

Complete monitoring system based on ASTM D4519-94 for the automatic, - continuous measurement of three conductivity values in water-steam cycles:

1. Specific (total) conductivity
2. Cation (acid) conductivity after a cation exchanger
3. Degassed conductivity after a sample reboiler

Calculation of sample pH and alkalizing reagent based on differential conductivity measurement.

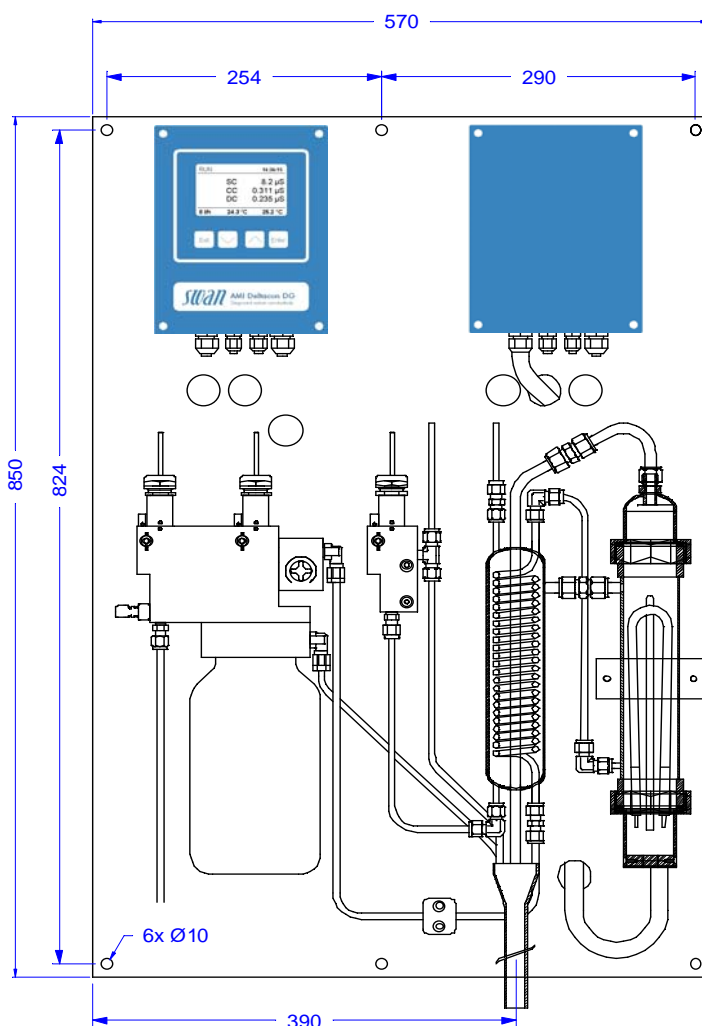
## Monitor AMI Deltacon DG

Complete system mounted on stainless steel panel:

- **Transmitter AMI Deltacon DG** in a rugged aluminum enclosure (IP 66).
- **Swansensors UP-Con1000-SL**  
Three 2-electrode conductivity sensors with integrated Pt1000 temperature probe.
- **Flow cell Catcon-Plus-SL** with sample flow adjustment valve, digital sample flow meter and integrated cation exchanger.
- **Sample reboiler unit** with heating and cooling system made of stainless steel.
- **DG electronic controller** for sample reboiler with vapor pressure control (IP 66).
- Factory tested, ready for installation and operation.

### Specifications:

- Conductivity measurement range:  
0.055 to 1000  $\mu\text{S}/\text{cm}$ .
- Calculation of pH value in the range from  
pH 7.5 to 11.5 (VGB-directive 450L).
- Calculation of alkalizing reagent concentration, e.g. ammonia in the range from  
0.01 to 10 ppm.
- Simultaneous measurement and display of  
conductivities, pH, alkalizing reagent, sample temperature and sample flow.
- Two current outputs (0/4 - 20 mA) for  
measured signals.



Order scheme	Monitor AMI Deltacon DG	A - 2 3 . 4 8 1 . 1	X	0
Signal output option .....	None .....		↑	0
	Third current signal output 0/4 - 20 mA .....			1
	Profibus DP interface .....			2
	HyperTerminal interface (for logger download) .....			3
	Modbus interface (for Webserver connection) .....			4

## Measuring System

Three **conductivity sensors**  
UP-Con1000-SL with integrated Pt1000 temperature probe.

