

**SIEMENS**  
*Ingenuity for life*

You can't manage what  
you don't measure.

Accurate solutions for District Energy,  
HVAC and Energy Efficiency.





## The Siemens promise:

**Quality** – our first priority

**Energy efficiency** – obstruction-free measurement technologies and energy-saving meter intelligence

**Single-source-supplier** – broad range of cost-efficient instrumentation

**Decades of experience** – broad installed base worldwide

**Certification** – custody-transfer approved for billing

**Integration** – seamless integration into leading building automation management systems

**At your service** – we are there for you 24 hours a day, 365 days a year

# Take energy efficiency to the next level

Along with significant growth, today's global district energy industry faces enormous challenges. As world-wide concern over the security of a future energy supply continues to grow, so does the emphasis on controlling rising energy prices and ensuring long-term environmental sustainability. Government programs and internationally recognized certifications such as ISO 50001 and LEED further encourage efforts to meet very strict standards of energy usage.



Siemens is a trusted partner for single-source solutions that bring your HVAC and industrial auxiliary installations to a whole new level of energy efficiency. From cogeneration energy production, district heating and cooling systems to compressed air and steam applications, we maximize your energy conservation and optimize the cost effectiveness of every process.

#### **Proven in use**

Our broad installed base is proven around the world and includes a variety of infrastructure and building automation projects such as:

- Industrial production facilities
- Commercial and data centers
- Hotels
- Airports and train stations
- Hospitals
- Universities
- Other governmental buildings

Highly accurate and reliable process instrumentation from Siemens delivers the information you need to optimize your operations. Take advantage of:

#### **Optimized energy savings**

- For every type of energy from heating and cooling to compressed air and steam
- Greater visibility into individual tenant consumption for more accurate billing

#### **The perfect fit for new and retrofit projects**

- Flexible, space- and cost-effective installation options, even for systems already in operation
- Portable clamp-on metering solution available for energy audits

#### **Comprehensive certificates and approvals**

- Custody transfer-approved for billing (e.g. MI004, PTB K7.2 and OIML R75)
- Features leading international and local certificates and approvals

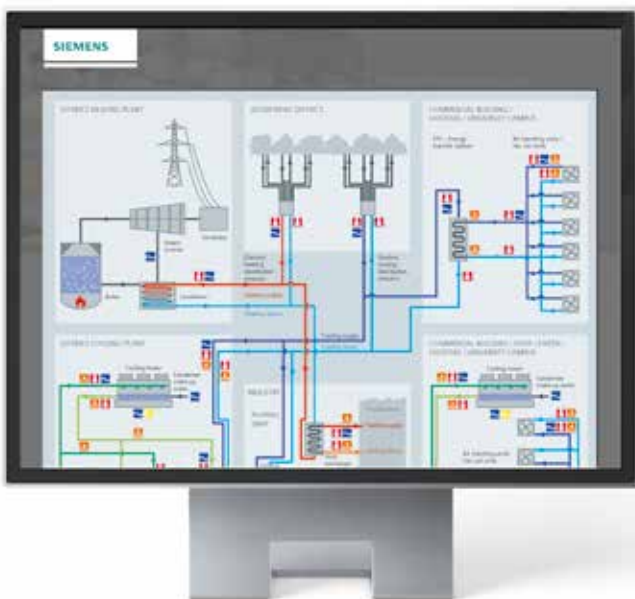
#### **Seamless integration into any automation system**

- Direct integration into BMS via BACnet, Modbus, Ethernet IP and M-Bus
- Compatible with all main communication standards (HART, Modbus and Profibus)



## Solutions to match your needs

Siemens is your partner for process instrumentation. From flow, temperature and pressure to level and positioners, our complete portfolio of measurement technologies meets the needs of every application and offers you the reassurance of seamless integration into any automation system.



To find the perfect solution for your process, you can explore our interactive process charts or our District Energy and Water product overview brochure by visiting:

[siemens.com/sensors/districtenergy](https://www.siemens.com/sensors/districtenergy)

To configure a product for your individual specifications, visit the PIA Selector:

[usa.siemens.com/piaselector](https://usa.siemens.com/piaselector)

