

## **Installation and Operation Manual**

**Drelloscop 3015** 频闪检测仪

安装使用手册

# **FLASHLIGHT STROBOSCOPE DRELLOSCOP<sup>®</sup> 3015**

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

在安装使用本机之前，请仔细阅读本手册

仅供参考

**DRELO**

内部资料

仅供参考

This installation and operation manual  
Edition 1.3015.2B001e is only valid for the  
Flashlight Stroboscope DRELLOSCOP 3015

本手册版本为 1.3015.2B001e，仅供 Drelloscop 3015 频闪检测仪  
安装及操作者使用

# List of contents

## 目录

<b>Introduction.....</b>	
概述	
Correct use.....	4
应用	
Name plate.....	4
产品铭牌	
Electro magnetic compatibility.....	4
电磁兼容性	
<b>Safety measures.....</b>	
安全说明	
Danger through electric current.....	5
如何避免触电危险	
Danger through stroboscopic light flashes.....	5
如何避免闪光的危害	
Operation.....	6
操作注意事项	
Repair.....	6
维修	
Maintenance.....	6
维护	
Symbols used in this manual.....	6
本手册中使用的警示符号	
<b>Product description.....</b>	
产品描述	
Function.....	7
功能说明	
Storing of adjustments.....	7
操作的储存	
Manual control of the flash sequence.....	7
手动控制闪光频率	
Control of the flash sequence through external pulses.....	7
通过外部脉冲信号控制闪光频率	
Image shifting.....	7
移相功能	
<b>Scope of supply.....</b>	8

## 供货范围

Standard accessories.....	8
供选标准配件	

Available accessories.....	8
可选其他配件	

Operating elements and connection.....	9
按键及接口说明	

Connection for external control.....	10
外部控制的连接	

<b>Connection</b> .....	
连接说明	

Preparations.....	12
连接准备	

Application.....	13
应用领域	

## **Operation** 操作说明

Switching ON/OFF.....	14
开机/关机	

Manual control of the flash sequence.....	14
闪光频率的手动控制	

Slow Motion effect.....	15
慢动效果	

Control of the flash sequence through external pulses.....	16
闪光频率的外部控制	

Charging indicating lamp for battery operation.....	17
电池低电量指示	

Recharging the battery.....	17
电池充电说明	

## **Maintenance** 维护

Exchange of the flashtube.....	18
如何更换灯管	

Exchange of the fuses.....	19
如何更换保险丝	

Back up battery.....	21
如何更换电池	

Initializing of the stroboscope.....	22
初始化操作	

## **Annexe**

### **附录**

Repair.....	23
维修	

Technical Data.....	24
技术参数	

Declaration of conformity.....	25
产品合格证	

内部资料

仅供参考

## Introduction

### 概述

The manual for the installation of the DRELLOSCOP 3015 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.

在安装及维护本机之前，请相关人士（电气工程师&服务工程师）仔细阅读本手册，并按照相关规程进行操作。

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.

在使用本机之前，请相关人士仔细阅读本手册，并按照相关规程进行操作。

Carefully read this manual in order to become familiar with it and to operate it correctly. 对本机进行操作之前，请相关人士仔细阅读本手册，以确保正确使用。

### Correct use

#### 应用

The DRELLOSCOP 3015 is exceptionally destined for the professional application for 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.

DRELLOSCOP 3015 频闪检测仪特别为视觉观测周期性的运动而开发。

The main application of this unit is the contactless measurement of revolutions and oscillations as well as the inspection of fast periodic and quasiperiodic motions at an apparent stand still.

主要适用于非接触转速或振动频率的测量以及高速周期运动的视觉观测。

One 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.

例如，用于高速机械运动或振动频率的测量等。

The maintenance of this unit must only be made by electrical specialists.

本机的维护必须由专业人士完成。

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

本手册未尽事宜，请直接与 Drello 公司联系，联系方式如下：

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: [info@drello.de](mailto:info@drello.de)

### **Name plate**

产品铭牌

For the identification of the unit you find its serial number on the name plate on the backside of the DRELLOSCOP 3015. 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.

本机的铭牌贴于其背面，铭牌上印有本机的序列号（“SN”右边的数字），请相关人士做好记录，以备日后返厂维修或订购备品时使用。

### **Electromagnetic compatibility**

电磁兼容性

The DRELLOSCOP 3015 meets the protective requirements of the European Directive 89/336.

本机符合 European Directive 89/336 标准。



## Safety measures

### 安全说明

#### Danger through electric current

##### 如何避免触电危险

- Make sure that only qualified personnel (electrical engineers) are instructed with the maintenance of the unit.

本机的维护必须由专业人士依据相关规程操作完成；

- Separate the DRELLOSCOP 3015 from the rechargeable battery and all other peripherals when there is an indication for a defect by smoke or a sharp smell.

如发现本机冒烟或有异味发出，必须立即将本机与充电电池及其他外围装置分离；

- 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 repair or replace.

更换保险丝、备用电池及灯管等操作必须由专业人士完成，进行上述操作时须注意本机内部的残余电荷；

- Make sure that no liquids are allowed to enter into the unit (e.g. by cleaning). Never continue using the unit when liquids have entered into the stroboscope !

请勿让液体进入本机；如有液体进入，请立即停止使用本机；

- If you do not intend to use the unit for a longer period, store the DRELLOSCOP 3015 only in dry rooms which are protected against weather.

如长时间不使用本机，请将本机置于干燥的房间存放；

- Make sure that the connected cables will not be bent, squeezed or damaged otherwise. Replace damaged cables immediately.

请勿过度挤压连接电缆而使其发生变形或损坏；如发现连接电缆发生损坏，必须立即更换；

- If a safe operation is no more assured separate the battery from the stroboscope and against unintended switching on.

如无法确保安全的使用本机，请关闭本机并将其与充电电池分离；

- A safe operation is no more possible in the following cases:

如发生下述情况，则无法确保安全的使用本机：

- When the unit or the connection cable shows visible damages.

