

Signet 9900-1BC Batch Controller System



Member of the SmartPro® Family of Instruments



The Signet 9900-1BC Batch Controller system provides control capability and process fine-tuning in a familiar package. The programming interface uses a four-button keypad and an intuitive menu for adjusting a batching system to the best performance possible. Choose between simple or advanced modes. In simple mode, relay outputs can be used for batching, external counter, missing signal alarm and 4 to 20 mA output can be used to indicate batch status. In advanced mode relays can also be used for end of batch pulse, two-stage shutdown, overrun alarm, high flow detection, total volume or source volume alarm.

New to Generation IV, Automatic Overrun Compensation feature. The 9900-1BC can measure excess flow after a batch stops and use it to reduce flow to the next batch by de-energizing the batch relay early, thus closing the flow control valve, and eliminating batch overrun.

Designed for a variety of batch applications, the 9900-1BC can save up to 10 batch sizes for batching or blending a variety of liquid volumes. Customize batch names for easy distinction between batches. One K-Factor can be used for all batches, or use a different K-Factor for each batch for when different liquids are batched. User can choose to be prompted prior to starting a batch with a Yes/No or with a password to prevent inadvertently starting a batch.

The 9900-1BC operates on 10.8 to 35.2 VDC, regulated. Connect a remote start or stop switch for remote batch control. Use the end-of-batch pulse to trigger the next step in the process.

Features

- **New Rear Enclosure option** means the 9900-1BC Batch Controller can be installed on a pipe or wall mounted in addition to panel mount installations
- **Store up to 10 batch sizes** for batching or blending a variety of liquid volumes
- **Customize 10 batch names** for easy distinction between batches
- **Modular Design** - Can be purchased as a complete system or add a Batch Module and Relay Module to an existing 9900 Transmitter (Generation II or later)
- **New! Automatic Overrun Compensation** can eliminate excess flow by automatically reducing the next batch size by the overrun value of previous batch.
- **Remote control wiring** with start, stop & resume terminals for remote batch control
- **3 programmable relays**, one open collector, two dry-contact relays
- **Two-stage control** to prevent overfilling or to minimize water hammer
- **Confirmation START/RESUME** – Can prompt user prior to starting each batch with a Yes/No or password to prevent inadvertently starting a batch
- **Enter 10 different K-Factors** - one per batch for when different liquids are batched



Applications

- **Batch Process**
- **Filter Backwash Initiation**
- **Chemical Addition**
- **Canning and Bottling**
- **Tank Filling**
- **Bulk Storage Transfer**
- **Chemical Processing**
- **Food and Beverage**
- **Life Sciences**
- **Water Treatment**

U.S. Patent No.: D662,844 S

Taiwan Patent No.: D147,150

Specifications

| General | | |
|---|------------------|---|
| Input Channels | | One |
| Accuracy | | ±0.2% |
| Terminal Blocks | | Pluggable screw type 16 AWG max wire gauge |
| Enclosure and Display | | |
| Case Material | | PBT |
| Window | | Shatter-Resistant Glass |
| Keypad | | 4 buttons, injection-molded silicone rubber seal |
| Display | | Backlit, 7- and 14-segment |
| Indicators | | Dial-type digital bar graph |
| Update Rate | | 1 s |
| LCD Contrast | | 5 settings |
| Enclosure size and color | | ¼ DIN |
| Mounting | Panel | ¼ DIN, ribbed on four sides for use with mounting bracket for panel mount installations |
| | Wall | Large enclosure (sold as an accessory) that encases the panel mount transmitter or using optional rear enclosure |
| | Pipe | Using optional rear enclosure |
| Environmental Requirements | | |
| Ambient Operating Temperature | | |
| Backlit LCD | | -10 °C to 70 °C 14 °F to 158 °F |
| Storage Temperature | | -15 °C to 70 °C 5 °F to 158 °F |
| Operating Temperature | | -10 °C to 70 °C 14 °F to 158 °F |
| Relative Humidity | | 0 to 100% condensing for field and panel mount (front only); 0 to 95% non-condensing for panel mount back side |
| Maximum Altitude | | 4,000 m (13,123 ft) |
| Enclosure Rating | | Designed to meet NEMA 4X/IP65 (front face only) |
| Input Power | | |
| DC | | 24 VDC input; range: 10.8 to 35.2 VDC regulated |
| Overvoltage Protection | | 48 Volt transient protection device |
| Current limiting for circuit protection | | |
| Reverse-Voltage Protection | | |
| Input Specifications | | |
| Digital (S ³ L) | | Serial ASCII, TTL level, 9600 bps |
| Accuracy | | Determined by sensor |
| Frequency | | |
| | Sensitivity | 80 mV @ 5 Hz, mV threshold gradually increasing with frequency |
| | Range | 0.5 Hz to 1500 Hz @ TTL level input for open collector |
| | Accuracy | ± 0.5% of reading max error @ 25 °C |
| | Repeatability | ± 0.2% of reading |
| | Resolution | 1 μs |
| | Update Rate | 150 ms nominal |
| Power to Sensors | | |
| | Voltage | +4.9 to 5.5 VDC @ 25 °C, regulated |
| | Current | 20 mA max. |
| | Short Circuit | Protected |
| Power Supply | | |
| | Reverse Polarity | Protected |

Specifications (continued)

Output Specifications

Relay Specifications

| | | | | | |
|----------------------------|--|--|----------------|--------------------|--|
| | | Dry-Contact Relays (2) | | Open Collector (1) | |
| | Type | SPDT | | NPN | |
| | Form | C | | N/A | |
| | Max. Voltage Rating | 30 VDC or 250 VAC | | 30 VDC | |
| | Max. Current Rating | 5 A | | 50 mA | |
| Hysteresis | | Adjustable (absolute in Engineering Units) | | | |
| Latch | | Reset in test screen or view mode | | | |
| Delay | | 9999.9 seconds (maximum) | | | |
| Test Mode | | Set On or Off | | | |
| Maximum Pulse Rate | | 400 pulses/minute | | | |
| Volumetric Pulse Width | | 0.1 s to 3200 s | | | |
| 4 to 20 mA | | | | | |
| Current Loop Output | | ANSI-ISA 50.00.01 Class H (passive: external power required) | | | |
| | Output | 1 | | | |
| | Span | 3.8 to 21 mA | | | |
| | Zero | 4.0 mA factory set; user programmable from 3.8 to 4.2 mA | | | |
| | Full Scale | 20.00 mA factory set; user programmable 19.0 to 21.0 mA | | | |
| | Accuracy | ± 32 µA max. error @ 25 °C @ 24 VDC | | | |
| | Resolution | 6 µA or better | | | |
| | Temperature Drift | ± 1 µA per °C | | | |
| | Power Supply Rejection | ± 1 µA per V | | | |
| | Isolation | Low voltage (< 48 VAC/DC) | | | |
| | Voltage | 10.8 to 35.2 VDC | | | |
| | Max. Impedance | 250 Ω @ 12 VDC | 500 Ω @ 18 VDC | 750 Ω @ 24 VDC | |
| | Update Rate | 150 ms nominal | | | |
| | Short circuit and reverse polarity protected | | | | |
| | Adjustable span | Reversible | | | |
| | Error Condition | Selectable error condition 3.6 or 22 mA or NONE | | | |
| | Actual update rate determined by sensor type | | | | |
| | Test Mode | Increment to desired current (range 3.6 to 21.00 mA) | | | |

Shipping Weights

| | | |
|--------------|---------|---------|
| Base Unit | 0.63 kg | 1.38 lb |
| Batch Module | 0.16 kg | 0.35 lb |
| Relay Module | 0.19 kg | 0.41 lb |

