

**CPC****COOPERATIVE PATENT CLASSIFICATION****G01P**

**MEASURING LINEAR OR ANGULAR SPEED, ACCELERATION, DECELERATION, OR SHOCK; INDICATING PRESENCE, ABSENCE, OR DIRECTION, OF MOVEMENT** (measuring or recording blood flow [A61B 5/02](#), [A61B 8/06](#); monitoring speed or deceleration of electrically-propelled vehicles [B60L 3/00](#); vehicle lighting systems adapted to indicate speed [B60Q 1/54](#); determining position or course in navigation, measuring ground distance in geodesy or surveying [G01C](#) ; combined measuring devices for measuring two or more variables of movement [G01C 23/00](#); measuring velocity of sound [G01H](#) ; measuring velocity of light [G01J 7/00](#); measuring direction or velocity of solid objects by reception or emission of radiowaves or other waves and based on propagation effects, e.g. Doppler effect, propagation time, direction of propagation, [G01S](#) ; measuring speed of nuclear radiation [G01T](#) ; measuring acceleration of gravity [G01V](#) ; { measuring or recording the speed of trains [B61L 23/00](#); speed indicators incorporated in motor vehicles [B60K 35/00](#); measuring frequency or phase [G01R](#) ; traffic control [G08G](#) })

**NOTE**

This subclass covers measuring direction or velocity of flowing fluids using propagation effects of radiowaves or other waves caused in the fluid itself, e.g. by laser anemometer, by ultrasonic flowmeter with "sing-around-system".

Attention is drawn to the Notes following the title of class [G01](#) .

**Guidance heading:****G01P 1/00****Details of instruments****G01P 1/003**

- . {used for damping }

**G01P 1/006**

- . {used for thermal compensation }

**G01P 1/02**

- . Housings

**G01P 1/023**

- . . {for acceleration measuring devices }

**G01P 1/026**

- . . {for speed measuring devices, e.g. pulse generator }

**G01P 1/04**

- . Special adaptations of driving means

**G01P 1/06**

- . Indicating or recording devices, e.g. for remote indication { (indicating or recording in general [G01D](#) ; registering or indicating working conditions of vehicles [G07C 5/00](#) ) }

**WARNING**

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**G01P 1/07**

- . indicating devices, e.g. for remote indication (indicating working conditions of vehicles

G07C 5/00)

- G01P 1/08 . . Arrangements of scales, pointers, lamps or acoustic indicators, e.g. in automobile speedometers
- G01P 1/10 . . . for indicating predetermined speeds
- G01P 1/103 . . . . {by comparing the value of the measured signal with one or several reference values (in general [G01R 17/00](#)) }
- G01P 1/106 . . . . {by comparing the time duration between two impulses with a reference time }
- G01P 1/11 . . . . by the detection of the position of the indicator needle
- G01P 1/12 . Recording devices ([indicating working conditions of vehicles G07C 5/00](#))
- G01P 1/122 . . {Speed recorders }
- G01P 1/125 . . . {with recording discs }
- G01P 1/127 . . {for acceleration values }
- G01P 1/14 . . for permanent recording { ([G01P 1/125 takes precedence](#)) }
- G01P 1/16 . . for erasable recording, e.g. magnetic recording

**G01P 3/00**

**Measuring linear or angular speed; Measuring differences of linear or angular speeds** ([G01P 5/00 to G01P 11/00 take precedence](#); {direction and speed indication [G01P 13/045](#) }; counting mechanisms [G06M](#) )

**NOTE**

The sub-groups of this group are distinguished by the method of measurement which is of major importance. Thus the mere application of other methods for giving a final indication does not affect the classification.

- G01P 3/02 . Devices characterised by the use of mechanical means
- G01P 3/04 . . by comparing two speeds
- G01P 3/06 . . . using a friction gear
- G01P 3/08 . . . using differential gearing
- G01P 3/10 . . by actuating an indicating element, e.g. pointer, for a fixed time
- G01P 3/12 . . by making use of a system excited by impact
- G01P 3/14 . . by exciting one or more mechanical resonance systems
- G01P 3/16 . . by using centrifugal forces of solid masses { ([governors G05D 13/10](#)) }
- G01P 3/18 . . . transferred to the indicator by mechanical means
- G01P 3/20 . . . transferred to the indicator by fluid means
- G01P 3/22 . . . transferred to the indicator by electric or magnetic means
- G01P 3/24 . . by using friction effects ([G01P 3/06 takes precedence](#))
- G01P 3/26 . Devices characterised by the use of fluids
- G01P 3/263 . . {by using fluidic impulse generators }
- G01P 3/266 . . {by using a vortex chamber }
- G01P 3/28 . . by using pumps
- G01P 3/30 . . by using centrifugal forces of fluids

