SECTION H — ELECTRICITY

H05 ELECTRIC TECHNIQUES NOT OTHERWISE PROVIDED FOR

H05B ELECTRIC HEATING; ELECTRIC LIGHT SOURCES NOT OTHERWISE PROVIDED FOR; CIRCUIT ARRANGEMENTS FOR ELECTRIC LIGHT SOURCES, IN GENERAL

Subclass index

Electric heating

1/00 Details of electric heating devices [1, 2006.01]

1/02 • Automatic switching arrangements specially adapted to heating apparatus (thermally-actuated switches H01H 37/00) **[1, 2006.01]**

3/00 Ohmic-resistance heating [1, 2006.01]

3/02 • Details **[1, 2006.01]**

3/03 • • Electrodes **[2, 2006.01]**

3/04 • • Waterproof or air-tight seals for heaters **[1, 2006.01]**

3/06 • • Heater elements structurally combined with coupling elements or with holders **[1, 2006.01]**

3/08 • • • having electric connections specially adapted for high temperatures **[1, 2006.01]**

3/10 • Heating elements characterised by the composition or nature of the materials or by the arrangement of the conductor **[1, 2006.01]**

3/12 • • characterised by the composition or nature of the conductive material **[1, 2006.01]**

3/14 • • • the material being non-metallic **[1, 2006.01]**

3/16 • • the conductor being mounted on an insulating base **[1, 2006.01]**

3/18 • • the conductor being embedded in an insulating material **[1, 2006.01]**

3/20 • Heating elements having extended surface area substantially in a two-dimensional plane, e.g. plate-heater (H05B 3/62, H05B 3/68, H05B 3/78, H05B 3/84 take precedence) **[1, 5, 2006.01]**

3/22 • • non-flexible **[1, 2006.01]**

3/24 • • • heating conductor being self-supporting **[1, 2006.01]**

3/26 • • • heating conductor mounted on insulating base **[1, 2006.01]**

3/28 • • • heating conductor embedded in insulating material **[1, 2006.01]**

3/30 • • • • on or between metallic plates **[1, 2006.01]**

3/32 • • • heating conductor mounted on insulators on a metallic frame **[1, 2006.01]**

3/34 • • flexible, e.g. heating nets or webs **[1, 2006.01]**

3/36 • • • heating conductor embedded in insulating material **[1, 2006.01]**

3/38 • • • • Powder conductors **[1, 2006.01]**

3/40 • Heating elements having the shape of rods or tubes (H05B 3/62, H05B 3/68, H05B 3/78 take precedence) **[1, 2006.01]**

3/42 • • non-flexible **[1, 2006.01]**

3/44 • • • heating conductor arranged within rods or tubes of insulating material **[1, 2006.01]**

3/46 • • • heating conductor mounted on insulating base **[1, 2006.01]**

3/48 • • • heating conductor embedded in insulating material **[1, 2006.01]**

3/50 • • • • heating conductor arranged in metal tubes, the radiating surface having heat-conducting fins **[1, 2006.01]**

3/52 • • • • Apparatus or processes for filling or compressing insulating material in tubes **[1, 2006.01]**

3/54 • • flexible **[1, 2006.01]**

3/56 • • • Heating cables **[1, 2006.01]**

3/58 • • • Heating hoses; Heating collars **[1, 2006.01]**

3/60 • Heating arrangements wherein the heating current flows through granular, powdered or fluid material, e.g. for salt-bath furnace, electrolytic heating (H05B 3/38 takes precedence) **[1, 2006.01]**

3/62 • Heating elements specially adapted for furnaces (H05B 3/60 takes precedence; arrangements of elements for electric heating in or on furnaces using ohmic resistance heating F27D 11/02) **[1, 2006.01]**

3/64 • • using ribbon, rod, or wire heater **[1, 2006.01]**

3/66 • • Supports or mountings for heaters on or in the wall or roof **[1, 2006.01]**

3/68 • Heating arrangements specially adapted for cooking plates or analogous hot-plates **[1, 2006.01]**

Note(s) [2]

Group H05B 3/76 takes precedence over groups H05B 3/70-H05B 3/74.

