

MA550 MASS FLOW METER FOR GAS



Model Type : Insertion with explosion-proof type Features :

- Robust shock-resistant aluminum die-cast housing
- All medium touch parts made of stainless steel 1,4571
- Suitable as insert version from 3/4" to DN 1000
- ATEX II 2G Ex d IIC T4 (up to 120°C) upon request for ATEX approval
- Request for DVGW approval for natural gas (up to 16 bar)
- Pressures up to 50 bar (Up to 100 bar for special versions)
- Temperature range up to 180°C
- No moving parts, no wear
- Extremely powerful and easy-to-clean sensor tip
- Easy installation and pressure relief via 1/2" ball valve
- Safety ring for installation and removal under pressure
- Depth scale for accurate installation

The MA series is a mass flow meter designed specifically for gas flow measurement. It is the most modern flow meter that can be used even for gases with low specific gravity and is equipped with the most technology among flow meters to realize higher precision and boast an error rate of 0.1%. It can be applied to a wide range of industries such as power plants..

Specifications

Measuring range	Up to 50 Nm/s, Low speed version Up to 92.7 Nm/s, Standard version Up to 185 Nm/s, Max version Up to 224 Nm/s, High speed version
Accuracy : accuracy class (m.v.: of meas. Value) (f.s.: of full scale)	±1.5% of m.v. ±0.3% of f.s. On request, ±1.0% of m.v. ±0.3% of f.s.
Accuracy indications	Referred to ambient temperature 22°C ±2°C, System pressure 6 bar
Repeatability	0.25% of m.v. in case of correct mounting (mounting aid, position, inlet section)
Measuring principle	Thermal mass flow sensor
Response time	t90 < 3 s
Operating temperature range probe tube/display unit	-40...180 °C probe tube / -40...70°C display unit / -40...120°C for ATEX version
Adjustment possibilities via display, external hand-held meter PI 500, PC Service Software, remote diagnosis	Nm ³ /h, Nm ³ /min, NI/min, l/s, ft/min, cfm, kg/h, kg/min, inner diameter, reference conditions °C/°F, mbar/hPa, zero-point correction, leak flow volume suppression, scaling of analogue output 4...20 mA, pulse/alarm, error codes and so on. scaling of analogue output 4...20 mA, pulse/alarm, error codes and so on
Adjustment possibilities via external device DS 400, DS 500	Gas type
Outputs	Standard: Modbus RTU, 4...20 mA activ (not galv. isolated), galvanically isolated pulse (pulse weight freely selectable), alarm relais (max. 48 VDC, 0.5A) Optional: 2 x 4...20 mA outputs galvanically isolated Ethernet Interface (Modbus/TCP) Profibus DP Profinet 2 x 4...20 mA outputs passive M-Bus
Burden	500 Ohm
Additional average value calculation:	for all parameters freely adjustable from 1 minute up to 1 day, e. g. 1/2 hours average value, average day value
Protection class	IP 67
Material	Housing aluminum die cast, probe tube stainless steel 1,4571

MA570 MASS FLOW METER FOR GAS



Model Type : Flange & Thread with explosion-proof type Features :

- MA570 comes with an integrated measurement section
- Measurement section available in Flange version or R resp
- NPT threads. Detachable measuring head
- Measuring section allows quick and easy removal of the measuring device for calibration or cleaning purposes, during which time the measuring section is sealed with a closing cap (accessory)
- Screwing with a centering device ensures that the sensor is accurately centered when screwing the sensor into the measuring section and gives a precise position to the flow cut-off, avoiding unnecessary measurement glitches

