

The **INVALCO Model 700 Batch Controller** is designed to interface with all INVALCO turbine meters and a wide range of flow measurement devices produced by other manufacturers.

Standard Features

- Automatic Overrun Compensation.
- Batch Limit
- Signal Time-Out
- Auto Restart
- Count Up/Down
- Remote Start/Stop
- Pulse Output for Remote Counters
- End of Batch

Options

- Mass Flow Indication
- Non-Linearity Correction
- Volume Correction
- Backlit Display
- RS-232/422/485 Output
- Quadrature Pulse Input
- 4-20 mA Inputs (700 LA only)
- 4-20 mA Output

Operation

Four buttons on the front panel enable the batch quantity to be set, and the batch operation to be started, stopped, and reset.

To set a batch quantity, the Batch Set button is pressed, and the \downarrow and \uparrow buttons are used to change and increment digits. Once set, the Batch Set button is again pressed to return to the Run mode. Four LED's indicate the operational status at all times.

In the Run mode, the Display button can be used to display both the flow rate and accumulated total.

Two output relays provide control for single or dual-stage valve operation. The first relay will energize at the start of the batch and de-energize when the batch is complete. The second relay can be programmed to energize at a fixed time after the start and de-energize at a fixed quantity prior to completion of the batch. This feature enables a slow start-up and slow shutdown of the flow.

Programming and operation are straightforward and simple, requiring minimal operator training.



Model 700 Batch Controller

Standard Features

Automatic Overrun Compensation

Overrun is defined as the difference between the batch quantity set by the operator and the batch total displayed once the flow has stopped. Typically, this overrun could be due to valve closing speed or the speed at which a pump stops pumping after receiving a signal from the batch controller.

The batch controller can be programmed to automatically compensate, based on previous batches, for any overrun at the end of a batch.

Batch Limit

To prevent accidental entry of large batch quantities, a maximum batch limit can be programmed during calibration. The operator is then prevented from entering a batch quantity which exceeds this value.

Signal Time-Out

The batch controller enables the user to program a time interval of up to 99 seconds to detect an absence of signal input. If there is no signal input for a time greater than the signal time-out period, the flow is deemed to have stopped and a flow alarm condition to exist causing both relays to de-energize and an alarm signal to be generated via an open-collector output.

Auto Restart

After reaching the end of batch, the batch controller will wait for a pre-programmed period before automatically resetting and starting the process once again. This mode of operation is selected during the programming procedure.

Count Up/Down

The instrument can be programmed to count up from zero or to count down from the batch quantity.

Remote Start/Stop

Remote pushbutton switches can be connected to the rear terminal strip to start and stop batches.

Pulse Output for Remote Counters

A pulse signal is produced each time the accumulated total increments by one digit.

End of Batch

An end of batch signal is provided via an open-collector transistor output.

Ticket Printing

A number of drivers are included to drive different printer types. Printouts include time and date; a sequential delivery/batch number and the gross, net, and accumulated totals. An optional header for the ticket can also be printed.

Support Printers:

Generic Computer Printer (Serial)

Epson CTM290 Slip Printer

Epson CTM290-2 Slip Printer

Syntest SP-210 Printer

Options (Model 700-L)

Mass Flow Indication

If a fluid has a known relationship between temperature and density, the density can be determined by measuring the temperature. Up to five temperature vs. density points can be programmed and the resulting curve can be used to determine density.

Non-Linearity Correction

Non-Linearity correction enables the instrument to correct for known non-linearities in the flow meter. UP to ten meter factors and corresponding meter frequencies can be programmed. Benefits of non-linearity correction are extended operating range and increased accuracy.

Volume Correction for Petroleum Products

Volume correction to 60°F (15°C) for petroleum products conforms to International Standards for custody transfer and covers gasoline, jet fuel, diesel, lube oil, crude oil, and LPG. Petroleum tables and equations for both Metric and US standards are built into the unit.

Volume Correction for General Liquids

Volumetric flow rate can be corrected to a programmable base temperature using a programmable thermal coefficient of expansion.

RS232/422/485 Output

Both RS-232 and RS-422/485 are provided for communications with computers or printers. The interface is bidirectional and allows the instruments to be fully controlled from a computer.

Approvals

Canadian Standards Association (CSA)

CE compliant

Specifications

Display

Six digit LCD, 0.7" high digits.

Keyboard

Sealed membrane keyboard with four keys.

Transducer Supply

8-24 Vdc field adjustable, 50mA maximum (2-3V less than minimum input voltage).

Power Requirements

11.5 to 28.0 Vdc, 140mA typical (no options).

AC Mains: Set internally to 95-135 Vac or 190-260 Vac.

Operating Temperature

32°F to 130°F (0°C to 55°C).

Facia

Watertight to NEMA 3S or IP65.

