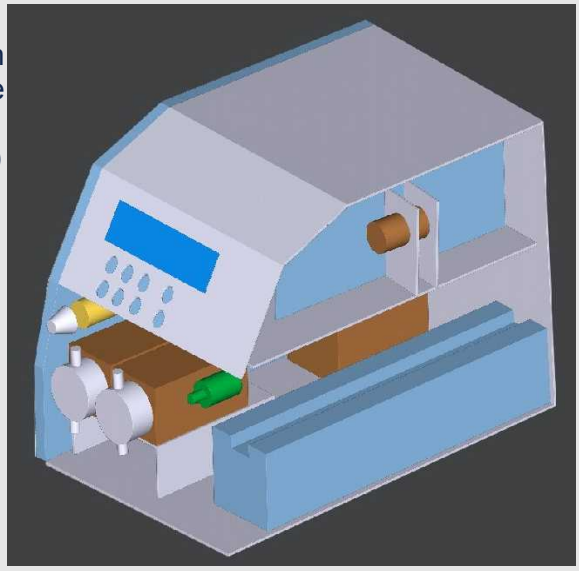
HPLC ANALYZERS
CHROM L10

Labio promotes compact analytical HPLC instruments that contain all facilities necessary for successful operation in a single cabinet. These chromatographs are primarily designed for routine use in industrial and agricultural control laboratories, pharmaceutical plants and biochemical laboratories in hospitals as well.
Since Labio manufacturers HPLC columns, the staff permanently use liquid chromatographs for testing and thus company designers know customers need. They devoted considerable attention to the design of the new chromatograph CHROM L10. The fundamental requirements comprise simple use, maximum accessibility and compact character of the instrument.
Compact instruments bring about an important advantage, as all the functions are controlled centrally by means of a single display and a keyboard which are situated on the oblique part of the front panel. To achieve maximum lucidity a backlit, high-contrast graphic display is used. The system is controlled by means of the proven system of three levels menu. The vertical and horizontal arrows enable easy navigation in the menus. Horizontal arrows are also used to enter numerical values of individual operating parameters. The speed of changing the parameter increases exponentially as an arrow key is held down. Special attention was devoted to the keyboard of the CHROM L10 instrument. Insulated keys were used instead of the unreliable membrane keyboards. Each key rests on an elastic o-ring, which seals the gap between the key and the panel, thus preventing liquids from penetrating areas where they may damage electronic parts. Bottom part of front panel comprises only a bypass tap and sample injection port. Six port loop injector handle is situated on the right side near to the front panel. The tilting front panel is held in the closed position by means of strong permanent magnets. With the front panel open all hydraulic connections (except the column – detector connection) can be easily controlled and tightened. Open panel enables the operator to access easily the pump, bypass valve, loop injector and the column compartment under it. Operator has the access to the gradient-controlling valves, bypass valve, loop injector too, if they are used. In CHROM L10 they are represented by a special block with three solenoid valves of very small volume that mix the pre-programmed mobile phase composition on the low-pressure side of the pump,
Inside the chromatograph columns are mounted on the same movable base as the pump or in a separate, thermostatted oven fixed to this base. CHROM L10 column oven is designed to be fast and allow fast cooling as well. Instead of currently used solid state oven Labio has developed a unit where a light column cover is heated by infrared beams along whole column length . Described design allows working with temperature gradients easily.

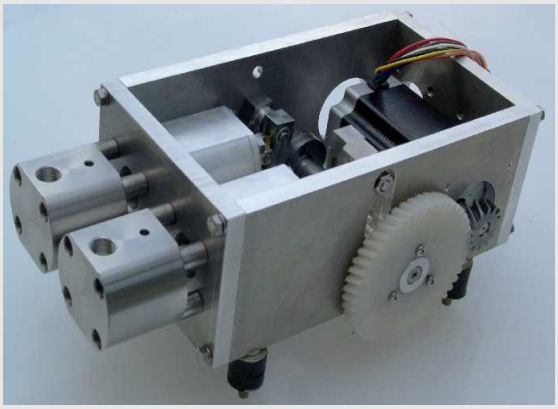
CHROM L10P HPLC chromatograph

The connection between the column and the detector, installed in the upper part of the cabinet, is accessible from the side by means of an opening. The opening enables the column to be connected to the detector cell and the latter to be removed. Measuring cell and light filters (when used) can be also removed through this opening.
The front oblique part of the cover is held in place by means of two screws at the rear side of the cabinet. Once the panel with the display and the keyboard is removed (the power cord must be first disconnected!) the operator has easy access to the installed detector.
Similarly to progressive car manufacturers who provide various engine types and optional accessories, Labio offers several types of pumps, detectors, gradient valves and column ovens. Production itself is organized in the way to stock not instruments but subsystems, from which the final product is assembled rapidly in conformity with individual customer's wishes. That´s why you may rest assured that we will devote full attention to your needs and satisfyl your specific requirements.



