

**CPC****COOPERATIVE PATENT CLASSIFICATION****G01F**

**MEASURING VOLUME, VOLUME FLOW, MASS FLOW OR LIQUID LEVEL; METERING BY VOLUME** (milk flow sensing devices in milking machines or devices [A01J 5/01](#); measuring or recording blood flow [A61B 5/02](#), [A61B 8/06](#); metering media to the human body [A61M 5/168](#); burettes or pipettes [B01L 3/02](#); arrangements of liquid volume meters or volume-flow meters in liquid-delivering apparatus, e.g. for retail sale purposes, **B67D 5/16**; pumps, fluid motors, details common to measuring or metering devices and pumps or fluid motors F01 to F04; { sampling [G01N 1/00](#)}; locating, determining distance or velocity using reflection or reradiation of radio waves, analogous arrangements using other waves G01S; systems for ratio control [G05D 11/00](#); { coin-freed apparatus for metering flow of liquid or gas [G07F 15/00](#)})

**NOTE**

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

**Measuring volume flow****G01F 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](#) to [G01F 1/68](#)

- G01F 1/002 . {specially adapted to be used in open channels}
- G01F 1/005 .. {using floats}
- G01F 1/007 . {by measuring the level variations of storage tanks relative to the time}
- G01F 1/05 . by using mechanical effects
- G01F 1/053 .. {using rotating vanes with tangential and axial admission}
- G01F 1/056 .. {Orbital ball flowmeters}
- G01F 1/06 .. using rotating vanes with tangential admission
- G01F 1/065 ... { with radiation as transfer means to the indicating device, e.g. light transmission}
- G01F 1/07 ... with mechanical coupling to the indicating device
- G01F 1/075 ... with magnetic or electromagnetic coupling to the indicating device
- G01F 1/0755 ..... {with magnetic coupling only in a mechanical transmission path}
- G01F 1/08 ... Adjusting, correcting or compensating means therefor
- G01F 1/10 .. using rotating vanes with axial admission

G01F 1/103	...	{ with radiation as transfer means to the indicating device, e.g. light transmission}
G01F 1/106	...	{with electrostatic coupling to the indicating device}
G01F 1/11	...	with mechanical coupling to the indicating device
G01F 1/115	...	with magnetic or electromagnetic coupling to the indicating device
G01F 1/1155	.....	{with magnetic coupling only in a mechanical transmission path}
G01F 1/12	...	Adjusting, correcting, or compensating means therefor
G01F 1/125	.....	{with electric, electro-mechanical or electronic means}
G01F 1/20	..	by detection of dynamic effects of the fluid flow
G01F 1/203	...	{Jet stream flowmeters}
G01F 1/206	...	{Measuring pressure, force or momentum of a fluid flow which is forced to change its direction}
G01F 1/22	...	by variable-area meters, {e.g. rotameters}
G01F 1/24	.....	with magnetic or electric coupling to the indicating device
G01F 1/26	.....	of the valve type
G01F 1/28	...	by drag-force, e.g. vane type or impact flowmeter
G01F 1/30	.....	for fluent solid material
G01F 1/32	...	by swirl flowmeter, e.g. using Karmann vortices
G01F 1/3209	.....	{using Karmann vortices}
G01F 1/3218	.....	{bluff body design}
G01F 1/3227	.....	{using fluidic oscillators (fluidic oscillators per se <a href="#">F15C 1/00</a> )}
G01F 1/3236	.....	{using guide vanes as swirling means}
G01F 1/3245	.....	{detection means for swirl flowmeters (detection means in general <a href="#">G01H</a> )}
G01F 1/3254	.....	{for detecting fluid pressure oscillations}
G01F 1/3263	.....	{by sensing mechanical vibrations}
G01F 1/3272	.....	{for detecting fluid speed oscillations by thermal sensors}
G01F 1/3281	.....	{for detecting variations in infrasonic, sonic or ultrasonic waves, due to modulation by passing through the swirling fluid}
G01F 1/329	.....	{circuits therefore}
G01F 1/34	..	by measuring pressure or differential pressure
G01F 1/36	...	the pressure or differential pressure being created by the use of flow constriction
G01F 1/363	.....	{with electrical or electro-mechanical indication ( <a href="#">G01F 1/37</a> and <a href="#">G01F 1/38</a> take precedence)}
G01F 1/366	.....	{with mechanical or fluidic indication ( <a href="#">G01F 1/37</a> and <a href="#">G01F 1/38</a> take precedence)}
G01F 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
G01F 1/372	.....	{with electrical or electro-mechanical indication}
G01F 1/375	.....	{with mechanical or fluidic indication}
G01F 1/377	.....	{using a ring-balance as indicating element}
G01F 1/38	.....	the pressure or differential pressure being measured by means of a movable element, e.g. diaphragm, piston, Bourdon tube or flexible capsule
G01F 1/383	.....	{with electrical or electro-mechanical indication}

