

**CPC****COOPERATIVE PATENT 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 [H01J 40/00](#) , [H01J 47/00](#) , [H01J 49/00](#))

**NOTE**

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](#).

**G01T 1/00**

**Measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation** ([G01T 3/00](#) , [G01T 5/00](#) take precedence)

G01T 1/003

- . {Scintillation (flow) cells}

G01T 1/006

- . {Total absorption calorimeters; Shower detectors}

G01T 1/02

- . Dosimeters ([G01T 1/15](#) takes precedence, measuring exposure time to X-rays [H05G 1/28](#))

G01T 1/023

- .. {Scintillation dose-rate meters}

G01T 1/026

- .. {Semiconductor dose-rate meters}

G01T 1/04

- .. Chemical dosimeters ([G01T 1/06](#) , [G01T 1/08](#) take precedence)

G01T 1/06

- .. Glass dosimeters {using colour change; including plastic dosimeters}

G01T 1/08

- .. Photographic dosimeters (sensitive materials, processing thereof [G03C](#) ; { photometry [G01J 1/52](#)})

G01T 1/10

- .. Luminescent dosimeters

G01T 1/105

- ... Read-out devices ([G01T 1/115](#) takes precedence)

G01T 1/11

- ... Thermo-luminescent dosimeters {(thermo-luminescent compositions [C09K 11/00](#))}

G01T 1/115

- .... Read-out devices

G01T 1/12

- .. Calorimetric dosimeters

G01T 1/14

- .. Electrostatic dosimeters (construction of ionisation chambers [H01J 47/02](#) ; { electrometers [G01R 5/28](#)})

G01T 1/142

- ... Charging devices; Read-out devices

G01T 1/15

- . Instruments in which pulses generated by a radiation detector are integrated, e.g. by a diode pump circuit (pulse rate meters in general [G01R 23/02](#))

G01T 1/16

- . Measuring radiation intensity ([G01T 1/29](#) takes precedence; { self-powered detectors [G01T 3/006](#) ; using an ionisation chamber filled with a liquid or solid, e.g. frozen liquid, dielectric [G01T 3/008](#)})

G01T 1/1603

- .. {with a combination of at least two different types of detector (see provisionally also [G01T 1/16](#))}

G01T 1/1606

- .. {with other specified detectors not provided for in the other sub-groups of [G01T 1/16](#) (see provisionally also [G01T 1/16](#))}

