Take total control of your HVAC system with cost-saving flow and thermal energy meters

Because you can’t manage what you don’t measure
Bringing HVAC to new levels of energy efficiency

With energy costs continuing to rise every year, it’s more important than ever to ensure that your HVAC applications are running as efficiently as possible – and that you know exactly where and when that energy is being used. After all, the system that works so hard to keep a building comfortable and safe often accounts for more than 50% of that building’s total energy consumption. Siemens can help. Our diverse portfolio of flow and thermal energy meters provides the real-time data you need to assess your operational efficiency and more effectively manage your energy usage.

Remember: you can’t manage what you don’t measure. Let Siemens empower you to take total control of your system – and your savings.
Reliable flow and thermal energy meters for every application

Whether your HVAC system is new or existing, and whatever your operating conditions may be, there is a flow or thermal energy meter from Siemens to get the job done reliably and cost-efficiently. With Siemens, you’ll experience:

- Accurate measurement of liquids, gases and steam
- Flexible installation options, including compact and remote versions
- Plug-and-play communication modules for easy integration and upgrades
- Minimal maintenance requirements
- Robust construction and materials

**SITRANS F US Ultrasonic Flow Meters**
Available in both inline and clamp-on varieties, SITRANS F US ultrasonic technology measures flow accurately in installations characterized by low load periods or low flow. The clamp-on meters feature sensors mounted externally on the pipe, making them an excellent option for retrofit projects where the pipe can’t be cut into or the flow can’t be stopped. A portable version of the clamp-on meter is also available for temporary installations and meter verification. SITRANS F US meters can be paired with insert or clamp-on temperature sensors to support hot or chilled water thermal energy measurement.

**SITRANS F M Electromagnetic Flow Meters**
SITRANS F M electromagnetic flow meters are the right choice for the vast majority of hot and chilled water applications, including new installations and small line sizes (less than 12 in). This highly accurate flow technology replaces traditional mechanical meters when greater functionality is required. SITRANS F M meters are ruggedly constructed to withstand nearly any environment and come equipped with an ebonite rubber liner for increased durability.

**SITRANS F C Coriolis Flow Meters**
The most accurate flow metering technology available, SITRANS F C Coriolis flow meters are ideal for installation on gas and oil feed lines to boilers as well as for measuring condensate. Their compact design also makes these meters a good option for low-flow applications. Other benefits of SITRANS F C include the capability for multiparameter measurement (e.g. mass flow, volume flow, density and temperature), very high turndown ratio and low pressure drop.
SITRANS F X Vortex Flow Meters
SITRANS F X vortex flow meters have the unique capacity for measuring steam flow, making them the perfect match for saturated or superheated steam applications. Because vortex meters can function relatively independent of conductivity, temperature, density and pressure, they work very well for systems that experience fluctuating process conditions, such as burners, boilers and compressed air systems. For added convenience, SITRANS F X incorporates two-wire technology with integrated pressure and temperature sensors, eliminating the need for cables.

SITRANS P DS III Differential Pressure Transmitter
The tried-and-tested SITRANS P DS III can measure flow in a variety of HVAC applications, including natural gas boilers, air ducts, combustion intakes, boiler stacks and chilled water. The transmitter is durable enough to function in a very wide range of temperatures and pressures and can be paired seamlessly with an assortment of primary elements (e.g. pitot tubes, Venturi or orifice plates).

SITRANS FEC920 Energy Calculator
SITRANS FEC920 is a high-accuracy thermal energy calculator designed for heating and cooling systems. It can be paired with one of several SITRANS F flow meters or existing flowmeters with 4-20 mA or frequency outputs to provide an instant, easy-to-read calculation of thermal energy. The modular design of the SITRANS FEC920 makes it possible to configure the calculator to the specifics of the customers heating or cooling applications. Outputs include 4-20 mA, Frequency and Data highway including BACnet, Modbus And Ethernet IP.

SITRANS F M Verificator
For energy billing applications where even the smallest metering error can result in major revenue loss, the highly advanced SITRANS F M Verificator carries out on-site validation of electromagnetic flow meter performance. The fully automatic test takes only 15 minutes after connection and checks the transmitter, flow meter insulation and sensor magnetism, then outputs a verification report according to ISO 9000 and 14001. Verification is traceable to NIST and international standards.

