Type 9900-1BC Batch Controller System

Member of the SmartPro® Family of Instruments

Product description

The GF 9900-1BC Batch Controller system provides control capability and process fine-tuning in a familiar package. The programming interface uses a fourbutton 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, twostage shutdown, overrun alarm, high flow detection, total volume or source volume alarm.

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

- 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)
- 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

Technical data

General			
Input Channels		One	
System response		Response time limited by sensor, maximum transmitter delay 300 mS	
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 mountingbracket for panel mount installations
	Wall	Large enclosure (sold as an accessory) that encases the panel mount transmitter
	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^3L)	Serial ASCII, TTL level, 9'600 bps
Accuracy	Determined by sensor
Frequency	
Sensitivity	80 mV @ 5 Hz, mV threshold gradually increasing with frequency
Range	0.5 Hz to 1'500 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

Output Specifications

Relay Specifications

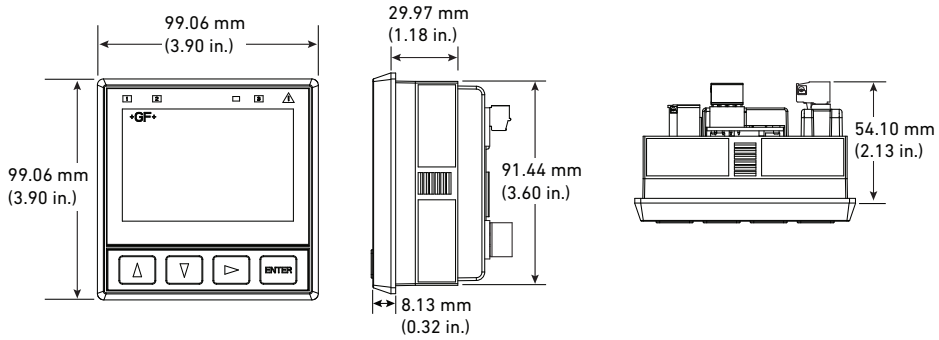
	Dry-Contact Relays (2)	Open Collector (1)	
Type	SPDT	NPN	
Form	C	N/A	
Max. Voltage Rating	30 VDC or 250 VAC	30 VDC	
Max. Current Rating	5 A	50 mA	
Hysteresis	Adjustable (absolute in Engineering Units)		
Latch	Reset in test screen or view mode		
Delay	9'999.9 seconds (maximum)		
Test Mode	Set On or Off		
Maximum Pulse Rate	400 pulses/minute		
Volumetric Pulse Width	0.1 s to 3'200 s		
4 to 10 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

Standard and Approvals
CE, UL, CUL, FCC
RoHS compliant, China RoHS
Manufactured under ISO 9001, ISO 14001 and ISO 45001

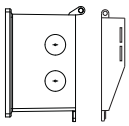
Dimensions



System Overview

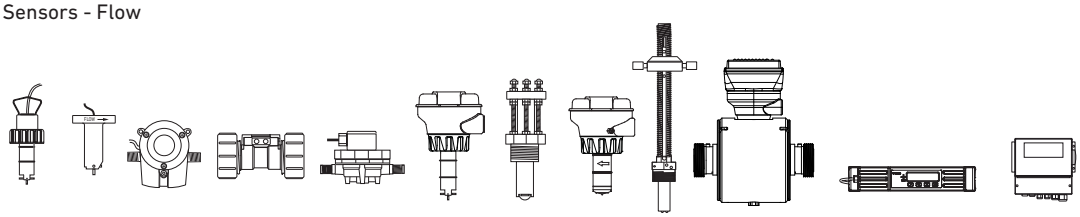
Panel Mount	Pipe, Tank, Wall Mount
9900-1BC **Batch Controller System** (Includes mounting bracket and panel gasket)	**9900-1BC Batch Controller System** with Wall Mount Accessory or Rear Enclosure

3-9900.392
(power supply sold separately)



3-9900.399-1

GF Sensors - Flow

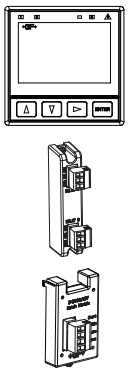


515
2536
525
2000
2100
2507
2537
2540
2551
2552
2581
U1000
U3000

GF 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



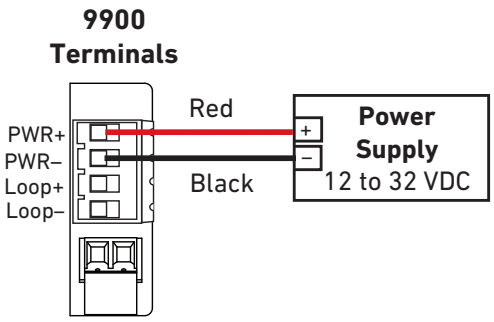
Accessories

Mfr. Part	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^3L) Plug, 4 Pos, In-Line
6682-3104	159 001 713	Freq/(S^3L) 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	159 300 351	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
3-8050.396	159 000 617	RC Filter Kit (for relay use, inductive loads), 2 per kit

