Process Instrumentation and Analytics

Precise process monitoring in tough environments

Power
Our process instrumentation and analytics devices ensure your efficient operations, energy optimization, emissions and safety. They put accuracy and reliability at the heart of your operations. And you have the reassurance of seamless integration with your management control and other systems. But they also give you much, much more.

Precise measurement for critical applications, as well as reliable monitoring for safe and efficient power generation help decrease operating costs and avoid downtimes. Ensure environmental compliance and lowest emission with intelligent process control for optimal flue gas treatment and CO₂ reduction, as well as continuous emission monitoring systems.

Safety and security are enhanced by using SIL standard instrumentation and smart instruments that reduce the need for field maintenance and thus keep the workers safe.

We also help you make the most of your human resources through easy installation and commissioning. Quick Start Wizards, devices that have easy-to-understand diagnostics and seamless integration with the distributed control system (DCS) all mean that you can focus your talent on your productivity. Start-up and commissioning is faster, maintenance is minimal, and day-to-day operation is smoother.

Our technology is designed to fit with the tough and often extreme conditions encountered in the power industry. Solutions such as remote-mounted transmitters, heavy-duty dust-tight enclosures and non-contacting sensors all mean that you can avoid accidents and hazardous situations.

With Siemens you have the reassurance of best-in-class products and a partner who understands your industry.

Reliable and precise process monitoring

Highest efficiency, reduced emissions, energy optimization and, moreover, safety are big issues for power producers. Partnering with Siemens gives the precision, integration, and reliability in process instrumentation and analytics to help address these issues.
PIA Life Cycle Portal

The PIA Life Cycle Portal is a web-based application for easy and convenient product selection and configuration.

How to get access
You can access the PIA Life Cycle Portal around-the-clock at www.siemens.com/piaportal. It offers you active support to find the best solution from the extensive Siemens portfolio of sensors and process analytical products. The portal can be used to see how different solutions can be put to use in process and factory automation.

You can choose between several selection access options to find the appropriate product solution for your specific requirements:
• Direct access sends you straight to a specific configuration if you know the product you are seeking.
• “Guided selection” lets you to select the appropriate application, technology or industry and specify the measurement task based on the various relevant parameters for your particular application.

Advantages at a glance:
• Convenient product selection support with answers to typical questions
• A variety of selection possibilities: see the sample power plants and simply select from the recommended process instrumentation and analytics products
• Project lists for an order enquiry can be quickly created
• Different possibilities for processing data and information
• No separate installation needed
• Product selection for spare parts
• The latest product data and information for Siemens process instrumentation and analytics

www.siemens.com/piaportal
# Product range

## Level measurement

<table>
<thead>
<tr>
<th>Radar</th>
<th>Guided wave radar</th>
<th>Ultrasonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids in silos or open air stack application to a range of 100 m (328 ft).</td>
<td>Guided wave radar transmitter for short and medium range level, interface and volume measurement of liquids and solids.</td>
<td>2-wire loop-powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels and simple process vessels.</td>
</tr>
<tr>
<td><strong>Brief description</strong></td>
<td><strong>Features and benefits</strong></td>
<td><strong>Typical applications</strong></td>
</tr>
<tr>
<td>2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).</td>
<td>• Affected by extreme dust, ambient noise, or high temperatures</td>
<td>All-round level measurement for dusty solids applications, coal, coal powder, raw materials, fly ash, gypsum silos, level in bunkers and lime additive silos.</td>
</tr>
<tr>
<td>2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).</td>
<td>• High-frequency 78 GHz FMCW technology allows for a compact design and narrow 4° beam angle for easy installation and setup</td>
<td>Level measurement of intake water, lime-stone suspension, tank level, chemicals.</td>
</tr>
<tr>
<td>Guided wave radar transmitter for short and medium range level, interface and volume measurement of liquids and solids.</td>
<td>• Cost-effective solution using either a horn antenna for large openings or a PTFE rod antenna for openings as small as 50 mm (2&quot;)</td>
<td>Level measurement of intake water, lime-stone suspension, tank level, chemicals.</td>
</tr>
<tr>
<td>• Integrated purge connection is standard for particularly sticky materials or air cooling</td>
<td>• Low-frequency microwave transmitter offering high immunity to buildup, extreme condensation, or extreme turbulence</td>
<td>Level/ interface and volume measurement for the boiler, condenser, feed water, ammonia water, lube oil tank level, preheater.</td>
</tr>
<tr>
<td>• Integrated purge connection is standard for particularly sticky materials or air cooling</td>
<td>• HART, PROFIBUS PA or FOUNDATION Fieldbus options available</td>
<td>Heavy fuel, water level, sump level, simple chemical tank level, water treatment.</td>
</tr>
<tr>
<td>• Integrated purge connection is standard for particularly sticky materials or air cooling</td>
<td>• Rigid and flexible single or twin rods for many applications</td>
<td><strong>More information:</strong> <a href="http://www.siemens.com/sitranslr560">www.siemens.com/sitranslr560</a></td>
</tr>
<tr>
<td><strong>Typical applications</strong></td>
<td>• Measures accurately on materials with dielectric (dK) as low as 1.4</td>
<td><strong>More information:</strong> <a href="http://www.siemens.com/sitranslr250">www.siemens.com/sitranslr250</a></td>
</tr>
<tr>
<td>All-round level measurement for dusty solids applications, coal, coal powder, raw materials, fly ash, gypsum silos, level in bunkers and lime additive silos.</td>
<td>• Guided wave radar measurement for up to 2.5 mm (0.12&quot;) accuracy</td>
<td><strong>More information:</strong> <a href="http://www.siemens.com/sitranslr200">www.siemens.com/sitranslr200</a></td>
</tr>
<tr>
<td>Level measurement of intake water, lime-stone suspension, tank level, chemicals.</td>
<td>• Measures level and interface on challenging applications including foam</td>
<td><strong>More information:</strong> <a href="http://www.siemens.com/lg200">http://www.siemens.com/lg200</a></td>
</tr>
<tr>
<td>Level measurement of intake water, lime-stone suspension, tank level, chemicals.</td>
<td>• Rigid and flexible single or twin rods for many applications</td>
<td><strong>More information:</strong> <a href="http://www.siemens.com/probelu">www.siemens.com/probelu</a></td>
</tr>
<tr>
<td>All-round level measurement for dusty solids applications, coal, coal powder, raw materials, fly ash, gypsum silos, level in bunkers and lime additive silos.</td>
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<td><strong>More information:</strong> <a href="http://www.siemens.com/probelu">www.siemens.com/probelu</a></td>
</tr>
</tbody>
</table>

