

**ECLA****EUROPEAN CLASSIFICATION****F25B****REFRIGERATION MACHINES, PLANTS OR SYSTEMS; COMBINED HEATING AND REFRIGERATION SYSTEMS; HEAT-PUMP SYSTEMS**

([N: evaporation or evaporation apparatus for physical or chemical purposes, e.g. evaporation of liquids for gas phase reactions [B01B1/00B](#)]; 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 [C09K5/00](#); 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](#)) [[C0311](#)]

**Notes**

1. Attention is drawn to Note (2) following the title of subclass [F24F](#).
2. When classifying heat pump circuits or systems, groups [F25B1/00](#) to [F25B25/00](#) and [F25B29/00](#) take precedence over group [F25B30/00](#).

**Guide heading:****Compression machines, plant, or systems****F25B1/00**

**Compression machines, plant, or systems with non-reversible cycle** ([F25B3/00](#), [F25B5/00](#), [F25B6/00](#), [F25B7/00](#), [F25B9/00](#) take precedence)

**F25B1/00B**

- . [N: of the single unit type ([F25B1/10](#) takes precedence)]

**F25B1/02**

- . with compressor of reciprocating-piston type ([N: [F25B1/00B](#),] [F25B1/10](#) take precedence)

**F25B1/04**

- . with compressor of rotary type ([N: [F25B1/00B](#),] [F25B1/10](#) take precedence)

**F25B1/047**

- . . of screw type

**F25B1/053**

- . . of turbine type

**F25B1/06**

- . with compressor of jet type, e.g. using liquid under pressure ([N: [F25B1/00B](#),] [F25B1/10](#) take precedence)

**F25B1/08**

- . . using vapour under pressure

**F25B1/10**

- . with multi-stage compression (with cascade operation [F25B7/00](#))

**F25B3/00**

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

**F25B5/00**

**Compression machines, plant, or systems, with several evaporator circuits, e.g. for varying refrigerating capacity** (with cascade operation [F25B7/00](#))

**F25B5/02**

- . arranged in parallel

**F25B5/04**

- . arranged in series

<b>F25B6/00</b>	<b>Compression machines, plant, or systems, with several condenser circuits</b>
F25B6/02	<ul style="list-style-type: none"> <li>arranged in parallel</li> </ul>
F25B6/04	<ul style="list-style-type: none"> <li>arranged in series</li> </ul>
<b>F25B7/00</b>	<b>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 (<a href="#">F25B9/00</a> takes precedence)</b>
<b>F25B9/00</b>	<b>Compression machines, plant, or systems, in which the refrigerant is air or other gas of low boiling point</b>
F25B9/00B	<ul style="list-style-type: none"> <li>[N: characterised by the refrigerant]</li> </ul>
F25B9/00B2	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>[N: the refrigerant being air (air conditioning F24F)]</li> </ul> </li> </ul>
F25B9/00B4	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>[N: the refrigerant containing more than one component (<a href="#">F25B9/00B2</a> takes precedence; refrigerant materials per se <a href="#">C09K5/00</a>)]</li> </ul> </li> </ul>
F25B9/00B6	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>[N: the refrigerant being carbon dioxide][N0310]</li> </ul> </li> </ul>
F25B9/02	<ul style="list-style-type: none"> <li>using Joule-Thompson effect; using vortex effect</li> </ul>
F25B9/04	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>using vortex effect</li> </ul> </li> </ul>
F25B9/06	<ul style="list-style-type: none"> <li>using expanders (<a href="#">F25B9/10</a> takes precedence)</li> </ul>
F25B9/06B	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>[N: using pressurised gas jets]</li> </ul> </li> </ul>
F25B9/08	<ul style="list-style-type: none"> <li>using ejectors (<a href="#">F25B9/10</a> takes precedence)</li> </ul>
F25B9/10	<ul style="list-style-type: none"> <li>with several cooling stages</li> </ul>
F25B9/12	<ul style="list-style-type: none"> <li>using 3He-4He dilution</li> </ul>
F25B9/14	<ul style="list-style-type: none"> <li>characterised by the cycle used, e.g. Stirling cycle [N: (engine plants with Vuilleumier-type cycles <a href="#">F02G1/044V</a>)] [C9702]</li> </ul>
F25B9/14B	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>[N: pulse-tube cycle]</li> </ul> </li> </ul>
<b>F25B11/00</b>	<b>Compression machines, plant, or systems, using turbines, e.g. gas turbines</b>
F25B11/02	<ul style="list-style-type: none"> <li>as expanders (<a href="#">F25B9/06</a> takes precedence)</li> </ul>
F25B11/04	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>centrifugal type</li> </ul> </li> </ul>
<b>F25B13/00</b>	<b>Compression machines, plant, or systems with reversible cycle (<a href="#">defrosting cycles F25B47/02</a>)</b>
<b>Guide heading:</b>	<b><u>Sorption machines, plant, or systems</u></b>
<b>F25B15/00</b>	<b>Sorption machines, plant, or systems, operating continuously, e.g. absorption type</b>

