Process instrumentation and analytics
Precise process monitoring in harsh environments

www.siemens.com/sensors/power
Our process instrumentation and analytics products ensure efficient processes, the optimum use of energy, low emissions, and safety. They focus on accuracy, reliability, and seamless integration in your control and management systems. Precise measurements in critical applications and reliable monitoring for safe, high-efficiency power generation help you to reduce your operating costs and prevent failures. Intelligent process monitoring and continuous emission measurement systems further ensure compliance with environmental regulations and help to reduce emissions. SIL-certified process instruments and intelligent measuring devices increase employee and plant protection, at the same time helping to minimize maintenance requirements.

Easy installation and commissioning help you to make the best possible use of your personnel. Quick-start wizards and devices with user-friendly diagnostic functions and seamless integration in the control system boost the productivity of your plant and employees. The devices feature faster commissioning, minimal maintenance expenses, and trouble-free operation in day-to-day use.

Our technology is suitable for use in the harsh and frequently extreme conditions typical of power plants. Solutions such as separately mounted transmitters, heavy-duty dust-tight enclosures, and non-contacting measuring sensors all help to prevent accidents and hazardous situations. With Siemens at your side, you are assured of a partner with in-depth industry expertise and best-in-class products for your applications.

Maximum efficiency, low emissions, energy optimization, and especially safety are all pressing topics for power companies. Siemens provides the precision, integration, and reliability in process instrumentation and analytics required to meet these demands.
PIA Life Cycle Portal

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

How to access the Portal
You can access the PIA Life Cycle Portal around the clock at www.siemens.com/pia-portal. It offers active support to find the best solution from the extensive Siemens portfolio of process instrumentation and analytics products. The Portal illustrates how different solutions can be put to use in process and plant automation.

You can choose between several options to find the appropriate product solution for your specific requirements:

- Direct access takes you straight to a specific configuration if you already know which product you are looking for.
- Guided selection allows 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:

- Intelligent product selection
- A variety of options: look at sample power plants and simply select from the recommended process instrumentation and analytics products
- Rapid compilation of project lists for order inquiries
- Different possibilities for processing data and information
- No additional installation required
- Product selection for spare parts
- The latest product data and information for process instrumentation and analytics

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Scan the code to explore the PIA Life Cycle Portal
www.siemens.com/pia-portal
**Level measurement**

### Radar

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS LR560</td>
<td>2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of bulk solids in silos or open air applications to a range of 100 m (328 ft).</td>
</tr>
<tr>
<td>SITRANS LR250</td>
<td>2-wire, 25 GHz pulse radar level transmitter for continuous measuring of liquids and slurries in storage and process vessels including high temperatures and pressures, to a range of 20 m (66 ft).</td>
</tr>
</tbody>
</table>

**Brief description**

- Unaffected by extreme dust and high temperatures
- High-frequency 78 GHz FMCW technology allows for a compact design, narrow 4° beam angle, and easy commissioning
- Small-diameter lens antenna is robust, maintenance-free, and eliminates large parabolic or horn antennas. It can be mounted on a tall standpipe away from extreme temperatures
- Integrated purge connection is standard for particularly sticky materials or air cooling
- HART, PROFIBUS PA, FOUNDATION Fieldbus

**Features and benefits**

- Interface and level measurement possible simultaneously, by digital communication or via two analog current outputs
- Advanced diagnostic functions, including trending, event recording, logging of multiple profiles
- Self-monitoring – for available operation in accordance with international NE 107 standards
- Automatic interference signal suppression to ensure consistently reliable measurement results, even in the event of built-up deposits
- Short response time with high precision
- Software and display wizards for easy installation
- Probe and tracking for material measurement with low dielectric coefficient
- Suitable for functional safety (SIL 2/redundant 3)
- Replaceable in the field, with adjustable probes
- USB port with remote display or electronics

**Typical applications**

- Universal level measurement of dusty bulk solids such as coal, coal powder, fly ash, gypsum, lime, and raw materials in silos, bunkers, and tips.

More information:

- [www.siemens.com/sitranslr560](http://www.siemens.com/sitranslr560)
- [www.siemens.com/sitranslr250](http://www.siemens.com/sitranslr250)
- [www.siemens.com/sitranslg250](http://www.siemens.com/sitranslg250)
- [www.siemens.com/sitranslg270](http://www.siemens.com/sitranslg270)
- [www.siemens.com/sitransprobelu240](http://www.siemens.com/sitransprobelu240)
- [www.siemens.com/sitranslut400](http://www.siemens.com/sitranslut400)

### Guided wave radar

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS LG250 / 270</td>
<td>Guided microwave transmitter for level, level/interface, and volume measurement of liquids and bulk solids, in small and medium range levels.</td>
</tr>
</tbody>
</table>

**Typical applications**

- Level measurement of cooling water, limestone slurry, combustible materials, and chemicals.
- Heaters, water temperature, pump sump, easy level measurements in chemical tanks and water treatment facilities.
- Open-air storage, material handling, coal feeding, coal bunkers, waste material, pump control, crane positioning.

