SFC-SERIES

WALLACE & TIERNAN® ANALYZERS/CONTROLLERS

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. With the SFC unit a second measurement is possible via the SiDiSens module, for example an additional pH measurement to allow a pH corrected chlorine measurement. 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

Key Benefits:

- Permits the use of the Wallace & Tiernan® potentiostatic sensors used in the DEPOLOX® 5, Micro/2000® and Deox/2000® modules
- 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
- Simple configuration and operation
- Data connection to SCADA via 4 – 20 mA output, Web technology via optional Process Monitoring System and to optional PROFIBUS® DP, PROFINET® IO or MODBUS® TCP fieldbus modules

measurement with the DEPOLOX® 5 flow cell and a pH sensor. Alternatively the pH correction can be accomplished via a SiDiSens module which allows a second measurement with a single SFC unit.

SENSOR SELECTION

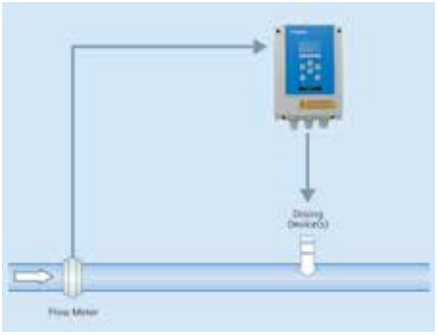
The portfolio of measurements includes the following parameters, and where appropriate, the supporting measurement modules are depicted.

- Free chlorine
- Total chlorine
- Chlorine dioxide
- Ozone
- Pot. permanganate
- pH value
- Redox (ORP)
- Fluoride
- 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 hydromechanical cleaning of the sensor.
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. The membrane measurement module utilizes membrane covered electrodes with the VariaSens flow cell and is the least affected by water supply chemistry variations. Strantrol® flowcell with proprietary HRR® sensor provides highest accuracy in ORP measurment designed for industrial applications.

FLOW PROPORTIONAL CONTROL

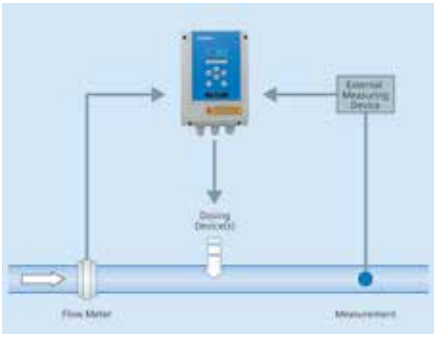


	SFC SC
External setpoint value for single feedback closed loop control and/or combi-control	–
External dosing factor for flow prop control	–
Temperature input	–
Feedback inputs	✓
2 digital inputs	✓
mA outputs	✓
Relay outputs	2
RS 232 interface for Firmware update	✓
Slot for fieldbus modules*	–
RS 485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

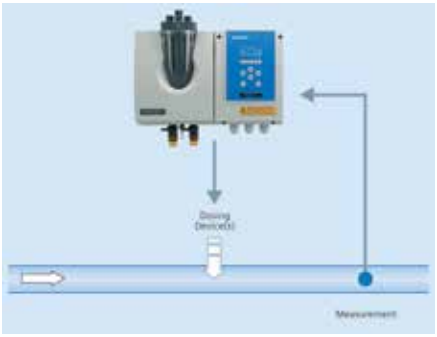
CONTROL OPTIONS

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.

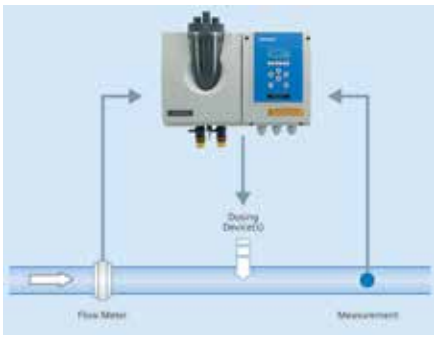
COMPOUND LOOP CONTROL
mit Festwertregelung



MEASUREMENT
single feedback closed-loop control



MEASUREMENT
with compound loop control



SFC PC	SFC with corresp. measuring module	SFC with corresp. measuring module & control functionality
✓	✓	✓
✓	–	✓
–	✓	✓
✓	✓	✓
✓	✓	✓
✓	✓	✓
4	4	4
✓	✓	✓
✓	✓	✓
✓	✓	✓
✓	✓	✓
✓	✓	✓

* available fieldbus modules: PROFIBUS DP, PROFINET IO, MODBUS TCP

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.

ADDITIONAL FEATURES

The CAN sensor/actuator bus allows easy expansion of the SFC functionality by providing interconnection of two or more SFC devices. The CAN sensor/actuator bus allows for a pH compensated chlorine measurement or a more complex control scheme such a set-point trim control. The connection of field bus systems such as PROFIBUS® DP or MODBUS® TCP is by a communication slot. 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 SFC

Display:
Graphical display, resolution 128 x 64 pixels, white background illumination

Mesurement inputs:
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):

- 3-electrode cell for chlorine, ozone, chlorine dioxide and potassium permanganate DEPOLOX® 5, Micro/2000® and Deox/2000® modules
- Membrane sensors for total chlorine (TC1/ TC1-S), free chlorine (FC1), chlorine dioxide (CD7), ozone (OZ7)
- pH value
- Redox voltage (ORP) with HRR® sensor or standard sensor
- Fluoride
- Conductivity
- mA/V input

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)

Digital inputs:
2 x for voltage-free contact (< 100 Ω) for controller stop, flow control

Relay outputs:
4 free selectable two-way switches for process monitoring; SFC SC: 2 alarm/control contacts

mA outputs:
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

Interfaces:
1 x RS 485 for connection to a Process Monitoring System and OPC-Server.
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® DP, PROFINET® IO, MODBUS® TCP (not applicable to SFC SC)

1 x RS 232 for firmware updates (not electrically isolated)

Memory card:
1 x SD memory card slot for installation of an SD memory card (not applicable to SFC SC)

Power supply:
100 – 240 V AC ± 10 %, 50 – 60 Hz, 30 VA
24 V DC ± 20 %, 15 W

Enclosure: IP 66, , designed to meet NEMA 4X

Testing and marking:
CE, EMC-EN 61326
IEC EN 61010
UL listed/CSA certified

Ambient temperature:
0 – 50 °C, (32 – 122 °F)
(do not expose to direct sunlight)

Storage temperature: -20 to +70 °C (12 – 158 °F)

Dimensions (W x H x D):
185 x 265 x 145 mm (7.3 x 10.4 x 5.7 “)

Weight: approx. 2.5 kg (5.5 lbs)

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Leveraging our deep experience and proven expertise, Evoqua Water Technologies helps customers realize maximum value from their water treatment systems – from installation and optimization to ongoing service and maintenance with industry leading response times.