**More information:**
- [www.siemens.com/sitranslr560](http://www.siemens.com/sitranslr560)
- [www.siemens.com/sitranslr250](http://www.siemens.com/sitranslr250)
- [www.siemens.com/sitranslr200](http://www.siemens.com/sitranslr200)
- [www.siemens.com/lg200](http://www.siemens.com/lg200)
- [www.siemens.com/probelu](http://www.siemens.com/probelu)
## Point level

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Features and benefits</th>
<th>Typical applications</th>
<th>More Information</th>
</tr>
</thead>
</table>
| SITRANS LUT400 | Compact, single-point, long-range ultrasonic controllers for continuous level, or volume measurement of liquids, slurries, and solids, and high-accuracy monitoring of open channel flow. | • A reliable continuous level device using proven ultrasonic technology  
  • 3 relays for pump and process control  
  • Separated transceiver/transducer protects the electronics from extreme vibration  
  • The non-contacting ultrasonic transducer is rugged and fully potted to provide long-term reliability in a harsh environment  
  • Sonic Intelligence is standard and is proven to provide superior performance in difficult conditions | Open-air storage, material handling, coal feeding, coal bunkers, waste material, sump level and pump control, crane positioning. | More information: [www.siemens.com/sitranslut400](http://www.siemens.com/sitranslut400) |
| Pointek CLS 200/300 | Inverse frequency shift capacitance level switches with optional rod/cable choices and configurable output. They are ideal for detecting liquids, solids, slurries, foam and interfaces in demanding conditions where high pressure and temperatures are present. | • Provides accurate and repeatable measurement, even in dusty, turbulent, and vapor-filled environments or situations with product buildup  
  • Self check and diagnostic alarms available allow better maintenance schedules and improves asset management  
  • PROFIBUS PA communication  
  • Requires little or no maintenance, despite the extreme process conditions | High-/low-level detection e.g. filters, coal, fly ash, chemicals and water. | More information: [www.siemens.com/pointekcls200](http://www.siemens.com/pointekcls200) [www.siemens.com/pointekcls300](http://www.siemens.com/pointekcls300) |
| SITRANS LVS100/200 | Vibrating Fork level switch, detects high, low or demand levels of dry bulk solids in bins, silos or hoppers. The liquid/solid interface version detects settled solids within liquids or solids within confined spaces such as feed pipes. | • High resistance to mechanical forces and high bulk material loads  
  • Suitable for low-density material  
  • The unit is only tip-sensitive, meaning that it will remain reliable even when there is product buildup on the upper part of the sensor  
  • Customer-specific lengths up to 20,000 mm (787”)  
  • Durable short fork option with 165 mm (6.5 inch) insertion length | High-/low level detection of solids. | More information: [www.siemens.com/sitranslvs100](http://www.siemens.com/sitranslvs100) [www.siemens.com/sitranslvs200](http://www.siemens.com/sitranslvs200) |
| SITRANS LVL100/200 | Vibrating level switch for use in all liquid and slurry applications such as overfill protection, high- or low-level detection and pump protection. For use in SIL-2 applications. | • Designed for industrial use in all areas of process technology for liquids and slurries  
  • Compact tuning fork insertion length of 40 mm (1.57”) for confined space applications  
  • Can be used in difficult conditions including turbulence, air bubbles, foam generation, buildup, or external vibration  
  • Fault monitoring for corrosion, loss of vibration or line break to the piezo drive  
  • SIL 2 qualified for high-level and dry-run applications | High-/low-level detection of liquids and slurries. | More information: [www.siemens.com/sitranslvl100](http://www.siemens.com/sitranslvl100) [www.siemens.com/sitranslvl200](http://www.siemens.com/sitranslvl200) |
| SITRANS LPS200 | Rotating Paddle Switch technology for bulk solids. It has a rugged design for use in harsh conditions in the solids industry. It comes in a variety of configurations including compact, extended and cable extension. | • Proven paddle switch technology to detect the presence or absence of bulk solids materials with bulk densities as low as 15 g/l (0.9 lb/ft)  
  • High-integrity mechanical seal  
  • Unique friction clutch mechanism to increase motor life  
  • Rotatable enclosure  
  • Simple installation through existing process connection  
  • High-temperature model, up to 600 °C (1112 °F) and optional extension kit available | High-/low-level detection of solids. | More information: [www.siemens.com/sitranslps200](http://www.siemens.com/sitranslps200) |
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<tr>
<th>Level measurement</th>
<th>Weighing and solids flow</th>
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<td><strong>Point level</strong></td>
<td><strong>Belt scales</strong></td>
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<tr>
<td>SITRANS LC500</td>
<td>Miltronics MSI / MMI</td>
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</table>

