CLAIMS

1. A valve assembly for a manifold, the valve assembly comprising:

a body, the body defining a fluid passage and a valve passage, the fluid passage extending axially between a first fluid opening and a second fluid opening and including a cross-bore opening disposed axially between the first and second fluid openings, and the valve passage being in communication with the fluid passage via the cross-bore opening of the fluid passage, the body including a stub projection defining the cross-bore opening;

a valve member, at least a portion of the valve member being disposed in the valve passage of the body, the valve member being selectively movable over a range of travel between an open position, in which the first fluid opening and the second fluid opening of the fluid passage of the body are in fluid communication with each other, and a closed position, in which the valve member occludes the fluid passage to fluidly isolate the first fluid opening and the second fluid opening, the valve member including a core and a mounting flange, at least a portion of the core being disposed within the valve passage of the body, the core defining a longitudinal axis, the core being rotatable about the longitudinal axis with respect to the body to move the valve member over the range of travel between the open position and the closed position, the mounting flange circumscribing the core and extending radially therefrom, and the mounting flange including a first stop surface and a second stop surface;

a coupling assembly, the coupling assembly adapted to removably mount the valve member to the body, the coupling assembly including a coupling member, a retention lug, and a biasing member, the coupling member defining an internal cavity, the biasing member and at least the mounting flange of the valve member being disposed within the internal cavity of the coupling member, the retention lug being connected to one of the body and the coupling member, and the other of the body and the coupling member including a retention surface, the retention surface defining a lug raceway, the lug raceway being configured to removably receive the retention lug therein such that the retention lug and the retention surface are in interfering relationship with each other to removably mount the coupling member to the body with the valve member being movably retained therebetween, the biasing member interposed between the mounting flange of the valve member and the coupling member when the coupling member is removably mounted to the body such that the biasing member exerts an opposing force against the mounting flange of the valve member to urge the mounting flange into interfering relationship with the stub projection and against the coupling member to urge the retention lug and the retention surface into interfering relationship with each other;

a stop lug, the stop lug being connected to the body;

wherein the first stop surface of the mounting flange of the valve member is adapted to interferingly engage the stop lug when the core of the valve member is in the open position

to prevent the core from rotating in a first direction about the longitudinal axis with respect to the body and to permit the core to rotate in a second direction about the longitudinal axis with respect to the body, the second direction being in opposing relationship to the first direction, and wherein the second stop surface of the mounting flange of the valve member is adapted to interferingly engage the stop lug when the core of the valve member is in the closed position to prevent the core from rotating in the second direction about the longitudinal axis with respect to the body and to permit the core to rotate in the second direction about the longitudinal axis with respect to the body.

2. The valve assembly according to claim 1, wherein the valve passage comprises a blind cross bore.

3. The valve assembly according to claim 1 or claim 2, wherein the lug raceway includes a first portion extending in a first direction and a second portion extending at an angle with respect to the first portion, the first portion including an opening, and the second portion including a closed terminal surface, and wherein the coupling member is removably mounted to the body when the retention lug is positioned in the second portion of the lug raceway.

4. The valve assembly according to claim 3, wherein the coupling member includes the retention surface, the first portion of the lug raceway extends axially along the coupling member, and the second portion of the lug raceway extends transversely to the first portion.

5. The valve assembly according to claim 3 or claim 4, wherein the second portion of the lug raceway is arcuate-shaped.

6. The valve assembly according to any one of claims 1 to 5, wherein the core defines a core through passage, the core through passage being in communication with the fluid passage of the body when the valve member is in the open position such that the first fluid opening and the second fluid opening of the fluid passage of the body are in fluid communication with each other via the core through passage, and the core through passage being in fluid isolation from the fluid passage of the body when the valve member is in the closed position.

7. The valve assembly according to claim 6, wherein the valve member includes a knob, the core of the valve member including a stem, at least a portion of the stem extending from the body, the knob being connected to the stem of the core, and at least a portion of the knob disposed in outward relationship to the coupling member.

