

# 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.

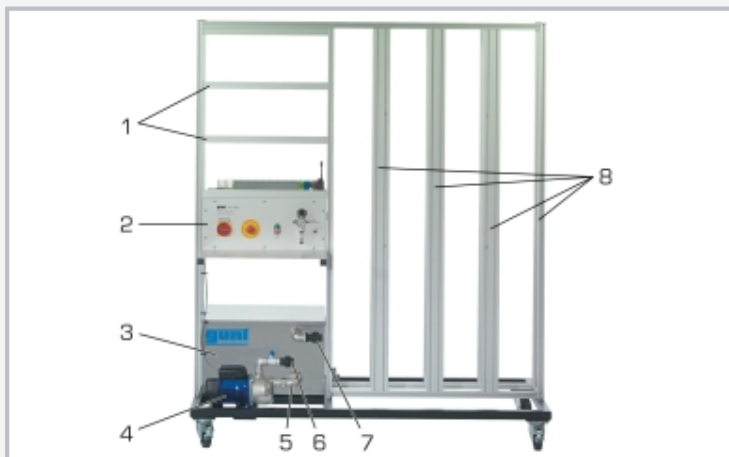
Connecting up the measuring and control cables and the process lines, as well as connection to the electricity supply, form key elements of the programme of exercises. Alongside the purely systematic technical learning content involved, key aspects of the teaching goals are pre-planning, modification, 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 (RT 450.41) is available as an accessory. This enables the key process variables to be displayed and control functions to be executed.

# RT 450

## 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).

### 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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## Process automation training system: base module

### Required accessories

RT 450.01	Controlled system module: level
RT 450.02	Controlled system module: flow
RT 450.03	Controlled system module: pressure
RT 450.04	Controlled system module: temperature
Controller	
RT 450.10	Continuous controller module
RT 450.11	Switching controller module
RT 450.42	PLC module with software
Control valve	
RT 450.20	Control valve, pneumatically driven, Kvs 0,4
RT 450.21	Control valve, pneumatically driven, Kvs 1,0
RT 450.23	Control valve, electrically driven, Kvs 0,4
RT 450.24	Control valve, electrically driven, Kvs 1,0
Sensor	
RT 450.30	Pressure sensor, 0...6bar
RT 450.31	Pressure sensor, 0...2bar
RT 450.32	Pressure sensor, 0...100mbar
RT 450.33	Orifice with differential pressure sensor
RT 450.34	Flow rate sensor: electromagnetic
RT 450.35	Level sensor, capacitive
RT 450.36	Temperature sensor Pt100
RT 450.37	Thermocouple (K) with head transmitter

### Optional accessories

RT 450.12	Paperless recorder module
RT 450.13	Digital display
RT 450.40	Visualisation software
with	
RT 450.41	Ethernet module for controller