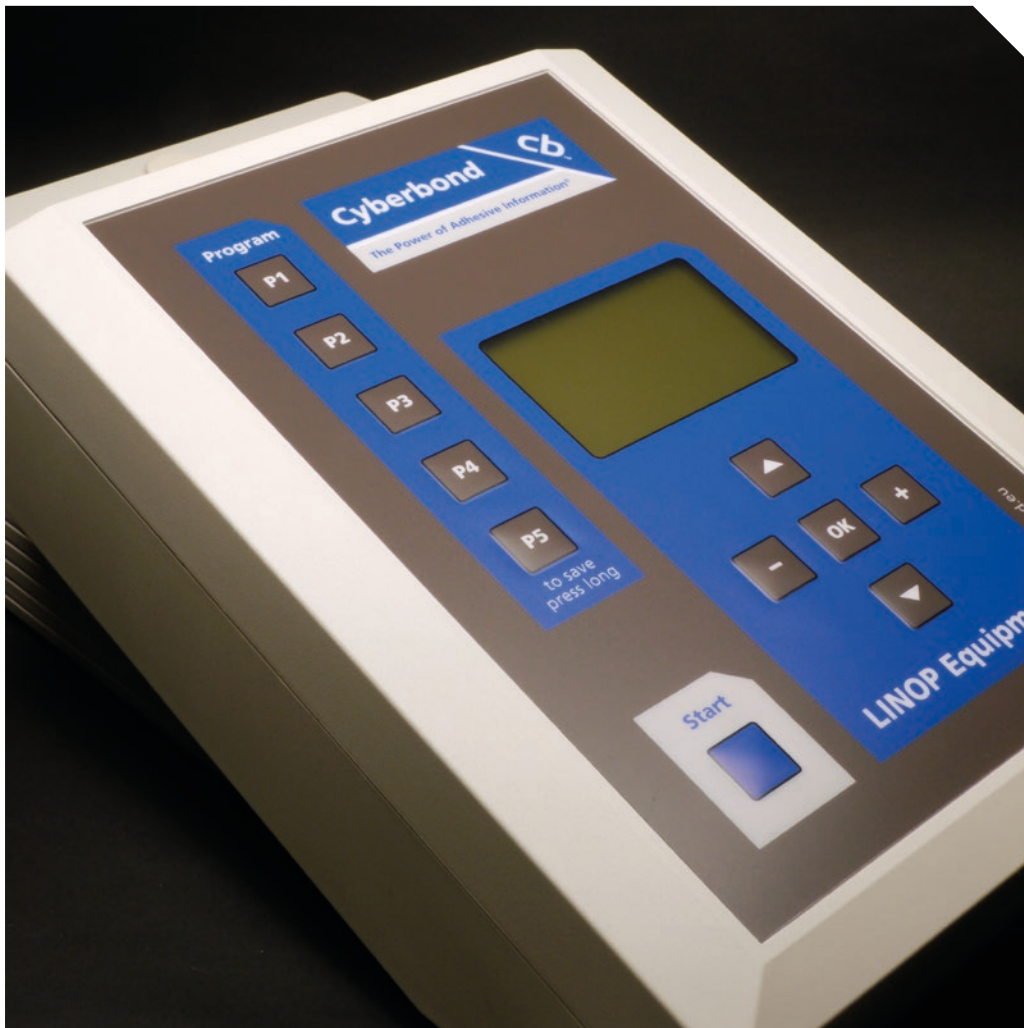




## LINOP Equipment Programme

### Dosing Units and Curing Systems



Programme

# LINOP Equipment

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### LINOP Equipment

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## LINOP Equipment

### 1 LINOP Equipment Programme

#### 1.1 Idea and Design

On one hand, our customers require state-of-the-art micro processed dosing, (also UV curing device) to be used as either a compact table top unit, or as an integrated part of a PLC (Programmable Logic Controller) controlled line of production. On the other, as Cyberbond we wanted to develop this further for our customers and offer a very easy-to-use, clearly defined **design** for all **Cyberbond LINOP** devices.

#### 1.2 The Result

**LINOP M 2000, LINOP M 1500, LINOP M 600 and LINOP U 400** achieve all of the required tasks within a production environment perfectly and we are very proud of the successful **design** of the current generation of **LINOP** equipment. The units are always based on the same **white housing with flexible arm**. When the **LINOP** is used as a table top unit, the innovative **flexible arm** can carry the valve or the UV lamp. This means that the worker has both hands free to hold the mating parts as necessary. With this integrated design there is no requirement for the suitable positioning of the valve or the UV lamp. It is already done.

The **LINOP** unit is also equipped with a serial interface in order to integrate it easily into a PLC driven production process. In total, 4 valves, 4 Cyberlite4 S LED lamps or 2 CyberFlood 400 S LED lamps in parallel can be run. With this sort of set-up the flexible arm can be neglected.

Another feature is the **ergonomically designed** electrical display panel. This angular design allows for easy viewing of the panel.

Furthermore, the microprocessor-controlled system allows an adjustment of the relevant **figures to a tenth of a percent**. The whole system is very easy to use and up to five different programmes can be stored.



LINOP U 400 / M 600 / M 1500 / M 2000

## LINOP LED Curing Equipment

### 2 CyberFlood 400 S LED Floodlight Lamp

The new LED based Floodlight Lamp generation  
for Curing UV or Light Curing Adhesives



CyberFlood 400 S



LINOP U 400

This year we introduce our **CyberFlood 400 S**, which stands for a new lamp concept. The **CyberFlood 400 S** consists of 4 cluster LED lamps with 10 watt each (there are 9 light chips per lamp) and works at a wavelength of 395 nm. Each cluster LED is covered by an aspheric condenser lens. The light which is going to the outside is reflected by the side mirrors so that it is equally distributed.

There is no problem to combine several **CyberFlood 400 S** lamps with each other. Therefore you dismantle the wanted mirror. Due to the aspheric lenses the respective light irradiations interlock and guarantee a very steady illumination of the area [see picture on page 6].

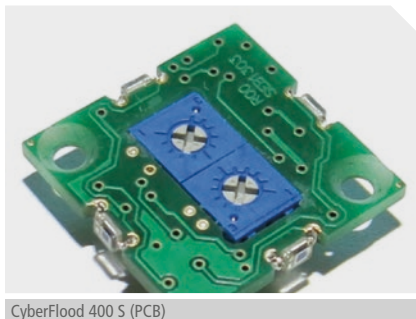
The **CyberFlood 400 S** is controlled by a **LINOP U 400** unit. A **LINOP U 400** is able to run 2 **CyberFlood 400 S** lamps in maximum. The **LINOP U 400** is equipped with a serial interface in order to guarantee a perfect integration into a PLC controlled production process. By means of the **LINOP U 400** you can mainly release time impulses.

