DIOX-A 5000
CHLORINE DIOXIDE GENERATOR

WALLACE & TIERNAN® PROCESS SYSTEMS

The chlorine dioxide generator DIOX-A 5000 is available in three sizes. It generates either 1000, 2500 or 5000 g/h chlorine dioxide in the two-chemical process. Concentrated solutions of sodium chlorite (24.5 % $NaClO_2$) and hydrochloric acid (30 – 38 % HCl) are used. An aqueous chlorine dioxide solution is prepared and transferred into the product tank. The concentration can be adjusted in the range of 1.5 to 3.0 g/l. Internal process regulation keeps the required concentration of the stock solution constant.

RANGE OF APPLICATIONS

- Drinking water: disinfection, oxidation of iron and manganese, removal of odour and taste causing compounds, prevention and elimination of legionella, residual disinfection of distribution networks
- Industry: disinfection of process and product water, prevention and elimination of legionella, control of biofilms, treatment of coolant
- Waste water disinfection and odour control

FEATURES

- Applicable for disinfecting drinking water (in accordance with the German Technical and Scientific Association for Gas and Water (DVGW) guidelines W624/W224) and Ö-Norm M-5879-3
- Integrated collecting basin with leak sensor and vent gas aspiration injector
- Simultaneous supply to several points of application out of the product tank possible
- Optional integrated booster pump for the operating water supply

Chlorine dioxide is a very effective disinfectant and oxidizing agent, excellent at destroying odours. It has been found to be superior to chlorine as a disinfectant. This chemical can achieve destruction of organic substances such as bacteria,

Key Benefits

- Inherent safe operation as a result of the double injector for chemical aspiration
- Monitoring of temperature and vent gas aspiration in the product tank
- High level of accuracy as a result of V-notch control of the precursors
- Process-related consistently high quality of the prepared solution
- User-friendly colour touch panel
- Wide-ranging connection options (e.g. PROFIBUS® DP)

spores and viruses which are not attacked by chlorine. When applied at the same concentration, chlorine dioxide is more effective than chlorine. One of the exceptional properties of chlorine dioxide is that its use does not result in the formation of undesirable trihalomethanes (haloforms) or chloramines. Chlorine dioxide oxidizes unpleasant odour compounds and tasting substances found in water such as phenols, algae and their decomposition products, and converts them into odour-neutral and neutrally tasting substances.

Chlorine dioxide does not react with ammonia or ammonia compounds. This is an important difference when compared with chlorine which forms chloramines, which in turn may have a negative influence on disinfection and the taste of treated water. Contrary to chlorine, the biocidal effectiveness of chlorine dioxide does not decrease when the pH value increases but remains steady instead. Chlorine dioxide has a very high persistence in water. After the oxidation process, chlorine dioxide is capable of maintaining an active residual for a long time. Therefore an active residual can be retained in extended distribution systems and reservoirs, effectively preventing bacterial regrowth in the water. Sodium chlorite solution and hydrochloric acid are diluted with water in the generator, before they react with each other. The chemical equation of this reaction is:

$5\ NaClO_2 + 4\ HCl \rightarrow 4\ ClO_2 + 5\ NaCl + 2\ H_2O$

Sodium chlorit + hdrochloric-acid → Chlorine dioxide + sodium chloride + water

HOW IT WORKS

The precursor chemicals, hydrochloric acid and sodium chlorite are simultaneously aspirated using a common flow rate controlled injector, diluted with water and combined. As a result of this inherently safe operational mode, the concentrated chemicals cannot be mixed and react in the undiluted state. The flow rate control in the aspiration lines means that level differences in the tanks of the basic chemicals have no influence on the process. Expensive reagent transfer equipment is not required.

A reaction tank designed according to DVGW W 624 ensures a max. conversion rate to chlorine dioxide. As a result of the constant supply to the reactor a consistently high quality of the prepared solution is achieved at all times.

The generator works intermittently depending on the filling level of an external storage tank. During the filling process the displaced air-gas mixture is aspirated by a vent gas aspiration injector. For safety reasons, the gas phase in the product tank is permanently monitored with regard to temperature.

The chlorine dioxide system is available with an optional integrated booster pump.

All flow rates are continuously measured and can be displayed on the touch panel. The control system continuously monitors and regulates the preparation process.

TECHNICAL DATA

Chlorine dioxide preparation capacity	1000 g/h	2500 g/h	5000 g/h
Flow sodium chlorite solution	6.6 l/h	16.5 l/h	33 l/h
Flow hydrochloric acid solution	6.6 l/h	16.5 l/h	33 l/h
Power supply (without booster pump)	1/N/PE AC 230 V 50 Hz		
Power supply (with booster pump)	3/N/PE AC 400/230 V 50 Hz		
Power consumption (without/with booster pump)	0,3 kVA / 4,1 kVA		
Enclosure rating	IP 54		
Dimensions (W x H x D)	1350 x 1880 x 790 mm		
Weight (without/with booster pump)	190 kg / 240 kg		
Safety equipment	Shut-off valve for operating water feed, shut-off in the event of power failure, critical faults like leaks or an overflowing product tank, monitoring of the vent gas aspiration in the product tank		

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