CPC  COOPERATIVE PATENT CLASSIFICATION

F  MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
(NOTE omitted)

LIGHTING; HEATING

F25  REFRIGERATION OR COOLING; COMBINED HEATING AND REFRIGERATION SYSTEMS; HEAT PUMP SYSTEMS; MANUFACTURE OR STORAGE OF ICE; LIQUEFACTION SOLIDIFICATION OF GASES

F25B  REFRIGERATION MACHINES, PLANTS OR SYSTEMS; COMBINED HEATING AND REFRIGERATION SYSTEMS; HEAT-PUMP SYSTEMS (evaporation or evaporation apparatus for physical or chemical purposes, e.g. evaporation of liquids for gas phase reactions B01B 1/005); heat-transfer, heat-exchange or heat-storage materials, e.g. refrigerants, or materials for the production of heat or cold by chemical reactions other than by combustion C09K 5/00; pumps, compressors F04; use of heat-pumps for domestic- or space-heating or for domestic hot-water supply F24D; air-conditioning, air-humidification F24F; fluid heaters using heat pumps F24H)

NOTES
1. Attention is drawn to Note (2) following the title of subclass F24F.
2. When classifying heat pump circuits or systems, groups F25B 1/00 - F25B 25/00 and F25B 29/00 take precedence over group F25B 30/00.

WARNING
In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Compression machines, plant, or systems

1/00  Compression machines, plant, or systems with non-reversible cycle (F25B 3/00, F25B 5/00, F25B 6/00, F25B 7/00, F25B 9/00 take precedence)
1/005 . of the single unit type (F25B 1/10 takes precedence)
1/02 . with compressor of reciprocating-piston type (F25B 1/005, F25B 1/10 take precedence)
1/04 . with compressor of rotary type (F25B 1/005, F25B 1/10 take precedence)
1/047 . of screw type
1/053 . of turbine type
1/06 . with compressor of jet type, e.g. using liquid under pressure (F25B 1/005, F25B 1/10 take precedence)
1/08 . using vapour under pressure
1/10 . with multi-stage compression (with cascade operation F25B 7/00)

3/00  Self-contained rotary compression machines, i.e. with compressor, condenser, and evaporator rotating as a single unit

5/00  Compression machines, plant, or systems, with several evaporator circuits, e.g. for varying refrigerating capacity (with cascade operation F25B 7/00)
5/02 . arranged in parallel
5/04 . arranged in series

6/00  Compression machines, plant, or systems, with several condenser circuits
6/02 . arranged in parallel
6/04 . arranged in series

7/00  Compression machines, plant, or systems, with cascade operation, i.e. with two or more circuits, the heat from the condenser of one circuit being absorbed by the evaporator of the next circuit (F25B 9/00 takes precedence)

9/00  Compression machines, plant, or systems, in which the refrigerant is air or other gas of low boiling point
9/002 . [characterised by the refrigerant]
9/004 . [the refrigerant being air (air conditioning F24F)]
9/006 . [the refrigerant containing more than one component (F25B 9/004 takes precedence; refrigerant materials per se C09K 5/00)]
9/008 . [the refrigerant being carbon dioxide]
9/02 . using Joule-Thompson effect; using vortex effect
9/04 . using vortex effect
9/06 . using expanders (F25B 9/10 takes precedence)
9/065 . [using pressurised gas jets]
9/08 . using ejectors (F25B 9/10 takes precedence)
9/10 . with several cooling stages
9/12 . using 3He-4He dilution
Compression machines, plant, or systems

F25B

11/00 Compression machines, plant, or systems, using
turbines, e.g. gas turbines
11/02 as expanders (F25B 9/06 takes precedence)
11/04 centrifugal type
13/00 Compression machines, plant or systems with
reversible cycle (defrosting cycles F25B 47/02)

