

# VAPBOX 1500

## > DLI\* CVD & ALD Vaporizer

High Performance, Compact, Precise, Innovative liquid and solid precursors Delivery and Vaporization System for ALD, CVD, MOCVD, PECVD, MLD and all gas phase processes.

The **VAPBOX 1500** vaporizes pure liquid compounds and solid ones dissolved in a carrier liquid (organic solvent) up to 300°C.

The **VAPBOX 1500** is able to handle and vaporize most of solid and liquid compounds including low vapor pressure, thermally labile and viscous ones.

The **VAPBOX 1500** provides high and unmatched performances based on a pulsed injection of a mixture of liquid and carrier gas. That pulsed injection is performed by a **proprietary Injection Head (atomizer)** and allows a very fine atomization of the liquid to be vaporized. The liquid is flash vaporized and the generated vapors can be used for the synthesis by ALD and CVD of thin films, multilayers structures, nanoparticles and nano-objects of numerous complex functional materials such as for instance multi-metallic oxides (high-k dielectrics, magnetic and superconducting materials, ferroelectrics, piezoelectrics), various chalcogenides (PCRAM and CIS/CIGS photovoltaic materials) and transparent conductive oxides (TCO).

Because of its unique proprietary way to deliver and atomize the liquid inside the vaporizer the **VAPBOX 1500** is able to achieve a real non-contact flash vaporization therefore generating particle free vapors.

Indeed, the blasting of the carrier gas/liquid mixture inside the vaporizer allows generating an aerosol of droplets around 10 microns in diameter. Such very small droplets can be easily flash vaporized. Competitors' vaporizers are generating bigger liquid droplets that cannot be flash vaporized and clog the vaporizer.

The **VAPBOX 1500** operates from vacuum to atmospheric pressure.

Thanks to delivering of accurate and stable liquid flows, the **VAPBOX 1500** delivers accurate and stable vapor flows.

The **VAPBOX 1500** can inject and vaporize 2 liquids or solutions simultaneously or sequentially.

\*DLI = Direct Liquid Injection

*US patent pending and patents pending in other countries*



## > Technical specifications

### Injection Heads (liquid inlets)

> 1 or 2

### ICU (Injection Control Unit)

> 24 VDC or 110-230 VAC remote and rackable 19" 2U unit

### Heating:

> 3 heating zones, up to **300°C**, 1650 W

> 4 K type thermocouples: (1 per heating zone + 1 alarm)

### Fittings:

> 1/8" compression type or 1/8" VCR male fitting for liquid inlet(s) (1-2)

> 1/4" VCR female fitting for carrier gas inlet(s) (1-2)

> 1/2" VCR male fitting for vapor outlet

### Versions:

> 230 VAC version and 115 VAC version

### Accessories:

> 1 Liquid flow controlling kit per Injection Head, including a Liquid Flow Meter (LFM)

> Liquid panel with 1 precursor tank per Injection Head and with an optional solvent tank (for rinsing purpose)

