

Product datasheet (en)

Version: 1304_09.08.2017

Photo:



Name:

leXsolar-ThermalEnergy Ready-to-go

Item number:

1304

Youtube link:

Area of application:

**Physics
Chemistry
Technology Training
Air-conditioning, Heating, Energy Efficiency
Renewable Energies**

Dimensions (cm x cm x cm)

64x37x16,5

Weight (kg):

8,80

User group:

**Basic Training
Highschool / Secondary School
Middle School / Junior High School
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 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
- 1 x 1100-27 Motor module without gear
- 1 x L2-04-080 Lamp housing
- 1 x L2-04-116 Illuminant 120W, 12°
- 2 x L2-06-011 Digital multimeter
- 1 x L2-06-016 Laboratory thermometer
- 1 x L3-01-100 Aluminium case "Thermal Energy RtG"
- 1 x L3-01-109 Insert "ThermalEnergy Ready-to-go"
- 1 x L2-06-125 Cooling pad
- 1 x L2-06-123 Temperature measuring sensor
- 2 x L2-02-007 Sorting rubber d=65, mark P
- 1 x L2-02-017 Propeller
- 1 x L2-06-082 Beaker 250 ml
- 1 x L3-03-016 leXsolar-CD
- 2 x L2-06-014 Test lead black 50 cm
- 2 x L2-06-015 Test lead red 50 cm
- 1 x L3-03-138 Layout diagram 1304 leXsolar-ThermalEnergy Ready-to-go

Extras needed:

No extras needed, all included.

Extras available:

- L3-03-046 Anleitungenheft leXsolar-ThermalEnergy Ready-to-go
- L3-03-047 Student's manual leXsolar-ThermalEnergy Ready-to-go
- L3-03-062 Lehrerheft leXsolar-ThermalEnergy Ready-to-go
- L3-03-063 Teacher's manual leXsolar-ThermalEnergy Ready-to-go
- 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 class. 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 Ready-to-go line, the leXsolar-ThermalEnergy Ready-to-go 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

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: +-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**

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

L2-04-080 Lamp housing:

L2-04-116 Illuminant 120W, 12°:

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

L3-01-100 Aluminium case "Thermal Energy RtG":

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

L2-06-125 Cooling pad:

L2-06-123 Temperature measuring sensor:

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

L2-02-017 Propeller:

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

L2-06-014 Test lead black 50 cm:
The black test lead is used for the electrical connection of the modules. The cable is directly plugged into the base plate or alternatively directly into the plug connection of the modules. The cables have two different colors to distinguish between the positive and the negative pole. The black cables are plugged into the negative pole.

L2-06-015 Test lead red 50 cm:
The red test lead is used for the electrical connection of the modules. The cable is directly plugged into the base plate or alternatively directly into the plug connection of the modules. The cables have two different colors to distinguish between the positive and the negative pole. The red cables are plugged into the positive pole.

L3-03-258 Info sheet initial startup:

L3-03-138 Layout diagram 1304 lexsolar-ThermalEnergy Ready-to-go:

Specifications extras needed:

No extras needed, all inclusive.

Specifications extras available:

L3-03-046 Anleitungsheft leXsolar-ThermalEnergy Ready-to-go:

L3-03-047 Student's manual leXsolar-ThermalEnergy Ready-to-go:

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.

L3-03-062 Lehrerheft leXsolar-ThermalEnergy Ready-to-go:

L3-03-063 Teacher's manual leXsolar-ThermalEnergy Ready-to-go:

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: