**Installation and Operation Manual** 

## FLASHLIGHT STROBOSCOPE DRELLOSCOP <sup>®</sup> 3120

Read and adhere to this manual before you install, operate, store or handle the unit





This installation and operation manual Edition 09/98 is only valid for the Flashlight Stroboscope DRELLOSCOP 3120

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#### Introduction

The manual for the installation of the DRELLOSCOP 3120 has been prepared for persons (electrical engineers and service engineers) who have to make the installation and the maintenance of the unit. These persons have to be familiar with all regulations concerning electrical engineering and have to adhere to these in any case.

The operation manual for this unit has been prepared for persons who use the unit for the inspection and who have to make adjustments on it.

Carefully read this manual in order to become familiar with it and to operate the strobe correctly.

#### **Correct use**

The DRELLOSCOP 3120 is exceptionally destined for the professional use in the visual inspection of periodic motions. Any other use is regarded as incorrect use, and all risks are solely on the part of the user.

One example for the correct use is the application in the quality control in the printing industry with continuous printing, e.g. form printing, flexo and label printing.

One further example for the correct use is the application during the observation of mechanical motions, for the improvement of machine settings, e.g. uniform running of gear drives, folding apparatus of form printing machines and folding/bending processes on packaging machines.

The installation and maintenance of this unit must only be made by electro-technical specialists.

Any questions concerning the operation of the unit or special applications which are not answered in this manual should be directed to:

DRELLO GmbH & Co. KG Max-Reger-Str. 35a D-41179 Mönchengladbach Phone: (+49) (0)2161/909-6 Fax: (+49) (0)2161/909-700 E-mail: DRELLO@T-online.de

#### Name plate

For the identification of the unit you find its serial number on the name plate on the backside of the DRELLOSCOP 3120. Note down this serial number in the figure on the right in the line "SN" to have this available in the case of questions or orders for spare parts.



#### **Electromagnetic compatibility**

The DRELLOSCOP 3120 meets the protective requirements of the European Direction 89/336.

#### Safety measures

#### Danger through electric current

- Operate the DRELLOSCOP 3120 and the peripherals only with the mains voltage stated on the name plate.
- Make sure that only qualified personnel (electrical engineers) are instructed with the installation and the maintenance of the unit.
- Separate the DRELLOSCOP 3120 from the mains voltage and the peripherals when there is an indication for a defect by smoke or a sharp smell.
- There may be residual voltages on the capacitors inside the unit! Opening of the housing must only be made by qualified personnel (electrical engineers) for replacing fuses, the back up battery and the flashtube. There are no other parts in the unit which you can replace.
- Make sure that no liquids enter into the unit (e.g. by cleaning). Never continue using the unit when liquids have entered into the stroboscope !
- If you do not intend to use the unit for a longer period separate the power unit from the mains voltage. Store the DRELLOSCOP 3120 only in dry rooms which are protected against weather.
- Make sure that the connected cables will not be bent, squeezed or damaged otherwise. Replace damaged cables immediately.
- If a safe operation is no more assured separate the unit from the mains voltage and against unintended switching on.
- A safe operation is no more possible in the following cases:
  - When the unit or the connection cable shows visible damages.
  - When the unit does not work correctly.
  - When the unit was exposed to moisture or rain
  - In the case of formation of condensing water.
  - When objects have entered into the unit.
  - When the permissible storage/operation temperature has been exceeded or fell below a permissible value.

#### Danger through stroboscopic light flashes

Stroboscopes, when operated with a frequency of approx. 10 ... 20 Hz can in exceptional cases cause epileptic fits. This risk is the higher the bigger the contrast is between flash and ambient light. Also persons who until now had never such an epileptic fit can be affected by this. Consequential injuries, e.g. through a fall cannot be excluded.

- For increasing the contrast we recommend to wear polarization glasses which are available as an accessory from DRELLO GmbH & Co. KG.
- If possible operate the stroboscope at normal ambient light.
- Start the adjustment of the flash sequence from the expected top frequency value, (only in connection with the remote control unit).
- Make sure that persons which may be affected by epilepsy do not stand closely to the stroboscope while in use.