- G01F 1/386 ..... {with mechanical or fluidic indication}
- G01F 1/40 ..... Details or construction of the flow constriction devices
- G01F 1/42 ..... Orifices or nozzles
- G01F 1/44 ..... Venturi tubes
- G01F 1/46 ..... Pitot tubes (specially adapted for measuring speed of fluids [G01P 5/165](#))
- G01F 1/48 ... the pressure of differential pressure being created by a capillary element
- G01F 1/50 ... Correcting or compensating means
- G01F 1/52 .. by measuring the height of the fluid level due to the lifting powder of the fluid flow
- G01F 1/54 .. by means of chains, flexible bands or wires introduced into and moved by the flow
  
- G01F 1/56 . by using electric or magnetic effects ([G01F 1/66](#) takes precedence)
- G01F 1/58 .. by electro-magnetic flowmeters
- G01F 1/582 ... {without electrodes}
- G01F 1/584 ... {constructions of electrodes, accessories therefor}
- G01F 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](#))}
- G01F 1/588 ... {combined constructions of electrodes, coils or magnetic circuits, accessories therefor}
- G01F 1/60 ... Circuits therefor
- G01F 1/64 .. by measuring electrical current 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)
  
- G01F 1/66 . by measuring frequency, phaseshift, or propagation time of electro-magnetic or other waves, e.g. ultrasonic flowmeters
- G01F 1/661 .. {using light}
- G01F 1/662 .. {Constructional details}
- G01F 1/663 .. {by measuring Doppler frequency shift}
- G01F 1/665 .. {of the drag-type}
- G01F 1/666 .. {by detecting noise and sounds generated by the flowing fluid}
- G01F 1/667 .. {Schematic arrangements of transducers of ultrasonic flowmeters; Circuits therefor ([G01F 1/663](#), [G01F 1/665](#), [G01F 1/666](#) take precedence)}
- G01F 1/668 ... {Compensating or correcting for variations in velocity of sound}
  
- G01F 1/68 . by using thermal effects
- G01F 1/684 .. Structural arrangements; Mounting of elements, e.g. in relation to fluid flow
- G01F 1/6842 ... {with means for influencing the fluid flow}
- G01F 1/6845 ... {Micro-machined devices}
- G01F 1/6847 ... {where sensing or heating elements are not disturbing the fluid flow, e.g. elements mounted outside the flow duct}
- G01F 1/688 ... using a particular type of heating, cooling or sensing element {(1/684N takes precedence)}
- G01F 1/6882 ..... {making use of temperature dependence of acoustic properties, e.g. propagation speed of surface acoustic waves}
- G01F 1/6884 ..... {making use of temperature dependence of optical properties}

- G01F 1/6886 . . . . {Pyroelectric elements}
- G01F 1/6888 . . . . {Thermoelectric elements, e.g. thermocouples, thermopiles}
- G01F 1/69 . . . . of resistive type
- G01F 1/692 . . . . . Thin-film arrangements
- G01F 1/696 . . . Circuits therefor, e.g. constant-current flow meters
- G01F 1/6965 . . . {comprising means to store calibration data for flow signal calculation or correction}
- G01F 1/698 . . . Feedback or rebalancing circuits, e.g. self heated constant temperature flowmeters
- G01F 1/6983 . . . . {adapted for burning-off deposits}
- G01F 1/6986 . . . . {with pulsed heating, e.g. dynamic methods}
- G01F 1/699 . . . . by control of a separate heating or cooling element
  
