

MICROWAVE GENERATOR

6 kW AT 2450 MHz

SAIREM's latest generation (G4) of microwave generators has been specially designed **for customers' industrial applications and plasma generation**. The 100 % digital architecture makes it a **modern and highly reliable product**, with smart power control.

Multiple features, like the **Automatic Restart Function (ARF)**, and **Preventive Alarm Management (PAM)**, (alarms without stopping the production) are implemented to allow you **to go to the end of your process**, even in case of micro power-cuts.



Finally, SAIREM's comprehensive customer service helps you to **maximize your production yield**, through support and advices.

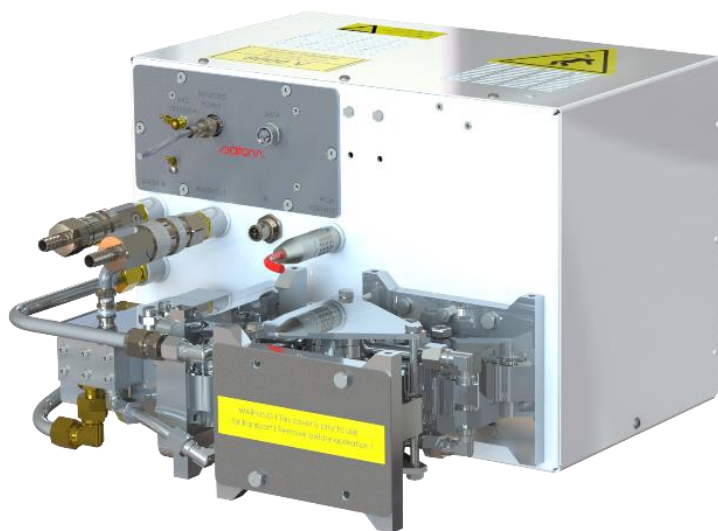
APPLICATIONS

LABORATORY APPLICATIONS

- Microwave-assisted liquid or solid chemistry
- Biochemistry
- Drying
- Sintering
- Melting

PLASMA APPLICATIONS

- CVD and CVD for diamonds
- Plasma generation with surface wave plasma source (Downstream, Surfaguide, Dual-stream ...)
- Nitriding
- Thin film deposition



INDUSTRIAL APPLICATIONS

- Microwave-assisted liquid or solid chemistry
- Drying
- Melting

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KEY BENEFITS

COMPACT 2 MODULES DESIGN

- 6 kW rackable Power Supply (19" 3U)
- 6 kW 2450MHz Microwave Head

BEST IN CLASS RELIABILITY

- **Automatic Restart Function (ARF)** in less than 5 ms, to avoid production stop or loss
- **Environment monitoring:** 35 parameters.
- Custom designed SAIREM magnetron, with high reliability and spectrum stability
- Expected Magnetron **lifespan above 15000 hours**, depending on operating conditions
- **Arc detection** included. One arc input is also available for customer's applicator/process.
- **Preventive Alarm Management (PAM)** that allows the continuation of the production
- **100 % digital design** offers better protection from the electrical network interferences and distortions
- Software compatible with previous generation (no need to change control software)
- **Comprehensive customer service**

CONTROLS

- **7" color TFT touch screen** (option) for easy and efficient control and configuration. Full-screen power display function available to read power easily even far away from the generator.
- Full digital design to allow smart power control.



COMMUNICATION

- **Ethernet connection** for online diagnostic. USB port available to export alarm messages for easy diagnostic.
- Many fieldbus interfaces available
- **Can be ordered without digital display** to save cost. Remote control only, by fieldbus
- Full upgradable USB inlet



