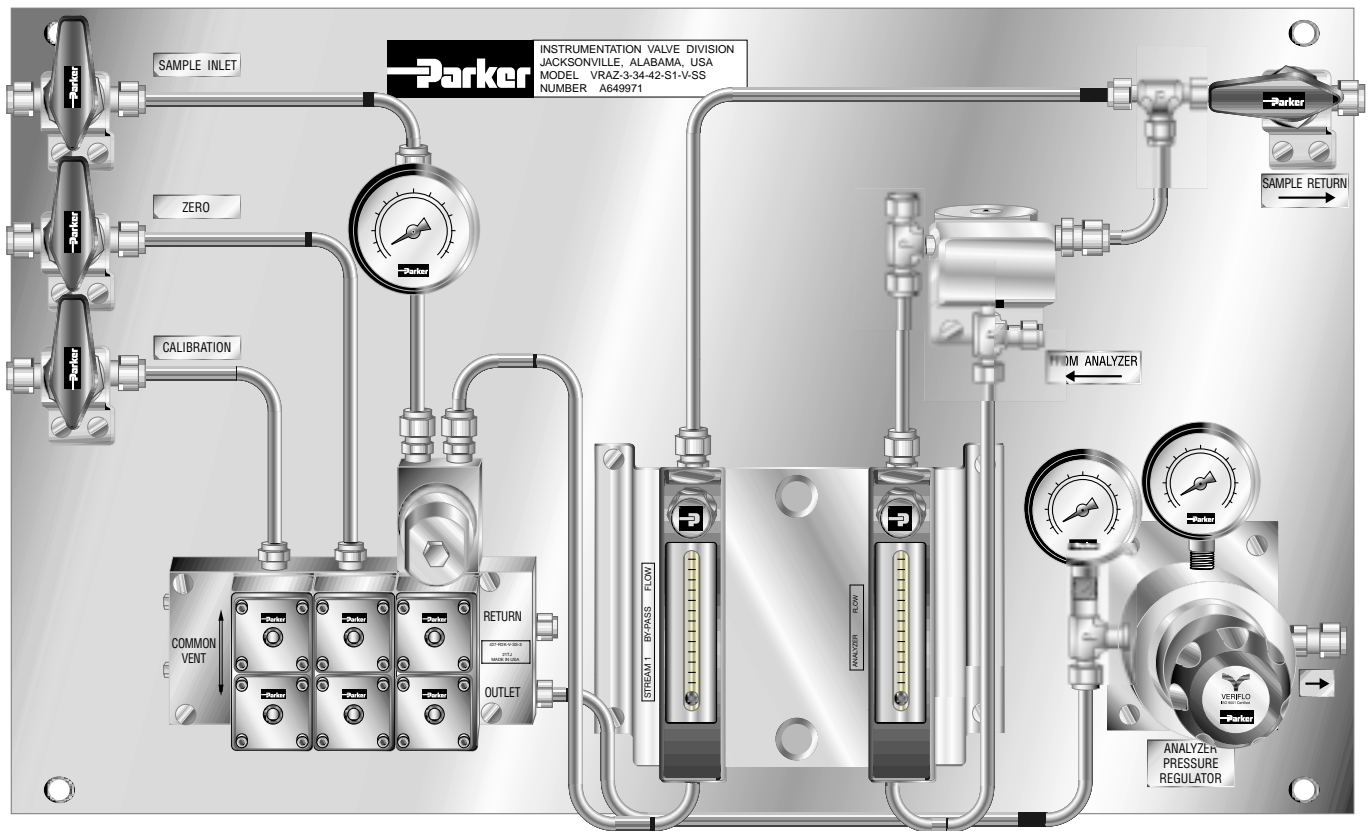


# Analyzer Pressure Regulation and Vent Recovery System

Bulletin 4141-VR  
November 2001



Model Shown: VRAZ3-01-22-DX-V-SS

## Unparalleled pressure and flow stability

The Parker Analyzer Pressure Regulation and Vent Recovery System automatically and continuously adjusts for variations in gas supply pressures and flows. This system has been engineered to meet the requirement of continuous analyzers designed to operate at constant pressure in order to provide accurate analyses of gases. The combination of pressure and flow regulation provides the required stability even with greatly varying inlet and outlet pressures.

