converters. For example, some variations of an energy storage unit do not have a capacitor bank, and some may be without a DC-DC converter.

Each DC supply unit 9 is at one end arranged to be connected with the main DC bus 3 and at its other end it is arranged to be connected to a power provision internal bus such as the drive unit bus system or the energy storage unit bus system. A DC supply unit 9 may form part of a power provision unit. Alternatively, a DC supply unit may be an external component which can be connected to a power provision unit.

Examples of the DC supply unit 9 will now be described with reference to Figs 2a-c.

Fig. 2a depicts a schematic diagram of a first example of a DC supply unit 9. DC supply unit 9-1 comprises a first conductor 16-1, a second conductor 16-2, a first current blocking device 17~~19~~, and a first switching unit 21.

The first current blocking device 17 can for example be a passive current blocking device such as a diode. Furthermore, depending on the power rating of the DC supply system in which the DC supply unit 9-1 is used, further current blocking devices may be arranged in parallel with the first current blocking device, e.g. a plurality of diodes may be parallel connected to be able to handle high currents.

The first switching unit 21 may for instance comprise one or more insulated gate bipolar transistors (IGBT).

The first current blocking device 17 is arranged to allow current to flow in a first direction 19-1 through the first current blocking device 17. The first direction 19-1 is the flow direction of current during normal operation of the DC supply network to which the DC supply unit 9-1 may be connected. In this sense, normal operation is the operational state of the DC supply network when no fault is present in the DC supply network, such fault being external to the DC supply unit 9-1 and external to the drive unit to which the DC supply unit 9-1 may be connected. Typically during normal operation, the

CLAIMS

1. A DC supply unit (9-1; 9-2; 9-3) for~~which at one end is arranged to be connected to a DC supply network and which at its other end is arranged to be connected to~~ a power provision unit (D1; D2; E) for use in a DC supply network (1)~~internal bus~~, wherein the DC supply unit (9-1; 9-2; 9-3) comprises:

a first current blocking device (17) arranged to allow current to flow in a first direction (19-1) through the first current blocking device (17), which first direction (19-1) is the flow direction of current during normal operation of the DC supply network (1), and to block current that flows in a second direction (19-2) opposite the first direction, and

a first switching unit (21) arranged in anti-parallel connection with the first current blocking device (17), wherein the first switching unit (21) is controllable ~~in its on-state state~~ to selectively be set in an on-state~~allow reverse current~~ during normal operation to allow reverse current~~of the DC supply network~~ to flow through the first switching unit (21) in the second direction (19-2) so as to bypass the first current blocking device (17) and in an off-state to block current in the second direction (19-2) when a fault occurs in the DC supply network.

2. The DC supply (9-1; 9-2; 9-3) as claimed in claim 1, comprising a first conductor (16-1) and a second conductor (16-2) for connecting the DC supply unit (9-1; 9-2; 9-3) to the DC supply network (3) and to the power provision unit (D1; D2; E), wherein each of the first current blocking device (17) and the first switching unit (21) has a respective input terminal (17-1, 21-1) and output terminal (17-2, 21-2) connected to the second conductor (16-2).

3. The DC supply unit (9-1; 9-2; 9-3) as claimed in any of the preceding claims, wherein the first current blocking device (17) is a passive current blocking device.

4. The DC supply unit (9-1; 9-2; 9-3) as claimed in claim 3, wherein the first current blocking device (17) is a diode.