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KEY SPECIFICATIONS

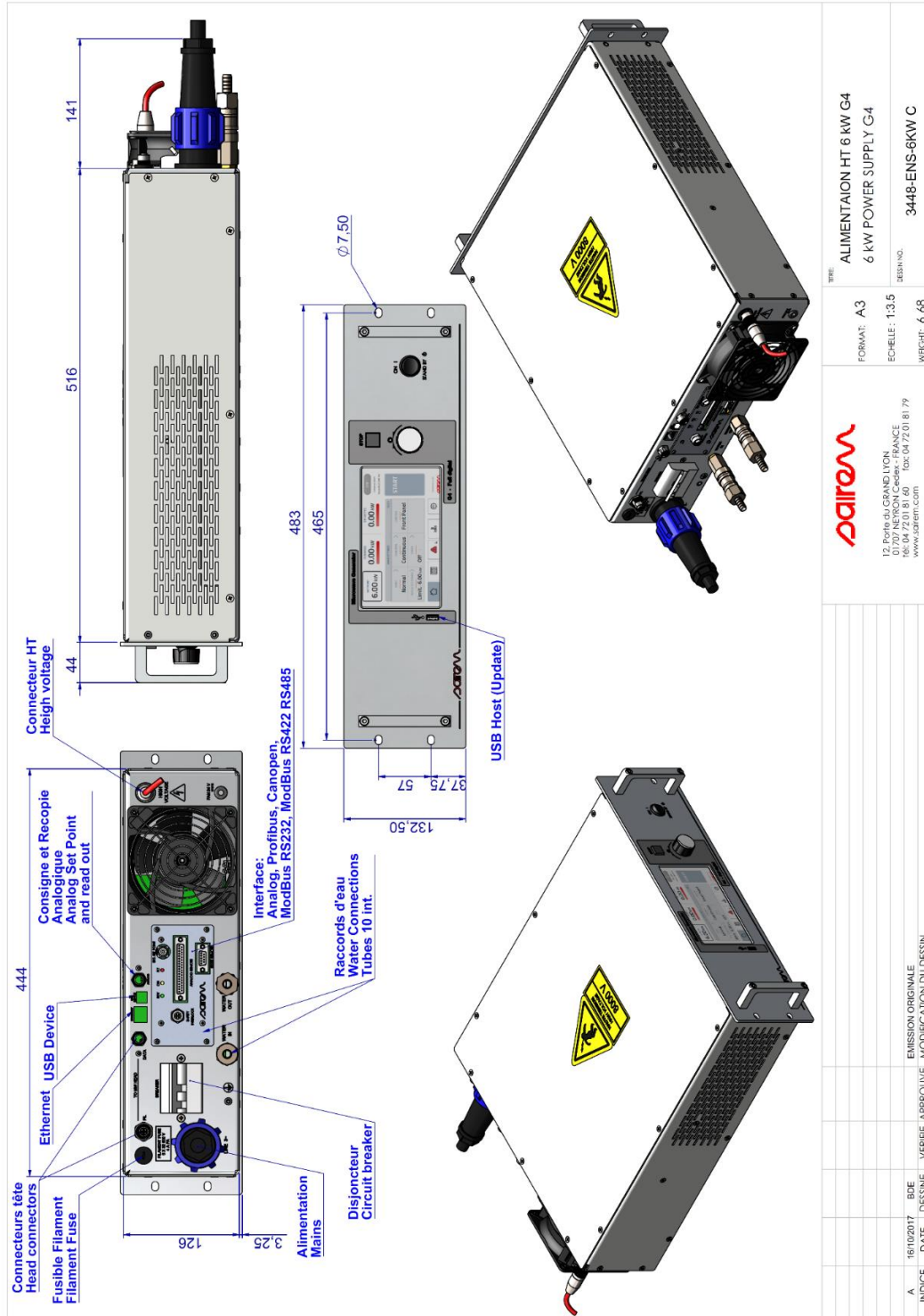
Reference	GMP G4 60K ⁽¹⁾ 56T ⁽²⁾ ⁽³⁾⁽⁴⁾ 3 IR
Presentation	Switch mode Power supply ($\eta > 90\%$) with separate microwave head Connecting cable: 5 m standard length; 2,5 m / 10 m / 15 m / 20 m optional - Other lengths available upon request.
Frequency	2450 MHz \pm 25 MHz
Output microwave power	6 kW adjustable from 10 % to 100 %, with 10 W steps
Power stability	1 % from 10 % to 100 %
Ripple	< 2 % RMS (Root Mean Square) from 10 % to 100 % of nominal power
Parameters	Measure of 35 parameters : output power, reflected power, water temperature, water flow, humidity, inside and ambient temperature, high voltage monitoring ...
Waveguide output	WR340
Maximum reflected power	100% with isolator
MW operating mode ⁽¹⁾	Continuous (SM) or pulsed (^{IP})
Power rise & fall times	< 100 μ s / 100 μ s with "IP" pulsed model
Mains ⁽²⁾	<ul style="list-style-type: none">• 360-440 V ⁽⁴⁰⁰⁾, 3-phase + earth with integrated filter• Or 208 V \pm 10 % ⁽²⁰⁸⁾, 3-phase + earth with integrated filter• Or 480 V \pm 10 % ⁽⁴⁸⁰⁾, 3-phase + earth with integrated filter
Display ⁽³⁾	With 7" TFT color touch screen (^F) or without (^X) digital front panel (local control)
Start mode	Standard On/Off, Plasma starting, ramp (with digital front panel)
Remote control ⁽⁴⁾	"Modbus Ethernet" & "EtherNet/Industrial Protocol (IP)" always available + to be chosen: Analogue (ST) <u>OR</u> Modbus on RS232 (^{MS}) <u>OR</u> Modbus RS485 (^{MM}) <u>OR</u> Profibus [®] (^{PR}) <u>OR</u> CanOpen (^{CA}).
Safety interlock	Safety relay and free contact to be shunted
Automatic Restart Function (ARF)	Detect all faults (including magnetron arcing) and automatically attempt to restart in less than 5 ms up to 3 times
Cooling system	Air and water (min. water flow 5 L/min with 2.5 bar between inlet & outlet) Cooling water between 18° to 23°C (other ranges available on demand)
Operating environment	Max. ambient temperature : 45°C. Maximum humidity : 60 % non-condensing
Safety Standards	<ul style="list-style-type: none">• Safety: EN 61010-10• EMC: EN 61000-6-4 and EN 61000-6-2
Connectors	Quick connectors for high voltage, mains line and water cooling
Consumption	8800 VA (power factor > 0.9)
Overall Dimensions (LxWxH)	<ul style="list-style-type: none">• Power supply: 701 x 483 x 132.5 mm• Microwave head: 401 x 357 x 249 mm
Weight	<ul style="list-style-type: none">• Power supply: 23.2 kg• Microwave head: 20.5 kg (including isolator)

