PT 500

Machinery diagnostic system, base unit

The illustration shows PT 500 together with the trolley PT 500.01

Description

- **base unit for setting up wide ranging experiments in machinery diagnostics using modular accessory sets**
- **aluminium base plate with slots for quick, flexible assembly of different experimental setups**

In order to avoid serious damage to machines and to carry out maintenance on time, the condition of the machine must be known. The state of a machine or machine parts can generally be judged well in terms of the type and size of its vibrations. The machinery diagnostic system can be used to simulate certain types of damage and investigate its effects on the vibration spectrum.

The PT 500 base unit permits vibration measuring exercises (measurement of vibration displacement, velocity and acceleration in the time/frequency range). Field balancing of rigid rotors and alignment of shafts can also be practiced.

The key components of the base unit are the mechanical elements (clutch, bearing blocks and shaft with rotors), the drive motor with variable speed via frequency converter and tachogenerator, and the display and control unit with digital displays for power output and speed.

The motor base plate is mounted on a carriage, enabling the motor to be aligned. The large aluminium base plate with locating slots allows quick, flexible and precise assembly of the system components. A transparent protective cover provides the necessary safety during operation, and enables clear system viewing during experiments. All parts are clearly laid out and well protected in a storage system.

To measure and evaluate all experiments, the computerised vibration analyser PT 500.04 is required. The accessory sets PT 500.10 – PT 500.19 enable repeatable simulation of the different types of damage.

Use of the trolley PT 500.01 is recommended for flexible deployment of the training system.

Learning objectives/experiments

- introduction to vibration measuring methods on rotating machinery systems
  - fundamentals of measurement of shaft and bearing vibrations
  - basic variables and parameters
  - sensors and measuring devices
  - influences of speed and shaft layout
  - influence of sensor positioning
- field balancing of rigid shafts
- influence of alignment between motor and coupling
- understanding and interpreting frequency spectra
- use of a computerised vibration analyser

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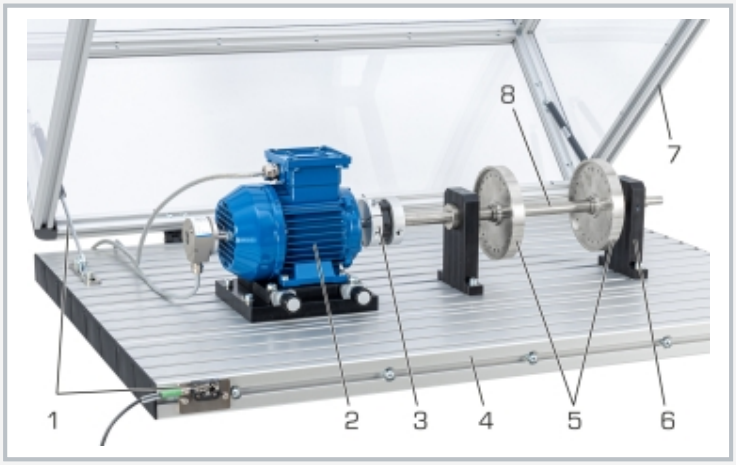
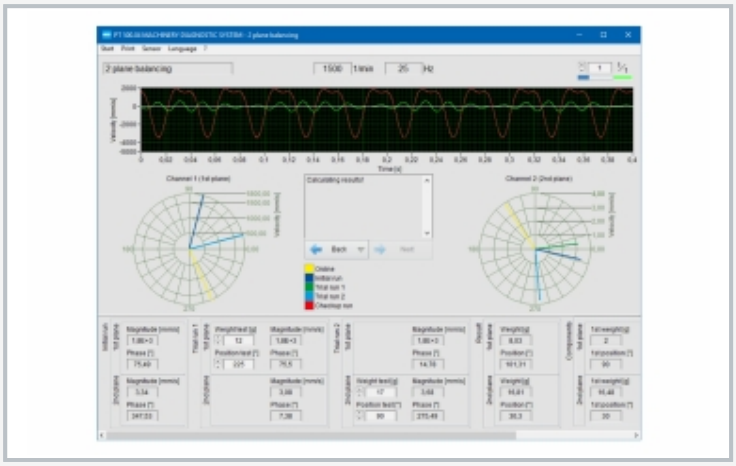


1 safety features: motor switches off when the protective cover is opened during operation ensure safe operation, 2 drive motor with adjustable carriage, 3 coupling, 4 base plate, 5 unbalanced flywheel, 6 bearing unit, 7 transparent cover, 8 shaft

The illustration shows the components in the storage system



Screenshot of evaluation software: field balancing in two planes

Specification

[1] base unit for machinery diagnostic training system
[2] rigid base plate with workpiece holder slots
[3] drive motor with variable speed via frequency converter
[4] digital speed and power display
[5] 2 shafts: 1x short, 1x long
[6] 2 unbalanced flywheels with interchangeable balance weights
[7] bearing blocks, roller bearings, interchangeable
[8] fixing holes for vibration measuring sensor
[9] flexible claw coupling and Controlflex^{R} coupling
[10] motor can be aligned obliquely and transversally
[11] transparent protective cover with safety features ensure safe operation
[12] stackable system for components

Technical data

Base plate LxW: 1100x800mm
- M8-slots, spacing 50mm

Asynchronous motor with frequency converter
- drive power output: 0,37kW
- nominal speed: 2800min^{-1}
- speed range via frequency converter 100...6000min^{-1}
- display and control unit with digital power and speed display

2 shafts: Ø=20mm, length 300mm, 500mm
2 unbalanced flywheels: Ø=150mm, each 1675g, with interchangeable balance weights (bolts)
2 bearing blocks with roller bearings 6004 (can be exchanged)
Controlflex^{R} coupling: nominal torque: 15Nm

230V, 50Hz, 1 phase
230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase
230V, 60Hz, 3 phases
LxWxH: 1100x800x500mm (base plate + cover)
LxWxH: 475x420x200mm (control unit)
LxWxH: 600x390x325mm (storage system)
Weight: approx. 95kg (total)

Scope of delivery

1 base plate with protective cover
1 display and control unit
1 asynchronous motor with frequency converter
2 shafts
2 unbalanced flywheels
2 clutches
2 bearing units
1 holder plate
2 clamp sets
1 set of tools
1 storage system with foam inlay
1 set of instructional material

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Required accessories

052.50004	PT 500.04	Computerised vibration analyser

Optional accessories

052.50010	PT 500.10	Elastic shaft kit
052.50011	PT 500.11	Crack detection in rotating shaft kit
052.50012	PT 500.12	Roller bearing faults kit
052.50013	PT 500.13	Couplings kit
052.50014	PT 500.14	Belt drive kit
052.50015	PT 500.15	Damage to gears kit
052.50016	PT 500.16	Crank mechanism kit
052.50017	PT 500.17	Cavitation in pumps kit
052.50018	PT 500.18	Vibrations in fans kit
052.50019	PT 500.19	Electromechanical vibrations kit
052.50005	PT 500.05	Brake & load unit
052.50001	PT 500.01	Laboratory trolley
052.50041	PT 500.41	Two displacement sensors