# Analyzer Pressure Regulation and Vent Recovery System

## Features

- Designed for a zero, a calibration, and up to two sample streams
- Capabilities
  - Stream switching
  - Sample filtering
  - Flow and pressure regulation
- Regulator controls analyzer pressure
- Metering valves control
  - Analyzer flow
  - Stream by-pass flow
- Flowmeters indicate stability of
  - Analyzer flow
  - Stream by-pass flow
- Pressure gauges indicate
  - Sample inlet pressure
  - Pressure to the analyzer
  - Pressure from the filter
- Utilizes Parker
  - R-Max™* Stream Switching System
  - MB Series Ball Valves
  - HR Series Metering Valves
  - IR5000 Pressure Regulator
  - SC Flow Controller
  - Balston® Particulate Filtration
  - CPI™ Connectors
- 100% Factory Tested
- Patent Pending
- Custom Engineered Systems Available

## Operating Conditions

- Pressure Rating:
  - 200 psig (14 bar) maximum
- Temperature Rating:
  - Media -40 °F to 200 °F (-40 °C to 93 °C)
  - Ambient -40 °F to 140 °F (-40 °C to 60 °C)

## Functional Performance

- Pressure Ratings:
  - IR5000 Pressure Regulator
    - 3500 psig (241 bar)
  - MB Series Ball Valve
    - 3000 psig (207 bar)
  - R-Max™* Stream Switching System
    - 500 psig (34 bar)
  - HR Series Metering Valve
    - 250 psig (17 bar)
  - Flowmeter
    - 200 psig (14 bar)
  - SC Flow Controller
    - 150 psig (10 bar)

## Materials of Construction\*

### Wetted

#### *R-Max™* System

Base, Body and Stems .....	316 Stainless Steel
Upper and Lower Seats .....	PCTFE
Seals .....	Fluorocarbon Rubber

#### IR5000 Regulator

Body .....	316L Stainless Steel
Diaphragm .....	Hastelloy C-22®
Compression Member .....	Inconel®
Poppet .....	Elgiloy®
Poppet Spring .....	Inconel®
Carrier .....	Stainless Steel
Seat .....	PCTFE
Back-up O-ring .....	Fluorocarbon Rubber
Inlet Screen/Filter .....	316L Stainless Steel

#### MB Ball Valves

Body and Stem .....	316 Stainless Steel
Seat/Packing .....	Perfluoroalkoxy (PFA)

#### HR Metering Valves

Cartridge Components .....	316 Stainless Steel
Orifice Liner .....	Mica Filled PTFE
Stem Seals .....	Fluorocarbon Rubber

#### SC Controller

Body and Piston .....	316L Stainless Steel
Seat and Seals .....	Fluorocarbon Rubber
Diaphragm .....	Hastelloy C-22®

#### Flowmeters

Body .....	316 Stainless Steel
Tube .....	Borosilicate Glass
Float .....	Glass
Float Stops .....	PTFE

#### Gauges

Body .....	316 Stainless Steel
Bourdon Tube .....	316 Stainless Steel
Fittings .....	316 Stainless Steel
Tubing .....	316 Stainless Steel

### Non-wetted

Panel .....	304 Stainless Steel
Brackets .....	304 Stainless Steel
Hardware .....	Stainless Steel
Operating Handles .....	ABS Plastic, Nylon 6/6
Gauge and Flowmeter Shields .....	Polycarbonate

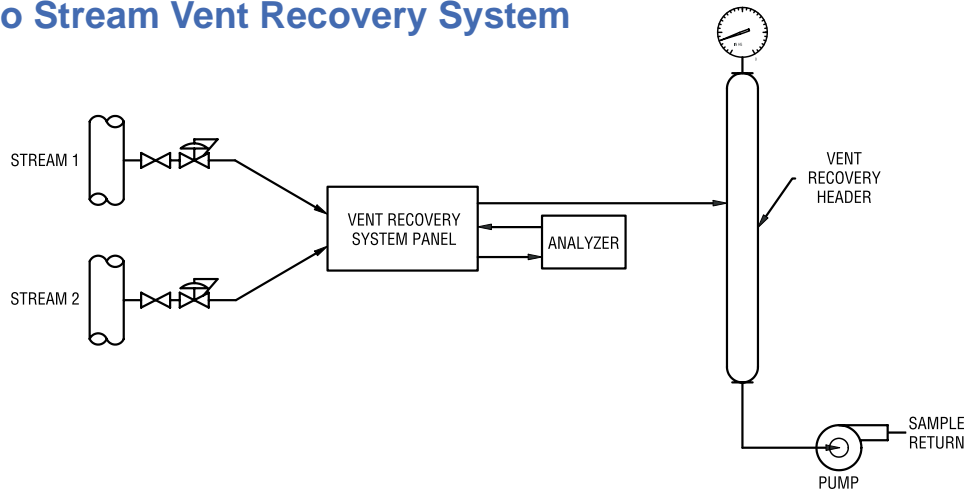
- \* Materials of construction for stainless steel systems. Consult factory for optional materials of construction.

