

**SITRANS F M MAGFLO**  
Electromagnetic Flowmeters  
Explore the Siemens Solution

# sitrans f MAGFLO

**SIEMENS**



**BELL**  
*Flow Systems*

[www.bellflowsystems.com](http://www.bellflowsystems.com)



# What makes MAGFLO simply better?

MAGFLO flowmeters will help you do an easier job of managing flow. Whether it is installation, managing operations or verifying continuous accuracy, customers rely on MAGFLO to improve the entire value chain of activities.

## Greater flexibility

- Wide product program
- Compact or remote installation using the same transmitter and sensor
- USM II communication platform for easy integration with all systems

## Easier to commission

- SENSORPROM enables instant measurement from the start of power-up
- User settings automatically stored in the SENSORPROM

## Easier to operate & maintain

- No moving parts
- Robust construction and materials
- Uniform user interface for all MAGFLO products

## Easier to service

- Transmitter replacement requires no programming. SENSORPROM automatically updates all settings after initialization.

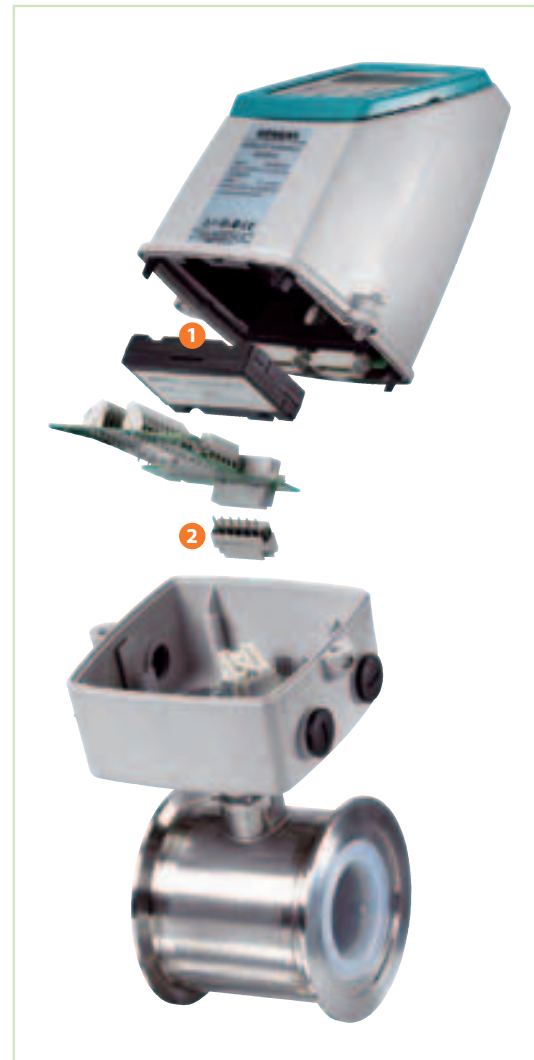
## Room for growth

- Plug & Play communication modules are available in a wide range of bus-protocols
- Add-on communication modules allow future upgrades without investing in a new flowmeter.

## Diagnostics:

### Application and metering

- Identification in clear text and Error-log
- Error categories: function; warning; permanent and fatal
- Transmitter self check including outputs and accuracy
- Sensor check
- Overflow
- Empty pipe; partial filling; low conductivity; electrode fouling
- System verification with MAGFLO Verificator



1 Plug & Play Communication Module

2 SENSORPROM





## The dedicated MAGFLO program

**Siemens offers a comprehensive selection of flowmeter technologies.**

Choosing the right flowmeter for the right application can dramatically improve your operations...and improve your bottom line. Get industry-specific solutions for:

- **Water & Wastewater**
- **Chemical**
- **Food & Beverage**
- **Pharmaceutical**
- **Mining/Aggregates/Cement**
- **Pulp & paper**
- **Power & Utilities**

Siemens can provide the best electromagnetic flowmeter options available. With Siemens flowmeters you get:

- The best value for the money
- The highest quality and most advanced technology
- User-friendly products and services
- Superior worldwide service and support





**Touchpad**

Touch response keypad with LED light feedback for safe & easy operation.



**SENSORPROM**

The memory unit will store calibration, programming and setup data.



**Communication Modules**

The USM II makes flowmeter networking installation and configuration easy. It is compatible with virtually every communication standard.