3/70 • • Plates of cast metal **[1, 2006.01]**

3/72 • • Plates of sheet metal **[1, 2006.01]**

3/74 • • Non-metallic plates **[1, 2006.01]**

3/76 • • Plates with spirally-wound heating tubes **[1, 2006.01]**

3/78 • Heating arrangements specially adapted for immersion heating **[1, 2006.01]**

3/80 • • Portable immersion heaters **[1, 2006.01]**

3/82 • • Fixedly-mounted immersion heaters **[1, 2006.01]**

3/84 • Heating arrangements specially adapted for transparent or reflecting areas, e.g. for demisting or de-icing windows, mirrors or vehicle windshields **[5, 2006.01]**

3/86 • • the heating conductors being embedded in the transparent or reflecting material **[5, 2006.01]**

6/00 Heating by electric, magnetic or electromagnetic fields [3, 2006.01]

6/02 • Induction heating **[3, 2006.01]**

6/04 • • Sources of current **[3, 2006.01]**

6/06 • • Control, e.g. of temperature, of power **[3, 2006.01]**

6/08 • • • using compensating or balancing arrangements **[3, 2006.01]**

6/10 • • Induction heating apparatus, other than furnaces, for specific applications **[3, 2006.01]**

6/12 • • • Cooking devices **[3, 2006.01]**

6/14 • • • Tools, e.g. nozzles, rollers, calenders **[3, 2006.01]**

6/16 • • Furnaces having endless cores (H05B 6/34 takes precedence) **[3, 2006.01]**

6/18 • • • having melting basin **[3, 2006.01]**

6/20 • • • having melting channel only **[3, 2006.01]**

6/22 • • Furnaces without an endless core (H05B 6/34 takes precedence) **[3, 2006.01]**

6/24 • • • Crucible furnaces (H05B 6/30 takes precedence) **[3, 2006.01]**

6/26 • • • • using vacuum or particular gas atmosphere **[3, 2006.01]**

6/28 • • • • Protective systems **[3, 2006.01]**

6/30 • • • Arrangements for remelting or zone melting **[3, 2006.01]**

6/32 • • • Arrangements for simultaneous levitation and heating **[3, 2006.01]**

6/34 • • Arrangements for circulation of melts **[3, 2006.01]**

6/36 • • Coil arrangements **[3, 2006.01]**

6/38 • • • specially adapted for fitting into hollow spaces of workpieces **[3, 2006.01]**

6/40 • • • Establishing desired heat distribution, e.g. to heat particular parts of workpieces **[3, 2006.01]**

6/42 • • • Cooling of coils **[3, 2006.01]**

6/44 • • • having more than one coil or coil segment **[3, 2006.01]**

6/46 • Dielectric heating (H05B 6/64 take precedence) **[3, 2006.01]**

6/48 • • Circuits **[3, 2006.01]**

6/50 • • • for monitoring or control **[3, 2006.01]**

6/52 • • Feed lines **[3, 2006.01]**

6/54 • • Electrodes **[3, 2006.01]**

6/56 • • • Rolling electrodes **[3, 2006.01]**

6/58 • • • "sewing machine" type **[3, 2006.01]**

6/60 • • Arrangements for continuous movement of material **[3, 2006.01]**

6/62 • • Apparatus for specific applications **[3, 2006.01]**

6/64 • Heating using microwaves **[3, 2006.01]**

6/66 • • Circuits **[3, 2006.01]**

6/68 • • • for monitoring or control **[3, 2006.01]**

6/70 • • Feed lines **[3, 2006.01]**

6/72 • • Radiators or antennas **[3, 2006.01]**

6/74 • • Mode transformers or mode stirrers **[3, 2006.01]**

6/76 • • Prevention of microwave leakage, e.g. door sealings **[3, 2006.01]**

6/78 • • Arrangements for continuous movement of material **[3, 2006.01]**

6/80 • • Apparatus for specific applications (stoves or ranges heated using microwaves F24C 7/02) **[3, 2006.01]**

