



ACE dual clamp  
1000 bar

FIG. 1:  
**CHRONECT Symbiosis Advanced**,  
Sampler shown with options: 2nd  
valve, Peltier Stacks 6DWW, vortexer  
solvent module

## CHRONECT Symbiosis Advanced

This system is fully compatible to be used with UHPLC columns up to 1000 bar and lower UHPLC flow rates than typically used for LC separations. It offers all the advantages of online SPE to increase assay performance while reducing method development time and manual sample preparation steps. With the solvent selector in the SPH1299 pumps and the optional column selector in the NEW Mistral™ it also allows you to run multiple batches under different LC conditions. You can even choose to do direct injection or to include the extraction, without reconfiguring your system hardware! The mix and dilute routine will be handled by the innovative and flexible PAL Sampler. Sample preparation steps such as adding internal standard can also be performed.

While the clean-up is performed on the left cartridge, the SPE-UHPLC-MS can run simultaneously on the right cartridge. Forward and backward wash is possible, giving clean samples and high assay sensitivities running your multicomponent UHPLC analysis. Peak focussing can be realized with mixed mode SPE cartridges and an additional SPH1299 UHPLC gradient pump.

CHRONECT Symbiosis is controlled by CHRONOS Symbiosis, a software platform developed by Axel Semrau®. CHRONOS controls the entire system in an efficient and intelligent way and enhances sample throughput by performing overlapping processes. The cartridge will be prepared while the analytics are running. CHRONOS organizes the connection to the LC-MS.

All CHRONECT Symbiosis Systems process multiple

batches/assays fast and reliably with the highest analytical performance, fully unattended.

### System configuration

- SPH1299 UHPLC pump
- ACE dual clamp 1000 bar, 4x UHPLC valves
- HPD MIX 1x SSM / Organizer, Mistral Cool
- PAL LSI sampler with second valve
- **CHRONOS Symbiosis** for control

### Features

- SPE-LC and liquid injection without manual interaction
- Concurrent SPE sample clean-up and online-SPE-LC-MS/MS analysis
- LC-Peak Focussing mode with optional UHPLC pump
- Injection volume variable, standard 100 µL
- Fast wash of syringe, aspire & dispense
- Internal standard addition

### With additional options

- Mistral CS Cool UHPLC for easy column handling
- Sample cooling with Peltier Stacks (4 to 40 °C)
- Upgrade mixed clamp version (right clamp 1000 bar)
- Solvent module with 3 extra solvents
- Higher capacity with more racks
- Better mixing with vortexer or agitator
- Integration in workflows with 2D Barcode Reader

*Many more options are available...*

## Specifications

- Direct UHPLC injection (LC mode)
- ACE dual cartridge clamp (SPE-LC mode): 1000 bar clamp & cartridges (10x1 mm ID), 4 UHPLC valves
- HPD Mix 1x SSM: 7 SPE solvents to select
- HPD syringe volume steps: 10 µL to 2 mL
- HPD SPE syringe flow rates: 100 µL/min up to 10 mL/min
- SPH1299 UHPLC gradient pump (binary gradient): 1300 bar, including degasser, 2x2 solvent selection for four different binary gradients, automatic purge and prime valves
- Mistral Cool column oven: 4 °C to 90 °C

## PAL Symbiosis standard specifications

- PAL3 LSI, 1 tray plate with 3 racks (VT54: racks for 3x54 2 mL vials)
- 2 Valco injection valves
- 1 - 250 µL syringe (fixed needle, gauge 22, PST3, different syringes up to 1 mL available, if needed)
- Standard: 100 µL sample loop, various loops possible
- Fast Wash module with pump and reservoirs for 2 solvents

## Specifications of options

- Mistral CS Cool UHPLC: 5 columns plus drain, 4 °C to 75 °C, 1000 bar
- Sample cooling with Peltier Stacks 2DW or 6DW: 2 or 6x 54 2 mL vials, 4 °C to 40 °C
- Vortexer: 2 mL / 10 mL / 20 mL, one slot for custom specific vials, mixing with up to 2000 rpm
- Agitator: 6 positions for 20 mL vials, adapters for 2 or 10 mL vials (optional), temperature range 40 to 100 °C, agitation speed 250-750 rpm

## CHRONOS Symbiosis software features

- Controls the entire system including integration in the lab environment
- Allows one sample list for front-end and LC-MS for MassHunter, OpenLAB, Analyst, LabSolutions, Masslynx, Clarity, Xcalibur & more
- Creates time schedules automatically with overlapping functions, comfortable functions to create task lists, easy navigation through bundling of tasks
- Ready-to-use methods, easy and safe method development, simple cut/copy/paste functions

CHRONOS specifications see: [www.axel-semrau.de](http://www.axel-semrau.de)

## Ordering Information

Article number	Description
AS-WS-0509	<b>CHRONECT Symbiosis Advanced</b> - 1000 bar clamp
AS-WS-0541	Upgrade <b>Peak Focusing</b> with additional UHPLC pump
AS-SP-886.202-UP	Upgrade <b>MISTRAL CS Cool UHPLC</b> (with column selector module)
AS-SP-730.110-UP	Upgrade <b>HPD MIX</b> 2x SSM
AS-CC-7420-SP	Upgrade <b>Sample Cooling</b> with Peltier Stacks <b>2DW</b> (VT54, with two racks, 54x 2 mL vials without vials)
AS-CC-7421-SP	Upgrade <b>Sample Cooling</b> with Peltier Stacks <b>6DW</b> (VT54, with 6 racks, 54x 2 mL vials without vials)
AS-CC-7555	<b>Vortexer</b> for better mixing
AS-CC-7550	<b>Agitator</b> for heated mixing
AS-CC-7575	<b>Solvent Module</b> - three additional solvents
AS-CC-5095	<b>2D Barcode Reader</b> - encoding up to 10 items of information on a 2 mL vial
AS-WS-0610	Upgrade <b>10 mL injection</b> for environmental applications

**Attention:** Many PAL options may require an upgrade of the standard 50 cm PAL LSI.



MD Scientific is an authorized distributor in Denmark  
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