

## F24H

**FLUID HEATERS, e.g. WATER OR AIR HEATERS, HAVING HEAT GENERATING MEANS, IN GENERAL (heat-transfer, heat-exchange or heat-storage materials [C09K 5/00](#); tube furnaces for thermal non-catalytic cracking [C10G 9/20](#); devices, e.g. valves, for venting and aerating enclosures [F16K 24/00](#); steam traps or like apparatus [F16T](#); steam generation [F22](#); combustion apparatus [F23](#); domestic stoves or ranges [F24B](#), [F24C](#); domestic- or space-heating systems [F24D](#); furnaces, kilns, ovens, retorts [F27](#); heat-exchangers [F28](#); electric heating elements or arrangements [H05B](#))**

### Definition statement

*This place covers:*

Self-contained heaters comprising heat generating means for heating fluids:

- Water heaters having heat generating means
- Air heaters having heat generating means
- Fluid heaters using a heat pump
- Combined water and air heaters
- Storage heaters in which energy is stored as heat in masses staying in the heater
- Fluid heaters having means specially adapted for extracting latent heat from flue gases by means of condensation
- Details thereof, including constructional details and control means for fluid heaters.

### Relationships with other classification places

Subclass [F24H](#) covers heater as such, i.e. the arrangements where the heat is generated.

Heaters integrated in a heating systems adapted for domestic- or space heating application, in which the heat is transmitted by a circuit to a consumer are classified in [F24D](#).

Self-contained heaters of the type stoves or ranges are classified in [F24B](#) and [F24C](#).

Subclass [F24H](#) concerns to the function of heating in general. Heaters adapted for special applications are classified both in [F24H](#) and in the relevant subclass for the application:

- application in vehicles [B60H](#) or [B60S](#);
- apparatus for making beverages [A47J](#).

The components of a heater are also classified in the relevant subclasses:

- burners in [F23B](#);
- electric heating means in [H05B](#);
- heat pumps in [F25B](#);
- solar collector or geothermal systems in [F24S](#), [F24T](#);
- heat exchangers in [F28](#);
- valves in [F16K](#);
- control of temperature in [G05D 23/00](#).

### References

#### Limiting references

*This place does not cover:*

Baking ovens and apparatus for baking	<a href="#">A21B</a>
Forge furnaces	<a href="#">B21J</a>

Domestic stoves or ranges	<a href="#">F24B</a> , <a href="#">F24C</a>
Domestic or space heating systems	<a href="#">F24D</a>
Driers for solid material	<a href="#">F26B</a>
Furnaces, kilns, ovens, retorts	<a href="#">F27</a>

### Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Apparatus for making beverages	<a href="#">A47J</a>
Application in vehicles	<a href="#">B60H</a> , <a href="#">B60S</a>

### Informative references

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

Valves	<a href="#">F16K</a>
Heat source: Burners	<a href="#">F23B</a>
Heat source: Solar and geothermal heating means	<a href="#">F24S</a> , <a href="#">F24T</a>
Heat source: Heat pumps	<a href="#">F25B</a>
Heat exchangers	<a href="#">F28</a>
Storage tanks	<a href="#">F28D 20/00</a>
Controlling temperature	<a href="#">G05D 23/00</a>
Heat source: Electric heating means	<a href="#">H05B</a>

### Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Water includes other liquids; air includes other gases or gas mixtures	"water" and "air" always mean respectively, the liquid and gas to be heated
Furnace tubes	means tubes inside the heater wherein combustion is performed
Fire tubes	means tubes inside the heater wherein combustion is performed
Water tubes	means the tubes inside the heater through which water to be heated flows
Heater	means apparatus including both heat generating means and means for transferring the generated heat to water or air

## F24H 1/00

**Water heaters having heat generating means, e.g. boiler, flow- heater, water-storage heater (F24H 7/00, F24H 8/00 take precedence; details F24H 9/00; steam boilers F22B; domestic stoves or ranges with additional provisions for heating water F24B 9/00, F24C 13/00)**

### Definition statement

*This place covers:*

Water heaters having generating means of the following kind:

- With reduced pressure or of the vacuum steam type;
- Electrically heated;
- Using fluid fuel;
- Immersion heaters for open containers of ponds;
- Using solid fuel;
- Special heating applications, i.e. heated bath tubs, vehicles;
- portable or mobile heaters;
- packaged or self-contained boilers comprising water heaters with control devices and pump in a single unit;
- Continuous-flow heaters, i.e. which heat is generated only while the water is flowing, said heater arranged either with water separated from the heating medium or with direct contact of the water with the heating medium;
- Water storage heaters;
- Water heaters other than continuous-flow or water storage heaters, e.g. water-heaters for central heating;
- Water heaters having plural combustion chambers;
- Water heaters for central heating incorporating heaters for domestic water.