F25B15/00B	<ul style="list-style-type: none"> <li>• [N: using the endothermic solution of salt]</li> </ul>
F25B15/00C	<ul style="list-style-type: none"> <li>• [N: of rotary type]</li> </ul>
F25B15/00D	<ul style="list-style-type: none"> <li>• [N: with cascade operation]</li> </ul>
F25B15/00F	<ul style="list-style-type: none"> <li>• [N: with multi-stage operation (<a href="#">F25B15/00D</a> takes precedence)]</li> </ul>
F25B15/02	<ul style="list-style-type: none"> <li>• without inert gas ([N: <a href="#">F25B15/00C</a>, <a href="#">F25B15/00D</a>, <a href="#">F25B15/00F</a>], <a href="#">F25B15/12</a>, <a href="#">F25B15/14</a>, <a href="#">F25B15/16</a> take precedence)</li> </ul>
F25B15/02B	<ul style="list-style-type: none"> <li>• • [N: Liquid transfer means]</li> </ul>
F25B15/04	<ul style="list-style-type: none"> <li>• • the refrigerant being ammonia evaporated from aqueous solution [N: (<a href="#">F25B15/02B</a> takes precedence)]</li> </ul>
F25B15/06	<ul style="list-style-type: none"> <li>• • the refrigerant being water vapour evaporated from a salt solution, e.g. lithium bromide [N: (<a href="#">F25B15/02B</a> takes precedence)]</li> </ul>
F25B15/08	<ul style="list-style-type: none"> <li>• • the refrigerant being sulfuric acid [N: (<a href="#">F25B15/02B</a> takes precedence)]</li> </ul>
F25B15/09	<ul style="list-style-type: none"> <li>• • the refrigerant being hydrogen desorbed from a hydride [N: (<a href="#">F25B15/02B</a> takes precedence)]</li> </ul>
F25B15/10	<ul style="list-style-type: none"> <li>• with inert gas ([N: <a href="#">F25B15/00C</a>, <a href="#">F25B15/00D</a>, <a href="#">F25B15/00F</a>], <a href="#">F25B15/12</a>, <a href="#">F25B15/14</a>, <a href="#">F25B15/16</a> take precedence)</li> </ul>
F25B15/12	<ul style="list-style-type: none"> <li>• with resorber ([N: <a href="#">F25B15/00C</a>, <a href="#">F25B15/00D</a>, <a href="#">F25B15/00F</a>], <a href="#">F25B15/14</a> take precedence)</li> </ul>
F25B15/14	<ul style="list-style-type: none"> <li>• using osmosis ([N: <a href="#">F25B15/00C</a>, <a href="#">F25B15/00D</a>, <a href="#">F25B15/00F</a> take precedence])</li> </ul>
F25B15/16	<ul style="list-style-type: none"> <li>• using desorption cycle ([N: <a href="#">F25B15/00C</a>, <a href="#">F25B15/00D</a>, <a href="#">F25B15/00F</a> take precedence])</li> </ul>
<b>F25B17/00</b>	<b>Sorption machines, plant, or systems, operating intermittently, e.g. absorption or adsorption type</b>
F25B17/02	<ul style="list-style-type: none"> <li>• the absorbent or adsorbent being a liquid, e.g. brine (<a href="#">F25B17/10</a> takes precedence)</li> </ul>
F25B17/04	<ul style="list-style-type: none"> <li>• • with two or more boilers operating alternately</li> </ul>
F25B17/06	<ul style="list-style-type: none"> <li>• • with the boiler and evaporator built-up as a unit in a tiltable or revolving arrangement</li> </ul>
F25B17/08	<ul style="list-style-type: none"> <li>• the absorbent or adsorbent being a solid, e.g. salt (<a href="#">F25B17/12</a> takes precedence)</li> </ul>
F25B17/08B	<ul style="list-style-type: none"> <li>• • [N: with two or more boiler-sorbers operating alternately]</li> </ul>
F25B17/08C	<ul style="list-style-type: none"> <li>• • [N: with two or more boiler-sorber/evaporator units]</li> </ul>
F25B17/10	<ul style="list-style-type: none"> <li>• using the endothermic solution of salt</li> </ul>
F25B17/12	<ul style="list-style-type: none"> <li>• using desorption of hydrogen from a hydride</li> </ul>
<b>Guide heading:</b>	<b><u>Machines, plant, or systems, with a single mode of operation, not covered by groups <a href="#">F25B1/00</a> to <a href="#">F25B17/00</a></u></b>
<b>F25B19/00</b>	<b>Machines, plant, or systems, using evaporation of a refrigerant but without recovery of the vapour</b>

