

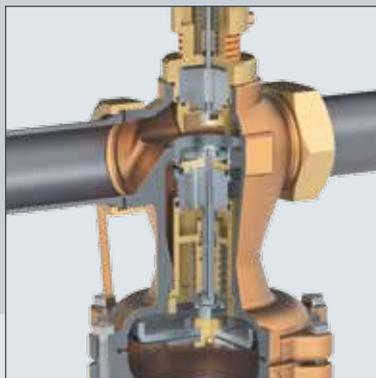
SAMSON

SAMSON



District Heating and Cooling Applications

References, Technology, Communication



BENEFIT FROM OUR EXPERTISE

An essential contribution to climate protection and the sustainable use of resources is made by exploiting the potential of cogeneration, i.e. using the waste heat produced during electricity generation. While geothermal and solar thermal systems as well as industrial waste heat feed more and more heat into district heating networks, ambient air cooling or absorption plants that convert heat into cold generate environmentally friendly cooling. The supply of district heating is scheduled for considerable expansion to achieve the climate protection objectives set for 2020 by the EU.

The requirements placed on components designed for use in district heating and cooling are: reliable operation over many years, an excellent control performance, and convenient operation. By relying on the extensive expertise and input from our R&D, production, and sales staff, we have been able to develop products perfectly tailored to the requirements of the markets.

SAMSON is the right partner for you in district heating and cooling applications to supply environmentally friendly energy to the world of tomorrow. We contributed actively to the development of the first district heating networks established at the beginning of the 20th century with our self-operated regulators. Since then, we have played a decisive role in defining the state of the art by cooperating closely with national and interna-

tional district heating and cooling suppliers and substation manufacturers as well as by participating actively in associations and organizations.

Our long-standing involvement in district heating and cooling allowed us to gain the necessary expertise for offering our customers the best-possible solution for their specific control task.





Innovative solutions for the low-noise throttling of liquids, gases, and steam and the exact pressure balancing across the entire travel range under all operating conditions ensure the unsurpassed control performance of our SAMSON self-operated regulators and the exceptional properties of the control valves designed for use in local heat supply, district heating, and district cooling.

Comprehensive testing (e.g. for electromagnetic compatibility) and the close cooperation between R&D, production, and our customers ensure the reliability, safety, and durability of our SAMSON products and components.

To meet the high quality level we strive to achieve, the proper functioning of our self-operated regulators is tested to check their steady-state and dynamic performances. In addition, the seamless interaction of all instruments and controls within a district heating house substation can be tested under realistic conditions on a high-performance test bench.



GLOBAL PRESENCE

SAMSON is one of the world's leading manufacturers of products used to control local heat supply, district heating, and district cooling systems. With over 50 largely independent subsidiaries and more than 220 representatives or engineering and sales offices, SAMSON is on hand to provide local customer service all over the world.

Every year, we manufacture tens of thousands of electric control valves, controllers, and self-operated regulators for the district heating and cooling markets. On top of that, we supply system components and a large number of electronic units for HVAC applications. As all our processes are subjected to a quality inspection according to ISO 9001 and thanks to comprehensive functional tests before delivery, we can ensure that our products work reliably in your systems.

With over 50 subsidiaries, our customers all across the world can rest assured that regional specifics are taken into account, that our high quality standards remain unchanged, that our local representatives find the right solution for any specific application, and that we provide extensive after-sales services.



REFERENCE APPLICATIONS IN DISTRICT HEATING

SAMSON possesses the know-how and products required for providing the perfect control solution for all district heating applications. Reliability and cost-effectiveness are typical traits of our wide range of regulators for differential pressure, flow, or a combination of both.



District heating plants where SAMSON products are installed:

Germany

Aachen · Berlin · Chemnitz · Dresden · Essen · Frankfurt · Gelsenkirchen
Hamburg · Ingolstadt · Jena · Kiel · Cologne · Krefeld · Leipzig · Munich
Nuremberg · Offenbach · Potsdam · Rostock · Stuttgart · Trier · Ulm
Würzburg · Zwickau