Dimensions

5.7" (144mm) wide x 2.8" (72mm) high x 7.4" (188mm) deep.

Panel Cutout

5.5" (139mm) x 2.6" (67mm).

Frequency Input

Frequency Range:

Minimum - 0.25 Hz on rate. 0 Hz on total.

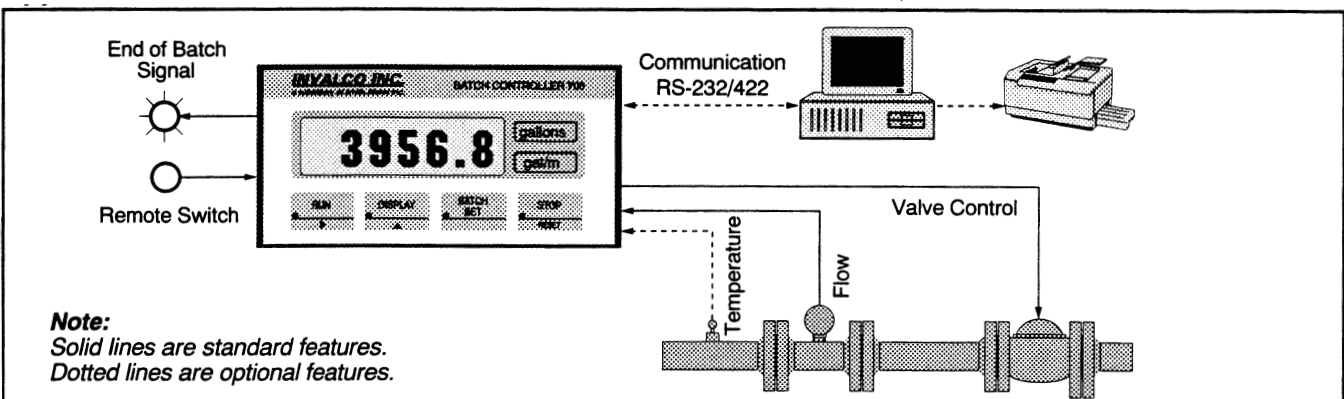
Maximum - 10 kHz.

Input Circuits:

Will accept most sine, logic, and proximity switch inputs.

K-Factor Range:

0.1000 to 50,000.



Non-Linear Correction:

Up to ten correction points.

Scaled Pulse Output**Pulse Width:**

10 mSec (negative going pulse).

Duty Cycle:

Maximum of 49 pulses per second.

Output:

An open-collector transistor will sink 100 mA maximum. The pulse output is suitable for driving remote counter or PLC's.

4-20mA Input Option (700LA Only)**Input:**

For density or temperature.

Input Impedance:

250 ohms.

Accuracy:

0.05%.

Circuit:

The 250 ohm resistors are connected to a common signal ground (current sinking).

RTD Input Option (700 LR)**Temperature Measurement Range:**

-148°F to 392°F (-100°C to 200°C).

Note: A wider temperature range can be handled via a 4-20mA input.

Accuracy:

0.1°C.

RTD Type:

Platinum PT100, two, three, or four-wire.

Linearity:

The non-linearity of the RTD is internally compensated for.

RS232/422/485 Option**Type:**

RS232, four wire RS422 and two wire RS485 are provided. When using the RS422/485, multipoint communication can be implemented with up to 32 instruments connected to a common bus.

Function:

Printer and computer protocols are fully programmable.

Printer:

A print is initiated on each reset or at a programmable time interval. Protocols are provided for roll and column printers.

Computer:

An ASCII-based protocol enables all displayed parameters to be read and the totals to be reset.

Baud Rate:

300 to 9,600.

Data Bits:

Seven or eight.

Parity:

Non, odd, or even.

Time:

A real-time clock is provided to give time and date on each output.

4-20mA Output Option**Function:**

Via 4mA and 20mA, fully scaled and programmable.

Resolution:

Ten bits.

Accuracy:

Better than 0.1%.

Maximum Load:

Voltage Burden: 5V

500 ohms internally powered.

950 ohms from external 24 Vdc.

Isolation:

Output is isolated.

Relay Output Option (Valve Control)**Function:**

One or two stage valve control is provided as standard.

Maximum Switching Power:

250 VA.

Maximum Switching Voltage:

250 Vac, 30 Vdc.

Maximum Switching Current:

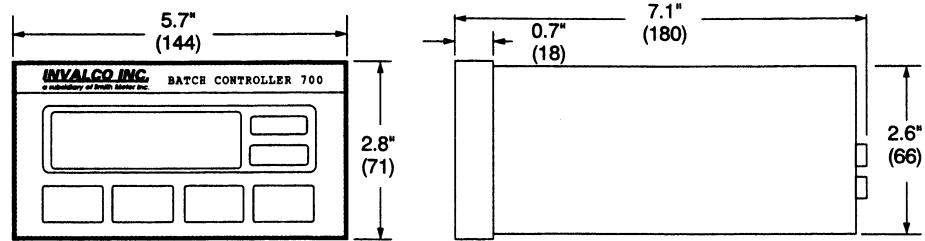
5 Amps.

