

# Ratio & Loop Controllers

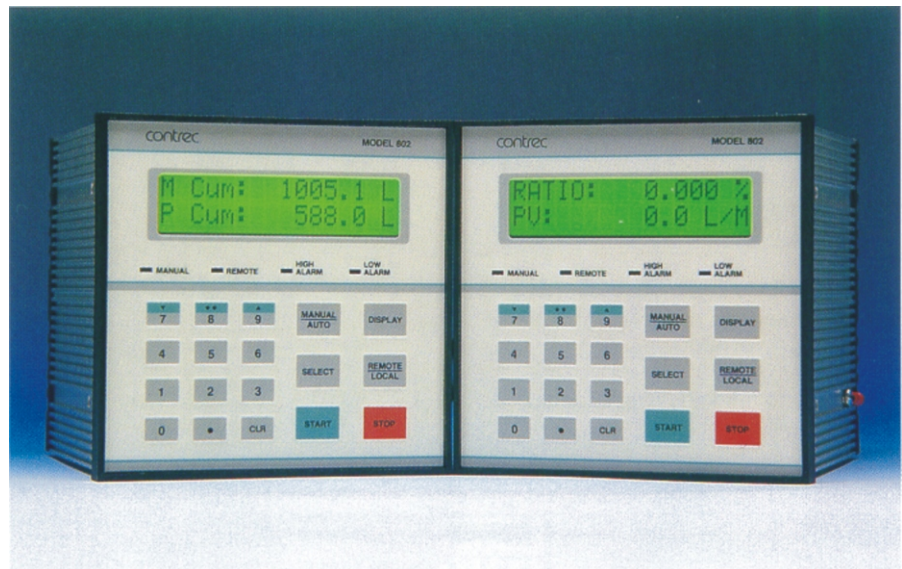
Models 802 & 802A

## Features

- P & I Control
- Large backlit 32 character alphanumeric LCD
- Rugged sealed keypad
- RS232/422 communication
- Two stage batch control
- Remote start/stop
- Compatible with most flowmeters
- User friendly

## Applications

- Ratio Control
- Blending
- Batch Control
- Dual Flow Streams



## Overview

The Contrec 802 and 802A Flow Controllers are exceptionally versatile instruments providing unique solutions to flow applications that involve ratio control and blending.

The controllers are ideal for both liquid and gas flows in situations where larger computer based systems are unwarranted.

The 802 accepts frequency or pulse inputs from two flowmeters and has a 4-20mA output for controlling a proportional control valve or variable motor speed control.

The 802A Flow Controller has two 4-20mA outputs for controlling two streams in ratio or independently.

### Clear Operator Interface

Both the 802 and 802A are fully programmable with all set-up parameters password protected. Large backlit alphanumeric LCD displays provide a clear readout of all operating parameters.

Various display windows can be programmed and called up by the operator at any time. These display flow rates, totals, set points and control functions.

Operation is straightforward with ratios and batch quantities easily programmed via the front panel keypad.

Separate START and STOP keys are provided to control operations and a MANUAL/AUTO key allows the output to be manually adjusted.

### Ratio Control

In ratio applications, the instruments measure the flow rate in the main flow stream and multiply this by an operator entered ratio to internally derive a set point value for the second flow stream. The Flow Controllers adjust the process flow stream until it equals the set point by outputting a control signal to a proportional control valve or variable speed drive.

### Single/Dual Loop Control

The Model 802 will handle single loop control applications whilst for dual loop control applications the Model 802A can be used to independently control two flow streams.

## Ratio & Loop Controllers

### Models 802 & 802A

#### P + I flow control

The 802 and 802A controllers use Proportional plus Integral control to ensure that the flow rate maintains the set point value. The P + I control algorithm incorporates protection from integral wind-up and has an adjustable output deadband.

For applications involving more than two flow channels, multiple instruments can be cascaded together.

In addition to ratio and single loop control functions, the 802 can be used to add and subtract flows and to independently monitor or batch two flows.

#### Versatile performance

The instrument will operate from 12 to 15V dc or from 110 to 220V ac mains. A regulated dc output is available for powering transducers.

The fascia of the 802 and 802A is fully watertight to Nema 4X (IP65) and is resistant to most chemicals.

The standard instrument is supplied as panel mount. Explosionproof enclosures are optionally available.

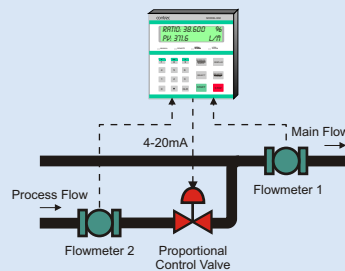
RS232 and RS422 communication using Modbus ASCII protocol is available for both the 802 and the 802A.

The 802 has twelve programmable control configurations whilst the 802A has two.