The described combination (**LINOP U 400** and **CyberFlood 400 S**) illuminates an area of about 60 x 60 mm from a distance of about 55 mm. The intensity of light is about 60 mW/cm<sup>2</sup>

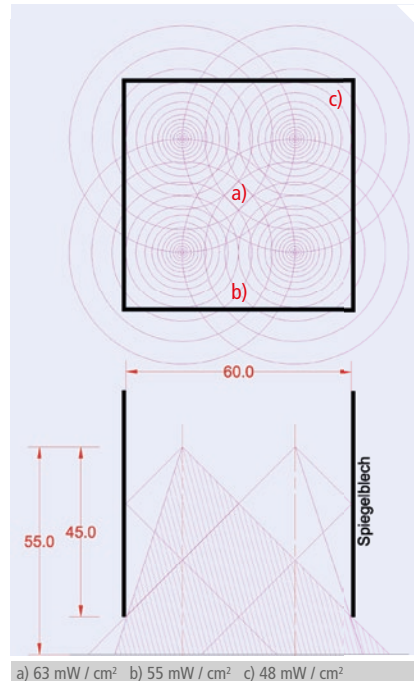
## LINOP LED Curing Equipment



CyberFlood 400 S



CyberFlood 400 S (PCB)



This intensity doesn't sound too impressive, but it is. Take into consideration that a LED lamp just emits relevant light (e.g. 395 nm). Also, it is true that the electronic produces heat, not so the source of LED light itself. But this heat is a problem of the traditional lamps and ends in an enormous loss of energy. For this reason a LED lamp needs much less energy than traditional lamps, by guaranteeing similar results.

Nevertheless the **CyberFlood 400 S** has got a temperature sensor in order to stop the system when heat becomes too high. Again, LED light is a cold light which allows illuminating heat sensitive parts, but the electronic itself develops heat. For this reason you find water cooled or similar systems in the market, which are relatively complex and expensive. We decided to go a different way. We designed a cooling rip construction which is also equipped with a small cooling fan (30 db). The whole system comes out quite compact and the emitted temperature will not exceed 35 °C.

Also the **CyberFlood 400 S** is equipped with sensors which indicate, if the emitted light is not sufficient. This guarantees a constant production control.

One item has to be considered by the use of LED technology as a floodlight. You get just optimal results, when the process is clocked. You should avoid a permanent switching on of the light to illuminate e.g. a tunnel equipped with a conveyer belt. You reach more efficiency and a longer work life with the LED lamp, if the LED is clocked for the time of curing the adhesive. This constant switching on and off does not damage the lamp at all.

**The CyberFlood 400 S is a great and compact unit equipped with advanced LED and lens technology.**

It weighs only about 450 g, the dimensions are about: 116 mm x 64 mm x 64 mm.

# LINOP LED Curing Equipment

## 2.1 Advantages of LED Technique

The general advantages of LED technology are described as following:

- ▼ Very long service life of the lamp (> 10.000 hours)
- ▼ Switching the lamp on and off does not negatively influence it's long life expectancy
- ▼ Instant UV light emission at the rated value when switched on
- ▼ LED light does not generate heat or ozone/air ionization
- ▼ Minimal power consumption

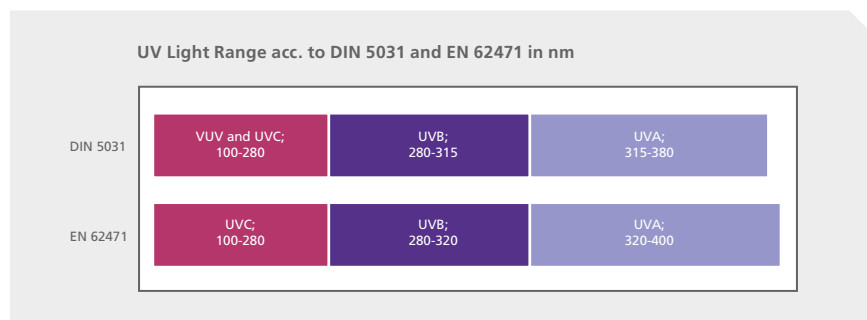
## 2.2 Definition of UV resp. Visible Light and Potential Dangers

UV LED lights are classified according to EN 62471: 2008 (photo-biological safety of lights and light systems). There are differences between the classification of visible and UV- light concerning the wave lengths compared to DIN 5031, chapter 7. DIN 5031 defines UV light from 100 to 380 nm whereas EN 62471 determines the range between 100 to 400 nm. This is due to the fact that the biological and the dermatological effect of UV light on eyes and skin is judged very strictly.

**Cyberlite4** lamp partly emits UVA light (according to EN norm), as its spectrum is between 380 nm to 440 nm. Therefore, to protect oneself against this light, suitable protective equipment should always be used.

According to EN 62471 the **CyberFlood 400 S** is classified as: at-risk-group 3 with the additional hint: visible and invisible LED radiation. Exposure to eye and skin by stray radiation must be avoided! Read operating instructions carefully! Additionally, a UV symbol is affixed.

Short-wave light such as UVB or UVC is not released.



## LINOP LED Curing Equipment

### 2.3 Technical Data LINOP CyberFlood 400 S

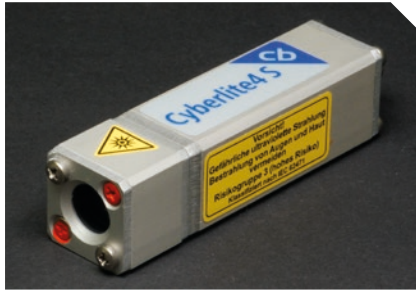
#### LINOP CyberFlood 400 S

Peak wavelength	approx. 395 nm
Approximate spectrum	approx. 380 to 440 nm
4 Cluster LED lamps	with each 9 chips
Aspheric lenses	
Very consistent distribution of light	approx. 60 mW / cm <sup>2</sup>
Intensity of light, distance approx. 55 mm, area approx. 60 x 60 mm	
a) center	63 mW / cm <sup>2</sup>
b) middle / edge	55 mW / cm <sup>2</sup>
c) corner / edge	48 mW / cm <sup>2</sup>
Distance lenses to surface, due to side mirrors	approx. 45 mm
Working temperature	- 25 °C to + 60 °C
Power input	4 x 10 W (lamps)
Limits	max. 10 V / 1.000 mA constant
Control unit LINOP U 400, 2 exits	2 x 20 V / 600 mA – 24 W
Life expectancy	> 15.000 hours
Additional equipment	cooling fan
Housing material	Metal
Weight	approx. 450 g
Measurements	approx. 116 x 64 x 64 mm

## LINOP LED Curing Equipment

### 3 Cyberlite4 S LED Spotlight

The Cyberlite4 S UV LED light is a very powerful and compact LED Spotlight for Curing UV- and light Curing Adhesives.



LINOP Cyberlite4 S



LINOP U 400

**Cyberlite4 S** works best at 395nm wavelength. For safety reasons Cyberlite4 S is equipped with a temperature sensor that interrupts the flow of electricity as soon as the temperature of the light gets above 60°C.

**Cyberlite4 S** can easily penetrate transparent plastics as well as UV opaque plastics. A successful and very fast bond is achieved when the adhesive corresponds with the wavelength of 395nm.

Furthermore, **Cyberlite4 S** is equipped with a lens system (LINOP Lens) to focus the light. As an option, an extension attachment (LINOP LWL) is available. With the aid of an approx. 30 cm long flexible fibre-optic cable, one can bring the light even closer to the place of application.

The 'S' stands for sensor technique. The **LINOP U 400** is especially suitable when used within a PLC controlled process as monitoring electronics have been increased, as compared to the basic version. There is a constant control indicating whether the LED lamps that are connected to the unit are actually working and if the lamps are emitting sufficient light. This ensures greater safety in production.

