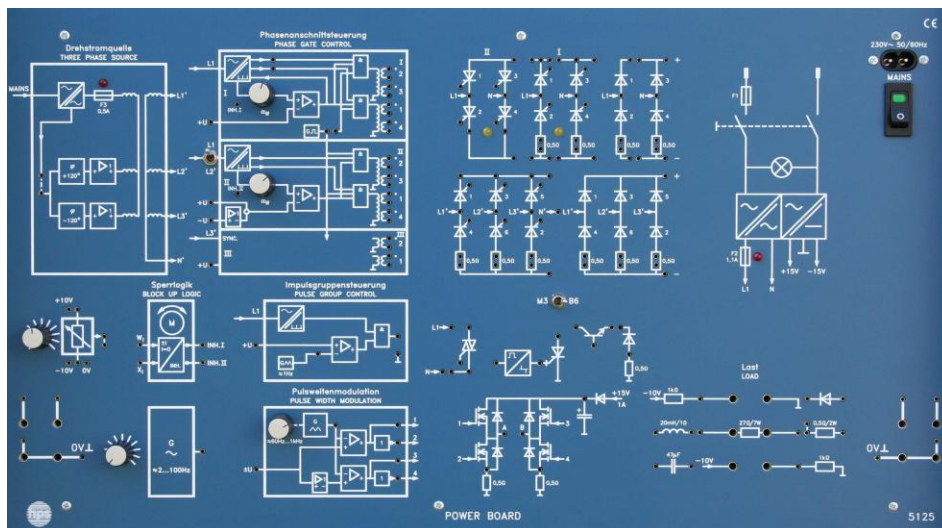


Power Electronics / Control Engineering



POWER BOARD

Type 5125



POWER BOARD (Type 5125)

- The whole power electronics on one Board
- With built-in three-phase source
- Connection field for Temperature and Brightness Controlled System
- All experiments with protective low voltage (12 V)
- Four-quadrant operation with H-circuit (MOS-FET) or antiparallel thyristor bridges
- Can be combined with PID BOARD, MOTOR BOARD and STEPPING BOARD

With the POWER BOARD, hps SystemTechnik offers a demonstration and training system with which experiments covering the whole field of power electronics can be conducted.

Experiments on the single-phase AC supply

- The uncontrolled half-wave rectifier
- The uncontrolled bridge rectifier
- The half-controlled bridge rectifier

- The fully controlled bridge rectifier
- The line-commutated inverter
- Two fully controlled bridge rectifiers, antiparallel with circulating current-free wiring and optical indication by 2 LEDs

Experiments on the three-phase supply

- The uncontrolled rectifier (M3)

- The uncontrolled rectifier (B6)
- The controlled rectifier (M3)
- The controlled rectifier (B6)

Experiments on the DC supply

- Basic pulse width modulation (PWM) circuits
- PWM with H-circuit, DC-evaluated
- PWM with H-circuit, sine-evaluated

Experiments with the GTO (Gate-Turn-Off)

- Firing pulse conditioning for the GTO
- The GTO as a DC actuator

The POWER BOARD contains ohmic, inductive and capacitive loads for conducting the experiments mentioned above.

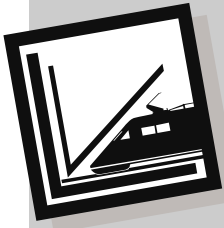
Bridgeable shunts are integrated in all the important load current branches for measuring the currents.

In the phase gate control no. I, all the important test points in the circuit are accessible at jacks. This circuit can be used both in single-pulse and multi-pulse mode.

Phase gate control no. II has an additional input for operation with negative setpoint.

This makes it possible to simulate a four-quadrant drive in conjunction with the controlled system MOTOR BOARD (Type 5130).

All firing pulse outputs of the phase gate controls are electrically isolated with firing transformers. In this way,



POWER BOARD

Type 5125

ground- or potential-free measurements can be carried out.

The basic frequency of the PWM control can be varied for investigation of the smoothing with uniform inductance.

The POWER BOARD is connected to the single-phase mains, the required three-phase voltage is generated internally.

Mechanical Data

The front panel of the POWER BOARD is made of 5 mm thick laminate, matt blue in colour with white engraving. The rear of the Board is protected with a grey plastic cover.

hps SystemTechnik also offers the POWER BOARD in a Box version in addition to the Board version.

Accessories Recommended

- Experiment manual:
„Introduction to Power Electronics“ (Type V 0121)
- Set of Accessories:
consisting of connecting plugs and leads (Type 5125.1)

Temperature and Brightness Controlled System (Type 5125.5)

This plug-in module is included in the delivery scope of the POWER BOARD and contains:



Type 5125.5

- Actual value acquisition of temperature:
by PTC resistor
- Actual value acquisition of brightness: by LDR resistor
- Heat and light source:
filament lamp 12 V / 5 W

A connection field wired with the necessary voltage dividers for the measuring resistances is built in the POWER BOARD for accommodating the Temperature and Brightness Controlled System (Type 5125.5).

Technical Data

Mains connection

- Voltage: 230 V AC / 115 V AC (110 V AC);
50 ... 60 Hz; 80 VA

Integrated power supplies

- DC voltage: ± 15 V DC / 2.5 A
 - AC voltage (L1): 12 V AC / 1 A
 - Three-phase source: switchable for M3 or B6 circuit;
 $U_{O,rms} = 12$ V DC
- All power supplies are electrically isolated from each other.

Controls

- Phase gate control I, II and III
- Pulse group control
- Pulse width modulation
- Block-up logic for circulating current-free four-quadrant drive
- GTO pulse shaper
- Signal generator: $f = 2 \dots 100$ Hz (for sine-evaluated PWM)

Rectifiers

- Uncontrolled rectifiers
- Controlled rectifiers (thyristors)
- H-circuit (Power MOS-FET)

Additional semiconductor components

- 1 diode, transistor, GTO thyristor, TRIAC

Load components

- Ohmic load (27 Ω)
- Inductive load (20 mH)
- Capacitive load (47 μ F)

Adapter field

Serves to adapt 4 mm plugs to 2 mm plugs and for plugging in four adapters (BNC socket @two 4 mm plugs).

Dimensions and weights

- Board version (Type 5125): 532 x 297 x 130 mm (w x d x h);
weights: approx. 5.4 kg
- Box version, consisting of:
POWER BOARD (Type 5125) and Box (Type 5125.20)
585 x 425 x 155 mm;
weight: approx. 8.8 kg
- Temperature and Brightness Controlled System (Type 5125.5):
37 x 56 x 35 mm (w x d x h), dimensions without plugs;
weight: approx. 65 g

Subject to technical modifications.