NOTE

Attention is drawn to the Notes following the title of class G01.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Measuring volume flow

1/00  Measuring the volume flow or mass flow of fluid or fluent solid material wherein the fluid passes through the meter in a continuous flow (measuring a proportion of the volume flow G01F 5/00; measuring speed of flow G01P 5/00; indicating presence or absence of flow G01P 13/00; regulating quantity or ratio {G05D 7/00, G05D 11/02})

NOTE

G01F 1/72, G01F 1/74 and G01F 1/76 take precedence over G01F 1/05 - G01F 1/68

1/002  .  [specially adapted to be used in open channels]
1/005  .  [using floats]
1/007  .  [by measuring the level variations of storage tanks relative to the time]
1/05  .  by using mechanical effects
1/053  .  [using rotating vanes with tangential and axial admission]
1/056  .  [Orbital ball flowmeters]
1/06  .  using rotating vanes with tangential admission
1/065  .  [with radiation as transfer means to the indicating device, e.g. light transmission]
1/07  .  with mechanical coupling to the indicating device
1/075  .  with magnetic or electromagnetic coupling to the indicating device
1/0755  .  [with magnetic coupling only in a mechanical transmission path]
1/08  .  .  .  adjusting, correcting or compensating means therefor
1/10  .  .  .  using rotating vanes with axial admission
1/103  .  .  .  [with radiation as transfer means to the indicating device, e.g. light transmission]
1/106  .  .  .  [with electrostatic coupling to the indicating device]
1/11  .  .  .  with mechanical coupling to the indicating device
1/115  .  .  .  with magnetic or electromagnetic coupling to the indicating device
1/1155  .  .  .  [with magnetic coupling only in a mechanical transmission path]
1/12  .  .  .  adjusting, correcting, or compensating means therefor
1/125  .  .  .  [with electric, electro-mechanical or electronic means]
1/20  .  .  .  by detection of dynamic effects of the fluid flow
1/203  .  .  .  [Jet stream flowmeters]
1/206  .  .  .  [Measuring pressure, force or momentum of a fluid flow which is forced to change its direction]
1/22  .  .  .  by variable-area meters [., e.g. rotameters]
1/24  .  .  .  with magnetic or electric coupling to the indicating device
1/26  .  .  .  .  of the valve type
1/28  .  .  .  .  by drag-force, e.g. vane type or impact flowmeter
1/30  .  .  .  .  for fluent solid material
1/32 . . . by swirl flowmeter, e.g. using Karmann vortices
1/3209 . . . [using Karmann vortices]  
1/3218 . . . [bluff body design]  
1/3227 . . . [using fluidic oscillators (fluidic oscillators per se F15C 1/00)]  
1/3236 . . . [using guide vanes as swirling means]  
1/3245 . . . [detection means for swirl flowmeters (detection means in general G01H)]  
1/3254 . . . [for detecting fluid pressure oscillations]  
1/3263 . . . [by sensing mechanical vibrations]  
1/3272 . . . [for detecting fluid speed oscillations by thermal sensors]  
1/3281 . . . [for detecting variations in infrasonic, sonic or ultrasonic waves, due to modulation by passing through the swirling fluid]  
1/329 . . . [circuits therefore]  
1/34 . . . by measuring pressure or differential pressure  
1/36 . . . the pressure or differential pressure being created by the use of flow construction  
1/363 . . . [with electrical or electro-mechanical indication (G01F 1/37 and G01F 1/38 take precedence)]  
1/366 . . . [with mechanical or fluidic indication (G01F 1/37 and G01F 1/38 take precedence)]  
1/37 . . . the pressure or differential pressure being measured by means of communicating tubes or reservoirs with movable fluid levels, e.g. by U-tubes  
1/372 . . . [with electrical or electro-mechanical indication]  
1/375 . . . [with mechanical or fluidic indication]  
1/377 . . . [using a ring-balance as indicating element]  
1/38 . . . the pressure or differential pressure being measured by means of a movable element, e.g. diaphragm, piston, Bourdon tube or flexible capsule  
