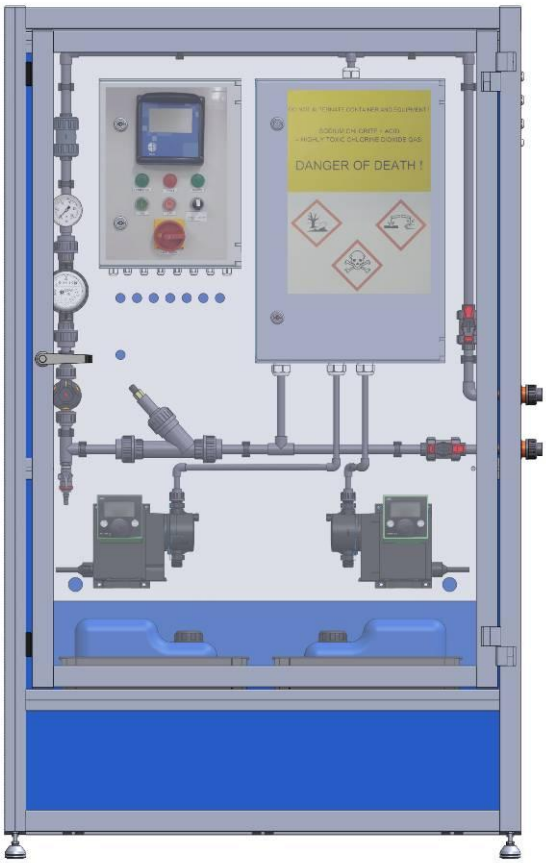
HYDRO **DOS**®
Chlorine dioxide system
HD 550 G – WRAS-Certification



Application

HYDRO **DOS**® HD 550 G chlorine dioxide systems can be used for disinfection of drinking, process, cooling and air-conditioning water.

- Elimination of odour and flavouring substances
  > no formation of malodorous substances
- Inhibition of algae growth in open storage systems
- Combating slime in cooling systems and open circuits
- Disinfection of filter and ion exchange systems
- Disinfection of ammonium-containing waters possible

  > a reaction with these substances doesn't take place
- Elimination of bio films in pipeline systems
- Combating legionella and rehabilitation of contaminated systems
- Disinfection within a wide pH-range

Design and process

The HYDRO **DOS**® chlorine dioxide system is designed as cabinet. Disinfection takes place in side stream process.

A chlorine dioxide solution is generated in the reaction vessel consisting of the substances hydrochloric acid (9%), sodium chlorite (7.5%) and drinking water.

The dosing of chlorine dioxide takes place proportional to water flow respectively dependent on the chlorine dioxide volume of the feed water.

Measurement equipment (chlorine dioxide and flow rate measurement) is provided for system monitoring.

The system is designed and controlled so that a safe operation is possible in all operating states.

Advantages

- Removes existing bio films.
- Prevention of new formation of bio films in case of continuous dosing.
- Chlorine dioxide is allowed according to drinking water regulation.
- Chlorine dioxide is resistant to water. A surplus of chlorine dioxide will last over a long time so that even in case of an broad pipe network the concentration of chlorine dioxide can be kept up to the line ends.
- Chlorine dioxide has a higher disinfecting efficiency than chlorine. Chlorine dioxide has excellent antibacterial properties.
- Chlorine dioxide has also an effect on bacteria, spores and viruses which are resistant to chlorine.
- Chlorine dioxide has an oxidizing but not a chlorinating effect.
- Energy cost reduction compared to thermal disinfection.
- No additional scale precipitation in pipe system and heat exchanger.
- The redox potential of chlorine dioxide in drinking water remains the same regardless of the concentration of ammonium in water.

Function

A chlorine dioxide solution becomes automatically generated in the HYDRO **DOS**® chlorine dioxide generator system with the chemical substances hydrochloric acid (9%) and $NaClO_2$ (7.5%), diluted with drinking water.
Concentration of chlorine dioxide solution amounts to a maximum of 20 g/l.

The disinfection of the drinking water is in accordance with side stream process. A partial (side) flow is conducted from the consumer line through the chlorine dioxide generator system.

The concentration of chlorine dioxide becomes distinctly diluted. Dosing takes place quantity-proportional and the volume of chlorine dioxide is permanently observed by means of the integrated chlorine dioxide measuring probe.

According to the German drinking water regulation only 0.2 mg/l maximum of chlorine dioxide are allowed to be in the water from consumers.

The observation of water flow rate becomes reported to the control. The contact transmission of the water meter can be via several ways: contact water meter / magnetic-inductive flow meter / ultrasonic flow meter.

The concentration of chlorine dioxide becomes permanently observed via the integrated chlorine dioxide measuring probe.

System components

HYDRO **DOS**® generator system consisting of:

- Installation cabinet for integration of the chlorine dioxide generator system. Profile frame girders made of PVC. Lockable door with transparent plastic glass.
- Reactor vessel installed in the reactor cabinet.
- Activated carbon filter for aeration and ventilation of the reactor cabinet.
- 2 x HYDRO **DOS**® dosing pumps for precise dosing of the original chemicals into the reactor vessel for generate the chlorine dioxide solution.
- Flow rate and pressure control.
- Isolation valves, non-return valve.
- Measuring and control device for monitoring the chlorine dioxide concentration in feed water.
- Microprocessor control accommodated in control cabinet.

The system is provided with a microprocessor control with integrated measuring amplifier and PID controller for volume proportional or measure value controlled chlorine dioxide dosing.

Notes / Installation conditions

- The combination of chlorine dioxide with other disinfectants is not allowed.
- Technical data and general technical standards as well as local installation conditions must be observed.
- According to DIN 1988 part 4 a safety against backflow (system separation) must be provided.
- The ambient temperature as well as possibly occurring radiation heat must not exceed 40° C. Direct sunlight must be prevented.
- The installation site has to be frost-resistant. The unit must not be installed outdoors.
- The installation site has to be free from solvent, colorant, varnish and chemical vapours. Good room ventilation must be ensured.
- The electrical connection must be carried out in accordance with the latest VDE regulations for electrical installations and according to the instructions in the electrical schematic. On-site feed pipes must be dimensioned according to the system performance.
- A floor drain must be provided. For discharge of waste water the locally valid regulations must be absolutely observed.
- The chlorine dioxide generator system must be placed on an even and stable floor.
- The installation site has to fulfil the accident prevention regulations and the room must not be used permanently as recreation room.
- A protection against access by unauthorised personnel must be provided. The installation site must be fireproof isolated from other rooms.
- A separate storage room/place must be provided for full and empty chemical tubs.
- In case of a heavy impact of the pipeline network due to bio films a disinfection flushing is recommended prior using the chlorine dioxide generator.
- Installation and pipeline materials must be checked for resistance to chemicals and corrosion.
- The use of a gas detector is recommended (see category accessories)

Accessories

- HYDRO **FIL**® fine filter for pre-filtration of the drinking water.
- System separator for protection of drinking water systems according to DIN 1988.
- Contact water meter / Magnetic inductive flow meter (MID) or ultrasonic flow meter for measuring the water flow rate.
- Digital photometer for regular control of the concentration of chlorine dioxide at extraction points.
- Protective equipment for personal protection in connection with chlorine dioxide generation systems.
- Basic material hydrochloric acid (9%)
  Tank: 25 kg
- Basic material $NaClO_2$ (7.5%)
  Tank: 25 kg
- Neutralising agent chlorine dioxide
- Caution label chlorine dioxide
- Gas sensor + processing unit for monitoring the room air for chlorine dioxide concentration

