CLASS 236, AUTOMATIC TEMPERATURE AND HUMIDITY REGULATION

SECTION I - CLASS DEFINITION

This class relates only to automatic temperature and humidity regulation, and is not to include the system where the thermostatic control constitutes but an element of the system, even though the system includes temperature regulation, such, for example, as refrigeration, where the refrigerating structure or method is claimed. Systems are also excluded where the specific burner structure, specific boiler structure, specific heat-exchange element, specific fire extinguishing structure, specific heat distributing system, specific internal-combustion engine structure, specific furnace structure, specific gas producer structure or method, specific heating and molding devices, etc., are claimed--that is, this class is confined to automatically operating temperature or humidity controlling mechanism, but excludes all patents to the specific mechanism controlled, even though the thermostat is claimed, either broadly or specifically, in combination therewith.

(1) Note. This class includes only patents for devices which control temperature or humidity automatically, but not those which are merely operated by temperature variation. The only apparent exceptions are the heating radiator thermostatic air relief valves, the thermostatic steam traps and thermostatically operated regulating valves.

(2) Note. This class provides for all heating radiator automatic air relief valves including a thermostat.

(3) Note. This class provides for all automatic steam traps including a thermostat in the combination.

(4) Note. Patents for devices for controlling the flow of air over an automobile radiator by means of a thermostat located either in the cooling water or under the hood are classified in this class unless some novelty in the engine or cooling system is claimed.

SECTION II - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, subclasses 524+ for automatic control of such apparatus, including temperature and humidity regulation for such specific apparatus.

62, Refrigeration, subclasses 132+ for automatically controlled apparatus specialized to refrigeration.

65, Glass Manufacturing, subclass 162 for temperature or heater control responsive to a condition sensing means combined with glassworking or treating apparatus.

73, Measuring and Testing, subclasses 29.02+ for hygrometers and hygrostats.

116, Signals and Indicators, subclasses 101+ for thermostatically controlled nonelectric alarms.

122, Liquid Heaters and Vaporizers, subclasses 451.1+ for devices for automatically controlling the feed water to a boiler by means of a thermostat and according to the level of the water in the boiler, 504.1 and 504.3 for fusible plugs where a pressure is released on the plug fusing at a certain temperature and 504.2 for devices where a thermostat operates on a fall of boiler water level to open a valve to sound an alarm.

123, Internal-Combustion Engines, appropriate subclasses for devices for automatically controlling the flow (or supply) of air to the manifold of an internal-combustion engine according to the temperature of the engine or manifold.

131, Tobacco, subclass 303 for processes and apparatus for treating tobacco with fluids combined with means for automatically regulating the temperature and/or humidity of the fluids.

137, Fluid Handling, appropriate subclass for fluid handling apparatus and processes not otherwise provided for, including automatic control of fluid flow in response to a change in a condition. Note particularly subclasses 59+, 72+, 79+, 457, and 468 for the control of flow in response to a change in thermal conditions.

165, Heat Exchange, subclasses 201+ for specific heating and cooling elements with automatic control, and subclasses 281+; 287+ for specific heat exchange elements with automatic temperature or pressure control or response.

169, Fire Extinguishers, subclass 42 for fusible links of general application.

261, Gas and Liquid Contact Apparatus, subclass 39 for fuel or air valves in carburetors thermostatically operated.

323, Electricity: Power Supply or Regulation Systems, subclasses 220 through 354 for voltage or current regulators.

337, Electricity: Electrothermally or Thermally Actuated Switches, subclasses 298+ for thermostatic switches.

340, Communications: Electrical, subclasses 584+ for electrical alarms automatically responsive to temperature, and subclass 602 for electrical alarms automatically responsive to humidity.

374, Thermal Measuring and Testing, subclasses 100+ for a thermometer.

399, Electrophotography, subclasses 91+ for internal machine environment control of an electrophotographic device.

431, Combustion, subclasses 18+ for (1) a residual specific burner with a timer, programmer, or condition responsive control; or (2) for a residual temperature modifying apparatus specialized to combustion having a nonspecific burner that is merely turned off and on by a conventional off and on thermostat sensing the temperature of the chamber or material being heated.

SUBCLASSES

1 MISCELLANEOUS:
This subclass is indented under the class definition. Subject matter not provided for in any of the following subclasses.

2 INCUBATOR TYPE OF HEATER:
This subclass is indented under the class definition. Subject matter for incubators.

SEE OR SEARCH CLASS:

119, Animal Husbandry, subclasses 314, 317, 319, for such devices having particular incubator structure.

237, Heating Systems, subclasses 3+ for the same with specific heating systems.

3 Electric:
This subclass is indented under subclass 2. Subject matter in which the controlling means is electrically operated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

74+, for the type of operating apparatus used.

4 Expanding fluid:
This subclass is indented under subclass 2. Subject matter in which the regulating means is operated directly by a thermostat of the expanding-fluid type.

5 Expanding solid:
This subclass is indented under subclass 2. Subject matter in which the regulating means is operated directly by a thermostat of the expanding solid type.