With a correctly adjusted DRELLOSCOP rotating machine parts will appear at a stand still. For persons who are not informed about this phenomenon there is the risk to touch the running machine or to be caught by it. The result are severe or fatal injuries.

- Inform all persons close to the illuminated area about the function principal of the DRELLOSCOP 3120 and remind them about the dangers which may result from the optical illusion.
- Make sure that the illuminated area is not accessible by other persons.

#### Installation

The installation described in this manual must only be made by qualified specialists. Observe and adhere to the relevant regulations of the electrical engineering.

#### <u>Repair</u>

Do not repair the DRELLOSCOP yourself. Always refer to the service department of company DRELLO GmbH & Co. KG. Incorrectly executed work on the unit may lead to personnel injury, material damage or damages on the unit itself.

#### Maintenance

Maintenance work as described in this manual must only be made by qualified personnel. The relevant regulations for the electrical engineering have to be observed and maintained thereby.

Carry out only the maintenance work described in this manual. All other work on this unit may lead to personnel injury, material damage and damage on the unit itself.

#### Symbols used in this manual

The security advices in this manual are classified in two stages:



#### **DANGER!**

Safety advices which non-observance may lead to danger for persons are marked with this symbol. This symbol is used in cases of imminent danger. The possible consequences of nonobservance can be death or serious injuries.

In some chapters you find the following advice symbol:



#### **ATTENTION!**

This symbol is used in front of warnings concerning damages on the unit or other materials.



#### Advice

This symbol refers to special advices for the use of the unit

#### **Product description**

#### Function

The DRELLOSCOP 3120 is a flashlight stroboscope. It delivers pulses to a connected lamp with which you can illuminate rotating or oscillating objects by light flashes. When the frequency of the light flashes coincides with the motion of the object and the light flashes are very short there appears for the eye the impression to see a "frozen" object. This optical illusion is a less tiring possibility for the observer to inspect periodic motions visually.

#### **Operation**

Allow for sufficient ventilation around the strobe. Insufficient ventilation will lead to overheating of the unit which may result in severe damage and subsequential damages.

In the printing industry the use of the strobe is a particular help for the direct visual inspection (no video transmission) and for checking the check marks and the colours.

The DRELLOSCOP 3120 has two possibilities for controlling the flash sequence: the manual control and the external control through pulse generators.

Depending on the selected control mode different functions are available.

#### Manual control of the flash sequence

For this, the optionally available remote control unit FB 3120 is necessary. It consists of a small separate box which is connected by a cable with the socket "CONTR" on the rear side of the strobe. For the manual control the toggle switch must be set to position "INTERN". You can now adjust the flash sequence on the rotary button.

#### Control of the flash sequence through external pulses

For the external control different pulse generators are available like proximity switches or a photoelectric pick-up. With this control mode you obtain a frozen image even when the speed changes.

#### **Image shifting**

For this, the optionally available remote control unit FB 3120 is necessary. The toggle switch must be set to position "EXTERN". You can now adjust the phase angle without steps from 0 to 360° and thus "shift" the object or printing image to be inspected to an optimum position for the observation. In fact, you change the flash trigger moment through which another part of the object is illuminated.

## Scope of supply

1	Flashlight stroboscope DRELLOSCOP 3120 - for 230 V supply voltage - for 115 V supply voltage	Product no. Product no.	1.3120.60001 1.3120.60002
1	Power cable	Product no.	22.01.02
1	Manual		
St	tandard accessories		
1	Lamp LE 4052/10	Product no.	1.4052.20001
1	Quartz-glass flashtube 105-1	Product no.	1.B105.20001
A	vailable accessories:		
Pı	ulse generators for the external control		
1	Pick-up NT8/02/6-L	Product no.	0.0NT8.20006
1 1	for optional scanning Clamp NT8/KLZ for the pick-up Proximity switch NJ 5/8-L	Product no. Product no.	0.0NT8.2KLZ 0.0NJ5.20007
L	amps		
1	Handlamp HL 4090	Product no.	1.4090.2
	1 Quartz-glass flashtube 300-1	Product no.	1.B300.20001
I	Ex-protected lamp LE 40/2/10	Product no.	1.40/2.60001
	1 Quartz-glass flashtube 300-1	Product no.	1.B300.20001
0	PTIONS		
1	Remote control unit FB 3120	Product no.	1.3120.20001
	with connection cable		
1	Polarization glasses for contrast improvement	Product no.	56.50.002

