller can be programmed for a wide variety of applications. Setup is easy for single or multi-stage batching. Automatic overrun correction keeps the batch size accurate, even over time and with system wear. It can record grand total, or non-resettable grand total with a time base of seconds, minutes, hours or days. The user can program a conversion factor, and configure a non-resettable grand total, and password protection.

## Single and Multi-Stage Batching

The PROVu can be used as a single or multi-stage batch controller. Relays assigned to the total act as batch control relays, with additional relays beyond the first including a preclose value. The preclose deactivates the relay before the batch is finished, to allow slower fill rates and a more accurate batch finish. With expansion module relays, up to eight-stage batching is possible. Each additional stage batching relay has an individually programmable preclose amount.

## Manual or Automatic Batch Control

Batches may be started manually with the START front panel button, or with a remote digital input trigger. Batches may also be programmed to start automatically after a 0 to 999.9 second delay after the end of the last completed batch. A manually stopped batch will not automatically restart. The START button or digital input must be used.

## Automatic Overrun Correction

The PROVu batch controller will correct for batch overrun or shortages automatically. By tracking the amount the batch was off by, the controller will automatically adjust the batch by modifying the batch relay deactivation time.

## Quick Preset Changes

The front panel BATCH key is configured by default to access the preset menu. The preset may be changed quickly and easily between batches without the need to enter setup menus.



## Non-Resettable Grand Total

The user can set up the grand total to be non-resettable by entering a specific password. Once this is done, the grand total can never be reset.

## Total Conversion Factor

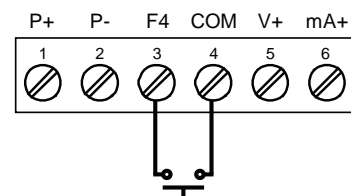
The user can enter a conversion factor that allows the controller to display total in different units than the rate. For instance, an operator could measure flow rate in gallons per minute and grand total in hundredths of acre-feet.

## Grand Total & Rate Alarms

The PROVu's four internal and four external relays can be set up to alarm when the grand total reaches a user-defined set point or when the rate is above or below a certain value. Rate alarms are only activated when the batching process is running. A variety of reset modes are available and the user can also program time delays and fail-safe operation.

## On-Board Digital Input

The PD6210 and PD6310 include a digital input as standard. This digital input can operate with the tare, reset tare, or interlock relays feature, force relays on from a signal from a PLC or relay on other equipment, and much more. This is ideal for installations where the meter is inaccessible behind a cover, or where an additional function key is needed for customized operation.





## Rounding

The rounding feature is used to give the user a steadier display with fluctuating signals. It causes the display to round to the nearest value according to the rounding value selected (1, 2, 5, 10, 20, 50, or 100). For example, with a rounding value of 10, and an input of 12346, the display would indicate 12350.

## Four Types of Password Protection

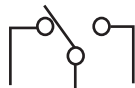
The PROVu offers 4 types of password protection. Level 1 protection allows the operator use of only the 3 pre-configured function keys on the front panel without a password. Level 2 protection allows the operator use of only the function keys and the ability to change set points without a password. Level 3 protection restricts the function keys and all configuration menus without a password. Grand total reset protection prevents the total from being reset manually.

## Rugged

A unique front panel design makes the PROVu nearly impenetrable in typical applications. Here, the PROVu easily survives a direct hit on the display from a heavy 2" solid stainless steel ball dropped from eight feet.

## OUTPUTS

### Relay Outputs



The PROVu has up to four 3 A Form C relays (SPDT) with multiple programmable functions. One (relay 1) should always be used for batch control. Other relays may be configured as additional batch relays, with or without preclose for multi-stage batching or as alarms for the rate or grand total. Each alarm has multiple power loss fail-safe options. Alarm relays can be configured for proper protective action upon input loop break. Alarm relay ON and OFF delay times are user adjustable. Up to eight front panel indicators show alarm and/or relay state. All alarm relays can be configured for 0-100% deadband. Rate alarms are only active while a batch is running.

