STANDBY DEVICE FOR AIR-CONDITIONING SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to a standby device, and more particularly, to a standby device for an air-conditioning system.

BACKGROUND OF THE INVENTION

[0002] A conventional bus air-conditioning system comprises a panel controller and an air-conditioning equipment box. The air-conditioning equipment box is equipped with a relay, a blower drive module, a condenser fan drive module and a compressor drive module. When the bus driver sets the air-conditioning mode, temperature and air volume through the panel controller, the panel controller will send signals to the air-conditioning equipment box to control the rotational speeds of the fan of the condenser, the blower and the compressor to adjust the temperature and air volume of the air outlet.

[0003] However, when the conventional bus air-conditioning system is running, if the panel controller or the communication wire of the panel controller fails and is damaged, the bus air-conditioning system will stop immediately and cannot provide a comfortable riding environment for the driver and passengers. If it is in the standby state, the bus air-conditioning system cannot be actuated. This will make the driver or passengers feel uncomfortable due to high temperature and stuffiness, reducing the ride quality. If a tourist group is on the vehicle, the vehicle needs to be repaired or replaced in time, which will increase the cost of dispatching a vehicle greatly. Accordingly, the inventor of the present invention has devoted himself based on his many years of practical experiences to solve these problems.

SUMMARY OF THE INVENTION

[0004] The primary object of the present invention is to provide a standby device for an air-conditioning system, which can keep the air-conditioning system running when the controller or circuit of the air-conditioning system is damaged.

[0005] In order to achieve the above object, the present invention provides a standby device for an air-conditioning system. The standby device is installed in an air-conditioning system. The standby device comprises a control device. The control device is electrically

connected to the air-conditioning system. The control device includes a first controller, a second controller, and a predetermined air-conditioning mode. The control device, the first controller and the second controller are electrically connected.

[0006] In the standby device of the air-conditioning system provided by the present invention, when the first controller interrupts the operation of the air-conditioning system, the predetermined air-conditioning mode will be actuated automatically to keep the air-conditioning system running. When the first controller is disconnected in the standby state of the air-conditioning system, the second controller can be used to control the switch of the air-conditioning system to keep the air-conditioning system running.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is a schematic diagram showing the configuration of the system according to a preferred embodiment of the present invention, and

[0008] FIG. 2 is a block diagram of the system according to the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings.

[0010] FIG. 1 is a schematic diagram showing the configuration of the system according to a preferred embodiment of the present invention. FIG. 2 is a block diagram of the system according to the preferred embodiment of the present invention. The present invention discloses a standby device 100 for an air-conditioning system. The standby device 100 is installed in an air-conditioning system 201 of a vehicle 200. The vehicle 200 is a bus or a coach. The air-conditioning system 201 comprises an air conditioner 202 and an electrical equipment box 209. The air conditioner 202 includes a compressor 203, a condenser 204, and an evaporator 205. The compressor 203 is connected to the condenser 204. The condenser 204 is connected to the evaporator 205. A blower 206 is provided on one side of the evaporator 205. An air outlet 207 is disposed on the other side of the evaporator 205.

[0011] The standby device 100 of the air-conditioning system comprises a defrosting temperature sensor 10, an outdoor temperature sensor 20, an outdoor temperature sensor 30, and a control device 40.

[0012] The defrosting temperature sensor 10 is disposed in the evaporator 205, and is configured to detect the temperature of the evaporator 205 and output a signal of the temperature of the evaporator.

[0013] The indoor temperature sensor 20 is disposed inside the vehicle 200 for detecting the indoor temperature and outputting an indoor temperature signal.

[0014] The outdoor temperature sensor 30 is disposed outside the vehicle 200 for detecting the outdoor temperature and outputting an outdoor temperature signal.