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MAIN DIMENSIONS

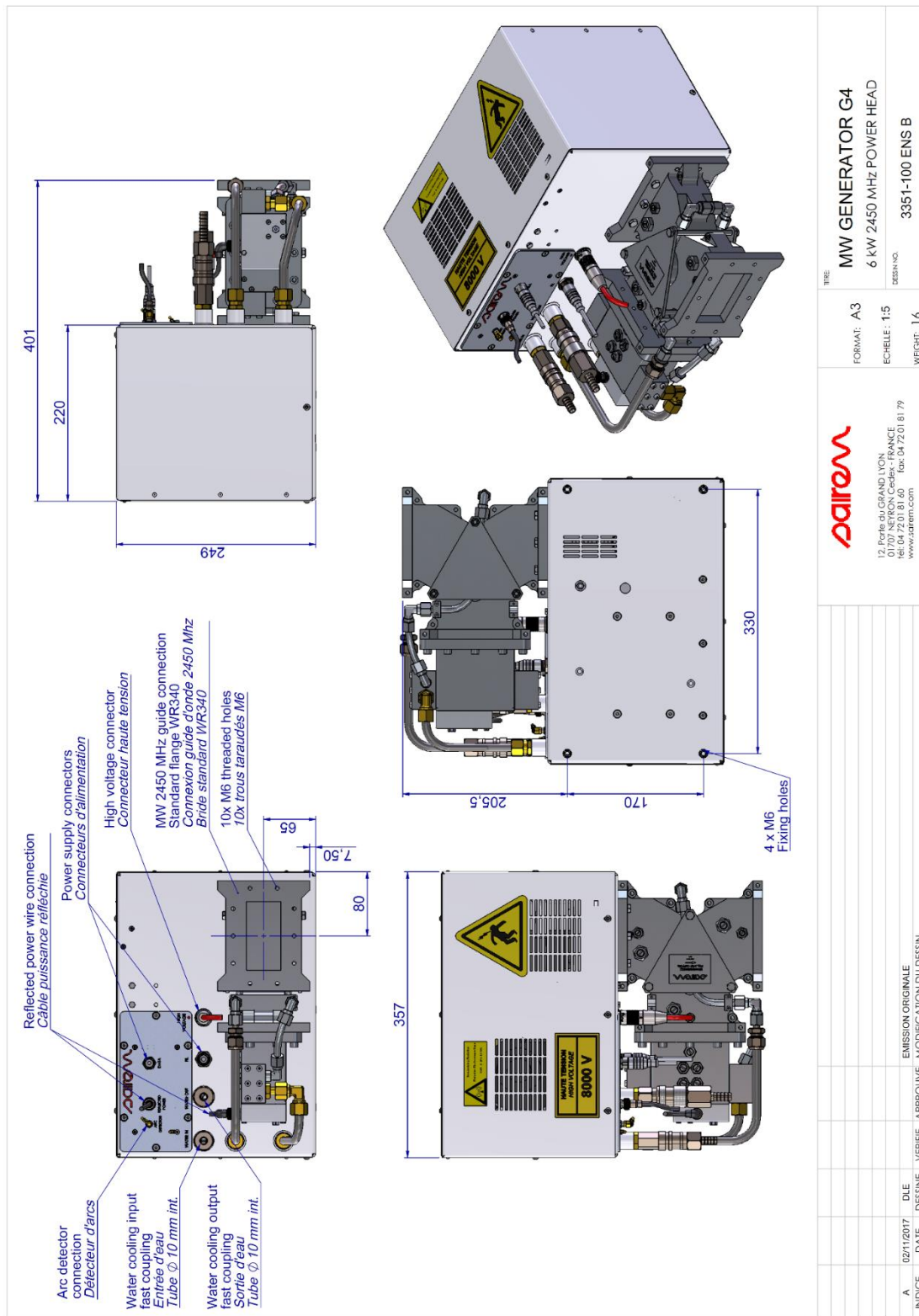
POWER SUPPLY MODULE



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MODULE MICROWAVE GENERATOR



					
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TITRE:	MW GENERATOR G4				
FORMAT:	A3				
ECHELLE:	1:5				
DESIGN NO.:	3351-100 ENS B				
WEIGHT:	1,6				
EMISSION ORIGINALE APPROUVE / MODIFICATION DU DESSIN					
A	02/11/2017	DLE	VERIFIE	APPROUVE	MODIFICATION DU DESSIN
INDEXE	DATE	DESINE	VERIFIE	APPROUVE	MODIFICATION DU DESSIN