Sorption machines, plant, or systems

15/00 Sorption machines, plant, or systems, operating
continuously, e.g. absorption type
15/002 (using the endothermic solution of salt)
15/004 (of rotary type)
15/006 (with cascade operation)
15/008 (with multi-stage operation (F25B 15/006 takes
precedence))
15/02 (without inert gas (F25B 15/004, F25B 15/006,
F25B 15/008, F25B 15/12, F25B 15/14,
F25B 15/16 take precedence))
15/025 (Liquid transfer means)
15/04 the refrigerant being ammonia evaporated
from aqueous solution (F25B 15/025 takes
precedence)
15/06 the refrigerant being water vapour evaporated
from a salt solution, e.g. lithium bromide
(F25B 15/025 takes precedence)
15/08 the refrigerant being sulfuric acid (F25B 15/025
takes precedence)
15/09 the refrigerant being hydrogen desorbed from a hydride
(F25B 15/025 takes precedence)
15/10 (with inert gas (F25B 15/004, F25B 15/006,
F25B 15/008, F25B 15/12, F25B 15/14,
F25B 15/16 take precedence))
15/12 (with resorber ((F25B 15/004, F25B 15/006,
F25B 15/008, F25B 15/14 take precedence))
15/14 using osmosis (F25B 15/004, F25B 15/006,
F25B 15/008 take precedence)
15/16 using desorption cycle (F25B 15/004,
F25B 15/006, F25B 15/008 take precedence)
17/00 Sorption machines, plant, or systems, operating
intermittently, e.g. absorption or adsorption type
17/02 the absorbent or adsorbent being a liquid, e.g. brine
(F25B 17/10 takes precedence)
17/04 with two or more boilers operating alternately
17/06 with the boiler and evaporator built-up as a unit in
a tiltable or revolving arrangement
17/08 the absorbent or adsorbent being a solid, e.g. salt
(F25B 17/12 takes precedence)
17/083 (with two or more boiler-sorbers operating
alternately)
17/086 (with two or more boiler-sorber/evaporator units)
17/10 using the endothermic solution of salt
17/12 using desorption of hydrogen from a hydride

Machines, plant, or systems, with a single mode of operation, not
covered by groups F25B 1/00 - F25B 17/00
19/00 Machines, plant, or systems, using evaporation of
a refrigerant but without recovery of the vapour
19/005 (the refrigerant being a liquefied gas)
19/02 using fluid jet, e.g. of steam (F25B 19/005 takes
precedence)
19/04 using liquid jet, e.g. of water
21/00 Machines, plant, or systems, using electric or
magnetic effects (magnetic refrigerating material
H01F 1/012 and H01F 1/017)
21/02 using Peltier effect; using Nernst-Ettinghausen
effect (thermoelectric elements H01L 35/00,
H01L 37/00)
21/04 reversible
23/00 Machines, plant, or systems, with a single
mode of operation not covered by groups
F25B 1/00 - F25B 21/00, e.g. using selective
radiation effect
23/003 using selective radiation effect
23/006 boiling cooling systems
25/00 Machines, plant, or systems, using a combination
of modes of operation covered by two or more of
the groups F25B 1/00 - F25B 25/00 (combinations
of two or more modes of operation covered by a single
main group, see the relevant group)
25/005 using primary and secondary systems
25/02 Compression-sorption machines, plants, or systems
27/00 Machines, plant, or systems, using particular
sources of energy (F25B 30/06 takes precedence)
27/002 using solar energy (solar heat collectors F24S)
27/005 in compression type systems
27/007 in sorption type systems
27/02 using waste heat, e.g. from internal-combustion
engines
29/00 Combined heating and refrigeration systems, e.g.
operating alternately or simultaneously
29/003 of the compression type system
29/006 of the sorption type system
30/00 Heat pumps
30/02 of the compression type
30/04 of the sorption type
30/06 characterised by the source of low potential heat

