

ECLA**EUROPEAN CLASSIFICATION****G01T**

MEASUREMENT OF NUCLEAR OR X-RADIATION (radiation analysis of materials, mass spectrometry G01N; counters per se G06M, H03K; electric discharge tubes for analysing radiation or particles [H01J40/00](#), [H01J47/00](#), [H01J49/00](#))

Notes

1. This subclass covers the measurement of X-radiation, gamma radiation, corpuscular radiation, cosmic radiation or neutron radiation.
2. Attention is drawn to the Notes following the title of class G01.

G01T1/00

Measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation ([G01T3/00](#), [G01T5/00](#) take precedence)

G01T1/00C

- [N: Scintillation (flow) cells]

G01T1/00F

- [N: Total absorption calorimeters; Shower detectors]

G01T1/02

- Dosimeters ([G01T1/15](#) takes precedence, measuring exposure time to X-rays [H05G1/28](#))

G01T1/02C

- • [N: Scintillation dose-rate meters] [N0208]

G01T1/02D

- • [N: Semiconductor dose-rate meters] [N0208]

G01T1/04

- • Chemical dosimeters ([G01T1/06](#), [G01T1/08](#) take precedence)

G01T1/06

- • Glass dosimeters [N: using colour change; including plastic dosimeters]

G01T1/08

- • Photographic dosimeters (sensitive materials, processing thereof [G03C](#); [N: photometry [G01J1/52](#)])

G01T1/10

- • Luminescent dosimeters

G01T1/105

- • • Read-out devices ([G01T1/115](#) takes precedence)

G01T1/11

- • • Thermo-luminescent dosimeters [N: (thermo-luminescent compositions [C09K11/00](#))]

G01T1/115

- • • • Read-out devices

G01T1/12

- • Calorimetric dosimeters

G01T1/14

- • Electrostatic dosimeters (construction of ionisation chambers [H01J47/02](#); [N: electrometers [G01R5/28](#)] [[C0702](#)])

G01T1/142

- • • Charging devices; Read-out devices

G01T1/15

- Instruments in which pulses generated by a radiation detector are integrated, e.g. by a diode pump circuit (pulse rate meters in general [G01R23/02](#))

G01T1/16

- Measuring radiation intensity ([G01T1/29](#) takes precedence; [N: self-powered detectors [G01T3/00D](#); using an ionisation chamber filled with a liquid or solid, e.g. frozen liquid, dielectric [G01T3/00E](#)])

G01T1/16E

- • [N: with a combination of at least two different types of detector (see provisionally also [G01T1/16](#))]

G01T1/16F

- • [N: with other specified detectors not provided for in the other sub-groups of [G01T1/16](#) (see provisionally also [G01T1/16](#))]

