

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS (NOTES omitted)

INSTRUMENTS

G01 MEASURING (counting [G06M](#)); TESTING (NOTES omitted)

G01D MEASURING NOT SPECIALLY ADAPTED FOR A SPECIFIC VARIABLE; ARRANGEMENTS FOR MEASURING TWO OR MORE VARIABLES NOT COVERED IN A SINGLE OTHER SUBCLASS; TARIFF METERING APPARATUS; MEASURING OR TESTING NOT OTHERWISE PROVIDED FOR (means structurally associated with lightning or other over-voltage discharging apparatus for recording the operation thereof [G01R](#); displaying information in general [G09F](#); recording in a way which requires playback through a transducer [G11B](#))

NOTES

1. This subclass covers :
 - devices for indicating or recording the results of measurements, not peculiar to variables covered by a single other subclass;
 - analogous apparatus but in which the input is not a variable to be measured, e.g. a hand operation;
 - details of measuring instruments, which are of general interest;
 - measurement transducers not adapted solely for the measurement of a single specified variable and not provided for elsewhere, i.e. means for converting the output of a sensing member to another variable where the form or nature of the sensing member does not constrain the means for converting;
 - measuring or testing not otherwise provided for.
2. Attention is drawn to the Notes following the title of class [G01](#).

1/00	Measuring arrangements giving results other than momentary value of variable, of general application (G01D 3/00 takes precedence; in tariff metering apparatus G01D 4/00 ; transducers not specially adapted for a specific variable G01D 5/00 ; computing G06)	3/02	• with provision for altering or correcting the law of variation
		3/021	• • {using purely analogue techniques}
		3/022	• • {having an ideal characteristic, map or correction data stored in a digital memory}
1/02	• giving mean values, e.g. root means square values (measuring root mean square values of currents or voltages G01R 19/02)	3/024	• • for range change; Arrangements for substituting one sensing member by another
1/04	• giving integrated values (giving mean values G01D 1/02)	3/028	• mitigating undesired influences, e.g. temperature, pressure
1/06	• • by intermittent summation	3/032	• • affecting incoming signal, e.g. by averaging; gating undesired signals
1/08	• • • over fixed periods of time	3/036	• • on measuring arrangements themselves
1/10	• giving differentiated values	3/0365	• • • {the undesired influence being measured using a separate sensor, which produces an influence related signal}
1/12	• giving a maximum or minimum of a value	3/06	• with provision for operation by a null method
1/14	• giving a distribution function of a value, i.e. number of times the value comes within specified ranges of amplitude	3/063	• • {Comparing the measuring value with a reference value which periodically or incidentally scans the measuring range}
1/16	• giving a value which is a function of two or more values, e.g. product, ratio	3/066	• • {Balancing a force which represents the measuring value, by means of a reference force (force measuring per se G01L)}
1/18	• with arrangements for signalling that a predetermined value of an unspecified parameter has been exceeded (G01D 1/14 takes precedence; for a specified parameter, see the subclass relevant to this parameter, e.g. level of a liquid exceeded G01F , temperature exceeded G01K)	3/08	• with provision for safeguarding the apparatus, e.g. against abnormal operation, against breakdown
		3/10	• with provision for switching-in of additional or auxiliary indicators or recorders
3/00	Indicating or recording apparatus with provision for the special purposes referred to in the subgroups		

