Incineration Plants

Full range of measurement instrumentation and solutions
Endress+Hauser is a leading supplier of measurement instrumentation, services and solutions for power plants worldwide. We design and manufacture a full range of industry-optimized instruments for every step of the process. Endress+Hauser also offers more than 50 years of application know-how to help customers increase their process efficiency, reduce their production down-time and streamline their stockholding and logistics processes.

As a Swiss, family-owned company, Endress+Hauser is dedicated to instrumentation plowing back all profits into the development of state-of-the-art process automation technologies. Since the beginning in 1953, Endress+Hauser has been a pioneer for cutting edge measurement and automation solutions. Endress+Hauser sales centers and representatives are located in 85 countries. Innovative measurement and automation systems are manufactured at 23 production centers in Switzerland, Germany, France, the United Kingdom, Italy, China, Japan, India, Russia and the USA.

References Europe

- ISSÉANE, Paris, – France
- Sète – France
- Le Mans – France
- Perpignan – France
- Heimdal/Trondheim – Norway
- Pfaffenau/Wien Austria
- Centré Tridel Lausanne – Switzerland
- KVA Thun – Switzerland
- KVA Trimmis – Switzerland
- KVA Niederurnen – Switzerland
- Allington – England
- Lakeside – England
- Xiamen – Japan

"Energy from waste" know-how
Endress+Hauser is powering its way to the top, providing solutions for waste-to-energy, fossil fuel (coal, gas and oil), nuclear and hydro power plants.

The portion of incinerated waste differs considerably worldwide and is generally higher in industrialized countries than in developing countries. In Germany, about 50 percent of domestic waste is subjected to thermal treatment and while this figure is increasing it already amounts to 100 percent in Switzerland. Today, the incineration of waste is usually preferred to landfilling since, particularly in densely populated countries, sites are scarce and depositing of incineration ashes requires considerably less space. A conventional incineration plant consists, for example, of the waste plant (weighing station, waste unloading hall, waste storage pit and crane), incineration plant (furnace, slag discharger and steam generator), flue gas cleaning system (filter facilities, chemical cleaning system and chimney stack) as well as several auxiliary and supporting systems.

References Germany

- AVS Zorbau
- EVZA Stassfurt
- MVA Darmstadt
- MVA Düsseldorf
- MVA Essen-Karnap
- MVA Kassel
- MVA Neunkirchen
- MVA Weisweiler
- MVA Wesel
- MVA Würzburg
- TAN Nürnberg
- TREA Breisgau

* Origin SITA Deutschland GmbH
Incineration plants

A waste-to-energy plant is a modern term for contemporary incinerators that burn waste in highly efficient furnaces/boilers to produce steam and/or electricity. Incineration is a waste treatment technology that involves the combustion of organic materials and/or substances. Incineration and other high temperature waste treatment systems are described as "thermal treatment". The incineration of waste materials converts the waste into ashes, flue gases, particulates and heat which can, in turn, be used to generate electricity.

Cross section of a waste incineration plant
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Optimizing the water-/steam systems

Level measurement in the steam drum

Traditional dp-level measurement
The key element of the plant is the boiler drum. Its main task is the provision of feedwater, after it has been preheated, to the external exonomizer, the superheaters and tube nests. Furthermore, saturated steam is withdrawn at this point for primary air and feedwater preheating.

Level measurement, the actual key to steam quantity and turbine control, must be highly reliable and consistently available. This main parameter is usually kept constant by a combustion control (multi-component control). However, different parameters of the partly vaporous partly liquid medium to be measured, i.e. water, a boiler pressure of up to 50 bar and temperatures of up to 265 °C place particularly high demands on the instrumentation and its corrective calculations.

To achieve a correct measuring signal, the consistencies of the medium in the drum, the condensate reference column, the communicating water column (if externally arranged) and of the superimposed steam in the drum must be taken into consideration.