Component parts or details

31/00 Compressor arrangements (compressors per se F04)
31/002 lubrication (of compressors per se F04B, of
machines or engines in general F01M)
31/004 (oil recirculating arrangements)
31/006 (cooling of compressor or motor (of compressors
per se F04B 39/06))
31/008 (by injecting a liquid (for compressors in general
F04B 39/062))
31/02 of motor-compressor units
31/023 (with compressor of reciprocating-piston type)
31/026 (with compressor of rotary type)
33/00 Boilers; Analysers; Rectifiers (boiler-absorbers
F25B 35/00)
35/00 Boiler-absorbers, i.e. boilers usable for absorption
or adsorption
35/02 using a liquid as sorbent, e.g. brine
35/04 using a solid as sorbent
Component parts or details

37/00  Absorbers; Adsorbers (boiler-absorbers F25B 35/00; separating processes involving the treatment of liquids with adsorbents B01D 15/00; separation of gases or vapours by adsorption B01D 53/02; separation of gases or vapours by absorption B01D 53/14; investigating using adsorption or adsorb G01N 30/00; {absorption or adsorption in general B01J 20000})

39/00  Evaporators; Condensers

39/02  .  Evaporators
39/022  .  {with plate-like or laminated elements}
39/024  .  {with elements constructed in the shape of a hollow panel (for heat exchange in general F28F 3/12) {specially adapted for sorption type systems}
39/026  .  {specially adapted for sorption type systems}
39/028  .  {having distributing means}
39/04  .  Condensers

40/00  Subcoolers, desuperheaters or superheaters

40/02  .  Subcoolers
40/04  .  Desuperheaters
40/06  .  Superheaters

41/00  Fluid-circulation arrangements, e.g. for transferring liquid from evaporator to boiler (pumps per se, sealings thereof F04)

41/003  .  {fluid line arrangements}
41/006  .  {optical fluid control arrangements}
41/02  .  using electro-osmosis
41/04  .  Disposition of valves (valves per se F16K)
41/043  .  {in the circuit between evaporator and compressor}
41/046  .  {of fluid flow reversing valves}
41/06  .  Flow restrictors, e.g. capillary tubes; Disposition thereof
41/062  .  {Expansion valves (regulating valves per se G05D) {Float control valves}
41/065  .  .  {capillary tubes}
43/00  Arrangements for separating or purifying gases or liquids in analysers or rectifiers F25B 33/00; Arrangements for vapourising the residuum of liquid refrigerant, e.g. by heat (F25B 40/00 takes precedence)

43/003  .  {filters (in general B01D)}
43/006  .  {accumulators}
43/02  .  for separating lubricants from the refrigerant
43/04  .  for withdrawing non-condensible gases
43/043  .  {for compression type systems}
43/046  .  {for sorption type systems}

45/00  Arrangements for charging or discharging refrigerant

47/00  Arrangements for preventing or removing deposits or corrosion, not provided for in another subclass

49/00  Arrangement or mounting of control or safety devices (testing refrigerators G01M; control in general G05)

49/005  .  {of safety devices (F25B 49/02 and F25B 49/04 take precedence)}
49/02  .  for compression type machines, plant or systems
49/022  .  {Compressor control arrangements (in general F04B)}
49/025  .  {Motor control arrangements (motors per se H02K)}
49/027  .  {Condenser control arrangements}
49/04  .  for sorption type machines, plant or systems
49/043  .  {Operating continuously}
49/046  .  {Operating intermittently}

230/00  Special arrangements or features for refrigeration machines, plants or systems, combined heating and refrigeration systems or heat-pump systems

230/00  Gas cycle refrigeration machines

230/001  .  with a linear configuration or a linear motor
230/002  .  with parallel working cold producing expansion devices in one circuit
230/003  .  characterised by construction or composition of the regenerator
230/004  .  using a compressor of the rotary type
230/005  .  using an expander of the rotary type
230/006  .  using a distributing valve of the rotary type
230/002  .  using the Joule-Thompson effect
230/021  .  with a cryosurgical probe tip having a specific construction
230/022  .  characterised by the expansion element
230/023  .  with two stage expansion
230/026  .  Compression machines, plant or systems characterised by the refrigerant being carbon dioxide
230/061  .  with cycle highest pressure above the supercritical pressure
230/014  .  Compression machines, plant or systems characterised by the cycle used
230/1401  .  Ericsson or Ericsson cycles
230/1402  .  Pulse-tube cycles with acoustic driver
230/1403  .  Pulse-tube cycles with heat input into acoustic driver
230/1404  .  Pulse-tube cycles with loudspeaker driven acoustic driver
230/1405  .  Pulse-tube cycles with travelling waves
230/1406  .  Pulse-tube cycles with pulse tube in co-axial or concentric geometrical arrangements
230/1407  .  Pulse-tube cycles with pulse tube having in-line geometrical arrangements
230/1408  .  Pulse-tube cycles with pulse tube having U-turn or L-turn type geometrical arrangements
230/1409  .  Pulse-tube cycles with pulse tube having special type of geometrical arrangements not being a coaxial, in-line or U-turn type
230/1411  .  Pulse-tube cycles characterised by control details, e.g. tuning, phase shifting or general control
230/1412  .  Pulse-tube cycles characterised by heat exchanger details
230/1413  .  Pulse-tube cycles characterised by performance, geometry or theory
Pulse-tube cycles characterised by pulse tube details
Pulse-tube cycles characterised by regenerator details
Pulse-tube cycles characterised by regenerator stack details
Pulse-tube cycles without any valves in gas supply and return lines
Pulse-tube cycles with valves in gas supply and return lines
the valves being of the rotary type
Pulse-tube cycles with pulse tube having a basic pulse tube refrigerator [PTR], i.e. comprising a tube with basic schematic
Pulse-tube cycles characterised by details not otherwise provided for
Pulse tubes with basic schematic including an inertance tube
Pulse tubes with basic schematic including an orifice and a reservoir
Pulse tubes with basic schematic including an orifice reservoir multiple inlet pulse tube
Pulse tubes with basic schematic including several pulse tubes
Pulse tubes with basic schematic including at the pulse tube warm end a so called warm end expander
Control of a pulse tube
Control of a Stirling refrigeration machine
Compressors, machines, plant, or systems with reversible cycle not otherwise provided for
with two or more accumulators
Indoor unit with water as a heat sink or heat source
Outdoor unit with water as a heat sink or heat source
Outdoor unit expansion valves
two pipes connecting the outdoor side to the indoor side with multiple indoor units
three pipes connecting the outdoor side to the indoor side with multiple indoor units
Refrigerant heaters
indoor unit in circulation with outdoor unit in first operation mode, indoor unit in circulation with another heat exchanger in second operation mode or outdoor unit in circulation with an other heat exchanger in third operation mode
Indoor unit or outdoor unit with auxiliary heat exchanger not forming part of the indoor or outdoor unit
the auxiliary heat exchanger being only used during defrosting
the auxiliary heat exchanger being only used during dehumidifying
the auxiliary heat exchanger being only used during heating
the auxiliary heat exchanger being used parallel to the indoor unit during heating operation
to the outdoor heat exchanger during heating operation
using multiple indoor units
with simultaneous units
with bypasses
during cooling
during defrosting
during heating
in parallel arrangements
during cooling
during defrosting
during dehumidification
during heating
in series arrangements
during cooling
during defrosting
during dehumidification
during heating
using multiple outdoor units
being defrosted alternately
with bypasses
during cooling
during defrosting
during heating
in parallel arrangements
during cooling
during defrosting
during heating
in series arrangements
during cooling
during defrosting
during heating
characterised by the reversing means
the compressor allows rotation in reverse direction
using bridge circuits of one-way valves
using one three-way valve
using two three-way valves
using one four-way valve
using two four-way valves
using three four-way valves
using six-way valves
using nine-way valves
using shut-off valves
using reversing valve changing the refrigerant flow direction due to pressure differences of the refrigerant and not by external actuation
related to the pressure of the indoor unit
related to reversing valves
related to the indoor fan, e.g. controlling speed
related to the outdoor fan, e.g. controlling speed
Sensor arrangements
Pressure sensors near the expansion valve
Pressure sensors near the indoor heat exchanger
Pressure sensors near the outdoor heat exchanger
Temperature sensors near the indoor heat exchanger
Temperature sensors near the outdoor heat exchanger
2339/00 Details of evaporators; Details of condensers

