PRIMES

Operating Manual

Translation of the original instructions

Cube M

Revision 01/2019 EN

IMPORTANT!

READ CAREFULLY BEFORE USE.

KEEP FOR FUTURE USE.

Table of contents

1 Basic safety instructions

Intended use

The Cube M is used to measure power in the beam path of lasers. Please observe and adhere to the specifications and limit values given in chapter 15, „Technical data“, on page 30. Other forms of usage are improper. The information contained in this operating manual must be strictly observed to ensure proper use of the device.

Using the device for unspecified use is strictly prohibited by the manufacturer. By usage other than intended the device can be damaged or destroyed. This poses an increased health hazard up to fatal injuries. When operating the device, it must be ensured that there are no potential hazards to human health.

The device itself does not emit any laser radiation. During the measurement, however, the laser beam is guided onto the device which causes reflected radiation (**laser class 4**). That is why the applying safety regulations are to be observed and necessary protective measures need to be taken.

In measuring mode, the device’s safety interlock must be connected with the laser control.

Observing applicable safety regulations

Please observe valid national and international safety regulations as stipulated in ISO/CEN/TR standards as well as in the IEC-60825-1 regulation, in ANSI Z 136 “Laser Safety Standards” and ANSI Z 136.1 “Safe Use of Lasers”, published by the American National Standards Institute, and additional publications, such as the “Laser Safety Basics”, the “LIA Laser Safety Guide”, the “Guide for the Selection of Laser Eye Protection” and the “Laser Safety Bulletin”, published by the Laser Institute of America, as well as the “Guide of Control of Laser Hazards” by ACGIH.

Taking necessary safety measures

If there are people present within the danger zone of visible or invisible laser radiation, for example near laser systems that are only partly covered, open beam guidance systems or laser processing areas, the following safety measures need to be taken:

- Connect the device’s safety interlock to the laser control. Check that the safety interlock will switch off the laser properly in case of error.
- Please wear **safety goggles** adapted to the power, power density, laser wave length and operating mode of the laser beam source in use.

- Depending on the laser source, it may be necessary to wear suitable **protective clothing** or **protective gloves**.
- Please protect yourself from direct laser radiation, scattered radiation as well as from beams generated from laser radiation (e.g. by using appropriate shielding walls or by weakening the radiation to a harmless level).
- Please use beam guidance- or beam absorber elements which do not emit any hazardous particles as soon as they get in contact with laser radiation and which resist the beam sufficiently.
- Please install safety switches and/or emergency safety mechanisms which enable an immediate closure of the laser shutter.
- Please ensure a stable mounting of the device in order to prevent a relative motion of the device to the beam axis of the laser and thus to reduce the risk of stray radiation.

Employing qualified personnel

The device may only be operated by qualified personnel. The qualified personnel must have been instructed in the installation and operation of the device and must have a basic understanding of working with high-power lasers, beam guiding systems and focusing units.

Conversions, modifications and repairs

The device must not be modified, neither constructionally nor safety-related, without our explicit permission. The device must not be opened e.g. to carry out unauthorized repairs. Modifications of any kind will result in the exclusion of our liability for resulting damages.

Liability disclaimer

The manufacturer and the distributor of the measuring devices do not claim liability for damages or injuries of any kind resulting from an improper use or handling of the devices or the associated software. Neither the manufacturer nor the distributor can be held liable by the buyer or the user for damages to people, material or financial losses due to a direct or indirect use of the measuring devices.

2 Symbol explanation

The following symbols and signal words indicate possible residual risks:

DANGER

means that death or serious physical injuries **will** occur if necessary safety precautions are not taken.

WARNING

means that death or serious physical injuries **can** occur if necessary safety precautions are not taken.

CAUTION

means that a slight physical injury **can** occur if necessary safety precautions are not taken.

NOTICE

means that property damages **can** occur if necessary safety precautions are not taken.

The device itself or the packing bears the following symbols to indicate requirements and possible dangers:

Read and observe the operating instructions and safety guidelines before the start-up!

Further symbols that are not safety-related:

Here you can find useful information and helpful hints.

With the CE marking the manufacturer guarantees that his product is in conformity with the EC guidelines.

Call for observing (visual feedback from the device or the software).

▶ Call for action

3 Conditions at the installation site

The device must only be operated in a dry and dust free atmosphere. High levels of humidity can lead to condensation, which can affect the operation of the device. This also applies to high environmental dust exposure.
In industrial environments erroneous measurements may be triggered by strong electromagnetic fields. In this case we recommend EMC compliant shielding of the safety interlock cable.

4 Special information for measuring devices with rechargeable lithium ion batteries

The device is equipped with a lithium-ion battery. Note that this battery may ignite or explode at high temperatures.
To operate the device, the ambient conditions must therefore be observed and adhered to in accordance with the specifications in chapter 15, „Technical data“, on page 30.
The lithium-ion battery is permanently installed in the device. Do not open the device to replace the lithium-ion battery, as damage to the battery may result in the escape of harmful substances.

