

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](#)})

Definition statement

This place covers:

Means to measure linear or angular rate of change of position of solid bodies or fluid mediums (speed, velocity).

Means to measure rate of change of linear or angular speed or velocity (acceleration, deceleration, shock) of solid bodies or fluid mediums.

Means to indicate or record movement of solid bodies or fluid mediums (presence, absence or direction).

Means to test or calibrate apparatus or devices covered by this subclass.

References

Limiting references

This place does not cover:

| | |
|--|----------------------------|
| Combined measuring devices measuring two or more variables of movement, e.g. distance, speed, acceleration | G01C 23/00 |
| Measuring volume flow or mass flow | G01F |
| Measuring the velocity of ultrasonic, sonic (sound) or infrasonic waves | G01H 5/00 |
| Measuring velocity of light | G01J 7/00 |
| Measuring speed of nuclear or X-radiation | G01T |

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

| | |
|---|---|
| Measuring or recording blood flow | A61B 5/02 , A61B 8/06 |
| Monitoring speed or acceleration of electrically-propelled vehicles | B60L 3/00 |
| Vehicle optical or lighting devices adapted to indicate speed | B60Q 1/54 |

Application-oriented references

| | |
|---|----------------------------|
| Control, warning or like safety means along the route or between vehicles or vehicle trains | B61L 23/00 |
| For determining direction or velocity of solid objects by reflection or reradiation of radio or other waves and based on propagation effects, e.g. Doppler effect, propagation time, direction of propagation | G01S |
| Measuring acceleration of gravity | G01V 7/00 |

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| Instruments specially adapted for vehicles; Arrangement of instruments in or on vehicles | B60K 35/00 |
| Determining position or course in navigation, measuring ground distance in geodesy or surveying | G01C |
| Gyroscopes or turn-sensitive devices per se | G01C 19/00 |
| 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 5/00 |
| Measuring torque | G01L 3/00 |
| Testing structures or apparatus not otherwise provided for | G01M |
| Measuring frequency or phase | G01R |
| Instruments for indicating weather conditions by measuring two or more variables, e.g., humidity, pressure, temperature, cloud cover, wind speed | G01W 1/02 |
| Measuring short time intervals | G04F |
| Systems for control of linear speed, angular speed, acceleration or deceleration, e.g. governors | G05D 13/00 |
| Devices for counting moving objects in general | G06M |
| Registering or indicating the working conditions of vehicles | G07C 5/00 |
| Traffic control | G08G |

G01P 1/00**Details of instruments****Definition statement**

This place covers:

Aspects of housings, e.g. related to providing particular operational conditions for the sensors, or indicating devices or recording devices

G01P 1/02

Housings

Definition statement

This place covers:

Support / mountings of sensors;

Sensor housings; e.g. protection against environmental influences;

Housings: also sensor encapsulations, overmoulding, potting.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|-----------------------------|
| Component parts of measuring arrangements not specially adapted for a specific variable | G01D 11/245 |
|---|-----------------------------|

Special rules of classification

Means for mounting the sensor in a defined position or orientation should additionally classified in [G01P 1/00](#)

G01P 1/023

{for acceleration measuring devices}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|----------------------|
| Housings for microstructural devices or systems in general | B81B |
| Measuring frequency or phase | G01R |

Special rules of classification

For wafer-level encapsulation Indexing Code [G01P 2015/088](#) should be used.

G01P 1/04

Special adaptations of driving means

Definition statement

This place covers:

(Mechanical) transmission elements between rotating object (the speed of which is determined) and

The speed indicator; e.g. flexible tachometer shaft or gearings therefor.

G01P 1/122**{Speed recorders}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

| | |
|---|---------------------------|
| Indicating working conditions of vehicles | G07C 5/08 |
|---|---------------------------|

G01P 3/00

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

References**Limiting references***This place does not cover:*

| | |
|--|-----------------------------|
| Measuring speed of fluids, e.g. of air stream; Measuring speed of bodies relative to fluids, e.g. of ship, of aircraft | G01P 5/00 |
| Measuring speed by integrating acceleration | G01P 7/00 |
| Measuring average value of speed | G01P 11/00 |
| Direction and speed indication | G01P 13/045 |
| Inertial angular velocity / angular rate sensors using gyroscopic effects | G01C 19/00 |

Informative references*Attention is drawn to the following places, which may be of interest for search:*

| | |
|--|----------------------|
| Devices for counting moving objects in general | G06M |
|--|----------------------|

G01P 3/263**{by using fluidic impulse generators}****Definition statement***This place covers:*

(E.g. detection of cyclical modulation of fluid flow or pressure)

G01P 3/266**{by using a vortex chamber}****Definition statement***This place covers:*

Detection of deflection of fluid streams caused by gyroscopic effects.

G01P 3/36

Devices characterised by the use of optical means, e.g. using infrared, visible, or ultraviolet light ([G01P 3/68](#) takes precedence; gyrometers using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams [G01C 19/64](#))

Definition statement

This place covers:

E.g. spacial filtering; speckle velocimetry;

References

Limiting references

This place does not cover:

| | |
|--|---------------------------|
| Determination of time taken to traverse a fixed distance using optical means, i.e. using infrared, visible, or ultraviolet light | G01P 3/68 |
|--|---------------------------|

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|---|
| Evaluation of sequences of (video-) camera images and of image processing | G01P 3/38 ; |
| Gyrometers using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams | G01C 19/64 |
| Velocity measurements using electromagnetic waves per se | G01S 17/00 , G01S 17/58 |
| Determination of speed relative to a surface by using image analysis see also | G06T 7/20 |

Special rules of classification

When classifying in this group, classification should also be considered in [G01S 17/00](#), in particular [G01S 17/58](#)

G01P 3/366

{by using diffraction of light (for measuring speed of fluids [G01P 5/26](#))}

Definition statement

This place covers:

Optical velocity measurement exploiting the Doppler effect; e.g. LDA,LDV; determining velocity over rough surfaces.

References

Limiting references

This place does not cover:

| | |
|---------------------------|---------------------------|
| Measuring speed of fluids | G01P 5/26 |
|---------------------------|---------------------------|

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| General aspects, i.e. not related to rough surfaces, of optical Doppler measurements of velocity of solid objects | G01S 17/00 |
| Optical mice | G06F 3/00 |

G01P 3/44

for measuring angular speed ([G01P 3/56](#) takes precedence)

References**Limiting references**

This place does not cover:

| | |
|--|---------------------------|
| Use of electric or magnetic means for comparing two speeds | G01P 3/56 |
| Determination of speed of an electric motor being based on model assumptions of the motor (e.g. speed determination from back-EMF) | H02P |

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|-----------------------------|
| Speed sensors in internal combustion engines | F02D 41/345 |
| Speed sensors in electric motors; | H02K 11/21 |
| Speed sensors in commutatorless electric motors | H02K 29/14 |

G01P 3/443

{mounted in bearings (bearings [F16C](#))}

Definition statement

This place covers:

The pick-up, and/or the encoder being integrated in a bearing unit or being designed in a particular manner for the purpose of being integrated in the bearing unit;

The detector elements being directly mounted to the bearing rings or to seal arrangements of the bearing.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|-----------------------------|
| Sensors being integrated in bearing seals | F16J 15/326 |
|---|-----------------------------|

G01P 3/48

by measuring frequency of generated current or voltage {(in general [G01R 23/00](#))}

Definition statement

This place covers:

The detection of physical parameters for deriving frequency information, e.g. microwave pick-ups or acoustic pick-ups.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| Detection of fluid flow or pressure pulses see | G01P 3/263 |
| Arrangements for measuring frequencies in general | G01R 23/00 |

G01P 3/4802

{by using electronic circuits in general}

Definition statement

This place covers:

Using analogue circuits.

References**Limiting references**

This place does not cover:

| | |
|---|----------------------------|
| Digital circuits for measuring speed from pulse signals | G01P 3/489 |
|---|----------------------------|

G01P 3/481

of pulse signals

Definition statement

This place covers:

Conditioning of raw sensor signals in order to provide standardized signals (e.g. square pulses or sinusoidal signals) from which frequency, timing, phase information or directional information may be extracted.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|-----------------------------|
| Extraction of speed information only by analogue means to be classified in | G01P 3/4802 |
| Extraction of speed information from these standardized pulse signals by digital means to be classified in | G01P 3/489 |

| | |
|---|----------------------------|
| Extraction of information relating to the direction of movement to be classified in | G01P 13/04 |
|---|----------------------------|

G01P 3/486

delivered by photo-electric detectors

Definition statement

This place covers:

Detectors making use of encoders having optical properties.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|---|
| Optical speed detectors not using encoders | G01P 3/36 , G01P 3/68 |
|--|---|

G01P 3/487

delivered by rotating magnets

Definition statement

This place covers:

Rotating permanent magnets or encoders comprising sections of permanent magnets (hard magnetic material).

