

Product datasheet (en)

Version: 1306_15.01.2018

Photo:



Name:

leXsolar-ThermalEnergy Professional

Item number:

1306

Youtube link:

Area of application:

**Air-conditioning, Heating, Energy Efficiency
Renewable Energies**

Dimensions (cm x cm x cm)

Weight (kg):

9,1

User group:

**Basic Training
Industrial Customers**

Key facts:

**Experimentation system for solar thermal energy conversion
Quantitative experiments for different collector systems
Flexible and location-independent usage**

List of components:

**1 x 1100-19 leXsolar-Base unit Large
1 x 1100-27 Motor module without gear**

1 x 1300-03 Solar collector
1 x 1300-04 Parabolic reflector
1 x 1300-05 Absorber tube
1 x 1300-06 Lens module
1 x 1300-07 Absorber module for lens
1 x 1300-08 Absorber B/W
1 x 1300-09 Pump module
1 x 1300-10 Peltier module
1 x 1300-11 Heat exchanger water
1 x 1300-12 Heat exchanger paraffin
1 x 1300-13 Hose-set
1 x 9100-05 PowerModule
2 x L2-02-007 Sorting rubber d=65, mark P
1 x L2-02-017 Propeller
2 x L2-04-059 Safety test lead, 50cm, red
2 x L2-04-060 Safety test lead, 50cm, black
1 x L2-04-080 Lamp housing
1 x L2-04-200 Illuminant infrared 230V
1 x L2-04-138 Safety plug, black
1 x L2-04-139 Safety plug, red
6 x L2-05-035 safety socket adapter SA 4000 red
4 x L2-05-036 safety socket adapter SA 4000 black
2 x L2-06-011 Digital multimeter
1 x L2-06-016 Laboratory thermometer
1 x L2-06-082 Beaker 250 ml
1 x L2-06-123 Temperature measuring sensor
1 x L2-06-125 Cooling pad
1 x L3-01-171 Aluminium case ThermalEnergy Professional 1306
1 x L3-03-190 Layout diagram 1306 ThermalEnergy Professional
1 x L3-01-109 Insert "ThermalEnergy Ready-to-go"
1 x L3-03-258 Info sheet initial startup

Extras needed:

No extras needed, all included.

Extras available:

L3-03-191
L3-03-193 Instructions manual leXsolar-ThermalEnergy Professional
L3-03-192
L3-03-194 Experiment handbook leXsolar-ThermalEnergy Professional
L2-04-044 electric grid adapter set
1100-63 DC converter 120V - 240V

Description:

This experimentation system allows for the application of different technologies of solar thermal energy transformation in technical education. The product does not only contain various solar collector systems, which can be operated with or without pumps,

but also CSP-technology (Concentrated Solar Power) and a Peltier element for the direct transformation into electric energy.

Another main feature are the experiments regarding the basics of thermodynamics, like absorption of heat radiation and the convective flow of heat, that provide a comprehensive understanding of the applied physical effects.

Like the other products of the Professional line, the leXsolar-ThermalEnergy Professional amazes with its flexible and location-independent usability that doesn't require any additional equipment.

Experiments:

- Absorptivity and reflectivity of different materials
- Focusing of light by a Fresnel lens
- Thermal convection and layering
- Thermal conduction
- Thermal insulation
- Solar thermal collector with pump circulation
- Solar thermal collector with thermosiphon circulation
- Variation of the flow speed
- Collector circuit with heat exchanger
- Collector circuit with paraffin heat reservoir
- Parabolic trough collector with pump cycle
- Defocussing
- Qualitative demonstration of the functional principle
- Investigating the thermoelectric generator
- Quantitative determination of the electrical power

Specifications of components

1100-19 leXsolar-Base unit Large:

- Main board for the leXsolar plug-in system with 3 slots
- Grid-dimension of the plugs: 70 mm
- Enables series and parallel connection of the modules
- Changing between series and parallel connection by turning the modules
- Equipped with 4 additional 4 mm jacks for connecting measuring lines