## **Operating elements and connections**



#### **Back side**

- 1 Power socket for power cable
- 2 Power switch ON/OFF
- 3 Overcurrent circuit breaker (responds in case of overload)
- 4 8 pin socket (for connecting the lamp)
- 5 7 pin socket (for connecting the remote control unit FB 3120 (OPTION))
- 6 5 pin socket (for supply of a control signal synchronous to the flash sequence of the unit, and a 12 V DC Voltage for further peripherals)
- 7 8 pin socket (for connecting a pulse generator, e.g. a proximity switch)
- 8 6 pin socket (for connecting the photoelectric pick-up NT 8)
- 9 Fuse base outside

#### **Remote control unit**



#### 1 Rotary button

For the manual adjustment of the flash sequence (with manual control), or for the phase shifting (with external control)

2 Toggle switch For switching between internal and external control

#### Pin allocation lamp

PIN	Function	Direction	Level
1	Anode Voltage	Output	approx. 700 V–
2	Supply Voltage	Output	approx. 400 V-
3	GND		
4	Reference potential		0 V
5	Ignition pulse	Output	approx. 18 V
6	Ignition pulse	Output	approx. 260 V
7	NC		
SO	NC		



Pin allocation Output Cable plug Stereo DIN, Part No. 17.03.016

PIN	Function	Direction	Level
1	Supply Voltage	Output	+12 V –, 50 mA
2	free for options		
3	Rectangular pulse	Output	12 V, approx.1ms, approx.10 mA
4	Reference potential		0 V
5	Needle pulse	Output	12 V via 100 nF

# AUSGANG OUTPUT

#### **Pin allocation INPUT**

Cable plug DIN 45326, Part No. 17.03.015

Pin	Function	Direction	Level
1	Supply Voltage	Output	+12 V – approx. 50 mA
2	Proximity switch	Input	
3	Pulse Input	Input	0,530 V <sub>s</sub>
4	Reference potential		0 V
5	Closing contact	Input	12 V to 0 V
6	free for options		
7	Optocoupling Anode	Input	412 V
8	Optocoupling Cathode	Input	Reference potential





#### **Installation and Connection**

#### Preparations



#### **ATTENTION:**

Choose an installation place which ensures that the unit is not exposed to extreme temperatures or extreme humidity. The ambient temperature must be between 0 and 50° C, the relative humidity of the air must not exceed 90 % not condensing.

Make sure that the mains voltage is identical with the supply voltage mentioned on the name plate.

Do not place the unit close to radiators. Avoid a place with direct sun radiation.

Provide for sufficient ventilation of the unit and do not cover the ventilation grid at the bottom side.

Avoid bright room illumination to utilise the full capacity of the DRELLOSCOP 3120.

Do not expose the unit the unit to vibration or shocks.

#### Use as table top unit

As table top unit the DRELLOSCOP 3120 is delivered with plates. Make sure that the plates are fixed at the bottom side of the unit. In this way a sufficient stability is guaranteed.

#### Installation in a cabinet

The DRELLOSCOP is supplied as a <sup>1</sup>/<sub>2</sub> 19" plug-in.

For fast and safe installation two mounting angles with four screws are available on request from DRELLO.

- Remove the two handles (if available) by unscrewing the two lateral screws.
- Screw on the two angles with the supplied screws.
- Screw the unit into the cabinet with the screwed on angles and adequate screws.
- Make sure that all screws are tightened.

#### **Connection of peripherals**



Danger for electric current! Separate the supply unit from the mains power before you connect any peripherals to the supply unit!

