

Installation and Operating Manual

Drelloscop 1090 频闪检测仪

安装使用手册

Flashlight Stroboscope **DRELLOSCOP® 1090**

Carefully read this manual, **before** you install, operate, store or use the device.

在安装使用本机之前，请仔细阅读本手册

DRELO

内部资料

仅供参考

This Installation and Operating Manual,
Edition 1.1090.2B002e, applies to the Flashlight Stroboscope DRELLOSCOP 1090
本手册版本为 1.1090.2B002e, 仅供 DRELLOSCOP 1090 频闪检测仪

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内部资料

仅供参考

Introduction

概述

The instructions for the installation of the DRELLOSCOP 1090 is directed at persons (skilled electricians and service technicians), who are charged with the installation and the maintenance of the device. These persons must be familiar with all regulations concerning electrical engineering and must always meet these regulations.

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 instructions concerning the installed device is directed at persons, who use the device for inspection purposes and who have to set and adjust the device.

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。

Please, read this manual carefully in order to familiarize yourself with the safe handling with the device.

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。

Use as directed

应用

The DRELLOSCOP 1090 is destined for the professional use for the visual quality control of sheet metal surfaces in cold rolling mills only. Any other use is considered to be not in correspondence with these directions. The full responsibility is on the part of the user.

本机特别为视觉观测冷轧钢板表面的瑕疵而开发。

The device may only be installed and maintained by specialized electricians.

本机的安装和维护必须由专业人士完成。

In case of any inquiries concerning the handling of the device or special applications, which are not contained in this manual, please contact:

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

Phone +49-(0)2161-909-6

Max-Reger-Strasse 35a

Telefax +49-(0)2161-909-700

D-41179 Mönchengladbach


e-mail info@drello.de

Nameplate

产品铭牌

For exact identification, the serial number can be found on the nameplate on the rear side of the DRELLOSCOP 1090. Make a note of this serial number in the figure to the right next to *SN*, in order to have this information available in the case of questions or spare part ordering.

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。

DRELO GmbH & Co. KG	
D-41179 Mönchengladbach Tel.: ++49(0)2161/909-6	Max-Reger-Straße 35 a Fax.: ++49(0)2161/909-700
DRELLOSCOP 1090 SN... 230 V AC, 2000 W 	OPTION:

Electromagnetic compatibility

电磁兼容性

The DRELLOSCOP 1090 meets the protection requirements of the
本机符合下述标准：

European Directive

89/336 (2004/108).

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

Safety Precautions

安全说明

Danger by electric current

如何避免触电危险

- * Always use the DRELLOSCOP 1090 and the connected devices only with the rated mains voltage.
请在额定电压下使用本机；
- * Always make sure that only qualified personnel (electricians) are charged with the installation and the maintenance of the device.
本机的安装和维护必须由专业人士依据相关规程操作完成；
- * Always disconnect the DRELLOSCOP 1090 and the connected devices from mains supply and from all other devices if, due to smoke development or sharp smell, the system is suspected of having a defect.
如发现本机冒烟或有异味发出，必须立即将本机与其他连接装置断开连接；
- * On the capacitors in the interior of the DRELLOSCOP 1090 and of the lamps there are always residual voltages, which mean danger to life! Before opening the units, disconnect the DRELLOSCOP from the mains supply and wait for at least 15 minutes for having the voltages reduced.
The housing may only be opened by qualified personnel (electricians) in order to replace the fuses respective to connect the lamp cables. The device has not other parts, which could be replaced or repaired by you.
更换保险丝、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；
- * Ensure that no liquid gets into the individual devices (e.g. from reservoirs placed on top of it or during cleaning). Never continue to use the device after liquid has got into the device!
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 the stroboscope will not be used for a longer period, please disconnect it from the mains supply. Only store the DRELLOSCOP 1090 and its peripheral devices in dry weatherproof rooms.
如长时间不使用本机，请在断开主电源后将本机置于干燥的房间存放；
- * Always make sure that the connected cables are not bent, squeezed or otherwise damaged. Immediately have a damaged cable replaced.
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；
- * In case the safe operation of the DRELLOSCOP 1090 or of one of the connected peripheral devices should not be guaranteed anymore, the device must be disconnected from the mains supply and protected against unintentional starting.
如无法确保安全使用本机及其外围装置，请立即断开主电源；

- * For example, safe operation is not possible anymore,
如发生下述情况，则无法确保安全的使用本机
 - if a device or a supply line is visibly damaged,
本机或连接电缆发生明显损坏；
 - if a device does not work correctly anymore,
本机无法正常工作；
 - if a device was exposed to moisture or rain,
本机受潮或遭到雨淋；
 - if there is condensation of water,
有冷凝水形成；
 - if foreign matters got into the device,
有污染粒子进入本机；
 - if the permitted storing/operating temperature is not reached or exceeded.
存储/工作温度低于或超过允许的温度。

Danger by stroboscopic flashlight

如何避免闪光的危害

If the DRELLOSCOP is set correctly, a periodically moving object (e.g. a rotating machine) is apparently standing still. Persons not knowing this run the risk of reaching into the machine or of being caught by it. Severe or fatal injuries are the result:

在正确的操作下，DRELLOSCOP 1090 频闪检测仪能够获取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 who could stay near to the illuminated area about the functioning of the DRELLOSCOP 1090 and inform them about this danger, which could 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。
- * You must ensure that the illuminated area cannot be accessed by other persons.
非本机操作人员请勿在附近停留。

Installation

安装

The installation procedures described in this manual may only be carried out by specialized personnel. In any case, the relevant electrotechnical regulations must be observed and met. 本机的安装必须由专业人士依据相关规程完成。

Operation

操作注意事项

The air must be able to freely circulate all around the device and the lamps. In case of insufficient ventilation, the device will be overheated. This might result in severe damage to the device and other material damage.

请将本机安装在通风良好的环境，以免影响本机散热，导致机器的损毁。

The ambient temperature for all components may not exceed +40°C. As protection against inadmissible heat radiation you must provide for cooling, if necessary.

请尽量不要在超过+40°C 的环境中使用本机。如本机周围有热源，请配备散热降温装置。

Deviations in mains voltages may only be within the range of tolerance according to the indications of technical data (refer to page 27 and 28). For greater deviations in mains voltages you have to provide for a voltage regulator.

电压偏离应在规定的范围内（见本手册 27 页及 28 页的说明），必要时，可使用电压调节器。

Repair

维修

Do not carry out any repair work. Always contact the after-sales service of DRELLO GmbH & Co. KG. Improper repair might result in personal injury, material damage or damage to the device.

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

The maintenance procedures described in this manual may only be carried out by specialized personnel. In any case, the relevant electrotechnical regulations must be observed and met.

本机的维护必须由专业人士依据相关规程完成；

Only carry out the maintenance work described in this manual. Any further work might result in personal injury, material damage or damage to the device.

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

Safety instructions in this manual are classified in two ways:

本手册中使用的警示符号分为以下等级：

**Danger! 危险!**

Safety instructions the non-compliance of which might result in personal injury are marked by this symbol. This symbol indicates direct danger. The possible results of non-compliance can be death or severe injury.

该符号表示：操作不当可能会导致严重或致命的伤害。

**Caution! 小心!**

This symbol indicates warning notes the non-compliance of which might result in damage to the device or other material.

该符号表示：操作不当可能会导致本机的毁坏。

In some places, notes are indicated by the following symbol:
在一些章节里，会出现下列提示符号：

**Note 建议**

This symbol indicates specific features concerning the handling of the device.

该符号用来提示操作者应注意的特殊事项。

Product Description

产品描述

Functional description

功能说明

The DRELLOSCOP 1090 is a flashlight stroboscope. It supplies pulses to two connected lamps 4049 with very efficient quartz-glass flashtubes which then illuminate the surface of sheet metals or sheet metal coils in the cold rolling mill from both sides with flashes. 本机配有两盏 LE4049 照明灯，其高强度闪光可实现对冷轧钢板上下表面瑕疵的检测。

By means of the flashes, the controlling personnel in the cold rolling mill is able to recognize repeating surface defects such as roller marks, chatter marks, scale coatings or emulsion drops easier and more exactly. When the frequency of the light flashes corresponds with the roller movement and when the light flashes are very short, the impression is given that a motionless error is watched. When the flash frequency is increased, smaller defects begin to "move", i.e. they can be recognized easier or only then.

