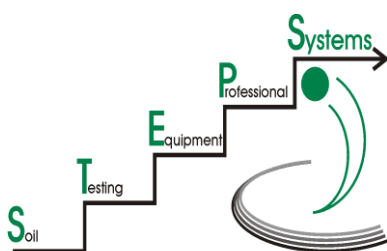


LUX - Multimeter

Operating instructions

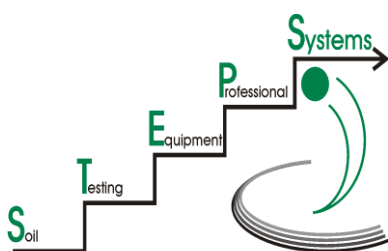


STEP Systems GmbH
Soil Testing Equipment - Professional Systems

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Duisburger Str. 44
Tel: ++49 (0) 911 96 26 05-0
Fax: ++49 (0) 911 96 26 05-9
D-90451 Nürnberg
e-mail: info@stepsystems.de
www.stepsystems.de

For your notes:



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Fax: ++49 (0) 911 96 26 05-9
D-90451 Nürnberg
e-mail: info@stepsystems.de
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Caution! Please ensure you read these instructions before proceeding further! Please read through these operating instructions carefully. Damage caused by failure to observe these instructions will invalidate the guarantee. We shall accept no liability for any consequential loss resulting therefrom.

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1. Requirements for operation

The requirements for operation of the luxmeter are:

- Measurement and display of the level of illumination of various light sources in the units LUX [lx] or foot-candle [ft-cd] in the range 0 to 100000 lx or 0 to 10000 ft-cd respectively.
- Measurement under the following adverse ambient conditions is not admissible:
 - dampness or high air humidity;
 - dust and flammable gases, vapours or solvents;
 - severe vibrations;
 - strong magnetic fields as in the vicinity of machines or loudspeakers;
 - static electricity (fields and discharges).

Use other than as described above will lead to damage of this product, besides being associated with hazards such as short-circuits, fire, electric shock etc. No part of this product may be altered or converted! Safety advice must be observed!

2. Functional description

The luxmeter with digital display is a light meter for determining existing or required brightness (luminance). It is an aid, for example when measuring lighting installations. This instrument is not however for a laboratory and so is not suitable for scientific purposes. Besides the null position (ZERO), this measuring instrument offers a so-called recording mode as a special function which you can use to capture and display at any time the maximum (MAX), the minimum (MIN) and the average (AVG) light intensity over a given period of time. In addition you can decide between various light sources, thereby finding out the approximate light level for your living room, office, hobby workshop and so on. You can choose between sunlight or the light of a filament lamp ('Tungsten/Sun'), fluorescent lamp ('Fluorescent'), sodium vapour lamp ('Sodium') and mercury vapour lamp ('Mercury'). With each of these four switch positions the incident light is evaluated in a different way. Using the HOLD function you can quickly hold / freeze the different signals measured. The LUX/FC key select lux (lx) or ft-cd (foot-candle, 1/10 lx).

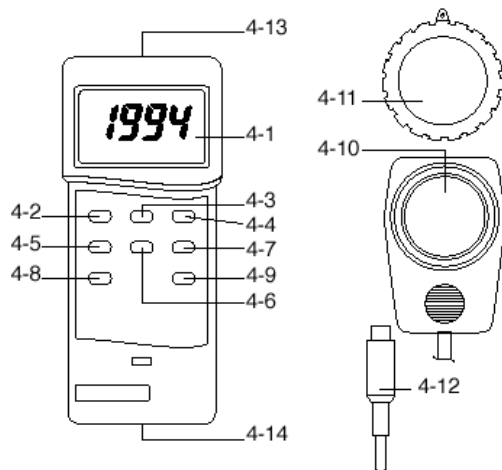
Principle of operation: by means of a sensitive photocell (sensor, light-dependent resistor LDR) the incident light is transferred over an stretchable spiral cable in the form of an electrical voltage to the measuring electronics and displayed in lux or fc, depending on the switch position. The external sensor thus allows convenient measurement points. The instrument is powered by a commercially available 9V monobloc battery.

