CLAIMS

1. An electrical room housing electrical and electronic apparatus for operating and controlling electrical motors of an industrial equipment, the electrical room comprising:

a cooling device for cooling the electrical room, which the cooling device is operated dependent on at least one temperature measurement, the cooling device comprising:

a first heat exchanger for cooling air in the electrical room, which the first heat exchanger is arranged with a first set of channels through which is conducted a first flow of air drawn from an inside of the electrical room, and

an enclosure housing the first heat exchanger, the enclosure having an outlet for returning the first flow of air to the inside of the electrical room,

wherein the first flow of air from inside the electrical room is circulated through the enclosure of the cooling device and returned to the electrical room in a closed loop, and wherein an air temperature in the electrical room is controlled dependent on a setpoint of between 24-40°C. for the at least one temperature measurement inside the electrical room,

characterised in that

the enclosure of the cooling device is arranged with at least one second heat exchanger positioned in the first flow of air from the inside of the electrical room, the at least one second heat exchanger being connected to at least one third heat exchanger arranged outside of the electrical room,

wherein the first flow of the air passes through the first heat exchanger, the at least one second heat exchanger and the outlet of the cooling device.

2. The electrical room according to claim 1, characterised in that the first heat exchanger is an air-to-air heat exchanger arranged with a second set of channels, which the second set of channels are in thermal contact with the first set of channels arranged in the air-to-air heat exchanger, through the second set of channels is conducted a second flow of air drawn from the outside of the electrical room.

3. The electrical room according to claim 2, characterised in that the first set of channels and the second set of channels in the first heat exchanger are arranged such that the first flow of air in the first set of channels flow in the first heat exchanger is conducted in a direction counter to a direction of the second flow of air in the second set of channels.

4. The electrical room according to claim 1, characterised in that the at least one second heat exchanger comprises two or more evaporator coils each containing a heat transfer fluid and each connected to a respective one of the at least one third heat exchangers.

5. The electrical room according to claim 4, characterised in that the two or more evaporator coils comprised in the at least one second heat exchanger are each connected to the respective one of two or more third heat exchangers which are arranged with control switches such that only a selected one of the two or more evaporator coils is cooled.

6. The electrical room according to claim 1, characterised in that the cooling device is arranged connected with an insulated air collecting space into which the first flow of air from the electrical room is conducted after cooling of the first flow of air.

7. The electrical room according to claim 6, characterised in that the insulated air collecting space is arranged under a floor of the electrical room and the cooled first flow of air is maintained at an overpressure relative to an air pressure in the electrical room.

8. The electrical room according to claim 1, characterised in that the cooling device is arranged with two or more air pressurising devices for conducting the first flow of air and the second flow of air into contact with the first heat exchanger.

9. The electrical room according to claim 8, characterised in that the cooling device is arranged with control switches for controlling at least the two or more air pressurising devices and the at least one third heat exchanger so that the air temperature in the electrical room is controlled dependent on a setpoint of between 35-40°C. for the at least one temperature measurement in the electrical room.

10. The electrical room according to claim 1, characterised in that the electrical room is constructed from a shipping container or a freight container.

11. A method for cooling an electrical room housing electrical and electronic apparatus for operating and

controlling electric motors of an industrial equipment, the electrical room comprising a cooling device for cooling the electrical room, which the cooling device is operated dependent on at least one temperature measurement, the cooling device comprising a first heat exchanger for cooling air in the electrical room, which the first heat exchanger is arranged with a first set of channels, and an enclosure housing the first heat exchanger, the enclosure having an outlet for returning the air to an inside of the electrical room, wherein the enclosure of the cooling device is arranged with at least one second heat exchanger, the method comprising

conducting a first flow of air from the inside of the electrical room through the first heat exchanger and returning the first flow of air to the electrical room in a closed loop, and

controlling an air temperature in the electrical room dependent on a setpoint of between 24-40°C. for the at least one temperature measurement inside the electrical room,

characterised by

further conducting the first flow of air past the at least one second heat exchanger which is connected to at least one third heat exchanger arranged outside of the electrical room,

wherein the first flow of the air passes through the first heat exchanger, the at least one second heat exchanger and the outlet of the cooling device.