More information:

- [www.siemens.com/sitranslr560](http://www.siemens.com/sitranslr560)
- [www.siemens.com/sitranslr250](http://www.siemens.com/sitranslr250)
- [www.siemens.com/sitranslg250](http://www.siemens.com/sitranslg250)
- [www.siemens.com/sitranslg270](http://www.siemens.com/sitranslg270)
- [www.siemens.com/sitransprobelu240](http://www.siemens.com/sitransprobelu240)
- [www.siemens.com/sitranslut400](http://www.siemens.com/sitranslut400)

### Ultrasonic

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>SITRANS Probe LU240</td>
<td>Ultrasonic transmitter for level, volume, and flow monitoring in measuring ranges up to 12 m.</td>
</tr>
<tr>
<td>SITRANS LUT400</td>
<td>Compact, single-channel ultrasonic evaluation units for continuous level or volume measurement of liquids, slurries, and bulk solids, as well as ultra-precise flow monitoring in open channels, for small to large measuring ranges.</td>
</tr>
</tbody>
</table>

**Typical applications**

- Heating oil, water level, pump sump, easy level measurements in chemical tanks and water treatment facilities.

More information:

- [www.siemens.com/sitranslr560](http://www.siemens.com/sitranslr560)
- [www.siemens.com/sitranslr250](http://www.siemens.com/sitranslr250)
- [www.siemens.com/sitranslg250](http://www.siemens.com/sitranslg250)
- [www.siemens.com/sitranslg270](http://www.siemens.com/sitranslg270)
- [www.siemens.com/sitransprobelu240](http://www.siemens.com/sitransprobelu240)
- [www.siemens.com/sitranslut400](http://www.siemens.com/sitranslut400)
## Level measurement

<table>
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<th>Point level</th>
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<tbody>
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<td><strong>SITRANS LC300</strong></td>
<td><strong>Pointek CLS200/300</strong></td>
</tr>
<tr>
<td><strong>SITRANS LVL100/200</strong></td>
<td><strong>SITRANS LVS100/200</strong></td>
</tr>
<tr>
<td><strong>SITRANS LPS200</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Brief description

- **Capacitance**: Proven in practice for a wide range of applications: the continuous capacitance level measurement with inverse frequency shift technology is suitable for liquid, solid, and interface applications. Capacitance level measurement instruments from Siemens employ Active Shield Technology to ensure a high degree of measuring accuracy from the surface of the material.

- **Point level**: Capacitance level switches with Inverse Frequency Shift Technology as rod/cable probes and configurable output. They are ideal for detecting liquids, bulk solids, slurries, foam, and interfaces in demanding conditions, high temperatures, or high pressure.

### Features and benefits

- **Capacitance**
  - Active Shield Technology
  - Calibration via two pushbuttons
  - Integrated local display
  - Use of Inverse Frequency Shift Technology provides high resolution

- **Point level**
  - For precise and reproducible measurements, even in environments with dust, eddies, and vapor, or in the event of product depositions
  - Self-test and diagnosis alarm functions enable optimized maintenance intervals and better plant management
  - PROFIBUS PA communication
  - Requires little or no maintenance, even in extreme process conditions

### Typical applications

- **Capacitance**: Ideal for standard and industrial applications in the following areas: chemical industry, hydrocarbon processing, food and beverage industry.

- **Point level**
  - Full/empty detection, e.g. coal, fly and filter ash, chemicals, and water.
  - Full/empty detection of liquids and slurries.
  - Full/empty detection of bulk solids.

### More information:

- **www.siemens.com/lc300**
- **www.siemens.com/pointekcls200**
- **www.siemens.com/sitranslvl100**
- **www.siemens.com/sitranslvs100**
- **www.siemens.com/sitranslps200**
### Flow measurement

