SCHREMPP electronic

OPERATING AND INSTALLATION INSTRUCTIONS

ML-3-LK-M12 / ML-3-LK-LC

CE / c UL US LISTED / c TÜV US

Keep for future reference!

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Approvals

This document requires the following approvals:

Name	Title
Wolfram Schrempp	Management

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Contents

Contents **3**

List of illustrations **6**

1 Introduction **7**
- 1.1 Display media 8
  - 1.1.1 Section-related warnings 8
  - 1.1.2 Embedded warnings 9
  - 1.1.3 Other means of representation 9
  - 1.1.4 Symbols used in the operating and installation instructions 9
- 1.2 Warranty and liability 12
- 1.3 Copyright 13
- 1.4 Warranty provisions 13
- 1.5 Service/Customer service 13

2 Safety **14**
- 2.1 Intended use 14
  - 2.1.1 Note on installing the Maschinenleuchte 15
  - 2.1.2 Structural modifications to the Maschinenleuchte 16
  - 2.1.3 Foreseeable misuse 17
- 2.2 Requirements for personnel 17
  - 2.2.1 Trainee personnel 18
  - 2.2.2 Trained personnel 18
  - 2.2.3 Qualified personnel 18
  - 2.2.4 Qualified electrician 18
  - 2.2.5 Responsibilities 18
  - 2.2.6 Obligations of personnel 19
  - 2.2.7 Unauthorized persons 19
- 2.3 Basic safety instructions 19
- 2.4 Safety measures for environmental protection 19
- 2.5 Special hazard warnings/residual hazards 20
  - 2.5.1 Symbols used on theMaschinenleuchte 20
  - 2.5.2 Hazards due to electrical energy 21
  - 2.5.3 Warning about incorrect power supply 22
  - 2.5.4 Warning about unsuitable power supply 22
  - 2.5.5 Warning about inadequate protection class 23
  - 2.5.6 Danger due to insufficient insulation requirements 23
  - 2.5.7 Danger due to incorrect application 23
  - 2.5.8 Warning against incorrect safety assumptions 23
  - 2.5.9 Warning of falling parts during assembly 24
  - 2.5.10 Caution in case of thermal hazard 24
  - 2.5.11 Caution with optical radiation 25
  - 2.5.12 Dangers from tripping 25
  - 2.5.13 Dangers due to the use of incorrect spare parts 25
  - 2.5.14 Dangers of insufficient qualification 25
  - 2.5.15 Dangers posed by Reinigungsflüssigkeiten 26

2.5.16 Note on environmental influences ... 26
2.5.17 Note on ESD hazard ... 26
2.5.18 Note on EMC hazard ... 26
2.5.19 Note on mechanical stress ... 27
2.5.20 Note on chemical exposure and cleaning ... 27
2.5.21 Note on installation errors ... 27
2.6 Personal protective equipment ... 28
2.7 Information for emergencies ... 29
2.8 Operator's obligations ... 29

3 Description of Maschinenleuchte ... 30
3.1 Function description ... 30
3.1.1 General ... 30
3.1.2 Optical Properties ... 30
3.1.3 Electrical connection ... 30
3.1.4 Safety features ... 30
3.1.5 Typical areas of application ... 31
3.2 Technical ... 31
3.2.1 Dimensions ... 33

4 Transport and storage ... 34
4.1 Delivery by an authorized transport company ... 34
4.2 Inspection upon receipt by the recipient ... 34
4.3 Packaging ... 34
4.3.1 Unpacking ... 35
4.3.2 Repackaging ... 35
4.4 Information on hazards during transport ... 35
4.5 Maschinenleuchteope of delivery ... 36
4.6 Temporary storage ... 36

5 Installation ... 37
5.1 Pre-assembly by Schrempp electronic GmbH ... 37
5.2 Information on hazards during installation ... 37
5.3 Preparatory measures ... 38
5.3.1 General ... 38
5.3.2 Preparatory measures for electrical work ... 38
5.4 MaschinenleuchteMounting ... 39
5.4.1 Mechanical fastening ... 40
5.4.2 Electrical connection ... 40
5.4.3 Installation instructions ... 40