Ordering Information

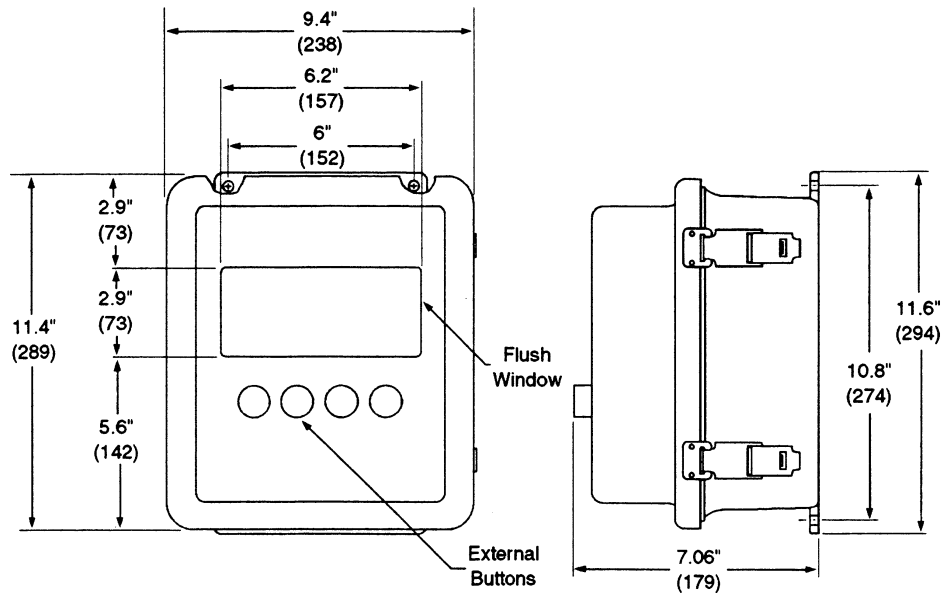
General Description	
700-D	Base Batch Controller w/ Batch Total, Accumulated Total, Preset Quantity, and Rate
700-LA	Temp/Density Compensating Batch Controller w/ Analog Input (4-20mA)
700-LR	Temp/Density Compensating Batch Controller w/ RTD Temperature Input
Enclosure Options	
- 1xxx	Panel Mount (Nema 4 Facia) (includes mounting hardware)
- 2xxx	Weather-proof to Nema 4X Definition (IP66)
- 3xxx	Explosion-proof to Nema 7 Definition
Output Options	
- x0xx	No Output Options Required
- x1xx	4-20mA Output of Rate
- x2xx	RS-232/422/485 Serial Communication
Power Supply Options	
- xxAx	12/28 Vdc or 110/120 Vac, Selectable (Std Selection)
- xxEx	220/240 Vac Input
- xxDx	12/28 Vdc Only (Typical for Truck Applications)
Other/Special Options	
- xxxB	Backlit Display
- xxxC	Conformal Coating of PC Boards
- xxxH	50 Watt Heater (only when enclosure is used)
Blank	No Requirements

Dimensions

Inches (mm)



Cutout: 5.5" Wide x 2.6" High
Depth Behind Panel: 6.5" **Panel Mount Enclosure**

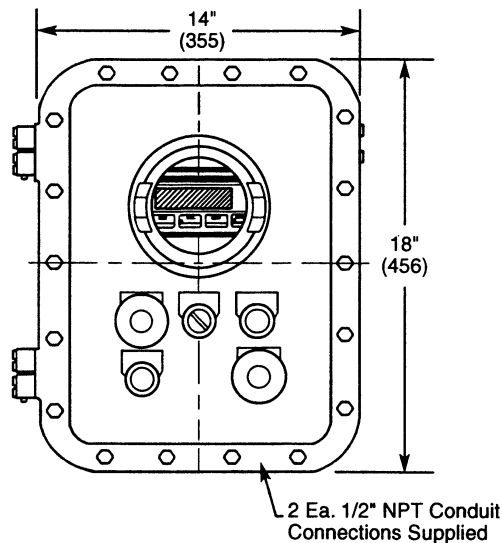


Weatherproof Enclosure (NEMA 4X)
(Conduit Holes Not Provided)

Note:

Weatherproof and explosion-proof enclosures are available. Consult factory for dimensions.

Dimensions--Inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.



Explosion Proof Enclosure (NEMA 7)



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The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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