**Brief description**
- Inverse frequency shift capacitance level or interface transmitter for extreme and critical process conditions, such as oil and liquified natural gas (LNG) as well as toxic and aggressive chemicals and vapors.
- Heavy-duty, high-accuracy multiple idler belt scale used for critical process and load-out control.
- Medium- to high-capacity weighfeeder. Low- to medium-capacity flowmeters for various product sizes, densities, and fluidities.
- Multiple ranges of load cells, suitable for almost any application, even hazardous areas.

**Features and benefits**
- Patented Active-Shield technology so measurement is unaffected by material buildup in active shield section
- Simple push-button calibration and integrated local display
- Inverse frequency approach provides high resolution
- 2-wire loop-powered 4 to 20/20 to 4 mA measurement signal
- Pre-detection alarm and diagnostics
- Suitable for retrofit to existing conveyor systems offering accuracies to meet the requirements for custody transfer
- Typical approvals include NTEP, OIML, MID, Measurement Canada and others
- MSI/MMI’s proven use of parallelogram-style load cells results in fast reaction to vertical forces, ensuring instant response to product loading
- Stand-alone integration with BW500/L or direct integration into SIMATIC S7 with the SIWAREX FTC module
- Rugged, durable design for heavy-duty applications, available in open or enclosed construction with a design rate of up to 800 T/hr
- Fast installation, easy to clean and an easy to replace the “endless” belt keeps the maintenance downtime to an absolute minimum
- The accuracy of ±0.5% allows precise dosing and ratio control of raw material
- Stand-alone integration with BW500 or direct integration into SIMATIC S7 with the SIWAREX FTC module
- The sensing element is mounted outside the process, keeping the maintenance to an absolute minimum
- The standard version can measure from 0.2 to 40 t/h however; larger versions are available to handle flow rates up to 300 t/h
- Stand-alone integration with SF500 or direct integration into SIMATIC S7 with the SIWAREX FTC module
- The SF500 integrator has 2 PID controllers and all communication possibilities for seamless integration in every control system
- The accuracy of 3000d (OIML R60)
- Large measuring range from 3 kg to 500 t (6.6 lbs to 551.2 tons)
- High-temperature version up to 250 °C available
- Hermetically sealed, extremely long service life
- Stainless steel or aluminum
- Smart design mounting devices for simple and safe installation
- Direct integration into SIMATIC S7 with SIWAREX U, SIWAREX CS, SIWAREX MS or SIWAREX FTA

**Typical applications**
- Interface level measurement of separator, oil extractor, storage tank.
- Certified conveyor load out, solids flow control, inventory monitoring.
- Limestone storage, solid fuel handling, biomass, energy from waste.
- Solids flow monitoring, truck loading e.g. fly ash.
- Static weighing, batching, dosing, dynamic weighing, loss-in-weight.

More information:
- www.siemens.com/sitranslc500
- www.siemens.com/msi
- www.siemens.com/mmi
- www.siemens.com/sitransww300
- www.siemens.com/sitranswf300
- www.siemens.com/loadcells
<table>
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<tr>
<th>Weighing integrators</th>
<th>Electromagnetics</th>
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</thead>
<tbody>
<tr>
<td><strong>Stand-alone weighing integrators</strong></td>
<td><strong>SITRANS F M MAG 3100</strong></td>
</tr>
<tr>
<td>Milltronics BW500: Fully featured integrator for use with both belt scales and weighfeeders</td>
<td>Electromagnetic flow sensor with a large variety of liners, electrode material and with grounding electrodes as standard.</td>
</tr>
<tr>
<td>Milltronics BW500 / L: Integrator for use in basic belt scale or weighbelt applications</td>
<td></td>
</tr>
<tr>
<td>Milltronics SF500: Fully featured integrator for use with solids flowmeters</td>
<td></td>
</tr>
</tbody>
</table>