#### Electromagnetics

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Features and Benefits</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS F M MAG 3100</td>
<td>Electromagnetic flowmeters with a large variety of liners, electrode materials, and with grounding electrodes as standard.</td>
<td>- Flange for a wide pressure range: PN 6 to PN 100, ANSI Class 150/300, AS 2129/AS 4087, AWWA or JIS &lt;br&gt; - Wide range of electrodes and liner materials &lt;br&gt; - Fully welded construction for the harshest applications and environments &lt;br&gt; - Designed for patented on-site checking of the entire flowmeter using the &quot;fingerprint&quot; data in SENSORPROM &lt;br&gt; - Easy commissioning: SENSORPROM unit automatically uploads calibration data and settings &lt;br&gt; - Particularly resistant to aggressive and chemical substances</td>
<td>Suitable for virtually all flow applications – e.g. water, cooling systems, or chemicals.</td>
</tr>
<tr>
<td>SITRANS F M MAG 5000/6000</td>
<td>Electromagnetic flow transducers for flow and volume measurement in combination with any flowmeter.</td>
<td>- Cost-effective sensor offering good performance &lt;br&gt; - SENSORPROM technology supports easy sensor setup without data loss – and maintaining high precision &lt;br&gt; - Multiple functional output for process control &lt;br&gt; - Electronics optionally remote-mounted up to 300 meters away &lt;br&gt; - Wide range of communication modules available – e.g. PROFIBUS PA, FF; MODBUS, HART &lt;br&gt; - SITRANS F M MAG 6000: high precision of 0.2 % &lt;br&gt; - Can be combined with MAG 1100, 3100, and 5100 W flow sensors</td>
<td>Universal flow measurements and custody transfer approval in accordance with OIML R49, MI-001.</td>
</tr>
<tr>
<td>SITRANS FUS SONO 3100/FUS060</td>
<td>The flowmeter consists of a SITRANS FUS SONO 3100 sensor with an O-ring or flange, depending on the application, and the SITRANS FUS060 transmitter.</td>
<td>- Ideal flowmeter for demanding applications &lt;br&gt; - Standard version is supplied as a two-track with or without flanges; four tracks are available on request. &lt;br&gt; - Available pipe materials: carbon or stainless steel on request &lt;br&gt; - Easy exchange of integrated transformers – without interrupting process &lt;br&gt; - In addition to standard outputs, PROFIBUS PA or HART communication is available</td>
<td>Oils, condensates, cold, hot, demineralized, or feed water.</td>
</tr>
<tr>
<td>SITRANS FUS SONOKIT</td>
<td>A simple and accurate alternative to conventional flowmeters – suitable for retrofitting on existing pipelines. IP68 version available for underground/underwater applications, comprises the FUS060 or FUS080 transmitters.</td>
<td>- Cost-effective solution: all components required for retrofitting included &lt;br&gt; - Easy to install in piping with sizes of between DN 100 and DN 4000 (4” to 160”) – without shutting down the process or interrupting the flow &lt;br&gt; - High precision – the larger the pipe, the more precise the result &lt;br&gt; - Solid design with no moving parts for 100 % maintenance-free and tripless measurements &lt;br&gt; - Automatic calculation of calibration factor on entering pipe geometry in the transmitter &lt;br&gt; - Battery-operated option with FUS080</td>
<td>Water intake, retrofit for water/oil applications, district heating.</td>
</tr>
<tr>
<td>SITRANS FS230</td>
<td>Advanced, ultra-precise digital clamp-on ultrasonic flowmeter for measurements in practically all applications involving liquids.</td>
<td>- Accuracy of 0.5 to 1 % of the flow rate and repeatability of 0.25 % in accordance with ISO 11631 &lt;br&gt; - 100 Hz data update &lt;br&gt; - Low maintenance and operating costs, as sensors have no moving parts and never make contact with liquids &lt;br&gt; - Removable SensorFlash® Micro SD card for unique data analysis and service &lt;br&gt; - User-friendly with full graphical display, simple menu navigation, and numerous setup wizards &lt;br&gt; - No pressure loss or power loss</td>
<td>Cold and hot water, condensate, domestic water, verification.</td>
</tr>
</tbody>
</table>

More information:  
- www.siemens.com/mag3100  
- www.siemens.com/sitransfmmag5000  
- www.siemens.com/sitransfmmag6000  
- www.siemens.com/fussono3100  
- www.siemens.com/fussonokit  
- www.siemens.com/fs230
## Flow measurement

<table>
<thead>
<tr>
<th>Flowmeter Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SITRANS FUE380</strong></td>
<td>SITRANS FUE380 operates as part of a complete heat meter system. The two-track flowmeter is battery- or mains-powered and approved for power meter measuring systems (MID, EN 1434, and OIML R75).</td>
</tr>
<tr>
<td><strong>SITRANS FUE950</strong></td>
<td>Universal energy calculator approved for custody transfer – battery- or mains-operated.</td>
</tr>
<tr>
<td><strong>SITRANS FC310 / 330</strong></td>
<td>Digital Coriolis flow measurement systems in a compact design with excellent performance for outstanding multi-parameter measuring accuracy – for mass and volume flow, and for temperature measurement of liquids and gases.</td>
</tr>
<tr>
<td><strong>SITRANS FX330</strong></td>
<td>Vortex flowmeters provide accurate volumetric and mass flow measurements of steam, gases, and liquids as an all-in-one solution with integrated temperature and pressure compensation.</td>
</tr>
<tr>
<td><strong>SITRANS FO</strong></td>
<td>Differential pressure measurement with an orifice plate is a universal flow measurement for liquids, gases, and vapors – always supplying precise measurements, even with large bores, high temperatures, and extreme pressure.</td>
</tr>
</tbody>
</table>

