



13.56 MHz or 27.12 MHz
50 kW 50 Ω RF quartz driven GENERATOR
Ref 13.56 MHz: GRP 500 KE & Ref 27.12 MHz: GHP 500 KE

The GRP/GHP family RF generators are 50 ohm triode RF amplifiers, driven by a semiconductor quartz-driven source.

They operate in the ISM band (Industrial, Science & Medical), at 13.56 MHz or 27.12 MHz. Their RF output power is 50 kW within 50 Ω matched load.

Their power stability and spectrum quality make them adequate to supply applicators with high overvoltage coefficients, for a wide range of applications such as plasma at atmospheric pressure and equally thermal treatment by dielectric losses for research or industry, e.g. meat defrosting. The electric field (RF voltage) on applicator can be regulated.

The GRP / GHP generator is composed of:

- **Low power (2.5 kW) stage:** solid state driver (SSD), to drive final stage consisting of a 50 Ω solid state generator (Mosfet transistors).
- **High power (final) stage:** the high level power amplifier consisting of a high gain triode associated to an oscillating circuit coil/capacitor which uses a grounded grid montage. Input and output impedance are 50 Ω .

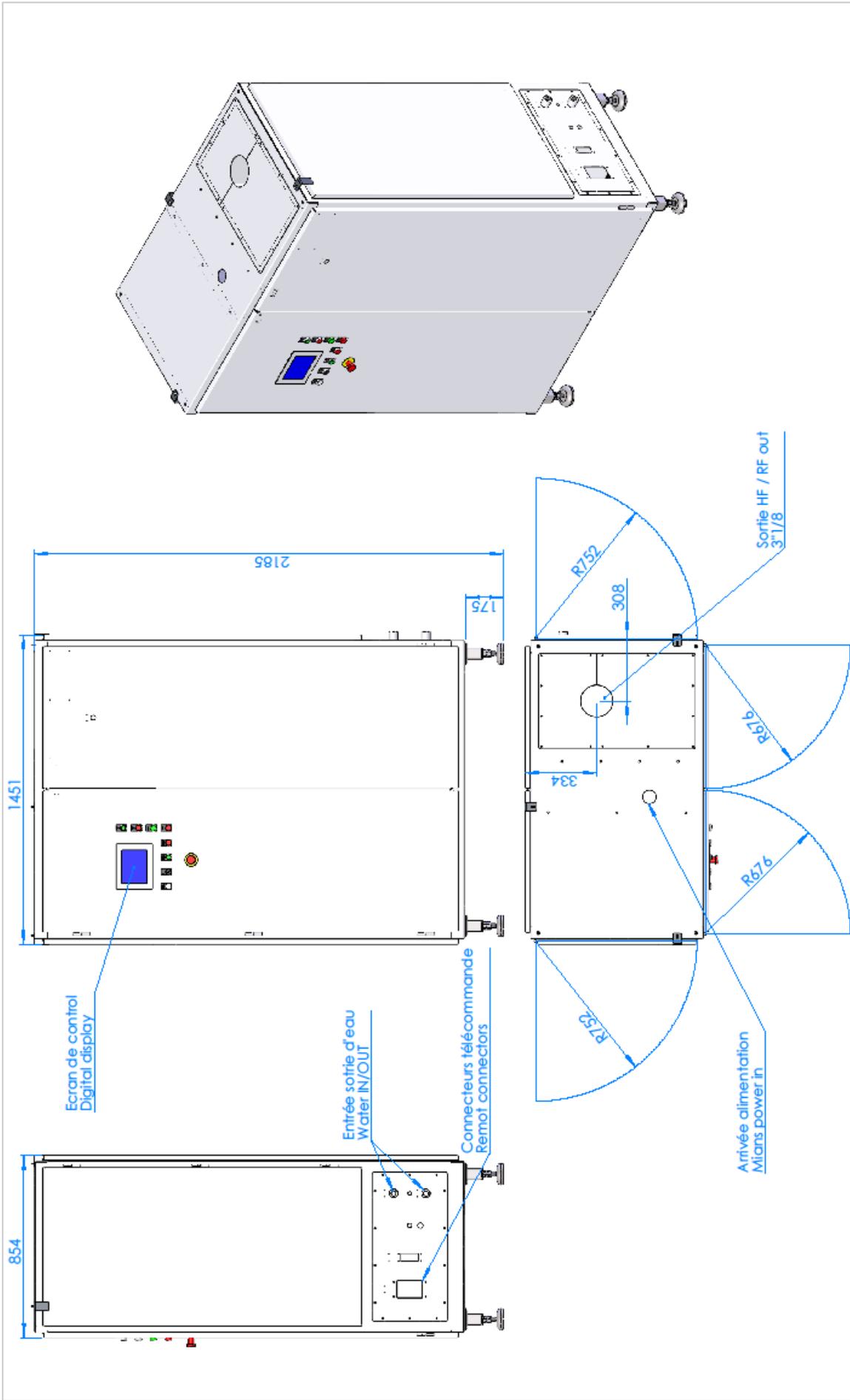
The generator is equipped with a dual directional coupler allowing a linear measuring of forward (FP) and reflected output power (RP).