### Relationships with other classification places

The group heaters of the reduced pressure or vacuum steam type ([F24H 1/0009](#)) is rarely used. Steam boilers as such are covered by [F22B](#).

The group heaters using solid fuel ([F24H 1/0063](#)) is rarely used. Domestic stoves or ranges with additional provisions for heating water are covered by [F24B 9/00](#), [F24C 13/00](#).

In the group water storage heaters ([F24H 1/18](#)) the water must be able to flow outside the storage tank for being used. If the storage mass, which can be water, stays in the tank and there is a further intermediate medium for conveying the heat, this arrangement is only classified in [F24H 7/00](#).

Water heaters with a heating pump as heat source are classified in [F24H 4/00](#).

Water heaters extracting latent heat from flue gases (condensing boilers) are classified in [F24H 8/00](#).

The group [F24H 1/48](#) covers water heaters for central heating incorporating heaters for domestic water, i.e. the heaters (tank, heat exchanger) for domestic water have to be within the boiler. If the domestic water heaters are located outside of the boiler, the invention is classified in [F24D 3/08](#).

Heat exchangers which are exclusively used in boilers are classified in this group. Heat exchangers being able to be used in a boiler and elsewhere are classified both in this group and in the relevant subclass in [F28](#).

Arrangement or mountings of control or safety device for water heaters are covered by [F24H 9/20](#).

## References

### Limiting references

*This place does not cover:*

Storage heater	<a href="#">F24H 7/00</a>
Fluid heaters having heat-generating means specially adapted for extracting latent heat from flue gases by means of condensation; Condensing boilers	<a href="#">F24H 8/00</a>
Steam boilers	<a href="#">F22B</a>
Domestic stoves or ranges with additional provisions for heating water	<a href="#">F24B 9/00</a> , <a href="#">F24C 13/00</a>

### Informative references

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

Liquid storage heaters using heat pumps	<a href="#">F24H 4/04</a>
Details of fluid heaters	<a href="#">F24H 9/00</a>
Solid fuel fired boiler	<a href="#">F24H 2230/00</a>
Cooking vessels	<a href="#">A47J 27/00</a>
Apparatus for making beverages	<a href="#">A47J 31/54</a>
Apparatus for making beverages	<a href="#">A47J 31/542</a>
Bathing devices for therapeutic purposes	<a href="#">A61H 33/00</a>
Windscreens comprising a water heater	<a href="#">B60S 1/487</a>
Details concerning the thermal insulation of a container	<a href="#">B65D 81/38</a>
Details of washing machines	<a href="#">D06F 39/00</a>
Plumbing installations for fresh water having heating or cooling apparatus	<a href="#">E03C 1/044</a>
Heating swimming pools	<a href="#">E04H 4/129</a>
Heating or cooling pipes or pipe systems	<a href="#">F16L 53/00</a>
Steam boilers of furnace-tube type, i.e. the combustion of fuel being performed inside one or more furnace tubes built-in in the boiler body	<a href="#">F22B 7/00</a>
Details of baffles or deflectors within the combustion chamber	<a href="#">F23M 9/00</a>
Domestic stoves or ranges with additional provisions for heating water	<a href="#">F24B 9/00</a>
Other domestic stoves or ranges with additional provisions for heating water	<a href="#">F24C 13/00</a>
Hot-water central heating systems in combination with systems for domestic hot-water supply	<a href="#">F24D 3/08</a>
Central heating systems using heat accumulated in storage masses	<a href="#">F24D 11/00</a>
Solar heating of swimming pools	<a href="#">F24S 20/02</a>
Storing heat collected by solar heat collectors	<a href="#">F24S 60/30</a>
Storing geothermal heat	<a href="#">F24T 10/30</a>
Tubular heat-exchangers	<a href="#">F28D 7/00</a>
Tubular elements, Assemblies of tubular elements	<a href="#">F28F 1/00</a>
Ohmic-resistance heating	<a href="#">H05B 3/00</a>

## F24H 3/00

**Air heaters having heat generating means ([F24H 7/00](#), [F24H 8/00](#) take precedence; details [F24H 9/00](#); domestic stoves or ranges with additional provisions for convection heating of air [F24B](#), [F24C](#))**

### Definition statement

*This place covers:*

Air heaters sorted by the type of heat source: e.g. using electric energy supply or using fluid combustible or using solid combustibles.