**Brief description**
- Milltronics BW500: Fully featured integrator for use with both belt scales and weighfeeders
- Milltronics BW500 / L: Integrator for use in basic belt scale or weighbelt applications
- Milltronics SF500: Fully featured integrator for use with solids flowmeters
- SIWAREX WP231: Integrated or stand-alone
- SIWAREX FTA: Integrated, calibratable and versatile
- SIWAREX FTC: Integrated, versatile, flexible weighing module for conveyor scales, loss-in-weight scales and bulk flowmeters
- SIWAREX U and CS: Integrated, versatile and flexible weighing module for level monitoring, platform scales

**Features and benefits**
- Offer rate, totals, alarms, analogue outputs and digital communications
- Differential speed detection with second speed sensor
- Suitable for belt scale custody approval
- Automatic zero and electronic span calibration
- Alarms for rate, load, speed, or diagnostic error
- On-board Modbus®, optional PROFIBUS DP, Allen-Bradley® RIO, Ethernet IP, Modbus TCP/IP, PROFINET and DeviceNet™
- Comprehensive weighfeeder control functions
- PID control and on-line calibration with optional analog I/O card
- Moisture meter input with optional analog I/O card for calculation of dry weight
- Complete integration of the SIWAREX weighing module into the SIMATIC system platform
- Using standard SIMATIC components, it is simple to adapt the weighing system to your individual requirements
- Standardized interfaces, totally integrated functions, and uniform tools enable cost-effective configuration
- SIWAREX WP231 is programmable via the Totally Integrated Automation (TIA) Portal engineering platform
- Flexible design with wide range of materials
- Easy "plug and play" installation and servicing of flowmeter
- Highly resistant liner material to both abrasive and chemical media
- Cost-effective transmitter with good performance
- SENSORPROM technology facilitates easy transmitter setup without loss of data and accuracy
- Multiple functional output for process control
- Up to 300 m remote-mounted electronic as option
- Wide range of communications modules like PROFIBUS PA, FF, Modbus, HART available
- SITRANS F M MAG 6000: 0.2 % high accuracy
- To be combined with the flow sensors MAG 1100, 3100 and 5100W

**Typical applications**
- BW500 / L integrator for use with belt scales or BW500 for use with weighfeeders
- SF500 integrator for use with solid flowmeter
- Static weighing, batching, dosing, dynamic weighing, loss-in-weight.
- General purpose flow measurement e.g. water, cooling system and chemicals.
- Custody transfer applications: OIML R49, MI-001.

More information:
- www.siemens.com/milltronicsbw500
- www.siemens.com/milltronicssf500
- www.siemens.com/weighingmodules
- www.siemens.com/mag3100
- www.siemens.com/sitransfmmag5000
- www.siemens.com/sitransfmmag6000
# Flow measurement

## Ultrasonics

<table>
<thead>
<tr>
<th>SITRANS FUS SONO3100/FUS060</th>
<th>SITRANS FUS SONOKIT</th>
<th>SITRANS FUE380</th>
<th>SITRANS FUS1010 Clamp-on</th>
<th>SITRANS FUE950</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brief description</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A flowmeter consisting of a sensor with O-ring or flange transducers depending on the application.</td>
<td>A simple and accurate alternative to traditional flowmeters. It is a transit time based ultrasonic flowmeter for retrofitting on existing pipelines.</td>
<td>Operates as part of a complete heat meter system. The 2-track flowmeter comes as battery or mains-powered and is approved to EN 1434, OIML R75 and MID class 2.</td>
<td>The most versatile clamp-on ultrasonic flow display transmitter available.</td>
<td>The most versatile clamp-on ultrasonic flow display transmitter available.</td>
</tr>
<tr>
<td><strong>Features and benefits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ideal flowmeter system for challenging applications</td>
<td>• Transit time and doppler makes it a versatile flowmeter</td>
<td>• Flexibility to customize your perfect flowmeter solution</td>
<td>• Has been developed for the combination with SITRANS FUS380/FUE380 and alternatively MAG 5000/6000 or FST020</td>
<td>• MID directive approval for custody transfer for water energy metering</td>
</tr>
<tr>
<td>• SITRANS F US SONOKIT has in-line transducers which assure superior accuracy and performance</td>
<td>• Suitable for a wide range of operating conditions and even liquids with high aeraions or suspended solids</td>
<td>• Designed to provide accurate high-resolution energy measurement</td>
<td>• MID directive approval for custody transfer for water energy metering</td>
<td>• Easy installation and minimal maintenance</td>
</tr>
<tr>
<td>• Takes complexity out of retrofitting</td>
<td>• Provides uncompromising performance for high-volume, water-based applications</td>
<td>• Provides uncompromising performance for high-volume, water-based applications</td>
<td>• Delivered with heat-/cooling-approved PT300 sensor set (incl. sensor pockets)</td>
<td>• Wide turndown ratio</td>
</tr>
<tr>
<td>• Cost-effective and accurate solution, containing all the necessary components</td>
<td>• Approved according to the MID directive and is designed and approved for custody transfer</td>
<td>• Choice of single channel or dual channel/dual path, with doppler capability. Four channel/four path optional</td>
<td>• Optical M-Bus data reading in accordance with EN 1434</td>
<td>• Temperature sensor connection</td>
</tr>
<tr>
<td>• Very robust as it can be buried and withstands constant flooding</td>
<td>• Custody transfer sealed to ensure total data security</td>
<td>• Optional four channels allow measurement of four independent pipes at the same time, reducing overall ownership costs</td>
<td>• Used in combination with a flowmeter in applications like: heatmetering, chilled water applications or combined cooling/heating applications.</td>
<td>• Reduced maintenance due to the solid construction and no moving parts</td>
</tr>
<tr>
<td>• Minimum maintenance due to the solid construction and no moving parts</td>
<td>• Flexibility to customize your perfect flowmeter solution</td>
<td>• Transit time and doppler makes it a versatile flowmeter</td>
<td>• Has been developed for the combination with SITRANS FUS380/FUE380 and alternatively MAG 5000/6000 or FST020</td>
<td>• Easy installation and minimal maintenance</td>
</tr>
<tr>
<td>• In addition to the standard outputs, it also offers communication e.g. HART or PROFIBUS PA</td>
<td>• Suitable for a wide range of operating conditions and even liquids with high aeraions or suspended solids</td>
<td>• Designed to provide accurate high-resolution energy measurement</td>
<td>• Delivered with heat-/cooling-approved PT300 sensor set (incl. sensor pockets)</td>
<td>• Wide turndown ratio</td>
</tr>
<tr>
<td><strong>Typical applications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow measurement of e.g. oil, condensate, cold, hot, demineralized- and feed water.</td>
<td>Water intake, retrofit for water/oil applications, district heating.</td>
<td>Measure water flow in district heating plants, local networks, boiler stations, substations, chiller plants and other general water applications.</td>
<td>Chilled water, hot water, condenser water condensate, domestic water, fuel oil, verification.</td>
<td>Used in combination with a flowmeter in applications like: heatmetering, chilled water applications or combined cooling/heating applications.</td>
</tr>
</tbody>
</table>

