



## Full Steam Ahead!

**Location:**

Krefeld, Germany

**Segment:**

MOEM

**Problem:**

Supplying the steam on demand and energy efficiently.

**Solution:**

HMI/PLC XV102, PKZ motor starter combinations with SmartWire-DT, easySafety control relay, FAZ miniature circuit-breaker

**Results:**

The customer doesn't fix himself to a particular version when ordering, but has a system that is future-proof, since SmartWire-DT also allows for "gap programming".

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*Safety has top priority with our steam generators. We only use standards compliant and tested components. Eaton control components meet all these requirements*

*Alfred Thomas, Certuss Dampfautomaten*

**Background**

There are several production processes that require the provision of steam, either continuously, seasonally or on demand. This ranges from the sterilization or cleaning of tanks such as in large-scale catering kitchens and hospitals, right through to food processing plants or concrete works. Steam is likewise used for the heating of greenhouse floors, as well as grass pitches in football stadiums or even for de-icing mooring ropes in the Arctic.

**Challenges**

The Krefeld company Certuss Dampfautomaten GmbH & Co. KG has been developing steam generators for over 50 years and uses Eaton automation technology with SmartWire-DT for the control system. Depending on the primary energy used, automatic steam generators are fired with oil, gas, electricity or with the combined oil/gas burners. Gas and oil-fired steam generators are "forced-flow once-through" boilers that are also called high-speed steam generators, since

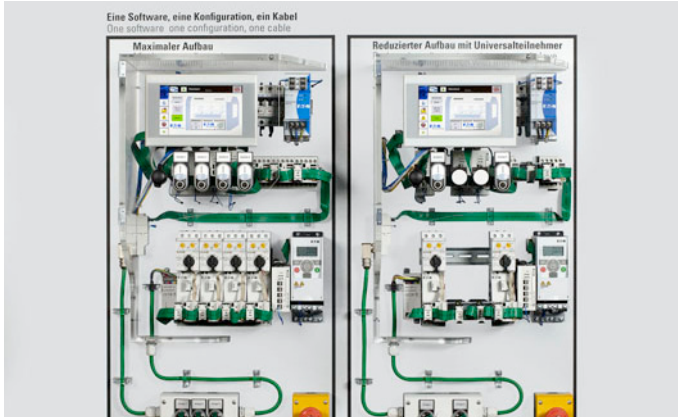
they can supply steam within five minutes. Certuss builds around 350 units a year in different performance classes and sells them around the world.

When the high-speed steam generator is started, water is first of all pumped into the heating system. As soon as the set flow rate is reached, the firing is activated. The steam production is then activated according to the temperature measured. The boiler then runs up to the set pressure which can be selected as required. Previously, steam generators, particularly shell boilers, required a two-stage circuit for 50 and 100 percent. Today, Certuss produces high-speed steam generators that generate steam from the first stage, modulating from 50 to 100 percent. This virtually eliminates the need for a steam accumulator even though a permanently uniform steam supply is still ensured. In this way, precise quantities of energy can be produced that are then also taken on demand.



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Same software – different hardware – "gap programming with SmartWire-DT"

## Solution

For the electrical equipment of the steam generators, Certuss chose an Eaton XV102 touch display PLC with a 7 inch wide screen, a CANopen and a SmartWire-DT interface. The touch display enables the individual elements such as pumps, blowers, fans, or additional heaters to be accessed directly. All additional parts can be configured. The pumps are actuated via PKZ motor starter combinations that are connected to SmartWire-DT. A special advantage of SmartWire-DT is the facility for system-integrated slave diagnostics: Faults are indicated in the display in plain text in 15 languages – thus enabling them to be localized and rectified quickly.

An HMI/PLC controls the complete system, and the Galileo visualization software, as well as the CoDeSys

programming system, is also implemented. For Certuss customers, this makes all the closed-loop and open-loop control functions much simpler since they only have to access one unit.

In future, Certuss steam generators will also be fitted with remote access, either via Ethernet, Profibus or DSL or GSM modules, as required by the customer. The entire plant can be started or disabled via an SMS server. Several authorization levels are provided to prevent unauthorized access. In this way, an operator with the lowest authorization level is only allowed, for example, to switch the boiler on or off, and if required by sending an SMS activation request to the technical or production manager. The process is also graphically displayed so that the user is shown via a graphic which

valves are to be operated and when. Although the plant is fully automated, it must be initialized for safety reasons.

All operating hours and error messages are stored with date and time. This enables the easy tracing of the power values of a boiler or how often it was switched on or off manually.

To comply with the latest requirements of the Machinery Directive, Eaton's easySafety assigns all pressure and temperature monitoring circuits individually to one input. The benefit of easySafety is the simple installation: A safety signal indicates whether wiring faults or cable breaks are present.

With its new system generation, Certuss places particular importance on the problem-free integration in any (building) control system. Plants can be connected remotely via a bus system – also over large distances. This simplifies the load reduction of a boiler in the event of a fault or supports the demand for steam with an additional boiler. A loop system, such as via Ethernet, can then be used in large plants to distribute the required steam between the boilers.

Certuss plants also provide a great deal of flexibility for the control cabinet design: The standard type is a control cabinet for gas, from which either an oil or a gas-oil combination switch can be produced with a minor modification in the controller. These options are provided for in the circuit diagrams, and the same applies to the software. The customer doesn't fix himself to a particular version when ordering, but has a system that is future-proof. Certuss deals with its circuit diagrams in the same way – at a test authority like TÜV Köln, for example, only one circuit diagram has to be approved, which then covers all plant variants. As SmartWire-DT now supports this modular approach without any problem, Certuss placed the order for it since SmartWire-DT also allows for "gap programming".

A universally designed SmartWire-DT slave in the

RMQ housing is thus able to accommodate the requirements of the OEMs: These companies prefer to use only one PLC program for the maximum configuration of a machine/plant and for all its variants. The universal modules allow a full expansion to be designed and programmed in the PLC configuration and in the user program of the PLC. The hardware required for expansions does not yet have to be physically present. By exchanging the universal slave with the actually designed device, plant sections can be integrated flexibly at any time later, without having to change the program or the hardware configuration, for which only one SmartWire-DT cable is required.

## Results

Alfred Thomas, head of the development department at Certuss Dampfautomaten GmbH & Co. KG sums up as follows: "Safety has top priority with our steam generators. We only use EN/IEC standards compliant and tested components. UL and CSA approvals are also important for applications in North America / Canada, as well as GOST-R approvals for Russia. Eaton control components meet all these requirements."