In complement of the generator, SAIREM can provide:

- *SAIREM Automatic matching box, with 2 vacuum capacitors and a tune / load discriminator, RF characteristics regarding the applicator impedance, directly driven by generator electronic and HMI;*
- *The closed water cooling circuit (specification below) HYFRA PEDIA calculated in connection with the ambient temperature, water hose length etc.*



REF	13.56 MHz : GRP 500 KE or 27.12 MHz : GHP 500 KE
Presentation	Stainless steel cabinet, IP52, all components included, HV supply (soft start HV transformer & HV rectifier & filter), grid supply, filament heating regulated supply, air/water exchanger included, electronic board without adjustment (easily replaceable).
Frequency	13.56 MHz or 27.12 MHz, quartz stability typically 10^{-6}
Output RF impedance	50 Ω +/- 5 Ω
RF power FP (forward power) RP (reflected power)	50 kW on 50 Ω dummy load, adjustable from 0 to 100 % (100 W step), power stability 0.5%, quadratic system to linear FP & RP measure, ripple 2 % RMS maximum at full power, rise & fall time < 100 μ s.
Control generator, HMI (human machine interface)	By touch screen, 7.5", 65000 colours, Ethernet & USB user ports, links with internal electronics parts (SSD driver & control unit board) by CanOpen, interlock safety contact input, local or remote control key button...
Mains functions	FP & RP readings, FP set point, RF voltage (on applicator electrodes) set point for limitation, matching box controller (capacitors position set point and reading, manual or automatic matching), all faults with historic, 40 recipes, all currents & voltages around triode, SSD parameters...
RP (reflected power) function	Self fast limitation of FP at 5 kW of reflected power, adjustable level 0.1 kW to 5 kW, switch off FP instead limitation available
Control circuit functions	RP, anodic overcurrent, grid overcurrent, low grid voltage, filament voltage regulated, water flow and water temperature, air temperature, reflected power coming back to SSD (solid state driver)
Water cooling	Closed circuit recommended, 38 kW to be removed, min. flow 50 L/min, max. 5 bar, inlet water temperature 18 °C to 22 °C, min. resistivity 5 k Ω /cm (or conductivity max. 200 μ S), 7 < pH < 9, TH < 6
RF output connector	EIA 3"1/8, vertical axis, at the top of the stainless steel cabinet
Efficiency	> 70 % at full power in 50 Ω load, with cooling water specified
Mains / consumption	400 V, 3 phases + earth, 50/60 Hz. Consumption: 90 kVA at full power
Sizes, weight	See drawing, 980 kg
Designed to comply with norms (CE marking)	Safety: EN 61010-10 ; EMC: EN 61000-6-4 and EN 61000-6-2



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				WIRE: GHP 500 KE / GRP 500 KE GENERATEUR 50KW / 50KW GENERATOR		DESIGNO: 3176-COM	
				FORMAT: A3		ECHELLE: 1:16	
				WEIGHT: 297.10			
INDEXE	DATE	DESSINE	VERBIE	APPROUVE	EMISSION ORIGINALE	MODIFICATION DU DESSIN	
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