[Summary of Invention]

[Problem to be Solved by the Invention]

[0007]

An embodiment of the invention provides a power conversion system having a simple configuration.

[Means for Solving the Problem]

[0008]

According to an embodiment of the invention, a power conversion system including a main circuit and a control circuit is provided. The main circuit includes a power converter and an electrical storage part. The power converter includes a pair of direct current terminals connected to a direct current circuit, multiple alternating current terminals connected to an alternating current circuit, multiple switching elements having a full-bridge connection, and multiple rectifying elements connected in anti-parallel respectively to the multiple switching elements. The electrical storage part is connected to each of the multiple alternating current terminals via multiple reactors and is connected to one of the pair of direct current terminals. The control circuit controls, by an ON/OFF of the multiple switching elements, a power flow in three directions between the direct current circuit, the alternating current circuit, and the electrical storage part. The control circuit is configured to control the power flow in the three directions between the direct current circuit, the alternating current circuit, and the electrical storage part by controlling an alternating current terminal voltage of the power converter to independently track target values of each of a direct current power of the electrical storage part and a positive-phase power of the alternating current circuit.

[Effects of the Invention]

[0009]

According to an embodiment of the invention, a power conversion system that has a simple configuration is provided.

[Brief Description of Drawings]

[0010]

[Fig. 1]

FIG. 1 is a block diagram schematically illustrating a power conversion system according to a first embodiment.

[Fig. 2]

FIG. 2 is a block diagram schematically illustrating an example of the control circuit according to the first embodiment.

CLAIMS

[Claim 1]

A power conversion system, comprising:

a main circuit including

a power converter including a pair of direct current terminals, a plurality of alternating current terminals, a plurality of switching elements having a full-bridge connection, and a plurality of rectifying elements connected in anti-parallel respectively to the plurality of switching elements, the pair of direct current terminals being connected to a direct current circuit, the plurality of alternating current terminals being connected to an alternating current circuit, and

an electrical storage part connected to each of the plurality of alternating current terminals via a plurality of reactors and connected to one of the pair of direct current terminals; and

a control circuit controlling, by an ON/OFF of the plurality of switching elements, a power flow in three directions between the direct current circuit, the alternating current circuit, and the electrical storage part,

the control circuit being configured to control the power flow in the three directions between the direct current circuit, the alternating current circuit, and the electrical storage part by controlling an alternating current terminal voltage of the power converter to independently track target values of each of a direct current power of the electrical storage part and a positive-phase power of the alternating current circuit.

[Claim 2]

The power conversion system according to claim 1, wherein

the main circuit includes:

a plurality of the power converters;

a plurality of the electrical storage parts connected to the plurality of alternating current terminals of each of the plurality of power converters via the plurality of reactors; and

a transformer providing a parallel multiple connection of the plurality of power converters to the alternating current circuit.

[Claim 3]

The power conversion system according to claim 1, wherein

the main circuit includes:

a plurality of the power converters;

a plurality of the electrical storage parts connected to the plurality of alternating current terminals of each of the plurality of power converters via the plurality of reactors; and

a transformer providing a series multiple connection of the plurality of power converters to the alternating current circuit.

[Claim 4]

The power conversion system according to claim 1, wherein

an alternating current power of the alternating current circuit is three-phase alternating current power,

the power converter includes three of the alternating current terminals corresponding to the phases,

the main circuit includes a transformer provided between the power converter and the alternating current circuit,

the transformer includes:

three primary windings provided to correspond to the phases and connected respectively to the three alternating current terminals; and

three secondary windings magnetically coupled respectively with the three primary windings and connected to the alternating current circuit,

the three primary windings have a Y-connection, and

the electrical storage part is connected to a neutral point of the three primary windings having the Y-connection and uses the three primary windings as the plurality of reactors.

[Claim 5]

The power conversion system according to claim 1, wherein the main circuit further includes a core having each of the plurality of reactors wound around the core.

[Claim 6]

The power conversion system according to claim 1, wherein the electrical storage part includes a positive pole connected to each of the plurality of alternating current terminals via the plurality of reactors, and a negative pole connected to the direct current terminal of the pair of direct current terminals on a low potential side.

[Claim 7]

The power conversion system according to claim 1, wherein the electrical storage part includes a negative pole connected to each of the plurality of alternating current terminals via the plurality of reactors, and a positive pole connected to the direct current terminal of the pair of direct current terminals on a high potential side.