

# Analyzers/Controllers

## SFC series

### Continuous analysis of water parameters

#### General

The SFC series of instrumentation provides for the continuous measurement and control of a wide variety of water quality parameters. As a single input device, the SFC unit can be used to monitor any one of a number of different measurement technologies and perform a related control function suited to the specific application. The SFC system can control automatic v-notch positioners in gas feed systems, such as the V10k™ and V2000™ systems, or automatic stroke length positioners and variable speed drives in dosing pump systems to maintain a setpoint concentration. For multiple measurement applications, the MFC analyzer/controller is available.

#### Typical applications

- Potable water treatment
- Waste water treatment
- Cooling water circuits
- Industrial and process water treatment
- Swimming pools

#### Features

The SFC analyzer/controller is a modular system consisting of a wall or panel-mounted electronic module, a flow cell module and a plug-and-play sensor measuring module. The SFC unit can be configured as an analyzer only, with over 10 different measurement choices, a set-point or flow proportional controller or a combined analyzer/controller. The additional control function offers an easy, software selectable range of control modes from flow proportional to compound loop with "fuzzy-logic" auto-tuning. Utilizing the CAN sensor/actuator bus allows communication between electronic modules if more than one parameter is being measured. This can be particularly useful for pH-corrected free chlorine measurement with the DEPOLOX® 5 flow cell and a pH sensor.

#### Key Benefits

- Permits the use of the Wallace & Tiernan potentiostatic sensors like DEPOLOX® 5, Micro®/2000 and Deox®/2000
- For use with Strantrol® ORP and Strantrol® pH measurement modules that are well proven in industrial and waste water disinfection applications
- Four different control modes can be selected
- Measurement and control of individual or multiple parameters when combined using a CAN sensor/actuator bus
- Simple configuration and operation
- Data connection to SCADA via 4 – 20 mA output, Web technology via optional ChemWeb-Server and to PROFIBUS® DP, Profinet IO or Modbus TCP via optional fieldbus modules



An example of a SFC system:  
SFC pH for individual pH measurement

#### Product Sheet

Water Technologies



**SIEMENS**

## The SFC system is available with the following functionality

### Sensor selection

The portfolio of measurements includes the following parameters, and where appropriate, the supporting measurement modules are depicted.

- Free chlorine (DEPOLOX® 5, Micro®/2000 & Membrane)
- Total chlorine (Micro®/2000 & Membrane)
- Chlorine dioxide (DEPOLOX® 5, Micro®/2000 & Membrane)
- Ozone (DEPOLOX® 5, Micro®/2000 & Membrane)
- Potassium permanganate (DEPOLOX® 5 & Micro®/2000)
- pH value (Strantrol® pH sensor and standard sensor)
- Redox (ORP) (Strantrol® ORP sensor and standard sensor)
- Fluoride
- Chlorine-sulfite (Deox®/2000)
- Conductivity
- Temperature
- Standard sensors/measurement with a milliamp signal.

The application and water quality will determine what measurement module best suits the application;

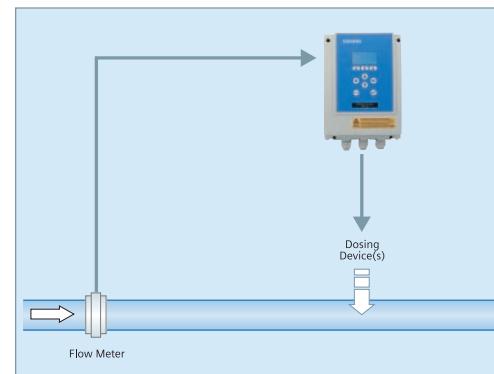
The DEPOLOX® 5 measurement module uses the potentiostatic bare electrode technology that is fast acting to a change in chlorine concentration and therefore well suited for disinfection control. It incorporates continuous hydro-mechanical cleaning of the sensor. (further information: WT.050.585.001.PS.)

The Micro®/2000 and Deox®/2000 measurement modules are also potentiostatic bare electrodes that can incorporate the addition of buffer chemicals. The Micro®/2000 and Deox®/2000 measurement modules can be used in poor quality water without fouling. The Micro®/2000 module offers unmatched accuracy of chlorine measurements down to one part per billion. The Deox®/2000 module is utilized for dechlorination chemistry measurements. (further information: WT.050.585.003.PS and WT.050.585.004.PS.)