6 Commissioning ... 41
6.1 Safety measures before commissioning ... 41
6.2 Connection ML-3-LK-M12 / ML-3-LK-LC ... 41

7 Troubleshooting ... 42
7.1 Remedial measures ... 42

8 Mainten , and cleaning ... 43
8.1 Safety measures during maintenance work ... 43
8.1.1 General safety measures during maintenance work ... 43
8.2 Inspection and maintenance work ... 44

8.2.1 Maintenance intervals 44
8.2.2 Preparatory measures for electrical system 44
8.2.3 Maintenance - monthly 45
8.2.4 Maintenance - annually 45
8.2.5 Replacement of components 46

9 Decommissioning and dismantling 46
9.1 Disposal gen 47

10 Appendix 47
10.1 EU Declaration of Conformity 47

List of illustrations

1 : Dimensions 33

1 Introduction

These operating and installation instructions provide you with all the information you need for the smooth operation of themachine light .

The operating and installation instructions must be read, understood, and applied by all persons who are responsible for the assembly/installation, transport, commissioning, operation, maintenance, cleaning, troubleshooting, decommissioning, disassembly, and disposal of themachine light . This applies in particular to the safety instructions listed.

After reading the operating and installation instructions , you will be able to:

- transport themachine light safely,
- install/assemble themachine light safely,
- put the machine light into operation in a safe manner,
- operate the machine light in a safe manner,
- take the appropriate measures in the event of a malfunction,
- Maintain the machine light in accordance with the regulations.
- Clean the machine light in accordance with the regulations.
- decommission the machine light in a safe manner,
- Dismantle the machine light in accordance with safety regulations.
- Dispose of the machine light in accordance with regulations.

In addition to the operating and installation instructions , generally applicable, statutory, and other binding regulations on accident prevention and environmental protection in the country of use must be observed.

1.1 Display media

As a note and direct warning of hazards, text statements in this operating and installation instructions that require special attention are marked as follows:

1.1.1 Section-related warnings

Section-related warnings apply not only to a specific action, but to all actions within a section.

Structure

⚠ SIGNAL WORD

Symbol for further explanation of the hazard

Type and source of the hazard!

Possible consequence(s) of non-compliance!

► Measures to avoid the hazard.

Hazard levels

⚠ DANGER

High-risk hazard which, if not avoided, will result in death or serious injury.

⚠ WARNING

Medium-risk hazard which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Low-risk hazard which, if not avoided, may result in minor or moderate bodily injury.

NOTE

Low-risk hazard which, if not avoided, may result in property damage.

1.1.2 Embedded warnings

Embedded warnings apply to specific actions and are integrated directly into the action.

Structure

⚠ **SIGNAL WORD** Type and source of the hazard

Possible consequences of non-compliance

► Measures to avoid the hazard

Hazard levels

– ⚠ **DANGER/WARNING/CAUTION**

– ***NOTE*** (without warning triangle)

1.1.3 Other means of representation

The info symbol provides useful information.

– Texts following this symbol are lists.

► Text following this symbol describes measures in warning notices and steps to be taken.

a) Text following this symbol describes activities that must be performed in the specified order.

" " Text in quotation marks refers to other chapters or sections.

1.1.4 Symbols used in the operating and installation instructions

Warning notices additionally indicate specific hazards as follows:

Symbol	Description
	Warning sign
	Warning of hand injuries This symbol warns of hand injuries.
	Warning of obstacles on the floor This symbol warns of tripping hazards caused by obstacles on the floor.
	Warning of suspended loads This symbol warns of hazards when standing under suspended loads.

Symbol	Description
	Warning of electrical voltage This symbol warns of hazards due to electrical voltage.
	Warning of electrostatic sensitive components This symbol warns of components that can be damaged by electrostatic discharge (ESD).
	Warning of hot surfaces This symbol warns of the risk of burns from hot surfaces.
Mandatory sign	
	operating and installation instructions This symbol indicates that the operating and installation instructions must be observed.
	Wear safety shoes This symbol indicates that safety shoes must be worn in the area of application.
	Use hand protection This symbol indicates that hand protection must be worn in the area of application.
	Wear protective clothing This symbol indicates that protective work clothing must be worn in the area of application.
	Use head protection This symbol indicates that head protection must be worn in the area of application.
Hazardous substance symbols	
	Warning of environmentally hazardous substances This symbol warns of environmentally hazardous substances.
	Danger - Caution/Systemic health hazard This symbol warns of systemic health hazards if inhaled or swallowed.
	Danger - Caution toxic (harmful to health)/Corrosive or irritant effect/Lower systemic health hazard This symbol warns of substances that are harmful to health.