8. A manifold assembly for processing a fluid sample, the manifold assembly comprising:

a manifold, the manifold including a manifold housing defining a main manifold passage, at least one manifold inlet port in fluid communication with the main manifold passage, and a main manifold passage outlet in fluid communication with the main manifold passage;

a body, the body connected to one of said at least one manifold inlet port of the manifold housing, the body defining a fluid passage and a valve passage, the fluid passage extending axially between a first fluid opening and a second fluid opening and including a cross-bore opening disposed axially between the first and second fluid openings, the second fluid opening being in fluid communication with the main manifold passage, and the valve passage being in communication with the fluid passage via the cross-bore opening of the fluid passage, the body including a stub projection defining the cross-bore opening;

a valve member, at least a portion of the valve member being disposed in the valve passage of the body, the valve member being selectively movable over a range of travel between an open position, in which the first fluid opening and the second fluid opening of the fluid passage of the body are in fluid communication with each other, and a closed position, in which the valve member occludes the fluid passage to fluidly isolate the first fluid opening and the second fluid opening, the valve member including a core and a mounting flange, at least a portion of the core being disposed within the valve passage of the body, the core defining a longitudinal axis, the core being rotatable about the longitudinal axis with respect to the body to move the valve member over the range of travel between the open position and the closed position, the mounting flange circumscribing the core and extending radially therefrom, and the mounting flange including a first stop surface and a second stop surface;

a coupling assembly, the coupling assembly adapted to removably mount the valve member to the body, the coupling assembly including a coupling member, a retention lug, and a biasing member, the coupling member defining an internal cavity, the biasing member and at least the mounting flange of the valve member being disposed within the internal cavity of the coupling member, the retention lug being connected to one of the body and the coupling member, and the other of the body and the coupling member including a retention surface, the retention surface defining a lug raceway, the lug raceway being configured to removably receive the retention lug therein such that the retention lug and the retention surface are in interfering relationship with each other to removably mount the coupling member to the body with the valve member being movably retained therebetween, the biasing member interposed between the mounting flange of the valve member and the coupling member when the coupling member is removably mounted to the body such that the biasing member exerts an

opposing force against the mounting flange of the valve member to urge the mounting flange into interfering relationship with the stub projection and against the coupling member to urge the retention lug and the retention surface into interfering relationship with each other;

a stop lug, the stop lug being connected to the body;

wherein the first stop surface of the mounting flange of the valve member is adapted to interferingly engage the stop lug when the core of the valve member is in the open position to prevent the core from rotating in a first direction about the longitudinal axis with respect to the body and to permit the core to rotate in a second direction about the longitudinal axis with respect to the body, the second direction being in opposing relationship to the first direction, and wherein the second stop surface of the mounting flange of the valve member is adapted to interferingly engage the stop lug when the core of the valve member is in the closed position to prevent the core from rotating in the second direction about the longitudinal axis with respect to the body and to permit the core to rotate in the second direction about the longitudinal axis with respect to the body.

9. The manifold assembly according to claim 8, further comprising:

a filter device, the filter device associated with the body, the filter device including a porous filter medium and a funnel portion, the funnel portion having an interior surface defining a reservoir, the reservoir in fluid communication with the first fluid opening of the fluid passage of the body via the filter medium.

10. The manifold assembly according to claim 8 or claim 9, further comprising:

a vacuum source, the vacuum source in fluid communication with the main manifold passage outlet of the manifold, the vacuum source adapted to selectively generate a vacuum within the main manifold passage of the manifold.

11. The manifold assembly according to any one of claims 8 to 10, wherein the valve passage of the body comprises a blind cross bore.

12. The manifold assembly according to any one of claims 8 to 11, wherein the lug raceway of the coupling assembly includes a first portion extending in a first direction and a second portion extending at an angle with respect to the first portion, the first portion including an opening, and the second portion including a closed terminal surface, and wherein the coupling member is removably mounted to the body when the retention lug is positioned in the second portion of the lug raceway.

13. The manifold assembly according to any one of claims 8 to 12, wherein the core defines a core through passage, the core through passage being in communication with the fluid passage of the body when the valve member is in the open position such that the first fluid opening and the second fluid opening of the fluid passage of the body are in fluid communication with each other via the core through passage of the core, and the core through passage of the core being in fluid isolation from the fluid passage of the body when the valve member is in the closed position.