

INTRODUCTION – Large errors in analyser readings can occur if it is assumed that the analyser is linear. Calibration at one point is therefore not sufficient.

The Model 821S has been developed by Signal to allow both instrument operators and manufacturers to check the linearity of their instruments, by the use of only one calibration gas and one diluent. Eleven fixed steps from 0-100% concentration are provided, each step rising by 10%.

The Model 821S has a reproducibility of $\pm 0.1\%$ F.S.D., ensuring that analyser linearity checks can be carried out at any time, without the necessity of keeping up to ten cylinders of certified gas in stock.

When operated in conjunction with the Signal Model 852V5SP Pre-Diluter, gases of up to 1,000 times greater in concentration can be used.

OPERATION OF THE MODEL 821S

The Model 821S operates on a method of dividing the two gases down a chain of ten identical capillary tubes, in such a way that the operator selects the number of capillaries to which each gas is open. For example, selecting 10% allows the main gas to flow through one capillary only, and the diluent through nine capillaries, thus giving a 10% mixture. Switching to 20% allows the main gas to flow through two capillaries, and so on.

A precision pressure regulator maintains equal pressures of both main gas and diluent upstream of the capillaries irrespective of range setting. This is verified by the differential gauge mounted on the front panel of the instrument. The operator can see at a glance that the pressures of both gases are identical, and therefore he can be assured, as all the capillaries are identical in size, that the correct ratio will be obtained.

The Model 821S is simple to operate. Calibration gas and diluent gas are connected to the compression fittings at the rear, with pressures of 25psi for the calibration gas and 30psi for the diluent. Any of the eleven concentrations 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90% or 100% can then be chosen by turning the selector knob on the front panel.

The gauge mounted on the front panel verifies to the operator that the pressures of each gas are identical. The flow meter, also mounted on the front panel, indicates the output flow rate, which can be varied by means of a needle valve between 2-5L/min.

The design of the Model 821S allows it to check itself for correct operation, by simple reversal of the gas inputs. For example, if an analyser under examination is fed with gas from a gas divider selected at 50% concentration, and the analyser indicates a reading of 49%, it is normally difficult to ascertain which instrument is in fact performing correctly. With the 821S, the gases can be connected in reverse order. If the gas divider were incorrect, the analyser would then indicate a reading of 51%. If a reading of 49% continues to be shown, then the analyser is clearly non-linear, while the gas divider is functioning correctly.

Signal design all their instruments to accept computer control, and the Model 821S is therefore provided with a built-in industry standard computer interface, 4line BCD optically isolated, via a D connector at the rear of the instrument and a remote/local switch.

MODEL 821S GAS DIVIDER MODEL 852V5SP PRE-DILUTER

OPERATION OF THE MODEL 852V5SP

In order to increase the versatility of the Model 821S, and allow it to dilute from much higher concentrations, the Signal Model 852V5SP Pre-Diluter is a simple addition, which can be purchased later if required.

When using the Pre-Diluter, the calibration gas to be diluted, and the diluent gas, are connected to the input ports on the rear of the unit, at a pressure of 50psi. A 20-turn counting dial and a flow meter, both on the front of the 852V5SP, allow the percentage dilution to be set. Signal provide each model in their blender range with its own logarithmic calibration curve for the purpose of correctly setting the dilution ratio.

The output from the Pre-Diluter is fed directly to the input of the 821S, and the correct flow pressure is automatically set. Condensation problems are avoided, as all instruments in the 852 Series are temperature controlled to 40°C.

The pre-diluter can be purchased with a remote motor control for use with computers. Thus both the pre-diluter and the gas divider can be built into a computer controlled quality audit system, and Signal have software available for this purpose.

SPECIFICATION – 821S

SETPOINTS:

0-100%, IN 10% STEPS

CONSTRUCTION:

All gas wetted parts manufactured from 36 stainless steel or Teflon; 1/4in Swagelok compression fittings

FRONT PANEL READINGS:

Differential pressure gauge Output flow Meter

INPUT PRESSURE:

Calibration gas 25psi, diluent gas 30psi

SET POINT PRECISION:

$\pm 0.2\%$ F.S.D.

REPRODUCIBILITY:

$\pm 0.1\%$ of F.S.D.

FLOW RANGE:

1-5L/min

POWER:

240V 50Hz

COMPUTER INTERFACE:

Fitted with 4-line BCD optically isolated Interface (requires additional +5V

return)

WEIGHT:

Gross 10 kg, Nett 9kg

DIMENSIONS:

19in rack mounted, 3u x 300mm depth

SPECIFICATION – 852V5S

DILUTION:

Continuously variable between 0-100%

CONSTRUCTION:

316 stainless steel

TEMPERATURE CONTROL:

Controlled to 40°C

CALIBRATION:

Air/Air

NUMBER OF GAS STREAMS:

One controlled stream, one diluent

FLOW RANGE:

0-5L/min

INPUT PRESSURE:

50psig

OUTPUT PRESSURE:

25psig

ACCURACY:

$\pm 2\%$ point, $\pm 0.02\%$ F.S.

STABILITY:

$\pm 2\%$ point

POWER:

240V 50Hz

WEIGHT:

Gross 8kg, Nett 7kg

DIMENSIONS:

19in rack, 3u x 300mm depth

Every effort has been made to ensure the accuracy of the information contained in this publication. However, Signal's policy of continuous product improvement could possibly result, without notice, in changes being made to the specification as described. Responsibility cannot be accepted for damage, loss or expenses arising as a result.
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