ECLA EUROPEAN CLASSIFICATION

H01J ELECTRIC DISCHARGE TUBES OR DISCHARGE LAMPS (spark-gaps H01T; arc lamps with consumable electrodes H05B; particle accelerators H05H)

Notes

1. This subclass covers only devices for producing, influencing, or using a flow of electrons or ions, e.g. for controlling, indicating, or switching of electric current, counting electric pulses, producing light or other electromagnetic oscillations, such as X-rays, or for separating or analysing radiation or particles, and having a closed or substantially closed casing containing a chosen gas, vapour, or vacuum, upon the pressure and nature of which the characteristics of the device depend. Light sources using a combination (other than covered by group H01J61/96 of this subclass) of discharge and other kinds of light generation are dealt with in H05B35/00.

2. In this subclass, groups H01J1/00 to H01J7/00 relate only to:

   a. details of an unspecified kind of discharge tube or lamp, or

   b. details mentioned in a specification as applicable to two or more kinds of tubes or lamps as defined by groups H01J11/00, H01J13/00, H01J15/00, H01J17/00, H01J21/00, H01J25/00, H01J27/00, H01J31/00, H01J33/00, H01J35/00, Ho1J37/00, H01J40/00, H01J41/00, H01J47/00, H01J49/00, H01J61/00, H01J63/00 or H01J65/00, hereinafter called basic kinds. A detail only described with reference to, or clearly only applicable to, tubes or lamps of a single basic kind is classified in the detail group appropriate to tubes or lamps of that basic kind, e.g. H01J17/04.

3. In this subclass, the following term is used with the meaning indicated:

   - "lamp" includes tubes emitting ultra-violet or infra-red light.

4. Attention is drawn to the definition of the expression "spark gaps" given in the Note following the title of subclass H01T.

5. Apparatus or processes specially adapted for the manufacture of electric discharge tubes, discharge lamps, or parts thereof are classified in group H01J9/00.

H01J1/00 **Details of electrodes, of magnetic control means, of screens, or of the mounting or spacing thereof, common to two or more basic types of discharge tubes or lamps** (details of electron-optical arrangements or of ion traps H01J3/00)

H01J1/02 . Main electrodes

H01J1/02A . . [N: Hollow cathodes]

H01J1/04 . . Liquid electrodes, e.g. liquid cathode

H01J1/05 . . . characterised by material

H01J1/06 . . . Containers for liquid-pool electrodes; Arrangement or mounting thereof

H01J1/08 . . . Positioning or moving the cathode spot on the surface of a liquid-pool cathode

H01J1/10 . . . Cooling, heating, circulating, filtering, or controlling level of liquid in a liquid-pool electrode

H01J1/12 . . Cathodes having mercury or liquid alkali metal deposited on the cathode surface during operation of the tube

H01J1/13 . . Solid thermionic cathodes

H01J1/13A . . . [N: Circuit arrangements therefor, e.g. for temperature control]

H01J1/14 . . . characterised by the material

H01J1/142 . . . . with alkaline-earth metal oxides, or such oxides used in conjunction with reducing agents, as an emissive material [N9512]

H01J1/144 . . . . with other metal oxides as an emissive material [N9512]

H01J1/146 . . . . with metals or alloys as an emissive material [N9512]

H01J1/148 . . . . with compounds having metallic conductive properties, e.g. lanthanum boride, as an emissive material [N9512]

H01J1/15 . . . Cathodes heated directly by an electric current

H01J1/16 . . . . characterised by the shape

H01J1/18 . . . . Supports; Vibration-damping arrangements

H01J1/20 . . . Cathodes heated indirectly by an electric current; Cathodes heated by electron or ion bombardment

H01J1/22 . . . . Heaters (filaments for incandescent lamps H01K1/02)

H01J1/24 . . . . Insulating layer or body located between heater and emissive material

H01J1/26 . . . . Supports for the emissive material

H01J1/28 . . . . Dispenser-type cathodes, e.g. L-cathode

H01J1/30 . . Cold cathodes, e.g. field-emissive cathode

H01J1/304 . . . Field-emissive cathodes [N0101]

H01J1/304B . . . . [N: microengineered, e.g. Spindt-type] [N0101]

H01J1/304B2 . . . . . [N: Point emitters] [N0101]

H01J1/304B4 . . . . . [N: Edge emitters] [N0101]

H01J1/304D . . . . [N: Distributed particle emitters] [N0101]

H01J1/308 . . . Semiconductor cathodes, e.g. cathodes with PN junction layers [N0101]

H01J1/312 . . . having an electric field perpendicular to the surface, e.g. tunnel-effect cathodes of Metal-Insulator-Metal [MIM] type [N: (H01J1/304 to H01J1/308 take predecence)] [N0101] [C0902]

H01J1/316 . . . having an electric field parallel to the surface, e.g. thin film cathodes [N0101]

H01J1/32 . . Secondary-electron-emitting electrodes (H01J1/35 takes precedence; luminescent screens H01J1/62; charge storage screens in general H01J1/78; charge storage screens using secondary emission for image tubes H01J29/41; dynodes for secondary emission tubes H01J43/10; secondary-emission detectors for measurement of nuclear or X-radiation G01T1/28)

H01J1/34 . . Photo-emissive cathodes (H01J1/35 takes precedence; photoelectric screens H01J1/78)

H01J1/35 . . Electrodes exhibiting both secondary emission and photo-emission

H01J1/36 . . Solid anodes; Solid auxiliary anodes for maintaining a discharge

H01J1/38 . . . characterised by the material

H01J1/40 . . . forming part of the envelope of the tube or lamp

H01J1/42 . . . Cooling of anodes (cooling rotary anodes H01J1/44); Heating of anodes

H01J1/44 . . . Rotary anodes; Arrangements for rotating anodes; Cooling rotary anodes

H01J1/46 . Control electrodes, e.g. grid (for igniting arrangements H01J7/30); Auxiliary electrodes (auxiliary anodes for maintaining a discharge H01J1/36)

H01J1/48 . . characterised by the material

H01J1/50 . Magnetic means for controlling the discharge

H01J1/52 . Screens for shielding (screens acting as control electrodes H01J1/46); Guides for influencing the discharge; Masks interposed in the electron stream

H01J1/53 . Electrodes intimately associated with a screen on or from which an image or pattern is formed, picked up, converted, or stored [N: see provisionally also H01J29/08 to 29/36]

H01J1/54 . Screens on or from which an image or pattern is formed, picked up, converted, or stored; Luminescent coatings on vessels [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/56 . . acting as light valves by shutter operation, e.g. for eidophor [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/58 . . acting by discolouration, e.g. halide screen [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/60 . . Incandescent screens [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/62 . . Luminescent screens; Selection of materials for luminescent coatings on vessels [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/63 . . . characterised by the luminescent material (luminescent materials or compositions C09K11/00) [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/64 . . . characterised by the binder or adhesive for securing the luminescent material to its supports [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/66 . . . Supports for luminescent material (vessels H01J5/02) [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/68 . . . with superimposed luminescent layers [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/70 . . . with protective, conductive, or reflective layers [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/72 . . . with luminescent material discontinuously arranged, e.g. in dots or lines [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/74 . . . . with adjacent dots or lines of different luminescent material [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/76 . . . provided with permanent marks or references [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/78 . . Photoelectric screens; Charge-storage screens [N: see provisionally also H01J29/08 to H01J29/36]

H01J1/88 . Mounting, supporting, spacing, or insulating of electrodes or of electrode assemblies

H01J1/90 . . Insulation between electrodes or supports within the vacuum space (leading-in conductors H01J5/46)

H01J1/92 . . Mountings for the electrode assembly as a whole

H01J1/94 . . Mountings for individual electrodes (for directly-heated cathodes H01J1/15)

H01J1/96 . . Spacing members extending to the envelope

H01J1/98 . . . without fixed connection between spacing member and envelope

H01J3/00 Details of electron-optical or ion-optical arrangements or of ion traps common to

two or more basic types of discharge tubes or lamps

H01J3/02 . Electron guns [N: (electron guns for discharge tubes with provision for introducing objects or material to be exposed to the discharge H01J37/06; for cathode ray tubes H01J29/48)] [C0409]

H01J3/02B . . [N: Electron guns using a field emission, photo emission, or secondary emission electron source]

H01J3/02B2 . . . [N: with micro-engineered cathode, e.g. Spindt-type]

H01J3/02C . . [N: Electron guns using electron multiplication]

H01J3/02D . . [N: Electron guns using thermionic emission of cathode heated by electron or ion bombardment or by irradiation by other energetic beams, e.g. by laser]

H01J3/02E . . [N: Electron guns using a discharge in a gas or a vapour as electron source (gas-filled discharge tubes with gaseous cathodes H01J15/00)]

H01J3/02F . . [N: Eliminating deleterious effects due to thermal effects, electric or magnetic field (H01J3/02B to H01J3/02E take precedence)] [N0409]

H01J3/02G . . [N: Construction of the gun or parts thereof (H01J3/02B to H01J3/02E, H01J3/02F and H01J3/02R take precedence)] [N0409]

H01J3/02R . . [N: Replacing parts of the gun; Relative adjustment (H01J3/02B to H01J3/02E take precedence)] [N0409]

H01J3/02T . . [N: Schematic arrangements for beam forming] [N0409]

H01J3/04 . Ion guns [N: see provisionally also H01J27/00]

H01J3/06 . two or more guns being arranged in a single vacuum space, e.g. for plural-ray tubes (H01J3/07 takes precedence) [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/07 . Arrangements for controlling convergence of a plurality of beams [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/08 . Arrangements for controlling intensity of ray or beam (H01J3/02, H01J3/04 take precedence) [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/10 . Arrangements for centering ray or beam (H01J3/02, H01J3/04 take precedence) [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/12 . Arrangements for controlling cross-section of ray or beam; Arrangements for correcting aberration of beam, e.g. due to lenses (H01J3/02, H01J3/04 take precedence) [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/14 . Arrangements for focusing or reflecting ray or beam (H01J3/02, H01J3/04 take precedence) [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/16 . . Mirrors [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/18 . . Electrostatic lenses [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/20 . . Magnetic lenses [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/22 . . . using electromagnetic means only [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/24 . . . using permanent magnets only [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/26 . Arrangements for deflecting ray or beam (circuit arrangements for producing

saw-tooth pulses or other deflecting voltages or currents H03K; [N: H01J29/46 to H01J29/84 and H01J37/147 take precedence])

H01J3/28 . . along one straight line or along two perpendicular straight lines [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/30 . . . by electric fields only [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/32 . . . by magnetic fields only [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/34 . . along a circle, spiral, or rotating radial line [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/36 . Arrangements for controlling the ray or beam after passing the main deflection system, e.g. for post-acceleration or post-concentration [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/38 . Mounting, supporting, spacing, or insulating electron-optical or ion-optical arrangements [N: see provisionally also H01J29/46 to H01J29/84]

H01J3/38D . . [N: Dispersed generators] [N1202]

H01J3/38D1 . . . [N: the generators exploiting regenerative energy] [N1202]

H01J3/38D1S . . . . [N: Solar energy (generation of electric power by conversion of light H02S)] [N1202]

H01J3/38D1W . . . . [N: Wind energy (wind motors F03D)] [N1202]

H01J3/38D2 . . . [N: using fuel cells (fuel cells per se H01M8/00)] [N1202]

H01J3/40 . Traps for removing or diverting unwanted particles, e.g. negative ions, fringing electrons; Arrangements for velocity or mass selection [N: see provisionally also H01J29/46 to H01J29/84]

H01J5/00 **Details relating to vessels or to leading-in conductors common to two or more basic types of discharge tubes or lamps**

H01J5/02 . Vessels; Containers; Shields associated therewith; Vacuum locks

H01J5/03 . . Arrangements for preventing or mitigating effects of implosion of vessels or containers

H01J5/04 . . Vessels or containers characterised by the material thereof (selection of the material of the coating H01J5/08)

H01J5/06 . . Vessels or containers specially adapted for operation at high tension, e.g. by improved potential distribution over surface of vessel

H01J5/08 . . provided with coatings on the walls therof; Selection of materials for the coatings (luminescent coatings H01J1/62)

H01J5/10 . . . on internal surfaces

H01J5/12 . . Double-wall vessels or containers

H01J5/12B . . . [N: with a gas tight space between both walls]

H01J5/14 . . Dismountable vessels or containers, e.g. for replacing cathode heater

H01J5/16 . . Optical or photographic arrangements structurally combined with the vessel (luminescent coatings H01J1/62) [N: see provisionally H01J29/84]

H01J5/18 . . Windows permeable to X-rays, gamma-rays, or particles

H01J5/20 . Seals between parts of vessels

H01J5/22 . . Vacuum-tight joints between parts of vessel

H01J5/24 . . . between insulating parts of vessel
H01J5/26 . . . between insulating and conductive parts of vessel
H01J5/28 . . . between conductive parts of vessel
H01J5/30 . . . using packing-material, e.g. sealing-liquid or elastic insert

H01J5/32 . Seals for leading-in conductors
H01J5/34 . . for an individual conductor (pinched-stem seals H01J5/38; end-disc seals H01J5/40; annular seals H01J5/44)
H01J5/36 . . . using intermediate part
H01J5/38 . . Pinched-stem or analogous seals
H01J5/40 . . end-disc seals, e.g. flat header
H01J5/42 . . . using intermediate part
H01J5/44 . . Annular seals disposed between the ends of the vessel

H01J5/46 . Leading-in conductors

H01J5/48 . Means forming part of the tube or lamp for the purpose of supporting it (associated with electrical connecting means H01J5/50)

H01J5/50 . Means forming part of the tube or lamps for the purpose of providing electrical connection to it (construction of connectors H01R)
H01J5/52 . . directly applied to or forming part of the vessel
H01J5/54 . . supported by a separate part, e.g. base
H01J5/56 . . . Shape of the separate part
H01J5/56A . . . . [N: Bases for circular lamps]
H01J5/58 . . . Means for fastening the separate part to the vessel, e.g. by cement
H01J5/60 . . . . for fastening by mechanical means
H01J5/62 . . . Connection of wires protruding from the vessel to connectors carried by the separate part

H01J7/00 Details not provided for in the preceding groups and common to two or more basic types of discharge tubes or lamps

H01J7/02 . Selection of substances for gas fillings; Specified operating pressure or temperature (radioactive fillings H01J7/40)
H01J7/04 . . having one or more carbon compounds as the principal constituent
H01J7/06 . . having helium, argon, neon, krypton, or xenon as the principal constituent
H01J7/08 . . having a metallic vapour as the principal constituent
H01J7/10 . . . mercury vapour
H01J7/12 . . . vapour of an alkali metal

H01J7/14 . Means for obtaining or maintaining the desired pressure within the vessel
H01J7/16 . . Means for permitting pumping during operation of the tube or lamp
H01J7/18 . . Means for absorbing or adsorbing gas, e.g. by gettering
H01J7/18C . . . [N: Composition or manufacture of getters]
H01J7/18S . . . [N: Getter supports]

H01J7/20 . . Means for producing, introducing, or replenishing gas or vapour during operation of the tube or lamp

H01J7/22 . . Tubulations therefor, e.g. for exhausting; Closures therefor

H01J7/24 . Cooling arrangements (for main electrodes H01J1/02); Heating arrangements (for main electrodes H01J1/02); Means for circulating gas or vapour within the discharge space

H01J7/26 . . by flow of fluid through passages associated with tube or lamp

H01J7/28 . . by latent heat or evaporation of cooling liquid

H01J7/30 . Igniting arrangements (circuit arrangements H02M1/02, H05B)

H01J7/32 . . having resistive or capacitative igniter

H01J7/34 . . . having resistive igniter only

H01J7/36 . . Igniting by movement of a solid electrode

H01J7/38 . . Igniting by movement of vessel as a whole, e.g. tilting

H01J7/40 . . Igniting by associated radioactive materials or fillings

H01J7/42 . Means structurally associated with the tube or lamp for indicating defects or previous use

H01J7/44 . One or more circuit elements structurally associated with the tube or lamp

H01J7/46 . . Structurally associated resonator having distributed inductance and capacitance

H01J9/00 **Apparatus or processes specially adapted to the manufacture,** [N: installation, removal, maintenance] **of electric discharge tubes, discharge lamps, or parts thereof** (manufacture of vessels or containers from metal B21, e.g. B21D51/00, from glass C03B)**; Recovery of material from discharge tubes or lamps** [C0501]

H01J9/00B . [N: Auxiliary devices for installing or removing discharge tubes or lamps]

H01J9/00B1 . . [N: for fluorescent lamps]

H01J9/02 . Manufacture of electrodes or electrode systems

H01J9/02B . . [N: of cold cathodes]

H01J9/02B2 . . . [N: of field emission cathodes]

H01J9/02B4 . . . [N: of thin film cathodes] [N9607]

H01J9/04 . . of thermionic cathodes

H01J9/04B . . . [N: Manufacture, activation of the emissive part]

H01J9/04B2 . . . . [N: Activation of assembled cathode (regeneration H01J9/50B)]

H01J9/04B4 . . . . [N: Cathodes having impregnated bodies (H01J9/04B2 takes precedence)]

H01J9/06 . . . Machines therefor

H01J9/08 . . Manufacture of heaters for indirectly-heated cathodes

H01J9/10 . . . Machines therefor

H01J9/12 . . of photo-emissive cathodes; of secondary-emission electrodes

H01J9/12B . . . [N: of secondary emission electrodes] [N9807]

H01J9/14 . . of non-emitting electrodes

H01J9/14B . . . [N: of shadow-masks for colour television tubes]

H01J9/14B2 . . . . [N: Mask treatment related to the process of dot deposition during manufacture of luminescent screen]

H01J9/14B4 . . . . [N: Surface treatment, e.g. blackening, coating (H01J9/14B2 takes precedence)]

H01J9/14D . . . [N: of electron emission flat panels, e.g. gate electrodes, focusing electrodes or anode electrodes] [N1112]

H01J9/16 . . . Machines for making wire grids

H01J9/18 . . Assembling together the component parts of electrode systems

H01J9/18B . . . [N: of flat panel display devices, e.g. by using spacers] [N9809] [C9908]

H01J9/20 . Manufacture of screens on or from which an image or pattern is formed, picked up, converted or stored; Applying coatings to the vessel

H01J9/20B . . [N: Applying optical coatings or shielding coatings to the vessel of flat panel displays, e.g. applying filter layers, electromagnetic interference shielding layers, anti-reflection coatings or anti-glare coatings] [N1112]

H01J9/22 . . Applying luminescent coatings

H01J9/22B . . . [N: in continuous layers]

H01J9/22B2 . . . . [N: constituted by coated granules emitting light of different colour]

H01J9/22B4 . . . . [N: by uniformly dispersing of liquid]

H01J9/22B6 . . . . [N: by precipitation]

H01J9/22B8 . . . . [N: by electrostatic or electrophoretic processes]

H01J9/227 . . . with luminescent material discontinuously arranged, e.g. in dots or lines

H01J9/227B . . . . [N: by photographic processes (final treatment of shadow-mask prior to or after dot deposition H01J9/14B2)]

H01J9/227B2 . . . . . [N: Devices for carrying out the processes, e.g. light houses]

H01J9/227B2B . . . . . [N: Auxiliary lenses and filters]

H01J9/227B2D . . . . . [N: Light sources particularly adapted therefor]

H01J9/227D . . . . [N: including the exposition of a substance responsive to a particular radiation]

H01J9/227F . . . . [N: Development of latent electrostatic images (per se G03G15/06)]

H01J9/227H . . . . [N: by other processes, e.g. serigraphy, decalcomania]

H01J9/227J . . . . [N: Application of light absorbing material, e.g. between the luminescent areas]

H01J9/233 . . Manufacture of photo-electric screens or charge-storage screens [N: no documents, see H01J29/36]

H01J9/236 . Manufacture of magnetic deflecting devices for cathode-ray tubes (manufacturing coils for transformers, inductances, reactors or choke coils H01F41/04)

H01J9/24 . Manufacture or joining of vessels, leading-in conductors or bases

H01J9/24B . . [N: the vessel being for a flat panel display (H01J9/26B takes precedence; flat discharge lamps H01J9/24D2B)] [N0612] [C0704]

H01J9/24B2 . . . [N: Spacers between faceplate and backplate] [N0612]

H01J9/24C . . [N: specially adapted for cathode ray tubes (H01J9/24B, H01J9/26 take precedence)] [C0612]

H01J9/24D . . [N: specially adapted for gas discharge tubes or lamps (H01J9/24B, H01J9/26 take precedence)] [C0612]

H01J9/24D2 . . . [N: specially adapted for gas-discharge lamps]
H01J9/24D2B . . . . [N: the vessel being flat] [N0704]
H01J9/26 . . Sealing together parts of vessels
H01J9/26B . . . [N: the vessel being for a flat panel display (for flat discharge lamps H01J9/26D2B)] [C0704]
H01J9/26C . . . [N: specially adapted for cathode-ray tubes(H01J9/26Btakes precedence)]
H01J9/26D . . . [N: specially adapted for gas-discharge tubes or lamps (H01J9/26B takes precedence)]
H01J9/26D2 . . . . [N: specially adapted for gas-discharge lamps]
H01J9/26D2B . . . . . [N: the vessel being flat] [N0707]
H01J9/28 . . Manufacture of leading-in conductors
H01J9/30 . . Manufacture of bases
H01J9/32 . . Sealing leading-in conductors
H01J9/32A . . . [N: Sealing leading-in conductors into a discharge lamp or a gas-filled discharge device (for incandescent lamps H01K3/20, joining glass to metal C03C27/00)]
H01J9/32A1 . . . . [N: making pinched-stem or analogous seals]
H01J9/34 . . Joining base to vessel
H01J9/36 . . Joining connectors to internal electrode system

H01J9/38 . Exhausting, degassing, filling, or cleaning vessels
H01J9/385 . . Exhausting vessels
H01J9/39 . . Degassing vessels
H01J9/395 . . Filling vessels

H01J9/40 . Closing vessels

H01J9/42 . Measurement or testing during manufacture

H01J9/44 . Factory adjustment of completed discharge tubes or lamps to comply with desired tolerances
H01J9/44B . . [N: Aging of tubes or lamps, e.g. by "spot knocking" (cathode activation H01J9/04B2)]

H01J9/46 . Machines having sequentially arranged operating stations
H01J9/48 . . with automatic transfer of work-pieces between operating stations

H01J9/50 . Repairing or regenerating used or defective discharge tubes or lamps
H01J9/50B . . [N: Regeneration of cathodes (activation H01J9/04B2)]

H01J9/52 . Recovery of material from discharge tubes or lamps (H01J9/50 takes precedence) [N0501]

H01J11/00 **Gas-filled discharge tubes with alternating current induction of the discharge, e.g. AC-PDPs [Alternating Current Plasma Display Panels]** (circuits or methods for driving PDPs G09G 3/28); Gas-filled discharge tubes without any main electrode inside the vessel; Gas-filled discharge tubes with at least one main electrode outside the vessel (discharge lamps H01J 65/00 [N: H01J61/00, H01J63/00]) [C1105]

Note [N1105]

(1) When classifying in this group, classification is made in all appropriate places.
(2) In this group, the following term is used with the meaning indicated:
- "main electrode" means any of a sustain electrode, scan electrode or address electrode.

H01J11/10 . AC-PDPs with at least one main electrode being out of contact with the plasma [N1104] [C1105]
H01J11/12 . . with main electrodes provided on both sides of the discharge space [N1104]
H01J11/14 . . with main electrodes provided only on one side of the discharge space [N1104]
H01J11/16 . . with main electrodes provided inside or on the side face of the spacers [N1104]
H01J11/18 . . containing a plurality of independent closed structures for containing the gas, e.g. plasma tube array [PTA] display panels [N1104] [C1105]

H01J11/20 . Constructional details [N1104] [C1105]
H01J11/22 . . Electrodes, e.g. special shape, material or configuration [N1104]
H01J11/24 . . . Sustain electrodes or scan electrodes [N1104] [C1105]
H01J11/26 . . . Address electrodes [N1104]
H01J11/28 . . . Auxiliary electrodes, e.g. priming electrodes or trigger electrodes [N1104] [C1105]
H01J11/30 . . . Floating electrodes [N1104]
H01J11/32 . . . Disposition of the electrodes [N1104]
H01J11/34 . . Vessels, containers or parts thereof, e.g. substrates [N1104]
H01J11/36 . . . Spacers, barriers, ribs, partitions or the like [N1104]
H01J11/38 . . . Dielectric or insulating layers [N1104]
H01J11/40 . . . Layers for protecting or enhancing the electron emission, e.g. MgO layers [N1104] [C1105]
H01J11/42 . . . Fluorescent layers [N1104]
H01J11/44 . . Optical arrangements or shielding arrangements, e.g. filters, black matrices, light reflecting means or electromagnetic shielding means [N1104] [C1105]
H01J11/46 . . Connecting or feeding means, e.g. leading-in conductors [N1104]
H01J11/48 . . Sealing, e.g. seals specially adapted for leading-in conductors [N1104]
H01J11/50 . . Filling, e.g. selection of gas mixture [N1104]
H01J11/52 . . Means for absorbing or adsorbing the gas mixture, e.g. by gettering [N1104]
H01J11/54 . . Means for exhausting the gas [N1104]

H01J13/00 **Discharge tubes with liquid-pool cathodes, e.g. metal-vapour rectifying tubes** (lamps H01J61/00)

H01J13/02 . Details
H01J13/04 . . Main electrodes; Auxiliary anodes
H01J13/06 . . . Cathodes
H01J13/08 . . . . characterised by the material
H01J13/10 . . . . Containers for the liquid pool; Arrangements or mounting thereof
H01J13/12 . . . . Positioning or moving the cathode spot on the surface of the pool

H01J13/14 . . . . Cooling, heating, circulating, filtering, or controlling level of the liquid
H01J13/16 . . . Anodes; Auxiliary anodes for maintaining the discharge (screens H01J13/22)
H01J13/18 . . . . Cooling or heating of anodes
H01J13/20 . . Control electrodes, e.g. grid (for igniting arrangements H01J13/34)
H01J13/22 . . Screens, e.g. for preventing or eliminating arcing-back
H01J13/24 . . Vessels; Containers
H01J13/24B . . . [N: characterised by the material] [N9512]
H01J13/24D . . . [N: characterised by the shape] [N9512]
H01J13/24E . . . [N: Treatment of, or coating on interior parts of vessel] [N9512]
H01J13/24G . . . [N: Envelope means outside vessel, i.e. screens, reflectors, filters] [N9512]
H01J13/26 . . Seals between parts of vessels; Seals for leading-in conductors; Leading-in conductors
H01J13/26B . . . [N: Leading-in conductors to the liquid electrode] [N9512]
H01J13/26D . . . [N: Leading-in conductors to the anode] [N9512]
H01J13/28 . . Selection of substances for gas filling; Means for obtaining the desired pressure within the tube
H01J13/30 . . . Means for permitting pumping during operation of the tube
H01J13/32 . . Cooling arrangements; Heating arrangements (for cathodes H01J13/14; for anodes H01J13/18)
H01J13/34 . . Igniting arrangements (circuits arrangements H02M1/02)
H01J13/36 . . . having resistive or capacitative igniter
H01J13/38 . . . . having resistive igniter only
H01J13/40 . . . Igniting by movement of a solid electrode
H01J13/40B . . . . [N: Interrupting contact with liquid cathode] [N9512]
H01J13/42 . . . Igniting by movement of vessel as a whole, e.g. tilting
H01J13/44 . . Devices for preventing or eliminating arcing-back (screens therefor H01J13/22)
H01J13/46 . . One or more circuit elements structurally associated with the tube
H01J13/48 . . Circuit arrangements not adapted to a particular application of the tube and not otherwise provided for

H01J13/50 . Tubes having a single main anode
H01J13/52 . . with control by one or more intermediate control electrodes
H01J13/54 . . with control by igniter, e.g. single-anode ignitron

H01J13/56 . Tubes having two or more main anodes
H01J13/58 . . with control by one or more intermediate control electrodes

H01J15/00 **Gas-filled discharge tubes with gaseous cathodes, e.g. plasma cathode** (lamps H01J61/62)

H01J15/02 . Details, e.g. electrode, gas filling, shape of vessel
H01J15/04 . . Circuit arrangements not adapted to a particular application of the tube and not otherwise provided for

H01J17/00 **Gas-filled discharge tubes with solid cathode** (H01J25/00, H01J27/00, H01J31/00 to H01J41/00 [N: H01J11/00] take precedence; gas or vapour discharge lamps H01J61/00;

gas filled spark gaps H01T; Marx converters H02M7/26 ; tubes for generating potential differences by charges carried in a gas stream H02N) [C1105]

H01J17/00B . [N: specially adapted as noise generators (electronic circuits for generation of noise currents or voltages H03B29/00)]

H01J17/02 . Details

H01J17/04 . . Electrodes; Screens

H01J17/06 . . . Cathodes

H01J17/06C . . . . [N: Indirectly heated cathodes, e.g. by the discharge itself]

H01J17/06F . . . . [N: Cold cathodes]

H01J17/08 . . . . having mercury or liquid alkali metal deposited on the cathode surface during operation of the tube

H01J17/10 . . . Anodes

H01J17/12 . . . Control electrodes

H01J17/14 . . Magnetic means for controlling the discharge

H01J17/16 . . Vessels; Containers

H01J17/18 . . Seals between parts of vessels; Seals for leading-in conductors; leading-in conductors

H01J17/18B . . . [N: Seals between parts of vessel]

H01J17/18C . . . [N: Seals between leading-in conductors and vessel]

H01J17/20 . . Selection of substances for gas fillings; Specified operating pressure or temperature (radioactive fillings H01J17/32)

H01J17/22 . . Means for obtaining or maintaining the desired pressure within the tube

H01J17/24 . . . Means for absorbing or adsorbing gas, e.g. by gettering

H01J17/26 . . . Means for producing, introducing, or replenishing gas or vapour during operation of the tube

H01J17/28 . . Cooling arrangements

H01J17/30 . . Igniting arrangements

H01J17/32 . . . Igniting by associated radioactive materials or fillings

H01J17/32B . . . . [N: Current stabilising tubes, e.g. curpistors]

H01J17/34 . . One or more circuit elements structurally associated with the tube

H01J17/36 . . Circuit arrangements not adapted to a particular application of the tube and not otherwise provided for

H01J17/38 . Cold-cathode tubes (TR boxes H01J17/64)

H01J17/40 . . with one cathode and one anode, e.g. glow tube, tuning-indicator glow tube, voltage-stabiliser tube, voltage-indicator tube, (cathode-glow lamps H01J61/04)

H01J17/42 . . . having one or more probe electrodes, e.g. for potential dividing

H01J17/44 . . . having one or more control electrodes

H01J17/46 . . . . for preventing and then permitting ignition but thereafter having no control

H01J17/48 . . with more than one cathode or anode, e.g. sequence-discharge tube, counting tube, dekatron

H01J17/48B . . . [N: Plasma addressed liquid crystal displays [PALC]] [N1104]

H01J17/49 . . . Display panels, e.g. with crossed electrodes [N: e.g. making use of direct

t] (gas discharge type indicating arrangements effected by the combination of a number of individual lamps G09F9/313 [N: display panels making use of alternating current H01J11]) [C1105]

H01J17/49B . . . . [N: with electrodes arranged side by side and substantially in the same plane, e.g. for displaying alphanumeric characters]

H01J17/49D . . . . [N: with crossed electrodes]

H01J17/49D2 . . . . . [N: using sequential transfer of the discharges, e.g. of the self-scan type (addressing circuits therefor G09G3/29)] [C0304]

H01J17/49D2D . . . . . [N: display panels using sequential transfer of the discharge along dielectric storage elements]

H01J17/49D4 . . . . . [N: for several colours]

H01J17/49P . . . . [N: with a gas discharge space and a post acceleration space for electrons]

H01J17/50 . Thermionic-cathode tubes (TR boxes H01J17/64)