- F25B19/00C . [N: the refrigerant being a liquefied gas] [N0304]
- F25B19/02 . using fluid jet, e.g. of steam [N: ([F25B19/00C](#) takes precedence)] [C0304]
- F25B19/04 . . using liquid jet, e.g. of water
  
- F25B21/00** **Machines, plant, or systems, using electric or magnetic effects [N: (magnetic refrigerating material [H01F1/01B](#) and [H01F1/01B4](#))]**
- F25B21/02 . using Peltier effect; using Nernst-Ettinghausen effect ([thermo-electric elements H01L35/00, H01L37/00](#))
- F25B21/04 . . reversible
  
- F25B23/00** **Machines, plant, or systems, with a single mode of operation not covered by groups [F25B1/00](#) to [F25B21/00](#), e.g. using selective radiation effect**
- F25B23/00B . [N: using selective radiation effect]
- F25B23/00C . [N: boiling cooling systems]
  
- F25B25/00** **Machines, plant, or systems, using a combination of modes of operation covered by two or more of the groups [F25B1/00](#) to [F25B23/00](#) (combinations of two or more modes of operation covered by a single main group, see the relevant group)**
- F25B25/00B . [N: using primary and secondary systems]
- F25B25/02 . Compression-sorption machines, plants, or systems
  
- F25B27/00** **Machines, plant, or systems, using particular sources of energy ([F25B30/06](#) takes precedence)**
- F25B27/00B . [N: using solar energy (use of solar heat not otherwise provided for [F24J2/00](#))]
- F25B27/00B2 . . [N: in compression type systems]
- F25B27/00B4 . . [N: in sorption type systems]
- F25B27/02 . using waste heat, e.g. from internal-combustion engines
  
- F25B29/00** **Combined heating and refrigeration systems, e.g. operating alternately or simultaneously**
- F25B29/00B . [N: of the compression type system]
- F25B29/00C . [N: of the sorption type system]
  
- F25B30/00** **Heat pumps**
- F25B30/02 . of the compression type

F25B30/04 . of the sorption type

F25B30/06 . characterised by the source of low potential heat

**Guide heading:** **Component parts or details**

**F25B31/00 Compressor arrangements (compressors per se F04)**

F25B31/00B . [N: lubrication (of compressors per se F04B, of machines or engines in general F01M)]

F25B31/00B2 . . [N: oil recirculating arrangements]

F25B31/00C . [N: cooling of compressor or motor (of compressors per se [F04B39/06](#))]

F25B31/00C2 . . [N: by injecting a liquid (for compressors in general [F04B39/06B](#))]

F25B31/02 . of motor-compressor units

F25B31/02B . . [N: with compressor of reciprocating-piston type]

F25B31/02C . . [N: with compressor of rotary type]

