Claims

[Claim 1]

A safety valve system comprising:

a main valve that has an introduction port into which pressure from a pressure source is introduced, a release port which is configured to release the pressure, a valve body that is arranged between the introduction port and the release port, and a dome chamber, the valve body being in a closed state when a pressure of the introduction port and a pressure of the dome chamber are equal to each other, and the valve body being in an open state when the pressure of the dome chamber decreases and a pressure difference occurs between the introduction port and the dome chamber;

a high-pressure side pilot valve that is set to a first operating pressure value and that is configured to release the pressure by allowing the introduction port and the release port to communicate with each other by opening the valve body when the pressure exceeds the first operating pressure value;

a low-pressure side pilot valve that is set to a second operating pressure value lower than the first operating pressure value and that is configured to release the pressure by allowing the introduction port and the release port to communicate with each other by opening the valve body when the pressure exceeds the second operating

pressure value;

a switching unit that performs switching between operation and non-operation of the low-pressure side pilot valve,

a first pressure introduction line that connects the high-pressure side pilot valve and the dome chamber;

a first return line that connects the pressure source and the high-pressure side pilot valve;

a second pressure introduction line that connects the low-pressure side pilot valve and the dome chamber; and

a second return line that connects the pressure source and the low-pressure side pilot valve;

wherein the switching unit includes a first opening-closing valve provided on the second pressure introduction line and a second opening-closing valve provided on the second return line.

[Claim 2]

The safety valve system according to Claim 1, further comprising:

a pressure detecting unit that is configured to detect a pressure between the first opening-closing valve and the second opening-closing valve.

[Claim 3]

The safety valve system according to Claim 1 or 2,

wherein each of the first opening-closing valve and the second opening-closing valve is an electromagnetic valve or a manual valve with an opening/closing detector, and

wherein the safety valve system further comprises a control unit that is configured to control an opening/closing operation of the electromagnetic valve, or a detecting unit that is configured to detect opening and closing of the manual valve with the opening/closing detector.

[Claim 4]

The safety valve system according to any one of Claims 1 to 3, further comprising:

cutoff valves that are provided in front of and behind each of the first opening-closing valve and the second opening-closing valve and are capable of cutting off flow to each of the first opening-closing valve and the second opening-closing valve.

[Claim 5]

The safety valve system according to Claim 4, further comprising:

a bypass flow passage that is parallel with each of the first opening-closing valve and the second opening-closing valve; and

a bypass valve that is configured to open and close the bypass flow passage.

[Claim 6]

The safety valve system according to any one of Claims 1 to 5, further comprising:

a pressure-reducing unit that reduces the pressure to be introduced into the high-pressure side pilot valve and the low-pressure side pilot valve.

[Claim 7]

The safety valve system according to any one of Claims 1 to 6, further comprising:

a system internal pressure detecting unit that is configured to detect the pressure to be introduced from the pressure source.

[Claim 8]

The safety valve system according to any one of Claims 1 to 7,

wherein the high-pressure side pilot valve is set to the first operating pressure value by including a plurality

of springs in series, and the plurality of springs are attachable and detachable.

[Claim 9]

A tank comprising:

a tank body that accommodates a fluid as the pressure source; and

the safety valve system according to any one of Claims 1 to 8.

[Claim 10]

A ship comprising:

a hull; and

the tank according to Claim 9 mounted on the hull.

[Claim 11]

An operation method for a safety valve system in the ship according to Claim 10,

wherein the first opening-closing valve and the second opening-closing valve are closed in a state where the hull is anchoring, and

the first opening-closing valve and the second opening-closing valve are opened in a state where the hull is navigating.