



Flow Processor

EC80

DESCRIPTION

The Cox EC80 Flow Processor is a programmable electronic processor, providing total compensation to enhance flow meter accuracy, while extending the linear flow range. Packaging is provided for remote, direct or embedded mounting to support most installation or application requirements.

The compact design includes both single and dual frequency inputs from 4 or 10 Ohm pickups, as well as an RTD input. The EC80 processor tracks all variables to compensate for viscous and inertial effects, using proven Strouhal-Roshko algorithms. Enhanced DSP technology allows for exceptional signal characterization using a 32-bit floating point processor at 150 MHz, capable of producing a 100 microsecond speed of response.

Features	Benefits
Rotor blade pulse averaging	Enhanced low-flow resolution and output smoothing
Strouhal-Roshko computation, using 16-bit resolution	Dynamic response to changing conditions with fully compensated output
Dual outputs provide both frequency and analog signals	Easily interfaces to data acquisition or control system
Recallable and stored calibration data	Revert to original settings via stored files
Internal amplifier and signal conditioners	No need for additional amplifiers or signal conditioners, yielding cost savings
Assignable outputs	User assigned output variables allows for greater ease of system integration



APPLICATIONS

Meeting the demanding requirements of the aerospace, automotive, industrial processing, and test and measurement industries, the EC80 processor provides significant improvements in flow meter performance under varying process conditions. The processor thrives in, but is not limited to, the following applications:

- Precision monitoring
- Engine test cells and test stands
- On-board automotive and aerospace testing
- Control loops
- Custom OEM flight and commercial applications

CUSTOMIZATION

The EC80 processor design permits custom configurations, allowing you to directly embed the flow processor into the flow meter OEM housing design. Greater customization ability and adherence to application requirements makes the EC80 processor a versatile robust solution for unique applications. Benefits to having the meter electronics embedded onto the flow meter include:

- 100% interchangeability of the flow meter while maintaining the same scaled outputs
- Signal conditioning for temperature sensors embedded in the flow meter
- Compact packaging
- Close coupling to protect signal integrity



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PRINCIPLE OF OPERATION

The EC80 processor accepts all types of square wave pulse inputs. Fully compensated and linearized volumetric flow rates, totals and temperature are examples of flow parameters that can be viewed through serial communications, included software program or an embedded rate indicator (depending on product configuration).

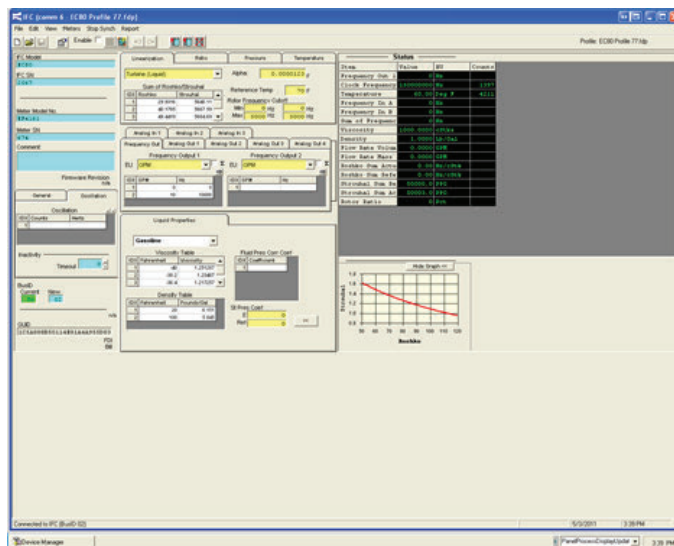
Varying fluid temperature and viscosity conditions can be compensated for by means of a universal viscosity curve. In addition, Strouhal- Roshko algorithms are applied for a more comprehensive compensation method, taking into consideration all the secondary effects to which the meter is sensitive, like the expansion and contraction of the meter bore diameter. Inferred mass flow rate is achieved by extracting the density value of a known fluid from a stored temperature/density table, which is multiplied by the volumetric flow rate.

SOFTWARE INTERFACE

All Cox EC80 Flow Processors come with software that provides a graphical user interface that allows for the characterization of process signals, output signals and liquid properties. Users have the ability to change the graphical user interface to a layout that suits their needs.

Features:

- Identification and comments
- Input linearization
- Configuration of output channels
- Instantaneous data
- Fluid property data
- RTD calibration data
- Data logging with plot display
- Blade averaging and smoothing
- Configuration and service history stored directly in processor
- Compatible with Windows® operating systems



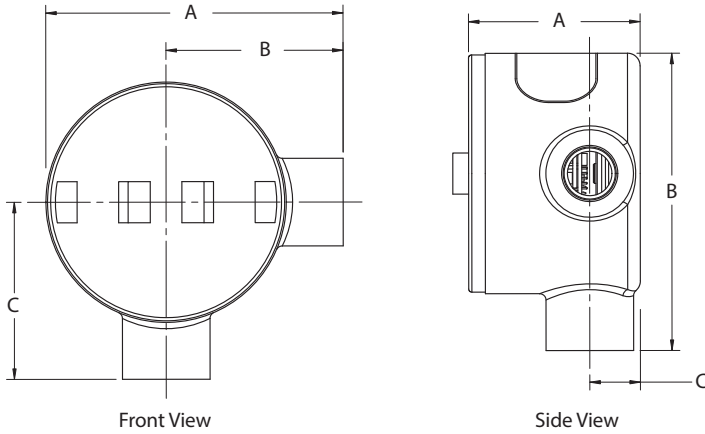
MODEL NUMBER



Product	EC80 Flow Processor	EC80				
Pickup Input Type	RF Carrier		R			
Enclosure Options	Remote Without Rate Indicator				RM1	
	Remote With Rate Indicator				RM2	
	Integral Mounted Electronics Without Rate Indicator				XP1	
Additional Functions	Bi-Directional Flow Capability				B	
	None (Reserved)				N	
Reserved	Reserved					N
Special	Three Digit Code (Leave Blank for Non-Custom Configurations)					XXX