- G01F 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)
- G01F 1/7042 . . . {using radioactive tracers}
- G01F 1/7044 . . . {using thermal tracers}
- G01F 1/7046 . . . {using electrical loaded particles as tracer, e.g. ions or electrons}
- G01F 1/7048 . . . {the concentration of electrical loaded particles giving an indication of the flow}
- G01F 1/708 . . . Measuring the time taken to traverse a fixed distance
- G01F 1/7082 . . . {using acoustic detecting arrangements}
- G01F 1/7084 . . . {using thermal detecting arrangements}
- G01F 1/7086 . . . {using optical detecting arrangements}
- G01F 1/7088 . . . {using electrical loaded particles as tracers}
- G01F 1/712 . . . using auto-correlation or cross-correlation detection means ([G01F 1/7082](#) to [G01F 1/7088](#) take precedence); measuring speed by using correlation means in general [G01P 3/80](#), [G01P 5/22](#))
- G01F 1/716 . . . using electron paramagnetic resonance (EPR) or nuclear magnetic resonance (NMR)
  
- G01F 1/72 . . . Devices for measuring pulsing fluid flows
  
- G01F 1/74 . . . Devices for measuring flow of a fluid or flow of a fluent solid material in suspension in another fluid
  
- G01F 1/76 . . . Devices for measuring mass flow of a fluid or a fluent solid material ([weighing a continuous stream of material during flow G01G 11/00](#))
- G01F 1/78 . . . Direct mass flowmeters
- G01F 1/785 . . . {using fluidic bridge circuits}
- G01F 1/80 . . . operating by measuring pressure, force, momentum, or frequency of a fluid flow to which a rotational movement has been imparted
- G01F 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
- G01F 1/84 . . . . Gyroscopic mass flowmeters
- G01F 1/8404 . . . . . { details of flowmeter manufacturing methods}

G01F 1/8409	.....	{ constructional details}
G01F 1/8413	.....	{ means for influencing the flowmeter's motional or vibrational behaviour, e.g., conduit support or fixing means, or conduit attachments}
G01F 1/8418	.....	{ motion or vibration balancing means}
G01F 1/8422	.....	{ exciters}
G01F 1/8427	.....	{ detectors}
G01F 1/8431	.....	{ electronic circuits}
G01F 1/8436	.....	{ signal processing}
G01F 1/844	.....	{ micro-fluidic or miniaturised flowmeters}
G01F 1/8445	.....	{ micro-machined flowmeters}
G01F 1/845	.....	{ arrangements of measuring means, e.g., of measuring conduits}
G01F 1/8454	.....	{ rotating or rotatingly suspended measuring conduits}
G01F 1/8459	.....	{ vibrating means being located inside the measuring conduits}
G01F 1/8463	.....	{ the measuring conduits' cross-section being deformed during measurement, e.g. by periodically deflecting a portion of the conduits' surface}
G01F 1/8468	.....	{ vibrating measuring conduits}
G01F 1/8472	.....	{ having curved measuring conduits, i.e. whereby the measuring conduits' curved center line lies within a plane ( <a href="#">G01F 1/8481</a> takes precedence)}
G01F 1/8477	.....	{ with multiple measuring conduits}
G01F 1/8481	.....	{ having loop-shaped measuring conduits, e.g. the measuring conduits form a loop with a crossing point}
G01F 1/8486	.....	{ with multiple measuring conduits}
G01F 1/849	.....	{ having straight measuring conduits}
G01F 1/8495	.....	{ with multiple measuring conduits}
G01F 1/86	..	Indirect mass flowmeters, e.g. measuring volume flow and density, temperature or pressure
G01F 1/88	...	with differential pressure measurement to determine the volume flow
G01F 1/90	...	with positive displacement meter or turbine meter to determine the volume flow
<b>G01F 3/00</b>		<b>Measuring the volume flow of fluids or fluent solid material wherein the fluid passes through the meter in successive and more or less isolated quantities, the meter being driven by the flow (<a href="#">measuring a proportion of the volume flow G01F 5/00</a>)</b>
G01F 3/02	.	with measuring chambers which expand or contract during measurement
G01F 3/04	..	having rigid movable walls
G01F 3/06	...	comprising members rotating in a fluid-tight or substantially fluid-tight manner in a housing
G01F 3/065	....	{sliding-vane meters}
G01F 3/08	....	Rotary piston or ring piston meters
G01F 3/10	....	Geared or lobed impeller meters
G01F 3/12	....	Meters with nutating members, e.g. discs
G01F 3/14	...	comprising reciprocating pistons, e.g. reciprocating in a rotary body

- G01F 3/16 . . . . . in stationary cylinders
- G01F 3/18 . . . . . involving two or more cylinders
- G01F 3/20 . . . . . having flexible movable walls, e.g. diaphragms, bellows ([diaphragms and bellows therefor G01F 15/16](#))
- G01F 3/22 . . . . . for gases
- G01F 3/221 . . . . . {Valves therefor ([valves for flowmeters in general G01F 15/005](#))}
- G01F 3/222 . . . . . {characterised by drive mechanism for valves or membrane index mechanism}
- G01F 3/223 . . . . . {with adjustment of stroke or timing; Calibration thereof; Testing}
- G01F 3/224 . . . . . {with means for pressure or temperature compensation}
- G01F 3/225 . . . . . {characterised by constructional features of membranes or by means for improving proper functioning of membranes ([diaphragms for flowmeters in general G01F 15/16](#))}
- G01F 3/226 . . . . . {characterised by features of meter body or housing}
- G01F 3/227 . . . . . {characterised by the means for transfer of membrane movement information to indicating means}
- G01F 3/228 . . . . . {using mechanical transmission means}
- G01F 3/24 . . . . . with measuring chambers moved during operation ([wet gasmeters G01F 3/30](#))
- G01F 3/26 . . . . . Tilting-trap meters
- G01F 3/28 . . . . . on carriers rotated by the weight of the liquid in the measuring chambers
- G01F 3/30 . . . . . Wet gas-meters
- G01F 3/32 . . . . . comprising partitioned drums rotating or nutating in a liquid
- G01F 3/34 . . . . . comprising bells reciprocating in a liquid
- G01F 3/36 . . . . . with stationary measuring chambers having constant volume during measurement ([with measuring chambers which expand or contract during measurement G01F 3/02](#))
- G01F 3/38 . . . . . having only one measuring chamber
- G01F 5/00** **Measuring a proportion of the volume flow**
- G01F 5/005 . . . . . {by measuring pressure or differential pressure, created by the use of flow constriction}
- G01F 7/00** **Volume-flow measuring devices with two or more measuring ranges; Compound meters**
- G01F 7/005 . . . . . {by measuring pressure or differential pressure, created by the use of flow constriction}
- G01F 9/00** **Measuring volume flow relative to another variable, e.g. of liquid fuel for an engine**
- G01F 9/001 . . . . . {with electric, electro-mechanic or electronic means ([G01F 9/008](#) and [G01F 9/02](#) take precedence)}
- G01F 9/003 . . . . . {by measuring the weight}

- G01F 9/005 . . {by using calibrated reservoirs}
- G01F 9/006 . {with mechanic means ([G01F 9/008](#) and [G01F 9/02](#) take precedence)}
- G01F 9/008 . {where the other variable is the flight or running time}
- G01F 9/02 . wherein the other variable is the speed of a vehicle
- G01F 9/023 . . {with electric, electro-mechanic or electronic means}
- G01F 9/026 . . {with mechanic means}

