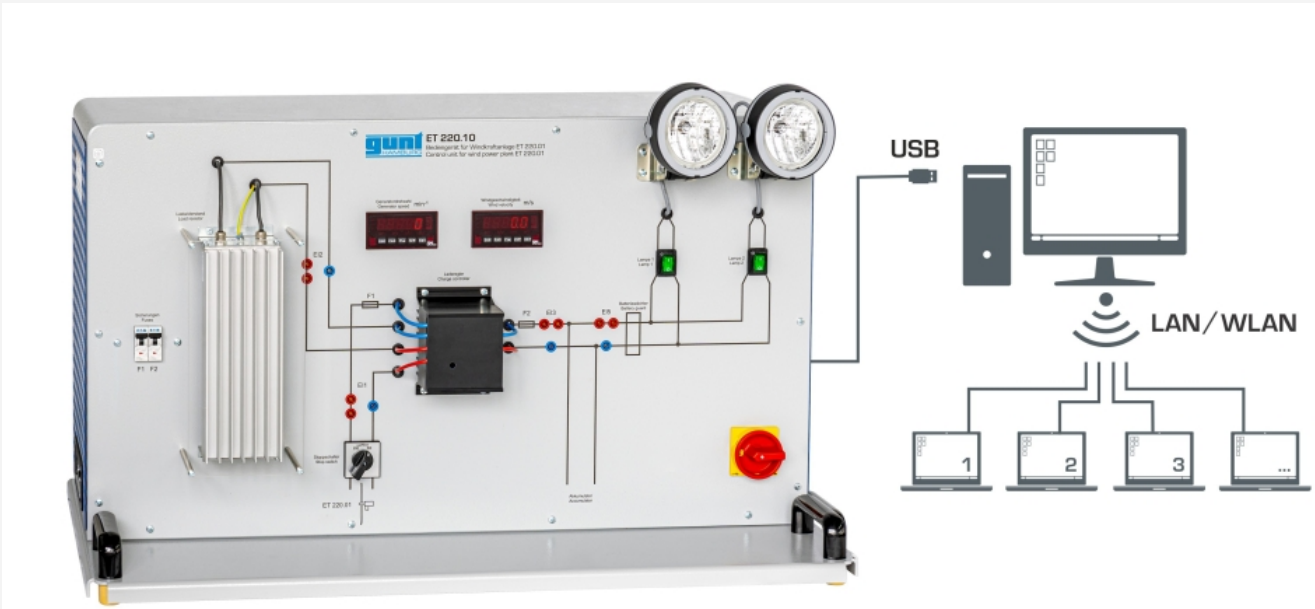
ET 220.10

Control unit for wind power plant ET 220.01



Network capable GUNT software for data acquisition: observation, acquisition, analysis of the experiments at any number of workstations via the customer's own LAN/WLAN network.

Description

- **use of wind energy in stand-alone operation under real weather conditions**
- **compact control unit with charge controller and electrical consumers**
- **network capability: observe, acquire, analyse experiments via customer's own network**

The generation of power in wind power plants covers a significantly increasing proportion of energy needs worldwide. Both the conversion of the kinetic wind energy and the use and storage of the generated electrical power are crucial aspects in this context.

ET 220.10 is a compact control unit for the mobile wind power plant ET 220.01. The electrical energy from the wind power plant ET 220.01 is fed into the stand-alone system of ET 220.10, which is independent from the power grid.

The electrical energy is stored temporarily by means of a charge controller in an accumulator included in ET 220.01. As soon as the accumulator is charged, the excess electrical energy is dissipated in fixed resistors. This overcharge protection is triggered when the defined end-of-charge voltage is reached.

It is indicated on the charge controller by means of an LED lamp. The wind power plant will continue to run under these conditions, and can provide electrical energy again instantaneously when needed.

Within the stand-alone system the stored electrical energy of the accumulator can be absorbed with the help of electrical loads. Two lamps act as consumers. The energy is not intended to be supplied to a public power grid.

Sensors record the wind velocity and the rotor speed of ET 220.01 as well as the current and voltage of the stand-alone system. The measured values are transmitted directly to a PC via USB, where they can be analysed using the GUNT software included. The network capable GUNT software makes it possible to observe, acquire, and analyse the experiments at any number of workstations via the customer's own network with just one licence. In addition, digital displays indicate the wind velocity and rotor speed. The laboratory's own multimeters can be connected via lab jacks to measure and display current and voltage.

Learning objectives/experiments

- in combination with the wind power plant ET 220.01:
  - conversion of kinetic wind energy into electrical energy
  - operating behaviour of a wind power plant under real weather conditions
  - components, function and setup of a stand-alone system with a wind power plant
  - energy balance of a stand-alone system with a wind power plant
- GUNT E-Learning
  - multi-media online course on the fundamentals of wind power
  - learning independent of time and place
  - access via Internet browser
  - check through targeted review of the learning objectives

