intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.

SUMMARY

[0009] This section provides a general summary of the disclosure, and is not a comprehensive disclosure of its full scope or all of its features.

[0010] The present disclosure provides a throttle valve and method for operating the same that reduces safety hazards. The present disclosure also provides a valve that protects upstream equipment and is relatively inexpensive to manufacture.

[0011] In one aspect of the disclosure, ~~a throttle housing having an inlet end and an outlet end includes a shuttle housing disposed within the throttle housing. The shuttle housing has a first end cap at a first end and an orifice array on a second end. The shuttle housing comprises a shuttle housing therein. The shuttle has an opened position and a closed position relative to the shuttle housing. The shuttle defines a varying control volume between the end cap, the shuttle and the shuttle housing. The control inlet fluidically communicates a control fluid to the control volume to control the position of the shuttle in the shuttle housing.~~there is provided a throttle valve comprising;

a throttle housing having an inlet end and an outlet end;

a shuttle housing disposed within the throttle housing, said shuttle housing having a first end cap at a first end and an orifice array having a plurality of openings therethrough, said shuttle housing comprising a shuttle housing therein, said shuttle having an opened position and a closed position relative to the shuttle housing, said shuttle defining a varying control volume between the end cap, the shuttle and the shuttle housing and varying the amount of flow through the plurality of openings in the orifice array; and

a control inlet fluidically communicating a control fluid to the control volume to control the position of the shuttle in the shuttle housing, wherein the control fluid is controlled through a valve assembly comprising a first valve selectively communicating fluid from a high pressure source to the control inlet and a second valve selectively communicating fluid from a low pressure source to the control inlet.

[0012] In another aspect of the disclosure, ~~a method of operating a throttle valve having a control volume between a shuttle, a shuttle housing and an end cap of the shuttle housing is set forth. The shuttle is disposed within the shuttle housing. The shuttle exposes an orifice array in the shuttle housing. The method includes generating a flow signal from another control. The method further includes when the process variable signal is above a first control point, communicating fluid from the throttle valve input to the control volume, moving the shuttle toward a throttle valve output and reducing flow through the orifice array. The method further includes when the process variable signal is below a second control point, communicating fluid from the throttle valve output to the control volume, moving the shuttle toward the throttle valve input and increasing flow through the orifice array.~~there is provided a method of operating a throttle valve having a control volume between a shuttle, a shuttle housing and an end cap of the shuttle housing, said shuttle disposed within the shuttle housing, said shuttle exposing an orifice array in the shuttle housing comprising:

generating a flow signal from a flow sensor in a throttle valve output;

when the flow signal is above a first control point, communicating fluid from a throttle valve input to the control volume, moving the shuttle toward the throttle valve output and reducing flow through the orifice array;

when the flow signal is below a second control point, communicating fluid from the throttle valve output to the control volume, moving the shuttle toward the throttle valve input and increasing flow through the orifice array; and

when the flow signal is between the first control point and the second control point, maintain the position of the shuttle within the shuttle housing.

[0013] Further areas of applicability will become apparent from the description provided herein. The description and specific examples in this summary are intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.