1100-27 Motor Module without Gear:

- Plug-in module with DC-motor
- Initial current: 20 mA
- Initial voltage: 0.35 V
- Equipped with automatic fuse protecting from overvoltage
- Layout: plug-in module with 4 mm jacks
- Grid-dimension of the jacks: 70 mm
- Module size: 85 mm x 85 mm

1300-03 Solar collector:

1300-04 Parabolic reflector:

1300-05 Absorber tube:

1300-06 Lens module:

1300-07 Absorber module for lens:

1300-08 Absorber B/W:

1300-09 Pump module:

1300-10 Peltier module:

1300-11 Heat exchanger water:

1300-12 Heat exchanger paraffin:

1300-13 Hose-set:

9100-05 PowerModule:

The PowerModule is a compact, robust and easy-to-use power supply for experiments. The voltage can be varied incrementally in 0.5V steps from 0 to 12V. It supplies up to 24W output power!

With the acoustic feedback during operation and the voltage indicator by LEDs it is simple and intuitive for the user. With only 70g it is the most lightweight power supply of its power class. Due to the design as leXsolar plug-in module it is fully compatible with all leXsolar experiments. However, it can also be used in other setups with standard 4mm-connectors.

With software control* continuous variable voltages - even time-dependent - can be realized.

Technical data:

Output voltage 0-12V DC

Maximum current 2A

Maximum output power 24W

Automatic overcurrent detection

Voltage variation in 0.5V steps (manually) or continuous (with software* via USB-Connect* or Wireless-Connect*)

Accuracy: $\pm 0.15V$

Contacts: 4mm standard connectors and compatible to leXsolar main board

Input voltage 110-230V AC 50-60Hz

Adaptors for all common sockets included

Weight: 70g (+180g included wall power supply)

RiSU conform

***Please ask for availability**

L2-02-007 Sorting rubber d=65, mark P:

L2-02-017 Propeller:

L2-04-059 Safety test lead, 50cm, red:

L2-04-060 Safety test lead, 50cm, black:

L2-04-080 Lamp housing:

L2-04-200 Illuminant infrared 230V:

L2-04-138 Safety plug, black:

L2-04-139 Safety plug, red:

L2-05-035 safety socket adapter SA 4000 red:

L2-05-036 safety socket adapter SA 4000 black:

**L2-06-011 Digital multimeter:
TÜV/GS-approved Pocket size mini Multimeter.**

**L2-06-016 Laboratory thermometer:
Alcohol laboratory thermometer with red liquid. White occupied capillaries, amber stain graduation, Length according to ISO 305 mm, 6mm Ø, with suspension eye, packed in a protective plastic holder, measurement range: -10..+ 110°C, graduation: 1°C**

**L2-06-082 Beaker 250 ml:
Borosilicate beaker 250ml**

L2-06-123 Temperature measuring sensor:

L2-06-125 Cooling pad:

L3-01-171 Aluminium case ThermalEnergy Professional 1306:

L3-03-190 Layout diagram 1306 ThermalEnergy Professional:

L3-01-109 Insert "ThermalEnergy Ready-to-go":

L3-03-258 Info sheet initial startup:

Specifications extras needed:

No extras needed, all inclusive.

Specifications extras available:

L3-03-191 :

L3-03-193 Instructions manual leXsolar-ThermalEnergy Professional:

The instruction manuals are available as PDF and Word versions in the online portal. A description of how to download the booklets is attached to every experiment set.

L3-03-192 :

L3-03-194 Experiment handbook leXsolar-ThermalEnergy Professional:

The experiment handbooks are available as PDF and Word versions in the online portal. A description of how to download the booklets is attached to every experiment set.

L2-04-044 electric grid adapter set:

1100-63 DC converter 120V - 240V: