

# HV 400 Wafer Module



## HIGHLIGHTS

### General Features

- High pumping speed for all active gases
- High sorption capacity and increased lifetime
- Constant pumping speed in HV, UHV and XHV
- Reversible pumping of hydrogen and its isotopes
- Operation in the presence of high magnetic fields
- Oil free and vibration free
- Low weight
- Fast pumpdown after air venting and without baking
- Capable of coping with large air leaks
- Suitable for viton sealed systems

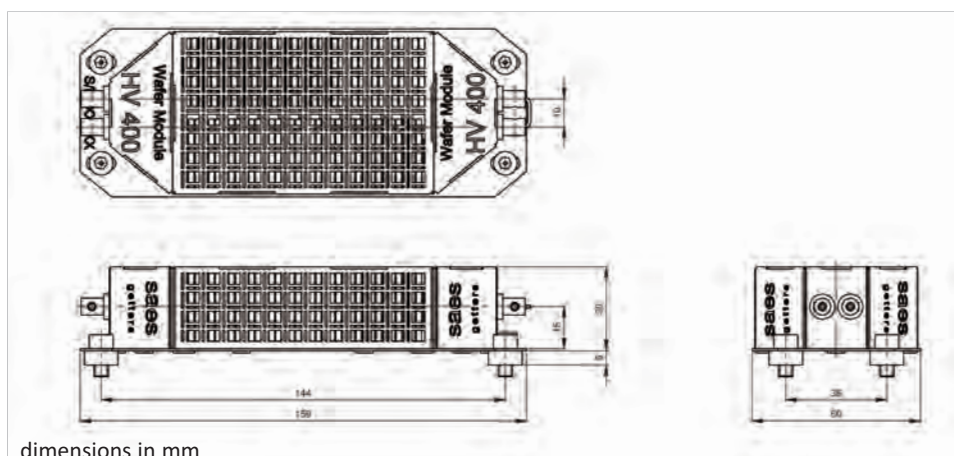
### Applications

- Improving ultimate vacuum in combination with ion, diffusion, cryogenic or turbomolecular pumps
- Surface analysis systems
- Particle accelerators, synchrotron radiation sources and related equipment
- Process pumps for vacuum devices and deposition chambers
- Thin films deposition systems
- Portable vacuum instrumentation
- Pumping, storing and releasing hydrogen isotopes
- Impurities removal in rare gas filled devices

The HV 400 Wafer Module is a flangeless high performance NEG pump solution suited for several vacuum applications requiring the distribution of large pumping speeds and capacity for H<sub>2</sub> and all the active gases (i.e., H<sub>2</sub>O, O<sub>2</sub>, N<sub>2</sub>, CO, CO<sub>2</sub>). The module consists of a stainless steel structure made of SS316L hosting two stacks of sintered Non Evaporable Getter (NEG) disks. Two built-in heaters allow for the activation and the operation in warm condition (~200 °C) of the module. The NEG disks are made of the new ZAO1 getter alloy. Thanks to the flexibility of the ZAO1 technology, the benefits of the NEG pumping can be extended to the high vacuum regime (1•10<sup>-9</sup> Torr to 1•10<sup>-7</sup> Torr). The HV 400 Wafer Module presents also significant pumping speed for hydrocarbon species. Operating it at approximately 200 °C, the hydrocarbon species can be dissociated on the surface of the ZAO1 sintered disks and partially diffuses into the bulk. As a result, the HV 400 Wafer Module can distribute large pumping speeds for H<sub>2</sub>, all active gases and hydrocarbon species in vacuum systems characterized by large gas loads with minimum power requirement (approximately 15 W at 200 °C). The two heaters are connected in series by electrical bridge connection. The bridge can be removed in the case the two stacks of ZAO1 disks must be activated in parallel. The electrical parameters reported in the table are recommended when the modules is at least 15 cm far from the front wall. If a more screened configuration is used or several modules are installed close to each other, the electrical parameters can be evaluated.

More NEG Wafer Modules can be powered at the same time by series and/or parallel connection. Recommendations on the best electrical parameters and installation of the Wafer Modules can be given on request.

HV 400 wafer module with thermocouple are also available.



