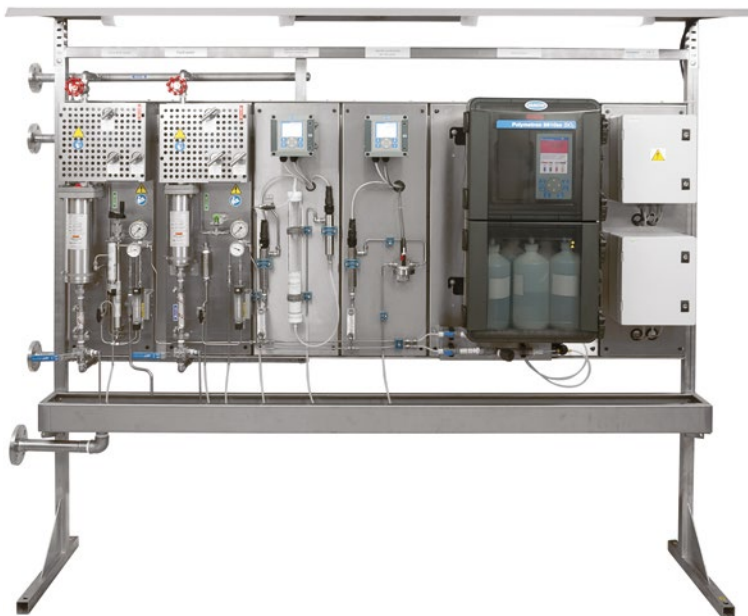


# SWAS

## Steam & Water Analysis System

Modular sampling and physico-chemical monitoring  
of steam and water cycles



# Application

Steam and Water Analysis System (SWAS) from Hach® is a ready-to-use system for sampling and online monitoring of steam and water parameters in heat and power plants, incinerators, and other industrial facilities. It provides precise, real-time knowledge about process status, and can be implemented in both automatic process control and security systems.

During the industrial steam cycle samples are usually extremely hot and under high pressure, and must be cooled and depressurised prior to online analysis or laboratory use. Fixed and correct flow-rate must also be set in order to guarantee accurate, repeatable data.

**SWAS makes it simple: install, connect the sample and cooling water, and start!**

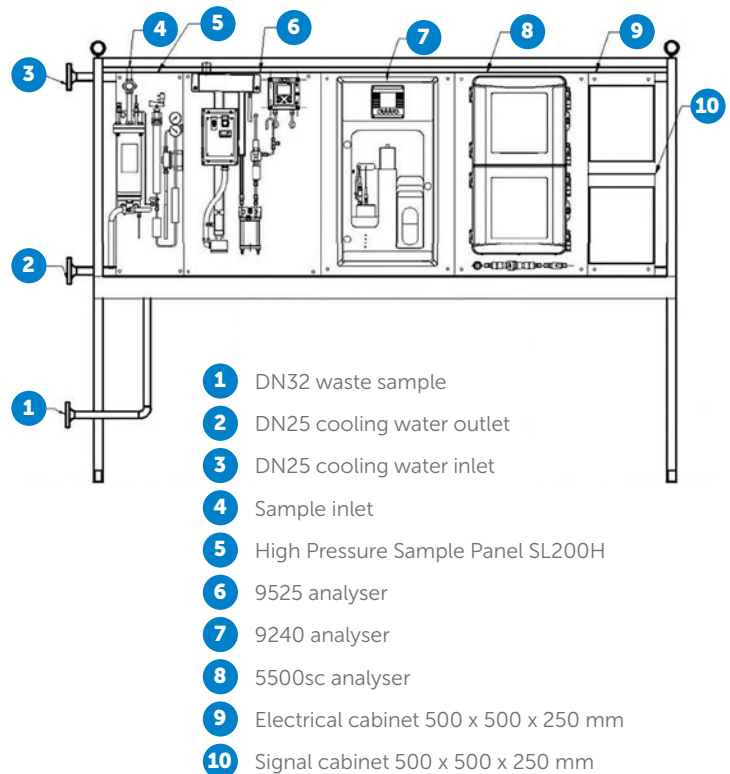
## The right solution for your application

### Standardised Steam Panels

SWAS standardised steam panel solutions have been optimised for simple configuration in order to minimize engineering time.

To configure a custom panel for your application, a Hach specialist will need to know the following parameters:

- sample pressure
- sample temperature
- cooling water type  
(*surface, potable, softened, DEMI, other*)
- cooling water parameters  
(*maximum temperature and pressure, chlorides concentration, turbidity, pH, conductivity*)



# SWAS Specification

## Features

The standard SWAS is best-suited for low parameters (< 70 bar / 380°C).

A version for high parameters (< 345 bar / 540 °C) is available.