H01J17/52 . . with one cathode and one anode

H01J17/54 . . . having one or more control electrodes

H01J17/56 . . . . for preventing and then permitting ignition, but thereafter having no control

H01J17/58 . . with more than one cathode or anode

H01J17/60 . . . the discharge paths priming each other in a predetermined sequence, e.g. counting tube

H01J17/62 . . . with independent discharge paths controlled by intermediate electrodes, e.g. polyphase rectifier

H01J17/64 . Tubes specially designed for switching or modulating in a waveguide, e.g. TR box

H01J19/00 Details of vacuum tubes of the types covered by group H01J21/00

H01J19/02 . Electron-emitting electrodes; Cathodes

H01J19/04 . . Thermionic cathodes

H01J19/06 . . . characterised by the material

H01J19/062 . . . . with alkaline-earth metal oxides, or such oxides used in conjunction with reducing agents, as an emissive material [N9512]

H01J19/064 . . . . with other metal oxides as an emissive material [N9512]

H01J19/066 . . . . with metals or alloys as an emissive material [N9512]

H01J19/068 . . . . with compounds having metallic conductive properties, e.g. lanthanum boride, as an emissive material [N9512]

H01J19/08 . . . Cathodes heated directly by an electric current

H01J19/10 . . . characterised by the shape

H01J19/12 . . . . Supports; Vibration-damping arrangements

H01J19/14 . . . Cathodes heated indirectly by an electric current; Cathodes heated by electron or ion bombardment

H01J19/16 . . . . Heaters (filaments for incandescent lamps H01K1/02)

H01J19/18 . . . . Insulating layer or body located between heater and emissive material

H01J19/20 . . . . Supports for the emissive material

H01J19/22 . . . . Dispenser-type cathodes, e.g. L-cathode

H01J19/24 . . Cold cathodes, e.g. field-emissive cathode

H01J19/28 . Non-electron-emitting electrodes; Screens
H01J19/30 . . characterised by the material
H01J19/32 . . Anodes
H01J19/34 . . . forming part of the envelope
H01J19/36 . . . Cooling of anodes
H01J19/38 . . Control electrodes, e.g. grid
H01J19/40 . . Screens for shielding (screens acting as control electrodes H01J19/38)

H01J19/42 . Mounting, supporting, spacing, or insulating of electrodes or of electrode assemblies
H01J19/44 . . Insulation between electrodes or supports within the vacuum space (leading-in conductors H01J19/62)
H01J19/46 . . Mountings for the electrode assembly as a whole
H01J19/48 . . Mountings for individual electrodes (for directly-heated cathodes H01J19/12)
H01J19/50 . . Spacing members extending to the envelope
H01J19/52 . . . without fixed connection between spacing member and envelope

H01J19/54 . Vessels; Containers; Shield associated therewith
H01J19/56 . . characterised by the material of the vessel or container
H01J19/57 . . provided with coatings on the walls thereof; Selection of materials for the coatings

H01J19/58 . Seals between parts of vessels

H01J19/60 . Seals for leading-in conductors

H01J19/62 . Leading-in conductors

H01J19/64 . Means forming part of the tube for the purpose supporting it (associated with electrical connecting means H01J19/66)

H01J19/66 . Means forming part of the tube for the purpose of providing electrical connection to it (construction of connectors H01R) [N: no documents, see H01J5/46 to H01J5/62]

H01J19/68 . Specified gas introduced into the tube at low pressure, e.g. for reducing or influencing space charge

H01J19/70 . Means for obtaining or maintaining the vacuum, e.g. by gettering
H01J19/72 . . Tubulations therefor, e.g. for exhausting; Closures therefor

H01J19/74 . Cooling arrangements (cooling of anodes H01J19/36)

H01J19/76 . Means structurally associated with the tube for indicating defects or previous use

H01J19/78 . One or more circuit elements structurally associated with the tube
H01J19/80 . . Structurally associated resonator having distributed inductance and capacitance

H01J19/82 . Circuit arrangements not adapted to a particular application of the tube and not otherwise provided for

H01J21/00 Vacuum tubes (H01J25/00, H01J31/00 to H01J37/00, H01J43/00 take precedence;

details of vacuum tubes H01J19/00; cathode ray or electron stream lamps H01J63/00) [C0704]

H01J21/02 . Tubes with a single discharge path

H01J21/04 . . without control means, i.e. diodes

H01J21/06 . . having electrostatic control means only

H01J21/06B . . . [N: Devices for short wave tubes] [N9512]

H01J21/08 . . . with movable electrode or electrodes

H01J21/10 . . . with one or more immovable internal control electrodes, e.g. triode, pentode, octode

H01J21/10B . . . . [N: with micro-engineered cathode and control electrodes, e.g. Spindt-type]

H01J21/12 . . . . Tubes with variable amplification factor

H01J21/14 . . . . Tubes with means for concentrating the electron stream, e.g. beam tetrode

H01J21/16 . . . with external electrostatic control means and with or without internal control electrodes

H01J21/18 . . having magnetic control means; having both magnetic and electro-static control means

H01J21/20 . Tubes with more than one discharge path; Multiple tubes, e.g. double diode, triode-hexode (secondary-emission tubes, electron-multiplier tubes H01J43/00)

H01J21/22 . . with movable electrode or electrodes

H01J21/24 . . with variable amplification factor

H01J21/26 . . with means for concentrating the electron stream

H01J21/34 . Tubes with electrode system arranged or dimensioned so as to eliminate transit-time effect (with flat electrodes H01J21/36)

H01J21/36 . Tubes with flat electrodes, e.g. disc electrode

H01J23/00 **Details of transit-time tubes of the types covered by group H01J25/00**

H01J23/00B . [N: Cooling methods or arrangements (H01J23/033 takes precedence)]

H01J23/02 . Electrodes; Magnetic control means; Screens (associated with resonator or delay system H01J23/16)

H01J23/027 . . Collectors

H01J23/027B . . . [N: Multistage collectors] [N9412]

H01J23/033 . . . Collector cooling devices

H01J23/04 . . Cathodes

H01J23/05 . . . having a cylindrical emissive surface, e.g. cathodes for magnetrons

H01J23/06 . . Electron or ion guns

H01J23/065 . . . producing a solid cylindrical beam (H01J23/075 takes precedence)

H01J23/07 . . . producing a hollow cylindrical beam (H01J23/075 takes precedence)

H01J23/075 . . . Magnetron injection guns

H01J23/08 . . Focusing arrangements, e.g. for concentrating stream of electrons, for preventing

spreading of stream

H01J23/083 . . . Electrostatic focusing arrangements

H01J23/087 . . . Magnetic focusing arrangements

H01J23/087B . . . . [N: with at least one axial-field reversal along the interaction space, e.g. P.P.M. focusing]

H01J23/087C . . . . [N: with arrangements improving the linearity and homogeniety of the axial field, e.g. field straightener]

H01J23/09 . . Electric system for directing or deflecting the discharge along a desired path, e.g. E-type (focusing arrangements H01J23/08)

H01J23/10 . . Magnet systems for directing or deflecting the discharge along a desired path, e.g. a spiral path (magnetic focusing arrangements H01J23/08)

H01J23/11 . . Means for reducing noise (in electron or ion gun H01J23/06)

H01J23/12 . Vessels; Containers

H01J23/14 . Leading-in arrangements; Seals therefor

H01J23/15 . . Means for preventing wave energy leakage structurally associated with tube leading-in arrangements, e.g. filters, chokes, attenuating devices

H01J23/16 . Circuit elements, having distributed capacitance and inductance, structurally associated with the tube and interacting with the discharge (circuit elements, having distributed capacitance and inductance, in general H01P)

H01J23/16B . . [N: Manufacturing processes or apparatus therefore]

H01J23/18 . . Resonators

H01J23/20 . . . Cavity resonators; Adjustment or tuning thereof

H01J23/207 . . . . Tuning of single resonator

H01J23/213 . . . . Simultaneous tuning of more than one resonator, e.g. resonant cavities of a magnetron

H01J23/22 . . . Connections between resonators, e.g. strapping for connecting resonators of a magnetron

H01J23/24 . . Slow-wave structures, [N: e.g. delay systems]

H01J23/26 . . . Helical slow-wave structures; Adjustment therefor

H01J23/27 . . . . Helix-derived slow-wave structures

H01J23/28 . . . Interdigital slow-wave structures; Adjustment therefor

H01J23/30 . . . Damping arrangements associated with slow-wave structures, e.g. for suppression of unwanted oscillations

H01J23/34 . Circuit arrangements not adapted to a particular application of the tube and not otherwise provided for

H01J23/36 . Coupling devices having distributed capacitance and inductance, structurally associated with the tube, for introducing or removing wave energy

H01J23/38 . . to or from the discharge

H01J23/40 . . to or from the interaction circuit

H01J23/42 . . . the interaction circuit being a helix or a helix-derived slow-wave structure (H01J23/44 to H01J23/48 take precedence)

H01J23/44 . . . Rod-type coupling devices (H01J23/46, H01J23/48, H01J23/54 take precedence)

H01J23/46 . . . Loop coupling devices

H01J23/48 . . . for linking interaction circuit with coaxial lines; Devices of the coupled helices type (H01J23/46 takes precedence)

H01J23/50 . . . . the interaction circuit being a helix or derived from a helix (H01J23/52 takes precedence)

H01J23/52 . . . . the coupled helices being disposed coaxially around one another

H01J23/54 . . Filtering devices preventing unwanted frequencies or modes to be coupled to, or out of, the interaction circuit; Prevention of high frequency leakage in the environment

H01J25/00 **Transit-time tubes, e.g. Klystrons, travelling-wave tubes, magnetrons** (details of transit-time tubes H01J23/00; particle accelerators H05H)

H01J25/00B . [N: Gas-filled transit-time tubes]

H01J25/02 . Tubes with electron stream modulated in velocity or density in a modulator zone and thereafter giving up energy in an inducing zone, the zones being associated with one or more resonators (tubes in which a travelling-wave is simulated at spaced gaps H01J25/34)

H01J25/02B . . [N: with an electron stream following a helical path]

H01J25/04 . . Tubes having one or more resonators, without reflection of the electron stream, and in which the modulation produced in the modulator zone is mainly density modulation, e.g. Heaff tube

H01J25/06 . . Tubes having only one resonator, without reflection of the electron stream, and in which the modulation produced in the modulator zone is mainly velocity modulation, e.g. Lüdi-Klystron

H01J25/08 . . . with electron stream perpendicular to the axis of the resonator

H01J25/10 . . Klystrons, i.e. tubes having two or more resonators, without reflection of the electron stream, and in which the stream is modulated mainly by velocity in the zone of the input resonator

H01J25/11 . . . Extended interaction Klystrons

H01J25/12 . . . with pencil-like electron stream in the axis of the resonators

H01J25/14 . . . with tube-like electron stream coaxial with the axis of the resonators

H01J25/16 . . . with pencil-like electron stream perpendicular to the axis of the resonators

H01J25/18 . . . with radial or disc-like electron stream perpendicular to the axis of the resonators

H01J25/20 . . . having special arrangements in the space between resonators, e.g. resistive-wall amplifier tube, space-charge amplifier tube, velocity-jump tube

H01J25/22 . . Reflex Klystrons, i.e. tubes having one or more resonators, with a single reflection of the electron stream, and in which the stream is modulated mainly by velocity in the modulator zone

H01J25/24 . . . in which the electron stream is in the axis of the resonator or resonators and is pencil-like before reflection

H01J25/26 . . . in which the electron stream is coaxial with the axis of the resonator or resonators and is tube-like before reflection

H01J25/28 . . . in which the electron stream is perpendicular to the axis of the resonator or resonators and is pencil-like before reflection

H01J25/30 . . . in which the electron stream is perpendicular to the axis of the resonator or resonators and is radial or disc-like before reflection

H01J25/32 . . Tubes with plural reflection, e.g. Coeterier tube

H01J25/34 . Travelling-wave tubes; Tubes in which a travelling wave is simulated at spaced gaps

H01J25/36 . . Tubes in which an electron stream interacts with a wave travelling along a delay line or equivalent sequence of impedance elements, and without magnet system producing an H-field crossing the E-field

H01J25/38 . . . the forward travelling wave being utilised

H01J25/40 . . . the backward travelling wave being utilised

H01J25/42 . . Tubes in which an electron stream interacts with a wave travelling along a delay line or equivalent sequence of impedance elements, and with a magnet system producing an H-field crossing the E-field (with travelling wave moving completely around the electron space H01J25/50)

H01J25/44 . . . the forward travelling wave being utilised

H01J25/46 . . . the backward travelling wave being utilised

H01J25/48 . . Tubes in which two electron streams of different velocities interact with one another, e.g. electron-wave tube

H01J25/49 . . Tubes using the parametric principle, e.g. for parametric amplification

H01J25/50 . Magnetrons, i.e. tubes with a magnet system producing an H-field crossing the E-field (with travelling wave not moving completely around the electron space H01J25/42; functioning with plural reflection or with reversed cyclotron action H01J25/62, H01J25/64)

H01J25/52 . . with an electron space having a shape that does not prevent any electron from moving completely around the cathode or guide electrode

H01J25/54 . . . having only one cavity or other resonator, e.g. neutrode tube (having a composite resonator H01J25/58)

H01J25/55 . . . . Coaxial cavity magnetrons

H01J25/56 . . . . with interdigital arrangements of anodes, e.g. turbator tube

H01J25/58 . . . having a number of resonators; having a composite resonator, e.g. a helix

H01J25/587 . . . . Multi-cavity magnetrons

H01J25/593 . . . . . Rising-sun magnetrons

H01J25/60 . . with an electron space having a shape that prevents any electron from moving completely around the cathode or guide electrode; Linear magnetrons

H01J25/61 . Hybrid tubes, i.e. tubes comprising a klystron section and a travelling-wave section

H01J25/62 . Strophotrons, i.e. tubes with H-field crossing the E-field and functioning with plural reflection

H01J25/64 . Turbine tubes, i.e. tubes with H-field crossing the E-field and functioning with reversed cyclotron action

H01J25/66 . Tubes with electron stream crossing itself and thereby interacting or interfering with itself

H01J25/68 . Tubes specially designed to act as oscillator with positive grid and retarding field, e.g. for Barkhausen-Kurz oscillators (with secondary emission H01J25/76)

H01J25/70 . . with resonator having distributed inductance with capacitance, e.g. Pintsch tube

H01J25/72 . . in which a standing wave or a considerable part thereof is produced along an electrode, e.g. Clavier tube (with resonator having distributed inductance and

capacitance H01J25/70)

H01J25/74 . Tubes specially designed to act as transit-time diode oscillators, e.g. monotron (with secondary emission H01J25/76)

H01J25/76 . Dynamic electron-multiplier tubes, e.g. Farnsworth multiplier tube, multipactor

H01J25/78 . Tubes with electron stream modulated by deflection in a resonator

H01J27/00 **Ion beam tubes** (H01J25/00, H01J33/00, H01J37/00 take precedence; particle accelerators H05H)

H01J27/02 . Ion sources; Ion guns ([N: for examination or processing discharge tubes H01J37/08; ion sources, ion guns for particle spectrometer or separator tubes H01J49/10; ion propulsion F03H1/00]; arrangements for handling particles, e.g. focusing, [N: charge exchanging, polarising], G21K1/00; generating ions to be introduced into non-enclosed gases H01T23/00; generating plasma H05H1/24) [M1208]

H01J27/02B . . [N: Details]

H01J27/02B1 . . . [N: Extraction optics, e.g. grids] [N1105]

H01J27/02C . . [N: Cluster ion sources] [N1203]

H01J27/02N . . [N: Negative ion sources]

H01J27/04 . . using reflex discharge, e.g. Penning ion sources [N: Electron bombardment ion sources H01J27/08]

H01J27/06 . . . without applied magnetic field

H01J27/08 . . using arc discharge

H01J27/10 . . . Duoplasmatrons (for use in particle accelerators H05H7/00) [N: H05H7/00 not used therefor; Duopigatrons]