Symbol	Description
Other symbols	
	Disposal instructions This symbol indicates that the labeled product must not be disposed of with household waste.
	Recycling This symbol indicates that various materials can be returned to the recycling cycle.
	Qualified electrician required This symbol indicates tasks that may only be performed by a qualified electrician.
	Mechanical specialist required This symbol indicates activities that may only be performed by a qualified mechanic.
	CE marking CE marking: Product complies with essential EU requirements.
	Limited surface temperature DIN EN 60598-2-24:2014-04 For luminaires with this marking, the temperature on all surfaces of the luminaire exposed to dust deposition must not exceed 90°C.
	UL approval (versions without M12 connectors) Product complies with essential UL requirements
	UL approval (versions with M12 connector) Product meets essential UL requirements as a component used in a finished product.
	Electrical safety class which ensures protection through ** safety extra-low voltage** (SELV), whereby the supply voltage is a maximum of 50 V AC or 120 V DC.

1.2 Warranty and liability

The obligations agreed in the delivery contract, the general terms and conditions, the delivery conditions and the legal regulations valid at the time of conclusion of the contract apply.

All information and instructions in these operating and installation instructions have been compiled taking into account the applicable standards and regulations, the state of the art, and our many years of knowledge and experience.

This operating and installation instructions is not intended to replace the suitability or reliability of themachine light for specific user applications and must not be used to determine its suitability or reliability.

Themachine light may only be used for the applications described by the manufacturer. All other applications are improper and considered dangerous. The manufacturer cannot be held liable for damage caused by errors, unintentional or improper use of themachine light .

Warranty and liability claims for personal injury and property damage are excluded if they are attributable to one or more of the following causes:

- Improper or inappropriate use of themachine light ,
- improper transport, assembly/installation, commissioning, operation, troubleshooting, maintenance/cleaning, decommissioning, disassembly, and disposal of machine light,
- Operation of machine lightwith a defective housing,
- Failure to observe the operating and installation instructions and the information in the operating and installation instructions regarding assembly, commissioning, operation, maintenance, and cleaning of themachine light ,
- Use of unqualified or untrained personnel,
- structural modifications to themachine light (Modifications or other changes to themachine light may not be made without the prior written consent ofSchrempp electronic GmbH . In the event of non-compliance, the machine light will lose its suitability.),
- improperly performed repairs,
- use of unauthorized spare parts or spare parts that do not meet the specified technical requirements,
- disasters, foreign object impact, and force majeure.

Furthermore, Schrempp electronic GmbHreserves the right to revise this publication at any time due to technical changes in the context of improving the usage properties and further development, without being obliged to inform other persons of the revision.

1.3 Copyright

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We reserve the right to make any changes that serve technical progress.

1.4 Warranty provisions

The warranty provisions are contained in the General Terms and Conditions of Schrempp electronic GmbH .

1.5 Service/Customer service

Our customer service team is available to provide technical information:

Phone: +49 6196 802399-0

In addition, our employees are always interested in new information and experiences resulting from the use of our products that may be valuable for improving them.

2 Safety

⚠ WARNING

Failure to observe the following safety instructions can have serious consequences:

Endangerment of persons due to electrical, mechanical, or chemical influences, failure of important functions, and damage to the environment!

- ► Read the safety and hazard warnings listed in this section thoroughly before putting the machine lightinto operation.
- ► In addition to the instructions in this operating and installation instructions , observe the generally applicable safety and accident prevention regulations.
- ► In addition to the information in this operating and installation instructions , observe the existing national work, operating, and safety regulations. Also comply with existing internal factory regulations.

2.1 Intended use

The operational safety of themachine light is only guaranteed if it is used for its intended purpose.

The machine light is used exclusively for illuminating industrial machines, equipment or systemsInstallation may only be carried out by trained control and automation technology specialists who are familiar with the applicable national, regional, and local safety and accident prevention regulations.

