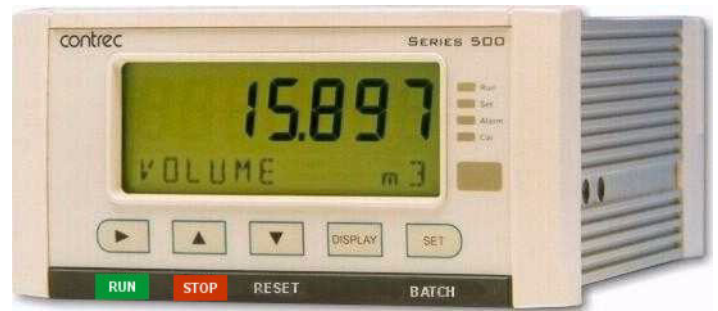


# Application BF03

## Dual Stage Batch/Flow Controller

for Mass Frequency Flowmeters



### Features

- Tailored for mass frequency flow input
- Single or Dual stage control
- Preset or manual On-Off modes
- Easy access to batch and flow rate presets
- No-flow, leakage and overflow error detection
- Remote RUN/STOP/RESET
- Uses PI Loop Control
- Protection against Integral wind-up
- Allows for non-linear correction
- Storage of 1000 transactions with time and date stamp
- Selection of second language and user tags
- Infra-red communications port on front panel
- Pulse width and scaling of pulse output
- 4-20mA retransmission
- Selectable protocols on serial ports including Modbus RTU and Printer output
- Front panel adjustment of 8-24V DC output voltage
- Backlit display
- LCD backup



### Overview

The 515 BF03 application is a batching flow controller for delivery of preset quantities at preset flowrates using a mass frequency input. Batch control can operate in preset or on-off modes, while flow control can be set to local (manual) or PI loop mode.

This application provides the operator with clear local readout including flowrate deviation and can be controlled via communications in more automated systems. There is quick access to commonly used preset values directly from the front panel if access has been authorized.

The PI control of the process flow is via a 4-20mA proportional valve or pump controller. It has integral wind-up protection, a deadband, output hold and ramp time that can be programmed to reduce wear on valves and actuators and provide for bumpless operation.

### Calculations

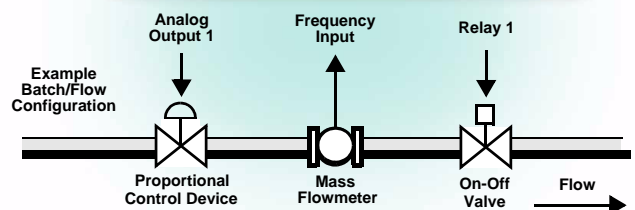
The total and flowrate are derived from accurately measured frequency and the number of received pulses.

$$mass = pulses / k-factor$$

$$mass\ flow = frequency / k-factor$$

Automatic overrun compensation calculates the new valve closure point to ensure correct delivery by averaging the overrun amount from the last three complete batches.

The overrun compensation value is valid for a new preset value provided the stored overrun is less than 20% of the new preset.



## Displayed Information

The front panel display shows the current values of the input variables and the results of the calculations. A list of the variables for this application and their type (total or rate) is shown at the end of this document.

The instrument can be supplied with a real-time clock for storage of up to 1000 transactions with time and date stamps.

## Communications

There are three communication ports available as follows:

- RS-232 port (standard)
- RS-485 port (advanced option)
- Infra-red port (on front panel)

The ports are available for remote data reading, printouts and for initial application loading of the instrument.

## Isolated Outputs

The opto-isolated outputs can retransmit any main menu variable. The type of output is determined by the nature of the assigned variable. Totals are output as pulses and rates are output as 4-20mA signals. One output is standard, a second output is available as an option.

## Relay Outputs

The relay outputs 1 and 2 are used to control the flow of product for each delivery. These contacts are normally open and can be used to drive external relays, valves, pump circuits etc. The advanced option provides another two relays that can be used as fully programmable alarms for any rate type variable.

## Software Configuration

The instrument can be further tailored to suit specific application needs including units of measurement, custom tags, second language or access levels. A distributor can configure these requirements before delivery.

Instrument parameters including units of measurement can be programmed in the field, according to the user-access levels assigned to parameters by the distributor.

All set-up parameters, totals and logged data are stored in non-volatile memory with at least 30 years retention.

