

SOLUTIONS BY

LC *tech*

AUTOMATED SAMPLE PREPARATION FOR WATER ANALYSIS

FREE-STYLE™
XANA

Unique Automation for Sample Preparation in Water Analysis

Developed for Water

Sample preparation in water analysis has special requirements for automation, in particular where the processing of large-volume or particulate-laden samples is concerned.

The module XANA™ of the FREESTYLE™ robotic system has been specifically developed for sample preparation of large-volume water samples, for example of drinking water, raw water or river water. Without the need for supervision, the system processes samples reliably over 24 hours and 7 days/week through all stages beginning with the raw sample up to filling into GC vials, ready for subsequent analysis. Samples with suspended matter in many cases can also be pushed through the SPE columns in a controlled manner due to controlled pressurisation of up to 4 bar. By running individual processing steps in parallel and simultaneous processing of several samples, a high sample throughput is realised.

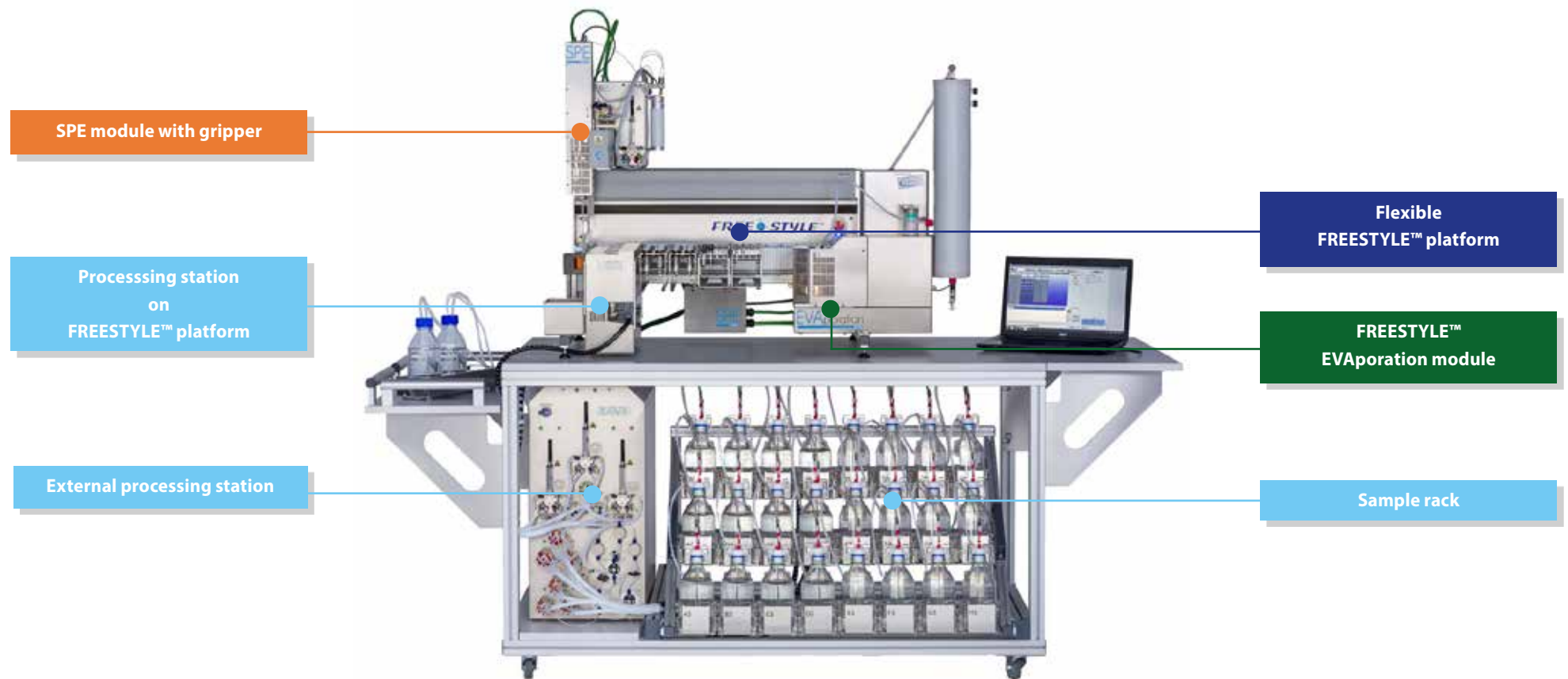
FREESTYLE™ XANA™ consists of the basic building block of the xyz-robotic system, FREESTYLE™ BASIC, and the SPE module. As an option, the platform can be fitted with an EVAporation module, whereby the sample can be eluted directly into the EVAporation chamber. Moreover, each module can be used separately for solid phase extraction, evaporation or for combined applications.



FREESTYLE™ BASIC platform equipped with SPE and EVAporation module.



FREESTYLE™ XANA™ - Configuration



SPE module with gripper:

Transports the SPE columns to the required position on the FREESTYLE™ platform and executes the elution steps.