- G01P 3/32 . . . in a rotary container communicating with a fixed container
- G01P 3/34 . . by using friction effects
- G01P 3/36 . Devices characterised by the use of optical means, e.g. using infra-red, visible, or ultra-violet light ([G01P 3/68](#) takes precedence; gyrometers using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams [G01C 19/64](#))
- G01P 3/363 . . {by using a ring laser (ring lasers in general [H01S 3/083](#)) }

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- G01P 3/366 . . {by using diffraction of light (for measuring speed of fluids [G01P 5/26](#)) }
- G01P 3/38 . . using photographic means
- G01P 3/40 . . using stroboscopic means
- G01P 3/42 . Devices characterised by the use of electric or magnetic means ([G01P 3/66](#) takes precedence; measuring electric or magnetic values in general [G01R](#) )
- G01P 3/44 . . for measuring angular speed ([G01P 3/56](#) takes precedence)
- G01P 3/443 . . . {mounted in bearings (bearings [F16C](#)) }
- G01P 3/446 . . . . {mounted between two axially spaced rows of rolling elements }
- G01P 3/46 . . . by measuring amplitude of generated current or voltage { (in general [G01R 19/00](#)) }
- G01P 3/465 . . . . {by using dynamo-electro tachometers or electric generator }
- G01P 3/48 . . . by measuring frequency of generated current or voltage { (in general [G01R 23/00](#)) }
- G01P 3/4802 . . . . {by using electronic circuits in general }
- G01P 3/4805 . . . . . {by using circuits for the electrical integration of the generated pulses (measuring impulse frequency by integration [G01R 23/09](#)) }
- G01P 3/4807 . . . . . {by using circuits for the detection of the pulses delivered by the ignition system of an internal combustion engine }
- G01P 3/481 . . . . of pulse signals
- G01P 3/4815 . . . . . {using a pulse wire sensor, e.g. Wiegand wire }
- G01P 3/482 . . . . . delivered by nuclear radiation detectors
- G01P 3/483 . . . . . delivered by variable capacitance detectors
- G01P 3/484 . . . . . delivered by contact-making switches
- G01P 3/486 . . . . . delivered by photo-electric detectors
- G01P 3/487 . . . . . delivered by rotating magnets
- G01P 3/488 . . . . . delivered by variable reluctance detectors
- G01P 3/489 . . . . . Digital circuits therefor
- G01P 3/49 . . . using eddy currents
- G01P 3/495 . . . . where the indicating means responds to forces produced by the eddy currents and the generating magnetic field
- G01P 3/4953 . . . . . {with a counter for the covered distance incorporated (measuring the covered distance [G01C 22/00](#)) }

- G01P 3/4956 . . . . . {with thermal compensation }
- G01P 3/50 . . . for measuring linear speed ([G01P 3/56](#) takes precedence)
- G01P 3/505 . . . {by using eddy currents }
- G01P 3/52 . . . by measuring amplitude of generated current or voltage
- G01P 3/54 . . . by measuring frequency of generated current or voltage
- G01P 3/56 . . . for comparing two speeds
- G01P 3/565 . . . {by measuring or by comparing the phase of generated current or voltage  
(phase comparators per se [H03D 13/00](#); phase measurement [G01R 25/00](#)) }
- G01P 3/58 . . . by measuring or comparing amplitudes of generated currents or voltage {  
(amplitude comparators [H03K 5/24](#)) }
- G01P 3/60 . . . by measuring or comparing frequency of generated currents or voltages {  
(frequency comparators [H03K 5/26](#)) }
  
- G01P 3/62 . . . Devices characterised by the determination or the variation of atmospheric pressure  
with height to measure the vertical components of speed ([measuring pressure in  
general G01L](#) )
  