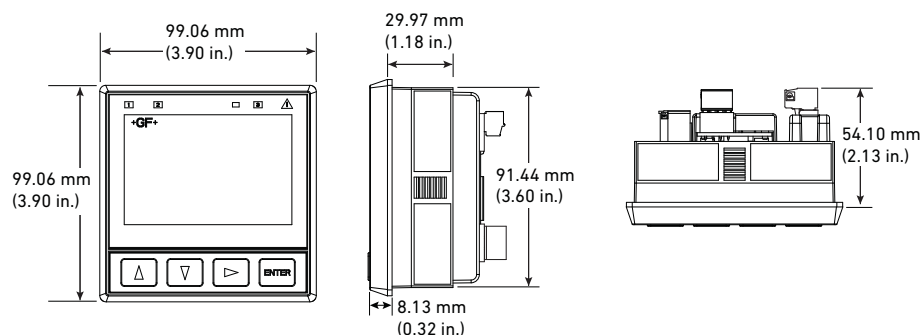
Standards and Approvals

CE, UL, CUL, FCC



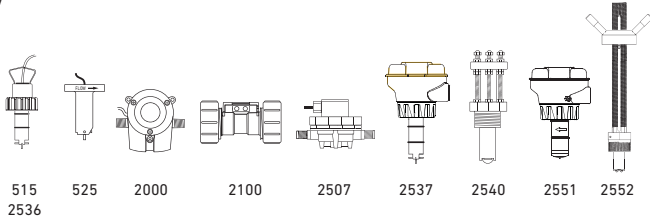
RoHS compliant, China RoHS

Manufactured under ISO 9001 for Quality, ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety

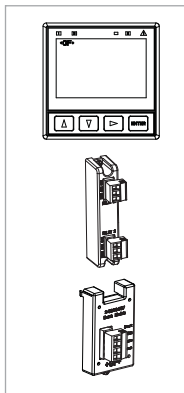
Dimensions



System Overview

| Panel Mount | Pipe, Tank, Wall |
|--|---|
| Signet Model 9900-1BC Batch Controller System (Includes mounting bracket and panel gasket)  | Signet Model 9900-1BC Batch Controller System with Wall Mount Accessory or Rear Enclosure  3-9900.392 (power supply sold separately) |
| Signet Sensors - Flow  515 525 2000 2100 2507 2537 2540 2551 2552 2536 | |
| Signet Fittings - See individual sensor data sheets | |
| All sold separately | |

Ordering Information



| Mfr. Part No. | Code | Description |
|---------------|--------------------|---|
| 3-9900-1BC | 159 001 770 | Batch Controller System |
| 3-9900-1P | 159 001 695 | 9900 Panel Mount Transmitter |
| 3-9900.393 | 159 001 698 | Relay Module - 2 DCR (dry-contact relays) |
| 3-9900.397 | 159 310 163 | Batch Module |

Accessories and Replacement Parts

| Mfr. Part No | Code | Description |
|--------------|--------------------|--|
| 6682-1102 | 159 001 710 | DC Power Plug, 2 Pos, Right Angle |
| 6682-1103 | 159 001 711 | Relay Module Plug, 3 Pos, Right Angle |
| 6682-1104 | 159 001 712 | Loop Power Plug, 4 Pos, Right Angle |
| 6682-3004 | 159 001 725 | Freq/S ³ L Plug, 4 Pos, In-Line |
| 6682-3104 | 159 001 713 | Freq/S ³ L Plug, 4 Pos, Right Angle |
| 7310-1024 | 159 873 004 | 24 VDC Power Supply, 10W, 0.42 A |
| 7310-2024 | 159 873 005 | 24 VDC Power Supply, 24W, 1.0 A |
| 7310-4024 | 159 873 006 | 24 VDC Power Supply, 40W, 1.7 A |
| 7310-6024 | 159 873 007 | 24 VDC Power Supply, 60W, 2.5 A |
| 7310-7024 | 159 873 008 | 24 VDC Power Supply, 96W, 4.0 A |
| 3-9900.390 | 159 001 714 | Standard Connector Kit, Right Angle |
| 3-9900.391 | 159 001 715 | Connector Kit, In-Line |
| 3-9900.392 | 159 001 700 | Wall Mount Accessory |
| 3-9000.392-1 | 159 000 839 | Liquid Tight Connector Kit, NPT (1 pc.) |
| 3-9900.399-1 | 159 001 834 | Rear Enclosure Hinged Cover |
| 3-9900.399-2 | 159 001 835 | Rear Enclosure Flat Cover |
| 3-0252 | 159 001 808 | Configuration Tool |

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