Themachine light may only be used within the scope of its technical data. Intended use also includes compliance with the specifications in the technical data, compliance with the operating and installation instructions , compliance with the maintenance and servicing regulations, and compliance with the applicable national safety, occupational safety, and accident prevention regulations. Any use beyond this is considered improper.

The specified maximum technological data must not be exceeded. The devices are suitable for indoor use within the scope of the specified protection class and are only intended for stationary installation. The machine lights are not intended for installation in aircraft or spacecraft or for any use other than that specified here, and such use is considered improper. In particular, it is prohibited to:

- using defective or unsuitable accessories,
- operate the machine light in potentially explosive atmospheres,
- operate the machine light if it is not ready for operation or has been modified,
- Place objects on the machine light . Remove all objects from themachine light .
- Operate the machine light if the housing is damaged.

- In the case of luminaires, the temperature on all surfaces of the luminaire that are exposed to the deposition of dust must not exceed 90°C.
- Open the machine light for maintenance work.
- Operate themachine light if the safety and warning notices have been removed or are illegible.
- operate the machine light if it has been installed incorrectly. Incorrect installation of the mechanical or electrical connection can result in personal injury and property damage.
- operate themachine light if cables are damaged. Damage to cables can result in personal injury and property damage.
- Operating the machine light if the vibration and temperature ranges are not observed. Failure to observe the vibration and temperature ranges can result in personal injury and property damage.
- machine light Not storing and transporting the product in accordance with the manufacturer's specifications. Incorrect storage and transport can lead to personal injury and property damage.

Proper use also includes:

- Compliance with all instructions in the operating and installation instructions ,
- Compliance with the inspection intervals in accordance with the applicable machine directives, if available
- the use of operating and auxiliary materials in accordance with applicable safety regulations,
- Compliance with national, regional, and local safety and accident prevention regulations,
- Compliance with operating conditions

The technical specifications stated in the technical data must be observed without exception.

► Use themachine light only for its intended purpose; otherwise, safe operation cannot be guaranteed.

► Observe the information on the type plate.

The manufacturer is not liable for any personal injury or property damage resulting from improper use; the operator of themachine light is responsible!

2.1.1 Note on installing the machine light

Installation may only be carried out by trained control and automation technology specialists who are familiar with the applicable national, regional, and local safety and accident prevention regulations.

The machine light is intended for installation in a machine, system, or device; the control system is therefore specified by the machine, system, or device or installed in it.

Themachine light may only be put into operation once it has been established that the machine, system, or device in which themachine light is to be installed complies with all safety requirements of the Machinery Directive 2006/42/EC and other applicable directives and standards.

It is the responsibility of the manufacturer or distributor to carry out an appropriate and complete risk assessment, evaluation, and testing of themachine light with regard to the specific application or use.

In emergencies, it is recommended to observe and apply the procedures described in the operating and maintenance instructions for the machine, system, or device on which themachine light is installed.

► During maintenance work, secure the machine lightagainst unexpected restarting on the machine, system, or device in which the machine lightis installed.

2.1.2 Structural modifications to the machine light

The design and manufacturer's approval are based on the General Product Safety Ordinance. No changes, additions, or modifications may be made to the xml-ph-0000@deepl.internal machine light xml-phrase without the prior written consent of Schrempp electronic GmbH , no modifications, additions, or conversions may be made to themachine light .

Failure to comply will render themachine light unsuitable for use. The manufacturer of machine lightis hereby released from any warranty obligations.

Replace devices that are not in perfect condition immediately.

Only use original spare parts/wear parts/accessories. These parts are specially designed for themachine light . There is no guarantee that parts sourced from third parties are designed and manufactured to meet stress and safety requirements.

Parts and special equipment not supplied bySchrempp electronic GmbH are not approved for use with themachine light .

2.1.3 Foreseeable misuse

Any use of the machine light that exceeds its intended use and/or is otherwise different may result in serious injury.

- ► Only use the machine light for its intended purpose.
- ► Only use the machine lightif it has been properly maintained and inspected.
- ► Do not use the machine light outside the environmental conditions (temperature, humidity, protection class) specified in the Technical Data chapter.
- ► For luminaires marked “D”, the temperature on all surfaces of the luminaire exposed to dust deposition must not exceed 90°C.
- ► Do not operate the machine lightwithout proper, secure fastening or with loose fastening elements.
- ► Do not connect the machine light to a power supply that does not meet the specifications. When using in North America (USA/Canada), only use a 24V / Class 2 power supply.
- ► Do not operate the machine lightin potentially explosive areas unless it has the appropriate ATEX approval.
- ► Do not look directly into the illuminated LED surface from a short distance.
- ► Do not change or manipulate the factory settings if this would alter the defined signal meaning.
- ► Do not carry out any unauthorized repairs, modifications, or alterations to themachine light .