- Install the lamp and the pulse generator/photoelectric pick-up and further peripherals according to the relevant installation and operation manuals.
- Put the plug of the connection cable for the lamp into the 8-pin socket "LEUCHTE/LAMP" (position 4) on the backside of the unit and tighten.
- Put the plug of the connection cable for the rotary button into the 7-pin socket "CONTR" (position 5) on the backside of the unit and tighten.
- If necessary put the plug of the connection cable of further peripherals to which a control signal shall be delivered synchronous to the flash sequence into the 5-pin socket "AUSGANG/OUTPUT" (position 6) on the backside of the unit and tighten.
- If necessary put the plug of the connection cable of the pulse generator to the 8-pin socket "EINGANG/INPUT" (position 7) and tighten.
- If necessary put the plug of the connection cable for the photoelectric pick-up into the 6-pole socket "NT8" (position 8) and tighten.
- Connect the power plug with the mains connection "NETZ/MAINS".
- Connect the power cable with a wall outlet with a voltage as stated on the name plate of the unit.

The DRELLOSCOP 3120 is now ready for operation.

#### Switching on/off



#### Danger through electric current!

Make sure that after the connection all cables are laid such that they are not bent or squeezed or damaged otherwise.

Switch the unit on only after all connections have been made and were checked for firm seat.

- Set the power switch 1 on the backside of the unit to position I, switch the unit on. The green LED on the front panel must now go on. There is no acoustical signal.
- Set the power switch 1 to position 0 to switch the unit off. The green LED on the front side of the unit goes out.



#### Operation

Before you start operating the stroboscope connect all peripherals and check the connection cables for firm seat.

#### Manual control of the flash sequence

For this function the optionally available remote control FB 3120 is necessary. It consists of a small separate box which is connected by a cable to socket "CONTR" on the backside of the stroboscope.

For the manual control of the flash sequence the toggle switch must be set to position "INTERN". Now you can set the flash sequence on the rotary button.

#### Control of the flash sequence through external pulses

In the external control mode the pulses are supplied by pulse generators, e.g. proximity switches or photoelectric pick-ups. In this mode you obtain a frozen image even when the speed changes.



Note

With control pulses which cycle is lower than 30 min<sup>-1</sup> and higher than 6000 min<sup>-1</sup>, no flash triggering takes place.

The flash sequence and pulses are synchronous. The object to be inspected appears to stand still.

#### Image shifting (Phase shifter)

For this the optionally available remote control unit FB 3120 is necessary. Set the toggle switch to position "EXTERN". Now you can infinitely adjust the phase angle from 0 to  $360^{\circ}$  on the rotary button. The object to be inspected can be shifted to the optimum position for the inspection. In fact you change the flash trigger moment through which another part of the object is illuminated.

#### Maintenance Faults, trouble shouting and remedy

#### Fault

The unit switches off suddenly. The button of the overcurrent circuit breaker SI CBE on the backside of the DRELLOSCOP 3120 has tripped.

#### Note Note

In the switched on status the button protrudes approx. 5 mm. If the overcurrent circuit breaker has tripped, the button stands out only approx. 10 to 12 mm.

#### **Possible reason**

The flashtube of the lamp has arced through.

#### Remedy

After a few minutes the button of the overcurrent circuit breaker SI CBE on the backside of the unit can be pushed in again.

If it trips again after a short time, switch the unit off, separate it from the mains and check whether the flashtube in the lamp is still in order. If necessary replace the flashtube as described in the lamp manual. Push in the button of the overcurrent circuit breaker SI CBE on the backside of the unit.

If the button should trip again separate the DRELLOSCOP 3120 from the mains, secure it against switching on and return it for repair to DRELLO GmbH & Co. KG.

#### **Replacement of fuses**

The DRELLOSCOP 3120 has four fuses. One is in the plug socket on the backside, three further fuses are inside the unit.



#### Danger through electric current!

All fuses of the unit must only be exchanged by qualified personnel (electrical engineers). Observe and adhere to the relevant regulations of the electrical engineering.



#### Danger through electric current!

First separate the unit from the mains and all other peripherals and secure it against switching on.



#### Attention!

Before you insert the new fuse check for the reason which caused the fault.

#### **Outside fuse**

When the outside fuse has burned it can easily be replaced. The outside fuse is in a base between the power connection and the power switch on the backside.



#### Attention!

For 230 V mains connection use only a fuse with the values 250 V, T 2 A, 5 x 20 mm.

