

# Modular-Lab

## Module diversity



**4-fold Modular-Lab PharmTracer** (SLM-4; Dimensions: 262 x 198 x 191 mm; Weight: 5.0 kg)  
The 4-fold Modular-Lab PharmTracer (for 4 manifolds with 3 stopcocks each) is used in combination with disposable cassettes for labeling different tracers. Available for the following applications:  $^{68}\text{Ga}$ -peptides,  $^{111}\text{In}$ -peptides,  $^{177}\text{Lu}$ -peptides,  $^{90}\text{Y}$ -peptides,  $^{64}\text{Cu}$ ATSM,  $^{18}\text{F}$  based tracers,  $^{11}\text{C}$ Acetate and  $^{11}\text{C}$ Methyl iodide "wet chemistry" approach.



**2-fold Modular-Lab PharmTracer** (SLM-2; Dimensions: 130 x 198 x 191 mm; Weight: 2.7 kg)  
The 2-fold Modular-Lab PharmTracer (for 2 manifolds with 3 stopcocks each) is used in combination with disposable cassettes allowing the production of compounds such as  $^{68}\text{Ga}$ ,  $^{18}\text{F}$ NaF,  $^{11}\text{C}$ Choline and  $^{11}\text{C}$ Methionine from  $^{11}\text{C}$ Methyl iodide. It is also used for dispensing processes with Modular-Lab systems.



**1-fold Modular-Lab PharmTracer** (SLM-1; Dimensions: 130 x 155 x 113 mm; Weight: 1.7 kg)  
The 1-fold Modular-Lab PharmTracer (for 1 manifold with 3 stopcocks) can be used in combination with the above mentioned modules and disposable cassettes. There are two versions available: Luer up or Luer down. The standard module has ports for activity detector, pressure sensor and temperature sensor each. Upon request the back can alternatively also contain ports for 3 solenoid valves (3/2-way).



**Solenoid Valve Module** (SVM; Dimensions: 130 x 154 x 113 mm; Weight: 1.5 kg)  
With 5 valves (3/2-way) for liquid and gas transport. Standard UNF connectors at front. Easy to access for mounting of "finger tight" fittings. SMC LVM155, max. 6 bar, dead volume 10  $\mu\text{l}$ , body: PEEK, sealing: Viton (Kalrez), certified for clean room use. Other valves upon request.



**Hamilton Single Stopcock Module** (SSM; Dimensions: 130 x 172 x 113 mm; Weight: 1.7 kg)  
Hamilton Single Stopcock Module is equipped with three valves. Liquid flow into the centre port of a valve can be directed to one of the three exit ports. Additionally the valve can be switched to a closed position blocking the flow completely. Standard connections for 1/4-28 UNF makes the module fully compatible with other Modular-Lab modules.



**Single Stopcock Module** (SSM; Dimensions: 130 x 176 x 113 mm; Weight: 1.7 kg)  
Holders and adapters for quick mounting of 3 single stopcocks (driven by servo motors). Stopcocks of different material and size can be used on the same module. Adapters for disposable sterile, plastic, Luer stopcocks, Teflon PTFE valves with UNF threads are available.



**Stopcock Manifold Module** (SMM; Dimensions: 130 x 160 x 113 mm; Weight: 1.7 kg)  
Holder and adapter for quick mounting of stopcock manifold. Standard stopcock manifold with Luer connectors for medical applications (one way, sterile) is used. Stopcocks are driven by servo motors.



**Vial Holder Module** (VHM; Dimensions: 130 x 152 x 113 mm; Weight: 1.5 kg)  
Holds up to 3 vials or cartridges. Can be obtained as passive module (no electric parts) or to operate additional activity detector, pressure sensor, temperature sensor or HPLC pump. Holders for different vials and cartridges are available. The holders can easily be adjusted in their position and fit with the respective handles of all Modular-Lab modules.



**Vial Holder Plate** (VHP; Dimensions: 108 x 67 x 55 mm; Weight: 0.3 kg)  
Holds up to 3 vials or cartridges. The holders can easily be adjusted in their position and fit with the respective handles on the side of any Modular-Lab module.



**Multi Position Valve Module** (MVM; Dimensions: 130 x 165 x 113 mm; Weight: 1.7 kg)  
The 7-port 6 position rotary valve is driven by a servo motor into 6 different positions and has no dead volume. From the seventh position liquids can be distributed to 6 ports or liquids from 6 different locations can be collected into one reservoir via the seventh position. Solenoid valve at the front can be used to close the system when switch is rotating. Other valves upon request.



**Single Syringe Module** (SYM; Dimensions: 130 x 184 x 270 mm; Weight: 3.8 kg)  
A single syringe with a volume of 1, 2, 5, 10 or 20 ml can be fixed via holder and is operated by a linear transfer axis. Customer specific syringes can be adapted on request.

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## Flex Module (Dimensions: 130 x 130 x 74 mm)

Module can easily be stacked underneath, between or on top of other modules to provide more space. It enables to turn other modules by 90° and it can also be used for vial storage on top of the system.



## Heater Reaction Module (aircooled) (HRM; Dimensions: 130 x 220 x 113 mm; Weight: 2.0 kg)

Heating with heating-foil from room temperature to 180 °C. Integrated activity detector and internal temperature sensor included. Vials from 1 to 24 ml can be used with different adapter rings. Reaction vial can be cooled by airflow. If necessary for customized applications, the HRM type 6-29-10 with a maximum heating temperature of 220 °C is available on request.