Worldwide

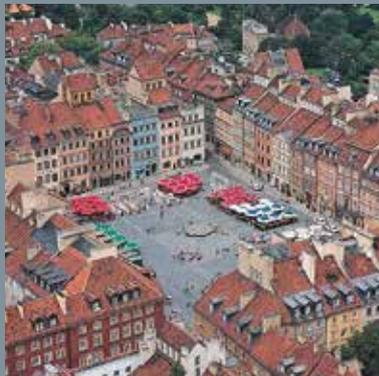
Amsterdam, the Netherlands · Belgrade, Serbia · Brescia, Italy · Budapest,
Hungary · Gdansk, Poland · Copenhagen, Denmark · Linz, Austria · London,
UK · Nottingham, UK · Paris, France · Beijing, China · Seoul, South Korea
Toblach, Italy · Warsaw, Poland · Vienna, Austria · Zurich, Switzerland





Berlin, Germany

Around 30 % of all residential buildings in the German capital are supplied with heat through Western Europe's largest district heating network. SAMSON's district heating products have been a part of this network right from the beginning. For over three decades, the Type 44-3 Safety Shut-off Valve has been used as a pressure reducing valve in directly connected house substations. The valve maintains the adjusted pressure constant within a small permissible pressure range at low noise emissions and also acts as a safety valve.



Warsaw, Poland

SAMSON's combined regulators for differential pressure and flow are also used in big Eastern European cities, e.g. in Poland's capital, Warsaw. Several thousand regulators of the Type 47-1 with threaded end connections and Type 42-39 with flanged end connections are installed in Warsaw's district heating network. At peak load, the regulators restrict the flow rates at the consumer substations. At partial and low loads, they keep the differential pressure across the temperature control valves at a constant value, thus ensuring an optimal distribution of the network capacity.



Beijing, China

The Type 42-36 E Combined Self-operated Regulator for Flow Rate with additional electric actuator is used extensively in China's capital, Beijing. Several thousands of these multitalented regulators have been fulfilling their duty also in the Forbidden City, the former imperial palace. In combination with a customized system design for heating control, the SAMSON components work exactly according to the customer's specifications.

REFERENCE APPLICATIONS IN DISTRICT COOLING

District cooling ensures efficient energy use and low-cost air-conditioning. SAMSON regulators for differential pressure, flow or a combination of both ensure proper control.



District cooling plants where SAMSON products are installed:

Germany

Aachen · Berlin · Chemnitz · Düsseldorf · Frankfurt · Gera · Hamburg · Munich
Würth

Worldwide

Barcelona, Spain · Dhahran, Saudi Arabia · Dubai, UAE · Doha, Qatar
Hong Kong, China · Kuala Lumpur, Malaysia · London, UK · Madrid, Spain
Mecca, Saudi Arabia · Oman, Oman · Paris, France · Singapore · Tokyo,
Japan · Taipei City, Taiwan · Yokohama, Japan





Dubai

Dubai's Mall of the Emirates is a true architectural gem and figures among the world's largest shopping centers. The mall also houses an enormous indoor skiing resort, Ski Dubai. This is where 13 pilot-operated Type 2334 Differential Pressure Regulators are installed to limit the flow of the cold water supply. Regulators in sizes DN 250 to 400 are installed. One of their major tasks is to ensure that a minimum temperature is maintained under all circumstances.



London, UK

During the 2012 Summer Olympics celebrated in London, the 246 ha Olympic Park constructed in Stratford served as the temporary home for approx. 40,000 athletes, officials, and journalists. Numerous sporting venues, facilities, and residential blocks were built on site. London's goal was to host the most sustainable Olympic Games ever. To achieve this goal, two new combined heat and power (CHP) plants were erected to cogenerate electricity, heat and cold. Focus was placed on ensuring reliability in operation and supply. SAMSON products were installed as well, e.g. Type 3214 Valves in the heating and cooling systems with Type 3374 Electric Actuators and Type 3274 Electrohydraulic Actuators.



Lusail Smart City

Lusail Smart City is being built in Qatar. 19 districts distributed over an area of 38 km² will encompass a wide variety of facilities including a stadium where the 2022 FIFA World Cup is to be played. The city has been designed for a total capacity of 450,000 (including 200,000 residents, 170,000 jobs, and 80,000 visitors). With our Type 42-36 E Valves fitted with Type 3374 Electric Actuators designed for energy-saving networks, we provide the best control solution for the smart cooling systems, which allows for a fast response to the cooling demand of the network.