# LINOP LED Curing Equipment

## 3.1 Advantages of LED Technique

The general advantages of LED technology are described as following:

- ▼ Very long service life of the lamp (> 10.000 hours)
- ▼ Switching the lamp on and off does not negatively influence it's long life expectancy
- ▼ Instant UV light emission at the rated value when switched on
- ▼ LED light does not generate heat or ozone/air ionization
- ▼ Minimal power consumption

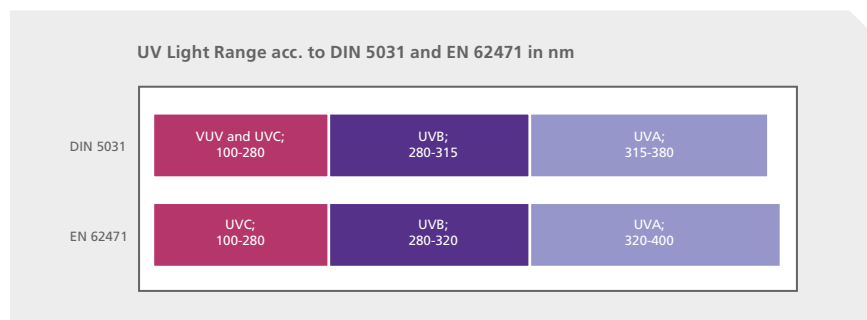
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**Cyberlite4** lamp partly emits UVA light (according to EN norm), as its spectrum is between 380 nm to 440 nm. Therefore, to protect oneself against this light, suitable protective equipment should always be used.

According to EN 62471 the **Cyberlite4 S** is classified as: at-risk-group 3 with the additional hint: visible and invisible LED radiation. Exposure to eye and skin by stray radiation must be avoided! Read operating instructions carefully! Additionally, a UV symbol is affixed.

Short-wave light such as UVB or UVC is not released.



## LINOP LED Curing Equipment

### 3.3 Technical Data LINOP Cyberlite4 / Cyberlite4 S

#### LINOP Cyberlite4 and Cyberlite4 S

Peak wave length	approx. 395 nm
Light spectrum	approx. 380 to 440 nm
Intensity of light, distance 10 mm	approx. 350 mW / cm <sup>2</sup>
Intensity of light, area approx. 20 x 20 mm	approx. 270 mW / cm <sup>2</sup>
Intensity of light, area approx. 60 x 60 mm	approx. 14 mW / cm <sup>2</sup>
- of that in UVA range (380 bis 400 nm)	approx. 1/3
- of that in visible light range (> 400nm)	approx. 2/3
Working temperature	- 25 °C to + 60 °C
Power input	5 W
Limits	max. 700 mA constant respectively 1.000 mA Peak
Control unit LINOP U 400, 1 exit	4,6 V / 600 mA – 2,76 W
Life expectancy	> 15.000 hours
Housing material	Aluminium
Weight Cyberlite4	approx. 60 g
Weight Cyberlite4 S	approx. 65 g
Measurements Cyberlite4	approx. 63 x 20 x 20 mm
Measurements Cyberlite4 S	approx. 70 x 20 x 20 mm

## LINOP LED Curing Equipment

### 4 LINOP U 400 Control Unit

The Control Unit for Cyberlite4 S and CyberFlood 400 S.



**Cyberlite4 S** is operated and controlled by the **LINOP U 400** control unit. Up to 4 Cyberlites in parallel can be connected with this device. Each light can be adjusted individually depending on the intensity required. Should 4 positions not be enough, then a LINOP Splitter can be introduced allowing for 3 lights to be connected per exit. This means that with the aid of one device, control of up to 12 **Cyberlite4** resp. **Cyberlite4 S** lamps is made possible. However, direct activation of each lamp is not possible.

The **CyberFlood 400 S** flood light is also controlled by the **LINOP U 400**. You can run 2 **CyberFloods** with 1 **U 400** unit. A splitter cannot be used.

The **LINOP U 400** is a state of the art, microprocessor-controlled UV curing device. In typical Cyberbond fashion, the ergonomically designed electronic display panel allows for easy viewing and simplified selection of the programmes. When used as a tabletop unit, the **Cyberlite4 S** UV lamp is held in place by the user-friendly flexible arm, allowing for very easy lamp positioning. The unit is also compatible with any PLC and can be easily integrated for use on a production line.

Via the membrane keyboard, features such as length of exposure and the intensity of each individual LED lamp can be fixed and saved within 5 memory locations. The electrical impulse to start the light is typically given by means of a foot or hand switch.

Another handy installation is the 'Cont' that is used for the determination of the optimal length of exposure. A timer counts the past exposure of light in seconds

#### 4.1 Characteristics LINOP U 400

- ▼ Microprocessor switchable for every control
- ▼ Mode is switchable for single impulse or permanent impulse
- ▼ Extra low voltage 24 V, external power adapter ~ 230 V, galvanic separated assembly
- ▼ Start signal is processed potential-free
- ▼ Large range of dosing time (0, 01 to 99, 99 sec.)
- ▼ 5 memory locations for individual time and pressure control
- ▼ Integrated flexible arm for holding the valve, for easy positioning of the lamp

## LINOP LED Curing Equipment

### 4.2 LINOP Splitter S (80300)

The **LINOP U 400** is equipped with 4 separate I/O-Ports. Each Port can be connected with 1 **LINOP Splitter**. Each Splitter takes 3 **LINOP Cyberlites4/Cyberlite4 S**. Resulting in the fact that you are able to run a maximum of 12 **LINOP Cyberlites** with just 1 **LINOP U 400**.



LINOP Splitter (LED light manifold)

### 4.3 LINOP Cords (80190, 80192)



LINOP Cord 80190

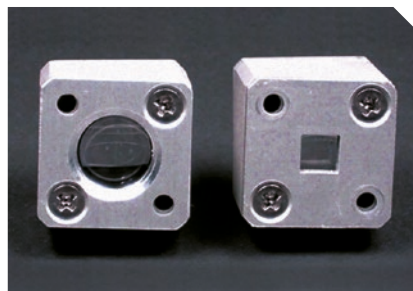


LINOP Cord 80192

To connect the Cyberlites with the **LINOP U 400** unit, Cyberbond offers an option of 2 electrical cords which differ in length. The standard version is a cable of 0.46 m with rectangular connectors; the long version is 2 m with straight contacts. Any other length can be ordered as a custom made design

### 4.4 LINOP Lens Blocks (80250)

The **Cyberlite4 S** is equipped with a set of lenses, which covers as well the sensor technique. The lenses are mounted in order to focus the LED light in a perfect way.



LINOP Cyberlite4 lens (round or square)

## LINOP LED Curing Equipment

### 4.5 LINOP Light Guide 100 (80400)

In case the **Cyberlite** is too bulky to come close enough to the space to be illuminated, a 1 m long **Light Guide** can be easily installed by means of a certain connector (80450).