Air heaters with forced circulation of air.

Air heaters with a main heat source and additional heating arrangements.

This group covers air heaters where the air is heated at the same location where the heat is generated.

### Relationships with other classification places

Central heating radiators are not considered as an air heater as covered in this group. The central heating radiators as such are covered by [F28D 1/00](#). Central heating radiators comprising additional heating means located within the radiator are covered by [F24D 13/04](#).

Hot-air central heating systems are covered by [F24D 5/00](#).

Ventilation systems which can be heated and cooled are covered by [F24F](#).

Air heaters adapted for special applications are classified both in [F24H 3/00](#) and in the relevant subclass for the application:

- welding [B23K](#)
- hair dryer [A45D 20/00](#)
- vehicles [B60H](#)

## References

### Limiting references

*This place does not cover:*

Air heaters in which the air is heated by a heat pump	<a href="#">F24H 4/06</a>
Storage heater	<a href="#">F24H 7/00</a>
Fluid heaters having heat-generating means specially adapted for extracting latent heat from flue gases by means of condensation; Condensing boilers	<a href="#">F24H 8/00</a>
Hot air central heating system	<a href="#">F24D 5/00</a>
Central heating radiators for heating air comprising an additional electric heating means	<a href="#">F24D 13/04</a>
Air conditioning devices which provide heated and cooled air	<a href="#">F24F</a>
Lighting fixture and air heating means	<a href="#">F24F 13/078</a>
Central heating radiators as such	<a href="#">F28D 1/00</a>

**Application-oriented references**

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Adapted for hair drying	<a href="#">A45D 20/00</a>
Adapted for welding	<a href="#">B23K</a>
Adapted to be used in vehicles	<a href="#">B60H</a>

**Informative references**

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

Hair dryers	<a href="#">A45D 20/00</a>
Towel racks, Towel rails, Towel rods, Towel rolls	<a href="#">A47K 10/00</a>
Welding wherein the heat is provided by a hot air stream	<a href="#">B23K</a>
Interaction of the air heater with the vehicle (mounting a heater with in a vehicle)	<a href="#">B60H 1/2215</a>

**Glossary of terms**

In this place, the following terms or expressions are used with the meaning indicated:

For air heaters using electric energy supply, the term

Heating medium	means the resistive element
Direct contact	means that the resistive element, electrodes and fins are bond together without additional elements (e.g. tubes or plates) in between

**F24H 4/00****Fluid heaters using heat pumps****Definition statement**

This place covers:

Liquid or gas heaters using heat pumps as heat source.

**References****Limiting references**

This place does not cover:

Air conditioning devices using heat pumps which provide heated and cooled air	<a href="#">F24F</a>
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**Informative references**

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

Combined water and air heaters	<a href="#">F24H 6/00</a>
Other domestic or non-central space heating system, consisting of self-contained heating units	<a href="#">F24D 15/02</a>

Heat pumps (heat of condenser is used for a specific purpose, e.g. heating tap water)	<a href="#">F25B 30/00</a>
Heat storage plants or apparatus in general	<a href="#">F28D 20/00</a>

## F24H 6/00

Combined water and air heaters ([F24H 8/00](#) takes precedence)

### Definition statement

*This place covers:*

Combined water and air heaters.

### References

#### Limiting references

*This place does not cover:*

Fluid heaters having heat-generating means specially adapted for extracting latent heat from flue gases by means of condensation	<a href="#">F24H 8/00</a>
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#### Informative references

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

Hot-air central heating systems	<a href="#">F24D 5/00</a>
Hot-air central heating systems using heat pumps	<a href="#">F24D 5/12</a>

## F24H 7/00

Storage heaters, i.e. heaters in which energy is stored as heat in masses for subsequent release (domestic stoves or ranges with additional heat storage masses [F24B 1/24](#), [F24C 15/34](#))

### Definition statement

*This place covers:*

Storage heaters ranked by the kind of the heat source, in which the heat storing material stays in the heater and wherein the released heat is either conveyed to a transfer fluid, e.g. air, water or the released heat is radiated.

### Relationships with other classification places

Water storage heaters where the heated water is able to flow outside the storage tank for being used are covered by [F24H 1/18](#).