SELF-OPERATED REGULATOR TECHNOLOGY

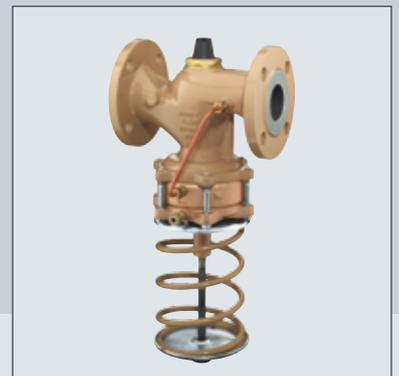
Self-operated regulators by SAMSON have been used in district heating systems for many years. Their tasks include controlling, monitoring, or limiting variable parameters as well as compensating fluctuations in network pressure or differential pressure that occur in transfer stations. All in all, the regulators ensure the safe operation of district heating and cooling networks.



The principle of operation employed by self-operated regulators is both simple and effective. They do not need any additional energy supply as they draw the required actuating force from the process medium they control. The pressure to be controlled is routed onto an actuator diaphragm through a control line. In pressure-balanced regulators, only the force of the set point spring opposes the actuating force. Any change to this balance

of forces causes the valve plug to move. Self-operated regulators, which are easy to install and configure, fulfil the tasks you set them reliably, yet they require little maintenance. Install them, adjust the set point, and they are ready to work. These regulators are a cost-effective solution for handling control tasks with a fixed set point and permissible tolerance band. Sometimes less is more.

SAMSON has a full range of self-operated regulators for regulating the flow rate, pressure, and differential pressure in water and steam networks. Flow regulators combined with an electric actuator ensure an excellent control response of the control valve regardless of the differential pressure. Our portfolio also includes pilot-operated regulators up to DN 400, and combined regulators (valves with monitoring and limiting functions).





Self-operated regulators with threaded or flanged bodies are available in all common materials.

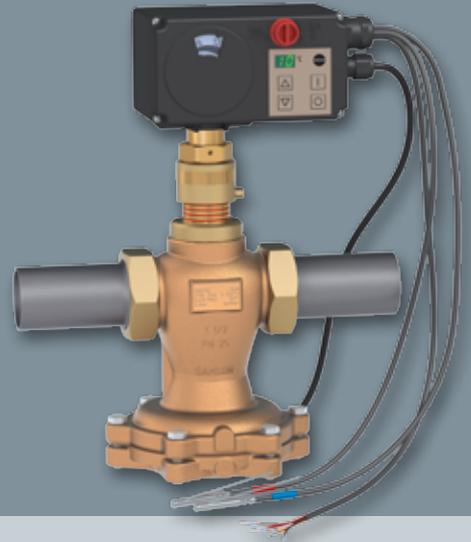
At SAMSON, you will find the right equipment for your specific controlled system, for example:

- Temperature regulators
- Pressure reducing valves
- Excess pressure valves
- Differential pressure regulators
- Combined regulators, e.g. differential pressure and temperature regulators with flow limitation



ELECTRIC CONTROL

Whether it's a globe and three-way valve with electric actuator or electric actuator with process controller, we offer proven, cost-effective solutions for any application.



It is taken for granted that hot water at a constant temperature is available at all tapping points in a house.

This level of comfort can be achieved at a low price thanks to SAMSON's temperature control for domestic hot water in instantaneous heating systems, which relies on the TROVIS 5757, TROVIS 5724, and TROVIS 5725 Electric Actuators with Process Controller.

The combination is especially designed for small to medium-sized residential buildings connected to a local or district heating network. The DHW temperature is controlled almost without delay to reach the desired value thanks to the quick-response Pt 1000 sen-

sor, the actuator's short transit time, and tapping detection using a water flow sensor. The function to maintain the water temperature in the heat exchanger at a constant temperature ensures that hot water is always available during a certain period. For thermal disinfection, a binary input can be used to switch between two set points.

With a memory pen, settings and configurations can be easily copied to many devices.

The TROVIS 5724-8 Electric Actuator with Process Controller with ready-wired temperature sensors and integrated Bluetooth® module fulfils various control tasks, such as flow temperature control depending on the outdoor temperature for

district heating transfer stations or override control for district cooling transfer stations.