H01J27/12 . . . . provided with an expansion cup

H01J27/14 . . . Other arc discharge ion sources using an applied magnetic field

H01J27/14C . . . . [N: Hall-effect ion sources with closed electron drift] [N1105]

H01J27/14E . . . . [N: End-Hall type ion sources, wherein the magnetic field confines the electrons in a central cylinder] [N1105]

H01J27/16 . . using high-frequency excitation, e.g. microwave excitation

H01J27/18 . . . with an applied axial magnetic field

H01J27/20 . . using particle [N: beam] bombardment, e.g. ionisers

H01J27/20E . . . [N: with electrons, e.g. electron impact ionisation, electron attachment] [N1105]

H01J27/22 . . . Metal ion sources

H01J27/24 . . using photo-ionisation, e.g. using laser beam

H01J27/26 . . using surface ionisation, e.g. field effect ion sources, thermionic ion sources (H01J27/20, H01J27/24 take precedence)

H01J29/00 **Details of cathode-ray tubes or of electron-beam tubes of the types covered by group H01J31/00** [C1108]

H01J29/00B . [N: Arrangements for eliminating unwanted electromagnetic effects, e.g. demagnetisation arrangements, shielding coils (H01J29/06, H01J29/86H take precedence; demagnetisation in general H01F13/00; circuit arrangements therefor H04N9/29; screening of apparatus against electric or magnetic fields H05K9/00)] [C9412]

H01J29/00D . [N: Arrangements for eliminating unwanted temperature effects]

H01J29/02 . Electrodes; Screens; Mounting, supporting, spacing or insulating thereof

H01J29/02B . . [N: arrangements for eliminating interferences in the tube (H01J29/48F takes precedence)] [C0409]

H01J29/02D . . [N: secondary-electron emitting electrode arrangements (secondary-emission tubes H01J43/00)]

H01J29/02H . . [N: Mounting or supporting arrangements for grids (H01J29/02K takes precedence)] [C9809]

H01J29/02J . . [N: Mounting or supporting arrangements for charge storage screens not deposited on the frontplate]

H01J29/02K . . [N: Mounting or supporting arrangements for flat panel cathode ray tubes, e.g. spacers particularly relating to electrodes] [N9809] [C0612]

H01J29/04 . . Cathodes (electron guns H01J29/48)

H01J29/06 . . Screens for shielding; Masks interposed in the electron stream

H01J29/07 . . . Shadow masks for colour television tubes

H01J29/07B . . . . [N: Mounting arrangements associated with shadow masks]

H01J29/07D . . . . [N: characterised by the shape or distribution of beam-passing apertures]

H01J29/08 . . Electrodes intimately associated with a screen on or from which an image or pattern is formed, picked up, converted, or stored, e.g. backing-plate for storage tube, for collecting secondary electrons (arrangements for colour switching H01J29/80)

H01J29/08A . . . [N: Anode plates, e.g. for screens of flat panel displays] [N9704]

H01J29/10 . . Screens on or from which an image or pattern is formed, picked up, converted or stored

H01J29/12 . . . acting as light valves by shutter operation, e.g. for eidophor

H01J29/14 . . . acting by discoloration, e.g. halide screen

H01J29/16 . . . Incandescent screens

H01J29/18 . . . Luminescent screens

H01J29/18B . . . . [N: acting upon the lighting-up of the luminescent material other than by the composition of the luminescent material, e.g. by infra red or UV radiation, heating or electric fields]

H01J29/18C . . . . [N: measures against halo-phenomena]

H01J29/18D . . . . [N: screens with more than one luminescent material (as mixtures for the treatment of the screens) (for several superimposed luminescent layers H01J29/26; for adjacent dots or lines of different luminescent material H01J29/32)]

H01J29/20 . . . . characterised by the luminescent material [N: for luminescent screens for X-ray purposes G21K4/00]

H01J29/22 . . . . characterised by the binder or adhesive for securing the luminescent material to its support, e.g. vessel

H01J29/22B . . . . . [N: photosensitive adhesive]

H01J29/24 . . . . Supports for luminescent material

H01J29/26 . . . . with superimposed luminescent layers

H01J29/28 . . . . with protective, conductive or reflective layers

H01J29/30 . . . . with luminescent material discontinuously arranged, e.g. in dots, in lines

H01J29/32 . . . . . with adjacent dots or lines of different luminescent material, e.g. for

r television

H01J29/32B . . . . . [N: with adjacent dots]

H01J29/32D . . . . . [N: with adjacent lines]

H01J29/32F . . . . . [N: Black matrix materials] [N0704]

H01J29/34 . . . . provided with permanent marks or references

H01J29/36 . . . Photoelectric screens; Charge-storage screens

H01J29/38 . . . . not using charge storage, e.g. photo-emissive screen, extended cathode [N: (electrodes using photo-emission in general H01J1/34)]

H01J29/38B . . . . . [N: Photocathodes comprising a layer which modified the wave length of impinging radiation (luminescent layers sensitive to UV and X-rays C09K11/00, G21K4/00)]

H01J29/39 . . . . Charge-storage screens [N: (H01J29/39B takes precedence)]

H01J29/39B . . . . . [N: charge-storage grids exhibiting triode effect]

H01J29/41 . . . . . using secondary emission, e.g. for supericonoscope [N: (electrodes using secondary emission in general H01J1/32; secondary emission tubes H01J43/00)]

H01J29/41B . . . . . [N: for writing and reading of charge pattern on opposite sides of the target, e.g. for superorthicon]

H01J29/41B2 . . . . . {7 dots} [N: with a matrix of electrical conductors traversing the target]

H01J29/43 . . . . . using photo-emissive mosaic, e.g. for orthicon, for iconoscope

H01J29/43B . . . . . [N: with a matrix of conductors traversing the target]

H01J29/44 . . . . . exhibiting internal electric effects caused by particle radiation, e.g. bombardment-induced conductivity [N: (particle detectors exhibiting internal electric effects G01T1/26)]

H01J29/45 . . . . . exhibiting internal electric effects caused by electromagnetic radiation, e.g. photo-conductive screen, photo-dielectric screen, photovoltaic screen [N: photoconductive layers for electrography G03G5/00]

H01J29/45B . . . . . [N: with photosensitive junctions]

H01J29/45B2 . . . . . {7 dots} [N: provided with diode arrays]

H01J29/45B2B . . . . . {8 dots} [N: formed on a silicon substrate]

H01J29/45B4 . . . . . {7 dots} [N: exhibiting no discontinuities, e.g. consisting of uniform layers]

H01J29/45D . . . . . [N: pyroelectrical targets; targets for infra-red or ultra-violet or X-ray radiations]

H01J29/46 . Arrangements of electrodes and associated parts for generating or controlling the ray or beam, e.g. electron-optical arrangement [N: (transit time tubes H01J23/00, H01J25/00; X-ray tubes H01J35/00; beam tubes for examining ions, e.g. electron or ion microscopes, or processing of objects or materials e.g. electron or ion beam tubes H01J37/04; electron multipliers H01J43/04; handling of radiation or particles, e.g. focusing, deviating, not otherwise provided for G21K1/00)]

H01J29/46B . . [N: arrangements for interrupting the beam during inoperative periods]

H01J29/46C . . [N: for simultaneous focalisation and deflection of ray or beam]

H01J29/46D . . [N: Control electrodes for flat display tubes, e.g. of the type covered by group H01J31/12F] [N9701] [C9709]

Note
H01J29/48 to H01J29/51 take precedence over groups H01J29/52 to H01J29/68.

H01J29/48 . . Electron guns

H01J29/48B . . . [N: Electron guns using field-emission, photo-emission, or secondary-emission electron source]

H01J29/48C . . . [N: Electron guns using electron multiplication]

H01J29/48F . . . [N: Eliminating deleterious effects due to thermal effects, electrical or magnetic fields; Preventing unwanted emission (H01J29/48B and H01J29/48C take precedence)] [N0409]

H01J29/48G . . . [N: Construction of the gun or of parts thereof (H01J29/48B, H01J29/48C, H01J29/48F and H01J29/48R take precedence)] [N0409]

H01J29/48R . . . [N: Replacing parts of the gun; Relative adjustment of the electrodes (H01J29/48B and H01J29/48C take precedence; vacuum locks H01J29/86F)] [N0409]

H01J29/48T . . . [N: Schematic arrangements of the electrodes for beam forming; Place and form of the elecrodes] [N0409]

H01J29/50 . . . Two or more guns in a single vacuum space, e.g. for plural-ray tube (H01J29/51 takes precedence)

H01J29/50B . . . . [N: Three or more guns, the axes of which lay in a common plane]

H01J29/50D . . . . [N: guns in delta or circular configuration]

H01J29/51 . . . Arrangements for controlling convergence of a plurality of beams [N: by means of electric field only]

H01J29/52 . . Arrangements for controlling intensity of ray or beam, e.g. for modulation [N: (H01J29/46D takes precedence)] [C9709]

H01J29/52B . . . [N: Digitally controlled systems, e.g. Digisplay]

H01J29/54 . . Arrangements for centring ray or beam [N: (H01J29/46D takes precedence)] [C9709]

H01J29/56 . . Arrangements for controlling cross-section of ray or beam; Arrangements for correcting aberration of beam, e.g. due to lenses [N: (H01J29/46D takes precedence)] [C9709]

H01J29/56B . . . [N: for controlling cross-section]

H01J29/56D . . . [N: for correcting aberration]

H01J29/58 . . Arrangements for focusing or reflecting ray or beam[N: (H01J29/46D,H01J29/58Btake precedence)][C9709]

H01J29/58B . . . [N: in which the transit time of the electrons has to be taken into account]

H01J29/60 . . . Mirrors

H01J29/62 . . . Electrostatic lenses

H01J29/62B . . . . [N: producing fields exhibiting symmetry of revolution]

H01J29/62B2 . . . . . [N: co-operating with or closely associated to an electron gun]

H01J29/62D . . . . [N: producing fields exhibiting periodic axial symmetry, e.g. multipolar fields]

H01J29/62D2 . . . . . [N: co-operating with or closely associated to an electron gun]

H01J29/64 . . . Magnetic lenses

H01J29/66 . . . . using electromagnetic means only

H01J29/68 . . . . using permanent magnets only

H01J29/70 . . Arrangements for deflecting ray or beam ([N: H01J29/46D, H01J29/52B, H01J29/70B, H01J29/70C take precedence]; circuit arrangements for producing saw-tooth pulses or other deflecting voltages or currents H03K)

H01J29/70B . . . [N: Systems for correcting deviation or convergence of a plurality of beams by means of magnetic fields at least]

H01J29/70B2 . . . . [N: Convergence correction arrangements therefor]
H01J29/70B2B . . . . . [N: Static convergence systems]
H01J29/70B2D . . . . . [N: Dynamic convergence systems]
H01J29/70B4 . . . . [N: Deviation correction devices, i.e. having the same action on each beam]
H01J29/70B6 . . . . [N: Arrangements intimately associated with parts of the gun and co-operating with external magnetic excitation devices]
H01J29/70C . . . [N: in which the transit time of the electrons has to be taken into account]
H01J29/72 . . . along one straight line or along two perpendicular straight lines
H01J29/74 . . . . Deflecting by electric fields only
H01J29/76 . . . . Deflecting by magnetic fields only
H01J29/76B . . . . . [N: using saddle coils or printed windings (coils per se H01F)]
H01J29/76D . . . . . [N: using toroidal windings]
H01J29/76F . . . . . [N: using a combination of saddle coils and toroidal windings]
H01J29/76G . . . . . [N: using printed windings (printed windings in general H01F27/28A; manufacturing printed coils per se H01F41/04; printed circuits and apparatus or processes for manufacturing printed circuits in general H05K1/00, e.g. H05K1/16, and H05K3/00)]
H01J29/78 . . . along a circle, spiral or rotating radial line, e.g. for radar display
H01J29/80 . . Arrangements for controlling the ray or beam after passing the main deflection system, e.g. for post-acceleration or post-concentration, for colour switching [N: (H01J29/70B takes precedence)]
H01J29/80B . . . [N: for post-acceleration or post-deflection, e.g. for colour switching]
H01J29/80B2 . . . . [N: Electron lens mosaics, e.g. fly`s eye lenses, colour selection lenses]
H01J29/81 . . . using shadow masks (shadow masks per se H01J29/07)
H01J29/82 . . Mounting, supporting, spacing, or insulating electron-optical or ion-optical arrangements
H01J29/82B . . . [N: around the neck of the tube]
H01J29/82B2 . . . . [N: Deflection arrangements]

H01J29/84 . Traps for removing or diverting unwanted particles, e.g. negative ions, fringing electrons; Arrangements for velocity or mass selection (particle spectrometer or separator tubes H01J49/00)
H01J29/84B . . [N: by means of magnetic systems]

H01J29/86 . Vessels; Containers; Vacuum locks
H01J29/86B . . [N: Vessels or containers characterised by the form or the structure thereof]
H01J29/86B2 . . . [N: of flat panel cathode ray tubes] [N0612]
H01J29/86C . . [N: Vessels or containers characterised by the material thereof]
H01J29/86D . . [N: Spacers between faceplate and backplate of flat panel cathode ray tubes] [N0612]
H01J29/86F . . [N: Vacuum locks (for tubes for examining or processing of objects or materials e.g. electron microscopes H01J37/18)]
H01J29/86F2 . . . [N: Devices for introducing a recording support into the vessel]
H01J29/86H . . [N: Means associated with the outside of the vessel for shielding, e.g. magnetic shields (screens for shielding inside the vessel H01J29/06; magnetic shielding in general H05K9/00)]
H01J29/86H2 . . . [N: Screens covering the input or output face of the vessel, e.g. transparent

anti-static coatings, X-ray absorbing layers]

H01J29/87 . . Arrangements for preventing or limiting effects of implosion of vessels or containers

H01J29/88 . . provided with coatings on the walls thereof; Selection of materials for the coatings ([N: H01J29/86H2 and H01J29/89 take precedence]; luminescent screens H01J29/18)

H01J29/89 . . Optical or photographic arrangements structurally combined [N: or co-operating] with the vessel [N: (H01J29/86F2 and H01J29/86H2 take precedence)]

H01J29/89B . . . [N: using fibre optics]

H01J29/89D . . . [N: Arrangements combined with the vessel for the purpose of image projection on a screen (projection arrangements for image reproduction, e.g. using eidophor H04N5/74)]

H01J29/89F . . . [N: Anti-reflection means, e.g. eliminating glare due to ambient light]

H01J29/89H . . . [N: Spectral filters]

H01J29/90 . Leading-in arrangements; Seals therefor

H01J29/92 . Means forming part of the tube for the purpose of providing electrical connection to it (construction of connectors H01R)

H01J29/92B . . [N: High voltage anode feedthrough connectors for display tubes] [C9509]

H01J29/94 . Selection of substances for gas fillings; Means for obtaining or maintaining the desired pressure within the tube e.g. by gettering [N: (exhausting, degassing, gettering of electric discharge tubes in general H01J9/38)]

H01J29/96 . One or more circuit elements structurally associated with the tube

H01J29/98 . Circuit arrangements not adapted to a particular application of the tube and not otherwise provided for

H01J31/00 **Cathode ray tubes; Electron beam tubes** (H01J25/00, H01J35/00, H01J37/00 take precedence; cathode ray or electron stream lamps H01J63/00; details of cathode ray tubes or of electron beam tubes H01J29/00)

H01J31/02 . having one or more output electrodes which may be impacted selectively by the ray or beam, and onto, from, or over which the ray or beam may be deflected or de-focused [N: pulse counting circuits therewith H03K29/02]

H01J31/04 . . with only one or two output electrodes [N: with only two electrically independant groups or electrodes]

H01J31/06 . . with more than two output electrodes, e.g. for multiple switching or counting

H01J31/06B . . . [N: for electrography or electrophotography, for transferring a charge pattern through the faceplate (leading-in arrangements H01J29/90; Lenard tubes H01J33/00; electrography or electrophotography per se G03C)]

H01J31/08 . having a screen on or from which an image or pattern is formed, picked up, converted, or stored

H01J31/10 . . Image or pattern display tubes, i.e. having electrical input and optical output; Flying-spot tubes for scanning purposes