- sample pressure up to 365 bar on request
- temperature up to 621 °C on request
- compact, efficient cooler (minimises cooling water needs)
- adjustable and clean-in-place VREL® pressure reducer for pressures > 70 bar
- thermal shut-off valve (TSV) to protect personnel and equipment
- back pressure regulator / relief valve (BPRV) to secure representative sample
- grab sample for laboratories
- self-standing rack mount, ready for operation
- heat protection grid and safety labels for operator protection

## Requirements for cooling water

- Water after treatment (at least of decarbonised water after filters) preferred
- pressure: 3 to 6 bar
- temperature: up to 40 °C (pressure drop downstream of cooler: 0.3 to 0.7 bar)
- turbidity: below 50 NTU
- pH: 7 to 12
- conductivity: <100 uS
- chlorides concentration:
  - < 250 ppm for sample temperature 25 - 180 °C
  - < 100 ppm for sample temperature 180 - 290 °C
  - < 25 ppm for sample temperature 290 - 550 °C (for higher concentration Inconel coolers have to be used)
- cooling water demand (depends on sample temperature and number of analysers connected):
  - For mid-range cooler:* 0.2 to 1.2 m<sup>3</sup>/h for water and to 1.6 m<sup>3</sup>/h for steam
  - For high output cooler:* 0.2 to 2.7 m<sup>3</sup>/h for water and steam

If cooling water with the above parameters is not available, we can deliver a cooling water close circuit (e.g. Cooling Water Isolation Skid or chiller).

### Cooled sample flow demand for analysers:

- 200 mL/min for conductivity,
- 100 mL/min for pH, O<sub>2</sub> and Na<sup>+</sup>,
- 150 mL/min for SiO<sub>2</sub> and for PO<sub>4</sub>,
- 350 mL/min for grab sample (additional to above selected flow)



## Customised sampling station

Let our specialists prepare sampling systems to your specifications, including features such as:

- chiller for cooling water to maintain sample temperature at 25 °C
- complete pre-piped and pre-wired analytical shelter (with samplers, analysers, power and signal distribution)
- design and quality documentation
- factory acceptance test (FAT)

## Key online analysers



### Analyser 5500sc Silica and Phosphate

Lower maintenance, less downtime. No pumps requiring maintenance: The industry's only pressurised reagent delivery system!

- 90 days of continuous runtime
- Low maintenance
- Reduced downtime
- Clean, fast and easy reagent change
- Easily verified with our lab products; no time wasted second-guessing
- Online silica analyser for identification of  $\text{SiO}_2$ , 0.5 - 5000 ppb.



### Analyser 924X – Na<sup>+</sup>

Trust your data and save time with the POLYMETRON 9240 multi-channel or POLYMETRON 9245 single-channel sodium analysers.

- Automatic electrode reactivation for optimum operation and response time behavior
- Easy to install, operate, calibrate and maintain
- Can be adapted to a variety of different conditions
- Lower detection limit of 0.01 ppb
- Online Sodium analyser for low range and high ranges (0 to 10,000 ppb, freely programmable, 0 to 200 ppm with Cation Kit option)



### Analyser K1100 – O<sub>2</sub>

Fast response and only one calibration per year.

- High accuracy in ppb range
- Minimal maintenance thanks to optical technology, eliminating the need for membrane and electrolyte
- Multi- or single-channel versions available



### Standardised Hach sc controller

Repeatable, accurate measurements of:

- Specific conductivity
- Cationic conductivity
- Degassed cationic conductivity
- Real pH
- Calculated pH
- Redox

# The water analysis experts for steam generation in power plants and industries

With more than 60 years as the leading expert in water quality analysis, you can trust Hach's knowledgeable and responsive support team to address your unique needs for water and steam applications throughout your entire process.

Hach provides laboratory, online, portable, and service solutions for routine and challenging power plant applications. Hach has the most comprehensive coverage of ultrapure, pure, and non-pure water parameters and the breadth of product solutions to support fossil power plants, nuclear power plants, cogeneration, and heat & steam production in the industry.



## Service solutions

Hach ServicePlus® Programs have been developed to help solve your maintenance and support problems. Whether it's a lack of resources or skills, an instrument that is down, compliance concerns or the need for a predictable budget, we have programs to fit the unique challenges you face in your organisation.