### Relay Operation/Configuration

There are powerful relay functions that can be configured in the PROVu controller, including:

- Single and multiple stage batch control with preclose
- Manual and automatic batch control modes
- Rate alarms during batch process
- Grand total alarms
- Sampling function
- User selectable fail-safe operation
- Relay action for loss (break) of 4-20 mA input signal (PD6210)
- Time delay (on and off), independent for each alarm relay

### Analog Output

The isolated analog retransmission signal can be configured to represent the batch total, grand total, maximum (peak) value, minimum (valley) value, the value for any of the eight relay set points, manual setting control, or Modbus input. While the output is nominally 4-20 mA, the signal will accurately accommodate under- and over-ranges from 1 to 23 mA.

## Isolated Transmitter Power Supplies

A powerful 24 V @ 200 mA power supply is a standard feature on the PROVu controller. It can be configured for 5, 10, or 24 V (default) by means of a simple internal jumper (see manual). An additional power supply (24 V @ 40 mA) is standard with the 4-20 mA output option.

## Batch Control From a Computer

Through MeterView Pro Software, the preset and relay 2 preclose may be easily changed from the main control window shown above. The total and grand total may be reset with just the click of a button. The batch controller may be started, paused, and stopped through the control window, for full featured batch controller operation.

## Fully Program the Controller

All the programming parameters of the controller may be configured from MeterView Pro Software. The configuration file may be saved for later use, and saved configuration files may be loaded into the software for download into the PROVu.

## DIGITAL COMMUNICATIONS

### Modbus® RTU Serial Communications

With the purchase of a serial communication adapter, PROVu controllers can communicate with any Modbus Master device using the ever-popular Modbus communications protocol that is included in every PROVu. Below are some examples of other things that can be done with PROVu's Modbus communications.

- Start, pause, stop, or change preset values
- Send a 6-character message to the lower display upon an event
- Remote user control (i.e. change set points, acknowledge alarms)
- Read rate, total, grand total, batch count, etc.



Modbus PV Input



Remote Message

## FIELD EXPANSION MODULES

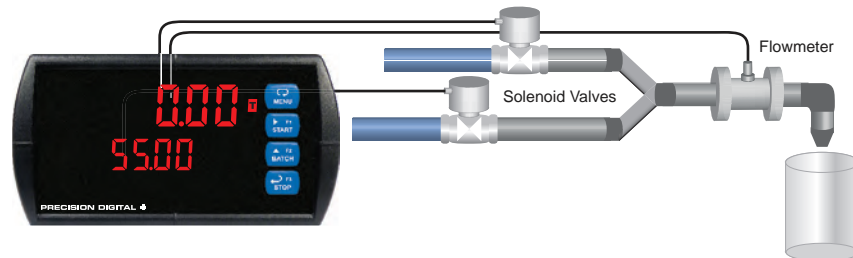
Add functionality to the PROVu in the field with easy-to-install external expansion modules. Add RS-232, RS-485 communications, I/O modules (up to 2), and 4-relay expansion module. The menu items for these modules do not appear until the module is connected, simplifying the basic menu. See ordering information for details.



## MANUAL MULTI-STAGE BATCH CONTROL OPERATION

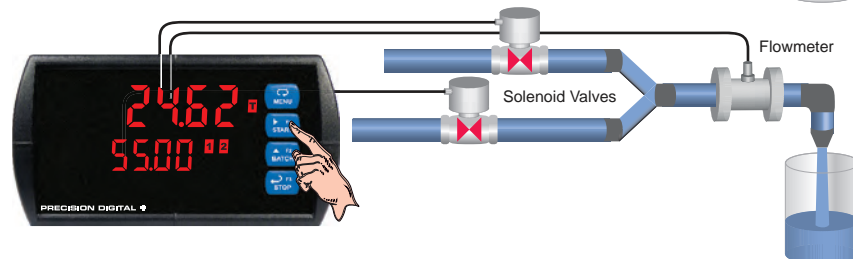
### System Setup

Both valves are closed with an empty barrel in place. The batched total is displayed in the upper display, the preset is selected for the lower display.