2.2 Requirements for personnel

The machine light may only be transported, assembled, installed, commissioned, maintained, cleaned, repaired, decommissioned, tested, dismantled, or disposed of by persons who are qualified and/or instructed to do so. If the personnel in question do not already have the necessary knowledge and skills, appropriate training and instruction must be provided. All local regulations must be followed.

These persons must be familiar with the operating and installation instructions and act in accordance with them. The respective responsibilities of the personnel must be clearly defined.

Persons with limited physical, sensory, or mental abilities, or who lack experience and knowledge, must be supervised or instructed in the safe use of machine lightand understand the associated hazards.

operating and installation instructions specify the following qualifications for various areas of activity:

2.2.1 Trainee personnel

Trainee personnel such as apprentices or temporary workers are not aware of all the hazards that may arise when operating themachine light . They may only carry out work on themachine light under the supervision of qualified or trained personnel.

2.2.2 Trained personnel

Trained personnel have been instructed by the operator or by qualified personnel on the tasks assigned to them and the possible dangers of improper behavior.

2.2.3 Qualified personnel

Qualified personnel are able to carry out the work assigned to them and to independently recognize and avoid potential hazards due to their professional training, knowledge, and experience, as well as their knowledge of the relevant regulations.

2.2.4 Qualified electrician

A qualified electrician is able to carry out work on electrical equipment and independently recognize and avoid potential hazards due to their professional training, knowledge, and experience, as well as their knowledge of the relevant standards and regulations.

The qualified electrician is trained for the specific location in which they work and is familiar with the relevant standards and regulations.

2.2.5 Responsibilities

Improper handling can result in significant personal injury and property damage.

- Only persons who can be expected to perform their work reliably are permitted to work on the equipment. No persons whose responsiveness is impaired by drugs, alcohol, medication, or similar substances may install and connect themachine light .
- All persons who carry out work on the machine light must read the operating and installation instructions and confirm with their signature that they have understood them.
- Trainee personnel may initially only carry out work on the machine light under the supervision of qualified personnel. Completion and successful training must be confirmed in writing.

► Observe the personnel requirements for the various life phases/operating modes.

Personnel requirement	Life cycle/operating mode
Qualified specialist personnel, qualified electrician	Transport, assembly, commissioning, malfunction, maintenance, decommissioning, disassembly, disposal

The operator is responsible for training the personnel.

2.2.6 Obligations of personnel

All persons assigned to the assembly and commissioning of themachine light undertake to do the following before starting work:

- To observe the basic regulations on occupational safety and accident prevention,
- to read the safety instructions and warnings in these operating and installation instructions and to confirm by signature that they have understood them.

2.2.7 Unauthorized persons

Unauthorized persons who do not meet the qualification requirements for personnel are not familiar with the hazards in the area of operation.

- ► Keep unauthorized persons away from the work area.
- ► If in doubt, speak to individuals and instruct them to leave the work area.
- ► Interrupt work as long as unauthorized persons are in the work area.

2.3 Basic safety instructions

- ► The machine lightmay only be put into operation and maintained after reading these operating and installation instructions .
- ► Only use themachine light for its intended purpose.
- ► When operating themachine light , refrain from any work that could compromise the safety of persons or themachine light .
- ► Always keep the area of use of themachine light clean and tidy.
- ► Only operate themachine light within the limits of its technical performance data.
- ► Keep all safety and hazard warnings on themachine light in a legible condition and renew them if necessary.
- ► Work on themachine light may only be carried out by qualified or trained personnel.
- ► In the event of malfunctions, immediately take themachine light out of operation.
- ► It must be ensured that all persons performing work on themachine light can consult the operating and installation instructions at any time.

2.4 Safety measures for environmental protection

- ► Comply with the regulations on waste prevention and proper waste recycling or disposal during all work.