6 BROODER TYPE OF HEATER:
This subclass is indented under the class definition. Subject matter for brooder type of heaters not otherwise classifiable.

SEE OR SEARCH CLASS:

119, Animal Husbandry, subclass 306 for such devices having particular brooder structure. See (1) note to that subclass definition.

237, Heating Systems, subclasses 3+ for the same with specific heating system.

7 SADIRON TYPE:
This subclass is indented under the class definition. Subject matter for self-heated sad-irons not otherwise classifiable.

SEE OR SEARCH CLASS:

38, Textiles: Ironing and Smoothing, subclasses 82+ for such devices having particular iron structure.

219, Electric Heating, subclasses 490+ for heating systems of general utility with automatic control means, and appropriate subclasses for specific type electrical heating devices with automatic current, voltage or temperature control means.

8 ATOMIZER TYPE OF BURNER:
This subclass is indented under the class definition. Devices controlling the flow of steam or air and fuel to an atomizer type of burner, according to changes in pressure or temperature in the device heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

26+, for controlling devices responsive to pressure changes in the closed fluid heater.

9 COMBINED HEATER AND APARTMENT CONTROLLED:

This subclass is indented under the class definition. Subject matter which are operated by devices responsive to temperature changes in a heater and also temperature changes in an apartment to be heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

37, for control by radiator temperature and apartment temperature.

91, for other controls responsive to temperatures at different places.

10 HOT-AIR FURNACE:

This subclass is indented under the class definition. Subject matter comprising hot air furnaces which are provided with automatic temperature regulating means. In the devices of this subclass the fire is generally regulated by the temperature in the air space of the furnace.

11 Air and fire control:

This subclass is indented under subclass 10. Subject matter in which the fire and also the flow of the heating air through the air chamber of the furnace is controlled.

12.1 MIXING FLUID OF DISSIMILAR TEMPERATURE:

This subclass is indented under the class definition. Apparatus mixing fluid from two or more different supplies in which at least one of the supplies of the fluid is controlled according to the temperature of the mixed fluid or the temperature of one of the fluid supplies.

12.11 Mixing valve with temperature controlled motive means:

This subclass is indented under subclass 12.1. Apparatus comprising flow control means positively moved to an adjusted position by a motor means wherein the motor means is moved to the adjusted position by a medium or force controlled by but not resulting directly from a sensed temperature condition or a change in such a condition.

(1) Note. Examples of motors to be found herein are electric motors controlled by thermostatic switches, fluid motors with independent sources of fluid pressure where a thermal responsive valve senses a system conditions and regulates fluid flow from said source to motor.

(2) Note. A valve merely moved by a heat motor which directly senses a system condition and responds to move a valve, e.g., bimetal, closed fluid system with sensing bulb, etc., will not be found herein.

12.12 Having electrical motive means:

This subclass is indented under subclass 12.11. Apparatus comprising a motor means responding to electrical energy input for moving the flow control means.

12.13 Including bypass:

This subclass is indented under subclass 12.1. Apparatus in which the device is provided with separate controllable through passages, leading from a source of fluid, at least one of the passages having a valving means permitting said fluid to pass directly to a point of use, regardless of the temperature existing in the system, and at least one other passage being provided with means for controlling the flow of said fluid in response to a temperature condition or a change in temperature occurring at some point in the apparatus.

12.14 Fluid from only one supply is controlled:

This subclass is indented under subclass 12.1. Apparatus in which the flow of only one of the supplies is controlled by the sensed temperature condition of the mix.

12.15 Including separate relatively movable valve for each fluid supply:

This subclass is indented under subclass 12.1. Apparatus wherein the flow of each supply is controlled by a separate flow control member movable in response to fluid temperature.

(1) Note. Each member may be movable in response to the temperature of either a respective fluid or a fluid mix.

12.16 Having oscillating or reciprocating valve:
This subclass is indented under subclass 12.1. Apparatus wherein a flow control means moves in a prescribed straight line or arcuate path of travel to control fluid flow.

12.17 Valving member moves about an axis:
This subclass is indented under subclass 12.16. Apparatus wherein the flow control means comprises a flow control portion movable in an arcuate path of travel.

12.18 Tubular valve member:
This subclass is indented under subclass 12.17. Apparatus wherein the flow control means comprises a hollow sleeve or cylinder like member or portion.

(1) Note. A cup shape flow control means is proper for classification here if the sleeve or cylinder portion performs a flow control function. Otherwise classification will be based on other features.

12.19 Axially spaced flow faces:
This subclass is indented under subclass 12.17. Apparatus wherein the flow control means comprises a member having a seating face at each of its sides for coacting with seats on oppositely disposed fluid inlets.

12.2 Tubular valve member:
This subclass is indented under subclass 12.16. Apparatus wherein the flow control means comprises a hollow sleeve or cylinder-like member or portion.

12.21 Axially spaced flow control faces:
This subclass is indented under subclass 12.16. Apparatus wherein the flow control means comprises a movable valving member having a seating face at each end for coacting with seats on oppositely disposed fluid inlets.