- Traditionally, a $\Delta P$ measuring point, e.g. Deltabar S PMD75, has been used for this task. The corrective calculation of the medium data can be statically realized for the main operating point of the boiler drum and set as a corrected measuring range in $\Delta P$.
- Special know-how is indispensable as well as a correct commissioning and calibration procedure, e.g. when filling reference columns or impulse lines.
- If a sliding corrective calculation is required, correcting components of the DCS/PCS manufacturer can be easily engineered and configured.

1.1 Deltabar S – differential pressure for level measurement

Deltabar S differential pressure transmitter is used as a standard for level measurement in the water/steam system.
- Very good reproducibility and long-term stability
- High reference accuracy
- Quick commissioning
Innovation: Higher plant availability with guided radar measurement

As an alternative to differential pressure, levels can be determined by Levelflex M FMP45 guided radar measurement. The instrument may be installed directly from the top using a coaxial tube in the boiler drum or as a bypass variant next to existing local water reflex displays. In this application, Levelflex M FMP45 with EN12952-11/12953-9 approval is used as high level and low level limit. To complete the installation, the respective bypass as well as the high pressure tensile bolts/screws and serrated gaskets can also be supplied for Levelflex M FMP45.

The gas phase compensation was particularly developed for these special measurements, in which steam phases occur, to compensate the time-of-flight shift in steam phases. A defined reference section at the probe combined with an electronic software algorithm corrects the level value automatically and continually thus offering correct and safe measurement. Furthermore, purging and filling of differential pressure pipes after stoppages is a thing of the past.

1.2 Levelflex M – guided microwave level measurement

Levelflex provides level measurement of condensed steam in front of the turbine in the main condenser (hotwell), as well as level measurement at the low pressure preheater, feedwater tank, high pressure preheater and boiler drum. Levelflex provides cyclic automatic gas phase compensation, the ideal solution for precise level measurement in all steam applications. Levelflex is independent of:

- Density fluctuations
- Changing dielectric numbers
- Gas covering of steam
- Pressure and temperature changes
- Vacuum (e.g. in main condenser hotwell)

This results in a better solution than differential pressure for level measurement, providing:

- More reliable measurement
- Increased safety
- Easier installation

Levelflex is ideal as a displacer replacer. It has no mechanical moving parts and, therefore, no wear and tear. Levelflex is suitable for pressures up to 400 bar and temperatures up to 400 °C.
The boiler feedwater circulates within the water/steam circuit. This is the main component in the power plant. After the steam has condensed in the main condenser, pumps convey the feedwater through subsequent low and high pressure heaters into the boiler. When it arrives at the boiler, the feedwater is vaporized to saturated steam under high pressures (up to 110 bar) and high temperatures (up to 318 °C). Passing through several levels of superheater, the steam is then supplied to the turbine to drive the generator. Condensation in the main condenser begins again and the entire procedure is repeated.

Monitoring levels in the hotwell, low and high pressure preheater, feedwater tank and boiler drum are of great importance for safe operation of the circuit.
Pressure and temperature measurement in water-/steam systems

Overheated steam from the superheaters of the boiler enters the steam distributors. This steam is fed to different consumers from the distribution station, e.g. turbine, feedwater heater (degasser), process steam for chemical or pharmaceutical plants, warm water heat exchanger for utility-supplied heat, etc. In order to serve all processes, the steam pressure has to be reduced to three levels:

- High pressure steam ≈ 49 bar
- Medium pressure steam ≈ 8.2 bar
- Low pressure steam ≈ 1.7 bar

A selection of instruments which measure this process with the highest degree of accuracy is:

2.1 Cerabar S

- High pressure impact resistance in the water-steam circuit
- Fast commissioning via Quick Set up menu
- Unique safety concept for your process application

2.2 Omnigrad TC15 and TC88

- Predominant use of D4 or D5 solid protecting pipes
- Preferred materials
  - 16Mo3/1.5415
  - 13CrMo4-5/1.7335
- HART®, head or DIN rail transmitter

The complete measuring point includes the thermometer and the option of iTemp head, rail or field transmitters.
**Temperature measurement in the boiler**

The waste conveyed to the reciprocating grate is kindled while applying primary and secondary air which also influences and controls the incineration. Temperature measurement in the combustion chamber contributes decisively to the reduction of emissions and pollutants. Temperature measurement arranged directly in the lateral boiler walls at different levels or sensors located in the burn-up zone as well as in the passage of further boiler flues provide information on the combustion temperature.