LINOP Light Guide 100

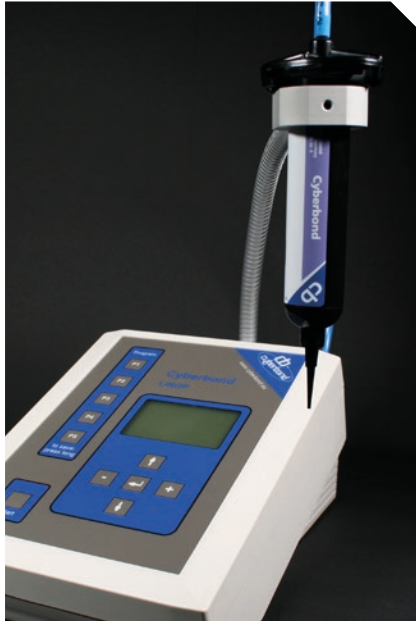
### 4.6 Technical Data LINOP U 400

#### LINOP U 400

Dimensions (WxHxD)	168 x 125 x 278 mm (without flexible arm)	
Material of cabinet	Plastic ABS, UL classification: UL 94 HB	
Colour	RAL 9002 grey / white	
Weight	ca. 1,6 kg	
Type of protection	IP31	
Voltage	24 Volt / DC	
Electricity	max. 3 Ampere	
Working temperature	+10 °C to +40 °C	
Storage temperature	-20 °C to +60 °C	
Relative humidity:	10 % to 90 %, not condensed	
Interfaces	DC 24V In	Potential plug 2,0 mm inside
	Interface	D-Sub 15-pol. pin
	I/O 1 ... I/O 4	Binder Series 712 socket
	PE	6,3 mm plug

## LINOP Dosing Equipment

### 5 LINOP M 600 Dosing Unit



LINOP M 600

The newly created **LINOP M 600** is addressed to applications when only very little amounts of liquids or pastes are used in progress (compared to the overall consumption). This unit is also ideal for sporadic applications. It is equipped with a cartridge that can be filled by the user. The other units like **LINOP M 2000** or **LINOP M 1500** are operated with a pressure pot and a 500 g bottle.

**LINOP M 600** is most suitable when used as a laboratory unit or in low volume production and it is mainly used for manual applications. The range of Cyberbond adhesives can ideally be applied with the UV- and light curing systems. Cyanoacrylates should not be used as the bonding of the plunger is possible.

In order to compensate the static pressure that is in every liquid, the device is additionally equipped with a vacuum valve.

The effect is that a slight vacuum is created after each dosage (pressure/time impulse) which hinders the product to overrun.

The whole range of LINOP dosing units (**LINOP M 2000** – electro-magnetically PLC control / **LINOP M 1500** – electro-pneumatically PLC control and the above mentioned **LINOP M 600**) is based on the same concept and the characteristics of the units are almost identical.

#### 5.1 Characteristics LINOP M 600

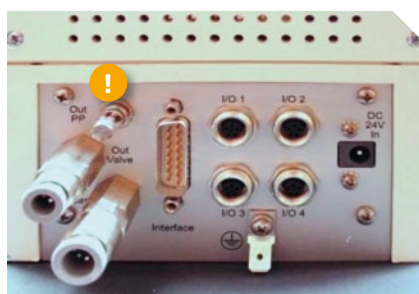
The **LINOP M 600** is the most recently developed dosing unit for Cyberbond reactive adhesives based on the latest findings in microelectronics. The features are:

- ▼ Microprocessors for all control systems
- ▼ Operating mode switchable from single impulse to permanent impulse and vice versa
- ▼ Low voltage 24 V, external power pack ~ 230 V
- ▼ Start signal is processed potential-free
- ▼ Wide range of dosing times (0, 01 to 99, 99 sec.)
- ▼ Exact electronic pressure control (0,01 to 2,00 bar)
- ▼ 5 memory locations for individual time- and pressure control
- ▼ Integrated cartridge holder with flexible arm
- ▼ Suitable for viscosities up to about 100.000 mPa\*s

## LINOP Dosing Equipment

### 5.2 Operation LINOP M 600 (short version)

The unit must be connected to electricity and compressed air (max. 8 bar). The cartridge filled with a medium is slid into the holder on the flexible arm. It is important that the cartridge is sealed with a plunger. After that the compressed air adapter is fixed on the cartridge. Now time and pressure can easily be set via the display. The value of the vacuum can be chosen by an adjusting screw on the rear side. If you turn the screw clockwise the vacuum will become stronger and so will the sucking effect and vice versa.



Vacuum adjusting screw



Cartridge holder



Compressed air adapter

### 5.3 Technical Data LINOP M 600

#### LINOP M 600

Dimensions (WxHxD)	168 x 125 x 278 mm (without flexible arm)	
Material of cabinet	Plastic ABS, UL classification: UL 94 HB	
Colour	RAL 9002 grey / white	
Weight	ca. 2,2 kg	
Type of protection	IP31	
Voltage	24 Volt / DC	
Electricity	max. 3 Ampere	
Working temperature	+10 °C to +50 °C	
Storage temperature	-20 °C to +60 °C	
Relative humidity:	10 % to 90 %, not condensed	
Incoming compressed air	max. 8 bar	
Pressure margin	0,00 to 5,00 bar	
Time setting for dispensing	0,01 to 99,99 Sec. (in steps of 0,01 sec.)	
Interfaces	DC 24V In	Potential plug 2,0 mm inside
	Interface	D-Sub 15-pol. pin
	I/O 1 ... I/O 4	Binder Series 712 socket
	In max 8 bar	8 mm hose coupling
	Out PP	6 mm hose coupling
	Out Valve	6 mm hose coupling
	PE	6,3 mm plug

## LINOP Dosing Equipment

### 6 LINOP M 1500 Dosing Unit



LINOP M 1500

The microprocessor and pneumatically controlled **LINOP M 1500** is the most important part in the dosing system for Cyberbond Anaerobic Adhesives as well as for high viscosity Cyanoacrylates ( $> 2.000 \text{ mPa}\cdot\text{s}$ ).

As a compact table top unit it is suitable for any place of work where exact and reproducible dosing amounts are required. The electronics can also be used to integrate the dosing system in serial production lines. The control unit is designed to apply the smallest drops as well as programmed lines. The unit can practically be called "maintenance free".

As the basis of the modular construction system it can be combined with the following components:

- ▼ **Pressure Pot LINOP PP 505** for storing adhesives
  - **LINOP PP 505** aluminium container for 500 g Cyberbond CA and 250 g AN and UV bottles, includes the capacitive momentary switch (empty alarm)
  - **LINOP 5 l** aluminium container for 2 kg Cyberbond AN and 1 kg Cyberbond UV bottles
  - **LINOP 40 l V2A**-container for 20 kg Cyberbond CA carboys
- ▼ **Dosing Valve LINOP** for viscosities up to  $20.000 \text{ mPa}\cdot\text{s}$ 
  - **LINOP VCA** a pneumatic valve for Cyanoacrylates
  - **LINOP VAN** a pneumatic valve for anaerobic and UV curing adhesives
- ▼ **Pulsing Device LINOP**
  - **LINOP FOT** footswitch as a pulsing device
  - **LINOP HG Pen** electric hand pen as a pulsing device

## LINOP Dosing Equipment



LINOP PP 505



LINOP VCA



LINOP VAN



LINOP FOT



LINOP HG Pen electric

Therefore a complete dosing station has to contain the following single components:

- ▼ Control Unit
- ▼ Pressure Pot with empty alarm
- ▼ Dosing Valve
- ▼ Pulsing device (foot switch or hand pen, external signal generator)

### 6.1 Characteristics LINOP M 1500

The **LINOP M 1500** is a dosing unit for Cyberbond reactive adhesives and has been developed with the most up dated knowledge available in microelectronics. The features are:

- ▼ Microprocessors for every control step
- ▼ Operating modes single / permanent impulse available
- ▼ Low voltage 24 V, external power pack ~ 230 V
- ▼ Empty alarm when using a pressure pot with level control
- ▼ Start impulse electric potential free processed
- ▼ Extended dosing time range (from 0.01 to 99.99 s)
- ▼ Extended electronic pressure control (0,01 to 2,00 bar)
- ▼ 5 possibilities to store individual pressure and time regulation
- ▼ Integrated flexible valve holder
- ▼ Maximum viscosity: about 20.000 mPa\*s

## LINOP Dosing Equipment

### 6.2 Operation LINOP M 1500 (short version)

First of all the pressure pot has to be prepared for the implementation. The most modern container is the **LINOP PP 505**. It consists of aluminium and allows the use of 500 g round bottles of CA as well as the 250 g bottle of AN and UV. There is a positioning adaptor for the oval UV bottle to optimize the level control function (capacitive sensor).

