



PRODUCT INFORMATION

Model 120FC—Impactor Flow Controller

- Accurate NIST traceable volumetric flow rate measurement and control
- Rugged enclosure for indoor/outdoor use
- Efficient pump operation with variable frequency speed control
- Absolute pressure and temperature measured at inlet conditions
- ON OFF signal suitable for remote operation



DESCRIPTION

The Model 120FC Impactor Flow Controller is a high-accuracy, high-capacity sampler designed to maintain a NIST-traceable, constant volumetric flow rate, regardless of normal variations of the impactor flow resistance or of ambient pressure and temperature.

The Model 120FC Impactor Flow Controller has been designed for use in conjunction with the Model 120 MOUDI™ II cascade impactor, but it can also be configured for other air samplers with similar flow pumping requirements (consult with the factory).

The magnitude of the volumetric flow rate at the impactor inlet is controlled in real time by adjusting the speed of the pump with a closed-loop feedback control system. The mass flow rate exiting the impactor is HEPA-filtered and measured with an internal, temperature-compensated mass flow sensor. With the measured ambient pressure and temperature, the inlet volumetric flow rate is calculated and compared with the flow rate setpoint (i.e. 30 L/min default value). The controller then adjusts the pump frequency needed to maintain a constant inlet volumetric flow rate equal to the setpoint. This adjustment is done in a continuous cycle during the complete sampling interval, and therefore the volumetric flow rate is always maintained constant (e.g. < 1% precision) regardless of changes in the sampling conditions (i.e. P, T or sampler ΔP).

The Model 120FC is designed for indoor and outdoor operation. The pump and associated electronics are mounted inside a sealed metal enclosure that has been designed for outdoor use.

FEATURES

- Accurate NIST traceable volumetric flow rate measurement and control
- Rugged enclosure for indoor/outdoor use
- Efficient pump operation with variable frequency speed control
- Absolute pressure and temperature measured at sampler inlet conditions
- ON/OFF signal suitable for remote operation of sampler

APPLICATIONS

- Environmental air sampling at constant flow rate

TO ORDER

HFI Impactors:

Specify	Description
120FC	Pump & Flow Controller for Model 120R
120R-120FC	MOUDI II Particle Sampling System

SPECIFICATIONS AND PERFORMANCE*

*Specifications are subject to change without notice

Mains Supply (select desired voltage input)	100–120VAC units: 115 V, 50/60 Hz, 20 A, 1 ϕ 220–240VAC units: 230 V, 50/60 Hz, 15 A, 1 ϕ	
Variable Frequency Drive	0.75 kW, (converts 115 VAC or 230 VAC single phase to 230 VAC three phase with variable output frequency)	
Pump	Rotary, carbon-vane, oil-less	
Motor Size	3/4 HP (0.56 kW), 208–230 VAC, 3 ϕ	
Motor Speed	1750 rpm @ 60 Hz; 1425 rpm @ 50 Hz	
Enclosure	Weather-proof, aluminum, forced convection cooling. (Protect from direct exposure to sun, precipitation and high winds)	
Dimensions (LxWxH)	0.71 m x 0.33 m x 0.76 m	
Weight (kg)	57 kg (125 lb.)	
Temperature	0°C to 50°C	
Ambient Pressure	50 to 105 kPa absolute	
Relative Humidity	10 to <100% non-condensing	
Noise	<70 dB(A) @ 1 m	
Parameter	Range	Accuracy
Pump Control Signal	12 VDC from impactor/sampler controller	
External Signal Output (analog)	Vol. Flow Rate (default); 0–10 VDC or Mass Flow Rate (opt); 0–10 VDC	
Mass Flow Rate Sensor	0–200 SLPM (0 to 50°C; 50 to 105 kPa operation)	5%
Absolute Pressure Sensor	15 to 105 kPa	± 1.5 kPa
Temperature Sensor	0 to 50°C	± 1.0 °C
Vacuum Pump	Rotary vane, 13.6 m ³ /h max flow @ 60 Hz, 116 mbar max vac.	
Volumetric Flow Rate Set Point and Pressure Drop Range	30.0 L/min with 30 to 60 kPa total pressure drop. Consult the factory for other flow rate set points in the 10 to 100 L/min range.	
Pump Frequency	20 to 60 Hz (adjusted by variable frequency drive)	
Flow Control Modes	Volumetric Flow (at inlet pressure and temperature) Mass Flow (ref. to 1 atm and 21.1°C; optional)	
Flow Control Stability	<1.0% of setpoint for operation between 20 and 60 Hz	
Controller Parameters (requires laptop with RS232 port)	Mass Flow Rate: Std L/min, Vol. Flow Rate: L/min (calculated), Pressure: kPa, Temp: °C, Volume: Liters, Pump Frequency: Hz	

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