For every key measurement a solution



Flow & Energy  
SITRANS F



Temperature  
SITRANS T



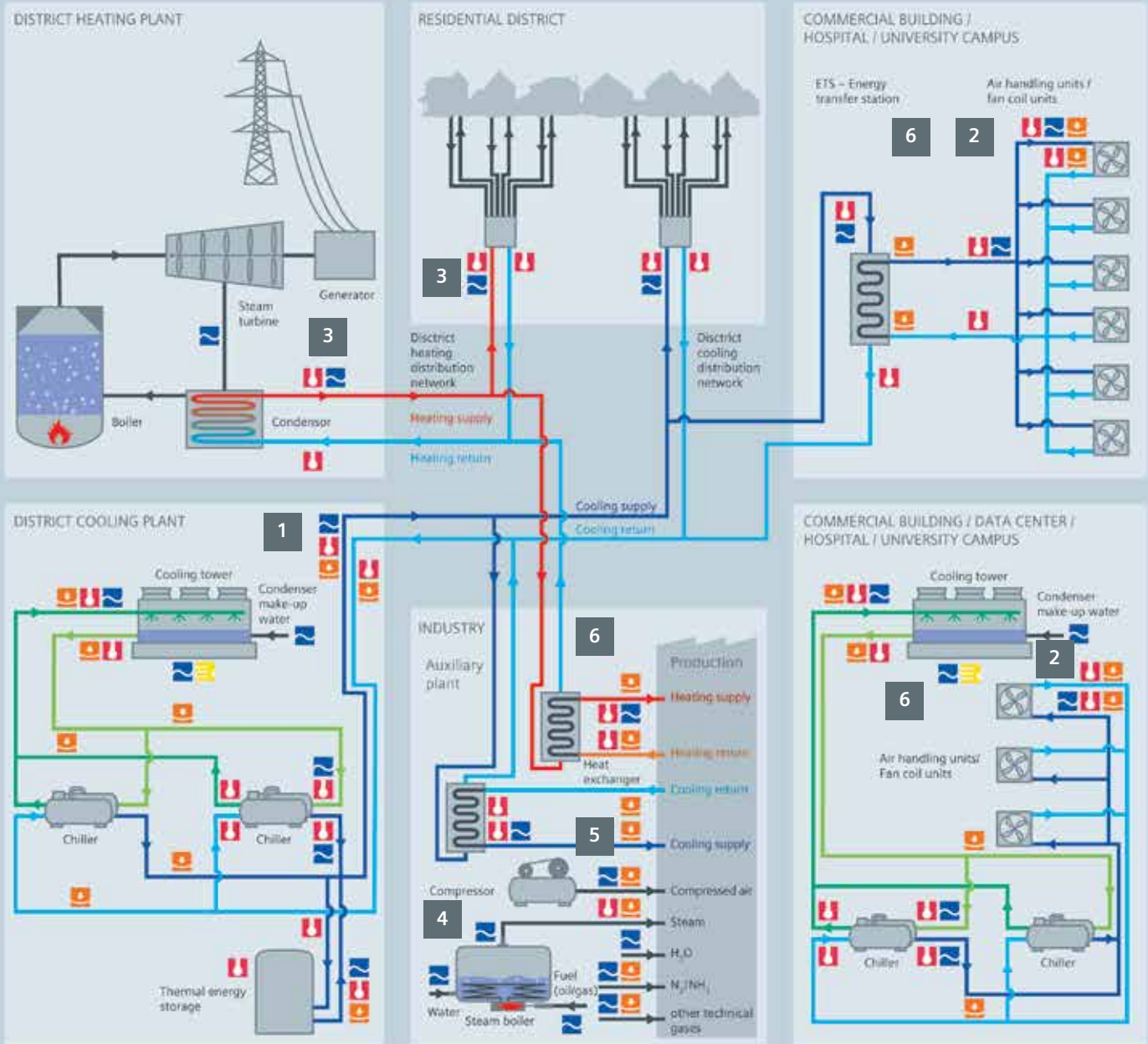
Pressure  
SITRANS P



Level  
SITRANS L



Positioners  
SIPART



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Cooling plant performance monitoring

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Control of cooling costs

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Billing-grade heat metering

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Temporary measurements and energy audits

# 1

## Cooling plant performance monitoring

Monitoring process variables provides greater control over cooling plant performance for increased plant efficiency and cost savings. Advanced maintenance and self-diagnostic features facilitate more accurate operational decisions, e.g. maintenance scheduling, performance monitoring and load balancing of equipment.

### Temperature and pressure solution

Preferred devices: SITRANS TH and SITRANS TS temperature transmitters and sensors

- Cost-competitive temperature measurement
- Complete portfolio of RTD sensors

Preferred devices: SITRANS P and dP pressure transmitters

- Wide range of easy-to-use transmitters
- Excellent cost-performance ratio

### Inline flow solution ideal for new installations

Preferred devices: SITRANS F M MAG 5100 W/MAG 6000 electromagnetic flowmeter system paired with SITRANS FEC920 thermal energy calculator and RTD sensors

- High accuracy of up to  $\pm 0.2\%$
- Medium temperatures up to  $80\text{ }^\circ\text{C}$  /  $176\text{ }^\circ\text{F}$
- DN 15 to DN 2000 /  $\frac{1}{2}$ " to 80"
- 4-20 mA and pulse outputs, with additional communications options including BACnet IP, Modbus TCP/IP and Ethernet IP.