HVAC Service Program
HVAC technology has advanced to the point where outside technical expertise is sometimes required, which is why Siemens offers individualized service packages ideally suited to meet your HVAC needs. Expertly-trained field service engineers are available to visit your site and provide a wide range of services including start-up assistance, troubleshooting, repairs, periodic calibration and verification, flow and site surveys, hands-on training, equipment rentals and more. Call the Siemens US Support Center at 1-800-333-7431 to get started.
<table>
<thead>
<tr>
<th></th>
<th>Electromagnetic</th>
<th>Thermal Energy</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>MAG 3100</td>
<td>MAG 5100W</td>
</tr>
<tr>
<td>Sensor Size</td>
<td>0.50&quot; – 78&quot;</td>
<td>1&quot; – 78&quot;</td>
</tr>
<tr>
<td></td>
<td>1&quot; – 48&quot;</td>
<td></td>
</tr>
<tr>
<td>Process Temperature</td>
<td>-40 - 212 °F</td>
<td>-40 – 158 °F (remote transmitter)</td>
</tr>
<tr>
<td></td>
<td>High temp option</td>
<td>-5 – 122 °F (integral transmitter)</td>
</tr>
<tr>
<td></td>
<td>356 °F</td>
<td>32 – 158 °F</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.20% or 0.40% of rate</td>
<td>0.20% or 0.40% of rate</td>
</tr>
<tr>
<td></td>
<td>0.2% or 0.4% of rate</td>
<td></td>
</tr>
<tr>
<td>Pressure Rating</td>
<td>Max 232 psi ≤ 78&quot;</td>
<td>Max 280 psi (1&quot;–24&quot;)</td>
</tr>
<tr>
<td></td>
<td>Max 1450 psi ≤ 12&quot;</td>
<td>Max 145 psi (28&quot;–78&quot;)</td>
</tr>
<tr>
<td>Straight Run (For best performance)</td>
<td>5x pipe diameter up 3x pipe diameter down</td>
<td>5x pipe diameter up 3x pipe diameter down</td>
</tr>
<tr>
<td></td>
<td>Current: 4 – 20 mA Digital: Pulse, Frequency,5000/HART 6000 transmitter only Plug-in modules: HART Modbus* DeviceNet Profibus PA,DP Foundation Fieldbus</td>
<td>Analog 4-20 mA (2) (500 ohm maximum) Relay output Max 1A at 230V RMS +/-15%, Min: 5mA @ 5V Maximum current through terminals: 1A BACnet IP server (Std), Modbus TCP/IP server, EtherNet/IP client/server</td>
</tr>
<tr>
<td>Applications</td>
<td>Chilled Water Hot Water Condenser Water Domestic Water Chemical Dosing</td>
<td>Domestic Water (Not designed for process control)</td>
</tr>
<tr>
<td></td>
<td>Chilled Water Hot Water Condenser Water Domestic Water Chemical Dosing</td>
<td>Chilled Water Hot Water Flow measurement on feed or return line. Water or Water/Glycol mixture UL, ULc Approval RoHS compliant Conforms to OIML R75 Class 4 and EN1434 Standards</td>
</tr>
<tr>
<td>Options</td>
<td>Liners: Soft rubber EPDM PTFE PFA Ebonite Linatex ANSI Class 150 / 300 / AWWA Special requests: Consult Factory</td>
<td>Liners: Ebonite hard rubber EPDM NBR hard rubber Liner: EPDM Fire meter approval for 2&quot;-12&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100...230 V AC, 50 ... 60 Hz, or 2 4 V DC</td>
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</tbody>
</table>