4/00	Tariff metering apparatus (tariff meters for measuring the time integral of electric power or current G01R 11/56 ; in taximeters G07B 13/00 ; coin-feed mechanisms therefor G07F)	5/06	. . acting through a wall or enclosure, e.g. by bellows, by magnetic coupling (in general F16)
4/002	. {Remote reading of utility meters }	5/08	. . Reducing the effects of friction, e.g. by applying vibrations
4/004	. . {Remote reading of utility meters to a fixed location }	5/10	. . Applying external forces to increase force available for operation of indicating or recording part
4/006	. . {Remote reading of utility meters to a non-fixed location, i.e. mobile location }	5/12	. using electric or magnetic means (G01D 5/06 takes precedence)
4/008	. {Modifications to installed utility meters to enable remote reading }	5/125	. . {characterised by a first part whose movement represents the measuring value, and by a second part which is moved by an external force in order to follow the movement of the first part (this group takes precedence on the following groups) }
4/02	. Details	5/14	. . influencing the magnitude of a current or voltage
4/04	. . Resetting-mechanisms, e.g. for indicating members (for mechanical counters G06M 1/28)	5/142	. . . {using Hall-effect devices (measuring magnetic variables using Hall-effect or other galvanomagnetic devices G01R 33/06) }
4/06	. . Arrangement of clutches between driving and indicating member, e.g. of hysteresis clutch (G01D 4/04 takes precedence)	5/145	. . . . {influenced by the relative movement between the Hall device and magnetic fields (see G01R 33/06) }
4/08	. . Transfer of indication from a counter into a summing counter (mechanical counters G06M) }	5/147	. . . . {influenced by the movement of a third element, the position of Hall device and the source of magnetic field being fixed in respect to each other }
4/10	. Maximum indicating or recording apparatus, i.e. where the tariff for a period is based on a maximum demand within that period	5/16	. . . by varying resistance
4/12	. . Apparatus for indicating or recording progressive maximum	5/165	. . . . by relative movement of a point of contact {or actuation} and a resistive track
4/14	. . Fixed-demand indicating or recording apparatus, i.e. where indication is made when a predetermined quantity has been consumed during a time interval greater or less than a predetermined time interval	5/1655	. . . . . {more than one point of contact or actuation on one or more tracks }
4/16	. Apparatus for indicating or recording maximum or minimum load hours	5/18	. . . by varying effective impedance of discharge tubes or semiconductor devices
4/18	. Apparatus for indicating or recording overconsumption with opposing torque which comes into effect when a predetermined level is exceeded, e.g. subtraction meters	5/20	. . . by varying inductance, e.g. by a movable armature
5/00	Mechanical means for transferring the output of a sensing member; Means for converting the output of a sensing member to another variable where the form or nature of the sensing member does not constrain the means for converting; Transducers not specially adapted for a specific variable (G01D 3/00 takes precedence ; specially adapted for apparatus giving results other than momentary value of variable G01D 1/00 ; sensing members, see the relevant subclasses , e.g. of G01 , H01 ; for converting a single current or a single voltage into a mechanical displacement G01R 5/00 ; specially adapted for high-voltage or high-current measuring arrangements G01R 15/04 , G01R 15/14 ; measuring currents or voltages using digital measurement techniques G01R 19/25 ; transmission systems for measured values, control or similar signals G08C , e.g. electrical signals G08C 19/00)	5/2006	. . . . {by influencing the self-induction of one or more coils (G01D 5/22 takes precedence) }
	NOTE	5/2013	. . . . . {by a movable ferromagnetic element, e.g. a core (G01D 5/2033 takes precedence) }
	The subgroups of this main group are distinguished by the means which is of major importance. Thus the mere application of other means for giving a final indication does not affect the classification.	5/202	. . . . . {by movable a non-ferromagnetic conductive element (G01D 5/2033 takes precedence) }
		5/2026	. . . . . . {constituting a short-circuiting element }
		5/2033	. . . . . . {controlling the saturation of a magnetic circuit by means of a movable element, e.g. a magnet }
		5/204	. . . . . {by influencing the mutual induction between two or more coils (G01D 5/22 takes precedence) }
		5/2046	. . . . . . {by a movable ferromagnetic element, e.g. a core }
		5/2053	. . . . . . {by a movable non-ferromagnetic conductive element }
		5/206	. . . . . . . {constituting a short-circuiting element }
		5/2066	. . . . . . . {by movement of a single coil with respect to a single other coil }
		5/2073	. . . . . . . {by movement of a single coil with respect to two or more coils }
		5/208	. . . . . . . . {using polyphase currents }
		5/2086	. . . . . . . . {by movement of two or more coils with respect to two or more other coils }
		5/2093	. . . . . . . . . {using polyphase currents }
5/02	. using mechanical means	5/22	. . . . differentially influencing two coils
5/04	. . using levers; using cams; using gearing (gearing in general F16)	5/2208	. . . . . {by influencing the self-induction of the coils }

