G01P

MEASURING LINEAR OR ANGULAR SPEED, ACCELERATION, DECELERATION, OR SHOCK; INDICATING PRESENCE, ABSENCE,OR DIRECTION, OF MOVEMENT (measuring or recording blood flow A61B5/02, A61B8/06; monitoring speed or deceleration of electrically-propelled vehicles B60L3/00; vehicle lighting systems adapted to indicate speed B60Q1/54; 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 G01C23/00; measuring velocity of sound G01H; measuring velocity of light G01J7/00; 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; [N: measuring or recording the speed of trains B61L23/00; speed indicators incorporated in motor vehicles B60K35/00; measuring frequency or phase G01R; traffic control G08G])

Definition statement

This subclass/group 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 relevant to classification in this subclass

This subclass/group 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,	G01H 5/00

sonic (sound) or infrasonic waves	
Measuring velocity of light	G01J 7/00
Measuring speed of nuclear or X-radiation	G01T

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
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:

Speed indicators incorporated in motor 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	G01D 5/00

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	
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 subclass/group 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 subclass/group covers:
Support / mountings of sensors;

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

Housings: also sensor encapsulations, overmoulding, potting.

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 within this group

Means for mounting the sensor in a defined position or orientation should additionally classified in G01P 1/00

G01P 1/023

[N: for acceleration measuring devices]]

Informative references

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

Measuring frequency or phase	G01R
Housings for micro-structural devices or systems in general	B81B

Special rules of classification within this group

For wafer-level encapsulation Indexing Code G01P 2015/088 should be used.

G01P 1/04

Special adaptations of driving means

Definition statement

This subclass/group 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

[N: Speed recorders]]

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 (G01P5/00 to G01P11/00 take precedence; [N: direction and speed indication G01P13/045]; counting mechanisms G06M))

References relevant to classification in this group

This subclass/group 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 speed by using gyroscopic effect	G01P 9/00
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

[N: by using fluidic impulse generators]

Definition statement

This subclass/group covers:

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

G01P 3/266

[N: by using a vortex chamber]

Definition statement

This subclass/group 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 infra-red, visible, or ultra-violet light (G01P3/68 takes precedence; gyrometers using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams G01C19/64)

Definition statement

This subclass/group covers:

E.g. spacial filtering; speckle velocimetry;

References relevant to classification in this group

This subclass/group does not cover:

Determination of time taken to traverse a fixed distance using optical means, i.e. using infra-red, visible, or ultra-violet light	G01P 3/68

Informative references

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

Determination of speed relative to a surface by using image analysis see also	G06T 7/20
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
Evaluation of sequences of (video-) camera images and of image processing	G01P 3/38;

Special rules of classification within this group

When classifying in this group, classification should also be considered in G01S 17/00, in particular G01S 17/58

G01P 3/366

[N: by using diffraction of light (for measuring speed of fluids G01P5/26)]

Definition statement

This subclass/group covers:

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

References relevant to classification in this group

This subclass/group 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:

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

G01P 3/44

for measuring angular speed (G01P3/56 takes precedence)

References relevant to classification in this group

This subclass/group 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 41/34B4
Speed sensors in commutatorless electric motors	H02K 29/14
Speed sensors in electric motors;	H02K 11/0015

G01P 3/443

[N: mounted in bearings (bearings F16C)]

Definition statement

This subclass/group 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.

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 of voltage [N: (in general G01R23/00)]

Definition statement

This subclass/group covers:

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

Informative references

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

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

G01P 3/4802

[N: by using electronic circuits in general]

Definition statement

This subclass/group covers:

Using analogue circuits.

References relevant to classification in this group

This subclass/group does not cover:

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

G01P 3/481

of pulse signals

Definition statement

This subclass/group 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.

Informative references

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

Extraction of speed information from these standardized pulse signals by digital means to be classified in	G01P 3/489
Extraction of speed information only by analogue means to be classified in	G01P 3/4802
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 subclass/group covers:

Detectors making use of encoders having optical properties.

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 subclass/group 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 subclass/group 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;

Informative references

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

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

G01P 3/489

Digital circuits therefor

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 subclass/group covers:

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

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 within this group

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)

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

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 subclass/group covers:

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

Relationship between large subject matter areas

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 relevant to classification in this group

This subclass/group does not cover:

Application of fluid speed measurement where the purpose is to determine volume flow or mass flow	G01F

through tubes	

G01P 5/001

[N: Full-field flow measurement, e.g. determining flow velocity and direction in a whole region at the same time, flow visualisation]

Definition statement

This subclass/group covers:

E.g. Flow field visualisation by tracers..

Special rules of classification within this group

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 subclass/group covers:

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

References relevant to classification in this group

This subclass/group 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 within this group

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 subclass/group covers:

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

Special rules of classification within this group

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 subclass/group, 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 G01C21/16)

Definition statement

This subclass/group covers:

Measuring speed by integrating acceleration.

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this group 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 9/00

Measuring speed by using gyroscopic effect, e.g. using gas, using electron beam (gyroscopes or turn-sensitive devices per se G01C19/00)

References relevant to classification in this group

This subclass/group does not cover:

Using turn-sensitive devices or angular rate sensors using vibrating masses	G01C 19/56
Determination of linear velocity by using the gyroscopic effect	G01P 3/50

Informative references

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

Measurement of acceleration making use of gyroscopes	G01P 15/14
Gyroscopes or turn-sensitive devices per se	G01C 19/00

Special rules of classification within this group

Recently subject to changes in IPC:

In ECLA not to be used any more;

All documents related to angular velocity or angular rate measurement based on the gyroscopic effect are classified in G01C 19/00

G01P 11/00

Measuring average value of speed (by determining time taken to traverse a fixed distance G01P3/64, G01P5/18)

Definition statement

This subclass/group covers:

Determining the average speed of a statistical ensemble.

References relevant to classification in this group

This subclass/group 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 G06M7/00)

Definition statement

This subclass/group covers:

Only detection of presence or absence of movement

Informative references

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

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

G01P 13/02

Indicating direction only, e.g. by weather vane

Definition statement

This subclass/group covers:

Direction in two or more dimensions.

G01P 15/00

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

References relevant to classification in this group

This subclass/group does not cover:

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

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

G01P 15/001

[N: by measuring acceleration changes, e.g. by using or based on triple differentiation of a displacement signal]

Definition statement

This subclass/group covers:

General aspects of shock detection, impact detection.

Special rules of classification within this group

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

[N: Kinematic accelerometers, i.e. measuring acceleration in relation to an external reference frame, e.g. Ferraris accelerometers (G01P15/001, G01P15/16, G01P15/165 take precedence)]

Definition statement

This subclass/group covers:

Non-inertial sensors.

References relevant to classification in this group

This subclass/group 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

[N: by using thermal pick-up]

Definition statement

This subclass/group covers:

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

G01P 15/038

[N: by using fluidic means]

Definition statement

This subclass/group covers:

Detection of deflection of a fluid jet;

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

References relevant to classification in this group

This subclass/group 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 subclass/group 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 within this group

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

[N: Details of manufacture]

Definition statement

This subclass/group 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).

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 photo-electric pick-up

Definition statement

This subclass/group covers:

Also including optical fibre accelerometers.

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 subclass/group 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 subclass/group covers:
E.g. Hall pick-ups, magnetoresistive pick-ups..

G01P 15/124

[N: by semiconductor devices comprising at least one PN junction, e.g. transistors]

Definition statement

This subclass/group covers:
Including acceleration responsive FETs.

G01P 15/125

by capacitive pick-up

Definition statement

This subclass/group covers:
Structural aspects of sensor capacitors; circuits for capacitive pick-up.

Informative references

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

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

G01P 15/135

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

Definition statement

This subclass/group covers:

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

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 of devices covered by the preceding groups

Definition statement

This subclass/group covers:

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