G01P 3/488

delivered by variable reluctance detectors

Definition statement

This place covers:

Encoders made of ferromagnetic (soft magnetic) materials;

Encoders made of electrically conductive materials in which induced eddy currents are generating the magnetic fields to be detected;

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| Encoders of electrically conductive materials where electrostatic fields are detected | G01P 3/483 |
| Rotating magnet encoders | G01P 3/487 |
| Eddy current in general | G01P 3/49 |

G01P 3/489

Digital circuits therefor

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|----------------------|-----------------------------|
| Analogue circuits in | G01P 3/4802 |
|----------------------|-----------------------------|

G01P 3/49

using eddy currents

Definition statement

This place covers:

Using eddy currents which are generated in continuous electrically conductive means.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|-----------------------------|
| Determination of acceleration using eddy current effects | G01P 15/003 |
|--|-----------------------------|

Special rules of classification

Magnetic detection of pulse signals originating from eddy currents being generated in encoders made of electrically conductive material (e.g. aluminum tooth wheel) are additionally classified in [G01P 3/488](#).

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](#))

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|---------------------------|
| Determination of barometric height per se | G01C 5/06 |
| Measuring pressure in general | G01L |

G01P 3/64

Devices characterised by the determination of the time taken to traverse a fixed distance

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|----------------------------|
| Vehicle speed measurement in traffic control systems | G08G 1/052 |
|--|----------------------------|

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](#))

Definition statement

This place covers:

Measuring of speed or velocity of fluids (liquids or gases) in an open space (e.g. wind velocity, velocity of air in a building).

Relationships with other classification places

[G01P 5/24](#) and [G01P 5/26](#) relate to the determination of velocity of fluids by using optical or acoustical waves, e.g. Doppler effect, propagation time, irrespective of the relevance of propagation effects.

[G01S](#) relates to the determination of velocity of fluids by using optical or acoustical waves, e.g. Doppler effect, propagation time, when propagation effects are relevant and therefore should also be considered for classification and search.

References

Limiting references

This place does not cover:

| | |
|---|----------------------|
| Application of fluid speed measurement where the purpose is to determine volume flow or mass flow through tubes | 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}

Definition statement

This place covers:

E.g. Flow field visualisation by tracers..

Special rules of classification

Further details of the sensors should additionally be classified in the subgroups according to the physical detection principle, e.g. [G01P 5/02](#), [G01P 5/26](#), [G01P 5/10](#), etc.

G01P 5/22

using auto-correlation or cross-correlation detection means

Definition statement

This place covers:

Characterisation of the collective movement of the particles of a volume section of the fluid stream

References**Limiting references**

This place does not cover:

| | |
|--|----------------------------|
| Using auto-correlation or cross-correlation detection means | G01P 5/22 |
| Determination of the speed of individual particles in the fluid stream | G01N 15/00 |

G01P 5/24

by measuring the direct influence of the streaming fluid on the properties of a detecting acoustical wave

Special rules of classification

When classifying in this group, classification should also be considered in [G01S 15/00](#)

G01P 5/26

by measuring the direct influence of the streaming fluid on the properties of a detecting optical wave

Definition statement

This place covers:

E.g. particle image velocimetry [PIV], speckle velocimetry, optical Doppler velocimetry..

Special rules of classification

When classifying in this group, classification should also be considered in [G01S 17/00](#), in particular [G01S 17/58](#), [G01S 17/95](#)

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

| | |
|-----|----------------------------|
| PIV | particle image velocimetry |
|-----|----------------------------|

G01P 7/00

Measuring speed by integrating acceleration (measuring travelled distance by double integration of acceleration [G01C 21/16](#))

Definition statement

This place covers:

Measuring speed by integrating acceleration.

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

| | |
|--|----------------------------|
| Electric or electronic controls for exercising apparatus of preceding groups | A63B 24/00 |
| Arrangements or fittings on vehicles for protecting or preventing injuries to occupants or pedestrians in case of accidents or other traffic risks | B60R 21/00 |
| Determining control parameters used in the regulation, e.g. by calculations involving measured or detected parameters | B60T 8/172 |
| Measuring travelled distance by double integration of acceleration | G01C 21/16 |
| Programme-control systems | G05B 19/00 |

G01P 11/00

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

Definition statement

This place covers:

Determining the average speed of a statistical ensemble.

References

Limiting references

This place does not cover:

| | |
|---|---------------------------|
| By determining time taken by solid bodies to traverse a fixed distance | G01P 3/64 |
| By determining time taken by fluid volumes to traverse a fixed distance | G01P 5/18 |

G01P 13/00

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

Definition statement

This place covers:

Only detection of presence or absence of movement

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| Counting moving objects | G06M 7/00 |
| Burglar, theft or intruder alarms with electrical actuation | G08B 13/00 |
| Electric switches | H01H |

G01P 13/02

Indicating direction only, e.g. by weather vane

Definition statement

This place covers:

Direction in two or more dimensions.

