



IGBT

MODULAR

HARMONICS

VALUE

← Applications

- The MODIPAC™ modular power supply units are used by Ozonia for their extensive range of ozone generators.
- Essentially, this range has been developed to replace the old rectification and inverter technologies based on thyristor components



The MODIPAC™ product is the latest development of modular power supply units for Ozonia's ozone generators. The main feature of the new PSU is an innovative frequency converter based on state-of-the-art Insulated Gate Bipolar Transistor semiconductor technology.

MAIN FEATURES

- State-of-the-art semiconductor technology
- High power factor of 0.99 at the mains means no additional power factor correction equipment is needed
- Because of the unique frequency switching at the mains, a low harmonic content is achieved which fulfils the US standard IEEE 519. This technology improvement makes the expensive 12 pulse power supply units obsolete

- The high voltage transformer is always inside of the PSU cubicle
- The output frequency is matched to the new Ozonia ozone generator technology



MODIPAC™: SPECIFIC TECHNOLOGY

The development of the "Insulated Gate Bipolar Transistors" (IGBT) was a major step forward in semiconductor power technology which was clearly destined to replace existing technologies such as thyristors and associated designs for certain applications. In order to keep abreast with technological development, Ozonia embarked on a development

program which has resulted in the top-of-the-line MODIPAC™ modular power supply systems.

These new power stages can be grouped together in 250kW steps which will provide the necessary power for the ozone generator in question at a frequency of 1450 Hz.

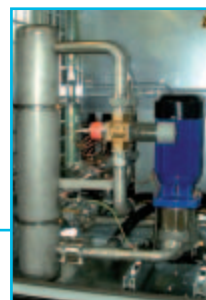
HOW IT WORKS

High voltage is fed to the ozone generator which causes a silent barrier discharge to form in the gap between the earthed steel pipes in the vessel and the dielectrics. When feed gas (either dry air or oxygen) is passed through this gap a portion of the oxygen molecules are converted to ozone.

It is possible to adjust the ozone concentration produced by adjusting the power density and/or the feed gas flow rate.



