WHAT IS CLAIMED IS:

1. A pressure regulating system, for stepped depressurization of a vapor sample, characterized by:

a housing;

a core disposed generally longitudinally along a central axis of the housing;

a vapor sample input port connected to a vapor sample passage integrally formed within the housing;

a plurality of unvented openings on an upper surface of the housing, each unvented opening being peripherally disposed about the core and adjacent to at least one other of said unvented openings, each of the unvented openings having a select cross-sectional dimension and extending substantially in the direction of elongation of the housing, and each of said unvented openings being connected by an interconnect channel integrally formed in said housing and connected to an adjacent ventless opening;

a plurality of pressure regulating valves each of said plurality of pressure regulating valves having a cross-sectional dimension corresponding to the select cross-sectional dimension of an unvented opening, each of said plurality of pressure regulating valves being switchable between a non-pressure regulating mode and a pressure regulating mode for passing a vapor sample to an adjacent downstream pressure regulating valve at a select regulated pressure via the connected interconnect channel where each of said plurality of pressure regulating valves establishes a pressure reducing stage and includes a valve stem, a sense piston, and sense piston actuator;

a most downstream regulating valve connected in series to said plurality of pressure regulating valves; and

a reduced vapor sample output port connected to said most downstream pressure regulating valve.

2. The pressure regulating system of Claim 1 where each pressure regulating valve at each pressure reducing stage self-adjusts based on a select pressure setting to regulate incoming vapor sample pressure.

3. The pressure regulating system of Claim 1, wherein at least one pressure regulating valve includes an adjustment device configured for adjustably setting an amount of pressure reduction applied at the pressure reducing stage by the respective pressure regulating valve.

4. The pressure regulating system of Claim 1, where in the pressure regulating mode the sense piston at each stage is configured to be in an open, regulating position and in the non-pressure regulating mode to be in a closed position based on the disposition of the sense piston actuator and the valve stem.

5. The pressure regulating system of Claim 4, wherein the disposition of the valve stem and sense piston actuator is based on a pressure of the vapor sample and a pressure reduction setting of the pressure regulating valve.

6. The pressure regulating system of claim 3 where the unvented openings are threaded and each adjustment device is threaded to move axially relative to the housing.

7. The pressure regulating system of Claim 5, when the sense piston is in the pressure regulating position, each pressure regulating valve has a valve stem channel for passing the vapor sample from the respective pressure regulating valve and when the sense piston is in the closed position the valve stem channel is blocked to prevent passage of the vapor sample through the pressure regulating valve.

8. The pressure regulating system of Claim 1, where the housing further characterized by an assembly having a base and stem generally disposed orthogonal to the base and extending axially therefrom, the stem being formed so as to generally conform to the dimensions of the core and extending axially from a central portion of the base, and wherein the pressure regulating system further includes a heating device disposed within the stem configured to heat vapor sample passing through the plurality of pressure regulating valves.

9. The pressure regulating system of Claim 1, wherein the housing further includes a plurality of unsealable pressure calibration ports disposed radially around the plurality of openings and each unsealable pressure calibration port corresponding to a respective pressure regulating valve and being configured to allow for measurement of pressure.

10. The pressure regulating system of Claim 9, wherein each of the unsealable pressure calibration ports is connected with a respective interconnect channel.

11. The pressure regulating system of Claim 10, wherein at least one of the unsealable pressure calibration ports includes a pressure gauge configured to display the pressure of the vapor sample the respective interconnect channel.

12. The pressure regulating system of Claim 3 where the adjustment device is electromechanically actuated and further including an unsealable pressure calibration port connected and an electronic pressure sensor configured to provide an electronic signal to the adjustment device for adjusting the pressure of the vapor sample pressure at a select pressure reducing stage.

13. The pressure reducing system of Claim 2 wherein at least one high pressure regulating valve assembly includes a pair of nested sense piston actuator compression springs, a bifurcated sense piston arrangement with an outer sense piston and a nested inner piston axially slidable relative thereto, a sense piston actuator contact disc disposed between the nested sense piston actuator compression springs and the bifurcated sense piston said contact disk contacting the valve stem to concentrate the force of at least one of the nested sense piston actuator compression springs to provide enhanced pressure reduction.

14. The pressure reducing system of claim 13 where the at least one high pressure regulating valve assembly possesses dimensions corresponding to the other regulating valve assemblies.

15. The pressure reducing system of claim 13 where the housing includes five unvented openings where the first valve opening is connected with the vapor sample passage connected to the vapor sample input port and where the first and second regulating valve assemblies are high pressure regulating valve assemblies.

16. A method for reducing the pressure of a vapor sample through a plurality of calibrated stepped stages of pressure reduction, the method comprising the steps of:

inputting the vapor sample via a vapor sample inlet port formed within a housing of a pressure regulating device;

selectively directing the vapor sample to an adjustable first pressure regulating valve assembly disposed within a first ventless opening integrally formed in the housing where the first ventless opening is connected by an interconnect channel to an adjacent second pressure regulating valve assembly disposed within a second ventless opening integrally formed in the housing;

reducing the pressure of the vapor sample to a preset amount and passing the vapor sample to the adjacent adjustable second pressure regulating valve assembly disposed within the second ventless opening integrally formed in the housing where the second ventless opening is connected by an interconnect channel to an adjacent third pressure regulating valve assembly disposed within a third ventless opening integrally formed in the housing;

reducing the pressure of the vapor sample to a second preset amount and passing the vapor sample to an adjacent adjustable third pressure regulating valve assembly; and

maintaining the sample in the vapor phase as the vapor sample passes through the first, second and third regulating valve assemblies.

17. The method for reducing the pressure of a vapor sample through a plurality of stepped stages of pressure reduction of claim 16 further comprising the step of outputting the vapor sample to an analyzer for analysis.

18. The method for reducing the pressure of a vapor sample through a plurality of stepped stages of pressure reduction of claim 17 further comprising the step of adjusting the amount of pressure regulation by each of the first, second, and third pressure regulating valve assemblies.

19. A pressure regulating system for depressurization of a natural gas vapor sample, characterized by:

a regulator body with a first surface and a second opposite surface and a perimetric surface incorporating a vapor sample input port and a vapor sample output port, a thermal control means for maintaining thermal stability of the regulator body;

a plurality of unvented openings disposed about the first surface proximate to the perimetric surface, each of the plurality of unvented openings having a select cross-sectional dimension and extending between the first and second surfaces, and each of said unvented openings being connected by a ventless interconnect channel integrally formed in said housing and connected to one of said unvented openings;

adjustable valve assembly means for adjustable pressure regulation dimensioned to be contained within each of the unvented openings to regulate vapor pressure of the vapor sample to a preset maximum and preventing passage of a vapor sample at a pressure outside of a preset range to pass to an adjacent one of said valve assembly means through the ventless interconnect channel to establish a means for serial, staged depressurization of the vapor sample while maintaining the vapor sample in the vapor phase.

20. The pressure regulating system for depressurization of a natural gas vapor sample of claim 19 further characterized by intelligent automatic control for each adjustable valve assembly means.