- G01T1/161 . . Application in the field of nuclear medicine, e.g. in vivo counting [N: (apparatus for radiation diagnosis [A61B6/00](#))]
- G01T1/161B . . . [N: using both transmission and emission sources sequentially (SPECT imaging [G01T1/164B1](#); PET imaging [G01T1/29D4](#); detecting hidden objects, e.g. weapons, explosives [G01V5/00D](#))] [N0711]
- G01T1/161B1 [N: with scintillation detectors ([G01T1/20](#) takes precedence)] [N0711]
- G01T1/161B2 [N: with semiconductor detectors ([G01T1/24](#) takes precedence)] [N0711]
- G01T1/161C . . . [N: using both transmission and emission sources simultaneously (SPECT imaging [G01T1/164B1](#); PET imaging [G01T1/29D4](#); detecting hidden objects, e.g. weapons, explosives [G01V5/00D](#))] [N0711]
- G01T1/161C1 [N: with scintillation detectors ([G01T1/20](#) takes precedence)] [N0711]
- G01T1/161C2 [N: with semiconductor detectors ([G01T1/24](#) takes precedence)] [N0711]
- G01T1/163 . . . Whole body counters [N: hand or feet contamination measurement [G01T1/167](#); lung, brain, thyroid, kidney or the like counting [G01T1/16](#)]
- G01T1/163B [N: involving relative movement between detector and subject; scanning beds (profile scanning [G01T1/166](#); positioning patients, tiltable tables for radiation diagnosis [A61B6/04](#))]
- G01T1/164 . . . Scintigraphy (radioisotopes [G21G4/00](#); tracers [G21H5/00](#); [N: measurement of spatial distribution [G01T1/29D](#); apparatus for radiation diagnosis in different planes [A61B6/02](#)])
- G01T1/164B [N: Static instruments for imaging the distribution of radioactivity in one or two dimensions using one or several scintillating elements; Radio-isotope cameras] [C0711]
- G01T1/164B1 [N: using a scintillation crystal and position sensing photodetector arrays, e.g. ANGER cameras]
- G01T1/164B2 [N: using an array of optically separate scintillation elements permitting direct location of scintillations ([G01T1/164B3](#) takes precedence)]
- G01T1/164B3 [N: using electron optical imaging means, e.g. image intensifier tubes, coordinate photomultiplier tubes, image converter]
- G01T1/164B7 [N: Processing of scintigraphic data (not related to a particular imaging system [G01T1/29D9](#); special purpose computers for nuclear physics [G06F15/52](#))]
- G01T1/164B9 [N: Ancillary equipment for scintillation cameras e.g. reference markers, devices for removing motion artifacts, calibration devices (adapted for flow studies [G01T1/164B7](#))]
- G01T1/166 involving relative movement between detector and subject ([N: scanners in general without using scintigraphy [G01T1/29D2](#)])
- G01T1/166B [N: Processing methods of scan data, e.g. involving contrast enhancement, background reduction, smoothing, motion correction, dual radio-isotope scanning, computer processing (for measuring spatial distribution of radiation [G01T1/29D9](#); digital computing or data processing equipment or methods specially adapted for nuclear physics or nuclear engineering [G06F15/52](#), e.g. for image data processing [G06F15/52D](#); general purpose image data processing [G06T1/00](#); computerized tomography [G06T11/00T](#)); Ancillary equipment (colour printers [G01T1/166B1](#))] [C0407]
- G01T1/166B1 [N: adapted for printing different symbols or colours according to the intensity or energy level of the detected radioactivity (depth discrimination in colour [G01T1/29D4](#))]
- G01T1/167 . . Measuring radioactive content of objects, e.g. contamination (whole body counters [G01T1/163](#))
- G01T1/169 . . Exploration, location of contaminated surface areas (prospecting by the use of

- clear radiation e.g. of natural or induced radioactivity [G01V5/00](#)) [N: in situ measurement, e.g. floor contamination monitor ([directional detectors G01T1/29C](#))]
- [G01T1/17](#) . . . Circuit arrangements not adapted to a particular type of detector [N: ([pulse-selection circuits H03K](#), [G01R](#))]
- [G01T1/17D](#) . . . [N: Compensation of dead-time counting losses (see provisionally also 1/17)]
- [G01T1/172](#) . . . with coincidence circuit arrangements ([G01T1/178](#) takes precedence; [N: combination of detectors, see [G01T1/16E](#), [G01T1/30](#), [G01T1/36A](#), [G01T1/36D2](#), [G01T1/36D3](#)])
- [G01T1/175](#) . . . Power supply circuits ([power supply circuits per se H02J](#); [converters H02M](#))
- [G01T1/178](#) . . . for measuring specific activity in the presence of other radioactive substances, e.g. natural, in the air or in liquids such as rain water
- [G01T1/18](#) . . . with counting-tube arrangements, e.g. with Geiger counters([tubesH01J47/08](#);[\[N: with alarm provisionG01T7/12B\]](#)) [[C0704](#)]
- [G01T1/185](#) . . . with ionisation chamber arrangements (construction of ionisation chambers [H01J47/02](#); [N: gas analysis by ionisation [G01N27/66](#); measuring pressure [G01L9/00](#); leak detection [G01M3/00](#); tele-measurements [G08C](#)])
- [G01T1/20](#) . . . with scintillation detectors
- [G01T1/20A](#) . . . [N: Optical details, e.g. reflecting or diffusing layers]
- [G01T1/20C](#) . . . [N: Scintilloscopes ([fluoroscopes G21K4/00](#); [radiation diagnosis A61B6/00](#))]
- [G01T1/20D](#) . . . [N: using a combination of a scintillator and photodetector which measures the means radiation intensity]
- [G01T1/20E](#) . . . [N: using a combination of different types of scintillation detectors, e.g. phoswich] [[M1108](#)]
- [N: **WARNING**
[[N1108](#)] Pending reclassification, for subject-matter regarding phoswich see also [G01T1/20](#)
]
- [G01T1/20F](#) . . . [N : using scintillating fibres] [[N1108](#)]
- [N: **WARNING**
[[N1108](#)] Not complete, see also [G01T1/29D9](#)
]
- [G01T1/20G](#) . . . [N : using stimuable phosphors, e.g. stimuable phosphor sheets] [[N1108](#)]
- [N: **WARNING**
[[N1108](#)] This group and subgroups are not complete pending reclassification; see also group [G01T1/29D9](#)
]
- [G01T1/20G2](#) [N: Reading out of stimuable sheets, e.g. latent image] [[N1108](#)]
- [G01T1/20G4](#) [N : Erasing of stimuable sheets, e.g. with light, heat or the like] [[N1108](#)]
- [G01T1/20P](#) [N: Scintillation-photodiode combination] [[N0208](#)]
- [G01T1/202](#) . . . the detector being a crystal
- [G01T1/202B](#) [N: Selection of materials ([see provisionally also G01T1/202](#))]
- [G01T1/202C](#) [N: Well-type detectors ([see provisionally also G01T1/202](#))]
- [G01T1/203](#) . . . the detector being made of plastics [[M1108](#)]
- [G01T1/203B](#) [N: Selection of materials ([see provisionally also G01T1/203](#))]
- [G01T1/203C](#) [N: Well-type detectors ([see provisionally also G01T1/203](#))]
- [G01T1/204](#) . . . the detector being a liquid

G01T1/204A [N: Composition for liquid scintillation systems]
G01T1/204A1 [N: Liquid scintillation quench systems]
G01T1/204A2 [N: Sample preparation]
G01T1/205	. . . the detector being a gas
G01T1/208	. . . Circuits specially adapted for scintillation detectors, e.g. for the photo-multiplier section
G01T1/22	. . with Cerenkov detectors
G01T1/24	. . with semiconductor detectors (semiconductor devices per se H01L31/00)
G01T1/24A	. . . [N: Electrode arrangements, e.g. continuous or parallel strips or the like (constructional or manufacturing details H01L31/00)] [N1204]
G01T1/24B	. . . [N : Stacked detectors, e.g. for depth information (constructional or manufacturing details H01L25/00)] [N1204]
G01T1/24C	. . . [N: Modular detectors, e.g. arrays formed from self contained units (constructional or manufacturing details H01L25/00)] [N1204]
G01T1/24D	. . . [N: Auxiliary details, e.g. casings, cooling, damping or insulation against damage by e.g. heat, pressure or the like] [N1204]
G01T1/24F	. . . [N: using memory cells] [N1204]
G01T1/24G	. . . [N: utilizing latent read-out, e.g. charge stored and read-out later] [N1204]
G01T1/24H	. . . [N: Detector read-out circuitry (for processing gain or off-set correction H04N)] [N1204]
G01T1/24J	. . . [N: Silicon photomultipliers [SiPM], e.g. an avalanche photodiode [APD] array on a common Si substrate] [N1204]
G01T1/24P	. . . [N: specially adapted for use in SPECT or PET (SPECT imaging G01T1/164B1 ; PET imaging G01T1/29D4 ; detecting hidden objects, e.g. weapons, explosives G01V5/00D)] [N0711]
G01T1/26	. . with resistance detectors [N: (photoresistors H01L31/00)]
G01T1/28	. . with secondary-emission detectors (secondary-electron-emitting electrodes in general H01J1/32) [N: optionally combined with scintillation counters (secondary emission tubes H01J43/00)]
G01T1/29	. Measurement performed on radiation beams, e.g. position or section of the beam; Measurement of spatial distribution of radiation(scintigraphy G01T1/164 ; mass-spectrometers H01J49/02B) [C0704]
G01T1/29C	. . [N: Angle determination; Directional detectors; Telescopes (prospecting by the use of nuclear radiation, e.g. of natural or induced radioactivity G01V5/00)] [C9506]
G01T1/29D	. . [N: Measurement of spatial distribution of radiation]
G01T1/29D1	. . . [N: Static instruments for imaging the distribution of radioactivity in one or two dimensions; Radio-isotope cameras (using scintigraphy G01T1/164B)] [C0407]
G01T1/29D1C [N: using solid state detectors]
G01T1/29D1D [N: using ionisation detectors]
G01T1/29D1E [N: using autoradiographic methods]
G01T1/29D1F [N: using coded aperture devices e.g. Fresnel zone plates (handling of radiation of particles e.g. using diaphragms, collimators, diffraction G21K1/00)]
G01T1/29D1G [N: using channel multiplier arrays (channel multipliers H01J43/18 ; G01T1/164B3 takes precedence)]
G01T1/29D2	. . . [N: Scanners (using scintigraphy G01T1/166)] [C0407]
G01T1/29D2C [N: using solid state detectors]

- G01T1/29D3 . . . [N: Hybrid imaging systems, e.g. using a position sensitive detector (camera) to determine the distribution in one direction and using mechanical movement of the detector or the subject in the other direction or using a camera to determine the distribution in two dimensions and using movement of the camera or the subject to increase the field of view ([G01T1/29D4](#) takes precedence)]
- G01T1/29D4 . . . [N: In depth localisation e.g. using positron emitters; Tomographic imaging (longitudinal and transverse section imaging; apparatus for radiation diagnosis sequentially in different planes, stereoscopic radiation diagnosis); (using external radiation sources [A61B6/02](#))]
- G01T1/29D9 . . . [N: Radioisotope data or image processing not related to a particular imaging system; Off-line processing of pictures, e.g. rescanners (for measuring radiation intensity [G01T1/166B](#); digital computing or data processing equipment or methods specially adapted for nuclear physics or nuclear engineering [G06F15/52](#), e.g. for image data processing [G06F15/52D](#); general purpose image data processing [G06T1/00](#); computerized tomography [G06T11/00T](#))] [C0407]
- G01T1/30 . Measuring half-life of a radioactive substance [N: (period meters for nuclear fission reactors [G21C17/14](#))]
- G01T1/32 . Measuring polarisation of particles
- G01T1/34 . Measuring cross-section, e.g. absorption cross-section of particles
- G01T1/36 . Measuring spectral distribution of X-rays or of nuclear radiation [N: spectrometry (pulse selection circuits per se [H03K](#); investigation of materials by radiation diffraction [G01N23/20](#); spectrometer tubes [H01J49/00](#))]
- G01T1/36A . . [N: with a combination of detectors of different types, e.g. anti-Compton spectrometers (intensity measurement with a combination of detectors [G01T1/16E](#); with coincidence circuit [G01T1/172](#); see provisionally also [G01T1/36](#))]
 [N: **Note:**
[G01T1/36A](#) takes precedence over [G01T1/36D](#)
]
- G01T1/36D . . [N: with scintillation detectors (see provisionally also [G01T1/36](#), [G01T1/20](#))]
- G01T1/36E . . [N: with Cerenkov detectors]
- G01T1/36F . . [N: with ionisation detectors e.g. proportional counter (see provisionally also [G01T1/36](#))]
- G01T1/36G . . [N: with semi-conductor detectors (see provisionally also [G01T1/36](#))]
- G01T1/36H . . [N: with resistance detectors (see provisionally also [G01T1/36](#))]
- G01T1/36K . . [N: with secondary-emission detectors (see provisionally [G01T1/36](#))]
- G01T1/38 . . Particle discrimination and measurement of relative mass, e.g. by measurement of loss of energy with distance (dE/dx) [N: (constructional details of semiconductor detectors therefor [H01L31/00](#))]
- G01T1/40 . . Stabilisation of spectrometers [N: (circuits specially adapted for scintillation detectors [G01T1/208](#))] [C0407]
- G01T3/00** **Measuring neutron radiation** ([G01T5/00](#) takes precedence; [N: tubes therefor [H01J47/12](#); circuits with such tubes [G01T1/18](#); measuring short time intervals [G04F10/00](#); measuring pulse characteristics [G01R29/02](#); neutron choppers [G21K1/04](#); polarimeters [G01T1/32](#))]

- G01T3/00B . [N: Spectrometry (see provisionally also [G01T1/36](#) to [G01T1/36K](#) -except [G01T1/36D3](#) - , [G01T3/00](#); other sub-groups of [G01T3/00](#) take precedence)]
- G01T3/00B2 . . [N: Recoil spectrometers (light-nuclei recoil ionisation tubes per se [H01J47/12F](#)) [C0407]
- G01T3/00B3 . . [N: Time-of-flight spectrometers (see provisionally also [G01T3/00](#))]
- G01T3/00D . [N: using self-powered detectors (for neutrons as well as for Y- or X-rays), e.g. using Compton-effect (Compton diodes) or photo-emission or a (n,B) nuclear reaction (photovoltaic semiconductors [H01L31/00](#); photo-tubes [H01J40/00](#); thermionic generators [H01J45/00](#); radioisotopic generators [G21H1/00](#), e.g. [G21H 1/02](#), [G21H1/04](#))]
- G01T3/00E . [N: using an ionisation chamber filled with a gas, liquid or solid, e.g. frozen liquid, dielectric ([G01T3/00D](#) takes precedence)] [M1108]
- G01T3/02 . by shielding other radiation
- G01T3/04 . using calorimetric devices
- G01T3/06 . with scintillation detectors
- G01T3/06B . . [N: Spectrometry]
- G01T3/08 . with semiconductor detectors (semiconductor detectors per se [H01L31/00](#))
- G01T3/08B . . [N: Spectrometry]
- G01T5/00** **Recording of movements or tracks of particles (spark chambers [H01J47/00](#)); Processing or analysis of such tracks [C0407]**
- G01T5/00B . [N: using a combination of several movement of track recording devices (detectors associated with recording chambers and only serving to trigger these chambers, see the appropriate groups of the chamber e.g. [G01T5/04](#) - [G01T5/08](#); see provisionally also [G01T5/00](#) and other sub-groups)]
- G01T5/00C . [N: Non-electrical readout of multi-wire or parallel-plate chambers (non-electrical readout in such chambers per se [H01J47/22](#))] [C0407]
- G01T5/00C2 . . [N: by optical methods]
- G01T5/00C3 . . [N: by acoustical methods]
- G01T5/02 . Processing of tracks; Analysis of tracks [N: (special purpose computers for nuclear physics [G06F15/52](#))]
- G01T5/04 . Cloud chambers, e.g. Wilson chamber
- G01T5/06 . Bubble chambers
- G01T5/08 . Scintillation chambers (discharge tubes [H01J40/00](#), [H01J47/00](#); semiconductor devices [H01L](#)) [C0407]
- G01T5/10 . Plates or blocks in which tracks or nuclear particles are made visible by after-treatment, e.g. using photographic emulsion, using mica
- G01T5/12 . Circuit arrangements with multi-wire or parallel-plate chambers, e.g. spark chambers

- tubes per se [H01J47/00](#)) [C0407]
- G01T5/12B . . [N: for readout of each individual wires; (readout in such chambers per se [H01J47/16](#)); for processing the output signals] [C0407]
- G01T5/12B2 . . . [N: by using delay lines]
- G01T5/12B2B [N: by using magnetostrictive delay lines]
- G01T7/00** **Details of radiation-measuring instruments**
- G01T7/00C . [N: calibration techniques (stabilization of spectrometer [G01T1/40](#))] [N0711]
- G01T7/02 . Collecting means for receiving or storing samples to be investigated [N: and possibly directly transporting the samples to the measuring arrangement; particularly for investigating radioactive fluids (sampling, preparing specimens for investigation in general [G01N1/00](#), [G01N1/02](#); shielded cells or rooms structurally combined with manipulative devices [G21F](#); measuring of chromatographically separated samples [G01N30/00](#) to [G01N30/96](#))]
- G01T7/04 . . by filtration
- G01T7/06 . . by electrostatic precipitation ([G01T7/04](#) takes precedence)
- G01T7/08 . Means for conveying samples received [N: (i.e. sample changers [G01N35/00](#))]
- G01T7/10 . . using turntables
- G01T7/12 . Provision for actuation of an alarm
- G01T7/12B . . [N: Alarm- or controlling circuits using ionisation chambers, proportional counters or Geiger-Mueller tubes, also functioning as UV detectors (measuring radiation intensity with counting tubes [G01T1/18](#); measuring radiation intensity with ionisation chambers [G01T1/185](#); fire alarms actuated by presence of radiation of particles, e.g. of infra-red radiation, of ions [G08B7/12](#); flame monitoring in combustion devices [F23Q7/00](#), [F23N](#); discharge tubes per se [H01J47/00](#))] [C0407]