

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS (NOTES omitted)

INSTRUMENTS

G01 MEASURING; TESTING (NOTES omitted)

G01K MEASURING TEMPERATURE; MEASURING QUANTITY OF HEAT; THERMALLY-SENSITIVE ELEMENTS NOT OTHERWISE PROVIDED FOR ([radiation pyrometry G01J 5/00](#))

NOTES

1. In this subclass, the following term is used with the meaning indicated :
 - "thermometer" includes thermally-sensitive elements not provided for in other subclasses.
2. Attention is drawn to the Notes following the title of class [G01](#).
3. Attention is drawn to the Notes following the titles of class [B81](#) and subclass [B81B](#) relating to "microstructural devices" and "microstructural systems".

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.

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|-------------|--|-------------|---|
| 1/00 | Details of thermometers not specially adapted for particular types of thermometer (circuits for reducing thermal inertia G01K 7/42) | 1/22 | • • by means of fluid contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the fluid |
| 1/02 | • Means for indicating or recording specially adapted for thermometers | 1/24 | • • by means of compounded strips or plates, e.g. by bimetallic strips |
| 1/022 | • • for recording | 1/26 | • Compensating for effects of pressure changes |
| 1/024 | • • for remote indication | 3/00 | Thermometers giving results other than momentary value of temperature (G01K 7/42 takes precedence) |
| 1/026 | • • {arrangements for monitoring a plurality of temperatures, e.g. by multiplexing} | 3/005 | • {Circuits arrangements for indicating a predetermined temperature (fire detection G08B 17/00)} |
| 1/028 | • • {arrangements for numerical indication} | 3/02 | • giving means values; giving integrated values |
| 1/04 | • • Scales | 3/04 | • • in respect of time |
| 1/045 | • • • {temperature indication combined with the indication of another variable (indicating of human comfort G01W 1/17)} | 3/06 | • • in respect of space |
| 1/06 | • • • Arrangements for facilitating reading, e.g. illumination, magnifying glass | 3/08 | • giving differences of values (using thermoelectric elements G01K 7/02); giving differentiated values |
| 1/065 | • • • • {of liquid column thermometers} | 3/10 | • • in respect of time, e.g. reacting only to a quick change of temperature |
| 1/08 | • Protective devices, e.g. casings | 3/12 | • • • based upon expansion or contraction of materials |
| 1/10 | • • for preventing chemical attack | 3/14 | • • in respect of space |
| 1/105 | • • • {for siderurgical use} | 2003/145 | • • • {Hotspot localization} |
| 1/12 | • • for preventing damage due to heat overloading | 5/00 | Measuring temperature based on the expansion or contraction of a material (G01K 9/00 takes precedence; giving other than momentary value of temperature G01K 3/00) |
| 1/125 | • • • {for siderurgical use} | 5/02 | • the material being a liquid (contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the material G01K 5/32) |
| 1/14 | • Supports; Fastening devices; Arrangements for mounting thermometers in particular locations | 5/025 | • • {Manufacturing of this particular type of thermometer} |
| 1/143 | • • for measuring surface temperatures | | |
| 1/146 | • • {arrangements for moving thermometers to or from a measuring position} | | |
| 1/16 | • Special arrangements for conducting heat from the object to the sensitive element | | |
| 1/165 | • • {for application in zero heat flux sensors} | | |
| 1/18 | • • for reducing thermal inertia | | |
| 1/20 | • Compensating for effects of temperature changes other than those to be measured, e.g. changes in ambient temperature | | |

- 5/04 . . Details
- 5/06 . . . Arrangements for driving back the liquid column
- 5/08 . . . Capillary tubes
- 5/10 . . . Containers for the liquid
- 5/12 . . . Selection of liquid compositions
- 5/14 . . the liquid displacing a further liquid column or a solid body ([for maximum or minimum indication G01K 5/20](#))
- 5/16 . . with electric contacts
- 5/18 . . with electric conversion means for final indication
- 5/20 . . with means for indicating a maximum or a minimum or both ([G01K 5/22 takes precedence](#))
- 5/22 . . with provision for expansion indicating over not more than a few degrees

WARNING

Group [G01K 5/22](#) is impacted by reclassification into groups [G01K 13/20](#), [G01K 13/25](#), and [G01K 13/252](#).