- 5/2216 {by a movable ferromagnetic element, e.g. a core}
- 5/2225 {by a movable non-ferromagnetic conductive element}
- 5/2233 {constituting a short-circuiting element}
- 5/2241 {by controlling the saturation of a magnetic circuit by means of a movable element, e.g. a magnet}
- 5/225 {by influencing the mutual induction between the two coils}
- 5/2258 {by a movable ferromagnetic element, e.g. core}
- 5/2266 {especially adapted circuits therefor (measuring inductance per se G01R 27/261; measuring transformation ratio or coupling factor of windings per se G01R 29/20)}
- 5/2275 {by a movable non-ferromagnetic conductive element}
- 5/2283 {constituting a short-circuiting element}
- 5/2291 {Linear or rotary variable differential transformers (LVDTs/RVDTs) having a single primary coil and two secondary coils}
- 5/24 by varying capacitance
- 5/2405 {by varying dielectric}
- 5/241 by relative movement of capacitor electrodes
- 5/2412 {by varying overlap}
- 5/2415 {adapted for encoders}
- 5/2417 {by varying separation}
- 5/242 by carrying output of an electrodynamic device, e.g. a tachodynamo
- 5/243 influencing the phase or frequency of ac
- 5/244 influencing characteristics of pulses or pulse trains; generating pulses or pulse trains
- 5/24404 {Interpolation using high frequency signals}
- 5/24409 {Interpolation using memories}
- 5/24414 {Encoders having selectable interpolation factors}
- 5/24419 {Interpolation not covered by groups G01D 5/24404, G01D 5/24409 or G01D 5/24414}
- 5/24423 {Mounting means or means for restraining during shipping (G01D 5/24442 takes precedence)}
- 5/24428 {Error prevention}
- 5/24433 {by mechanical means}
- 5/24438 {Special design of the sensing element or scale}
- 5/24442 {by mounting means}
- 5/24447 {by energy backup}
- 5/24452 {Calibration}
- 5/24457 {Failure detection}
- 5/24461 {by redundancy or plausibility}
- 5/24466 {Comparison of the error value to a threshold}
- 5/24471 {Error correction}
- 5/24476 {Signal processing (G01D 5/2448 - G01D 5/24495 take precedence)}
- 5/2448 {Correction of gain, threshold, offset or phase control}
- 5/24485 {using other sensors}
- 5/2449 {using hard-stored calibration data}
- 5/24495 {using previous values}
- 5/245 using a variable number of pulses in a train
- 5/2451 {Incremental encoders (G01D 5/2454 takes precedence)}
- 5/2452 {incorporating two or more tracks having an (n, n+1, ...) relationship}
- 5/2454 {Encoders incorporating incremental and absolute signals}
- 5/2455 {with incremental and absolute tracks on the same encoder}
- 5/2457 {Incremental encoders having reference marks}
- 5/2458 {with incremental and absolute tracks on separate encoders}
- 5/246 by varying the duration of individual pulses
- 5/247 using time shifts of pulses
- 5/248 by varying pulse repetition frequency
- 5/249 using pulse code
- 5/2492 {Pulse stream}
- 5/2495 {Pseudo-random code}
- 5/2497 {Absolute encoders (G01D 5/2454 takes precedence)}
- 5/25 Selecting one or more conductors or channels from a plurality of conductors or channels, e.g. by closing contacts
- 5/251 one conductor or channel
- 5/2515 {with magnetically controlled switches, e.g. by movement of a magnet}
- 5/252 a combination of conductors or channels
- 5/2525 {with magnetically controlled switches, e.g. by movement of a magnet}
- 5/26 characterised by optical transfer means, i.e. using infra-red, visible, or ultra-violet light
- 5/262 {with optical projection of a pointer or a scale}
- 5/264 {Mechanical constructional elements therefor (G01D 5/28, G01D 5/32, G01D 5/39 and G01D 5/40 take precedence); Mechanical adjustment thereof}
- 5/266 {by interferometric means (G01D 5/353 takes precedence)}
- 5/268 {using optical fibres (G01D 5/28 - G01D 5/38 take precedence)}
- 5/28 with deflection of beams of light, e.g. for direct optical indication (G01D 5/40 takes precedence; {mechanical adjustment G01D 5/264})
- 5/285 {using a movable mirror}
- 5/30 the beams of light being detected by photocells
- 5/305 {controlling the movement of a following part}
- 5/32 with attenuation or whole or partial obturation of beams of light (G01D 5/40 takes precedence {; mechanical adjustment G01D 5/264})
- 5/34 the beams of light being detected by photocells
- 5/341 {controlling the movement of a following part}
- 5/342 {the sensed object being the obturating part}
- 5/344 {using polarisation (G01D 5/35303 takes precedence)}
- 5/345 {Polarising encoders}
- 5/347 using displacement encoding scales

