

Complete monitoring system for the automatic, continuous measurement of the conductivity before (specific / total conductivity) and after a cation exchanger with electro deionization (acid / cation conductivity).

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

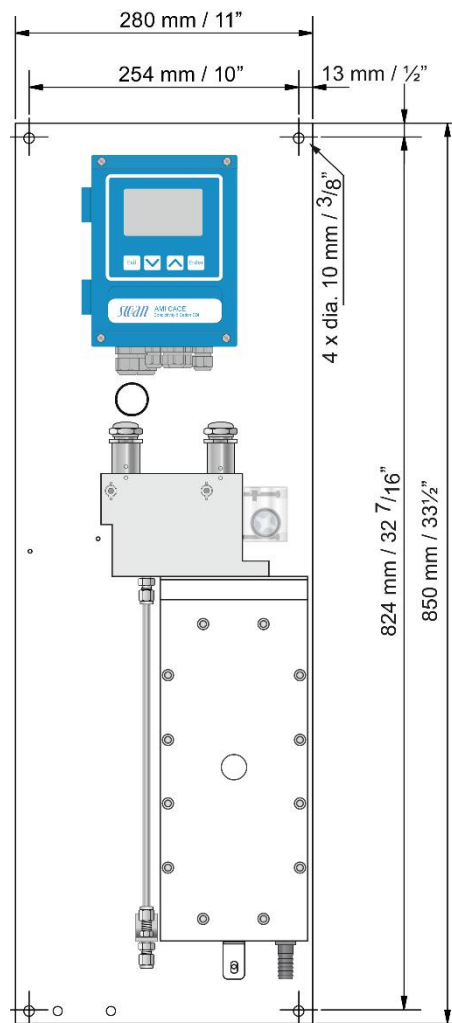
## Monitor AMI CACE

Complete system mounted on stainless steel panel:

- **Transmitter AMI CACE** in a rugged aluminum enclosure (IP 66).
- **Swansensor UP-Con1000-SL**; two 2-electrode conductivity sensors with slot-lock design and integrated Pt1000 temperature probe,  $k = 0.04 \text{ cm}^{-1}$ .
- **Flow cell Catcon-Plus-SL CACE** made of stainless steel 316L with digital sample flow meter. Quick sensor release with patented slot-lock design. EDI-Module with exchangeable sample chamber module and automatic deaeration.
- Factory tested, ready for installation and operation.

### Specifications:

- Conductivity measurement range: 0.055 to 1000  $\mu\text{S/cm}$ .
- Calculation of pH value in the range from pH 7.5 to 11.5 (VGB-S-010-T-00).
- Calculation of alkalizing reagent concentration, e.g. ammonia in the range from 0.01 to 10 ppm.
- Simultaneous measurement and display of both conductivities, pH, alkalizing reagent, sample temperature and sample flow.
- Temperature compensation preset for strong acids but wide range of others selectable for other sample conditions.
- Two current outputs (0/4 - 20 mA) for measured signals (3<sup>rd</sup> as option).



Order Nr.	Monitor AMI CACE AC	A-23.462.000
	Monitor AMI CACE DC	A-23.462.200
Option:	<input type="checkbox"/> 3 <sup>rd</sup> current signal output (0/4 – 20mA)	A-81.420.050
	<input type="checkbox"/> Profibus DP & Modbus RTU interface (RS-485)	A-81.420.020
	<input type="checkbox"/> USB interface	A-81.420.042
	<input type="checkbox"/> HART interface	A-81.420.060
Option:	<input type="checkbox"/> Inlet filter option V2 (1 $\mu\text{m}$ )	A-82.811.040
Accessory:	<input type="checkbox"/> Backpressure regulator, 1 channel with manometer	A-82.581.001

**Conductivity Measurement**

Swansensor UP-Con1000-SL with integrated Pt1000 temperature probe.

<b>Measuring range</b>	<b>Resolution</b>
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 or  $\pm 1$  digit (whichever is greater).