G01T 1/161	..	Application in the field of nuclear medicine, e.g. in vivo counting <a href="#">{(apparatus for radiation diagnosis A61B 6/00)}</a>
G01T 1/1611	...	<a href="#">{using both transmission and emission sources sequentially (SPECT imaging G01T 1/1642 ; PET imaging G01T 1/2985 ; detecting hidden objects, e.g. weapons, explosives G01V 5/0008)}</a>
G01T 1/1612	....	<a href="#">{with scintillation detectors (G01T 1/20 takes precedence)}</a>
G01T 1/1614	....	<a href="#">{with semiconductor detectors (G01T 1/24 takes precedence)}</a>
G01T 1/1615	...	<a href="#">{using both transmission and emission sources simultaneously (SPECT imaging G01T 1/1642 ; PET imaging G01T 1/2985 ; detecting hidden objects, e.g. weapons, explosives G01V 5/0008)}</a>
G01T 1/1617	....	<a href="#">{with scintillation detectors (G01T 1/20 takes precedence)}</a>
G01T 1/1618	....	<a href="#">{with semiconductor detectors (G01T 1/24 takes precedence)}</a>
G01T 1/163	...	Whole body counters <a href="#">{(hand or feet contamination measurement G01T 1/167 ; lung, brain, thyroid, kidney or the like counting G01T 1/16)}</a>
G01T 1/1635	....	<a href="#">{involving relative movement between detector and subject; scanning beds (profile scanning G01T 1/166 ; positioning patients, tiltable tables for radiation diagnosis A61B 6/04)}</a>
G01T 1/164	...	Scintigraphy (radioisotopes <a href="#">G21G 4/00</a> ; tracers <a href="#">G21H 5/00</a> ; <a href="#">{ measurement of spatial distribution G01T 1/2914 ; apparatus for radiation diagnosis in different planes A61B 6/02}</a> )
G01T 1/1641	....	<a href="#">{Static instruments for imaging the distribution of radioactivity in one or two dimensions using one or several scintillating elements; Radio-isotope cameras}</a>
G01T 1/1642	.....	<a href="#">{using a scintillation crystal and position sensing photodetector arrays, e.g. ANGER cameras}</a>
G01T 1/1644	.....	<a href="#">{using an array of optically separate scintillation elements permitting direct location of scintillations (G01T 1/1645 takes precedence)}</a>
G01T 1/1645	.....	<a href="#">{using electron optical imaging means, e.g. image intensifier tubes, coordinate photomultiplier tubes, image converter}</a>
G01T 1/1647	.....	<a href="#">{Processing of scintigraphic data (not related to a particular imaging system G01T 1/2992)}</a>
G01T 1/1648	.....	<a href="#">{Ancillary equipment for scintillation cameras e.g. reference markers, devices for removing motion artifacts, calibration devices (adapted for flow studies G01T 1/1647)}</a>
G01T 1/166	....	involving relative movement between detector and subject <a href="#">{(scanners in general without using scintigraphy G01T 1/2964)}</a>
G01T 1/1663	.....	<a href="#">{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 G01T 1/2992 ; general purpose image data processing G06T 1/00 ; computerized tomography G06T 11/003); Ancillary equipment (colour printers G01T 1/1666)}</a>
G01T 1/1666	.....	<a href="#">{adapted for printing different symbols or colours according to the intensity or energy level of the detected radioactivity (depth discrimination in colour G01T 1/2985)}</a>
G01T 1/167	..	Measuring radioactive content of objects, e.g. contamination <a href="#">(whole body counters G01T 1/163)</a>

- G01T 1/169 .. Exploration, location of contaminated surface areas (prospecting by the use of nuclear radiation e.g. of natural or induced radioactivity [G01V 5/00](#)) {in situ measurement, e.g. floor contamination monitor (directional detectors [G01T 1/2907](#))}
  - G01T 1/17 .. Circuit arrangements not adapted to a particular type of detector {(pulse-selection circuits [H03K](#) , [G01R](#))}
  - G01T 1/171 ... {Compensation of dead-time counting losses (see provisionally also [G01T 1/17](#))}
  - G01T 1/172 ... with coincidence circuit arrangements ([G01T 1/178](#) takes precedence; { combination of detectors, see [G01T 1/1603](#) , [G01T 1/30](#) , [G01T 1/361](#))}
  - G01T 1/175 ... Power supply circuits (power supply circuits per se [H02J](#) ; converters [H02M](#))
  - G01T 1/178 ... for measuring specific activity in the presence of other radioactive substances, e.g. natural, in the air or in liquids such as rain water
  - G01T 1/18 .. with counting-tube arrangements, e.g. with Geiger counters (tubes [H01J 47/08](#) ; { with alarm provision [G01T 7/125](#))}
  - G01T 1/185 .. with ionisation chamber arrangements (construction of ionisation chambers [H01J 47/02](#) ; { gas analysis by ionisation [G01N 27/66](#) ; measuring pressure [G01L 9/00](#) ; leak detection [G01M 3/00](#) ; tele-measurements [G08C](#))}
  - G01T 1/20 .. with scintillation detectors
  - G01T 1/2002 ... {Optical details, e.g. reflecting or diffusing layers}
  - G01T 1/2004 ... {Scintilloscopes (fluoroscopes [G21K 4/00](#) ; radiation diagnosis [A61B 6/00](#))}
  - G01T 1/2006 ... {using a combination of a scintillator and photodetector which measures the means radiation intensity}
  - G01T 1/2008 ... {using a combination of different types of scintillation detectors, e.g. phoswich}
- WARNING**
- Pending reclassification, for subject-matter regarding phoswich see also [G01T 1/20](#)
- G01T 1/201 ... {using scintillating fibres}
- WARNING**
- Not complete, see also [G01T 1/2992](#)
- G01T 1/2012 ... {using stimuable phosphors, e.g. stimuable phosphor sheets}
- WARNING**
- This group and subgroups are not complete pending reclassification; see also group [G01T 1/2992](#)
- G01T 1/2014 .... {Reading out of stimuable sheets, e.g. latent image}
  - G01T 1/2016 .... {Erasing of stimuable sheets, e.g. with light, heat or the like}
  - G01T 1/2018 ... {Scintillation-photodiode combination}
  - G01T 1/202 ... the detector being a crystal
  - G01T 1/2023 .... {Selection of materials (see provisionally also [G01T 1/202](#))}