通过照明灯的高强度闪光，操作工可以清楚的观察到钢板表面的瑕疵，如辊印、颤动擦痕、涂料痕迹或乳状滴痕等。当闪光频率与钢板运动速度实现同步时，钢板表面的瑕疵呈现“静止”状态，这种“静止”只是视觉的错觉；当闪光频率加快时，钢板表面的瑕疵也开始“移动”。

The DRELLOSCOP 1090 is controlled by means of the remote control DRELLOSCOP 1080 FB or 1090 FB, which is part of the delivery. All settings can be made for one lamp or for both at the same time.

本机还配有 DRELLOSCOP 1080 FB 或 1090 FB 控制装置，可实现对本机及照明灯（单盏或双盏）的功能控制。

When the DRELLOSCOP 1090 is switched off, the current settings are stored. These settings are active again when the device is switched on again.

关闭本机后，所有操作可以自动储存，这些操作将在下次开机时被激活。

In addition to the indication of the flash frequency by the number of flashes per second or per minute, the DRELLOSCOP 1090 offers the possibility to set a continuous slow motion sequence.

本机照明灯的闪光频率可以通过显示屏以 sec^{-1} 或 min^{-1} 为单位显示。

By means of an electronic control, you can "shift" the control image or the object to be controlled into the best position for monitoring. In reality, you change the flash time so that another part of the object is illuminated.

通过电子控制，可将运动目标“移位”至最佳位置进行观测。

By means of the Automatic function of the DRELLOSCOP 1090 you can, "in passing" and by pressing one key, activate the set flash function for a period of 2.5 minutes. Then the device will automatically switch the flash function off again.

按下控制装置的“Automatic function”键，可设置 2.5 分钟闪光释放模式；设置完成后，按下任意键即可激活此功能。

The DRELLOSCOP 1090 offers four ways to control the flash frequency:

可以通过下述四种方式控制本机的闪光频率：

- The manual control
通过手动控制；
- The control by means of a voltage proportional to the strip speed and
通过与带钢速度同步的比例电压控制；
- The control by means of a current proportional to the strip speed
通过与带钢速度同步的比例电流控制；
- The control by external pulses.
外部脉冲控制

Different functions are available, depending on the selected type of control.
通过不同的控制方式可以实现不同的控制功能。

Manual control of the flash frequency 闪光频率的手动控制

With the manual control of the flash frequency, the flash frequency is manually set by means of the rotary switch on the remote control. A fine adjustment function for the flash frequency is also provided.

可通过调节控制装置上的旋钮实现对闪光频率的控制；按下“FINE ADJUST”键，可对闪光频率进行微调。

Control of flash frequency by proportional DC voltage 通过比例电压控制闪光频率

When the control is effected by means of the control voltage 0-10 V, a tachometer generator supplies a control voltage proportional to the strip speed, which is used to generate the flash frequency. With this type of control, the flash frequency always corresponds with the strip speed, even if this speed is changed.

将 0-10 V 电压转换为脉冲信号，使闪光频率与带钢速度实现同步。

Control of flash frequency by proportional control current 通过比例电流控制闪光频率

When control is effected by a current of 0-20 mA which is proportional to the strip speed, for example out of a SPC control, the current is converted into DC voltage, of which the flash frequency is generated. By this the flash frequency corresponds to the respective strip speed.

将 0-20 mA 电流转换为脉冲信号，使闪光频率与带钢速度实现同步。

Control of flash frequency by external pulses 通过外部脉冲控制闪光频率

When the control is effected by means of external pulses, a machine signal or a sensor supplies the pulses for the flash frequency. With this type of flash frequency control, the pulses always correspond with the strip speed, even if this speed is changed.

通过机器或传感器发出的脉冲使闪光频率与带钢速度实现同步。

Safety circuitry

安全电路

The stroboscope DRELLOSCOP 1090 is provided with a safety circuitry. By means of the safety circuitry, the power supply unit will be switched off from the mains voltage immediately at inappropriate handling of the strobe system.

本机内置安全电路；不当操作发生时，供电装置的电源会自动切断。

The release of the safety circuitry will be effected by:

出现下述情况时，安全电路将自动启动：

- ⇒ Opening of the cover of the supply unit
当供电装置的机箱门打开时；
- ⇒ Opening of the frames with protective glasses of the lamp units
当照明灯的外壳或保护玻片打开时；
- ⇒ Opening of the cover of the lamp cable connecting boxes
当照明灯电缆连接器件的外壳打开时。

The control current of the safety circuitry will be connected at terminal switches. Switch on of the supply unit can be done only with closed control current.

安全电路的电流控制器与终端开关相连。当电流控制器闭合时，才可以启动供电装置。

The installation positions of the terminal switches:

终端开关安装在下述位置：

- ⇒ Cover of supply unit inside
供电装置机箱的内部
- ⇒ Frame of lamp unit outside
照明灯框架的外部
- ⇒ Cover of lamp cable connecting boxes inside
照明灯电缆连接器件的内部



Caution! 小心!

After opening of the lamp cable connecting boxes the covers has to be closed in the same position!

当照明灯电缆连接器件的外壳被打开后，应按照原位恢复！



Danger! 危险!

It is not admissible to manipulate or to reconcile the safety circuitry. The possible results of non-compliance can be death or severe injury !

请勿对安全电路进行拆装，否则会导致严重或致命的伤害！

The safety circuitry does not disengage service technicians to disconnect the stroboscope from mains voltage before starting with service and maintenance work !"

在进行相关维护之前，请切断本机的主电源！

Opening of the components of the strobe system may be effected only by skilled service technicians, approximately 15 minutes after disconnecting the supply unit from mains voltage !

如需打开机箱，请相关人士在进行操作 15 分钟前切断本机的主电源！

Scope of delivery

供货范围

- | | | |
|---|---|---|
| 1 | Flashlight stroboscope DRELLOSCOP 1090
for 230 V mains supply
DRELLOSCOP 1090 频闪检测仪主机 (230v 供电) | part no. 1.1090.60003
货号: 1.1090.60003 |
| 1 | Remote control DRELLOSCOP 1080 FB or 1090 FB
DRELLOSCOP 1080 FB 或 1090 FB 控制装置 | part no. 1.1090.60002
货号: 1.1090.60002 |
| 2 | Lamps 4049, each with 10 m connection cable
Lamp 4049 照明灯 (带 10 米电缆) | part no.. 1.4049.60001
货号: 1.4049.60001 |
| 2 | Flashtubes 106-1
106-1 闪光管 | part no. 1.B106.20001
货号: 1.B106.20001 |
| 1 | Mains supply cable, 6 m long
主电源电缆 (6 米) | part no. 1.K110.2R006
货号: 1.K110.2R006 |
| 1 | Remote control connection cable, 15 m long
遥控装置连接电缆 (15m) | part no. 1.K138.2R015
货号: 1.K138.2R015 |
| 1 | Connector plug for pulse generator
脉冲发生器用连接插头 | part no. 17.03.008
货号: 17.03.008 |
| 1 | Installation and Operating Manual
安装使用手册 | part no. 1.1090.2B001e
货号: 1.1090.2B001e |

Accessories

供选标准配件

In case of spare part order, the article numbers for standard accessories can be seen from the 'Scope of delivery'.

可参照“供货范围”中所列配件及货号订购所需配件。

Available accessories

可选其它配件

- | | | |
|---|--------------------------|-----------------------|
| 1 | Option 115V mains supply | part no. 1.1090.60003 |
| | 115v 供电型 | 货号: 1.1090.60003 |

Upon request, the following cables can be ordered in other lengths. For doing so, just order:
根据客户要求, 下述电缆长度可作调整:

- | | | |
|---|---|---|
| 1 | Remote control connection cable, xxx m long
(for xxx insert the desired length in metres)
遥控装置连接电缆, xxx 米长
(在 xxx 处填入所需电缆长度) | part no. 1.K138.2Rxxx
货号: 1.K138.2Rxxx |
| 1 | Lamp connection cable, xxx m long
(for xxx insert the desired length in metres)
照明灯连接电缆, xxx 米长
(在 xxx 处填入所需电缆长度) | part no. 1.K154.2Rxxx
货号: 1.K154.2Rxxx |
| 1 | Voltage regulator 2 kVA for 230 V mains supply
电压调节器 (将 2 kVA 调节至 230 V) | on request
应客户要求 |



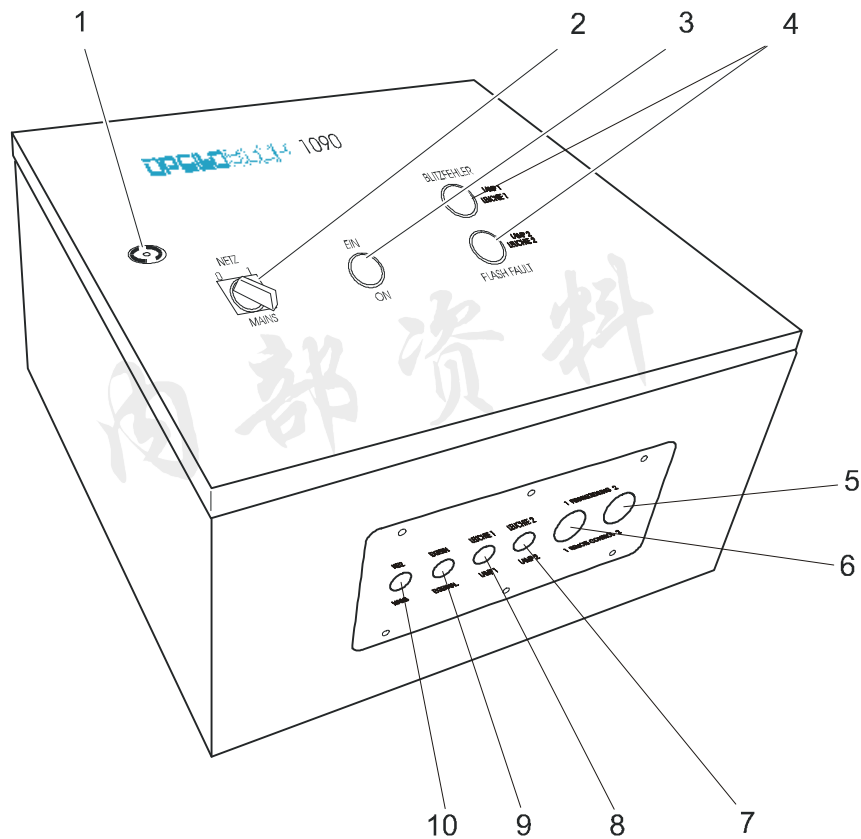
Note 注意

The mounting screws are **not** part of the delivery.

安装中所用螺丝不在供货范围内。

Operating elements and connections

按键及接口说明

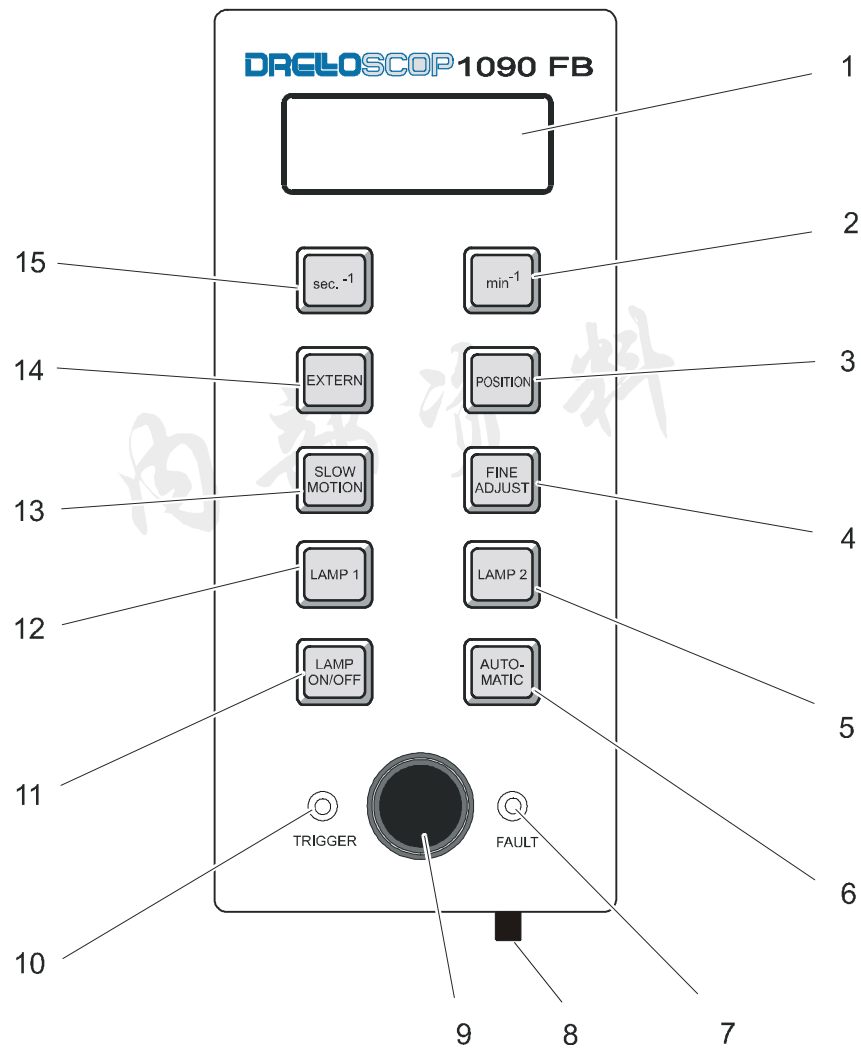


DRELLOSCOP 1090

- 1 Safety housing lock
The device can only be operated when the cover is closed
机箱锁
必须在机箱上锁后对本机进行操作
- 2 Rotary switch **NETZ/MAINS**
for switching the DRELLOSCOP 1090 on and off
旋钮式电源开关 **NETZ/MAINS**
用于启动和关闭 DRELLOSCOP1090
- 3 green LED **EIN/ON**
lights up when the DRELLOSCOP 1090 is switched on
绿色指示灯 **EIN/ON**
启动 DRELLOSCOP1090 时，灯亮
- 4 2 red LED **BLITZFEHLER/FLASH FAULT**
light up when an error occurred during flash generation.
2 盏红色指示灯 **BLITZFEHLER/FLASH FAULT**
闪光信号出现故障时，灯亮

- 5 Socket **FERNBEDIENUNG/REMOTE CONTROL 2** (Option)
for the connection of a second remote control 1080 FB or 1090 FB
遥控装置插口 2 **FERNBEDIENUNG/REMOTE CONTROL 2**
连接遥控装置 2
- 6 Socket **FERNBEDIENUNG/REMOTE CONTROL 1**
for the connection of the remote control 1080 FB or 1090 FB
遥控装置接口 1 **FERNBEDIENUNG/REMOTE CONTROL 1**
连接遥控装置 1
- 7 Cable entry **LAMP 2**
for connection of the second lamp 4049
电缆接口 **LAMP 2**
连接 LE4049 照明灯 2
- 8 Cable entry **LAMP 1**
for connection of the first lamp 4049
电缆接口 **LAMP 1**
连接 LE4049 照明灯 1
- 9 Socket **EXTERN** with 7 poles
for connection of the pulse generator for external control
7 针接口 **EXTERN**
连接脉冲发生器，进行外部控制
- 10 Socket **NETZ/MAINS**
for the connection of the mains supply cable
主电源电缆接口 **NETZ/MAINS**
连接主电源

Remote control DRELLOSCOP 1080 FB or 1090 FB



- 1 **Display**
for the indication of the selected settings
显示屏
显示设置数值
- 2 **Key *min*⁻¹**
for the indication of the number of flashes per minute
***min*⁻¹键**
选择每分钟的闪光次数
- 3 **Key *POSITION***
to shift the image electronically
***POSITION*键**
实现电子移像

- 4 **Key *FINE ADJUST***
for fine adjustment of the flash frequency with manual control, of the position and of the slow motion frequency
***FINE ADJUST* 键**
微调闪光频率
- 5 **Key *LAMP 2***
for the activation of the second flashlight. The flash operation is switched on and off by means of LAMP ON/OFF
***LAMP 2* 键**
开启或关闭 LAMP 2
- 6 **Key *AUTOMATIC***
for the activation of the flash operation for 2.5 minutes
***AUTOMATIC* 键**
设置 2.5 分钟闪光释放模式
- 7 **red LED *FAULT***
lights up in case of a flash error
红色指示灯 *FAULT*
闪光信号出现故障时，灯亮
- 8 **Flash potentiometer**
for setting of the flash intensity
闪光电位器
设置闪光强度
- 9 **Rotary knob**
for setting the flash frequency with manual control, the desired image *POSITION* and the *SLOW MOTION* function
旋钮
手动控制频率，或设置最佳图像位置，或设置慢动功能
- 10 **green LED *TRIGGER***
lights up when external pulses are applied
绿色指示灯 *TRIGGER*
有外部脉冲信号时，灯亮
- 11 **Key *LAMP ON/OFF***
for switching the flash operation on and off
***LAMP ON/OFF* 键**
控制闪光的开关

12 **Key LAMP 1**

for the activation of the first flashlight The flash operation is switched on and off by means of LAMP ON/OFF

LAMP 1 键

开启或关闭 LAMP 1

13 **Key SLOW-MOTION**

for setting an apparent image sequence (slow motion effect) with external pulse control

SLOW-MOTION 键

在外部脉冲控制下，实现慢动功能

14 **Key EXTERN**

for switching between external and manual control.