### Programmable Control Configurations for the 802

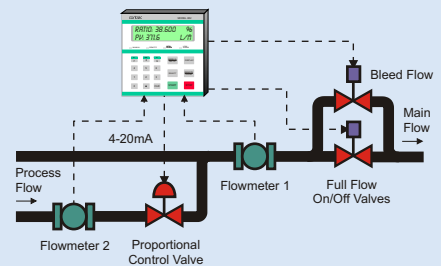
#### Configuration 1

Ratio Control where the Process Flow is significantly less than the main flow.



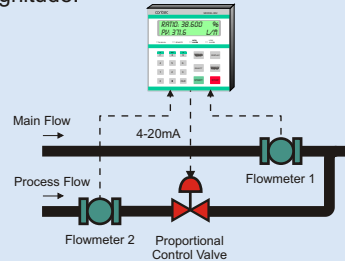
#### Configuration 2

Ratio Control with batch control.



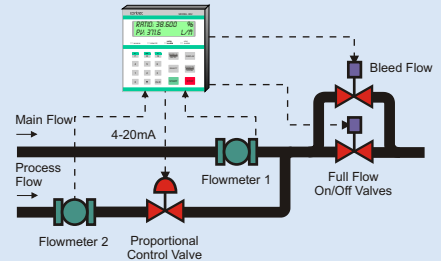
#### Configuration 3

Ratio Control where the Process Flow and the Main Flow are of the same order of magnitude.



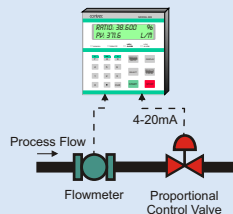
#### Configuration 4

Ratio Control with batch control.



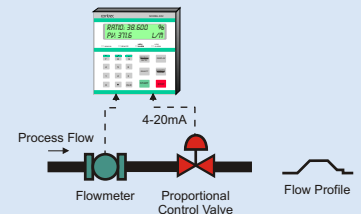
#### Configuration 5

Single loop flow control.



#### Configuration 6

Single loop with batch control.



#### Other configurations available

**Configuration 7** - Addition of two flows.

**Configuration 8** - Addition of two flows with batching.

**Configuration 9** - Subtraction of flow.

**Configuration 10** - Subtraction of flow with batching.

**Configuration 11** - Dual stream flow computer.

**Configuration 12** - Dual stream batch controller.

## Programmable Control Configurations for the 802A

The Model 802A is a variation of the standard Model 802 and is designed for flow rate control on two lines.

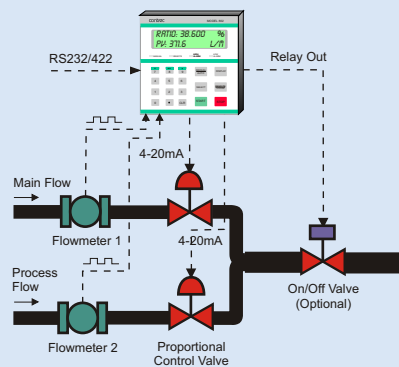
The instrument has two control configurations:

- as a ratio controller, where the main flow is programmed as a set point and the process flow is programmed as a ratio, and;
- as a dual channel controller where both the main flow and process flows are programmed as two independent set points.

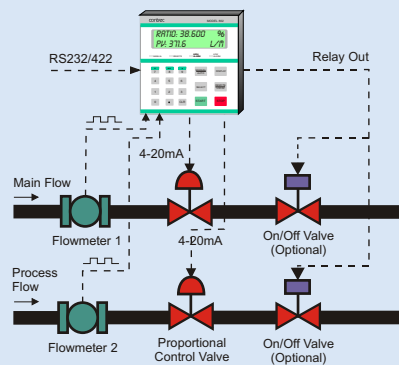
The Model 802A has two 4-20mA outputs for controlling two modulating valves or pumps, and has two pulse inputs from flowmeters.

Two relay outputs are provided as standard and can be used to alarm on deviation and high/low flow rate.

Using an optional on/off valve the flow can also be controlled by the START and STOP keys on the front panel keypad. Note that the 802A **does not** perform batch control.