- G01P 3/64 . . . Devices characterised by the determination of the time taken to traverse a fixed  
distance
- G01P 3/66 . . . using electric or magnetic means ([G01P 3/80](#) takes precedence; [measuring short  
time intervals G04F 8/00](#), [G04F 10/00](#))
- G01P 3/665 . . . {for projectile velocity measurements }
- G01P 3/68 . . . using optical means, i.e. using infra-red, visible, or ultra-violet light ([G01P 3/80  
takes precedence](#); { by reflection of waves [G01S 17/58](#) })
- G01P 3/685 . . . {for projectile velocity measurements }
- G01P 3/80 . . . using auto-correlation or cross-correlation detection means
- G01P 3/803 . . . {in devices of the type to be classified in [G01P 3/66](#) }
- G01P 3/806 . . . {in devices of the type to be classified in [G01P 3/68](#) }
  
- G01P 5/00** **Measuring speed of fluids, e.g. of air stream; Measuring speed of bodies relative to  
fluids, e.g. of ship, of aircraft** ([application of speed-measuring devices for measuring  
volume of fluid G01F](#) )
  
- G01P 5/001 . . . {Full-field flow measurement, e.g. determining flow velocity and direction in a whole  
region at the same time, flow visualisation }
  
- G01P 5/003 . . . {by measuring fluid level in front of an obstacle }
  
- G01P 5/005 . . . {by using a jet directed into the fluid }
- G01P 5/006 . . . {the jet used is composed of ionised or radioactive particles }
  
- G01P 5/008 . . . {by using an electrolyte added to the fluid }
  
- G01P 5/01 . . . by using swirlflowmeter
  
- G01P 5/02 . . . by measuring forces exerted by the fluid on solid bodies, e.g. anemometer
- G01P 5/04 . . . using deflection of baffle-plates
- G01P 5/06 . . . using rotation of vanes ([measuring speed of rotating shafts G01P 3/00](#))

- G01P 5/065 . . . {with mechanical coupling to the indicating device }
- G01P 5/07 . . . with electrical coupling to the indicating device
  
- G01P 5/08 . by measuring variation of an electric variable directly affected by the flow, e.g. by using dynamo-electric effect
- G01P 5/083 . . {by using electronic circuits for measuring the dynamoelectric effect }
- G01P 5/086 . . {by using special arrangements and constructions for measuring the dynamo-electric effect }
  
- G01P 5/10 . by measuring thermal variables
- G01P 5/12 . . using variation of resistance of a heated conductor
  
- G01P 5/14 . by measuring differences of pressure in the fluid
- G01P 5/16 . . using Pitot tubes, {e.g. Machmeter }
- G01P 5/165 . . . Arrangements or constructions of Pitot tubes
- G01P 5/17 . . . Coupling arrangements to the indicating device
- G01P 5/175 . . . with the determination of Mach number (analogue computers therefor [G06G 7/57](#))
  
- G01P 5/18 . by measuring the time taken to traverse a fixed distance
- G01P 5/20 . . using particles entrained by a fluid stream ([G01P 5/22](#) takes precedence)
- G01P 5/22 . . using auto-correlation or cross-correlation detection means
  
- G01P 5/24 . by measuring the direct influence of the streaming fluid on the properties of a detecting acoustical wave
- G01P 5/241 . . {by using reflection of acoustical waves, i.e. Doppler-effect }
- G01P 5/242 . . . {involving continuous, e.g. modulated or unmodulated, waves ([G01P 5/244](#) takes precedence) }
- G01P 5/244 . . . {involving pulsed waves }
- G01P 5/245 . . {by measuring transit time of acoustical waves (measuring propagation velocity of acoustical waves per se [G01H 5/00](#)) }
- G01P 5/247 . . . {Sing-around-systems }
- G01P 5/248 . . . {by measuring phase differences }
  
- G01P 5/26 . by measuring the direct influence of the streaming fluid on the properties of a detecting optical wave
  
- G01P 7/00** **Measuring speed by integrating acceleration** (measuring travelled distance by double integration of acceleration [G01C 21/16](#))
  
- G01P 9/00** **Measuring speed by using gyroscopic effect, e.g. using gas, using electron beam** (gyroscopes or turn-sensitive devices per se [G01C 19/00](#))
  
- NOTE**
- Absolute angular speed sensors are classified under [G01C 9/00](#) and s.gr.
  
- G01P 9/02 . using rotary gyroscopes

- G01P 9/04 . using turn-sensitive devices with vibrating masses, e.g. tuning-fork

**WARNING**

This group is not used in ECLA; its scope is covered by [G01C 19/56](#) and s.gr.