### Features and Benefits

| **SITRANS FUE380** | • Flexibility for a perfect, customized flowmeter solution  
• Designed for precise, high-resolution energy measurement  
• Provides uncompromising performance for high volume water-based applications  
• Approved according to the MID directive and designed and approved for custody transfer  
• Custody transfer sealed to ensure total data security |
| **SITRANS FUE950** | • Compatible with SITRANS FUS380, MAG 5000/6000/6000 I, and a number of other flowmeters  
• MID directive approval for custody transfer for water energy metering  
• Suitable for 2-wire and 4-wire temperature sensor connection  
• Delivered with heat/cooling-approved PT500 sensor set (incl. sensor pockets)  
• Optical interface for data reading in accordance with EN 1434  
• Instantaneous values for energy and volume flow  
• Flexible input/output option modules |
| **SITRANS FC310 / 330** | • Offers high accuracy over a wide range of flow rates  
• Multi-parameter measurement enables simultaneous monitoring of flow, density, and temperature – for higher chemical dosing quality  
• Coriolis technology enables measurement of non-conducting liquids  
• Can be installed practically anywhere – if required, small spaces can accommodate more than one device  
• FC310 is designed for direct integration in machine control systems |
| **SITRANS FX330** | • Maintenance-free due to fully welded sensor design, ensuring outstanding stability and reliability  
• Pressure, temperature, and flow can be read at a single point with no extra equipment, installation, or cabling costs  
• Reduced downtime thanks to shut-off valve enabling replacement of pressure sensor without process interruption  
• Integrated heat meter  
• Status indicator in accordance with NAMUR NE107 |
| **SITRANS FO** | • 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  
• Required additional electronics can be used over a long distance from the measuring location |

### Typical Applications

| **SITRANS FUE380** | District heating plants, local networks, boiler stations, substations, chiller plants, and other general water applications. |
| **SITRANS FUE950** | In combination with a flowmeter, can be used in district heating, chilled water, and combined cooling/heating applications. |
| **SITRANS FC310 / 330** | Heating fuel, limestone suspension, condensate treatment, fuel oils with various densities. |
| **SITRANS FX330** | Steam, condensate, demineralized water, measurement of consumption in compressed air. |
| **SITRANS FO** | Water steam cycle, high pressure/high temperature applications, combustion air, fuel gas. |

More information: [www.siemens.com/sitransfo](http://www.siemens.com/sitransfo)  
More information: [www.siemens.com/fue950](http://www.siemens.com/fue950)  
More information: [www.siemens.com/fue380](http://www.siemens.com/fue380)
### Pressure

#### Pressure measurement

<table>
<thead>
<tr>
<th>SITRANS P320</th>
<th>SITRANS P420</th>
<th>SITRANS P500</th>
<th>SITRANS P280</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital pressure transmitter for measuring gauge pressure, absolute pressure, differential pressure, flow, and level.</td>
<td>High-performance digital pressure transmitter version of the P320 for gauge and differential pressure measurements.</td>
<td>The SITRANS P500 meets the highest expectations for measuring accuracy, ruggedness, and user-friendliness.</td>
<td>WirelessHART pressure transmitter that provides all measured process values as well as diagnostic information, parameters, and functions via radio.</td>
</tr>
</tbody>
</table>

#### Brief description

- SITRANS P320:
  - High measuring accuracy of 0.065 %
  - Developed in accordance with IEC 61508 standards for SIL 2/3
  - Improved HMI display: new, larger, and better display with NAMUR NE107
  - 4 pushbutton operation
  - Remote safety handling

- SITRANS P420:
  - High measuring accuracy of 0.040 %
  - Developed in accordance with IEC 61508 standards for SIL 2/3
  - Improved HMI display: new, larger, and better display with NAMUR NE107
  - 4 pushbutton operation
  - Remote safety handling
  - Ready for digitalization

- SITRANS P500:
  - High measuring accuracy
  - Very fast response time
  - Extremely good long-term stability
  - Highly reliable, even under extreme chemical and mechanical loads
  - For aggressive and non-aggressive gases, vapors, and liquids
  - Extensive diagnostic and simulation functions that can be used both on site and via HART
  - Separate replacement of measuring cell and electronics without recalibration

- SITRANS P280:
  - Supports the WirelessHART standard for flexible pressure measurements
  - Enables cost savings on wiring for locations with difficult installation conditions, e.g. in remote areas of plants and on moving or rotating components
  - Device meets IP65 degree of protection
  - Very high security level for wireless data transmission
  - Powered by a battery with increased service life thanks to optimized power consumption

#### Features and benefits

- **SITRANS P320**
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  - Very high security level for wireless data transmission
  - Powered by a battery with increased service life thanks to optimized power consumption

#### Typical applications

- **SITRANS P320**
  - For applications that require functional safety and for safety-critical applications, e.g. in the chemical, oil and gas, and power generation industries. Robust materials underscore suitability for harsh environments.

