

ELEVATOR POWER SUPPLY CONTROL DEVICE AND ELEVATOR SYSTEM

The application is based on and claims priority to Chinese Patent Application No. 202220555366.5, titled “elevator power supply control device and elevator system” and filed on March 14, 2022, the entire content of which is incorporated herein by reference.

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FIELD

The present disclosure relates to the technical field of elevator, and specifically to a power supply control device of an elevator and an elevator system.

10 BACKGROUND

With the development of national urbanization, the number of elevators in use continues to grow. In order to improve the service level of elevators, it is necessary to pay attention to the operation status of elevators at all times to ensure their safety in use.

Electrical safety devices of elevators are arranged in a machine room, hoistway, landing
15 door, car roof and pit, and these electrical safety devices at different positions are connected in series in the elevator control, to control the elevator to run or stop. As a result, the entire electrical safety device of the elevator has the devices at above all positions connected in series, such that an electrical safety loop is very long, resulting in an excessive resistance, voltage drop, etc. in the circuit of the electrical safety device, which leads to unstable operation of the elevator,
20 presenting potential safety hazards under the long-term use of elevators.

Therefore, it is urgent to solve the problem of unstable operation of elevators.

SUMMARY

An objective of the present disclosure is to provide a power supply control device for an
25 elevator and an elevator system, so as to solve the problem of unstable operation of elevators.

In order to achieve the above objectives, embodiments of the present disclosure provide a power supply control device for an elevator, including: a power supply; a safety detecting assembly, including a plurality of detecting subunits connected in series in a safety detecting circuit, where the safety detecting circuit is electrically connected to the power supply; an

execution element, arranged in the safety detecting circuit; and a feedback control assembly including a controller, where the controller is connected between the safety detecting circuit and the power supply and configured to control the power supply to supply electricity, in response to electrical signal attenuation in the safety detecting circuit.

5 According to embodiments of the present disclosure, the power supply control device is provided with a feedback control assembly which feeds back electrical signal attenuation of the plurality of detecting subunits to the controller, such that the controller controls the power supply to adjust the output voltage, thus to improve the stability of the execution element, thereby achieving the effects of high efficiency, energy saving and safe use.

10 On the basis of the above technical solution, the following improvements may be further made according to embodiments of the present disclosure.

Further, the feedback control assembly further includes a circuit connector provided with at least one connecting interface, the connecting interface is electrically connected to the safety detecting circuit, and the controller is connected to the circuit connector.

15 Further, the circuit connector is provided with one connecting interface electrically connected to a negative electrode of the last detecting subunit.

Further, the circuit connector is provided with at least two connecting interfaces, where one connecting interface is electrically connected to a negative electrode of one detecting subunit.

20 Further, the power supply control device for an elevator further includes a main control device communicated to each of the detecting subunits.

Further, the controller is configured to detect, by the circuit connector, one or more of a voltage drop and a current drop in the safety detecting circuit.

Further, the feedback control assembly further includes an analog-digital converter connected between the circuit connector and the controller.

25 Further, the execution element includes a contactor configured to control an elevator running circuit to be on or off.

Further, the contactor is arranged in the safety detecting circuit.

30 Further, the plurality of detecting subunits at least includes a machine-room safety detecting unit, a hoistway safety detecting unit, a car-roof safety detecting unit, a front-car-door safety detecting unit, a rear-car-door safety detecting unit, a front-landing-door safety detecting

unit, and a rear-landing-door safety detecting unit.

Further, a frequency converter is further arranged in the safety detecting circuit, the frequency converter is communicated to the main control device.

Further, the execution element further includes a main switch arranged in the safety
5 detecting circuit.

Further, the power supply is a direct-current power supply.

Further, the power supply is an alternate-current power supply with a rectifying circuit electrically connected to the alternate-current power supply.

Embodiments of the present disclosure further provide an elevator system, including a
10 power supply control device for an elevator as described above.

According to embodiments of the present disclosure, the power supply control device for an elevator and the elevator system are provided with a feedback control assembly individually to detect and compensate electrical signal attenuation in the safety detecting circuit, thus to improve the stability of the safety detecting circuit and the elevator operation, solving the
15 problem of loop interference caused by the overlong safety detecting circuit, thereby improving the stability of the operation of the contactor and the safety of the elevator.

The power supply control device for an elevator and the elevator system provided in embodiments of the present disclosure could be used for monitoring the consistency of the voltage of the safety detecting circuit, and for judging the contact state of the detecting subunits,
20 thereby improving the use safety.