2339/02 . . . Details of evaporators

2339/021 . . . Evaporators in which refrigerant is sprayed on a surface to be cooled

2339/022 . . . Evaporators constructed from a pair of plates forming a space in which is located a refrigerant carrying coil

2339/023 . . . Evaporators consisting of one or several sheets on one face of which is fixed a refrigerant carrying coil

2339/024 . . . Evaporators with refrigerant in a vessel in which is situated a heat exchanger

2339/0241 . . . having plate-like elements

2339/0242 . . . having tubular elements

2339/04 . . . Details of condensers

2339/041 . . . of evaporative condensers

2339/042 . . . of pcm condensers

2339/043 . . . Condensers made by assembling plate-like or lminated elements

2339/044 . . . Condensers with an integrated receiver

2339/0441 . . . containing a drier or a filter

2339/0442 . . . characterised by the mechanical fixation of the receiver to the header

2339/0443 . . . the receiver being positioned horizontally

2339/0444 . . . where the flow of refrigerant through the condenser receiver is split into two or more flows, each flow following a different path through the condenser receiver

2339/0445 . . . with throttle portions

2339/0446 . . . characterised by the refrigerant tubes connecting the header of the condenser to the receiver; Inlet or outlet connections to receiver

2339/045 . . . Condensers made by assembling a tube on a plate-like element or between plate-like elements

2339/046 . . . Condensers with refrigerant heat exchange tubes positioned inside or around a vessel containing water or pcm to cool the refrigerant gas

2339/047 . . . Water-cooled condensers

2341/00 Details of ejectors not being used as compression device; Details of flow restrictors or expansion valves

2341/001 . . . Ejectors not being used as compression device

2341/0011 . . . Ejectors with the cooled primary flow at reduced or low pressure

2341/0012 . . . Ejectors with the cooled primary flow at high pressure

2341/0013 . . . Ejector control arrangements

2341/0014 . . . Ejectors with a high pressure hot primary flow from a compressor discharge

2341/0015 . . . using two or more ejectors

2341/0016 . . . Ejectors for creating an oil recirculation

2341/006 . . . Details of flow restrictors or expansion valves

2341/0061 . . . Bidirectional expansion restrictors

2341/0062 . . . Capillary expansion valves

2341/0063 . . . Feed forward expansion valves

2341/0064 . . . Superheater expansion valves

2341/0065 . . . Electric expansion valves

2341/00651 . . . actuated by electric heating means, e.g. a heated bimetallic element

2341/00652 . . . being opened and closed cyclically, e.g. with pulse width modulation

2341/00653 . . . actuated by an electric motor

2341/0066 . . . Refrigeration circuits using more than one expansion valve

2341/00661 . . . arranged in parallel

2341/00662 . . . arranged in series

2341/0067 . . . Expansion valves having a pilot valve

2341/00671 . . . the pilot valve is electrically actuated

2341/0068 . . . Expansion valves combined with a sensor

2341/00681 . . . the sensor is heated

2341/00682 . . . the sensor contains sorbent materials

2341/00683 . . . the sensor is disposed in the suction line and influenced by the temperature or the pressure of the suction gas
2347/00 Details for charging or discharging refrigerants; Service stations therefor
2347/001 Charging refrigerant to a cycle
2347/002 Collecting refrigerant from a cycle
2347/003 Control issues for charging or collecting refrigerant to or from a cycle
2347/004 with several tanks to collect or charge a cycle
2347/005 Service stations therefor
2347/0051 having a carrying handle
2347/0052 having wheels
2347/006 characterised by charging or discharging valves
2347/007 characterised by the weighing of refrigerant or oil

2347/00 Details for preventing or removing deposits or corrosion
2347/002 Details of defrosting cycles
2347/0021 Alternate defrosting
2347/0022 Cool gas defrosting
2347/0023 Set point defrosting