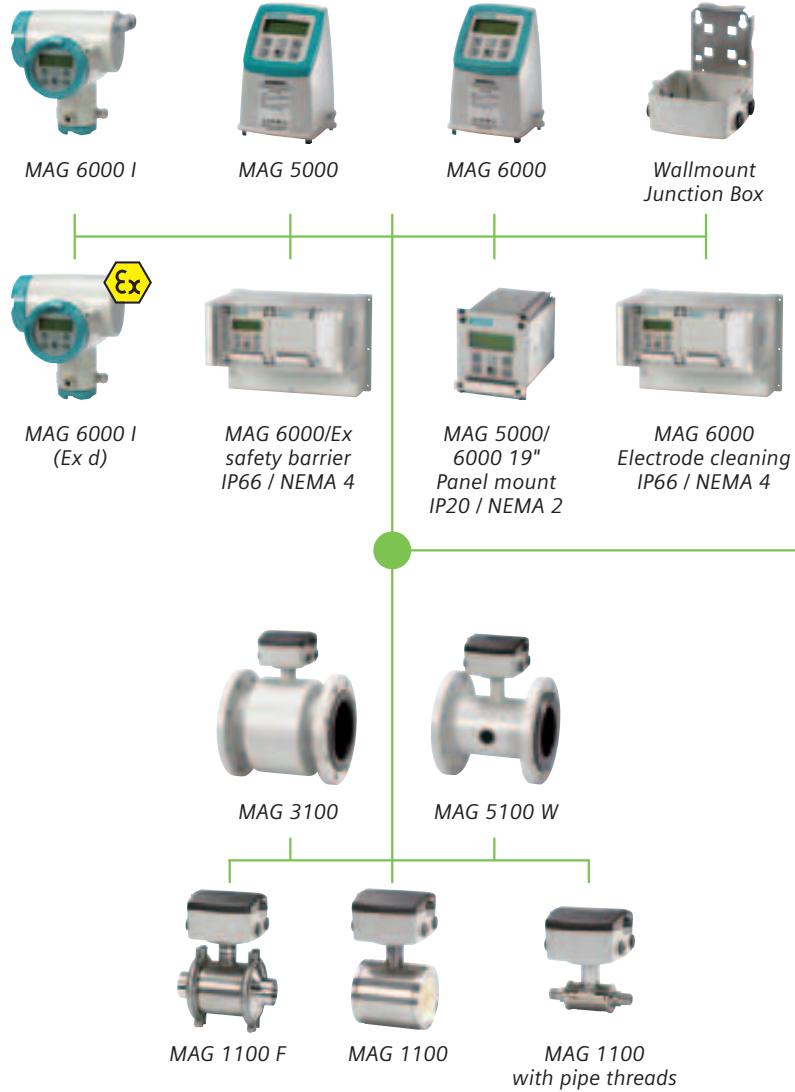


**MAGFLO Verificator**

In-situ verification to ensure continuous accuracy and confident flow measuring.

# One Platform. Infinite Solutions

Thanks to Siemens philosophy of modular design, we are making it easy to buy the magnetic flowmeter solutions and services you need.



**Modular pulsed DC magnetic flowmeters**

You can combine all the basic components of our flowmeters – the transmitters, sensors and more – because they are engineered on the shared Siemens technology platform.

**One of a kind technologies**

Siemens offers industry specific and proprietary solutions:



**TRANSMAG 2**  
The patented **pulsed AC** magnetic flowmeter  
The ideal solution for mining, cement, and pulp & paper.



**MAG 8000**  
**Battery-powered** magnetic water meters for distribution, revenue and irrigation.



Control room

# Totally Integrated Automation

## Gain full performance in the Value Chain

### Totally Integrated Automation Solutions – only from Siemens

With its Totally Integrated Automation (TIA) strategy, Siemens is in a class of its own as the sole provider of a common solutions platform for all industries. Designed for the individual customer demands, TIA enables the realization of industry specific automation solutions that significantly increase production while also offering sound investment security. These solutions are designed to ideally support companies in optimizing their plant, system and process flows.

Best of all, Siemens TIA solutions are completely scalable.

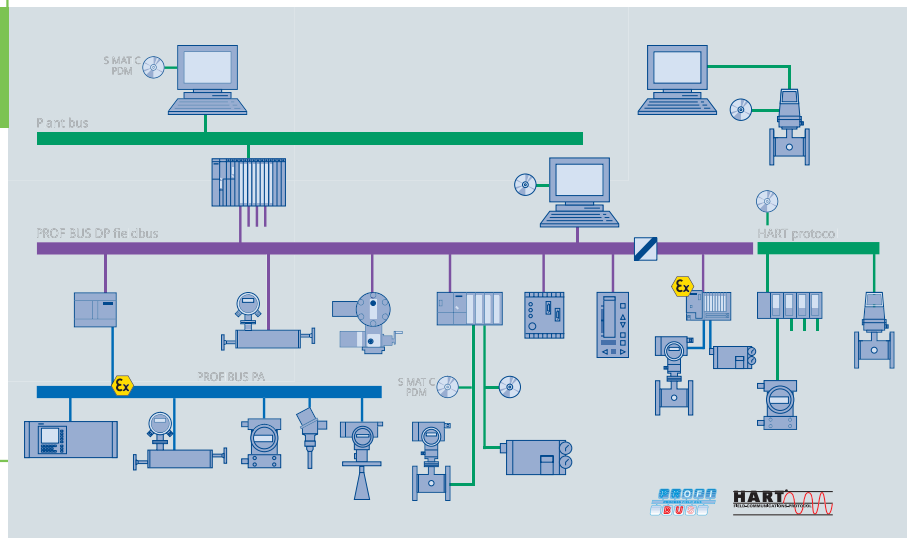
You can start with a stand-alone installation today, secure in the knowledge that you can always integrate your system tomorrow.

