



## 2000 W, 2450 MHz Microwave Generator GMP 20K SM 56M230 FST 3 IR

### Power supply

It is based upon the latest switch mode power supply technology, **offering size reduction** (i.e. 19" rack, 3U power supply), good power stability and significantly reduced electrical losses. The efficiency of the switch mode power supply is higher than 93 %. A real interlock is available for safety.



### Microwave head - compact size

This new head includes a water cooled magnetron and the filament transformer. An isolator with its reflected power crystal detector is connected to the microwave head. Quick release connectors for water cooling and high voltage are used on both the power supply and the microwave head. A water flow meter is connected at the exit of the cooling circuit of the isolator; this water sensor acts as an interlock which will completely shut down the microwave generator if not enough water flow is sensed.

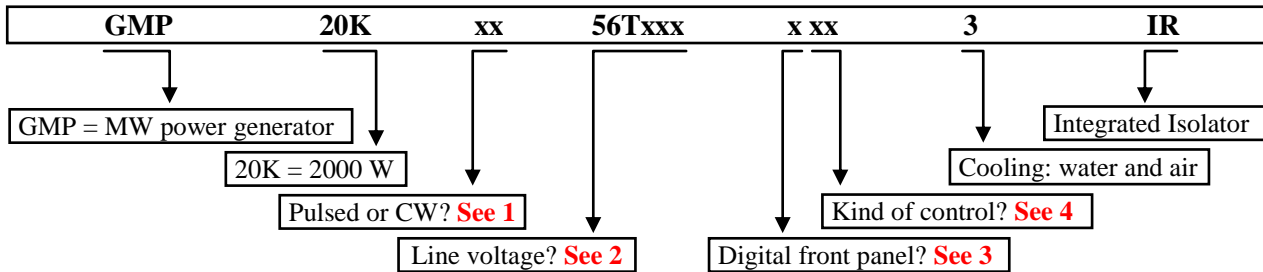


<b>Reference</b>	<b>GMP 20K – 56---- --- 3 IR</b>
<b>Presentation</b>	Switch mode Power supply ( $\eta > 93\%$ ) with separate microwave head Connecting cable: 4 m standard length. Other lengths on request
<b>Frequency</b>	2450 MHz $\pm$ 25 MHz
<b>Output microwave power</b>	2 kW adjustable from 10 % to 100 % with 10 W step
<b>Power stability</b>	1 % from 10 % to 100 %
<b>Ripple</b>	< 1 % RMS from 10 % to 100 %
<b>Waveguide output</b>	WR340
<b>Maximum SWR</b>	Infinite at any phase with isolator
<b>MW operating mode (*)</b>	Continuous or pulsed
<b>Power rise &amp; fall times</b>	< 50 $\mu$ s / 50 $\mu$ s with <b>IP</b> pulsed model
<b>Versions available (*)</b>	With or without digital front panel Digital front panel is used for local remote control
<b>Mains (*)</b>	230 V $\pm$ 10 %, 1-phase + earth with integrated filter 400 V $\pm$ 10 %, 3-phase + earth with integrated filter 208 V $\pm$ 10 %, 3-phase + earth with integrated filter
<b>Display of forward &amp; reflected powers</b>	On blue LCD screen (version with digital front panel) On serial link and / or on analogue interface
<b>Start mode (*)</b>	Standard On/Off, Plasma starting, ramp (with digital front panel)
<b>Remote control (*)</b>	Analogue and RS232, Modbus on RS232 or RS485, Profibus <sup>®</sup> , CanOpen
<b>Consumption</b>	3200 VA (power factor > 0.9)
<b>Weight</b>	Power supply 20.3 kg, microwave head 13.7 kg (including isolator)
<b>Cooling</b>	Power supply, microwave head & isolator: air and water (min. water flow 4 l/min)
<b>Operating temperature</b>	Ambient max. 40 °C, cooling water 18 – 25 °C
<b>Connectors</b>	Quick connectors for high voltage and water cooling
<b>Safety interlock</b>	Integrated water flow meter, safety relay and free contact to be shunted
<b>Complies with norms</b>	Safety: EN 61010-10, EMC: EN 61000-6-4 and EN 61000-6-2

(\* depending on version)

# How to choose your 2 kW microwave generator?

## References explanation



To help you choose the right 2 kW microwave generator for your application, please use the following questionnaire:

### 1. Pulsed or continuous wave? GMP 20K SM 56M230 XST 3 IR

- **SM** version is recommended for continuous wave operation
- With the **IP** version (internal pulse), you can choose the parameter of your pulse directly from the digital front panel or by software (frequency and duty cycle or ON time and OFF time)

### 2. Line voltage? GMP 20K SM 56M230 XST 3 IR

There exist three possibilities:

- 50/60 Hz, 1-phase 230 V + earth, i.e. **56M230**
- 50/60 Hz, 3-phase 400 V + earth, i.e. **56T400**
- 50/60 Hz, 3-phase 208 V + earth, i.e. **56T208**

### 3. With or without digital front panel? GMP 20K SM 56T400 XST 3 IR

- With digital front panel **F**: for local and visual control of the generator
- Without digital front panel **X**: control of the generator only via remote control

### 4. How to drive the generator? GMP 20K SM 56M230 XST 3 IR

- **ST**: Standard analogue and RS232 remote control (protocol SAIREM). Recommended if you have only one generator to drive. A Human Machine Interface could be developed on demand
- **PR**: PROFIBUS® industrial bus. Allows to drive multiple slaves
- **CA**: CanOpen industrial bus. Allows to drive multiple slaves
- **MS**: ModBus on RS232 control. Allows to drive a single slave, the generator is provided with a Labview driver which could be integrated in other Labview process
- **MM**: ModBus on RS485 or RS422 control. Allows to drive multiple slaves with one RS485 or RS422 port, the generator is provided with a Labview driver which could be integrated in other Labview process

# CONTROL AND OPERATION OF MICROWAVE GENERATORS WITH DIGITAL DISPLAY

## GMP 20K SM 56M230 EST 3 IR

The generator with digital front panel is wholly operated in local mode from the control panel located at the front of the power supply rack.

The front panel consists of a large white over blue graphical LCD screen 240 x 128 pixels, 3 push buttons and a knob for menu navigation and power control.

All operating parameters and control status, as well as any possible fault, forward power and reflected power are displayed on the screen. The forward power set-point is pre-displayed before starting.



Main operating functions:

- Start mode:
  - Standard mode ON/OFF
  - Overshoot mode
  - Ramp mode (adjustable from 0 to 30 s)
- Control mode
  - Local
  - Remote control
- Control of reflected power
  - Adjustable from 0 to 100 % of forward power
  - Disjunction mode or limit mode of forward power (sound signal)
- Various
  - Fault list
  - Filament hour counter
- Configuration
  - Preset and load configuration
  - Language (English or French)

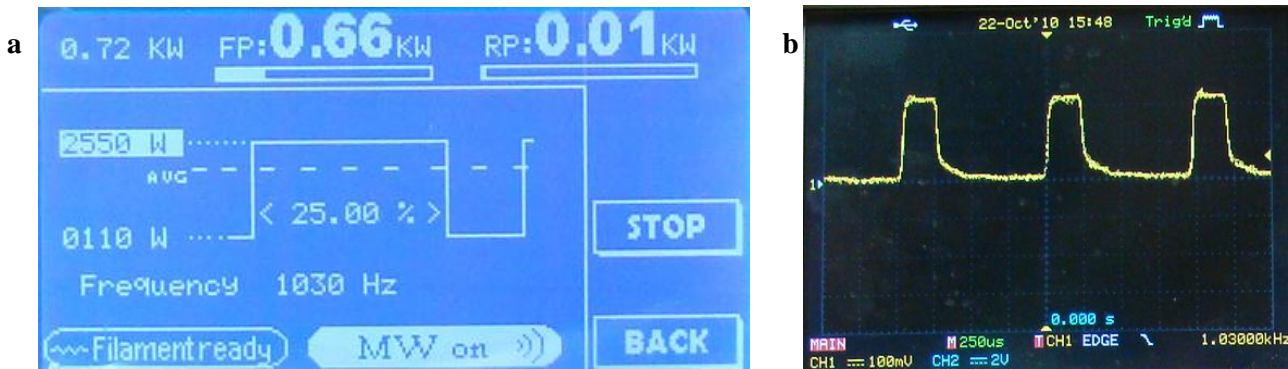
## CONTROL AND OPERATION FOR THE INTERNAL PULSE VERSION

### GMP 20K IP 56M230 FST 3 IR

The internal pulse mode integrated with the **IP** generator can be set up from the digital control panel of the power supply unit; a remote control is available at the rear of the power supply unit via PROFIBUS®, CanOpen or Modbus (RS2332 or RS485).