[0015] The control device 40 is a main program control panel and is disposed in the electrical equipment box 209. The control device 40 is electrically connected to the air-conditioning system 201. The control device 40 includes a first controller 41, a second controller 42, a condensing fan drive control unit 43, a blower drive control unit 44, a compressor drive control unit 45, a temperature sensor control unit 46, and a predetermined air-conditioning mode 47. The control device 40, the first controller 41 and the second controller 42 are electrically connected. The first controller 41 is a panel controller and is located at the driving position of the vehicle 200. The first controller 41 is configured to set the air-conditioning mode, wind speed and temperature and send commands for air-conditioning mode setting, wind speed setting and temperature setting to the control device 40. The condensing fan drive control unit 43, the blower drive control unit 44 and the compressor drive control unit 45 control the rotational speeds of the fan of the condenser 204, the blower 206 and the compressor 203, respectively. The second controller 42 is an emergency standby manual switch and is located in the electrical equipment box 209. When the air-conditioning system 201 is on standby and the first controller 41 is disconnected or fails, the control device 40 will not start automatically. The driver can control the switch of the air-conditioning system 201 through the second controller 42 in the electrical equipment box 209. The temperature sensor control unit 46 will receive signals, such as the defrosting temperature of the defrosting temperature sensor 10, the indoor temperature of the indoor temperature sensor 20, the outdoor temperature of the outdoor temperature sensor 30. The defrosting temperature, the indoor temperature and the outdoor temperature are displayed on the first controller 41. The predetermined air-conditioning mode 47 is that when the first controller 41 or its circuit breaks down, the control device 40 will detect automatically. At this time, if the first controller 41 interrupts the operation of the air-conditioning system 201, the predetermined air-conditioning mode 47 will be actuated automatically to keep the air-conditioning system 201 running. The predetermined air-

conditioning mode is the preset air-conditioning mode when the product leaves the factory or the air-conditioning mode set by the first controller 41.

[0016] Please refer to FIG. 1 and FIG. 2. When the standby device 100 of the air-conditioning system is in use, the driver uses the first controller 41 to start the air-conditioning system 201 and set the air-conditioning mode, wind speed and temperature and send commands to the control device 40, so that the control device 40 controls the rotating speeds of the fan of the condenser 204, the blower 206 and the compressor 203, respectively. When the first controller 41 interrupts the operation of the air-conditioning system 201, the predetermined air-conditioning mode 47 will be actuated automatically to keep the air-conditioning system 201 running. When the air-conditioning system 201 is on standby and the first controller 41 is disconnected or fails, the control device 40 will not start automatically. At this time, the driver can control the switch of the air-conditioning system 201 through the second controller 42 in the electrical equipment box 209 via the control device 40 to make the air-conditioning system 201 run, and the predetermined air-conditioning mode 47 will be actuated automatically. Thereby, when the air-conditioning system 201 is running or on standby, the second controller 42 of the present invention can be used as a standby device for the control device 40 to be switched on/off when the first controller 41 is disconnected or failures, such that the air-conditioning system 201 is running and the driver can drive the vehicle to the maintenance site or vehicle replacement site, so as to provide a comfortable riding environment for the driver and passengers.

[0017] When in use, the standby device 100 of the air-conditioning system has a smart air-conditioning mode. The control device 40 will repeatedly, automatically adjust the operation mode of the air conditioner 202 and the blower 206 according to the outdoor temperature and the indoor temperature, and then adjust the set temperature and air volume of the air outlet 207. The present invention has the advantages of fuel saving, light power load and good comfort.

[0018] Although particular embodiments of the present invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the present invention. Accordingly, the present invention is not to be limited except as by the appended claims.

WHAT IS CLAIMED IS:

1. A standby device for an air-conditioning system, installed in an air-conditioning system, the standby device comprising:

a control device, the control device being electrically connected to the air-conditioning system, the control device including a first controller, a second controller and a predetermined air-conditioning mode, the control device, the first controller and the second controller being electrically connected.

2. The standby device as claimed in claim 1, wherein the air-conditioning system includes an electrical equipment box, the control device is a main program control panel and is disposed in the electrical equipment box, the first controller is a panel controller, and the second controller is an emergency standby manual switch and is located in the electrical equipment box.

3. The standby device as claimed in claim 1, wherein the air-conditioning system includes an air conditioner, the air conditioner includes a compressor, a condenser and a blower, the control device further includes a condensing fan drive control unit, a blower drive control unit and a compressor drive control unit, and the condensing fan drive control unit, the blower drive control unit and the compressor drive control unit controls the condenser, the blower and the compressor, respectively.

4. The standby device as claimed in claim 1, further comprising a defrosting temperature sensor, an indoor temperature sensor and an outdoor temperature sensor, wherein the control device further includes a temperature sensor control unit, and the temperature sensor control unit is electrically connected to the defrosting temperature sensor, the indoor temperature sensor and the outdoor temperature sensor.