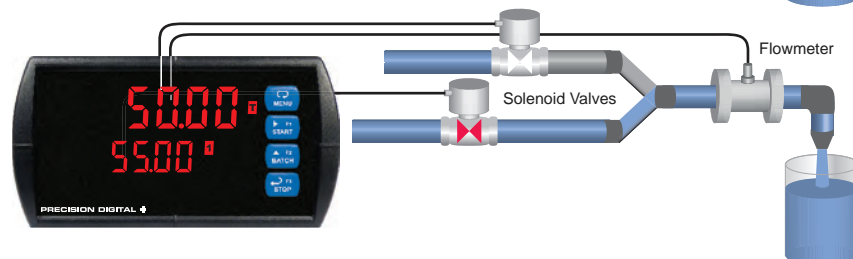
### Batch Start

The START button is pressed. Both valves open. The barrel begins to fill.



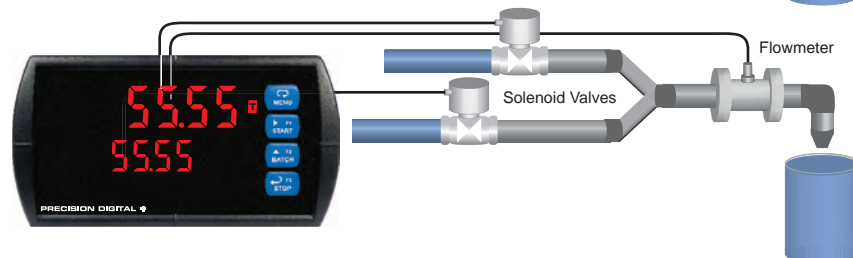
### Preclose Valve

When the batch total reaches a value of 50.00 (Preset [55.00] – Preclose [5.00]) the full-flow valve closes. The fill rate of the tank slows as a result.



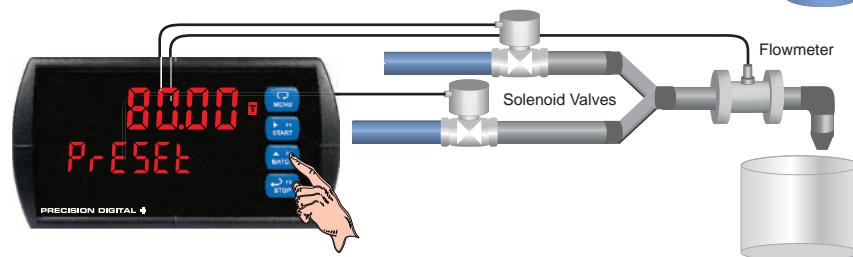
### Completed Batch

When the batch total equals the preset amount, the restricted-flow valve closes. The barrel is now full. If some overrun occurs, the next batch will adjust for this offset amount to maintain accuracy.



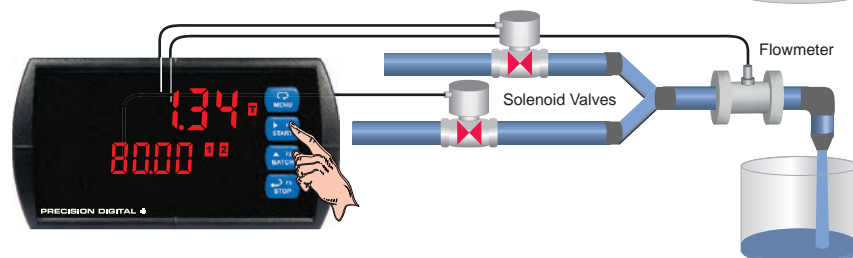
### Change Preset

After placing a new, empty barrel, a new preset fill amount may be selected with the Batch key, while the process is stopped.