The proven TROVIS-VIEW software, which comes with a variety of ready-configured systems for heating or cooling applications, is used to configure the actuator. The compact solution for heating and cooling tasks in district heating and cooling substations combines the mechanical differential pressure regulator, which includes an additional electric actuator and an electric actuator with process controller.



The Series N control valves with a force-locking actuator connection are tailor-made for controlling local heat networks and house substations.

Electric control valves in the control loop ensure that the temperature is always right. The various valves available have optimal characteristics for a stable control response and shut off tightly in the long run. Valves balanced by a bellows,

piston, or diaphragm can be combined with relatively small, cost-effective actuators as no additional forces are created by the pressure drop across the valve, which would affect the valve position.

With indirect district heating connection, combining an electric control valve with a flow regulator (e.g. in Type 2488/5825) helps cut costs while achieving accurate control of the adjusted maximum

flow rate, having good rangeability, and the control response being independent of the differential pressure in the district heating network.

SAMSON offers a whole range of electric actuators for valves in sizes up to DN 400 – with and without fail-safe action.



COMMUNICATION AT A COMPETITIVE PRICE

Our TROVIS 5500 Automation System shows you how to use energy intelligently with our standard TROVIS 5573 and TROVIS 5578 Heating and District Heating Controllers integrated into the automation system that meets your demands.



The TROVIS 5573 and TROVIS 5578 Heating and District Heating Controllers are characterized by their high performance, versatility, and convenient operation. They are delivered ready-to-use thanks to integrated control algorithms. No programming skills are required.

The controllers are adapted to the specific control tasks by selecting the desired plant scheme via the associated system code number. Specialists can access additional configuration and parameter levels by entering a key code.

The rotary switches make direct access to the operating modes and essential parameters of the different control circuits really easy.

The cost-effective TROVIS 5573-0 Heating Controller with icon display is designed for use with a maximum of two control valves. If required, communication is enabled by adding external modules. With the optional meter bus to Modbus gateway, up to six meter bus units can be connected.



Convenient operation

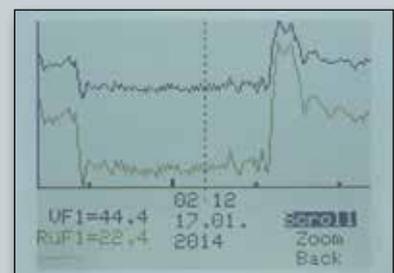
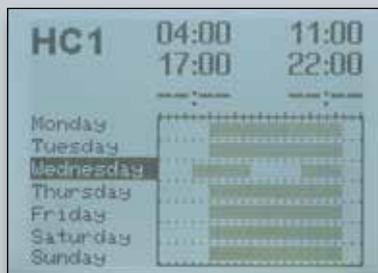
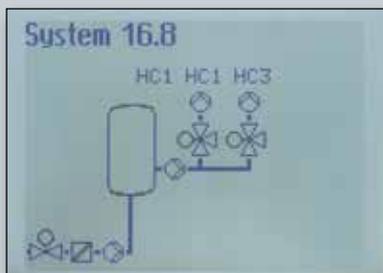
TROVIS 5573-1 has the same functions as TROVIS 5573-0 but comes with a convenient graphics display. Additionally, up to three meter bus units can be connected. Intuitive menus and plain text displays in various languages are further features of the controller. All available plant schemes are shown on the

display, which means that no instructions are needed for selection.

As a special feature, trend graphs of relevant temperatures are shown on the graphics display. You can move along the graphs using the rotary pushbutton to look up the associated values and states. Maximum transparency is

granted on the customer level, e.g. when viewing the weekly usage schedule.

If two control circuits are not enough, the TROVIS 5578 with three control circuits and graphics display is the right choice for you.



TROVIS TIE|AIM PORTAL

TROVIS TIE|AIM PORTAL is the new SAMSON web site for TROVIS 5500 Heating and District Heating Controllers.



Web interface and wizards

In addition to remote visualization of controller data, various management tools and wizards support you during your daily work.

Heat meters

Heat meters can be directly connected to controllers or gateways over a meter bus and indicated separately on the web site. As a result, consumption data can be displayed and reports created.

Historical data logging

Key data can be logged, sorted by date, and exported for further processing.

Alarm notification

Operators are notified by e-mail when a malfunction occurs in the system. After an initial fault analysis and possibly changeover to manual mode, concise instructions can be passed on to qualified personnel to enable them to find the problem quickly.