BRIEF DESCRIPTION OF THE DRAWINGS

Reference will now be made briefly to the accompanying drawings referred by illustration to the embodiments or the related art, to illustrate the solutions according to the embodiments of
25 the present disclosure or the related art more clear. Obviously, the accompanying drawings in the description below are only some embodiments of the present disclosure. For those skilled in the art, other accompanying drawings may be obtained according to the structures shown in these accompanying drawings without any creative effort.

Figure 1 is a schematic diagram showing an elevator safety circuit in the related art;

30 Figure 2 is a schematic diagram showing another elevator safety circuit in the related art;

Figure 3 is a schematic diagram showing yet another elevator safety circuit in the related art;

Figure 4 is a schematic diagram showing an elevator safety circuit according to embodiments of the present disclosure;

5 Figure 5 is a schematic diagram showing another elevator safety circuit according to embodiments of the present disclosure;

Figure 6 shows a larger version of a photoelectric coupler in Figure 4 and Figure 5 according to embodiments of the present disclosure;

10 Figure 7 is a schematic diagram showing a voltage-current monitoring circuit according to embodiments of the present disclosure; and

Figure 8 is a schematic diagram showing another voltage-current monitoring circuit according to embodiments of the present disclosure.

Drawing references:

reference	name	reference	name
100	power supply	210	execution element
211	first contactor	212	second contactor
220	detecting subunit	221	electrical safety device
310	controller	320	circuit connector
321	connecting interface	400	main control device
500	frequency converter	600	main switch
700	photoelectric coupler		

15 DETAILED DESCRIPTION

In the design of the electrical safety circuit, the connection of all electrical safety devices should be designed according to a standard that actions of any one of the electrical safety devices result in the stop of the elevator. Based on such a standard, in the elevator control system, as shown in Figures 1, 2 and 3, the electrical safety devices 221 are connected in series
20 to control the elevator to run or stop. However, considering the particular operation of the elevator, the electrical safety devices 221 of the elevator are respectively arranged in a machine room, hoistway, landing door, car roof and pit, making the safety detecting circuit pretty long.

For example, if a lifting height of the elevator is 100 meters, a length of the safety detecting circuit could be as long as 1000 meters or even longer. Traditional safety circuit usually adopts a power-supply voltage of AC 220Vac or 110Vac generated by a transformer, which inevitably causes a series of problems among the safety detecting circuit of the elevator such as loop interference, loop voltage drop, loop cable diameter, excessive resistance due to aging of contacts of electrical elements. With a long time use, the contacts will be with increased contact resistances due to dust pollution, oxidation of the contacts themselves, sulfurization, and insufficient travel and so on, thus increasing the voltage drop of the elevator safety circuit, which affect the stability and safety of the elevator operation. Although the above problems may be solved by increasing the cable diameter of the safety detecting circuit of the elevator and increasing the transformer capacity and the like, these will cause increasing production design costs.

In view of the above background, the power supply control device in embodiments of the present disclosure is provided with a feedback control assembly which feeds back electrical signal attenuation of a plurality of detecting subunits to a controller, such that the controller controls a power supply to adjust the output voltage, thus to improve the stability of an execution element, thereby achieving the effects of high efficiency, energy saving and safe use.

Reference will be made clearly and completely to embodiments of the present disclosure, referring to the accompanying drawings in embodiments of the present disclosure. Obviously, the embodiments described herein are only part of the embodiments of the present disclosure, but not all. Based on the embodiments in the present disclosure, all other embodiments obtained by a person of ordinary skill in the art without creative effort are within the protection scope of the present disclosure.

With reference to Figure 4, the power supply control device for an elevator provided in embodiments of the present disclosure includes: a power supply 100, a safety detecting assembly, an execution element 210 and a feedback control assembly, in which the safety detecting assembly includes a plurality of detecting subunits 220 connected in series in a safety detecting circuit; the execution element 210 is arranged in the safety detecting circuit, and the safety detecting circuit is electrically connected to the power supply 100; and the feedback control assembly includes a controller 310, the controller 310 is connected between the safety

detecting circuit and the power supply 100 and is configured to control the power supply 100 to supply electricity, in response to electrical signal attenuation in the safety detecting circuit.

