ELAP – Electrolytic Ozone Generator

- High safety versus recontamination through highly effective, systemic protection
- Generation of ultrapure ozone directly from water (in-situ) using solid electrolyte cell (PEM technology)
- High ozone concentrations, precisely dosable with analytically based display of the ozone production rate*
- Modular system (1.5 up to 5 gO_3/h per cell), up to 40 gO_3/h (1 master and 7 slave units)
- Integrated ozone analysis with extensive, internal data logging**, Safe-Logic***
- CE, UL (in preparation), materials/sealings according to FDA (CFR) title 21, paragraph 177.1550
- Economic and environmentally friendly method

For continious disinfection of cold purified water storage and distribution systems

UNIT DESCRIPTION

Electrolytic ozone generator for permanent or discrete disinfection of cold purified water storage and distribution systems (systemic protection). Ozone is generated directly from purified water. The construction of the **ELAP** allows fully automatic and low-maintenance operation. Electrolytic ozone generation guarantees high ozone input and high ozone concentrations in water without complex supply of feed gas. Information regarding process technology can be found in the current ISPE guideline “Ozone Sanitization of Pharmaceutical Water Systems”.

The ozone generator consists of a power supply and an electrolysis cell made of stainless steel, pure titanium and PTFE which is installed separately.

- Power supply galvanically isolated, short-circuit proof with color LCD touchscreen
- Silent operation through fanless construction, protection class IP65
- Expendable through modular design
- Quick, easy maintenance and exchange of components possible
- Power supply is downwards compatible to all earlier versions of the ozone cell (1, 2, 3 and 4 gO_3/h)
- Free configurable alarm outputs
- Automatic logging of operation states and alarms
- Cell unit with 7 internal sensors and LCD display
- New cell design with an increased ozone generation rate of 5 gO_3/h
- Extensive process system monitoring through Safe-Logic***

APPLIKATIONEN

- PW (purified water/aqua purificata)
- HPW (high purified water/aqua valde purificata)
- WFI (water for injection/aqua ad injectabilia)
- and similar process water qualities e. g. in the cosmetics- and semiconductor-industry as well as bio- and medical technology

* Optionally, the ozone production can be monitored by two integrated and independently working ozone sensors

** Supportive for the service is the storage of the operating conditions (for example, alarms) and sensor data by event and time interval

*** Used for error analysis in case of technical defects and the plausibility check of internal process sensor data (Firmware updates enable future process knowledge to contribute)

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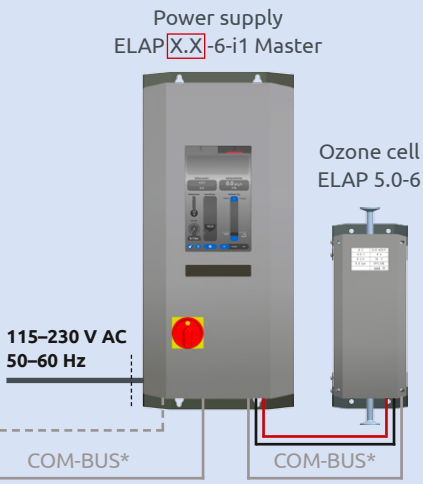
MODULAR SYSTEM

Master complete unit (obligatory for first generator): **ELAP X.X-6-i1 Master**

consisting of:



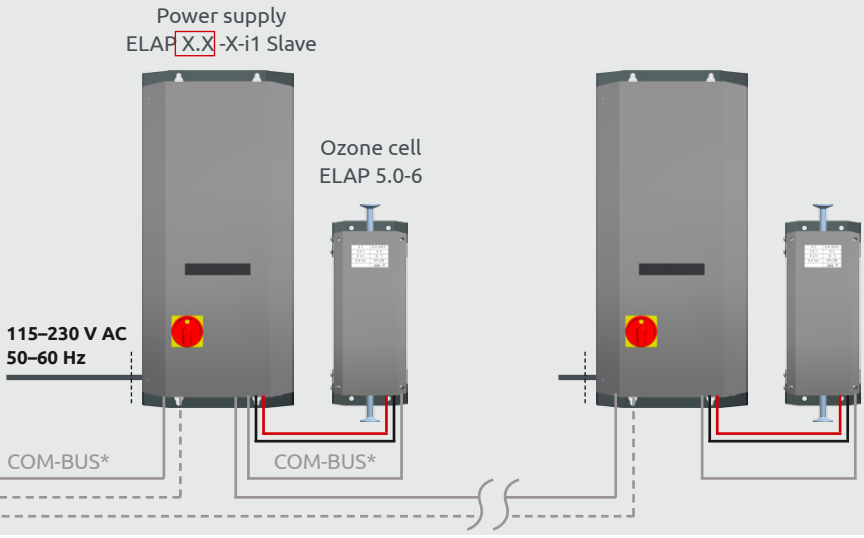
Typ	≙	Ozone prod.
1.5	≙	1,5 gO₃/h
3.0	≙	3,0 gO₃/h
4.0	≙	4,0 gO₃/h
5.0	≙	5,0 gO₃/h

External control option

- **Power 0…100 % 4…20 mA DC**
- **Remote-on/off**

Slave extension for up to 7 additional ozone generators: **ELAP X.X-6-i1 Slave**

consisting of *(same or different types)*:

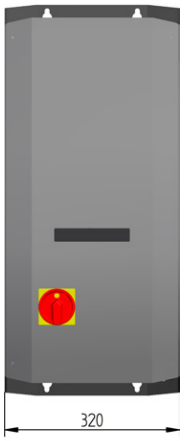


* Data line for internal communication

Ordering examples for components/spare parts	
Ozone cell, single:	ELAP 5.0-6
Master power supply for 1,5 gO₃/h:	ELAP-1.5-X-i1 Master
Slave power supply for 5,0 gO₃/h:	ELAP-5.0-X-i1 Slave

Ordering examples for complete unit	
Master unit + Ozone cell for 4,0 gO₃/h	ELAP-4.0-6-i1 Master
Device combination for 12 gO₃/h (example)	1 × ELAP-4.0-6-i1 Master 2 × ELAP-4.0-6-i1 Slave
Device combination for 14 gO₃/h (example)	1 × ELAP-5.0-6-i1 Master 1 × ELAP-5.0-6-i1 Slave 1 × ELAP-4.0-6-i1 Slave

POWER SUPPLY



Type:	ELAP X.X-6-i1 Master	ELAP X.X-6-i1 Slave
Output power:	current controlled 0…6 VDC 0...45 A max. 250 W (for ELAP 5.0)	
Display and control:	10'' touch display operating language switchable: English, German, others on request emergency operation via 7 segment display and magnet switches	operation through master unit emergency operation via 7 segment display and magnet switches
Input for remote on/off (1x per ozone cell):	via normally open contact (24 VDC/0.1 A)	
Input 4...20 mA for (1x per ozone cell):	ozone output control	
Potential-free signaling contacts for: (48 VDC / 1 A) (1x per ozone cell)	common alarm 1 (freely configurable) common alarm 2 (freely configurable) feedback ozone production rate	
Outputs 4...20 mA for: (1x per ozone cell)	cell voltage cell current	
Operating temperature:	0…40°C	
Humidity:	max. 90 % at 25 °C without condensation	
Protection class of the power supply:	IP 65 (DIN 40 050 IEC 529 respectively EN 60 529 / 10.91)	
Electrical protection class:	class I, protective grounding (acc. to DIN 57 100 respectively VDE 0100 and 0106 T1)	
Emergency power supply: (1x per ozone cell)	via battery, min. capacity 48 h, tool-free mounting of battery and charging connection	
Power input:	100…250 V AC, 50/60 Hz 1,5 gO_3/h: 250 VA 3,0 gO_3/h: 300 VA 4,0 gO_3/h: 350 VA 5,0 gO_3/h: 400 VA	
Thermal Design Power (TDP)	approx. 0,1 kW (ELAP 5.0)	
Power factor:	> 0,95	
Casing material:	Stainless steel/galvanized steel powder coated RAL 9022, aluminum black anodized (heatsinks)	
Weight:	max. 25 kg (ELAP 5.0)	