Data security

Data security has top priority. Our servers located in Germany have extensive access protection and strong data security to safeguard data against hacking, theft, or manipulation.



Remote maintenance

Remote maintenance does not just involve supporting our customers with informative plant schemes. It also allows the remote operation of controllers in the manual mode, for example to change time schedules or load and save controller configurations. Naturally, all these topics are explained in the associated documentation.

Accessibility

The web site can be accessed from anywhere at any time by computer, smartphone, or tablet computer. No special app is needed. A conventional web browser is all it takes, regardless of the operating system.



TROVIS TIE/AM PORTAL

The accessibility of house substations equipped with SAMSON heating and district heating controllers takes on a whole new dimension.



Worldwide access

TROVIS TIE/AM PORTAL enables access to controllers, heat meters, and electric actuators with process controller over the Internet within minutes.

Ways of communication

Various modules to upgrade communication are available:

- **Conventional telephone network**
(DSL, landline connection)
- **Mobile phone network**
(e.g. smartphones)
- **Meshed wireless networks**
(SAM-LAN)





Conventional telephone network

There is no configuration work involved when the TIEI/AM Portal is used to access TROVIS controllers over the SAMSON TCP gateway, which uses a router for connection to the Internet. This solution is ideal for single-family dwellings or properties that already have an Internet connection.

Mobile phone network

Regardless of the service provider or contract, SAMSON's GPRS gateway allows the controllers to be connected to the TIEI/AM Portal over the mobile phone network without the need for an additional router. This is particularly useful for systems and stations in remote areas or that do not have an Internet connection.

Meshed wireless networks

A SAM-LAN wireless network consists of TROVIS controllers that have been interconnected using SAMSON RF gateways. One of the RF gateways within the network serves as the access point to connect the SAM-LAN network to the TIEI/AM Portal over the Internet. This kind of stand-alone solution to connect TROVIS controllers and/or utility meters in urban and rural areas is rugged, reliable, and exceptionally cost effective.



SMART LOCAL HEATING

Looking for a turnkey solution for automating your local heating application? TROVIS Heating Network 60 is the all-in-one solution for local heat networks, such as biogas plants, combined heat and power plants, and house substations. It combines proven heating controllers with state-of-the-art DDC technology.



Simple configuration

Fundamental control tasks are ready-configured in the software for the operator to activate as required. Specific customer requirements are integrated on request at no extra charge.

Integrated boiler house automation

Standard functions include network control, heat generation and meter management as well as fault monitoring.

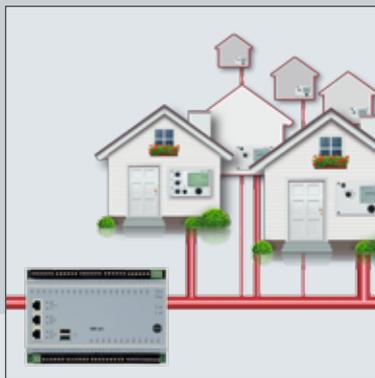


Connection

60 house substations without boiler house automation or 48 house substations with integrated boiler house automation can be connected without any programming.

Communication paths

The connected heating controllers can communicate using copper lines, optical fibers, or wireless networks.



Web interface

Customer data are entered and managed in ready-made interfaces. For example, the customer's name or address can be entered as plain text.

Meter management

The logged amounts of heat transmitted over the meter bus can be exported as CSV files and imported into billing systems. Ready-made forms are available to create the files.





Graphic plant schemes

The web visualization is generated automatically based on the selected system. Sensor values, set points, parameters, and consumption are indicated. You can be notified by e-mail, e.g. in the event of a collective error.

Manual operation

Using the web interface, set points can be adjusted, pumps can be switched, and control valves can be opened or closed.

On-site and remote access

Network operators can access and adapt the heat distribution from any computer using a password-protected Internet connection.

Mobile access

Apps are available for Android and iOS that enable access to the heat distribution using smartphones or other mobile devices.

Flexibility

TROVIS Heating Network 60 (THN 60) is the ideal solution for small local heat supply systems with up to 60 consumers. Larger networks can conveniently be automated by combining several THN 60 systems.

Accumulated heat metering

Heat meter readings are saved per year, month, or hour in CSV format, which allows them to be opened and edited in all commonly available billing and spreadsheet programs.