Measuring range	Resolution
0.055 to 0.999 $\mu\text{S/cm}$	0.001 $\mu\text{S/cm}$
1.00 to 9.99 $\mu\text{S/cm}$	0.01 $\mu\text{S/cm}$
10.0 to 99.9 $\mu\text{S/cm}$	0.1 $\mu\text{S/cm}$
100 to 1000 $\mu\text{S/cm}$	1 $\mu\text{S/cm}$

Automatic range switching.

**Accuracy**  $\pm 1\%$  of measured value

### Temperature compensation

Absolute (none), linear coefficient in  $\%/\text{°C}$  or non-linear function for strong acids, high purity water, neutral salts, strong bases, ammonia, ethanolamine and morpholine.

### pH and alkalizing reagent calculation

Ranges (25° C)  
pH: 7.5 to 11.5  
e.g. Ammonia: 0.01 to 10 ppm

### Conditions for pH calculation

Only 1 alkalinizing reagent, contamination is mostly NaCl, phosphates < 0.5 mg/L, if pH value < 8 the concentration of contaminant must be small compared to alkalinizing reagent.

### Temperature measurement Pt1000

Measuring range: up to +130 °C  
Resolution: 0.1 °C

**Atmospheric pressure measurement**  
for boiling point compensation in sample reboiler.

**Sample flow measurement** with security shut-off for sample heater in reboiler if sample flow is too low.

## Transmitter Specifications and Functionality

Electronics case: Cast aluminum  
Protection degree: IP 66 / NEMA 4X  
Display: backlit LCD, 75 x 45 mm  
Electrical connectors: screw clamps  
Ambient temperature: -10 to +50°C  
Humidity: 10 - 90% rel., non condensing

### Operation

Easy operation based on separate menus for "Messages", "Diagnostics", "Maintenance", "Operation" and "Installation". User menus in English, German, French and Spanish.

Separate menu specific password protection.

Display of process value, sample flow, alarm status and time during operation.

Storage of event log, alarm log and calibration history.

Storage of the last 1'000 data records in logger with selectable time interval.

## Safety features

No data loss after power failure, all data is saved in non-volatile memory.

Overvoltage protection of in- and outputs. Galvanic separation of measuring inputs and signal outputs.

**Transmitter temperature monitoring**  
with programmable high/low alarm limits.

### 1 Alarm relay

One potential free contact for summary alarm indication for programmable alarm values and instrument faults.

Maximum load: 1A / 250 VAC

### 1 Input

One input for potential-free contact. Programmable hold or remote off function.

### 2 Relay outputs

Two potential-free contacts programmable as limit switches for measuring values, controllers or timer for system cleaning with automatic hold function.

Rated load: 1A / 250 VAC

### 2 Signal outputs (3<sup>rd</sup> as option)

Two programmable signal outputs for measured values (freely scaleable, linear or bilinear) or as continuous control outputs (control parameters programmable).

Current loop: 0/4 - 20 mA  
Maximum burden: 510  $\Omega$

### Control functions

Relays or current outputs programmable for 1 or 2 pulse dosing pumps, solenoid valves or for one motor valve. Programmable P, PI, PID or PD control parameters.

### 1 Communication interface (option)

RS232 interface for logger download to PC with Microsoft HyperTerminal or RS485 interface (galvanically separated) with Fieldbus protocol Modbus or Profibus DP.

## Monitor Data

### Power supply

Voltage: 100 to 127 and  
200 to 240 VAC ( $\pm 10\%$ )  
50/60 Hz ( $\pm 5\%$ )

Max. current:

- Voltage at 90 VAC: 12 A  
- Voltage at 140 VAC: 19 A  
- Voltage higher than 180 VAC: 9.5 A

Max. power consumption:

- Voltage at 90 VAC: 1.1 kW  
- Voltage at 140 VAC: 2.6 kW  
- Voltage at 265 VAC: 2.6 kW

Average power consumption: 1.2kW

Mains connection: 2.5 mm<sup>2</sup> / AWG12  
stranded wires with end sleeves

### Sample conditions

Flow rate: 5 to 15 L/h  
Temperature: up to 50 °C  
Inlet pressure (25 °C): up to 2 bar  
Outlet pressure: pressure free  
No sand, no oil

### Sample connections

Inlet: Swagelok 1/4" tube adapter  
Outlet: 13/16" steel tube

### Cation exchanger

1L of rinsed resin with capacity indicator ready for operation.

Resin sufficient for alkalization with ammonia 1 mg/L (pH 9.4).

Resin capacity for 1L:  
4 months at sample flow 10 L/h or  
5 months at 5 L/h.

### Panel

Dimensions: 850 x 570 x 200 mm  
Material: stainless steel  
Total instrument weight: 20.0 kg

## Electrical Connection Scheme