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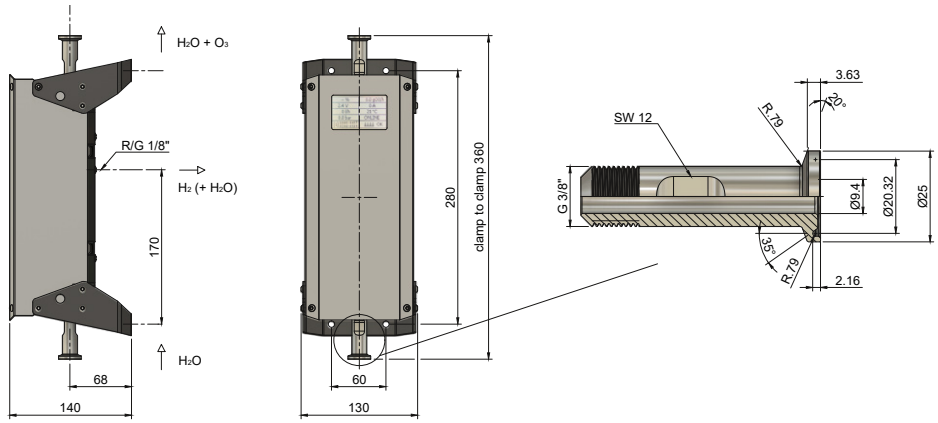
OZONE CELL



Type:	**ELAP 5.0-6**
Ozone production rate:	max. 5,0 gO_3/h
Casing material:	Stainless steel/galvanized steel powder coated RAL 9022
Materials and seals: (wetted)	DIN EN 10 027 stainless steel 1.4571 (AISI 316Ti), pure titanium 3.7035 (AISI Ti Grade 2), PTFE, FEP (materials according to FDA (CFR) title 21, paragraph 177.1550
Number of cells per unit:	1
Ozone concentration (in water):	determined by flow rate
Water flow rate (through cell) during standby:	periodically filling of the ozone cell or permanent very low flow rate (the ozone cell shall be filled with water at any time!)
Water flow rate (through cell) during operation:	approx. 100…250 ℓ/h (150 ℓ/h nominal)
Water quality:	demineralized, conductance value < 10 µS/cm, deviating qualities on request (aqua purificata or similar specification)
Water temperature:	approx. 15…25 °C
Operating temperature:	< 50 °C, nominal 30...40 °C
Humidity:	max. 90 % at 25 °C without condensation
Temperature measuring:	display range 0…60 °C (display on touchscreen, sensor integrated)
Flow rate measuring:	display range 50…300 ℓ/h (display on touchscreen, sensor integrated)
Pressure measuring:	display range 0…10 bar (display on touchscreen, sensor integrated)
Conductance value measuring:	alarm when limit is exceeded (display on touchscreen, sensor integrated)
Ozone quantity:	display range 0…5 g/h (display on touchscreen, sensor optionally integrated)
Parameter transfer to power supply:	data bus
Compressibility of the cell (test pressure):	-1…+16 bar
Operating pressure:	-0,9…+10 bar
Pressure loss over the cell:	max. 400 mbar at 150 l/h
Purified water connectors:	clamp connection 3/8“ 25mm following ASME BPE, others on request
Connection for hydrogen separation:	R/G 1/8“
Accumulated hydrogen gas:	proportional to output rate, approx. 19 Nℓ/h (at 5.0 gO_3/h)
Cable length:	standard 5 m (other lengths on request)
Weight:	approx. 4 kg