The length and the material of the protecting pipes as well as the mechanical and chemical strain are decisive for the corrosion and useful life of the thermocouples. The aggressiveness of the flue gas must not be dismissed either.

The following materials are predominantly used in furnaces:

- **Burn-up zones:**
  Predominantly 1.4762 / AISI446 or alternatively 1.4841 / AISI310, Type K respectively. The length of the thermocouples is determined by the lining thickness and considerations such as avoidance of mechanical damage by slag or similar materials.

- **Boiler walls adjacent to the grate:**
  Since the installation is mostly realized with a slight inclination the protecting pipes may bend downwards. The vicinity to auxiliary burners and liquid injections might have a negative influence in this situation.

- **Boiler combustion chamber ceiling:**
  Since the thermocouples are directly mounted in the flue gas flow we recommend the use of a protective pipe of 1.4876 / Incoloy 800HT with a solidly designed top or alternatively 1.4767 / Kanthal AF®.

- **Superheater and economizer:**
  The flue gases have now released their high temperatures to the tube nests and other components inside of the steam generator. Thermocouples with protecting pipes of 1.4762 / AISI446 are used at this point.

**3 Omnigrad S TAF16**

Thermocouple with a protecting tube of metal
- Customized immersion length
- Exchangeable measuring insert
- Internal ceramic protective sheaths
- Thermocouples with different diameters
- 2-wire transmitter PC-programmable (4…20 mA), HART®, PROFIBUS® and FOUNDATION™ Fieldbus protocol
- Double sensing element
- Various materials

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*Images depict various temperature measurement equipment and installations within a boiler system.*
Temperature measurement engineering

**Graphic configurator for temperature**

Today, the crucial factor of success is cost optimizing across the whole life cycle of a plant. The engineering costs for a temperature measuring point are frequently higher than the purchasing costs of the product itself and engineering, commissioning and maintenance costs together might amount to three times the purchasing costs. For this reason, Endress+Hauser has developed the graphic configurator together with its customers. The same supports engineering in particular with user-friendly navigation. It is thus a useful aid, from sizing, to the operation of a temperature measuring point.

1. Safe sizing of a temperature measuring point with graphic tracing and integrated calculation modules

2. Further information per click:
   - Learn More area,
   - Knowledge database,
   - Product sheet,
   - Installation instruction,
   - Technical documentation,
   - Certificates,
   - Spare part tracking tool including spare part list

The graphic configurator is part of the Endress+Hauser Applicator as described on page 22.

View of the burn-up zone / grate
Deltatop dp-flow measurement system in steam, water and air

Differential pressure flow devices – proven in practice. The way to avoid legal disputes on steam measurement.

The ISO 5167 standard details the design and volume calculations for orifice plates, venturi tubes and nozzles. This gives significant advantages over other dp types (such as pitot type devices) where no specific standard exists. It is important in contractual or legal agreements to have a common calculation basis to avoid disputes about the volume measured.

As an example, it is possible that a new power plant does not produce the thermal efficiency specified in the contract. The boiler supplier and the turbine manufacturer might disagree about the amount of steam actually supplied to the turbine. The use of an agreed standard and a meter of fixed design ensures that third party experts can easily validate the meter, the installation and the design calculations for the steam volume. This will eliminate any potential dispute regarding the energy contained in the steam flow so that thermal efficiency can be accurately quantified.