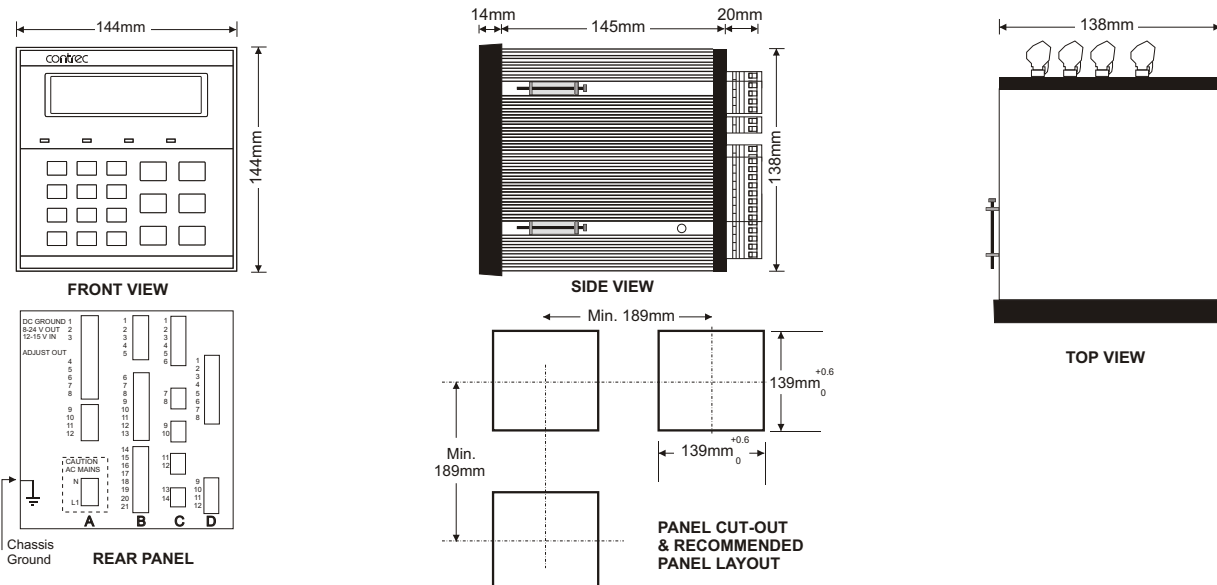


**Configuration 1**  
Ratio Control



**Configuration 2**  
Dual Stream

## Dimension Drawings



## General

<b>Display</b>	2-line x 16 character (5.55mm high) alphanumeric backlit LCD.
<b>Keypad</b>	Sealed membrane keypad with 10 numeric keys and 8 function keys.
<b>Units</b>	The engineering units are displayed and are programmable.

**Transducer Supply**  
8-24V dc field adjustable, 70mA maximum.

**Power Requirements**  
dc Supply: 11.5 to 15.5V dc 800mA typical.  
ac Supply: ac mains set internally to 95-135V ac or 190-260V ac.

**Operating Temperature**  
0 to 55°C.

**Facia** IP65 (Nema 4X) watertight.

## Frequency Input

<b>Range</b>	Range 1 - 0.5 to 2000Hz. Range 2 - 2 to 8000Hz.
<b>Accuracy</b>	0.05% of reading on rate. Absolute on total.
<b>Decimal Points</b>	Programmable.
<b>K-factor - Linear</b>	Single point 1.0000 to 50000.0000.
<b>Filtering</b>	A programmable digital filter is incorporated.

## Control Algorithm

<b>Ratio Range</b>	0.010 to 100.00%.
<b>Type</b>	Proportional plus Integral.
<b>Proportional Band</b>	20 to 999%.
<b>Reset</b>	0.1 to 600 repeats per minute.
<b>Cycle Time</b>	100ms.
<b>Integral Wind-up</b>	Anti wind-up (saturation) is provided, dependent on programming flow range.
<b>Deadband</b>	A programmable deadband on the output is provided to minimise valve and actuator wear.
<b>Rate of Change</b>	The set point rate of change can be programmed.

## Control Output

<b>Signal</b>	Isolated 4-20mA or 10V.
<b>Resolution</b>	10 bits.
<b>Maximum Load</b> (which output can drive)	Internal loop power - 500Ω. External loop power - 950Ω @ 24V (802 only).
<b>Isolation</b>	500V.

## Relays

<b>Function</b>	Isolated 4-20mA or 10V.
<b>Model 802:</b>	The relays can be programmed to perform any combination of batch control, deviation alarms, low flow alarms or an end of batch signal.
<b>Model 802A:</b>	Start/Stop control, High/Low flow rate, Deviation control.
<b>Type</b>	Electromechanical with isolated switch contacts.
<b>Maximum Current</b>	5 Amps.
<b>Maximum Voltage</b>	250V ac, 30V dc.

## Batch Control

<b>Type</b>	One or two stage relay control with slow start and slow stop.
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## RS232/422 Computer Communications

<b>Max Cable Length</b>	15m (RS232) and 1200m (RS422).
<b>Baud Rate</b>	300 to 9600.
<b>Data Bits</b>	7.
<b>Parity</b>	None, odd and even.
<b>Stop Bits</b>	1 or 2.
<b>Number of Devices</b>	1 master, 247 slaves maximum.

## Optional Enclosures

### Explosionproof Enclosures

CENELEC, FM, CSA and SAA approved enclosures available for hazardous areas.

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

## Ordering Information

When specifying please indicate model(s) required using the following method.

	802 . 1 1 3 E		
	802A . 1 1 1 A		
<p><b>Basic Model</b></p> <p><b>Mounting Options</b></p> <p>Panel Mount - 1</p> <p>Explosionproof Enclosure - 3</p> <p><b>Input</b></p> <p>Pulse Input (0.5 - 2000Hz) - 1</p> <p>Pulse Input (2 - 8000Hz) - 2</p>		<p><b>Power Supply</b></p> <p>E - 220-240V ac</p> <p>A - 110-120V ac</p> <p>D - 12-15V dc</p> <p><b>Output Options</b></p> <p>0 - No options</p> <p>1 - Additional 4 Relay Outputs</p> <p>2 - RS232/422</p> <p>3 - RS232/422 and Additional Relays</p>	

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