

CPC COOPERATIVE PATENT CLASSIFICATION

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

LIGHTING; HEATING

F24 HEATING; RANGES; VENTILATING (NOTE omitted)

F24D DOMESTIC- OR SPACE-HEATING SYSTEMS, e.g. CENTRAL HEATING SYSTEMS; DOMESTIC HOT-WATER SUPPLY SYSTEMS; ELEMENTS OR COMPONENTS THEREFOR (using steam or condensate extracted or exhausted from steam engine plants for heating purposes [F01K 17/02](#))

NOTE

In this subclass, the following expression is used with the meaning indicated:

- "Central heating system" means a system in which heat is generated or stored at central sources and is distributed by means of a transfer fluid to the spaces or areas to be heated.

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.}

Central Heating Systems

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| <p>1/00 Steam central heating systems (district heating systems F24D 10/00; central heating systems using heat accumulated in storage masses F24D 11/00)</p> <p>1/005 . {in combination with systems for domestic water supply}</p> <p>1/02 . operating with live steam {(F24D 1/005 takes precedence)}</p> <p>1/04 . operating with exhaust steam {(F24D 1/005 takes precedence)}</p> <p>1/06 . operating with superheated steam {(F24D 1/005 takes precedence)}</p> <p>1/08 . Feed-line arrangements, e.g. providing for heat-accumulator tanks, expansion tanks</p> <p>3/00 Hot-water central heating systems (district heating systems F24D 10/00; central heating systems using heat accumulated in storage masses F24D 11/00)</p> <p>3/005 . {combined with solar energy (solar heat collectors per se F24S)}</p> <p>3/02 . with forced circulation, e.g. by pumps</p> <p>3/04 . with the water under high pressure</p> <p>3/06 . . Arrangements or devices for maintaining high pressure</p> <p>3/08 . in combination with systems for domestic hot-water supply</p> <p>3/082 . . {Hot water storage tanks specially adapted therefor}</p> <p>3/085 . . . {Double-walled tanks}</p> <p>3/087 . . {Tap water heat exchangers specially adapted therefore}</p> <p>3/10 . Feed-line arrangements, e.g. providing for heat-accumulator tanks, expansion tanks {; Hydraulic components of a central heating system}</p> <p>3/1008 . . {expansion tanks}</p> | <p>3/1016 . . . {Tanks having a bladder}</p> <p>3/1025 . . . {Compressor controlled pressure heads}</p> <p>3/1033 . . . {with compressed gas cylinder}</p> <p>3/1041 . . . {Flow-through}</p> <p>3/105 . . {pumps combined with multiple way valves}</p> <p>3/1058 . . {disposition of pipes and pipe connections}</p> <p>3/1066 . . . {Distributors for heating liquids}</p> <p>3/1075 {Built up from modules}</p> <p>3/1083 . . {Filling valves or arrangements for filling}</p> <p>3/1091 . . {Mixing cylinders}</p> <p>3/12 . Tube and panel arrangements for ceiling, wall, or underfloor heating (electric underfloor heating F24D 13/02)</p> <p>3/122 . . {Details}</p> <p>3/125 . . . {Hydraulic pipe connections}</p> <p>3/127 . . . {Mechanical connections between panels}</p> <p>3/14 . . incorporated in a ceiling, wall or floor</p> <p>3/141 . . . {Tube mountings specially adapted therefor}</p> <p>3/142 {integrated in prefabricated construction elements}</p> <p>3/143 {Tube clips with barbed anchors}</p> <p>3/144 {Clips for fastening heating tubes on a reinforcement net or mesh, e.g. mesh for concrete reinforcement}</p> <p>3/145 . . . {Convecting elements concealed in wall or floor}</p> <p>3/146 . . . {Tubes specially adapted for underfloor heating}</p> <p>3/147 . . . {arranged in facades}</p> <p>3/148 . . . {with heat spreading plates}</p> <p>3/149 . . . {Tube-laying devices}</p> <p>3/16 . . mounted on, or adjacent to, a ceiling, wall or floor</p> <p>3/165 . . . {Suspended radiant heating ceiling}</p> <p>3/18 . using heat pumps</p> |
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5/00	Hot-air central heating systems (district heating systems F24D 10/00 ; central heating systems using heat accumulated in storage masses F24D 11/00 ; air conditioning F24F); Exhaust gas central heating systems	12/02	<ul style="list-style-type: none"> having more than one heat source (using heat pumps, in water central heating systems F24D 3/18; in air central heating systems F24D 5/12; in systems using heat storage masses F24D 11/02)
5/005	<ul style="list-style-type: none"> {combined with solar energy} 	Other domestic- or space-heating systems	
5/02	<ul style="list-style-type: none"> operating with discharge of hot air into the space or area to be heated 	13/00	Electric heating systems
5/04	<ul style="list-style-type: none"> <ul style="list-style-type: none"> with return of the air or the air-heater 	13/02	<ul style="list-style-type: none"> solely using resistance heating, e.g. underfloor heating
5/06	<ul style="list-style-type: none"> operating without discharge of hot air into the space or area to be heated 	13/022	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {resistances incorporated in construction elements}
5/08	<ul style="list-style-type: none"> <ul style="list-style-type: none"> with hot air led through radiators 	13/024	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {in walls, floors, ceilings}
5/10	<ul style="list-style-type: none"> <ul style="list-style-type: none"> with hot air led through heat-exchange ducts in the walls, floor or ceiling 	13/026	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {in door, windows}
5/12	<ul style="list-style-type: none"> using heat pumps 	13/028	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {Glass panels, e.g. mirrors, design radiators, etc.}