(*) Ethernet IP External Module.
<table>
<thead>
<tr>
<th>Clamp-on Ultrasonic</th>
<th>Pressure</th>
<th>Coriolis</th>
<th>Vortex</th>
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<tbody>
<tr>
<td>FS230</td>
<td>FS220</td>
<td>DS III</td>
<td>FC330</td>
</tr>
<tr>
<td>0.25&quot; – 394&quot;</td>
<td>0.25&quot; – 394&quot;</td>
<td>–</td>
<td>0.50&quot; – 3&quot;</td>
</tr>
<tr>
<td>±0.5-1.0% of rate at ≥ 1 ft/s</td>
<td>1.0% of rate at ≥ 1 ft/s</td>
<td>≤ 0.065%</td>
<td>± 0.10% of rate</td>
</tr>
<tr>
<td>Limited only by pipe</td>
<td>Limited only by pipe</td>
<td>0.014 – 10,150 psi</td>
<td>Max 1450 psi</td>
</tr>
<tr>
<td>10x pipe diameter up 5x pipe diameter down</td>
<td>10x pipe diameter up 5x pipe diameter down</td>
<td>–</td>
<td>None required</td>
</tr>
<tr>
<td>Current: Up to (4) 4-20 mA Voltage: 2x 0-10V DC Status alarm: Up to 4 SPDT relays Frequency: Up to 4 0-10 kHz RS232 Modbus (optional)</td>
<td>Current: 1x 4 – 20 mA DC Status alarm: 1x relay 30V DC Pulse: 41.6 ms ... 5 s pulse duration Frequency: 0 ... 12.5 kHz (50 % duty cycle) Modbus RTU RS 485</td>
<td>Current: 4 – 20 mA Digital Pulse, Frequency Relay Digital Input Digital Communication: HART Modbus RTU RS485 Profibus PA, DP</td>
<td>Current: 4 – 20 mA Digital Pulse, Frequency Relay Digital Input Digital Communication: HART DeviceNet Profibus PA, DP Modbus RTU</td>
</tr>
<tr>
<td>Chilled Water Hot Water Condensate Domestic Water Fuel Oil Verification</td>
<td>Chilled Water Hot Water Condensate Water Condensate Domestic Water</td>
<td>Chilled Water Hot Water Condensate Water Condensate Domestic Water Steam Compressed Air Natural Gas</td>
<td>Condensate Fuel Oil Natural Gas Chemical Produced Oil &amp; Gas Hot/Cold Water Food &amp; Beverage</td>
</tr>
<tr>
<td>Single channel Dual path Dual Channel, 4 Path and Four channel Portable ultrasonic clamp on Check Metering Kit available through rental program.</td>
<td>–</td>
<td>Orifice Plate Venturi Pitot Tube</td>
<td>Flanges: ANSI / ASME B16.5 CL150lb RF CL300lb RF CL600lb RF Pipe threads: ASME B1.20 (NPT), ISO228-1 G (BSPP), VCO Quick-connect Hastelloy tubes</td>
</tr>
</tbody>
</table>