5 System description

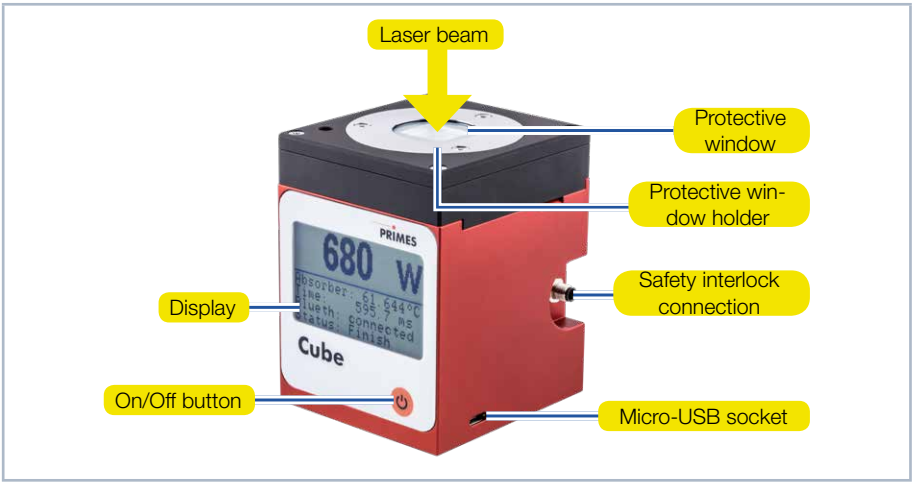


Fig. 5.1: System description of the Cube M

5.1 Measuring principles

The absorber of the calorimetric measurement system is irradiated by a laser for a short period of time. The temperature difference of the absorber between start and finish of the laser pulse is measured. From the increase in temperature, the microprocessor based electronics is able to calculate laser power to a high degree of accuracy.

6 Transportation

NOTICE

Damaging/Destruction of the device

Hard impacts or dropping the device can damage the optical and electrical components.

▶ **Only transport the device in its original packaging.**

7 Installation/Removal

7.1 Prepare installation

1. Turn off the laser source.
2. Ensure that moving parts, e.g. robot arms, etc. are at a standstill and that they cannot be set in motion unintentionally.

DANGER

Serious eye or skin injury due to laser radiation

If the stability of the device is not guaranteed or the inlet aperture is not centered and mounted perpendicular to the laser beam, increased scattered or directed reflection of the laser beam will occur.

- ▶ **Align the device as described in chapter 7.2 on page 12.**
- ▶ **Install the device according to chapter 7.3 on page 14 in a way that ensures, that the device can not shift or fall.**

CAUTION

Cutting hazard

Contamination and fingerprints on the protective window can lead to damage or shattering or splintering of the protective window during measuring operation.

- ▶ **Do not touch the protective window.**
- ▶ **Only operate the device with a clean protective window.**

7.2 Mounting position

The Cube M can be mounted vertically or horizontally. The Cube M must be aligned to the laser beam. The laser beam must hit the inlet aperture in the middle. Please mind and adhere to the specifications and limit values given in chapter 15, „Technical data“, on page 30.

The Cube M is positioned above the focus (see Fig. 7.1 on page 12). Make sure that the laser beam is convergent and the permissible power density at beam entrance is not exceeded. The focal position of the laser beam must be located on the lower edge of the device.

To align the Cube M under the laser, a alignment tool is included (see chapter 7.2.1 on page 13).

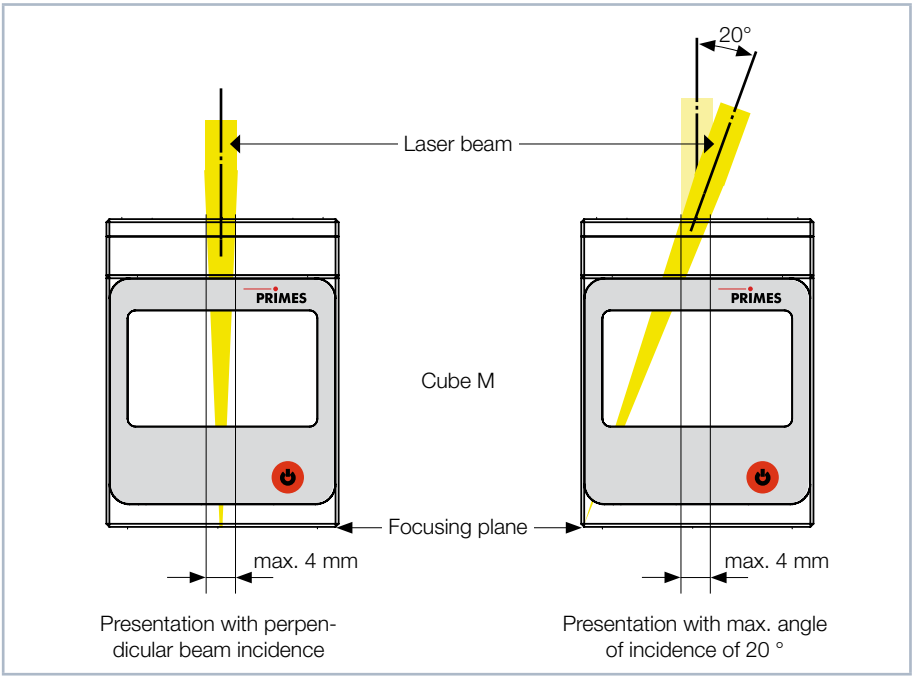


Fig. 7.1: Alignment to the laser beam

7.2.1 Align the Cube M with the alignment tool

Using the alignment tool and a pilot laser beam, you can position the device with the necessary accuracy (see Fig. 7.2 on page 13):

1. Put the alignment tool on the inlet aperture.
2. Turn on the pilot laser and align the device:

- If the laser beam hits the little marking in the alignment tool, the device is aligned.

NOTICE

Damaging/Destruction of the alignment tool

The alignment tool is made of plastic. The exposure with laser radiation will destroy the alignment tool.

