



Zero Blank Autosampler

The “Zero Blank” autosampler developed by Costech uses a “sealed carousel” design which has several advantages over an “open carousel” autosampler. All samples are purged simultaneously with helium in an enclosed chamber. This eliminates any nitrogen background (from atmosphere) which is introduced in the open carousel sampler when it moves to drop the sample into the reactor. The microstepper motor which drives the autosampler can switch from a 50 position carousel to a 32 position carousel for large or bulky samples.

The sampler consists of two parts; the sampler carousel and the control module. It can be connected to any CE Instruments (formerly Carlo Erba) elemental analyzer using 18 or 20 mm OD combustion reactors. The connection to the analyzer is simple, place the carousel on the combustion reactor and connect the helium carrier gas using the standard 2mm tubing. The purge line can be turned off (except for use with the optional isolation valve) as the carrier gas will now act as the purge for the carousel. A cable connects the carousel to the control module, and an additional wire is connected to the electrovalves (for the standard pneumatic autosampler) which will control the start and stop of the “Zero Blank” sampler. Set the sample start normally, and the sample stop for 1-2 seconds later. This generates a signal which will turn the carousel and drop the sample.

The front controls are; power (on and off), a manual advance button, and a switch to select the 50 or 32 position carousels. On the back is a “jog” switch which is used to initially align the carousel, and that alignment will hold as long as power is maintained.

Operating procedure

To add samples to the carousel:

Switch the carrier flow to standby or reduce pressure on the Main (Carrier) regulator. With a mass spectrometer turn on diluter, or switch connecting tube from M (Main) to R (Reference).

Open the purge vent on top of the autosampler to release the internal pressure.

Open the sampler lid and add samples to the carousel.

Close the lid and tighten the three main closure points.

Turn the carrier flow back on.

Let the carousel purge for 2-5 minutes with the purge vent open.

Close the purge vent.

Monitor the TCD baseline, when it returns to the original value start the analysis.

Changing Carousels

To switch carousels, lift the carousel out of the autosampler and place the new carousel onto the center shaft. Spin it around until the bottom plate connects with the alignment pin. Check to be sure it is seated properly and the lid will close. On the front panel of the control module turn the switch to the correct position for that carousel. Using the jog control on the back of the analyzer, align the carousel.

Optional Isolation Valve

An optional valve to minimize system changes is available. It replaces the standard drop tube and is the same length. The carrier gas connection is below the valve and a separate purge connection is provided above the valve. When opening the carousel to add samples it is only necessary to turn the valve, isolating the entire carousel section. The carrier gas will continue to flow through the rest of the analytical circuit. After adding samples to the carousel, close the lid, turn on the purge flow and let the carousel purge for 2-5 minutes. Close the purge vent, turn off the purge flow, and open the isolation valve.