1/383 . . . [with electrical or electro-mechanical indication]  
1/386 . . . [with mechanical or fluidic indication]  
1/40 . . . Details or construction of the flow construction devices  
1/42 . . . Orifices or nozzles  
1/44 . . . Venturi tubes  
1/46 . . . Pitot tubes (specially adapted for measuring speed of fluids G01P 5/165)  
1/48 . . . the pressure of differential pressure being created by a capillary element  
1/50 . . . Correcting or compensating means  
1/52 . . . by measuring the height of the fluid level due to the lifting powder of the fluid flow  
1/54 . . . by means of chains, flexible bands or wires introduced into and moved by the flow  
1/56 . . . by using electric or magnetic effects (G01F 1/66 takes precedence)  
1/58 . . . by electromagnetic flowmeters  
1/582 . . . [without electrodes]  
1/584 . . . [constructions of electrodes, accessories therefor]  
1/586 . . . [constructions of coils, magnetic circuits, accessories therefor (G01F 1/582 takes precedence; magnet; inductances; transformers; selection of materials for their magnetic properties per se H01F)]  
1/588 . . . [combined constructions of electrodes, coils or magnetic circuits, accessories therefor]  
1/60 . . . Circuits therefor  
1/64 . . . by measuring electrical currents passing through the fluid flow; measuring electrical potential generated by the fluid flow, e.g. by electrochemical, contact or friction effects (G01F 1/58 takes precedence)  
1/66 . . . by measuring frequency, phaseshift, or propagation time of electromagnetic or other waves, e.g. ultrasonic flowmeters  
1/661 . . . [using light]  
1/662 . . . [Constructional details]  
1/663 . . . [by measuring Doppler frequency shift]  
1/665 . . . [of the drag-type]  
1/666 . . . [by detecting noise and sounds generated by the flowing fluid]  
1/667 . . . [Schematic arrangements of transducers of ultrasonic flowmeters; Circuits therefor (G01F 1/663, G01F 1/665, G01F 1/666 take precedence)]  
1/668 . . . [Compensating or correcting for variations in velocity of sound]  
1/68 . . . by using thermal effects  
1/684 . . . Structural arrangements; Mounting of elements, e.g. in relation to fluid flow  
1/6842 . . . [with means for influencing the fluid flow]  
1/6845 . . . [Micromachined devices]  
1/6847 . . . [where sensing or heating elements are not disturbing the fluid flow, e.g. elements mounted outside the flow duct]  
1/688 . . . using a particular type of heating, cooling or sensing element ([G01F 1/6847 takes precedence)]  
1/6882 . . . [making use of temperature dependence of acoustic properties, e.g. propagation speed of surface acoustic waves]  
1/6884 . . . [making use of temperature dependence of optical properties]  
1/6886 . . . [Pyroelectric elements]  
1/6888 . . . [Thermoelectric elements, e.g. thermocouples, thermopiles]  
1/69 . . . of resistive type  
1/692 . . . Thin-film arrangements  
1/696 . . . Circuits therefor, e.g. constant-current flow meters  
1/6965 . . . [comprising means to store calibration data for flow signal calculation or correction]  
1/698 . . . Feedback or rebalancing circuits, e.g. self heated constant temperature flowmeters  
1/6983 . . . [adapted for burning-off deposits]  
1/6986 . . . [with pulsed heating, e.g. dynamic methods]  
1/699 . . . by control of a separate heating or cooling element  
1/704 . . . using marked regions or existing inhomogeneities within the fluid stream, e.g. statistically occurring variations in a fluid parameter (G01F 1/76, G01F 25/00) take precedence)  
1/7042 . . . [using radioactive tracers]
Measuring volume flow

- Devices for measuring pulsing fluid flows
- Devices for measuring flow of a fluid or flow of a fluent solid material in suspension in another fluid
- Devices for measuring mass flow of a fluid or a fluent solid material (weighing a continuous stream of material during flow [G01G 11/00])