The power supply control device in embodiments of the present disclosure is provided with the feedback control assembly which feeds back electrical signal attenuation of the plurality of detecting subunits 220 to the controller 310, such that the controller 310 controls the power supply 100 to adjust the output voltage, thus to improve the stability of the execution element 210, thereby achieving the effects of high efficiency, energy saving and safe use. Even if the plurality of detecting subunits 220 are arranged at dispersed positions such as a machine room, a hoistway, and a car roof thus making the safety detecting circuit pretty long, the feedback control assembly, by feeding back the electrical signal attenuation in the safety detecting circuit timely, could control the power supply 100 to adjust the output voltage, so as to compensate the electrical signal attenuation in the safety detecting circuit, thereby improving the stability of the safety detecting circuit and the elevator operation. This solution is free of extra production design cost and is convenient to use.

In an embodiment of the present disclosure, the power supply control device may be a circuit board. Alternatively, it may be a circuit board provided with partial parts such as the execution element 210, the power supply 100 and so on.

It would be understood that electrical signal of each detecting subunit 220 may include one or more of a voltage difference and a current difference across that detecting subunit 220.

In an embodiment of the present disclosure, the feedback control assembly further includes a circuit connector 320 provided with at least one connecting interface 321, the connecting interface 321 is electrically connected to the safety detecting circuit, and the controller 310 is connected to the circuit connector 320.

In an embodiment of the present disclosure, the circuit connector 320 may be a circuit board, and the connecting interface 321 may be a serial interface or a parallel interface.

In an embodiment of the present disclosure, the circuit connector 320 is provided with one connecting interface 321 electrically connected to a negative electrode of the last detecting subunit 220. Voltage collection and current collection are performed at the negative electrode of last detecting subunit 220, and the collected voltage or current of the negative electrode of the last detecting subunit 220 is transmitted to the controller 310 through the circuit connector 320.

In an embodiment of the present disclosure, the controller 310 is configured to detect, by the circuit connector 320, one or more of a voltage drop and a current drop in the safety detecting circuit. The controller 310 may be a micro controller unit (MCU).

5 In an embodiment of the present disclosure, the feedback control assembly further includes an analog-digital converter connected between the circuit connector 320 and the controller 310. The analog-digital converter, i.e. an A/D converter, is configured to convert an input voltage signal into a digital signal and transmit the digital signal to the controller 310.

10 In an embodiment of the present disclosure, the execution element 210 includes a contactor configured to control an elevator running circuit to be on or off. The contactor is arranged in the safety detecting circuit.

In an embodiment of the present disclosure, the contactor includes a first contactor 211 and a first contactor 212, and only when the electrical safety device 221 of each detecting subunit 220 is normally connected, the first contactor 211 and the first contactor 212 could be attracted thus to turn on the elevator running circuit and to supply power to a motor, thereby realizing the running of the elevator.

15 In an embodiment of the present disclosure, the power supply control device for an elevator further includes a main control device 400 communicated to each of the detecting subunits 220. The main control device 400 may be a main control panel including a micro controller unit (MCU). As shown in Figures 4 and 6, the detecting subunit 220, by a photoelectric coupler 700, may realize a conversion of a high voltage signal to a low voltage signal, where the photoelectric coupler 700 is of good anti-interference ability and can isolate electrical signals well.

25 In an embodiment of the present disclosure, the main control device 400 is in communication connection to the controller 310, which is convenient for the main control device 400 to transmit information of the elevator working state to the controller 310. It is convenient for the transmission of data signals by adopting the communication connection mode, which will not be limited to the respective arrangement positions of the main control device 400 and the controller 310, and thus is convenient to use.

30 The communication connection above includes, but is not limited to, one or more of bluetooth connection, a wired data connection, and a wireless signal network connection, and is

configured to transmit information between the detecting subunit 220 and the main control device 400.

The controller 310 is connected between the safety detecting circuit and the power supply 100. The controller 310 may be electrically connected to the safety detecting circuit and the power supply 100.

In an embodiment of the present disclosure, the plurality of detecting subunits 220 at least includes a machine-room safety detecting unit, a hoistway safety detecting unit, a car-roof safety detecting unit, a front-car-door safety detecting unit, a rear-car-door safety detecting unit, a front-landing-door safety detecting unit, and a rear-landing-door safety detecting unit. It would be understood that the machine-room safety detecting unit, the hoistway safety detecting unit, the car-roof safety detecting unit, the front-car-door safety detecting unit, the rear-car-door safety detecting unit, the front-landing-door safety detecting unit and the rear-landing-door safety detecting unit are connected in series, the sequence of which is not specifically limited here.