## Flow Controller Module – 3 valves (FCM; Dimensions: 130 x 170 x 113 mm; Weight: 1.7 kg)

The Flow Controller Module (FCM) can be selected with one of three mass flow controller (150 ml/min He, 500 ml/min He/Ar/N<sub>2</sub> or 500 ml/min H<sub>2</sub>:He, 10:90). The flow can be reliably controlled between maximum flow and 10 % of maximum flow. The flow controller and the three 3/2 way valves (SMC LVM 155) have all standard UNF connectors at the front for easy access of “finger tight” fittings. The FCM shows optimal performance between 3-5 bar.



## Peltier Reaction Module (PRM; Dimensions: 130 x 248 x 191 mm; Weight: 7.8 kg)

Heating and cooling with 8 double thermoelectric Peltier elements from -20 °C to +150 °C (additional heat exchanger necessary for operation, no liquid nitrogen necessary for cooling). Includes activity detector, camera, stirrer, thermo sensor inside the reactor block. Additional temperature measurement inside reaction vial is possible. Can be equipped with a lift. Vials from 1 to 24 ml can be used with different adapter rings.



## Peristaltic Pump Module (PPM; PPM-5400 Dimensions: 130 x 205 x 191 mm, Weight: 3.1 kg; PPM-5430 Dimensions: 130 x 220 x 200 mm, Weight: 3.8 kg)

**PPM-5400:** The Peristaltic Pump Module is used for controlled transport of media. The speed of the pump (rotations per minute) and direction are displayed during operation. A peristaltic pumphead with three rollers handles tube sizes with 1.6 mm wall thickness from 0.5 mm to 8.0 mm bore.



**PPM-5430:** The Peristaltic Pump Module is also available as a cassette-based version with four independent channels to transfer fluids. The tubing cassettes are fixed on the pump head by using purpose-built clasps and can be customized according to your needs. All basic cassette manifolds are designed for fail-free mounting and compatible with standard off-the-shelf components (filters, valves, etc.). This enables operators to develop own cassette designs and makes the PPM 54-3-0 an ideal module for in-house development. Please refer to the dedicated fact sheet for more information.



## HPLC Module (HPLC; Dimensions: 130 x 188 x 192 mm; Weight: 3.6 kg)

The HPLC module is designed to purify the reaction product of a radio-tracer synthesis by semi-preparative HPLC. Integrated parts of the module are an injection valve, a fluid detector and a shielded activity detector. The following optional devices are available: HPLC-column, external variable activity detector in lead shield, 2 HPLC-pumps for gradient HPLC (KNAUER), automated column switch, column oven, UV-detector with variable wave length (KNAUER) and refractive index detector (KNAUER). The module can operate 2 HPLC pumps and 1 UV detector.



## Tube Oven Module (TOM; Dimensions: 390 x 265 x 154 mm; Weight: 14.6 kg)

The Tube Oven Module (TOM) is used for continuous flow reactions of gases on hot surfaces, e.g. conversion of [<sup>11</sup>C]CO<sub>2</sub> to [<sup>11</sup>C]CH<sub>4</sub>, [<sup>11</sup>C]CO<sub>2</sub> to [<sup>11</sup>C]CO and [<sup>11</sup>C]CH<sub>4</sub> to [<sup>11</sup>C]CN. The TOM can be operated up to 1,000 °C. The TOM contains an internal temperature measurement and a heating spiral for reaching and maintaining the set temperatures. It can be installed on a special bottom plate for vertical or horizontal set-up. The horizontal TOM is available with an integrated double tube. When using pulverized filling material the TOM should be positioned vertically.

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**Carbon-11 Trapping Module (CTM; CTM-2767 400 °C – Dimensions: 130 x 203 x 270 mm; Weight: 4.0 kg; CTM-2778 200 °C - Dimensions: 130 x 169 x 113 mm; Weight: 2.0 kg)**

**CTM-2767:** Trapping of [<sup>11</sup>C]CO<sub>2</sub> is achieved by a molecular sieve (60 - 80 mesh) at room temperature. The column for heating is supplied by VICI with following attributes: 1/4" x 5 cm and 1/16" tube fitting. Compressed air influx for cooling through 4 mm tubing and 2/2 way valve. Gas distribution is performed by a valve manifold with two types of connectors: 1/16" tube fitting to waste, reactor and column; 1/8" tube fitting for [<sup>11</sup>C]CO<sub>2</sub> and Helium gas. The gases are distributed by 3/2 way valves. The Helium flow is especially controlled by an integrated Helium flow controller ranging from 0 to 150 ml/min (max. pressure: 3 bar). Gas will be trapped at room temperature and released at max. 400 °C. The module is equipped with an internal activity detector.

**CTM-2778:** Module can be equipped with glass tube filled with gas trapping material (e.g. used in the gas phase production system for [<sup>11</sup>C]methyl iodide/triflate). Gas will be trapped at room temperature and released at max. 200 °C. The module is equipped with an internal activity detector.



**Cooled Carbon Trapping Module (CCTM; Dimensions: 130 x 185 x 191 mm; Weight: 3.5 kg)**

The Cooled Carbon Trapping Module (CCTM) is used for reversible adsorption of radioactive gases (e.g. [<sup>11</sup>C]CO<sub>2</sub> delivered from a cyclotron). It is directly connected to target and gas supply. [<sup>11</sup>C]CO<sub>2</sub> from a cyclotron is trapped inside a copper U-tube filled with Carboxen™ for adsorbing gases. The trapping performance can be improved by cooling the U-tube (min. -10 °C). The U-tube is equipped with Swagelok™ connectors (made of stainless steel and Teflon) that can be easily connected to Teflon, FEP or PEEK tubing material. It is equipped with an internal activity detector.



*All dimensions have the format (W x D x H) and include handles.*

**For more detailed information on each module, please contact us.**

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