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

- 5/225 . . . {with means for indicating a maximum, e.g. a constriction in the capillary tube}
- 5/24 . . with provision for measuring the difference between two temperatures
- 5/26 . . with provision for adjusting zero point of scale, e.g. Beckmann thermometer
- 5/28 . the material being a gas ([contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the material G01K 5/32](#))
- 5/30 . . the gas displacing a liquid column
- 5/32 . the material being a fluid contained in a hollow body having parts which are deformable or displaceable ([under pressure developed by evaporation G01K 11/04; pressure measuring devices in general G01L](#))
- 5/323 . . {Selection of fluid compositions}
- 5/326 . . {using a fluid container connected to the deformable body by means of a capillary tube}
- 5/34 . . the body being a capsule ([G01K 5/36, G01K 5/42 take precedence](#))
- 5/36 . . the body being a tubular spring, e.g. Bourdon tube
- 5/38 . . . of spiral formation
- 5/40 . . . of helical formation
- 5/42 . . the body being a bellows
- 5/44 . . the body being a cylinder and piston
- 5/46 . . with electric conversion means for final indication
- 5/465 . . . {using electrical contact making or breaking devices}
- 5/48 . the material being a solid
- 5/483 . . {using materials with a configuration memory, e.g. Ni-Ti alloys}
- 5/486 . . {using microstructures, e.g. made of silicon ([G01K 7/015, G01K 7/028, G01K 7/226, G01K 17/006 take precedence](#))}
- 5/50 . . arranged for free expansion or contraction
- 5/52 . . . with electrical conversion means for final indication

- 5/54 . . consisting of pivotally-connected elements
- 5/56 . . constrained so that expansion or contraction causes a deformation of the solid
- 5/58 . . . the solid body being constrained at more than one point, e.g. rod, plate, diaphragm ([G01K 5/62 takes precedence](#))
- 5/60 the body being a flexible wire or ribbon
- 5/62 . . . the solid body being formed of compounded strips or plates, e.g. bimetallic strip
- 5/64 Details of the compounds system
- 5/66 Selection of composition of the components of the system
- 5/68 Shape of the system
- 5/70 specially adapted for indicating or recording
- 5/72 with electric transmission means for final indication

7/00 Measuring temperature based on the use of electric or magnetic elements directly sensitive to heat (giving results other than momentary value of temperature [G01K 3/00](#)) {; Power supply therefor, e.g. using thermoelectric elements}

- 7/003 . {using pyroelectric elements ([radiation pyrometers G01J 5/00](#))}
- 7/006 . {using superconductive elements}
- 7/01 . using semiconducting elements having PN junctions ([G01K 7/02, G01K 7/16, G01K 7/30 take precedence](#))
- 7/015 . . {using microstructures, e.g. made of silicon}
- 7/02 . using thermoelectric elements, e.g. thermocouples
- 7/021 . . {Particular circuit arrangements ([G01K 7/026, G01K 7/12, G01K 7/14 take precedence](#))}
- 7/023 . . {provided with specially adapted connectors ([connectors per se H01R](#))}
- 7/025 . . {expendable thermocouples}
- 7/026 . . Arrangements for signalling failure or disconnection of thermocouples
- 7/028 . . {using microstructures, e.g. made of silicon}
- 7/04 . . the object to be measured not forming one of the thermoelectric materials
- 7/06 . . . the thermoelectric materials being arranged one within the other with the junction at one end exposed to the object, e.g. sheathed type
- 7/08 . . the object to be measured forming one of the thermoelectric materials, e.g. pointed type
- 7/10 . . Arrangements for compensating for auxiliary variables, e.g. length of lead
- 7/12 . . . Arrangements with respect to the cold junction, e.g. preventing influence of temperature of surrounding air
- 7/13 Circuits for cold-junction compensation
- 7/14 . . Arrangements for modifying the output characteristic, e.g. linearising
- 7/16 . using resistive elements ([resistive elements per se H01C, H01L](#))
- 2007/163 . . {provided with specially adapted connectors}
- 2007/166 . . {Electrical time domain reflectometry}
- 7/18 . . the element being a linear resistance, e.g. platinum resistance thermometer ([G01K 7/26 takes precedence](#))
- 7/183 . . . {characterised by the use of the resistive element}
- 7/186 . . . {using microstructures}
- 7/20 . . . in a specially-adapted circuit, e.g. bridge circuit