During first use ensure that the product tubing is long enough and straight to reach the bottom of the container. By loosening the tube pass connection the corresponding length can be adjusted. To prevent the tube sucking tight on the bottom of the container and to guarantee a constant product flow it is recommended to cut the end of the tube at an angle.

The compressed air has to be free of humidity and oil to prevent contamination of the adhesive which could start the hardening process. This is especially important for Cyanoacrylates. When the container cover is opened the adhesive bottle can be put into place. Never pour the product directly into the container.

While the pressure pot is open the optional empty alarm can be checked. By switching on the dosing unit and lifting up the product bottle an alarm lamp on the capacitive sensor lights up and the display shows the error message "container empty". The unit is now blocked for other commands. When the product bottle is placed in the container again the control lamp goes out and the unit works in the mode it was in before.

### 6.3 Practical Advice LINOP M 1500

The following advice should avoid problems during the initiation process of the dosing system:

- ▼ While filling the dosing unit ensure that the adhesives reaches the dosing tip without any bubbles. This can be achieved by holding the dosing valve vertically with the product exit facing upwards while pressing the manual switch on the control unit. When the adhesive reaches the tip allow few grams to flow out to make sure that no more air is left in the system.
- ▼ When changing dosing tips it also has to be assured that no air bubbles are inside the tubing.
- ▼ Do not tilt the container.
- ▼ Dosing units may not be transported when they are filled with adhesives.
- ▼ Dosing valves should not be disassembled; otherwise the basic settings will be changed significantly.
- ▼ Valves with polymerized adhesives inside then should be sealed with appropriate means (polyethylene foil or plugs) and sent back to the manufacturer.
- ▼ When checking the dosing systems for leaks only use Cyberbond 9060 D-Bonder or air. Never use water.

## LINOP Dosing Equipment

### 6.4 Dosing Amount Adjustment LINOP M 1500

To adjust the correct dosing amount the following parameters can be changed:

- ▼ Pressure depending on the viscosity can be set respectively regulated with the control unit (Setting "0" holds the danger of product suck back)
- ▼ Valve opening time
- ▼ via integrated knurled screw at the valve
- ▼ Dosing tip and product tubing diameter

It is recommended to roughly adjust the dosing amount by setting the pressure while the fine tuning should be made by choosing valve opening time and dosing tip diameter. The valve is originally delivered in a medium state.

### 6.5 Technical Data LINOP M 1500

LINOP M 1500		
Dimensions (WxHxD)	168 x 125 x 278 mm (without flexible arm)	
Material of cabinet	Plastic ABS, UL classification: UL 94 HB	
Colour	RAL 9002 grey / white	
Weight	ca. 2,2 kg	
Type of protection	IP31	
Voltage	24 Volt / DC	
Electricity	max. 3 Ampere	
Working temperature	+10 °C to +50 °C	
Storage temperature	-20 °C to +60 °C	
Relative humidity:	10 % to 90 %, not condensed	
Incoming compressed air	max. 8 bar	
Pressure margin	0,00 to 3,00 bar	
Time setting for dispensing	0,01 to 99,99 Sec. (in steps of 0,01 sec.)	
Empty alarm	by capacitive sensing device PNP or NPN	
Interfaces	DC 24V In	Potential plug 2,0 mm inside
	Interface	D-Sub 15-pol. pin
	I/O 1 ... I/O 4	Binder Series 712 socket
	In max 8 bar	8 mm hose coupling
	Out PP	6 mm hose coupling
	Out Valve	6 mm hose coupling
	PE	6,3 mm plug

## LINOP Dosing Equipment

### 7 LINOP VCA / VAN Dosing Valves



LINOP VCA



LINOP VAN

The pneumatically controlled dosing valves **VCA** (Cyanoacrylates; golden metal ring) and **VAN** (Anaerobics and UVs; blue or green metal ring) have been designed for the application of one component reactive adhesives. The valves open when the pneumatic cylinder is charged with at least 4 bar of compressed air. After switching off the air a spring closes the valve in the flow direction. Inside the dosing valve is a PTFE diaphragm that shields the metal parts of the pneumatic cylinder

against the product. The valve body and the entire parts that touch the product are made out of PTFE. This prevents the product from starting the hardening process.

These valves are exclusively compatible with the **LINOP M 1500** control unit. The valves are especially suitable for higher viscosities ( $> 1.000 \text{ mPa}\cdot\text{s}$ ). The maximum viscosity to be used is approx.  $20.000 \text{ mPa}\cdot\text{s}$ .

#### 7.1 Differences LINOP VCA / VAN

The VAN valves offer a slight suck-back function that helps to prevent dripping. The VCA version does not have this feature as air or humidity can be sucked back into the valve. This could start the polymerization of the Cyanoacrylates within the valve.

#### 7.2 Technical Data LINOP VCA / VAN

##### Technical data LINOP VCA and VAN

Compressed air	4 – 6 bar
Product pressure	0,1 – 3 bar
Parts in contact with the product	PTFE
Shortest open- and closing times	0,02 sec.
Adapter thread	M10 x 1
Overall length	ca. 130 mm
Width without screw connection	ca. 30 mm

#### 7.3 Dosing Amount Adjustment LINOP VCA / VAN

The dosing amount can be easily varied by:

- ▼ adjusting the valve stroke (by turning the valve regulation screw)
- ▼ changing the container pressure (0,05 – 3 bar) – on the control unit **LINOP M 1500**
- ▼ altering the valve opening times on the control unit **LINOP M 1500**

With these possibilities every desired dosing amount is achievable.

## LINOP Dosing Equipment

### 7.4 Repair LINOP VCA / VAN

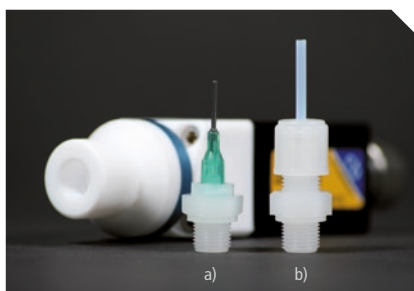
The valves should be viewed as consumable items as they can only be repaired to a limited extent. Cyberbond supplies valves as separate items.