G01T 1/2026	....	{Well-type detectors (see provisionally also <a href="#">G01T 1/202</a> )}
G01T 1/203	...	the detector being made of plastics
G01T 1/2033	....	{Selection of materials (see provisionally also <a href="#">G01T 1/203</a> )}
G01T 1/2036	....	{Well-type detectors (see provisionally also <a href="#">G01T 1/203</a> )}
G01T 1/204	...	the detector being a liquid
G01T 1/2042	....	{Composition for liquid scintillation systems}
G01T 1/2045	.....	{Liquid scintillation quench systems}
G01T 1/2047	.....	{Sample preparation}
G01T 1/205	...	the detector being a gas
G01T 1/208	...	Circuits specially adapted for scintillation detectors, e.g. for the photo-multiplier section
G01T 1/22	..	with Cerenkov detectors
G01T 1/24	..	with semiconductor detectors ( <a href="#">semiconductor devices per se H01L 31/00</a> )
G01T 1/241	...	{Electrode arrangements, e.g. continuous or parallel strips or the like (constructional or manufacturing details <a href="#">H01L 31/00</a> )}
G01T 1/242	...	{Stacked detectors, e.g. for depth information (constructional or manufacturing details <a href="#">H01L 25/00</a> )}
G01T 1/243	...	{Modular detectors, e.g. arrays formed from self contained units (constructional or manufacturing details <a href="#">H01L 25/00</a> )}
G01T 1/244	...	{Auxiliary details, e.g. casings, cooling, damping or insulation against damage by e.g. heat, pressure or the like}
G01T 1/245	...	{using memory cells}
G01T 1/246	...	{utilizing latent read-out, e.g. charge stored and read-out later}
G01T 1/247	...	{Detector read-out circuitry (for processing gain or off-set correction <a href="#">H04N</a> )}
G01T 1/248	...	{Silicon photomultipliers [SiPM], e.g. an avalanche photodiode [APD] array on a common Si substrate}
G01T 1/249	...	{specially adapted for use in SPECT or PET (SPECT imaging <a href="#">G01T 1/1642</a> ; PET imaging <a href="#">G01T 1/2985</a> ; detecting hidden objects, e.g. weapons, explosives <a href="#">G01V 5/0008</a> )}
G01T 1/26	..	with resistance detectors ({ <a href="#">photoresistors H01L 31/00</a> })
G01T 1/28	..	with secondary-emission detectors ( <a href="#">secondary-electron-emitting electrodes in general H01J 1/32</a> ) {optionally combined with scintillation counters (secondary emission tubes <a href="#">H01J 43/00</a> )}
G01T 1/29	.	Measurement performed on radiation beams, e.g. position or section of the beam; Measurement of spatial distribution of radiation ( <a href="#">scintigraphy G01T 1/164</a> ; <a href="#">mass-spectrometers H01J 49/025</a> )
G01T 1/2907	..	{Angle determination; Directional detectors; Telescopes (prospecting by the use of nuclear radiation, e.g. of natural or induced radioactivity <a href="#">G01V 5/00</a> )}
G01T 1/2914	..	{Measurement of spatial distribution of radiation}
G01T 1/2921	...	{Static instruments for imaging the distribution of radioactivity in one or two dimensions; Radio-isotope cameras (using scintigraphy <a href="#">G01T 1/1641</a> )}
G01T 1/2928	....	{using solid state detectors}
G01T 1/2935	....	{using ionisation detectors}
G01T 1/2942	....	{using autoradiographic methods}

