[Document Name] Claims

[Claim 1]

An electric circuit board connectable to a control board of a refrigerating apparatus comprising a heat source unit and a utilization unit via a communication line, the electric circuit board comprising:

a first input line (11) configured to receive a positive electrode signal or a negative electrode signal;

a second input line (12) configured to receive a signal having a polarity different from that of the signal received at the first input line (11);

a first output line (21) configured to output the positive electrode signal;

a second output line (22) configured to output the negative electrode signal;

a relay (30) comprising a relay coil (31);

a first voltage divider circuit (51) comprising at least a first voltage dividing resistor (R11) and a second voltage diving resistor (R12) connected in series, and configured to provide a first divided voltage (V1) as a potential difference between a connection point between the first voltage dividing resistor (R11) and the second voltage dividing resistor (R12) and a ground;

a second voltage divider circuit (52) comprising at least a third voltage dividing resistor (R21) and a fourth voltage dividing resistor (R22) connected in series, and configured to provide a second divided voltage (V2) as a potential difference between a connection point between the third voltage dividing resistor (R21) and the fourth voltage dividing resistor (R22) and the ground; and

a comparator (55) configured to compare the first divided voltage (V1) and the second divided voltage (V2) and to output a predetermined operating voltage (Vout) to the relay coil (31) based on the comparison,

wherein the relay (30) is controllable by the predetermined operating voltage (Vout) such that:

(i) when the first input line (11) receives the positive electrode signal, the first input line (11) is connected to the first output line (21) and the second input line (12) is connected to the second output line (22); and

(ii) when the first input line (11) receives the negative electrode signal, the first input line (11) is connected to the second output line (22) and the second input line (12) is connected to the first output line (21).

[Claim 2]

The electric circuit board according to claim 1, further comprising:

(a) a first circuit (41) configured to connect the first input line (11) with the first output line (21) and further configured to connect the second input line (12) with the second output line (22); and

(b) a second circuit (42) configured to connect the first input line (11) with the second output line (22) and further configured to connect the

second input line (12) with the first output line (21),

wherein the relay (30) includes a switching contact (33) configured such that;

(i) when the first input line (11) is a positive electrode, the first circuit (41) is turned on and the second circuit (42) is turned off; and

(ii) when the first input line (11) is the negative electrode, the first circuit (41) is turned off and the second circuit (42) is turned on.

[Claim 3]

The electric circuit board according to claim 1 or 2, wherein:

(a) the first voltage divider circuit (51) is configured such that, when the first input line (11) is a positive electrode, a voltage drop is caused from a connection end on the first input line (11) side toward a connection end on the second input line (12) side; and

(b) the second voltage divider circuit (52) is configured such that, when the first input line (11) is a negative electrode, a voltage drop is caused from the connection end on the second input line (12) side toward the connection end on the first input line (11) side.

[Claim 4]

The electric circuit board according to claim 3, wherein a first diode (D11) with the first resistor (R11) and the second resistor (R12) are connected in series, in which a forward current flows from the connection end with the first input line (11) toward the connection end with the second input line (12) in the first voltage divider circuit (51), and

a second diode (D21) with the third resistor (R21) and the fourth resistor (R22) are connected in series in which a forward current flows from the connection end with the second input line (12) toward the connection end with the first input line (11) in the second voltage dividing circuit (52).

[Claim 5]

The electric circuit board according to claim 4, wherein the first voltage (V1) is a potential difference between the connection point between the first resistor (R11) and the second resistor (R12) and the ground, and

the second voltage (V2) is a potential difference between the connection point between the third resistor (R21) and the fourth resistor (R22) and the ground.

[Claim 6]

The electric circuit board according to any one of claims 3 to 5, wherein the comparator (55) is configured such that:

(a) when the second voltage (V2) is larger than the first voltage (V1), the comparator (55) outputs the predetermined operating voltage (Vout) to the relay (30);

(b) a voltage at an inverting input of the comparator (55) is the first voltage (V1); and

(c) a voltage at a non-inverting input of the comparator (55) is the second voltage (V2).

[Claim 7]

The electric circuit board according to any one of claims 1 to 6, wherein:

(a) the control board comprises a first control board (81) equipped with the utilization unit and a second control board (82) equipped with the heat source unit; and

(b) the electric circuit board comprises a first electric circuit board (91) connectable to the first control board (81) and a second electric circuit board (92) connectable to the second control board (82).

[Claim 8]

The refrigerating apparatus equipped with the electric circuit board according to any one of claims 1 to 7.