2.5 Special hazard warnings/residual hazards

2.5.1 Symbols used on themachine light

Symbol	Description	Location
	Warning of electrical voltage This symbol warns of hazards due to electrical voltage.	Quick guide, operating instructions
	Warning of components at risk from electrostatic discharge This symbol warns of components that can be damaged by electrostatic discharge (ESD).	Quick guide, instructions for use
	Warning of hot surface This symbol warns of the risk of burns from hot surfaces.	Quick guide, instructions for use
Mandatory sign		
	operating and installation instructions This symbol indicates that the operating and installation instructions must be observed.	Quick guide, instructions for use
Other symbols		
	Disposal information This symbol indicates that the marked product must not be disposed of with household waste.	Type plate
	CE marking CE marking: Product complies with essential EU requirements.	Type plate
	Limited surface temperature For luminaires bearing this marking, the temperature on any surface of the luminaire exposed to dust deposition must not exceed 90°C.	Type plate
	UL approval (versions without M12 connectors) Product complies with essential UL requirements	Type plate
	UL approval (versions with M12 connectors) Product meets essential UL requirements as a component used in a finished product.	Type plate

Symbol	Description	Location
	Electrical safety class which ensures protection through ** safety extra-low voltage** (SELV), whereby the supply voltage is a maximum of 50 V AC or 120 V DC.	Type plate

► Keep all safety and hazard warnings on themachine light in a legible condition. Renew the warnings if necessary.

2.5.2 Hazards due to electrical energy

DANGER

Touching live parts poses a risk of electric shock!

Failure to observe this warning may result in death or serious injury!

- ► Always keep electrical components closed.
- ► Only allow work on electrical equipment to be carried out by a qualified electrician who is specially trained to work on electrical equipment and can recognize and avoid hazards.
- ► Switch off the power supply to all poles before starting work and check that there is no voltage.
- ► Installation in accordance with DIN VDE100-100 "Operation of electrical installations"
- ► Apply the five safety rules:
  1. Disconnect.
  2. Secure against reconnection.
  3. Check that there is no voltage.
  4. Ground and short-circuit.
  5. Cover or fence off live parts.

DANGER

In the event of an electric shock, there is a risk of secondary accidents due to shock (e.g., falling)!

Failure to comply may result in death or serious injury!

- ► Apply the five safety rules when working on electrical equipment.
- ► Only allow work on electrical equipment to be carried out by a qualified electrician.

- ► Before working on electrical equipment, disconnect themachine light from the power supply and secure it against being switched back on.
- ► Only allow work on electrical equipment to be carried out by a qualified electrician, e.g., a company electrician.
- ► Check electrical equipment regularly for defects such as loose connections or burnt cables. Have any defects repaired immediately.
- ► Have electrical equipment and stationary electrical equipment checked by a qualified electrician at least every 4 years. Stationary electrical equipment is equipment that is permanently installed or equipment that does not have a carrying device and is so large that it cannot be easily moved. This also includes electrical equipment that is temporarily installed and operated via movable connection cables.
- ► Have portable electrical equipment, connection cables with plugs, and extension and connection cables with their plugs checked by a qualified electrician at least every 6 months, if they are used. Equipment is considered portable if it can be moved while live according to its type and normal use.
- ► Any changes made to electrical equipment after inspection must comply with the currently valid standards and guidelines.
- ► Always keep all enclosures containing electrical equipment closed.
- ► Repair or replace damaged enclosures and cables immediately.
- ► If leakage currents exceed 10 mA, additional measures must be taken (grounding).

2.5.3 Warning about incorrect power supply

⚠ WARNING

There is a risk of short circuit or overload!

Failure to observe this warning may result in damage to the device or fire!

- ► Only use voltage ranges and power ratings in accordance with the device specifications.
- ► Provide a suitable backup fuse or current monitoring device.

2.5.4 Warning about unsuitable power supply

⚠ WARNING

Non-compliant power supplies pose a hazard!

Failure to comply may result in overload or fire hazard!

- ► Only use Class 2 power supplies for use in North America (USA/Canada).

2.5.5 Warning about inadequate protection class

⚠ WARNING

There is a risk of danger due to insufficient protection against dust or moisture!

Failure to observe this warning may result in failure!

► Observe the operating limits and the specified protection class.