- G01T 1/295 . . . . {using coded aperture devices e.g. Fresnel zone plates (handling of radiation of particles e.g. using diaphragms, collimators, diffraction [G21K 1/00](#))}
- G01T 1/2957 . . . . {using channel multiplier arrays (channel multipliers [H01J 43/18](#) ; [G01T 1/1645](#) takes precedence)}
- G01T 1/2964 . . . {Scanners (using scintigraphy [G01T 1/166](#))}
- G01T 1/2971 . . . . {using solid state detectors}
- G01T 1/2978 . . . {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 ([G01T 1/2985](#) takes precedence)}
- G01T 1/2985 . . . {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 [A61B 6/02](#))}
- G01T 1/2992 . . . {Radioisotope data or image processing not related to a particular imaging system; Off-line processing of pictures, e.g. rescanners (for measuring radiation intensity [G01T 1/1663](#) ; digital computing or data processing equipment or methods specially adapted for nuclear physics or nuclear engineering **G06F15/52** ; general purpose image data processing [G06T 1/00](#) ; computerized tomography [G06T 11/003](#))}
- G01T 1/30 . Measuring half-life of a radioactive substance {(period meters for nuclear fission reactors [G21C 17/14](#))}
- G01T 1/32 . Measuring polarisation of particles
- G01T 1/34 . Measuring cross-section, e.g. absorption cross-section of particles
- G01T 1/36 . Measuring spectral distribution of X-rays or of nuclear radiation {spectrometry (pulse selection circuits per se [H03K](#) ; investigation of materials by radiation diffraction [G01N 23/20](#) ; spectrometer tubes [H01J 49/00](#))}
- G01T 1/361 . . {with a combination of detectors of different types, e.g. anti-Compton spectrometers (intensity measurement with a combination of detectors [G01T 1/1603](#) ; with coincidence circuit [G01T 1/172](#) ; se provisionally also [G01T 1/36](#))}

**NOTE**

[G01T 1/361](#) takes precedence over [G01T 1/362](#)

- G01T 1/362 . . {with scintillation detectors (see provisionally also [G01T 1/36](#) , [G01T 1/20](#))}
- G01T 1/363 . . {with Cerenkov detectors}
- G01T 1/365 . . {with ionisation detectors e.g. proportional counter (see provisionally also [G01T 1/36](#))}
- G01T 1/366 . . {with semi-conductor detectors (see provisionally also [G01T 1/36](#))}
- G01T 1/367 . . {with resistance detectors (see provisionally also [G01T 1/36](#))}
- G01T 1/368 . . {with secondary-emission detectors (see provisionally [G01T 1/36](#))}
- G01T 1/38 . . Particle discrimination and measurement of relative mass, e.g. by measurement of loss of energy with distance (dE/dx) {(constructional details of semiconductor detectors therefor [H01L 31/00](#))}