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| 7/203 | {in an oscillator circuit} | 11/14 | . . of inorganic materials |
| 7/206 | {in a potentiometer circuit} | | WARNING |
| 7/21 | for modifying the output characteristic, e.g. linearising | | Group G01K 11/14 is incomplete pending reclassification of documents from group G01K 11/165 . |
| 7/22 | . . the element being a non-linear resistance, e.g. thermistor (G01K 7/26 takes precedence) | | Groups G01K 11/165 and G01K 11/14 should be considered in order to perform a complete search. |
| 7/223 | . . . {characterised by the shape of the resistive element} | | |
| 7/226 | . . . {using microstructures, e.g. silicon spreading resistance} | 11/16 | . . of organic materials |
| 7/24 | . . . in a specially-adapted circuit, e.g. bridge circuit | 11/165 | . . . of organic liquid crystals |
| 7/245 | {in an oscillator circuit} | | WARNING |
| 7/25 | for modifying the output characteristic, e.g. linearising | | Group G01K 11/165 is impacted by reclassification into group G01K 11/14 . |
| 7/26 | . . the element being an electrolyte | | Groups G01K 11/165 and G01K 11/14 should be considered in order to perform a complete search. |
| 7/28 | . . . in a specially-adapted circuit, e.g. bridge circuit | | |
| 7/30 | . using thermal noise of resistances or conductors | | |
| 7/32 | . using change of resonant frequency of a crystal | | |
| 7/34 | . using capacitative elements (capacitors per se H01G) | 11/18 | . . of materials which change translucency |
| 7/343 | . . {the dielectric constant of which is temperature dependant} | 11/20 | . using thermoluminescent materials (G01K 11/32 takes precedence) |
| 7/346 | . . {for measuring temperature based on the time delay of a signal through a series of logical ports} | 11/22 | . using measurement of acoustic effects |
| 7/36 | . using magnetic elements, e.g. magnets, coils (magnetic elements per se H01F) | 11/24 | . . of the velocity of propagation of sound |
| 7/38 | . . the variations of temperature influencing the magnetic permeability | 11/26 | . . of resonant frequencies |
| 7/40 | . using ionisation of gases | 11/265 | . . . {using surface acoustic wave [SAW]} |
| 7/42 | . Circuits effecting compensation of thermal inertia; Circuits for predicting the stationary value of a temperature | 11/28 | . using measurements of density {(measuring density in general G01N 9/00)} |
| 2007/422 | . . {Dummy objects used for estimating temperature of real objects} | 11/30 | . using measurement of the effect of a material on X-radiation, gamma radiation or particle radiation |
| 7/425 | . . {Thermal management of integrated systems} | 11/32 | . using changes in transmittance, scattering or luminescence in optical fibres |
| 7/427 | . . {Temperature calculation based on spatial modeling, e.g. spatial inter- or extrapolation} | 11/3206 | . . at discrete locations in the fibre, e.g. using Bragg scattering |
| 9/00 | Measuring temperature based on movements caused by redistribution of weight, e.g. tilting thermometer (not giving momentary value of temperature G01K 3/00) | 11/3213 | . . . using changes in luminescence, e.g. at the distal end of the fibres |
| 11/00 | Measuring temperature based upon physical or chemical changes not covered by groups G01K 3/00, G01K 5/00, G01K 7/00 or G01K 9/00 | 11/322 | . . using Brillouin scattering |
| 11/003 | . {using absorption or generation of gas, e.g. hydrogen} | 11/324 | . . using Raman scattering |
| 11/006 | . {using measurement of the effect of a material on microwaves or longer electromagnetic waves, e.g. measuring temperature via microwaves emitted by the object (G01K 17/003 , G01J 5/00 take precedence ; measuring the effect of a material on X-, gamma- or particle radiation G01K 11/30)} | 13/00 | Thermometers specially adapted for specific purposes |
| 11/02 | . using evaporation or sublimation, e.g. by observing boiling | 13/006 | . {for cryogenic purposes} |
| 11/04 | . . from material contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the vapour | 13/008 | . . {using microstructures, e.g. made of silicon} |
| 11/06 | . using melting, freezing, or softening | 13/02 | . for measuring temperature of moving fluids or granular materials capable of flow |
| 11/08 | . . of disposable test bodies, e.g. cone | 13/022 | . . {Suction thermometers} |
| 11/10 | . using sintering | 13/024 | . . of moving gases |
| 11/12 | . using changes in colour, translucency or reflectance | 13/026 | . . {of moving liquids} |
| 11/125 | . . using changes in reflectance | 13/028 | . . {for use in total air temperature [TAT] probes} |
| | | 13/04 | . for measuring temperature of moving solid bodies |
| | | 13/06 | . . in linear movement |
| | | 13/08 | . . in rotary movement |
| | | 13/10 | . for measuring temperature within piled or stacked materials (by special arrangements for conducting heat from the object to the sensitive heat element G01K 1/16) |
| | | 13/12 | . combined with sampling devices for measuring temperatures of samples of materials |
| | | 13/125 | . . {for siderurgical purposes} |