2.5.6 Danger due to insufficient insulation requirements

⚠ DANGER

There is a risk due to insufficient insulation and contact hazard!

Failure to observe this may result in electric shock!

► Follow the description for connection assignment and the disconnection process.

2.5.7 Danger due to incorrect application

⚠ DANGER

There is a risk when used in hazardous areas without approval!

Failure to comply may result in a risk of explosion!

► Do not use themachine light in potentially explosive areas.

2.5.8 Warning against incorrect safety assumptions

⚠ WARNING

There is a danger of false security!

Failure to observe this warning may result in danger!

► Do not use themachine light as a safety-related shut-off component.

2.5.9 Warning of falling parts during assembly

⚠ WARNING

Improper fastening poses a hazard!

Failure to observe this warning may result in head, hand, or foot injuries!

- ► Only fasten themachine light with suitable means and tighten the screws to the specified torque.
- ► Always wear the personal protective equipment required for the respective work (protective clothing, protective gloves, protective helmet, and safety shoes) while working.
- ► Use fasteners in accordance with the manufacturer's instructions and tighten them to the specified torque.

2.5.10 Caution in case of thermal hazard

⚠ CAUTION

There is a risk of burns from surfaces heated to over 50 °C!

Failure to observe this warning may result in burns!

- ► Observe the permissible ambient temperature and ensure adequate ventilation.
- ► Always wear suitable protective clothing and gloves when working near hot components. Components that can become hot are marked with the graphic symbol "Warning of hot surface."
- ► Allow components to cool to ambient temperature before performing maintenance or repair work.

2.5.11 Caution with optical radiation

⚠ CAUTION

There is a risk of glare from LEDs!

Failure to observe this warning may result in visual impairment!

► Do not stare at the LED surface due to possible glare.

2.5.12 Dangers from tripping

⚠ CAUTION

Risk of tripping due to improperly laid power supply cables!

Failure to comply may result in injury!

► Always lay cables in the supply shaft in such a way that they do not cause tripping hazards and are barrier-free.

► Mark unavoidable tripping hazards with color.

2.5.13 Dangers due to the use of incorrect spare parts

⚠ WARNING

Danger due to the use of incorrect spare parts!

Incorrect or faulty spare parts can lead to damage, malfunctions, or total failure, and can compromise safety!

► Only use original spare parts.

► Only purchase original spare parts.

2.5.14 Dangers of insufficient qualification

⚠ WARNING

Risk of injury if you are not sufficiently qualified!

Improper handling of themachine light can result in serious personal injury and property damage!

► Only allow qualified personnel to carry out any work.

2.5.15 Dangers posed by cleaning fluid

⚠ WARNING

The machine lightmachine light poses hazards due tocleaning fluid !

Failure to observe this warning may result in serious injury!

- ► When handling the product, observe the safety regulations applicable to cleaning fluid.
- ► Always wear the protective equipment required for the respective task (respiratory protection, protective clothing, safety goggles, and protective gloves) when working.

2.5.16 Note on environmental influences

NOTE

Dust or moisture may cause a hazard!

Failure to observe this may result in malfunctions!

- ► Only operate themachine light within the specified limits and follow the cleaning instructions.

2.5.17 Note on ESD hazard

NOTE

There is a risk of component damage due to electrostatic discharge!

Failure to observe this warning may result in loss of function!

- ► Observe the ESD regulations.

2.5.18 Note on EMC hazard

NOTE

There is a risk due to insufficient interference emission or interference immunity!

Failure to observe this may result in malfunctions!

- ► Follow the EMC installation instructions and separate signal lines from sources of interference.

2.5.19 Note on mechanical stress

NOTE

There is a risk due to vibration or shock!

Failure to comply may result in loosening or failure!

► Perform regular checks on the fastenings.

2.5.20 Note on chemical exposure and cleaning

NOTE

Improper cleaning poses a hazard!

Failure to comply may result in damage to materials and equipment!

► Only use approved cleaning agents. Clean the exterior only with a mild soap solution without using solvents or acids.

► Do not use sharp-edged tools for cleaning, especially to avoid scratching the optical diffuser.

► Do not clean with high pressure.

2.5.21 Note on installation errors

NOTE

There is a risk of danger due to incorrect hole pattern or incorrect torque!