- Confirm flowmeters are operating optimally and are properly utilized
- Reduce downtime through predictive maintenance programs
- Access real-time flow data
- Generate the highest yield by driving down waste and costs
- SIMATIC PDM software tool for the operation, configuration, parameterization, maintenance and diagnosis of intelligent field instruments based on the world-wide leading EDD standard.



Combine and integrate with TIA

### Control level/Field level



# The Transmitter Program

## What's right for you?



### MAG 5000 and MAG 6000

**For high performance, easy operation and reduced maintenance.**

MAG 5000 is the truly robust solution for all-around applications. MAG 6000 is for the more demanding applications where higher accuracy and greater functionality is required.

### MAG 6000 Industry

This transmitter is designed for the special demands in the process industry. The robust, full-metal housing provides superb protection, even in the harshest industrial environments. Full input and output functionality is given even in the ATEX EEx d version.

### Guaranteed Performance

- Compact or Remote Installation
- Superior signal resolution for optimized turn-down ratio
- Digital Signal Processing with unlimited possibilities
- User configurable operation menu with password protection

- Multiple functional output for process control
- Self-diagnostics for error detection and logging
- Batch control
- Multi-lingual display and keypad
- Custody Transfer Approved
- Electrode cleaning accessory option

### SENSORPROM

Each flow meter has its own identity stored in the SENSORPROM.

The information consists of:

- Calibration data
- "Fingerprint" – magnetism properties
- User setup and programming data

The individual calibration and fingerprint data are pre-programmed at the factory, whereas the setup data are customer-specific. This unique combination ensures a cost effective, easy and error-free installation.



### "Plug & Play" Communication Modules

USM II (Universal Signal Module) is "Plug & Play" at its very best. It makes flowmeter networking installation and configuration easy.

And it is compatible with virtually every communication standard used today, including PROFIBUS PA/DP, HART, Modbus RTU, DeviceNet and CANopen.

Transmitter	MAG 5000	MAG 6000	MAG 6000 I	MAG 6000 I (Ex d)
Enclosure	IP67 / NEMA 4X or IP20/66 / NEMA 2/4 Polyamid		IP67 / NEMA 6 die-cast aluminium	
Max measuring Error	0.50 % of rate	0.25 % of rate		
Display	3 line alpha numeric LCD with back light			
Inputs & outputs	1 digital input, 1 current output, 1 pulse/frequency output, 1 relay output			
Communication	HART	HART; Profibus PA/DP; Modbus RTU; DeviceNet; CANopen		HART; Profibus PA
Batch function	No	Yes	Yes	Yes
Power Supply	12 – 24 V AC/DC or 115 – 230 V AC		18 – 90 DC or 115-230 AC	24 V DC or 115 – 230 V AC
Approvals	CE; ULc; C-Tick FM Class 1, Div 2			ATEX EEx d e [ia] ia IIB T6 FM Class 1, Div 2
Custody Transfer Approval	Cold Water	Cold Water, Hot Water, Other Liquids		

# The Sensor Program

## Sensible. Flexible. Reliable

### MAG 1100

The flangeless wafer design that meets all flange standards. The MAG 1100 is used in all industries where the corrosion-resistant stainless steel housing and the highly resistant liner and electrodes fit even the most extreme process media.

### MAG 1100 FOOD

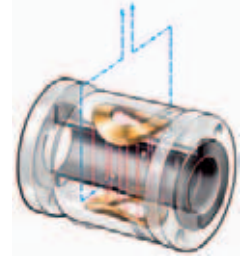
Especially designed for the food & beverage industry, it offers unique and flexible process connections. It was the first to pass the EHEDG hygienic test and meets all sanitary standards. Its performance is unaffected by suspended solids, viscosity and temperature challenges.

### MAG 5100 WATER

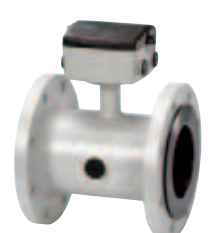
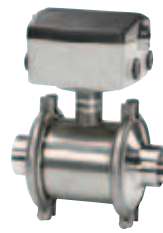
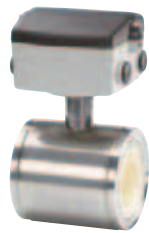
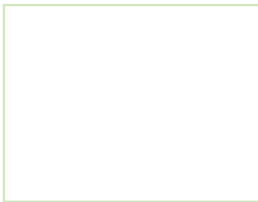
A sensor for all water and wastewater applications. With its coned design, increased low-flow accuracy is achieved, making it especially useful for leak detection. It can be made suitable for direct burial and constant flooding. MAG 5100 W complies with drinking water and custody transfer approvals.

### MAG 3100

This flexible and comprehensive sensor program offers a wide range of sizes. Liners and measuring electrodes capable of withstanding the most extreme processes are available. Fully welded construction provides a ruggedness that suits the toughest environments.