Each of the machine-room safety detecting unit, the hoistway safety detecting unit, the car-roof safety detecting unit, the front-car-door safety detecting unit, the rear-car-door safety detecting unit, the front-landing-door safety detecting unit and the rear-landing-door safety detecting unit corresponds to a plurality of electrical safety devices 221, and for ensuring safe operation of the elevator, the elevator will run only when all of the electrical safety devices 221 of each detecting subunit 220 work in a normal state; otherwise, the elevator will stop running.

In an embodiment of the present disclosure, the safety detecting circuit is further provided with a frequency converter 500 communicated to the main control device 400. The frequency converter 500 mainly functions on converting frequency so as to realize energy saving and speed regulating. The frequency converter 500 and the contactor are both used to control the movement of the motor for the elevator operation, thereby improving the operation efficiency and the operation stability, and prolonging the service life of the elevator.

In an embodiment of the present disclosure, the execution element 210 further includes a main switch 600 arranged in the safety detecting circuit.

In an embodiment of the present disclosure, the power supply 100 is a direct-current power supply. An output modulatable range of the power supply 100 is 48 - 56 VDC. By performing

voltage collection or current collection at an end of the the safety detecting circuit, the output voltage of the safety detecting circuit is automatically adjusted, where the adjustment range of the output voltage and the capacity of the safety detecting circuit may be selected according to the rated working voltage and current loaded by the end of the the safety detecting circuit.

5 In an embodiment of the present disclosure, the power supply 100 is a direct-current power supply, an output modulatable range of which is 48 - 56 VDC. By performing voltage collection and current collection at an end of the the safety detecting circuit, the output voltage of the safety detecting circuit is automatically adjusted, where the adjustment range of the output voltage and the capacity of the safety detecting circuit may be selected according to the rated
10 working voltage and current loaded by the end of the the safety detecting circuit.

In an embodiment of the present disclosure, the controller 310 is electrically connected to the power supply 100 through a voltage-current monitoring circuit. The voltage-current monitoring circuit is shown in Figure 7, where a resistor R1 is electrically connected to the power supply 100, and an output end of the voltage-current monitoring circuit is electrically
15 connected to the controller 310. The voltage-current monitoring circuit functions on stabilizing voltage and current.

In an embodiment of the present disclosure, as shown in Figure 8, the voltage-current monitoring circuit may be installed in the power supply 100 and to perform functions on stabilizing voltage and current, and the output end of the voltage-current monitoring circuit is
20 electrically connected to the controller 310.

During operation, the elevator system has multiple preset operation modes. When the operation modes are switched, the main control device 400 transmits a signal indicating the switch of the operation modes to the controller 310, and the controller 310 controls the power supply 100 to supply electricity, in response to the electrical signal attenuation in the safety
25 detecting circuit. The preset operation modes include a standby mode, working mode, sleep mode and open mode.

Considering the overlong safety detecting circuit, there is a certain voltage drop in each detecting subunit 220, such that an actual output voltage of the power supply 100 could not be completely used for the elevator running circuit. The controller 310 needs to learn the respective
30 voltages of the preset operation modes in advance, to learn the output voltage or output current

of the power supply 100 in each preset mode.

In the standby mode, the contactor is inoperative, and the main control device 400 transmits a signal indicating the standby mode to the controller 310, the controller 310 controls the output voltage of the power supply 100 to be equal to the rated working voltage of the safety
5 detecting circuit, thereby maintaining the safety detecting circuit at a normal working voltage.

In the working mode, the main control device 400 transmits a signal indicating the working mode to the controller 310, the controller 310 controls the output voltage of the power supply 100 and accelerates the attraction between the first contactor 211 and the first contactor 212. In response to the attraction between the first contactor 211 and the first contactor 212, the main
10 control device 400 transmits a signal indicating the attraction of the the first contactor 211 and the first contactor 212 to the controller 310, the controller 310 controls the output voltage of the power supply 100 to be equal to the rated working voltage of the contactor according to a feedback voltage detected by the circuit connector 320, thereby reducing the heating power consumption of the contactor.

15 In the sleep mode, the main control device 400 transmits a signal indicating the sleep mode to the controller 310, the controller 310 controls the output voltage of the power supply 100 to be zero, thus to reduce stand-by power consumption and stand-by time of electronic elements in the safety detecting circuit, thereby prolonging the service life of the electronic elements.

In the open mode, the controller 310 controls the output voltage of the power supply 100 to
20 be the maximum output voltage thereof.