## Comprehensive water analysis solutions

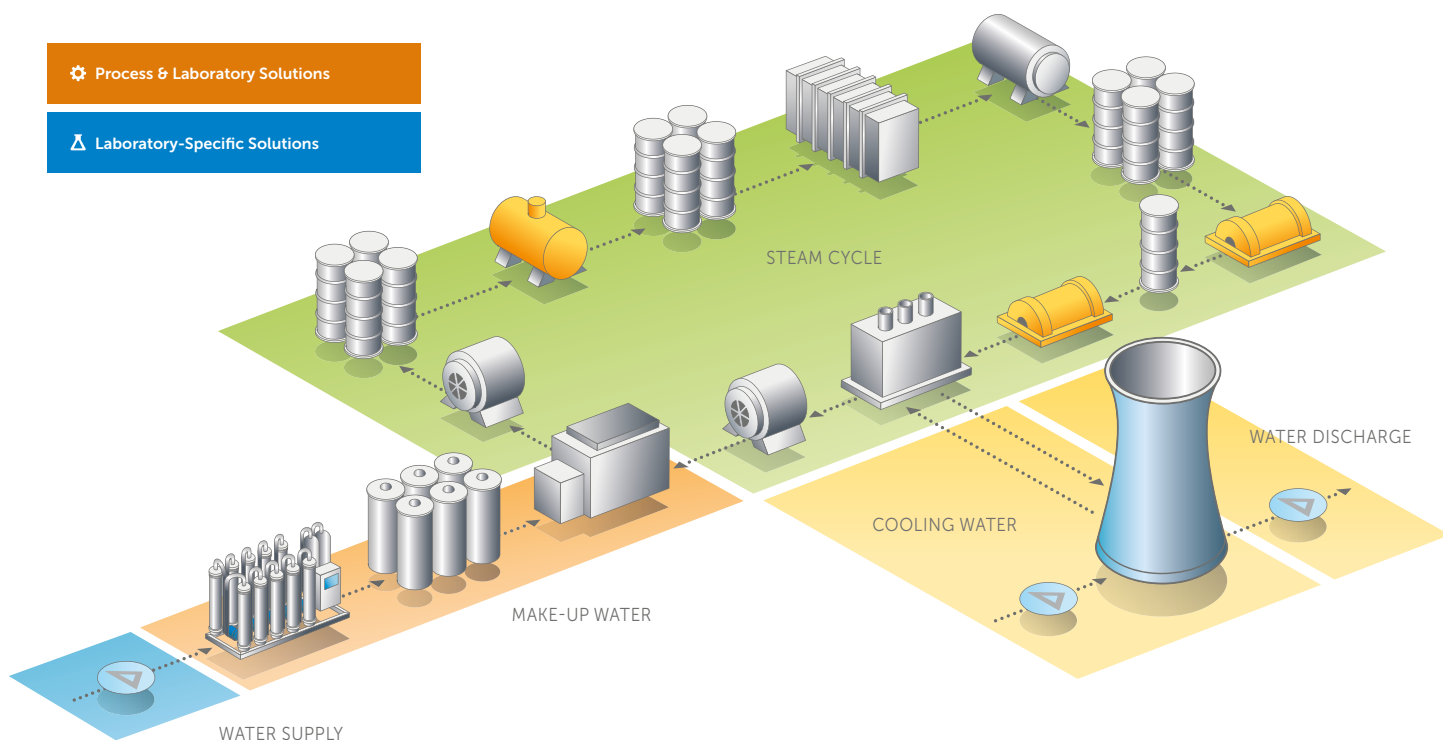
Whatever your water analysis challenge, Hach has the most complete solution – including an offering of easy-to-maintain online instrumentation, accurate laboratory equipment, comprehensive test kits, and high-quality prepared reagents, measuring the broadest range of test parameters in the industry.

Hach's solution-based approach saves you time on design, installation, training, maintenance, and operation.



## Technical training solutions

Hach Training Center provides relevant, hands-on training to your team, giving them the experience they need to master various theories and techniques – and produce results you can trust for quality assurance, environmental safety, and regulatory compliance. Hach experts offer a large course catalog of workshop training, personalised training, and digital learning designed to increase proficiency and confidence for plant operators, instrument and field technicians, laboratory personnel, and plant managers and superintendents.



## Water Treatment

- Cl Chloride
- Cl<sub>2</sub> Chlorine
- ClO<sub>2</sub> Chlorine Dioxide
- Cond Conductivity/  
Total Dissolved Solids (TDS)
- DO Dissolved Oxygen
- Ca Hardness/Alkalinity
- N<sub>2</sub>H<sub>4</sub> Hydrazine/Oxygen Scavenger
- ORP Oxidation-Reduction Potential
- O<sub>3</sub> Ozone
- pH pH
- SiO<sub>2</sub> Silica
- Na Sodium
- TOC Total Organic Carbon (TOC)
- Turb Turbidity and Suspended Solids

## Steam Cycle

- NH<sub>3</sub> Ammonia
- Cl Chloride
- Cond Conductivity/  
Total Dissolved Solids (TDS)
- Cu Copper
- DO Dissolved Oxygen
- N<sub>2</sub>H<sub>4</sub> Hydrazine/Oxygen Scavenger
- H<sub>2</sub> Hydrogen
- Fe Iron
- ORP Oxidation-Reduction Potential
- pH pH
- PO<sub>4</sub> Phosphate
- SiO<sub>2</sub> Silica
- Na Sodium
- TOC Total Organic Carbon (TOC)

## Cooling Water

- Cl Chloride
- Cl<sub>2</sub> Chlorine/Oxidants
- ClO<sub>2</sub> Chlorine Dioxide
- Cond Conductivity/  
Total Dissolved Solids (TDS)
- Cu Copper
- Ca Hardness/Alkalinity
- Micr Microbiology
- Mo Molybdate and  
Other Corrosion Inhibitors
- ORP Oxidation-Reduction Potential
- O<sub>3</sub> Ozone
- pH pH
- Na Sodium

[www.hach.com](http://www.hach.com)



Be Right™