



Vent Master

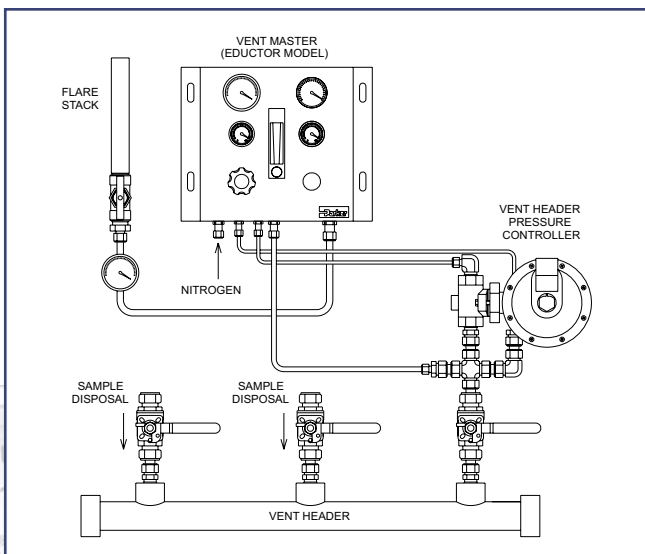
Bulletin 4142-VM
January 2006



Introduction

Sample streams discharged from process analyzers have historically been vented to atmosphere for disposal. This method is not only convenient, but also provides a very stable reference pressure necessary to insure accurate and repeatable analysis results. As environmental legislation becomes more stringent, sample discharge to atmosphere is no longer allowable in many cases and analyzer engineers must choose an alternate method. Catalytic burners offer one alternative, however they do not completely eliminate emissions, have a limited flow capacity and require frequent maintenance. Discharge to a vent header that subsequently feeds a flare header and stack offers another choice, but the dynamic nature of the header is not conducive to pressure stability which compromises analysis accuracy. Complex vent systems installed plant-wide are also available, but they are highly engineered and expensive to install.

The Parker Vent Master is a totally mechanical integrated solution that actually creates a stable pressure within the vent header within 0.3" H₂O. Test results prove the Vent Master provides analysis accuracy within 0.06% over a vent header flow range of 0-18 SLPM with a flare header back pressure as high as 20 psig.



Theory of Operation

The Vent Master is comprised of regulators, gauges, a rotometer and an eductor assembled in a compact panel for ease of operation and installation. A separate Pressure Controller is mounted directly to the vent header providing a constant flow of N₂ to the header at a rate sufficient to maintain a constant pressure of approximately 1" H₂O. As multiple analyzers dispose sample gas into the header by varying amounts, the Vent Master senses the header pressure and compensates to maintain a constant pressure regardless of discharge volume. The Vent Master also isolates the vent header from Flare Header pressure fluctuations up to 20 psig with test results indicating stability within 0.3" H₂O.



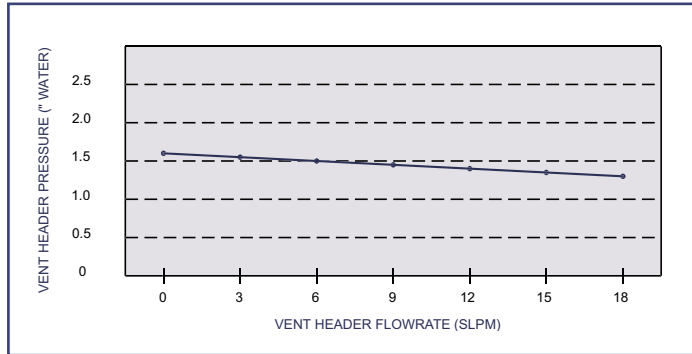
Image courtesy of ABB

Performance

Maximum Vent Header Discharge Volume: 18 SLPM

Maximum Flare Backpressure: 20 psig

Achieved % Error: 0.06%



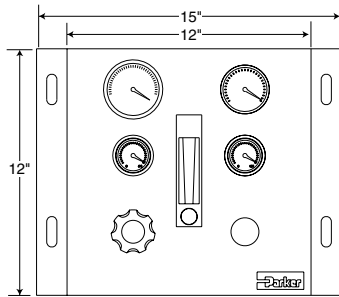
Vent Master Summary

- Simple solution to achieve environmental compliance
- Eliminate costly catalyst procurement, replacement labor and disposal
- Maintains analyzer data integrity during plant upset conditions
- Minimizes N₂ consumption on Eductor models with the Economizer Circuit
- Compact package, easy to install and operate
- Pre-engineered, easy startup and commission steps
- No maintenance required

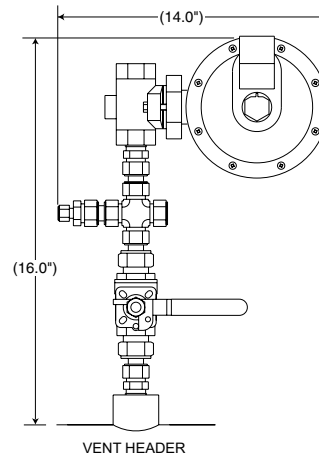




**Vent Master
(all models)**



**Vent Header Pressure Controller
(isolation valve not included)**



Design Options & How to Order

VENT-MASTER-EDR-xx (see layout, below left)

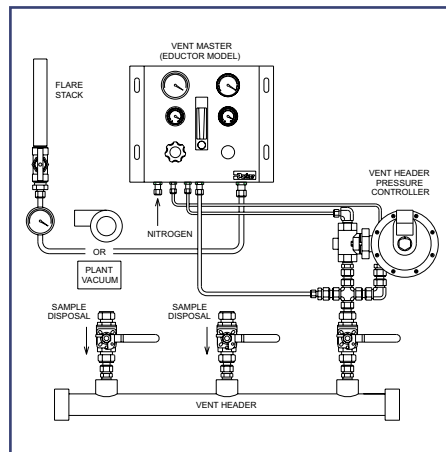
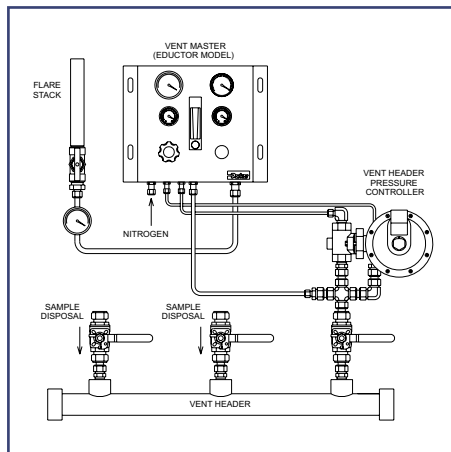
The EDR model employs an eductor, sized to accommodate maximum flow rates of 0-6, 0-12 or 0-18 SLPM vent header flow rates with a worst-case flare header back pressure of 20 psig. All EDR models incorporate a unique economizer circuit that conserves N₂ consumption when header back pressure conditions are low by reducing the eductor motive force flow to the amount necessary to maintain minimum vacuum on the eductor suction. Specify eductor flow range by choosing one of the following suffixes on the part number: 06 = 0-6 SLPM, 12 = 1- 12 SLPM, 18 = 0-18 SLPM. (Example: VENT MASTER-EDR-18)

VENT MASTER-PMP (see layout, below right)

The PMP model is designed for use in applications where a sample pump is already in place.

VENT-MASTER-NPE (see layout, below right)

The NPE model is designed for use in applications where a plant vacuum source is available.



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