Since the primary element has to be engineered to specific customer or project requirements and sized correctly to provide the required metering accuracy laid down in ISO 5167, the following information must be supplied:

- Mass flow or volume flow range
- Type of primary element preferred
- Range of differential pressures required
- Acceptable maximum permanent pressure loss
- Nominal pipe diameter
- Operating temperature
- Operating pressure
- Standard base conditions used for reference calculations

The choice of the primary element may be important if permanent pressure loss is an issue or is limited by process requirements. Reference texts show the permanent pressure drop as a function of the differential generated as:

- Long pattern venturi tube: 10...15 %
- Short pattern venturi tube: 10...20 %
- Venturi nozzle: 10...20 %
- Nozzle: 35...60 %
- Orifice plates: 35...70 %

It is not just the primary element selection that is important. The inclusion of condensation chambers, valve manifolds, impulse line length and the location of pressure and temperature sensors is also important in determining the overall system uncertainty as well as assuring a reliable and safe measurement system.

Typical dp-flow applications

<table>
<thead>
<tr>
<th>Application</th>
<th>Recommended primary elements</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP superheated steam into turbine</td>
<td>Venturi tube/venturi nozzle</td>
<td>➔ For lowest pressure loss, meets ISO 5167 requirements</td>
</tr>
<tr>
<td>LP saturated steam/condensate return</td>
<td>Orifice plate</td>
<td>➔ Common standard, meets ISO 5167 requirements</td>
</tr>
<tr>
<td>ISA or venturi nozzle</td>
<td></td>
<td>➔ Excellent long term stability, meets ISO 5167 requirements</td>
</tr>
<tr>
<td>Vortex (Prowir 73)</td>
<td></td>
<td>➔ Calibrated, easiest and cost effective solution up to 6</td>
</tr>
<tr>
<td>Primary- and secondary air flow</td>
<td>Venturi tube</td>
<td>➔ For lowest pressure loss, reduces energy, meets ISO 5167 requirements</td>
</tr>
</tbody>
</table>

In case ISO 5167 requirements are not important, pitot tubes can be installed in all mentioned applications as a cost effective solution for lowest possible pressure loss.

Deltatop - dp flow measurement of secondary air with venturi tube long

Deltabar S dp-flow transmitter installed for convenient operation
Typical cost saving case study*

What are the savings by using a venturi tube instead of an orifice plate metering the steam into the turbine?

Steam parameters: 40 bar abs., 400 °C, 100 t/h
Condensation turbine with exhaust pressure 0.05 bar abs.
Power generation: 21.25 MW

Annual runtime 8,000 h
Revenue per MWh produced: 100 €**
Pressure loss of venturi tube = 0.12 bar
Pressure loss of orifice plate = 1.2 bar

Using a venturi tube instead of an orifice plate increases the power generation output from 21.19 MW to 21.25 MW due to the lower pressure loss at the metering point. This increases the annual energy production by 543 MWh and leads to an increase of revenue in excess of 54’000 € per year. The additional revenue is by far higher than the price adder of a venturi tube over an orifice plate.

* Average figures at an incineration power plant
** common local €uro zone price estimation

Deltabar S – the heart of any dp-flow measuring system

- Clear on-site programming with display
- Easy and fast commissioning via Quick Setup menu
- The HistoROM memory module for fast recommissioning in case the transmitter needs to be replaced
- Single side overload resistance of 420 bar (630 bar for both sides) provides unsurpassed process safety

Our service:
www.applicator.com gives you free of charge selection and sizing of your flow measuring system as per ISO 5167 standards.

Furthermore, the dp-flow competence team at Endress+Hauser ensures that each custom-made Deltatop dp-flow solution fits correctly. This makes Endress+Hauser the right partner for dp-flow applications.
The feedwater of a steam generator must meet certain requirements. It must be free of hardness which would cause the formation of stones and sludge (scale) in the boiler. The formation of scale on the walls of the steam generator increases the sheet metal temperature thus impairing the stability of the boiler sheets.

Dissolved gases, e.g. carbonic acid and oxygen, as well as free acids are also not permitted in the water. They would cause corrosion of the boiler sheets and pipes. Finally, the water must be free of mechanic contamination and colloidally dissolved substances like oils and greases to avoid foaming of the boiler content.

