

CLAIMS

1. A power distribution assembly 11 for use with at least one computer in
5 a data centre comprising:
at least one controller 14 comprising at least one heat sensitive
component 16; and
at least one cooling arrangement 17 comprising a casing 18
configured to contain a coolant 19, at least a portion of the coolant 19
10 being configured to come into contact with at least part of the controller
and/or at least one component 16 for transferring heat away from the
at least one controller 14 and/or at least one component 16 towards at
least one wall of the casing 18.
2. A power distribution assembly, wherein at least part of the casing 18
15 is separate and distinct from an external wall of the power distribution
assembly support structure 12.
3. A power distribution assembly according to any preceding claim,
wherein the controller 14 and/or component 16 is substantially
immersed in the coolant 19.
- 20 4. A power distribution assembly according to any preceding claim,
wherein, in use, the amount of coolant 19 contained within the casing
18 remains constant.
5. A power distribution assembly according to any preceding claim,
wherein the coolant 19 is hermetically sealed within the casing 18.
- 25 6. A power distribution assembly according to any preceding claim,

wherein the coolant 19 is a non-electrically conductive fluid.

7. A power distribution assembly according to any preceding claim,
wherein the coolant 19 is a mineral oil.

5 8. A power distribution assembly according to any preceding claim,
wherein the at least one wall of the casing 18 comprises a thermally
conductive material.

9. A power distribution assembly according to any preceding claim,
wherein at least one wall of the casing 18 comprises at least one
protrusion 23, 24 that extends away from the internal and/or external
10 surface so as to increase the surface area of the casing 18 wall.

10.A power distribution assembly according to any preceding claim,
wherein a heat sink is located in thermal communication with at least
a portion of the at least one wall of the casing 18.

11.A power distribution assembly according to any preceding claim,
15 wherein an electrical transfer means 26 is configured to pass through
a wall of the casing 18 via a fluid tight seal 27.

12.A power distribution assembly according to any preceding claim,
further comprising a fluid agitator for increasing the flow of the coolant
within the casing.

20 13.A power distribution assembly according to claim 12, wherein the fluid
agitator comprises a fluid pump.

14.A power distribution assembly according to any preceding claim,
wherein in use the operational temperature at the controller 14 and/or
component 16 is of a value that is less than the boiling point of the

coolant 19.

15.A power distribution assembly according to any preceding claim, wherein there is provided a user interface to enable operation of the controller.

5 16.A power distribution assembly according to claim 15, wherein an electrical transfer means extends between the user interface 15 and the controller 14 so as to provide electrical communication between the user interface 15 and the controller 15, whereby at least a portion of the electrical transfer means passes through the coolant 19.

10 17.A power distribution assembly according to claim 15 or claim 16, further comprising at least one connector located on the user interface 15 to permit access and control of the controller 14 from a remote location.

15 18. A power distribution assembly according to claim 17, wherein the connector comprises a RJ45 connection cable or USB.

19.A power distribution assembly according to any of claims 15 to 18, wherein the user interface 15 is positioned adjacent to the casing 18 and a thermally insulating layer 28 is configured intermediate the external surface of the casing 18 and the user interface 15.

20 20.A power distribution assembly according to claim 19, wherein the combination of the cooling arrangement 17, the controller 14 and the user interface 15 is located within an aperture in a support structure.

21.A method of cooling for use with a computer powered by a power distribution assembly, the power distribution assembly 11 having at

- least one casing 19 for containing at least one controller 14 comprising at least one heat sensitive component 16 and a coolant 19, at least a portion of the at least controller 14 and/or at least one component 16 configured to come into contact with the coolant 19, the method comprising:
- 5 transferring heat away from the at least one controller 14 and/or at least one component 16 to at least one wall of the casing 18 via the coolant 19.
22. A method according to claim 21, wherein the at least one controller 14 and/or at least one component 16 is immersed in the coolant 19.
- 10 23. A method according to claim 21 or claim 22, comprising hermetically sealing the coolant 19 within the casing 18.
24. A method according to any of claims 21 to 23, wherein at least one wall of the casing 18 comprises thermally conductive material, the method further comprising conducting thermal energy from the interior of the casing 18 to the exterior of the casing 18 via the thermally
- 15 conducting material.
25. A method according to claim 24, further comprising removing thermal energy from at least one wall of the casing by thermally coupling the at least one wall of the casing 18 to at least one heat sink.
- 20 26. A method according to any of claims 21 to 25, further comprising agitating the coolant to increase the transfer of thermal energy from the at least one controller 14 and/or at least one component 16 to the casing via the coolant 19.

27. A server comprising at least one computer and at least one power distribution assembly 11 according to any of claims 1 to 20.

28. A data centre comprising at least one server according to claim 27.