2400/00 General features or devices for refrigeration machines, plants or systems, combined heating and refrigeration systems or heat-pump systems, i.e. not limited to a particular subgroup of F25B
2400/001 Heaters
2400/002 Centrifugal separation of gas, liquid or oil
2400/003 Suction accumulators with deflectors
2400/004 Refrigeration circuit bypassing means
2400/00401 for the compressor
2400/00403 for the condenser
2400/00405 for the desuperheater
2400/00407 for the ejector
2400/00409 for the evaporator
2400/00411 for the expansion valve or capillary tube
2400/00413 for the filter or drier
2400/00415 for the receiver
2400/00417 for the subcooler
2400/00419 for the superheater
2400/005 Compression system with heat exchange between particular parts of the system
2400/0051 between the accumulator and another part of the cycle
2400/0052 between the capillary tube and another part of the refrigeration cycle
2400/0053 between the storage receiver and another part of the system
2400/0054 between the suction tube of the compressor and another part of the cycle
2400/006 Several compression cycles arranged in parallel
2400/0061 the capacity of the first system being different from the second
2400/007 Details of compressors or related parts
2400/0071 Compressor mounted in a housing in which a condenser is integrated
2400/0072 Intercoolers therefor
2400/0073 Linear compressors
2400/0074 with multiple cylinders
2400/0075 with parallel compressors
2400/00751 the compressors having different capacities
2400/0076 having multiple cylinders driven by a rotating swash plate

2400/077 Compressor control units, e.g. terminal boxes, mounted on the compressor casing wall containing for example starter, protection switches or connector contacts
2400/08 Refrigeration machines, plants and systems having means for detecting the concentration of a refrigerant
2400/09 Refrigeration machines, plants and systems having means for detecting the concentration of a sorbent solution
2400/11 Drop catchers
2400/12 Inflammable refrigerants
2400/121 using R1234
2400/13 Economisers
2400/14 Power generation using energy from the expansion of the refrigerant
2400/141 the extracted power is not recycled back in the refrigerant circuit
2400/15 Microelectro-mechanical devices
2400/16 Receivers
2400/161 arranged in parallel
2400/162 characterised by the plug or stop
2400/17 Re-condensers
2400/18 Refrigerant conversion
2400/19 Pumping down refrigerant from one part of the cycle to another part of the cycle, e.g. when the cycle is changed from cooling to heating, or before a defrost cycle is started
2400/21 Modules for refrigeration systems
2400/22 Refrigeration systems for supermarkets
2400/23 Separators
2400/24 Storage receiver heat

2500/00 Problems to be solved
2500/01 Geometry problems, e.g. for reducing size
2500/02 Increasing the heating capacity of a reversible cycle during cold outdoor conditions
2500/03 Cavitations
2500/04 Clogging
2500/05 Cost reduction
2500/06 Damage
2500/07 Exceeding a certain pressure value in a refrigeration component or cycle
2500/08 Exceeding a certain temperature value in a refrigeration component or cycle
2500/09 Improving heat transfers
2500/11 Reducing heat transfers
2500/12 Sound
2500/13 Vibrations
2500/14 the presence of moisture in a refrigeration component or cycle
2500/15 Hunting, i.e. oscillation of controlled refrigeration variables reaching undesirable values
2500/16 Lubrication
2500/17 Size reduction
2500/18 Optimization, e.g. high integration of refrigeration components
2500/19 Calculation of parameters
2500/21 Reduction of parts
2500/22 Preventing, detecting or repairing leaks of refrigeration fluids
2500/221 Preventing leaks from developing
2500/222 Detecting refrigerant leaks
2500/23 High amount of refrigerant in the system
2500/24 Low amount of refrigerant in the system
2500/25 Standardisation of apparatus or parts
2500/26 characterised by the startup of the refrigeration cycle
2500/27 characterised by the stop of the refrigeration cycle
2500/28 Means for preventing liquid refrigerant entering into the compressor
2500/29 High ambient temperatures
2500/31 Low ambient temperatures
2500/32 Weight