The membrane measurement module utilizes membrane covered electrodes with the VariaSens™ flow cell and is the least affected by water supply chemistry variations. (further information: WT.050.585.005 to 008.PS.) Strantrol® flowcell with patented HRR® sensor provides highest accuracy in ORP measurement designed for industrial applications (further information: ST.050.585.014.PS)

The trend graph allows for daily data trending that can be extended to 30 days when the optional SD card is inserted.

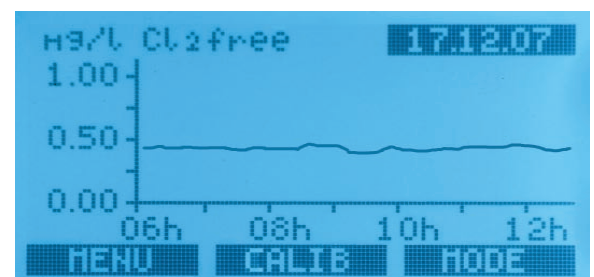
## Flow proportional control



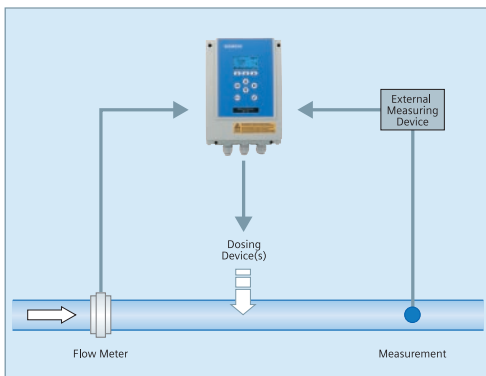
	SFC SC
External setpoint value for single feedback closed loop control and/or combi-control	—
External dosing factor for flow proportional control	—
Temperature input	—
Feedback input	✓
2 digital inputs	✓
mA outputs	✓
Relay outputs	2
RS 232 interface for firmware update	✓
Slot for fieldbus modules*	—
RS 485 interface	—
CAN sensor/actuator bus interface	—
SD card slot	—

### Control options

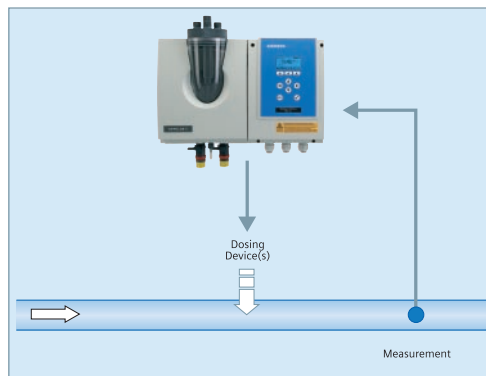
Both flow proportional and compound loop control are available with the SFC. The control mode required should be specified when ordering the equipment. With the wide range of SFC versions available, nearly all conceivable water treatment applications, including single feedback closed-loop control, can be monitored and controlled.



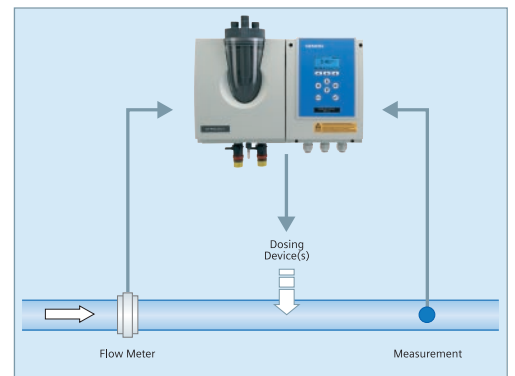
### Compound loop control with external measurement (mA)



### Measurement single feedback closed-loop control



### Measurement with compound loop control



#### SFC PC



4



#### SFC with corresponding measuring module



4



#### SFC with corresponding control module



4



\* available fieldbus moduls: PROFIBUS®, Profinet, Modbus

The fuzzy logic compound loop control, which was previously included in the Wallace & Tiernan® PCU process controller, has now been integrated in the SFC PC system. Each measuring system also has an optional integrated controller that can be used with external setpoint selection (as well as with single feedback closed-loop control). Depending on the application, the control parameters can also be used to control actuators such as the V10k™ gas feed system, dosing pumps, or frequency converters. This now also applies to CAN sensor/actuator bus enabled dosing devices.

