

Water Technologies

Wallace & Tiernan

DEPOLOX® Pool

for measuring free chlorine and combined chlorine, total chlorine, pH-value, redox voltage, conductivity and temperature

The DEPOLOX® Pool unit was designed for measurement and control functions as well as process control in swimming pool water treatment applications. With the patented CEDOX-procedure from Siemens Water Technologies it is for the first time possible to control the chlorine set point in dependence from the water quality. Its modular design allows the DIN 19643 compliant system to be fitted with analyser modules capable of measuring and displaying up to 7 parameters.

General

Measurement and control instruments for monitoring the hygiene parameters of free chlorine, pH-value and redox voltage are nowadays state-of-the-art technology. With its new DEPOLOX® Pool system, Siemens Water Technologies goes one step further and offers, in addition to the conventional standards, sensors for combined chlorine, total chlorine, conductivity, temperature and feed rate display, for example for gas feeders.

To adapt the DEPOLOX® Pool system as quickly as possible to the prevailing pool conditions, the customer can choose between several processadapted applications, for example electrolyzers or chlorine gas feed systems.

Through its integral process control the DEPOLOX® Pool provides total pool management.

Depending upon the applications the following functions can be selected.

- Dosing of disinfectant:
conventional or CEDOX-controlled
- Adjustment to the volume flow
- pH correction
- Control of PAC of UV disinfection systems
- Addition and calculation of flocculant demand (volume flow or pH control)

The start-up and exchange of sensor modules is user-friendly and could not be easier. The "Plug & Play" principle used makes an exchange simple and ensures that the modules are automatically recognised by the electronics.

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Benefits

- DIN contact to DIN 19643
- CEDOX-control possible
- Adjustment to reduced volume flow (economic mode)
- Two separate controller adaptations for standard and economic mode
- Timer controlled super chlorination
- control of flocculant and powdered activated carbon systems and UV disinfection units
- Automatic infrared calibration
- Easy connection to web technology via ChemWeb server



Design and function

The DEPOLOX® Pool system comprises of the main components of the electronic, the flow cell assembly and sensor modules.

The electronic module's prime role is the process management and visualisation by processing the measured data. Various controller outputs, alarm contacts and integral safety functions are provided.

The controller outputs for electric positioners, metering pumps, pulse pumps as well as analog signals (mA) can be easily configured in the set-up menu.

The alarm contacts are freely configurable. A multiple assignment of events, i.e. a general alarm for the monitoring of limit values, sample water failure etc., is also possible.

Integral safety functions:

- Safety shutdown in the case of circulating pump failure and/or supply-tank-empty-alarm (external stop), sample water failure
- Feed time monitoring, feed time delay

The flow cell assembly enables the simultaneous installation of up to 5 water hygiene sensors and guarantees a stable measurement signal by:

- Rugged 3-electrode chlorine sensor
- Constant sample water flow controlled by a flow valve
- Quartz grit hydromechanical cleaning of the chlorine sensor's measuring electrodes
- Optimised flow against all sensors

The "multi-sensor" integrated in the flow cell assembly monitors the constant sample water flow, measures the sample water temperature and includes protection against external electrical noise.

Economic mode

The transition into economic mode is communicated to the electronics module. Specially programmed control parameters ensure that in Economic Mode an optimal continuous control takes place.

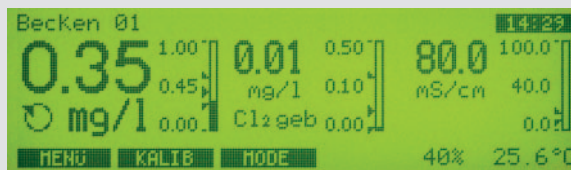
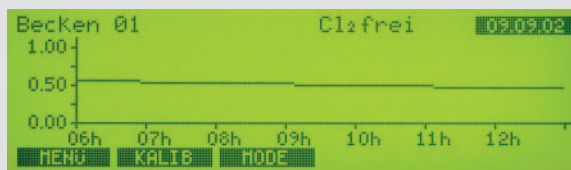
CEDOX-control

The patented CEDOX-(Chlorine-Redox) control, an optimised chlorine residual control, allows addition of as little chlorine as possible but as much as necessary considering the redox voltage. This ensures an especially economical use of chlorine or chlorine products. Chlorine addition can of course also be conventionally controlled.