*The coils in the sensor generate a consistent magnetic field. The liquid flowing through the sensor induces a voltage proportional to the flow velocity.*



Sensor	MAG 1100	MAG 1100 F	MAG 3100	MAG 5100 W
Size DN	2 – 100** mm / 1/2" to 4"	10 – 100 mm / 3/8" to 4"	15 – 2000 mm / 3/8" to 78"	25 – 1200 mm / 1" to 48"
Process temperature	-20 – 200 °C / -5 – 400 °F	-30 – 150 °C / -20 – 300 °F	-40 – 180 °C / -40 – 350 °F	-5 – 70 °C / 23 – 160 °F
Pressure rating max.	PN 40 / Max 600 PSI		PN 100 / Max 1500 PSI*	PN 16 / ANSI / AWWA 150
Liner Material	Ceramic PFA		Neoprene, EPDM, Ebonite, LINATEX, PTFE, NOVOLAK	Hard Rubber/ Composite elastomer
Electrode Material	Platinum Hastelloy C		AISI 316 Ti, Hastelloy C, Titanium, Tantalum, Platinum	AISI 316 Ti
Approvals	3A & EHEDG		Custody Transfer	Custody Transfer Drinking Water
	ATEX EEx [ia] [ib] IIB T4-T6		ATEX EEx [ia] [ib] IIB T4-T6 ATEX EEx e [ia] IIC T3 - T6	
FM Class 1, Div 2				

\* Optional high-pressure versions available – \*\* DN 2 and 3 available from 2005

# Water Supply and Metering

## MAG 8000 for applications everywhere



### MAG 8000 6 years of non-stop battery driven performance – no main- power required

MAG 8000 is an affordable battery-driven solution that gives you the flexibility to install a reliable water meter virtually anywhere without sacrificing accuracy or performance. No main power is required.

MAG 8000 complies with the OIML R49 water meter standard and is specially engineered for water applications:

- Abstraction
- Distribution/network
- Revenue
- Irrigation

### Outstanding performance

MAG 8000 delivers best-in-class performance to optimise water supply. It is optimised for leakage detection and for correct, accurate billing. It is easy to install. And it is low maintenance, delivering long term performance with minimal cost of ownership.

- Flexible power supply
- IP68 / NEMA 6P burial enclosure
- Minimized installation requirements
- Advanced software features
- Integrated data logger
- IrDA for onsite download
- Open communication platform
- Drinking water approvals
- Complies with most international approvals

### Intelligent, battery-driven operation

With a combination of high efficiency technology and advanced power management, MAG 8000 can be trusted to deliver long lasting, dependable operation for 6-10 years in a typical revenue application.



Battery pack available as an integrated or external battery pack with an IP68 / NEMA 6 enclosure and connection. Graphical display and keypad for simple operation and instant access to information.



### Low-flow Detection

The MAG 8000 is a low-flow detection Sensor. Its coned flow tube design greatly improves low-flow performance with minimal pressure drop.

MAG 8000	
<b>Sensor Size</b>	DN 50-300 mm / 2"-12" with hard rubber elastomer
<b>Enclosure</b>	IP68 / NEMA 6P
<b>Display</b>	Graphical display with touch keypad
<b>Output</b>	2 individual pulse outputs (include net flow volume)
<b>Communication</b>	Integrated standard IrDA interface
<b>Power Supply</b>	Internal or external battery pack
<b>Features</b>	Data logger with selectable log interval up to 26 months
	Power management with selectable battery alarm level
	Real time clock and date
	Self check feature and automated data back up
	3 totalizers including one with user reset



# Water and Wastewater MAGFLO for water processes

## Cost effective solution

The MAG 5000 transmitter and MAG 5100 W sensor are the perfect match for a cost effective solution.

- One solution for all your water & wastewater applications
- No moving parts ensures long term performance
- Hard rubber elastomer liner guarantees consistent accuracy
- Highly resistant to a wide range of chemicals used in treatment plants
- Increased low-flow measurement for leak detection
- Sensor suitable for burial and constant flooding
- Drinking water approvals
- Complies with most international standards and agency approvals
- Built-in ground electrodes eliminate grounding rings

## Process optimisation

MAG 6000 with the USM II add-on communication platform makes it easy to integrate MAGFLO information into process applications.



## Realize the full benefits of automation

- Optimise management and process control
- Ensure correct dosing and product quality
- Minimise process time and consumption of high-cost chemicals



The Siemens product range provides sensors from 2 mm up to 2000 mm and from 1/12" up to 78"



## In-situ MAGFLO Verification

Your guarantee for continuous accurate measurement

- Correct revenue metering
- Confidence in process and product quality
- As hand-over of new installations to ensure correct installation
- ISO 9000 and ISO 14001

**Hazardous areas**  
MAG 6000 I (Ex d)  
available for use in hazardous areas.

**Chemical dosing**  
MAG 1100 for optimising the treatment process.

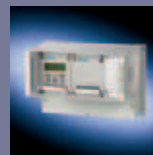
**Electrode Cleaning**  
Automatic self-cleaning of extreme deposits on the sensor electrodes.



