

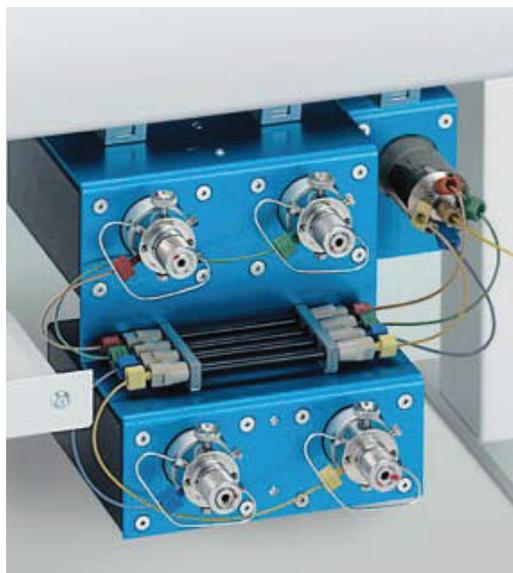
PAL HTS-xt equipped with 4-fold valve Drive

PAL Valve Options

Prep and Load Platform

4 Valve Option for automated parallel LC-MS analysis

The PAL 4-fold valve option was developed for automated parallel LC-MS analysis, especially required for multiplexed LC-MS interfaces. The accessory consists of 4 injection valves which are loaded in serial mode and switched to inject simultaneously. This allows to work with 4 LC columns in parallel which results in enhanced throughput. CTC's single syringe design allows even for parallel analysis the "cherry picking" sampling mode (random plate access to single wells). Additionally the 4-valve option can be combined with a 8-port stream selector valve for staggered sample injections. Important chromatogram areas can be cut-out and reach the LC-MS inlet. Beside enhanced throughput, this feature helps to keep the MS inlet clean for a prolonged period of time.



Automated parallel or staggered injections with 4 valves

Stream selector valve for staggered sample injection mode

Single syringe design enables "cherry picking mode"



UPLC Chromatography

Ultra performance liquid chromatography (UPLC) is a category of liquid chromatography where pressures up to 17'000psi (1200bar) are used. Researchers benefit from increased resolution, speed, and sensitivity in a variety of applications. These advantages result from packing columns with < 2.0 μm particles and HPLC instrumentation that are optimized for such conditions. In order to take advantage of this new technology, samples are introduced via ultra high pressure injection valves into the corresponding UPLC chromatography system. All PAL HPLC sample loaders can be equipped with injection valves built for pressures up to 17'000psi (1200bar). Various valve models are available e.g. 6 - or 10-port design and different bore sizes for nano- and micro applications

Ultra high pressure valves up to 17'000psi (1200 bar)

6 - or 10-port design available

Various bore sizes for nano- and micro applications



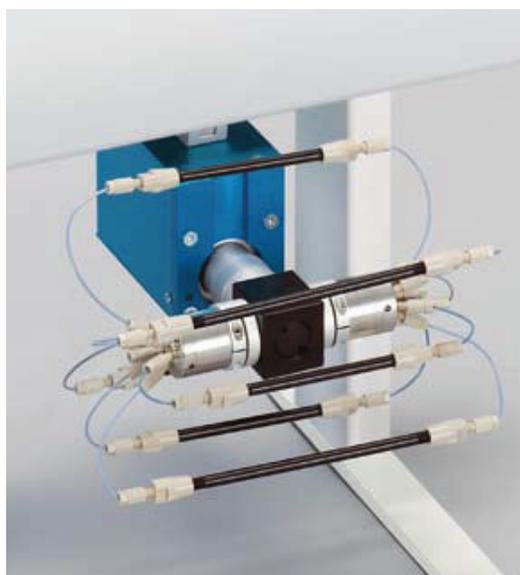
Valve Switching Modules

PAL valve drive modules consist of 2 or 3 individually controlled multiposition valve drives arranged in a vertical stack. The top valve acts usually as injection valve, while the remaining one or two valves are used as switching valves. Typical applications are pre-column SPE, pre-column cleanup, sample desalting, etc. For increased sample throughput the accessory can be used for time staggered "heart-cuts" of two independent gradient systems. Important chromatogram areas only reach the detector just in time using a selector valve, while the front- and end-cut goes to waste. The compact valve module arrangement results in a space saving setup with very short connection lines. The modules are compatible either with 4- 6- 8- or 10-port valves and can be mixed on the same valve drive module.

Pre-column sample cleanup, desalting or pre-column SPE

Alternate column regeneration

4 - 6 - 8 - or 10 - port valves individually arranged in a vertical stack



Column Selector Valve

Column selection helps to develop reproducible, rugged methods in the shortest possible time. With a variety of columns from which to choose, any method development lab can optimize selectivity, resolution and analysis time. The PAL Column Selector option allows a single or multiple users to select methods using the appropriate column for their assay. Columns are stored in the storage solvent of choice requiring no manual changes. Different types of samples can be run over night using different columns resulting in better utilization of existing equipment. In a validated environment, PAL column selection option can be used for column to column reproducibility, method ruggedness or long-term stability.

Column selection valve for up to 6 columns

Automated method development using different columns

Column to column reproducibility, method ruggedness, long-term stability