### 5.1 Conductivity sensor CLS15D

**Why is conductivity measured in the water-steam circulation system?**

The conductivity measurement detects the feedwater concentration of ions and measures it in μS/cm. A change in conductivity during operation indicates impurity in feedwater quality.

### 5.2 pH-sensor CPS41D

**Why is the pH-value measured in the water-steam circulation system?**

The pH-value, i.e. the concentration of hydrogen ions, shows whether a solution is acid, neutral or alkaline. The pH-value measurement thus monitors the feedwater to protect the pipes against corrosion and build-up.

### 5.3 Oxygen sensor COS21D

**Why is O2 measured in the water-steam circulation system?**

The feedwater oxygen concentration is stated in mg/l. High oxygen concentrations promote corrosion of the steel pipes by electrochemical processes and must be continually monitored.
5.4 **Liquiline M**

Liquiline is a modular two-wire transmitter for pH, conductivity and oxygen measurement in water-steam circulation systems. Variants are available to connect Liquiline to bus systems like FOUNDATION™ Fieldbus, PROFIBUS® and HART® protocol.

- Easy commissioning with Quick Setup and Navigator button
- Predictive maintenance system recognizes when a sensor has to be cleaned, calibrated or replaced
- Combined with Memosens cable breakage is indicated on the display
- User-guided commissioning, graphic display and plain text menu
- Modular concept: Sensor module exchangeable.

![Liquiline CM42](image)

5.5 **Digital sensor for pH-value, O₂, and conductivity: Memosens**

Memosens, the first digital sensor worldwide, may be precalibrated at the laboratory. An inductive plug-in connection with bidirectional signal and energy transfer ensures perfect transmission of digital signals between sensor and transmitter. The calibration values are stored in the sensor. The inductive plug-in connection is free of metal and excludes all impairments as they might occur in conventional connections which are not without contact:

- Safe, non-contact measurement also in case of humidity
- Process data is stored directly in the sensor
- Measured data cannot be falsified
- Calibration possible at the laboratory
- Significantly shorter downtimes of the measuring point
- Easier installation without special cable
- Predictive diagnostics directly in the sensor system

![Memosens technology](image)
Optimizing further applications

Level and flow measurement at the scrubber

Flue gas is washed in several stages in the scrubber. A non-contact system is recommended to measure the water circulation of the scrubber sump and the ring jet stage since the medium contains acid flue gas components and a dry content of 0.1-2 %. The pH-value of the scrubber sump usually ranges between pH 0.8-1.5. The installation of ultrasonic sensors is recommended with only one cross brace because of this dry content. Internal rubber lining of a steel pipe also has a favorable effect on the strength of the signal if only one cross brace is used > ~70 dB. The response time of this measurement directly influences scrubber protection, i.e. after starting the quench pumps a flow of more than 100 m³/h must be achieved within less than 10 sec. - otherwise the scrubber has to be restarted.

6.1 Prosonic Flow Clamp On 93W – ultrasonic flow meter

Prosonic Flow is an ultrasonic measuring instrument installed directly on pipelines via detecting sensors. The transmitter, which is mounted separately, completes the Prosonic Flow measuring system.

- External installation allowing easy retrofit with no intrusion into the pipe
- Maintenance-free with no moving parts
- No obstructions in the pipeline and no pressure loss
- Economical alternative for large diameters up to 4000 mm
- Portable ultrasonic transmitter for temporary metering
To prevent the flue gases from flowing unwashed through the scrubber, several stages within the scrubber are filled with water and their levels are controlled. The acid stage or sump is located at the scrubber inlet, then up to two packed bed stages follow, in which the flue gas is offered a large quantity of packing material, wetted by scrubbing water. The solids stay on the packing material, are washed out and moved downwards. To scrub the remaining suspended solids, the flue gas must pass spraying nozzles on the ring jet stage for the last time and is subsequently made neutral with a pH-value of 7.1.

To monitor all differential pressures and gas washing levels, remote seal differential pressure transmitters of the FMD78 type with tantalum as wetted parts are used, partly in a redundant fashion.