#### Metering by volume

- G01F 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**
- G01F 11/003 . {for fluent solid material}
- G01F 11/006 . {Details or accessories (general details [G01F 15/00](#))}
- G01F 11/02 . with measuring chambers which expand or contract during measurement
- G01F 11/021 . . {of the piston type ([G01F 11/04](#) takes precedence)}
- G01F 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](#))}
- G01F 11/023 . . . {with provision for varying the stroke of the piston}
- G01F 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](#))}
- G01F 11/025 . . . {with manually operated pistons ([G01F 19/005](#) takes precedence)}
- G01F 11/026 . . . . {of the gun type (hand operated grease guns [F16N 3/12](#))}
- G01F 11/027 . . . . {of the syringe type}
- G01F 11/028 . . . . {the dosing device being provided with a dip tube and fitted to a container, e.g. to a bottleneck}
- G01F 11/029 . . . {provided with electric controlling means ([G01F 11/022](#) and [G01F 11/024](#) take precedence)}
- G01F 11/04 . . of the free-piston type
- G01F 11/06 . . . with provision for varying the stroke of the piston
- G01F 11/08 . . of the diaphragm or bellows type (diaphragms or bellows therefor [G01F 15/16](#))
- G01F 11/082 . . . {of the squeeze container type (using squeeze bottles or the like for soap [A47K 5/122](#))}
- G01F 11/084 . . . {using a bulb to pressurise the fluid to be dispersed}
- G01F 11/086 . . . {using an auxiliary pressure to cooperate with the diaphragm or bellows}
- G01F 11/088 . . . {using a deformable conduit-like element}
- G01F 11/10 . with measuring chambers moved during operation
- G01F 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](#))

- G01F 11/125     ...     {of the peristaltic pump type (peristaltic pumps per se [F04B 43/12](#))}
- G01F 11/14     ...     wherein the measuring chamber reciprocates
- G01F 11/16     ....     for liquid or semi-liquid
- G01F 11/18     ....     for fluent solid material
- G01F 11/20     ...     wherein the measuring chamber rotates or oscillates
- G01F 11/22     ....     for liquid or semi-liquid
- G01F 11/24     ....     for fluent solid material
- G01F 11/26     ..     wherein the measuring chamber is filled and emptied by tilting or inverting the supply vessel, e.g. bottle emptying apparatus
- G01F 11/261    ...     {for fluent solid material}
- G01F 11/262    ...     {for liquid or semi-liquid}
- G01F 11/263    ....     {with valves}
- G01F 11/265    .....    {of the ball type}
- G01F 11/266    ....     {using the syphonic effect}
- G01F 11/267    ...     {with counters for counting the numbers of measures delivered}
- G01F 11/268    ...     {with provision for varying the volume to be delivered}
  
- G01F 11/28     .     with stationary measuring chambers having constant volume during measurement  
(with measuring chambers which expand or contract during measurement  
[G01F 11/02](#))
- G01F 11/282    ..     {for fluent solid material not provided for in [G01F 11/34](#), [G01F 11/40](#), [G01F 11/46](#)}
- G01F 11/284    ..     {combined with electric level detecting means ([G01F 11/282](#), [G01F 11/30](#) to  
[G01F 11/46](#) take precedence)}
- G01F 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}
- G01F 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)}
- G01F 11/30     ..     with supply and discharge valves of the lift or plug-lift type
- G01F 11/32     ...     for liquid or semi-liquid
- G01F 11/34     ...     for fluent solid material
- G01F 11/36     ..     with supply and discharge valves of the rectilinearly-moved slide type
- G01F 11/38     ...     for liquid or semi-liquid
- G01F 11/40     ...     for fluent solid material
- G01F 11/42     ..     with supply and discharge valves of the rotary or oscillatory type
- G01F 11/44     ...     for liquid or semi-liquid
- G01F 11/46     ...     for fluent solid material
  
- G01F 13/00     Apparatus for measuring by volume and delivering fluids or fluent solid materials, not provided for in the preceding groups**
  
- G01F 13/001    .     {for fluent solid material}
- G01F 13/003    ..     {comprising a conveyer belt}

- G01F 13/005 . . {comprising a screw conveyor}
- G01F 13/006 . {measuring volume in function of time}
- G01F 13/008 . {taps comprising counting- and recording means (counting devices, counting of objects in general [G06M](#))}
  
