

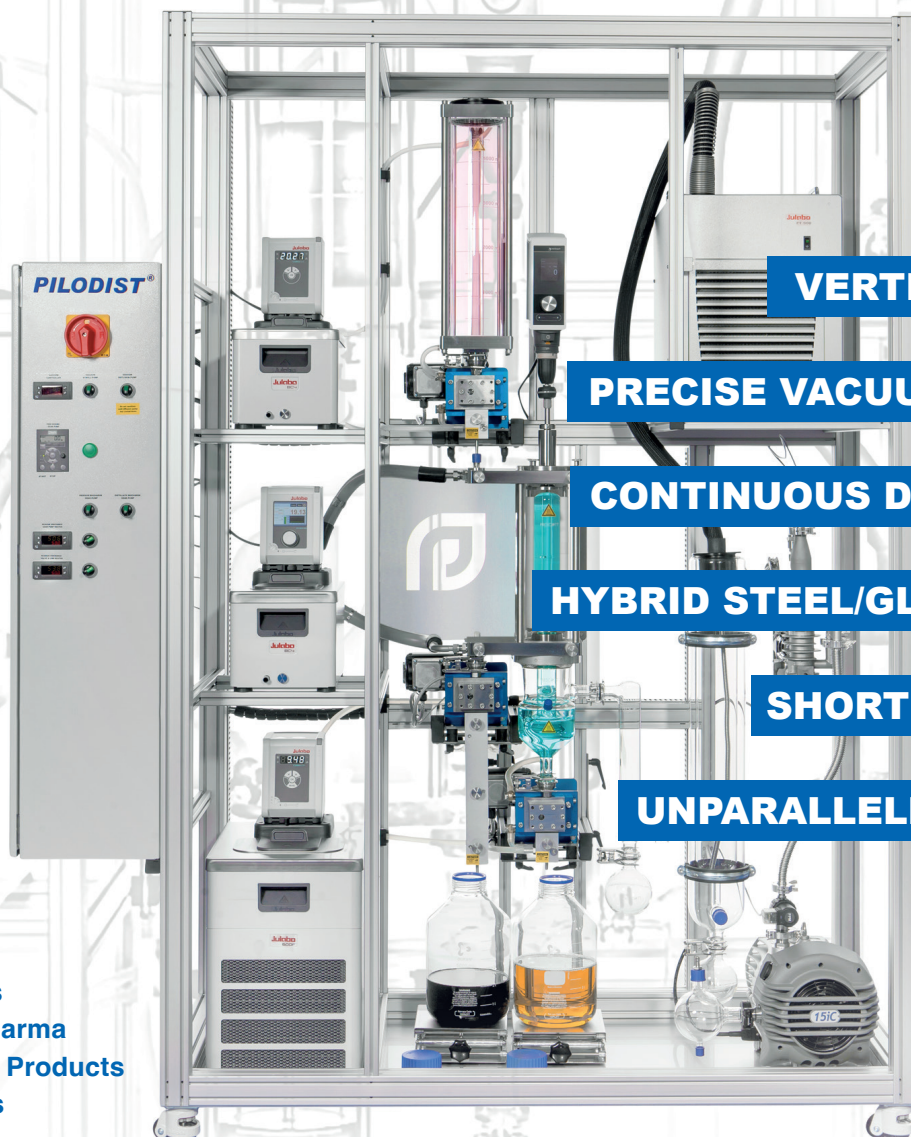
## PILODIST® SP1000-Series

### MOLECULAR THIN FILM DISTILLATION SYSTEMS

Our molecular wiped film short-path distillation units are made for the separation of thermally sensitive materials. This is achieved by the combination of optimized heat transfer, thin film technology, high vacuum and short residence times. The heart of all of them is our unique patented hydride evaporator, which combines all benefits of glass and stainless steel: visibility and robustness.



SP1000-Series



**VERTICAL DESIGN**

**PRECISE VACUUM CONTROL**

**CONTINUOUS DISTILLATION**

**HYBRID STEEL/GLASS DESIGN**

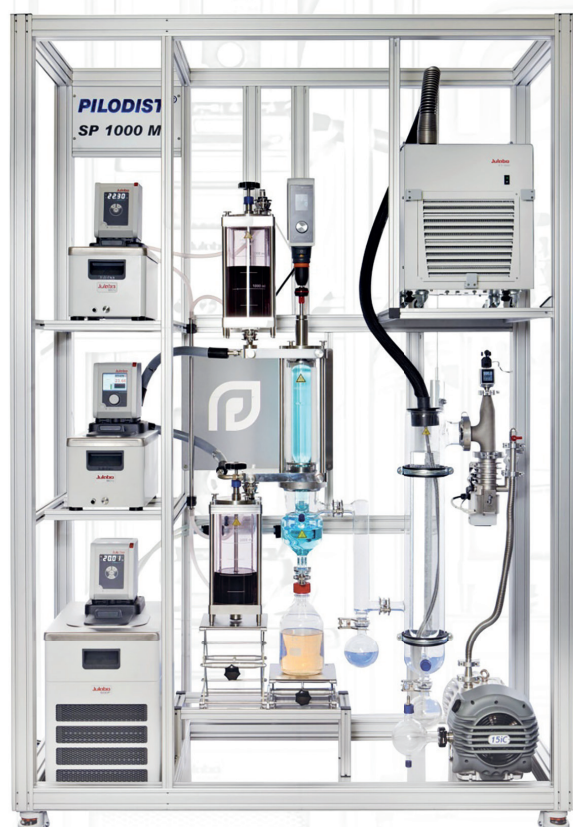
**SHORT LEAD TIMES**

**UNPARALLELED SUPPORT**

- Botanicals
- Food & Pharma
- Petroleum Products
- Lubricants
- Polymers
- Flavors & Fragrances
- R&D

## SP1000M

Interchangeable, double mantled and tempered vessels for feed and residue to eliminate refilling losses including completely heated precision dosing valve.