**Response time ( $t_{90}$ ):** < 5 sec.

**Temperature compensation**  
Strong acids or non-linear function for high purity water, neutral salts, strong bases, ammonia, ethanolamine, morpholine, linear coefficient in  $\%/\text{C}$ , absolute (none). Influence of temperature see PPChem2012 14(7) [Wagner]

**pH and alkalizing reagent calculation**  
Ranges ( $25^\circ\text{C}$ ): pH 7.5 to 11.5  
e.g. ammonia 0.01 to 10 ppm

**Temperature measurement Pt1000**  
Measuring range:  $-30$  to  $+130^\circ\text{C}$   
Resolution:  $0.1^\circ\text{C}$

**Sample flow measurement**  
With digital SWAN sample flow meter

**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  
Dimensions: 180 x 140 x 70 mm  
Weight: 1.5 kg  
Ambient temperature:  $-10$  to  $+50^\circ\text{C}$   
Humidity: 10 - 90% rel., non-condensing

**Power supply**  
Voltage:  
AC version: 100 - 240 VAC ( $\pm 10\%$ ), 50/60 Hz ( $\pm 5\%$ )  
DC version: 10-36 VDC  
Power consumption: max. 35 VA

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

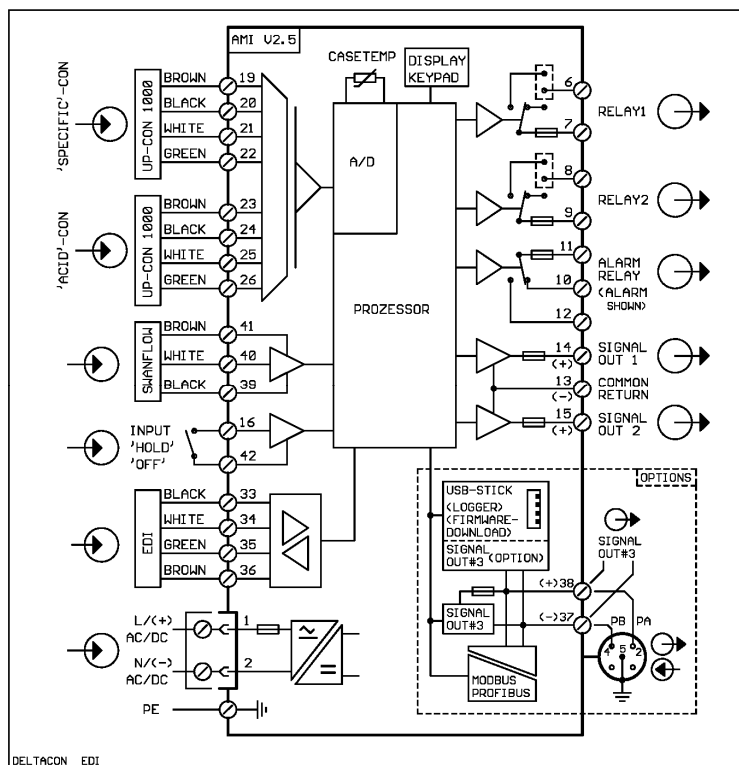
Separate menu specific password protection.

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.

**Electrical Connection Scheme**



**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 scalable, linear or bilinear) or as continuous control outputs (control parameters programmable) as current source. 3<sup>rd</sup> signal output selectable as current source or current sink.  
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)**  
RS485 interface (galvanically separated) with Fieldbus protocol Modbus RTU or Profibus DP / 3<sup>rd</sup> Signal output / USB interface.

**Monitor Data**

**Sample conditions**  
Flow rate: 3 to 4 L/h  
Temperature: up to  $50^\circ\text{C}$   
Inlet pressure ( $25^\circ\text{C}$ ): 0.5 bar  
Outlet pressure: pressure free  
No sand, no oil

**EDI Capacity:**  
 $s_{Cmax} = 40\mu\text{S/cm}$  as  $\text{NH}_4\text{OH}$   
 $s_{Cmax} = 350\mu\text{S/cm}$  as  $\text{NaOH}$

The use of SWAN Back Pressure Regulator is highly recommended. Particle filtration recommended in case of high iron concentration. Use of film forming products may reduce lifetime of EDI-module.

**Conditions for pH calculation**  
Only 1 alkalizing reagent, contamination is mostly NaCl, phosphates  $< 0.5\text{ mg/L}$ , if pH value  $< 8$  the concentration of contaminant must be small compared to alkalizing reagent.

**Sample connections**  
Inlet: Swagelok  $\frac{1}{4}$ " tube adapter  
Outlet: G  $\frac{3}{8}$ " adapter for tube for flexible tube  $\text{O} 20 \times 15\text{ mm}$

**Panel**  
Dimensions: 280 x 850 x 200 mm  
Material: stainless steel  
Total instrument weight: 14.0 kg