- **SITRANS P420**
  - For applications that require functional safety and for safety-critical applications, e.g. in the chemical, oil and gas, and power generation industries. Robust materials underscore suitability for harsh environments.

- **SITRANS P500**
  - Applications that require maximum accuracy and very short response times, e.g. in turbine steam systems.

- **SITRANS P280**
  - To communicate pressure measurement data:
    - from remote locations
    - from a moving machine

#### More information:

- SITRANS P320: [www.siemens.com/sitransp320](http://www.siemens.com/sitransp320)
- SITRANS P420: [www.siemens.com/sitransp420](http://www.siemens.com/sitransp420)
- SITRANS P500: [www.siemens.com/sitransp500](http://www.siemens.com/sitransp500)
- SITRANS P280: [www.siemens.com/sitransp280](http://www.siemens.com/sitransp280)
## Temperature

### Temperaturmeßgeräte

<table>
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<tr>
<th>Model</th>
<th>Brief Description</th>
<th>Features and Benefits</th>
<th>Typical Applications</th>
</tr>
</thead>
</table>
| SITRANS TH320 / 420 | For simple applications and for PROFIBUS and FOUNDATION fieldbus installations. Suitable for all common RTDs and thermocouples. Can also be used to evaluate RTD encoders and millivolt signals. | • High availability during measurement  
• High reliability and long-term stability  
• Avoidance of production downtime caused by measuring failures  
• Ideal cost-benefit ratio for plant management  
• Cost savings thanks to predictive maintenance  
• High sensing accuracy  
• Extended temperature range up to –50 °C + SIL 2/3 certification | Despite their compact design for installation directly in the connection head, the transmitters feature a high degree of convenience and safety – for simple applications and for PROFIBUS and FOUNDATION fieldbus installations. Safety-critical applications, even under extreme conditions, thanks to SIL 2/3 certification in combination with a wide range of Ex approvals. |
| SITRANS TR320 / 420 | The rail mount transmitters offer the performance features of SITRANS TH but are used at process level in terminal boxes or in the control room – enabling central access to all connecting measuring points. | • High availability during measurement  
• High reliability and long-term stability  
• Avoidance of production downtime caused by measuring failures  
• Ideal cost-benefit ratio for plant management  
• Cost savings thanks to predictive maintenance  
• High sensing accuracy  
• Extended temperature range up to –50 °C + SIL 2/3 certification | Available in robust die-cast aluminum or durable 316L stainless steel, the field transmitter with excellent IP66/67/68 degree of protection is particularly recommended for use in harsh ambient conditions. |
| SITRANS TF          | The field transmitter for harsh industrial environments. Thanks to its IP67 degree of protection, the SITRANS TF is used in conditions that are too harsh for other transmitters. It measures the signals from RTDs, RTD encoders, thermocouples, and voltage encoders. | • Supports the WirelessHART standard for flexible temperature measurements  
• Enables cost savings on wiring for locations with difficult installation conditions, e.g., in remote areas of plants and on moving or rotating components  
• Housing features IP66 degree of protection  
• Very high security level for wireless data transmission  
• Powered by a battery with increased service life thanks to optimized power consumption | To communicate temperature measurement data:  
• from remote locations  
• from a moving machine  
| SITRANS TF280       | WirelessHART temperature transmitter that provides all measured process values as well as diagnostic information, parameters, and functions via radio. | • Modular system enables exchangeability and flexibility, extensions, and connection heads with optional integrated transmitter or display  
• Versions for RTD (Pt100) and thermocouple  
• International approvals for IEC-Ex and ATEX for Ex d, Ex i and Ex n in gas and dust  
• Optional transmitter and local display | Temperature measurements in practically all power plant areas, e.g., boiler, water-steam cycle, turbine, auxiliaries. |
| SITRANS TS500       | SITRANS TS temperature sensors are suitable for wide use in the process industry, from simple applications to solutions for harsh environments. | | |

More information:  
- [www.siemens.com/sitransth320](http://www.siemens.com/sitransth320)  
- [www.siemens.com/sitranstr320](http://www.siemens.com/sitranstr320)  
- [www.siemens.com/sitranstf](http://www.siemens.com/sitranstf)  
- [www.siemens.com/sitranstf280](http://www.siemens.com/sitranstf280)  
- [www.siemens.com/sitransts](http://www.siemens.com/sitransts)
## Weighing technology