G01P 15/00

Measuring acceleration; Measuring deceleration; Measuring shock, i.e. sudden change of acceleration

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

| | |
|---|-----------------------------|
| Damage indicators on helmets | A42B 3/067 |
| In footwear | A43B 3/00 |
| Medical diagnostics | A61B 5/00 |
| Sensors for sports or training purposes | A63B 24/00 |
| Vehicle collision indicators | B60R 21/013 |
| Inclination detection | G01C 9/00 |
| Pedometers | G01C 22/00 |
| Data input devices | G06F 3/033 |

G01P 15/001

{by measuring acceleration changes by making use of a triple differentiation of a displacement signal}

Definition statement

This place covers:

General aspects of shock detection, impact detection.

Special rules of classification

Particular acceleration-related shock detection principles should also be classified in their relevant subgroups of [G01P 15/03](#) or [G01P 15/08](#).

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)}

Definition statement

This place covers:

Non-inertial sensors.

References**Limiting references**

This place does not cover:

| | |
|---|-----------------------------|
| Measuring acceleration by measuring acceleration changes by making use of a triple differentiation of a displacement signal | G01P 15/001 |
| Measuring acceleration by evaluating the time-derivative of a measured speed signal | G01P 15/16 |

G01P 15/008

{by using thermal pick-up}

Definition statement

This place covers:

E.g. using thermal pick-up being responsive to acceleration induced change of convection of air streams.

G01P 15/038

{by using fluidic means}

Definition statement

This place covers:

Detection of deflection of a fluid jet;

detection of fluid flow being influenced by acceleration induced movement of a solid mass.

References**Limiting references**

This place does not cover:

| | |
|--|-----------------------------|
| Inertial sensors having fluid seismic masses | G01P 15/006 |
|--|-----------------------------|

G01P 15/06

using members subjected to a permanent deformation

Definition statement

This place covers:

Mechanical shock indicators, e.g. breakable liquid filled vials, breakable or permanently deformable beams or membranes.

G01P 15/08

with conversion into electric or magnetic values

Special rules of classification

Further aspects of sensor devices covered by [G01P 15/08](#) but not provided for in any of its subgroups and not being related to the physical detection principle of displacement of seismic masses per se are mandatorily classified under the indexing scheme of [G01P 15/08](#).

G01P 15/0802

{Details}

Definition statement

This place covers:

Exclusively concerning details of the manufacture process (e.g. patterning of movable electrodes) or purely manufacture related structural elements of accelerometers (e.g. layered structure of a flexural beam).

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|---|
| General aspects of micromachining and of micromachined devices | B81B , B81C |
|--|---|

G01P 15/093

by photoelectric pick-up

Definition statement

This place covers:

Also including optical fibre accelerometers.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---------------------------------|----------------------------|
| Optical vibration detection | G01H 9/004 |
| Geophysical vibration detection | G01V 1/18 |

G01P 15/097**by vibratory elements****Definition statement**

This place covers:

Only those vibratory elements, which provide acceleration detection based on determination of acceleration dependent resonance frequency.

G01P 15/105**by magnetically sensitive devices****Definition statement**

This place covers:

E.g. Hall pick-ups, magnetoresistive pick-ups..

G01P 15/124

{by semiconductor devices comprising at least one PN junction, e.g. transistors}

Definition statement

This place covers:

Including acceleration responsive FETs.

G01P 15/125**by capacitive pick-up****Definition statement**

This place covers:

Structural aspects of sensor capacitors; circuits for capacitive pick-up.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|------------------------------------|------------------------------|
| Capacitive displacement sensors | G01D 5/24 |
| Measurement of capacitance per se | G01R 27/2605 |
| Switched capacitor networks per se | H03H 19/004 |
| Capacitive proximity switches | H03K 17/975 |

G01P 15/135

by making use of contacts which are actuated by a movable inertial mass

Definition statement

This place covers:

Single contacts for acceleration threshold measurement or wiper contacts for measurement over continuous acceleration ranges.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| Acceleration responsive switches per se | H01H 35/14 |
|---|----------------------------|

G01P 21/00

Testing or calibrating of apparatus or devices covered by the preceding groups

Definition statement

This place covers:

Testing or calibrating while sensor being mounted on calibration table or test bench or selftest or selfcalibration during use of the sensor.