## SP1000CC

High vacuum tight, tempered gear pumps for fully continuous operation. Sophisticated control cabinet for easy handling with cULus approval.



### Technical Data:

	SP1000M	SP1000CC
Operating temperature	up to 200°C (250...350°C upon request)	
Final pressure	down to 10 <sup>-5</sup> mbar	
Feed range :	approx. 1000 – 4000 ml/h, dep. on application (max. 7000 ml/h)	
Evaporator surface:	1000 cm <sup>2</sup> , short path	
Evaporator MOC:	borosilicate glass & AISI 316 stainless steel	
Feed vessel:	3000 ml, graduated, heated, interchangeable	5000 ml, graduated, refillable during operation (unlimited batch size)
Residue receiver:	3000 ml, graduated, heated, interchangeable or GL-45 bottles	variable (5000ml in scope of supply)
Distillate receiver:	2000 ml, graduated	variable (5000ml in scope of supply)
Speed range of stirrer:	30...2000 rpm	
Dimensions (w x h x d)	1750 x 2280 x 820 mm	
Electrical Supply	230/400V 25A 3L+N+PE (50Hz or 60Hz available)* *other voltages available upon request	

Due to the complete in-house production the systems can be fully customized.  
Please contact us to discuss your specific application!



## Short path and molecular distillation

The main concept of short path distillation is to prevent breakdown or cracking by minimizing residence time and thus thermal stress. This is achieved by letting the product pass through a heated tube where wipers distribute the material and create a thin film for enhanced evaporation. Additionally, thermal stress is reduced by lowering the boiling point of the product (i.e. by applying vacuum).

Molecular distillation is a special form of short path distillation where the pressure is reduced even further, typically to less than  $1 \times 10^{-2}$  mbar. Through this, the mean free path of any molecule leaving the evaporator is longer than the distance between evaporator and condenser. That way all back-pressure (like in a conventional distillation column) is eliminated. Thus the boiling point is no longer dependent on the vapor pressure but only on the molecular weight.

## Special Advantages of the new SP 1000 Series:

### ■ Patented Hybrid Evaporator

- Combines all the positive characteristics of glass and stainless steel
- Full visibility of the process
- Reliable and precise
- Lowest tolerances in the market (no welding, no forming)
- Easy cleaning with full access to all product channels and electropolished surfaces
- Lowest maintenance & repair costs due to changeable glass-cylinders
- Completely heated inlet and outlet lines
- Lowest hold up due to extreme compact design

### ■ High capacity glass condenser

- Reliable and strong design
- Easy removable for cleaning
- Full visibility
- Completely tempered
- Maximized surface and minimized distance to the evaporator

### ■ Precise Vacuum control system

- Digital vacuum controller for high reproducibility
- Double vacuum sensor system
- No problems with incondensable vapors due to high capacity oil free scroll vacuum pump (15m<sup>3</sup>/h)
- Vacuum line in huge diameter for maximum performance and easy cleaning
- Automatic safety circuit for diffusion pump control
- Double condensate receiver system to separate light ends
- High capacity diffusion pump (65l/s → 234m<sup>3</sup>/h) with oil level indicator
- Supersized vacuum cold-trap for outstanding vacuum performance
- Cold-Trap with drain nozzle for easy maintenance
- Optional electrical immersion cooler down to -90°C (no dry ice needed)

### ■ Vertical design for optimized product flow without hold-up in useless pumping lines




### ■ Completely tempered discharge system without any solidification of heavy residues

### ■ All heating/cooling circuits with maximized diameter and minimized length for optimized heat transfer



# SP1000-Series

## Our unique upgrade concept:

	<b>SP1000M</b> Entry level	<b>SP1000CC</b> Professional	<b>SP1000CC-DUAL</b> High-end
			
		→ upgrade →	→ upgrade →
Operating mode:	batchwise	continuous per pass	fully continuous
Evaporator surface:	1000 cm <sup>2</sup>	1000 cm <sup>2</sup>	1000 cm <sup>2</sup>
Throughput:	1-4 l/h (max. 7 l/h)	1-4 l/h (max. 7 l/h)	1-4 l/h (max. 7 l/h)
Vacuum down to:	< 1 x 10 <sup>-5</sup> Torr abs.	< 1 x 10 <sup>-5</sup> Torr abs.	< 1 x 10 <sup>-5</sup> Torr abs.
Required passes*:	2	2	1
Batch size:	0.3 – 3.0 l	unlimited	unlimited
Turn-key-ready system	✓	✓	✓
GMP Ready (optional)	✓	✓	✓
Refillable during operation	✗	✓	✓
1 <sup>st</sup> pass vacuum controller	optional	✓	✓
Tempered gear pumps	✗	✓	✓
Automatic run of 1 <sup>st</sup> & 2 <sup>nd</sup> pass*	✗	✗	✓

\* for applications which require a pre-pass like most botanical extracts.

**PILODIST GmbH**  
Laboratory & process technology

Eichelkampstrasse 2  
53340 Meckenheim/Bonn Germany

Tel.: +49 (0)2225 9559115

Fax: +49 (0)2225 9559111