1/78 Direct mass flowmeters
1/785 [using fluidic bridge circuits]
1/80 operating by measuring pressure, force, momentum, or frequency of a fluid flow to which a rotational movement has been imparted
1/82 using a driven wheel as impeller and one or more other wheels or moving elements which are angularly restrained by a resilient member, e.g. spring member as the measuring device
1/84 Gyroscopic mass flowmeters
1/8404 [details of flowmeter manufacturing methods]
1/8409 [constructional details]
1/8413 [means for influencing the flowmeter's motional or vibrational behaviour, e.g., conduit support or fixing means, or conduit attachments]
1/8418 [motion or vibration balancing means]
1/8422 [exciters]
1/8427 [detectors]
1/8431 [electronic circuits]
1/8436 [signal processing]
1/844 [microfluidic or miniaturised flowmeters]
1/8445 [micromachined flowmeters]
1/845 [arrangements of measuring means, e.g., of measuring conduits]
1/8454 [rotating or rotarily suspended measuring conduits]
1/8459 [vibrating means being located inside the measuring conduits]
1/8463 [the measuring conduits' cross-section being deformed during measurement, e.g. by periodically deflecting a portion of the conduits' surface]
1/8468 [vibrating measuring conduits]
1/8472 [having curved measuring conduits, i.e. whereby the measuring conduits' curved center line lies within a plane (G01F 1/8481 takes precedence)]
1/8477 [with multiple measuring conduits]
1/8481 [having loop-shaped measuring conduits, e.g. the measuring conduits form a loop with a crossing point]
1/8486 [with multiple measuring conduits]
1/849 [having straight measuring conduits]
1/8495 [with multiple measuring conduits]
1/86 Indirect mass flowmeters, e.g. measuring volume flow and density, temperature or pressure
1/88 with differential pressure measurement to determine the volume flow
1/90 with positive displacement meter or turbine meter to determine the volume flow
Measuring volume flow

Metering by volume

11/00 Apparatus requiring external operation and adapted at each repeated and identical operation to measure and separate a predetermined volume of fluid or fluent solid material from a supply or container without regard to weight and to deliver it

11/003 . . . [for fluent solid material]
11/006 . . . [Details or accessories (general details G01F 15/00)]
11/02 . . . with measuring chambers which expand or contract during measurement
11/021 . . . [of the piston type (G01F 11/04 takes precedence)]
11/022 . . . [of the gun type and actuated by fluid pressure or by a motor (air-operated grease guns F16N 5/02; devices to fill holes or cracks B05C 17/002)]
11/023 . . . [with provision for varying the stroke of the piston]
11/024 . . . [the pistons reciprocating in rotatable cylinders (dough-dividing machines with division boxes in a revolving body with radially-working pistons A21C 5/04)]
11/025 . . . [with manually operated pistons (G01F 19/005 takes precedence)]
11/026 . . . [of the gun type (hand operated grease guns F16N 3/12)]
11/027 . . . [of the syringe type]
11/028 . . . [the dosing device being provided with a dip tube and fitted to a container, e.g. to a bottleneck]
11/029 . . . [provided with electric controlling means (G01F 11/022 and G01F 11/024 take precedence)]
11/04 . . . of the free-piston type
11/06 . . . with provision for varying the stroke of the piston
11/08 . . . of the diaphragm or bellows type (diaphragms or bellows therefor G01F 13/16)
11/082 . . . [of the squeeze container type (using squeeze bottles or the like for soap A47K 5/122)]
11/084 . . . [using a bulb to pressurise the fluid to be dispersed]
11/086 . . . [using an auxiliary pressure to cooperate with the diaphragm or bellows]
11/088 . . . [using a deformable conduit-like element]
11/10 . . . with measuring chambers moved during operation
11/12 . . . of the valve type, i.e. the separating being effected by fluid-tight or powder-tight movements (involving the tilting or inverting of the supply vessel G01F 11/26)
11/125 . . . [of the peristaltic pump type (peristaltic pumps per se F04B 43/12)]
11/14 . . . wherein the measuring chamber reciprocates
11/16 . . . for liquid or semi-liquid
11/18 . . . for fluent solid material
11/20 . . . wherein the measuring chamber rotates or oscillates
11/22 . . . for liquid or semi-liquid
11/24 . . . for fluent solid material
11/26 . . . wherein the measuring chamber is filled and emptied by tilting or inverting the supply vessel, e.g. bottle emptying apparatus
11/261 . . . [for fluent solid material]
11/262 . . . [for liquid or semi-liquid]
11/263 . . . . . . . [with valves]
11/265 . . . . . . . [of the ball type]
11/266 . . . . . . . [using the syphonic effect]
11/267 . . . . . . . [with counters for counting the numbers of measures delivered]
11/268 . . . . . . . [with provision for varying the volume to be delivered]
11/28 . . . with stationary measuring chambers having constant volume during measurement (with measuring chambers which expand or contract during measurement G01F 11/02)
11/282 . . . [for fluent solid material not provided for in G01F 11/34, G01F 11/40, G01F 11/46]
11/284 . . . [combined with electric level detecting means (G01F 11/282, G01F 11/30 - G01F 11/46 take precedence)]
11/286 . . . [where filling of the measuring chamber is effected by squeezing a supply container that is in fluid connection with the measuring chamber and excess fluid is sucked back from the measuring chamber during relaxation of the supply container]
11/288 . . . [squeezing of the supply vessel causing filling of the measuring chamber and backflow from the measuring chamber to the supply vessel being prevented by a check valve (G01F 11/46 take precedence)]
Metering by volume

