

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS (NOTES omitted)

INSTRUMENTS

G01 MEASURING; TESTING (NOTES omitted)

G01T MEASUREMENT OF NUCLEAR OR X-RADIATION (radiation analysis of materials, mass spectrometry [G01N 23/00](#); tubes for determining the presence, intensity, density or energy of radiation or particles [H01J 47/00](#))

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](#).

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00	Measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation (G01T 3/00, G01T 5/00 take precedence)	1/161	. . Applications in the field of nuclear medicine, e.g. <u>in vivo</u> counting (apparatus for radiation diagnosis A61B 6/00)
1/003	. {Scintillation (flow) cells}	1/1611	. . . {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)}
1/006	. {Total absorption calorimeters; Shower detectors}	1/1612 {with scintillation detectors (G01T 1/20 takes precedence)}
1/02	. Dosimeters (G01T 1/15 takes precedence)	1/1614 {with semiconductor detectors (G01T 1/24 takes precedence)}
1/023	. . {Scintillation dose-rate meters}	1/1615 {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)}
1/026	. . {Semiconductor dose-rate meters}	1/1617 {with scintillation detectors (G01T 1/20 takes precedence)}
1/04	. . Chemical dosimeters (G01T 1/06 , G01T 1/08 take precedence)	1/1618 {with semiconductor detectors (G01T 1/24 takes precedence)}
1/06	. . Glass dosimeters {using colour change; including plastic dosimeters}	1/163	. . . Whole body counters {(hand or feet contamination measurement G01T 1/167 ; lung, brain, thyroid, kidney or the like counting G01T 1/16)}
1/08	. . Photographic dosimeters {(photometry G01J 1/52)}	1/1635 {involving relative movement between detector and subject; scanning beds (profile scanning G01T 1/166 ; positioning patients, tiltable tables for radiation diagnosis A61B 6/04)}
1/10	. . Luminescent dosimeters	1/164	. . . Scintigraphy
1/105	. . . Read-out devices (G01T 1/115 takes precedence)	1/1641 {Static instruments for imaging the distribution of radioactivity in one or two dimensions using one or several scintillating elements; Radio-isotope cameras}
1/11	. . . Thermo-luminescent dosimeters {(thermo-luminescent compositions C09K 11/00)}		
1/115 Read-out devices		
1/12	. . Calorimetric dosimeters		
1/14	. . Electrostatic dosimeters (construction of ionisation chambers H01J 47/02 ; electrometers G01R 5/28)		
1/142	. . . Charging devices; Read-out devices		
1/15	. Instruments in which pulses generated by a radiation detector are integrated, e.g. by a diode pump circuit		
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)		
1/1603	. . {with a combination of at least two different types of detector (see provisionally also G01T 1/16)}		
1/1606	. . {with other specified detectors not provided for in the other sub-groups of G01T 1/16 (see provisionally also G01T 1/16)}		

- 1/1642 {using a scintillation crystal and position sensing photodetector arrays, e.g. ANGER cameras}
- 1/1644 {using an array of optically separate scintillation elements permitting direct location of scintillations ([G01T 1/1645 takes precedence](#))}
- 1/1645 {using electron optical imaging means, e.g. image intensifier tubes, coordinate photomultiplier tubes, image converter}
- 1/1647 {Processing of scintigraphic data ([not related to a particular imaging system G01T 1/2992](#))}
- 1/1648 {Ancillary equipment for scintillation cameras, e.g. reference markers, devices for removing motion artifacts, calibration devices ([adapted for flow studies G01T 1/1647](#))}
- 1/166 involving relative movement between detector and subject {(scanners in general [without using scintigraphy G01T 1/2964](#))}
- 1/1663 {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](#))}
- 1/1666 {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](#))}
- 1/167 . . . Measuring radioactive content of objects, e.g. contamination ([whole body counters G01T 1/163](#))
- 1/169 . . . Exploration, location of contaminated surface areas
- 1/17 . . . Circuit arrangements not adapted to a particular type of detector {(pulse-selection circuits [H03K, G01R](#))}
- 1/171 . . . {Compensation of dead-time counting losses ([see provisionally also G01T 1/17](#))}
- 1/172 . . . with coincidence circuit arrangements ([G01T 1/178 takes precedence](#) ; combination of detectors, [see G01T 1/1603, G01T 1/30, G01T 1/361](#))}
- 1/175 . . . Power supply circuits
- 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
- 1/18 . . . with counting-tube arrangements, e.g. with Geiger counters ([tubes H01J 47/08](#); {with alarm provision [G01T 7/125](#)})
- 1/185 . . . with ionisation chamber arrangements
- 1/20 . . . with scintillation detectors
- 1/2002 . . . {Optical details, e.g. reflecting or diffusing layers}
- 1/2004 . . . {Scintillosopes (fluoroscopes [G21K 4/00](#); radiation diagnosis [A61B 6/00](#))}
- 1/2006 . . . {using a combination of a scintillator and photodetector which measures the means radiation intensity}

- 1/2008 . . . {using a combination of different types of scintillation detectors, e.g. phoswich}
- 1/201 . . . {using scintillating fibres}
- 1/2012 . . . {using stimuable phosphors, e.g. stimuable phosphor sheets}
- 1/2014 . . . {Reading out of stimuable sheets, e.g. latent image}
- 1/2016 . . . {Erasing of stimuable sheets, e.g. with light, heat or the like}
- 1/2018 . . . {Scintillation-photodiode combinations}

WARNING

Group [G01T 1/2018](#) is impacted by reclassification into groups [G01T 1/20181](#) - [G01T 1/2019](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 1/20181 {Stacked detectors, e.g. for measuring energy and positional information ([using a combination of different types of scintillation detectors, e.g. phoswich detectors, G01T 1/2008](#))}

WARNING

Group [G01T 1/20181](#) is incomplete pending reclassification from group [G01T 1/2018](#).

Group [G01T 1/2018](#) and [G01T 1/20181](#) should be considered in order to perform a complete search.

- 1/20182 {Modular detectors, e.g. tiled scintillators or tiled photodiodes ([stacked detectors G01T 1/20181](#))}

WARNING

Group [G01T 1/20182](#) is incomplete pending reclassification from group [G01T 1/2018](#).

Groups [G01T 1/2018](#) and [G01T 1/20182](#) should be considered in order to perform a complete search.

- 1/20183 {Arrangements for preventing or correcting crosstalk, e.g. optical or electrical arrangements for correcting crosstalk}

WARNING

Group [G01T 1/20183](#) is incomplete pending reclassification from group [G01T 1/2018](#).

Groups [G01T 1/2018](#) and [G01T 1/20183](#) should be considered in order to perform a complete search.

- 1/20184 {Detector read-out circuitry, e.g. for clearing of traps, compensating for traps or compensating for direct hits}
- WARNING**
- Group [G01T 1/20184](#) is incomplete pending reclassification from group [G01T 1/2018](#).
- Groups [G01T 1/2018](#) and [G01T 1/20184](#) should be considered in order to perform a complete search.
- 1/20185 {Coupling means between the photodiode and the scintillator, e.g. optical couplings using adhesives with wavelength-shifting fibres}
- WARNING**
- Group [G01T 1/20185](#) is incomplete pending reclassification from group [G01T 1/2018](#).
- Groups [G01T 1/2018](#) and [G01T 1/20185](#) should be considered in order to perform a complete search.
- 1/20186 {Position of the photodiode with respect to the incoming radiation, e.g. in the front of, below or sideways the scintillator}
- WARNING**
- Group [G01T 1/20186](#) is incomplete pending reclassification from group [G01T 1/2018](#).
- Groups [G01T 1/2018](#) and [G01T 1/20186](#) should be considered in order to perform a complete search.
- 1/20187 {Position of the scintillator with respect to the photodiode, e.g. photodiode surrounding the crystal, the crystal surrounding the photodiode, shape or size of the scintillator}
- WARNING**
- Group [G01T 1/20187](#) is incomplete pending reclassification from group [G01T 1/2018](#).
- Groups [G01T 1/2018](#) and [G01T 1/20187](#) should be considered in order to perform a complete search.
- 1/20188 {Auxiliary details, e.g. casings or cooling}
- WARNING**
- Groups [G01T 1/20188](#), [G01T 1/20189](#), and [G01T 1/2019](#) are incomplete pending reclassification from group [G01T 1/2018](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
- 1/20189 {Damping or insulation against damage, e.g. caused by heat or pressure}
- 1/2019 {Shielding against direct hits}
- 1/202 the detector being a crystal
- 1/2023 {Selection of materials ([see provisionally also G01T 1/202](#))}
- 1/2026 {Well-type detectors ([see provisionally also G01T 1/202](#))}
- 1/203 the detector being made of plastics
- 1/2033 {Selection of materials ([see provisionally also G01T 1/203](#))}
- 1/2036 {Well-type detectors ([see provisionally also G01T 1/203](#))}
- 1/204 the detector being a liquid
- 1/2042 {Composition for liquid scintillation systems}
- 1/2045 {Liquid scintillation quench systems}
- 1/2047 {Sample preparation}
- 1/205 the detector being a gas
- 1/208 Circuits specially adapted for scintillation detectors, e.g. for the photo-multiplier section
- 1/22 with Cerenkov detectors
- 1/24 with semiconductor detectors
- 1/241 {Electrode arrangements, e.g. continuous or parallel strips or the like ([constructional or manufacturing details H01L 31/00](#))}
- 1/242 {Stacked detectors, e.g. for depth information ([constructional or manufacturing details H01L 25/00](#))}
- 1/243 {Modular detectors, e.g. arrays formed from self contained units ([constructional or manufacturing details H01L 25/00](#))}
- 1/244 {Auxiliary details, e.g. casings, cooling, damping or insulation against damage by, e.g. heat, pressure or the like}
- 1/245 {using memory cells}
- 1/246 {utilizing latent read-out, e.g. charge stored and read-out later}
- 1/247 {Detector read-out circuitry ([for processing gain or off-set correction H04N](#))}
- 1/248 {Silicon photomultipliers [SiPM], e.g. an avalanche photodiode [APD] array on a common Si substrate}
- 1/249 {specially adapted for use in SPECT or PET ([SPECT imaging G01T 1/1642](#); [PET imaging G01T 1/2985](#); detecting hidden objects, e.g. weapons, explosives [G01V 5/0008](#))}
- 1/26 with resistance detectors ([photoresistors H01L 31/00](#))}
- 1/28 with secondary-emission detectors
- 1/29 Measurement performed on radiation beams, e.g. position or section of the beam; Measurement of spatial distribution of radiation
- 1/2907 {Angle determination; Directional detectors; Telescopes ([prospecting by the use of nuclear radiation, e.g. of natural or induced radioactivity G01V 5/00](#))}
- 1/2914 {Measurement of spatial distribution of radiation}
- 1/2921 {Static instruments for imaging the distribution of radioactivity in one or two dimensions; Radio-isotope cameras ([using scintigraphy G01T 1/1641](#))}
- 1/2928 {using solid state detectors}
- 1/2935 {using ionisation detectors}
- 1/2942 {using autoradiographic methods}
- 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](#))}