12.22 Seats face outwardly:
This subclass is indented under subclass 12.21. Apparatus wherein the seating faces on the member are directed away from each other.

12.23 Ports closed by valve action:
This subclass is indented under subclass 12.16. Apparatus wherein the movable flow control means moves to and from contiguously along a surface having fluid ports therein for controlling fluid passing therethrough.

13 Plenum type:
This subclass is indented under subclass 12.1. Devices controlling the mixing of warm and cold air in the plenum type of heating systems according to the temperature of the hot or cold air, mixed air, or apartment to be heated.

14 COMBINED BOILER AND FURNACE CONTROLLED:
This subclass is indented under the class definition. Devices controlling the fire under a boiler according to conditions in the boiler and also according to conditions in the furnace.

SEE OR SEARCH THIS CLASS, SUBCLASS:
15, for devices responsive to changes within the furnace.
20+, for control devices operated by changes in the boilers.

15 FURNACE CONTROLLED:
This subclass is indented under the class definition. Devices controlling the fire according to conditions in the furnace.

SEE OR SEARCH THIS CLASS, SUBCLASS:
14, for controls responsive to boiler and furnace.
95, 96, for furnace control where the thermostat is attached to the outside of the heater or flue.
104, for furnace controls operated by the expansion or contractions of the furnace parts due to temperature changes.

16 COMBINED DRAFT AND CHECK CONTROL:
This subclass is indented under the class definition. Devices controlling the draft damper and check damper of a stove or furnace according to changes in the temperature of apartment or element heated.

17 Pressure-operated:
This subclass is indented under the class definition. Devices controlling the supply of heating fluid to an exchange or surface heater by the pressure of the fluid heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

14, for the same combined with furnace control.

26+, for pressure operated closed fluid heater control.

85, for the control, per se.

18 Expanding fluid:

This subclass is indented under the class definition. Devices controlling the supply of heating fluid to an exchange or surface heater directly by means of a thermostat of the expanding fluid type responsive to the temperature of the fluid heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4, 42, 56+, 64, 95, and 99, for the type of thermostat used and control devices operated thereby.

32, for closed fluid heaters with similar controls.

93, for devices where flow is regulated by the temperature of the flowing fluid.

19 Expanding solid:

This subclass is indented under the class definition. Devices controlling the supply of heating fluid to an exchange or surface heater directly by means of a thermostat of the expanding solid type responsive to the temperature of the fluid heater.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, 43, 59+, 66, 96, and 101, for the type of thermostat used and control devices operated thereby.

33, for closed fluid heaters with similar controls.

93, for devices where flow is regulated by the temperature of the flowing fluid.

20 CLOSED FLUID HEATERS:

This subclass is indented under the class definition. Devices controlling the temperature of the fluid heated.

21 Safety cut-out:

This subclass is indented under subclass 20. Devices controlling the heating means according to the conditions in the heater, with additional means for cutting out the regulating means under abnormal conditions, such as failure of the regulator, (as by rupture of the diaphragm, for example), the pressure exceeding a certain limit, the water-level falling below a certain limit, the temperature getting too high, or heating means failing.

(1) Note. The regulator must generally be repaired or reset by hand.

SEE OR SEARCH THIS CLASS, SUBCLASS:

89, for magnetic trip release controls with cut-out features.

SEE OR SEARCH CLASS:

137, Fluid Handling, subclasses 59+, 72+, 79+, 457, and 468 for thermally responsive valves in general.

22 Radiator type:

This subclass is indented under subclass 20. Combined radiators and heaters where the heater is controlled according to the temperature of the radiator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

26+, for heaters controlled by the pressure in the radiator.

32, 33, for heaters controlled by a thermostat.

SEE OR SEARCH CLASS:

237, Heating Systems, subclass 7 for systems where the unit is specifically claimed.

23 One valve:

This subclass is indented under subclass 20. Devices in which the heating means, usually a gas-burner, is controlled by the combined action of a thermostat in the fluid heated and a flow-motor operated by the flow of the fluid heated, the thermostat and motor controlling the movement of a single control-valve.

24 Two or more valves:

This subclass is indented under subclass 20. Devices in which the heating means, usually a gas-burner, is controlled by the combined action of a thermostat in the fluid heated and a flow-motor operated by the flow of the fluid

heated, the thermostat and motor operating on separate valves.

24.5 Flow and pressure controlled:
This subclass is indented under subclass 20. Devices in which the combined dynamic and static pressure of the fluid heated controls the heating means, and those in which this combined force is opposed by one of its elements alone or by a different combination of them.

25 Flow controlled:
This subclass is indented under subclass 20. Devices in which the heating means is controlled according to the rate of flow of the fluid heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:
23, 24, 24.5, and 45, for other temperature or humidity regulators comprising flow control of the regulator.

SEE OR SEARCH CLASS:
137, Fluid Handling, subclasses 98+, 458 to 460, 486+, 496, and 497+ for valves responsive to change in rate of flow.