### 7.5 Adapter for LINOP VCA / VAN



LINOP AA

- ▼ LINOP adapter for product tube
- ▼ side entrance
- ▼ 6/4 oder 8/6 mm tube
- ▼ Item Number: 20194, 20195, 20196, 20197



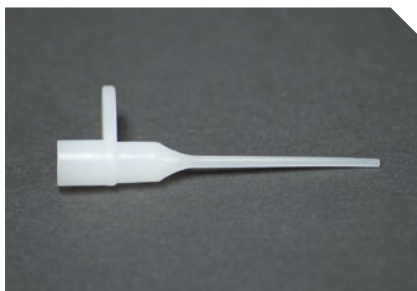
a) LINOP AD VAC LL / b) LINOP TC

- ▼ a) LINOP Luer Lock adapter for connection of dosing tips
- ▼ Item Number: 20150, 20151
- ▼ b) LINOP tube connector for 2.5, 4 oder 6 mm product tube
- ▼ Item Number: 20152, 20154, 20155, 20156, 20157

### 7.6 Dosing Tips for LINOP VCA / VAN

Using dosing tips in conjunction with the valves allow the products to be dispensed in the best possible manner. Metal and plastic based needles are distinguished here. Both are equipped with a Luer Lock connector.

**white, transparent**  
**(Luer-Lock plastic)**



LINOP DT plastic dosing tips Luer Lock

- ▼ LINOP DT „0“
- ▼ LINOP DT „0,5“
- ▼ LINOP DT „1“
- ▼ LINOP DT „0“ UV

**coloured**  
**(Luer-Lock metal)**



LINOP DS metal dosing tips Luer Lock

- ▼ LINOP DS 1" – 0,68 mm (brown) Ø 0,68 mm; length 1"
- ▼ LINOP DS 0.5" – 1,37 mm (orange) Ø 1,3 mm; length ½"
- ▼ LINOP DS 0.5" – 0,58 mm (rose) Ø 0,58 mm; length ½"

## LINOP Dosing Equipment

### 8 LINOP M 2000 Dosing Unit



LINOP M 2000

The microprocessor and electrical controlled **LINOP M 2000** is the most important part in the dosing system for Cyberbond cyanoacrylates, anaerobics and light cured adhesives.

As a compact table top unit it is suitable for any place of work where exact and reproducible dosing amounts are required. The electronics can also be used to integrate the dosing system in serial production lines. The control unit is designed to apply the smallest drops as well as programmed lines. The unit can practically be called "maintenance free".

As the basis of the modular construction system it can be combined with the following components:

- ▼ **Pressure Pot LINOP PP 505** for storing adhesives
  - **LINOP PP 505** aluminium container for 500 g Cyberbond CA and 250 g AN and UV bottles, includes the capacitive momentary switch (empty alarm)
  - **LINOP 5 l** aluminium container for 2 kg Cyberbond AN and 1 kg Cyberbond UV bottles
  - **LINOP 40 l V2A**-container for 20 kg Cyberbond CA carboys
- ▼ **Dosing Valve LINOP** for viscosities up to 2.000 mPa\*s, max. 2 bar
  - **LINOP EM 24** an electromagnetic valve for CA, AN and UV adhesives
- ▼ **Pulsing Device LINOP**
  - **LINOP FOT** footswitch as a pulsing device
  - **LINOP HG Pen** electric hand pen as a pulsing device

## LINOP Dosing Equipment



LINOP PP 505



LINOP EM 24 + Adaptor A1 (2x) and A2 + dosing tip



LINOP FOT



LINOP HG Pen electric

Therefore a complete dosing station has to contain the following single components:

- ▼ Control Unit
- ▼ Pressure Pot with empty alarm
- ▼ Dosing Valve
- ▼ Pulsing device (foot switch or hand pen, external signal generator)

### 8.1 Characteristics LINOP M 2000

The **LINOP M 2000** is a dosing unit for Cyberbond reactive adhesives and has been developed with the most up dated knowledge available in microelectronics. The features are:

- ▼ Microprocessors for every control step
- ▼ Operating modes single / permanent impulse available
- ▼ Low voltage 24 V, external power pack ~ 230 V
- ▼ Empty alarm when using a pressure pot with level control
- ▼ Start impulse electric potential free processed
- ▼ Extended dosing time range (from 0.01 to 99.99 s)
- ▼ Extended electronic pressure control (0,01 to 2,00 bar)
- ▼ 5 possibilities to store individual pressure and time regulation
- ▼ Integrated flexible valve holder
- ▼ Maximum viscosity: about 2.000 mPa\*s

## LINOP Dosing Equipment

### 8.2 Operation LINOP M 2000 (short version)

First of all the pressure pot has to be prepared for the implementation. The most modern container is the **LINOP PP 505**. It consists of aluminium and allows the use of 500 g round bottles of CA as well as the 250 g bottle of AN and UV. There is a positioning adaptor for the oval UV bottle to optimize the level control function (capacitive sensor).

During first use ensure that the product tubing is long enough and straight to reach the bottom of the container. By loosening the tube pass connection the corresponding length can be adjusted. To prevent the tube sucking tight on the bottom of the container and to guarantee a constant product flow it is recommended to cut the end of the tube at an angle.

The compressed air has to be free of humidity and oil to prevent contamination of the adhesive which could start the hardening process. This is especially important for cyanoacrylates. When the container cover is opened the adhesive bottle can be put into place. Never pour the product directly into the container.

While the pressure pot is open the optional empty alarm can be checked. By switching on the dosing unit and lifting up the product bottle an alarm lamp on the capacitive sensor lights up and the display shows the error message "container empty". The unit is now blocked for other commands. When the product bottle is placed in the container again the control lamp goes out and the unit works in the mode it was in before.

### 8.3 Practical Advice LINOP M 2000

The following advice should avoid problems during the initiation process of the dosing system:

- ▼ While filling the dosing unit ensure that the adhesives reaches the dosing tip without any bubbles. This can be achieved by holding the dosing valve vertically with the product exit facing upwards while pressing the manual switch on the control unit. When the adhesive reaches the tip allow few grams to flow out to make sure that no more air is left in the system.
- ▼ When changing dosing tips it also has to be assured that no air bubbles are inside the tubing.
- ▼ Do not tilt the container.
- ▼ Dosing units may not be transported when they are filled with adhesives.
- ▼ Dosing valves should not be disassembled; otherwise the basic settings will be changed significantly.
- ▼ Valves with polymerized adhesives inside then should be sealed with appropriate means (polyethylene foil or plugs) and sent back to the manufacturer.
- ▼ When checking the dosing systems for leaks only use Cyberbond 9060 D-Bonder or air. Never use water.

## LINOP Dosing Equipment

### 8.4 Dosing Amount Adjustment LINOP M 2000

To adjust the correct dosing amount the following parameters can be changed:

- ▼ Pressure depending on the viscosity can be set respectively regulated with the control unit (Setting "0" holds the danger of product suck back)
- ▼ Valve opening time
- ▼ Dosing tip and product tubing diameter

It is recommended to roughly adjust the dosing amount by setting the pressure while the fine tuning should be made by choosing valve opening time and dosing tip diameter. The valve is originally delivered in a medium state.