### Clamp-on flow solution perfect for retrofitting

Preferred devices: FFEC920 Thermal Energy Calculator with FS220 ultrasonic clamp-on flow meter and RTD sensors

- Non-intrusive sensors with no flow interruption
- Accuracy of  $\pm 0.5\text{-}1\%$
- Medium temperatures up to  $230\text{ }^\circ\text{C}$  /  $446\text{ }^\circ\text{F}$
- DN 6 to DN 9140 /  $\frac{1}{8}$ " to 360"
- Communication options include BACnet IP, Modbus TCP/IP and Ethernet IP (FEC920).
- Built-in energy calculator (FEC920)
- Simultaneous measurement of 2 pipes (FEC920)

Flexible installation options for minimal impact on systems in operation

# 2

## Control of cooling costs

Measuring the flow of energy throughout a cooling system provides full transparency into the consumption pattern of each tenant within a building. This makes it possible to reduce energy costs by adjusting the number of chillers to fulfill actual cooling demand, as well as to bill users according to actual energy usage.

### Inline flow solution ideal for new installations

Preferred devices: SITRANS F M MAG 5100 W/MAG 5000 electromagnetic flowmeter system paired with SITRANS FUE950 energy calculator and RTD sensors

- Easy integration into leading building automation systems via M-Bus RS 232/RS 485, pulse or 4-20 mA
- CT approvals including MI004 and PTB K 7.2
- High accuracy of  $\pm 0.2\text{-}0.4\%$
- DN 15 to DN 2000 /  $\frac{1}{2}$ " to 80"

### Clamp-on flow solution perfect for retrofitting

Preferred devices: SITRANS FS220 ultrasonic flowmeter paired with SITRANS FEC920 energy calculator and RTD sensors

- No flow interruption required
- Performs basic measurement tasks
- Integrated data logger
- Accuracy of  $\pm 0.5\text{-}1\%$

### Clamp-on flow solution with integrated thermal energy measurement

Preferred devices: SITRANS FEC920 Thermal Energy Calculator with FS220 ultrasonic clamp-on meter and RTD sensors

- Integrated data logger
- Dual path/channel options for increased accuracy and multiple measurements via a single transmitter
- Supports leading building automation communication standards including BACnet IP, RTU, Modbus TCP/IP, and, Ethernet

High measurement sensitivity even in periods of poor load or low flow

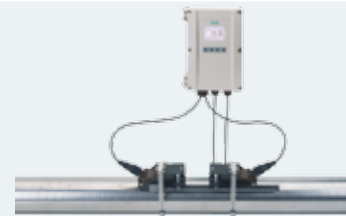
## SITRANS F US



FUS/FUE380



FEC920



FS220/FST020

### 3

#### Billing-grade heat metering

Custody transfer metering systems guarantee highly accurate billing based on actual heat consumption.

##### Inline flow solution ideal for new installations

Preferred devices: SITRANS FUE380 ultrasonic energy meter paired with SITRANS FUE950 energy calculator and RTD sensors

- CT approved according to MI004
- High accuracy of  $\pm 0.5\%$
- Medium temperatures up to 200 °C / 392 °F
- DN 15 to DN 600 / 1/2" to 24"
- Minimal maintenance costs due to no moving parts
- No pressure drop for greater efficiency

##### Clamp-on flow solution perfect for retrofitting

Preferred device: SITRANS FEC920 Thermal Energy Calculator with FS220 Clamp On Ultrasonic flow meter ultrasonic energy meter

- Integral energy meter and data logger
- Approved for billing purposes in the USA
- Simultaneous measurement of 2 pipes

Custody transfer approved as designated by international energy meter standards

### 4

#### Optimal steam boiler system operation

Precise flow monitoring that remains stable despite fluctuating process conditions is crucial for efficient operation of a steam boiler system.

Preferred devices: SITRANS FX300 vortex flowmeter or SITRANS FO orifice flowmeter/DP transmitters combined with RTD sensors

- Volumetric and mass flow measurement of saturated and superheated steam
- Accuracy of  $\pm 1\%$  for steam and gases
- Built-in calculation of energy and mass flow

Integrated pressure and temperature sensors for direct compensation and reduced cabling

### 5

#### Better transparency for lower compressed air costs

Monitoring compressor operation and eliminating leaks can significantly reduce energy usage and expenses.