26 Pressure-operated:
This subclass is indented under subclass 20. Devices not otherwise classifiable controlling the heating of the closed fluid-heater according to the pressure in the heater.

SEE OR SEARCH THIS CLASS, SUBCLASS:
8, 14, 17, and 85, for other pressure operated controls.

27 With balancing pressure chamber:
This subclass is indented under subclass 26. Devices where the effect of the heater-pressure is counterbalanced by a closed pressure-chamber.

28 Stroke retarding:
This subclass is indented under subclass 26. Devices with means for increasing the resistance to movement of a control element as movement from normal increases.

29 Relay, puppet:
This subclass is indented under subclass 26. Devices in which at a given pressure a puppet-valve opens, allowing pressure from the boiler to operate a motor, which actuates the heat-controlling means.

30 Bourdon type:
This subclass is indented under subclass 26. Devices in which the pressure-responsive element which operates the controlling means is a Bourdon tube.

31 Float:
This subclass is indented under subclass 26. Devices in which the pressure acts on a body of liquid, thereby varying the level thereof, and a float or piston rising and falling with the change in level of the liquid operates the controlling means. Also includes devices where a float is raised more or less by change in pressure of steam thereunder when water boils.

SEE OR SEARCH THIS CLASS, SUBCLASS:
100, for other float responsive devices.

32 Expanding fluid:
This subclass is indented under subclass 20. Devices controlling the heating means directly by a thermostat of the expanding-fluid type responsive to the temperature of the fluid heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:
4, 42, 56+, 64, 86, 95, and 99, for the type of thermostat used and devices operated thereby.
18, for similar structure in exchange heaters.

33 Expanding solid:
This subclass is indented under subclass 20. Devices controlling the heating means directly by a thermostat of the expanding-solid type responsive to the temperature of the fluid heated. The thermostat may be the walls of the container.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, 19, 43, 59+, 66, 87, 96, and 101+, for the type of thermostat used and devices operated thereby.

34 COOLING RADIATOR:

This subclass is indented under the class definition. Devices not otherwise classified controlling the temperature of the fluid within a cooling-radiator, as the radiator in the cooling system of an internal-combustion engine.

SEE OR SEARCH CLASS:

123, Internal-Combustion Engines, subclasses 41.02+ for specific cooling systems peculiar to internal-combustion engines.

34.5 Bypass:

This subclass is indented under subclass 34. Subject matter in which a by pass is interposed in the cooling circuit to by pass the radiator, usually including a thermostatically operated valve responsive to the temperature of the coolant or engine and positioned in the circuit to direct the flow of the coolant either to the radiator or the by pass.

35 Air control:

This subclass is indented under subclass 34. Devices controlling the flow of air over the radiator according to the temperature of the fluid cooled or the cooling-air or the engine temperature.

SEE OR SEARCH CLASS:

123, Internal-Combustion Engines, subclasses 41.04+ and 41.11+ for shutter and impeller controls associated with engine cooling.

165, Heat Exchange, subclass 98 for radiator with means controlling the flow of air therethrough not automatically controlled, and subclasses 281+; 287+ for a heat exchanger having automatic temperature or pressure control.

35.2 Shutters:

This subclass is indented under subclass 35. Subject matter in which the means for controlling the air flow is shutters.

35.3 Servomotor:

This subclass is indented under subclass 35. Subject matter in which the means for operating the shutters includes a servo-motor.

36 HEATING RADIATOR:

This subclass is indented under the class definition. Devices not otherwise classified controlling the supply of heating fluid to a heating-radiator.

37 Combined radiator and apartment controlled:

This subclass is indented under subclass 36. Devices responsive to conditions in the radiator and temperature of the apartment heated thereby.

SEE OR SEARCH THIS CLASS, SUBCLASS:

9, for systems in which the temperature of a heater and of the apartment controls the regulation.

91, for controls responsive to temperatures at different places.

38 Air control:

This subclass is indented under subclass 36. Means regulating the flow of air over the radiator according to temperature changes in the radiator, the air heated, or the apartment to be heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

13, for similar structure in fluid mixers.

39 Aspirator:

This subclass is indented under subclass 36. Heating-radiators with means for exhausting the air therefrom in which the heating effect of the radiator is controlled by a fluid-motor operated by said exhaust, the connection between the exhaust and the motor being controlled by a thermostat.

SEE OR SEARCH THIS CLASS, SUBCLASS:

54, for steam traps incorporating a pressure motor and a thermostatic pilot therefor.

40 Thermostatic:
This subclass is indented under subclass 36. Heating-radiators provided with a thermostat subjected to the exhaust from the radiator and controlling the supply of heating fluid to the radiator.

41 With trap:
This subclass is indented under subclass 40. Subject matter in combination with an automatic trap for discharging the air and water of condensation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
53, through 60, under "Traps", for the specific automatic trap construction.
53+, for steam traps with float valve and thermostatically controlled air vent valve.

42 Expanding fluid:
This subclass is indented under subclass 36. Heating-radiators with a thermostat of the expanding-fluid type for directly regulating the supply of heating fluid to the radiator.