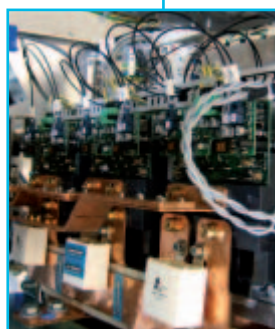
IGBT
Converter



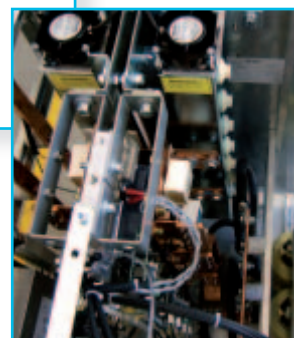
IGBT cooling
water unit



IGBT converter in the workshop



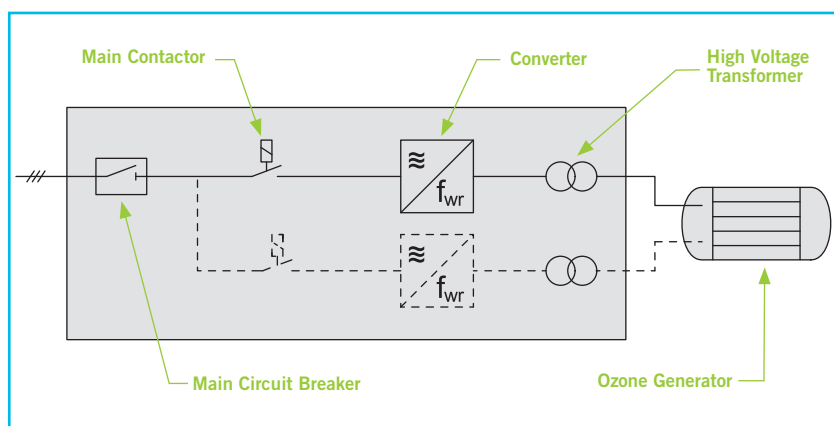
Converter electronics



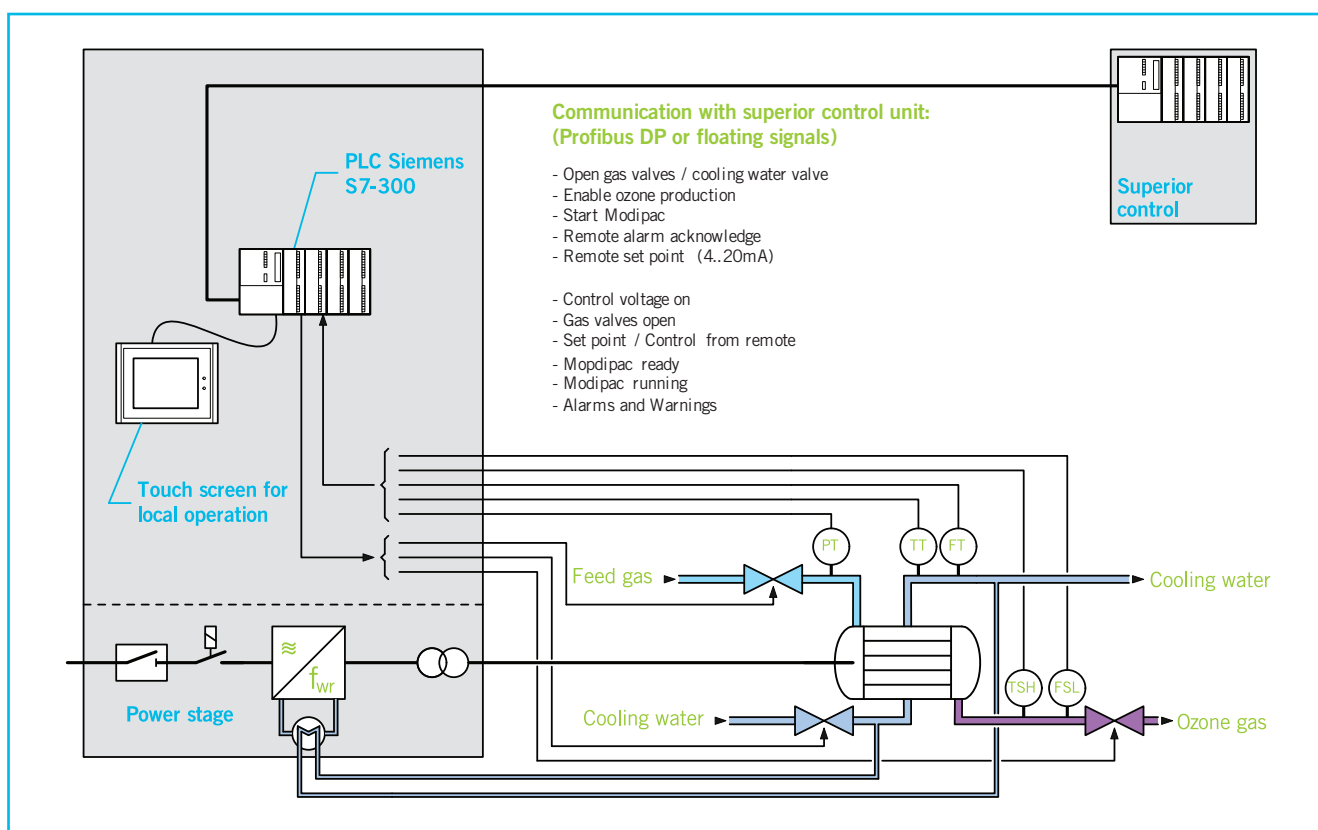
IGBT power packs

MODIPAC™: BASIC FUNCTION

The IGBT converter converts the 3-phase 400/480 VAC, 50/60 Hz mains voltage into the desired single phase voltage at 1450 Hz which is then transformed with the high voltage transformer to the necessary voltage level for the ozone generator. This system is switched in parallel for multiple power stages.



