

AGILENT 7820 GC WITH ELECTRONIC PNEUMATICS REGULATION (EPR)

A simple, precise, and cost-effective alternative to traditional manual GC control



Introduction

The Agilent 7820A GC offers uncompromising performance in an affordable instrument for your routine applications. A simple, precise, and cost-effective alternative to traditional manual pneumatic operation for select inlets and detectors is provided, using the 7820A GC electronic pneumatics regulation (EPR). EPR makes it easy to manually adjust gas pressures and flows electronically.

Technology Overview

Pressure or flow in a 7820A GC equipped with EPR is manually increased or decreased using the + or – key on the software keyboard. The pressure or flow values are displayed in real time on the system's display and software keyboard (Figure 1).

EPR technology is available for split/splitless and packed column inlets, and flame ionization (FID) and thermal conductivity detectors (TCD).

- For the split/splitless inlet, you can change the column constant head pressure and total flow. The split flow and split ratio will automatically be changed with total flow adjustments.
- For the packed column inlet, the flow can be adjusted.
- For the detector flows, it is a matter of simply setting the flows for the operational gases.

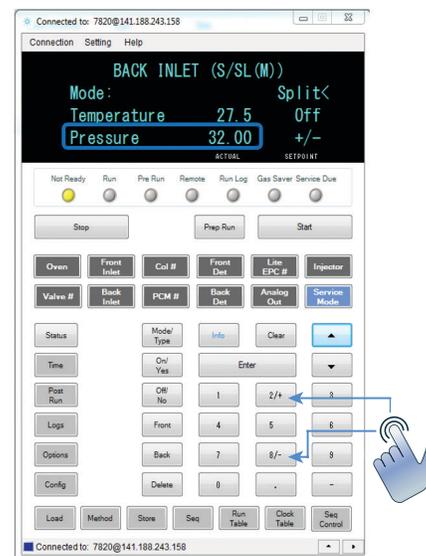


Figure 1. Gas flow and pressures can easily adjusted using the + and – keys.

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The use of mechanical regulators is avoided; gauges and diaphragms are susceptible to drift over time. The EPR technology, which includes temperature and barometric compensation, significantly improves stability over traditional manual pneumatic-based systems. Moreover, it eliminates the need for inconvenient bubble meters to measure and adjust flows.

For these experiments, a mixture of even hydrocarbons from C10 to C40 at approximately 50 mg/L each in *n*-heptane was used.

Results and Discussion

This Technical Overview shows a comparison between EPC and EPR, with the same constant column head pressure. Figure 2 shows that the retention times match for the two technologies over the whole sample range.

Ten consecutive runs using EPR flow regulation for both the inlet and detector gave excellent system repeatability, approximately 0.5 % RSD, for peak area. Stable retention times and detector baselines were obtained using EPR technology; retention time repeatability was measured at 0.03 % RSD and lower. Table 1 shows the results for all compounds.

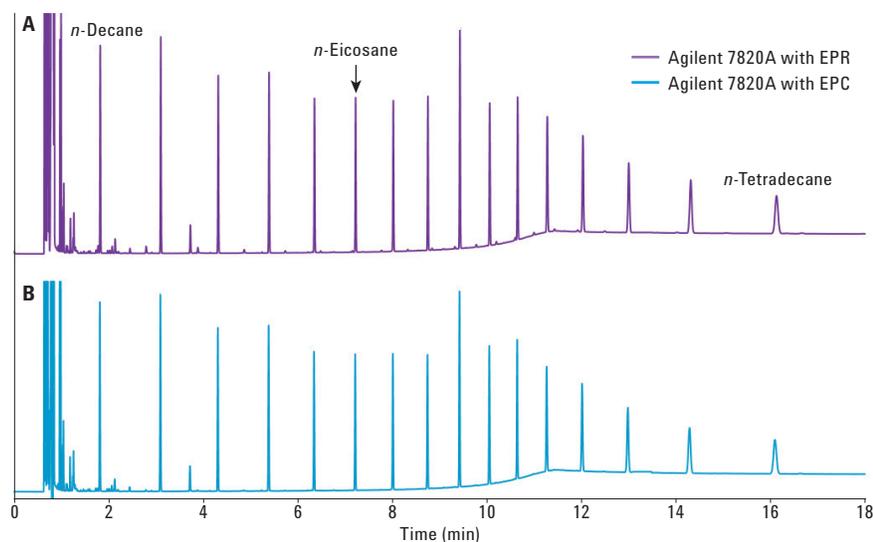


Figure 2. Comparison of retention times for the hydrocarbon mixture using an Agilent 7820A GC with EPR (A), and with EPC (B).

Conclusion

The Agilent 7820A GC with EPR combines the simplicity of manual operation with high precision in a cost-effective design. With EPR, you can manually adjust pressures and flows electronically, while measured values are displayed on the system's display and software keypad.

For more information about the Agilent 7820A GC with electronic pneumatics regulation (EPR) contact your local Agilent representative or visit: <http://www.agilent.com/en-us/products/gas-chromatography/gc-systems>

Experimental

Parameter	Value
GC	Agilent 7820A GC with an Agilent 7693A 16-vial auto injector
SSL with EPR	350 °C, 25 psi (constant pressure), total flow 175 mL/min, split flow 164 mL/min (calculated), split 1:20 (calculated)
Column	Agilent J&W HP-5ms Ultra Inert, 30 m × 0.32 mm, 0.25 μm (p/n 19091J-413)
Oven program	80 °C (1 minute) 25 °C/min (ramp rate) 320 °C (8 minutes)
FID with EPR	350 °C H ₂ 30 mL/min Air 400 mL/min Makeup (N ₂) 25 mL/min

Table 1. Repeatability results (n = 10) for the hydrocarbon mixture.

Compound	Repeatability RSD% (n = 10)	
	Area	Retention time
C10	0.44	0.027
C12	0.50	0.016
C14	0.52	0.009
C16	0.55	0.006
C18	0.52	0.008
C20	0.55	0.011
C22	0.59	0.008
C24	0.52	0.008
C26	0.50	0.008
C28	0.52	0.008
C30	0.49	0.007
C32	0.53	0.008
C34	0.52	0.012
C36	0.50	0.013
C38	0.66	0.027
C40	0.45	0.023

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