

Model 1120 Standard Addition Controller

Rev 041514

The **Tekran® Model 1120 Standard Addition Controller** allows standard additions of elemental mercury into ambient air while using the **Model 2537 Mercury Vapour Monitor**. It is a valuable quality assurance tool that provides positive indication that the analyzer is operating properly.

The unit allows periodic activation of the **Model 2537** internal permeation source. Activations are timed to occur late in a measurement cycle. This provides confidence that the pure gold cartridges are, in fact adsorbing mercury quantitatively. This affords certainty in the validity of the results when unusually low readings are being measured.



A prototype of the **Model 1120** has been in use in the high Arctic for several years. The measurements, taken at Alert in the Canadian Northwest Territories, showed periods of unusually low **TGM** (Total Gaseous Mercury) readings during and shortly after polar sunrise. These values were initially met with extreme scepticism since the reaction mechanisms causing scavenging of gaseous elemental mercury were not immediately apparent. The standard addition unit confirmed that these values were indeed genuine.

The **Model 1120**, in addition to providing periodic activations of the permeation source, also allows periodic instrument zero checks using the internal **ZERO** switching solenoid.

Applications

- Research
- Network QA/QC protocols
- Survey Results Validation

Principles of Operation

The **Model 1120** connects to the **Model 2537 STATUS & CONTROL** connector using a ribbon cable (supplied). The unit monitors the status of the instrument and counts the number of measurements made since the last **QA/QC** cycle. After the programmed number of cycles elapse, the controller will activate a **ZERO** and/or a **STANDARD ADDITION** cycle as required.

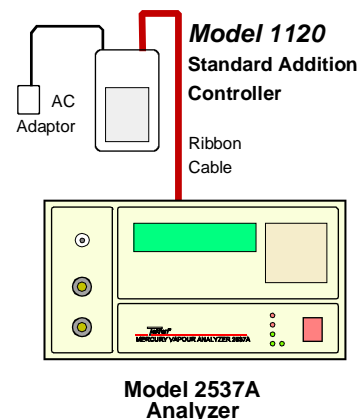
For a **ZERO** cycle, the internal zero solenoid is activated. This feeds zero air to the analyser and allows a quick check of internal instrument background levels. Both the delay time before activation of the solenoid, and the activation period itself are user programmable.

The **STANDARD ADDITION** cycle is similar to a zero cycle. The delay time before source activation is generally chosen to yield injections as late in the cycle as possible. The activation period is selected to provide an appropriate level of added elemental mercury.

The controller allows one or more **Event Flags** to be set to record when a reading is actually a zero or standard addition cycle.

Data Handling

Tekran provides a Windows® based application, **Combine** with every **Model 2537**. This free utility provides proper time alignment for any set of data readings, leaving appropriate gaps during periods of no data. It also combines results from several data files into one data set. **Combine** can separate data based on the **Events** field of each data point. Since the value of the **Event** field can be set to different values when a standard addition or zero cycle is being performed, data for the QA/QC fields can easily be placed into separate columns for analysis.



In order to calculate the percent recovery of each standard addition, an estimate of the ambient mercury concentration during the addition measurement is required. Unless a second instrument is available to provide this information, the mean of the readings immediately before and after the addition cycle is used as the background correction.

Additional Functions

The **Model 1120** allows manual activation of the following functions at any time using the controller keypad.

- Event Flags 1, 2 & 3
- Immediate zero solenoid & perm source activation
- Calibration Request
- Reset of the QC cycle timing parameters to a known starting state
- Immediate trigger of automated **ZERO** or **STANDARD ADDITION** cycle with the next measurement period

Ordering Information

The **Model 1120** includes the following standard components. The cable supplied contains a piggyback connector that allows the use of multiple accessories, for example the **Model 1100 Zero Air Generator**, with one instrument.

- Control Unit
- User Manual
- Power Adaptor
- Instrument Interface Cable (6 ft)

Options

Power supply for 220-240 VAC operation. (Standard is 110-120 VAC: Option 220)