

Claims

1. A modular isolator apparatus comprising:
 - an isolator comprising a housing, having an opening therein, and an isolator coupling member disposed around the opening;
 - at least one functional unit comprising a functional unit coupling member configured to reversibly couple with the isolator coupling member, thereby reversibly coupling the functional unit and the isolator;
 - at least one sealing member, configured to create an airtight seal between the isolator and functional unit coupling members when they are coupled; and
 - at least one locking member, configured to secure the functional unit to the isolator when the isolator and functional unit are coupled;characterised in that when the functional unit is not secured to the isolator it is removable therefrom.
2. The modular isolator apparatus according to claim 1, wherein the at least one locking member comprises at least one first lock, wherein the or each first lock is configured to be controlled by a user.
3. The modular isolator apparatus according to claim 2, wherein the at least one locking member comprises a plurality of spaced apart first locks, and the plurality of spaced apart first locks consists of between 2 and 10 first locks.
4. The modular isolator apparatus according to either claim 2 or claim 3, wherein the or each first lock is a cam lock and is disposed on the isolator.
5. The modular apparatus according to any one of claims 2 to 4, wherein the at least one locking member comprises at least one second lock, wherein the apparatus comprises an isolator controller, and the isolator controller is configured to control the or each second lock.
6. The modular isolator apparatus according to claim 5, wherein the at least one locking member comprises a plurality of spaced apart second locks, and the plurality of spaced apart second locks consists of between 2 and 10 second locks.

7. The modular isolator apparatus according to either claim 5 or claim 6, wherein the or each second lock is a pneumatic lock and is disposed on the isolator.
8. The modular isolator apparatus according to any one of claims 5 to 7, wherein
5 the apparatus comprises at least one sensing units connected to the isolator controller, wherein the at least one sensing units are configured to sense when the functional unit is coupled to the isolator and/or to sense when the or each first lock is locked.
9. The modular isolator apparatus according to claim 8, wherein the isolator
10 controller is configured to engage the at least one second lock when the at least one sensing units sense that the functional unit is coupled to the isolator and/or the or each first lock is locked.
10. The modular isolator apparatus according to any one of claims 5 to 9, wherein
15 the isolator controller is configured to not disengage the at least one second lock until a user input confirms that the isolator has been fully cleaned.
11. The modular isolator apparatus according to any preceding claim, wherein the
20 isolator coupling member comprises an isolator collar, wherein the isolator collar comprises a first side, configured to contact a first side of the functional unit coupling member, a second, internal side, disposed substantially adjacent to the opening.
12. The modular isolator apparatus according to claim 11, wherein the functional
25 unit coupling member comprises a functional unit collar disposed on the first side of the functional unit coupling member.
13. The modular isolator apparatus according to claim 12, wherein the functional
unit collar is configured to sit within the isolator collar.
- 30 14. The modular isolator apparatus according to any one of claims 11 to 13, wherein the apparatus comprises a first sealing member, which is disposed on an internal side of the isolator collar.
15. The modular isolator apparatus according to claim 14, wherein the first sealing
35 member is an inflatable seal or vacuum inflatable seal, wherein the apparatus

comprises an isolator controller, and the isolator controller is configured to inflate or deform the seal. .

16. The modular isolator apparatus according to any one of claims 11 to 15, wherein
5 a second sealing member is disposed on the first side of the isolator coupling member, and is preferably an O-ring.

17. The modular isolator apparatus according to any preceding claim, wherein the
10 apparatus comprises an isolator controller and the isolator controller is configured to power down the apparatus, wherein the isolator controller is configured to not initiate powering down of the apparatus until a user has confirmed that the isolator has been cleaned.

18. The modular isolator apparatus according to any preceding claim, wherein the
15 apparatus comprises at least one guide member configured to guide the functional unit into a desired position on the coupling member.

19. The modular isolator apparatus according to any preceding claim, wherein the
20 at least one functional unit comprises a functional unit comprising a panel and the functional unit coupling member is disposed around the edge of the panel.

20. The modular isolator apparatus according to claim 19, wherein the functional
unit comprises one or more of a rapid transfer port (RTP), a bag-out port and/or a flexible isolator port disposed in the panel.

21. The modular isolator apparatus according to any preceding claim, wherein the
25 at least one functional unit comprises a pass-through hatch end airlock functional unit comprising a housing defining a chamber therein, wherein the chamber is configured to allow a user access to the chamber from outside of the isolator.

22. The modular isolator apparatus according to any preceding claim, wherein the
30 at least one functional unit comprises at least one functional unit configured to reversibly connect the isolator to a second isolator, wherein the at least one functional unit configured to connect the isolator to a second isolator comprises a first functional unit coupling member configured to reversibly couple with a first isolator coupling

member on a first isolator, and a second functional unit coupling member configured to reversibly couple with a second isolator coupling member on the second isolator.

23. The modular isolator apparatus according to claim 22, wherein the at least one
5 functional unit configured to reversibly connect the first isolator to the second isolator comprises a conduit extending between the first and second isolator coupling members.

24. The modular isolator apparatus according to claim 23, wherein the functional
10 unit comprises a panel extending across the conduit, and the panel comprises one or more of a rapid transfer port, a bag-out port and/or a HEPA filter.

25. The modular isolator apparatus according to any one of claims 22 to 24,
wherein the at least one functional unit configured to reversibly connect the isolator to
a second isolator comprises a centre isolator to isolator pass hatch airlock functional
15 unit comprising a housing defining a chamber therein, wherein the chamber is configured to reversibly connect the first and second isolators and to allow a user access to the chamber from outside of the isolators.

26. An isolator comprising:
20 - a housing, having an opening therein, and an isolator coupling member disposed around the opening, the isolator coupling member being configured to couple with a functional unit coupling area, and thereby couple the isolator to a functional unit;
- at least one sealing member, disposed on the isolator coupling member and
25 being configured to create an airtight seal between the isolator and functional unit coupling members when they are coupled; and
- at least one locking member, configured to secure the functional unit to the isolator when the isolator and functional unit are coupled;
characterised in that the isolator may be disconnected from the functional unit.

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