H01J31/12 . . . with luminescent screen

H01J31/12B . . . . [N: tubes for oscillography (colour display tubes H01J31/20; cathode ray oscillography G01R13/20)]

H01J31/12D . . . . [N: Direct viewing storage tubes without storage grid (with storage grid H01J31/18)]

H01J31/12F . . . . [N: Flat display tubes]

H01J31/12F2 . . . . . [N: using electron beam scanning]

H01J31/12F4 . . . . . [N: provided with control means permitting the electron beam to reach selected parts of the screen, e.g. digital selection]

H01J31/12F4B . . . . . [N: using line sources]

H01J31/12F4D . . . . . [N: using large area or array sources, i.e. essentially a source for each pixel group]

H01J31/12G . . . . [N: provided with control means permitting the electron beam to reach selected parts of the screen, e.g. digitally controlled display tubes (H01J31/12F takes precedence)]

H01J31/14 . . . . Magic-eye or analogous tuning indicators [N: (mounting of visual indicators in a radio set H03J1/04; circuits for timing indicators H03J3/14)]

H01J31/15 . . . . with ray or beam selectively directed to luminescent anode segments [N: (printing by application of radiation B41J2/447)] [C9809]

H01J31/16 . . . . with mask carrying a number of selectively displayable signs, e.g. charactron, numeroscope [N: (tubes with a mask carrying a matrix of openings, a selection of which permits a sign to be displayed H01J31/12L)]

H01J31/18 . . . . with image written by a ray or beam on a grid-like charge-accumulating screen, and with a ray or beam passing through and influenced by this screen before striking the luminescent screen, e.g. direct-view storage tube [N: (charge storage grids exhibiting triode effect H01J29/39B)]

H01J31/20 . . . for displaying images or patterns in two or more colours [N: (circuits for colour television H04N9/16 to H04N9/28)]

H01J31/20B . . . . [N: using a colour-selection electrode]

H01J31/20B2 . . . . . [N: with more than one electron beam]

H01J31/20B2B . . . . . [N: with three electron beams in delta configuration]

H01J31/20B2D . . . . . [N: with three coplanar electron beams]

H01J31/20D . . . . [N: using variable penetration depth of the electron beam in the luminescent layer, e.g. penetrons]

H01J31/22 . . . for stereoscopic displays

H01J31/24 . . . with screen acting as light valve by shutter operation, e.g. eidophor [N: (projection arrangements for image reproduction, e.g. using eidophor H04N5/74)]

H01J31/26 . . Image pick-up tubes having an input of visible light and electric output (tubes without defined electron beams and having a light ray scanning photo-emissive screen H01J40/20)

H01J31/26B . . . [N: with light spot scanning]

H01J31/28 . . . with electron ray scanning the image screen [N: H01J31/28B, H01J31/28C take precedence]

H01J31/28B . . . . [N: with a target comprising semiconductor junctions]

H01J31/28C . . . . [N: correlater tubes]

H01J31/30 . . . . having regulation of screen potential at anode potential, e.g. iconoscope

H01J31/32 . . . . . Tubes with image amplification section, e.g. image-iconoscope, supericonoscope

H01J31/34 . . . . having regulation of screen potential at cathode potential, e.g. orthicon

H01J31/36 . . . . . Tubes with image amplification section, e.g. image-orthicon

H01J31/38 . . . . . Tubes with photoconductive screen, e.g. vidicon

H01J31/40 . . . . having grid-like image screen through which the electron ray passes and by which the ray is influenced before striking the output electrode, i.e. having "triode action"

H01J31/42 . . . with image screen generating a composite electron beam which is deflected as a whole past a stationary probe to simulate a scanning effect, e.g. Farnsworth pick-up tube

H01J31/44 . . . . Tubes with image amplification section

H01J31/46 . . . Tubes in which electrical output represents both intensity and colour of image [N: colour television cameras with only one tube H04N9/06]

H01J31/48 . . . Tubes with amplification of output effected by electron multiplier arrangements within the vacuum space

H01J31/49 . . Pick-up adapted for an input of electromagnetic radiation other than visible light and having an electric output, e.g. for an input of X-rays, for an input of infra-red radiation

H01J31/495 . . Pick-up tubes adapted for an input of sonic, ultrasonic, or mechanical vibrations and having an electric output

H01J31/50 . . Image-conversion or image-amplification tubes, i.e. having optical, X-ray, or analogous input, and optical output

H01J31/50B . . . [N: with an electrostatic electron optic system (H01J31/52 to H01J31/56 take precedence)]

H01J31/50B2 . . . . [N: with means to interrupt the beam e.g. shutter for high speed photography (circuits using electron-beam shutters G03B27/72B)]

H01J31/50D . . . [N: with an electromagnetic electron-optic system (H01J31/52 to H01J31/56 take precedence)]

H01J31/50F . . . [N: flat tubes, e.g. proximity focusing tubes]

H01J31/50G . . . [N: tubes using secondary emission effect]

H01J31/50G2 . . . . [N: using a large number of channels, e.g. microchannel plates]

H01J31/50H . . . [N: Multistage converters]

H01J31/52 . . . having grid-like image screen through which the electron ray or beam passes and by which the ray or beam is influenced before striking the luminescent output screen, i.e. having "triode action"

H01J31/54 . . . in which the electron ray or beam is reflected by the image input screen on to the image output screen

H01J31/56 . . . for converting or amplifying images in two or more colours

H01J31/58 . . Tubes for storage of image or information pattern or for conversion of definition of television or like image, i.e. having electrical input and electrical output [N: (electrostatic memories using electron beam tubes G11C11/329)]

H01J31/58B . . . [N: Monoscopes (H01J31/60 takes precedence)]

H01J31/60 . . . having means for deflecting, either selectively or sequentially, an electron ray on to separate surface elements of the screen (by circuitry alone H01J29/08)

H01J31/62 . . . . with separate reading and writing rays

H01J31/64 . . . . . on opposite sides of screen, e.g. for conversion of definition

H01J31/66 . . . having means for allowing all but selected cross-section elements of a homogeneous electron beam to reach corresponding elements of the screen, e.g. selectron

H01J31/68 . . . in which the information pattern represents two or more colours

H01J33/00 **Discharge tubes with provision for emergence of electrons or ions from the vessel** ([N: irradiation devices G21K]; particle accelerators H05H)**; Lenard tubes**

H01J33/02 . Details [N: (vessels for operation at high tension H01J5/06)]

H01J33/04 . . Windows

H01J35/00 **X-ray tubes** (X-ray lasers H01S4/00; X-ray technique in general H05G, [N: e.g. apparatus or processes specially adapted for producing X-rays, not involving X-ray tubes, e.g. involving generation of a plasma H05G2/00])

H01J35/02 . Details

H01J35/02B . . [N: X-ray tubes with structurally associated circuit elements]

H01J35/04 . . Electrodes [N: mutual position thereof and constructional adaptations of the electrodes therefor]

H01J35/04C . . . [N: Electrodes for controlling the current of the cathode ray, e.g. control grids] [N1111]

H01J35/06 . . . Cathodes [N: (electron guns in general H01J3/02)]

H01J35/06B . . . . [N: Field emission, photo emission or secondary emission cathodes]

H01J35/08 . . . Anodes; Anti cathodes [N: (anti-cathodes serving as windows H01J35/18)]

H01J35/10 . . . . Rotary anodes; Arrangements for rotating anodes; Cooling rotary anodes

H01J35/10B . . . . . [N: Arrangements for rotating anodes, e.g. supporting means; greasing; sealing the axle; shielding or protecting the driving means]

H01J35/10B2 . . . . . [N: Rotating anodes with a magnetic bearing]

H01J35/10C . . . . . [N: Cooling of rotating anode, e.g. heat emitting layers or structures]

H01J35/10C2 . . . . . [N: Active cooling, e.g. fluid flow, heat pipes]

H01J35/10D . . . . . [N: Substrates for and bonding of emissive target, e.g. composite structures]

H01J35/12 . . . . Cooling non-rotary anodes [N: (mounting the tube within a closed housing, e.g. for cooling purposes H05G1/04)]

H01J35/14 . . Arrangements for concentrating, focusing, or directing the cathode ray [N: (for cathode ray tubes in general H01J29/46)]

H01J35/16 . . Vessels; Containers; Shields associated therewith [N: (vessels for high tension operation in general H01J5/06; mounting the tube within a closed housing H05G1/04)]

H01J35/16B . . . [N: joining connectors to the tube]

H01J35/18 . . . Windows

H01J35/20 . . Selection of substances for gas fillings; Means for obtaining or maintaining the desired pressure within the tube, e.g. by gettering [N: (for gas-discharge tubes in general H01J7/02 to H01J61/76; evacuating, filling, gettering in general H01J9/38)]

H01J35/22 . specially designed for passing a very high current for a very short time, e.g. for flash operation

H01J35/24 . Tubes wherein the point of impact of the cathode ray on the anode or anti-cathode is movable relative to the surface thereof

H01J35/26 . . by rotation of the anode or anti-cathode

H01J35/28 . . by vibration, oscillation, reciprocation, or swash-plate motion of the anode or anti-cathode

H01J35/30 . . by deflection of the cathode ray

H01J35/30B . . . [N: by using a rotating X-ray tube in conjunction therewith]

H01J35/32 . Tubes wherein the X-rays are produced at or near the end of the tube or a part thereof which tube or part has a small cross-section to facilitate introduction into a small hole or cavity

H01J37/00 **Discharge tubes with provision for introducing objects or material to be exposed to the discharge, e.g. for the purpose of examination or processing thereof** (H01J33/00, H01J40/00, H01J41/00, H01J47/00, H01J49/00 take precedence; [N: scanning-probe techniques or apparatus G01Q]; contactless testing of electronic circuits using electron beams G01R31/305; [N: particle accelerators H05H])

H01J37/02 . Details

H01J37/02B . . [N: Means for mechanically adjusting components not otherwise provided for (mechanically adjusting from the outside of electron or ion-optical components H01J37/067; positioning the object or material H01J37/20; vacuum locks, means for obtaining or maintaining the desired pressure within the tube H01J37/18; other manipulating devices H01L21/48, G21F)]

H01J37/02D . . [N: Means for avoiding or neutralising unwanted electrical charges on tube components]

H01J37/04 . . Arrangements of electrodes and associated parts for generating or controlling the discharge, e.g. electron-optical arrangement, ion-optical arrangement [N: electron or ion-optical systems for localised treatment of materials H01J37/30A4; discharge control means in gas filled discharge tubes H01J37/32D1]

H01J37/04B . . . [N: Beam blanking or chopping, i.e. arrangements for momentarily interrupting exposure to the discharge]

H01J37/05 . . . Electron or ion-optical arrangements for separating electrons or ions according to their energy [N: or mass] (particle separator tubes H01J49/00) [C1112]

H01J37/06 . . . Electron sources; Electron guns [N: electron sources in general H01J1/02, H01J19/02; electron guns in general H01J3/02]

H01J37/06C . . . . [N: Electron guns using electron multiplication]

H01J37/063 . . . . Geometrical arrangement of electrodes for beam-forming

H01J37/065 . . . . Construction of guns or parts thereof (H01J37/067 to H01J37/077 take precedence)

H01J37/067 . . . . Replacing parts of guns; Mutual adjustment of electrodes (H01J37/073 to H01J37/077 take precedence; vacuum locks H01J37/18)

H01J37/07 . . . . Eliminating deleterious effects due to thermal effects or electric or magnetic fields (H01J37/073 to H01J37/077 take precedence)

H01J37/073 . . . . Electron guns using field emission, photo emission, or secondary emission electron sources

H01J37/075 . . . . Electron guns using thermionic emission from cathodes heated by particle bombardment or by irradiation, e.g. by laser

H01J37/077 . . . . Electron guns using discharge in gases or vapours as electron sources

H01J37/08 . . . Ion sources; Ion guns

H01J37/09 . . . Diaphragms; Shields associated with electron or ion-optical arrangements; Compensation of disturbing fields

H01J37/10 . . . Lenses

H01J37/12 . . . . electrostatic

H01J37/14 . . . . magnetic

H01J37/141 . . . . . Electromagnetic lenses

H01J37/141B . . . . . [N: Means for interchanging parts of the lens, e.g. pole pieces, within

the tube (mechanically adjusting electron (ion) optical components H01J37/15)]

H01J37/141C . . . . . [N: with supra-conducting coils] [C1112]

H01J37/143 . . . . . Permanent magnetic lenses

H01J37/145 . . . . Combinations of electrostatic and magnetic lenses

H01J37/147 . . . Arrangements for directing or deflecting the discharge along a desired path ([N: H01J37/04B takes precedence]; lenses H01J37/10)

H01J37/147B . . . . [N: for centering, aligning or positioning of ray or beam]

H01J37/147D . . . . [N: Deflecting along given lines]

H01J37/147D2 . . . . . [N: Scanning means]

H01J37/147D2B . . . . . [N: magnetic]

H01J37/147D2D . . . . . [N: electrostatic]

H01J37/147F . . . . [N: Beam tilting means, i.e. for stereoscopy or for beam channelling]

H01J37/15 . . . . External mechanical adjustment of electron or ion optical components (H01J37/067, H01J37/20 take precedence)

H01J37/153 . . . Electron-optical or ion-optical arrangements for the correction of image defects, e.g. stigmators

H01J37/16 . . Vessels; Containers

H01J37/16B . . . [N: Means associated with the vessel for preventing the generation of or for shielding unwanted radiation, e.g. X-rays]

H01J37/18 . . Vacuum locks; [N: Means for obtaining or maintaining the desired pressure within the vessel (vacuum locks for electron-beam tubes in general H01J29/86F)] [C1112]

H01J37/18A . . . [N: Means for transferring objects between different enclosures of different pressure or atmosphere]

H01J37/20 . . Means for supporting or positioning the objects or the material; Means for adjusting diaphragms or lenses associated with the support [N: (introducing the objects H01J37/18; preparing specimens for investigation G01N1/06, G01N1/28)]

H01J37/21 . . Means for adjusting the focus [N: (adjusting the focus while observing the image by photographic or optical means H01J37/22; means for observing the object or the point of impact on the object in tubes for the localised treatment of materials H01J37/30A2)] [C0406]

H01J37/22 . . Optical or photographic arrangements associated with the tube [N: (using a CRT for the display of the image in a scanning electron microscope H01J37/28; observing the object or the point of impact on the object in tubes for the localised treatment of materials H01J37/30A4)] [C0406]

H01J37/22A . . . [N: Image processing arrangements associated with the tube (image data processing or generation, in general G06T)] [C9410]

H01J37/22C . . . [N: Luminescent screens or photographic plates for imaging (photosensitive materials for photographic purposes G03C); Apparatus specially adapted therefor, e.g. cameras, TV-cameras, photographic equipment, exposure control; Optical subsystems specially adapted therefor, e.g. microscopes for observing image on luminescent screen] [N1109]

H01J37/22E . . . [N: Optical arrangements for illuminating the object; optical arrangements for collecting light from the object] [N1109]

H01J37/22E1 . . . . . [N: whereby illumination and light collection take place in the same area of the discharge] [N1109]

H01J37/24 . . Circuit arrangements not adapted to a particular application of the tube and not otherwise provided for

H01J37/24B . . . [N: High voltage power supply or regulation circuits (components H01J37/248)]

H01J37/24D . . . [N: Filament heating power supply or regulation circuits (H01J37/24B takes precedence)]

H01J37/24F . . . [N: Beam current control or regulation circuits (H01J37/24B takes precedence)]

H01J37/244 . . Detectors; Associated components or circuits therefor (detectors per se G01T)

H01J37/248 . . Components associated with high voltage supply ([N: Means for measuring the high voltage per se G01R15/00]; high voltage supply per se H02J, H02M)

H01J37/252 . Tubes for spot-analysing by electron or ion beams; Microanalysers (investigating or analysing thereby G01N23/22) [C1112]

H01J37/256 . . using scanning beams

H01J37/26 . Electron or ion microscopes; Electron or ion diffraction tubes

H01J37/26A . . [N: Details]

H01J37/26A2 . . . [N: Contrast, resolution or power of penetration] [N0406]

H01J37/26A4 . . . [N: Controlling the tube; circuit arrangements adapted to a particular application not otherwise provided, e.g. bright-field-dark-field illumination] [N0406]

H01J37/26B . . [N: Measurement of magnetic- or electric fields in the object; Lorentzmicroscopy (emission microscopes H01J37/285; reflecting microscopes H01J37/29; spot analysing H01J37/252)]

H01J37/26B2 . . . [N: with scanning beams]

H01J37/27 . . Shadow microscopy

H01J37/28 . . with scanning beams ([N: H01J37/26B2, H01J37/29B, H01J37/295B take precedence]; microanalysers using scanning beams H01J37/256)

H01J37/285 . . Emission microscopes, e.g. field-emission microscopes

H01J37/29 . . Reflection microscopes

H01J37/29B . . . [N: using scanning ray]

H01J37/295 . . Electron or ion diffraction tubes

H01J37/295B . . . [N: using scanning ray]

H01J37/30 . Electron-beam or ion-beam tubes for localised treatment of objects

H01J37/30A . . [N: Details]

H01J37/30A2 . . . [N: Observing the objects or the point of impact on the object] [N0406]

H01J37/30A4 . . . [N: Electron or ion-optical systems (electron or ion-optical details H01J37/06 to H01J37/153)] [N0406]

H01J37/301 . . Arrangements enabling beams to pass between regions of different pressure

H01J37/302 . . Controlling tubes by external information, e.g. programme control (H01J37/304 takes precedence)

H01J37/302B . . . [N: Programme control]

H01J37/302B2 . . . . [N: Patterning strategy]

H01J37/304 . . Controlling tubes by information coming from the objects [N: or from the beam], e.g. correction signals

H01J37/304B . . . [N: Object or beam position registration]

H01J37/305 . . for casting, melting, evaporating or etching [N: (methods for casting or melting of metals with electron beam or gas discharges C22B9/22)]

H01J37/305B . . . [N: for evaporating or etching (methods for evaporating or etching metals with electron or ion beams C23C14/30)]

H01J37/305B2 . . . . [N: for microworking, e.g. etching of gratings, trimming of electrical

components (trimming of resistors H01C17/22)]

H01J37/31 . . for cutting or drilling [N: (methods for cutting or drilling metals with electron beams B23K15/00)]

H01J37/315 . . for welding [N: (methods for welding metals with electron beams B23K15/00)]

H01J37/317 . . for changing properties of the objects or for applying thin layers thereon, e.g. for ion implantation (H01J37/36 takes precedence)

H01J37/317A . . . [N: for ion implantation (plasma immersion ion implantation H01J37/32J)]

H01J37/317A1 . . . . [N: Maskless patterned ion implantation]

H01J37/317B . . . [N: Particle-beam lithography, e.g. electron beam lithography] [C1204]

H01J37/317B2 . . . . [N: Projection methods, i.e. transfer substantially complete pattern to substrate]

H01J37/317B4 . . . . [N: Multi-beam, e.g. fly`s eye, comb probe]

H01J37/317C . . . [N: for applying thin layers on objects]

H01J37/32 . Gas-filled discharge tubes, [N: e.g. for surface treatment of objects such as coating, plating, etching, sterilising or bringing about chemical reactions] ([N: general methods or devices for heat treatments of ferrous or non-ferrous metals or alloys by cathodic discharges C21D1/38; methods of carburising or nitriding of metals in general C23C8/00; methods for coating, plating or surface treating of or with metallic material C23C8/36, C23C14/32, C23C16/50; methods for coating, plating or surface treating of or with semiconductors H01L21/00;] heating by discharge H05B)

[N: **WARNING**
[N1207]Subgroups H01JH01J37/32D and H01JH01J37/32D1 are no longer used for the classification of new documents as from 1 November 2011. The backlog of these groups is being continuously reclassified to the subgroups H01JH01J37/32M-H01JH01J37/32S. Pending reorganisation, the subgroups H01JH01J37/32M-H01JH01J37/32S6 are not complete, see provisionally also H01JH01J37/32D and H01JH01J37/32D1
]

H01J37/32M . . [N: Arrangements for generation of plasma specially adapted for examination or treatment of objects, e.g. plasma sources (plasma generation in general H05H1/24)] [N1204]

H01J37/32M2 . . . [N: Glow discharge] [N1204] [C1207]

H01J37/32M2B . . . . [N: DC powered] [N1204] [C1207]

H01J37/32M2D . . . . [N: AC powered] [N1204]

H01J37/32M2F . . . . [N: Circuits specially adapted for controlling the glow discharge] [N1204]

H01J37/32M4 . . . [N: Arc discharge] [N1204]

H01J37/32M4B . . . . [N: Circuits specially adapted for controlling the arc discharge (for plasma torches H01H1/36] [N1204]

H01J37/32M6 . . . [N: Corona discharge] [N1204]

H01J37/32M8 . . . [N: Radio frequency generated discharge (H01JH01J37/32M16, H01JH01J37/32M18, H01JH01J37/32M20 and H01JH01J37/32M22 take precedence)] [N1204]

H01J37/32M8B . . . . [N: the radio frequency energy being capacitively coupled to the plasma] [N1204]

H01J37/32M8D . . . . [N: the radio frequency energy being inductively coupled to the plasma] [N1204]

H01J37/32M8D2 . . . . . [N: Antennas, e.g. particular shapes of coils] [N1204]

H01J37/32M8D4 . . . . . [N: Windows] [N1204]

H01J37/32M8F . . . . [N: using particular waveforms, e.g. polarised waves] [N1204]
H01J37/32M8H . . . . [N: controlling of the discharge by modulation of energy] [N1204]
H01J37/32M8H2 . . . . . [N: Amplitude modulation, includes pulsing] [N1204]
H01J37/32M8H4 . . . . . [N: Frequency modulation] [N1204]
H01J37/32M8H4B . . . . . [N: Plural frequencies] [N1205]
H01J37/32M8J . . . . [N: Circuits specially adapted for controlling the RF discharge] [N1204]
H01J37/32M8J2 . . . . . [N: Matching circuits, impedance matching circuits per se H03H7/38 and H03H7/40] [N1205]
H01J37/32M10 . . . [N: Microwave generated discharge (H01JH01J37/32M16, H01JH01J37/32M18, H01JH01J37/32M20, H01JH01J37/32M22 take precedence)] [N1204]
H01J37/32M10B . . . . [N: Generating means] [N1204]
H01J37/32M10D . . . . [N: Means for coupling power to the plasma] [N1204]
H01J37/32M10D2 . . . . . [N: Antennas] [N1204]
H01J37/32M10D4 . . . . . [N: Waveguides] [N1204]
H01J37/32M10D6 . . . . . [N: Windows] [N1204]
H01J37/32M10D8 . . . . . [N: Resonators] [N1204]
H01J37/32M10D8B . . . . . [N: Tuning means] [N1204]
H01J37/32M10F . . . . [N: Means for controlling power transmitted to the plasma] [N1204]
H01J37/32M10F2 . . . . . [N: Microwave reflectors] [N1204]
H01J37/32M10F4 . . . . . [N: Means for controlling or selecting resonance mode] [N1204]
H01J37/32M10H . . . . [N: using particular waveforms, e.g. polarised waves] [N1204]
H01J37/32M10J . . . . [N: Plural frequencies] [N1204]
H01J37/32M10L . . . . [N: Circuits specially adapted for controlling the microwave discharge] [N1204]
H01J37/32M12 . . . [N: Discharge generated by other radiation (H01JH01J37/32M4, H01JH01J37/32M4, H01JH01J37/32M6, H01JH01J37/32M8, H01JH01J37/32M10, H01JH01J37/32M14 take precedence)] [N1204]
H01J37/32M12B . . . . [N: using charged particles] [N1204]
H01J37/32M12D . . . . [N: using electromagnetic radiation] [N1204]
H01J37/32M14 . . . [N: Dielectric barrier discharge] [N1204]
H01J37/32M16 . . . [N: Generation remote from the workpiece; e.g. down-stream] [N1204]
H01J37/32M18 . . . [N: Localised processing] [N1204]
H01J37/32M18B . . . . [N: Scanning across large workpieces] [N1204]
H01J37/32M18D . . . . [N: Treating the edge of the workpieces [N1204]
H01J37/32M20 . . . [N: Treating interior parts of workpieces] [N1204]
H01J37/32M22 . . . [N: Treating multiple sides of workpieces; e.g. 3D workpieces] [N1204]
H01J37/32M24 . . . [N: Plasma immersion ion implantation] [N1204]
H01J37/32M26 . . . [N: Arrangement for selecting ions or species in the plasma] [N1204]
H01J37/32O . . [N: Constructional details of the reactor] [N1204]
H01J37/32O2 . . . [N: Gas supply means] [N1204]
H01J37/32O2B . . . . [N: Gas control, e.g. control of the gas flow] [N1204]
H01J37/32O4 . . . [N: Vessel] [N1204]
H01J37/32O4B . . . . [N: Material] [N1204]
H01J37/32O4D . . . . [N: characterised by the means for protecting vessels or internal parts, e.g.

coatings] [N1204]

H01J37/32O4D2 . . . . . [N: Means for reducing recombination coefficient] [N1204]

H01J37/32O4D4 . . . . . [N: Means for protecting the vessel against plasma] [N1204]

H01J37/32O4D6 . . . . . [N: Means for preventing sputtering of the vessel] [N1204]

H01J37/32O4F . . . . [N: Sealing means, e.g. sealing between different parts of the vessel] [N1204]

H01J37/32O4H . . . . [N: Temperature] [N1204]

H01J37/32O6 . . . [N: Electrodes] [N1204]

H01J37/32O6B . . . . [N: Shape] [N1204]

H01J37/32O6D . . . . [N: Material] [N1204]

H01J37/32O6F . . . . [N: Protection means, e.g. coatings] [N1204]

H01J37/32O6H . . . . [N: Relative arrangement or disposition of electrodes; moving means] [N1204]

H01J37/32O6J . . . . [N: Electrical connecting means] [N1204]

H01J37/32O6L . . . . [N: Triode systems] [N1204]

H01J37/32O6N . . . . [N: Hollow cathodes] [N1204]

H01J37/32O6P . . . . [N: Removable or replaceable electrodes or electrode systems] [N1204]

H01J37/32O6R . . . . [N: Consumable cathodes for arc discharge] [N1204]

H01J37/32O8 . . . [N: Mechanical discharge control means] [N1204]

H01J37/32O8B . . . . [N: Baffles] [N1204]

H01J37/32O8D . . . . [N: Focus rings] [N1204]

H01J37/32O8F . . . . [N: Shields, e.g. dark space shields, Faraday shields] [N1204]

H01J37/32O10 . . . [N: Magnetic control means] [N1204]

H01J37/32O10B . . . . [N: Particular magnets or magnet arrangements for controlling the discharge] [N1204]

H01J37/32O10D . . . . [N: Electron cyclotron resonance] [N1204]

H01J37/32O10F . . . . [N: Multi-cusp fields] [N1204]

H01J37/32O12 . . . [N: Electrostatic control] [N1204]

H01J37/32O12B . . . . [N: Polarising the substrate] [N1204]

H01J37/32O14 . . . [N: Workpiece holder] [N1204]

H01J37/32O14B . . . . [N: Temperature] [N1204]

H01J37/32O16 . . . [N: Means for moving the material to be treated] [N1204]

H01J37/32O16B . . . . [N: for introducing the material into processing chamber] [N1204]

H01J37/32O16D . . . . [N: for moving the material across the discharge] [N1204]

H01J37/32O16D2 . . . . . [N: Continuous moving] [N1204]

H01J37/32O16D2B . . . . . [N: of continuous material] [N1204]

H01J37/32O16D2D . . . . . [N: of batches of workpieces] [N1204]

H01J37/32O16F . . . . [N: for extracting the material from the process chamber] [N1204]

H01J37/32O18 . . . [N: Further details of plasma apparatus not provided for in groups H01J37/32O2- H01J37/32O16F; special provisions for cleaning or maintenance of the apparatus] [N1204]

H01J37/32O18B . . . . [N: Construction (includes replacing parts of the apparatus)] [N1204]

H01J37/32O18D . . . . [N: Pressure] [N1204]

H01J37/32O18D2 . . . . . [N: Working under atmospheric pressure or higher] [N1204]

H01J37/32O18D4 . . . . . [N: Exhausting] [N1204]
H01J37/32O18D4B . . . . . [N: Treating effluent gases] [N1204]
H01J37/32O18F . . . . [N: Hygiene] [N1204]
H01J37/32O18F2 . . . . . [N: In situ cleaning of vessels and/or internal parts] [N1204]
H01J37/32O18F4 . . . . . [N: Means for trapping or directing unwanted particles] [N1204]
H01J37/32O18H . . . . [N: Maintenance] [N1204]
H01J37/32O18J . . . . [N: Connection or combination with other apparatus [N1204]
H01J37/32O18L . . . . [N: Multiple chambers, e.g. cluster tools] [N1204]
H01J37/32O18N . . . . [N: Utilities] [N1204]
H01J37/32S . . [N: Plasma diagnostics] [N1204]
H01J37/32S2 . . . [N: Software, data control or modelling] [N1204]
H01J37/32S4 . . . [N: Monitoring and controlling tubes by information coming from the object and/or discharge] [N1204]
H01J37/32S4B . . . . [N: Arc detection] [N1204]
H01J37/32S4D . . . . [N: Electron temperature measurement] [N1204]
H01J37/32S4F . . . . [N: End-point detection] [N1204]
H01J37/32S4H . . . . [N: Spectral analysis] [N1204]
H01J37/32S4J . . . . [N: Gas analysis] [N1204]
H01J37/32S6 . . . [N: Feedback systems] [N1204]
H01J37/34 . . operating with cathodic sputtering (H01J37/36 takes precedence; [N: methods of cathodic sputtering C23C14/34])
H01J37/34M . . . [N: using supplementary magnetic fields]
H01J37/34M2 . . . . [N: Magnetron sputtering]
H01J37/34M2A . . . . . [N: Planar magnetron sputtering]
H01J37/34O . . . [N: Constructional aspects of the reactor] [N1204]
H01J37/34O2 . . . . [N: Targets] [N1204]
H01J37/34O2B . . . . . [N: Arrangements] [N1204]
H01J37/34O2D . . . . . [N: Hollow targets] [N1204]
H01J37/34O2F . . . . . [N: Shape] [N1204]
H01J37/34O2H . . . . . [N: Material] [N1204]
H01J37/34O2H2 . . . . . [N: Plural materials] [N1204]
H01J37/34O2J . . . . . [N: Target-material dispenser] [N1204]
H01J37/34O4 . . . . [N: Target holders (includes backing plates and endblocks)] [N1204]
H01J37/34O6 . . . . [N: Electrodes other than cathode] [N1204]
H01J37/34O8 . . . . [N: Dark space shields] [N1204]
H01J37/34O10 . . . . [N: Associated circuits] [N1204]
H01J37/34O12 . . . . [N: Collimators, shutters, apertures] [N1204]
H01J37/34O14 . . . . [N: Magnet arrangements in particular for cathodic sputtering apparatus (material of magnets or magnets in general H01F1/00, H01F7/00)] [N1204]
H01J37/34O14B . . . . . [N: Magnet distribution] [N1204]
H01J37/34O14D . . . . . [N: Movable magnets] [N1204]
H01J37/34O14F . . . . . [N: Electromagnets in particular for cathodic sputtering apparatus (electromagnets in general H01F7/06)] [N1204]

H01J37/34O16 . . . . [N: Means for shaping the magnetic field, e.g. magnetic shunts] [N1204]
H01J37/34Q . . . [N: Operating strategies] [N1204]
H01J37/34Q2 . . . . [N: Pulsed operation, e.g. HIPIMS] [N1204]
H01J37/34Q4 . . . . [N: Thickness uniformity of coated layers or desired profile of target erosion] [N1204]
H01J37/34Q6 . . . . [N: Composition uniformity or desired gradient] [N1204]
H01J37/34S . . . [N: Testing and control] [N1204]
H01J37/34S2 . . . . [N: Detecting exhaustion of target material] [N1204]
H01J37/34S4 . . . . [N: Detecting or avoiding eroding through] [N1204]
H01J37/34S6 . . . . [N: Means for avoiding target poisoning] [N1204]
H01J37/34U . . . [N: Constructional details of particle beam apparatus not otherwise provided for, e.g. arrangement, mounting, housing, environment; special provisions for cleaning or maintenance of the apparatus] [N1204]
H01J37/34U2 . . . . [N: Manufacturing of targets] [N1204]
H01J37/34U4 . . . . [N: Adaptation to extreme pressure conditions] [N1204]
H01J37/34U6 . . . . [N: Temperature of target] [N1204]
H01J37/36 . . for cleaning surfaces while plating with ions of materials introduced into the discharge, e.g. introduced by evaporation [N: (condensing of electrically charged vapour onto a surface for covering materials with metals C23C14/32)]

H01J40/00 **Photoelectric discharge tubes not involving the ionisation of a gas** (H01J49/00 takes precedence; cathode-ray or image-pick-up tubes H01J31/26)

H01J40/02 . Details
H01J40/04 . . Electrodes
H01J40/06 . . . Photo-emissive cathodes
H01J40/08 . . Magnetic means for controlling discharge
H01J40/10 . . Selection of substances for gas fillings
H01J40/12 . . One or more circuit elements structurally associated with the tube
H01J40/14 . . Circuit arrangements not adapted to a particular application of the tube and not otherwise provided for

H01J40/16 . having photo- emissive cathode, e.g. alkaline photoelectric cell (operating with secondary emission H01J43/00)
H01J40/18 . . with luminescent coatings for influencing the sensitivity of the tube, e.g. by converting the input wavelength (image-conversion or image-amplification tubes H01J31/50)
H01J40/20 . . wherein a light-ray scans a photo-emissive screen

H01J41/00 **Discharge tubes for measuring pressure of introduced gas** [N: or for detecting presence of gas]**; Discharge tubes for evacuation by diffusion of ions**

H01J41/02 . Discharge tubes for measuring pressure of introduced gas [N: or for detecting presence of gas]
H01J41/04 . . with ionisation by means of thermionic cathodes
H01J41/06 . . with ionisation by means of cold cathodes

H01J41/08 . . with ionisation by means of radioactive substances, e.g. alphatrons

H01J41/10 . . of particle spectrometer type (particle spectrometers per se H01J49/00) [N: not used, see G01L21/30] [C0706]

H01J41/12 . Discharge tubes for evacuating by diffusion of ions, e.g. ion pumps, getter ion pumps

H01J41/14 . . with ionisation by means of thermionic cathodes

H01J41/16 . . . using gettering substances

H01J41/18 . . with ionisation by means of cold cathodes

H01J41/20 . . . using gettering substances

H01J43/00 **Secondary-emission tubes; Electron-multiplier tubes** (dynamic electron-multiplier tubes H01J25/76; secondary-emission detectors for measurement of nuclear or X-radiation G01T1/28)

H01J43/02 . Tubes in which one or a few electrodes are secondary-electron emitting electrodes

H01J43/02B . . [N: Circuits therefor]

H01J43/04 . Electron multipliers [N: (if forming part of electron gun H01J3/02C)]

H01J43/04B . . [N: Position sensitive electron multipliers]

H01J43/06 . . Electrode arrangements

H01J43/08 . . . Cathode arrangements ([N: photo-emissive electrodes H01J1/34, H01J1/35]; construction of photo cathodes H01J40/06, H01J40/16, H01J47/00, H01J49/08)

H01J43/10 . . . Dynodes (H01J43/24, H01J43/26 take precedence; secondary-electron-emitting electrodes in general H01J1/32)

H01J43/12 . . . Anode arrangements

H01J43/14 . . . Control of electron beam by magnetic field

H01J43/16 . . . Electrode arrangements using essentially one dynode

H01J43/18 . . . Electrode arrangements using essentially more than one dynode

H01J43/20 . . . . Dynodes consisting of sheet material, e.g. plane, bent

H01J43/22 . . . . Dynodes consisting of electron-permeable material, e.g. foil, grid, tube, venetian blind

H01J43/24 . . . . Dynodes having potential gradient along their surfaces

H01J43/24B . . . . . [N: Dynodes consisting of a piling-up of channel-type dynode plates]

H01J43/24M . . . . . [N: Micro-channel plates [MCP] (image amplification tubes using MCP H01J31/50G2)] [N1203]

H01J43/26 . . . . Box dynodes

H01J43/28 . . Vessels [N: wall of the tube]; Windows; Screens; Suppressing undesired discharges or currents

H01J43/30 . . Circuit arrangements not adapted to a particular application of the tube and not otherwise provided for

H01J45/00 **Discharge tubes functioning as thermionic generators** [N: (structural combination of fuel element with thermoelectric element G21C3/40; nuclear power plants using thermionic converters G21D7/04; structural combination of a radioactive source with a thermionic converter, e.g. radioisotope batteries G21H1/10; generators in which thermal or kinetic energy is converted into electrical energy by ionisation of a fluid and removal of the charge therefrom H02N3/00)]

H01J47/00 **Tubes for determining the presence, intensity, density or energy of radiation or particles** ([N: discharge tubes using igniting by associated radioactive materials or fillings, e.g. current stabilising tubes H01J17/32]; photoelectric discharge tubes not involving the ionisation of a gas H01J40/00; [N: discharge tubes for measuring the pressure, partial pressure of introduced gas or for detecting presence of gas H01J41/02; ionisation chambers using a solid dielectric G01T3/00E])

H01J47/00A . [N: Details]

H01J47/00A2 . . [N: Vessels or containers]

H01J47/00A2B . . . [N: using tissue-equivalent materials]

H01J47/00A2C . . . [N: Windows permeable to X-rays, gamma-rays, or particles (windows for discharge tubes with provision for emergence of electrons or ions from the vessel H01J33/04; windows for X-ray tubes H01J35/18)]

H01J47/00A3 . . [N: Gas fillings (H01J47/12 takes precedence); Maintaining the desired pressure within the tube]

H01J47/00A3B . . . [N: Tissue equivalent gas fillings]

H01J47/00B . [N: Flash detectors]

H01J47/00C . [N: Drift detectors]

H01J47/02 . Ionisation chambers

H01J47/02B . . [N: Calibration thereof]

H01J47/02C . . [N: Well-type ionisation chambers]

H01J47/02D . . [N: Gas flow ionisation chambers]

H01J47/02E . . [N: using a liquid dielectric]

H01J47/04 . . Capacitive ionisation chambers, e.g. the electrodes of which are used as electrometers

H01J47/06 . Proportional counter tubes

H01J47/06B . . [N: Multiwire proportional counter tubes]

H01J47/06C . . [N: Well-type proportional counter tubes]

H01J47/06D . . [N: Gas flow proportional counter tubes]

H01J47/08 . Geiger-Müller counter tubes [N: (gas filling with very short deionisation times H01J17/64, H01T)]

H01J47/10 . Spark counters (H01J47/14 takes precedence; spark gaps H01T)

H01J47/12 . Neutron detector tubes, e.g. BF3 tubes

H01J47/12B . . [N: using nuclear reactions of the type (n, alpha) in solid materials, e.g. Boron-10 (n,alpha) Lithium-7, Lithium-6 (n, alpha) Hydrogen-3]

H01J47/12B2 . . . [N: Ionisation chambers]

H01J47/12B2B . . . . [N: Gamma compensated]

H01J47/12B3 . . . [N: Proportional counters]

H01J47/12C . . [N: Fission detectors]

H01J47/12C2 . . . [N: Ionisation chambers]

H01J47/12C3 . . . [N: Counters]
H01J47/12C3B . . . . [N: Multiwire counters]
H01J47/12D . . [N: Helium ionisation detectors]
H01J47/12D2 . . . [N: Ionisation chambers]
H01J47/12D3 . . . [N: Counters]
H01J47/12D3B . . . . [N: Multi-wire counters]
H01J47/12E . . [N: BF3 tubes]
H01J47/12F . . [N: Light-nuclei-recoil ionisation detectors, e.g. using protons, alpha-particles]
H01J47/12F2 . . . [N: Ionisation chambers]
H01J47/12F3 . . . [N: Counters]
H01J47/12F3B . . . . [N: Multi-wire counters]

H01J47/14 . Parallel electrode spark or streamer chambers; Wire spark or streamer chambers [N: (circuit arrangements with multi-wire or parallel-plate chambers for recording of movements or tracks of particles G01T5/12)]
H01J47/16 . . characterised by readout of each individual wire
H01J47/18 . . . the readout being electrical (H01J47/20 takes precedence)
H01J47/20 . . . the readout employing electrical or mechanical delay lines, e.g. magnetostrictive delay lines
H01J47/22 . . characterised by another type of readout
H01J47/24 . . . the readout being acoustical
H01J47/26 . . . the readout being optical

H01J49/00 **Particle spectrometer or separator tubes** [C0902] **[M1105]**

Note
In classifying particle separators, no distinction is made between spectrometry and spectrography, the difference being only in the manner of detection which in the first case is electrical and in the second case is by means of a photographic film.

H01J49/00B . [N: Imaging particle spectrometry] [N0902]

H01J49/00C . [N: Calibration of the apparatus] [N0902]

H01J49/00M . [N: Miniaturised spectrometers, e. g. having smaller than usual scale, integrated conventional components] [N0902]
H01J49/00M1 . . [N: Microminiaturised spectrometers, e. g. chip-integrated devices, Micro-Electro-Mechanical Systems (MEMS)] [N0902]

H01J49/00P . [N: Portable spectrometers, e. g. devices comprising independent power supply, constructional details relating to portability (small scale devices per se H01J49/00M and H01J49/00M1)] [N0901]

H01J49/00S . [N: Methods for using particle spectrometers] [N0902]
H01J49/00S1 . . [N: Step by step routines describing the use of the apparatus (H01J49/00T3 takes precedence)] [N0902]
H01J49/00S3 . . [N: Step by step routines describing the handling of the data generated during a measurement (recognising patterns in signals G06K9/00M; bioinformatics G06F19/10)] [N0902] [M1110]

H01J49/00T . [N: Combinations of spectrometers, tandem spectrometers, e. g. MS/MS, MSn] [N0902]

H01J49/00T1 . . [N: characterised by the fragmentation or other specific reaction] [N0902] [C1105]

H01J49/00T1C . . . [N: by collision with gas, e.g. by introducing gas or by accelerating ions with an electric field] [N1105]

H01J49/00T1E . . . [N: by an electron beam, e.g. electron impact dissociation, electron capture dissociation] [N1105]

H01J49/00T1P . . . [N: by a photon beam, photo-dissociation] [N1105]

H01J49/00T1R . . . [N: by applying a resonant excitation voltage] [N1105]

H01J49/00T1S . . . [N: by collision with a surface, e.g. surface induced dissociation] [N1105]

H01J49/00T1T . . . [N: by ion/ion reaction, e.g. electron transfer dissociation, proton transfer dissociation] [N1105]

H01J49/00T1Z . . . [N: specific reactions other than fragmentation] [N1105]

H01J49/00T3 . . [N: Tandem in time, i.e. using a single spectrometer] [N0902]

H01J49/00T5 . . [N: Accelerator mass spectrometers] [N0902]

H01J49/00T7 . . [N: Spectrometers having multiple channels, parallel analysis] [N1105]

H01J49/00V . [N: Particular arrangements for generating, introducing or analyzing both positive and negative analyte ions (ion/ion reactions H01J49/00T1T)] [N1203]

H01J49/02 . Details

H01J49/02A . . [N: Circuit arrangements, e.g. for generating deviation currents or voltages (regulating electric or magnetic variables in general e.g. current, magnetic field G05F); Components associated with high voltage supply (high voltage supply per se H02M)] [C1105]

H01J49/02B . . [N: Detectors specially adapted to particle spectrometers (data acquisition H01J49/00S3; detectors per se G01T, e.g. G01T1/28, G01T1/29)] [M1105]

H01J49/02B1 . . . [N: detecting image current induced by the movement of charged particles (H01J49/38 takes precedence)] [N1105]

H01J49/04 . . Arrangements for introducing or extracting samples to be analysed, e.g. vacuum locks; Arrangements for external adjustment of electron- or ion-optical components [C1105]

H01J49/04C . . . [N: Capillaries used for transferring samples or ions (electrospray nozzles H01J49/16E1)] [N0901]

H01J49/04E . . . [N: Sample holders or containers (containers for retaining a material to be analyzed, B01L3/00C, for DNA, C12Q1/68B10, for biological materials, G01N33/543)] [N0902]

H01J49/04E1 . . . . [N: for automated handling] [N0902]

H01J49/04E3 . . . . [N: for laser desorption, e.g. matrix-assisted laser desorption/ionisation [MALDI], surface enhanced laser desorption/ionisation [SELDI] plates] [N0902]

H01J49/04G . . . [N: for gaseous samples (interfaces to gas chromatographs G01N30/72G)] [N0902]

H01J49/04G1 . . . . [N: using a membrane permeable to gases] [N1203]

H01J49/04L . . . [N: for liquid samples (interfaces to liquid chromatographs G01N30/72L)] [N0902]

H01J49/04L1 . . . . [N: using a membrane permeable to liquids] [N1203]

H01J49/04L3 . . . . [N: with means for preventing droplets from entering the analyzer;

Desolvation of droplets] [N1203]

H01J49/04L5 . . . . [N: with means for introducing as a spray, a jet or an aerosol (electrospray ion sources H01J49/16E)] [N1203]

H01J49/04L5P . . . . . [N: with means for using a nebulising gas, i.e. pneumatically assisted] [N1203]

H01J49/04L7 . . . . [N: with means for vaporising using mechanical energy, e.g. by ultrasonic vibrations] [N1203]

H01J49/04S . . . [N: for solid samples] [N0902]

H01J49/04S1 . . . . [N: Desorption by laser or particle beam, followed by ionisation as a separate step (sample holder per se H01J49/04E3)] [N0902]

H01J49/04T . . . [N: with means for heating or cooling the sample] [N1105]

H01J49/04T1 . . . . [N: with means for pyrolysis] [N1203]

H01J49/04T3 . . . . [N: using a hot fluid] [N1203]

H01J49/04T5 . . . . [N: with means for collisional cooling] [N1203]

H01J49/04T7 . . . . [N: with means for monitoring the sample temperature] [N1203]

H01J49/04T9 . . . . [N: with means for applying heat to desorb the sample; Evaporation] [N1203]

H01J49/04V . . . [N: Vacuum locks; Valves (valves per se F16K)] [N1105]

H01J49/06 . . Electron- or ion-optical arrangements [C1105]

H01J49/06D . . . [N: Ion deflecting means, e. g. ion gates] [N0902]

H01J49/06G . . . [N: Ion guides (linear ion traps performing mass selection H01J49/42D3L, mass filters H01J49/42D1)] [N0902] [C1105]

H01J49/06G1 . . . . [N: Multipole ion guides, e.g. quadrupoles, hexapoles] [N0902]

H01J49/06G3 . . . . [N: having stacked electrodes, e.g. ring stack, plate stack] [N0902]

H01J49/06G3F . . . . . [N: Ion funnels] [N0902]

H01J49/06L . . . [N: Ion lenses, apertures, skimmers] [N0902]

H01J49/06M . . . [N: Mounting, supporting, spacing, or insulating electrodes] [N1203]

H01J49/08 . . Electron sources, e.g. for generating photo-electrons, secondary electrons or Auger electrons

H01J49/10 . . Ion sources; Ion guns

H01J49/10A . . . [N: using reflex discharge, e.g. Penning ion sources]

H01J49/10B . . . [N: using high-frequency excitation, e.g. micro wave excitation, Inductively Coupled Plasma [ICP]] [M1203]

H01J49/10S . . . [N: Arrangements for using several ion sources] [N0902]

H01J49/12 . . . using an arc discharge, e.g. of the duoplasmatron type

H01J49/12A . . . . [N: Duoplasmatrons]

H01J49/12B . . . . [N: Other arc discharge ion sources using an applied magnetic field]

H01J49/14 . . . using particle bombardment, e.g. ionisation chambers

H01J49/14A . . . . [N: using a solid target which is not previously vapourised]

H01J49/14B . . . . [N: using chemical ionisation]

H01J49/14E . . . . [N: with electrons, e.g. electron impact ionisation, electron attachment (H01J49/14B takes precedence)] [N0902]

H01J49/16 . . . using surface ionisation, e.g. field-, thermionic- or photo-emission

H01J49/16A . . . . [N: using photoionisation, e.g. by laser]

H01J49/16A1 . . . . . [N: Direct photo-ionisation, e.g. single photon or multi-photon ionisation] [N0902]

H01J49/16A3 . . . . . [N: Laser desorption/ionisation, e.g. matrix-assisted laser desorption/ionisation [MALDI] (sample holders H01J49/04E3)] [N0902]

H01J49/16E . . . . [N: Electrospray ionisation] [N0902]

H01J49/16E1 . . . . . [N: Capillaries and nozzles specially adapted therefor; (electrostatic spraying per se B05B5)] [N0902]

H01J49/16F . . . . [N: field ionisation, e.g. corona discharge (atmospheric pressure corona discharge per se H01T19)] [N0902] [C1105]

H01J49/18 . . . using spark ionisation

H01J49/20 . . Magnetic deflection

H01J49/22 . . Electrostatic deflection

H01J49/24 . . Vacuum systems, e.g. maintaining desired pressures

H01J49/26 . Mass spectrometers or separator tubes (isotope separation using these tubes B01D59/44)

H01J49/28 . . Static spectrometers

H01J49/28B . . . [N: using electrostatic analysers]

H01J49/28D . . . [N: using electrostatic and magnetic sectors with simple focusing, e.g. with parallel fields such as Aston spectrometer]

H01J49/28D2 . . . . [N: with energy analysis, e.g. Castaing filter (in cathode-ray or electron-beam tubes H01J29/84; electron-or ion-optical arrangements for separating electrons or ions from an analysing or processing beam H01J37/05; micro- or spot-analysing tubes H01J37/252)]

H01J49/28D2A . . . . . [N: using crossed electric and magnetic fields perpendicular to the beam, e.g. Wien filter]

H01J49/30 . . . using magnetic analysers, [N: e.g. Dempster spectrometer]

H01J49/30A . . . . [N: with several sectors in tandem]

H01J49/32 . . . using double focusing

H01J49/32A . . . . [N: with a magnetic sector of 90 degrees, e.g. Mattauch-Herzog type] [M1203]

H01J49/32B . . . . [N: with an electrostatic section of 90 degrees, e.g. Nier-Johnson type] [M1203]

H01J49/32C . . . . [N: with magnetic and electrostatic sectors of 90 degrees] [M1203]

H01J49/32D . . . . [N: with a cycloidal trajectory by using crossed electric and magnetic fields, e.g. trochoidal type] [C1203]

H01J49/34 . . Dynamic spectrometers

H01J49/36 . . . Radio frequency spectrometers, e.g. Bennett-type spectrometers, Redhead-type spectrometers

H01J49/38 . . . . Omegatrons [N: Using ion cyclotron resonance]

H01J49/40 . . . Time-of-flight spectrometers (H01J49/36 takes precedence)

H01J49/40A . . . . [N: characterised by orthogonal acceleration, e.g. focusing or selecting the ions, pusher electrode] [N0902]

H01J49/40B . . . . [N: characterised by the acceleration optics and/or the extraction fields] [N1105]

H01J49/40R . . . . [N: characterised by the reflectron, e. g. curved field, electrode shapes] [N0902]

H01J49/40S . . . . [N: with multiple reflections (electrostatic traps H01J49/42D7)] [N1203]

H01J49/40T . . . . [N: with multiple changes of direction, e.g. by using electric or magnetic sectors, closed-loop time-of-flight] [N1203]

H01J49/42 . . . Stability-of-path spectrometers, e.g. monopole, quadrupole, multipole, farvitrons [C1105]
H01J49/42D . . . . [N: Device types] [N0902]
H01J49/42D1 . . . . . [N: Mass filters, i.e. deviating unwanted ions without trapping] [N0902]
H01J49/42D1Q . . . . . [N: Quadrupole mass filters (H01J49/42D3L takes precedence)] [N1105]
H01J49/42D3 . . . . . [N: Two-dimensional RF ion traps (ion guides without mass selection H01J49/06G)] [N0902]
H01J49/42D3L . . . . . [N: Multipole linear ion traps, e.g. quadrupoles, hexapoles] [N0902]
H01J49/42D3R . . . . . [N: with radial ejection] [N0902]
H01J49/42D3S . . . . . [N: Stacked rings or stacked plates] [N0902]
H01J49/42D5 . . . . . [N: Three-dimensional ion traps, i.e. comprising end-cap and ring electrodes] [N0902]
H01J49/42D7 . . . . . [N: Electrostatic ion traps (H01J49/42D3 takes precedence; multi-reflection time of flight spectrometers H01J49/40R1)] [N0902]
H01J49/42D7L . . . . . [N: with a logarithmic radial electric potential, e.g. orbitraps] [N0902]
H01J49/42D9 . . . . . [N: with particular constructional features] [N1105]
H01J49/42M . . . . [N: Methods for controlling ions] [N0902]
H01J49/42M1 . . . . . [N: Controlling the number of trapped ions, preventing space charge effects] [N0902]
H01J49/42M3 . . . . . [N: Ejection and selection methods] [N0902]
H01J49/42M3A . . . . . [N: Applying a non-resonant auxiliary oscillating voltage, e.g. parametric excitation] [N1203]
H01J49/42M3N . . . . . [N: Applying a notched broadband signal] [N1203]
H01J49/42M3R . . . . . [N: Applying a resonant signal, e.g. selective resonant ejection matching the secular frequency of ions (H01J49/42M3S, H01J49/42M3N take precedence)] [N1203]
H01J49/42M3S . . . . . [N: Scanning an electric parameter, e.g. voltage amplitude or frequency] [N1203]
H01J49/42M5 . . . . . [N: Storage methods] [N0902]

H01J49/44 . Energy spectrometers, e.g. alpha-, beta-spectrometers
H01J49/44A . . [N: Dynamic spectrometers]
H01J49/44A2 . . . [N: Time-of-flight spectrometers]
H01J49/46 . . Static spectrometers
H01J49/46B . . . [N: using static magnetic fields] [N9704]
H01J49/46D . . . [N: using crossed electric and magnetic fields perpendicular to the beam, e.g. Wien filter (see also H01J49/28D2A)]
H01J49/48 . . . using electrostatic analysers, e.g. cylindrical sector, Wien filter
H01J49/48A . . . . [N: with cylindrical mirrors]
H01J49/48B . . . . [N: with spherical mirrors]
H01J49/48C . . . . [N: with plane mirrors, i.e uniform field]
H01J49/48D . . . . [N: with retarding grids]

Guide heading: **Discharge lamps**

H01J61/00 **Gas- or vapour-discharge lamps** (use for sterilising milk products A23C; use for

medical purposes A61N5/00; use for disinfecting water C02F ; use for lighting F21; [N: use for advertising G09F]; circuits therefor H05B; arc lamps with consumable electrodes H05B; electro-luminescent lamps H05B)

H01J61/02	.	Details
H01J61/02C	. .	[N: Associated optical elements]
H01J61/04	. .	Electrodes (for igniting H01J61/54); Screens ; Shields
H01J61/04A	. . .	[N: Thermic screens or reflectors (heat-reflecting coatings on the wall of the vessel H01J61/35)]
H01J61/06	. . .	Main electrodes
H01J61/067	. . . .	for low-pressure discharge lamps
H01J61/067A	. . . . .	[N: characterised by the construction of the electrode]
H01J61/067B	. . . . .	[N: characterised by the material of the electrode]
H01J61/067B1	. . . . .	[N: characterised by the electron emissive material]
H01J61/073	. . . .	for high-pressure discharge lamps
H01J61/073A	. . . . .	[N: characterised by the construction of the electrode]
H01J61/073B	. . . . .	[N: characterised by the material of the electrode]
H01J61/073B1	. . . . .	[N: characterised by the electron emissive material]
H01J61/09	. . . .	Hollow cathodes
H01J61/10	. . .	Shields, screens, or guides for influencing the discharge
H01J61/10A	. . . .	[N: Shields, screens or guides arranged to extend the discharge path (H01J61/10C takes precedence)]
H01J61/10C	. . . .	[N: using magnetic means]
H01J61/12	. .	Selection of substances for gas fillings; Specified operating pressure or temperature
H01J61/12B	. . .	[N: having an halogenide as principal component]
H01J61/14	. . .	having one or more carbon compounds as the principal constituents
H01J61/16	. . .	having helium, argon, neon, krypton, or xenon as the principle constituent
H01J61/18	. . .	having a metallic vapour as the principal constituent
H01J61/20	. . . .	mercury vapour
H01J61/22	. . . .	vapour of an alkali metal
H01J61/24	. .	Means for obtaining or maintaining the desired pressure within the vessel
H01J61/26	. . .	Means for absorbing or adsorbing gas, e.g. by gettering; Means for preventing blackening of the envelope
H01J61/28	. . .	Means for producing, introducing, or replenishing gas or vapour during operation of the lamp
H01J61/30	. .	Vessels; Containers
H01J61/30A	. . .	[N: characterised by the material of the vessel]
H01J61/30F	. . .	[N: Flat vessels or containers] [N9412]
H01J61/30F2	. . . .	[N: with folded elongated discharge path] [N9412]
H01J61/32	. . .	Special longitudinal shape, e.g. for advertising purposes [N: (H01J61/30F takes precedence)] [C9412]
H01J61/32A	. . . .	[N: Circular lamps]
H01J61/32B	. . . .	[N: U-shaped lamps]

H01J61/32C . . . . [N: "Compact"-lamps, i.e. lamps having a folded discharge path]
H01J61/33 . . . Special shape of cross-section, e.g. for producing cool spot
H01J61/34 . . . Double-wall vessels or containers
H01J61/35 . . . provided with coatings on the walls thereof; Selection of materials for the coatings (using coloured coatings H01J61/40; using luminescent coatings H01J61/42)
H01J61/36 . . Seals between parts of vessels; Seals for leading-in conductors; Leading-in conductors
H01J61/36B . . . [N: Seals between parts of vessel]
H01J61/36B1 . . . . [N: End-disc seals or plug seals]
H01J61/36B2 . . . . [N: Annular seals disposed between the ends of the vessel (H01J61/36B1 takes precedence)]
H01J61/36C . . . [N: Seals for leading-in conductors]
H01J61/36C1 . . . . [N: Pinched seals or analogous seals]
H01J61/38 . . Devices for influencing the colour or wavelength of the light
H01J61/40 . . . by light filters; by coloured coatings in or on the envelope
H01J61/42 . . . by transforming the wavelength of the light by luminescence
H01J61/44 . . . . Devices characterised by the luminescent material (luminescent materials C09K11/00)
H01J61/46 . . . . Devices characterised by the binder or other non-luminescent constituent of the luminescent material, e.g. for obtaining desired pouring or drying properties
H01J61/48 . . . . Separate coatings of different luminous materials
H01J61/50 . . Auxiliary parts or solid material within the envelope for reducing risk of explosion upon breakage of the envelope, e.g. for use in mines
H01J61/52 . . Cooling arrangements; Heating arrangements; Means for circulating gas or vapour within the discharge space [N: (heating or cooling arrangements to promote ionisation for starting H01J61/54)]
H01J61/52B . . . [N: Heating or cooling particular parts of the lamp]
H01J61/52B1 . . . . [N: heating or cooling of electrodes]
H01J61/54 . . Igniting arrangements, e.g. promoting ionisation for starting (circuit arrangements H05B)
H01J61/54A . . . [N: using a bimetal switch]
H01J61/54A1 . . . . [N: and an auxiliary electrode inside the vessel]
H01J61/54A2 . . . . [N: and an auxiliary electrode outside the vessel]
H01J61/54B . . . [N: using an auxiliary electrode inside the vessel (H01J61/54A1 takes precedence)]
H01J61/54C . . . [N: using an auxiliary electrode outside the vessel (H01J61/54A2 takes precedence)]
H01J61/54D . . . [N: using radioactive means to promote ionisation]
H01J61/56 . . One or more circuit elements structurally associated with the lamp

H01J61/58 . Lamps with both liquid anode and liquid cathode

H01J61/60 . Lamps in which the discharge space is substantially filled with mercury before ignition

H01J61/62 . Lamps with gaseous cathode, e.g. plasma cathode

H01J61/64 . Cathode glow lamps (designed as tuning or voltage indicators H01J17/40)

H01J61/66 . . having one or more specially shaped cathodes, e.g. for advertising purposes [N: alphanumeric]

H01J61/68 . Lamps in which the main discharge is between parts of a current-carrying guide, e.g. halo lamp

H01J61/70 . Lamps with low-pressure unconstricted discharge [N: having a cold pressure < 400 Torr]

H01J61/72 . . having a main light-emitting filling of easily vaporisable metal vapour, e.g. mercury

H01J61/74 . . having a main light-emitting filling of difficult vaporisable metal vapour, e.g. sodium

H01J61/76 . . having a filling of permanent gas or gases only

H01J61/78 . . . with cold cathode; with cathode heated only by discharge, e.g. high-tension lamp for advertising

H01J61/80 . . Lamps suitable only for intermittent operation, e.g. flash lamp

H01J61/82 . Lamps with high-pressure unconstricted discharge [N: having a cold pressure > 400 Torr]

H01J61/82A . . [N: High-pressure mercury lamps]

H01J61/82B . . [N: High-pressure sodium lamps]

H01J61/82C . . [N: Metal halide arc lamps]

H01J61/84 . Lamps with discharge constricted by high pressure

H01J61/86 . . with discharge additionally constricted by close spacing of electrodes, e.g. for optical projection

H01J61/88 . . with discharge additionally constricted by envelope

H01J61/90 . . Lamps suitable only for intermittent operation, e.g. flash lamp

H01J61/92 . Lamps with more than one main discharge path

H01J61/94 . . Paths producing light of different wavelenghts, e.g. for simulating daylight

H01J61/95 . Lamps with control electrode for varying intensity or wavelength of the light, e.g. for producing modulated light

H01J61/96 . Lamps with light-emitting discharge path and separately-heated incandescent body within a common envelope, e.g. for simulating daylight (lamps with filament heated only by non-luminous discharge H01K)

H01J61/98 . Lamps with closely spaced electrodes heated to incandescence by light-emitting discharge, e.g. tungsten arc lamp

H01J63/00 **Cathode-ray or electron-stream lamps** (flying-spot tubes H01J31/10; magic-eye tuning indicators H01J31/14; lamps with incandescent body heated by the ray or stream H01K) [N: see also H01J29/00]

H01J63/02 . Details, e.g. electrode, gas filling, shape of vessel

H01J63/04 . . Vessels provided with luminescent coatings; Selection of materials for the coatings

H01J63/06 . Lamps with luminescent screen excited by the ray or stream

H01J63/08 . Lamps with gas plasma excited by the ray or stream

H01J65/00 Lamps without any electrode inside the vessel; Lamps with at least one main electrode outside the vessel

H01J65/04 . Lamps in which a gas filling is excited to luminesce by an external electromagnetic field or by external corpuscular radiation, e.g. for indicating [N: plasma display panels]

H01J65/04A . . [N: by an external electromagnetic field]

H01J65/04A1 . . . [N: the field being produced by a separate microwave unit]

H01J65/04A2 . . . [N: the field being produced by using capacitive means around the vessel]

H01J65/04A3 . . . [N: the field being produced by using an excitation coil]

H01J65/06 . Lamps in which a gas filling is excited to luminesce by radioactive material structurally associated with the lamp, e.g. inside the vessel

H01J65/08 . Lamps in which a screen or coating is excited to luminesce by radioactive material located inside the vessel [N: (direct conversion of radiation energy from radioactive sources into light G21H3/02)]

H01J99/00 Subject matter not provided for in other groups of this subclass [N0704]