**More information:**
- [www.siemens.com/fussono3100](http://www.siemens.com/fussono3100)
- [www.siemens.com/fussonokit](http://www.siemens.com/fussonokit)
- [www.siemens.com/fue380](http://www.siemens.com/fue380)
- [www.siemens.com/fus1010](http://www.siemens.com/fus1010)
- [www.siemens.com/fue950](http://www.siemens.com/fue950)
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<th>Vortex</th>
<th>Differential pressure</th>
<th>Motion sensors</th>
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<tr>
<td>[Image]</td>
<td>[Image]</td>
<td>[Image]</td>
<td>[Image]</td>
</tr>
</tbody>
</table>

### Brief description
- **Coriolis**
  - Flowmeter system with compact design and excellent performance for accurate and multi-functional measurements as mass and volumetric flow, density, temperature on liquids as well as gases.
- **Vortex**
  - Vortex flowmeter providing accurate volumetric and mass flow measurement of steam, gases and liquids as an all-in-one solution with integrated temperature and pressure compensation.
- **Differential pressure**
  - Differential pressure measurement with an orifice plate is a universal flow measurement for liquids, gases and vapors. Differential pressure flowmeter always provide accurate results even with large bores, high temperature and extreme pressure.
- **Motion sensors**
  - Motion failure alarm controller and probe, highly sensitive single setpoint motion sensor system.

### Features and benefits
- **Coriolis**
  - Offers high accuracy over a wide range of flow rates
  - Multi-parameter measurement enables simultaneous monitoring of density leading to higher chemical dosing quality
  - Coriolis technology enables measurement of non-conducting liquids
  - Validated and configured for SIL 2 or SIL 3 operation as standard
  - Thanks to its outstanding flexibility, it can be installed practically anywhere and if required, small spaces can accommodate more than one device
- **Vortex**
  - Maintenance-free due to fully welded sensor construction with high corrosion, pressure and temperature resistance
  - Pressure, temperature and flow can be read at a single point with no extra equipment, installation or cabling costs
  - Saves downtime because of isolation valve, which makes an exchange of pressure sensor possible without interrupting the process
- **Differential pressure**
  - Orifice / differential pressure flowmeters are very robust and can be used in a wide range of nominal diameters
  - Suitable for wide ranges of temperature and pressure
  - No calibration required as the process is standardized
  - The electronics required in addition can be used over a long distance from the measuring location
  - Differential pressure measurement is well known and has a large installed base
- **Motion sensors**
  - Designed specifically for the handling of raw materials
  - 100 mm sensing range allows detection on machinery with poor tolerances such as bucket elevators
  - The sensor is capable of penetrating stainless steel and detecting a ferrous target behind, which is particularly suited to screw conveyor applications
  - Rugged, low maintenance suitable for tough environments
  - Non-contacting design eliminates the need for lubricating, cleaning and part replacement
  - It alarms to minimize spillage, prevent extensive damage or even fire caused by belt slippage at the head pulley and warn against conveyor malfunction

### Typical applications
- **Coriolis**
  - Heating fuel, limestone suspension, condensate treatment chemical addition, fuel oils with type discernment from density.
- **Vortex**
  - Steam, condensate, demineralized water, measurement of consumption in compressed air.
- **Differential pressure**
  - Water steam cycle, high pressure / high temperature applications, combustion air, fuel gas.
- **Motion sensors**
  - Motion sensing on tail pulleys, driven pulleys, motor shaft sensing, screw conveyor flights, bucket elevators.