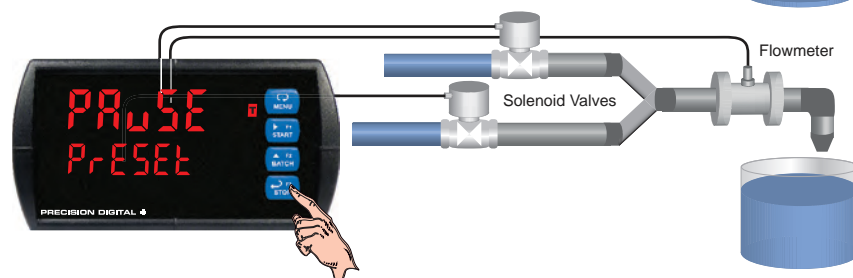
### Begin New Batch

Press the START key and a new batch will begin. With both valves open, the process continues.



### Pause/Stop

At any time, the STOP button may be pressed, once to Pause the process, or twice to cancel the batch, which stops the process.



# PD6210 / PD6310 ProVu® Batch Controllers

## NEMA 4, NEMA 4X, AND EXPLOSION-PROOF ENCLOSURES

Thermoplastic and stainless steel NEMA 4X, and painted steel NEMA 4 enclosures are available. Also available is the ProtEX-MAX for hazardous area applications requiring explosion-proof enclosures.



**PDA2600**  
Stainless Steel



**PDA2811**  
Plastic Low-Cost

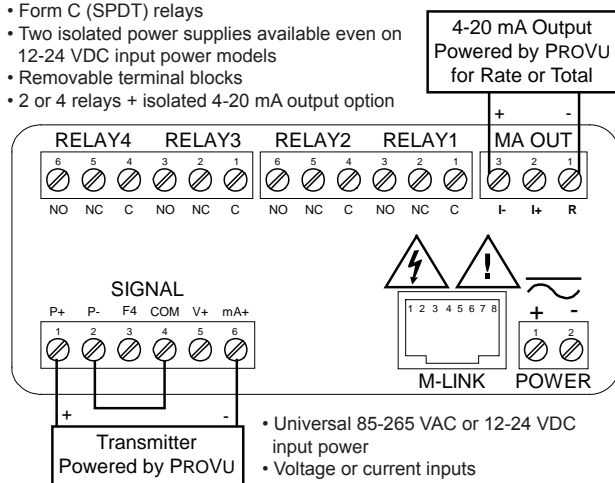


**PD8 Series**  
ProtEX-MAX

## CONNECTIONS

### PD6210

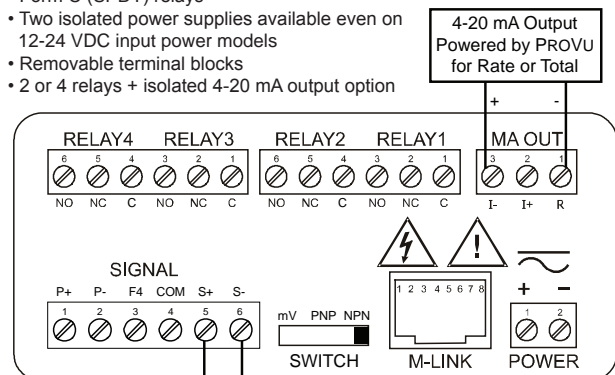
- Form C (SPDT) relays
- Two isolated power supplies available even on 12-24 VDC input power models
- Removable terminal blocks
- 2 or 4 relays + isolated 4-20 mA output option



- Universal 85-265 VAC or 12-24 VDC input power
- Voltage or current inputs
- No jumpers needed for V/mA input selection
- M-Link for adding expansion modules
- Digital Input (F4) is standard

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## SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

### General

**Display:** Upper display: 0.60" (15 mm) high. Lower display: 0.46" (12 mm) high. Both are 6 digits (-99999 to 999999), red LEDs.

**Default Display Assignment:** The upper display shows batch total. The lower display shows rate with alternating units, and can be switched to show grand total, batch count, or preset with the STOP key.

**Custom Display Assignment:** The upper and lower displays may be assigned to rate, total, grand total, batch count, preset, set points, units (lower display only), alternating R & T, R & GT, preset & rate, max & min, or a Modbus display register. Any rate/total/grand total display may be programmed to alternate with a custom unit or tag.