7/00	Central heating systems employing heat-transfer fluids not covered by groups F24D 1/00 - F24D 5/00, e.g. oil, salt or gas (district heating systems F24D 10/00 ; central heating systems using heat accumulated in storage masses F24D 11/00)	13/04	<ul style="list-style-type: none"> using electric heating of heat-transfer fluid in separate units of the system
9/00	Central heating systems employing combinations of heat transfer fluids covered by two or more of groups F24D 1/00 - F24D 7/00 (district heating systems F24D 10/00 ; central heating systems using heat accumulated in storage masses F24D 11/00)	15/00	Other domestic- or space-heating systems
9/02	<ul style="list-style-type: none"> Hot water and steam systems 	15/02	<ul style="list-style-type: none"> consisting of self-contained heating units, e.g. storage heaters
10/00	District heating systems	15/04	<ul style="list-style-type: none"> using heat pumps
10/003	<ul style="list-style-type: none"> {Domestic delivery stations having a heat exchanger} 	17/00	Domestic hot-water supply systems
10/006	<ul style="list-style-type: none"> {Direct domestic delivery stations} 	17/0005	<ul style="list-style-type: none"> {using recuperation of waste heat (F24D 17/0036 takes precedence)}
11/00	Central heating systems using heat accumulated in storage masses (self-contained storage heating units F24D 15/02)	17/001	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {with accumulation of heated water}
11/001	<ul style="list-style-type: none"> {district heating system} 	17/0015	<ul style="list-style-type: none"> {using solar energy (F24D 17/0036 takes precedence)}
11/002	<ul style="list-style-type: none"> {water heating system} 	17/0021	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {with accumulation of the heated water}
11/003	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {combined with solar energy} 	17/0026	<ul style="list-style-type: none"> {with conventional heating means (F24D 17/0036 takes precedence)}
11/004	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {with conventional supplementary heat source} 	17/0031	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {with accumulation of the heated water}
11/005	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {with recuperation of waste heat} 	17/0036	<ul style="list-style-type: none"> {with combination of different kinds of heating means}
11/006	<ul style="list-style-type: none"> {air heating system} 	17/0042	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {recuperated waste heat and solar energy}
11/007	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {combined with solar energy} 	17/0047	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {with accumulation of the heated water}
11/008	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {with conventional supplementary heat source} 	17/0052	<ul style="list-style-type: none"> {recuperated waste heat and conventional heating means}
11/009	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {with recuperation of waste heat} 	17/0057	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {with accumulation of the heated water}
11/02	<ul style="list-style-type: none"> using heat pumps 	17/0063	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {solar energy and conventional heaters}
11/0207	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {district heating system} 	17/0068	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {with accumulation of the heated water}
11/0214	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {water heating system} 	17/0073	<ul style="list-style-type: none"> {Arrangements for preventing the occurrence or proliferation of microorganisms in the water}
11/0221	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {combined with solar energy} 	17/0078	<ul style="list-style-type: none"> {Recirculation systems}
11/0228	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {combined with conventional heater} 	17/0084	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {Coaxial tubings}
11/0235	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {with recuperation of waste energy} 	17/0089	<ul style="list-style-type: none"> {Additional heating means, e.g. electric heated buffer tanks or electric continuous flow heaters, located close to the consumer, e.g. directly before the water taps in bathrooms, in domestic hot water lines}
11/0242	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {contained in exhausted air} 	17/0094	<ul style="list-style-type: none"> {Recovering of cold water}
11/025	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {contained in waste water} 	17/02	<ul style="list-style-type: none"> using heat pumps
11/0257	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {air heating system} 	18/00	Small-scale combined heat and power [CHP] generation systems specially adapted for domestic heating, space heating or domestic hot-water supply
11/0264	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {combined with solar energy} 	NOTE	
11/0271	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {combined with conventional energy} 	In this group, it is desirable to add the indexing codes of groups F24D 2101/00 - F24D 2105/00 .	
11/0278	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {with recuperation of waste energy} 		
11/0285	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {contained in exhausted air} 		
11/0292	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> {contained in waste water} 		
12/00	Other central heating systems		