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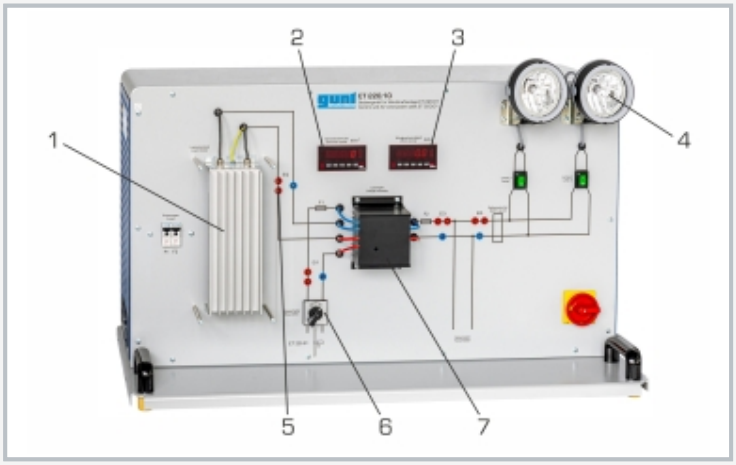
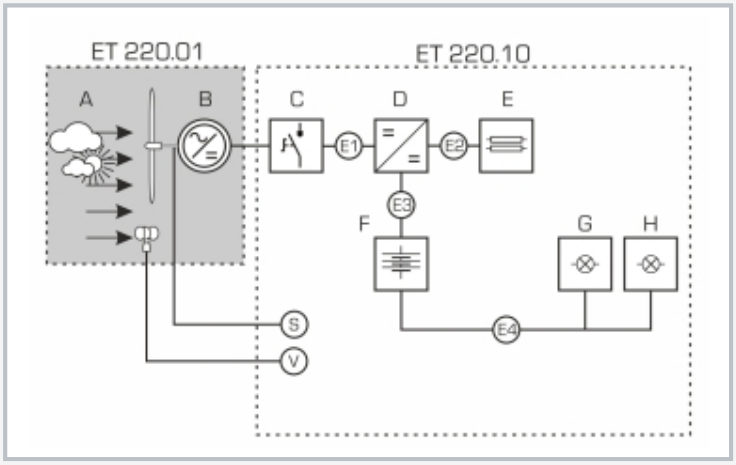
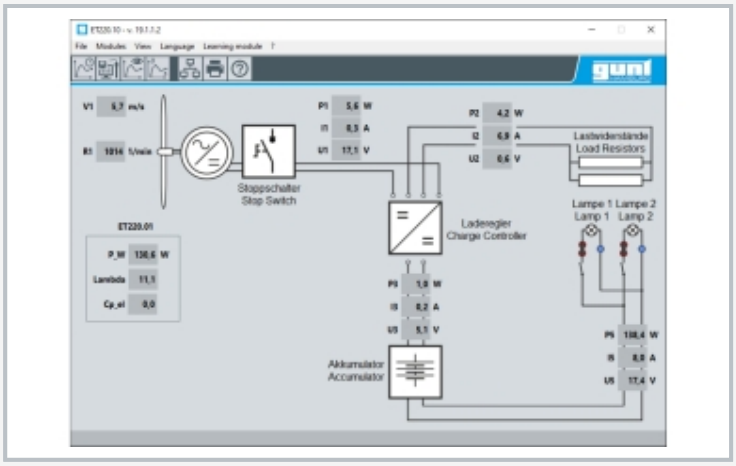


1 fixed resistors, 2 rotor speed display, 3 wind velocity display, 4 electrical load, 5 measuring point for current and voltage, 6 wind power plant brake switch, 7 charge controller



Process schematic ET 220.10 together with ET 220.01
A natural wind, B wind turbine, C brake switch, D charge controller, E fixed resistors for surplus, F accumulator, G, H lamps;
S speed, V wind velocity, E1-E4 current, voltage



Screenshot GUNT software for data acquisition: display of measured values in process schematic

Specification

[1] control unit for wind power plant ET 220.01 in stand-alone operation
[2] connections for wind power plant ET 220.01 and the accumulator in ET 220.01 on the rear
[3] charge controller with overcharge protection with fixed resistors
[4] 2 lamps as electrical loads (consumers)
[5] detection and display of the wind velocity and rotor speed of ET 220.01
[6] detection of current and voltage at different points of the stand-alone system
[7] additional measuring points for current and voltage using the laboratory's own measuring equipment
[8] remote learning: detailed E-Learning course on the basics of wind power accessible online
[9] network capability: observe, acquire, analyse experiments at any number of workstations with GUNT software for data acquisition via the customer's own LAN/WLAN network
[10] GUNT software for data acquisition via USB under Windows 11

Technical data

Charge controller
- nominal voltage: 12V
- max. charging voltage: 14,2V
- max. current: 40A
- control procedure: PWM

Electrical load (2 lamps)
- voltage: 12VDC
- power: 55W each

Measuring ranges
- wind velocity: 0,3...50m/s
- speed: 0...3000min^{-1}
- voltage: 0...20VDC
- current: 0...35A

230V, 50Hz, 1 phase
230V, 60Hz, 1 phase
120V, 60Hz, 1 phase
UL/CSA optional
LxWxH: 1000x550x590mm
Weight: approx. 47kg

Required for operation

PC with Windows

Scope of delivery

1 control unit
1 GUNT software + USB cable
1 set of instructional material

ET 220.10
Control unit for wind power plant ET 220.01

Required accessories

ET 220.01	Wind power plant

Optional accessories

for Remote Learning

GU 100	Web Access Box
with	
ET 22010W	Web Access Software

Other accessories

WP 300.09	Laboratory trolley