### 8.5 Technical Data LINOP M 2000

LINOP M 2000		
Dimensions (WxHxD)	168 x 125 x 278 mm (without flexible arm)	
Material of cabinet	Plastic ABS, UL classification: UL 94 HB	
Colour	RAL 9002 grey / white	
Weight	ca. 2,2 kg	
Type of protection	IP31	
Voltage	24 Volt / DC	
Electricity	max. 3 Ampere	
Working temperature	+10 °C to +50 °C	
Storage temperature	-20 °C to +60 °C	
Relative humidity:	10 % to 90 %, not condensed	
Incoming compressed air	max. 8 bar	
Pressure margin	0,00 to 2,00 bar	
Time setting for dispensing	0,01 to 99,99 Sec. (in steps of 0,01 sec.)	
Empty alarm	by capacitive sensing device PNP or NPN	
Interfaces	DC 24V In	Potential plug 2,0 mm inside
	Interface	D-Sub 15-pol. pin
	I/O 1 ... I/O 4	Binder Series 712 socket
	In max 8 bar	8 mm hose coupling
	Out PP	6 mm hose coupling
	Out Valve	6 mm hose coupling
	PE	6,3 mm plug

## LINOP Dosing Equipment

### 9 LINOP EM 24 / EM 24 R Dosing Valves (electro / magnetic)



LINOP EM 24 Valve



LINOP EM 24 R Valve

The **LINOP EM 24** and the **LINOP EM 24 R** (knurled screw) valves are a very popular PTFE based diaphragm valve which is used for dispensing Cyanoacrylate adhesives. There are many reasons for this innovative development. The valve is small and light weight and therefore it is predestined for direct use in PLC controlled robot lines. The contacts are exclusively electronic, and connecting to the valve is simple. The valve is capable of applying the smallest amounts of adhesive (0.005 g). With appropriate use, 1,000,000 switching cycles of the valve can be expected.

A maximum facilitated viscosity of approx. 2000 mPa\*s can be dispensed.

The standard valve is the **EM 24** as it has been factory-adjusted. The **EM 24 R** valve allows an additional fine adjustment by the operator.

#### 9.1 Technical Data LINOP EM 24 / EM 24 R

##### Technical data LINOP EM 24 and EM 24 R

Product pressure	0,01 – 2,00 bar
Parts in contact with the product	PTFE
Voltage	20 – 30 V DC
Insulation class	IP 00
Shortest open- and closing times	0,05 sec to 0,10 sec
Overall length	ca. 48 mm
Width without screw connection	ca. 33 mm
Weight	ca. 72 g incl. adapter

#### 9.2 Dosing Amount Adjustment LINOP EM 24 / EM 24 R

The dosing amount can be easily varied by:

- ▼ changing the container pressure (0,01 – 2,00 bar) – on the control unit **LINOP M 2000**
- ▼ altering the valve opening times on the control unit **LINOP M 2000** (0,01 to 99,99 sec.)

With these variations of control, requirements for dosing should be easily met.

## LINOP Dosing Equipment

### 9.3 Repair LINOP EM 24 / EM 24 R

The valves should be viewed as consumable items and that they cannot be repaired. Appropriate use of the valves should allow more than 1 million cycles of operation without any problems.

### 9.4 Adapter for LINOP EM 24 / EM 24 R



LINOP Luer Lock adapter

At Cyberbond we have tried to keep the number of adaptors to a minimum. The input and output adaptors are similar and have a Luer Lock thread. With this type of adaptor a wide variety of plastic and metal dosing tips can be used easily and safely.

- ▼ LINOP EM 24 Luer Lock adapter for valve
- ▼ entry / exit
- ▼ Item Number: 30190, 30191(black)



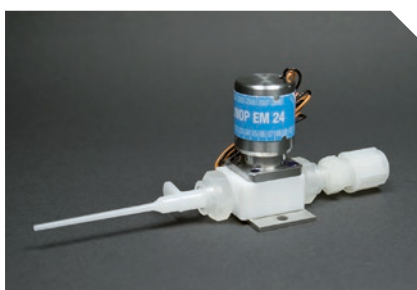
LINOP adapter for tube

- ▼ LINOP EM 24 adapter for product tube
- ▼ 4 or 6 mm
- ▼ Item Number: 60450, 60451, 60650, 60651

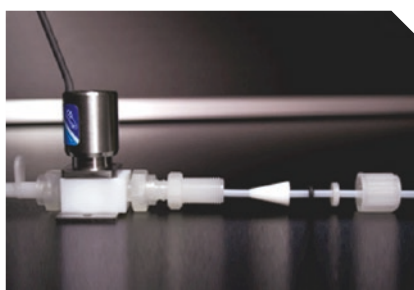


LINOP adapter for tube

- ▼ LINOP EM 24 adapter for product tube
- ▼ 2,5 mm
- ▼ Item Number: 60250



LINOP EM 24 + adapter + dosing tip



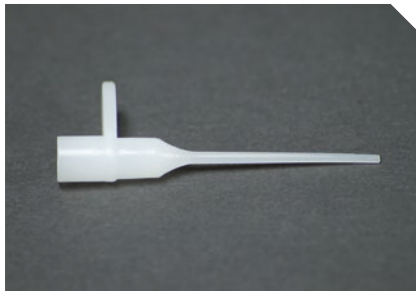
LINOP EM 24 + View of parts in the adaptor

## LINOP Dosing Equipment

### 9.5 Dosing Tips for LINOP EM 24 / EM 24 R

Using dosing tips in conjunction with the valves allow the products to be dispensed in the best possible manner. Metal and plastic based needles are distinguished here. Both are equipped with a Luer Lock connector.

**white, transparent**  
(Luer-Lock plastic)



LINOP DT plastic dosing tips Luer Lock

- ▼ LINOP DT „0“
- ▼ LINOP DT „0,5“
- ▼ LINOP DT „1“
- ▼ LINOP DT „0“ UV

**coloured**  
(Luer-Lock metal)



LINOP DS metal dosing tips Luer Lock

- ▼ LINOP DS 1" – 1,37 mm (brown) Ø 1,37 mm; length 1"
- ▼ LINOP DS 0.5" – 0,33 mm (orange) Ø 0,33 mm; length ½"
- ▼ LINOP DS 0.5" – 0,61 mm (rose) Ø 0,61 mm; length ½"

## LINOP Dosing Equipment

### 10 LINOP PP 505 Pressure Pot



LINOP PP 505

The most commonly used pressure pots for reactive adhesives contain a volume of 1 litre. They are suitable for 500 g Cyanoacrylate round bottles, 250g anaerobic oval bottles and 500g oval bottles for UV and light curing adhesives.

Cyberbond offers the **LINOP PP 505**, a blue anodized aluminium pressure pot. The **LINOP PP 505** has easy to use quick-release fasteners. Every Cyberbond pressure pot is equipped with a capacitive sensor, respectively an empty alarm. This is highly recommended and helps to prevent the system from running dry.

With the help of a thread on the bottom panel the pressure pot can be easily and safely fixed to the workbench

#### 10.1 Technical Data LINOP PP 505

##### LINOP PP 505

Suitable Units	CB 500 g Cyanoacrylate round bottle
	CB 500 g UV oval bottle
	CB 250 g AN oval bottle
Dimensions	Height: 240 mm (without pipe adapter)
	Inner diameter: 94 mm
	Outer diameter: 120 mm (without empty alarm)
Colour	Body blue, Lid silver galvanized
Material	Aluminium



LINOP adapter



LINOP PP 505

- ▼ LINOP adapter for pressure pot
- ▼ 2.5, 4, 6 or 8 mm tubes
- ▼ Item Number: 50192, 50194, 50196, 50198

- ▼ Adjustment of the empty alarm
- ▼ Item Number: 50150

## LINOP Dosing Equipment

### 11 LINOP Pulsing Devices

Pulsing devices can either be the **LINOP FOT** Footswitch or the **LINOP HG** Electrical Hand Pen or an external PLC control.