The external control is active when the key lights up.

The manual control is active when the key does not light up.

EXTERN 键

实现外部控制和手动控制的切换

外部控制时，按键灯亮；

手动功能时，按键灯不亮

15 **Key sec⁻¹**

for the indication of the number of flashes per second

sec⁻¹ 键

选择每秒钟的闪光次数



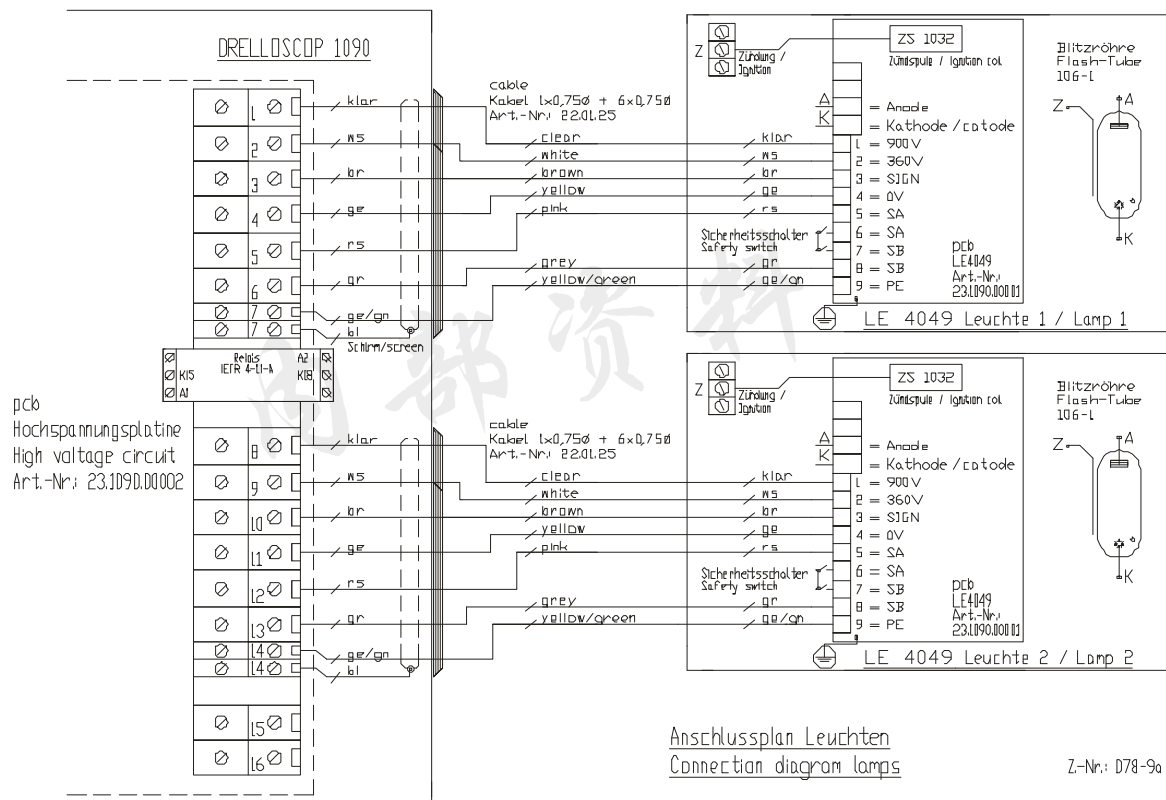
Note 注意

Activated function keys light up.

实现按键所示功能时，按键灯亮。

Connection of the Lamps

照明灯接线图



Pin assignment between DRELLOSCOP 1090 and Remote control 1080 FB or 1090 FB
DRELLOSCOP 1090 频闪检验仪主机与 1080 FB 或 1090 FB 控制装置的连接设置

Pin 接口	Assignment 连接端	Direction 输入/ 输出	Level 电压等级
1	Supply voltage 供电电压	Output 输出	+12 V –
2	Supply voltage 供电电压	Output 输出	+12 V –
3	Supply voltage 供电电压	Output 输出	0 V –
4	Supply voltage 供电电压	Output 输出	0 V –
5	external control frequency 外部控制频率	Pulse 脉冲	12 V , 2 KHz max.
6	external control frequency 外部控制频率	Pulse 脉冲	12 V , 2 KHz max.
7	Housing ground 外壳接地	GND 接地	0 V
8	free		
9	Input frequency fi 输入频率	GND 接地	0V
10	Lamp failure 照明灯故障		12 V
11	Analogue control voltage 模拟控制电压	Output 输出	0 ...10 V
12	Housing ground 外壳接地		GND
13	Housing ground 外壳接地		GND
14	Analogue control voltage 模拟控制电压	GND 接地	0V
15	Recovery phase of the lamps 照明灯相位恢复		12 V, not used at present
16	Lamps on/off 照明灯开/关	Input 输入	1080FB: 12 V pulse, 350 ms approx. 1090FB: not used

17	Input frequency fi 输入频率		Pulse, 30V max.
18	Housing ground 外壳接地	GND 接地	
19	Light intensity control voltage 闪光强度控制电压	Input 输入	0 ... 5V
20	Supply voltage 供电电压	Output 输出	+12 V –
21	Lamp 1 On/Off 照明灯 1 开/关	Input 输入	12 V
22	Lamp 2 On/Off 照明灯 2 开/关	Input 输入	12 V
23	Control bus RS485.A 控制总线 RS485.A	Input / output 输入/输出	-7 ... +12V
24	Control bus RS485.B 控制总线 RS485.B	Input / output 输入/输出	-7 ... +12V

仅供参考

Pin assignment EXTERN/EXTERNAL**外部控制的连接设置**

External control by analogue voltage and control frequency

通过模拟电压及控制频率实现外部控制

Pin 接口	Assignment 连接端	Direction 输入/ 输出	Level 电压等级
1		Output 输出	+12 V via $R_i = 10\text{ k}\Omega$
2	Pulse input 脉冲输入	Input 输入	Pulse 0.6 ... 30 V $R_i = 100\text{ k}\Omega$
3	Analogue voltage 模拟电压	GND 接地	0V
4	Pulse input 脉冲输入	GND 接地	0V
5	Analogue voltage 模拟电压	Input 输入	0 ... 10 V, $R_i = 100\text{ k}\Omega$
5	Analogue current 模拟电流	Input 输入	0...20 mA with external resistor of 500 Ohm between connection 3 and 5
6		Output 输出	+12 V via $R_i = 470\text{ k}\Omega$
MP	Protective conductor 保护导体		

Installation and connection

安装及连接

Preparation

准备



Caution! 小心!

Always select an installation site where the device is not exposed to extreme temperatures or extreme humidity. The ambient temperature must be between 0 and 40 °C.

请将本机置于 0-+40°C 的环境中，勿将本机置于极端温度或极端湿度环境中。

Always make sure that the mains voltage corresponds with the supply voltage shown on the nameplate.

请在铭牌上标识的额定电压范围使用本机。

Intensive ambient light should be avoided so that the performance of the DRELLOSCOP 1090 can be utilized well.

为获得最佳的闪光照射效果，请勿在强光环境使用本机。

Never expose the device and the peripheral devices to vibrations or impacts.