11/30 . . with supply and discharge valves of the lift or plug-lift type
11/32 . . for liquid or semiliquid
11/34 . . for fluent solid material
11/36 . . with supply and discharge valves of the rectilinearly-moved slide type
11/38 . . for liquid or semiliquid
11/40 . . for fluent solid material
11/42 . . with supply and discharge valves of the rotary or oscillatory type
11/44 . . for liquid or semiliquid
11/46 . . for fluent solid material

13/00 Apparatus for measuring by volume and delivering fluids or fluent solid materials, not provided for in the preceding groups

13/001 . . [for fluent solid material]
13/003 . . [comprising a conveyor belt]
13/005 . . [comprising a screw conveyor]
13/006 . . [measuring volume in function of time]
13/008 . . [taps comprising counting- and recording means (counting devices, counting of objects in general G06M)]

15/00 Details of, or accessories for, apparatus of the preceding groups insofar as such details or appliances are not adapted to particular types of such apparatus

15/001 . . [Means for regulating or setting the meter for a predetermined quantity]
15/002 . . [for gases]
15/003 . . [using electromagnetic, electric or electronic means (G01F 15/002, G01F 15/02 take precedence)]
15/005 . . [Valves (valves in general FI6K)]
15/006 . . [characterised by the use of a particular material, e.g. anti-corrosive material (G01F 15/14 takes precedence)]
15/007 . . [comprising means to prevent fraud]
15/008 . . [comprising lubricating means]
15/02 . . [Compensating or correcting for variations in pressure, density or temperature]
15/022 . . [using electrical means]
15/024 . . . [involving digital counting]
15/026 . . . [using means to maintain zero differential pressure across the motor (G01F 1/08 and G01F 1/12 take precedence)]
15/028 . . . [for low flow rates]
15/04 . . . of gases to be measured
15/043 . . . . [using electrical means]
15/046 . . . . . [involving digital counting]
15/06 . . Indicating or recording devices, e.g. for remote indication
15/061 . . . . [for remote indication]
15/063 . . . . [using electrical means]
15/065 . . . . [with transmission devices, e.g. mechanical]
15/066 . . . . [involving magnetic transmission devices]
15/068 . . . . [with electrical means (G01F 15/063 takes precedence)]
15/07 . . Integration to give total flow, e.g. using mechanically-operated integration mechanisms
15/075 . . . [using electrically operated integrating means]
15/0755 . . . [involving digital counting]

15/08 . . Air or gas separators in combination with liquid meters; Liquid separators in combination with gas meters
15/10 . . Preventing damage by freezing or excess pressure or insufficient pressure
15/105 . . . (Preventing damage by hydraulic shocks)
15/12 . . Cleaning arrangements; Filters (filters in general B01D)
15/125 . . . [Filters]
15/14 . . Casings, e.g. of special material
15/16 . . Diaphragms; Bellows; Mountings therefor
15/18 . . Supports or connecting means for meters
15/185 . . . [Connecting means, e.g. bypass conduits]