19/00	Details (of water or air heaters F24H 9/00; of heat-exchange or heat-transfer apparatus, of general application F28F)	19/0226	. . . {Additional means supporting the process of mounting}
19/0002	. {Means for connecting central heating radiators to circulation pipes}	19/023	. . . {Radiators having fixed suspension means for connecting the radiator to the support means}
19/0004	. . {In a one pipe system}	19/0233	. . . {Templates for installing the radiator}
19/0007	. . . {Comprising regulation means}	19/0236	. . . {Water tubes or pipes forming part of the supporting means}
19/0009	. . {In a two pipe system}	19/024	. . {Functioning details of supporting means for radiators}
19/0012	. . . {Comprising regulation means}	19/0243	. . . {Means for moving the radiator horizontally to adjust the radiator position}
19/0014	. . {Connection means adaptable for one and two pipe systems}	19/0246	. . . {Means for moving the radiator vertically to adjust the radiator position}
19/0017	. . {Connections between supply and inlet or outlet of central heating radiators}	19/025	. . . {Eccentric means for moving the radiator vertically}
19/0019	. . . {Means for adapting connections}	19/0253	. . . {Adjusting a dimension, e.g. length, of the radiator support, e.g. telescopic rails}
19/0021	. . . {Flexible tubes or hoses}	19/0256	. . . {Radiators clamped by supporting means}
19/0024	. . . {Connections for plate radiators}	19/0259	. . . . {Radiators clamped by supporting means around a column or tube}
19/0026	. . {Places of the inlet on the radiator}	19/0263	. . . . {Radiators clamped by supporting means between two columns or tubes}
19/0029	. . . {on a top corner}	19/0273	. . . {Radiators fixed in order to prevent undesired detachment}
19/0031	. . . {on the top in the middle}	19/0276	. . . . {Radiators fixed on the bottom}
19/0034	. . . {on a bottom corner}	19/0279	. . . . {Radiators fixed on the sides}
19/0036	. . . {on the bottom in the middle}	19/0283	. . . . {Radiators fixed on the top}
19/0039	. . {Places of the outlet on the radiator}	19/0286	. . . . {Radiators fixed using a spring}
19/0041	. . . {on the top in the middle}	19/0289	. . . . {Radiators fixed using a flexible clip}
19/0043	. . . {on the opposite top corner}	19/0293	. . . {Radiators rotating without being demounted}
19/0046	. . . {on the top on the same side}	19/04	. . in skirtings
19/0048	. . . {on the bottom in the middle}	19/06	. Casings, cover lids or ornamental panels, for radiators
19/0051	. . . {on the bottom on the opposite corner}	19/061	. . {Radiator shelves}
19/0053	. . . {on the bottom on the same side}	19/062	. . {Heat reflecting or insulating shields}
19/0056	. . {Supplies from the central heating system}	19/064	. . {Coverings not directly attached to a radiator, e.g. box-like coverings}
19/0058	. . . {coming out the floor}	19/065	. . {Grids attached to the radiator and covering its top}
19/006	. . . . {Alongside the radiator}	19/067	. . {Front coverings attached to the radiator}
19/0063	. . . . {under the radiator}	19/068	. . {Side coverings attached to the radiator}
19/0065	. . . {coming out the wall}	19/08	. Arrangements for drainage, venting or aerating (valves for venting or aerating F16K 24/00)
19/0068	. . . . {alongside the radiator}	19/081	. . {for steam heating systems}
19/007	. . . . {under the radiator}	19/082	. . {for water heating systems}
19/0073	. . {Means for changing the flow of the fluid inside a radiator}	19/083	. . . {Venting arrangements}
19/0075	. . {Valves for isolating the radiator from the system}	19/085	. . . . {Arrangement of venting valves for central heating radiators}
19/0078	. . {Plugs}	19/086	. . . . . {hand-operated}
19/008	. {Details related to central heating radiators}	19/087	. . . . . {automatic}
19/0082	. . {Humidifiers for radiators}	19/088	. . . {Draining arrangements}
19/0085	. . {Fresh air entries for air entering the room to be heated by the radiator}	19/10	. Arrangement or mounting of control or safety devices (only the heater being controlled F24H 9/20)
19/0087	. . {Fan arrangements for forced convection}	19/1003	. . {for steam heating systems}
19/009	. . {Magnets, e.g. for attaching a cover}	19/1006	. . {for water heating systems}
19/0092	. {Devices for preventing or removing corrosion, slime or scale}	19/1009	. . . {for central heating}
19/0095	. {Devices for preventing damage by freezing}	19/1012	. . . . {by regulating the speed of a pump}
19/0097	. {Casings or frame structures for hydraulic components}	19/1015	. . . . . {using a valve or valves}
19/02	. Arrangement of mountings or supports for radiators	19/1018	. . . . . {Radiator valves}
19/0203	. . {Types of supporting means}	19/1021	. . . . . {a by pass valve}
19/0206	. . . {Tube shaped supports inserted into a wall}	19/1024	. . . . . {a multiple way valve}
19/0209	. . . {Supporting means having bracket}	19/1027	. . . . . {hand operated}
19/0213	. . . {Floor mounted supporting means}		
19/0216	. . . {Supporting means having a rail}		
19/022	. . {Constructional details of supporting means for radiators}		
19/0223	. . . {Distance pieces between the radiator and the wall}		