MAG 6000 I  
(Ex d)



MAG 1100



MAG 6000  
electrode cleanings



# Chemical Industry

## The power of protection

Siemens offers the market's most versatile flowmeter program dedicated to work in the harshest environments.

Every component Siemens makes combines the highest levels of safety, quality and reliability with a low cost of ownership.

### Highest level of safety and quality

Siemens offers a full range of ATEX and FM approved flowmeters for remote or compact installations.

- Intrinsically safe rated input and outputs
- Compliance with NAMUR NE 21
- Multi-informational, multi-lingual display
- Actual flow & totalizers: forward, reverse & net totals
- Sophisticated self diagnostics
- Error log & error-pending indication



### Touchpad

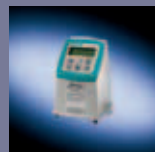
This innovative capacitive touch-sensitive keypad has an LED light indication for positive feedback, ensuring safe and easy operation in hazardous areas without having to open the enclosure.



The MAG 1100 ceramic liner is resistant to virtually all media and combined with the platinum electrodes no application is too tough.



MAG 6000 I  
(Ex d)



MAG 5000/6000



MAG 1100



MAG 1100  
with pipe threads

# Proven to meet the harsh demands in the chemical industry

Siemens flowmeters have a robust design that meets the demanding applications that flowmeters in the process industry require. They are chemically resistant, fully operational in hazardous environments, and able to perform a number of difficult measurement tasks.

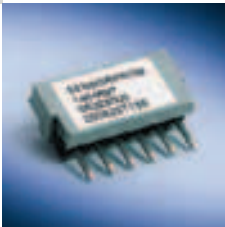
In addition, Siemens offers the in-situ verification for documenting continuous accuracy for crucial process applications, important where verification is required to meet ISO 9001, ISO 14001 or other quality control management programs.



"Plug & Play"



NOVOLAK



SENSORPROM

## Communication

With the USM II, Siemens brings flexibility and "future-proof" design one step further with fieldbus modules like Profibus PA/DP, HART, Modbus RTU, DeviceNet and CANopen.

## Lifetime corrosive resistance

The often harsh environment in the chemical industry require the use of a wide range of corrosive resistant materials. Siemens offers liner, electrode and housing materials that withstand such extreme process media.

## Well fitted liner materials:

PTFE, PFA, Ceramic, NOVOLAK

## Electrode materials

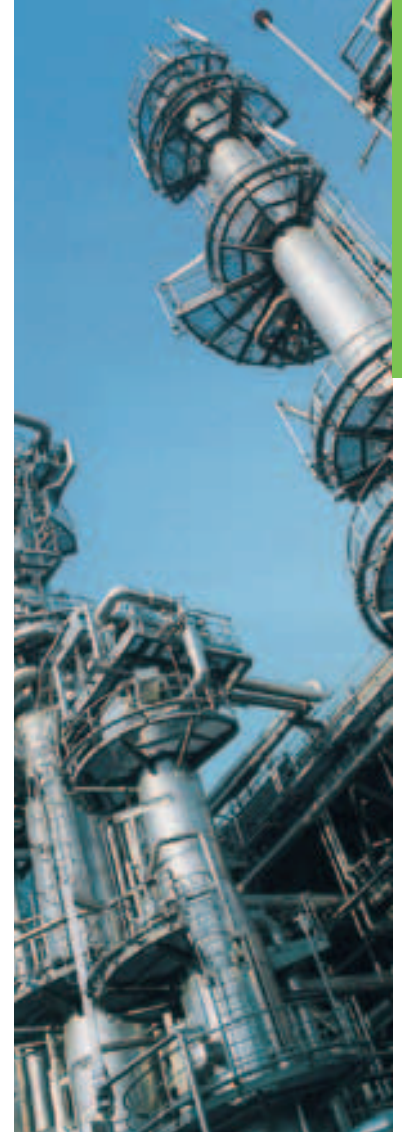
AISI 316 Ti, Hastelloy C, Titanium, Tantalum, Platin

## NOVOLAK. The revolution in liner materials

Only Siemens offers NOVOLAK, a revolutionary liner material with a smooth, hard and non porous finish that provides the highest level of protection against corrosion, abrasion, high pressure & temperatures, and vacuum conditions. It has the chemical resistance you'd expect from PTFE, with the mechanical strength and stability of steel.

## SENSORPROM

It not only stores calibration data but also the programming and setup data entered during commissioning. Ensures fast, easy and reliable servicing.



## The confidence of In-situ verification

Unique verification concept based on years of know-how is ideal for quality control management

- In-situ verification requires no interruption of flow or opening of pipes
- Full installation test of transmitter, sensor and cabling
- Testing is made on location without disconnecting any cabling.
- A fully automated verification test in less than 15 minutes



# Pharmaceutical Industry

## For accuracy, sterility and complete confidence

With cost-effective solutions that meet the high standards of accuracy and hygienic design, Siemens provides flow solutions to customers in the pharmaceutical industry which reduce the cost of high purity flow measurements.

