

STANDARD GAS DIVIDERS

SGD Series *



SGD-XC / SC SERIES



SGD-710C

Now you no longer need to store a large number of gas cylinders

SGD Series Standard Gas Dividers are unique devices which accurately blend a calibration gas of known concentration with a diluent gas in up to 10 steps. SGD Gas Dividers reduce the number of gas cylinders needed to calibrate a gas analyzer to just two: those for a component (upscale) gas and a diluent gas.

Using the capillary flow rate ratio mixing method, these simple yet sophisticated gas dividers blend gases in proportion to their flow rates through specially manufactured and selected capillary tubes.

The SGD Series includes the cylinder-mountable SGD-XC/SGD-SC Series for 5-step blending, the portable SGD-710C for 10-step applications and the standard 19-inch rack-mountable SGD-A10 which can be controlled by an external command signal. All models are non-bleeding and feature blending of gases at an accuracy of 0.5%. Delivery flow rate of the standard gas is determined by the pressure of the diluent gas. Component gas supply is stopped automatically if the diluent gas pressure becomes zero, allowing safe use of poisonous gases.

Combining of SGD Gas Dividers expands applications even further. Connect two SGDs in series for 5x5 to 10x10 dilutions or in parallel for simultaneous blending of three component gases.

The SGD-710C and SGD-A10 are designed expressly to comply with U.S. Environmental Protection Agency requirements for calibration of automotive emission analyzers.

Simple, yet sophisticated non-bleeding gas blenders



SGD-XC/SC SERIES

Portable, compact, 5-step gas dividers. Utilizing the capillary flow rate ratio mixing method, these non-bleeding gas dividers feature 0.5% accuracy and simple knob selector setting.

The SGD-XC Series offers lightweight, compact gas dividers for non-corrosive gases. The stainless steel SGD-SC Series is for accurate blending of corrosive gases. Both series include models for generated flow rates of 0.2 to 0.5 l/min and 2 to 5 l/min. No power is required.

SPECIFICATIONS

Model	SGD-XC-5L	SGD-XC-0.5L	SGD-SC-5L	SGD-SC-0.5L
Application	Non-corrosive gases		General purpose	
Flow rate (l/min)	2 ~ 5	0.2 ~ 0.5	2 ~ 5	0.2 ~ 0.5
Blending ratio	0, 20, 40, 60, 80, 100 % of original concentration of component gas			
Accuracy	±0.5 % of upscale concentration			
Repeatability	±0.2 % of upscale concentration			
Delivery pressure	Up to 0.7 kg/cm ² (depending on load at outlet)			
Supply pressure	Max. 1.5 kg/cm ² G (at inlet)			
Response	Less than 10 sec			
Ambient temp.	0 ~ 40°C			
Tube connections	Joint for Teflon tube of O.D. 6/I.D. 4 (mm)			
Materials in contact with gases	Aluminum, brass, Neoprene		304 stainless-steel, Viton	
Weight	Approx. 800 g		Approx. 2 kg	



SGD-710C

A compact, 10-step gas divider that can prepare even the large variety of concentrations needed for research use. Utilizing the capillary flow rate ratio mixing method, this non-bleeding gas divider features 0.5% accuracy and simple knob selector setting.

The SGD-710C covers all points of the emissions analyzer calibration curve specified by the U.S. Environmental Protection Agency. It is packaged in a tough casing to protect the flowmeter and main unit. No power is required.

SPECIFICATIONS

Model	SGD-710C
Application	General purpose
Blending ratio	0, 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100 % of original concentration of component gas
Accuracy	±0.5 % of upscale concentration
Repeatability	±0.2 % of upscale concentration
Flow rate	2 ~ 5 l/min (adjustable by inlet pressure)
Delivery pressure	Up to 0.7 kg/cm ² G (depending on load at outlet)
Supply pressure	Max. 1.5 kg/cm ² G
Response	Less than 10 sec.
Ambient temp.	0 ~ 40°C
Tube connections	Inlets: 1/4NPT, Outlet: 1/8NPT, female
Materials in contact with gases	304 stainless steel, Viton
Weight	Approx. 5.5 kg



SGD-A10

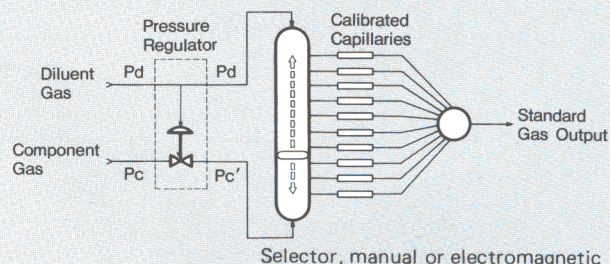
The 19-inch rack-mountable 10-step SGD-A10 is a non-bleeding gas divider that combines 0.5% accuracy with push-button control and control signal interface. Front panel push-buttons set the selector, switch between air and N₂ as a diluent gas, and allow one-touch purging.

All operations can also be done by remote control, making the SGD-A10 ideal for automatic operation at emission test facilities. The SGD-A10 covers all points of the emissions analyzer calibration curve specified by the U.S. Environmental Protection Agency.

