

RT 590 Process control engineering experimental plant

RT 590 represents a process engineering system with practice-oriented design, such as a separate supply unit and centralised process control/monitoring.

Process control engineering, serving as the technical basis of Industry 4.0, is essential for the automated operation and monitoring of complex technical processes. Control and monitoring of the processes are usually centralised. All necessary information on the process state is summarised there and represented clearly, e.g. by means of a visual representation of the process.



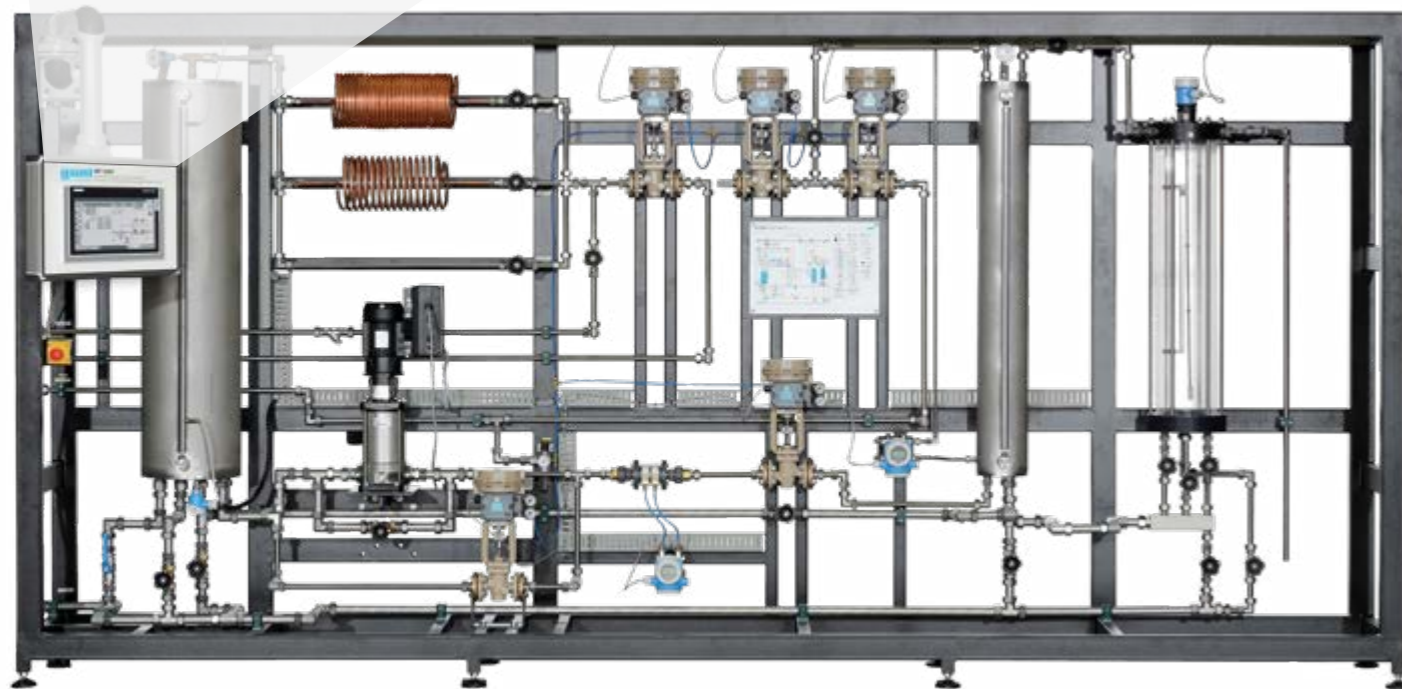
The visualisation with control function used as an interface for interaction with the experimental plant is called "human-machine interface" (HMI). The effects of any adjustments are immediately visible on the display.

The consolidated, centralised supply of multiple processes with media such as cooling water, steam, compressed air and electric power is also typical of industrial process engineering plants. Such consolidated supply delivers the advantage of cost and energy savings.

Control and monitoring of the processes

- PLC with four integrated controllers
- HMI: operation via touch screen or PC with GUNT process control software
 - ▶ parameterization of controllers
 - ▶ selection of controlled system, controlled variables, actuators and operating modes
 - ▶ display of time functions
 - ▶ simulation of 11 typical faults such as cable break, frozen measured values, reduced setting range
- data acquisition via GUNT process control software
- software-provided Remote Learning
 - ▶ LAN/WLAN connection of any number of workstations with GUNT process control software using only one licence
 - ▶ experiments executed in the lab can be observed and evaluated via the local network