**Alternating Display:** Displays alternate every 10 seconds when display is selected or the batch is paused.

**Display Intensity:** Eight user selectable intensity levels

**Display Update Rate:** 5/second (200 ms)

**Overrange:** Display flashes 999999

**Underrange:** Display flashes -99999

**Front Panel:** NEMA 4X, IP65

**Operating Methods:** Three programmable front panel buttons (default START, BATCH, STOP), digital inputs, PC and MeterView Pro software, and Modbus registers.

**Programming Methods:** Four front panel buttons, digital inputs, PC and MeterView Pro software, Modbus registers, or cloning using Copy function.

**F4 Digital Input Contacts:** 3.3 VDC on contact. Connect normally open contacts across F4 to COM.

**F4 Digital Input Logic Levels:** Logic High: 3 to 5 VDC

Logic Low: 0 to 1.25 VDC

**Noise Filter:** Programmable from 2 to 199 (0 will disable filter)

**Filter Bypass:** Programmable from 0.1 to 99.9% of calibrated span.

**Recalibration:** Recommended at least every 12 months.

**Max/Min Display:** Max (Peak) / min (Valley) readings reached by the process are stored until reset by the user or until power is cycled.

**Password:** Three programmable passwords restrict modification of programmed settings and two prevent resetting the totals.

**Non-Volatile Memory:** All programmed settings are stored in non-volatile memory for a minimum of ten years if power is lost.

**Power Options:** 85-265 VAC 50/60 Hz, 90-265 VDC, 20 W max, or optional model with 12-24 VDC  $\pm 10\%$ , 15 W max.

**Fuse:** Required external fuse: UL Recognized, 5 A max, slow blow; up to 6 controllers may share one 5 A fuse.

**Isolated Transmitter Power Supply:** Terminals P+ & P-: 24 VDC  $\pm 10\%$ .

Internally selectable jumper for 24, 10, or 5 VDC supply.

85-265 VAC models rated @ 200 mA max, 12-24 VDC powered models rated @ 100 mA max, @ 50 mA max for 5 or 10 VDC supply.

**Normal Rejection Mode:** Greater than 60 dB at 50/60 Hz (PD6210)

**Isolation:** 4 kV input/output-to-power line. 500 V input-to-output or output-to-P+ supply.

**Overvoltage Category:** Installation Overvoltage Category II: Local level with smaller transient overvoltages than Installation Overvoltage Category III.

**Environmental:** Operating temperature range: -40 to 65°C

Storage temperature range: -40 to 85°C

Relative humidity: 0 to 90% non-condensing

**Connections:** Removable screw terminal blocks accept 12 to 22 AWG wire, RJ45 for external relays, digital I/O, and serial communication adapters.

**Enclosure:** 1/8 DIN, high impact plastic, UL 94V-0, color: black

**Mounting:** 1/8 DIN panel cutout required: 3.622" x 1.772" (92 mm x 45 mm).

**Weight:** 9.5 oz. (269 g)

**Dimensions:** 4.68" x 2.45" x 5.64" (119 mm x 62 mm x 143 mm) (W x H x D)

**UL File Number:** UL & c-UL Listed. E160849; 508 Industrial Control Equipment.

**Warranty:** 3 years parts & labor

**USB Connection:** Compatibility: USB 2.0 Standard, Compliant

Connector Type: Micro-B receptacle

Cable: USB A Male to Micro-B Cable

Driver: Windows 98/SE, ME, 2000, Server 2003/2008, XP 32/64-Bit, Vista 32/64-Bit, Windows 7 32/64-Bit, Windows 10 32/64-Bit

Power: USB Port



## PD6210 Analog Input

**Inputs:** Field selectable: 0-20, 4-20 mA,  $\pm 10$  VDC (0-5, 1-5, 0-10 V), Modbus PV (Slave)

**Accuracy:**  $\pm 0.03\%$  of calibrated span  $\pm 1$  count, square root & programmable exponent accuracy range: 10-100% of calibrated span