- G01T 1/40 . . . Stabilisation of spectrometers [{\(circuits specially adapted for scintillation detectors G01T 1/208\)}](#)
- G01T 3/00** **Measuring neutron radiation** [\(G01T 5/00 takes precedence; { tubes therefor H01J 47/12 ; circuits with such tubes G01T 1/18 ; measuring short time intervals G04F 10/00 ; measuring pulse characteristics G01R 29/02 ; neutron choppers G21K 1/04 ; polarimeters G01T 1/32}\)](#)
- G01T 3/001 . {Spectrometry}
- G01T 3/003 . . {Recoil spectrometers (light-nuclei recoil ionisation tubes per se [H01J 47/1277](#))}
- G01T 3/005 . . {Time-of-flight spectrometers (see provisionally also [G01T 3/00](#))}
- G01T 3/006 . {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 [H01L 31/00](#) ; photo-tubes [H01J 40/00](#) ; thermionic generators [H01J 45/00](#) ; radioisotopic generators [G21H 1/00](#) , e.g. [G21H 1/02](#), [G21H 1/04](#))}
- G01T 3/008 . {using an ionisation chamber filled with a gas, liquid or solid, e.g. frozen liquid, dielectric ([G01T 3/006](#) takes precedence)}
- G01T 3/02 . by shielding other radiation
- G01T 3/04 . using calorimetric devices
- G01T 3/06 . with scintillation detectors
- G01T 3/065 . . {Spectrometry}
- G01T 3/08 . with semiconductor detectors ([semiconductor detectors per se H01L 31/00](#))
- G01T 3/085 . . {Spectrometry}
- G01T 5/00** **Recording of movements or tracks of particles** [\(spark chambers H01J 47/00\); Processing or analysis of such tracks](#)
- G01T 5/002 . {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. [G01T 5/04](#) - [G01T 5/08](#) ; see provisionally also [G01T 5/00](#) and other sub-groups)}
- G01T 5/004 . {Non-electrical readout of multi-wire or parallel-plate chambers (non-electrical readout in such chambers per se [H01J 47/22](#))}
- G01T 5/006 . . {by optical methods}
- G01T 5/008 . . {by acoustical methods}
- G01T 5/02 . Processing of tracks; Analysis of tracks
- G01T 5/04 . Cloud chambers, e.g. Wilson chamber
- G01T 5/06 . Bubble chambers
- G01T 5/08 . Scintillation chambers ([discharge tubes H01J 40/00](#) , [H01J 47/00](#) ; semiconductor devices [H01L](#))
- G01T 5/10 . Plates or blocks in which tracks or nuclear particles are made visible by after-treatment, e.g. using photographic emulsion, using mica
- G01T 5/12 . Circuit arrangements with multi-wire or parallel-plate chambers, e.g. spark chambers ([tubes per se H01J 47/00](#))
- G01T 5/122 . . {for readout of each individual wires; (readout in such chambers per se [H01J 47/16](#)); for processing the output signals}
- G01T 5/125 . . . {by using delay lines}

G01T 5/127

. . . . {by using magnetostrictive delay lines}

**G01T 7/00****Details of radiation-measuring instruments**

G01T 7/005

. {calibration techniques (stabilization of spectrometer [G01T 1/40](#))}

G01T 7/02

. Collecting means for receiving or storing samples to be investigated {and possibly directly transporting the samples to the measuring arrangement; particularly for investigating radioactive fluids (sampling, preparing specimens for investigation in general [G01N 1/00](#) , [G01N 1/02](#) ; shielded cells or rooms structurally combined with manipulative devices [G21F](#) ; measuring of chromatographically separated samples [G01N 30/00](#) to [G01N 30/96](#))}

G01T 7/04

. . by filtration

G01T 7/06

. . by electrostatic precipitation ([G01T 7/04](#) takes precedence)

G01T 7/08

. Means for conveying samples received {(i.e. sample changers [G01N 35/00](#))}

G01T 7/10

. . using turntables

G01T 7/12

. Provision for actuation of an alarm

G01T 7/125

. . {Alarm- or controlling circuits using ionisation chambers, proportional counters or Geiger-Mueller tubes, also functioning as UV detectors (measuring radiation intensity with counting tubes [G01T 1/18](#) ; measuring radiation intensity with ionisation chambers [G01T 1/185](#) ; fire alarms actuated by presence of radiation of particles, e.g. of infra-red radiation, of ions [G08B 17/11](#) ; flame monitoring in combustion devices [F23Q 7/00](#) , [F23N](#) ; discharge tubes per se [H01J 47/00](#))}