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| 13/20 | <ul style="list-style-type: none"> • Clinical contact thermometers for use with humans or animals | 17/20 | <ul style="list-style-type: none"> • . . . across a radiating surface, combined with ascertainment of the heat transmission coefficient { (materials therefor G01K 17/08) } |
| | WARNING | | |
| | Groups G01K 13/20 , G01K 13/25 , and G01K 13/252 are incomplete pending reclassification of documents from group G01K 5/22 . | 19/00 | Testing or calibrating calorimeters |
| | All groups listed in this Warning should be considered in order to perform a complete search. | 2201/00 | Application of thermometers in air-conditioning systems |
| 13/223 | <ul style="list-style-type: none"> • . {Infrared clinical thermometers, e.g. tympanic} | 2201/02 | <ul style="list-style-type: none"> • in vehicles |
| 13/25 | <ul style="list-style-type: none"> • . Protective devices therefor, e.g. sleeves preventing contamination | 2203/00 | Application of thermometers in cryogenics |
| 13/252 | <ul style="list-style-type: none"> • . . {for tympanic thermometers} | 2205/00 | Application of thermometers in motors, e.g. of a vehicle |
| 15/00 | Testing or calibrating of thermometers | 2205/02 | <ul style="list-style-type: none"> • for measuring inlet gas temperature |
| 15/002 | <ul style="list-style-type: none"> • {Calibrated temperature sources, temperature standards therefor (arrangements with respect to the cold junction of thermo-electric elements G01K 7/12)} | 2205/04 | <ul style="list-style-type: none"> • for measuring exhaust gas temperature |
| 15/005 | <ul style="list-style-type: none"> • {Calibration} | 2207/00 | Application of thermometers in household appliances |
| 15/007 | <ul style="list-style-type: none"> • {Testing} | 2207/02 | <ul style="list-style-type: none"> • for measuring food temperature |
| 17/00 | Measuring quantity of heat (measuring temperature by calorimetry G01K 3/00 - G01K 11/00; specially adapted for measuring thermal properties of materials, e.g. specific heat, heat of combustion G01N) | 2207/04 | <ul style="list-style-type: none"> • . for conservation purposes |
| 17/003 | <ul style="list-style-type: none"> • {for measuring the power of light beams, e.g. laser beams} | 2207/06 | <ul style="list-style-type: none"> • . for preparation purposes |
| 17/006 | <ul style="list-style-type: none"> • {Microcalorimeters, e.g. using silicon microstructures} | 2207/08 | <ul style="list-style-type: none"> • . with food recipients having temperature sensing capability |
| 17/02 | <ul style="list-style-type: none"> • Calorimeters using transport of an indicating substances, e.g. evaporation calorimeters | 2211/00 | Thermometers based on nanotechnology |
| 17/025 | <ul style="list-style-type: none"> • . {where evaporation, sublimation or condensation caused by heating or cooling, is measured} | 2213/00 | Temperature mapping |
| 17/04 | <ul style="list-style-type: none"> • Calorimeters using compensation methods {, i.e. where the absorbed or released quantity of heat to be measured is compensated by a measured quantity of heating or cooling} | 2215/00 | Details concerning sensor power supply |
| 17/06 | <ul style="list-style-type: none"> • Measuring quantity of heat conveyed by flowing media, e.g. in heating systems (G01K 17/02, G01K 17/04 take precedence){e.g. the quantity of heat in a transporting medium, delivered to or consumed in an expenditure device} | 2217/00 | Temperature measurement using electric or magnetic components already present in the system to be measured |
| 17/08 | <ul style="list-style-type: none"> • . based upon measurement of temperature difference {or of a temperature} | 2219/00 | Thermometers with dedicated analog to digital converters |
| 17/10 | <ul style="list-style-type: none"> • . . between an inlet and an outlet point, combined with measurement of rate of flow of the medium {if such, by integration during a certain time-interval} | | |
| 17/12 | <ul style="list-style-type: none"> • Indicating product of flow and temperature difference directly {or temperature} | | |
| 17/14 | <ul style="list-style-type: none"> • using mechanical means for both measurements | | |
| 17/16 | <ul style="list-style-type: none"> • using electrical {or magnetic} means for both measurements | | |
| 17/18 | <ul style="list-style-type: none"> • using electrical {or magnetic} means for one measurement and mechanical means for the other | | |
| 17/185 | <ul style="list-style-type: none"> • {where the indicating-instrument is driven electrically or magnetically by the temperature-measurement device and mechanically by the flow-measurement device} | | |