12. The method according to claim 11, characterised in that the first heat exchanger is an air-to-air heat exchanger arranged with a second set of channels, and characterised by conducting a second flow of air from the

outside of the electrical room through the second set of channels of the first heat exchanger.

13. The method according to claim 12, characterised by conducting the first flow of air through the first set of channels and conducting the second flow of air through the second set of channels in the first heat exchanger such that the direction of the first flow of air is counter to a direction of the second flow of air.

14. The method according to claim 11, characterised by the conducting the first flow of air past two or more evaporator coils comprised in the at least one second heat exchanger and by switching on and operating a respective one of the at least one third heat exchangers to cool a heat transfer medium circulating from a selected one of the two or more evaporator coils.

15. The method according to claim 11, characterised by conducting the first flow of air past the first heat exchanger of the cooling device after cooling the air and into an insulated air collecting space in a lower part of the electrical room.

16. The method according to claim 15, characterised in that the insulated air collecting space is arranged under a floor of the electrical room, and characterised by conducting the first flow of air after cooling the first flow of air into the insulated air collecting space and maintaining the cooled air at an overpressure compared to an air pressure in a remainder of the electrical room.

17. The method according to claim 11, characterised in

that the cooling device is arranged with two or more air pressurising devices and by operating the two or more air pressurising devices and so conducting the first flow of air and the second flow of air into contact with the first heat exchanger.

18. The method according to claim 17, characterised in that the cooling device is arranged with control switches for controlling at least the two or more air pressurising devices and by operating one or more control switches for controlling the at least two or more air pressurising devices and the at least one third heat exchanger and controlling the air temperature in the electrical room dependent on a setpoint of between 35-40°C. for the at least one temperature measurement in the electrical room.

19. A computer program provided on a non-transitory computer readable medium comprising computer code and/or computer software means which, when fed into a computer, will make the computer carry out a method for cooling an electrical room housing electrical and electronic apparatus for operating and controlling electric motors of an industrial equipment, the electrical room comprising a cooling device for cooling the electrical room, which the cooling device is operated dependent on at least one temperature measurement, the cooling device comprising a first heat exchanger for cooling air in the electrical room, which the first heat exchanger is arranged with a first set of channels, and an enclosure housing the first heat exchanger, the enclosure having an outlet for returning the air to an inside of the electrical room, wherein the enclosure of the cooling device is arranged

with at least one second heat exchanger, the method comprising

conducting a first flow of air from the inside of the electrical room through the first heat exchanger and returning the first flow of air to the electrical room in a closed loop, and

controlling an air temperature in the electrical room dependent on a setpoint of between 24-40°C. for the at least one temperature measurement inside the electrical room,

characterised by

further conducting the first flow of air past the at least one second heat exchanger which is connected to at least one third heat exchanger arranged outside of the electrical room,

wherein the first flow of the air passes through the first heat exchanger, the at least one second heat exchanger and the outlet of the cooling device.

20. A non-transitory computer readable medium comprising a computer program which when read into a computer or processor will cause the computer or processor to carry out a method for cooling an electrical room housing electrical and electronic apparatus for operating and controlling electric motors of an industrial equipment, the electrical room comprising a cooling device for cooling the electrical room, which the cooling device is operated dependent on at least one temperature measurement, the cooling device comprising a first heat exchanger for cooling air in the electrical room, which the first heat exchanger is arranged with a first set of channels, and an enclosure housing the first heat exchanger, the enclosure having an outlet for returning the air to an inside of the electrical room,

wherein the enclosure of the cooling device is arranged with at least one second heat exchanger, the method comprising

conducting a first flow of air from the inside of the electrical room through the first heat exchanger and returning the first flow of air to the electrical room in a closed loop, and

controlling an air temperature in the electrical room dependent on a setpoint of between 24-40°C. for the at least one temperature measurement inside the electrical room,

characterised by

further conducting the first flow of air past the at least one second heat exchanger which is connected to at least one third heat exchanger arranged outside of the electrical room,

wherein the first flow of the air passes through the first heat exchanger, the at least one second heat exchanger and the outlet of the cooling device.