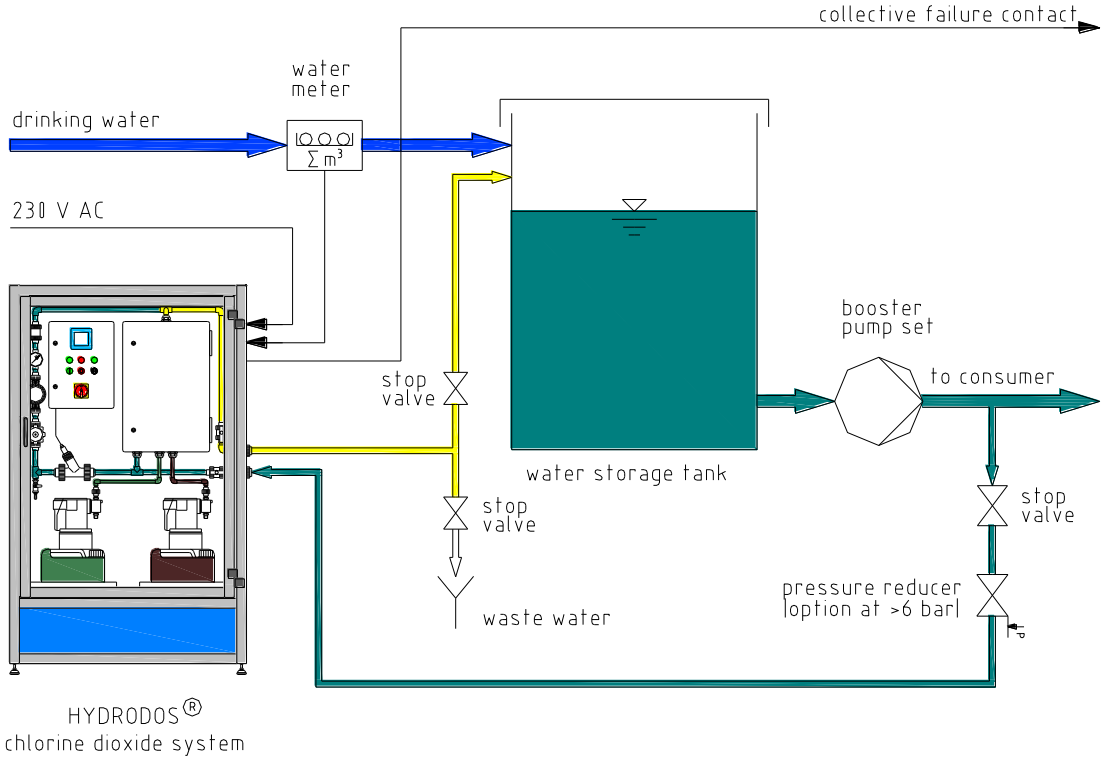
Technical data

HYDRO DOS® Chlorine dioxide system		
Water feed (input / output)		DN 15 / DN 15
Mains electrical connection		230 V / 50 Hz AC
Power input (min./max.)	VA	20 / 500
Protection type		IP 54
Operational pressure	bar	2.0 – 6.0
Water temperature	°C	5 – 30
Ambient temperature	°C	>10 – 40 (no direct sun radiation)
Relative humidity		70 % (not condensing)
Dosing pumps	l/h	6
Max. pressure	bar	10
Chlorine dioxide preparation efficiency	g/h	215
Chemical consumption		
Hydrochloric acid (9 %) DIN EN 939 Consumption max.:	l/h	6
Sodium chlorite (7.5 %) DIN 938 Consumption max.:	l/h	6
Max. water flow	l/h	300
Reactor vessel volume	litres	0.92
Concentration chlorine dioxide solution		Reactor output: 20 g ClO_2/l After dilution: 0.1 – 2.5 g ClO_2/l
Height ca.	mm	1790
Width ca.	mm	1120
Depth ca.	mm	530
Weight ca.	kg	120

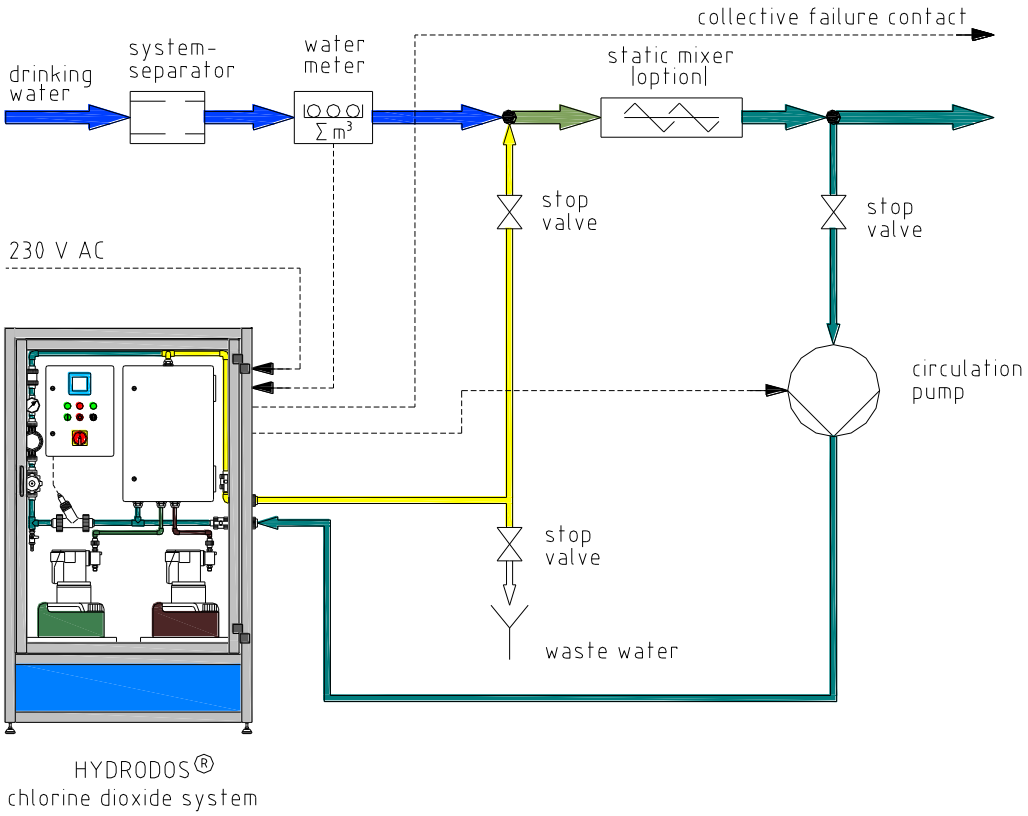
Electrical connections:

- Power supply 230 V / 50 Hz
- Contact input – water meter
- BMS contacts
  Collective failure record – volt-free alternating contact
  Signal contact maintenance – volt-free lock (max. load 8 A / 230 V)

Installation example 1: HYDRO **DOS**® HD 550 G
Installation in a bypass pipe (water storage tank local)



Installation example 2: HYDRO **DOS**® HD 550 G
Installation into local drinking water pipe



Dimensions and connections