GASGUARD® Direct Blender

On-Site Dynamic Gas Blender Supply System

Description

The PV, IC and flat panel industries all require large volumes of gas dopants for the epitaxial layer. Usually the dopants are mixed at ratios between .5% to 5% in Hydrogen (H_2). As production ramps and gas flow rates increase, traditional gas supplies using cylinders or even a supply of "Y" sized (40.5 M3) cylinders of the gas mix are a challenge due to cylinder handling, space requirements and inventory costs. In an attempt to reduce these costs for our customers, Air Products has leveraged its own mixed gas production experience to create an on-site gas blender designed to dynamically blend the mix at your site.

Pure dopant is contained within the blender module. The pure dopant cylinder feeds gas into the mixing panel which then blends the dopant gas with on-site hydrogen to the pre-defined mix ratios. The integral analytical system validates and dynamically adjusts the blend accuracy, real time. The mixed gases are then stored in the surge tank or day tank located nearby. If the delivery gases begin to go off-spec, the integral analytical system adjusts the mix to maintain blend tolerance.

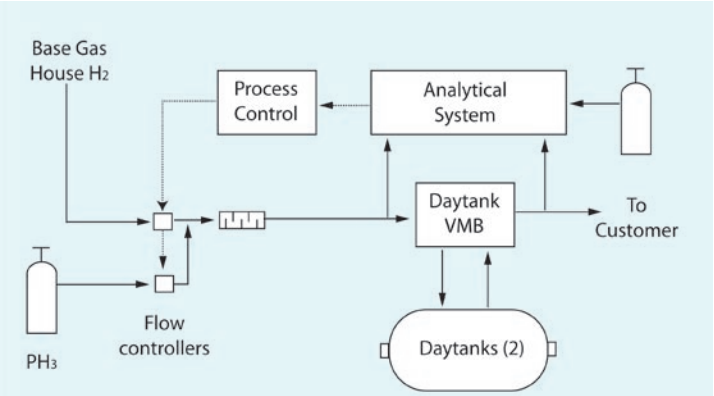
Experience

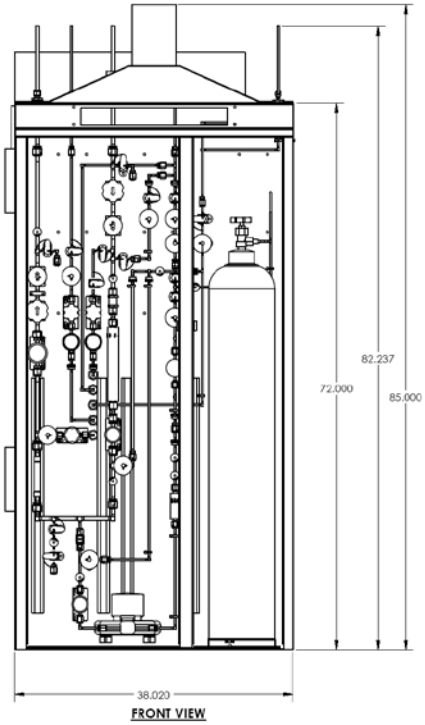
An advantage of this integrated all-in-one system over an alternative separate blender and analytical system is that both the mixing process and the continual analysis controls the blend. This also makes the system more cost-effective since it is driven by one controller. The system is a smaller scale replica of Air Products' own dynamic blend production plant located in Choenan, Korea. This offering is designed with real world, production experience.

Cabinet Side View

The mix analyzer is housed in the back of the blender cabinet and is central to the control of both the QC analytical and mixing process.

The schematic below explains the blending process. The technical specification of the blender can also be found below. Please contact Air Products today for help in properly scoping the blender to your application and budget.





Total Solutions

To improve operating costs for our customers, Air Products pioneered the use of BSGS to supply larger volumes of specialty gases, instead of the traditional cylinder gas cabinets. Air Products latest approach to improve the costs position for our customers is to again use its specialty gas plant experience to move larger volumes of specialty gases with onsite dynamic blending. The blender can take advantage of the fact that on-site H_2 is already available to make the mix and the only other ingredients are the pure dopant, the dynamic blending equipment, and the expertise to operate and maintain the system to run reliably. This total solutions approach is what made Air Products the global leader in BSGS supply. By taking the approach to own, operate and maintain the blender system, Air Products can provide the same guarantee of quality, safety and reliability that BSGS is also known for. So the choice is simple: handle too many cylinders of an expensive mixed gas that has limited shelf life, or get the same product made fresh as needed, where needed.

Technical Specifications

Overall System

Flow Rate	5.4 slpm avg., 200 slpm peak (by EFS)
Houseline Pressure	80 psig – 20 psig Range
Related Pressure	High Pressure PH_3 Circuit = 1000 psig Low Pressure H_2 and Blend Circuits = 250 psig Analytical Circuit = 20psig
Operating Temperature	Indoor Installation

PH_3 Blender Cabinet (includes Controller and Analytical Bay)

Footprint	43 5/8" wide x 38 1/8" deep (1147 mm x 968.4 mm)
Height	85 inches (to ventilation stack Connection)
Weight	1000 lbs (455 kg)
Process Out	½ inch OD butt weld tube connection, process gas to use point
Dedicated Purge	44 L N_2 and He blend (90%, 10% respectively)
Purge In	¼ inch OD butt weld tube connection, purge gas in from purge module Inert gas supply at 80 to 90 psig
Venturi Vent Out	3/8 inch OD butt weld connection, vent gas to abatement system PH_3 Vent Peak Flow = 16.1 slpm (3.02 lbm/hr) Total PH_3 Vent per cylinder change = 3.1 stand liters (0.01 lbm) Total PH_3 Vent Per Conditioning Cycle (1 to 5 typical per cylinder change) = 3.1 standard liters (0.01 lbm)
Analyser Vent	½ inch OD butt weld tube connection, vent gas to abatement PH_3 & H_2 blend (95.5 & .5% respectively) = 0.5 slpm (continuous flow)
Electrical Power	Accepts 220 VAC, 1 phase, 50-60 Hz, 20 amps +/- 10% Fluctuation of Normal Voltage Range Note: Connection through ¾ inch conduit hole
Grounding	3/8 inch split blot grounding lug. Wire range #10 to #3 AWG
Pneumatic Supply	¼ inch compression fitting, houseline N_2 to HPCM Inert gas supply or Clean Dry Air at 85 to 95 psig, negligible consumption
LSS Shutdown	Gas Detection and Shutdown Input from Customer

For More Information

If you would like additional information or technical assistance, please feel free to contact:

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