▶ **Remove the alignment tool before measurement.**

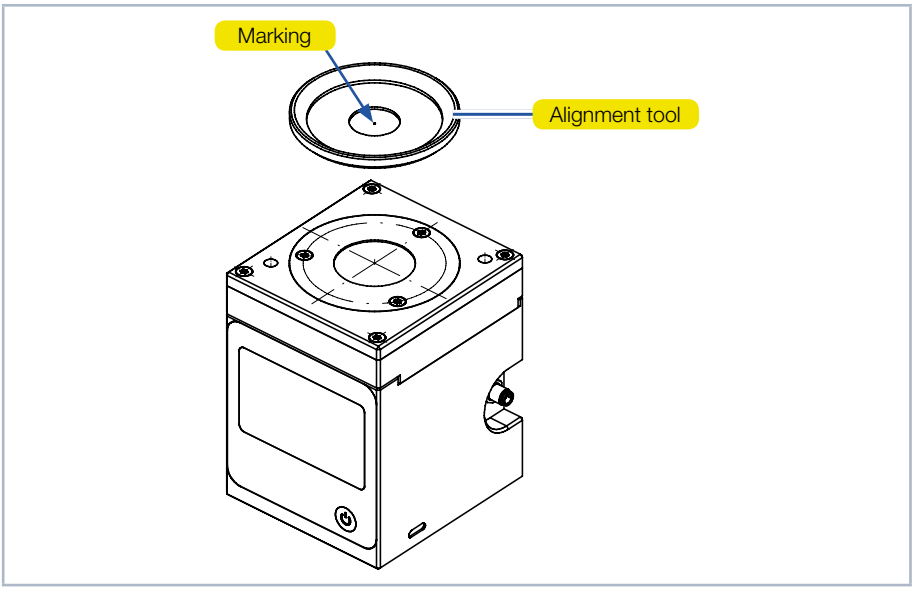


Fig. 7.2: Alignment of the Cube M using the alignment tool

7.3 Install the Cube M

1. Align the device with the laser beam as described in chapter 7.2 on page 12 and Fig. 7.1 on page 12.
2. Install the device with the mounting threads as shown in Fig. 7.3 on page 14.
3. Ensure a stable installation of the device:

- The device must not be able to move.

4. Connect the safety interlock connection cable.
5. Remove the alignment tool from the protective window of the device.

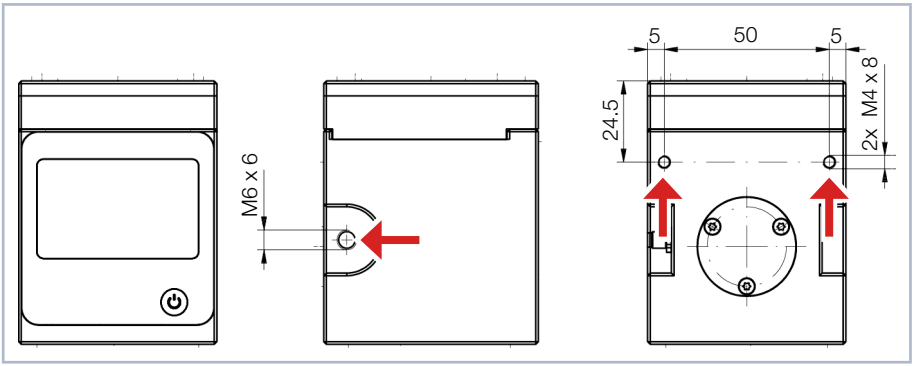


Fig. 7.3: Mounting threads in the Cube M housing

7.4 Remove the Cube M

1. Turn off the laser source.
2. Ensure that moving parts, e.g. robot arms, etc. are at a standstill and that they cannot be set in motion unintentionally.
3. Unscrew the mounting screws from the mounting threads (see Fig. 7.3 on page 14).
4. Remove the safety interlock connection cable and remove the device from the laser system.
5. Apply the alignment tool to prevent contamination of the protective window.

8 Connections

Fig. 8.1: Connections

8.1 Safety interlock

At temperatures over 100 °C, the safety interlock is triggered in order to protect the absorber from overheating. If the absorber is hotter than 100 °C, Pin 3 and Pin 4 will connect.

Since the heat is concentrated in the area where the laser beam hits, the safety interlock may be triggered shortly after the beam comes on, since the temperature of the absorber briefly exceeds 100 °C. When the device is used in accordance with the technical specifications, this brief spike in the temperature of the absorber does not pose a risk to the absorber and does not constitute an error.

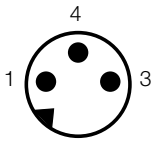
Unfortunately, it is not possible to trigger the safety interlock on a time delay, because otherwise there would be no way to ensure that it protects against overheating.
Once the absorber cools off, Pin 1 and Pin 4 of the safety interlock are connected. A suitable 2 m long connection cable is included.

NOTICE

Damaging/Destruction of the device

If the safety circuit is not connected, the device can be damaged or destroyed due to overheating.

- ▶ **When connecting the laser control, please ensure that the laser is turned off in case of an interruption of the connection.**

Pin diagram safety interlock plug (view connector side)	Pin	Wire color	Function
	4	Black	Mutual pin
	1	Brown	Connected with pin 4, when ready for operation
	3	Blue	Connected with pin 4, when in safety interlock mode (absorber too hot)

Tab. 8.1: Pin assignment of the safety interlock plug

8.2 Micro-USB socket

You can charge the rechargeable lithium ion battery of the measuring device by plugging it into the micro-USB socket on the PC. A suitable cable is included in the scope of delivery. When using the optional LaserDiagnosticsSoftware LDS, the device communicates with the LDS via the micro-USB socket.
You will find the PRIMES USB-driver for all USB-capable devices on the PRIMES website at: https://www.primes.de/en/support/downloads/software.html.