In response to the attraction of the contactor, the output voltage of the power supply 100 being the maximum output voltage thereof and the feedback voltage received by the controller 310 being the minimum feedback voltage, it indicates that the contact in the safety detecting circuit is seriously aged, and the main control device 400 will enter a locking mode after
25 completing the control of the present operation, waiting for maintenance personnel to service, thereby preventing the elevator from accidents due to the aging of the contact in the safety detecting circuit.

When a short-circuit fault occurs, the controller 310 locks the fault and notifies the main control device 400 through communication, and the locking can only be released by manual
30 reset, to restore the normal operation of the elevator, thereby improving the safety performance.

In an embodiment of the present disclosure, an optimal working voltage of the contactor is 48 V, an optimal working current is 100 mA. In the working mode, the output voltage of the power supply 100 is adjusted to 52 V, 4 V in which corresponds to the voltage attenuation due to the overlong safety detecting circuit.

5 In an embodiment of the present disclosure, based on the standby mode between 24:00 and 5:00 am, the contact state in the safety detecting circuit may be monitored at intervals of time. With data comparison, it can be judged in advance that there is a contact aging in the safety detecting circuit, thus avoiding accidents by early warning and fault detection. For example, through the learning of the voltage in the working mode, it is known that the output voltage of
10 the power supply 100 is 48 VDC and the current in the safety detecting circuit is 10 mA, while with actual detection, the output voltage is 48 VDC and the current in the safety detecting circuit is 5 mA, indicating that there is a hidden danger of aging contact in the safety detecting circuit and maintenance is need, which is beneficial to increasing the convenience of elevator maintenance and reducing the hidden danger of elevator accidents.

15 In other embodiments of the present disclosure, as shown in Figure 5, the circuit connector is provided with at least two connecting interfaces 321, where one connecting interface 321 is connected to a negative electrode of one detecting subunit 220.

In an embodiment of the present disclosure, the circuit connector is provided with a plurality of connecting interfaces 321, and the number of the connecting interface 321 is greater
20 than or equals to that of the detecting subunit 220, in which one connecting interface 321 is connected to a negative electrode of one detecting subunit 220 correspondingly, so as to feed back the output voltage or current of each detecting subunit 220 at its negative electrode to the controller 310, such that the controller 310 could control the output voltage of the power supply 100.

25 In embodiments of the present disclosure, “series connection” refers to electrical series connection, including but not limited to series connection realized by using wires such as cables.

In other embodiments of the present disclosure, the power supply 100 is an alternate-current power supply with a rectifying circuit electrically connected to the alternate-current power supply. It would be understood that the rectifying circuit is a circuit for
30 converting alternate-current electric energy into direct-current electric energy, so that the power

supply control device for an elevator provided in embodiments of the present disclosure is suitable for the alternate-current power supply and may be connected to an external power grid.

Embodiments of the present disclosure further provide an elevator system, including an elevator, a power supply control device for an elevator above and an elevator tractor system. The power supply control device above is beneficial to the elevator system to operate more stable, thereby providing reliable and good protection performance.

The power supply control device for an elevator and the elevator system provided in embodiments of the present disclosure is provided with the feedback control assembly which feeds back electrical signal attenuation in the safety detecting circuit to the controller 310, such that the controller 310 controls the power supply 100 to supply electricity at a suitable output voltage, which solves the problem of loop interference caused by the overlong safety detecting circuit, thereby improving the stability of the operation of the contactor.

The power supply control device for an elevator and the elevator system provided in embodiments of the present disclosure could be used for monitoring the consistency of the voltage of the safety detecting circuit, and judging the contact state of the detecting subunits, thereby improving the use safety and usage experience, and increasing user confidence in elevator products.

In addition, terms such as “first” and “second” are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or impliedly indicate quantity of the technical feature referred to. Thus, the feature defined with “first” and “second” may expressly or impliedly comprise one or more this feature. In the description of the present disclosure, “a plurality of” means at least two of this features, such as two, three, etc., unless specified otherwise.

In the present disclosure, unless specified or limited otherwise, the terms “mounted,” “connected,” “coupled,” “fixed” and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integrated connections; may also be mechanical or electrical connections; may also be direct connections or indirect connections via intervening structures; may also be inner communications of two elements or mutual interaction between two elements unless specified otherwise, which can be understood by those skilled in the art according to specific situations.