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Specifications

Measuring range	Up to 50 Nm/s, Low speed version Up to 92.7 Nm/s, Standard version Up to 185 Nm/s, Max version Up to 224 Nm/s, High speed version
Accuracy : accuracy class (m.v.: of meas. Value) (f.s.: of full scale)	±1.5% of m.v. ±0.3% of f.s. On request, ±1.0% of m.v. ±0.3% of f.s.
Accuracy indications	Referred to ambient temperature 22°C ±2°C, System pressure 6 bar
Repeatability	0.25% of m.v. in case of correct mounting (mounting aid, position, inlet section)
Measuring principle	Thermal mass flow sensor
Response time	t90 < 3 s
Operating temperature range probe tube/display unit	-40...180 °C probe tube / -40...70°C display unit / -40...120°C for ATEX version
Adjustment possibilities via display, external hand-held meter PI 500, PC Service Software, remote diagnosis	Nm³/h, Nm³/min, NI/min, l/s, ft/min, cfm, kg/h, kg/min, inner diameter, reference conditions °C/°F, mbar/hPa, zero-point correction, leak flow volume suppression, scaling of analogue output 4...20 mA, pulse/alarm, error codes and so on. scaling of analogue output 4...20 mA, pulse/alarm, error codes and so on
Adjustment possibilities via external device DS 400, DS 500	Gas type
Outputs	Standard: Modbus RTU, 4...20 mA activ (not galv. isolated), galvanically isolated pulse (pulse weight freely selectable), alarm relais (max. 48 VDC, 0.5A) Optional: 2 x 4...20 mA outputs galvanically isolated Ethernet Interface (Modbus/TCP) Profibus DP Profinet 2 x 4...20 mA outputs passive M-Bus
Burden	500 Ohm
Additional average value calculation:	for all parameters freely adjustable from 1 minute up to 1 day, e. g. 1/2 hours average value, average day value
Protection class	IP 67
Material	Housing aluminum die cast, probe tube stainless steel 1,4571

MA520 MASS FLOW METER FOR GAS



Model Type : Flange & Thread type

Features :

- Digital interface enables connection to advanced systems such as energy management systems, building management systems, SPS, etc.
- Easy and inexpensive installation
- Units freely selectable via key on display m^3/h , m^3/min , l/min , l/s , kg/h , kg/min , kg/s , cfm
- Compressed air counter up to 1.999.999.999 m^3 . Resettable to "0" via keypad
- Analog output 4 ... 20 mA, pulse output (galvanically separated)
- High measurement accuracy even at low measuring ranges (ideal for leak measurements)
- Very small pressure loss
- Calorimetry principle, no additional pressure and temperature measurement required, no mechanically moving parts

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Specifications

Parameters	m^3/h , l/min (1000 mbar, 20°C) in case of compressed air resp. Nm^3/h , NI/min (1013mbar, 0°C) in case of gases	
Units adjustable via keys at display	m^3/h , m^3/min , l/min , l/s , ft/min , cfm , m/s , kg/h , kg/min	
Measuring principle	Calorimetric measurement	
Sensor	Thermal mass flow sensor	
Measuring medium	Air, gases	
Gas types adjustable via external device DS 400, DS 500, PI 500	air, nitrogen, argon, nitrous oxide, CO ₂ , oxygen	
Accuracy: (m.v.: of meas. value) (f.s.: of full scale)	± 1.5 % of m.v. ± 0.3 % of f.s. on request ± 1.0 % of m.v. ± 0.3 % of f.s.	
Operating temperature	-30...80 °C	
Operating pressure	up to 16 bar / optional up to PN 40	
Digital output	RS 485 interface, Modbus-RTU, M-Bus (optionally)	
Analogue output	4...20 mA for m^3/h resp. l/min	
Pulse output	1 pulse per m^3 resp. per liter galvanically separated	
Power supply	18...36 VDC, 5 W	
Burden	<500Ω	
Housing	Thread type	Polycarbonate
	Flange type	Polycarbonate (IP 65)
Measurement section	Thread type	Stainless steel, 1.4301 or 1.4571
	Flange type	Stainless steel, 1.4571
Mounting section	Thread type	: R 1/4", R 1/2", R 3/4", R 1", R 1 1/4", R 1 1/2", R 2" external thread.
	Flange type	Weld neck flange according to DIN EN 1092-1, Groove-faced and tongue-faced on request

MA500 MASS FLOW METER FOR GAS



Model Type : Insertion type

Features :

- RS 485 interface, standard Modbus-RTU
- Included temperature measurement
- Integrated display for m³/h and m³
- Available from 1/2" to DN 1000
- Easy installation under pressure
- 4..20mA analog output for m³/h resp. m³/min
- Pulse output for m³ or M-Bus (optional)
- Adjustable inside diameter via keypad
- Consumption counter can be reset
- Grounding possible via key on display: reference condition, °C and mbar, 4 ... 20 mA scaling, pulse weight