8.3 Bluetooth

A class 1 Bluetooth interface was integrated in the Cube M. This enables a wireless connection with the PC, tablet or the smart phone. When connected to a PC with a class 1 Bluetooth stick, the range under free space conditions is approx. 100 m. After switching on the device, the Bluetooth connection is permanently active. When the Bluetooth connection is activated, the USB interface is deactivated.
When using the PRIMES Cube App for mobile devices with Android™ (not included in delivery), the device communicates with the app via Bluetooth. The PRIMES Cube App is available in the Google Play Store/Tools.

9 Control elements

9.1 On/Off button

The on/off button have several functions:

	Keystroke	Function
⏻	5 seconds	Turn on/Turn off
	2 seconds	Show measuring values
	Repeated pushing for 2 seconds	Turn over measuring value display

Tab. 9.1: On/Off button

10 Display

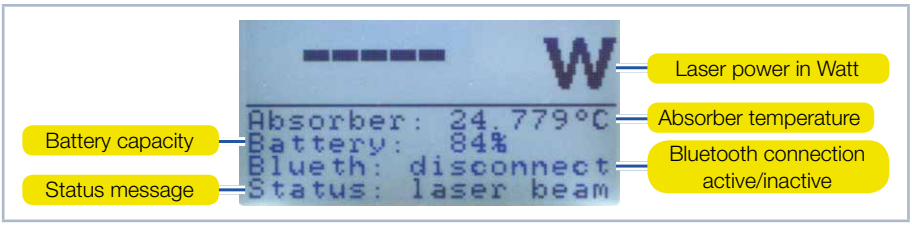


Fig. 10.1: Display

10.1 Status messages

Status message	Meaning
Waiting for laser beam	The device is ready for operation, the laser can be turned on.
Check temp.	The temperature gradient (change in the absorber temperature/time) is checked. Please wait until the message disappears. Thereafter, the device is ready to measure again.
Thermalize	The thermalization time allows for a uniform temperature distribution in the absorber. Afterwards, the temperature is measured.
Finished	The measurement is completed.

Tab. 10.1: Status messages

10.2 Warning message

Warning message	Reason
Safety interlock open	The absorber temperature has exceeded 100 °C. In order to protect the device, the safety interlock is open.

Tab. 10.2: Warning message

This warning message does not imply an error. The message is automatically reset as soon as the absorber temperature is below 100 °C again. Likewise, the safety interlock is then closed again.

10.3 Capacity of the rechargeable lithium ion battery

The capacity of the rechargeable lithium-ion battery is displayed in percentage. The accuracy of this display is subject to various factors (such as, for example, the temperature, the battery condition, etc.). We therefore recommend charging the battery when 20 % are displayed.
If the battery is fully discharged, the charging can take between 12 and 14 hours. Please note that the charging process can only be carried out in the temperature range from 0 °C to + 45 °C to protect the battery.
With a battery capacity of 100 %, the device has an operating time of approx. 6 hours (equivalent to approx. 100 measurements). When using all power saving functions (see Tab. 12.1 on page 25) approx. 15 hours.

11 Measuring and displaying with the Cube M

11.1 Safety instructions

DANGER

Severe eye or skin injury due to laser radiation

During the measurement the laser beam is guided on the device, which causes scattered or directed reflection of the laser beam (laser class 4).

- ▶ Please wear safety goggles adapted to the power, power density, laser wave length and operating mode of the laser beam source in use.
- ▶ Wear suitable protective clothing and protective gloves.
- ▶ Protect yourself from laser radiation by separating protective devices (e.g. by using appropriate shielding).

CAUTION

Cutting hazard

Contamination and fingerprints on the protective window can lead to damage or shattering or splintering of the protective window during measuring operation.

- ▶ Do not touch the protective window.
- ▶ Regularly check the condition of the protective window and exchange it in case of pollution (see chapter 13.1, „Exchanging the protective window“, on page 26).
- ▶ Only operate the device with a clean protective window.

CAUTION

Damaging/Destruction of the device

The maximum permissible energy per laser pulse depends on various variables, including the absorber temperature.

- ▶ Please observe the limit values and dependencies specified in chapter 15, „Technical data“, on page 30 and chapter 18, „Appendix“, on page 34 before the measurement.

11.2 Laser parameter setting

11.2.1 Setting the laser rise time

The applicable measurement time is between 0.1 s and 2.0 s, which has to be transferred to the laser controller as pulse length. The maximum laser rise time for measuring the power cannot exceed 100 µs. This limit has to be adhered to in order to avoid incorrect results of the power measurement.
Some laser beam sources are factory set with power ramps of up to a few 100 ms to switch on the laser beam. To achieve the correct power values the shortest possible rise time (< 100 µs) has to be set.