### 6.2 Deltabar S FMD78

- Very good reproducibility and long-term stability
- High reference accuracy: up to ±0.075 %
- Turn down 100:1, higher upon request
- Applications for flow and differential pressure monitoring up to SIL3, certified by TÜV SÜD according to IEC 61508
- Memory module HistoROM®/M-DAT
- Function controlled from the measuring cell through to electronics
Limit and continuous level measurement in silos

Monitoring of limits and the continuous acquisition of silo levels contribute substantially to the availability and safe operation of thermal power plants. Storage tanks supply pulverized lignite coke and quicklime (Calcium oxide - CaO) for flue gas cleaning in which these substances reduce the flue gas emissions in fabric filters and return flow centrifugal separators. Continuous measurement by Levelflex M and level limit detection by Soliphant M ensure consumption-controlled silo management.

7.1 Soliphant M – vibration limit switch for bulk materials

Soliphant is a rugged, compact level limit switch for silos containing fine-grained or dusty bulk material. It is used as a high or low level indicator in the lime silo.

- Easy commissioning
- Maintenance-free – no moving parts
- Compact design
- Simple and cost effective

7.2 Levelflex M – guided microwave level measurement

Levelflex is a compact radar instrument for continuous measurement, especially for fine-grained bulk material. It measures independently of changing product characteristics.

- Suitable for narrow silos or containers
- Ideal for fine-grained bulk material such as lime, fly ash and pulverized coal
- Maintenance-free – no moving parts
- Double safety due to automatic EOP (end of probe) measurement
Feed hopper control

Continuous feeding of waste material or combustible matter is the main goal of the furnace. In order to prevent a backdraft of flames into the feed hopper, levels are monitored for each grate track. The metering position and speed control the supply of waste material. Usual grate widths range between 1 to 5 tracks, i.e. approx. 5 to 25 m.

If the feed hopper is also monitored by a microwave arranged crosswise, semiautomatic filling is possible via the crane. Plates of oak wood or PTFE molded parts are attached flush to the hopper to protect the sending and receiving units against damage and high temperatures. Particular care has to be taken that the incinerator charge does not jam and block the hopper.

8 Soliwave - microwave barrier, level limit switch for bulk solids

The emitter sends out a microwave signal. The receiver mounted opposite detects this signal and forwards a signal to the rail-mounted switching unit. Alarm and control devices are connected to these relay outputs.

- Easy mounting
- Optional mounting outside the process
  - No temperature influences
  - No abrasion
- Mechanically robust
  - No wear and tear
  - Maintenance-free
  - No mechanical parts
- Easy access to the switching unit due to remote installation
- Emitter-receiver distance 8 m and 20 m selectable
- Accessories available
  - Installation clamp
  - Adapter flange
  - Viewglass fittings

2x Soliwave minimum detection:
Above: Control of semiautomated loading mechanism into the feed hopper
Below: Protection against backdraft

Feed hopper above the water-cooled reciprocating grate.
On the opposite side: Microwave barrier emitter. One feed hopper control system for each reciprocating grate.
Complete supplier

Comprehensive solutions for power plants

The trend of outsourcing of industrial services is evident. Cost and competition pressure continues to increase and requires maximum flexibility. Outsourcing of certain internal services permits power plant operators to concentrate more intensively on their own core competencies.

The know-how of Endress+Hauser makes sure that the productivity and performance of power plant operators increase. The integration of Endress+Hauser offers chances for cost and process optimization well above the average.

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**Project management**

- Project management and building site coordination for field instrumentation projects
- Nationwide coordination of suppliers
- Realization of standardized equipment pools

**Engineering**

- Specification of the complete measuring circle
- Interpretation of measuring points and corrections to conditions (e.g. screen computation)
- Production of technical documentation (hook-ups, electrical connection diagrams, etc.)
Installation

- Assembly of effected pressure pipes, measuring frames and measurement instrumentation
- Building site and assembly monitoring
- Final inspection

Commissioning

- Examination of the mechanical structure
- Examination of electrical connections
- Cold and warm start-up
- Production of the start-up documentation
**W@M – Life cycle management**

Knowledge is a critical factor in the productivity and competitiveness drive. Full knowledge of your plant status allows for good maintenance planning. W@M – Life Cycle Management from Endress+Hauser provides up-to-date and complete information on all of your assets, including products from other suppliers. From engineering, procurement and commissioning through to operation, maintenance and the replacement of individual components, W@M is an open and flexible information platform with on-site tools and services supporting you throughout your plant’s life cycle.