CHROM L10 crosssection

The variant comprising a reciprocating pump and a programmable UV-VIS detector, known as CHROM L10P, is the fundamental and most often requested combination. The progressive mechanical design of ACP L2 pump is employed in this instrument. The pump has two piston heads in serial configuration. Both pistons have the diameter 4 mm, the latter has half stroke. Pistons are covered by a polycrystalic carbon to improve their hardness. They are moved through identically shaped cams to create pulsless flow. A patented system of levers is used to differ piston strokes. The pump crankshaft is driven by a stepper motor exhibiting an enormous range of speeds.The pumping heads are held by four screws; removal provides access to the piston seal which is in typical Labio design (similar to PCP pumps, comprising of three plastic rings formed as cones). A rear part of a seal set made of PEEK serves as a chamber for rinsing the pistons under special working conditions. Seal is permanently pressed by plate springs. The whole pump unit is situated in the bottom part of chromatograph on a base with rails and can be moved out for maintenance when necessary.



ACP L2 mechanical part

HPLC would be impossible without top-quality photometric (UV and UV-VIS) detectors. CHROM L10P is equipped with a variable-wavelength UV-VIS detector SAPPHIRE. It normally operates with an analytical cell of 8 ml volume. In addition to a number of auxiliary operations (calibration, compensation of lamp intensity variation) the detector offers a programmable wavelength feature, where the wavelength can be changed up to three times during one analysis as well. Each such change is accompanied by an AUTOZERO operation to correct the baseline. The instrument exhibits a low noise level (3 x 10-5 AU) and provides both digital and analog output signals.

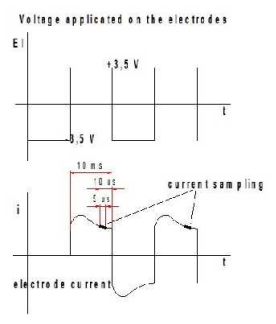
ACP L2 pistons

CHROM L10P is an efficient tool for HPLC, but it can be still improved using gradient of mobile phase (CHROM L10PG). The variant of CHROM L10PT utilizes stabilized or increased column temperature possibility. Top model is known under name CHROM L10PGT.
In some cases the requirements imposed on an HPLC detector are not so demanding and the system can be operated with a filter-based UV-VIS detector, which is substantially less expensive. The instrument equipped with this detector (model OPAL), a reciprocating pump and a standard loop sample injector is marketed as CHROM L10 FP. An other available variant (CHROM L10 P2) is equipped with TOPAZ detector, which operates at two wavelengths, monitored by means of a simple diode array.

Micro HPLC analyzers are designed for applications where either small quantity of sample is available or rather expensive mobile phases are necessary. Microchromatographs are not so widely used because of their complicated design and maintenance. CHROM LM10 is here to convince customers that micro HPLC is simple and efficient method when proper instrument is used. Basic model CHROM LM10PL is equipped with linear pump Linar 30, SAPPHIRE detector with the microcell (0,5 µl volume, highly luminous design) and a special loop injector with internal loop (sample volume of 0.2 µl). It has a corundum ceramics rotor and polyimide sealing.

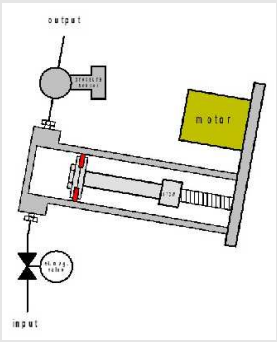
A view to the inside of L10

Totally pulse-free linear pump LINAR 30 consists of a high-capacity cylinder (30 ml) and a piston with a PTFE seal. The piston is operated by a ball screw and a stepper motor. Output valve is a ball type, input one is made as high pressure solenoid one. The cylinder/piston assembly is mounted in the cabinet slightly askew to prevent accumulation of air bubbles inside the cylinder. High flow rate range is available (1 to 2000 µl/min) and the short filling time (2 minutes) is to be achieved. The MAG 0 column (1.4 x 150 mm) having dead mobile phase volume of 200 µl and can suffice for an analysis lasting 4 hours at a flow rate of 120 µl/min.



CD DUO sampling

Chromatograph CHROM L10 LION enjoys a special position among the CHROM L10 series. LION is a chromatograph equipped with conductivity detector CD DUO and pulseless pump LINAR 30 with cylinder of 30 ml volume. Detector CD DUO has a measuring and a reference cell for facile compensation of mobile-phase conductance, noise and drift reduction. Conductance is not measured continuously as in other detectors; instead, the signal is sampled at the end of each pulse to eliminate signal components other than conductance. Cells of volume of 1 µl are made of PTFE, Kel-F, and stainless steel 316Ti. Six measuring ranges are available (0.1 µS to 100 mS). The instrument is equipped with standard loop injector, a column thermostat and an ion suppressor.



LINAR 30 schema

The mobile phase passes in the ion suppressor through a semipermeable capillary surrounded from the outside with a circulating solution (actuated by an auxiliary non-metal membrane pump) of an electrolyte that only selectively permeate into the capillary. The suppressor block is installed in the upper-right part of the chromatograph cabinet and is easily accessible by removing the cover.

ASAM L40 autosampler

All CHROM L10 chromatographs use manual injection of sample by six port injectors; injection port is situated on the front panel. Nevertheless they can be combined with autosampler ASAM L40 as well. ASAM L40 is designed to allow injection of 40 samples by a 500 µl syringe which sucks the samples from vials. Sample is filled to the loop of a motor-driven injector installed at the place of the manual one.

CHROM L10 – TECHNICAL PARAMETERS OF DELIVERED MODELS

Type	Description & technical parameters
CHROM L10 LION	Compact analytical chromatograph with conductivity detector for all ion type analyses. Integrated syringe pump LINAR 30, conductivity detector DUO CD, column oven, ion suppressor Sequant, loop injector. Flow rate 0,001 – 1,99 ml.min–1, detector range 0,1 µS - 10 mS, detection limit cca 10 ppb (chlorides), microprocessor control, 7 lines graphic display, keyboard
CHROM L10 P	Compact analytical chromatograph with integrated photometric detector. Piston pump ACP L2, photometric detector Sapphire, loop injector. Flow rate 0,01 – 9,99 ml.min–1, UV VIS detector with variable wavelength 190-800 nm, up to 3 wavelength changes in one analysis, noise 0,5.10-5 AU, drift 1.10-4 AU, microprocessor control, 7 lines graphic display, keyboard
CHROM L10 PG	Compact analytical chromatograph with integrated photometric detector. Piston pump ACP L2 with gradient (low pressure, 3 phases, 10 linear steps), photometric detector Sapphire, manual loop injector. Flow rate 0,01 – 9,99 $ml.min^{-1}$, UV VIS detector with variable wavelength 190-800 nm, upto 3 wavelength changes in one analysis, noise 0,5.10-5 AU, drift 1.10-4 AU, microprocessor, control, 7 lines graphic display, keyboard
CHROM L10 PGT	Compact analytical chromatograph with integrated photometric detector. Piston pump ACP 2 with gradient (low pressure, 3 phases, 10 linear steps), photometric detector Sapphire, column oven, loop injector. Flow rate 0,01 – 9,99 ml.min–1, UV VIS detector with variable wavelength 190-800 nm, up to 3 wavelength changes in one analysis, noise 0,5.10-5 AU, drift 1.10-4 AU, column temperature up to 99 °C, microprocessor control, 7 lines graphic display, keyboard.
CHROM L10 MP	Compact analytical microchromatograph with integrated photometric detector. Syringe pump LINAR 30, photometric detector Sapphire equipped with microcell 0,5 ul, microcolumn loop injector (internal loop 0,3 ul). Flow rate 0,001 – 1,99 ml.min–1, UV VIS detector with variable wavelength 190-800 nm, 3 wavelength changes in one analysis, noise 0,5.10-5 AU, drift 1.10-4 AU, microprocessor control, 7 lines graphic display, keyboard.

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