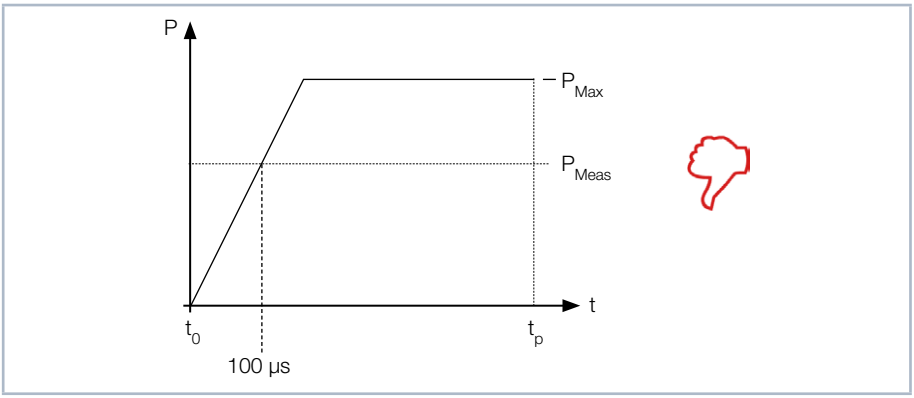


Fig. 11.1: Laser rise time > 100 µs

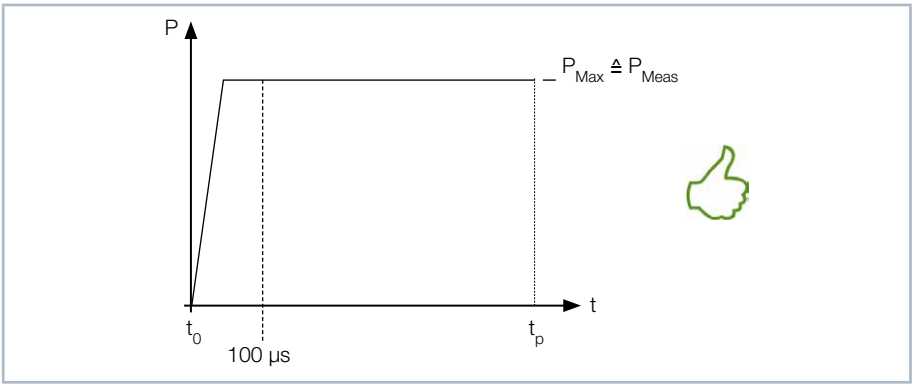


Fig. 11.2: Laser rise time < 100 µs

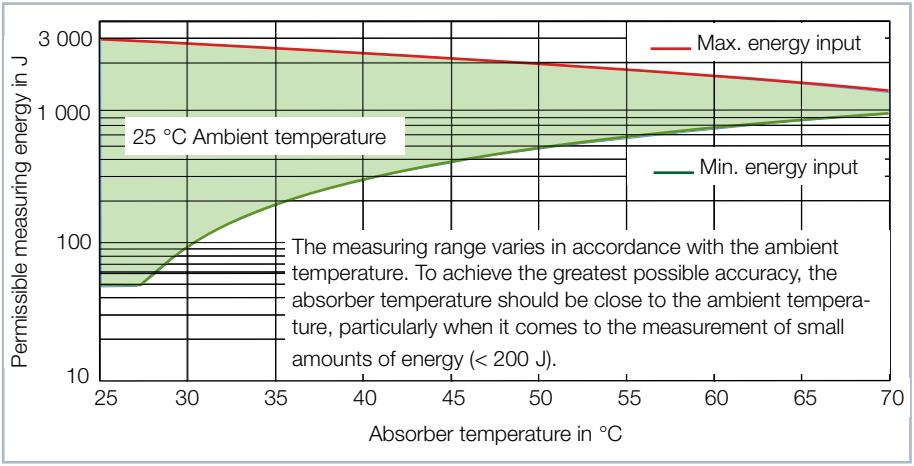
11.2.2 Minimum energy per single measurement

The energy used for the measurement must achieve a sufficiently high temperature in the absorber to be recorded with high precision. Energy of about 300 J is generally recommended, as long as the measurement duration is < 2 s.

Example: With a laser power of 1 kW and an irradiation time of 300 ms, 300 J are absorbed.

$E = P \cdot t = 1\,000\ W \cdot 0.3\ s = 300\ J$

Tab. 11.1 on page 21 shows information for selecting the energy permissible for a measurement in conjunction with the absorber temperature.

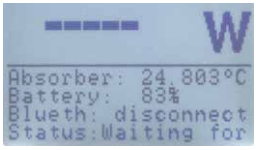
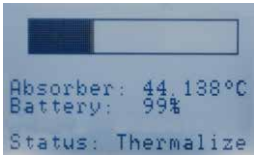


Tab. 11.1: Measuring range as a function of the absorber temperature

The minimum energy application shows the limit above which a measurement can be performed with high precision. The maximum energy application value specifies the limit at which the absorber reaches its reliable limit temperature. The energy, e.g. for multiple measurements (series measurements) can be distributed across the range shown in green.
If the absorber temperature is greater than 70 °C, it won't be possible to take any further measurements. In this case, please wait until the temperature falls to below 50 °C (depending on the energy application selected). Please take the limit values from Tab. 11.1 on page 21.

11.3 Single measurement

Please read chapter 11.1, „Safety instructions“, on page 19 first.

▶ Press the on/off button for at least 5 seconds.	
The start menu appears.	
After approx. 5 seconds, the device is ready for operation.	
▶ Turn on the laser.	For a high measurement accuracy, we recommend an energy input of 300 J per measurement. See chapter 11.2.2, „Minimum energy per single measurement“, on page 21.
The thermalization is displayed by means of a progress bar (duration approx. 15 seconds).	
The measured power, the temperature, and the irradiation time are displayed.	