SEE OR SEARCH THIS CLASS, SUBCLASS:
4, 18, 32, 56+, 64, 86, and 99, for the type of thermostat used and controlling devices operated thereby.
40+, for similar devices exhaust operated.

43 Expanding solid:
This subclass is indented under subclass 36. Heating-radiators with a thermostat of the expanding solid type for directly regulating the supply of heating fluid to the radiator.

(1) Note. This also includes devices operated by the expansion of the radiator.

SEE OR SEARCH THIS CLASS, SUBCLASS:
5, 19, 33, 59+, 66, 87, 96, and 101+, for the type of thermostat and controlling devices operated thereby.

44 HUMIDITY CONTROL:
This subclass is indented under the class definition. Devices controlling the humidity of a room or apartment by means of a device responsive to the relative humidity therein.

SEE OR SEARCH CLASS:
165, Heat Exchange, subclasses 282; 283; 294; 296; and 297 for a heating and cooling system having humidity control.
261, Gas and Liquid Contact Apparatus, subclasses 129+ for temperature or humidity controlled gas liquid contactors having heating or cooling means.

45 DRAFT-OPERATED:
This subclass is indented under the class definition. Devices controlling the operation of a heater according to the draft.

SEE OR SEARCH CLASS:
137, Fluid Handling, subclasses 98+, 458 to 460, 486+, 496, and 497+ for valves responsive to change in rate of flow.

46 WITH TIMING ELEMENT:
This subclass is indented under the class definition. Devices in which a clock is employed for adjusting the regulating device at a given time or where the clock cuts in or cuts out the regulating device; also devices with timing means for periodically placing the regulating means into and out of operation.

SEE OR SEARCH CLASS:
110, Furnaces, subclass 192 for a refuse incinerator or solid fuel furnace provided with a timer control.

47 HIGH AND LOW TEMPERATURE ALTERNATE:
This subclass is indented under the class definition. Devices controlling the temperature by two different devices alternately, one set to maintain the temperature relatively high and the other relatively low.

SEE OR SEARCH THIS CLASS, SUBCLASS:

46, for clock controlled regulators that may be operated to maintain different temperatures at different times.

48 SNAP-ACTING:

This subclass is indented under the class definition. Devices in which the temperature control valve does not move on slight changes in temperature, but its operating force is stored up during a certain movement of the temperature responsive device, and then the valve (or controlling means) suddenly moves throughout its entire movement not provided for more specifically below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

81, 83, for such devices incorporating a fluid motor which is relay operated.

SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, subclasses 100.1+ for snap action devices associated with mechanism for converting reciprocating motion to or from oscillating motion.

49.1 VENTILATOR TYPE:

This subclass is indented under the class definition. Device comprising particular temperature responsive means for operating a device which controls air flow to, from, or within a ventilated space.

(1) Note. Inclusion in this subclass requires specific temperature sensing and coupled operating means structure (i.e., a "means for controlling a ventilator in response to temperature" is not sufficient to inclusion in this subclass whereas a "bimetallic element operated actuating linkage for a ventilator" is sufficient for inclusion).

(2) Note. The means usually detects and responds to air temperature within the ventilated space or within an air passage leading to the space.

SEE OR SEARCH THIS CLASS, SUBCLASS:

2+, and the search notes thereunder, for a similar control means associated with an incubator.

44+, for a humidity response means for operating a device which controls air flow to, from, or within a ventilated space.

SEE OR SEARCH CLASS:

454, Ventilation, appropriate subclasses, for ventilator structures, per se, and for ventilator operated by a nominal temperature responsive control means for automatic temperature regulation; note, in particular, subclass 370 for ventilation means with condition responsive control, subclass 258 for an air distributing, moveable louver responsive to temperature, and subclass 369 for an outlet cowl having a spaced cap and a positively actuated valve with a fusible release.

49.2 Responsive to fire or smoke:

This subclass is indented under subclass 49.1. Device wherein the air flow control means is responsive to a sensing means which detects a presence of (1) a flame due to combustion or (2) a vaporous emission resulting from combustion.

SEE OR SEARCH CLASS:

169, Fire Extinguishers, appropriate subclasses, for a specific fire extinguisher apparatus combined with a fire or smoke responsive control means; see, in particular, subclasses 56+ for such a condition responsive fire-extinguisher for a special application.

454, Ventilation, subclass 257 for an inlet-ceiling-type air diffuser having an emergency smoke or fire responsive valve, subclass 342 for an outlet airway with an air pump and specific emergency smoke handling structure, subclass 357 for an outlet airway having an emergency smoke handling feature, and subclass 369 for fire dampers which cut off ventilated flow in response to elevated temperatures.

49.3 Electrically actuated:
This subclass is indented under subclass 49.1. Device wherein the means operates the air flow control device by way of electricity.

49.4 Pneumatically actuated:
This subclass is indented under subclass 49.1. Device wherein the means operates the air flow control device by way of air pressure.