**Notes:**
- **AWSA**: AWWA standards for water treatment equipment.
- **Linatex**: Linatex is a type of rubber used for high-pressure applications.
- **Ebonite**: Ebonite is a type of synthetic rubber used for seals and gaskets.
- **PFA**: PFA (Polytetrafluoroethylene) is a popular material for chemical resistance applications.
- **PTFE**: PTFE (Polytetrafluoroethylene) is a type of plastic used for chemical resistance and abrasion resistance.
- **Soft rubber**: Soft rubber is used in applications requiring flexibility and durability.
- **Chemical Dosing**: Chemical dosing involves the precise addition of chemicals to water for treatment purposes.
- **Condenser Water**: Condenser water is used in cooling systems.
- **Hot Water**: Hot water is used for heating purposes.
- **Chilled Water**: Chilled water is used for cooling and refrigeration applications.
- **Domestic Water**: Domestic water is used for general household use.
- **Fuel Oil**: Fuel oil is used as a fuel source.
- **Condensate**: Condensate is the water produced as a result of condensation.
- **Natural Gas**: Natural gas is a fossil fuel used for heating and cooking.
- **Produced Oil & Gas**: Produced oil and gas are natural resources.
- **Food & Beverage**: Food and beverage applications require specific material compatibility.
- **Steam**: Steam is used for heating and power generation.
- **Water or Water/Glycol**: Water or water/glycol mixtures are used in various applications.
- **Fire meter approval**: Fire meter approval ensures the meter meets fire safety standards.
- **EPDM**: EPDM (Ethylene Propylene Diene Monomer) is a type of elastomer used for gaskets and seals.
- **NBR hard rubber**: NBR (Nitrile Butadiene Rubber) is a type of synthetic rubber.
- **EPDM**: EPDM is a synthetic rubber used for gaskets and seals.
- **Ebonite hard rubber**: Ebonite hard rubber is a type of synthetic rubber.
- **Water or Water/Glycol**: Water or water/glycol mixtures are used in various applications.
- **Foundation Fieldbus**: Foundation Fieldbus is a digital communication protocol for industrial automation systems.
- **Profibus PA, DP**: Profibus PA and DP are communication protocols used in industrial automation.
- **DeviceNet**: DeviceNet is an industrial communication protocol.
- **Modbus**: Modbus is a widely used industrial communication protocol.
- **HART**: HART (Highway Addressable Remote Transducer) is a communication protocol used in industrial automation.
- **Plug-in modules**: Plug-in modules allow for easy installation and removal of components.
- **6000 transmitter only**: Specific transmitter modules are designed for specific applications.
- **Frequency, 5000/HART**: Frequency outputs and HART communication are used for industrial automation.
- **Digital: Pulse, Current: 4 – 20 mA**: Digital pulse and current outputs are used for industrial automation.
- **Max 232 psi ≤ 78”**: Maximum pressure ratings for different pipe diameters are specified.
- **356 °F**: Maximum temperature ratings are specified.
- **-5  – 122 °F**: Temperature range for operation is specified.
- **32 – 158 °F**: Temperature range for operation is specified.
- **Customer specific ranges**: Custom temperature ranges are available.
- **Relay output**: Relay outputs are used for control and signaling.
- **Analog 4-20 mA (2) (500 ohm maximum)**: Analog outputs are used for process control.
- **Input from RTD or TC**: Input from RTDs (Resistive Temperature Detectors) or TCs (Thermocouples) is used for temperature measurement.
- **±0.75%**: Accuracy of measurements is specified.
- **±0.5-1.0% of rate**: Accuracy of measurements is specified.
- **According to flow and temperature device**: Accuracy is specified according to flow and temperature conditions.
- **Consult Factory**: Consultation with the manufacturer is recommended for specific applications.
- **Max 145 psi  (28”–78”)**: Maximum pressure ratings for different pipe diameters are specified.
- **Max 280 psi (1”–24”)**: Maximum pressure ratings for different pipe diameters are specified.
- **High temp option**: High temperature options are available.
- **-40 – 212 °F**: Temperature range for operation is specified.
- **-58 – 356 °F**: Temperature range for operation is specified.
- **-40 – 464 °F**: Temperature range for operation is specified.
- **±0.5-1.0% of rate at ≥ 1 ft/s**: Accuracy of measurements is specified at higher flow rates.
- **±0.5-1.0% of rate at ≥ 1 ft/s**: Accuracy of measurements is specified at higher flow rates.
- **±0.5-1.0% of rate at ≥ 1 ft/s**: Accuracy of measurements is specified at higher flow rates.
- **2 individual passive pulse outputs**: Pulse outputs are used for control and signaling.
- **GSM/GPRS (wireless)**: Wireless communication modules are available for remote monitoring.
- **Encoder interface**: Encoder interfaces are used for data acquisition.
- **Integrated standard IrDA interface**: Integrated IrDA interfaces are used for short-range wireless communication.
- **2x 0-10V DC**: Voltage outputs are specified.
- **50 ... 60 Hz**: Frequency range is specified.
- **1A**: Current rating is specified.
- **Relay output**: Relay outputs are used for control and signaling.
- **Status alarm: Up to 4 relay 30V DC**: Status alarms are used for alerting.
- **Frequency: Up to 4 0-10 kHz**: Frequency range is specified.
- **Frequency: Up to 4 0-10 kHz**: Frequency range is specified.
- **Status alarm: Up to 4 relay 30V DC**: Status alarms are used for alerting.
- **Digital Pulse, Frequency**: Digital pulse and frequency outputs are used for industrial automation.
- **Digital Input**: Digital inputs are used for control and signaling.
- **Digital Communication: HART Modbus RTU RS485 Profibus PA, DP**: Digital communication protocols are supported.
- **Current: 4 – 20 mA**: Current outputs are specified.
- **Relay**: Relay outputs are used for control and signaling.
- **Digital Input**: Digital inputs are used for control and signaling.
- **Digital Communication: HART DeviceNet Profibus PA, DP Modbus RTU**: Digital communication protocols are supported.
- **Current: 4 – 20 mA HART Pulse Profibus PA (pending) Foundation Fieldbus (optional)**: Current outputs and communication protocols are specified.
- **Status alarm: 1x 0-10V DC**: Status alarm output is specified.
- **Frequency: 0 ... 12.5 kHz (50 % duty cycle)**: Frequency range is specified.
- **Modbus RTU RS 485**: Modbus RTU and RS 485 communication protocols are supported.
- **Max 145 psi**: Maximum pressure rating is specified.
- **Max 3844 psi (Hast)**: Maximum pressure rating is specified.
- **Pressure limits tube size**: Pressure limits are specified.
- **10x pipe diameter up 5x pipe diameter down**: Pipe diameter considerations are specified.
- **Limited only by pipe**: Limitations are specified.
- **None required**: No additional requirements are necessary.
- **None required**: No additional requirements are necessary.
- **20x pipe diameter up 5x pipe diameter down**: Pipe diameter considerations are specified.
- **Flanged 0.50” – 12” Sandwich 0.50” – 4”**: Flanged connections are specified.
- **Limitation on feed or control**: Limitations are specified.
- **Fire meter approval for 2”–12”**: Fire meter approval is specified for specific pipe diameters.