- G01F 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**
  
- G01F 15/001 . {Means for regulating or setting the meter for a predetermined quantity}
- G01F 15/002 . . {for gases}
- G01F 15/003 . . {using electromagnetic, electric or electronic means ([G01F 15/002](#), [G01F 15/02](#) take precedence)}
  
- G01F 15/005 . {Valves (valves in general [F16K](#))}
- G01F 15/006 . {characterised by the use of a particular material, e.g. anti-corrosive material ([G01F 15/14](#) takes precedence)}
- G01F 15/007 . {comprising means to prevent fraud}
- G01F 15/008 . {comprising lubricating means}
  
- G01F 15/02 . Compensating or correcting for variations in pressure, density or temperature
- G01F 15/022 . . {using electrical means}
- G01F 15/024 . . . {involving digital counting}
- G01F 15/026 . . {using means to maintain zero differential pressure across the motor ([G01F 1/08](#) and [G01F 1/12](#) take precedence)}
- G01F 15/028 . . {for low flow rates}
- G01F 15/04 . . of gases to be measured
- G01F 15/043 . . . {using electrical means}
- G01F 15/046 . . . . {involving digital counting}
  
- G01F 15/06 . Indicating or recording devices, e.g. for remote indication
- G01F 15/061 . . { for remote indication}
- G01F 15/063 . . . {using electrical means}
- G01F 15/065 . . {with transmission devices, e.g. mechanical}
- G01F 15/066 . . . {involving magnetic transmission devices}
- G01F 15/068 . . {with electrical means ([G01F 15/063](#) takes precedence)}
- G01F 15/07 . . Integration to give total flow, e.g. using mechanically-operated integration mechanisms
- G01F 15/075 . . . using electrically operated integrating means
- G01F 15/0755 . . . . {involving digital counting}
  
- G01F 15/08 . Air or gas separators in combination with liquid meters; Liquid separators in combination with gas meters

- G01F 15/10 . Preventing damage by freezing or excess pressure or insufficient pressure
- G01F 15/105 .. {Preventing damage by hydraulic shocks}
- G01F 15/12 . Cleaning arrangements; Filters (filters in general [B01D](#))
- G01F 15/125 .. {Filters}
- G01F 15/14 . Casings, e.g. of special material
- G01F 15/16 . Diaphragms; Bellows; Mountings therefor
- G01F 15/18 . Supports or connecting means for meters
- G01F 15/185 .. {Connecting means, e.g. bypass conduits}

### Measuring volume

**G01F 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](#))

**G01F 19/00** **Calibrated capacity measures for fluids or fluent solid material, e.g. measuring-cups** {(powder measuring spoons [A61J](#); burettes, weighing bottles [B01L](#))}

- G01F 19/002 . {Measuring spoons or scoops}
- G01F 19/005 . {for semi-liquid, e.g. fat}
- G01F 19/007 . {for non fluent solid material, e.g. filamentary}

**G01F 22/00** **Methods or apparatus for measuring volume of fluids or fluent solid material, not otherwise provided for**

- G01F 22/02 . involving measurement of pressure

### Level indicators

**G01F 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 [G08B](#); {for accumulators [H01M 10/48](#))}

- G01F 23/0007 . {for discrete indicating and measuring ([G01F 23/02](#) to [G01F 23/28](#) take precedence)}
- G01F 23/0015 .. {with a whistle or other sonorous signal}
- G01F 23/0023 . {with a probe suspended by a wire or thread (with floats [G01F 23/40](#))}
- G01F 23/003 . {with a probe suspended by rotatable arms (with floats [G01F 23/32](#))}

- G01F 23/0038 . {using buoyant probes (with floats [G01F 23/30](#) to [G01F 23/76](#))}
- G01F 23/0046 . {with a stationary probe, where a liquid specimen is separated from the main mass and measured (by gauge glasses [G01F 23/02](#))}
- G01F 23/0053 . {with over-flow pipes}
- G01F 23/0061 . {characterised by the level signal processing means}
- G01F 23/0069 .. {particular electronic circuits for digital processing equipment}
- G01F 23/0076 ... {containing circuits handling parameters other than liquid level}
- G01F 23/0084 .. {particular electronic circuits for handling non-digital processing equipment}
- G01F 23/0092 ... {containing circuits handling parameters other than liquid level}
- G01F 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
- G01F 23/04 . by dip members, e.g. dip-sticks
- G01F 23/045 .. {cleaning means therefor (e.g. dip-stick wipers)}
- G01F 23/14 . by measurement of pressure (measuring pressure in general [G01L](#))
- G01F 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
  - G01F 23/161 ... {for discrete levels ([G01F 23/162](#) - [G01F 23/165](#) take precedence)}
  - G01F 23/162 ... {by a liquid column}
  - G01F 23/164 ... {using a diaphragm, bellow as transmitting element}
  - G01F 23/165 ... {of bubbler type}
  - G01F 23/167 .... {with mechanic or fluid indicating or recording}
  - G01F 23/168 .... {with electric indicating or recording}
- G01F 23/18 .. Indicating, recording or alarm devices actuated electrically
- G01F 23/185 ... {for discrete levels}
- G01F 23/20 . by measurement of weight, e.g. to determine the level of stored liquified gas (weighing in general [G01G](#))
- G01F 23/205 .. {for discrete levels}
- G01F 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 (involving use of floats [G01F 23/30](#))
  - G01F 23/223 .. {using a melting or dissolving material as a part of alarm-means}
  - G01F 23/226 .. {measuring the braking of a rotatable element}
- G01F 23/24 .. by measuring variations of resistance of resistors due to contact with conductor fluid
  - G01F 23/241 ... {for discrete levels}
  - G01F 23/242 .... {Mounting arrangements for electrodes}
  - G01F 23/243 .... {Schematic arrangements of probes combined with measuring circuits}

G01F 23/244	.....	{comprising oscillating circuits}
G01F 23/245	...	{with a probe moved by an auxiliary power, e.g. meter, to follow automatically the level}
G01F 23/246	...	{thermal devices}
G01F 23/247	.....	{for discrete levels}
G01F 23/248	.....	{Constructional details; Mounting of probes}
G01F 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
G01F 23/261	...	{for discrete levels}
G01F 23/263	...	{using capacitors}
G01F 23/265	.....	{for discrete levels}
G01F 23/266	.....	{measuring circuits therefor}
G01F 23/268	.....	{mounting arrangements of probes}
G01F 23/28	..	by measuring the variations of parameters of electric or acoustic waves applied directly to the liquid or fluent solid material
G01F 23/282	...	{for discrete levels ( <a href="#">G01F 23/284</a> , <a href="#">G01F 23/296</a> take precedence)}
G01F 23/284	...	Electromagnetic waves
G01F 23/2845	.....	{for discrete levels ( <a href="#">G01F 23/288</a> , <a href="#">G01F 23/292</a> take precedence)}
G01F 23/288	.....	X-rays; Gamma rays {or other forms of ionising radiation}
G01F 23/2885	.....	{for discrete levels}
G01F 23/292	.....	Light {,e.g. infra-red or ultra-violet}
G01F 23/2921	.....	{for discrete levels}
G01F 23/2922	.....	{with light-conducting sensing elements, e.g. prisms}
G01F 23/2924	.....	{for several discrete levels, e.g. with more than one light-conducting sensing element ( <a href="#">G01F 23/2927</a> takes precedence)}
G01F 23/2925	.....	{using electrical detecting means}
G01F 23/2927	.....	{for several discrete levels, e.g. with more than one light-conducting sensing element}
G01F 23/2928	.....	{using light reflected on the material surface}
G01F 23/296	...	Acoustic waves
G01F 23/2961	.....	{for discrete levels ( <a href="#">G01F 23/2962</a> to <a href="#">G01F 23/2968</a> take precedence)}
G01F 23/2962	.....	{Transit time measurement}
G01F 23/2963	.....	{magnetostrictive}
G01F 23/2965	.....	{measuring wave attenuation}
G01F 23/2966	.....	{making use of acoustical resonance or standing waves}
G01F 23/2967	.....	{for discrete levels}
G01F 23/2968	.....	{Transducers specially adapted for acoustic level indicators}
G01F 23/30	.	by floats ( <a href="#">switches operated by floats H01H 35/18</a> , {with magnets <a href="#">H01H 36/02</a> })
G01F 23/303	..	{characterised by means to prevent fault-level readings due to turbulence of the fluid, e.g. special float housings}
G01F 23/306	..	{using radioactive radiation}
G01F 23/32	..	using rotatable arms or other pivotable transmission elements