49.5 Mechanical linkage actuated:
This subclass is indented under subclass 49.1. Device wherein the means operates the air flow control device by way of a system of interconnected machine elements.

50 LIQUID VALVE:
This subclass is indented under the class definition. Devices in which the regulating means controls the heating means by means of a liquid valve.

51 DISTANCE-ADJUSTED:
This subclass is indented under the class definition. Devices provided with means for adjusting from a distance the effect of the regulating means.

52 FLOAT-OPERATED:
This subclass is indented under the class definition. Devices not otherwise classifiable which are operated by the rise and fall of a float.

SEE OR SEARCH THIS CLASS, SUBCLASS:
31, for heaters controlled by pressure wherein the pressure causes the rise and fall of liquid which motion operates a float.
65, 100, for regulators operated by expanding fluid and incorporating a float moved by the fluid.

53 Thermostatic air valve:
This subclass is indented under the class definition. Automatic steam-traps in which the water-drain valve is float-operated, but which are provided with a thermostatically-controlled air-vent.

SEE OR SEARCH CLASS:
137, Fluid Handling, subclasses 171+ for steam traps in which there is no thermally controlled air vent.

54 Thermostatic pilot:
This subclass is indented under the class definition. Automatic steam-traps with a pressure-motor for operating the drain-valve and a thermostatically-operated pilot-valve for controlling the action of the motive fluid on the pressure-motor.

SEE OR SEARCH THIS CLASS, SUBCLASS:
80, for the control in other combinations.

SEE OR SEARCH CLASS:
137, Fluid Handling, subclasses 191 and 195 for steam traps responsive to liquid level operated by float controlled servo or pilot.

55 With float-controlled pilot:
This subclass is indented under the class definition. Automatic steam-traps with the drain-valve operated by a thermostat and a float-controlled pilot-valve for controlling the flow of heating fluid to the thermostat for operating the same.

SEE OR SEARCH THIS CLASS, SUBCLASS:
68, for similar controls in other combinations.

56 Expanding fluid:
This subclass is indented under the class definition. Automatic steam-traps in which the drain-valve is directly operated by a thermostat of the expanding-fluid type.

SEE OR SEARCH THIS CLASS, SUBCLASS:
41, for radiator heat controls incorporating a similar device.
64, for air relief valve of similar type.

57 Bourdon type:
This subclass is indented under subclass 56. Automatic steam-traps in which the drain-valve is directly operated by a thermostat of the

expanding-fluid type in the shape of a Bourdon tube.

58 Wafer type:
This subclass is indented under subclass 56. Devices in which the drain-valve is operated directly by an expanding-fluid thermostat of the wafer type.

59 Expanding solid:
This subclass is indented under the class definition. Automatic steam-traps in which the drain-valve is directly operated by a thermostat of the expanding-solid type.

SEE OR SEARCH THIS CLASS, SUBCLASS:
66, for air relief valve controlled by thermostat.

60 Conduit:
This subclass is indented under subclass 59. Devices in which the drain-valve is directly operated by a thermostat of the expanding-solid type, but which is in the shape of a conduit, through which the heating fluid passes or is discharged.

SEE OR SEARCH THIS CLASS, SUBCLASS:
103, for controls operated by the expansions of a conduit.

61 With pressure control:
This subclass is indented under the class definition. Air relief-valves controlled by both thermostatic and pressure-controlled means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
92, for controls with pressure and temperature responsive means.

62 With separate float:
This subclass is indented under the class definition. Air relief-valves controlled by both thermostatic and float-controlled means, the float being distinct from the thermostat.

63 Expanding float:
This subclass is indented under the class definition. Air relief-valves controlled by both thermostatic and float-controlled means, the float being also the expanding element.

64 Expanding fluid:
This subclass is indented under the class definition. Air relief-valves controlled by a thermostat only, the thermostat being of the expanding-fluid type.

SEE OR SEARCH THIS CLASS, SUBCLASS:
56+, for traps operated by expanding fluid thermostats.

65 Float-operated:
This subclass is indented under subclass 64. Subject matter controlled by a thermostat only, the thermostat being of the expanding-fluid type, the expanding fluid operating a float or piston to operate the valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:
100, for controls in which an expanding fluid operates a float.

66 Expanding solid:
This subclass is indented under the class definition. Air relief-valves controlled by a thermostat only, the thermostat being of the expanding-solid type.

SEE OR SEARCH THIS CLASS, SUBCLASS:
53, 59 and 62, for other applications of this control.

67 MOTORS:
This subclass is indented under the class definition. Devices which are operated by motors whose operation is controlled by means responsive to the temperature to be regulated.

68 Auxiliary heater:
This subclass is indented under subclass 67. Devices in which an expanding element is used to operate the controlling means, the expanding element being heated (or cooled) by a heater set into operation by means of a separate element responsive to the temperature to be regulated.

SEE OR SEARCH CLASS:
60, Power Plants, subclasses 516+ for the expanding element and heater alone or where the heater is not set into

operation by a heat responsive element.