- 5/34707 {Scales; Discs, e.g. fixation, fabrication, compensation}
- 5/34715 {Scale reading or illumination devices}
- 5/34723 {involving light-guides}
- 5/3473 {Circular or rotary encoders}
- 5/34738 {Axles; Driving or coupling means}
- 5/34746 {Linear encoders}
- 5/34753 {Carriages; Driving or coupling means}
- 5/34761 {Protection devices, e.g. caps; Blowing devices}
- 5/34769 {Sealing means}
- 5/34776 {Absolute encoders with analogue or digital scales}
- 5/34784 {with only analogue scales or both analogue and incremental scales}
- 5/34792 {with only digital scales or both digital and incremental scales}
- 5/353 influencing the transmission properties of an optical fibre
- 5/35303 {using a reference fibre, e.g. interferometric devices}
- 5/35306 {using an interferometer arrangement}
- 5/35309 {using multiple waves interferometer}
- 5/35312 {using a Fabry Perot}
- 5/35316 {using a Bragg gratings}
- 5/35319 {using other multiple wave interferometer}
- 5/35322 {using interferometer with one loop with several directions of circulation of the light, e.g. Sagnac interferometer}
- 5/35325 {using interferometer with two arms in reflection, e.g. Mickelson interferometer}
- 5/35329 {using interferometer with two arms in transmission, e.g. Mach-Zender interferometer}
- 5/35332 {using other interferometers}
- 5/35335 {Aspects of emitters or receivers used by an interferometer in an optical fibre sensor arrangement (using multiple sensor devices using multiplexing techniques [G01D 5/35383](#))}
- 5/35338 {using other arrangements than interferometer arrangements}
- 5/35341 {Sensor working in transmission}
- 5/35345 {using Amplitude variations to detect the measured quantity}
- 5/35348 {using stimulated emission to detect the measured quantity}
- 5/35351 {using other means to detect the measured quantity}
- 5/35354 {Sensor working in reflection}
- 5/35358 {using Backscattering to detect the measured quantity}
- 5/35361 {using inelastic backscattering, e.g. Rayleigh, to detect the measured quantity}
- 5/35364 {using elastic backscattering, i.e. Brillouin or Raman, to detect the measured quantity}
- 5/35367 {using reflected light other than backscattered to detect the measured quantity}
- 5/3537 {Optical fibre sensor using a particular arrangement of the optical fibre itself}
- 5/35374 {Particular layout of the fiber}
- 5/35377 {Means for amplifying or modifying the measured quantity}
- 5/3538 {using a particular type of fiber, e.g. fibre with several cores, PANDA fiber, fiber with an elliptic core or the like}
- 5/35383 {using multiple sensor devices using multiplexing techniques}
- 5/35387 {using wavelength division multiplexing}
- 5/3539 {using time division multiplexing}
- 5/35393 {using frequency division multiplexing}
- 5/35396 {using other forms of multiplexing}
- 5/36 Forming the light into pulses
- 5/363 {Direction discrimination}
- 5/366 {Particular pulse shapes}
- 5/38 by diffraction gratings
- 5/39 Scanning a visible indication of the measured value and reproducing this indication at the remote place, e.g. on the screen of a cathode ray tube ([mechanical adjustment G01D 5/264](#))
- 5/40 specially adapted for use with infra-red light ([mechanical adjustment G01D 5/264](#))
- 5/42 using fluid means
- 5/425 {characterised by a first part whose movement represents the measuring value, and by a second part which is moved by an external force in order to follow the movement of the first part ([this group takes precedence on the following groups](#))}
- 5/44 using jets of fluid
- 5/46 by deflecting or throttling the flow
- 5/48 using wave or particle radiation means ([G01D 5/26 takes precedence](#))
- 5/485 {using magnetostrictive devices}
- 5/50 derived from a radioactive source
- 5/52 detected by a counter tube
- 5/54 using means specified in two or more of groups [G01D 5/02](#), [G01D 5/12](#), [G01D 5/26](#), [G01D 5/42](#), and [G01D 5/48](#)