7/00 Heating by electric discharge (plasma torches H05H 1/26) **[1, 2006.01]**

7/02 • Details **[1, 2006.01]**

7/06 • • Electrodes **[1, 2006.01]**

7/07 • • • designed to melt in use **[2, 2006.01]**

7/08 • • • non-consumable **[1, 2, 2006.01]**

7/085 • • • • mainly consisting of carbon **[2, 2006.01]**

7/09 • • • • • Self-baking electrodes **[2, 2006.01]**

7/10 • • Mountings, supports, terminals, or arrangements for feeding or guiding electrodes **[1, 2, 2006.01]**

7/101 • • • Mountings, supports, or terminals at head of electrode, i.e. at the end remote from the arc **[2, 2006.01]**

7/102 • • • • specially adapted for consumable electrodes **[2, 2006.01]**

7/103 • • • Mountings, supports, or terminals with jaws (H05B 7/101 takes precedence) **[2, 2006.01]**

7/105 • • • • comprising more than two jaws equally spaced along circumference, e.g. ring holders **[2, 2006.01]**

7/107 • • • specially adapted for self-baking electrodes **[2, 2006.01]**

7/109 • • • Feeding arrangements (H05B 7/107 takes precedence; where the electrode movement is a part of a closed loop for automatic control of power H05B 7/148) **[2, 2006.01]**

7/11 • • Arrangements for conducting current to the electrode terminals **[2, 2006.01]**

7/12 • • Arrangements for cooling, sealing, or protecting electrodes **[1, 2, 2006.01]**

7/14 • • Arrangements or methods for connecting successive electrode sections **[1, 2, 2006.01]**

7/144 • • Power supplies specially adapted for heating by electric discharge; Automatic control of power, e.g. by positioning of electrodes **[2, 2006.01]**

7/148 • • • Automatic control of power (electrode feeding arrangements H05B 7/109; automatic feeding or moving of electrodes for spot or seam welding or cutting B23K 9/12; disposition of electrodes in or on furnaces F27D 11/10; regulating electric characteristics of arcs G05F 1/02) **[2, 2006.01]**

7/152 • • • • by electromechanical means for positioning of electrodes **[2, 2006.01]**

7/156 • • • • by hydraulic or pneumatic means for positioning of electrodes **[2, 2006.01]**

7/16 • Heating by glow discharge **[1, 2006.01]**

7/18 • Heating by arc discharge **[1, 2006.01]**

7/20 • • Direct heating by arc discharge, i.e. where at least one end of the arc directly acts on the material to be heated, including additional resistance heating by arc current flowing through the material to be heated **[2, 2006.01]**

7/22 • • Indirect heating by arc discharge **[2, 2006.01]**

11/00 Heating by combined application of processes covered by two or more of groups H05B 3/00-H05B 7/00 (H05B 7/20 takes precedence) **[1, 2006.01]**

Electric light sources

31/00 Electric arc lamps (regulating electric characteristics of arcs G05F 1/02) **[1, 2006.01]**

31/02 • Details **[1, 2006.01]**

31/04 • • Housings **[1, 2006.01]**

31/06 • • Electrodes **[1, 2006.01]**

31/08 • • • Carbon electrodes **[1, 2006.01]**

31/10 • • • • Cored carbon electrodes **[1, 2006.01]**

31/12 • • • • Beck-effect electrodes **[1, 2006.01]**

31/14 • • • Metal electrodes **[1, 2006.01]**

31/16 • • • Apparatus or processes specially adapted for manufacturing electrodes **[1, 2006.01]**

31/18 • • Mountings for electrodes; Electrode feeding devices **[1, 2006.01]**

31/20 • • • Mechanical arrangements for feeding electrodes **[1, 2006.01]**

31/22 • • • Electromagnetic arrangements for feeding electrodes **[1, 2006.01]**

31/24 • • Cooling arrangements **[1, 2006.01]**

31/26 • • Influencing the shape of arc discharge by gas blowing devices **[1, 2006.01]**

31/28 • • Influencing the shape of arc discharge by magnetic means **[1, 2006.01]**