**G01P 11/00** **Measuring average value of speed** (by determining time taken to traverse a fixed distance [G01P 3/64](#), [G01P 5/18](#))

- G01P 11/02 . Measuring average speed of number of bodies, e.g. of vehicles for traffic control

**G01P 13/00** **Indicating or recording presence, absence, or direction, of movement** (electric switches [H01H](#) ; counting moving objects [G06M 7/00](#))

- G01P 13/0006 . {of fluids or of granulous or powder-like substances }
- G01P 13/0013 . . {by using a solid body which is shifted by the action of the fluid }
- G01P 13/002 . . . {with electrical coupling to the indicating devices }
- G01P 13/0026 . . {by using deflection of baffle-plates }
- G01P 13/0033 . . . {with electrical coupling to the indicating device }
- G01P 13/004 . . {by using the rotation of vanes }
- G01P 13/0046 . . . {with electrical coupling to the indicating device }
- G01P 13/0053 . . {by using dynamo-electric effect }
- G01P 13/006 . . {by using thermal variables }
- G01P 13/0066 . . {by using differences of pressure in the fluid }
- G01P 13/0073 . . {by using vibrations generated by the fluid }
- G01P 13/008 . { by using a window mounted in the fluid carrying tube [G01P 13/0013](#), [G01P 13/0026](#), [G01P 13/004](#) take precedence }
- G01P 13/0086 . . {with photo-electric detection }
- G01P 13/0093 . {by making use of products, e.g. chemical products added to the fluid in order to make the fluid flow visible }
- G01P 13/02 . Indicating direction only, e.g. by weather vane
- G01P 13/025 . . {indicating air data, i.e. flight variables of an aircraft, e.g. angle of attack, side slip, shear, yaw }
- G01P 13/04 . . Indicating positive or negative direction of a linear movement or clockwise or anti-clockwise direction of a rotational movement
- G01P 13/045 . . . {with speed indication }

**G01P 15/00** **Measuring acceleration; Measuring deceleration; Measuring shock, i.e. sudden change of acceleration**

- G01P 15/001 . {by measuring acceleration changes by making use of a triple differentiation of a displacement signal }
- G01P 15/003 . {Kinematic accelerometers, i.e. measuring acceleration in relation to an external

- reference frame, e.g. Ferratis accelerometers ([G01P 15/001](#), [G01P 15/16](#), [G01P 15/165](#) take precedence) }
- G01P 15/005 . . {measuring translational acceleration }
  - G01P 15/006 . {by making use of fluid seismic masses }
  - G01P 15/008 . . {by using thermal pick-up }
  - G01P 15/02 . by making use of inertia forces { using solid seismic masses } ([G01P 15/14](#) takes precedence)
  - G01P 15/03 . . by using non-electrical means
  - G01P 15/032 . . . {by measuring the displacement of a movable inertial mass }
  - G01P 15/034 . . . . {for indicating angular accelerations ([G01P 15/036](#) takes precedence) }
  - G01P 15/036 . . . . {for indicating predetermined acceleration values }
  - G01P 15/038 . . . {by using fluidic means }
  - G01P 15/04 . . for indicating maximum value
  - G01P 15/06 . . . using members subjected to a permanent deformation
  - G01P 15/08 . . with conversion into electric or magnetic values
  - G01P 15/0802 . . . {Details }
  - G01P 2015/0805 . . . being provided with a particular type of spring-mass-system for defining the displacement of a seismic mass due to an external acceleration
  - G01P 2015/0808 . . . . for defining in-plane movement of the mass, i.e. movement of the mass in the plane of the substrate
  - G01P 2015/0811 . . . . . for one single degree of freedom of movement of the mass
  - G01P 2015/0814 . . . . . for translational movement of the mass, e.g. shuttle type
  - G01P 2015/0817 . . . . . for pivoting movement of the mass, e.g. in-plane pendulum
  - G01P 2015/082 . . . . . for two degrees of freedom of movement of a single mass
  - G01P 2015/0822 . . . . for defining out-of-plane movement of the mass
  - G01P 2015/0825 . . . . . for one single degree of freedom of movement of the mass
  - G01P 2015/0828 . . . . . the mass being of the paddle type being suspended at one of its longitudinal ends
  - G01P 2015/0831 . . . . . the mass being of the paddle type having the pivot axis between the longitudinal ends of the mass, e.g. see-saw configuration
  - G01P 2015/0834 . . . . . the mass constituting a pendulum having the pivot axis disposed symmetrically between the longitudinal ends, the center of mass being shifted away from the plane of the pendulum which includes the pivot axis
  - G01P 2015/0837 . . . . . the mass being suspended so as to only allow movement perpendicular to the plane of the substrate, i.e. z-axis sensor
  - G01P 2015/084 . . . . . the mass being suspended at more than one of its sides, e.g. membrane-type suspension, so as to permit multi-axis movement of the mass
  - G01P 2015/0842 . . . . . the mass being of clover leaf shape
  - G01P 2015/0845 . . . . using a plurality of spring-mass systems being arranged on one common planar substrate, the systems not being mechanically coupled and the sensitive direction of each system being different
  - G01P 2015/0848 . . . . using a plurality of mechanically coupled spring-mass systems, the sensitive direction of each system being different