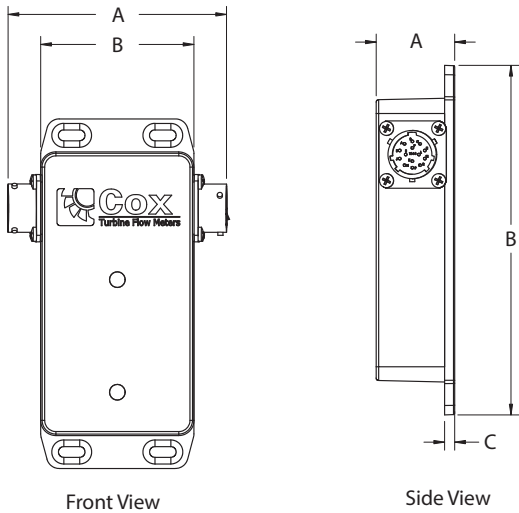
DIMENSIONS

XP1 Configuration



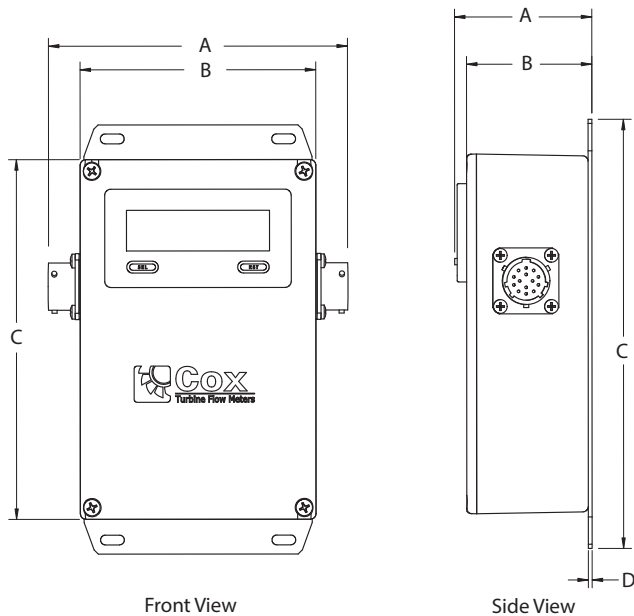
	Front View	Side View
A	4.70 in. (119.38 mm)	2.71 in. (68.83 mm)
B	2.80 in. (71.12 mm)	4.70 in. (119.38 mm)
C	2.80 in. (71.12 mm)	0.80 in. (20.32 mm)

RM1 Configuration



	Front View	Side View
A	3.40 in (86.36 mm)	1.22 in. (30.99 mm)
B	2.38 in. (60.45 mm)	5.43 in. (137.92 mm)
C	—	0.16 in (4.06 mm)

RM2 Configuration



	Front View	Side View
A	4.75 in (120.65 mm)	2.18 in. (55.37 mm)
B	3.74 in. (95.00 mm)	1.99 in. (50.55 mm)
C	5.71 in. (145.03 mm)	6.81 in. (172.97 mm)
D	—	0.06 in. (1.52 mm)

SPECIFICATIONS

Performance	Linearized Frequency	± 0.1% of reading
	Linearized Analog Output	± 0.1% of full scale
	Process Latency	100 µs
Input Power	Nominal	24V DC, 2W maximum
	With Digital Output	7...32V DC
	With Analog Output	12...32V DC
Temperature Environment	Operating	-40...185° F (-40...85° C)
	Storage	-67...257° F (-55...125° C)
	Humidity	0...80% RH, non-condensing
Flow Meter Input Type (A and B) (Two Independent Channels)	Pulse TTL Compatible (A and B)	Frequency range: 5 Hz...5.0 kHz
	RF Carrier 4 or 10 Ohm Pickup	Carrier frequency range: 25...65 kHz
		Frequency range: 5 Hz...5.0 kHz
RTD Temperature Input 4-Wire	Type	100 Ohm platinum, 0.00385 alpha
	Useable Range	-65...365° F (-55...185° C)
Analog Input (For Temperature)	Response	5 Hz Sine Response
	Voltage	0...5V or 0...10V DC
	ADC Resolution	12 bit (1/4096)
	Input Impedance	>100k Ohms
Frequency Output (Two Independent Channels)	0...5V, TTL, 1...20,000 Hz, square wave	
	50% duty cycle	
	Minimum Load Impedance	10k Ohm
Analog Outputs (Two Independent Channels)	Resolution	16-bit resolution
	Channel One	4...20 mA, 0...5V DC or 0...10V DC
	Channel Two	0...5V DC or 0...10V DC
	Load Impedance (4...20 mA)	500 Ohms maximum
EIA-485 Serial Data	Baud	115k
	Update Rate	Selectable, 0.1 sec minimum
	Data Bits	8
	Stop Bit	1
	Parity	None
Raw Frequency Output (Two Independent Channels)	0...5V, TTL, 5...3500 Hz, square wave	
	5k Ohm minimum load	
Enclosure Environmental Rating	Remote	Aluminum enclosure with weatherproof mounting flange
	Remote with Display	Aluminum enclosure with weatherproof mounting flange
	Blind Integral	NEMA 4 (IP65) Class 1, Groups C and D Class 2, Groups E, F and G Class 3, WET LOC — Cast Aluminum
Remote Cable Length	Flow Meter to EC80	20 ft (6.1 m)
	EC80 to DAQ or Control System	100 ft (30.5 m)
Software	Conforms to SAE ARP4990 calculations for temperature	

Control. Manage. Optimize.

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