31/30 • • Starting; Igniting **[1, 2006.01]**

31/32 • • Switching-off **[1, 2006.01]**

31/34 • • Indicating consumption of electrodes **[1, 2006.01]**

31/36 • having two electrodes in line **[1, 2006.01]**

31/38 • • specially adapted for AC **[1, 2006.01]**

31/40 • having two electrodes at an angle **[1, 2006.01]**

31/42 • • specially adapted for AC **[1, 2006.01]**

31/44 • having two parallel electrodes **[1, 2006.01]**

31/46 • • specially adapted for AC **[1, 2006.01]**

31/48 • having more than two electrodes **[1, 2006.01]**

31/50 • • specially adapted for AC **[1, 2006.01]**

31/52 • • • electrodes energised from different phases of the supply **[1, 2006.01]**

33/00 Electroluminescent light sources [1, 2006.01]

33/02 • Details **[1, 2006.01]**

33/04 • • Sealing arrangements **[1, 2006.01]**

33/06 • • Electrode terminals **[1, 2006.01]**

33/10 • Apparatus or processes specially adapted to the manufacture of electroluminescent light sources **[1, 2006.01]**

33/12 • Light sources with substantially two-dimensional radiating surfaces **[1, 2006.01]**

33/14 • • characterised by the chemical or physical composition or the arrangement of the electroluminescent material **[1, 2006.01]**

33/18 • • characterised by the nature or concentration of the activator **[1, 2006.01]**

33/20 • • characterised by the chemical or physical composition or the arrangement of the material in which the electroluminescent material is embedded **[1, 2006.01]**

33/22 • • characterised by the chemical or physical composition or the arrangement of auxiliary dielectric or reflective layers **[1, 2006.01]**

33/24 • • • of metallic reflective layers (H05B 33/26 takes precedence) **[1, 2006.01]**

33/26 • • characterised by the composition or arrangement of the conductive material used as an electrode **[1, 2006.01]**

33/28 • • • of translucent electrodes **[1, 2006.01]**

35/00 Electric light sources using a combination of different types of light generation [1, 2006.01]

Circuit arrangements for electric light sources [2022.01]

39/00 Circuit arrangements or apparatus for operating incandescent light sources (structurally associated with the incandescent lamps H01K 1/62) **[1, 2006.01]**

39/02 • Switching-on, e.g. with predetermined rate of increase of lighting current **[1, 2006.01]**

39/04 • Controlling **[1, 2006.01]**

39/06 • • Switching arrangements, e.g. from series operation to parallel operation **[1, 2006.01]**

39/08 • • by shifting phase of trigger voltage applied to gas-filled controlling tubes **[1, 2006.01]**

39/09 • in which the lamp is fed by pulses **[1, 2006.01]**

39/10 • Circuits providing for substitution of the light source in case of its failure **[1, 2006.01]**

41/00 Circuit arrangements or apparatus for igniting or operating discharge lamps (structurally associated with the discharge lamps H01J 61/54, H01J 61/56) **[1, 2006.01]**

41/02 • Details **[1, 2006.01]**

41/04 • • Starting switches **[1, 2006.01]**

41/06 • • • thermal only **[1, 2006.01]**

41/08 • • • • heated by glow discharge **[1, 2006.01]**

41/10 • • • magnetic only **[1, 2006.01]**

41/12 • • • combined thermal and magnetic **[1, 2006.01]**

41/14 • Circuit arrangements **[1, 2006.01]**

41/16 • • in which the lamp is fed by DC or by low-frequency AC, e.g. by 50 cycles/sec AC (H05B 41/26 takes precedence) **[1, 2006.01]**

41/18 • • • having a starting switch **[1, 2006.01]**

41/19 • • • • for lamps having an auxiliary starting electrode **[1, 2006.01]**

41/20 • • • having no starting switch **[1, 2006.01]**

41/22 • • • • for lamps having an auxiliary starting electrode **[1, 2006.01]**

41/23 • • • • for lamps not having an auxiliary starting electrode **[1, 2006.01]**