The flow proportional control SFC SC enables proportionally controlled feed of chemicals used in water treatment and for industrial applications. The dosing capacity of the connected device is controlled automatically, on the basis of a measuring signal, for example an external flow rate measurement, and a configurable dosing factor. If actuators

with feedback are used, the non-linearity can be adjusted using a maximum of 11 calibration points.

For further technical details, please refer to the appropriate documentation. Separate product information leaflets are available for the SFC PC process controller, for the flow proportional control SFC SC, and the individual parameters.

#### Additional features

The CAN sensor/actuator bus allows easy expansion of the SFC functionality by allowing two or more SFC devices to be interconnected. The CAN sensor/actuator bus allows for a pH compensated chlorine measurement or a more complex control scheme such a set-point trim control. A communication slot will allow connection of field bus systems such as PROFIBUS® DP or Modbus. The removable SD card available for the SFC and SFC PC allows for data storage as well as back-up of the configuration.

## Technical data SFC electronic module

<b>Display:</b>	Graphical display, resolution 128 x 64 pixels, white background illumination
<b>Measurement inputs:</b>	1 x measured value input (electrically isolated up to 50 V to ground) for plug-in cards of the sensor measuring module (not with SFC SC): <ul style="list-style-type: none"><li>■ 3-electrode cell for chlorine, ozone, chlorine dioxide and potassium permanganate DEPOLOX® 5, Micro®/2000 and Deox®/2000 modules</li><li>■ Membrane sensors for total chlorine (TC1/TC1-S), free chlorine (FC1), chlorine dioxide (CD7), ozone (OZ7)</li><li>■ pH value</li><li>■ Redox voltage (ORP) with HRR® sensor or standard sensor</li><li>■ Fluoride</li><li>■ Conductivity</li><li>■ mA/V input</li></ul> 1 x mA input for flow rate 0 – 20 mA/4 – 20 mA 1 x mA input for external setpoint or dosing factor 0 – 20 mA/4 – 20 mA (not applicable to SFC SC) 1 x temperature input PT 1000 (0 – 50 °C/32 – 122 °F) with sensor error display (not applicable to SFC SC/SFC PC) 1 x feedback input for servo motor position feedback (1 kΩ, 5 kΩ, mA, V)
<b>Digital inputs:</b>	2 x for voltage-free contact (< 100 Ω) for controller stop, flow control
<b>Relay outputs:</b>	4 free selectable two-way switches for process monitoring; SFC SC: 2 alarm/control contacts
<b>mA output:</b>	1 x mA output for measurement or control output (freely configurable) Output 0/4 – 20 mA Accuracy < 0.5 % FS Load protected ≤ 500 Ω Temperature drift max. 0.2 % / 10 °C Electrically isolated up to 50 V to ground
<b>Interfaces:</b>	1 x RS 485 for connection to a ChemWeb-Server, OPC-Server Data Access V2.0, CMS software 3.0, SECO-S7 (not applicable to SFC SC) The RS 485 interface is electrically isolated up to 50 V to ground. 1 x CAN sensor/actuator bus interface for controlling actuators and evaluating external measurements and module communication (not applicable to SFC SC) 1 x slot for fieldbus connection: PROFIBUS®, Profinet, Modbus (not applicable to SFC SC) 1 x RS 232 for firmware updates (not electrically isolated)
<b>Memory card:</b>	1 x SD memory card slot for installation of an SD memory card (not applicable to SFC SC)
<b>Power supply:</b>	100 – 240 V AC ± 10 %, 50 – 60 Hz, 30 VA 24 V DC ± 20 %, 30 W
<b>Enclosure:</b>	IP 66, designed to meet NEMA 4X
<b>Testing and marking:</b>	CE, EMC-EN 61326 LUD-EN 61010 UL listed/CSA certified
<b>Ambient temperature:</b>	0 – 50 °C (32 – 122 °F) (do not expose to direct sunlight)
<b>Storage temperature:</b>	-20 to +70 °C (12 – 158 °F)
<b>Dimensions (W x H x D):</b>	185 x 265 x 145 mm (7.3 x 10.4 x 5.7 ")
<b>Weight:</b>	approx. 2.5 kg (5.5 lbs)

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