

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

- In this subclass, the following term is used with the meaning indicated :
 - "thermometer" includes thermally-sensitive elements not provided for in other subclasses.
- Attention is drawn to the Notes following the title of class [G01](#).
- 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.

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
 - 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 . . {expandable 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
 - 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
 - 7/203 {in an oscillator circuit}
 - 7/206 {in a potentiometer circuit}
 - 7/21 for modifying the output characteristic, e.g. linearising
 - 7/22 . . the element being a non-linear resistance, e.g. thermistor ([G01K 7/26](#) takes precedence)
 - 7/223 . . . {characterised by the shape of the resistive element}
 - 7/226 . . . {using microstructures, e.g. silicon spreading resistance}

- 7/24 . . . in a specially-adapted circuit, e.g. bridge circuit
- 7/245 {in an oscillator circuit}
- 7/25 for modifying the output characteristic, e.g. linearising
- 7/26 . . the element being an electrolyte
- 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 capacitive elements ([capacitors per se H01G](#))
- 7/343 . . {the dielectric constant of which is temperature dependant}
- 7/346 . . {for measuring temperature based on the time delay of a signal through a series of logical ports}
- 7/36 . using magnetic elements, e.g. magnets, coils ([magnetic elements per se H01F](#))
- 7/38 . . the variations of temperature influencing the magnetic permeability
- 7/40 . using ionisation of gases
- 7/42 . Circuits effecting compensation of thermal inertia; Circuits for predicting the stationary value of a temperature
- 2007/422 . . {Dummy objects used for estimating temperature of real objects}
- 7/425 . . {Thermal management of integrated systems}
- 7/427 . . {Temperature calculation based on spatial modeling, e.g. spatial inter- or extrapolation}
- 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](#))**
- 11/00 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](#)**
- 11/003 . {using absorption or generation of gas, e.g. hydrogen}
- 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](#))}
- 11/02 . using evaporation or sublimation, e.g. by observing boiling
- 11/04 . . from material contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the vapour
- 11/06 . using melting, freezing, or softening
- 11/08 . . of disposable test bodies, e.g. cone
- 11/10 . using sintering
- 11/12 . using changes in colour, translucency or reflectance
- 11/125 . . using changes in reflectance
- 11/14 . . of inorganic materials
- 11/16 . . of organic materials
- 11/165 . . . of organic liquid crystals
- 11/18 . . of materials which change translucency
- 11/20 . using thermoluminescent materials ([G01K 11/32](#) takes precedence)
- 11/22 . using measurement of acoustic effects
- 11/24 . . of the velocity of propagation of sound
- 11/26 . . of resonant frequencies
- 11/265 . . . {using surface acoustic wave [SAW]}
- 11/28 . using measurements of density {(measuring density in general [G01N 9/00](#))}
- 11/30 . using measurement of the effect of a material on X-radiation, gamma radiation or particle radiation
- 11/32 . using changes in transmittance, scattering or luminescence in optical fibres
- 11/3206 . . at discrete locations in the fibre, e.g. using Bragg scattering
- 11/3213 . . . using changes in luminescence, e.g. at the distal end of the fibres
- 11/322 . . using Brillouin scattering
- 11/324 . . using Raman scattering
- 13/00 Thermometers specially adapted for specific purposes**
- 13/006 . {for cryogenic purposes}
- 13/008 . . {using microstructures, e.g. made of silicon}
- 13/02 . for measuring temperature of moving fluids or granular materials capable of flow
- 13/022 . . {Suction thermometers}
- 13/024 . . of moving gases
- 13/026 . . {of moving liquids}
- 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}
- 13/20 . Clinical contact thermometers for use with humans or animals
- 13/223 . . {Infrared clinical thermometers, e.g. tympanic}
- 13/25 . . Protective devices therefor, e.g. sleeves preventing contamination
- 13/252 . . . {for tympanic thermometers}
- 15/00 Testing or calibrating of thermometers**
- 15/002 . {Calibrated temperature sources, temperature standards therefor (arrangements with respect to the cold junction of thermo-electric elements [G01K 7/12](#))}
- 15/005 . {Calibration}
- 15/007 . {Testing}
- 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](#))**
- 17/003 . {for measuring the power of light beams, e.g. laser beams}
- 17/006 . {Microcalorimeters, e.g. using silicon microstructures}
- 17/02 . Calorimeters using transport of an indicating substances, e.g. evaporation calorimeters
- 17/025 . . {where evaporation, sublimation or condensation caused by heating or cooling, is measured}
- 17/04 . 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}

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- 17/06 . 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}
- 17/08 . . based upon measurement of temperature difference {or of a temperature}
- 17/10 . . . 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 Indicating product of flow and temperature difference directly {or temperature}
- 17/14 using mechanical means for both measurements
- 17/16 using electrical {or magnetic} means for both measurements
- 17/18 using electrical {or magnetic} means for one measurement and mechanical means for the other
- 17/185 {where the indicating-instrument is driven electrically or magnetically by the temperature-measurement device and mechanically by the flow-measurement device}
- 17/20 . . . across a radiating surface, combined with ascertainment of the heat-transmission coefficient

19/00 Testing or calibrating calorimeters

2201/00 Application of thermometers in air-conditioning systems

- 2201/02 . in vehicles

2203/00 Application of thermometers in cryogenics

2205/00 Application of thermometers in motors, e.g. of a vehicle

- 2205/02 . for measuring inlet gas temperature
- 2205/04 . for measuring exhaust gas temperature

2207/00 Application of thermometers in household appliances

- 2207/02 . for measuring food temperature
- 2207/04 . . for conservation purposes
- 2207/06 . . for preparation purposes
- 2207/08 . . with food recipients having temperature sensing capability

2211/00 Thermometers based on nanotechnology

2213/00 Temperature mapping

2215/00 Details concerning sensor power supply

2217/00 Temperature measurement using electric or magnetic components already present in the system to be measured

2219/00 Thermometers with dedicated analog to digital converters