251, Valves and Valve Actuation, subclass 11 for heat motor operated valves in general.

69 Pyrometer galvanometer:

This subclass is indented under subclass 67. Devices operated by motors which are controlled by a relay consisting of a galvanometer operated by the current generated in a thermocouple responsive to the temperature to be regulated.

SEE OR SEARCH CLASS:

323, Electricity: Power Supply or Regulation Systems, subclasses 234 through 298 for output responsive regulators.

70 With beating element:

This subclass is indented under subclass 69. Devices in which an additional beating element is used to press the pointer of the galvanometer onto the controlling-contacts at regular predetermined intervals.

71 Balanced:

This subclass is indented under subclass 67. Devices operated by a balanced motor in which changes in temperature destroy the balance of the motor, and thus operate the regulating means.

72 Thermostatic relay:

This subclass is indented under subclass 71. Devices in which changes in temperature destroy the balance of the motor by means of a thermostatically-operated relay.

73 Continuous drive:

This subclass is indented under subclass 67. Devices operated by a continuously-driven motor normally disconnected from the regulating means, but placed in operative connection therewith by means responsive to the temperature to be controlled.

74 Electric:

This subclass is indented under subclass 67. Devices not otherwise classifiable which are operated by electric motors whose operation is controlled by means responsive to the temperature to be regulated.

SEE OR SEARCH CLASS:

388, Electricity: Motor Control Systems, Art Collection 934 for running-speed control systems with feedback responsive to a thermal condition.

75 Reciprocating or oscillating:

This subclass is indented under subclass 74. Devices of the type where the regulating member is operated by an element reciprocated or oscillated by means of a solenoid or electric magnet whose operation is controlled by means responsive to the temperature to be regulated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

84, for similar controls which constitute relays for the control of a fluid pressure motor.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclasses 15+ for reciprocating electric motor structure, and subclasses 36+ for oscillating electric motor structure.

318, Electricity: Motive Power Systems, subclasses 119+ for reciprocating or oscillating electric motor systems.

76 Step-by-step:

This subclass is indented under subclass 74. Devices which do not operate the controlling means to the limits at a single operation, but give step-by-step action.

77 Vibrating arm:

This subclass is indented under subclass 74. Devices in which the control element is operated by means of a vibrator and circuit-make-and-break device.

78 Relay:

This subclass is indented under subclass 74. Devices the motors being set into operation by a relay, which is in turn controlled by means responsive to the temperature to be controlled.

79 Relay:

This subclass is indented under subclass 67. Devices operated by fluid pressure and controlled by a relay, which is in turn controlled by

means responsive to the temperature to be regulated.

SEE OR SEARCH CLASS:
110, Furnaces, subclass 185 for refuse incinerators and solid fuel furnaces provided with control means responsive to a sensed condition.
137, Fluid Handling, subclasses 82+ for fluid pressure relays or followers, per se.

80 Shunt:
This subclass is indented under subclass 79. Devices in which the fluid for operating the motor is shunted from the fluid controlled.

SEE OR SEARCH THIS CLASS, SUBCLASS:
39, 54, 68, for other controls which employ the fluid of the system regulated to motivate the control.

SEE OR SEARCH CLASS:
137, Fluid Handling, subclasses 485+ for the type of motors in pressure responsive regulators.

81 Snap-acting:
This subclass is indented under subclass 79. Devices in which the relay does not operate on slight changes in temperature, but its operating force is stored up during a certain movement of the temperature-responsive device and then suddenly moves through its entire movement.

SEE OR SEARCH THIS CLASS, SUBCLASS:
48, for snap acting controls not a fluid operated relay.
83, for the same in a compound relay system.

82 Compound:
This subclass is indented under subclass 79. Devices wherein the fluid-motor controlled by a relay is controlled by another relay, which is in turn controlled by the means responsive to the temperature to be regulated.

83 Snap-acting:
This subclass is indented under subclass 82. Devices the first relay being of the type which does not operate on slight movements in the second relay, but the operating force is stored up during a certain movement of the second relay and then suddenly the first moves through its entire movement.

SEE OR SEARCH THIS CLASS, SUBCLASS:
48, 81, for other snap acting controls.

84 Electric:
This subclass is indented under subclass 79. Devices wherein the fluid-operated motor is controlled by an electrically-operated relay-valve, which is in turn controlled by the means responsive to the temperature to be regulated. The electric device must actually operate the relay-valve at least in one direction.

SEE OR SEARCH THIS CLASS, SUBCLASS:
79, for means where power for operating the relay-valve is stored up by action of the motor and this is released by electric means.

85 Pressure-operated:
This subclass is indented under subclass 79. Devices wherein the relay is operated by a device responsive to changes in pressure in the fluid to be regulated.

SEE OR SEARCH THIS CLASS, SUBCLASS:
29, for devices where the pressure controlled operates directly on the valve which controls its flow to the motor.
82+, for similar devices including compound controls.

86 Expanding fluid:
This subclass is indented under subclass 79. Devices wherein the means responsive to the temperature is a thermostat of the expanding-fluid type.