For 115 V mains connection use only a fuse with the values 250 V, T 3,15 A, 5 x 20 mm.

- Withdraw power cable from the wall outlet.
- Withdraw the power cable from the power socket of the DRELLOSCOP 3120. The fuse base is now accessible.
- Carefully insert a screw driver into the slot on the left side of the fuse base and lift with the screw driver.
- Take out the burned fuse.
- Insert the new fuse and insert the base until the stop into the housing.
- Plug in the power cable.



#### **Fuses inside**

There are three safety fuses inside the unit. For replacing these you have to open the unit. Opening of the unit must only be made by qualified personnel (Electrical Engineers) and only for exchanging the fuses and the battery.



#### Danger through electric current!

There are dangerous voltages applied at the capacitors inside the unit. Before you open the unit separate it from the mains power and wait minimum 15 minutes for discharging of the voltages.



#### Attention!

Provide for adequate earthing to avoid static discharges. Inside the unit there are electronic components which might be destroyed by static discharges.



#### Attention!

The housing cover has sharp edges. Deposit the cover such that injuries are excluded.

- Loosen the two upper screws (1) on the back side of the unit with a suitable hexagonal spanner.
- Carefully pull the housing cover to the back and lift it from the unit.



Fuse 1 is in a holding on the base PCB below the two light grey flat cables.



#### Attention!

Use only a fuse with the value 250 V, T 500 mA, 5 x 20 mm.

Fuse 2 is in the fuse holder left from fuse 1 below the two light grey flat cables.



#### Attention!

Use only a fuse with the value 250 V, T 500 mA, 5 x 20 mm.

Fuse 3 is in the middle on the horizontal PCP directly next to the two red capacitors.

#### **DRELLOSCOP 3120**



#### Attention!

Use only a fuse with the value 250 V, T 1 A, 5 x 20 mm.



- If necessary withdraw the flat cable to get access to the fuses.
- Insert a screw driver into the slot of the fuse socket and lift it carefully.
- Take out the burned fuse.
- Insert the new fuse with the correct values and push the holding until the stop in the housing.

- If necessary fasten the flat cable.
- Put on the housing cover so that it fits into the frame and tighten the screws on the backside.

#### Annexure

### Repair

For all repairs on the DRELLOSCOP 3120 refer to

DRELLO GmbH & Co. KG Max-Reger-Str. 35 a D-41179 Mönchengladbach

Phone(+49) (0) 2161 / 909-6Fax(+49) (0) 2161 / 909-700E-mail+DRELLO@T-online.de

#### **Technical Data**

Supply voltage depending on the unit	230 V (+10 %, -15 %), 40 60 Hz
	115 V (+10 %, -15 %), 40 60 Hz
Power consumption:	Max. 180 VA
Current consumption:	Max. 0.8 A (230 V) or 1.6 A (115 V)
Outside fuses (5 x 20 mm):	2 AT (230 V) or 3.15 A (115 V)
Inside fuses (5 x 20 mm):	2 x T 600 mA 250 V for supply voltage 5 V and 12 V DC 1 x T 1 A 250 V for supply voltage 4.5 V AC
Input from pulse generator:	1 x 8-pin socket
Input from photoelectric pick-up:	1 x 6-pin socket
Lamp connector:	1 x 8-pin socket
Connector of FB 3120:	1 x 7-pin socket
Output for peripherals:	1 x 5-pin socket
Phase shifter:	0 to 360°
Range of flash sequence:	30 to 6000 min <sup>-1</sup>
Operating conditions:	Temperature: 0 to 50°C relative humidity of the air 90 % not condensing
Storage conditions:	Temperature: -20° to +70°C store in dry
Housing:	Light metal half shell housing 1/2 19" standard housing
Dimensions (W x H x D):	235 x 140 x 265 mm (Handles: +45 mm depth)
Weight:	approx. 8 kg
Protection class:	Connection of protective conductor according to IEC 348 and VDE 0411
Applied regulations and standards:	VDE 0110b, VDE 0411, VDE 05501 IEC 348 EN 50082-2, EN 55011B, EN 55140, EN 55141, EN 61000-4-2, EN 61000-4-4