3. Safety advice

- The Lux Multimeter instrument has been CE tested (for domestic use) and so meets the EMC directive 89/336/EEC.
- The instrument left the factory in a safe condition free of defect. To maintain this standard and ensure hazard-free operation, the user must observe the safety advice and caution notes contained in these operating instructions.
- Measuring instruments and accessories do not belong in children's hands!
- In commercial premises the accident prevention regulations for electrical plant and equipment of the federation of industrial trade associations are to be observed.
- In schools, training establishments, hobby and self-help workshops, the use of measuring instruments is to be supervised by trained responsible personnel.
- Do not operate the instrument unless the casing is securely closed and screwed up, e.g. after changing the battery.
- Before each measurement, check the probe(s) and the instrument (leads, socket, keypad covers) for signs of damage.
- Avoid operation in very damp and wet conditions.
- Adverse light conditions, e.g. sunlight, may make reading the optical display difficult.
- Do not work with the instrument in rooms or in adverse environments where flammable gases, vapours, dusts are or might be present. Avoid operation in the immediate vicinity of
 - a) strong magnetic fields (loudspeakers, magnets);
 - b) electromagnetic fields (transformers, motors, coils, relays, contactors, electromagnets etc.);
 - c) electrostatic fields (charging and discharges);
 - d) radio antenna since this could cause erroneous readings.
- When measuring, only use the light sensor supplied with the instrument. Alteration of the mechanical or electrical properties of the instrument or light sensor by distortion/bending or conversion respectively will invalidate warranty.
- If operation becomes unsafe, the instrument is to be rendered inoperable to avoid inadvertent operation. Unsafe operation is to be assumed if
 - the instrument shows visible signs of damage;
 - the instrument no longer works; and
 - after a fairly lengthy period in store under adverse conditions; or
 - after severe shock during transport.
- Never switch the measuring instrument on immediately after bringing it into a warm room from the cold. The condensation produced may possibly destroy your instrument. Leave the instrument switched off and let it come up to room temperature.

4. Controls

- 4-1** 3-digit LCD for displaying measurements and a sub-display (of smaller size underneath) for the multiplier (in the case of larger measurement ranges) and the sub-functions Record and Recall.
- 4-2** ON and OFF key
- 4-3** HOLD function key
- 4-4** Toggle from LUX (lx, lm/m²) to ft-cd (FC = FOOT-CANDLE, lm/ft²)
- 4-5** Record key for recording a Min/Max/Avg value
- 4-6** Recall key for recalling Min (minimum), Max (maximum) and Avg (average) values
- 4-7** Key for selecting from four benchmark levels for four different light sources:
 - Tungsten (filament lamp)/Sun (sunlight)
 - Fluorescent (fluorescent lamp)
 - Sodium (sodium vapour lamp)
 - Mercury (mercury vapour lamp)
- 4-8** Key for zeroizing display
- 4-9** Measurement range switch for the ranges 2000 lx or 200 ftcd, 20000 lx or 2000 ft-cd and 100000 lx or 10000 ft-cd.
- 4-10** Light sensor
- 4-11** Sensor cover
- 4-12** Sensor connection plug
- 4-13** Sensor connector socket (on measuring instrument)
- 4-14** Battery compartment cover (on underside of casing)



5. Changing the battery, connection and working position

5.1 Changing the battery

For your battery to operate correctly, it must be fitted with a 9V battery. If the low-battery symbol LBT appears at the top left of the display (at a battery voltage below about 6.5V to 7.5V), you will have to do a battery change to maintain 'full' precision of measurement. To do this proceed as follows:

Disconnect the sensor from the measuring instrument which should be switched off. Using a suitable flat-blade screwdriver, carefully prise off the battery compartment cover on the lower underside of the casing. Unclip the used battery from the connector and replace it with an unused battery of the same type, observing the correct polarity. After completing the battery change, lay the battery in the battery compartment which should then be carefully closed again. Take care not to pinch the connector leads to the battery clip.