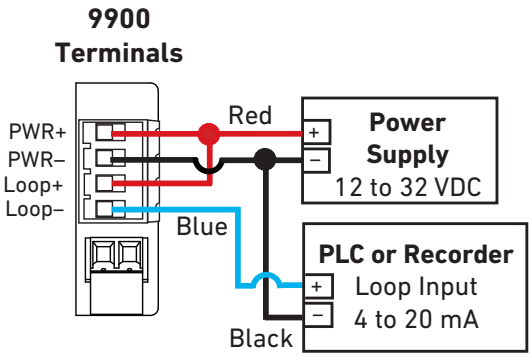
Wiring information

Rear Terminal Views type 9900-1BC Batch Controller

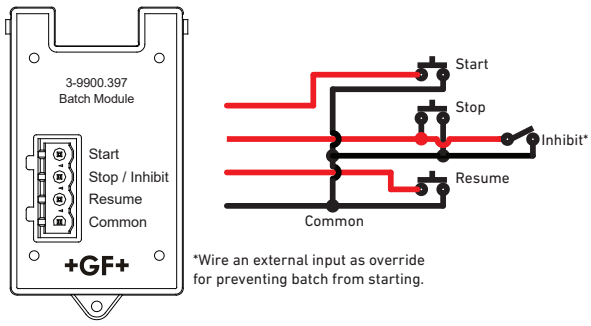
Stand Alone Application, no current loop used



Connection to a PLC/Recorder, separate supply



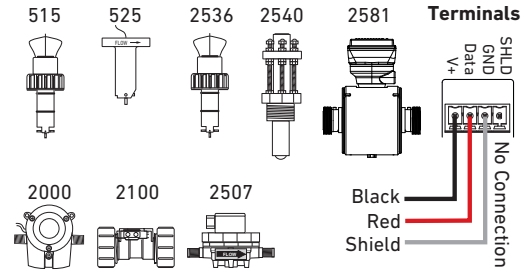
9900.397 Batch Module Wiring

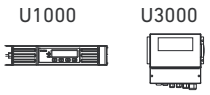


*Wire an external input as override for preventing batch from starting.

Frequency

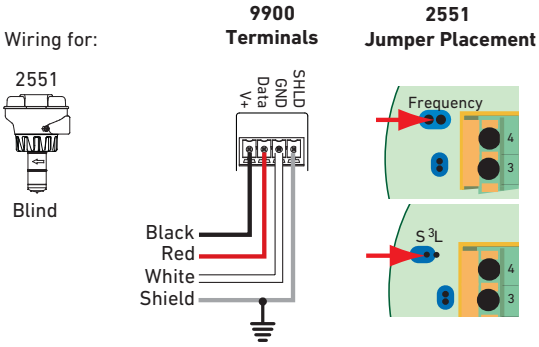
Wiring for:





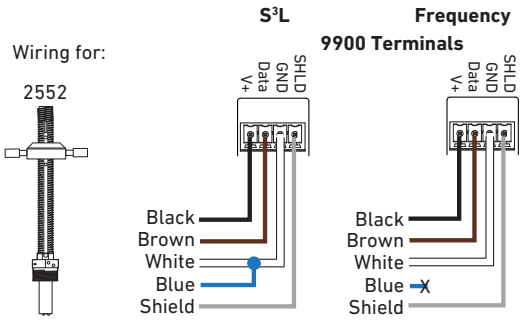
Frequency/S³L

Wiring for:



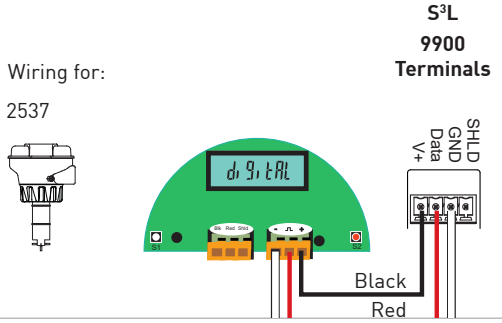
S³L

Wiring for:



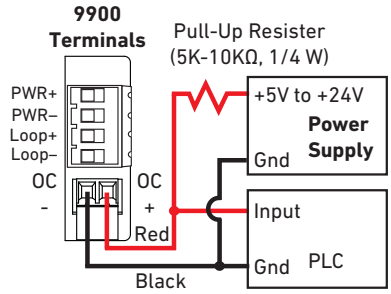
S³L

Wiring for:



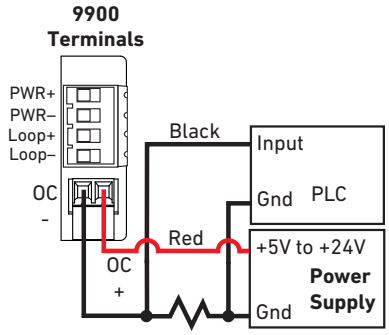
Rear Terminal Views type 9900-1BC Batch Controller

NPN Style Wiring

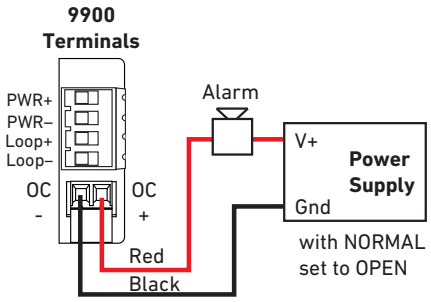


If PLC needs 0 logic input when relay is not energized, set NORMAL to CLOSED in the RELAY menu when using the Open Collector (R1) with NPN style wiring

PNP Style Wiring

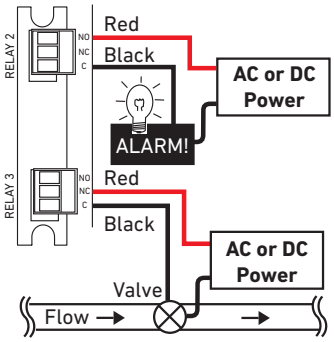


Pull-Down Resister
(5K-10KΩ, 1/4 W)



with NORMAL set to OPEN

Relay Module Wiring



The alarm is OFF during normal operation, and will go ON when relay energizes according to 9900 Relay settings.

The valve is ON during normal operation, and will go OFF when relay energizes according to 9900 Relay settings

NO = Normally Open (closes when energized)
NC = Normally Closed (opens when energized)

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