SEE OR SEARCH THIS CLASS, SUBCLASS:
39, for similar controls in heating radiator.

87 Expanding solid:
This subclass is indented under subclass 79. Devices wherein the means responsive to the temperature is a thermostat of the expanding-solid type.

SEE OR SEARCH THIS CLASS, SUBCLASS:
39, 80, 81, and 82+, for similar responsive means in other controls.

88 Magnetic release:
This subclass is indented under subclass 67. Devices wherein the motor is a spring or weight motor which is released by magnetic means controlled by the means responsive to the temperature to be regulated.

89 Safety cut-out:
This subclass is indented under subclass 88. Devices which is provided with means for opening the circuit through the magnetic means when the motor is run down.

90 Thermal release:
This subclass is indented under subclass 67. Devices wherein the motor is a spring or weight motor which is released by the thermostat responsive to the temperature to be controlled.

91 Hot and cold:
This subclass is indented under the class definition. Devices operated by a plurality of thermostats, one or more in a location at low temperature (as the outside of a building) and the others at a relatively high temperature, (as the inside of a building).

SEE OR SEARCH THIS CLASS, SUBCLASS:
9, 14, 37, and 47, for systems which are controlled by temperature at plural places.
44, for opposed thermostats.

SEE OR SEARCH CLASS:
165, Heat Exchange, subclass 257 for a selective heating or cooling arrangement controlled by room and ambient temperature sensors.

92 With pressure control:
This subclass is indented under the class definition. Devices operated by a thermostat and pressure-responsive means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
61, for radiator air relief means controlled by thermostat and pressure.

93 In fluid controlled:
This subclass is indented under the class definition. Devices operated by a thermostat located in the fluid controlled, so that its flow is controlled by its own temperature.

SEE OR SEARCH THIS CLASS, SUBCLASS:
55, through 60, for trap responsive controls.
61, through 66, for radiator responsive controls.

SEE OR SEARCH CLASS:
188, Brakes, subclasses 277+ for a fluid-resistance brake having a thermostatic valve to regulate resistance.

94 With indicator or alarm:
This subclass is indented under the class definition. Devices thermostatically operated, with an indicator or alarm to indicate the operation or failure to operate.

95 Expanding fluid:
This subclass is indented under the class definition. Devices controlled by a thermostat of the expanding-fluid type, attached to the outside of the heater or flue controlled and responsive to the temperature thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
4, 18, 32, 40+, 42, 56, and 99, for the type of thermostat with a controlling device operated thereby.

96 Expanding solid:
This subclass is indented under the class definition. Devices controlled by a thermostat of the expanding-solid type attached to the outside of the heater or flue controlled and responsive to the temperature thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, 19, 33, 43, 59, and 87, for the type of thermostat with a controlling means operated thereby.

97 Cooled element:

This subclass is indented under the class definition. Devices operated by a thermostat one element of which is provided with means for cooling it or keeping it cool, so as to increase the sensitiveness of the device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

91, for plural controls of different temperature.

98 Fluid transmission:

This subclass is indented under the class definition. Devices operated by a thermostat in which a fluid is used to transmit the movement of the thermostatic element to the element controlled.

SEE OR SEARCH THIS CLASS, SUBCLASS:

31, for systems wherein the fluid is transmitted to a float.

99 Expanding fluid:

This subclass is indented under the class definition. Devices in which the regulating means is operated directly by a thermostat of the expanding-fluid type.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4, 18, 32, 40+, 42, 56+, 64, 68, 86, and 95, for certain regulator systems incorporating such a thermostat.

100 Float or piston operation:

This subclass is indented under subclass 99. Devices where the motion of the expanding fluid is transmitted by a float or piston operated thereby.

SEE OR SEARCH THIS CLASS, SUBCLASS:

31, 65, for certain systems employing this type of control.

52, for a regulator employing a float not provided for in this subclass or subclasses 31 and 65.

101 Expanding solid:

This subclass is indented under the class definition. Devices in which the regulating means is operated directly by a thermostat of the expanding-solid type.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, 19, 33, 43, 59, 66, 87, 93, and 96, for certain regulator systems employing this type of thermostat.

102 Concentric elements:

This subclass is indented under subclass 101. Devices in which the thermostat of the expanding-solid type is made up of two or more elements of different coefficients of expansion, and in which these elements are concentrically arranged. The coefficient of expansion of one element might be zero.

SEE OR SEARCH THIS CLASS, SUBCLASS:

23, 24, and 33, for special combinations using this type of thermostat.

103 Conduit:

This subclass is indented under subclass 101. Devices in which the thermostat of the expanding-solid type is in the shape of a tube through which the fluid to which the thermostat is responsive flows.

SEE OR SEARCH THIS CLASS, SUBCLASS:

60, for air relief devices in which a conduit acts as part of a thermostat.

104 Fire pot:

This subclass is indented under subclass 101. Devices in which the expansion and contraction of a fire-pot, or a combustion-chamber wall of a heater is used to regulate the heating effect thereof.

END