## Terminal Designations

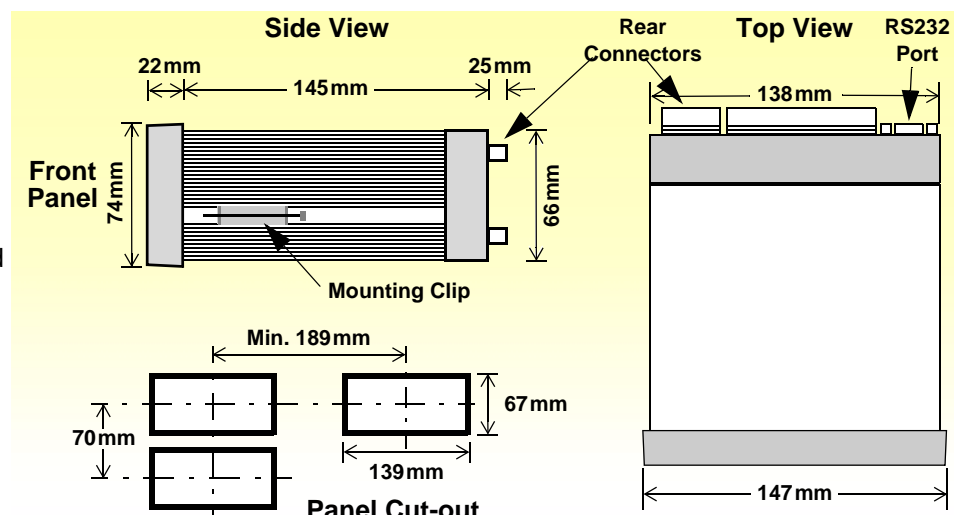
Terminal Label	Designation	Comment
1 FINP	1+	Frequency Input 1+
3 SG	-	Signal ground
15 Vo	+	8-24 volts DC output
16 G	-	DC Ground
17 Vi	+	DC power input
18 SH	E	Shield terminal
19	+	RS485 (+)
20 RS485	-	RS485 (-)
21	G	RS485 ground
22	1+	Switch 1
23	2+	Switch 2
24 LOGIC INPUTS	3+	Switch 3
25	4+	Switch 4
26	C-	Signal ground
27	+	Output ch 1 (+)
28 OUT 1	-	Output ch 1 (-)
29	+	Output ch 2 (+)
30 OUT 2	-	Output ch 2 (-)
31	RC	Relay common
32	R1	Relay 1
33 RELAYS	R2	Relay 2
34	R3	Relay 3
35	R4	Relay 4
E	E	Mains ground
N	N	Mains neutral
A	A	Mains active
RS232 port		9-pin serial port

## Dimension Drawings

### Part Number

515-XXXXXX-BF03  
see **Product Codes** to select required features

Default Application software:  
515-BF03-000000



# Specifications

## General

### Operating Environment

<b>Temperature</b>	-20°C to +60°C (conformal coating) +5°C to +40°C (no coating)
<b>Humidity</b>	0 to 95% non condensing (conformal coating) 5% to 85% non condensing (no coating)
<b>Power Supply</b>	95...135 V AC or 190...260 V AC or 12...28 V DC
<b>Consumption</b>	Typically 6W
<b>Protection</b>	Sealed to IP65 (Nema 4X) when panel mounted
<b>Dimensions</b>	147mm (5.8") width 74mm (2.9") height 167mm (6.6") depth

### Display

<b>Type</b>	Backlit LCD with 7-digit numeric display and 11-character alphanumeric display
<b>Digits</b>	15.5mm (0.6") high
<b>Characters</b>	6mm (0.24") high
<b>LCD Backup</b>	Last data visible for 15min after power down
<b>Update Rate</b>	0.3 second

### Non-volatile Memory

<b>Retention</b>	> 30 years
<b>Data Stored</b>	Setup, Totals and Logs

### Approvals

<b>Interference</b>	CE compliance
<b>Enclosure</b>	ATEX, FM, CSA and SAA approved enclosures available for hazardous areas

### Real Time Clock (Optional)

<b>Battery Type</b>	3 volts Lithium button cell (CR2032)
<b>Battery Life</b>	5 years (typical)

## Inputs

### Frequency Input (General)

<b>Range</b>	0 to 10kHz
<b>Overvoltage</b>	30V maximum
<b>Update Time</b>	0.3 sec
<b>Cutoff frequency</b>	Programmable (default at 0.25Hz)
<b>Configuration</b>	Pulse, coil or NPS input
<b>Non-linearity</b>	Up to 10 correction points

### Pulse

<b>Signal Type</b>	CMOS, TTL, open collector, reed switch
<b>Threshold</b>	1.3 volts