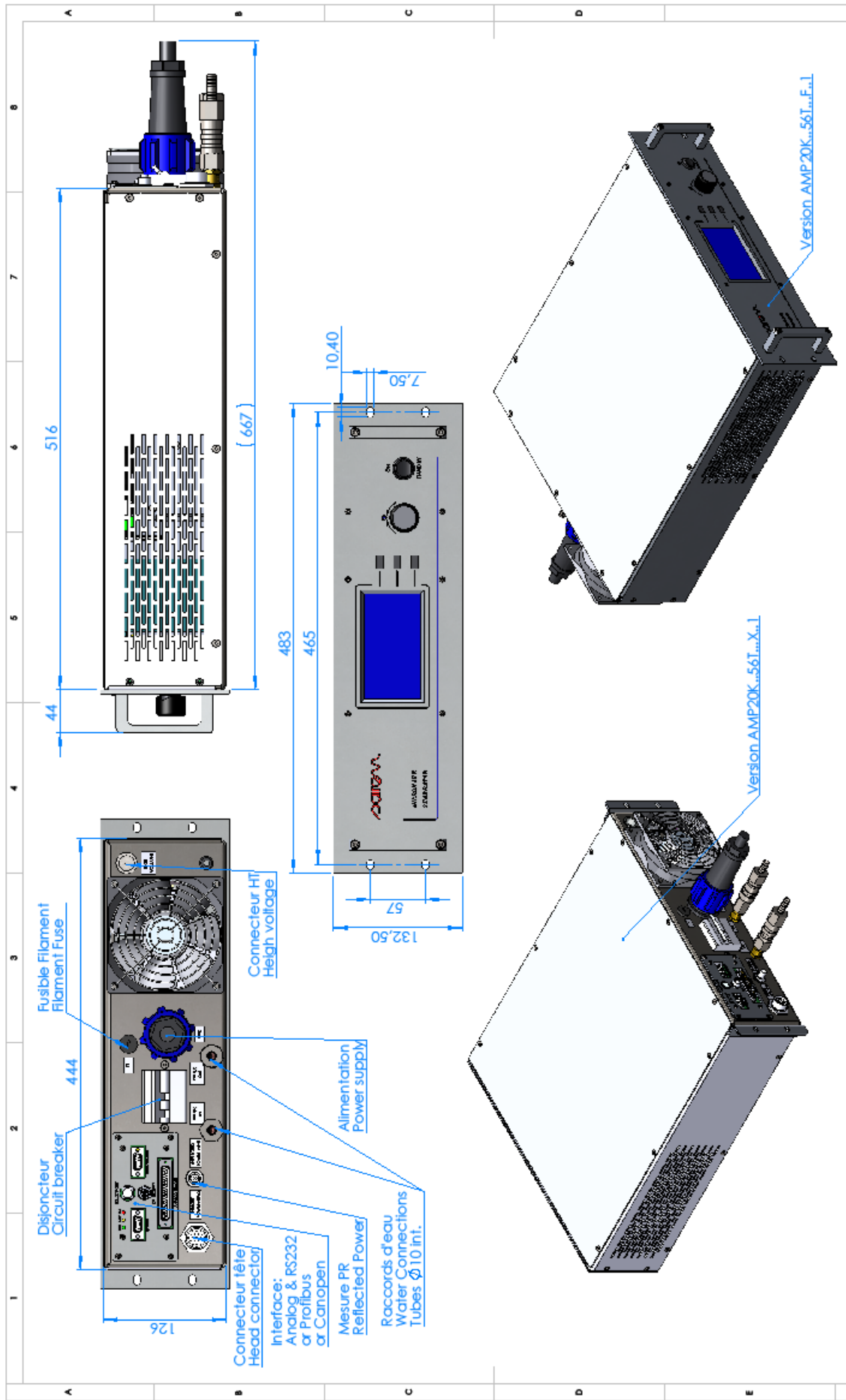
All operating pulse parameters are displayed on the screen as follows:

- Pulse maximum, minimum and average power level
- Pulse duty cycle and frequency
- Time ON/OFF



Main pulse parameters:

- Frequency: from 0.25 to 2500 Hz
- Duty cycle: from 1 to 99 %, 10 % min at 1000 Hz, 20 % min at 2000 Hz
- Rise and fall time: < 50  $\mu$ s
- Minimum pulse duration: 100  $\mu$ s



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