SPECIFICATIONS

Model	SGD-A10
Application	General purpose
Blending ratio	0, 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100 % of original concentration of component gas
Accuracy	±0.5 % of upscale concentration
Repeatability	±0.2 % of upscale concentration
Flow rate	2 ~ 7 l/min (at 25°C, 1 atm)
Delivery pressure	0.2 ~ 0.7 kg/cm ² G
Supply pressure	Max. 1.5 kg/cm ² G
Response	Less than 10 sec
Ambient temp.	0 ~ 40°C
Tube connections	1/4 NPT female
Materials in contact with gases	304 stainless steel, Viton
Operation	Manually by push-button switch or externally through integral interfaces
Power	115/230 V AC, 50/60 Hz, switch-selectable
Weight	Approx. 15 kg

* The SGD-A10 complies with the test requirements of FCC.



PRINCIPLE

The SGD Series Standard Gas Divider utilizes the capillary flow rate ratio mixing method to blend a component gas and a diluent gas to produce standard gases of different concentrations in 5 or 10 steps.

The basic components of the SGD Series are 1) precision pressure regulator, 2) selector, 3) 5 or 10 calibrated capillaries of identical flow characteristics. The pressure regulator matches the pressure of the component gas entering the selector (Pc') to that of the diluent gas (Pd) and the selector determines the blending ratio of the two gases (see diagram).

For example, if the selector is set to 3 as in the diagram, the component gas is introduced into 3 capillaries while the diluent gas flows through the remaining capillaries. This forms a standard gas with 3/10 the initial concentration of the component gas (Ci) according to the formula below.

$$C = \frac{m}{m + (n - m)} \cdot C_i$$

m: number of capillaries through which component gas flows

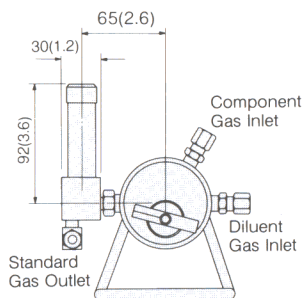
n: total number of capillaries (5 or 10)

Output flow rate of the standard gas is determined by the pressure of the diluent gas (Pd).

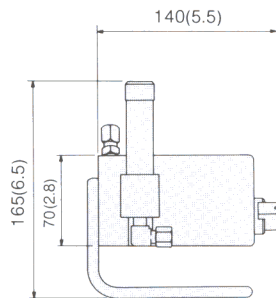
Note: Generally, the difference in the viscosities of the component and diluent gases may be ignored when the concentration of the component gas is less than 1% (0.5% for hydrocarbons). For high-concentration gases, refer to the instruction manual for the correction factors.

Dimensional Outlines Unit:mm(in)

SGD-XC/SC SERIES

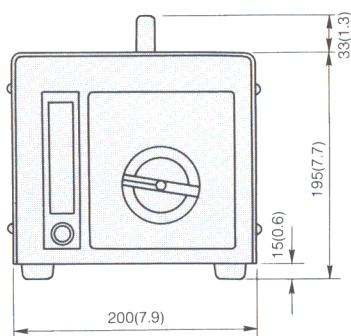


Front View

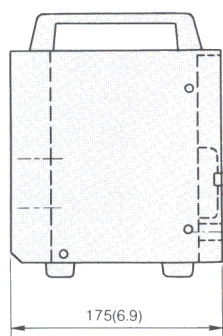


Side View

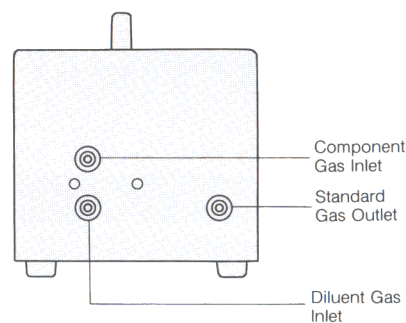
SGD-710C



Front View

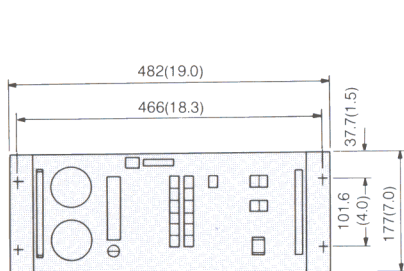


Side View

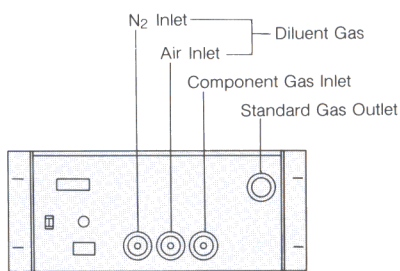


Rear View

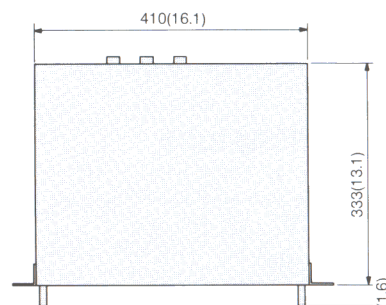
SGD-A10



Front View



Rear View



Top View

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