Preferred devices: SITRANS P DSIII differential pressure transmitter with SITRANS FO orifice flowmeter

- Universal air/gas flow measurement
- Extreme pressures up to 4570 psi / 315 bar
- DN10 to DN1000 / 3/8" to 40"
- Accredited to international DIN standard
- Comprehensive diagnostic and simulation functions

Reliable measurement of a wide pressure range regardless of fluctuating process conditions

### 6

#### Temporary measurements and energy audits

Portable flow technology enables you to audit heating or cooling systems and diagnose conditions that can negatively impact performance in piping installations, including aeration and cavitation.

Device: SITRANS F US clamp-on ultrasonic portable metering kits can be rented for the following purposes

- Available for energy and liquid metering
- Easy installation with no interruption of flow or cutting of pipes required
- Includes all equipment necessary to conduct performance and verification tests
- Battery-powered for field use
- Siemens' comprehensive service offering also includes meter rentals, consulting, installation and data reporting for energy auditing purposes

Everything for energy surveys and system balancing, all in one kit

SITRANS F M	SITRANS F X	SITRANS P	SITRANS T	
				
MAG 5100 W/MAG 6000	FX300	DSIII & Orifice plate	P200/210/220	TH/TS500



Gardens by the Bay was designed to embody the principles of environmental sustainability. Much effort was made to plan and design for sustainable cycles of energy and water throughout Bay South Garden.

### Full transparency of energy flows in HVAC installations

Gardens by the Bay, an urban outdoor recreation space in Singapore, needed a way to monitor the distribution of chilled and hot water as well as bill individual shops and restaurants for energy consumption.

A combination of SITRANS F M MAG 3100/MAG 5100 W electromagnetic sensors, SITRANS F M MAG 5000 transmitters and SITRANS FUE950 energy calculators now provide precise measurement of flow for more efficient chiller operation, hot water distribution and tenant billing.

#### Key customer benefits

- Easy integration in BMS
- Optimal chiller loading and sequencing based on accurate, reliable data

### Dual-mode flow measurement for more efficient air conditioning

A university just outside of Washington, DC, in the USA needed to measure a water/glycol mixture flowing through the thermal storage unit of their air conditioning system, but they knew this would be a challenge due to fluctuating amounts of foam in the mixture.

The university decided to install a SITRANS FUS1010, which can operate using either transit-time or Doppler measurement. This was considered a major benefit because it ensured consistent accuracy despite constantly changing conditions and eliminated the need to purchase two separate flowmeters. The efficiency of the air conditioning system improved considerably, and the FUS1010 is now the flowmeter of choice across the entire campus.

#### Key customer benefits

- Dual-mode capability enables consistent performance in fluctuating conditions
- Automatic switch between transit-time and Doppler improves measurement accuracy and reduces installation costs





### Single-source solutions for district cooling in the Middle East

The district cooling industry has been booming in the Middle East since the late 1990s, resulting in major regional developments including the world's largest district cooling plant, the first seawater-cooled district cooling plant and the first use of treated sewage effluents for cooling tower make-up water. Siemens has played an important role in this rapid growth by supplying these sites and others with a variety of process instrumentation and automation solutions.

Temperature, pressure and flow instrumentation from Siemens monitors the district cooling plants' evaporators, condensers, cooling towers and thermal storage units, helping to improve process control and overall energy efficiency monitoring. The plants' energy transfer stations are enhanced by temperature, flow and differential pressure devices, while additional Siemens instruments complement the building management systems by facilitating individual tenant billing.

#### Key customer benefits

- Single-source solution provider for multiple district cooling plants
- Greater visibility into every application for improved process control, chiller efficiency and overall energy efficiency monitoring

### Energy efficiency in industrial productions

As part of an energy performance contracting project to reduce energy costs, a mobility factory in Krefeld, Germany, chose the custody transfer-approved SITRANS FUE380 ultrasonic energy meter to monitor and better control their combined heat and power units.

The highly accurate Siemens metering solution was integrated seamlessly into their BMS and allowed for individual energy cost allocation based on actual consumption data.

#### Key customer benefits

- In-depth transparency of energy consumption across the plant for easier identification of areas with energy-saving potential
- Improved cost allocation based on accurate meter data
- Energy-reduction measures led to cost saving of 15%

**Note:** The FUS1010 can be replaced with the new FS230 transmitter and the FUE950 can be replaced with the FEC920 thermal energy calculator.



Detailed analysis of the operations within the mobility factory resulted in a package of seven energy efficiency measures enabling contractually guaranteed double-digit cost savings and CO<sub>2</sub> reductions.

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