

F01K

STEAM ENGINE PLANTS; STEAM ACCUMULATORS; ENGINE PLANTS NOT OTHERWISE PROVIDED FOR; ENGINES USING SPECIAL WORKING FLUIDS OR CYCLES (gas-turbine or jet-propulsion plants F02; nuclear power plants, engine arrangements therein G21D)

Definition statement

This subclass/group covers:

All aspects of power plants using steam, vapour or special working fluids in a thermodynamic cycle. It covers also steam or vapour accumulators and power plants which are characterised by steam or heat accumulators, by the use of specific types of engines and by condensers and by the use of steam or condensate extracted from the power plant. Furthermore general lay-out, control and methods of operation of complete power plants and methods of converting heat or fluid energy into mechanical energy are covered.

Relationship between large subject matter areas

Specific elements forming a thermodynamic cycle like the steam or vapour generator ([F22B](#)), expander ([F01D](#)), condenser ([F28B](#)) and pump (F04) are the subject of other subclasses.

Documents related to constructional features of steam turbines, gas turbines, internal combustions piston engines, condensers and pumps can be found in [F01D](#), [F02C](#), [F02B](#), [F28B](#) and [F04B](#), [F04C](#), [F04D](#) respectively.

References relevant to classification in this subclass

This subclass/group does not cover:

Nuclear power plants and engine arrangements therein	G21D
Internal-combustion piston engines	F02B
Gas turbine plants	F02C
Jet propulsion plants	F02K
Non-positive displacement machines or engines, like steam turbines	F01D
Refrigeration machines, plants and systems	F25B

Special rules of classification within this subclass

Attention is drawn to the definition of "steam" and "vapour". In cases where a specific entry for vapour is missing documents related to special vapours are classified in groups where only "steam" is explicitly mentioned.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

CHP	Combined Heat and Power, Cogeneration
Trigeneration	Combined production of heat, power and cold
HRSG	Heat Recovery Steam Generator
CCS	Carbon capture and storage carbon capture and sequestration
Combined cycle	The exhaust of one heat engine is used as the heat source for another
FBC	Fluidized Bed Combustion
PFBC	Pressurised Fluidized Bed Combustion
APFBC	Advanced Pressurised Fluidized Bed Combustion
GFBC	Gasification Fluidized Bed Combustion Combined cycle systems
CHIPPS	Combustion-based High Performance Power System

F01K 1/00

Steam accumulators (use of accumulators in steam engine plants F01K3/00)

Definition statement

This subclass/group covers:

Steam or vapour accumulators acting as an energy storage device including:

- accumulators for storing steam in a liquid, like varying pressure accumulators (e.g. Ruth's type);
- accumulators for storing steam otherwise than in a liquid (e.g. pressure tanks);
- charging and discharging devices of accumulators with steam;
- safety and regulation means for accumulators;
- other parts, details and accessories of accumulators.

Relationship between large subject matter areas

Group [F01K 3/00](#) covers the use of accumulators in steam engine plants and not the accumulator per se.

References relevant to classification in this group

This subclass/group does not cover:

Use of accumulators in steam engine plants	F01K 3/00
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Methods of steam generation using heat evolved in a solution absorbing steam; Soda steam boilers	F22B 1/20
Charging or discharging of accumulators with steam	F01K 1/08
Multiple accumulators; Charging, discharging or regulating peculiar thereto	F01K 1/12
Steam circulation in multiple accumulators	F01K 1/14

Special rules of classification within this group

All vapour accumulators which use special vapour instead of water vapour also have to be classified in this group.

Synonyms and Keywords

In patent documents the following expressions/words "storage tank", "pressure tank", "vessel", "energy storage device" and "volume" are often used as synonyms.

F01K 3/00

Plants characterized by the use of steam or heat accumulators, or intermediate steam heaters, therein (regenerating exhaust steam F01K19/00)

Definition statement

This subclass/group covers:

This group covers the use of steam/vapour accumulators, in general heat accumulators and intermediate steam/vapour heaters in power plant arrangements and in arrangements adapted for a specific use like for vehicle drive. Control of said devices is also covered.

Relationship between large subject matter areas

Vapour or heat accumulators are often used in relationship with steam or vapour regeneration which is treated in [F01K 19/00](#)

Constructional features of accumulators and the accumulators per se are classified in [F01K 1/00](#)

Methods of steam generation in general characterized by the form of heating method are classified in [F22B 1/00](#)

References relevant to classification in this group

This subclass/group does not cover:

Heat-transfer, heat-exchange or heat-storage materials	C09K 5/00
Regenerating exhaust steam	F01K 19/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Methods of steam generation characterized by the form of heating method	F22B 1/00
Heating, cooling or ventilating devices characterised by comprising regenerative heating or cooling means, e.g. heat accumulators	B60H 1/00492
Heat storage plants or apparatus in general	F28D 20/00
Solar heat collectors having heat storage mass	F24J 2/34
Solar heat collectors with hot water storage	F24J 2/345

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Ruth's type steam accumulator	accumulator for storing steam in a liquid (variable pressure system)
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F01K 5/00

Plants characterised by use of means for storing steam in an alkali to increase steam pressure, e.g. of Honigmann or Koenemann type

Definition statement

This subclass/group covers:

Storing steam based on thermo chemical energy storage and conversion. Absorbing and desorbing vapour into an alkali solution for discharging heat or producing cold taking into account pressure changes. Furthermore regenerative installations using absorption and desorption are also covered.

Relationship between large subject matter areas

Accumulators where steam is stored in a liquid are classified in [F01K 1/04](#) in

general.

References relevant to classification in this group

This subclass/group does not cover:

Thermodynamic cycles with an absorption fluid remaining at least partly in the liquid state, like Kalina cycles	F01K 25/065
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Accumulators using materials absorbing or liberating heat during crystallisation	C09K 5/063
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Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Accumulator of Honigmann type	Steam or vapour accumulator based on a process based on the vapour pressure depression of a concentrated solution or adsorbed vapour in comparison to the pure working fluid
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F01K 7/00

Plants characterised by the use of specific types of engine (F01K3/02 takes precedence); Plants or engines characterised by their use of special steam systems, cycles, or processes (reciprocating piston engines using uniflow principle F01B17/04); Regulating means peculiar to such systems, cycles, or processes; Use of withdrawn or exhaust steam for feed-water heating

F01K 9/00

Plants characterised by condensers arranged or modified to co-operate with the engines (by condensers structurally combined with engines F01K11/00; steam condensers per se F28B) (F01K23/04 takes precedence)

F01K 11/00

Plants characterised by the engines being structurally combined with boilers or condensers

F01K 13/00

General lay-out or general methods of operation of complete plants

F01K 15/00

Adaptations of plants for special use [N: F01K7/02 takes precedence]

F01K 17/00

Using steam or condensate extracted or exhausted from steam engine plant (for heating feed-water F01K7/34; returning condensate to boiler F22D) [N: F01K7/36 takes precedence]

F01K 19/00

Regenerating or otherwise treating steam exhausted from steam engine plant (plants characterised by use of means for storing steam in an alkali to increase steam pressure F01K5/00; returning condensate to boiler F22D) [N: F01K3/006 takes precedence]

F01K 21/00

Steam engine plants not otherwise provided for

F01K 23/00

Plants characterised by more than one engine delivering power external to the plant, the engines being driven by different fluids

F01K 25/00

Plants or engines characterised by use of special working fluids, not otherwise provided for; Plants operating in closed cycles and not otherwise provided for

F01K 27/00

Plants for converting heat or fluid energy into mechanical energy, not otherwise provided for