Sample rack with 24 positions for 1 L sample containers each.

Processing station on the FREESTYLE™ platform:

3 SPE columns are simultaneously being processed in two blocks: in Block 1 the 3 columns are being conditioned, loaded and washed whereas in the subsequent Block 2 the previous 3 columns are being dried in parallel. *More on page 4*

External processing station:

Control centre of the water module including the mechanics for pumping 1-4 L samples, valves and sensors for process monitoring.

Flexible FREESTYLE™ platform

For easy hanging of racks for SPE columns and elution containers.

Optional:

EVaporation module for precise concentration to a continuously adjustable end volume of 5.0 mL to 0.2 mL; direct elution from the SPE column into the EVaporation chamber.

Sophisticated Parallelisation

Unique with XANA™:
Throughput of 65 samples
in 24 hours!

Operating Principle of FREESTYLE™ XANA™

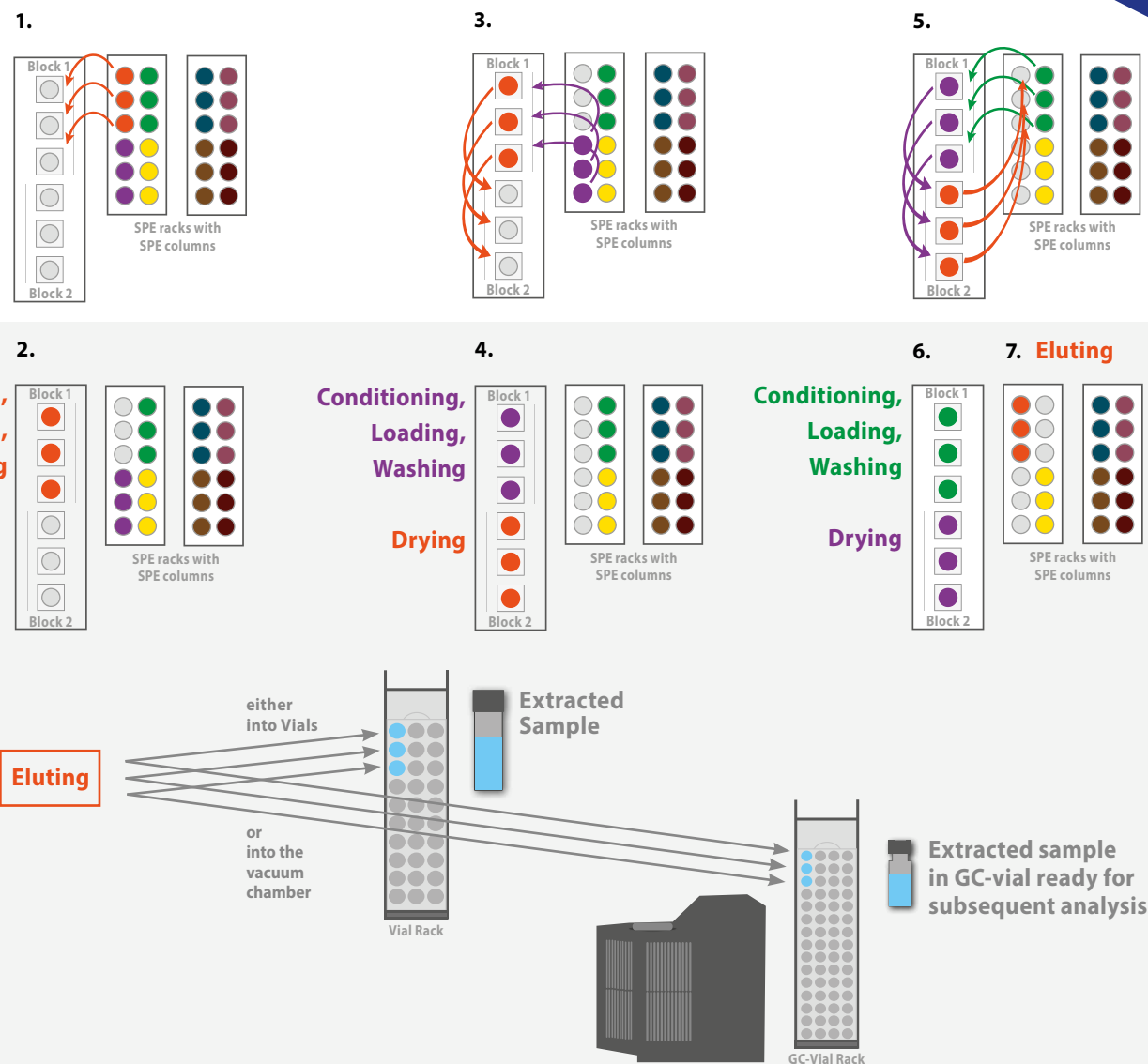
1. The SPE gripper places up to 3 columns from the SPE rack into Block 1 of the processing station:
2. Conditioning, loading and washing of up to 3 columns simultaneously.
3. The SPE gripper places up to 3 columns from Block 1 into Block 2 of the processing station.
The SPE gripper fetches the next columns (up to 3) from the SPE rack and places them into Block 1 of the processing station.

