CLAIMS

1. An alternating current (AC)/direct current (DC) common busbar (200), comprising:

a base plate (1), provided with at least one pair of bar bodies (2) which are detachable and arranged side-by-side, wherein a same side of each of the at least one pair of bar bodies (2) is connected to a copper bar group (4), and each copper bar group (4) comprises a plurality of copper bars arranged at intervals; characterized in that it further comprises

at least one pair of limiting protection structures (9), each of which is correspondingly mounted at a respective copper bar group (4),

wherein the limiting protection structure (9) is configured to be separable from a corresponding copper bar group (4) when the corresponding copper bar group (4) is in a use state, and is configured to be inserted into a gap between adjacent copper bars in a corresponding copper bar group (4) when the corresponding copper bar group (4) is in a non-use state;

wherein the limiting protection structure (9) comprises at least a clamping plate assembly,

wherein the clamping plate assembly comprises:

a plurality of first clamping plates (96) arranged at intervals, a first end of each of the first clamping plates (96) formed with a channel (94) respectively, each of the first clamping plates (96) configured to be inserted into the gap between adjacent copper bars when the corresponding copper bar group (4) is in the non-use state, and copper bars in a non-maintenance state configured to be correspondingly inserted into channels (94) of the first clamping plates (96) respectively when a corresponding copper bar is in a maintenance state; and

a partition plate (93), connected to a same end of each of the first clamping plates (96), and formed with a plurality of through holes (12) communicating with the channels (94) of the first clamping plates (96) respectively.

2. The AC/DC common busbar (200) of claim 1, wherein an inner wall of the first clamping plate (96) is formed with a snapping groove (106), each of outer sidewalls of the copper bar group (4) is formed with a positioning snapping block (11), and the copper bar in the non-maintenance state is configured to be inserted into the first clamping plate (96) and the positioning snapping block (11) of the copper bar in the non-maintenance state is assembled into the snapping groove (106).



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3. The AC/DC common busbar (200) of claim 2, wherein the limiting protection structure (9) further comprises at least a protection assembly,

wherein the protection assembly comprises:

a plurality of protection mechanisms (10) arranged at intervals, each of the protection mechanisms (10) comprising a strut (105), a protection spring (103) and a top block (102), the strut (105) having a first end inserted into the channel (94) of the first clamping plate (96) and connected to the top block (102) through the protection spring (103), and a second end passing through the through hole (12) of the partition plate (93) and extending outward; and

a top plate (101), connected to the second end of each strut (105).

4. The AC/DC common busbar (200) of claim 3, wherein a sidewall of the strut (105) is formed with a protective snapping block (104) configured to be assembled into the snapping groove (106) when the first clamping plate (96) is inserted in the gap between adjacent copper bars.

5. The AC/DC common busbar (200) of claim 1, wherein the clamping plate assembly further comprises:

at least a second clamping plate (97), having an end connected to the partition plate (93), and arranged between adjacent first clamping plates (96) with a gap with respect to each of the first clamping plates (96); and

a pair of stopping plates (95), connected to both ends of the partition plate (93) respectively and positioned on both sides of all of the first clamping plates (96).

6. The AC/DC common busbar (200) of any one of claims 1 to 5, wherein the limiting protection structure (9) further comprises:

at least one pair of collars (91), connected to a side of the partition plate (93) facing away from the first clamping plates (96);

a connection rod (8), detachably inserted into each of the collars (91);

a connection tube (5), fixedly connected to the base plate (1) between the bar bodies (2), an end of the connection tube (5) away from the base plate (1) fixedly connected to a connection nut (6); and



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a connection bolt (7), having a first end connected to the connection rod (8) and a second end assembled into the connection nut (6) through threads, and inserted into the connection tube (5) in an extensible and retractable manner.

7. The AC/DC common busbar (200) of any one of claims 1 to 5, wherein the bar body (2) is detachably connected to the base plate (1) through a fixing mechanism (3),

wherein the fixing mechanism (3) comprises:

a projection block (31), arranged on the base plate (1);

a pair of side plates (34), connected to the base plate (1) respectively and positioned on both sides of the projection block (31) respectively, to form, between the projection block (31) and the pair of side plates (34), a pair of mounting positions where the bar body (2) is disassembled and assembled;

a fixing nut (33), fixedly connected to the side plate (34); and

a limiting bolt (35), assembled into the fixing nut (33) through threads and connected to the bar body (2) at the mounting position through a limiting spring (32).

8. A method for detecting performance of a busbar, characterized in that the method detects performance of the AC/DC common busbar (200) of any one of claims 1 to 7, and comprises:

driving an inspection robot (100) to slide along a plurality of AC/DC common busbars (200) connected in sequence, and performing, by the inspection robot (100), a continuous detection at a joint of adjacent AC/DC common busbars (200), to obtain performance data,

wherein the performance data comprises at least one of:

at least one of voltage, current or power at the joint acquired by a bus performance sensor;

a plug-in torque at the joint acquired by a deformation sensor;

at least one of temperature or humidity at the joint acquired by a temperature and humidity sensor; or

image data at the joint acquired by an image acquisition mechanism and identifying obstacles around the AC/DC common busbar (200).

9. The method of claim 8, wherein the performance data further comprises:

communication state data at the joint acquired by a communication detection sensor.



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10. The method of claim 8 or 9, wherein the inspection robot (100) is in signal connection with a controller (400), and the method further comprises:

determining, by the controller (400), a navigation mode, and driving the inspection robot (100) to move through at least a tracked navigation mode or a trackless navigation mode.

11. The method of claim 10, wherein the controller (400) is connected to an emergency intervention module (405), and the method further comprises:

transmitting, by the inspection robot (100), the performance data to the controller (400);

analyzing, by the controller (400), the performance data, to obtain an analysis result; and

in response to the analysis result indicating that the performance data reaches a boundary of preset early warning parameters or exceeds a range of the preset early warning parameters, starting the emergency intervention module (405) to correct deviation.

12. A system comprising the AC/DC common busbar (200) of anyone of claims 1 to 7 and a device for detecting performance of the AC/DC common busbar (200), wherein the device comprises:

a controller (400); and

an inspection robot (100), in signal connection with the controller (400), slidable along a length direction of the AC/DC common busbar (200), capable of passing through a joint of adjacent AC/DC common busbars (200) during sliding, and comprising a bus performance sensor, a temperature and humidity sensor, a deformation sensor and an image acquisition mechanism.



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