Equipment set TP 610 – Advanced level
Measurement and control in Hydraulics with FluidLab®-H

Fit for tomorrow?

The equipment set for TP 610 expands the training content of TP 501 and TP 601 to include the topic of hydraulics measurement and control. The material covered ranges from recording simple characteristic curves of individual hydraulic valves through to the basic principles of cylinder control. In addition, awareness is raised in a clear and striking manner about the effective use of hydraulic energy, e.g. with resistance experiments.

New features of FluidLab®-H include the measurement experiments for proportional technology with recording characteristic curves, and applications such as pressure stages and rapid traverse feed circuits, as well as control technology with position, sequence and pressure control.

Exercises for the measurement and analysis of system and control behavior point to a future in which diagnostics, preventative maintenance, and saving energy are becoming more and more important.

Something extra special
In order to the complete the exercises, sensors (e.g., pressure, flow and position) are connected to the inputs, and control signals are transmitted to the EasyPort USB outputs. The FluidLab®-H software included in the scope of delivery interprets and visualizes the signals. Analog values are displayed as measurement curves.

Each exercise includes notes on its implementation, with positional sketches and block circuit diagrams. Students are guided step-by-step through the experiments. Measured results are then interpreted and compared with sample solutions, and questions are asked to check students' understanding.

Training content
– Basic principles of analog processing
– Using and adjusting sensors
– Interpreting measurement results
– Reading and understanding technical data and measurement curves
– Getting to know fluid engineering components and their influence and function
– Demonstrating fluid engineering effects and special features
– Analytical fault finding
– Hydraulic energy
– Evaluating changes of state
– Proportional technology
– Control technology with position, sequence and pressure control

Your advantages
– Fast, PC-supported recording of measured values
– Greater training success through measurement of components and interpretation of results
– Sensors that enable students "to look into" the circuit and components
– Suppositions regarding system behavior can be easily proven
– Learning the principles of measurement and analysis and applying them directly in other circuits
– Demonstrate and understand the principles of fluid engineering faster
– System analysis via a PC: State-of-the-art diagnostic method
– Better understanding of fluid engineering components and processes and thus better training outcomes

Complete equipment set TP 610 in equipment tray	**567194**

The most important components at a glance:

1	1x	I/O data cable with SysLink connectors (IEEE 488) at both ends, 2.5 m	34031
2	1x	Universal connection unit, digital (SysLink)	162231
3	1x	Analog cable, parallel, 2 m	529141
4	1x	Connection unit, analog	567232
5	1x	EasyPort USB	548687
6	1x	Quick-Fix screw adapter	549806
7	1x	4/3-way solenoid valve, relieving mid-position (AB –› T)	544348
8	2x	Pressure sensor	525964
9	1x	Flow control valve	152842
10	1x	Resistance hose line with quick release couplings, 1000 mm	549858
11	1x	FluidLab-H Single license, de/en	573286
12	1x	Limit switch, electrical, left-actuated	183322

The exercises for proportional and control hydraulics also require:

Proportional amplifier	162255
Displacement encoder for cylinder, 200 mm stroke	167090
Mounting kit for cylinders	544371
4/3-way proportional valve	544350
Proportional pressure relief valve	544351
Pressure filter	548609

Optionally, the regulating valve can be used instead of the proportional amplifier with the proportional valves for the control technology exercises.

4/3-way regulating valve	567269
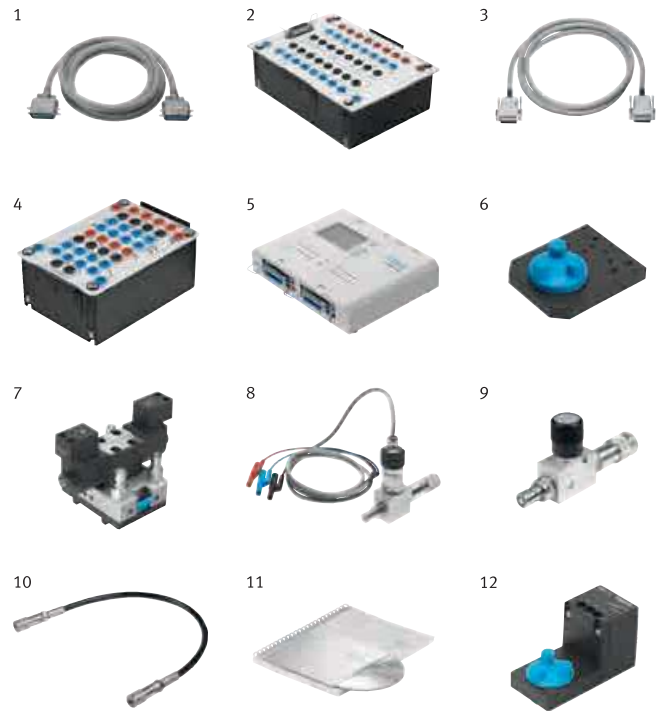
Includes FluidLab®-H measurement software

The FluidLab®-H software is an important component of the training package TP 610. Just a few simple steps are needed to configure the interface, adapt the sensors, and select the language (de/en). Then the exercises can begin, which are divided into the areas of basic experiments, cylinder controls, proportional technology and control engineering. Connection diagrams, descriptions, and sample solutions support students during the exercises. The software also controls the measurement sequence. Diagrams can be dimensioned and printed out using the cursors. The software also includes the complete book of exercises, with sample solutions, in PDF format.

System requirements
– PC with Windows 7/8/10
– Pentium® III or equivalently
– 2 GB RAM
– CD-ROM disk drive
– USB 2.0 or serial interface
– 1280 x 1024 pixels
– NI LabView 2012 Runtime
  (included in scope of delivery)

To carry out the exercises, students require the components and appropriate accessories from training packages 501 and 601.