DIN contact

When the hygiene parameters required by DIN 19643 "Treatment of swimming pool water" are met, this information is transmitted via the DIN contact to the swimming pool's control desk.

The volume flow can now be reduced, if considered useful. This "Economic Mode" is mainly intended for night-time operation or for periods of low frequency.



Display

The back-lit graphic display shows all parameters simultaneously. Their respective limit values are visualised by bar graphs. The measuring point's description (e.g. name of pool) can be entered in the display and is consequently maintained during the whole data logging and communication process. All measured data is continuously recorded. A line graphic gives an overview for up to 4 parameters over the past 7 days.

Integral controller

The DEPOLOX® Pool system operates according to specially developed control algorithms for the control of metering equipment.

| | Cl ₂ | pH | mS |
|---|-----------------|----|----|
| Electronic positioner without feedback signal | X | X | |
| Electronic positioner with feedback signal | X | | |
| Solenoid diaphragm metering pump | X | X | X |
| Metering pump | X | X | X |
| Continuous positioners | X | X | |

For monitoring the maximum permissible combined chlorine limit a release contact for starting a powdered activated carbon system or a UV disinfection unit is provided.

Setting of the chlorine control parameters is enhanced by an adjustment programme. This feature eliminates timeconsuming manual adjustments that can last several days. The programme automatically computes optimised control parameters and thus ensures a high-quality control.

Feed rate display

Direct feed rate control of gas feeders can be achieved via a feedback system from the electric positioner and their feed rate be accurately indicated. Compensation is automatic.

Sensor measuring modules

A measuring module comprises of a sensor, a sensor cable and a pre-calibrated and tested card. The special cable is designed for a water-proof cable bushing.

Sensor measuring module for free chlorine:

Rugged 3-electrode DEPOLOX® Pool chlorine sensor with integral electrolyte salt supply.
Potentiostatic 3-electrode amperometric system
Measuring range 0 to max 20 mg/l, scale freely selectable
Resolution up to 10 mg/l – 0.01 mg/l
Resolution up to 20 mg/l – 0.1 mg/l
Temperature compensation 0 – 50 °C
Sensor plug connection IP 67

Sensor measuring module for total chlorine:

Potentiostatic 3-electrode amperometric system, Membrane-covered (pressureless)
Measuring range 0 to max 20 mg/l, scale freely selectable
Resolution up to 10 mg/l – 0.01 mg/l
Resolution up to 20 mg/l – 0.1 mg/l
Temperature compensation 0 – 45 °C
Sensor plug connection IP 67
Applicable for salt water pools with up to 4 % salt concentration

Combined chlorine:

The measured value of combined chlorine (chloramine) is calculated and displayed by the DEPOLOX® Pool as the difference between total chlorine and free chlorine.

Range displayed 0 to max 20 mg/l, scale freely selectable
Resolution up to 10 mg/l – 0.01 mg/l
Resolution up to 20 mg/l – 0.1 mg/l

Sensor measuring module for pH-value:

Measuring range 0 to 5 pH ... 9 to 14 pH,
Scale freely selectable in 1 pH steps
Resolution 0.01 pH
Temperature compensation 0 – 50 °C
Sensor plug connection IP 67

Sensor measuring module for redox voltage:

Measuring range 0 to 400 mV ... 500 to 1000 mV,
Scale freely selectable in 100 mV steps
Resolution 1 mV
Sensor plug connection IP 67

Sensor measuring module for conductivity:

Measuring 10, 20, 50, 100 mS/cm
Resolution 0.1 mS/cm
Can be switched over to NaCl display in mg/l and %
Temperature compensation 0 – 50 °C

Sensor for temperature:

With the integral Pt 1000 temperature sensor the temperature of the sample water is measured and used for the temperature compensation of the chlorine and pH-value measurement.
Measuring range 0 to 50 °C
Resolution 0.1 °C



Electronic module

Display:

Back-lit LCD graphic display
Resolution 240 x 64 Pixel

Measuring inputs (max.):

For sensor measuring modules
1 x chlorine (free)
1 x chlorine (total)
1 x pH-value
1 x Redox voltage
1 x conductivity

Integrated features:

1 x temperature Pt 1000
1 x feed rate display (feedback signal of positioner)

Digital inputs:

1 x digital input of sample water monitor
1 x external stop, e.g. circulation pump monitor
1 x freely selectable, e.g. controller stop, mode change-over, second set point of parameter

Output contacts:

For max. four freely selectable alarm contacts/general alarm signal as well as controller outputs for free chlorine, combined chlorine, pH-value and conductivity.