本机或连接电缆发生明显损坏；

- When the unit does not work correctly.

本机无法正常工作；

- When the unit was exposed to moisture or rain

本机受潮或遭到雨淋；

- In the case of formation of condensing water.

有冷凝水形成；

- When objects have entered into the unit.



有污染粒子进入本机；

- When the permissible storage/operation temperature has been exceeded or fell below a permissible value.  
存储/工作温度超过或低于允许的温度。

### **Danger through stroboscopic light flashes**

#### **如何避免闪光的危害**

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.

本机频率调至 10 ... 20 Hz 时所发出的闪光有可能引发癫痫的发作；闪光的强度与环境光线的反差越大，癫痫患者发病的可能性也就越大。

- If possible operate the stroboscope at normal ambient light.  
请尽量在柔和的光线环境中使用本机；
- Start the adjustment of the flash sequence from the expected top frequency value.  
请从期望的最高频率开始调节以确保获得精确的闪光频率；
- Make sure that persons which may be affected by epilepsy do not stand closely to the stroboscope while in use.  
有癫痫病史者请勿在本机工作时靠近。

仅供参考

## **Operation**

### **操作注意事项**

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.

在正确的操作下，DRELLOSCOP 3015 频闪检测仪能够获取振动、高速旋转或作周期运动构件的单一“静止”，或者两个及多个位置的“静止”图像，但是，这种“静止”只是视觉的错觉，事实上，构件还在高速运动，因此，不要用手触摸，以免受到伤害。

- Inform all persons close to the illuminated area about the function principal of the DRELLOSCOP 3015 and remind them about the dangers which may result from the optical illusion.

在频闪照射区域附近工作的人员须被告知：静止只是视觉的错觉，事实上机器还在高速运动；不要伸手触摸，以免受到伤害。

- Make sure that the illuminated area is not accessible by other persons.  
非本机操作人员请勿在附近停留。

## **Repair**

### **维修**

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.

请勿擅自对本机进行维修，以免引发意外；如需维修服务，请联系 DRELLO 公司维修部。

## **Maintenance**

### **维护**

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.

本机的维护必须由专业人士依据相关规程完成；

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.

日常维护必须按照本手册的规定进行，以免引发意外。

## **Symbols used in this manual**

### **本手册中使用的警示符号**

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

本手册中使用的警示符号分为以下等级：



**DANGER! 危险!**

Safety advice 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 non-observance can be death or serious injuries.

该符号表示：操作不当可能会导致严重或致命的伤害。

In some chapters you find the following advice symbol:

在一些章节里，会出现下列警示符号：



**ATTENTION! 注意!**

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

该符号表示：操作不当可能会导致本机的毁坏。



**Advice 建议!**

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

该符号用来提示操作者应注意的特殊事项。

仅供参考

## **Product description**

### **产品描述**

#### **Function**

##### **功能说明**

The DRELLOSCOP 3015 is a flashlight stroboscope. It delivers pulses to an installed quartz flashtube 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 and to measure rotations or oscillations in a contactless way. DRELLOSCOP 3015 频闪检测仪配有独立的手持照明灯，能够获取振动、高速旋转或作周期运动构件的单一“静止”，或者两个及多个位置的“静止”图像，适用于非接触转速或振动频率的测量以及高速周期运动的视觉观测。

#### **Storing of adjustments**

##### **操作的储存**

When you switch off the DRELLOSCOP 3015 all actual adjustments will be stored. When switching the unit on again all these adjustments become active, however the flashtube first remains switched off.

关闭本机后，所有操作会自动储存，这些操作将在下次开机时被激活。

The DRELLOSCOP 3015 has two possibilities for the flash control: the manual control and the control through external pulses.

本机的闪光频率可以通过下述两种方式控制：手动控制及通过外部脉冲信号控制。

Depending on the selected control mode different functions are available.

在不同的控制条件下，可以实现多种不同的功能。

#### **Manual control of the flash sequence**

##### **手动控制闪光频率**

In the manual control mode the flash sequence is adjusted by hand in the control field via push buttons.

在手动控制条件下，可通过调节控制面板的按钮来控制本机的闪光频率。

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

##### **通过外部脉冲信号控制闪光频率**

In the external control mode different pulse generators, inductive or photoelectric pulse generators supply the pulses for the flash sequence. In this control mode a frozen image is even then obtained when the speed changes.

在外部控制条件下，可通过脉冲发生器产生的脉冲信号来控制本机的闪光频率。

#### **Image shifting**

##### **移相功能**

The installed control allows for shifting the object to be inspected to an optimum position for the observation.

通过移相功能，可减少图像漂移对观测的影响。

## Scope of supply

### 供货范围

- |                                                                                                      |                                                |
|------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 1 Flashlight stroboscope DRELLOSCOP 3015<br>with quartz glass flashtube 307-2,<br>connection 12 V DC | Product no. 1.3015.60002                       |
| DRELLOSCOP 3015 频闪检测仪主机 (带 307-2 灯管, 12 V DC 供电) 货号: 1.3015.60002                                    |                                                |
| 1 Cable plug for external control<br>外部控制接口                                                          | Product no. 17.03.015<br>货号: 17.03.015         |
| 1 Manual<br>安装使用手册                                                                                   | Product no. 1.3015.2B001e<br>货号: 1.3015.2B001e |

## Standard accessories

### 供选标准配件

- |                                                                                        |                           |
|----------------------------------------------------------------------------------------|---------------------------|
| 1 Rechargeable battery 12 V, 2.6 Ah attachable to the<br>handle of the DRELLOSCOP 3015 | Product no. AKKU.21202,6  |
| 12 V, 2.6 Ah 充电电池 (附于本机手柄处) 货号: AKKU.21202,6                                           |                           |
| 1 Battery charger LA 3015 for rechargeable battery<br>12 V, 2.6 Ah                     | Product no. 59.3015.20003 |
| 12 V, 2.6 Ah 电池充电器 货号: 59.3015.20003                                                   |                           |

