GMW PM10 High Volume Air Samplers

Volumetric Flow Controlled

The Volumetric Flow Controller (VFC) is a dimensional venturi device used to control gas flow. When applied to a high volume air sampler, this flow control principal incorporates a smooth-wall venturi orifice that gradually opens to a recovery section. Vacuum is provided by a motor downstream of the venturi. Over 95% of the energy lost in differential pressures across the restricting orifice is recovered in this design.

Flow control is accomplished by occluding or restricting and thus accelerating the air flow through the venturi. At some point in the flow stream, the air velocity will equal the acoustic velocity or speed of sound, and critical flow will be achieved. As long as downstream changes are small, all conditions at the venturi (including the flow rate) are determined by upstream conditions. This condition is referred to as "choking" and is a distinctive characteristic of all VFC's. The GMW PM10/VFC utilizes this principle of choked or critical flow to maintain a constant actual flow rate of 40 ACFM (1.13 ACMM) over the sample period. Since critical flow through the venturi is not greatly affected by changes in the filter loading, ambient temperature or barometric pressure, a stable volumetric flow rate is maintained as long as power is provided to the sampler blower motor.

The orifice used in this system can also be described as a well documented Critical Venturi Meter (CVM). A CVM is a specially machined nozzle or restriction device designed to react to a specific pressure ratio expressed in absolute terms. When air reaches the speed of sound in the throat (smallest diameter) of the CVM, a sound pressure barrier is set up that will not allow more air through under the existing temperature and pressure conditions. This is the "critical flow" point of the meter, thus the name Critical Venturi Meter. Simply put, the Volumetric Flow Controller regulates flow at a constant but unadjustable rate without any moving parts or electronic components. GMW PM10 Samplers bear an identification label with the FRM designation number RFPS-1287-063.

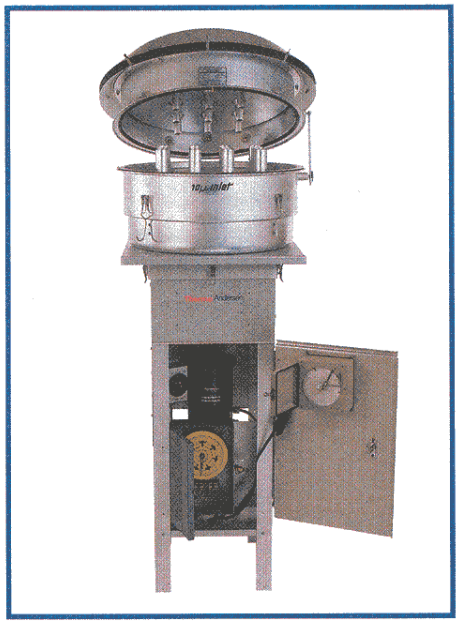
Specifications

Motor	HP 1.0 P/N G115923
Amperage	7.0
Wattage	840
Flow Set Point	36 - 44 ACFM
Flow Control Accuracy	<1% deviation over 24 hour sampling period
Power Source	110v, 1-Phase, 60Hz (other electrical options available on request)
Net Weight, System	136 lbs (62 kg)
Net Weight, G360PM10	25 lbs (11 kg)

Shipping Sizes and Weight

Shelter	46" x 20" x 23", 74 lbs (117cm x 51cm x 58cm, 34 kg)
Inlet	32" x 32" x 26", 58 lbs (81cm x 81cm x 66cm, 26 kg)
VFC, Blower & Filter Holder (G360PM10)	28" x 21" x 19", 27 lbs (71cm x 53cm x 48cm, 12 kg)

Federal Reference Method Designation Number: RFPS-1287-063



Thermo Andersen 500 Technology Court ▪ Smyrna, GA 30082-5211
TEL: 770-319-9999 ▪ FAX: 770-319-0336 ▪ TOLL FREE: 800-241-6898
Web Site: www.ThermoAndersen.com ▪ Email: sales@ThermoAndersen.com