41/231 • • • • • for high-pressure lamps **[1, 2006.01]**

41/232 • • • • • for low-pressure lamps **[1, 2006.01]**
41/233 • • • • • • using resonance circuitry **[1, 2006.01]**
41/234 • • • • • • to eliminate stroboscopic effects, e.g. feeding two lamps with different phases **[1, 2006.01]**
41/24 • • in which the lamp is fed by high-frequency AC (H05B 41/26 takes precedence) **[1, 2006.01]**
41/26 • • in which the lamp is fed by power derived from DC by means of a converter, e.g. by high-voltage DC **[1, 2006.01]**
41/28 • • • using static converters **[1, 2006.01]**
41/282 • • • • with semiconductor devices (H05B 41/288, H05B 41/295 take precedence) **[7, 2006.01]**
41/285 • • • • • Arrangements for protecting lamps or circuits against abnormal operating conditions **[7, 2006.01]**
41/288 • • • • with semiconductor devices and specially adapted for lamps without preheating electrodes, e.g. for high-intensity discharge lamps, high-pressure mercury or sodium lamps or low-pressure sodium lamps **[7, 2006.01]**
41/292 • • • • • Arrangements for protecting lamps or circuits against abnormal operating conditions **[7, 2006.01]**
41/295 • • • • with semiconductor devices and specially adapted for lamps with preheating electrodes, e.g. for fluorescent lamps **[7, 2006.01]**
41/298 • • • • • Arrangements for protecting lamps or circuits against abnormal operating conditions **[7, 2006.01]**
41/30 • • in which the lamp is fed by pulses, e.g. flash lamp **[1, 2006.01]**
41/32 • • • for single flash operation **[1, 2006.01]**
41/34 • • • to provide a sequence of flashes **[1, 2006.01]**
41/36 • • Controlling **[1, 2006.01]**
41/38 • • • Controlling the intensity of light **[1, 2006.01]**
41/39 • • • • continuously **[1, 2006.01]**
41/391 • • • • • using saturable magnetic devices **[1, 2006.01]**
41/392 • • • • • using semiconductor devices, e.g. thyristor **[1, 2006.01]**
41/40 • • • • discontinuously **[1, 2006.01]**
41/42 • • • • • in two steps only **[1, 2006.01]**
41/44 • • • for providing special optical effects, e.g. progressive motion of light **[1, 2006.01]**
41/46 • • Circuits providing for substitution in case of failure of the lamp **[1, 2006.01]**

44/00 Circuit arrangements for operating electroluminescent light sources (for operating light emitting diodes H05B 45/00) **[2022.01]**

45/00 Circuit arrangements for operating light-emitting diodes [LED] [2020.01, 2022.01]

45/10 • Controlling the intensity of the light **[2020.01]**
45/12 • • using optical feedback **[2020.01]**
45/14 • • using electrical feedback from LEDs or from LED modules **[2020.01]**
45/18 • • using temperature feedback **[2020.01]**
45/20 • Controlling the colour of the light **[2020.01]**
45/22 • • using optical feedback **[2020.01]**
45/24 • • using electrical feedback from LEDs or from LED modules **[2020.01]**
45/28 • • using temperature feedback **[2020.01]**
45/30 • Driver circuits **[2020.01]**
45/305 • • Frequency-control circuits **[2020.01]**
45/31 • • Phase-control circuits **[2020.01]**
45/315 • • • Reverse phase-control circuits **[2020.01]**
45/32 • • Pulse-control circuits **[2020.01]**
45/325 • • • Pulse-width modulation [PWM] **[2020.01]**
45/327 • • • Burst dimming **[2020.01]**
45/33 • • • Pulse-amplitude modulation [PAM] **[2020.01]**
45/335 • • • Pulse-frequency modulation [PFM] **[2020.01]**
45/34 • • Voltage stabilisation; Maintaining constant voltage **[2020.01]**
45/345 • • Current stabilisation; Maintaining constant current **[2020.01]**
45/347 • • Dynamic headroom control [DHC] **[2020.01]**
45/35 • • Balancing circuits **[2020.01]**
45/355 • • Power factor correction [PFC]; Reactive power compensation **[2020.01]**
45/357 • • specially adapted for retrofit LED light sources **[2020.01]**
45/3574 • • • Emulating the electrical or functional characteristics of incandescent lamps **[2020.01]**
45/3575 • • • • by means of dummy loads or bleeder circuits, e.g. for dimmers **[2020.01]**
45/3577 • • • • Emulating the dimming characteristics, brightness or colour temperature of incandescent lamps **[2020.01]**
45/3578 • • • Emulating the electrical or functional characteristics of discharge lamps **[2020.01]**
45/36 • • Circuits for reducing or suppressing harmonics, ripples or electromagnetic interferences [EMI] **[2020.01]**
45/37 • • Converter circuits **[2020.01]**
45/3725 • • • Switched mode power supply [SMPS] **[2020.01]**
45/375 • • • • using buck topology **[2020.01]**
45/38 • • • • using boost topology **[2020.01]**
45/382 • • • • with galvanic isolation between input and output **[2020.01]**
45/385 • • • • using flyback topology **[2020.01]**
45/39 • • • • Circuits containing inverter bridges **[2020.01]**
45/392 • • • • wherein the LEDs are placed as freewheeling diodes at the secondary side of an isolation transformer **[2020.01]**
45/395 • • Linear regulators **[2020.01]**
45/397 • • • Current mirror circuits **[2020.01]**
45/40 • Details of LED load circuits **[2020.01]**
45/42 • • Antiparallel configurations **[2020.01]**
45/44 • • with an active control inside an LED matrix **[2020.01]**
45/46 • • • having LEDs disposed in parallel lines **[2020.01]**
45/48 • • • having LEDs organised in strings and incorporating parallel shunting devices **[2020.01]**
45/50 • responsive to malfunctions or undesirable behaviour of LEDs; responsive to LED life; Protective circuits **[2020.01, 2022.01]**
45/52 • • in a parallel array of LEDs **[2020.01]**
45/54 • • in a series array of LEDs **[2020.01]**
45/56 • • involving measures to prevent abnormal temperature of the LEDs **[2020.01]**
45/58 • • involving end of life detection of LEDs **[2020.01]**
45/59 • • for reducing or suppressing flicker or glow effects **[2022.01]**