More information:
- Coriolis: [www.siemens.com/fc430](http://www.siemens.com/fc430)
- Vortex: [www.siemens.com/sitransfx300](http://www.siemens.com/sitransfx300)
- Differential pressure: [www.siemens.com/sitransfo](http://www.siemens.com/sitransfo)
- Motion sensors: [www.siemens.com/mfa4p](http://www.siemens.com/mfa4p)
- [www.siemens.com/sitranswm100](http://www.siemens.com/sitranswm100)
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<thead>
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<th><strong>Process protection</strong></th>
<th><strong>Pressure</strong></th>
<th><strong>Temperature</strong></th>
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<tbody>
<tr>
<td><strong>Acoustic sensors</strong></td>
<td><strong>Pressure measurement</strong></td>
<td><strong>Temperature measurement</strong></td>
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<tr>
<td><strong>Brief description</strong></td>
<td><strong>Features and benefits</strong></td>
<td><strong>Typical applications</strong></td>
</tr>
<tr>
<td>Acoustic sensor used for solids flow detection.</td>
<td>Series of digital pressure transmitters for measuring gauge pressure, absolute pressure, differential pressure, flow and level.</td>
<td>WirelessHART pressure transmitter that provides all measured process values as well as diagnostic information, parameters, and functions via radio.</td>
</tr>
<tr>
<td><strong>Features and benefits</strong></td>
<td></td>
<td>Designed to support all common RTDs, thermocouples, resistance and Millivolt sensors. Setup is quick and easy with the transmitter modem and SIPROM T software or SIMATIC PDM.</td>
</tr>
<tr>
<td>Burst filter bag detection, detection of blockages in pneumatic conveyor systems, ensure that mechanical conveying systems maintain their set speed.</td>
<td>Pressure measurement is found nearly in every part of power plant, e.g. boiler, water steam cycle, turbine, auxiliaries.</td>
<td>Temperature measurement is found nearly in every part of power plant, e.g. boiler, water steam cycle, turbine, auxiliaries.</td>
</tr>
</tbody>
</table>

**SITRANS AS100**
- **Series**: Digital acoustic sensor for solids flow detection.
- **Features**: Detects and react instantly to changes in solids flow to warn of blockages, product absence, or equipment failure such as burst filter bags.
- **Typical applications**: Burst filter bag detection, detection of blockages in pneumatic conveyor systems, ensure mechanical conveying systems maintain their set speed.
- **More information**: www.siemens.com/sitransas100

**SITRANS P DS III**
- **Series**: Digital pressure transmitters.
- **Features**: Remote mounting capability allows isolation from high temperatures and vibration sources.
- **Typical applications**: Pressure measurement is found nearly in every part of power plant, e.g. boiler, water steam cycle, turbine, auxiliaries.
- **More information**: www.siemens.com/sitranspdsIII

**SITRANS P500**
- **Series**: Digital pressure transmitters.
- **Features**: High measuring accuracy, very fast response time, extremely good long-term stability, high reliability even under extreme chemical and mechanical loads.
- **Typical applications**: Applications where highest accuracy and very fast response time is required, e.g. turbines.
- **More information**: www.siemens.com/sitransp500

**SITRANS P280**
- **Series**: WirelessHART pressure transmitters.
- **Features**: Supports the WirelessHART standard for a flexible temperature measurement.
- **Typical applications**: To communicate pressure measurement data: from a remote location like the quarry, from a moving machine.
- **More information**: www.siemens.com/sitransp280

**SITRANS TH / TR 200 / 300**
- **Series**: WirelessHART temperature transmitters.
- **Features**: Measures temperature with a linear output signal, high accuracy across entire ambient temperature range, alarm signal for sensor break or short circuit.
- **Typical applications**: Temperature measurement is found nearly in every part of power plant, e.g. boiler, water steam cycle, turbine, auxiliaries.
- **More information**: www.siemens.com/sitransstr
## SITRANS TS

**Brief description**
- The industry-grade temperature sensor supports a wide range of measuring goals from basic applications to solutions in harsh environment.

**Features and benefits**
- The modular system allows exchangeability and variety, extension and connection head with optional integrated transmitter or display
- Available as RTD (Pt100) and thermo-couple
- International approvals for IEC-Ex and ATEX for Ex d, Ex i and Ex n in gas and dust
- Optional transmitter and local display

**Typical applications**
- Temperature measurement is found nearly in every part of power plant, e.g. boiler, water steam cycle, turbine, auxiliaries.

