Claims

1. A method for reducing variation during dynamic blending occurring on an intermittent basis to produce a target concentration of a gas mixture, comprising the steps of:

ramping up to a first predetermined flow rate of an active gas at a first preset rate based on a previous blending run;

ramping up to a second predetermined flow rate of a balance gas at a second preset rate based on the previous blending run so as to maintain a substantially constant flow ratio of the active gas to the balance gas;

activating an in-line analyzer when the pressure across the analyzer, the flow rate of the active gas and the flow rate of the balance gas each has stabilized to their corresponding target values;

blending the active gas with the balance gas to produce a blended gas mixture;

measuring a concentration of the blended gas mixture with the in-line analyzer situated downstream of the mixer to generate a measured concentration of the blended gas mixture;

minimizing variation between the measured concentration of the blended gas mixture and the target concentration by dynamically fine-tuning the flow rate of the active gas and/or the flow rate of the balance gas in response to the measured concentration of the blended gas mixture;

deactivating the in-line analyzer, followed by;

ramping down the flow rate of the active gas and ramping down the flow rate of the balance gas at the substantially constant flow ratio until the flow rate of the active gas and the balance gas each reaches substantially zero, further comprising accumulating all of the blended gas mixture into a surge vessel in the absence of venting or generating off-spec gas before, during or after said accumulation, further comprising

discharging the mixture from the surge vessel at a predetermined delivery pressure to an end-user point in the absence of generating waste or off-spec gas, wherein the blended gas mixture has a tolerance of plus or minus 0.1% or lower of a target concentration.