NOTES

1. For a combination of two or more of the means specified, the first applicable one of the subgroups below takes precedence over any others of these groups.
2. Classification is made in this group only if no other group can be selected as being predominantly applicable.

- 5/56 using electric or magnetic means
- 5/58 using optical means, i.e. using infra-red, visible or ultra-violet light
- 5/60 using fluid means
- 5/62 using wave or particle radiation means not covered by group [G01D 5/58](#)

7/00 Indicating measured values

- 7/002 {giving both analog and numerical indication}
- 7/005 {Indication of measured value by colour change}
- 7/007 {Indication of measured value by tactile means}
- 7/02 Indicating value of two or more variables simultaneously

- 7/04 . . using a separate indicating element for each variable
- 7/06 . . . Luminous indications projected on a common screen
- 7/08 . . using a common indicating element for two or more variables
- 7/10 . . . giving indication in co-ordinate form
- 7/12 . Audible indication of meter readings, e.g. for the blind
- 9/00 Recording measured values**
- 9/005 . {Solid state data-loggers}
- 9/02 . Producing one or more recordings of the values of a single variable
- 9/04 . . with provision for multiple or alternative recording
- 9/06 . . . Multiple recording, e.g. duplicating
- 9/08 giving both graphical and numerical recording
- 9/10 . . the recording element, e.g. stylus, being controlled in accordance with the variable, and the recording medium, e.g. paper roll, being controlled in accordance with time
- 9/12 . . . recording occurring continuously
- 9/14 with provision for altering speed of recording medium in accordance with the magnitude of the variable to be recorded
- 9/16 . . . recording occurring at separated intervals, e.g. by chopper bar
- 9/18 recording element actuated only upon change in value of variable
- 9/20 . . the recording element, e.g. stylus, being controlled in accordance with time and the recording medium, e.g. paper roll, being controlled in accordance with the variable
- 9/22 . . . recording occurring continuously
- 9/24 . . . recording occurring at separated intervals, e.g. by chopper bar
- 9/26 . . either the recording element, e.g. stylus, or the recording medium, e.g. paper roll, being controlled in accordance with both time and the variable
- 9/28 . Producing one or more recordings, each recording being of the values of two or more different variables ([G01D 9/38](#), [G01D 9/40](#) take precedence)
- 9/285 . . {producing additional marks (e.g. reference lines time marks)}
- 9/30 . . there being a separate recording element for each variable, e.g. multiple-pen recorder
- 9/32 . . there being a common recording element for two or more variables
- 9/34 . . . the variables being recorded in a predetermined sequence
- 9/36 in separate columns
- 9/38 . Producing one or more recordings, each recording being produced by controlling the recording element, e.g. stylus, in accordance with one variable and controlling the recording medium, e.g. paper roll, in accordance with another variable
- 9/40 . Producing one or more recordings, each recording being produced by controlling either the recording element, e.g. stylus or the recording medium, e.g. paper roll, in accordance with two or more variables
- 9/42 . Recording indications of measuring instruments by photographic means, e.g. of counters
- 11/00 Component parts of measuring arrangements not specially adapted for a specific variable** ([G01D 13/00](#), [G01D 15/00](#) take precedence)
- 11/02 . Bearings or suspensions for moving parts ([bearings in general F16C](#))
- 11/04 . . Knife-edge bearings
- 11/06 . . Strip or thread suspensions, e.g. in tension
- 11/08 . Elements for balancing moving parts
- 11/10 . Elements for damping the movement of parts
- 11/12 . . using fluid damping
- 11/14 . . using magnetic induction damping
- 11/16 . Elements for restraining, or preventing the movement of, parts, e.g. for zeroising ([caging of moving parts when not in use G01D 11/20](#))
- 11/18 . . Springs ([G01D 11/06](#) takes precedence)
- 11/20 . Caging devices for moving parts when not in use
- 11/22 . . automatically actuated
- 11/24 . Housings {; Casings for instruments}
- 11/245 . . {Housings for sensors (for particular sensors see the relevant subclasses, e.g. [G01J 5/04](#), [G01K 1/14](#), [G01L 19/14](#), [G01P 1/02](#), [G01R 1/04](#), [G10K 11/004](#))}
- 11/26 . . Windows; Cover glasses; Sealings therefor
- 11/28 . Structurally-combined illuminating devices
- 11/30 . Supports specially adapted for an instrument; Supports specially adapted for a set of instruments ([in general F16M](#); specially adapted for aircraft, or vehicles, see the relevant subclasses)
- 11/305 . . {Panel mounting of instruments}
- 13/00 Component parts of indicators for measuring arrangements not specially adapted for a specific variable**
- 13/02 . Scales; Dials
- 13/04 . . Construction
- 13/06 . . . Moving bands ([G01D 13/10](#) takes precedence)
- 13/08 . . . Rotating drums ([G01D 13/10](#) takes precedence)
- 13/10 . . . with adjustable scales; with auxiliary scales, e.g. vernier
- 13/12 . . Graduation
- 13/14 . . . for rotations of more than 360 degrees
- 13/16 . . . with staggered markings
- 13/18 . . . with raised or recessed markings
- 13/20 . . . with luminescent markings
- 13/22 . Pointers, e.g. settable pointer
- 13/24 . . for indicating a maximum or minimum
- 13/26 . . adapted to perform a further operation, e.g. making electrical contact
- 13/265 . . . {Pointers which conduct light}
- 13/28 . . with luminescent markings
- 15/00 Component parts of recorders for measuring arrangements not specially adapted for a specific variable**
- 15/005 . {Effaceable recording}
- 15/02 . Styli or other recording elements acting to mechanically deform or perforate the recording surface ([printing recording elements G01D 15/20](#))
- 15/04 . . acting to punch holes in the recording surface
- 15/06 . Electric recording elements, e.g. electrolytic
- 15/08 . . for spark erosion

