



## HIGH TEMPERATURE MICROWAVE FURNACE LABOTRON™ HTE M20K B or M60K B



The Labotron™ HTE M60K B or M20K B is a microwave-assisted high performance furnace designed for elevated temperature processing (e.g. sintering) and can be used both for laboratory & industrial applications.

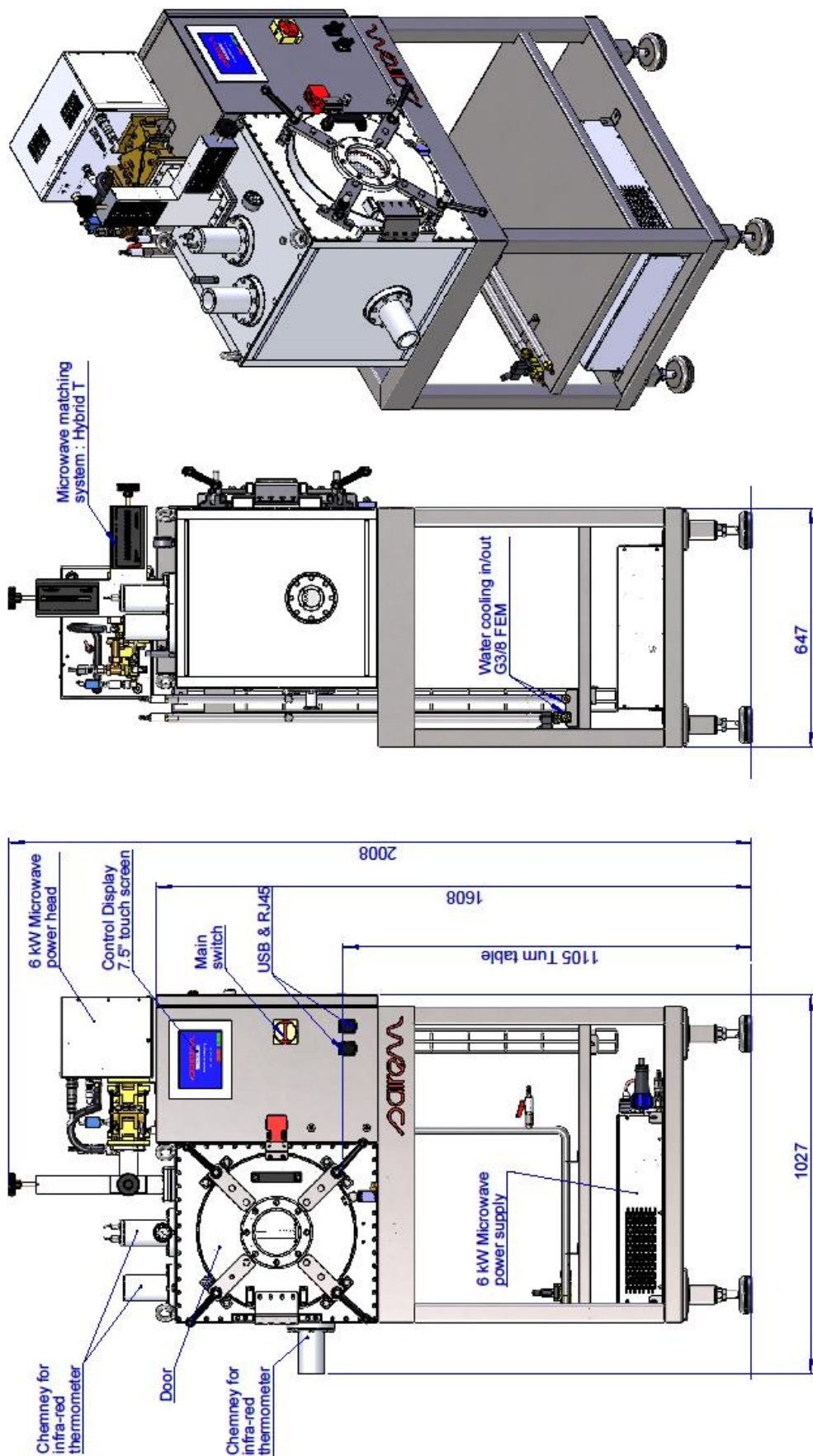
LABOTRON's high performance is assured by the choice of aluminium as wall-material (reminder: aluminium has over 10 times higher electric conductivity than stainless steel) and by the integrated impedance tuner, i.e. E/H tuner with magic-T. Due to this, the LABOTRON HTE M60K B or M20K B can equally treat high microwave absorbing materials as well as very low absorbing ones, ex. ceramics, glass etc. The homogeneity of the treatment is guaranteed by two main construction features:

- 'Mirror polishing' finish of the internal walls allowing for the irradiated heat by the sample to return to the sample itself thus, increasing the efficiency of the heating process (90% IR reflexion);
- Turning table with alternate rotation.

In addition, the integrated microwave generator allows microwave treatment in continuous wave (CW) or in controlled pulsed regime.

The Labotron HTE can be used for the treatment of high-volume samples, significant for scaling-up. Equally, when used adequately, the system allows for very fast rate of heating.

<b>REF.</b>	<b>LABOTRONHTEM60KB with max. 6 kW microwave</b> <b>LABOTRONHTEM20KB with max. 2 kW microwave</b>
<b>HMI Control</b>	Coloured touch screen digital display 7.5'' Data loading in csv files, USB, RJ45 Programming: power, temperature, time, microwave pulse, incident & reflected power etc.
<b>Microwave cavity</b>	Aluminium, internal size 427x427x488 mm (V = 88 L), 30 mm thick walls, inside-wall mirror polishing, turn table, hand-operated door
<b>Temperature measurement/control</b>	Standard: from oven's top central port via 2 infrared thermometers: 1st from 50 to 400 °C, 2nd from 400 to 1700 °C, regulation and steps temperature control. When microwaves are applied, the product to be heated increases its temperature depending on its thermal properties (Cp)
<b>Heating rate</b>	For 6 kW microwave power transferred in to product, the heating rate is 30 °C/s for 1 kg sample, with average Cp = 2 Jg <sup>-1</sup> K <sup>-1</sup> (before heat loss overcomes the heating rate). P=m*CP*Δt
<b>Vacuum/Pressure treatment</b>	Integrated DN25 flange for primary vacuum (vacuum pump not supplied). Maximum dif. pressure: 0.5 bar (safety release valve)
<b>Microwave generator (switch mode power supply, magnetron head and isolator)</b>	2450 MHz, adjustable power from 600 to 6000 W or from 0 to 2000 W, continuous wave & pulsed operation. Low-ripple reducing the risks of arcing/plasma inside the oven when operating at high electric field, low pressure and high temperature
<b>Windows/Door</b>	Quartz, microwave sealed on the front door.
<b>Turn table</b>	Diameter 330 mm, thickness 2 mm, continue or alternative rotation Material of construction Micalite
<b>Gas inlets/outlets</b>	Standard: 5 gas connections 3/8 G (1 off on the bottom side, 1 off at the rear, 1 off on the left panel, 2 off on the upper panel), manometer from 30 mm Hg vac to 150 psi, safety release valve (1.8 bar)
<b>Impedance matching</b>	Manual E/H impedance tuner & magic T reducing the reflected power level even in case of high power density (small load inside the cavity). Field density measurement
<b>Safety</b>	Safety interlock connected to the microwave generator to avoid running the oven with the door open. On-screen sample temperature warning when furnace's door opens (to avoid wrong manipulation when sample temperature > 60 0C)
<b>Mains</b>	3 x 400 V + earth, 11 kVA
<b>Microwave generator cooling</b>	By water, min. flow 6 L/min, min. 3 bar. Quick release connectors mounted on water inlet and outlet. Cooling power : 8 kW Max.
<b>Sample thermal insulation (option)</b>	Two models of insulation 'cage' can be ordered, 1 L and 8 L; the cage consists of six independent solid walls arranged over the sample like Lego, no screws or other fixing required. The insulating material is made out of pressed silica fibre (max temperature 1600 °C, IR reflexion > 90% between 300 et 2500 μm). An upper aperture (diam. ~ 50 mm) will allow temperature measurement via the 2 IR thermometers. Inside cage dimensions: 1 L model 100 x 100 x 100 mm, 8 L model 200 x 200 x 200 mm, or other sizes on request.
<b>Dimensions, weight</b>	For accurate dimensions see attached drawings, 260 kg (with support)
<b>OBSERVATION</b>	Min. sample diam. 30 mm, max. processing T = 1650 °C