Special output contacts:

1 x for flocculant metering
1 x for DIN contact for release of economic mode
Each output contact is visualised by a signal LED
Max. 1240 VA up to 250 V AC
Max. 150 W up to 220 V DC

Analog outputs (optional):

4 x 0/4 ... 20 mA, freely configurable
Ohmic load ≤ 1000 Ohm
Accuracy < 0.5 % FS
Galvanically isolated up to 50 V relative to earth

Interfaces:

RS 232 for direct control of printer or configuration download or firmware update

RS 485 for connection to

- ChemWeb server
- OPC server data access V 2.0
- CMS software

Infrared-interface for remote calibration via the Wallace & Tiernan P42 *i-cal* photometer

Power supply:

115/230 V ± 10 %, 50 – 60 Hz,
max. 30 VA oder 24 V DC, max. 2 A

Ambient temperature: 0 ... 50 °C

Enclosure: IP 67

Tests and marks:

Conform to CE (89/336/EEC)
EMC tests to EN 61326
Electric safety to EN 61010

Weight (incl. packing): 5.5 kg

Dimensions of electronic module (W x H x D):

320 x 310 x 175 mm

Flow cell module

The flow cell module is arranged in a plastic housing. The transparent flow body provides a good visual check of all sensors used. Up to 5 sensors, pressureless or pressurized (*), can be installed.

The following components are integrated in the flow cell module:

Flow control valve:

- Controlled sample water flow: 33 l/h
- Control range 0.2 ... 4.0 bar at valve inlet
- Maximum back pressure: From pressureless up to 1.5 bar at valve outlet
- Maximum sample water temperature: 50 °C

"Multi-sensor":

- Monitoring of correct sample water flow switching point:
18 l/h \pm 3 l/h
hysteresis: 2 l/h
- Measurement of sample water temperature by Pt 1000 sensor
- Protection against external electrical noise by a stainless steel sleeve (earthing of sample water)

Additional functions:

- Sample water tapping
- Isolating valves at sample water inlet and outlet of the flow block module in pressurized design
- Ball check valve at sample water inlet
- Simple cell drain assembly
- Integral bracket for sensor/buffer solution of calibrating instruments

Sample water connections:

PVC hose 6 x 3 mm or

PE hose 6 x 1 mm

Hose connectors on W&T 1/2" union

Weight (incl. packing): approx. 2 kg

Dimensions (W x H x D): 215 x 375 x 155 mm

* provided sensors are suitable for operation under pressure



Flow control valve and Multi-Sensor



Infrared calibration with time-stamp function

Infrared calibration

In addition to the conventional calibration of analysers the DEPOLOX® Pool provides calibration with IR time-stamp function. When combined with the infrared photometer P42 *i-cal*, the manual calibration of the chlorine value stipulated in DIN 19643 takes place with this timestamp function, simultaneously with zero calibration.

For detailed information see

WT.050.308.IE.PS

Potential connections

CMS 3.0

Via the proven Wallace & Tiernan CMS visualisation software the DEPOLOX® Pool data can be visualised, recorded and processed under Windows.

For detailed information see

WT.040.501.IE.PS

SECO-S7

The Wallace & Tiernan SECO-S7 software enables serial data coupling to Siemens Simatic S7 300 controllers.

For detailed information see

WT.040.520.DE.PS

OPC-Server data access V2.0

Simple connection to superimposed visualisation systems via Wallace & Tiernan OPC Server Data Access V2.0

For detailed information see

WT.040.510.IE.PS

ChemWeb-Server

Simple connection to Web technology via the Wallace & Tiernan ChemWeb-Server. Complete display and operation of the DEPOLOX® Pool unit via pre-defined Internet pages.

For detailed information see

WT.040.525.IE.PS

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