Caution!

False polarity will inevitably lead to destruction of the instrument. Under no circumstances operate the instrument when opened. Do not leave used batteries in the instrument since even leak-proof batteries can corrode, thereby releasing chemicals which are harmful to your health and will destroy the battery compartment. Used batteries do not belong in normal waste: they are to be regarded as hazardous waste and must therefore be disposed of carefully, compatible with the environment.

5.2 Connecting the light sensor

The measuring instrument comes with a light sensor and its cover. Connect the 4-pole plug of the light sensor to the INPUT socket on the instrument so that the lug of the plug points to the underside of the casing. Ensure the plug is always firmly seated in the socket otherwise errors in readings may occur.

5.3 Working position

The Lux-Multimeter must not be operated whilst lying on its keys: the display must always be readable.

6. Operation and taking measurements

6.1 General

- Switch on the Lux-Multimeter by the ON/OFF switch. After a short initialisation phase, during which all segments of the LCD appear (self-test), the instrument is ready for operation.
- Cover the light sensor (4-10) with the cover cap (4-11) and set the range switch to 2000 lx (200 ft-cd).
- Operate the ZERO key once: the display will then be set to '0'. Next remove the sensor cover again.

Caution!

Above a casing temperature of about +60°C the display may darken or the LCD become black with the result that the display will no longer be readable. The luxmeter is not defective: the blackening disappears as soon as the temperature falls below about 60°C. (Take note of the technical data, including the working temperature range of the instrument).

6.2 Taking measurements

To take measurements proceed as follows:

1. Using the LUX/FC key, select the desired unit, where LUX, or lx, is the current unit in Europe. FC stands for ft-cd, an 'obsolete' unit, which nevertheless continues to be used in some English-speaking countries. Convert as follows: 1 ft-cd = approx. 10 lx = 1 lm (lumen) per m².

2. Select the light source to be measured. There are four switchable benchmark levels to choose from:

1 = Tungsten or Sun - filament lamps or sunlight/day-light at 2856K

2 = Fluorescent - fluorescent lamp light

3 = Sodium - light from a sodium vapour lamp (orangeemitting light, street flood)

4 = Mercury - light from a mercury-vapour lamp (whiteemitting light, lantern)

Caution!

If the setting is incorrect, a false benchmark filter will be taken as a basis and errors in measurements may occur.

3. Use the measurement range switch to select the measurement range expected. Example: in a secretarial or drawing office, illumination levels of up to 2000 lx are possible. If '----' is shown instead of a measurement, then the measurement range is too low, so select the next higher range. If '____' is shown instead of a measurement, then the measurement range is too high, so select the next lower range.

4. Position the sensor as directly under the light source as possible and read off the illumination level.

5. As the display is 3-1/2 digits, a max. measured value of 1999 lx can be displayed. In the 20000-lx range, the last digital place will therefore be displayed in the form '0' in the subdisplay beneath corresponding to the factor 10. The value read off in the 20000-lx range must therefore be multiplied by 10. And in the 100000-lx range the last digital place will be displayed in the form '00' in the sub-display corresponding to the factor 100. The value read off in the 100000-lx range must therefore be multiplied by 100.

6.3 How to use the data 'Hold' function

When taking measurements, if you want to capture a 'stationary' value from relatively fast changing data, operate the HOLD key once. That will hold the instantaneous value. The symbol D.H. appears at the same time on the top line of the display. To leave the Hold function or to revert to instantaneous measurement,

operate either the Hold key again or change the measurement range, or switch the instrument off. During the Data Hold function the other keys are inoperative.

6.4 How to use the RECORD/RECALL to record measurements

Using the RECORD key starts recording and storing the measurement of the minimum (MIN), maximum (MAX) and average (AVG) values.

Using the RECALL key you can retrieve the minimum (MIN), maximum (MAX) and average (AVG) values in turn at any time. To terminate recording measurements, operate the RECORD key again once and you will return to instantaneous measurement.