#### 11.1 LINOP FOT Footswitch



LINOP FOT

- ▼ The footswitch is equipped with a 3 pin plug
- ▼ Item Number: 40100



LINOP Hand Pen adapter

- ▼ LINOP adapter for product tube
- ▼ 2,5 or 4 mm
- ▼ Item Number: 40392, 40394



LINOP Hand Pen adapter

- ▼ LINOP adapter for product tube

#### 11.2 LINOP HG Hand Pen electric



LINOP HG Hand Pen electric

- ▼ As an alternative the impulse can also be tripped by the electric pen
- ▼ Item Number: 40300



LINOP HG Hand Pen electric + adapter

- ▼ The adapter is installed in the Hand Pen and fixed in place by the knurled screw.
- ▼ Dosing tips are fixed at the front (Luer Lock)



LINOP HG Hand Pen electric + adapter + LINOP EM 24

- ▼ 4 mm
- ▼ Item Number: 60450

## LINOP Equipment

### 12 LINOP Item Numbers

LINOP Dosing and Curing Equipment		
Dosing & Curing Units	LINOP M 600	10100
	LINOP M 1500	10200
	LINOP M 2000	10300
	LINOP U 400	10400
	power supply unit	10190
	cord for power supply unit (EU standard)	10191
	flexible arm	10192
	valve plate (to hold valve M 1500 / M 2000 & Cyberlite)	10193
	syringe plate (to hold 30 ml syringe / M 600)	10194
VCA and VAN Valves	LINOP VCA Valve for CA	20100
	LINOP VAN Valve for AN	20200
	adapters product flow into the valve	
	product adapter (rectangular) AA 4/6	20194
	product adapter (rectangular) AA 4/6 (for UV)	20195
	product adapter (rectangular) AA 6/8	20196
	product adapter (rectangular) AA 6/8 (for UV)	20197
	adapters product flow out of the valve	
	dosing tip adapter (Fine Thread (in) / Luer Lock (out)) 1/8	20150
	UV dosing tip adapter (Fine Thread (in) / Luer Lock (out)) 1/8	20151
	adapter as tube connector (Fine Thread (in)) 1/8-2,5 (for 2,5 mm tube)	20152
	adapter as tube connector (Fine Thread (in)) 1/8-4,0 (for 4 mm tube)	20154
	UV adapter as tube connector (Fine Thread (in)) 1/8-4,0 (for 4 mm tube)	20155
	adapter as tube connector (Fine Thread (in)) 1/8-6,0 (for 6 mm tube)	20156
	UV adapter as tube connector (Fine Thread (in)) 1/8-6,0 (for 6 mm tube)	20157
EM 24 Valves	EM 24 Valve with plug	30100
	EM 24 Valve without plug	30150
	EM 24 R Valve with plug	30200
	EM 24 R Valve without plug	30250
	adapters product flow into and out of the valve	
	adapter Fine Thread (in) / Luer Lock male (out) (former A1)	30190
Impuls Devices	electrical footswitch with plug (FOT)	40100
	Hand Pen	40200
	Hand Pen electric	40300
	adapter tube fixing hand pen for 2,5 mm tube	40392
	adapter tube fixing hand pen for 4,0 mm tube	40394
Druckbehälter	PP 505 Pressure Pot with air pressure nipple	50100
	empty alarm with plug	50150
	adapter for pressure pot lid / 1/4" for 2,5 product tube	50192
	adapter for pressure pot lid / 1/4" for 4 product tube	50194
	adapter for pressure pot lid / 1/4" for 6 product tube	50196
	adapter for pressure pot lid / 1/4" for 8 product tube	50198

## LINOP Equipment

Tubes and Tube Connectors	product tube PTFE, 2,5 mm outside (per meter)	60200
	adapter as tube connection / Luer Lock for 2,5 mm tube	60250
	product tube PTFE, 4 mm outside (per meter)	60400
	adapter as tube connection / Luer Lock for 4 mm tube	60450
	UV product tube PTFE, 4 mm outside (per meter)	60401
	UV adapter as tube connection / Luer Lock 4 mm tube	60451
	product tube PTFE, 6 mm outside (per meter)	60600
	adapter tube connection / Luer Lock (former A2) for 6 mm tube	60650
	UV product tube PTFE, 6 mm outside (per meter)	60601
	UV adapter tube connection / Luer Lock for 6 mm tube	60651
	product tube PTFE, 8 mm outside (per meter)	60700
	UV product tube PTFE, 8 mm outside (per meter)	60701
	blue air supplying tube (per meter)	60800
Syringes for M 600	10 ml syringe black	70110
	30 ml syringe black	70130
	piston 10 ml syringe UV	70111
	piston 30 ml syringe UV	70131
	closure cap for 10 and 30 ml syringes)	70141
	Adapter for air supply to syringe 10 ml	70115
Cyberlites	Adapter for air supply to syringe 30 ml	70135
	Reducer from 30 to 10 ml syringe	70200
	electrical cord 0,46 m (with rectangular connector)	80190
	electrical cord 2,00 m (with straight connectors)	80192
	Cyberlite4 S	80200
	lens Block Cyberlite4 S	80250
Dosing Tips	Splitter	80300
	liquide fibre light guide	80400
	block keeping light guide	80450
	Cyberflood 400 S	80600
Dosing Tips	Dosing Tips plastic (only DT 1 with Luer Lock)	
	10 pieces	DT „0“
	10 pieces	DT „0,5“
	10 pieces	DT „1“
	10 pieces	DT „0“ UV
	Dosing Tips metal, LL	
	10 pieces DS 1,0" - 1,37 brown	DS 1,0" - 1,37
	10 pieces DS 0,5" - 0,33 orange	DS 0,5" - 0,33
	10 pieces DS 0,5" - 0,61 rose	DS 0,5" - 0,61

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LINOP Equipment

Programme

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Instruction date: May 2013

### **Exclusion of Liability**

Cyberbond guarantees that LINOP Dispensing and Curing Equipment is fully operational when handled in an appropriate way and Cyberbond products are used. Nevertheless we refer to the Operation Instructions of each item, which can be downloaded from our Website ([www.cyberbond.de](http://www.cyberbond.de)).

In case of using other than Cyberbond goods for dispensing, cleaning or curing Cyberbond should be contacted beforehand, if this is suitable.

In case of installing LINOP equipment in a bigger production unit, Cyberbond can neither take any liability for the functionality of the whole construction nor for the suitability of the LINOP equipment within this unit.

We recommend discussing all matters concerning LINOP equipment intensively with Cyberbond beforehand, in order to prove the suitability in each single case. Such a counselling interview should also be recorded in writing. If all this does not take place Cyberbond cannot take over any guaranty for functionality at all.

Cyberbond is working with price lists. These prices refer to the equipment alone. In case you wish support for the initial start-up or more advice after delivery, prices for this additional work have to be negotiated.

All given information, the data mentioned in this reference book, as well as particularly the recommendations for using LINOP equipment are based on our recent knowledge and experience. Due to the fact that the application possibilities are manifold and that the general working conditions are out of our influence, we strongly recommend doing sufficient tests in order to guarantee that LINOP equipment is suitable for the intended process. Except for wilful acts any liability based on such recommendations or any verbal advice is hereby expressly excluded.

Wunstorf, 30.05.2013

Ulrich Lipper  
Managing Director

Dieter Rademacher  
Technical Director

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