Use W@M as a stand-alone solution or it can support your existing systems like Enterprise Resource Planning (ERP) systems or Computerized Maintenance Management Systems (CMMS) using open and flexible interfaces. At any time of the life cycle, W@M provides you with updated knowledge and guarantees time and cost savings while contributing to your competitive edge through constant planning reliability.

**Engineering**
- Fast and safe selection and sizing of the correct measuring instrument for your application
- Documentation and administration of projects

**Procurement**
- Reduction of procurement costs
- Optimization of the quality and speed of your procurement processes
- Your price and delivery data is always available on-line

**Installation**
- Product documentation is available in different languages
- Software versions are always up-to-date

**Commissioning**
- Simplified remote commissioning
- Increased safety of your personnel
- Elimination of time consuming testing

**Operations**
- Up-to-date information: 365 days a year/24 hours a day
- Effective service, maintenance and optimization of your installed base
- Constant planning reliability

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**Applicator – engineering with answers**

There are many challenges in plant engineering. You must keep track of things during the planning process and harmonize application and instrumentation to arrive at safe decisions. Applicator from Endress+Hauser is a comfortable selection and dimensioning software to simplify your engineering processes. Applicator provides clear process guidance and a straightforward module structure:

- **Selection** – determine the suitable measuring system for the application. Product areas include level, flow, density, pressure, analysis, temperature, registrations and system components
- **Sizing** – choose the correct dimensioning for the measuring device
- **Administration** – manage the project with a database to save your selection and dimensioning results and reproduce them, if required.
FieldCare – Plant Asset Management

FieldCare is the Plant Asset Management Tool of Endress+Hauser based on the Field Device Tool (FDT). It can configure all intelligent field devices at your plant and supports you in managing them. By using status information, it also provides a simple but effective instrumentation check.

- Supports Ethernet, HART®, PROFIBUS®, FOUNDATION™ Fieldbus, etc.
- Operates all Endress+Hauser devices
- Integrates third-party devices such as actuators, I/O systems and sensors supporting the FDT standard
- Ensures full functionality for all devices with Device Type Managers (DTM)
- Offers generic profile operation for any third-party Fieldbus device that does not have a vendor DTM

FieldCare manages device life-cycle information and presents it quickly and clearly to the user.

System Integration – from individual sensor through to complete solutions

With the introduction of communication technologies such as HART®, PROFIBUS® and FOUNDATION™ Fieldbus a little more than ten years ago, the barriers between field instrumentation and the systems level began to disappear. The instruments became more intelligent and an integral part of the automation architecture. Having recognized this development at an early stage, Endress+Hauser has been actively involved in standardization committees and user organizations from the introduction of fieldbus technology in order to ensure that our customers do not lose touch with new trends.

A fieldbus output is both an interface to the field instrument and a carrier of additional information from the field. Instrument status, maintenance and diagnostic information from the process to the control room increases plant availability.
Our sales and service network guarantees qualified support

Short notice support, fast spare part delivery or competent help in start-up – more than 40 sales and service units guarantee that users can rely on the same high Endress+Hauser standards all over the world.

In short: wherever our customers have their locations, Endress+Hauser is close by. Thus, users can rely on finding a service partner in their vicinity who speaks the local language and at the same time has the complete know-how of Endress+Hauser at its disposal.

With numerous service training programs Endress+Hauser continuously safeguards the high competence of its associates and always provides them with the latest technical standards in all developments connected with process automation.

Additional documentation

Fossil Fuel Power Plants
Full range of measurement instrumentation and solutions
SO601B/27/en

www.endress.com/service