

3.5 Accessories for the flame technique

3.5.1 Automatic samplers AS-F and AS-FD

Manual or automatic sample supply may be employed in the flame technique and the mercury/hydride technique. Automatic operation and multi-element analysis are possible if an autosampler is used. The parameters are set and the function is controlled with the ZEE nit 700 P control software.

The ZEE nit 700 P can be operated with the following autosamplers:

- The autosampler AS-F is an automatic autosampler.
- The autosampler AS-FD also has a dilution function.

The autosamplers use sample trays with the same diameter. The following sample tray types are available:

| | |
|---------------|--|
| 139 positions | Sample tray with 129 positions for 15 mL Sarstedt cups on the outer track and 10 sample positions for 50 mL Sarstedt cups on the inner track |
| 54 positions | Sample tray with 54 positions for 50 mL Sarstedt cups |

The sample trays should be selected according to the requirements of the analysis:

- Available sample volume
- Type of signal evaluation

The software controlled autosampler arm reaches all the positions intended for sample-taking. The dipping depth into the sample and the special cups is preset, however, it can be adjusted via the control software.

The ZEE nit 700 P supplies the autosamplers with operational voltage. Tray and autosampler arm are driven by stepping motors. The tray is rotated. The autosampler arm is rotatable and can be lowered by 120 mm.

On the top of the autosampler AS-F there is a wash cup with overflow next to the sample tray. In the autosampler AS-FD the wash cup is located in a plastic block together with a mixing cup. A diaphragm pump delivers the washing liquid from the supply bottle into the wash cup – this action cleans the dipped cannula by washing it inside and out. Excess washing liquid flows through the overflow into the waste receptacle, which is under the table during the wash cycle.

The autosampler AS-FD features an extra Fluidics module with a dosing unit (5000 µL). The Fluidics module is electrically connected to the autosampler and is supplied with operating voltage via the ZEE nit 700 P. Standards or samples are diluted in the mixing cup by first placing the concentrate into the mixing cup. Then the diluent is added at a high dosing speed (max. volume: $V = 25 \text{ mL}$). A fixed waiting time ensures complete mixing. A second diaphragm pump extracts the residual liquid that has not been taken up by the nebulizer.

The autosampler AS-FD with dilution function features the following advantages:

- Preparation of standards for the calibration by diluting one or several stock standards in the mixing cup
- Dilution of the sample if its concentration is too high, i.e., its element content is higher than 110 % of the calibration standard with the highest concentration
- Dilution of all samples at freely selectable dilution ratios up to a ratio of 1:500