### Ordering Information

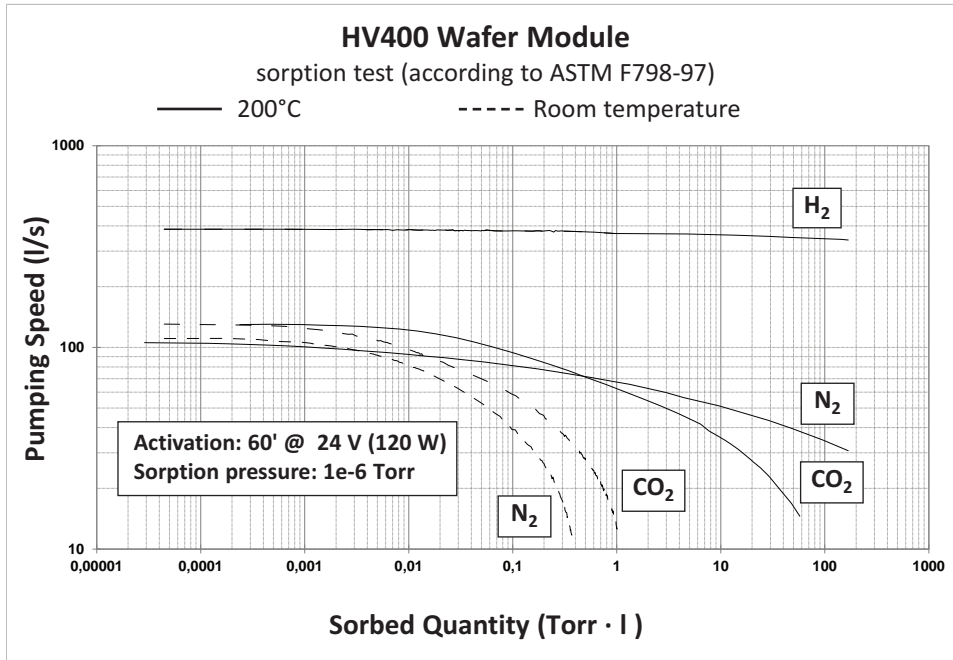
| Product                              | Product description              | Code   |
|--------------------------------------|----------------------------------|--------|
| NEG ZAO1 module for high vacuum      | HV 400 wafer module              | 5H0702 |
| Power supply                         | NEG POWER C1                     | 3B0501 |
| Output cable                         | OUTPUT CABLE WAFER MODULE - 3 MT | 3B8003 |
| Flange-wafer module connecting cable | WAFER MODULE KIT OF CABLES       | 3B8002 |
| Flange with feedthroughs             | WAFER MODULE FLANGE CF35         | 3B8001 |



# HV 400 Wafer Module

| Typical of Module   | Type of operation | Temperature | Electrical parameter |
|---------------------|-------------------|-------------|----------------------|
| HV 400 WAFER MODULE | Activation        | 550° C      | 24 V (120 W)         |
|                     | Working           | 200° C      | 6 V (15 W)           |

The parameters must be considered in nude configuration



| Typical Pump Characteristics      |                                      | HV 400<br>Wafer Module |
|-----------------------------------|--------------------------------------|------------------------|
| Alloy Type                        |                                      | ZAO®                   |
| Alloy Composition                 |                                      | Zr V Ti Al             |
| Getter Mass (g)                   |                                      | 250                    |
| Getter Surface (cm <sup>2</sup> ) |                                      | 750                    |
| Pumping Speed (l/s)@200 °C        | H <sub>2</sub>                       | 390                    |
|                                   | O <sub>2</sub>                       | 180                    |
|                                   | CO <sub>2</sub>                      | 130                    |
|                                   | N <sub>2</sub>                       | 105                    |
| Sorption Capacity<br>(Torr·l)     | H <sub>2</sub>                       | 5000                   |
|                                   | O <sub>2</sub> Single run at 200 °C  | 240                    |
|                                   | CO <sub>2</sub> Single run at 200 °C | 58                     |
|                                   | N <sub>2</sub> Single run at 200 °C  | 240                    |
| Number of runs (sorption cycles)  |                                      | >20                    |

**Note:** Pumping speed data refer to the initial values.

The "Single run" capacity is intended as the recommended absorbed quantity per run allowing to perform more than 20 sorption cycles at 1e-6 Torr. In case of operation under much lower gas loads or at RT, the module can be reactivated 100 times or more.

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