45/60 • Circuit arrangements for operating LEDs comprising organic material, e.g. for operating organic light-emitting diodes [OLED] or polymer light-emitting diodes [PLED] **[2022.01]**

46/00 Circuit arrangements for operating light sources using a charge of combustible material [2020.01]

47/00 Circuit arrangements for operating light sources in general, i.e. where the type of light source is not relevant [2020.01]

47/10 • Controlling the light source **[2020.01]**
47/105 • • in response to determined parameters **[2020.01]**
47/11 • • • by determining the brightness or colour temperature of ambient light **[2020.01]**
47/115 • • • by determining the presence or movement of objects or living beings **[2020.01]**
47/12 • • • • by detecting audible sound **[2020.01]**
47/125 • • • • by using cameras **[2020.01]**
47/13 • • • • by using passive infrared detectors **[2020.01]**
47/135 • • • by determining the type of light source being controlled (electrical parameters of light source being controlled H05B 47/14) **[2020.01]**
47/14 • • • by determining electrical parameters of the light source **[2020.01]**
47/155 • • Coordinated control of two or more light sources **[2020.01]**
47/16 • • by timing means **[2020.01]**
47/165 • • following a pre-assigned programmed sequence; Logic control [LC] **[2020.01]**
47/17 • • Operational modes, e.g. switching from manual to automatic mode or prohibiting specific operations **[2020.01]**
47/175 • • by remote control **[2020.01]**
47/18 • • • via data-bus transmission **[2020.01]**
47/185 • • • via power line carrier transmission **[2020.01]**
47/19 • • • via wireless transmission **[2020.01]**
47/195 • • • • the transmission using visible or infrared light **[2020.01]**
47/20 • Responsive to malfunctions or to light source life; for protection **[2020.01]**
47/21 • • of two or more light sources connected in parallel **[2020.01]**
47/23 • • of two or more light sources connected in series **[2020.01]**
47/24 • • Circuit arrangements for protecting against overvoltage **[2020.01]**
47/25 • • Circuit arrangements for protecting against overcurrent **[2020.01]**
47/26 • • Circuit arrangements for protecting against earth faults **[2020.01]**
47/28 • • Circuit arrangements for protecting against abnormal temperature **[2020.01]**
47/29 • • Circuits providing for substitution of the light source in case of its failure **[2020.01]**