Measuring volume

17/00 Methods or apparatus for determining the capacity of containers or cavities, or the volume of solid bodies (measuring linear dimensions to determine volume G01B)

19/00 Calibrated capacity measures for fluids or fluent solid material, e.g. measuring-cups (powder measuring spoons A61J; burettes, weighing bottles B01L)

20/00 Methods or apparatus for measuring volume of fluids or fluent solid material, not otherwise provided for

22/02 . . involving measurement of pressure

Level indicators

23/00 Indicating or measuring liquid level, or level of fluent solid material, e.g. indicating in terms of volume, indicating by means of an alarm (in wells E21B 47/04; adaptation to, or mounting on, steam boilers F22B 37/78; level regulation G05D; alarm devices G08F; for accumulators H01M 10/48)

23/0007 . . . [for discrete indicating and measuring (G01F 23/02; G01F 23/28 take precedence)]
23/0015 . . . [with a whistle or other sonorous signal]
23/0023 . . . [with a probe suspended by a wire or thread (with floats G01F 23/46)]
23/003 . . . [with a probe suspended by rotatable arms (with floats G01F 23/32)]
23/0038 . . . [using buoyant probes (with floats G01F 23/30 - G01F 23/76)]
23/0046 . . . [with a stationary probe, where a liquid specimen is separated from the mean mass and measured (by gauge glasses G01F 23/02)]
23/0053 . . . [with over-flow pipes]
23/0061 . . . [characterised by the level signal processing means]
23/0069 . . . [particular electronic circuits for digital processing equipment]
23/0076 . . . . [containing circuits handling parameters other than liquid level]
23/0084 . . . [particular electronic circuits for handling non-digital processing equipment]
23/0092 . . . . [containing circuits handling parameters other than liquid level]
Level indicators

23/02 . . by gauge glasses or other apparatus involving a window or transparent tube for directly observing the level to be measured or the level of a liquid column in free communication with the main body of the liquid.

23/04 . . by dip members, e.g. dip-sticks

23/045 . . . [cleaning means therefor (e.g. dip-stick wipers)]

23/14 . . by measurement of pressure (measuring pressure in general G01L)

23/16 . . Indicating, recording, or alarm devices being actuated by mechanical or fluid means, e.g. using gas, mercury, or a diaphragm as transmitting element, or by a column of liquid

23/161 . . . [for discrete levels (G01F 23/162 - G01F 23/165 take precedence)]

23/162 . . . [by a liquid column]

23/164 . . . [using a diaphragm, bellow as transmitting element]

23/165 . . . [of bubbler type]

23/167 . . . . [with mechanic or fluid indicating or recording]

23/168 . . . . [with electric indicating or recording]

23/18 . . Indicating, recording or alarm devices actuated electrically

23/185 . . . . [for discrete levels]

23/20 . . by measurement of weight, e.g. to determine the level of stored liquefied gas (weighing in general G01G)

23/205 . . . . [for discrete levels]

23/22 . . by measurement of physical variables, other than linear dimensions, pressure or weight, dependent on the level to be measured, e.g. by difference of heat transfer of steam or water (invoking use of floats G01F 23/30)

23/223 . . . . [using a melting or dissolving material as a part of alarm-means]

23/226 . . . . [measuring the braking of a rotatable element]

23/24 . . by measuring variations of resistance of resistors due to contact with conductor fluid

23/241 . . . . [for discrete levels]

23/242 . . . . [Mounting arrangements for electrodes]

23/243 . . . . [Schematic arrangements of probes combined with measuring circuits]

23/244 . . . . . [comprising oscillating circuits]

23/245 . . . . . [with a probe moved by an auxiliary power, e.g. meter, to follow automatically the level]

23/246 . . . . . [thermal devices]

23/247 . . . . . [for discrete levels]

23/248 . . . . . . [Constructional details; Mounting of probes]

