

Equipment set TP 702 – Advanced level

Advanced proportional hydraulics training



Proportional hydraulics, Advanced Level

The training package TP 702 builds directly on the material covered in package TP 701, Basic Level, and adds nine additional more in-depth and real-life case studies.

The package includes the following steps:

- Understanding the task using a positional sketch, diagram and problem description
- Designing the hydraulic circuit diagram
- Determining the necessary signal transmitters
- Compiling the sequence table
- Designing the electric signal control system
- Structuring and commissioning the proportional hydraulic control system
- Settings and evaluating the result

Training content

Components:

- Determining characteristics curves and characteristics of different sensors
- Coordinating electrical and hydraulic equipment
- Creating characteristic curves for displacement, pressure, and temperature sensors

Measurements and calculations:

- Measuring and processing parameters such as displacement, time, pressure, and temperature
- Further signal processing of analog signals

Hydraulic circuits:

- Controlling pressure, speed, acceleration, delay, and position
- Reading and creating proportional hydraulic and electric circuit diagrams
- Reading motion diagrams
- Designing and commissioning proportional hydraulic control systems, including fault finding
- Adjusting and coordinating as per the specified procedure description
- Using basic circuits for proportional hydraulics such as: speed, rotational speed, stage, acceleration, braking, and differential circuits, as well as positioning
- Implementing specific displacement-time and positioning programs

- Setting precise switch-off positions
- Implementing drive acceleration with a proportional pressure-relief valve
- Implementing oscillating movements for a cylinder with a proportional hydraulic control system
- Implementing the specified speed profile by means of an additional bypass circuit and slow retraction to the end positions
- Implementing a travel process with a 2/2-way proportional valve and a proportional pressure-relief valve

Complete equipment set TP 702

184466

The most important components at a glance:

1	1x Setpoint value card	162256
2	1x Comparator	162257
3	1x Time relay, two-fold	162243
4	1x Indicator unit and distributor, electrical	162244
5	3x Relay, three-fold	162241
6	1x Limit switch, electrical, left-actuated	183322
7	1x Limit switch, electrical, right-actuated	183345
8	1x Proximity sensor, capacitive, M12	548651
9	1x Proximity sensor, optical, M12	572744
10	1x Non-return valve, delockable	544339
11	1x T-distributor	152847
12	1x Non-return valve, 0.05 MPa opening pressure	548617
13	1x Displacement encoder for cylinder, 200 mm stroke	167090
14	1x Mounting kit for cylinders	544371

Necessary accessories, also order:

5x	Hose line with quick release couplings, 600 mm	152960
3x	Hose line with quick release couplings, 1000 mm	152970
2x	Hose line with quick release couplings, 1500 mm	159386
	Measuring case	177468
	Pressure relief unit	152971
	4 mm Safety laboratory cables → Page 155	
	Aluminum profile plate → Page 39	
	Hydraulic power pack → Pages 148 – 149	
	Protective cover for weight, 9 kg → Page 143	
	Power supply unit for mounting frame → Page 155	

Also order:

Workbook



Nine exercises illustrate the most important circuits and equipment in proportional hydraulics. To carry out the exercises, the equipment sets for proportional hydraulics TP 701 (Basic Level) and TP 702 (Advanced Level) are required.

The workbook contains:

- Sample solutions
- Training notes
- Worksheets for students

Campus license (→ Page 19):

de	94458
en	94473
es	94450

Supplementary media

- Designing and simulating with FluidSIM®
- Measuring and controlling with FluidLab®
- WBT Hydraulics
- WBT Electrohydraulics
- WBT Open- and closed-loop control
- Textbook: Proportional hydraulics, Basic level
- Hydraulics poster set