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Specifications	
Parameters	m ³ /h, l/min (1000 mbar, 20°C) in case of compressed air resp. Nm ³ /h, NI/min (1013mbar, 0°C) in case of gases
Units adjustable via keys at display	m ³ /h, m ³ /min, l/min, l/s, ft/min, cfm, m/s, kg/h, kg/min, g/s, lb/min, lb/h
Adjustable via keypad	Diameter for volume flow calculation, counter resettable
Sensor	Thermal mass flow sensor
Measuring medium	Air, gases
Gas types are adjustable over cs service software or CS data logger	air, nitrogen, argon, helium, CO ₂ , oxygen, vacuum
Accuracy: (m.v.: of meas. value) (f.s.: of full scale)	± 1.5 % of m.v. ± 0.3 % of f.s. on request ± 1.0 % of m.v. ± 0.3 % of f.s.
Operating temperature	-30...110 °C probe tube -30...80 °C housing
Operating pressure	-1~50 bar
Digital output	RS 485 interface, Modbus-RTU (Optional; Ethernet-interface PoE, M-Bus)
Analogue output	4...20 mA for m ³ /h resp. l/min
Pulse output	1 pulse per m ³ or per liter galvanically separated. Pulse value can be set on the display, Alternatively the pulse output can be used as an alarm relay.
Power supply	18...36 VDC, 5 W
Burden	<500Ω
Housing	Polycarbonate (IP 65)
Probe tube	Stainless steel, 1.4571 Mounting length 220mm, Ø 10mm
Mounting thread	G 1/2"
Ø Casing	65mm
Mounting position	Any

DS400 FLOW MONITOR CONTROLLER



Model Type : Flow Monitor Controller

Features :

- 3.5" graphic display – easy to use with touch screen
- Plug-in system: all wired and ready
- 2 alarm contacts (230VAC, 3A)
- Freely adjustable pre-alarm main alarm
- Alarm delay can be set for each alarm
- 4 ... 20 mA analog output
- Optional: Ethernet and RS 485 interface (Modbus protocol)
- Option: Web Server

The DS 400 controller is a mass flow meter controller specifically designed to externally display the local flow display in which the MA series mass flow meter is installed.

Specifications

Dimensions	118 x 115 x 98 mm IP 54 (wall housing) 92 x 92 x 75 mm (panel mounting)
Inputs	2 digital inputs for HA 510 resp. MA 500/520
Interface	USB interface
Power supply	100...240 VAC, 50~60 Hz
Accuracy	Please see MA500
Alarm outputs	2 relays, (pot. – free)
Data logger	100 million measuring values start/stop time, measuring rate freely adjustable
2 additional sensor inputs	For connection of pressure sensors, temperature sensors, clamp-on ammeters, third-party sensors with 4...20 mA 0 to 10V, Pt 100, Pt 1000

Flow MA500 for compressed air (ISO 1217: 1000 mbar, 20°C)

Inner diameter of pipe			MA500 Standard (92.7 m/s)	MA500 Max. (185.0 m/s)	MA500 High Speed (224.0 m/s)
Inch	mm		Measuring range m ³ /h (cfm)	Measuring range m ³ /h (cfm)	Measuring range m ³ /h (cfm)
½"	16.1	DN15	759 l/m	1516 l/m	1836 l/m
¾"	21.7	DN20	89 m ³ /h	177 m ³ /h	215 m ³ /h
1"	27.3	DN25	148 m ³ /h	294 m ³ /h	356 m ³ /h
1 ¼"	36.0	DN32	266 m ³ /h	531 m ³ /h	643 m ³ /h
1 ½"	41.9	DN40	366 m ³ /h	732 m ³ /h	886 m ³ /h
2"	53.1	DN50	600 m ³ /h	1197 m ³ /h	1450 m ³ /h
2 ½"	68.9	DN65	1028 m ³ /h	2051 m ³ /h	2484 m ³ /h
3"	80.9	DN80	1424 m ³ /h	2842 m ³ /h	3441 m ³ /h
4"	110.0	DN100	2644 m ³ /h	5279 m ³ /h	6391 m ³ /h
5"	133.7	DN125	3912 m ³ /h	7808 m ³ /h	9453 m ³ /h
6"	159.3	DN150	5560 m ³ /h	11096 m ³ /h	13436 m ³ /h
8"	200.0	DN200	8785 m ³ /h	17533 m ³ /h	21229 m ³ /h
10"	250.0	DN250	13744 m ³ /h	27428 m ³ /h	33211 m ³ /h
12"	300.0	DN300	19814 m ³ /h	39544 m ³ /h	47880 m ³ /h