G01D

- 15/10 . Heated recording elements acting on heatsensitive layers
- 15/12 . Magnetic recording elements
- 15/14 . Optical recording elements; Recording elements using X-or nuclear radiation
- 15/16 . Recording elements transferring recording material, e.g. ink, to the recording surface ([printing recording elements G01D 15/20](#); [implements for writing or drawing in general B43K](#))
- 15/18 . . Nozzles emitting recording material
- 15/20 . Recording elements for printing with ink or for printing by deformation or perforation of the recording surface, e.g. embossing
- 15/22 . Chopper bars for bringing recording element into contact with recording surface
- 15/24 . Drives for recording elements and surfaces not covered by [G01D 5/00](#)
- 15/26 . . operating by clockwork ([clockworks per se G04B, G04C](#))
- 15/28 . Holding means for recording surfaces; Guiding means for recording surfaces; Exchanging means for recording surfaces
- 15/30 . . for foldable strip charts
- 15/32 . . for circular charts
- 15/34 . Recording surfaces {(for printing or reproducing [B41M](#))}
- 15/342 . . {of circular shape}
- 15/345 . . {of cylindrical shape}
- 15/347 . . {Strip or Tape}
- 18/00** **Testing or calibrating of apparatus or arrangements provided for in groups**
[G01D 1/00 - G01D 15/00](#)
- 18/002 . {Automatic recalibration ([G01D 18/008](#) takes precedence)}
- 18/004 . . {Continuous recalibration}
- 18/006 . . {Intermittent recalibration}
- 18/008 . {with calibration coefficients stored in memory}
- 21/00** **Measuring or testing not otherwise provided for**
- 21/02 . Measuring two or more variables by means not covered by a single other subclass