



minimag

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(Patent no: 1002970)

SMALL MAGNETIC FLOWMETER FOR INDUSTRIAL & HYGIENIC APPLICATIONS

- Economically priced
- From 1 L/Hr. to 3000 L/Hr.
- Diameter choice 1.5 to 12 mm internal
- Up to 0.1% (and better) accuracy
- High speed response (> 1000 M/sec)
- 100% Free passage (full bore)
- 100% Hygienic
- Perfect “**EMPTY METER DETECTION**”
- Chemical resistant PVDF/PVC/PTFE/POM-selectable body
- Remote and/or local counter-reset
- Serial output (RS 232), pulse-train and mA for remote read-out
- Integral 2-steps **PRESET BATCHCOUNTER** with automatic overshoot compensation
- Adjustable signalling contacts(2) on flow
- Integral **PID CONTROLLER**-unit with mA-output for CONSTANT- or RATIO-flowcontrol
- High accuracy linearisation for special applications or control-output (valve-curve)
- Optional returnflow detection and/or subtraction
- Low-cost “ DUO”-version for 2 flowsensors connected to 1 read-out
- Differential flow-measurement as a special of the “DUO”-system
- 2-flow-ranges optional (not with DUO), manually selectable or autoranging



The **free passage** together with the **reliability** are amongst the main features to use a flowmeter with the magnetic principle.

Minimag has added **very high accuracy** and **superfast speed of response** by means of its patented extremely stable magnetic field generator.

MINIMAG-SENSOR

- Capacity :

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- 1.5 (/ 2S) mm **1 to 10 Litre/hour** (1 - 20 optional)
 - 2 mm **2 to 20 Litre/hour** (2 - 40 optional)
 - 4 mm **10 to 100 Litre/hour** (10 - 200 optional)
 - 6 mm **25 to 250 Litre/hour** (25 - 500 optional)
 - 8 mm **50 to 500 Litre/hour** (50 - 1000 optional)
 - 10 mm **100 to 1000 Litre/hour**(100 - 2000 optional)
 - 12 mm **150 to 1500 Litre/hour**(150 - 3000 optional)

Dual-range and/or auto-range for greater rangeability available as an option (ranges upward extendable)

With [*1] marked features not available for the "DUAL"-version (see page 4)

- Combined **repeatability** and **linearity** (in % of reading):
 - **0.1 %** between 50 and 100 % of basic capacity,(0.2 % for dual and below 10 L/hour)
 - 0.2 % between 20 and 50 % of basic capacity, (0.4 % for dual and below 10 L/hour)
 - 0.5 % between 10 and 20 % of basic capacity, (1 % for dual and below 10 L/hour)
- Very high speed of response : **> 1000 measurements per second**
- Contact with liquid : **100% hygienic** .
- Measuring body : PVDF-standard.
 - PVC, PTFE (Teflon) with 25% glass-filling or POM optional.
- Electrodes : standard SS 316.
 - HastelloyC22, Tantalum and Titanium optional.
- Minimum **E.C.** (electrolytic conductivity). :
 - **20 microSiemens/cm** standard, **5 microSiemens/cm** optional, (1 mS/cm in development)
- **Temperature-range** : -20 to +140 °C (PVDF).
- **Temperature-coefficient** : max **0,04% / °C**.
 - Temperature-compensation optional [*1]
- **Empty-meter-detection** (low E.C-dependent)
- Negative flow can be detected and subtracted [*1]
- Maximum **pressure** : **10 bar**. (20 bar optional)
- Medium-connections : (with connection-ferrules)
 - 1/4" Innerthread (up to 4 mm)
 - 3/8" Innerthread (6 to 8 mm)
 - 1/2" Innerthread or 3/8 outerthread (10 to 12 mm)
 - or welding connections (pipe)
- Connection-length (without ferrules) : 108 mm
- Electrical connection (to read-out-unit) :
 - 5(or 6)-wire shielded cable
- Cable-connections : PG9 gland
- Material housing flow-element:
 - Light-metal with powder coating
- Dimensions housing flow-element:
 - 100(h) x 100(w) x 80(d) mm
 - Suitable for wall-mounting
 - IP-67 dust and water-tight
 - Weight : 800 grams