勿将本机置于有强烈机械振动之处。

Wall-mounting of the DRELLOSCOP 1090

主机的壁挂式安装

The DRELLOSCOP 1090 has been designed for wall-mounting and is delivered with four suitable angle brackets with bore holes for screws M8.

DRELLOSCOP 1090 频闪检测仪主机配有角形托座及 M8 螺丝钻孔，特别适合于挂墙式安装。

- * Mount the DRELLOSCOP 1090 with the angle brackets and suitable screws to the wall.

通过角形托座及安装螺丝将 DRELLOSCOP 1090 频闪检测仪主机挂在墙上；

- * Finally check that all screws are tightened properly.

最后检查一下螺丝是否拧紧。

Installation of the lamps 4049

LE4049 照明灯的安装

The lamps must be installed at a distance of approx. 1.5 ...2.5 m from the running rolling strip in order to ensure a uniform distribution of light.

为获得均匀的照明效果，照明灯必须安装在距离钢板表面 1.5 —2.5 米的位置。

If you loosen the lateral mounting screws, you can continuously adjust the incidence angle in order to achieve a non-dazzling view to the rolling strip.

可通过调整照明灯侧面的安装螺丝改变照明灯的照射角度，以减少钢板上的反光。

For operation, the lamps must be closed.

安装时，必须保证照明灯处于关闭状态。

In case the safety circuit is not closed, because only one of the two lamps has been connected, the stroboscope does not work.

在安全电路开启的情况下，两盏照明灯中只有一盏灯处于连接状态，此时，本机无法正常工作。

Installation of the remote control 1080 FB or 1090 FB

1080 FB 或 1090 FB 控制装置的安装

If possible, the remote control should be installed at the place from where you visually control the surface of the rolling strip. You can either mount the device to the wall by means of fixtures or you can safely fix it at a steel housing by means of the magnet at the underside of the device.

请尽量将控制装置安装在便于观测钢板的位置。可通过支架将控制装置挂在墙上，也可将控制装置吸附在钢质机架上。

Connection of peripheral devices

外围装置的安装



Danger by electric current!

小心触电！

There are residual voltages on the capacitors in the interior of the DRELLOSCOP 1090 and of the lamps, which mean danger to life! Before opening the devices, disconnect the DRELLOSCOP 1090 from the mains and wait for at least 15 minutes to have the voltages reduced.

如需打开本机机箱，请相关人士在进行操作 15 分钟前切断本机主电源！
请注意在本机及照明灯的电容器内会有残余电荷，小心触电！

- * Connect the lamp and, if applicable, the pulse generator and other peripheral devices in accordance with the respective Installation and Operating Manuals.

请按照本手册要求连接照明灯、脉冲发生器及其它外围装置；

- * Connect the numerical marked connection wires of the lamps to the intended series connectors in the supply unit.

请按照照明灯连接电缆的编码将其与主机连接器对应连接；

- * Insert the plugs of the connecting cable for the remote control into the socket *FERNBEDIENUNG/REMOTE CONTROL* of the DRELLOSCOP 1090 and of the remote control and tighten them.

请将控制装置连接电缆的插头分别插入主机 *FERNBEDIENUNG/REMOTE CONTROL* 及控制装置的插槽中，同时检查插头是否插紧；

- * If applicable, insert the plug of the connecting cable for the pulse generator of the tachometer generator or of the current control into the socket *EXTERN/EXTERNAL* and tighten it.

请将脉冲发生器连接电缆的插头插入 *EXTERN/EXTERNAL* 插槽，同时检查插头是否插紧；

- * Connect the mains cable plug with the mains supply connection *NETZ MAINS*.

请将主电源电缆插头插入主机 *NETZ MAINS* 插槽；

- * Connect the mains cable with the mains supply.

接通主电源；

The DRELLOSCOP 1090 is ready for operation.

本机可以开始工作。

Switching on/off

开机/关机



Danger by electric current! 小心触电!

After the connection, always make sure that the cables are not bent, squeezed or otherwise damaged.

请勿过度挤压连接电缆而使其发生变形或损坏。

Only switch the device on after all desired connections have been established and have been checked for tight seat.

请在确认所有电缆均连接到位后再开启本机。

- * Set the toggle switch of the DRELLOSCOP 1090 to position **I** in order to switch the device on.

The green LED *EIN/ON* directly next to the toggle switch lights up.

将开关调至 **I** 位置，即可开启本机，此时绿色 LED *EIN/ON* 灯亮；

- * Set the toggle switch to position **0** in order to switch the device off. The green LED *EIN/ON* directly next to the toggle switch goes out.

将开关调至 **0** 位置，即可关闭本机，此时绿色 LED *EIN/ON* 灯灭。

Operation

操作说明

Prior to the operation, all connections to the peripheral devices must have been established checked for tight seat.

请在确认所有电缆均连接到位后再开启本机。

The DRELLOSCOP 1090 and all peripheral devices must be switched on.

开启本机后，请同时确认所有外围装置均已开启。

- * Switch the device on, see section above.

关于如何开启本机，请参照上一章最后一节说明；

When the green LED *EIN/ON* of the DRELLOSCOP 1090 and the *TRIGGER* of the remote control 1080 FB or 1090 FB (only with external pulse control) light up, the system is ready for operation.

看到绿色 LED *EIN/ON* 灯亮后，请同时确认 1080 FB 或 1090 FB 控制装置 *TRIGGER* 灯是否发出亮光（仅在外部脉冲控制模式），如果 *TRIGGER* 灯亮，可确定本机可以开始工作。

Control of the lamps

照明灯的控制

By means of the remote control one or both lamps, as required, can be switched on/off and the flash frequency can be controlled.

按下控制装置上的 **LAMP 1** 键，或 **LAMP 2** 键，亦或同时按下两键，便可选择 **LAMP 1** 工作，或 **LAMP 2** 工作，亦或两盏灯同时工作。

- * Activate the lamp/s by selecting key *LAMP 1*, *LAMP 2* or both keys. The key of the selected lamp lights up.

按下控制装置上的 **LAMP 1** 键，或 **LAMP 2** 键，亦或同时按下两键后，按键会发出亮光。

- * The flash operation is switched on or off by pressing the key *LAMP ON/OFF*. The key lights up when the flash operation is switched on.

按下控制装置上的 **LAMP ON/OFF** 键，照明灯便开始或停止工作；当照明灯处于正常工作状态，连续发出闪光时，**LAMP ON/OFF** 键会发出亮光。

Now you can make the desired settings for the lamp/s.

请根据实际情况选择工作照明灯的数目。

On the bottom end of the remote control there is a potentiometer beside the connection socket, by which the light intensity can be set. By turning it to the very right, the highest light intensity is set, by turning to the very left, the lowest light intensity is set.

在控制装置的底部安装有电位器，可以用来设定照明灯闪光的强度。调至最右端时，闪光强度设置为最高；调至最左端时，闪光强度设置为最低。

Activation of flash automatic

自动闪光释放

After you have made all required settings for an optimum control, you can activate the flash operation for a period of 2.5 minutes by means of the key *AUTOMATIC* in order to carry out visual control. After 2.5 minutes, the flash operation will be switched off. However, it can be activated immediately again, if required.

按下 *AUTOMATIC* 键后，可设置 2.5 分钟闪光释放模式；设置完成后，按下任意键即可激活此功能。

内部资料

仅供参考

Manual control of flash frequency

闪光频率的手动控制

This function is active when the key *EXTERN* on the remote control **does not** light up. With manual control, the flash frequency is set by means of the rotary knob.