> Carrier gas panel with 1 carrier gas Mass Flow Meter (MFM) per Injection Head

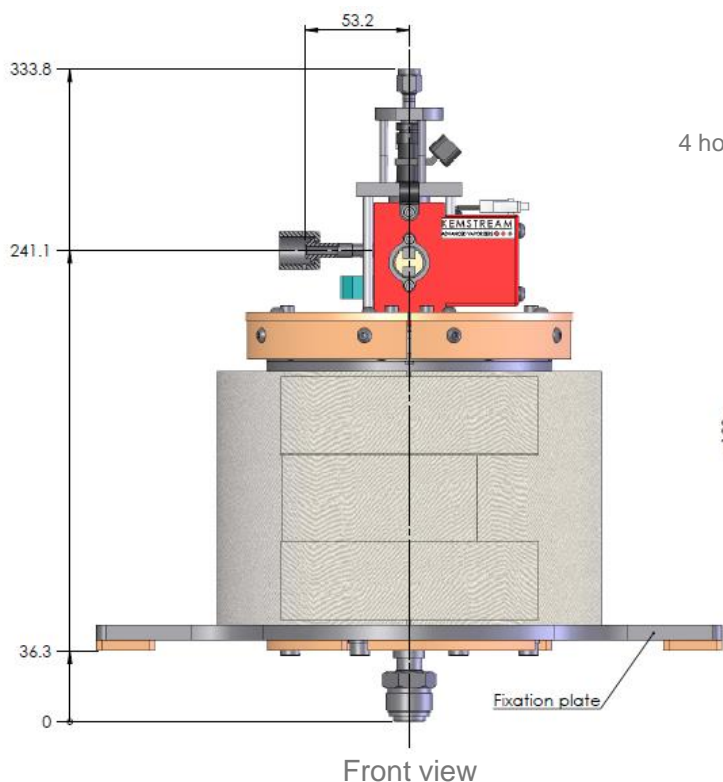
> TCU (Temperature Control Unit): 19" remote and rackable 3U unit

### Flows range (per Injection Head):

> Typical carrier gas flow range = 120 to 5000 sccm

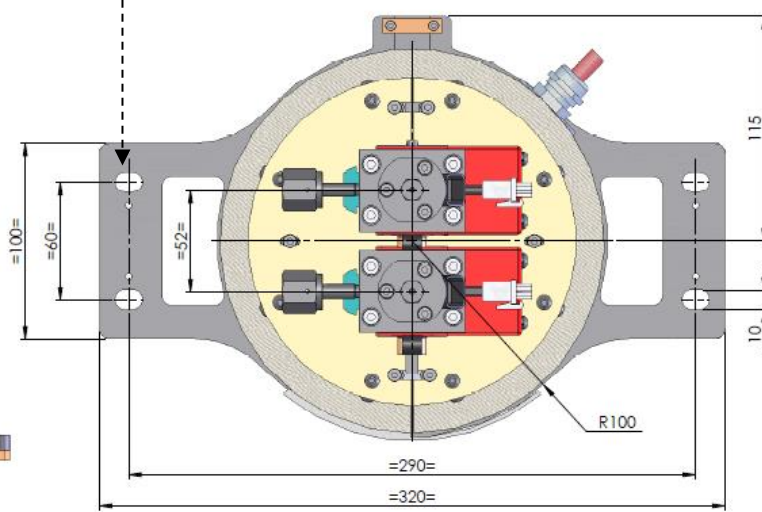
> Typical liquid flow range = 0.1 to 10 g/min

## > Dimensions (mm)



## VAPBOX 1500 with 2 Injection Heads

4 holes for M6 screws



Total weight is about 22 kg

## > Ordering information

### Injection Head

HB4 - S2V F4 H

#### Liquid inlet fitting

<b>S2V</b>	1/8" Swagelok
<b>M2V</b>	1/8" VCR male

#### Carrier gas inlet fitting

<b>F4</b>	1/4" VCR female (standard)
<b>M4</b>	1/4" VCR male
<b>S4</b>	1/4" Swagelok
<b>T4</b>	1/4" OD tube

#### Carrier gas inlet direction

<b>H</b>	Horizontal (standard)
<b>V</b>	Vertical

### Vaporizer

V15 HBR2 M8 V

#### Voltage (for heating)

<b>HBR2</b>	230 VAC
<b>LBR2</b>	115 VAC

#### Vapor outlet fitting

<b>M8</b>	1/2" VCR male (standard)
<b>M4</b>	1/4" VCR male
<b>K1</b>	KF16 mm
	other fittings upon request

#### Vaporizer pressure (process P)

<b>V</b>	from 0 to 1.5 bara
<b>A</b>	above 1.5 bara

For ordering information about the ICU (Injection Control Unit), please see the datasheet of the ICU

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