21. An industrial installation comprising an electrical room housing electrical and electronic apparatus for operating and controlling electrical motors of an industrial equipment, the electrical room comprising

a cooling device for cooling the electrical room, which the cooling device is operated dependent on at least one temperature measurement, the cooling device comprising:

a first heat exchanger for cooling air in the electrical room, which the first heat exchanger is arranged with a first set of channels through which is conducted a first flow of air drawn from an inside of the electrical room, and

an enclosure housing the first heat exchanger, the enclosure having an outlet for returning the first flow of air to the inside of the electrical room,

wherein the first flow of air from inside the electrical room is circulated through the enclosure of the cooling device and returned to the electrical room in a closed loop, and wherein an air temperature in the electrical room is controlled dependent on a setpoint of between 24-40°C. for the at least one temperature measurement inside the electrical room

characterised in that

the enclosure of the cooling device is arranged with at least one second heat exchanger positioned in the first flow of air from the inside of the electrical room, the at least one second heat exchanger being connected to at least one third heat exchanger arranged outside of the electrical room,

wherein the first flow of the air passes through the first heat exchanger, the at least one second heat exchanger and the outlet of the cooling device.

CLAIMS

1. An electrical room (15) housing electrical and electronic apparatus (16) for operating and controlling electrical motors of an industrial equipment (9), the electrical room comprising

a cooling device (25) for cooling the electrical room, which cooling device is operated dependent on at least one temperature measurement, the cooling device comprising

a first heat exchanger (30) for cooling air in the electrical room, which first heat exchanger is arranged with a first set of channels through which is conducted a first flow of air (W_1) drawn from inside the electrical room,

wherein the air (W_1) from inside the electrical room is circulated through the first heat exchanger (30) of the cooling device and returned (C_1) to the electrical room in a closed loop, and wherein the air temperature in the electrical room is controlled dependent on a setpoint of between 24-40°C for at least one temperature measurement inside the electrical room,

characterised in that

the cooling device (25) is arranged with at least one second heat exchanger (31) positioned in the flow of air (W_1, C_1) from inside the electrical room (15), the at least one second heat exchanger being connected to at least one third heat exchanger (22) arranged outside of the electrical room.

2. The electrical room (15) according to claim 1, **characterised** in that the first heat exchanger (30) is an air-to-air heat exchanger arranged with a second set of channels, which second channels are in thermal contact with the first set of channels arranged in the air-to-air heat exchanger, through which channels is conducted a second flow of air (C_2) drawn from outside the electrical room (15).

3. The electrical room (15) according to claim 1, **characterised** in that the at least one second heat exchanger (31) comprises

two or more evaporator coils each containing a heat transfer fluid and each connected to one of the at least one third heat exchangers (22).

4. The electrical room (15) according to claim 3, **characterised** in that two or more evaporator coils comprised in the at least one second heat exchanger (31) are each connected to one of two or more third heat exchangers (22) which are arranged with control switches such that only a selected one of the two or more evaporator coils is cooled.

5. The electrical room (15) according to claim 2, **characterised** in that the first channels and the second channels in the first heat exchanger (30) are arranged such that the first flow of air (W_1) in the first channels flow in the first heat exchanger is conducted in a direction counter to the direction of the second flow of air (C_2) in the second channels.

6. The electrical room (15) according to claim 1, **characterised** in that the cooling device (25) is arranged connected with an insulated air collecting space (27) into which the air from the electrical room is conducted after cooling (C_1).

7. The electrical room (15) according to claim 1, **characterised** in that the insulated air collecting space (27) is arranged under a floor (28) of the electrical room and the cooled air (C_1) is maintained at an overpressure relative to the air pressure in the electrical room.

8. The electrical room (15) according to claim 1, **characterised** in that the cooling device is arranged with two or more air pressurising devices (40, 42) for conducting the first flow of air (W_1) and the second flow of air (C_2) into contact with the first heat exchanger (30) or air-to-air heat exchanger.

9. The electrical room (15) according to claim 1, **characterised** in that the cooling device is arranged with control switches for controlling at least the two or more air pressurising devices (40, 42) and the at least one third heat exchanger (22) arranged controlled dependent on a setpoint of between 35-40°C for a temperature measurement (T_5) in the electrical room.

10. The electrical room (15) according to claim 1, **characterised** in that the electrical room is constructed from a shipping container or freight container.