Hastelloy C-22 is a registered trademark of Haynes International, Inc.  
Inconel is a registered trademark of Inco Alloys International  
Elgiloy is a registered trademark of Elgiloy Company

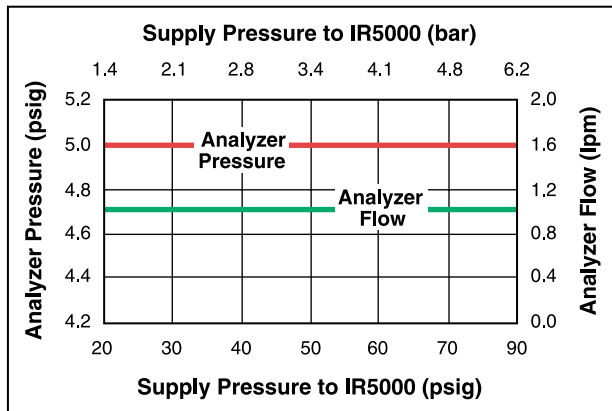
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# Analyzer Pressure Regulation and Vent Recovery System

## Typical Two Stream Vent Recovery System

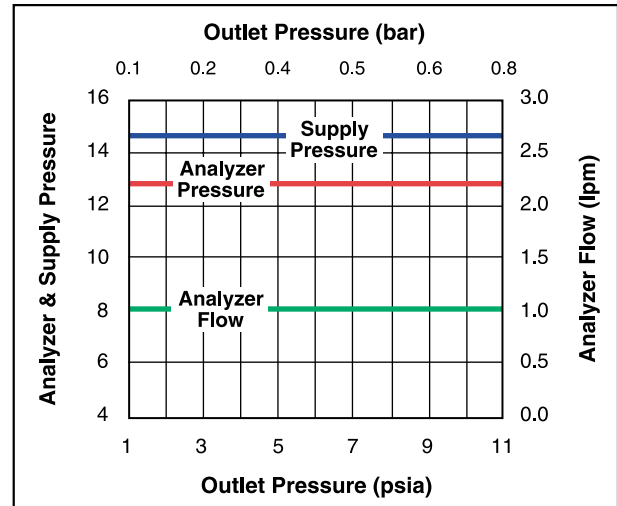


### Performance Example 1 - Varying Inlet Pressure with Constant Outlet Pressure



Analyzer Pressure set to 5 psig (0.3 bar);  
Supply Pressure varied from 20 to 90 psig (1.4 to 6.2 bar)

### Performance Example 2 - Varying Outlet Pressure with Constant Inlet Pressure



Analyzer Pressure set to 12.7 psia (0.87 bar);  
Supply Pressure set to 14.5 psia (1.01 bar);  
Outlet Pressure varied from 1 to 11 psia (0.07 to 0.76 bar)

## Options

**By-pass Filter** - Approximately 90% of the inlet flow by-passes the cartridge filter and exists the filter bowl. This provides three benefits: 1) It reduces the transport time of the sample stream from the process line to the analyzer; 2) Provides a continuous flushing action on the filter element; and, 3) The life of the filter element is greatly extended since only a small percentage of the flow is filtered - and only when the stream is selected for analysis.

**Manual Stream Switching** - The *R-Max*<sup>™</sup> Stream Switching System is replaced with two-way and three-way MB Series manual Ball Valves. The optional By-pass Filter(s), if ordered, is mounted as a stand-alone unit downstream of the sample inlet MB Series manual Ball Valve(s).

**Integral Aspirator** - A Parker VC Vacuum Generator is added between the Flow Controller and MB Series Ball Valve on the Sample Return line. A Parker IR4000 Pressure Regulator is also added to control the vacuum generated.

**Filter Purge Valve** - A three-way MB Series manual Ball Valve is placed upstream of the Filter to enable switching between sample and purge gas.

**Aspirator and Filter Purge Valve** - Adds both the Integral Aspirator and the Filter Purge components to the panel.

# Analyzer Pressure Regulation and Vent Recovery System

## How to Order

VRA Z 3 - 3 4 - 4 2 - S1 - V - SS

### System Series

VRA = Automatic Stream Switch  
VRM = Manual Stream Switch

### System Options

A = Integral Aspirator  
B = Filter Purge Valve  
C = Aspirator & Filter Purge Valve  
Z = None of the above

### Number of Streams

3 = Three  
4 = Four

### Inlet Pressure Gauge

0 = 30 psig  
1 = 60 psig  
2 = 100 psig  
3 = 200 psig

### Pressure Regulator

0 = 0 - 5 psig  
1 = 1 - 30 psig  
2 = 1 - 60 psig  
3 = 2 - 100 psig  
4 = 2 - 250 psig

\* Systems without a By-pass Filter will have a Tee branching from the Sample Stream Switch inlet to the By-pass Flowmeter.

### Component Materials

SS = Stainless Steel

### Seal Material

V = Fluorocarbon Rubber

### By-pass Filter

0 - No Filter\*  
S5 - 5 Micron Sintered Metal  
S1 - 10 Micron Sintered Metal  
S2 - 20 Micron Sintered Metal  
S4 - 40 Micron Sintered Metal  
S7 - 70 Micron Sintered Metal  
S0 - 100 Micron Sintered Metal  
DQ - 93% Microfibre @ 0.01 Micron  
DX - 99.999% Microfibre @ 0.01 Micron

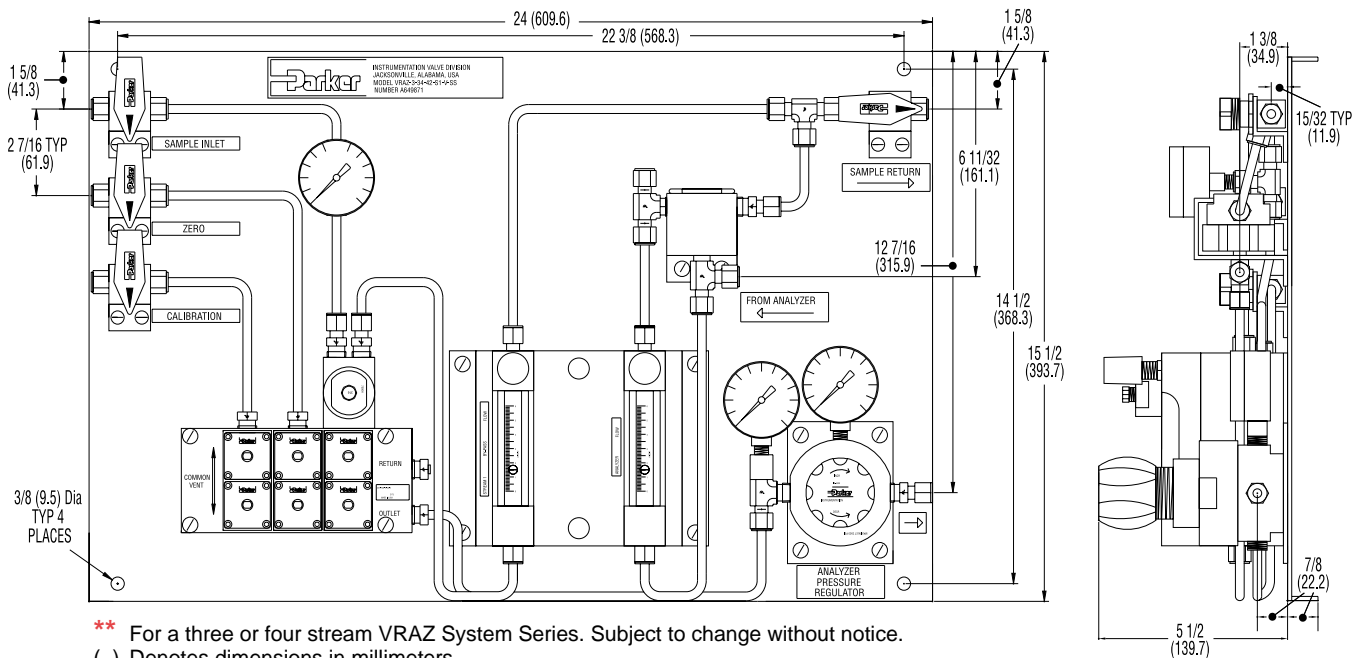
### Analyzer Flowmeter Range (LPM)

0 = 0 - 2.2  
2 = 0 - 4.5  
4 = 0 - 6.1  
6 = 0 - 10.7

### By-pass Flowmeter Range (LPM)

0 = 0 - 2.2  
2 = 0 - 4.5  
4 = 0 - 6.1  
6 = 0 - 10.7

## Dimensions\*\*



\*\* For a three or four stream VRAZ System Series. Subject to change without notice.  
( ) Denotes dimensions in millimeters



Bulletin 4141-VR, 5M, 11/01

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