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<th>Integrators</th>
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<td><strong>Briefs description</strong></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
| Heavy-duty, high-accuracy multiple idler belt scales used for critical processes and load-out control. | Low to medium capacity solids flowmeters for a wide range of product sizes, densities, and fluidities. | Various load cells suitable for almost any application, even hazardous areas. | • Milltronics BW500: Powerful integrator for use with belt scales and weighfeeders  
• Milltronics BW500/L: Integrator for use in simple applications with belt scales and weighfeeders  
• Milltronics SF500: Powerful integrator for use with solids flowmeters  
• SIWAREX WP231: Integrated or stand-alone versions  
• SIWAREX FTA: Integrated, calibrated, and versatile  
• SIWAREX FTC: Integrated, versatile, and flexible weighing electronics for belt scales, loss-in-weight weighfeeders, and solids flowmeters  
• SIWAREX U and CS: Integrated, versatile, and flexible weighing electronics for level measurement, platform scales |

| Features and benefits | | | |
| • Suitable for upgrading existing conveyor systems, with high precision for custody transfer  
• Typical approvals include NTEP, OIML, MID, Measurement Canada, and others  
• The patented use of parallelogram-style load cells results in a fast reaction to vertical forces, ensuring instant response to product loading  
• Stand-alone evaluation electronics with BW500/L or direct integration in SIMATIC S7 with the SIWAREX FTC module  
• The sensor element is mounted externally, reducing maintenance requirements to the absolute minimum  
• The standard version can measure throughput quantities from 0.2 to 40 t/h; larger versions can handle up to 300 t/h  
• Stand-alone evaluation electronics with SF500 or direct integration in SIMATIC S7 with the SIWAREX FTC module  
• The SF500 integrator features 2 PID controllers and all communication possibilities for seamless integration in any control system  
• High accuracy of 3000 d (OIML R60)  
• Large measuring range from 3 kg to 500 t  
• High-temperature version up to 250 °C available  
• Hermetically sealed, extremely long service life  
• Stainless steel or aluminum  
• Smart design mounting devices for simple, safe installation  
• Direct integration in SIMATIC S7 with SIWAREX U, SIWAREX CS, SIWAREX MS, or SIWAREX FTA  
• Capacities, totals, alarms, analog outputs and digital communication  
• Differential speed detection with second speed sensor  
• Suitable for belt scale custody approval  
• Automatic zero and electronic span calibration  
• Alarm functions: rate, load, speed, or diagnostic error  
• On-board Modbus®, optional PROFIBUS DP, Allen-Bradley® RIO, Ethernet I/P, Modbus TCP/IP, PROFINET, and DeviceNet™  
• Comprehensive weighfeeder control functions  
• PID control and online calibration with optional analog I/O cards  
• Hygrometer input with optional I/O card for calculation of dry weight  
• Reliable, continuous level measurement instrument with established ultrasonic technology  
• Three relays for pump/process control  
• Separation of sensors and transmitters protects the electronics from extreme vibrations  
• Robust and fully sealed, the non-contacting ultrasonic sensor is extremely reliable, even in harsh environments  
• Sonic Intelligence signal processing is proven to provide superior performance in difficult conditions | |

| Typical applications | | | |
| Certified conveyor load-out, solids flow control, inventory monitoring. | Solids flow monitoring, truck loading, e.g. fly ash. | Static weighing, batching, dosing, dynamic weighing, loss-in-weight. | • BW500IL integrator for use with belt scales or BW500 for use with weighfeeders  
• SF500 integrator for use with solids flowmeter  
• Static weighing, batching, dosing, dynamic weighing, loss-in-weight. |
### Positioners

#### Valve positioners

**SIPART PS2 & PS100**

Positioner for linear and part-turn actuators. Non-contacting sensor (NCS option) enables remote mounting of the positioner away from the harsh ambient conditions.

**ULTRAMAT 23**

Up to four gas components can be measured simultaneously with the ULTRAMAT 23 gas analyzer: up to three IR-active gases such as CO, CO₂, NO, SO₂, CH₄, additionally O₂ with an electrochemical sensor or paramagnetic oxygen cell.

**CALOMAT 6**

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

**LDS 6 / SITRANS SL**

The fast and non-contacting 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 even measure gases under extreme conditions.

**Set CEMS**

Standardized system for monitoring flue gases for emission components. Meets all requirements for sampling, sample preparation, and gas analysis under EU and EPA guidelines.