4. Block 1: Conditioning, loading and washing of up to 3 columns simultaneously
Block 2: Drying of the first 3 columns

5. The SPE gripper places up to 3 columns from Block 2 back onto the SPE rack.
The SPE gripper places up to 3 columns from Block 1 into Block 2 of the processing station.
The SPE gripper fetches the next columns (up to 3) from the SPE rack and places them into Block 1 of the processing station.

6. Block 1: Conditioning, loading and washing of up to 3 columns simultaneously.
Block 2: Drying of up to 3 columns simultaneously.

7. The first 3 columns are eluted into vials or into the vacuum chamber of the EVaporation module.
After the precise EVaporation to the desired end volume, the filling into the GC- vials is taking place making the water sample ready for the subsequent analysis.



The required processing time of 3 samples is determined by the block with the longest lasting process step. A high sample throughput of 65 samples/day is achieved by parallelisation of the individual process steps and simultaneous processing of 3 samples.

Flexible Sample Volumes



Sample rack



Space for 24 x 1 L sample bottles



Sample bottle with specially designed closure

Large Volumes, High Sample Throughput, Little Effort

Water analysis deals mainly with large-volume samples. Hence, the FREESTYLE™ XANA™ sample rack provides space for 24 x 1 L sample bottles. Optionally, sample volumes of 1 L up to 4 L can be loaded onto the columns.

The handling of the sample racks is simple: rollers allow for easy movement of the racks, and thus loading of the racks with the samples is straightforward.

Sample bottles are placed into the rack slightly tilted and together with a specially designed sample bottle closure, which affects the suction capillary to be positioned at an angle, the sample load is maximised.

The Key to Flexibility

FREESTYLE™ Software: One for All

The FREESTYLE™ software provides the user with a powerful and easy-to-use software.

All FREESTYLE™ modules are pre-configured and can be operated via the FREESTYLE™ software.

Each module includes a method editor backed with a default method. The user can, however, simply modify this by input of various processing parameters and save it as a new method. Alternatively, an already validated, manual method can be created as a new method and saved. Combinations of existing methods, as e.g. SPE-EVA, are also possible.

Thus, the software provides the flexibility to change from a water application to another SPE application with a smaller sample volume by just a few mouse clicks.

During sample input in the main window of the water module, the samples are positioned in the specially installed sample rack by mouse click.

The software checks immediately, whether the sample positions, according to the selected method, have already been allocated. It is possible to add new samples at all times during processing and to prioritise recently entered samples – even at ongoing operation. A prioritised sample will be automatically started after the current sample has been finished.



Screen method input



Screen sample input

Unique: XANA™ applies the pressure - up to 4 bar when loading onto SPE columns

Innovative Technology - Made in Germany



Processing station on the FREESTYLE™ platform



External processing station

FREESTYLE™ XANA™ - Technical Specifications:

- Developed for unattended 24/7 operation
- 24 samples are loaded in groups of 3 for sequential throughput
- Use of 3 mL and 6 mL SPE columns made of polypropylene with MACHEREY-NAGEL closures
- Liquid and pressure tight up to 4 bar
- Free adjustable flow rates of 0.1 – 30 mL/min
- Drying with pre-set nitrogen pressure
- Up to 5 solvents selectable for conditioning and washing

One System, Many Advantages

The FREESTYLE™ XANA™ robotic system offers innovative automation for unattended, automated processing of large-volume water samples around the clock, seven days a week.

Owing to the option of permanent system use, the parallelisation of the processing procedures and the simultaneous processing of 3 samples, a high sample throughput is achieved. While the system is reliably processing the samples, the user of the system has time to focus on other tasks.

The Pressure Makes the Difference

With a positive pressure of up to 4 bar during loading FREESTYLE™ XANA™ ignores suspended particles and simply pushes many samples through the SPE-columns.

Permanent pressure monitoring during loading and elution gives users the security they need. If a pre-defined pressure value is exceeded, the system will stop the processing of this sample, which will be marked in the sequence list for post-processing action. Then the system will start with the next sample.

Since the FREESTYLE™ system can be used for the processing of water samples as well as for automated solid phase extraction or evaporation, it is equally well suited for use in both smaller and high throughput laboratories.



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The information contained in this brochure is based on our current knowledge and has been carefully checked. However, since we continually work on the further development of our products, please accept texts, pictures and numbers on these pages as non-binding and exemplary only.

FREESTYLE™ XANA™

Column adapter and caps depend on used columns.

FREESTYLE™ XANA™	P/N 14769
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FREESTYLE™ XANA™ with EVAporation module for concentration and filling into 1 mL GC-vials	P/N 14771
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Column adapter and caps depend on used columns.
Please contact us for your individual offer.

FREESTYLE™ **XANA**

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