11. A method for cooling an electrical room (15) housing electrical and electronic apparatus (16) for operating and controlling electric motors of an industrial equipment (9), the electrical room comprising a cooling device (25) for cooling the electrical room, which cooling device is operated dependent on at least one temperature measurement, the cooling device comprising a first heat exchanger (30) for cooling air in the electrical room, which first heat exchanger is arranged with a first set of channels, and wherein the cooling device is arranged with at least one second heat exchanger (31), the method comprising

conducting a first flow of air (W_1) from inside the electrical room through the first heat exchanger (30) and returning it (C_1) to the electrical room in a closed loop, and

controlling the air temperature in the electrical room dependent on a setpoint of between 24-40°C for at least one temperature measurement inside the electrical room,

characterised by

further conducting the first flow of air (W_1, C_1) past the at least one second heat exchanger (31) which is connected to at least one third heat exchanger (22) arranged outside of the electrical room (15).

12. The method according to claim 10, **characterised** in that the first heat exchanger (30) is an air-to-air heat exchanger arranged with a second set of channels, and by conducting a second flow of air (C_2) from outside the electrical room through the second set of channels of the first heat exchanger (30).

13. The method according to claim 11, **characterised** by the conducting the first flow of air (W_1) past two or more evaporator coils comprised in the at least one second heat exchanger (31) and by switching on and operating one of the at least one third heat exchangers (22) to cool a heat transfer medium circulating from a selected one of the two or more evaporator coils.

14. The method according to claim 11, **characterised** by conducting the first flow of air (W_1) through the first channels and conducting the second flow of air (C_2) through the second channels in the first heat exchanger (30) such that the direction of the first flow is counter to the direction of the second flow.

15. The method according to claim 11, **characterised** by conducting the first flow of air past the first heat exchanger (30) of the cooling device after cooling (C_1) and into an insulated air collecting space (27) in the lower part of the electrical room.

16. The method according to claim 11 or 15, **characterised** in that the insulated collecting space (27) is arranged under a floor (28) of the electrical room and by conducting the first flow of air after cooling (C_1) into the insulated air collecting space (27) and maintaining the cooled air at an overpressure compared to the air pressure in the remainder of the electrical room.

17. The method according to claim 11, **characterised** in that the cooling device is arranged with two or more air pressurising devices (40, 42) and by operating the two or more air pressurising devices (40, 42) and so conducting the first flow of air (W_1) and the second flow of air (C_2) into contact with the first heat exchanger (30) or air-to-air heat exchanger.

18. The method according to claim 17, **characterised** in that the cooling device is arranged with control switches for controlling at least the two or more air pressurising devices (40, 42) and by operating one or more control switches for controlling the at least two or air more pressurising devices (40, 42) and the at least one third heat exchanger (22) and controlling the air temperature in the electrical room dependent on a setpoint of between 35-40°C for a temperature measurement (T_5) in the electrical room.

19. A computer program arranged for cooling an electrical room (15) housing electrical and electronic apparatus (16) for operating and controlling electrical motors of an industrial equipment (9), the computer program comprising computer code and/or computer software means which, when fed into a computer, will make the computer carry out the method according to claims 11-18.

20. A computer readable medium comprising a computer program which when read into a computer or processor will cause the computer or processor to carry out a method according to the steps of any of claims 11-18.

21. An industrial installation comprising an electrical room (15) housing electrical and electronic apparatus (16) for operating and controlling electrical motors of an industrial

equipment (9), the electrical room comprising

a cooling device (25) for cooling the electrical room, which cooling device is operated dependent on at least one temperature measurement, the cooling device comprising

a first heat exchanger (30) for cooling air in the electrical room, which first heat exchanger is arranged with a first set of channels through which is conducted a first flow of air (W1) drawn from inside the electrical room,

wherein the air (W1) from inside the electrical room is circulated through the first heat exchanger (30) of the cooling device and returned (C1) to the electrical room in a closed loop, and wherein the air temperature in the electrical room is controlled dependent on a setpoint of between 24-40°C for at least one temperature measurement inside the electrical room

characterised in that

the cooling device (25) is arranged with at least one second heat exchanger (31) positioned in the flow of air (W_1, C_1) from inside the electrical room (15), the at least one second heat exchanger being connected to at least one third heat exchanger (22) arranged outside of the electrical room.