The device turns off automatically after approx. 10 minutes. You can also turn off the device manually by keeping the on/off button pressed for approx. 4 seconds.

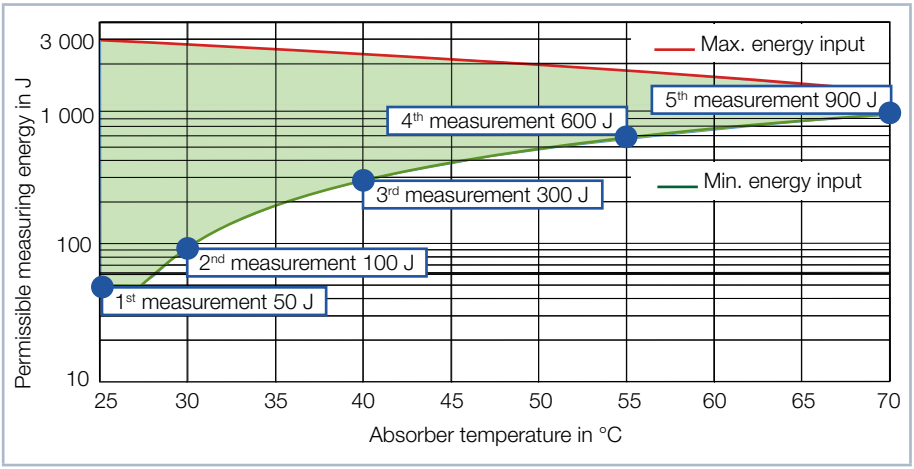
11.4 Serial measurement

Please read chapter 11.1, „Safety instructions“, on page 19 first.

Always start a measurement series with the smallest power and increase it gradually. Small amounts of energy should be measured with absorber temperatures that are close to the ambient temperature.

In general:
The minimum amount of irradiated energy should amount to approximately twenty times the difference of the absorber temperature minus room temperature, so at least 50 J.

In case of subsequent measurements, the residual capacity of the absorber for another laser pulse has to be considered. Tab. 11.2 on page 23 shows information for selecting the energy permissible for a series measurement in conjunction with the absorber temperature.



Tab. 11.2: Example of a series measurement in conjunction with the absorber temperature

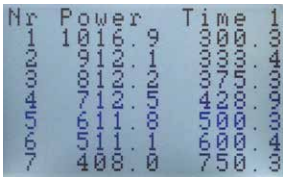
If the absorber temperature is greater than 70 °C, it won't be possible to take any further measurements. In this case, please wait until the temperature falls to below 50 °C (depending on the energy application selected). Please take the limit values from Tab. 11.2 on page 23.

11.5 Measurement with pulsed lasers

Limited measurement with pulsed lasers is possible. When it comes to pulsed laser radiation a correct exposure time measurement up to a pulse frequency of 1 kHz and a duty cycle of 50 % is possible.
In case of on/off times shorter than 500 µs a correct exposure time measurement is not possible.

11.6 Reading off measuring values

The last 14 measuring values can be read off from the display of The Cube M. You can read off the last 30 measuring values with the optional Android™ PRIMES Cube App for mobile devices or optional LaserDiagnosticsSoftware LDS.

▶ Press the on/off button for approx. 2 seconds.	
The measured values and the time are displayed. ▶ Press the on/off button again for 2 seconds to have the remaining measuring values (no. 8-14) displayed.	

12 Measurement and evaluation via software

12.1 Measurement and evaluation with the LaserDiagnosticsSoftware LDS

With the optional operating and evaluation software LaserDiagnosticsSoftware LDS you can also operate the device via the PC and evaluate the measurements. The functions can be found in Tab. 12.1 on page 25.

12.2 Measurement and evaluation with the PRIMES Cube App

With the PRIMES Cube app (not included in delivery) for mobile devices with Android™ you can operate and evaluate the device via a smartphone/tablet.
The PRIMES Cube App is available in the Google Play Store/Tools. The functions can be found in Tab. 12.1 on page 25.

12.3 Functions and settings via the software

Function	Possible settings
Auto ready	By default, the device automatically returns to measurement readiness after each measurement. If you uncheck the box, you will need to reset the unit after each measurement by briefly pressing the on/ of button.
Power Saving Function	Continuous background on/off
	Turn off backlight after (in s). The set time only applies if the permanent backlight is switched off.
	Switch safety interlock on/off. For safety reasons switching off the safety interlock is not recommended.
	Switch off the device after an entered time

Tab. 12.1: Functions and settings

13 Maintenance and service

The operator is responsible for determining the maintenance intervals for the measuring device.
PRIMES recommends a maintenance interval of 12 months for inspection and validation or calibration.
If the device is used only sporadically, the maintenance interval can also be extended up to 24 months.

13.1 Exchanging the protective window

The protective window in the beam entrance is a wearing part and can be replaced if necessary. Low levels of contamination of the protective window can be carefully removed when cooled with Isopropanol (observe the manufacturer's safety instructions). In case of heavy, non-removable contamination or damage, the protective window must be replaced with a new one.

The protective window is coated with an antireflection coating and has low reflection values of less than 1%. To avoid increased reflection values, use only original PRIMES protective windows.

Protective window diameter	30 mm
Glass thickness	1.5 mm
Order number	801-004-054 (1 piece); 410-011-022 (10 pieces)

13.1.1 Safety instructions

DANGER

Severe eye or skin injury due to laser radiation

If the protective window is not correctly positioned, reflections can cause directional laser radiation.