**F25B33/00 Boilers; Analysers; Rectifiers (boiler-absorbers [F25B35/00](#))**

**F25B35/00 Boiler-absorbers, i.e. boilers usable for absorption or adsorption**

F25B35/02 . using a liquid as sorbent, e.g. brine

F25B35/04 . using a solid as sorbent

**F25B37/00 Absorbers; Adsorbers (boiler-absorbers [F25B35/00](#); separating processes involving the treatment of liquids with adsorbents [B01D15/00](#); separation of gases or vapours by adsorption [B01D53/02](#); separation of gases or vapours by absorption [B01D53/14](#); investigating using adsorption or absorption [G01N30/00](#)); [N: (absorption or adsorption in general [B01J1/22](#))]**

**F25B39/00 Evaporators; Condensers**

F25B39/02 . Evaporators

F25B39/02B . . [N: with plate-like or laminated elements]

F25B39/02B2 . . . [N: with elements constructed in the shape of a hollow panel (for heat exchange in general [F28F3/12](#))]

F25B39/02C . . [N: specially adapted for sorption type systems]

F25B39/02D . . [N: having distributing means]

F25B39/04 . Condensers

**F25B40/00 Subcoolers, desuperheaters or superheaters**

F25B40/02	. Subcoolers
F25B40/04	. Desuperheaters
F25B40/06	. Superheaters
<b>F25B41/00</b>	<b>Fluid-circulation arrangements, e.g. for transferring liquid from evaporator to boiler (pumps per se, sealings therefor <a href="#">F04</a>)</b>
F25B41/00C	. [N: fluid line arrangements]
F25B41/00D	. [N: optical fluid control arrangements]
F25B41/02	. using electro-osmosis
F25B41/04	. Disposition of valves (valves per se <a href="#">F16K</a> )
F25B41/04B	. . [N: in the circuit between evaporator and compressor]
F25B41/04D	. . [N: of fluid flow reversing valves]
F25B41/06	. Flow restrictors, e.g. capillary tubes; Disposition thereof
F25B41/06B	. . [Expansion valves (regulating valves per se <a href="#">G05D</a> )]
F25B41/06B2	. . . [N: Float control valves]
F25B41/06C	. . [N: capillary tubes]
<b>F25B43/00</b>	<b>Arrangements for separating or purifying gases or liquids (in analysers or rectifiers <a href="#">F25B33/00</a>); Arrangements for vaporising the residuum of liquid refrigerant, e.g. by heat (<a href="#">F25B40/00</a> takes precedence)</b>
F25B43/00B	. [N: filters (in general <a href="#">B01D</a> )]
F25B43/00C	. [N: accumulators]
F25B43/02	. for separating lubricants from the refrigerant
F25B43/04	. for withdrawing non-condensable gases
F25B43/04B	. . [N: for compression type systems]
F25B43/04C	. . [N: for sorption type systems]
<b>F25B45/00</b>	<b>Arrangements for charging or discharging refrigerant</b>
<b>F25B47/00</b>	<b>Arrangements for preventing or removing deposits or corrosion, not provided for in another subclass</b>
F25B47/00D	. [N: for preventing corrosion]
F25B47/00F	. [N: for preventing frost]
F25B47/02	. Defrosting cycles

- F25B47/02B . . [N: hot gas defrosting]
- F25B47/02B2 . . . [N: by reversing the cycle]
- F25B47/02C . . [N: for defrosting sorption type systems]

**F25B49/00**      **Arrangement or mounting of control or safety devices** (testing refrigerators [G01M](#); control in general [G05](#))

- F25B49/00F . [N: of safety devices ([F25B49/02](#) and [F25B49/04](#) take precedence)]

- F25B49/02 . for compression type machines, plant or systems
- F25B49/02B . . [N: Compressor control arrangements (in general F04B)]
- F25B49/02C . . [N: Motor control arrangements (motors per se [H02K](#))]
- F25B49/02D . . [N: Condenser control arrangements]

- F25B49/04 . for sorption type machines, plant or systems
- F25B49/04B . . [N: Operating continuously]
- F25B49/04C . . [N: Operating intermittently]