### MAG 1100

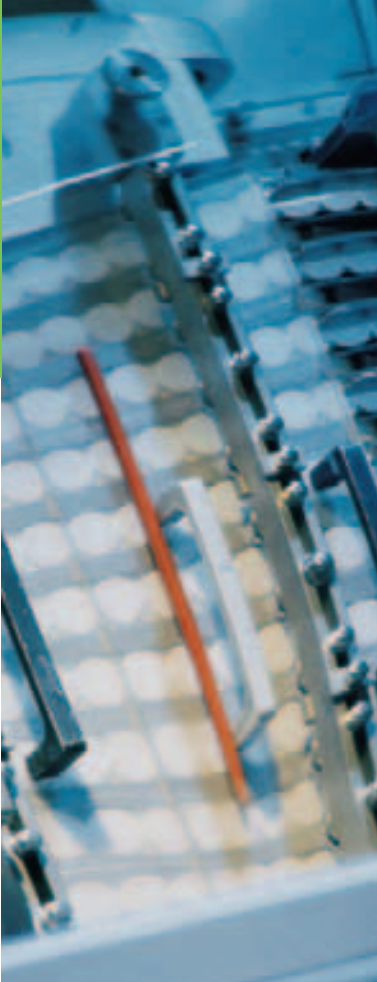
The MAG 1100 is ideally suited for pharmaceutical applications. Its obstruction-free performance minimizes the risk of deposits, and it is unaffected by the suspended solids, viscosity, and temperatures typically found in pharmaceutical processes.

### Additional benefits include:

- Suitable for CIP and SIP cleaning
- High pressure, hose down cleaning flexibility
- High levels of chemical resistance
- Resistance to high temperatures and temperature shock
- AISI 316 flangeless wafer design
- High confidence validation and accuracy in batch processing applications
- Custody transfer approvals available
- Meets 3A sanitary and EHEDG requirements

### Hazardous areas

For installations in hazardous areas the flowmeters are available with FM and ATEX approvals in remote or compact design. Still the full functionality is given by the touch keypad and multi lingual display.



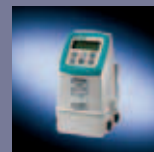
PFA reinforced with stainless steel mask has excellent mechanical stability characteristics to ensure long term stability.



EHEDG



MAG 6000 I  
(Ex d)



MAG 5000/6000  
wallmount



MAG 1100  
with pipe threads

# Food and Beverage

## A higher standard of precision and purity

Siemens provides flow solutions for the food and beverage industry to efficiently manage flow processes, giving them a competitive edge.

Our flowmeters are designed to meet the challenges in the tough environment of the food and beverage industry where extreme temperature changes, humidity, condensation, hose-down and CIP cleaning are ever present.

### The sanitary solution

MAG 1100 F is specially designed for the food and beverage industry. It was the first to pass the EHEDG hygienic test and meets all sanitary standards.

MAG 1100's obstructionless performance is unaffected by the suspended solids, viscosity, and temperature challenges typically found in food and beverage processes.

### Your guarantee for hygienic food safety

- AISI 316 stainless steel enclosure
- Hygienic seal, EHEDG and 3A approvals
- Suitable for CIP and SIP cleaning
- IP67 / NEMA 4X rating that is upgradeable to IP68 / NEMA 6P
- Delivered with your specified connection; with metal-to-metal design, no grounding connection is required.
- Direct access to covered keypad and display
- Accredited custody transfer approvals



### Process connections

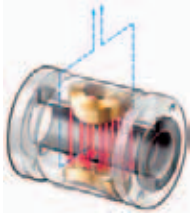
With the unique and flexible adaptor concept, one flowmeter fits nearly every process connection. Adaptors are offered for clamp connection, threaded connection or weld in type connection for direct welding into the process piping.

# TRANSMAG 2: Designed for all heavy-duty applications



## Benefits for heavy-duty solutions

- Eliminates problems related to zero-point stability
- No movable parts that can wear or degrade measurement accuracy
- Electrode noise-resistant
- Noise-resistant
- Heavy-duty industrial enclosure
- A wide choice of corrosion-resistant liner materials



## Pulsed AC technology

The pulsed AC TRANSMAG 2 flowmeter generates a strong magnetic field, a high excitation frequency and a stable zero point. Providing an accurate, repeatable, fast responding and stable flow signal.

## TRANSMAG 2 AC Flowmeter. A Siemens Exclusive.

Thanks to its pulsed alternating field system, the TRANSMAG 2 is capable of measuring where conventional DC field technology can not, like in applications involving:

- High concentrated pulp stock
- Heavy mining slurries
- Mining slurries with magnetic particles

The alternating field technology generates a much stronger magnetic field within the sensor compared to DC technology. This is why it measures more reliably and with greater precision – even when the media has a high concentration of solids.

Thanks to its patented signal integration, the TRANSMAG 2 provides only the real flow measurement by removing unwanted electrode noise from the sensor's signal. With the pulsed AC technology, it's possible to have a stable zero-point, thereby a reliable and accurate measurement.