- 1/2957 {using channel multiplier arrays (channel multipliers [H01J 43/18](#); [G01T 1/1645](#) takes precedence)}
- 1/2964 {Scanners (using scintigraphy [G01T 1/166](#))}
- 1/2971 {using solid state detectors}
- 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)}
- 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](#))}
- 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 [G06F 15/00](#); general purpose image data processing [G06T 1/00](#); computerized tomography [G06T 11/003](#))}
- 1/30 Measuring half-life of a radioactive substance {(period meters for nuclear fission reactors [G21C 17/14](#))}
- 1/32 Measuring polarisation of particles
- 1/34 Measuring cross-section, e.g. absorption cross-section of particles
- 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](#))}
- 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](#); [see provisionally also](#) [G01T 1/36](#))}
- NOTE**
- [G01T 1/361](#) takes precedence over [G01T 1/362](#)
- 1/362 {with scintillation detectors ([see provisionally also](#) [G01T 1/36](#), [G01T 1/20](#))}
- 1/363 {with Cerenkov detectors}
- 1/365 {with ionisation detectors, e.g. proportional counter ([see provisionally also](#) [G01T 1/36](#))}
- 1/366 {with semi-conductor detectors ([see provisionally also](#) [G01T 1/36](#))}
- 1/367 {with resistance detectors ([see provisionally also](#) [G01T 1/36](#))}
- 1/368 {with secondary-emission detectors ([see provisionally](#) [G01T 1/36](#))}
- 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](#))}
- 1/40 Stabilisation of spectrometers
- 3/00 Measuring neutron radiation ([G01T 5/00](#) takes precedence)**
- 3/001 {Spectrometry}
- 3/003 {Recoil spectrometers (light-nuclei recoil ionisation tubes [per se](#) [H01J 47/1277](#))}
- 3/005 {Time-of-flight spectrometers ([see provisionally also](#) [G01T 3/00](#))}
- 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](#))}
- 3/008 {using an ionisation chamber filled with a gas, liquid or solid, e.g. frozen liquid, dielectric ([G01T 3/006](#) takes precedence)}
- 3/02 by shielding other radiation
- 3/04 using calorimetric devices
- 3/06 with scintillation detectors
- 3/065 {Spectrometry}
- 3/08 with semiconductor detectors
- 3/085 {Spectrometry}
- 5/00 Recording of movements or tracks of particles (spark chambers [H01J 47/00](#)); Processing or analysis of such tracks**
- 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)}
- 5/004 {Non-electrical readout of multi-wire or parallel-plate chambers (non-electrical readout in such chambers [per se](#) [H01J 47/22](#))}
- 5/006 {by optical methods}
- 5/008 {by acoustical methods}
- 5/02 Processing of tracks; Analysis of tracks
- 5/04 Cloud chambers, e.g. Wilson chamber
- 5/06 Bubble chambers
- 5/08 Scintillation chambers (discharge tubes [H01J 40/00](#), [H01J 47/00](#); semiconductor devices [H01L](#))
- 5/10 Plates or blocks in which tracks of nuclear particles are made visible by after-treatment, e.g. using photographic emulsion, using mica
- 5/12 Circuit arrangements with multi-wire or parallel-plate chambers, e.g. spark chambers (tubes [per se](#) [H01J 47/00](#))
- 5/122 {for readout of each individual wires; (readout in such chambers [per se](#) [H01J 47/16](#)); for processing the output signals}
- 5/125 {by using delay lines}
- 5/127 {by using magnetostrictive delay lines}
- 7/00 Details of radiation-measuring instruments**

G01T

- 7/005 . {calibration techniques (stabilization of spectrometer [G01T 1/40](#))}
- 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](#) - [G01N 30/96](#))}
- 7/04 . . by filtration
- 7/06 . . by electrostatic precipitation ([G01T 7/04](#) takes precedence)
- 7/08 . Means for conveying samples received
- 7/10 . . using turntables
- 7/12 . Provision for actuation of an alarm
- 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](#))}