**Temperature Drift:** 0.005% of calibrated span/ $^{\circ}\text{C}$  max from 0 to 65 $^{\circ}\text{C}$  ambient, 0.01% of calibrated span/ $^{\circ}\text{C}$  max from -40 to 0 $^{\circ}\text{C}$  ambient

**Signal Input Conditioning:** Linear, square root, programmable exponent, or round horizontal tank volume calculation.

**Multi-Point Linearization:** 2 to 32 points

**Programmable Exponent:** 1.0001 to 2.9999

**Low-Flow Cutoff:** 0-999999 (0 disables cutoff function)

**Decimal Point:** Up to five decimal places or none: dddddd, dddddd, dddddd, dddddd, or dddddd.

**Calibration Range:**

Input Range	Minimum Span Input 1 & 2
4-20 mA	0.15 mA
$\pm 10$ V	0.10 V

*An error message will appear if input 1 and input 2 signals are too close together.*

**Input Impedance:** Voltage ranges: greater than 1 M $\Omega$ .

Current ranges: 50 - 100  $\Omega$  (depending on resettable fuse impedance).

**Input Overload:** Current input protected by resettable fuse, 30 VDC max. Fuse resets automatically after fault is removed.

## PD6310 Pulse Input

**Inputs:** Field selectable: Pulse or square wave 0-5 V, 0-12 V, or 0-24 V @ 30 kHz; TTL; open collector 4.7 k $\Omega$  pull-up to 5 V @ 30 kHz; NPN or PNP transistor, switch contact 4.7 k $\Omega$  pull-up to 5 V @ 40 Hz; coil (sine wave) 40 mVp-p min @ 10 kHz; Modbus PV (Slave)

**Low Voltage Mag Pickup (Isolated):** Sensitivity: 40 mVp-p to 8 Vp-p

**Minimum Input Frequency:** 0.001 Hz - Minimum frequency is dependent on high gate setting.

**Maximum Input Frequency:** 30,000 Hz (10,000 for Low Voltage Mag Pickup)

**Input Impedance:** Pulse input: Greater than 300 k $\Omega$  @ 1 kHz. Open collector/switch input: 4.7 k $\Omega$  pull-up to 5 V.

**Accuracy:**  $\pm 0.03\%$  of calibrated span  $\pm 1$  count

**Display Update Rate:** Total: 10/sec, Rate: 10/sec to 1/1000 sec

**Temperature Drift:** Rate display is not affected by changes in temperature.

**Multi-Point Linearization:** 2 to 32 points

**Low-Flow Cutoff:** 0-999999 (0 disables cutoff function)

**Decimal Point:** Up to five decimal places or none: dddddd, dddddd, dddddd, dddddd, or dddddd.

**Calibration:** May be calibrated using K-factor, scale using internal calibration, or calibrate by applying an external calibration signal.

**K-Factor:** Field programmable K-factor converts input pulses to rate in engineering units. May be programmed from 0.00001 to 999,999 pulses/unit.

**Calibration Range:** Input 1 signal may be set anywhere in the range of the controller; input 2 signal may be set anywhere above setting.

**Filter:** Programmable contact de-bounce filter, 40 to 999 Hz maximum input frequency allowed with low speed filter.

**Time Base:** Second, minute, hour, or day

**Low Gate:** 0.1-99.9 seconds; this function determines how often the incoming pulses are calculated and the rate display is updated.

**High Gate:** 2.0-999.9 seconds; this function determines how long to wait for pulses before the display goes to zero. This function is used to display slow pulse rates.

