RT 522
Flow control trainer

Description

- **experimental introduction to control engineering using an example of flow control**
- **construction of the system with components commonly used in industry**
- **digital controller with freely selectable parameters: P, I, D and all combinations**
- **integrated 2-channel line recorder**
- **optional process control software RT 650.50 available**
- **construction of a complete networked system via Profibus interface possible**

This trainer provides a comprehensive experimental introduction to the fundamentals of control engineering using an example of flow control.

A pump delivers water from a storage tank through a piping system. The flow rate is measured by an electromagnetic sensor, which permits further processing of the measured value by outputting a standardised current signal. A rotameter indicates the flow rate. The controller used is a state-of-the-art digital industrial controller. The actuator in the control loop is a control valve with electric motor operation. A ball valve in the outlet line enables defined disturbance variables to be generated. The controlled variable X and the manipulating variable Y are plotted directly on an integrated 2-channel line recorder. Alternatively, the variables can be tapped as analogue signals at lab jacks on the switch cabinet. This enables external recording equipment, such as an oscilloscope or a flatbed plotter, to be connected.
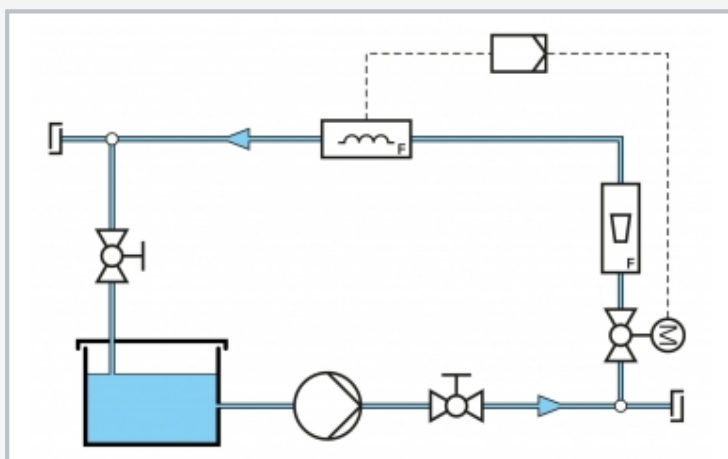
A process control software (RT 650.50) is optionally available. The software permits the construction of a complete networked system comprising multiple trainers from the RT 512 – RT 552 series. The key process variables can also be represented, and control functions executed.
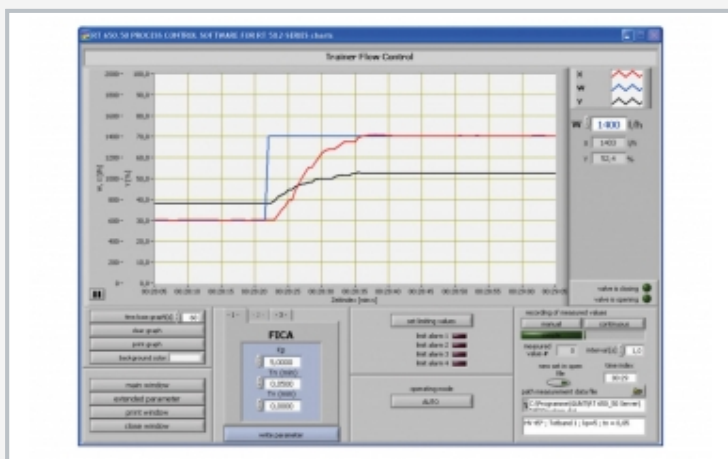
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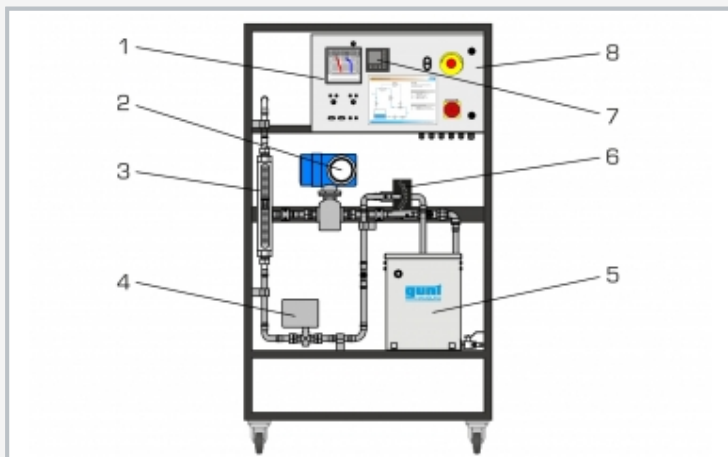
1 line recorder, 2 electromagnetic flow rate sensor, 3 rotameter, 4 control valve, 5 storage tank with pump, 6 ball valve with scale, 7 controller, 8 switch cabinet

Process schematic

Screenshot of optional process control software RT 650.50: step response to change in reference variable, PI controller

Technical data

Storage tank: 30L
Centrifugal pump
- power consumption: 250W
- max. flow rate: 150L/min
- max. head: 7m
- speed: $2800min^{-1}$

Rotameter: 0...1960L/h
Electromagnetic flow rate sensor: 0...6000L/h
Control valve with electric motor
- Kvs: $5,7m^3/h$
- stroke: 5mm
- characteristic curve equal-percentage
- valve-opening position sensor: 0...1000Ω

Line recorder
- 2x 4...20mA
- feed rate 0...7200mm/h, stepped

Controller
- process variables X, Y as analogue signals: 4...20mA

230V, 50Hz, 1 phase
230V, 60Hz, 1 phase
120V, 60Hz, 1 phase
UL/CSA optional
LxWxH: 1000x700x1750mm
Weight: approx. 110kg

Scope of delivery

1 trainer
1 set of cables
1 hose
1 set of instructional material

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Optional accessories

080.65050	RT 650.50	Process Control Software for RT 512 - RT 552 Series

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