<b>Transmitter</b>	<b>TRANSMAG 2</b>
<b>Measuring principle</b>	Pulsed alternating field
<b>Enclosure</b>	IP67 / NEMA 4X
<b>Max measuring Error</b>	0,50% of rate
<b>Display</b>	2 line alpha numeric LCD with back light
<b>Inputs &amp; outputs</b>	1 current, 1 digital, 1 relay (or 1 digital input) output
<b>Communication</b>	HART, Profibus PA
<b>Power Supply</b>	100 – 230 V AC

# Pulp & Paper and Mineral Industries

## Heavy duty solutions for tough applications

### Pulp & Paper Industry

Siemens MAGFLO and TRANSMAG 2 flowmeters offer exceptional value for pulp & paper applications. They are well-suited for any flow applications even with high solids content and are ready to take on your toughest applications – no matter how challenging they may be!

#### **Pulp**

The high energy magnetic field generated with pulsed AC technology provides a powerful signal ideal for measuring high concentrations of paper stock, i.e., greater than 3 %.



### Mining Industry

Rugged in design and unaffected by electrode noise, disturbances or vibration, Siemens MAGFLO flowmeters for the mineral industry can be easily installed virtually anywhere.

All models produce accurate and repeatable results, contributing to improved quality-based performance.

#### **Slurries**

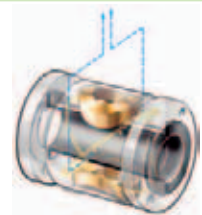
The high energy magnetic field generated with pulsed AC technology provides a powerful signal ideal for measuring high concentrations of slurries.

#### **Magnetic particles – no problem**

Magnetic particles in the media will boost the magnetic field in the flowmeter and cause a misreading. To overcome this, the TRANSMAG 2 is designed with a second compensating coil circuit.

#### **Maximum protection**

There's a solution for every abrasive media application, but the choice of material is crucial to protect the flowmeter. Besides inlet protection rings, Siemens offers a wide range of liner and electrode materials. Especially the soft LINATEX rubber and the NOVOLAK liner have proven themselves in these harsh environments.



#### **Compensation coil**

The TRANSMAG 2 offers a second coil circuit to compensate for fluctuations in the magnetic field, caused by fluctuations in the main power supply or magnetic particles in the media.



#### **LINATEX Protection**

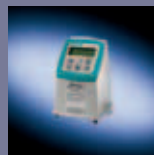
Minerals or particles will bounce off the soft rubber liner, instead of wearing it down.



TRANSMAG 2



MAG 6000 I –  
MAG 3100



MAG 5000/6000



MAG 1100



MAG 5100 W

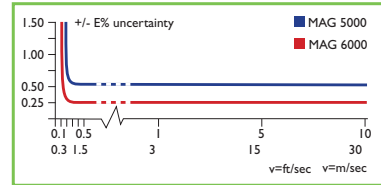
# Continuous Accuracy. Verifiable Confidence.



## Calibration

To ensure accurate flow measurement, a flowmeter must be validated through calibration. Every Siemens flowmeter is calibrated at facilities that are individually accredited in accordance with EN 45001 EA by UKAS, DANAK and traceable to NIST. A calibration certificate is shipped with every Siemens sensor. Siemens Calibration facilities comply with ISO 9001.

- High accuracy rigs with better than 0.1% calibration uncertainty
- UKAS accredited calibration laboratory #0301
- Documentation for ISO 9000 and ISO 14001 management system



## Meter performance

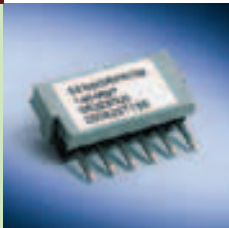
Thanks to their reliable performance, electromagnetic flowmeters are those recommended most for measurement of conductive liquids. Siemens flowmeters, among the best in the world, comply with standards such as custody transfer approvals for billing purpose. They deliver;

- Uncertainty better than 0.25% / 0.5% down to 0.5 m/s / 1.5 ft/s
- PTB type approvals (cold water), OMIL R75 and OIML R117
- Comply with OIML R49 and ISO 4064

## MAGFLO SENSORPROM

During the calibration process, measurement parameters and "Fingerprint" data, as well as other important data are stored in the SENSORPROM memory:

- Sensor information and identification
- Calibration parameters
- Fingerprint parameters
- Default flowmeter settings



Test		Full Scale Flow	Water Temp	True Flow Rate	Flowmeter Output	Flowmeter Frequency output	Error
No	[Hz]	[m³/h]	[°C]	[m³/h]	[mA]	[Hz]	[Hz]
1	25	21.3	0.74555	1899.8	0.74540	0.656	0.05
2	25	21.3	0.74615	1899.3	0.74589	0.74589	0.25
3	75	21.4	2.2257	5654.8	2.2258	2.2258	-0.15
4	75	21.4	2.2253	5653.4	2.2250	2.2250	-0.15
5							
6							
7							
8							
9							
10							

Calibrated by	GG	Approved by	[Signature]
Date	2005-12-17	Time	14:00:38

# In-situ MAGFLO verification – three simple steps

Through in-depth analysis, Siemens has identified the parameters which influence the accuracy of a flowmeter operating in the real world.