Schematic diagram



► Electrical data

- **Mains power:** 250 kW per module
- **Voltage:** 400/480 VAC
- **Frequency:** 50/60 Hz
- **Mains connection:** 4 wire (3L + PE)

► Cooling water

- **Inlet temperature:** 5 ... 30°C (30°C ... 35°C with PSU power reduction)
- **Flow per stage:** 1.2 m³/h
- **Inlet pressure:** 1.5 ... 2 bar(g)
- **Hardness:** < 3.0 mMol/l
- **Conductivity:** < 500 µS/cm
- **ph:** 6 to 8
- **SS:** < 50mg/l
- **Particle size:** < 0.5 mm
- **Chloride content:** < 100mg/l

► Materials

- **Enclosure:** powder-coated mild steel
- **Components:** copper, aluminium, etc.

► Ambient conditions

- **Temperature:** 5...45°C for operation
(24h average temperature = 35°C, -25°C...+55°C for transport and storage)
- **Altitude:** < 1000 m.a.s.l.
- **Atmospheric Conditions:** DIN 40040 : Class G, generally for location in dust-free, dry environment
- **Humidity:** < 65% annual average, 75% 60 days/year, 85% occasionally
- **Vibration:** vibration-free
- **General:** only for non-aggressive environments
- **Protection:** IP n x 250 – AO : IP20
IP n x 250 – AC : IP54

► Emissions

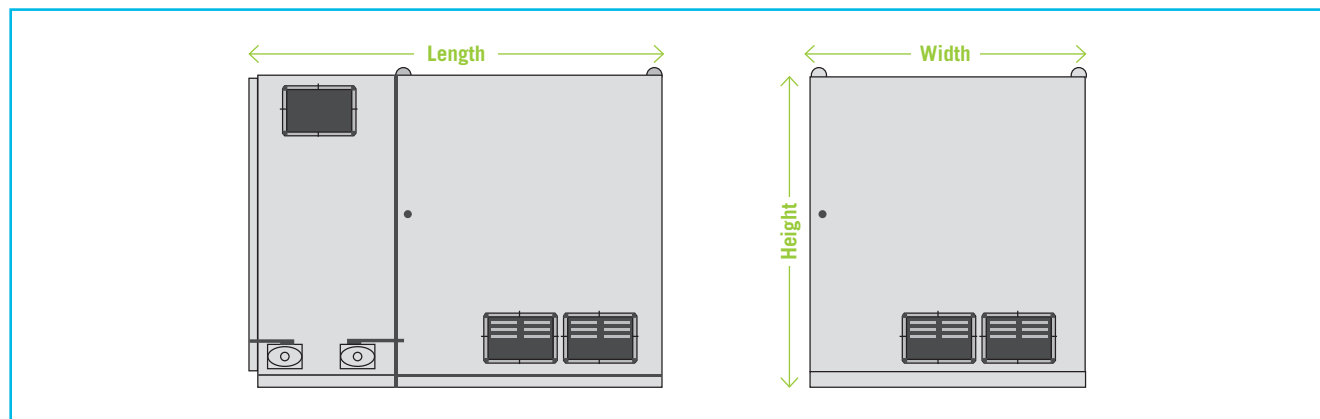
- **Noise:** 95 dB(A) at 1m
- **Heat to air:** 20 kW per stage (open air cooling)
1 kW per stage (closed air cooling)

► Standards

- **Design standards:** SN-EN, IEC, ISO
- **Protection class:** IP 20
- **Conformity:** CE

DIMENSIONS

PSU Model	l x h x w	Weight
	mm	kg
MODIPAC 1x250-AO	1800 x 2000 x 2000	2700
MODIPAC 2x250-AO	3000 x 2000 x 2000	5000
MODIPAC 3x250-AO	4200 x 2000 x 2000	7300
MODIPAC 4x250-AO	5400 x 2000 x 2000	9600



OZONIA QUALITY & CERTIFICATION

Ozonia operates a Quality Assurance System covering all aspects of business activity.

The system is supervised by a QA manager and is subject to

regular internal audits and annual certification by the company Bureau Veritas.



HOTLINE SERVICES

Take-over... and then?

Having placed their trust in Ozonia equipment, it is only logical that clients expect a professional and competent after-sales service plus technical assistance in cases of emergency.

Ozonia has the structure to ensure that clients get the best support.

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