ELECTRONIC READ-OUT/DISPLAY-UNIT

- Text-display : **2 lines of 16 characters** with 6 mm character-height
- Back-lighting :
 - Standard : on , flashes with abnormal situations like “meter empty”
- Standard-display:
 - 1e line : total quantity counter (or “SET”-volume if BATCH-COUNTER is selected)
 - 2e line : resettable (day-) counter
- 3 control buttons and a secret button or key-switch (optional)
 - Button for resetting the daycounter
 - Button for accepting an alarm/preset-value condition
 - Button for display-variations by toggling: Litres, units or flow
 - Secret key for management activities
 - Button/key-combinations for resetting the totalcounter and menu-operation
- **Management**-menu-selections :
 - Preset-value for shut-off (batchsystems) or signalling-contact **[*1]**
 - The setpoint-value for alarms or control **[*1]**
 - Value for a standard volume-unit (used for calculations)
- **Service**-menu-selections are grouped in 7 main FUNCTION-blocks
 - CALIBRATION with several settings like:
Calibration-factor used for adjusting volumecount
Units-, dot and display-setting
 - FLOW SETTINGS like:
Calibration-factor for the flow-value (units, dot, timebase, damping and % of max) **[*1]**
 - CONTACT/BATCH-COUNTER SETTINGS like
Relay- and opto-coupler-output-functions and configurations : N.C or N.O . **[*1]**
Overshoot- and 2-step-shut-off-setting **[*1]**
 - GENERAL SETTINGS like:
Language-selection: Dutch, English or French (German optional, service-menu: English)
Speed of serial connection : 9600, 19.200 baud or service(115 K)
Empty detect sensitivity, networknumber, analog outputsettings
Selection for single range, dual-range and auto-range of flow
 - P.I.D.-CONTROL UNIT with local or remote SETPOINT and controlsettings like:
standard control actions with various specials (anti-reset wind-up etc.),
frozen control-action-values while stopped and time-delay after restart
 - LINEARISATION for special applications or control-valve-curve correction:
11 points of settings(per 10%) with straigh-line interpolation between 2 break-points
 - RETURNFLOW DETECTION: Negative flows can be detected and signalled.
Menu-selection to subtract negative flows or not.
 - FACTORY SETTINGS like:
Tracking number of power-downs and resets, suppress-options for resetting totalcounter etc.
- **2 relais-output** with volt-free contact for alarm/shut-off or empty-meter function **[*1]**
Contact-rating : 250 VAC , 5 Amp.
- **2 solid-state outputs** (isolated opto-couplers with “open collector” output) for a.o. : **[*1]**
Frequency-output (pulse-train) for remote counters or frequency-converters
1 pulse equals smallest volume, adjustable via calibrationfaktor (max 1000 Hz)
Various start-stop (PLC) functions
- **2 solid-state out- or in-puts** (isolated opto-couplers with “open collector” output) for a.o. : **[*1]**
Various start-stop or PLC- functions
Functionality for in or output by positioning the “Opto-coupler” in a socket
- **Serial-output** (RS 232 non-isolated) for computer or network-module
 - this serial output can be connected by means of a connector(service),
or via 3 terminals for cable connection
- **Milliampere output** (16 bit) for remote dataloggers, plc’s and other read-out equipment
 - non-isolated 4/0-20 mA or Volt-signal
- **64 K internal EEPROM** for time-based recording of data
- **Various external auxiliary connections** (analog and digital I/O)
- Mains-supply: 220 VAC,50 Hz, **4VA**. If the mains drops, the countervalues are saved in flash-rom
- Electrical connections:
 - 5(of 6)-wire shielded cable to connect to the flow/sensing-element
 - 3 wire mains cable
 - multicore cable for 1 or 2 relais and/or for the serial connection
- Cable-connections : 3 x PG9 gland + 1 plugged (max 4 glands)
- Dimensions display-housing: 100(h) x 160(b) x 60(d) mm, weight : 1100 grams
 - Suitable for wall-mounting, IP-67 dust and water-tight (without key-switch)

ECONOMICAL DISPLAY-VERSION MODEL MINIMAG-DUAL

- Specifications: as previous, but suitable for 2 off sensing-elements giving 2 separate measurements
 - With [*1] marked accessories are not available or with limitations
- Standard-display: 1e line : total quantity counterA , 2e line : total quantity counterB
- **SPECIAL DIFFERENTIAL VERSION: MEASUREMENT OF THE DIFFERENCE BETWEEN 2 METERS**

Accessories

STAINLESS STEEL HOUSING

- For extreme chemical condition or hygienic environment
- Dimensions: 100 x 100 x 90 mm



PNEUMATICALLY ACTUATED SHUT-OFF-VALVES

- Used for batching systems etc.
- Hygienic version for food lines available
- Miniature pneumatic motor
- Materials in contact with the liquid : Stainless Steel and Teflon
- Standard diameter 10 mm (8 mm optional on certain models)
- 3/8 " BSP or NPT innerthread or welding (Hygienic)
- Control via solenoid-valve
- Pneumatic pressure-supply required (instrument air)

CONNECTION-FERRULES INDUSTRIAL

- 1/4", 3/8" or 1/2" innerthread BSP or NPT
- Without ferrule : flare (3/8 inner-thread)
- Standard diameters :
2, 4, 6, 8, 10 and 12 mm inner-size
- Material : SS with "O"-ring
- Specials in HastelloyC, Titanium or Tantalum



CONNECTION-FERRULES HYGIENIC

- Hygienic version for food-lines, no dirt-chambers
- From flare (3/8 inner-thread) in the meter-housing to:
5/8 outer-thread (hose connection)
3/8 inner-thread (flare-system)
- Standard diameters :
6, 8, and 10 mm inner-size
- Material : SS with "O"-ring
- Suitable for S.S. and plastic lines

NETWORKS AND SOFTWARE FOR COMPUTERS

- **Low-cost networks** via internal network-facility (no additional equipment needed); direct to 1 selectable Com-port on PC
- Networks via RS 232-connections to a ethernet-concentrator (16 channels/unit)
- Standard (Windows) software for up to 16(1 page) or 32 meters (2 pages).Countervalue are stored at selectable time-intervals in a database, where reports can be printed or visualised with remote control to stop or reset counters

