



Online Monitoring for



Water Steam Cycles

| | |
|-----------------------|-----------|
| Conductivity | Oxygen |
| Silica | Hydrogen |
| Sodium | Phosphate |
| pH | Hydrazine |
| Redox Potential (ORP) | Turbidity |

**Specific
Conductivity**

AMI Powercon S



Automatic, continuous measurement of specific (total) conductivity

- Selectable temperature compensations for all common alkalizing agents
- Automatic verification with integrated high precision resistor
- Patented slot lock sensor design for easy installation and release

▶ **Specific Conductivity**
0.055-1000 $\mu\text{S}/\text{cm}$

**Acid
Conductivity**

AMI Powercon A



Conductivity after cation exchange (CACE)

- Temperature compensations for strong acids
- Integrated, easy to replace cation exchanger with automatic deaeration
- Trail and lead option to provide a second replacement pre-rinsed cation exchanger when first exchanger resin has exhausted

▶ **Acid Conductivity**
0.055-1000 $\mu\text{S}/\text{cm}$

**Specific/Acid
Conductivity**

AMI CACE



Conductivity before and after cation exchange (CACE) with an EDI module for continuous resin regeneration

- No resin columns needed:
 - no resin exchange
 - no maintenance
 - no chemicals
- No resin rinse down time required: Instrument available at all times
- Calculation and display of alkalizing agent concentration and pH (VGB-directive 450L)

▶ **Specific Conductivity**
0.055-1000 $\mu\text{S}/\text{cm}$
▶ **Acid Conductivity**
0.055-1000 $\mu\text{S}/\text{cm}$
▶ **pH Range**
7.5-11.5
▶ **Alkalizing agent**
Concentration in ppm

AMI Deltacon P



Monitor for conductivity before and after cation exchange (CACE) with conventional resin columns

- Calculation of pH and alkalizing agent concentration
- Reduced gaps in monitoring from column changes via automatic monitoring of the resin consumption
- Selectable temperature compensations (for all common alkalizing agents and strong acids)

▶ **Specific Conductivity**
0.055-1000 $\mu\text{S}/\text{cm}$
▶ **Acid Conductivity**
0.055-1000 $\mu\text{S}/\text{cm}$
▶ **pH Range**
7.5-11.5
▶ **Alkalizing agent**
Concentration in ppm

Degassed Acid Conductivity

AMI Deltacon DG



Complete monitor for specific conductivity, CACE and degassed CACE according to ASTM D4519-94 via sample reboiler

- Automatic detection of boiling point for reproducible measurements
- Calculation and display of alkalinizing agent concentration and pH value
- Safe operation due to automatic shutdown function of boiler in absence of sample

- ▶ **Conductivity (specific, acid, degassed acid)**
0.055-1000 $\mu\text{S}/\text{cm}$
- ▶ **pH Range**
7.5-11.5
- ▶ **Alkalinizing Agent Concentration** in ppm

Silica

AMI Silica



Complete monitoring system for the automatic, continuous measurement of silica in water steam cycles

- Freely adjustable measuring intervals for optimized use of reagents
- Fast and easy to use verification with user-friendly solid state standard
- Easy to use, integrated grab sample function

- ▶ **Silica**
1-5000 ppb

AMI Silitrace



Automatic determination for trace concentrations of silica in water steam cycles

- Highly stable measurement due to thermostatically controlled photometer
- Programmable, automatic calibration (zero-point and slope) and verification
- Easy to use, integrated grab sample function

- ▶ **Silica**
0-1000 ppb

Sodium

AMI Sodium P



Analyzer for the continuous determination of dissolved sodium for samples with $\text{pH} \geq 7$

- Reliable alkalization reagent addition system for diisopropylamine or ammonia with continuous pH monitoring
 - Simple automatic temperature compensation and two-point calibration with storage of calibration history
 - Easy to use, integrated grab sample function
- ▶ **Sodium**
0.1 ppb-10 ppm

AMI Sodium A



Analyzer for the continuous determination of dissolved sodium for samples with $\text{pH} \geq 2$

- pH controlled alkalization reagent addition for diisopropylamine with maintenance-free air pump
 - Simple automatic temperature compensation and two-point calibration with storage of calibration history
 - Easy to use, integrated grab sample function
- ▶ **Sodium**
0.1 ppb-10 ppm

AMI Soditrace



Automatic measurement for trace amounts of dissolved sodium ions in high purity water applications and steam generation

- Fully automatic three-point known addition calibration in ppb range (detection limit for sodium remains: 0.001 ppb)
 - Programmable automatic regeneration of sodium electrode
 - pH controlled alkalization reagent addition for diisopropylamine via maintenance-free air pump
- ▶ **Sodium**
0.001 ppb-10 ppm

pH Redox Potential

AMI pH-Redox QV



Long term stable potentiometric determination of pH value or redox potential

- Easily maintainable due to straightforward calibration procedure without sensor disassembling
 - Integrated temperature compensation for calibration and measurement
 - Economical operation of the instrument due to refillable liquid electrolyte
- ▶ **pH Range**
1-12 pH
- ▶ **Redox Potential (ORP)**
-500 to +1500 mV

Dissolved Oxygen

AMI Oxytrace



Continuous amperometric measurement of trace dissolved oxygen concentrations in high purity water

- Integrated air pressure and temperature compensation for simple calibration using ambient air
 - Long-term stable measuring system with robust electrode for minimized operating cost
 - Easy to handle membrane and electrolyte exchange, sensor cap for up to 24 months of operation
- ▶ **Dissolved Oxygen**
0-20 ppm
- ▶ **Saturation**
0-200 %