- ▶ **Ensure that the new protective window is positioned evenly in the indentation on the O-ring.**

CAUTION

Burns due to hot components

After a measurement the optics below the protective window is hot! Unintentional contact during the protective window exchange could lead to burns.

- ▶ Do not replace the protective window directly after a measurement.
- ▶ Let the device cool down for an adequate period of time. The cooling time varies depending on the laser power and the irradiation time.

CAUTION

Cutting hazard

Contamination and fingerprints on the protective window can lead to damage or shattering or splintering of the protective window during measuring operation.

- ▶ Only replace the protective window in a dust-free environment.
- ▶ Do not touch the protective window.
- ▶ When exchanging the protective window, always wear cotton- or powder-free latex gloves.

NOTICE

Damage to the optics

Pollution on the optics surface causes measurement deviation during laser beam irradiation by means of absorption and can damage the optics.

- ▶ Ensure during exchanging the protective window that the subjacent optics will not be polluted.

1. Observe the safety instructions in chapter 13.1.1, „Safety instructions“, on page 26.
2. Unscrew the 3 Torx screws M2.5 x 4 mm on the protective window holder.
3. Place the device as shown in Fig. 13.1 on page 28 and carefully remove the protective window holder upwards.

- Make sure that the inserted O-ring does not fall out of the device.

4. Remove old protective window from the device and dispose of it.
5. Wear cotton or powder-free latex gloves and insert new protective window into the device.

- Ensure that the inserted O-ring is not out of place.

6. Place the protective window holder according to Fig. 13.1 on page 28.
7. Tighten the protective window holder with 3 Torx screws M2.5 x 4 mm.

8. Check for secure fit of the protective window holder:

- The protective window holder must lie flat against the device.

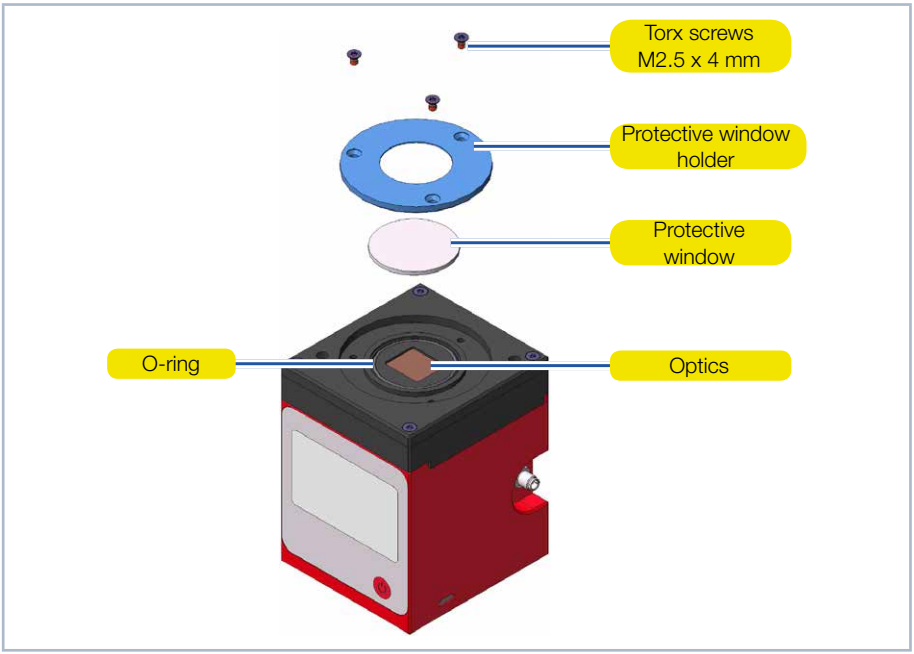


Fig. 13.1: Exchanging the protective window on the Cube M

14 Measures for the product disposal

Due to the Electrical and Electronic Equipment Act (“Elektro-G“) PRIMES is obliged to dispose PRIMES measuring devices manufactured after August, 2005, free of charge. PRIMES is a registered manufacturer in the German “Used Appliances Register“ (Elektro-Altgeräte-Register “EAR“) with the number WEEE-reg.-no. DE65549202.

Provided that you are located in the EU, you are welcome to send your PRIMES devices to the following address, where they will be disposed free of charge (this service does not include shipping costs):

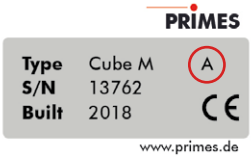
PRIMES GmbH
Max-Planck-Str. 2
64319 Pfungstadt
Germany

15 Technical data

Measurement parameters	
Max. beam diameter on the protective window	4 mm
Min. beam diameter on the protective window	1 mm
Wavelength range	1 030 – 1 090 nm
Power range Devices with standard absorber [1] Devices with advanced absorber [1]	 25 – 1 000 W [2] 25 – 2 000 W [2]
Irradiation time	0.1 – 2.0 s [2] (depending on laser power)
Total duration until measurement value output	< 15 s
Nominal measurement frequency	300 J: 1 cycle/min 3 000 J: 1 cycle/15 min
Accuracy Angle of incidence up to 5 ° Angle of incidence from 10 ° to 20 °	 ± 3 % ± 5 %
Reproducibility	± 1 %

[1] **Please read the information on the identification plate to determine if your device is equipped with a standard or advanced absorber.**

When nothing is marked, a standard absorber is built into the device.