G01F 23/34	...	using mechanically actuated indicating means {(G01F 23/38 takes precedence)}
G01F 23/345	....	{using pneumatically or hydraulically actuated indicating means}
G01F 23/36	...	using electrically actuated indicating means {(G01F 23/38 takes precedence)}
G01F 23/363	....	{using electromechanically actuated indicating means}
G01F 23/366	....	{using optoelectrically actuated indicating means}
G01F 23/38	...	{ using magnetically actuated indicating means}
G01F 23/40	..	using bands or wires as transmission elements
G01F 23/42	...	using mechanically actuated indicating means
G01F 23/425	....	{using pneumatically or hydraulically actuated indicating means}
G01F 23/44	...	using electrically actuated indicating means
G01F 23/443	....	{using electromechanically actuated indicating means}
G01F 23/446	....	{using opto-electrically actuated indicating means}
G01F 23/46	...	using magnetically actuated indicating means
G01F 23/48	..	using twisted spindles as transmission means
G01F 23/50	...	using mechanically actuated indicating means
G01F 23/505	....	{using hydraulically or pneumatically actuated indicating means}
G01F 23/52	...	using electrically actuated indicating means
G01F 23/523	....	{using electromechanically actuated indicating means}
G01F 23/526	....	{using opto-electrically actuated indicating means}
G01F 23/54	...	using magnetically actuated indicating means
G01F 23/543	....	{using magnets only as coupling means in a mechanical transmission path}
G01F 23/546	....	{using magnets only for directly actuating of switches}
G01F 23/56	..	using elements rigidly fixed to and rectilinearly moving with the float as transmission elements
G01F 23/58	...	using mechanically actuated indicating means
G01F 23/585	....	{using pneumatically or hydraulically actuated indicating means}
G01F 23/60	...	using electrically actuated indicating means
G01F 23/603	....	{using electromechanically actuated indicating means}
G01F 23/606	....	{using opto-electrically actuated indicating means}
G01F 23/62	...	using magnetically actuated indicating means
G01F 23/64	..	of the free float type {without mechanical transmission elements}
G01F 23/66	...	using mechanically actuated indicating means
G01F 23/665	....	{using pneumatically or hydraulically actuated indicating means}
G01F 23/68	...	using electrically actuated indicating means
G01F 23/683	....	{using electromechanically actuated indicating means}
G01F 23/686	....	{using opto-electrically actuated indicating means}
G01F 23/70	....	for sensing changes in level only at discrete points
G01F 23/703	.....	{using electromechanically actuated indicating means}
G01F 23/706	.....	{using opto-electrically actuated indicating means}
G01F 23/72	...	using magnetically actuated indicating means
G01F 23/74	....	for sensing changes in level only at discrete points
G01F 23/76	..	characterised by the construction of the float

**G01F 25/00****Testing or calibrating apparatus for measuring volume, volume flow or liquid level, or for metering by volume**

- G01F 25/0007 . {for measuring volume flow}
- G01F 25/0015 .. {using a seal ball or piston in a test loop}
- G01F 25/0023 .. {using tracer}
- G01F 25/003 .. {using a reference counter}
- G01F 25/0038 .. {using a calibrated reservoir}
- G01F 25/0046 .. {using a weighing apparatus}
- G01F 25/0053 .. {specially adapted for gas meters ([G01F 25/0015](#) to [G01F 25/0046](#) take precedence)}
  
- G01F 25/0061 . {for measuring liquid level}
- G01F 25/0069 .. { checking proper indicating of discrete level by floats}
- G01F 25/0076 .. {testing proper functioning of electronic circuits}
  
- G01F 25/0084 . {for measuring volume}
  
- G01F 25/0092 . {for metering by volume}