AMI Oxytrace QED



Measurement of dissolved oxygen in high purity water including integrated auto-verification

- Faraday electrode setup for automatic or manual verification by electrochemically generated oxygen concentration
 - Monitoring of electrolyte and membrane integrity
 - Easy to handle membrane and electrolyte exchange, sensor cap for up to 24 months of operation
- ▶ **Dissolved Oxygen**
0 ppb-20 ppm
- ▶ **Saturation**
0-200 %

Dissolved Hydrogen

AMI Hydrogen QED



Continuous measurement of dissolved hydrogen for corrosion monitoring in water steam cycles

- Faraday electrode for automatic or manual verification by electrochemically generated hydrogen concentration
 - Self-monitoring of membrane integrity and electrolyte
 - Long-life amperometric hydrogen sensor
- ▶ **Dissolved Hydrogen (H₂)**
0-800 ppb
- ▶ **Saturation**
0-50 %

Phosphate

AMI Phosphate HL



Complete monitoring system for the automatic, continuous measurement of phosphate in boiler water

- Automatic zero calibration for a long term stable measurement
 - Robust process photometer suitable for highly contaminated boiler samples
 - Reproducible measurement without silica interferences
- ▶ **Phosphate (PO₄)**
0-50 ppm
- ▶ **Phosphate (P-PO₄)**
0-16 ppm

**Hydrazine
Carbohydrazide**

AMI Hydrazine



Membrane-free, amperometric three electrode system for determination of hydrazine or carbohydrazide

- Low maintenance device without need for membrane or electrolyte exchange
 - Highly reliable measurement with stable zero-point, sample conditioning without measurement interference
 - Long-life sensor due to automatic sensor cleaning and continuous monitoring of cleaning efficiency
- ▶ **Hydrazine**
0-600 ppb
- ▶ **Carbohydrazide**
0-600 ppb

Turbidity

AMI Turbiwell



Contact-free turbidity measurement for corrosion product trend monitoring

- LED light source for long life and stable measurement, heated optics to prevent condensation effects
 - Automatic measuring chamber flushing; trouble-free operation without manual intervention
 - Fast and easy verification with primary and secondary standard
- ▶ **Turbidity ISO**
0-200 NTU
- ▶ **Turbidity EPA W/LED**
0-100 NTU

**Portable
Instruments**

AMI INSPECTORS



Portable quality assurance (verification) of existing on-line measurements. Available for conductivity, hydrogen, oxygen and pH measurements

- USB data logger interface for lifelong data storage at a selectable interval
 - Rechargeable battery for more than 24 hours of stand-alone operation
 - Re-certification by Swan possible
- ▶ **Conductivity**
0.055-1000 μ S/cm
- ▶ **Hydrogen**
0-800 ppb
0-50 % Saturation
- ▶ **Dissolved Oxygen**
0.01 ppb-20 ppm
0-200 % Saturation
- ▶ **pH Range**
1-12 pH

Swan Monitor Concept



Swan Instruments are delivered as fully functional, ready-to-use instruments. This ensures easy system integration as well as user-friendly operation and maintainability.

Highest standards in development and production assure the instrument quality expected by our customers.

System Integration

- Complete panel-mounted systems with fluidic connections preconfigured for a quick start up
- Simple system design with only two panel sizes
- Various communication possibilities via Profibus, Modbus, HART-Protocol, USB-interface and third analogue output

Service and Maintenance

- Uniform menu navigation for simple operation and maintenance – one platform for all instruments
- Clearly arranged setup of instruments, easy accessibility of all components for efficient maintenance
- Self-explanatory maintenance procedures can be easily performed by the operating company

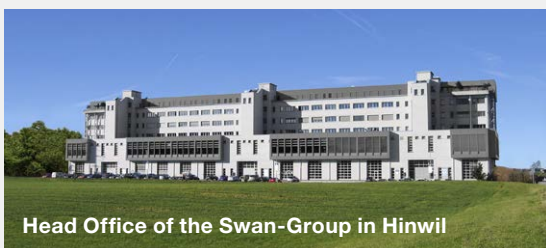
Quality Assurance

- Every analyzer is wet bench tested and factory calibrated prior to delivery
- Automatic diagnostics – sensor function and reagent level monitoring
- Fully integrated flow monitoring system for validity check



Headquarters:

Swan Analytische Instrumente AG
Studbachstrasse 13
CH-8340 Hinwil
Phone +41 44 943 63 00
swan@swan.ch
www.swan.ch



Head Office of the Swan-Group in Hinwil

Represented by:

Sales & Customer Service ME:

Swan Analytical Middle East FZE
LB 19, 2004 JAFZA View 18 & 19
P.O. Box 263219, Jebel Ali Free Zone
UAE-Dubai
Phone +971 4 884 8238
sales@swananalyticalme.com
www.swan.ch

Sales & Customer Service SG:

Swan Analytical Singapore Pte Ltd.
55 Serangoon North Avenue 4
#01-14, S9 Building
SG-555859 Singapore
Phone +65 65700539
morris.teo@swan.sg
www.swan.ch

Sales & Customer Service UK:

Swan Analytical UK Ltd.
Unit 3 The Steading, Copthill Farm
Deeping Road
Stamford PE9 4TD
Phone +44 1780 755 500
sales@swan-analytical.co.uk
<https://uk.swan.ch>

Sales & Customer Service ZA:

Swan Instrumentation South Africa (Pty) Ltd.
Unit 13 Aquaplan Business Park
120 E P Malan Road, Pomona
ZA-Kempton Park 1619
Phone +27 11 396 3892
sales@swan.za.com
www.swan-analytical.co.za