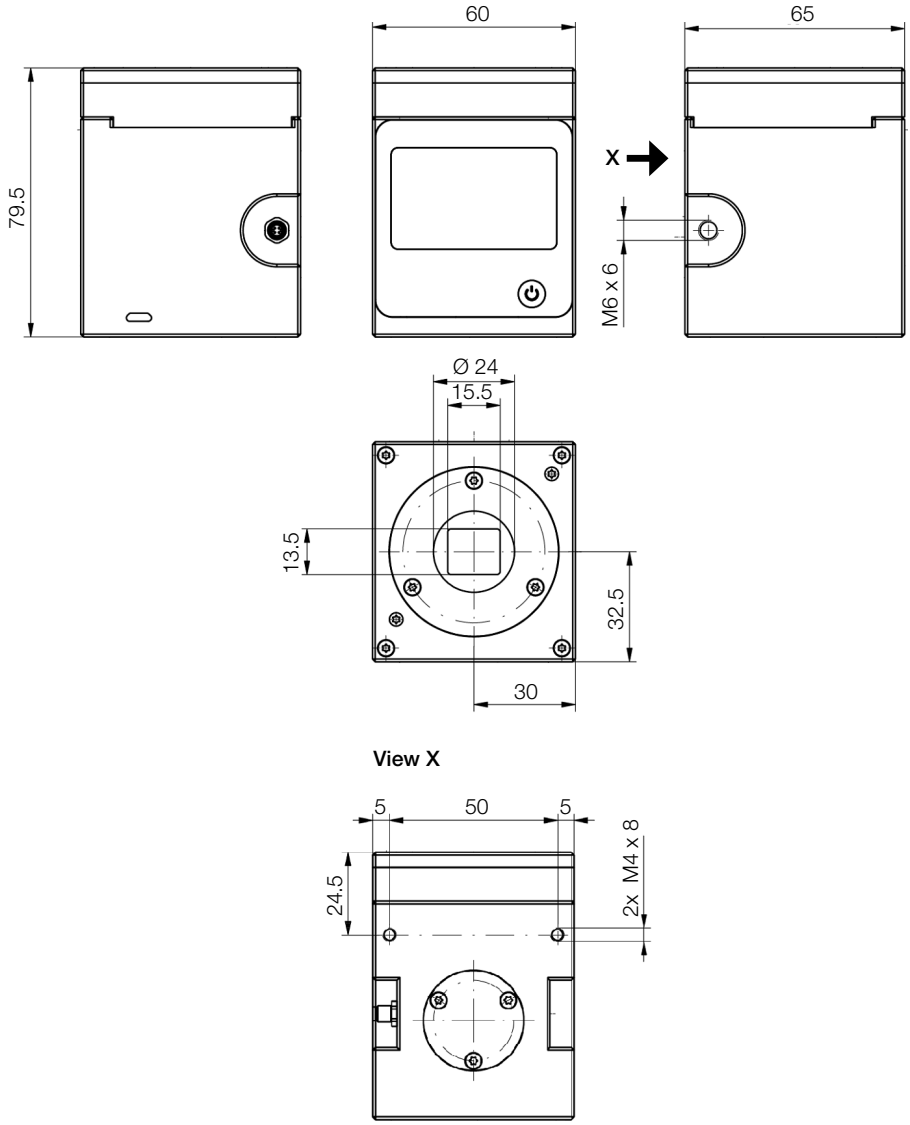


When an A marking is made, an advanced absorber is built into the device.

[2] **The stated limit values are to be understood in correlation with the permitted maximum energy (E = P · t).**

Limit values	
Max. absorber temperature	120 °C
Energy per measurement	50 – 3 000 J
Recommended energy per measurement	300 – 500 J
Max. power density (peak) at beam entrance	250 kW/cm²
Max. laser rise time	100 µs
Max. angle of incidence perpendicular to inlet aperture	± 20 °
Max. centered tolerance	± 2.0 mm
Supply data	
Power supply	Integrated lithium-ion battery, which can be charged via a micro-USB port
Temperature range for charging the lithium-Ion battery	0 – 45 °C
Communication	
Interfaces	USB/Bluetooth
Dimensions and weight	
Dimensions (LxWxH) (without connectors)	60 x 65 x 80 mm
Weight (approx.)	600 g
Environmental conditions	
Operating temperature range	15 – 40 °C
Storage temperature range	5 – 50 °C
Reference temperature	22 °C
Permissible relative humidity (non-condensing)	10 – 80 %

16 Dimensions



All dimensions in mm (general tolerance ISO 2768-v)

17 Declaration of conformity

Original EG Declaration of Conformity

The manufacturer: PRIMES GmbH, Max-Planck-Straße 2, 64319 Pfungstadt, Germany,

hereby declares that the device with the designation:

Cube

Types: Cube; Cube M

is in conformity with the following relevant EC Directives:

- EMC Directive EMC 2014/30/EU
- Low voltage Directive 2014/35/EU
- Directive 2011/65/EC on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment
- Radio Equipment Directive 2014/53/EU

Authorized for the documentation:
PRIMES GmbH, Max-Planck-Straße 2, 64319 Pfungstadt, Germany

The manufacturer obligates himself to provide the national authority in charge with technical documents in response to a duly substantiated request within an adequate period of time.

Pfungstadt, April 26, 2017

Dr. Reinhard Kramer, CEO

18 Appendix

18.1 System control (option)

An optional connection to the system control is available. Please contact your PRIMES sales partner with any questions.

PRIMES GmbH
Max-Planck-Str. 2
64319 Pfungstadt
Germany

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