Reliable operation

The integrated e-mail client quickly and reliably alerts plant operators in case a collective error exists.

TROVIS HEATING NETWORK XL: VISUALIZATION

TROVIS Heating Network XL (THN XL) is the right choice as a powerful visualization and management software for users who need to monitor large-scale local or district heating networks.



Everything on board

Users can select descriptive plant graphics from a library to visualize SAMSON heating controllers in a few steps.

Easy start-up

Step 1: Connect the controllers in the house substations to the THN XL network.

Step 2: Enter customer data in the SAMSON database front end. THN XL does the rest automatically.

Based on the system code number set in the heating controller (on-site hydraulic situation), the correct visualization is automatically set up and key plant data are immediately displayed.

Extendable at any time

The automation of the heat generation system (boiler house) can be optionally included in the plant visualization. However, visualization is just one of the strengths of THN XL. All key plant data are also saved.

Data are not lost

All data that are essential for operators (such as heat consumption, meter readings, etc.), are saved once a day in an SQL database. Conclusive reports can be generated based on these data and printed out or sent by e-mail.

Stay informed

Operators of large-scale plants need all information on the entire plant available at a glance. Malfunctions in the plants are immediately indicated in the overview graphics. Various sorting options (by customer name, street name, etc.) make it easier to find certain units in the system.



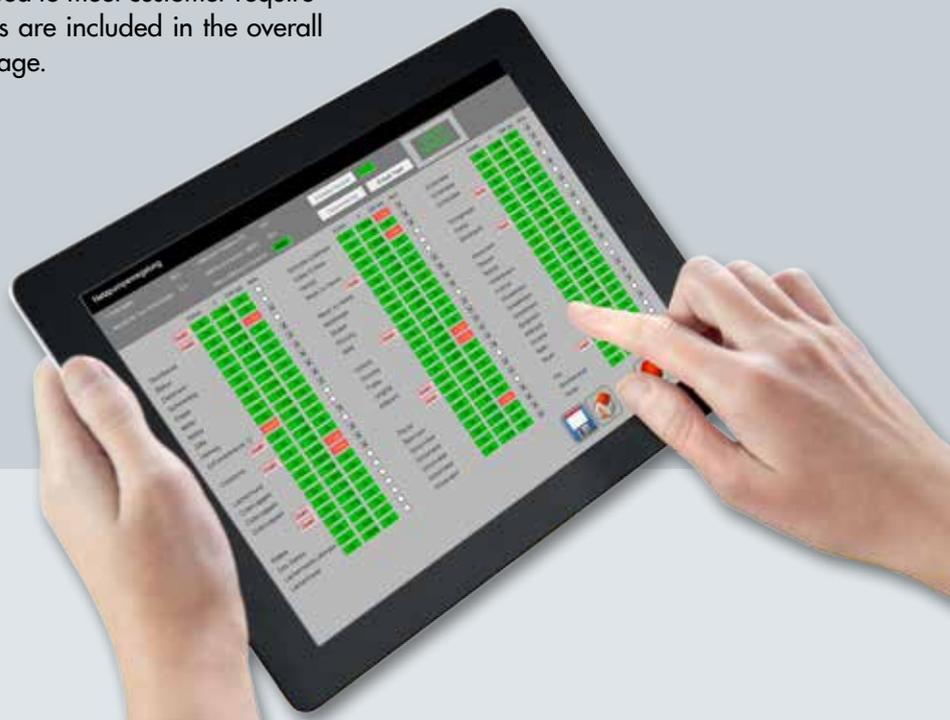
Data analysis

Relevant temperatures that have been logged are displayed in clear trend charts for simple analysis. Various functions, such as the exact starting times, zooming, reference lines to monitor temperatures at a certain time, overview images with information on valve positions, primary temperatures (spreading), and heat meter data, support users in making the right decisions.

Keeping pace with the times

The challenges our customers set help us grow. THN XL already is a comprehensive package with a multitude of helpful tools designed for large-scale district heating systems. Yet we continue to develop it further. New ideas specially developed to meet customer requirements are included in the overall package.

THN XL also offers solutions for modern visualization of district heating systems, for example to manage network pumps and peak load boilers as well as flow limitation of all house substations in a single branch.



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● Production sites ● Subsidiaries

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