### Gas analysis

#### Continuous gas analysis – extractive

**ULTRAMAT 23**

- AUTOCAL with ambient air (dependent on the measured component); highly cost-effective because calibration gases are not required
- High selectivity thanks to multilayer detectors, e.g. low cross-sensitivity to water vapor
- Sample chambers can be cleaned, if required on site
- Service information and logbook enable preventive maintenance, support for service and maintenance personnel, and cost savings
- Short T90 time due to micromechanical Si sensor
- Electronics and analyzer part: gas-tight separation, purgeable
- IP65, long service life, even in harsh environments
- EX(p) for ATEX Zone 1 and 2 and 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

**CALOMAT 6**

- 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

**LDS 6 / SITRANS SL**

- Simultaneous multi-component analysis of up to 16 gas components
- Up to 3 analyzers (FTIR, O₂, and FID) can be combined in one set
- QAL1-certified emission monitoring under EU and EPA guidelines

#### Typical applications

**Control of pneumatic actuators, e.g. condensate control valves, cooling systems, air dampers.**

**Emission monitoring.**

**Monitoring of turbo-alternators.**

**Ammonia slip downstream of SCR and SNCR DeNOx stages, combustion control in furnaces and boilers, waste gas concentration in flue gas.**

**Emission monitoring.**

### More information:

- **SIPART PS2 & PS100**: [www.siemens.com/sipartps2](http://www.siemens.com/sipartps2)
- **ULTRAMAT 23**: [www.siemens.com/ultramat23](http://www.siemens.com/ultramat23)
- **CALOMAT 6**: [www.siemens.com/calomat6](http://www.siemens.com/calomat6)
- **Set CEMS**: [www.siemens.com/gasmetcems](http://www.siemens.com/gasmetcems)
## Process monitoring

### Speed sensors

<table>
<thead>
<tr>
<th>Milltronics MFA 4p and MSP-12</th>
<th>SITRANS AS100</th>
<th>SITRANS RD100/200/300</th>
<th>SITRANS RD500</th>
<th>SIMATIC PDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief description</td>
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<tr>
<td>Speed monitor and probe as a highly sensitive single setpoint system.</td>
<td>Acoustic sensor for solids flow monitoring.</td>
<td>Local or remote display of level, temperature, flow, pressure, and weighing measured values.</td>
<td>Remote data manager providing remote monitoring via integrated web access, alarm event processing, and acquisition of data from instrumentation.</td>
<td>Universal, vendor-independent tool for configuration, parameterization, commissioning, diagnostics, and maintenance of intelligent field devices and field components.</td>
</tr>
<tr>
<td>Features and benefits</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>• Suitable for demanding industrial applications and handling of raw materials</td>
<td>• Reacts instantly to changes in the material flow to warn of blockages, absence of material, or equipment failure (e.g. burst filter bags)</td>
<td>• SITRANS RD100 with impact-resistant NEMA 4X/IP67 enclosure is extremely versatile: for indoor and outdoor applications, in hot or cold environments, and in safe or hazardous zones</td>
<td>• RD500 supports report and alarm events via e-mail, SMS, and FTP transfer</td>
<td>• For point-to-point connection or integration in process control systems</td>
</tr>
<tr>
<td>• Up to 100 mm (4&quot;) distance between probe and measured object enables measurements on machines with large tolerances, e.g. crushing plants</td>
<td>• Operating with a SITRANS CU02 evaluation unit, switching points can be configured to display various operating states (e.g. high, low, or no material flow)</td>
<td>• SITRANS RD200 is a remote digital display with a universal input enabling panel mounting for process measuring instruments. RD software supports remote configuration, monitoring, and recording of up to 100 displays. Double display size is available as an option</td>
<td>• The integrated web server enables worldwide access to device data, as well as RD500 configuration and setup</td>
<td>• Enables the configuration of field devices from different manufacturers using a standard user interface and access to the instruments on every level of the automation hierarchy</td>
</tr>
<tr>
<td>• The sensor is capable of penetrating stainless steel to detect a ferrous target behind, which is particularly useful for applications with screw conveyors</td>
<td>• Sensor is mounted on the outside of the pipe, without contact with the material</td>
<td>• SITRANS RD300 is a two-line panel-mount remote digital display for process instrumentation</td>
<td></td>
<td>• Process device data can be easily set, changed, checked for plausibility, managed, and simulated</td>
</tr>
</tbody>
</table>

### Features and benefits

- Suitable for demanding industrial applications and handling of raw materials
- Up to 100 mm (4") distance between probe and measured object enables measurements on machines with large tolerances, e.g. crushing plants
- The sensor is capable of penetrating stainless steel to detect a ferrous target behind, which is particularly useful for applications with screw conveyors

### Typical applications

- Speed sensing on tail pulleys, driven pulleys, motor shafts, belt/chain conveyors and screw conveyors, crushing plants, blowers, and pumps.
- Detection of defective filter bags and blockages in pneumatic conveyor systems, chutes, and pipes.
- Remote display of process values.
- Remote monitoring, asset management.
- Configuration, parameterization, commissioning, diagnostics, and maintenance of field devices and field components.