### Coil

<b>Signal Type</b>	Turbine and sine wave
<b>Sensitivity</b>	15mV p-p minimum

### NPS

<b>Signal Type</b>	NPS sensor to Namur standard
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### Logic Inputs

<b>Signal Type</b>	CMOS, TTL, open collector, reed switch
<b>Overvoltage</b>	30V maximum

## Outputs

### Relay Output

<b>No. of Outputs</b>	2 relays plus 2 optional relays
<b>Voltage</b>	250 volts AC, 30 volts DC maximum
<b>Current</b>	3A maximum

### Communication Ports

<b>Ports</b>	RS-232 port RS-485 port (optional) Infra-red port
<b>Baud Rate</b>	2400 to 19200 baud
<b>Parity</b>	Odd, even or none
<b>Stop Bits</b>	1 or 2
<b>Protocols</b>	ASCII, Modbus RTU, Printer (RS232)

### Transducer Supply

<b>Voltage</b>	8 to 24 volts DC, programmable
<b>Current</b>	70mA @ 24V, 120mA @ 12V maximum
<b>Protection</b>	Power limited output

### Isolated Output

<b>No. of Outputs</b>	1 configurable output (plus 1 optional)
<b>Configuration</b>	Pulse/Digital or 4-20mA output

### Pulse/Digital Output

<b>Signal Type</b>	Open collector
<b>Switching</b>	200mA, 30 volts DC maximum
<b>Saturation</b>	0.8 volts maximum
<b>Pulse Width</b>	Programmable: 10, 20, 50, 100, 200 or 500ms

### 4-20mA Output

<b>Supply</b>	9 to 30 volts DC external
<b>Resolution</b>	0.05% full scale
<b>Accuracy</b>	0.05% full scale (20°C) 0.1% (full temperature range, typical)

*Important: Specifications are subject to change without notice.*

# Ordering Information

Customer: .....

Purchase Order Ref: .....

If custom settings are required prior to delivery, please specify preferences in the table below. Include this form with the purchase order and specify "Custom Selection Attached". (Units of measurement can be changed in field if required).

## Product Codes

Model	Supplementary Code						Description
515	- BF03						
Enclosure	1						Panel mount enclosure
	2						Field mount enclosure (not yet available)
	3/5						Explosion proof Ex410 with metric glands (5 specifies heater version)
	4/6						Explosion proof Ex410 with NPT glands (6 specifies heater version)
Output Options	0						<b>Basic</b> – 9 way DB RS232 serial port, 2 relays, 1 isolated 4-20 or pulse output and 4 logic inputs
	1						<b>Advanced</b> - also includes RS485 port, 2 extra relays, 1 extra isolated output and Real-time clock for printer output and logging
CPU Type	1						<b>Standard</b> - ASCII and printer protocol, extra logging (1000+ logs)
Power Supply	E						For 220/240 VAC
	A						For 110/120 VAC
	D						For DC power only 12-28 VDC
Display Panel Option	F						Fully optioned (with backlight, LCD backup and Infra-Red comms port)
PCB Protection	C						<b>Conformal coating</b> - required for maximum environmental operating range. Recommended to avoid damage from moisture and corrosion.
	N						<b>None</b> - suitable for IEC standard 654-1 Climatic Conditions up to Class B2 (Heated and/or cooled enclosed locations)
Application Pack Number						BF03	Defines the application software to be loaded into the instrument

Example full product part number is 515.111EFC-BF03 (This is the number used for placing orders).

## Main Menu Variables

Main Menu Variables	Default Units	Preferred Units	Variable Type
Mass	kg		Total
Mass Flowrate	kg/min		Rate
Control Output	%		Rate
Flowrate Deviation	%		Rate

Please specify the preferred units of measurement.



500 Series in Ex410 Enclosure

[www.contrec.com.au](http://www.contrec.com.au)

### Contrec Pty Ltd

22 Hall Street Hawthorn East  
 Victoria 3123 AUSTRALIA  
 Tel: +61 3 9804 4200 Fax: +61 3 9822 8329  
 Email: sales@contrec.com.au

### Contrec Europe Limited

PO Box 436 Sowerby Bridge,  
 West Yorkshire HX6 3YA, UK  
 Tel: +44 1422 829 940 Fax +44 1422 829 941  
 Email: sales@contrec.co.uk

### Contrec - USA, LLC

916 Belcher Drive, Pelham AL 35124 USA  
 Tel: (205) 685 3000 Fax: (205) 685 3001  
 Email: contrec@contrec-usa.com

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