*Note: The combination of the low and high gate functions makes it possible to have a fast display update for fast pulse rates while displaying slow pulse rates, if needed. For example: If the low gate is set to 1.0 second and the high gate to 999.9 second, with a fast pulse rate the display is updated every second; with a slow pulse rate the controller is capable of waiting up to 999.9 seconds before calculating the rate, making it possible to display a very slow rate down to 1 pulse/999.9 second (0.001 pulse/second).*

## Batch Controller

**Rate Display Indication:** 0 to 999999, lead zero blanking. "R" LED illuminates while displaying rate.

**Total Displays & Grand Total Overflow:** 0 to 999,999; automatic lead zero blanking. "T" LED is illuminated while displaying batch total and "GT" for grand total. Up to 999,999,999 with total-overflow feature. "dF" is displayed to the left of grand total overflow and  $\blacktriangle$  LED is illuminated.

**Batch Total Decimal Point:** Up to five decimal places or none: dddddd, dddddd, dddddd, dddddd, or dddddd.

*Total decimal point is independent of rate decimal point.*

**Totalizer:** Calculates total based on rate and field programmable multiplier to display total in engineering units. Time base must be selected according to the time units in which the rate is displayed.

**Total Conversion Factor:** 0.00001 to 999,999

**Batch Preset:** 0.00001 to 999,999 based on batch total decimal point.

**Automatic Batch Restart Delay:** 0.0000.1 to 999.9 seconds. The batch will automatically restart after completion of the last batch.

**Grand Total Rollover:** Totalizer rolls over when display exceeds 999,999,999. Relay status reflects the display value.

**Grand Total Alarms:** Up to seven, user selectable under Setup menu. Any set point can be assigned to grand total and may be programmed anywhere in the range of the controller for grand total alarm indication. Note that Relay 1 should always be assigned to batch control (EaRL).

**Grand Total Reset:** Via front panel button, external contact closure on digital inputs, automatically via user selectable preset value and time delay, or through serial communications.

**Grand Total Reset Password:** A grand total password may be entered to prevent resetting the grand total from the front panel.

**Non-Resettable Grand Total:** The grand total can be programmed as a non-resettable total by entering the password "050873".

*Caution: Once the Grand Total has been programmed as "non-resettable" the feature cannot be disabled.*

## Relays

**Rating:** 2 or 4 SPDT (Form C) internal and/or 4 SPST (Form A) external; rated 3 A @ 30 VDC and 125/250 VAC resistive load; 1/14 HP ( $\approx 50$  W) @ 125/250 VAC for inductive loads

**Noise Suppression:** Noise suppression is recommended for each relay contact switching inductive loads.

**Relay Assignment:** Relays may be assigned to batch control, sampling, rate, or grand total alarms.

**Preclose:** 0-100% of batch size, individually user programmable for each additional batch control relay beyond the first.

**Alarm Deadband:** 0-100% of span, user programmable

**High or Low Alarm:** User may program any alarm for high or low trip point. Unused alarm LEDs and relays may be disabled (turned off).

**Batching Relay Operation:** Single or (2 to 8) multi-relay batching with optional preclose for multi-stage operation. Each additional relay may be programmed with an individual preclose value.

**Alarm Relay Operation:** Automatic (non-latching), latching (requires manual acknowledge), sampling (based on rate or grand total), pump alternation control (2 to 8 relays), off (disable unused relays), and manual on/off control mode. Alarms are active only when the batch is running.

**Alarm Relay Reset:** User selectable via front buttons, digital inputs, or PC

1. Automatic reset only (non-latching), when input passes the reset point or total is reset to zero.

2. Manual reset only, when batch is stopped (latching).

3. Manual reset only after alarm condition has cleared (latching)

*Note: Front panel button or digital input may be assigned to acknowledge relays programmed for manual reset. This replaces one of the standard batch control function keys. Only the PAUSE/STOP key function is possible during a batch process, so manual reset may only be done when the controller is in STOP mode.*

**Deadband:** 0-100% of span, user programmable

**Time Delay:** 0 to 999.9 seconds, on & off relay time delays. Programmable and independent for each relay.

**Fail-Safe Operation:** Programmable and independent for each relay.

*Note: Relay coil is energized in non-alarm condition. In case of power failure, relay will go to alarm state.*

**Auto Initialization:** When power is applied, relays will reflect the state of the input. Alarms are active only when the batch is running.