### More information:

- More information: [www.siemens.com/sitransas100](http://www.siemens.com/sitransas100)
- More information: [www.siemens.com/sitransrd100](http://www.siemens.com/sitransrd100)
- More information: [www.siemens.com/sitransrd500](http://www.siemens.com/sitransrd500)
## Communication and software

### SITRANS Library

The SITRANS Library can be used to facilitate the integration of SITRANS and SIPART family devices in SIMATIC PCS 7 control systems and enable full use of the data available in the devices.

### COMOS

COMOS provides the user with a consistent data basis, from the process design to the engineering and ongoing operation, thereby enabling integrated plant management.

### SCALANCE

The SCALANCE product range is primarily designed for use in various industrial applications. It provides everything for extremely efficient industrial networks and bus systems.

### Ruggedcom

Highly specialized, rugged communication components for the electric power grid. Ideal for security-related and mission-critical applications. Meets even the highest requirements for EMC, impact and vibration resistance – at operating temperatures of between −40 °C and +85 °C.

<table>
<thead>
<tr>
<th>Features and benefits</th>
<th>SITRANS Library</th>
<th>COMOS</th>
<th>SCALANCE</th>
<th>Ruggedcom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced engineering effort</td>
<td>•</td>
<td>• Uniform data platform for all units</td>
<td>• Standardized for PROFINET/Industrial Ethernet</td>
<td>• Rugged switches and routers up to 10 GBit/s</td>
</tr>
<tr>
<td>APL (Advanced Process Library)-compliant</td>
<td>•</td>
<td>• Seamless flow of information and optimum coordination of units</td>
<td>• Industrial Ethernet layer 2 and layer 3 switches</td>
<td>• Serial server devices for legacy equipment</td>
</tr>
<tr>
<td>Supports SIMATIC PCS 7</td>
<td>•</td>
<td>• Data is maximally transparent, consistent, and up to date</td>
<td>• Industrial Ethernet media converter</td>
<td>• Ethernet over VDSL portfolio</td>
</tr>
<tr>
<td>Opening and closing of valves directly by the operator and increased transparency of control behavior</td>
<td>•</td>
<td>• Modular software design enables customized solutions to meet your requirements</td>
<td>• IEC 62439-3 for redundant, always-on communication and instant network recovery</td>
<td>• 4G broadband wireless technology</td>
</tr>
<tr>
<td>Device-specific alarm management</td>
<td>•</td>
<td>• Industrial Security modules</td>
<td>• Industrial Security modules</td>
<td>• NERC CIP security compliance</td>
</tr>
<tr>
<td>Visualization of HART auxiliary variables</td>
<td>•</td>
<td>• Industrial Wireless LAN in accordance with IEEE 802.11n for top performance of up to 450 MBit/s (gross data rates)</td>
<td>• Industrial Wireless LAN controller for enhanced operation of IWLAN networks</td>
<td>• Certified to IEC 61850 and IEEE 1613</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical applications</th>
<th>SITRANS Library</th>
<th>COMOS</th>
<th>SCALANCE</th>
<th>Ruggedcom</th>
</tr>
</thead>
<tbody>
<tr>
<td>The SITRANS Library offers considerable advantages as part of an optimized process control system: reduced engineering effort thanks to device-specific function blocks, integration of and access to all relevant device and diagnostic data in ongoing operation, and information on simplified process control.</td>
<td>Plant planning and design, as well as consistent data management in ongoing operation and during maintenance work.</td>
<td>Connection of the control level with the management level on the basis of Industrial Ethernet.</td>
<td>IP data communication for modern energy supply, transmission, and distribution systems, e.g. in electric power substations, transformer stations, for condition monitoring of circuit breakers, and in all types of protection and control installations.</td>
<td></td>
</tr>
</tbody>
</table>

More information:
- [www.siemens.com/sitranslibrary](http://www.siemens.com/sitranslibrary)
- [www.siemens.com/comos](http://www.siemens.com/comos)
- [www.siemens.com/scalance](http://www.siemens.com/scalance)
- [www.siemens.com/ruggedcom](http://www.siemens.com/ruggedcom)
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 key competitive advantage by boosting profitability, reliability, and ease of use. Major benefits of the SPPA-T3000:

- Easy and intuitive in use – to the benefit of operating personnel
- High-performance data distribution – the right information anytime, anywhere
- Easy to engineer – built for simultaneous online modification of the HMI and automation 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 the lowest possible lifecycle costs.
Siemens’ SPPA-T3000 control system is one of the world’s most powerful and future-proof 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.