Trainer with integrated PLC and touch screen

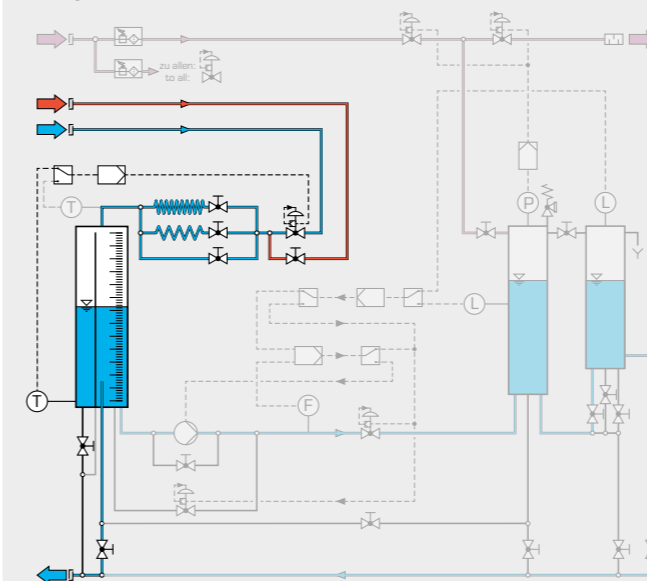


Learning objectives

- flow rate control
- level control with first order controlled system, with and without counter pressure
- level control with second order controlled system
- cascade control of level and flow rate
- pressure control with time-varying response of the controlled system
- temperature control with time-varying response of the controlled system
- fault finding

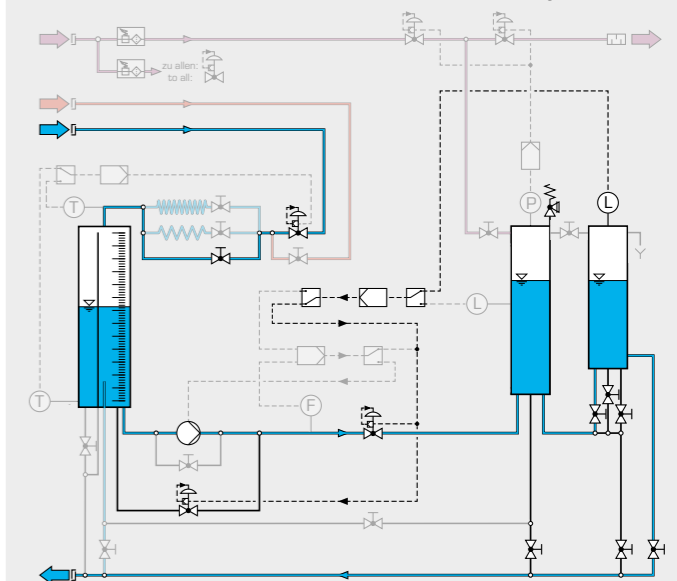
Examples of selectable controlled systems

Temperature control

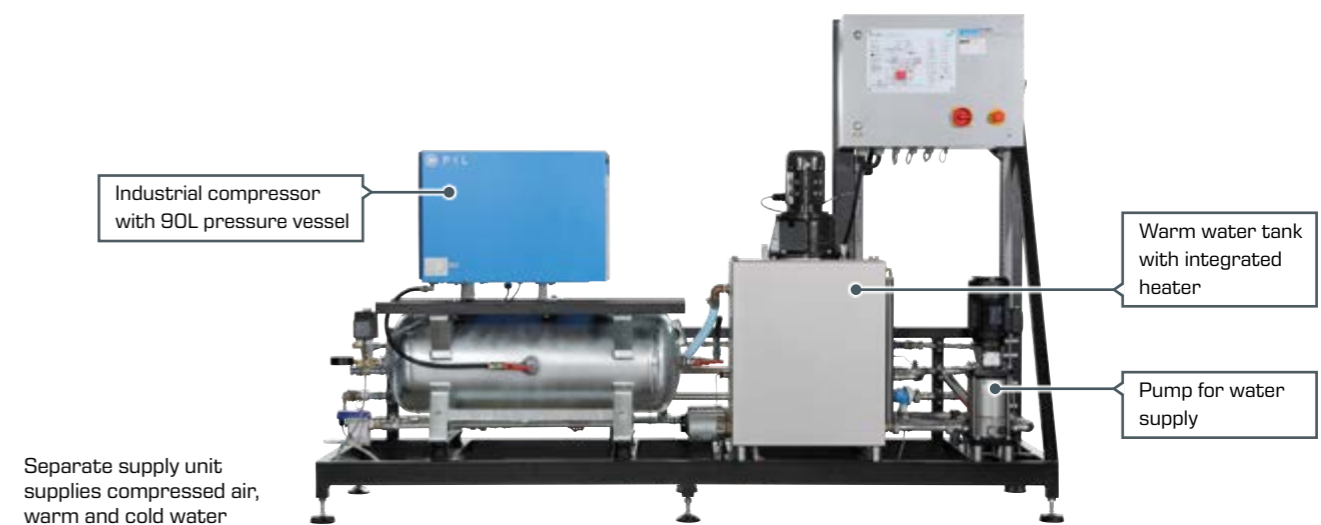


Warm water flows from the supply unit into the collecting tank. The temperature is altered by adding cold water by way of a control valve. The controlled variable is recorded with the sensor directly in the collecting tank. Three delay sections are included of differing lengths, these permit the setting of differing dead times.

Level control with a second order controlled system



Two series-configured tanks form the second order controlled system. The level in the rear tank is measured. It is controlled by two opposite-acting control valves. The response over time of the controlled system is varied by way of valves.



Separate supply unit supplies compressed air, warm and cold water