REF: HEIGH TEMPERATURE MICROWAVE OVEN  
LABOTRONHEM60KBVAC

FORMAT: A3

ECHELLE: 1:10

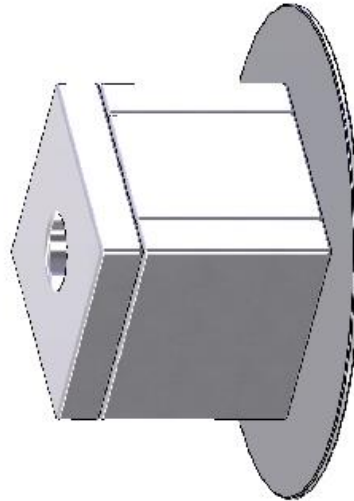
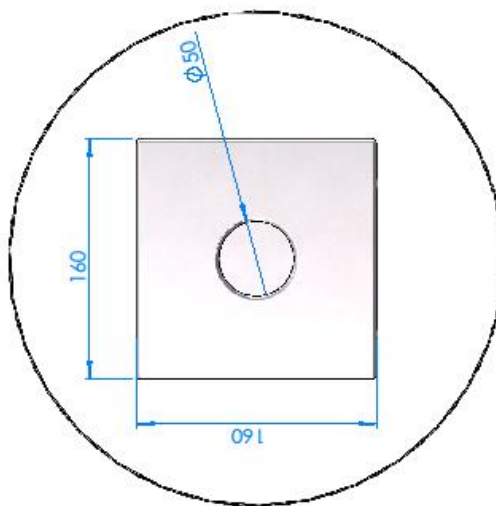
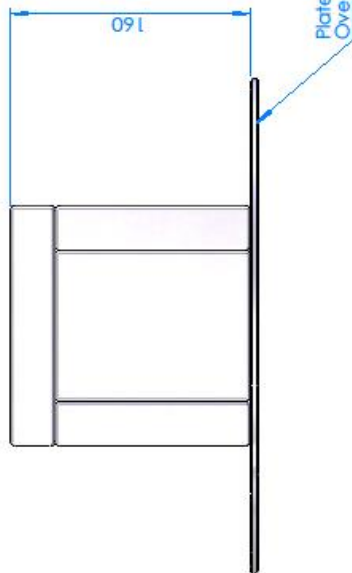
DESIGNO: 3336-COM

WEIGHT: 301,41

**sairom**

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INDEX	DATE	BDE	VERIFIE	APPROUVE	EMISSIION ORIGINALE	MODIFICATION DU DESSIN
A	20-01-11	DESSEINE				



Ploques d'épaisseur/Wall Thickness: 30mm  
 Volume interne/Internal volume : (100x100x100) lL

		<b>saiREM</b>		12, Porte du GRAND LYON 01700 NEYRON Cedex - FRANCE tél: 04 72 01 81 60 fax: 04 72 01 81 79 www.saiREM.com	
		<b>CAISSON ISOLANT</b> INSULATING CAVITY		ORDRE NO. 3225-100A	
		FORMAT: A3		ECHAELLE: 1:3	
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