

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.

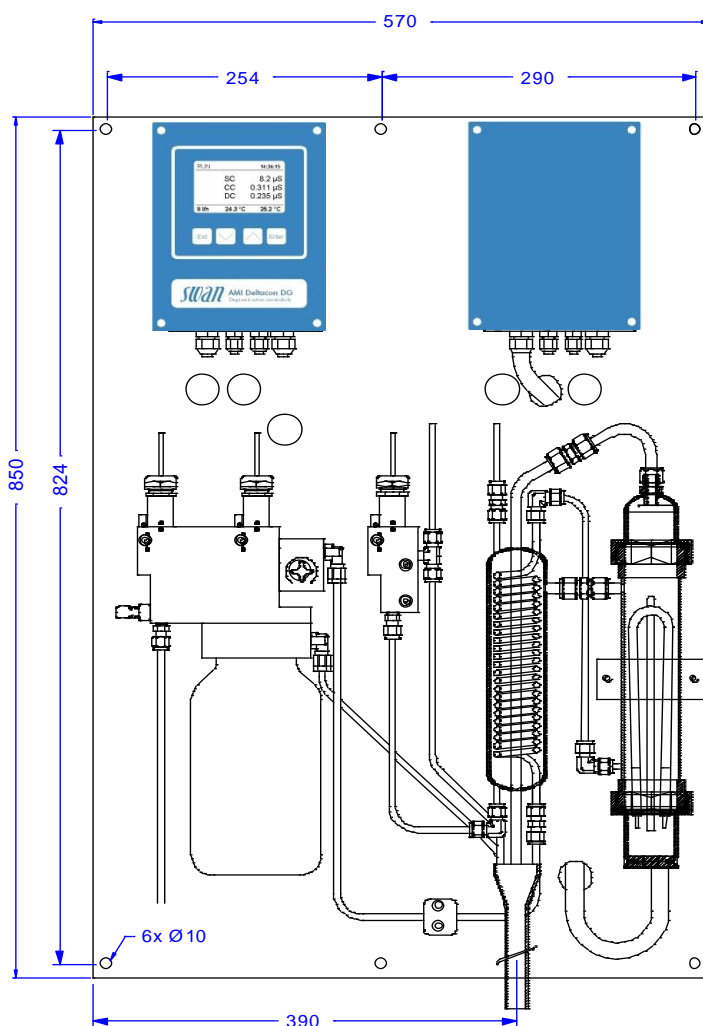
Monitor AMI Deltacon DG

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 Nr.	Monitor AMI Deltacon DG	A-23.481.100
Option:	[] 3 rd current signal output (0/4 – 20mA)	A-81.420.050
	[] Profibus DP & Modbus RTU interface (RS-485)	A-81.420.020
	[] USB interface	A-81.420.042
	[] HART interface	A-81.420.060
Option:	[] Cation exchanger, 1 bottle with 1l resin	A-82.841.030

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.
 Influence of temperature see PPChem
 2012 14(7) [Wagner].

pH and alkalinizing 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, contamina-
 tion is mostly NaCl, phosphates < 0.5
 mg/L, if pH value < 8 the concentration
 of contaminant must be small com-
 pared to alkalinizing reagent.

Temperature measurement Pt1000

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

Atmospheric pressure measurement
 for boiling point compensation in sam-
 ple reboiler.

Sample flow measurement with secu-
 rity 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 "Instal-
 lation". User menus in English, Ger-
 man, French and Spanish.

Separate menu specific password pro-
 tection.

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

Storage of event log, alarm log and cal-
 ibration 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 out-
 puts. Galvanic separation of measuring
 inputs and signal outputs.

Transmitter temperature monitoring
 with programmable high/low alarm lim-
 its.

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 func-
 tion.

2 Relay outputs

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

Rated load: 1A / 250 VAC

2 Signal outputs (3rd as option)

Two programmable signal outputs for
 measured values (freely scaleable, lin-
 ear or bilinear) or as continuous control
 outputs (control parameters program-
 mable) as current source. 3rd signal
 output selectable as current source or
 current sink.

Current loop: 0/4 - 20 mA
 Maximum burden: 510 Ω

Control functions

Relays or current outputs programma-
 ble for 1 or 2 pulse dosing pumps, sol-
 enoid valves or for one motor valve. Pro-
 grammable P, PI, PID or PD control pa-
 rameters.

1 Communication interface (option)

- RS485 interface (galvanically sepa-
 rated) with Fieldbus protocol Modbus
 RTU or Profibus DP
- 3rd Signal output
- USB interface
- HART interface

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 mm² / 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

The use of SWAN Back Pressure
 Regulator is highly recommended.

Sample connections

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

Cation exchanger

1L of rinsed resin with capacity indica-
 tor 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: 570 x 850 x 200 mm
 Material: stainless steel
 Total instrument weight: 26.0 kg

Electrical Connection Scheme

