Technical Data:

Power supply:	6 to 15 V, stabilized, min. 5 A briefly Recommended: P3120-1N box-fixed voltage transformer, magnetic or P3120-1B box-rechargeable battery, 6 V/10 Ah, magnetic
Output:	4 4 mm safety receptacles in delta and star circuits 3 x 13 V_{eff} 3 x 23 V_{eff} up to 500 mA_{eff} load, continuous short-circuit protection

3 mm LED indicator for power source voltage

Case:	Plastic, ABS
Dimensions:	approx. 160 x 120 x 45 mm
Weight:	approx. 570 g

Do not drop the instrument. Should this occur, have the instrument checked and, if necessary, repaired by authorized service personnel.

In the event that unexpected problems arise during installation or use, turn the instrument off and contact an authorized dealer.

Do not expose the instrument to water drops or spray.

This instrument contains no parts that need to be serviced by the user.

The instrument may only be repaired by authorized service personnel.

This device is only to be operated by qualified persons and by others duly instructed by such persons

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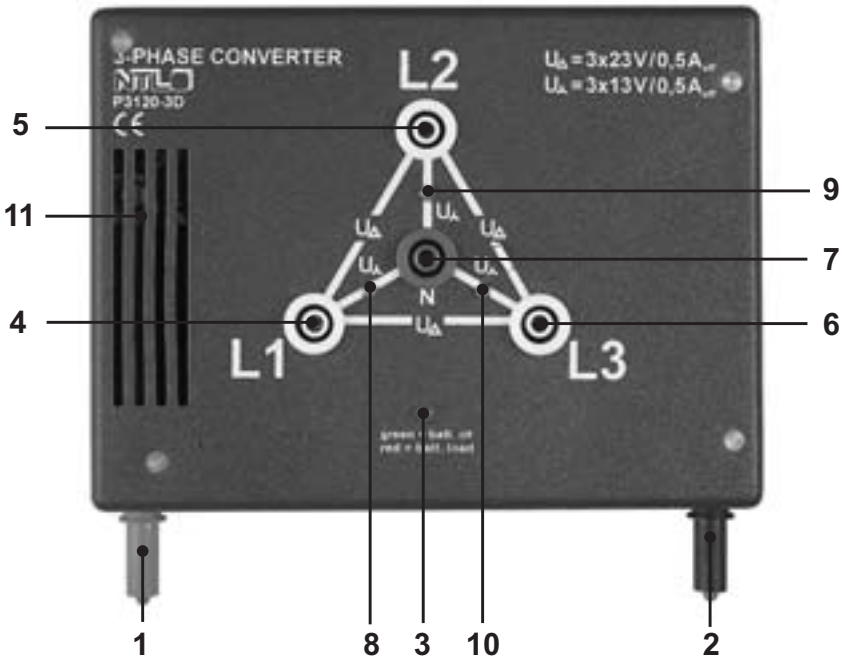
NTL inno SYSTEM

Box-3-phase converter, magnetic P3120-3D

This device is used mainly in conjunction with the box-rechargeable battery 6 V/10 Ah, magnetic P3120-1B or box-fixed voltage transformer, magnetic P3120-1N for carrying out experiments with three-phase current. Even if no three-phase power mains is available in the physics lab, this device allows for essentially all school physics experiments with three-phase current to be done and may be used either on the magnetic panel or on a table.

The converter provides three phases of AC voltage in either a star or delta circuit with a frequency cycle of 70 Hz.
The voltage amounts to 13 or 23 V_{eff} and the phases are shifted at angles of 120 or 240 degrees to each other.



1 4 mm safety receptacle, red (positive terminal), for connection to P3120-1B box-rechargeable battery, magnetic, or P3120-1N box-fixed voltage transformer, magnetic

2 4 mm safety receptacle, black (negative terminal) for connection to power source

3 LED display for voltage output

4 4 mm safety receptacle for voltage output (phase L_1)

5 4 mm safety receptacle for voltage output (phase L_2)

6 4 mm safety receptacle for voltage output (phase L_3)

7 4 mm safety receptacle for voltage output (neutral N)

8 LED indicator for voltage output (phase L_1)

9 Kontroll-LED for voltage output (phase L_2)

10 Kontroll-LED for voltage output (phase L_3)

11 Ventilation slits

2 magnets on the reverse side

NTL inno SYSTEM

Operation:

Due to the large amount of current needed, this device is designed as a converter and thus must be powered by either a fixed voltage transformer (e.g.P3120-1N box-fixed voltage transformer, magnetic) or by the P3120-1B box-rechargeable battery 6 V/10 Ah, magnetic, connected to the 4 mm safety receptacles (1, 2).

The amount of charge in the rechargeable battery is indicated by the two-colored LED (3) on the converter. Green indicates that sufficient power for operation is available. Red indicates that too little power is being supplied. In this case sufficient output voltage cannot be ensured. If nothing lights up, then either the power supply is not working or is too weak or the connections have been reversed.

The 3-phase converter provides AC voltage between the three phase leads (4, 5, 6) and the neutral lead (7). The curve generated is similar to a sine wave (defined by 12 points and smoothed out) at a frequency of about 70 Hz. The individual phases are set at exact angles to each other, 120° and 240°, thanks to quasi-digital generation.

The voltage outputs are about 13 V_{eff} in the star circuit and thus about 23 V_{eff} in the delta circuit. The maximum continuous load is 400 mA_{eff} for each outlet, while 600 mA_{eff} can be drawn for brief periods. The presence of output potential in the star circuit is indicated by three green LEDs (8, 9, 10) along the lines of the star circuit. The output terminals are permanently protected against short-circuiting as well as inductive overloading. Capacitive loads may only be powered with the wiring-in of a protective resistance of several ohms in order to prevent a surge in the internal final stage. In the case of continued overloading of one of the output terminals (e.g. due to short-circuiting), a PTC shuts the output off; the other output terminals remain unaffected. This is indicated by the corresponding LED which no longer glows. This is very helpful when looking for an error. Should one of the terminals be shut down, turn the device off, allowing it to cool down for a minute, and correct the circuit before turning the device on again. Inadvertently connecting power supplies to the output terminals is of no consequence up to 12 V_{eff}, beyond that there is a danger of the device being destroyed.

The neutral lead (7) is connected to the negative input terminal (2). This should be noted particularly in the case of experiments involving complicated circuitry.

In order to prevent the device from overheating, do not cover the ventilation slits (11). The fan is necessary since the device has a high power density and the heat generated could not otherwise be drawn off by means of convection.

The output frequency has been set to 70 Hz in order not to supersede the maximum current rating even in the delta circuit.