These parameters are checked using a unique, patented verification technique for MAGFLO flowmeters. Testing at WRC proved the accuracy of the verification result for a complete flowmeter.

## 1 Transmitter Test

The transmitter test is a flow simulation test that checks the whole electronic system from signal input to output. Using the magnetic field energy, the Vericator simulates a flow signal to the transmitter input.

By measuring the transmitter output, the Vericator calculates its accuracy against factory defined values.

## 2 Flowmeter Insulation Test

The verification test of the flowmeter insulation is a "cross-talk" test of the entire flowmeter. It ensures that the sensor flow signal is unaffected by external influences.

In this test, the Vericator generates a high voltage disturbance within the coil circuit and then looks for any "cross-talk" induced in the flow signal circuit. By generating dynamic disturbances close to the

flow signal the flowmeter is tested for noise immunity to a maximum level.

## 3 Sensor Magnetism Test

The verification of the sensor magnetism is a "boost" test of the magnetic field coil. It ensures that the magnetism behaviour compares to its original behavior by comparing the current sensor magnetism with the "fingerprint" determined during initial calibration and stored in the SENSORPROM.

In the "Boost" test the Vericator changes the magnetic field pattern and uses high voltage to get quick stable magnetic condition.

## Certificate

An authorized, signed certificate documents the verification and includes:

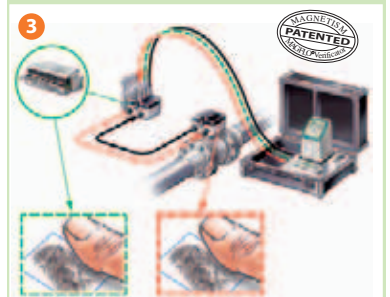
- Test result with pass or failed approval
- Installation specification
- Flowmeter specification and configuration
- Vericator specification with date of calibration ensuring traceability to national and international standards.



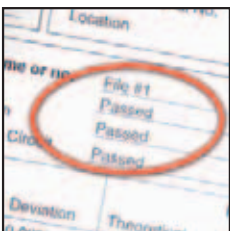
Flow Simulation Test



"Cross-Talk" Test



"Boost" Test



SIEMENS MAGFLO® Verification Certificate			
<b>Customer:</b>	<b>MAGFLO® Identification:</b>		
Name: Aida Zool	TAG No./Name: 0		
Address: Sanden	Sensor Code No.: 0032074		
Substrate: Alan Pedersen	Sensor Serial No.: 107901110		
Phone:	Converter Code No.: 003F001		
Email:	Converter Serial No.: 002124002		
	Location: Indefining F02		
<b>Details:</b>	File #10		
Verification file name or No.:	Passed		
Converter:	Passed		
Sensor:	Passed		
Insulation:	Passed		
Magnetic Circuit:	Passed		
Velocity:	Current Output	Freq. Output	
Theoretical	Theoretical	Actual	Deviation
0,5m/s	4,800mA	4,800mA	0,14%
1,0m/s	9,600mA	9,600mA	0,00%
1,5m/s	14,400mA	14,400mA	0,00%
2,0m/s	19,200mA	19,200mA	0,00%
2,5m/s	24,000mA	24,000mA	0,00%
3,0m/s	28,800mA	28,800mA	0,00%
Current Output @ 20mA:	Freq. Output @ 10Hz:		
Converter Settings:	Sensor Details:		
Range:	Size:	DN 80 3/4"	
Orifice:	Flow Direction:	Forward	
Flow Direction:	Cal Factor:	0,00000	
Low Flow Cut-off:	Correction Factor:	1,00000	
Empty Flag:	Excitation Frequency:	3,125Hz	
Output:	Current Output:	ON (4-20mA)	
Time Constant:	Relay Output:	OFF	
Relay Output:	Digital Output:	OFF	
Frequency Range:	Frequency Range:	Not Valid	
Time Constant:	Time Constant:	Not Valid	
Volt/Hz:	Volt/Hz:	0,0 0/0	
Pulse width:	Pulse width:	N/A	
Pulse priority:	Pulse priority:	MS	
Validator 1 value before test:	Validator 1 value after test:	18851918,0.1	
Validator 2 value before test:	Validator 2 value after test:	1885300,3.1	
Validator 3 value before test:	Validator 3 value after test:	174833,8.1	
Validator 4 value before test:	Validator 4 value after test:	174833,8.1	
Comments:	Special mounting:		
These tests verify that the flowmeter is functioning within 2% deviation of the original test parameters. Verification is traceable to National and International Standards.			
Date and signature: 2001.01.18 John Hansen			

**WRC\***

What independent testing by WRC says: **"The MAGFLO Vericator correctly detected all set-up faults in the complete flowmeter...is straightforward to use.....is sturdy and suitable for field use"**

WRC, Water Research Centre is a leading, independent research, technology and consultancy company with a reputation for scientific and technical excellence. WRC has over 15 years of experience in instrument testing and evaluation. WRC's full report, UC3600 March 2000, is available for inspection.