### References

#### Limiting references

*This place does not cover:*

Water storage heaters	<a href="#">F24H 1/18</a>
Domestic stoves or ranges with additional heat storage masses	<a href="#">F24B 1/24</a>
Elements and arrangements for heat storage	<a href="#">F24C 15/34</a>

**Informative references**

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

Storage materials	<a href="#">C09K 5/00</a>
Material undergoing a change of physical state when being used	<a href="#">C09K 5/02</a>
Central heating systems using heat accumulated in storage masses	<a href="#">F24D 11/00</a>
Electric heating systems with resistances incorporated in construction elements, e.g. panels	<a href="#">F24D 13/022</a>
Air-conditioning systems or apparatus not covered by <a href="#">F24F 1/00</a> or <a href="#">F24F 3/00</a> e.g. using solar heat, combined with household units such as an oven or water heater	<a href="#">F24F</a>
Heat storage plants or apparatus	<a href="#">F28D 20/00</a>

**F24H 8/00****Fluid heaters having heat-generating means specially adapted for extracting latent heat from flue gases by means of condensation****Definition statement**

*This place covers:*

Fluid heaters arranged in a self-contained manner:

- having heat-generating means specially adapted for extracting latent heat from flue gases by means of condensation located within the heater
- having means for moistening the combustion air with condensate from the combustion gases
- having means for removing condensate from the heater.

**Relationships with other classification places**

This group covers the arrangements of condensing boilers where the condensing heat exchanger is located inside the boiler.

The arrangements where the condensing heat exchanger is located outside the boiler (e.g. economizer) are covered by [F24D 12/02](#) combined with [F24D 2200/18](#).

**References****Limiting references**

*This place does not cover:*

Fluid heaters in combination with a separate flue gas condenser	<a href="#">F24D 12/02</a>
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**Informative references**

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

Arrangements for treating smokes in the chimneys, in particular coolers	<a href="#">F23J 15/06</a>
Fumes purifications: water draining devices associated with fumes	<a href="#">F23J 2900/13004</a>
Flue gas condenser	<a href="#">F28D 21/00</a>



## F24H 9/00

### Details

#### Definition statement

*This place covers:*

Details of liquid/water heaters and gas/air heaters.

Casings; Cover lids; Ornamental panels therefore (not for central heating radiators).

Arrangement of mountings or supports therefore (not for central heating radiators).

Connecting heaters to circulation pipes.

Connecting different sections within water-heaters.

Arrangements for water drainage.

Arrangement or mounting of grates, burners, or heating elements within the heater.

Arrangement or mounting of control or safety devices.

Combustion air preheating arrangements.

Fluid heaters having electric generators.

Details about the kind of electrical heat generating means.

#### Relationships with other classification places

This group covers details concerning the device generating the heat.

Details concerning central heating radiators are covered by [F24D](#).

Valves which are exclusively used in boilers are classified in this group. Valves being able to be used elsewhere are classified in the relevant subclass in [F16K](#).

Pipe joints which are exclusively used in boilers are classified in this group. Pipe joints being able to be used elsewhere are classified in the relevant subclass in [F16L](#).

Details concerning the control of a boiler are covered in [F24H 9/20](#). Arrangements for control of temperature and algorithm therefore are also covered in [G05D 23/00](#). In the particular case of electric heating means, the controls/automatic switching for the electric heater are also covered by [H05B 1/02](#).

### References

#### Limiting references

*This place does not cover:*

Control valves	<a href="#">F16K</a>
Safety devices for burners	<a href="#">F23D</a>
Combustion control devices	<a href="#">F23N</a>
Connecting central heating radiator to circulation pipes	<a href="#">F24D 19/0002</a>
Arrangements for mountings or supports for central heating radiators	<a href="#">F24D 19/02</a>
Casings, cover lids or ornamental panels for central heating radiators	<a href="#">F24D 19/06</a>
Arrangements for connecting different sections of heat exchange elements, e.g. of radiators	<a href="#">F28F 9/26</a>

**Informative references**

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

Constructional details of combustion chambers , not otherwise provided for	<a href="#">F23M</a>
Regulating or controlling combustion	<a href="#">F23N</a>
Arrangements for drainage, venting or aerating in domestic- or space heating systems	<a href="#">F24D 19/08</a>
Casings, Header boxes, Auxiliary supports for elements, Auxiliary members within casings	<a href="#">F28F 9/00</a>