开机后，本机将自动进入手动控制模式（在此模式下，控制装置的 *EXTERN* 键不亮）；在此模式下，闪光频率可以通过控制装置上的旋钮进行调节。

- * Press the key *EXTERN* when it lights up.
The key does not light up anymore and the manual control is activated.
在手动控制模式下，控制装置的 *EXTERN* 键不亮。
- * On running strip until periodic repeating faults on the strip surface appear to stand still.
当闪光频率与钢板运动速度实现同步时，钢板表面的瑕疵呈现“静止”状态。
- * Adjust the flash frequency so that the errors can be inspected well.
请通过旋钮调节闪光频率，直至可以清楚地观察到钢板表面的瑕疵。

Fine adjustment

闪光频率的微调

With manual control, the flash frequency can be fine-adjusted. For doing so:
在手动控制模式下，可通过下述方式微调闪光频率：

- * Press the key *FINE ADJUST*.
The key lights up. The function is activated;
按下 *FINE ADJUST* 键，激活微调功能，此时，*FINE ADJUST* 键发出亮光。
- * Make the desired fine adjustment of the flash frequency by turning the rotary knob.
通过调节旋钮获得期望的闪光频率；
- * Press the key again in order to deactivate the function.
The light in the key goes out.
再按一下 *FINE ADJUST* 键，即可关闭微调功能，此时，*FINE ADJUST* 键无亮光。



Note 注意

If the strip speed varies, the flash frequency must always be readjusted manually. Therefore it is recommended to use an external pulse generator which automatically adapts the flash frequency to the strip speed.

如果钢板不是作匀速运动，操作工则需要根据钢板的速度变化随时手动调节闪光频率，以获得良好的观察效果。在这种情况下，强烈推荐使用脉冲发生器，使闪光频率与钢板速度实现同步；

Alternatively it is recommended to control the flash frequency by tachometer voltage or control current proportionally to the strip speed.

亦可通过比例电压或比例电流控制闪光频率，使其与钢板速度实现同步。

Control of flash frequency by proportional control voltage

通过比例电压控制闪光频率

This function is active when the key *EXTERN* on the remote control 1080 FB or 1090 FB lights up and when no external pulses are applied. With this type of flash frequency control you will get the desired still or the desired slow motion sequence when the strip speed changes.

按下控制器的 *EXTERN* 键，激活外部控制功能，此时，*EXTERN* 键发出亮光，即可通过比例电压控制闪光频率，观察到钢板表面的瑕疵呈现“静止”或慢速运动状态。



Note 注意

With a control voltage of 0V, a flash frequency of 60 Hz is set and with a control voltage of 10V, a frequency of 130 Hz is set.

当控制电压为 0V 时，可获得 60 Hz 的闪光频率；当控制电压为 10V 时，可获得 130 Hz 的闪光频率。

- * Activate the key *EXTERN* by pressing it.
The external control is activated when the key *EXTERN* lights up.

按下控制器的 *EXTERN* 键，激活外部控制功能，此时，*EXTERN* 键发出亮光。

Flash frequency and strip speed are synchronous.

当闪光频率与钢板运动速度实现同步时，

The errors to be controlled are apparently standing still.

钢板表面的瑕疵呈现“静止”状态。

Control of flash frequency by external pulses

通过外部脉冲控制闪光频率

This function is active when the key *EXTERN* on the remote control 1080 FB or 1090 FB lights up. With external control, the pulses for the flash frequency are for example supplied by a proximity initiator or by a photoelectric path sensor. With this type of flash frequency control you will get the desired still or the desired slow motion sequence when the strip speed changes.

按下控制器的 *EXTERN* 键，激活外部控制功能，此时，*EXTERN* 键发出亮光，即可通过接近触发装置或光电传感器控制闪光频率，观察到钢板表面的瑕疵呈现“静止”或慢速运动状态。



Note 注意

Flashes will not be triggered in the case of control pulses with a frequency smaller than 60 s^{-1} and greater than 2080 s^{-1} .

当控制脉冲的频率小于 60 s^{-1} 或大于 2080 s^{-1} 时，闪光不能被触发。

- * The input frequency is divided automatically by 1; 2; 3; 4; 8 or 16, that results in a flash frequency between 65 and 130 Hz.

输入频率自动除以 1; 2; 3; 4; 8 或 16，这样，获得的闪光频率值在 65—130 Hz 之间

- * Activate the key *EXTERN* by pressing it.
The external control is activated when the key *EXTERN* lights up.

按下控制器的 *EXTERN* 键，激活外部控制功能，此时，*EXTERN* 键发出亮光。

Flash frequency and pulses are synchronous.

当闪光频率与脉冲信号实现同步时，

The strip to be controlled is apparently standing still.

钢板表面的瑕疵呈现“静止”状态。

Switching the slow motion function on

激活慢动功能

By means of the key *SLOW MOTION* and the rotary knob you can set with low speed a continuous apparent motion of a possible fault on the strip. The eye sees this as a slow motion sequence. For doing so:

可通过 *SLOW MOTION* 键及旋钮实现慢动功能，通过此功能，可使操作工观察到钢板上的瑕疵呈现连续慢动的状态。具体操作如下：

- * Press the key *SLOW MOTION*.
The key lights up.
按下控制器的 *SLOW MOTION* 键，此时，*EXTERN* 键发出亮光；
- * Set the slow motion speed by turning the rotary knob.
通过调节旋钮获得期望的慢动速度。

Fine adjustment

闪光频率的微调

With the slow motion function, the flash frequency can be fine-adjusted. For doing so:
在慢动模式下，可通过下述方式微调闪光频率：

- * Press the key *FINE ADJUST*.
The key lights up. The function is activated.
按下 *FINE ADJUST* 键，激活微调功能，此时，*FINE ADJUST* 键发出亮光。
- * Make the desired fine adjustment of the flash frequency by turning the rotary knob.
通过调节旋钮获得期望的闪光频率；
- * Press the key again in order to deactivate the function.
The light in the key goes out.
再按一下 *FINE ADJUST* 键，即可关闭微调功能，此时，*FINE ADJUST* 键无亮光。

Shifting of the control image

移相功能

You can "shift" the strip to be controlled into the position which is best for monitoring. In reality, you change the flash time so that another part of the strip is illuminated. For doing so:

通过移相功能，操作工可将钢板上的瑕疵移至期望的位置进行观测，具体操作如下：

- * Press the key *POSITION*.
The key lights up.

按下控制器的 *POSITION* 键，此时，*POSITION* 键发出亮光；

- * Set the desired position by turning the rotary knob.

通过调节旋钮获得期望的相位。



Note 注意

If the key *POSITION* is not activated, the previously set shift remains active.

如不再次按下 *POSITION* 键，之前所设置的相位仍处于激活状态。

Fine adjustment

相位的微调

The position of the errors can be fine-adjusted. For doing so:
钢板上瑕疵的相位可通过下述方式微调：

- * Press the key *FINE ADJUST*.
The key lights up. The function is activated.

按下 *FINE ADJUST* 键，激活微调功能，此时，*FINE ADJUST* 键发出亮光。

- * Set the desired position by turning the rotary knob.

通过调节旋钮获得期望的相位。

- * Press the key again in order to deactivate the function.
The light in the key goes out.

再按一下 *FINE ADJUST* 键，即可关闭微调功能，此时，*FINE ADJUST* 键无亮光。

Maintenance

维护

Apart from cleaning the glass pane at regular intervals and changing the flashtube, the DRELLOSCOP 1090 is maintenance-free.

本机的日常维护极其简单，如：定期擦拭照明灯玻璃及更换灯管。

Prior to each operation, carefully check the cabling for safety and firmly fixed connections. Have a damaged cable replaced immediately.

同时，需定期检查电缆是否连接到位，电缆是否有破损；如发现有电缆破损，请立即更换。

Failures – causes and remedy

故障—原因及其排除措施

This section deals with failures, possible causes and remedies concerning the DRELLOSCOP 1090. Never carry out any repair work which is not described in this section.

对于表格里列出的故障，请相关人士参照对应的排除措施进行操作；

For all other failures, always contact

DRELLO GmbH & Co. KG.