23/26 . . by measuring variations of capacity or inductance of capacitors or inductors arising from the presence of liquid or fluent solid material in the electric or electromagnetic fields

23/261 . . . . [for discrete levels]

23/263 . . . . [using capacitors]

23/265 . . . . . [for discrete levels]

23/266 . . . . . [measuring circuits therefor]

23/268 . . . . . . [mounting arrangements of probes]

23/28 . . by measuring the variations of parameters of electric or acoustic waves applied directly to the liquid or fluent solid material

23/282 . . . . [for discrete levels (G01F 23/284, G01F 23/296 take precedence)]

23/284 . . . . Electromagnetic waves

23/2845 . . . . . [for discrete levels (G01F 23/288, G01F 23/292 take precedence)]

23/288 . . . . . X-rays; Gamma rays [or other forms of ionising radiation]

23/2885 . . . . . [for discrete levels]

23/292 . . . . . Light [, e.g. infra-red or ultra-violet]

23/2921 . . . . . [for discrete levels]

23/2922 . . . . . [with light-conducting sensing elements, e.g. prisms]

23/2924 . . . . . . [for several discrete levels, e.g. with more than one light-conducting sensing element (G01F 23/2927 takes precedence)]

23/2925 . . . . . . [using electrical detecting means]

23/2927 . . . . . . [for several discrete levels, e.g. with more than one light-conducting sensing element]

23/2928 . . . . . [using light reflected on the material surface]

23/296 . . . . Acoustic waves

23/2961 . . . . . [for discrete levels (G01F 23/2962 - G01F 23/2968 take precedence)]

23/2962 . . . . . [Transit time measurement]

23/2963 . . . . . . [magnetostriuctive]

23/2965 . . . . . [measuring wave attenuation]

23/2966 . . . . . . [making use of acoustical resonance or standing waves]

23/2967 . . . . . . [for discrete levels]

23/2968 . . . . . [Transducers specially adapted for acoustic level indicators]

23/30 . . . . . by floats (switches operated by floats H01H 35/18, with magnets H01H 36/02)]

23/303 . . . . [characterised by means to prevent fault-level readings due to turbulence of the fluid, e.g. special float housings]

23/306 . . . . [using radioactive radiation]

23/32 . . . . . using rotatable arms or other pivotable transmission elements

23/34 . . . . . using mechanically actuated indicating means (G01F 23/38 takes precedence)

23/345 . . . . . [using pneumatically or hydraulically actuated indicating means]

23/346 . . . . . using electrically actuated indicating means (G01F 23/38 takes precedence)

23/363 . . . . . [using electromechanically actuated indicating means]

23/366 . . . . . [using optoelectrically actuated indicating means]

23/38 . . . . . using magnetically actuated indicating means

23/40 . . . . . using bands or wires as transmission elements

23/42 . . . . . using mechanically actuated indicating means

23/425 . . . . . [using pneumatically or hydraulically actuated indicating means]

23/44 . . . . . using electrically actuated indicating means

23/443 . . . . . [using electromechanically actuated indicating means]

23/446 . . . . . [using opto-electrically actuated indicating means]

23/46 . . . . . using magnetically actuated indicating means
using twisted spindles as transmission means
using mechanically actuated indicating means
using electrically actuated indicating means
using electromechanically actuated indicating means
using opto-electrically actuated indicating means
using magnetically actuated indicating means
using elements rigidly fixed to and rectilinearly moving with the floats as transmission elements
using mechanically actuated indicating means
using pneumatically or hydraulically actuated indicating means
using electrically actuated indicating means
using electromechanically actuated indicating means
using opto-electrically actuated indicating means
for sensing changes in level only at discrete points
... characterised by the construction of the float

Testing or calibrating apparatus for measuring volume, volume flow or liquid level, or for metering by volume

... for measuring volume flow
... using a seal ball or piston in a test loop
... using tracer
... using a reference counter
... using a calibrated reservoir
... using a weighing apparatus
... specially adapted for gas meters
... for measuring liquid level
... checking proper indicating of discrete level by floats
... testing proper functioning of electronic circuits
... for measuring volume