G01P 2015/0851	....	using a plurality of spring-mass systems, each system having a different range of sensitivity to acceleration
G01P 2015/0854	....	using a particular shape of the mass, e.g. annular
G01P 2015/0857	....	using a particular shape of the suspension spring
G01P 2015/086	.....	using a torsional suspension spring
G01P 2015/0862	...	being provided with particular means being integrated into a MEMS accelerometer structure for providing particular additional functionalities to those of a spring mass system
G01P 2015/0865	....	using integrated signal processing circuitry
G01P 2015/0868	....	using self-test structures integrated into the microstructure
G01P 2015/0871	....	using stopper structures for limiting the travel of the seismic mass
G01P 2015/0874	....	using means for preventing stiction of the seismic mass to the substrate
G01P 2015/0877	....	using integrated interconnect structures
G01P 2015/088	....	for providing wafer-level encapsulation
G01P 2015/0882	....	for providing damping of vibrations
G01P 15/0885	...	{by magnetostrictive pick-up }
G01P 15/0888	...	{for indicating angular acceleration }
G01P 15/0891	...	{with indication of predetermined acceleration values ( <a href="#">G01P 15/135</a> takes precedence) }
G01P 15/0894	...	{by non-contact electron transfer, i.e. electron tunneling }
G01P 15/0897	...	{by thermal pick-up ( <a href="#">G01P 15/008</a> takes precedence) }
G01P 15/09	...	{by piezo-electric pick-up }
G01P 15/0907	....	{of the compression mode type }
G01P 15/0915	....	{of the shear mode type }
G01P 15/0922	....	{of the bending or flexing mode type }
G01P 15/093	...	by photo-electric pick-up
G01P 15/097	...	by vibratory elements
G01P 15/0975	....	{by acoustic surface wave resonators or delay lines }
G01P 15/10	....	by vibratory strings
G01P 15/105	...	by magnetically sensitive devices
G01P 15/11	...	by inductive pick-up
G01P 15/12	...	by alteration of electrical resistance { ( <a href="#">G01P 15/0897</a> , <a href="#">G01P 15/105</a> take precedence) }
G01P 15/121	....	{by potentiometers }
G01P 15/122	....	{by metal resistance strain gauges, e.g. wire resistance strain gauges }
G01P 15/123	....	{by piezo-resistive elements, e.g. semiconductor strain gauges }
G01P 15/124	....	{by semiconductor devices comprising at least one PN junction, e.g. transistors }
G01P 15/125	...	by capacitive pick-up
G01P 15/13	...	by measuring the force required to restore a proofmass subjected to inertial forces to a null position
G01P 15/131	....	{with electrostatic counterbalancing means }
G01P 15/132	....	{with electromagnetic counterbalancing means }
G01P 15/133	....	{with piezo-electric counterbalancing means }



- G01P 15/135 . . . by making use of contacts which are actuated by a movable inertial mass
- G01P 15/14 . by making use of gyroscopes ([gyroscopes per se G01C 19/00](#))
- G01P 15/16 . by evaluating the time-derivative of a measured speed signal
- G01P 15/165 . . {for measuring angular accelerations }
- G01P 15/18 . in two or more dimensions
- G01P 21/00      Testing or calibrating of apparatus of devices covered by the preceding groups**
- G01P 21/02 . of speedometers
- G01P 21/025 . . {for measuring speed of fluids; for measuring speed of bodies relative to fluids ([for measuring volume flow G01F 25/0007](#)) }