**More information:**
www.siemens.com/sitransts

## SITRANS TF280

**Valve positioner**

**Gas analysis**

**Continuous gas analysis – extractive**

**Positioning**

**Valve positioner**

**Brief description**
- WirelessHART temperature transmitter that provides all measured process values as well as diagnostic information, parameters, and functions via radio.

**Positioner for linear and part-turn actuators. Optional remote-mounted non-contacting sensor (NCS-Option) can keep the positioner away from the harsh environment.**

**Features and benefits**
- Supports the WirelessHART standard for a flexible temperature measurement
- Enables cost savings on wiring for locations with difficult installation conditions, like for mounting in remote areas of plants
- Housing meets IP65 degree of protection
- Very high security level for wireless data transmission
- Powered by an internal battery and is designed for ultralow power consumption

**Typical applications**
- To communicate temperature measurement data:
  - from a remote location like the quarry
  - from a moving machine

**More information:**
www.siemens.com/sitranstf280

## SIPART PS2

**Positioner**

**Gas analysis**

**Continuous gas analysis – extractive**

**Positioning**

**Valve positioner**

**Brief description**
- Positioner for linear and part-turn actuators. Optional remote-mounted non-contacting sensor (NCS-Option) can keep the positioner away from the harsh environment.

**Features and benefits**
- The industry benchmark for linear and rotary valves, double- and single-acting actuators
- Advanced diagnostics including predictive maintenance allow operators to plan in advance of failures
- Extremely low air consumption
- Full range of communication via HART, PROFIBUS PA or FOUNDATION fieldbus

**Typical applications**
- Control of pneumatic actuators, e.g. condensate control valve, cooling systems.

**More information:**
www.siemens.com/sipartps2

## ULTRAMAT 23

**Positioning**

**Gas analysis**

**Continuous gas analysis – extractive**

**Features and benefits**
- AUTOCL with ambient air (dependent on the measured component):
  - Highly cost-effective because calibration gases are not required
  - High selectivity thanks to multi-layer detectors, e.g. low cross-sensitivity to water vapor
  - Sample chambers can be cleaned if required on site
  - Cost savings due to reuse after contamination
  - Preventive maintenance; help for service and maintenance personnel, cost savings
- Small T90 time due to micromechanical-produced Si sensor
- Electronics and analyzer part: gas-tight separation, purgeable
- IP65, long service life even in harsh environments
- EEx(p) for ATEX Zone 2 and FM / CSA Class I Div 2
- Monitoring equipment for hydrogen-cooled turbo-alternators:
  - 0 to 100 % CO2 / Ar in air
  - 0 to 100 % H2 in CO2 / Ar
  - 80 to 100 % H2 in air

**Typical applications**
- Emission monitoring

**More information:**
www.siemens.com/ultramat23

## CALOMAT 6

**Features and benefits**
- Primarily used for quantitative determination of components (e.g. H2, He, CO2, etc.) in binary or quasi-binary non-corrosive gas mixtures.

**Typical applications**
- Turbo Generator

**More information:**
www.siemens.com/calomat6
### Gas analysis

**Continuous gas analysis – in situ**  
Process Gas Chromatography  
Analytical application sets  
Remote displays

<table>
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<tr>
<th>LDS 6 / SITRANS SL</th>
<th>SITRANS CV / MicroSAM</th>
<th>Gasmet CEMS</th>
<th>SITRANS RD100 / 200</th>
<th>SITRANS RD500</th>
</tr>
</thead>
</table>

#### Brief description
- The fast and non-contact measurement of gas concentrations directly in the process is the domain of in-situ diode laser gas analyzers. The robust and reliable LDS 6 and SITRANS SL in-situ gas analyzer can measure gases even under extreme conditions.
- SITRANS CV / MicroSAM provides all information to the natural gas quality and its physical properties such as calorific value and density, which are required for manifold applications in the energy industry.
- Standardized complete multi-component emission monitoring system for combustion plants which covers all requirements associated with sampling, sample preparation, and gas analysis in accordance to EU and EPA guidelines.
- Universal remote display for level, flow, pressure, temperature, weighing, and other process instruments.

#### Features and benefits
- **Little installation effort**
- **Minimum maintenance requirements**
- **Extremely rugged design**
- **Long-term stability through built-in, maintenance-free reference gas cell, field calibration is unnecessary**
- **Real-time measurements**
- **Fast analysis through innovative MEMS technology**
- **Precision through valveless live injection**
- **High separation performance through narrow-bore capillary columns**
- **Low detection limits through powerful detectors**
- **High linearity over the entire measuring range saves expensive calibration gases**
- **Can be mounted directly at the sample extraction point; with its extremely robust design installation requirements are minimal**
- **Low operation costs through modular design and low power consumption**
- **Simultaneous multicomponent analysis of up to 16 gas components**
- **Up to 3 analyzers (FTIR, O₂, and FID) may be combined in one set**
- **QAL1 certified emission monitoring in accordance to EU and EPA guidelines**
- **SITRANS RD100 is NEMA 4X / IP67 enclosed for indoor and outdoor applications, in hot or cold environments, and in safe or hazardous areas**
- **SITRANS RD200 is a universal input, panel mount, remote digital display for remotely collecting, logging, and presenting data from as many as 100 displays to your local computer. RD200 is also available with new large display option**
- **RD500 supports report and alarm events via e-mail, SMS, and FTP transfer**
- **Web server provides worldwide access to instrument data log and RD500 configuration and setup**

#### Typical applications
- Ammonia slip behind SCR and SNCR DeNOx, combustion control in furnaces and boilers, waste gas concentration in flue gas.
- CV measurement of fuel.
- Emission monitoring.
- Remote display of process data.
- Remote monitoring, inventory management.