## Available accessories:

### 可选其他配件:

- |                                                                          |                          |
|--------------------------------------------------------------------------|--------------------------|
| 1 Transport case TK 3015 for DRELLOSCOP 3015<br>and standard accessories | Product no. 1.3015.2TKA  |
| DRELLOSCOP 3015 频闪检测仪专用便携箱 货号: 1.3015.2TKA                               |                          |
| 1 Proximity switch NJ2/8-L 10 K for external control<br>alternatively:   | Product no. 0.0NJ2.20008 |
| 外部控制用 NJ2/8-L 10 K 接近开关 货号: 0.0NJ2.20008                                 |                          |
| 1 Photoelectric pick-up KT5-3015<br>with 5 m cable and plug              | Product no. 0.0KT5.00003 |
| 外部控制用 KT5-3000 光电传感器 (带 5m 电缆及插头) 货号: 0.0KT5.00003                       |                          |

## Operating elements and connections

按键及接口说明

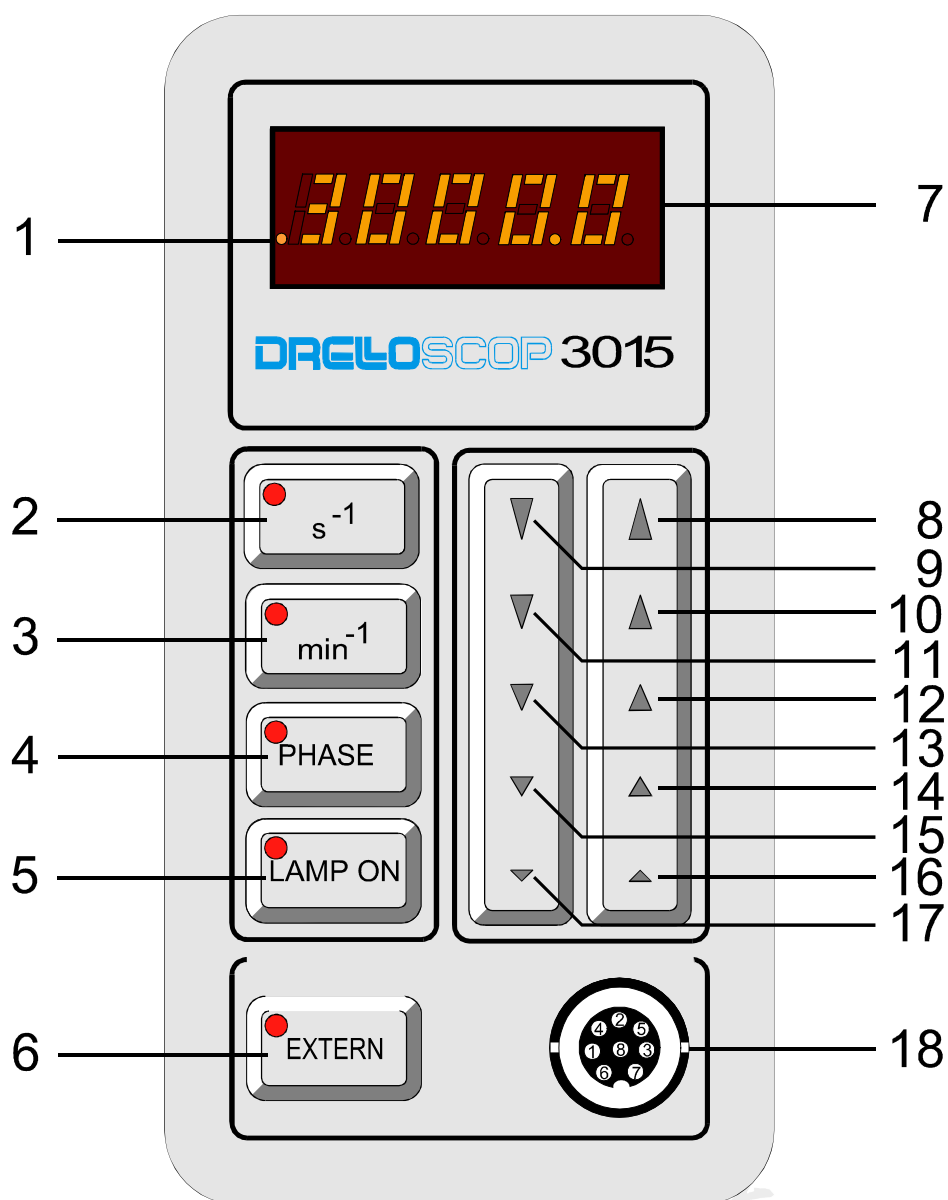


Fig. 1

1 Indication for state of charge of battery voltage  
显示电池电量

2 Key for display in s<sup>-1</sup>  
以 s<sup>-1</sup> 为单位显示闪光频率

3 Key for display in min<sup>-1</sup>  
以 min<sup>-1</sup> 为单位显示闪光频率

**4 Phase shifter (active with external control)**

（在外部控制模式下）实现移相功能

**5 Lamp on/off**

照明灯开/关

**6 Control mode: externally or manually**

选择控制模式（外部控制模式或手动控制模式）

**7 Digital display (5 digits)**

数字显示屏

**8 Increase frequency in first digit from left or increase phase angle by 100°**

使左起第 1 位的频率数增加或使相位角增大 100°

**9 Reduce frequency in first digit from left or reduce phase angle by 100°**

使左起第 1 位的频率数减少或使相位角减小 100°

**10 Increase frequency in second digit from left or increase phase angle by 10°**

使左起第 2 位的频率数增加或使相位角增大 10°

**11 Reduce frequency in second digit from left or reduce phase angle by 10°**

使左起第 2 位的频率数减少或使相位角减小 10°

**12 Increase frequency in third digit from left or increase phase angle by 1°**

使左起第 3 位的频率数增加或使相位角增大 1°

**13 Reduce frequency in third digit from left or reduce phase angle by 1°**

使左起第 3 位的频率数减少或使相位角减小 1°

**14 Increase frequency in fourth digit from left or increase phase angle by 0.1°**

使左起第 4 位的频率数增加或使相位角增大 0.1°

**15 Reduce frequency in fourth digit from left or reduce phase angle by 0.1°**

使左起第 4 位的频率数减少或使相位角减小 0.1°

**16 Increase frequency in fifth digit from left or increase phase angle by 0.1°**

使左起第 5 位的频率数增加或使相位角增大 0.1°

17 Reduce frequency in fifth digit from left or reduce phase angle by 0.1°

使左起第 5 位的频率数减少或使相位角减小 0.1°

18 Input socket

脉冲输入接口

### External control

外部控制的连接

Pin allocation of input socket

Cable plug DIN 45326, product no. 17.03.015

DIN 45326 8 针连接头, 货号: 17.03.015

Connection 针孔	Connection 连接端子	Direction 输入/输出	Value 数值
1	Supply voltage 供电电压	Output 输出	+12 V – max. 20 mA
2	NC		
3	Pulse input 脉冲输入	Input 输入	0,5...30 V <sub>p</sub>
4	Reference potential 基准电压		0 V
5	NC		
6	Free for options 自选		
7	Optocoupling Anode 耦合阳极	Input	4...12 V
8	Optocoupling Cathode 耦合阴极	Input	Reference potential

INPUT

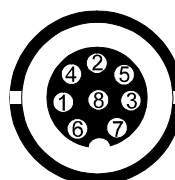
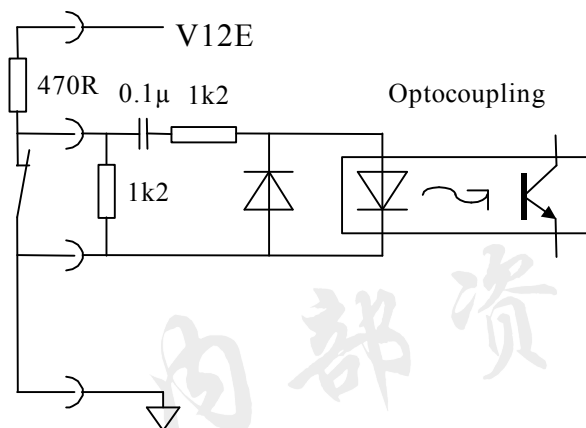


Fig. 2

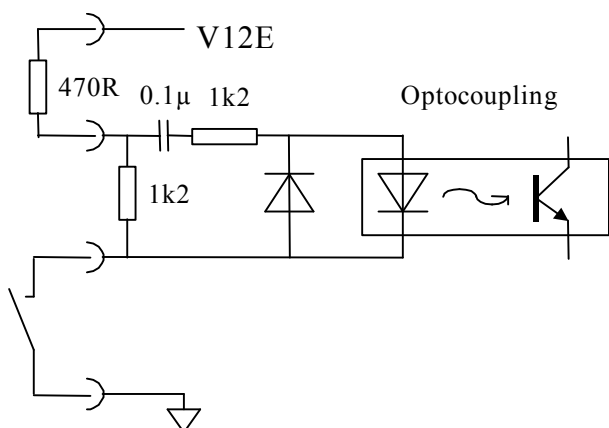


Circuit diagram of the input for the connection of a contact via the opto coupling  
 输入脉冲的电路图（输入脉冲通过光电耦合器与闭开接点通连）

Break contact  
 开路接点



Make contact  
 闭合接点



## Connection

### 连接说明

## Preparations

### 连接准备

The DRELLOSCOP 3015 is a portable stroboscope. It can be powered by a rechargeable battery, which is attached to the lower part of the handle.

DRELLOSCOP 3015 手持式频闪检测仪通过安在手柄上的充电电池供电。



#### **ATTENTION: 注意:**

Make sure that the unit is not exposed to extreme temperatures or extreme humidity. The ambient temperature should be between 0 and +50°C.

请将本机置于 0-+50°C 的环境中，勿将本机置于极端温度或极端湿度环境中。

In order to obtain the maximum operation time of the DRELLOSCOP, make sure that the rechargeable battery is completely loaded

请使用满电量电池，从而保证本机长时间工作。

Do not use the unit close to radiators. Avoid direct sun radiation.

勿将本机放置在阳光直射处或靠近热源的地方。

Avoid strong room illumination to obtain best contrast for the illumination with the DRELLOSCOP 3015.

为获得最佳的闪光照射效果，请勿在强光环境使用本机。

#### **DO NOT EXPOSE THE UNIT TO VIBRATIONS OR SHOCKS.**

勿将本机置于有强烈机械振动之处。

仅供参考

## **Application**

### 应用领域

The compact flashlight stroboscope DRELLOSCOP 3015 with high light intensity serves for contactless measurements of rotations or oscillations as well as for the observation of fast periodic and quasiperiodic motions at an apparent stand still.

DRELLOSCOP 3015 频闪检测仪设计紧凑，闪光强度高，适用于非接触转速或振动频率的测量以及高速周期运动的视觉观测，亦能够获取振动、高速旋转或作周期运动构件的单一“静止”，或者两个及多个位置的“静止”图像。

The handy design makes it universally applicable especially in the service range.

Major fields of application:

本机可广泛应用于以下领域：

## **Electrical engineering**

### 电机工程

- Speed measurement on motors and blowers

测量发动机及风机的转速

- Collector inspection on generators

检测发电机的极性

- Slip measurement on asynchronous machines

测定异步电机的转速差

## **Chemical industry**

### 化工

- Visual inspection on stirring operators and centrifuges

观测搅拌机及离心机的运转情况

- Inspection on driving engines, vibrating and oscillating screens

观测驱动引擎及振动筛

- Speed control on pumps

测定化学泵的转速

- Observation of atomization processes

观测雾化过程

## **Machine construction**

### 机械制造

- Observation of the amplitude and measurement of the frequency of oscillations

观测振幅及测量振动频率

- Inspection of drilling and milling tools during the production

检查钻铣工具

- Slip measurement on clutches and belt drives

测量离合器及皮带传动的滑差

- Inspection of the backlash on gear units

观测齿轮传动装置的侧隙

## **Textile Industry**

纺织

- Inspection of the speed of spindles, rotors and spindles on spinning and winding machines

测定纺纱机或绕纱机上纺锭及转子的转速

- Observation of the warp thread on weaving machines

观测织机上的经纱

- Representation of the motion of sewing threads on mechanical elements on sewing Machines

观测缝纫机织线的运动状态

## **Graphics Industry**

印刷

- Observation and control of the reference marks with label, form, flexo and intaglio printing

观测标签、表格、柔版及凹版印刷中的参照符号

- Inspection of longitudinal and transverse perforation as well as of marginal perforation during form continuous printing

观测表格印刷中横纵向打孔及边缘打孔情况

- Motion analysis on the folding apparatus during form printing

分析表格印刷用折叠机的运动轨迹

- Synchronism inspection on machine drives and machine gear drives

机器传动装置及机器齿轮传动装置的同步检测

## **Packaging Industry**

包装

- Motion analysis of mechanical processes on packaging machines, e.g. folding and bending processes

包装机的运动轨迹分析，如折边过程中的运动轨迹分析

- Inspection of the application of cold setting adhesives

检测冷固胶粘剂的使用情况

## **Steel Industry**

钢铁

- Visual inspection of surface defects in the cold rolling area as well as with galvanised and coated sheets.

观测冷轧钢板、镀锌钢板及带涂层钢板的表面瑕疵

## Operation

### 操作说明

Before you start operating the stroboscope observe the following advice:

在使用本机之前，请注意以下两点：

- Always use completely charged batteries in order to obtain the maximum operation time of the stroboscope. Make sure that the battery is safely locked into the handle and has a firm seat in it.  
务必使用满电量电池，从而保证本机长时间工作；同时，请检查电池是否安装到位；
- Make sure that with external control of the flash sequence the connection cable of the pulse generator has a firm seat in the input socket of the stroboscope. The connection cable must not be bent or damaged otherwise. Install the pulse generator according to the installation/operation manual of the generator.  
务必确认脉冲发生器连接电缆已与脉冲输入接口连接到位；请勿过度挤压连接电缆而使其发生变形或损坏。

### Switching on/off

#### 开机/关机

The on/off switch of the DRELLOSCOP 3015 is mounted in the handle of the DRELLOSCOP 3015 (fig. 4 page 20).

本机的开关安装在手柄处（见 fig. 4）。

After switching the unit on the display and the LED's in the keys used last go on. Push key "Lamp on" for switching the flashtube on/off. Approx. 2 minutes after pushing any key the flashtube is switched off automatically. This reduces the discharging of the battery and prolongs the readiness for flash operation. Push key "Lamp on" for switching the flashtube on again.

开启本机后，显示屏及上次最后使用的按键均发出亮光；按下"Lamp on"键后，有闪光发出；再按下任意键，2 分钟后，闪光自动熄灭，再按一下"Lamp on"键，有闪光发出。

If no key was pushed for more than 5 minutes the display is switched off. For switching the display on again push any key, preferably  $s^{-1}$  or  $min^{-1}$ .

如 5 分钟内无按键操作，显示屏会自动关闭；再按下任意键，显示屏即可恢复工作。

### Manual control of the flash sequence

## 闪光频率的手动控制

This function is active when the key "EXTERN" does not light.

开机后，本机将自动进入手动控制模式（在此模式下，"extern"键不亮）。

- Direct the DRELLOSCOP on the object to be observed for adapting the correct flash sequence.

手持本机，使闪光照射在观测区域，同时调节闪光频率直至获得理想的观测状态。

The flash sequence is adjusted with the arrow keys on the key panel. The key panel is divided into two vertical fields which cursors show to the top and to the bottom. The numbers of the cursors correspond to the numbers of the digits in the display. Consequently for each digit one key is available which allows an adjustment of the flash sequence to the high and low values from coarse to very fine. Arrow keys which show to the top increase the flash sequence whilst the arrow keys showing downwards reduce it.

本机的闪光频率可通过面板上的箭头按键进行调节；在面板上，有两竖排带箭头按键：一排为箭头向上的按键；另一排为箭头向下的按键；向上的箭头数目及向下的箭头数目均与显示屏上显示数位的数目相同；关于箭头按键的使用说明，请参照“按键及接口说明”。

The flash sequence can be read in the display in  $\text{sec}^{-1}$  as well as in  $\text{min}^{-1}$ , depending on which of two keys is active. The respective LED in the key lights thereby.

闪光频率以  $\text{sec}^{-1}$  或为  $\text{min}^{-1}$  单位通过显示屏显示；按下“ $\text{sec}^{-1}$ ”键，以为单位显示闪光频率；按下“ $\text{min}^{-1}$ ”键，以  $\text{min}^{-1}$  为单位显示闪光频率。

### Slow motion effect

#### 慢动效果

When you increase or reduce the flash sequence with the fine adjustment keys you can achieve a slow motion effect. Hereby it is possible to move the object to be observed to the most favourable position or to let it move slowly.

通过按键调节闪光频率的过程中，可获得图像的慢动效果，这样一来，可将图像移至理想的位置进行观测。

仅供参考

## Control of the flash sequence through external pulses

### 闪光频率的外部控制

This function is active when the LED in key "EXTERN" of the DRELLOSCOP 3015 is on. In the external control mode pulse generators supply the pulses for controlling the flash sequence. In this mode you will obtain a frozen image even when the object speed changes.

按下"EXTERN"键，即可进入外部控制模式。在外部控制模式下，可通过脉冲发生器输出的脉冲控制闪光频率，获得运动构件的“静止”图像。



#### Note 注意

With control pulses which cycle is lower than  $60 \text{ min}^{-1}$  or higher than  $25.000 \text{ min}^{-1}$  there will be no flash release.

当控制脉冲的频率小于  $60 \text{ min}^{-1}$  或大于  $25.000 \text{ min}^{-1}$  时，闪光不能被触发。

- Press key "EXTERN" to activate the external control mode. The LED in the key must go on.  
按下"EXTERN"键，激活外部控制功能，此时，EXTERN 键发出亮光。
- Mount the external pulse generator on your machine and connect it with the cable to the respective socket on the DRELLOSCOP.  
务必确认脉冲发生器已与脉冲输入接口连接到位。

The flash sequence is now in synchronism with the produced pulses and you will obtain a frozen image of the object.

当闪光频率与外部脉冲实现同步时，可获得运动构件的“静止”图像。

## Image shifting

### 移相功能

This stroboscope allows to "shift" the object to be inspected into the most favourable position. In fact, you change only the trigger point for the flashes by which the object is illuminated in another place.

通过移相功能，可将运动构件移至理想位置进行观测，具体操作如下：

- Press key "PHASE".  
The LED in the key goes on and the display shows the phase angle in degrees.  
按下"PHASE"键后，该键发出亮光，此时，显示屏将以度为单位显示相位角；
- When you increase or reduce the phase angle via the arrow keys you can shift the object clockwise or counter-clockwise. There is a fixed relation between the keys and the angle:  
可通过调节面板上的箭头按键获得理想的相位角；

The upper arrow keys 8 and 9 change the angle by + or  $-100^\circ$ .

键 8 或键 9 可使相位角增大或减少  $100^\circ$ ；

The arrow keys 10 and 11 change the angle by + or  $-10^\circ$ .

键 10 或键 11 可使相位角增大或减少  $10^\circ$ ；

The arrow keys 12 and 13 change the angle by + or  $-1^\circ$ .

键 12 或键 13 可使相位角增大或减少  $1^\circ$ ；

The arrow keys 14 and 15, 16 and 17 change the angle by + or  $-0.1^\circ$ .

键 14、16 或键 15、17 可使相位角增大或减少  $0.1^\circ$ ；

## Charging control with battery operation

### 电池低电量指示

When the voltage of the rechargeable battery reaches a value of 11 V the red LED in front of the first digit in the display starts blinking (number 1 in fig. 1 page 9). The battery must now be recharged. At a voltage of 10.5 V the stroboscope switches automatically off.

当电池电压降至 11V 时，显示屏上会出现一个闪烁的红点，此时，必须给电池充电。当电压降至 10.5V 时，本机会自动关闭。

## Recharging the battery

### 电池充电说明

Discharged batteries should be recharged immediately. Never deposit a discharged battery as this will lead to damages.

看到电池低电量的指示后，请立即给电池充电。

For recharging the battery serves the battery charger LA 3015 supplied with the unit. 请使用本机所配充电器 LA 3015 给电池充电。

Before recharging the battery pay attention to the manual for the charger which is attached separately.

给电池充电之前，请仔细阅读本手册的相关说明。



#### **Note 注意**

- The battery will reach its full capacity only after 5...10 times discharging and recharging.  
电池在充电、放电 5—10 次后会达到其满载电量。
- Recharge discharged batteries immediately.  
看到电池低电量的指示后，请立即给电池充电。
- The battery can be recharged up to 1000 times  
电池可反复充电 1000 次以上。
- Do not open the battery !  
请勿拆解电池！
- Protect battery against moisture.  
请勿将电池置于潮湿环境，以免受潮。
- Never use defective or deformed batteries !  
如发现电池损坏或变形，请勿继续使用！
- Never throw the battery into fire or water !  
勿将电池弃于火中或水中！
- Do not touch battery contacts or short circuit !  
勿将金属物体接触到电池的正负极，以免发生短路！



## Maintenance

### 维护

There are not serviceable parts inside the stroboscope except the flashtube and the back up battery.

本机的日常维护极其简单，如：更换灯管或备用电池。

### Exchange of flashtube

#### 如何更换灯管



#### **Danger through electric current !**

小心触电！

Dangerous voltages are applied at the capacitors inside the unit. Before you open it separate the stroboscope from the battery and wait minimum 5 minutes for discharging of the voltages.

请在关闭本机 5 分钟后再将本机与电池分离，以确保残余电荷已完全释放！



#### **ATTENTION !**

注意！

Ensure sufficient ground to avoid static discharges. Inside the unit there are electronic components which might be destroyed through static discharging.

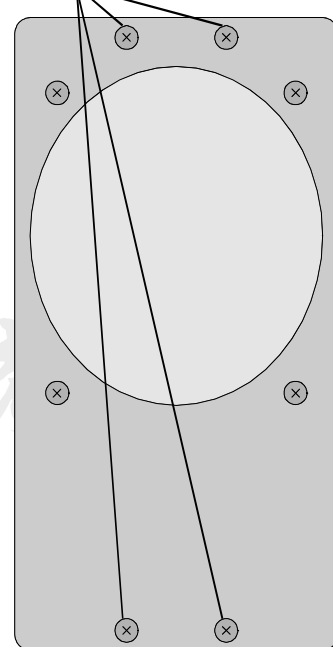
请确保本机接地良好，以免静电电流损坏本机的电子元件。

- Withdraw battery  
取出电池；
- Unscrew the four fixing screws of the edge protection at the light exit side.  
拧开位于外保护胶条处的 4 个螺丝；
- Withdraw edge protection  
取下外保护胶条；
- Remove the four fixing screws from the diffusing lens and remove (fig. 3).  
再拧开扩散透镜旁的 4 个螺丝（如图 3 所示）；
- Put on protective gloves and pull flashtube out of its socket.  
戴上防护手套，将旧灯管取出；

**ATTENTION !****注意！****Danger of broken glass !****小心被玻璃划伤！**

- Grasp the new flashtube with gloves and insert into the socket until the stop.  
再将新灯管放入插槽；
- Screw on the diffusing lens  
拧紧扩散透镜旁的 4 个螺丝；
- Put on edge protection and tighten screws  
装上外保护胶条并拧紧旁边的 4 个螺丝；
- Attach battery again.  
再装上电池。

only loose these  
screws



. 3

fig. 3

## Exchange of the fuses

### 如何更换保险丝

The DRELLOSCOP 3015 has one fuse. You find this in the fuse holder inside the unit at the light exit side (fig. 4 page 20).

本机只有一根保险丝，位置如图 4 所示。



#### **Risk through electric current !**

小心触电！

There are dangerous voltages applied at the capacitors inside the unit.

Before you open it separate the stroboscope from the battery and wait minimum 5 minutes for discharging of the voltages.

请在关闭本机 5 分钟后再将本机与电池分离，以确保残余电荷已完全释放！



#### **ATTENTION !**

注意！

Ensure sufficient ground to avoid static discharging. Inside the unit there are electronic components which may be destroyed through static discharging.

请确保本机接地良好，以免静电电流损坏本机的电子元件。



#### **ATTENTION !**

注意！

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

在更换保险丝前，请查明其损坏原因！

- Withdraw battery.  
取出电池；
- Unscrew the four fixing screws from the edge protection at the light exit side.  
拧开位于外保护胶条处的 4 个螺丝；
- Take off edge protection  
取下外保护胶条；
- Unscrew the four fixing screws from the diffusing lens and remove (fig. 3, page 18)  
再拧开扩散透镜旁的 4 个螺丝（如图 3 所示）；
- Lift the fuse with a suitable tool (e.g. screw driver)  
使用适当的工具（如螺丝刀）将保险丝取出；
- Replace fuse  
换上新保险丝。



### **ATTENTION !**

**注意！**

Use only a fuse with the  
values 250 V; T 6.3 A;  
5 x 20 mm

请使用下述规格的保险丝：

250 V; T 6.3 A;  
5 x 20 mm

- Push fuse holder into the socket until the stop  
将新保险丝安装到位；
- Tighten fixing screws of diffusing lens  
拧紧扩散透镜旁的 4 个螺丝；
- Put on edge protection and tighten screws  
装上外保护胶条并拧紧旁边的 4 个螺丝；
- Attach battery again  
再装上电池。

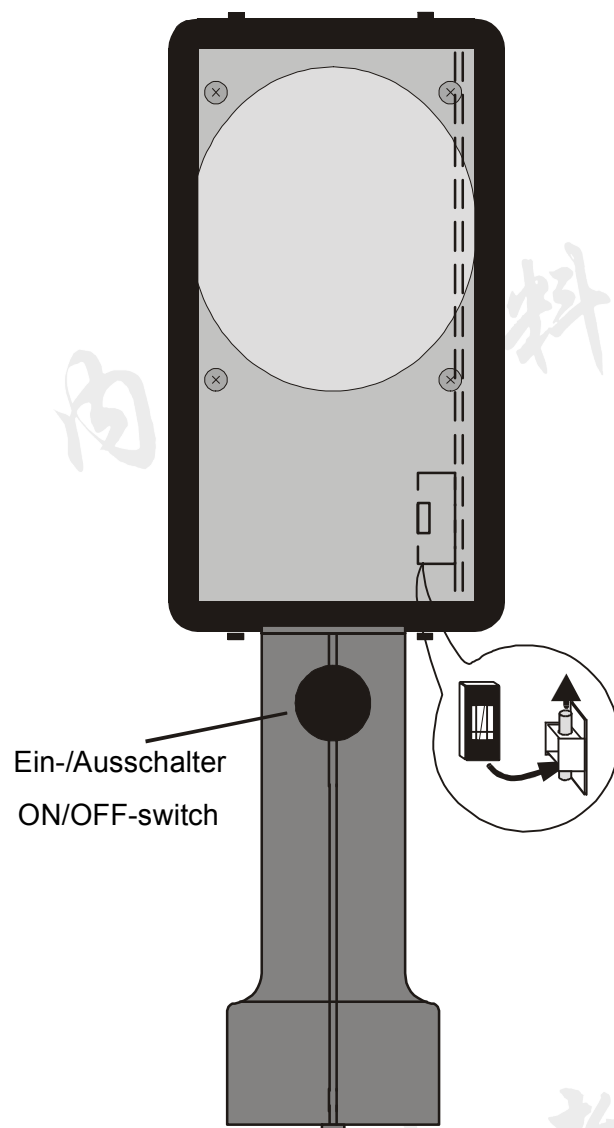


Bild 4

## Replacement of the back-up battery

### 如何更换电池

The back-up battery for the memory of the last settings is inside the unit (fig. 5). Open the unit for replacing the battery. The stroboscope must only be opened by qualified personnel (electrical engineers) and only for replacing the fuses and the battery.

本机设置记忆装置的位置如图 5 所示。更换保险丝、备用电池及灯管等操作必须由专业人士完成。



#### **Risk through electric current !**

小心触电！

There are dangerous voltages applied at the capacitors inside the unit.

Before you open the unit separate it from the battery and wait for minimum 5 minutes for discharging of the voltages.

请在关闭本机 5 分钟后再将本机与电池分离，以确保残余电荷已完全释放！



#### **ATTENTION !**

Ensure sufficient ground to avoid static discharges.

Inside the unit there are electronic components which may be destroyed by static discharges.