Whilst recording a measurement, the following symbols will appear at the bottom left of the display: REC (start of recording), Max (maximum value), Min (minimum value) and AVG (average value).

Caution!

The average value is not the algebraic sum of the Min. + Max values divided by 2. The LIGHT SOURCE, LUX/FC and ZERO keys are inoperable when recording a measurement.

6.5 Auto power-off function

During normal measurement the instrument automatically switches off after about 10 minutes without operation of the keys to save power. This automatic switching is not active when the instrument is in the recording mode.

6.6 Table for different levels of illumination

By means of the external sensor you can monitor the illumination at particular points along different angles whilst the instrument itself continues to remain in the same position. In the same way the effect of individual luminaries and their beam angles can easily be determined at any desired point. As an indication, the table below gives some optimal levels of illumination for typical environments:

| Standard values for illuminance in Lux (lx) | |
|---|-------------|
| Office | |
| Konferenz-, Empfangsraum | 250 - 750 |
| Schreib- und Zeichenbüro | 1200 - 2000 |
| Industrie | |
| Verpackung | 150 - 300 |
| Produktion | 450 - 750 |
| Qualitätssicherung | 800 - 1200 |
| Platinenbestückung | 1500 - 2500 |
| Kaufhaus | |
| Stairs | 100 - 200 |
| Packtisch | 200 - 400 |
| Schaufenster | 1500 - 2500 |
| Hospital | |
| Krankenzimmer | 100 - 150 |
| Laboratory | 300 - 600 |
| Operationsraum, Emergency, Intensivstation | 750 - 1400 |
| Schule | |
| Aula | 100 - 300 |
| Klassenzimmer | 400 - 700 |
| Labor, Bibliothek, Zeichenraum | 750 - 1400 |
| at home | |
| Kitchen, Living room | 200 - 500 |
| Floors and stairs | 100 - 200 |

7. Maintenance

The lux-Multimeter is maintenance-free, save for changing the battery and occasionally cleaning the casing and sensor (and the display window).

Caution!

For cleaning do not use any cleaning agent containing carbon, alcohols or suchlike. These will attack the surface of the instrument. Moreover the vapours are harmful to health and explosive.

8. Technical data, measurement errors and table of units

8.1 Technical data

| | |
|--|--|
| Display: | 3-1/2-digit LCD display up to 1999 with 13 mm-high figures and with sub-display underneath |
| Speed of measurement: | approx. 2.5 measurements per s, or 5 measurements in 2 s. |
| Measurement range: | 0 to 1999 lx or 0 to 199.9 ft-cd 2000 to 1999 '0' lx or 200 to 1999 ft-cd 2000 '0' to 1999 '00' lx or 2000 to 999 '0' ft-cd (switchable)) |
| Zero adjustment: | Manual with the ZERO key, keeping the sensor covered |
| Sensor: | Photodiode with colour-correction filter, approximately conforming to the C.I.E. |
| Operating temperature (instrument): | 0° to +50°C at relative humidity less than 80% non-condensing |
| Battery supply: | 1 x 9V monobloc battery |

| | |
|--|---|
| Current consumption: | approx. 5.3 mA DC |
| Low battery indication: | LBT is displayed for battery voltages below 7.5 V |
| Auto Power-Off Function: | Automatically switches instrument off after approx. 10 min. without operation of keys (except when on RECORD) |
| Temperature for guaranteed precision: | +23°C (5 K, at rel. humidity < 80%, non-condensing) |
| Weight: | approx. 335 g (incl. Batteries, but without sensor) |
| Dimensions (LxWxH): | Instrument 180x72x32 mm (without sensor connection); sensor 85x55x12 mm (without lead) |

8.2 Measurement tolerances

Tolerances are given for an instrument environmental temperature range of +23°C ± 5K. The precision is given in ±(% of the reading + number of digits in error = digits).