19/103	. . . . . {bimetal operated}	2200/046	. . Condensing boilers
19/1033	. . . . . {motor operated}	2200/06	. Solid fuel fired boiler
19/1036	. . . . . {Having differential pressure measurement facilities}	2200/062	. . Coal fired boilers
19/1039	. . . . . {the system uses a heat pump}	2200/065	. . Wood fired boilers
19/1042	. . . . . {the system uses solar energy}	2200/067	. . . Pellet fired boilers
19/1045	. . . . . {the system uses a heat pump and solar energy}	2200/07	. Solid fuel burners
19/1048	. . . . . {Counting of energy consumption}	2200/08	. Electric heater
19/1051	. . . {for domestic hot water}	2200/10	. Fire place
19/1054	. . . . . {the system uses a heat pump}	2200/11	. Geothermal energy
19/1057	. . . . . {the system uses solar energy}	2200/115	. . Involving mains water supply
19/106	. . . . . {the system uses a heat pump and solar energy}	2200/12	. Heat pump
19/1063	. . . . . {counting of energy consumption}	2200/123	. . Compression type heat pumps
19/1066	. . . {for the combination of central heating and domestic hot water}	2200/126	. . Absorption type heat pumps
19/1069	. . . . . {regulation in function of the temperature of the domestic hot water}	2200/13	. Heat from a district heating network
19/1072	. . . . . {the system uses a heat pump}	2200/14	. Solar energy
19/1075	. . . . . {the system uses solar energy}	2200/15	. Wind energy
19/1078	. . . . . {the system uses a heat pump and solar energy}	2200/16	. Waste heat
19/1081	. . . . . {counting of energy consumption}	2200/18	. . Flue gas recuperation
19/1084	. . {for air heating systems}	2200/19	. . Fuel cells
19/1087	. . . {system using a heat pump}	2200/20	. . Sewage water
19/109	. . . {system using solar energy}	2200/22	. . Ventilation air
19/1093	. . . {system using a heat pump and solar energy}	2200/24	. . Refrigeration
19/1096	. . {for electric heating systems}	2200/26	. . Internal combustion engine
		2200/28	. . Biological processes
		2200/29	. . Electrical devices, e.g. computers, servers
		2200/30	. . Friction
		2200/31	. . Air conditioning systems
		2200/32	. involving multiple heat sources in combination or as alternative heat sources

Indexing scheme associated with group F24D 18/00, relating to electric generators, thermal aspects and constructional aspects of small-scale combined heat and power [CHP] systems

2101/00	Electric generators of small-scale CHP systems
2101/10	. Gas turbines; Steam engines or steam turbines; Water turbines, e.g. located in water pipes
2101/20	. Wind turbines
2101/30	. Fuel cells
2101/40	. Photovoltaic [PV] modules
2101/50	. Thermophotovoltaic [TPV] modules
2101/60	. Thermoelectric generators, e.g. Peltier or Seebeck elements
2101/70	. Electric generators driven by internal combustion engines [ICE]
2101/80	. Electric generators driven by external combustion engines, e.g. Stirling engines
2103/00	Thermal aspects of small-scale CHP systems
2103/10	. Small-scale CHP systems characterised by their heat recovery units
2103/13	. . characterised by their heat exchangers
2103/17	. . Storage tanks
2103/20	. Additional heat sources for supporting thermal peak loads
2105/00	Constructional aspects of small-scale CHP systems
2105/10	. Sound insulation

Heat sources; Energy sources

2200/00	Heat sources or energy sources
2200/02	. Photovoltaic energy
2200/04	. Gas or oil fired boiler
2200/043	. . More than one gas or oil fired boiler

Central Heating Systems

2220/00	Components of central heating installations excluding heat sources
2220/003	. Generic central heating systems
2220/006	. Parts of a building integrally forming part of heating systems, e.g. a wall as a heat storing mass
2220/02	. Fluid distribution means
2220/0207	. . Pumps
2220/0214	. . Inlets or outlets
2220/0221	. . Mixing cylinders
2220/0228	. . Branched distribution conduits
2220/0235	. . Three-way-valves
2220/0242	. . Multiple way valves
2220/025	. . Check valves
2220/0257	. . Thermostatic valves
2220/0264	. . Hydraulic balancing valves
2220/0271	. . Valves
2220/0278	. . Expansion vessels
2220/0285	. . Pipe sections
2220/0292	. . Fluid distribution networks
2220/04	. Sensors
2220/042	. . Temperature sensors
2220/044	. . Flow sensors
2220/046	. . Pressure sensors
2220/048	. . Level sensors, e.g. water level sensors
2220/06	. Heat exchangers
2220/07	. Heat pipes
2220/08	. Storage tanks
2220/10	. Heat storage materials, e.g. phase change materials or static water enclosed in a space
2220/20	. Heat consumers

- 2220/2009 . . Radiators
- 2220/2018 . . . Column radiators having vertically extending tubes
- 2220/2027 . . . Convectors (radiators wherein heat transfer mainly takes place by convection)
- 2220/2036 . . . Electric radiators
- 2220/2045 . . . Radiators having horizontally extending tubes
- 2220/2054 . . . Panel radiators with or without extended convection surfaces
- 2220/2063 . . . Central heating radiators having heat storage material incorporated
- 2220/2072 . . . Radiators being skirting boards between floor and wall or ledges between wall and ceiling
- 2220/2081 . . Floor or wall heating panels
- 2220/209 . . Sanitary water taps
- 2240/00** **Characterizing positions, e.g. of sensors, inlets, outlets**
- 2240/10 . Placed within or inside of
- 2240/12 . Placed outside of
- 2240/20 . Placed at top position
- 2240/22 . Placed at bottom position
- 2240/24 . Placed at centre position
- 2240/243 . . Vertically centred
- 2240/246 . . Horizontally centred
- 2240/26 . Vertically distributed at fixed positions, e.g. multiple sensors distributed over the height of a tank, or a vertical inlet distribution pipe having a plurality of orifices
- 2240/28 . Horizontally distributed at fixed positions
- 2240/30 . At vertical variable positions, e.g. a movable inlet pipe within a tank
- 2240/32 . At horizontal variable positions