13.56 MHz or 27.12 MHz
30 kW 50 Ω RF quartz driven RF GENERATOR
Ref 13.56 MHz: GRP300KE & Ref 27.12 MHz: GHP300KE

3 off x 30 kW 27.12MHz generators and their closed water cooling circuit

The GRP/GHP family RF generators are 50 Ohms triode RF amplifiers, driven by a semi-conductor 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 30 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 or thermal treatment by dielectric losses for research or industry, e.g. meat defrosting. The level of RF supplied to the applicator can be controlled using either the value of forward power or that of the electric field (RF voltage).

The GRP / GHP generator consists of:

- **Low power (1.5 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 impedances are 50 Ω.

The generator is equipped with a dual directional coupler allowing the linear measure of forward and reflected power.

Complementary to this generator, SAIREM can also 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, HYFRA PEDIA model, chosen as a function of the ambient temperature, distance to water pipe etc.*

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REF	13.56 MHz: GRP300KE or 27.12 MHz: GHP300KE
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 +/- 5Ω
RF power **FP (forward power)** **RP (reflected power)**	30 kW on 50 Ω dummy load, adjustable from 0 to 100 % (100 W steps), power stability 0.5 %, quadratic system to linear FP & RP measure, ripple 2 % RMS maximum at full power, rise & fall time < 100 µs.
Control generator, HMI (human machine interface)	By digital 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...
Main functions	Forward and reflected power (FP, RP) values, FP set point, RF voltage (on applicator's electrodes) set point for limitation, matching box controller (capacitors position set point and reading, manual or automatic matching), faults history, 40 recipes, all currents & voltages around triode reading, SSD parameters....
RP function	Self fast limitation of FP at 3 kW of reflected power, adjustable level 0.1 kW to 3 kW, switch off FP instead limitation available
Control circuit functions	RP, anodic over-current, grid over-current, low grid voltage, filament voltage regulated, water flow and water temperature, air temperature, high reflected power coming back to SSD (solid state driver)
Water cooling	• With closed loop water chiller, 20 kW to be removed, min. flow 50 L/min at 4 bar, inlet water temperature 18°C to 23°C. • 50 µS/cm > water conductivity > 150 µS/cm - 7 < pH < 9 - TH < 6. • Air/water heat exchangers built-in the cabinet, air tight cabinet (dust-proof). • Ambient temperature: from 5 °C to 45 °C & RH up to 50 %. For higher humidity, an A/C system prevents condensation inside cabinet.
RF output connector	EIA 3"1/8, vertical axis, at the top
Efficiency	> 70 % at full power in 50 Ω load, with specified cooling water
Mains / consumption	400 V, 3 phase + earth, 50/60 Hz. Consumption: 55 kVA at full power
Sizes, weight	See drawing, 840 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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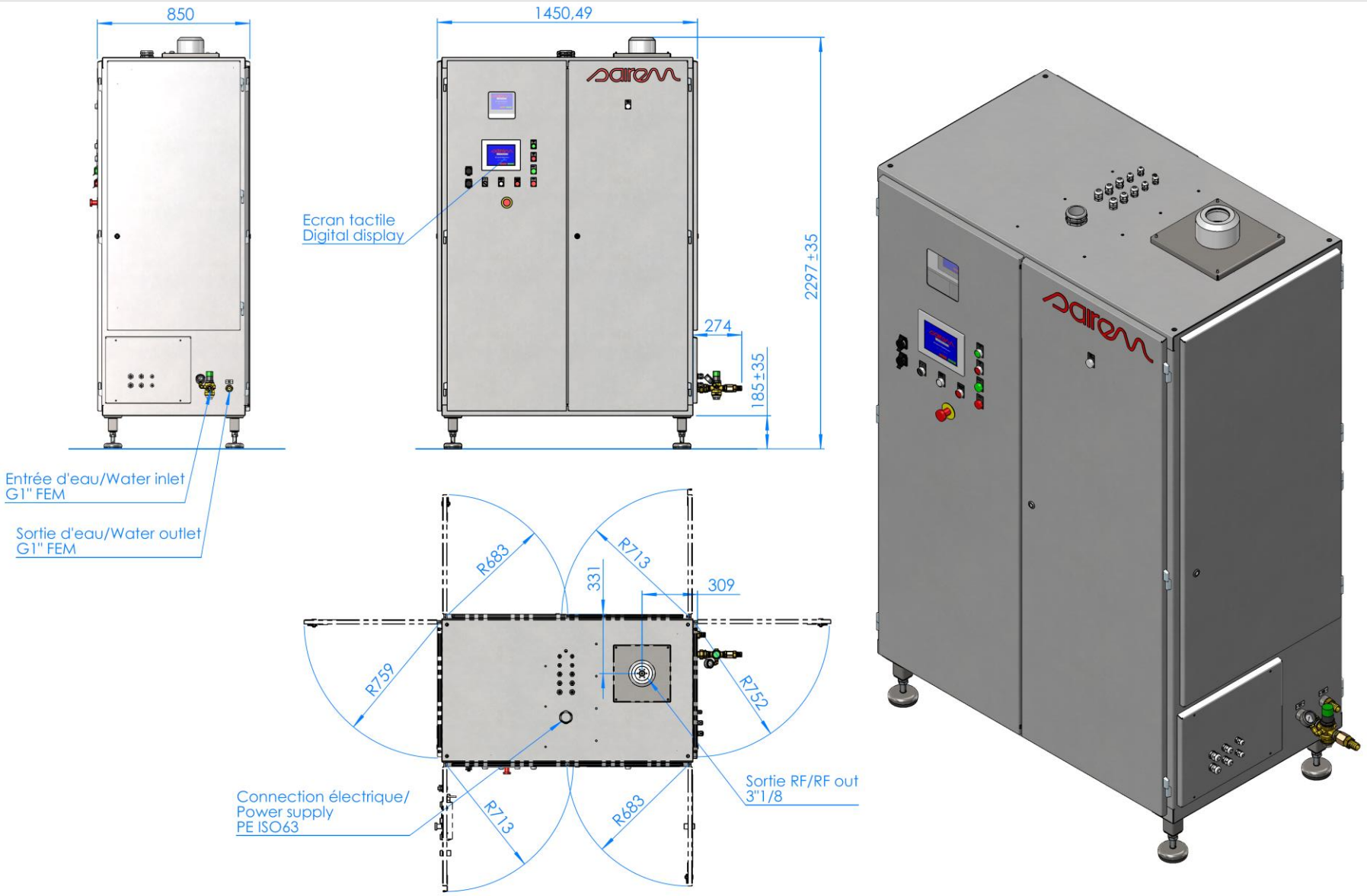

INDICE	DATE	DESSINE	VERIFIE	APPROUVE	MODIFICATION DU DESSIN
C	20/10/2016	BDE			MAJ PORTES ET VENTILATEUR
B		GUEDES			Mise à jour ouverture sortie HF + ouverture plaque connecteur
A		BDE			EMISSION ORIGINALE

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FORMAT: A3
ECHELLE : 1:20
WEIGHT: 533.31

TITRE:
GRP - GHP 300 / 500 KE

DESSIN NO.
3326-ENS C