

# RT 450

## Process automation training system: base module



### Learning objectives/experiments

- together with accessory components, the following learning content and exercises are possible
  - ▶ planning and construction of different process applications
  - ▶ planning and construction of different automation solutions for the control systems
  - ▶ familiarisation with the design, function and behaviour of industrial automation components, such as controllers, PLCs, actuators and measuring devices
  - ▶ commissioning and optimisation of automated process applications
  - ▶ making process connections (via pipes/hoses), connecting up the electricity supply and the instrumentation and control components
  - ▶ fundamentals of the use of data acquisition, system control and parameter setting using the RT 450.40 software

### Description

- modular training system providing an introduction to the fundamentals of process automation
- base module with large frame for preassembled components
- extensive range of accessories available: process application modules, sensors, actuators, controllers, PLCs etc.
- software for data acquisition, operator control and parameter setting optionally available

Together with its wide-ranging accessory components, the RT 450 base module provides a modular, fully flexible and open-design system for learning the fundamentals of process automation by means of experimentation. The accessory components are pre-installed on panels. The base module provides an extensive frame for quick and safe mounting of the components required for the various experiments.

It includes a water supply with tank and pump, a switch cabinet for power supply as well as connections, maintenance units, and a pressure regulator for an external compressed air supply.

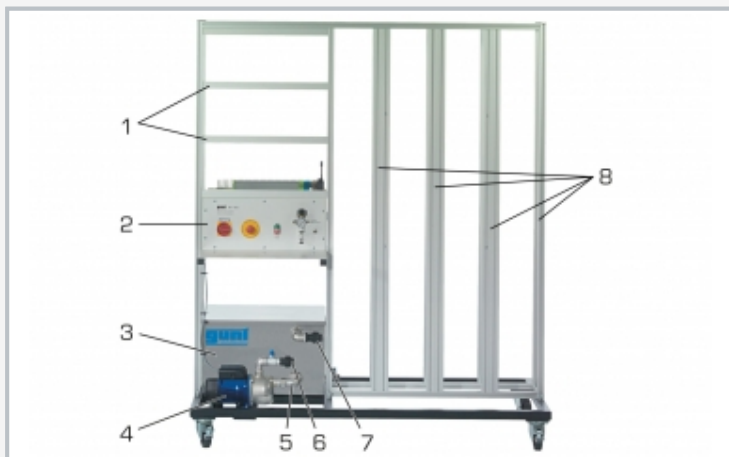
Connecting up the measuring and control cables and the process lines, as well as connection to the electricity supply, form key elements of the programme of exercises. Alongside the purely systematic technical learning content involved, key aspects of the teaching goals are pre-planning, modification, testing, commissioning and optimisation.

Optimal learning is achieved when two or three students work together on a training system as a group.

An instrumentation and control software (RT 450.40) with an interface module for Profibus DP (RT 450.41) is available as an accessory. This enables the key process variables to be displayed and control functions to be executed.

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## Process automation training system: base module



1 frame for electrical modules, 2 switch cabinet with power supply and maintenance and pressure control unit for compressed air, 3 storage tank, 4 centrifugal pump, 5 pump outlet, 6 pump inlet, 7 system water return, 8 aluminium frame



The illustration shows the layout of a level control system. In addition to the base module RT 450, it includes the following components: RT 450.01 (controlled system module: level), RT 450.10 (controller), RT 450.12 (recorder), RT 450.21 (control valve) and RT 450.35 (level sensor).



RT 450.10 (controller), RT 450.12 (recorder) and RT 450.42 (PLC module)

### Specification

- [1] base module for a flexible process automation training system
- [2] large frame with aluminium rails
- [3] frame for electrical modules
- [4] water circuit with centrifugal pump and tank
- [5] switch cabinet with 24V power supply
- [6] practice-oriented terminal blocks for wiring of the instrumentation and control signals
- [7] 2x maintenance unit and a pressure regulator for compressed air
- [8] installation and connecting material including tools for connecting accessory modules

### Technical data

Stainless steel storage tank: 75L

Centrifugal pump

- max. head: 20m
  - max. flow rate: 5,4m<sup>3</sup>/h
  - power consumption: 370W
- 24VDC supply for components

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase

120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 1650x850x1950mm

Weight: approx. 120kg

### Required for operation

compressed air (RT 450.03, RT 450.20, RT 450.21):  
6...10bar

### Scope of delivery

- 1 base module with pump, tank and switch box
- 1 set of tools
- 1 set of hoses
- 1 set of accessories (plastic tube, single-core non-sheathed cable, connecting elements)
- 1 set of instructional material

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### Required accessories

080.45001	RT 450.01	Controlled system module: level
080.45002	RT 450.02	Controlled system module: flow
080.45003	RT 450.03	Controlled system module: pressure
080.45004	RT 450.04	Controlled system module: temperature
Controller		
080.45010	RT 450.10	Continuous controller module
080.45011	RT 450.11	Switching controller module
080.45042	RT 450.42	PLC module with software
Control valve		
080.45020	RT 450.20	Control valve, pneumatically driven, Kvs 0,4
080.45021	RT 450.21	Control valve, pneumatically driven, Kvs 1,0
080.45023	RT 450.23	Control valve, electrically driven, Kvs 0,4
080.45024	RT 450.24	Control valve, electrically driven, Kvs 1,0
Sensor		
080.45030	RT 450.30	Pressure sensor, 0...6bar
080.45031	RT 450.31	Pressure sensor, 0...2bar
080.45032	RT 450.32	Pressure sensor, 0...100mbar
080.45033	RT 450.33	Orifice with differential pressure sensor
080.45034	RT 450.34	Flow rate sensor: electromagnetic
080.45035	RT 450.35	Level sensor, capacitive
080.45036	RT 450.36	Temperature sensor Pt100
080.45037	RT 450.37	Thermocouple (K) with head transmitter

### Optional accessories

080.45012	RT 450.12	Chart recorder module
080.45013	RT 450.13	Digital display
080.45014	RT 450.14	Software for controller configuration
080.45040	RT 450.40	Visualisation software
with		
080.45041	RT 450.41	Profibus DP module for controller
or		
080.45043	RT 450.43	Profibus DP module for PLC