请确保本机接地良好，以免静电电流损坏本机的电子元件。

- Loosen the eight screws at the front and rear edge protection and remove.  
拧开位于外保护胶条前部及后部的 8 个螺丝；
- Remove housing sheet on the left side.  
移开箱体盖；
- Lift old battery from its socket with a small screw driver.  
取出旧电池；
- Firmly press the new battery with the correct value into the socket until it snaps in. The inscription on the battery must be visible.  
装入新电池；
- Put on housing cover.  
装好箱体盖；
- Put on edge protection and tighten the eight screws  
拧紧外保护胶条旁的螺丝。

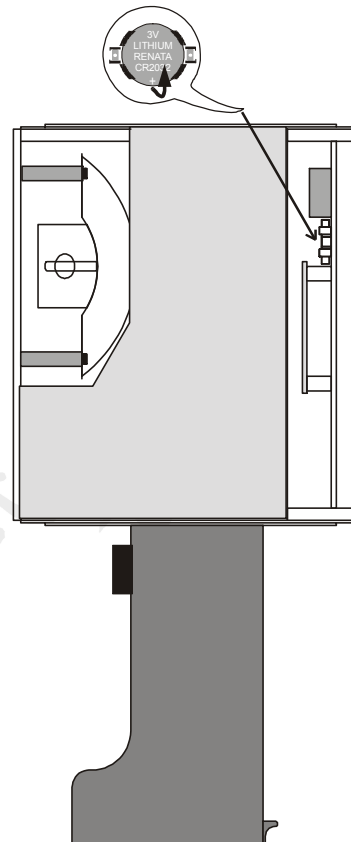


Fig. 5

## Initializing of the stroboscope 初始化操作

When the strobe is in an undefined switch status, i.e. it does not respond upon pressing any key, you have to proceed for the initialization as follows:

当本机所有按键均无法工作时，请按照下述方法初始化本机：

- switch strobe off

先关闭本机；

- depress key  $\text{min}^{-1}$  and switch the strobe on at the same time.

再按下  $\text{min}^{-1}$  键，同时开启本机，即完成初始化操作。

内部资料

仅供参考

Annexure

## 附录

### **Repair**

维修

For any repair on the DRELLOSCOP 3015 refer to

Drello 公司维修部的联系方式如下:

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

Phone +49-(0)2161-909-6  
Fax +49-(0)2161-909-700  
E-mail [service@drello.de](mailto:service@drello.de)



Technical Data  
技术参数

Supply voltage	12 V DC by rechargeable battery 12V, 2.6 Ah attached to the handle
供电电压:	12 V DC (通过附在手柄上的 12V, 2.6 Ah 充电电池供电)
Power consumption:	Max. 36 W
功率:	Max. 36 W
Current consumption:	Max. 3 A at 12 V
电流消耗:	Max. 3 A at 12 V
Fuses inside (5 x 20 mm):	6.3 A
保险丝(5 x 20 mm):	6.3 A
Phase shifter:	0 ... 360°
移相:	0 ... 360°
Range of flash sequence:	60 ... 25.000 min <sup>-1</sup> or 1 ... 416 s <sup>-1</sup>
闪光频率的范围:	60 ... 25.000 min <sup>-1</sup> 或 1 ... 416 s <sup>-1</sup>
Operating conditions:	Temperature 0 ... +50°C
工作温度:	0 ... +50°C
Storing conditions:	Temperature -20° ... +70°C store in dry rooms.
存放温度:	-20 ... +70°C (干燥环境)
Housing:	Light metal half shell housing with handle
机箱:	半壳式设计, 轻质金属机身, 带手柄
Dimensions (W x H x D):	85 x 165 x 150 mm (without handle).
尺寸(W x H x D):	85 x 165 x 150 mm (不含手柄)
Weight:	Approx. 1.4 kg
重量:	约 1.4 kg

Standards applied:

VDE 0110b, VDE 0411  
IEC 348  
EN 50082-2, EN 55011B,  
EN 55140, EN 55141,  
EN 61000-4-2, EN 61000-4-4

执行标准:

VDE 0110b, VDE 0411  
IEC 348  
EN 50082-2, EN 55011B,  
EN 55140, EN 55141,  
EN 61000-4-2, EN 61000-4-4

内部资料

仅供参考

- Industrial Stroboscopes
- Video Inspection Systems
- Measuring Equipment for Ballistics
- Seed Counting Equipment

# DRELO

Ing. Paul Drewell GmbH & Co. KG

## Declaration of conformity

according to ISO/IEC Guide 22 and EN 45014

Manufacturer: Drello GmbH & Co. KG  
Address: Max-Reger-Straße 35a  
D- 41179 Mönchengladbach

### We declare that the products

Product name: Flashlight - Stroboscope  
Model: DRELLOSCOP 3015  
Possible accessories: Socket power unit, rechargeable battery, battery charger, transport case, trigger unit

### Correspond to the following product specifications:

Safety: VDE 0110b, VDE 0411, IEC 348  
EMV: EN 500082-2, EN 55011B, EN 55140,  
EN 55141, EN 61000-4-2, EN 61000-4-4  
Additional Information: The product corresponds to the EMC regulations 89/336/EEC and is consequently labeled with the CE mark.

This product has been tested with calibrated test units which can be traced back to PTB standards.

*H.-G. Seibt-Drewell*  
Signature/Stamp:

Date: 01.01.2007

**DRELO** Ing. Paul Drewell  
GmbH & Co. KG  
41171 Mönchengladbach • Postfach 500126  
41179 Mönchengladbach • Max-Reger-Str. 35a  
Tel. 0 21 61 / 909-6 Fax 0 21 61 / 909-700

Drello Ing. Paul Drewell GmbH & Co.

Mailing address:  
Postfach 500126  
D-41171 Mönchengladbach

Factory address:  
Max-Reger-Straße 35a  
D-41179 Mönchengladbach (Rheinland)

Phone  
++49-(0)2161/909-6  
Telefax:  
++49-(0)2161/909-700

e-Mail  
info@drello.de  
internet  
www.drello.de

Dresdner Bank Mönchengladbach  
Account 904928900 Bank Code 310 800 15  
IBAN: DE 07 3108 0015 0904 9289 00  
SWIFT-BIC: DRES DE 330

Sparkasse Mönchengladbach  
Account 82395 Bank Code 310 300 00  
IBAN: DE 41 3105 0000 0000 0823 95  
SWIFT-BIC: MGLSDE33

VAT-No.: DE120434695  
Kommanditgesellschaft, Mönchengladbach  
Amtsgericht Mönchengladbach, HRA 411  
p.h.G. Drewell-Verwaltungs-GmbH, Mönchengladbach  
Amtsgericht Mönchengladbach, HRB 253

Managing Directors  
Hans-Günter Seibt-Drewell