| Measurement range | Tolerance | Resolution |
|-------------------|--------------------|------------|
| 2 000 lx | ± (5 % + 2 digits) | 1 lx |
| 20 000 lx | ± (5 % + 2 digits) | 10 lx |
| 100 000 lx | ± (5 % + 2 digits) | 100 lx |
| 200 ft-cd | ± (5 % + 2 digits) | 0,1 ft-cd |
| 2 000 ft-cd | ± (5 % + 2 digits) | 1 ft-cd |
| 10 000 ft-cd | ± (5 % + 2 digits) | 10 ft-cd |

Remarks

1. The precision given applies only up to 50000 lx or 4650 ft-cd; above that no specification is given.
2. Tolerances refer to filament lamps with a light temperature of 2856 K.
3. Tolerances are valid for electromagnetic field strengths up to 3V/m at 30 MHz and below.

8.3 Conversion table (approx.)

| Lux lx (lm / m ²) | phot ph (lm / cm ²) | foot candle fc (lm / ft ²) | Watts per cm ² W / cm ² |
|-----------------------------------|-------------------------------------|--|--|
| 1 | 1 x 10 exp -4 | 9,290 x 10 exp -2 | 5 x 10 exp -4 |
| 1 000 | 1 | 9,290 x 10 exp 2 | 5 x 10 exp -2 |
| 10,76 | 1,076 x 10 exp -3 | 1 | 5,4 x 10 exp -5 |
| 200 000 | 20 | 19 000 | 1 |

(1 ft = 33 cm approx.)

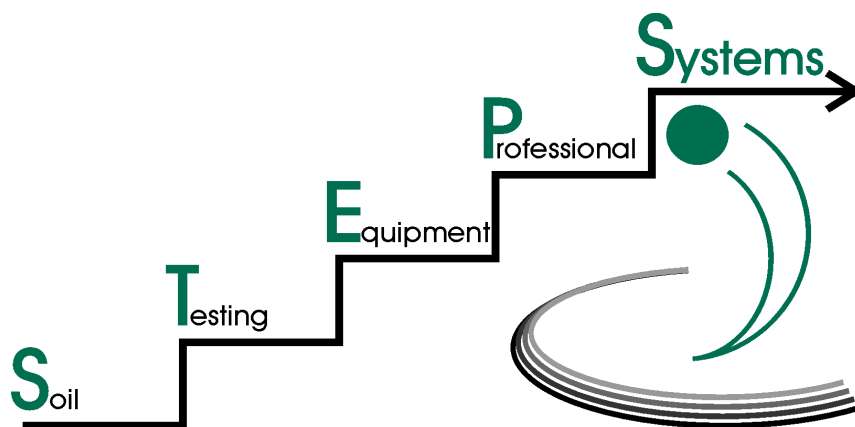
8.4 Max. inputs

| Measurement range | Max. input / reading |
|-------------------|--|
| 2 000 lx | 0 to 1999 lx |
| 20 000 lx | 2000 to 1999 „0” (factor 10) lx |
| 100 000 lx | 2000 „0” to 1 000 „00” (factor 100) lx |
| 200 ft-cd | 0 to 180,6 ft-cd |
| 2 000 ft-cd | 167 to 1806 ft-cd |
| 10 000 ft-cd | 1670 to 1000 „0” (factor 10) ft-cd |

Note:

The luxmeter serves only as an aid. It is not suitable for the laboratory or for scientific purposes.

Optimal Lux Values Table



STEP Systems GmbH
Soil Testing Equipment - Professional Systems
Duisburger Str. 44
D-90451 Nürnberg

Tel: 0049 (0) 911-96 26 05-0
Fax 0049 (0) 911-96 26 05-9
e-Mail: info@stepsystems.de
Internet: www.stepsystems.de

How much light does your plant need?

| Botanic Name | German Name | Minimum lux |
|---------------------------------------|-------------------------------|-------------|
| Abutilon hybr. | Schönmalve (Zimmerahorn) | 2.000 Lux |
| Achimenes hybr. | Schiefsteller | 1.500 Lux |
| Aechmea fasciata | Aechmea | 800 Lux |
| Aeschynanthus commutatum | Goldrebe | 1.000 Lux |
| Aglaonema commutatum | Kolbenfaden | 300 Lux |
| Aglaonema commutatum 'Silver King' | Kolbenfaden | 300 Lux |
| Aglaonema pseudobracteatum | Kolbenfaden | 300 Lux |
| Ananas comosus | Ananas | 1.200 Lux |
| Allamada cathartica | Allamanda | 2.000 Lux |
| Anthurium andreanum | Flamingoblume | 1.200 Lux |
| Anthurium crystallium | Flamingoblume mit Silberadern | 1.500 Lux |
| Aphelandra squarrosa | Glanzkölbchen | 1.500 Lux |
| Araucaria columnaris | Zimmertanne | 2.000 Lux |
| Asparagus falcatus | Zierspargel | 800 Lux |
| Aspidistra clatior | Metzgerpalme (Schusterpalme) | 300 Lux |
| Aucuba crotonifolia/japonica | Aucube | 600 Lux |
| Begonia masoniana 'Iron Cross' | Schiefblattgewächs | 2.000 Lux |
| Billbergia nutans | Billbergia | 300 Lux |
| Bougainvillea glabra | Bougainvillee | 2.000 Lux |
| Brunfelsia calycina | Brunfelsie | 1.000 Lux |
| Cactaceae | Kakteen | 2.000 Lux |
| Caladium bicolor | Buntwurz | 2.000 Lux |
| Calceolaria hybr. | Pantoffelblume | 800 Lux |
| Campanula hybr. | Glockenblume | 1.800 Lux |
| Chamaedorea elegans | Bergpalme | 600 Lux |
| Chlorophytum comosum | Grünlilie (Graslilie) | 600 Lux |
| Chrysalidocarpus lutescens | Palme | 800 Lux |
| Cissus rhombifolia | Russischer Wein | 600 Lux |
| Citrus mitis | Apfelsinenbaum | 1.800 Lux |
| Codiaeum variegatum 'Norma/Bravo' | Wunderstrauch, Croton | 800 Lux |
| Codiaeum variegatum andere Sorten | Wunderstrauch, Croton | 1.000 Lux |
| Coffea arabica | Kaffeebaum | 1.200 Lux |
| Coleus hybr. | Buntnessel | 1.800 Lux |
| Columnnea microphylla | Feuezünglein (Rachenrebe) | 1.000 Lux |
| Cordyline terminalis | Keulenlilie | 1.000 Lux |
| Crassula falcata | Dickblatt (Blausichel) | 1.800 Lux |
| Crossandra infundibuliformis | Crossandre | 1.500 Lux |
| Cyclamen persicum | Alpenveilchen | 1.000 Lux |
| Clivia miniata | Clivie (Riemenblatt) | 300 Lux |
| Cyperus | Zypengras | 1.500 Lux |
| Dieffenbachia bausei | Dieffenbachie | 1.000 Lux |
| Dieffenbachia maculata | Die(fenbachie | 600 Lux |
| Diplandenia sanderi | Diplandenie | 1.500 Lux |
| Dizygotheca elegantissima, veredelt | Fingeraralie | 1.400 Lux |
| Dirygotheca elegantissima, unveredelt | Fingeraralie | 2.500 Lux |
| Dracaena deremensis 'Wameckii' | Drachenbaum | 500 Lux |
| Dracaena deremensis andere Sorten | Drachenbaum | 600 Lux |
| Dracaena marginata | Drachenbaum | 500 Lux |
| Echeveria falcata | Sandglöckchen | 2.000 Lux |
| Euphorbia hermensiana | Wolfsmilch | 2.000 Lux |
| Euphorbia trigona | Wolfsmilch | 2.000 Lux |
| Euphorbia tirucalli | Wolfsmilch | 2.000 Lux |
| Euphorbia pulcherrima | Weihnachtsstern, Poinsettia | 2.000 Lux |
| Euphorbia milü | Christusdom | 2.000 Lux |
| Euterpe edulis | Palme | 80p Lux |
| Fatsia japonica | Zimmeraralie | 600 Lux |
| Fatsnederia lizei | Efeuaralie | 800 Lux |
| Ficus altissima | Feigenbaum, Gummibaum | 600 Lux |
| Ficus boxifolia | Feigenbaum, Gummibaum | 2.000 Lux |
| Ficus bengalensis | Feigenbaum, Gummibaum | 600 Lux |
| Ficus benjamina | Feigenbaum, Gummibaum | 1.000 Lux |

Botanic Narne**German Name****Minimum lux**

| | | |
|---|----------------------------------|-----------|
| Ficus Cyathistipula | Feigenbaum, Gummibaum | 1.200 Lux |
| Ficus deltoidea | Feigenbaum, Gummibaum | 1.500 Lux |
| Ficus elastica 'Decora' | Feigenbaum, Gummibaum | 400 Lux |
| Ficus elastica 'Schrijveriana | Feigenbaum, Gummibaum | 800 Lux |
| Ficus triangularis | Feigenbaum, Gummibaum | 1.200 Lux |
| Ficus indiva | Feigenbaum, Gummibaum | 1.000 Lux |
| Ficus strida | Feigenbaum, Gummibaum | 1.000 Lux |
| Ficus lyrata | Feigenbaum, Gummibaum | 600 Lux |
| Ficus pandureforae | Feigenbaum, Gummibaum | 500 Lux |
| Ficus pumila | Feigenbaum, Gummibaum, kriechend | 800 Lux |
| Ficus rubiginosa | Feigenbaum, Gummibaum | 800 Lux |
| Filices | Farne | 1.000 Lux |
| Grevillea robusta | Australische Silbereiche | 800 Lux |
| Guzmania hybr. | Guzmanie | 800 Lux |
| Harpephyllum qffrum | Falscher Kaffeebaum | 1.000 Lux |
| Hedera helix | Efeu | 800 Lux |
| Heimeriodendron brunonianum | Pisonia | 1.500 Lux |
| Hibiscus rosa sinensis | Roseneibisch | 2.000 Lux |
| Hoya camosa | Wachsblume | 600 Lux |
| Howeia forsteriana | Kentie | 800 Lux |
| Hydrangea macrophylla | Hortensie | 800 Lux |
| Impatiens holstü | Fleisiges Lieschen | 1.800 Lux |
| Kalanchoe hytx. | Flammendes Käthchen | 1.800 Lux |
| Medinilla magnifica | Medinilla | 1.200 Lux |
| Monstera deftciosa | Philodendron, Fensterblatt | 300 Lux |
| Musa ensete | Banane | 1.000 Lux |
| Neoregelia | Neoregelia | 800 Lux |
| Nerium oleandef | Oleander | 2.000 Lux |
| Orchidaceae | Orchideen | 1.800 Lux |
| Pachypodium | Madagaskarpalme | 1.200 Lux |
| Pachystachis | Goldkölbchen | 1.500 Lux |
| Pandanus | Schraubenbaum | 1.000 Lux |
| Passiflora caerulea | Passiaisblume | 1.000 Lux |
| Peperonia magnolifolia | Pfeffergesicht | 800 Lux |
| Philodendron erubescens 'Queen' | Baumlieb | 300 Lux |
| Philodendron ervbescens 'Red Eme.' | Baumlieb | 300 Lux |
| Philodendron taciniatum | Baumlieb | 600 Lux |
| Philodendron kmgitaminatum | Baumlieb | 500 Lux |
| Philodendron,panduriforme, imbe | Baumlieb | 300 Lux |
| Philodendron scandens | Baumfieb, kriechend | 300 Lux |
| Philodendron bipinatifidum, squaniferum | Baumlieb | 1.000 Lux |
| Philodendron pertusum | Baumlieb, Fensterblatt | 300 Lux |
| Phönix canariensis | Dattelpalme | 1.000 Lux |
| Pilea repens, qdierei | Karwnierblume | 2.000 Lux |
| Platynerium allicome | Gewehfam | 800 Lux |
| Polysicias balfouriana | Fiederaralie | 1.000 Lux |
| Primula obconica | Primel | 800 Lux |
| Rhaphidophora aurea | Efeutute | 300 Lux |
| Rhododendron sinnii | Azalee, Alpenrose | 800 Lux |
| Saintpaulia ionantha | Usambaraveilchen | 800 Lux |
| Sansevieria hyacinthoides | Bogenhanf | 600 Lux |
| Sansevieria trifasciata | Bogenhanf | 300 Lux |
| Saxifrage sarmentosa | Steinbrech, Judenbart | 1.800 Lux |
| Sinningia speciosa | Gloxinie | 1.000 Lux |
| Solanum hendersonü | Korallenkirsche | 1.000 Lux |
| Spatiphyllum, hybr., wallissii | Blattfahne, Einblatt | 400 Lux |
| Stephanotis floribunda | Kranzschlinge | 1.000 Lux |
| Syngonium podophyllum, auritum | Purpurtute | 300 Lux |
| Scheffleria arboricola | Schefflerie | 800 Lux |
| Tillandsia cyanea | Tillandsia | 800 Lux |
| Vriesea splendens | Vriesea | 800 Lux |
| Yucca elephantipe | Palmlilie | 1.000 Lux |
| Yucca aloifolia | Palmlilie | 2.500 Lux |
| Zantedeschia aethiopica | Calla | 1.000 Lux |
| Zebrina pendula | Tradescantie (Schnellläufer) | 600 Lux |

The following table you can use as a help while conversing the radiation (W/m²) in radiation sum (J / cm²). For example, if you measure in one hour an average radiation of 25 W / m², so it corresponds to the calculated total radiation of 9 J / cm². The table contains also a directive for measurements with a lux meter. Light intensity of 4,500 lux corresponds to an average radiation of about 100 W / m².

Measured total radiation (J / cm²), when for the duration of one hour, a certain radiation (W / m²) is measured, and the relation between lux and W / m².

| W/m ² | J/cm ² | Lux-Meter |
|------------------|-------------------|-----------|
| 25 | 9 | 1.050 |
| 50 | 18 | 2.140 |
| 75 | 27 | 3.290 |
| 100 | 36 | 4.500 |
| 150 | 54 | 7.145 |
| 200 | 72 | 10.270 |
| 250 | 90 | 14.240 |
| 300 | 108 | 20.900 |
| 350 | 126 | 29.950 |
| 400 | 144 | 34.675 |
| 450 | 162 | 39.550 |
| 500 | 180 | 44.570 |
| 550 | 198 | 49.800 |
| 600 | 216 | 55.200 |
| 650 | 234 | 60.800 |
| 700 | 252 | 66.700 |
| 750 | 270 | 72.850 |
| 800 | 288 | 79.300 |
| 900 | 324 | 93.100 |
| 1.000 | 360 | 104.000 |

At 100 W/m² about 4.500 lux is measured (1:45)

At 500 W/m² about 44,570 lux is measured (1:89,14)

At 1,000 W/m² about 104,000 lux is measured (1:104)

The lux values are classified as follows:

| | |
|-------------------------|---|
| < 300 lux | = growth stagnation, plants wither |
| 300 lux – 1,000 lux | = no growth of plants |
| 1,000 lux – 3,000 lux | = plants grow very slowly |
| 3,000 lux – 10,000 lux | = plants grow proportionally with increasing lux level |
| 10,000 lux – 12,000 lux | = optimum for the most plants |
| > 12,000 lux | = the light intensity is no longer utilized by the plants, because in most cases the heat interferes with the assimilation process. |

By shading the lux values should not be reduced below 8,000 lux.

Exception is propagation, here not less than 3000-5000 lux

Reference values in lux

Cloudy weather

Sunshine

Open land

5.000 - 15.000

40.000 -150.000

Greenhouse

3.000 - 10.000

30.000 - 40.000

Under old plastics

2.000 - 8.000

10.000 - 30.000