如需排除未列出的故障，请直接联系 DRELLO 公司。

Failure 故障描述	Possible cause 可能原因	Remedy 措施
The flashtubes do not flash, the LEDs <i>EIN/ON</i> and <i>BLITZFEHLER/FLASH FAULT</i> do not light up. 无闪光， LEDs <i>EIN/ON</i> 键和 <i>BLITZFEHLER/FLASH FAULT</i> 键都不亮。	Power supply interrupted. 电源没有连接好 The cover of the housing is not closed correctly, i.e. the safety switch is not switched on. 机箱门没有关好。	Check the cable connections. Make sure that the unit is switched on. 检查电缆连接状况。 检查本机是否开启。 Check if the device is switched on. 检查本机是否开启。 Close and lock the cover properly. 检查机箱门是否关好。
One of the flashtubes does not flash or flashes irregularly. The LED <i>FLASH FAULT</i> lights up. 无闪光或闪光不正常， LED <i>FLASH FAULT</i> 灯亮。	The flashtube is worn or defective. 灯管损坏。	Replace the flashtube 更换新灯管。

Failure 故障描述	Possible cause 可能原因	Remedy 措施
<p>After replacement the flashtube does not flash or flashes irregularly. The LED <i>FLASH FAULT</i> lights up again.</p> <p>更换新灯管后，仍无闪光或闪光不正常，LED <i>FLASH FAULT</i> 灯亮。</p>	<p>The cable connection between lamp and defective flashtube is not correct, for example no tight connection.</p> <p>照明灯电缆连接出现故障。</p>	<p>First step: Check the cable and cable connections in the cable box on the supply unit and the lamp.</p> <p>第一步： 检查主机及照明灯的连接电缆；</p> <p>Second step: Exchange the connection cables between the two lamps. Connect connecting cable of lamp I to the terminals of lamp II and connecting cable of lamp II to the terminals of lamp I.</p> <p>第二步：互换两盏照明灯的连接电缆。</p>
<p>After exchange of the connecting cables of both lamps the lamp with the irregularly or not flashing tube still does not work properly.</p> <p>The LED <i>FLASH FAULT</i> lights up again.</p> <p>互换两盏照明灯的连接电缆后，仍无闪光或闪光不正常，LED <i>FLASH FAULT</i> 灯亮。</p>	<p>The ignition coil incorporated in the connection box of the lamp is defective.</p> <p>照明灯的点火线圈损坏。</p>	<p>Contact DRELLO either by fax: +49-2161-909-700 or by eMail: service@drello.de</p> <p>通过传真：+49-2161-909-700 或电邮： service@drello.de，直接联系 DRELLO 公司</p>
<p>Both flashtubes flash irregularly or do not flash at all at external synchronisation. The LED <i>FLASH FAULT</i> does not light up.</p> <p>在外部控制模式下，无闪光或闪光不正常，LED <i>FLASH FAULT</i> 灯不亮。</p>	<p>Incorrect control pulses at external synchronisation.</p> <p>脉冲信号出现问题。</p>	<p>Check external control signal (DC voltage, control current or electric pulses)</p> <p>检查外部控制信号（直流电压，控制电流或电子脉冲）。</p>
<p>After checking the external control signal both flashtubes flash irregularly or do not flash at all. The LED <i>FLASH FAULT</i> does not light up.</p> <p>检查外部控制后，仍无闪光或闪光不正常，LED <i>FLASH FAULT</i> 灯不亮。</p>	<p>Control circuit for external synchronisation is defective.</p> <p>外部同步控制电流出现故障。</p>	<p>Contact DRELLO either by fax: +49-2161-909-700 or by eMail: service@drello.de</p> <p>通过传真：+49-2161-909-700 或电邮： service@drello.de，直接联系 DRELLO 公司</p>

Replacing the flashtube of the lamp 4049

如何更换 Lamp 4049 照明灯灯管

The flashtube is behind the glass covering of the lamp 4049. During the replacement, always wear cotton gloves in order to prevent injury and to protect the flashtubes. 请务必戴上棉线手套更换 Lamp 4049 照明灯灯管，以免受伤，同时也可保护灯管。

Danger of burning! 小心烫伤！



During the operation, the lamp and especially the flashtubes get extremely hot. After switching off, wait for at least 15 minutes so that the housing and the flashtubes can cool down.

本机工作时，照明灯特别是灯管会变得很热，请在关闭照明灯 15 分钟且确认灯管已经冷却后，再进行操作。

Danger by electric current! 小心触电！

On the capacitors in the interior of the lamps there are residual voltages, which mean danger to life! Before you open the lamps, disconnect the DRELLOSCOP 1090 from the mains and wait for at least 15 minutes to have these voltages reduced.

在照明灯电容器内部会有残余电荷，小心触电！请在进行操作 15 分钟前切断本机的主电源，并稍等一段时间后再卸下照明灯的前玻片。

Caution! 小心！



Always ensure sufficient grounding in order to avoid electrostatic discharging. In the device there are electronic components which could be destroyed by electrostatic 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。

The frame with the safety glass pane is connected with the lamp housing by means of two screws. In the case of overhead mounting, the glass frame can, when the lamp is opened, swing downward and cause injury.

将照明灯前玻片卸下更换灯管后，请将前玻片复位，同时确认螺丝已拧紧。

Touch the flashtubes with cotton gloves only in order to avoid injury due to broken glass and fingerprints on the glass.

请务必戴上棉线手套更换灯管，以免受伤，同时也可防止在灯管上留下指纹印。

- * Disconnect the DRELLOSCOP 1090 from the mains and protect it against unintentional starting.

请断开本机主电源；

- * Let the lamp cool down for at least 15 minutes.

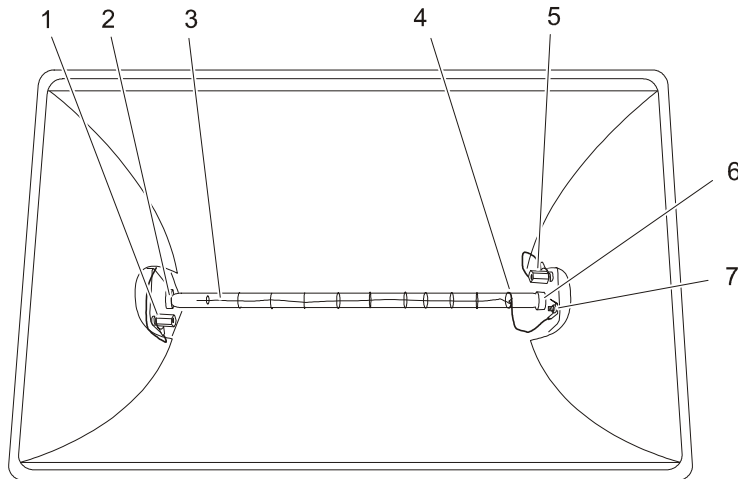
确保照明灯的冷却时间超过 15 分钟；

- * Ensure that the lamp and the flashtubes cooled down.

确保照明灯和灯管完全冷却；

- * Unlock the snaps on the lamp by means of a suitable tool (e.g. 5mm screwdriver) and carefully open the lamp.

使用合适的工具（如 5mm 螺丝起子）打开照明灯。



1 Anode connection line flashtube

灯管正极连接线

2 Anode contact

正极触点

3 Flashtube

灯管

4 Ignition connection

点火接头

5 Cathode connection line flashtube

灯管负极接线

6 Cathode contact

负极触点

7 Ignition connection line

点火连接线

- * Carefully take off the ignition connection line of the flashtube from the ignition connection and loosen the anode contact and the cathode contact by means of a wrench.

将灯管的点火连接线从点火接头处移开，再使用扳手将灯管与正极触点和负极触点分离；

- * Push the flashtube into one direction of the longitudinal axis until the brass connection of the tube is free.
手持灯管的一端，将其纵向抬起，使灯管另一端从触点处移出；
- * Carefully lift the flashtube on the free side and remove it from the lamp.
再慢慢将灯管从另一触点处移出；
- * Insert the new flashtube into the socket so that the ignition connection line is on the side of the flashtube at which the ignition connection is located.
将新灯管的一端放入插槽，使其点火连接线与点火接头对接；
- * Press the flashtube into the socket until the other end of the flashtube can slide into the opposite socket.
再将新灯管的另一端放入对应插槽；
- * Connect the ignition connection line with the ignition connection again and tighten the anode and the cathode connection.
使新灯管另一端的点火连接线与点火接头对接，同时检查灯管是否与正极触点和负极触点连接到位；
- * Check that the cable does not contact the flashtube and the reflector.
请确认接线没有与灯管和反光镜接触；
- * Position the wire 5 and 7 in a distance of min. 15 mm to each other because of the high voltage of the ignition wire.
请确认接线 5 和接线 7 至少保持 15 mm 的距离，以避免点火线的电压过高；
- * Lock the frame with the protective glass by means of the snaps.
请将照明灯的前玻片复位；
- * Move the lamp into its operating position, if required.
再将照明灯复位；
- * Connect the mains supply of the DRELLOSCOP 1090 again.
接通本机主电源；
- * Put the DRELLOSCOP 1090 into operation.
本机可以开始工作。

Replacing a fuse

如何更换保险丝

The DRELLOSCOP 1090 is provided with seven fuses.:

本机配有下述保险丝:

1 x 10 AT	for 230 V
1 x 10 AT	配 230v 供电型;
2 x 10 AT	for 115 V
2 x 10 AT	配 115v 供电型;
1 x 1 AT	for the control voltage power supply unit
1 x 1 AT	配主机控制电压电路
2 x 4 AT	one for each lamp
2 x 4 AT	一盏照明灯各配一根

The fuses are located in the interior of the device. The three 10A and the 1A fuses are located at the upper right side of the large printed circuit board. The both 4A fuses are located at the bottom side of the printed circuit board beside the connecting terminals. 上述保险丝安装在本机内部，其中 3 根 10A 保险丝及 1 根 1A 保险丝安装在印制电路板的右上方，另外两根 4A 保险丝安装在印制电路板底部靠近连接终端的位置。

You have to open the device in order to replace these fuses. The housing may only be opened by specialised personnel (electricians) and only for the purpose of replacing the fuses.