More information:
- [www.siemens.com/lds6](http://www.siemens.com/lds6)
- [www.siemens.com/sitranssl](http://www.siemens.com/sitranssl)
- [www.siemens.com/sitranscv](http://www.siemens.com/sitranscv)
- [www.siemens.com/microsam](http://www.siemens.com/microsam)
- [www.siemens.com/gasmetcems](http://www.siemens.com/gasmetcems)
- [www.siemens.com/sitransrd100](http://www.siemens.com/sitransrd100)
- [www.siemens.com/sitransrd200](http://www.siemens.com/sitransrd200)
- [www.siemens.com/sitransrd500](http://www.siemens.com/sitransrd500)
<table>
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<tr>
<th>Software</th>
<th>WirelessHART communication components</th>
<th>SCALANCE</th>
<th>Ruggedcom</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMATIC PDM</td>
<td>Universal, vendor-independent tool for the configuration, parameterization, commissioning, diagnostics and maintenance of intelligent field devices and field components.</td>
<td>WirelessHART adapter for integration of a wide range of field devices into a WirelessHART network.</td>
<td>The SCALANCE product line is designed primarily for use in industrial applications and provides everything for ultraefficient industrial networks and bus systems.</td>
</tr>
<tr>
<td>SITRANS AW210</td>
<td>• Available as point-to-point or as an integrated part of control system • Allows the user to configure field devices by different manufacturers using a single user interface and access the instruments on every level of the automation hierarchy • Process device data can be easily set, changed, checked for plausibility, managed and simulated • Monitors selected process values, alarms and status signals of devices online • Allows backup parameters and advanced diagnostics</td>
<td>WirelessHART gateway for connecting a WirelessHART network to Industrial Ethernet.</td>
<td>• Standardized for PROFINET/Industrial Ethernet • Industrial Ethernet layer 2 and layer 3 switches • Industrial Ethernet media converters • IEC 62439-3 for redundant always-on communications and zero second network recovery times • Industrial Security modules • Industrial Wireless LAN according IEEE 802.11n for high performance up to 450 MBit/sec (gross data rates) • Industrial Wireless LAN controller for enhanced operation of IWLAN networks • Industrial 2G/3G modems and routers • SINEMA Server network management • Cables &amp; plugs</td>
</tr>
<tr>
<td>IE / WSN-PA LINK</td>
<td>• Connects up to 100 WirelessHART devices • Approved for operation in hazardous areas in Zone 2 • Open TCP/IP communication and Modbus TCP via the Ethernet interface • Integrated Web interface allows simple configuration of LINK and network as well as monitoring • State-of-the-art security for wireless network and data communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCALANCE</td>
<td></td>
<td>Connecting the control level with the operations level based on Industrial Ethernet.</td>
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</tr>
<tr>
<td>Ruggedcom</td>
<td>Typical applications</td>
<td>Integration of field devices into a WirelessHART network.</td>
<td>Connecting a WirelessHART network to Industrial Ethernet.</td>
</tr>
</tbody>
</table>

More information:
- www.siemens.com/simatic-pdm
- www.siemens.com/sitransaw210
- More information: www.siemens.com/wirelessHART-gateway
- More information: www.siemens.com/industrial-communication
- More information: www.siemens.com/ruggedcom
Siemens Power Plant Automation

Seamlessly integrated solutions from the management level to the field level with Siemens Power Plant Automation (SPPA)

Siemens is the global market and technology leader for all automation tasks in every type of power plant – with its SPPA-T3000 control system.

SPPA-T3000 is the fourth generation control system that has been developed to provide a competitive advantage by boosting profitability, reliability and ease of use. Major benefits of SPPA-T3000 are:

• Easy handling to support operators at mastering controls
• High-performance data distribution – the right information anytime, anywhere
• Easy to engineer – built for simultaneous online modification HMI and automatic functions

The SPPA-T3000 platform integrates not only the power generation process but all parts of the company – seamlessly: from instrumentation at the field level to IT landscapes at the management level. The result is a perfectly coordinated overall solution that enables lowest life-cycle costs.
Siemens’ SPPA-T3000 Control System is one of the world’s most powerful and future-safe power plant control systems. It is a perfect fit for all types of power plants and ensures seamless integration of all solutions from electrical and IT systems to process optimization, diagnostics and instrumentation of a single plant or even an entire fleet.
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