In the present disclosure, unless specified or limited otherwise, a structure in which a first feature is “on” or “below” a second feature may be an embodiment in which the first feature is in direct contact with the second feature, or an embodiment in which the first feature and the second feature are contacted indirectly via an intermediation. Furthermore,
5 a first feature “on,” “above,” or “on top of” a second feature may include an embodiment in which the first feature is right or obliquely “on,” “above,” or “on top of” the second feature, or just means that the first feature is at a height higher than that of the second feature; while a first feature “below,” “under,” or “on bottom of” a second feature may include an embodiment in which the first feature is right or obliquely “below,” “under,” or
10 “on bottom of” the second feature, or just means that the first feature is at a height lower than that of the second feature.

Reference throughout this specification to “an embodiment,” “some embodiments,” “one embodiment,” “another example,” “an example,” “a specific example,” or “some examples,” means that a particular feature, structure, material, or characteristic described in connection with
15 the embodiment or example is included in at least one embodiment or example of the present disclosure. Thus, the appearances of the phrases such as “in some embodiments,” “in one embodiment,” “in an embodiment,” “in another example,” “in an example,” “in a specific example,” or “in some examples,” in various places throughout this specification are not necessarily referring to the same embodiment or example of the present disclosure. Furthermore,
20 the particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples. Besides, any different embodiments and examples and any different characteristics of embodiments and examples may be combined by those skilled in the art without contradiction.

Although explanatory embodiments have been shown and described, it would be
25 appreciated by those skilled in the art that the above embodiments cannot be construed to limit the present disclosure, and changes, alternatives, and modifications can be made in the embodiments in the scope of the present disclosure.

WHAT IS CLAIMED IS:

1. A power supply control device for an elevator, comprising:

a power supply;

a safety detecting assembly, comprising a plurality of detecting subunits connected in series

5 in a safety detecting circuit, wherein the safety detecting circuit is electrically connected to the power supply;

an execution element, arranged in the safety detecting circuit; and

a feedback control assembly comprising a controller, wherein the controller is connected
between the safety detecting circuit and the power supply and configured to control the power
10 supply to supply electricity, in response to electrical signal attenuation in the safety detecting circuit.

2. The power supply control device for an elevator according to claim 1, wherein the
feedback control assembly further comprises a circuit connector provided with at least one
15 connecting interface, the connecting interface is electrically connected to the safety detecting circuit, and the controller is connected to the circuit connector.

3. The powersupply control device for an elevator according to claim 2, wherein the
circuit connector is provided with one connecting interface electrically connected to a
20 negative electrode of the last detecting subunit.

4. The power supply control device for an elevator according to claim 2, wherein the
circuit connector is provided with at least two connecting interfaces, wherein one
connecting interface is electrically connected to a negative electrode of one detecting
25 subunit.

5. The power supply control device for an elevator according to any one of claims 1 to
4, further comprising: a main control device communicated to each of the detecting
subunits.

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6. The power supply control device for an elevator according to any one of claims 2 to 4, wherein the controller is configured to detect, by the circuit connector, one or more of a voltage drop and a current drop in the safety detecting circuit.

5 7. The power supply control device for an elevator according to any one of claims 2 to 4, wherein the feedback control assembly further comprises an analog-digital converter connected between the circuit connector and the controller.

10 8. The power supply control device for an elevator according to any one of claims 1 to 4, wherein the execution element comprises a contactor configured to control an elevator running circuit to be on or off.

15 9. The power supply control device for an elevator according to claim 8, wherein the contactor is arranged in the safety detecting circuit.

20 10. The power supply control device for an elevator according to any one of claims 1 to 4, wherein the plurality of detecting subunits at least comprises a machine-room safety detecting unit, a hoistway safety detecting unit, a car-roof safety detecting unit, a front-car-door safety detecting unit, a rear-car-door safety detecting unit, a front-landing-door safety detecting unit, and a rear-landing-door safety detecting unit.

25 11. The power supply control device for an elevator according to claim 5, wherein a frequency converter is further arranged in the safety detecting circuit, the frequency converter is communicated to the main control device.

12. The power supply control device for an elevator according to any one of claims 1 to 4, wherein the execution element further comprises a main switch arranged in the safety detecting circuit.

30 13. The power supply control device for an elevator according to any one of claims 1

to 4, wherein the power supply is a direct-current power supply.

14. The power supply control device for an elevator according to any one of claims 1
to 4, wherein the power supply is an alternate-current power supply with a rectifying
5 circuit electrically connected to the alternate-current power supply.

15. An elevator system, comprising a power supply control device for an elevator
according to any one of claims 1 to 14.