如需要更换上述保险丝，则必须由相关人士（如专业电工）打开本机完成相应的操作。



Danger by electric current! 小心触电!

All fuses of the device may only be replaced by specialised personnel (electricians). In any case, the relevant electrotechnical regulations must be observed.

如需更换保险丝，请相关人士（如专业电工）依据相关规程操作完成。

Danger by electric current! 小心触电!

First, disconnect the device from the mains supply and from all other devices, and protect against restoring of power.

更换保险丝前，请切断主电源，同时，请切断本机与外围装置的连接，还需小心电容器内的残余电荷。

Danger by electric current! 小心触电!

Hazard! The capacitors in the device are current-carrying! Prior to opening the device, disconnect it from the mains supply and wait for 15 minutes, so that the voltage is reduced.

请小心本机电容器的残余电荷！请在进行操作 15 分钟前切断本机的主电源。



Caution! 小心!

Check why the defect was caused before a new fuse is inserted.

换上新保险丝的同时请查明旧保险丝的损坏原因。

Caution! 小心!

Always ensure sufficient grounding in order to avoid electrostatic discharging. In the device there are electronic components which could be destroyed by electrostatic discharging.

请确保本机接地良好，以免放电电流损坏本机的电子元件。

*

- * Ensure that the device is disconnected from mains supply and from all other devices.
更换保险丝前，请确认已经切断主电源，同时，请确认已经切断本机与外围装置的连接；
- * Unlock the housing cover by means of the delivered toggle wrench, open the housing cover and secure it.
请使用随机的钥匙打开本机的机箱。

The fuses are in one fuse carrier each on the main board below the two light-grey flat cables.

本机的保险丝安装在主板下面两根浅灰色扁排线下方的保险丝座处。



Caution! 小心!

Only use fuses according to the technical data with the dimension 5×20 mm.

请使用尺寸为 5×20 mm 的保险丝。

- * Take the defective fuse out of the fuse carrier.
将损坏的保险丝移出保险丝座；
- * Insert a new fuse with the correct values and insert the carrier again. Then check that it fits in properly.
再将一根新保险丝插入保险丝座，并检查是否安装到位；
- * Close the housing cover and lock it by means of the toggle wrench.
使用随机扳手将机箱外壳复位；
- * Connect the DRELLOSCOP 1090 with the peripheral devices again.
再将本机与外围装置连接；
- * Check if all cable connections are tight and connect the device with the mains supply again.
检查电缆是否连接到位，之后接通主电源。

Appendix

附录

Repair

维修

For any repair of the DRELLOSCOP 1090 please contact:
Drello 公司维修部的联系方式如下:

DRELLO GmbH & Co. KG

After-sales-service

Max-Reger-Strasse 35a

D-41179 Mönchengladbach

Phone +49-(0)2161-909-6

Telefax +49-(0)2161-909-700

E-mail service@drello.de

Technical data

技术参数

DRELLOSCOP 1090

Supply voltage	230 V ($\pm 10\%$), 40 ... 60 Hz or (optional) 115 V ($\pm 10\%$), 40 ... 60 Hz
供电电压:	230 V ($\pm 10\%$), 40 ... 60 Hz 或 115 V ($\pm 10\%$), 40 ... 60 Hz (可选)
Power input	1600 W max.
输入功率:	1600 W max.
Current consumption	7 A max. at 230 V
电流消耗:	7 A max. at 230 V
Device fuses, inside (5 × 20 mm)	3 × 10 AT 250 V 1 × 1 AT 2 × 4 AT
保险丝: (5 × 20 mm) :	3 × 10 AT 250 V 1 × 1 AT 2 × 4 AT
Input external control	1 × Socket, 7 poles
外部控制接口:	7 针插槽, 数量 1
Connection for the remote control	1 × Socket, 24 poles 2 × Socket, 24 poles (Option)
控制装置连接接口:	24 针插槽, 数量 1 或 24 针插槽, 数量 2 (可选)
Display of remote control	5-digit
控制装置的显示器:	5 位
Automatic flash operation	switches off after 2.5 minutes
自动闪光功能:	闪光释放 2.5 分钟后自动关闭
Phase shifting	0 ... 360°
移相:	0 ... 360°

Slow motion control 慢动控制:	-9.5 ... 0.002 Hz and 0.002 ... 9.5 Hz -9.5 ... 0.002 Hz 和 0.002 ... 9.5 Hz
External control frequency 外部控制频率:	60 ... 2080 Hz 60 ... 2080 Hz
Flash energy 闪光能量:	max.. 5.5 J/flash continuous adjustable max.. 5.5 J/flash (持续可调)
Flash half intensity width 闪光半高宽:	approx. 50 μ s 约 50 μ s
Flash frequency range 闪光频率的范围:	60 ... 130 Hz 60 ... 130 Hz
Operating conditions 工作温度:	Temperature: 0 ... 40°C 0 ... 40°C
Storage conditions 存放温度:	Temperature: -20 ... +70°C store at a dry place -20 ... +70°C (干燥环境)
Air humidity: 湿度:	max. 80 % max. 80 %
Protective class 保护等级:	Protect. conductor accord. to IEC 348 and VDE 0411 Protect. conductor accord. to IEC 348 and VDE 0411
Regulations and standards met 执行标准:	VDE 0110b, VDE 0411, VDE 05501, IEC 348 IEC 348 EN 50082-2, EN 55011B, EN 55140, EN 55141, EN 61000-4-2, EN 61000-4-4 VDE 0110b, VDE 0411, VDE 05501, IEC 348 IEC 348 EN 50082-2, EN 55011B, EN 55140, EN 55141, EN 61000-4-2, EN 61000-4-4

DRELLOSCOP 1090

DRELLOSCOP 1090 主机

Housing	Wall-mounted housing made of light metal protect. class IP54, colour RAL 7032
机箱:	挂墙式设计, 轻质金属材质, 防护等级 IP54, 颜色 RAL 7032

Dimensions (W × H × D)	500 × 500 x 225 mm (275 mm depth with wall fixture)
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尺寸(W × H × D)	500 × 500 x 225 mm 500 × 500 x 275 mm (含挂墙固定装置)
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Weight for : 230 V - Version	approx. 16,5 kg
重量 (230 V 供电型)	约 16,5 kg

Weight with option for 115 V - Version	approx. 26,0 kg
重量 (115 V 供电型)	约 26,0 kg

Remote control 1080 FB or 1090 FB 1080 FB 或 1090 FB 控制装置

Housing	Aluminium or plastics
外壳:	铝质或塑胶材质

Dimensions (W × H × D)	210 × 90 × 288 mm (225 mm depth with wall fixture)
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尺寸(W × H × D)	210 × 90 × 288 mm 210 × 90 × 255 mm (含挂墙固定装置)
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Weight	approx. 2,5 kg
重量:	约 2,5 kg

Lamp 4049

Lamp 4049 照明灯

Housing	made of light metal protect. class IP54, colour RAL 9005
外壳:	轻质金属材质, 防护等级 IP54, 颜色 RAL 9005
Dimensions (W × H × D)	560 × 345 × 327 mm
尺寸(W × H × D)	560 × 345 × 327 mm
Weight	approx. 15,5 kg
重量:	约 15,5 kg

Technical changes subject to further development!
本产品的技术规格和设计可能修改, 恕不另行通知!