2600/00 Control issues
2600/01 Timing
2600/02 Compressor control
2600/021 Inverters therefor
2600/022 for multi-stage operation
2600/023 controlling swash plate angles
2600/024 by controlling the electric parameters, e.g. current or voltage
2600/025 by controlling speed
2600/0251 with on-off operation
2600/0252 with two speeds
2600/0253 with variable speed
2600/026 by controlling unloaders
2600/0261 external to the compressor
2600/0262 internal to the compressor
2600/0267 by controlling pressure
2600/0271 the discharge pressure
2600/0272 the suction pressure
2600/05 Refrigerant levels
2600/07 Remote controls
2600/11 Fan speed control
2600/111 of condenser fans
2600/112 of evaporator fans
2600/13 Pump speed control
2600/15 during shut down
2600/17 by controlling the pressure of the condenser
2600/19 Refrigerant outlet condenser temperature
2600/21 Refrigerant outlet evaporator temperature
2600/23 Time delays
2600/25 Control of valves
2600/251 Bypass valves
2600/253 Condenser exit valves
2600/255 Fixed-differential control valves
2600/257 Flow-diverting valves
2600/259 Economiser valves
2600/2511 Evaporator distribution valves
2600/2513 Expansion valves
2600/2515 Flow valves
2600/2517 Head-pressure valves
2600/2519 On-off valves
2600/2521 On-off valves controlled by pulse signals
2600/2523 Receiver valves
2600/2525 Pressure relief valves

2700/00 Sensing or detecting of parameters; Sensors therefor
2700/01 Sensors determining characteristics of the burner for a generator
2700/02 Humidity
2700/03 Oil level
2700/04 Refrigerant level
2700/05 Load shedding of a compressor
2700/06 Piston positions of a compressor
2700/11 Sensor to detect if defrost is necessary
2700/111 using an emitter and receiver, e.g. sensing by emitting light or other radiation and receiving reflection by a sensor
2700/13 Mass flow of refrigerants
2700/131 at the outlet of a subcooler
2700/133 through the condenser
2700/1331 at the inlet
2700/1332 at the outlet
2700/135 through the evaporator
2700/1351 of the cooled fluid upstream or downstream of the evaporator
2700/1352 at the inlet
2700/1353 at the outlet
2700/15 Power, e.g. by voltage or current
2700/151 of the compressor motor
2700/17 Speeds
2700/171 of the compressor
2700/172 of the condenser fan
2700/173 of the evaporator fan
2700/19 Pressures
2700/191 near an expansion valve
2700/193 of the compressor
2700/1931 Discharge pressures
2700/1932 Oil pressures
2700/1933 Suction pressures
2700/195 of the condenser
2700/197 of the evaporator
2700/21 Temperatures
2700/2101 in a bypass
2700/2102 at the outlet of the gas cooler
2700/2103 near a heat exchanger
2700/2104 of an indoor room or compartment
2700/2105 Oil temperatures
2700/2106 of fresh outdoor air
2700/2107 of a Peltier element
2700/2108 of a receiver
2700/2109 of a separator
2700/2111 of a heat storage receiver
2700/2113 of a suction accumulator
2700/2115 of a compressor or the drive means therefor
2700/21151 at the suction side of the compressor
2700/21152 at the discharge side of the compressor
2700/21153 of electronic components
2700/21154 of an inverter
2700/21155 of the oil
2700/21156 of the motor
2700/21157 . . . at the coil or rotor
2700/2116 of a condenser
2700/21161 of the fluid cooled by the condenser
2700/21162 of the refrigerant at the inlet of the condenser
2700/21163 of the refrigerant at the outlet of the condenser
2700/2117 of an evaporator
2700/21171 of the fluid cooled by the evaporator
2700/21172 at the inlet
2700/21173 at the outlet
2700/21174 of the refrigerant at the inlet of the evaporator
2700/21175 of the refrigerant at the outlet of the evaporator