Failure to observe this may result in fastening failure!

► Install themachine light in accordance with chapter 5Installation .

2.6 Personal protective equipment

When operating themachine light , personal protective equipment must be worn regardless of the risk assessment for the area of application in order to minimize health hazards. Personal protective equipment must be designed specifically for the relevant risk.

- ► Always wear the protective equipment required for the task at hand when working.
- ► Do not wear rings, chains, or other jewelry during transport, assembly, disassembly, and maintenance work.
- ► Follow all instructions regarding personal protective equipment.

The symbols have the following meanings:

Symbol	Description
	Safety shoes Wear non-slip safety shoes to protect yourself from heavy falling objects or slipping on slippery surfaces.
	Work safety clothing Protective work clothing is close-fitting work clothing with low tear resistance, tight sleeves, and no protruding parts. It is primarily used to protect against being caught by moving machine parts.machine light nteile.
	Protective gloves Wear protective gloves to protect your hands from friction, abrasions, punctures, or deeper injuries, as well as from contact with hot surfaces or chemical substances.
	Safety helmet Wear a protective helmet to protect against falling or flying parts.

Personal protective equipment must be provided by the operator and must comply with the applicable requirements.

In addition, national regulations and specifications from the application area risk assessment and, if applicable, internal instructions from the operator must be observed.

2.7 Information for emergencies

Preventive measures:

- ► Always be prepared for accidents or fire.
- ► Keep first aid equipment (first aid kit, blankets, etc.) and fire extinguishers within easy reach.
- ► Familiarize personnel with accident reporting, first aid, fire extinguishing, and rescue equipment.
- ► Keep access routes clear for emergency vehicles.

Measures in the event of accidents:

- ► Disconnect the power supply to the machine light.
- ► Rescue people from the danger zone.
- ► In the event of cardiac and/or respiratory arrest, initiate resuscitation immediately.
- ► In the event of personal injury, notify the first aid officer and an emergency doctor or the emergency services.
- ► Clear the access routes for emergency vehicles. If necessary, assign someone to direct the emergency services.
- ► Löschen Sie einen Brand in der elektrischen Steuerung mit einem CO2-Löscher.

2.8 Operator's obligations

Themachine light is used in commercial applications, and the operator must comply with the statutory occupational safety regulations. In addition to the safety instructions in the operating manual, the applicable safety regulations for the area of application must be observed.

The operator must ensure that themachine light is used properly, that the operating instructions are available on site, and that clear responsibilities for installation, operation, maintenance, and cleaning are defined. Only qualified and trained personnel above the legal minimum age may carry out work on themachine light . Regular training, information about hazards, and the provision and use of personal protective equipment are required. The operator must ensure that persons working with themachine light have read and understood the operating and installation instructions . In addition, adequate virus protection/firewall in the IT infrastructure and compliance with maintenance intervals are required. The operator must regularly check the technical condition of the device and ensure that the safety and warning notices are legible.

3 Description of machine light

3.1 Function description

3.1.1 General

3.1.2

The ML-3-LK machine light is a high-quality 24V DC LED panel light for demanding industrial applications and is designed for commercial use. It is designed as a permanently fixed assembly for industrial use and is powered directly by 24 V DC. The device has a robust, anodized aluminum housing and a rotatable light housing. The glued-in optics ensure a high level of protection against dust ingress.

3.1.3 Optical Properties

- Lighting area: Full-surface, diffuse illumination.
- Daylight color 5700K
- Light type: Continuous light; controlled with "EN" pin
- LED lighting with high color fidelity and high contrast for good visibility in industrial environments.

3.1.4 Electrical connection

- Power supply: Operating voltage 21–27 V DC, Class II (for USA/Canada)
- Connection options: M12 connector or 3 m PVC/PVC cable.

3.1.5 Safety features

- Protection class: IP 54, suitable for harsh industrial environments.
- Protection class: III (operation with safety extra-low voltage).
- Electrical safety: Operation in North America (USA/Canada) permitted exclusively with Class II power supply.
- Shock and vibration resistant: Insensitive to mechanical influences.
- Compliance with standards: Meets the requirements of Directive 2014/30/EU (EMC) and Directive 2011/65/EU (RoHS) including extension 2015/863/EU.

3.1.6 Typical areas of application

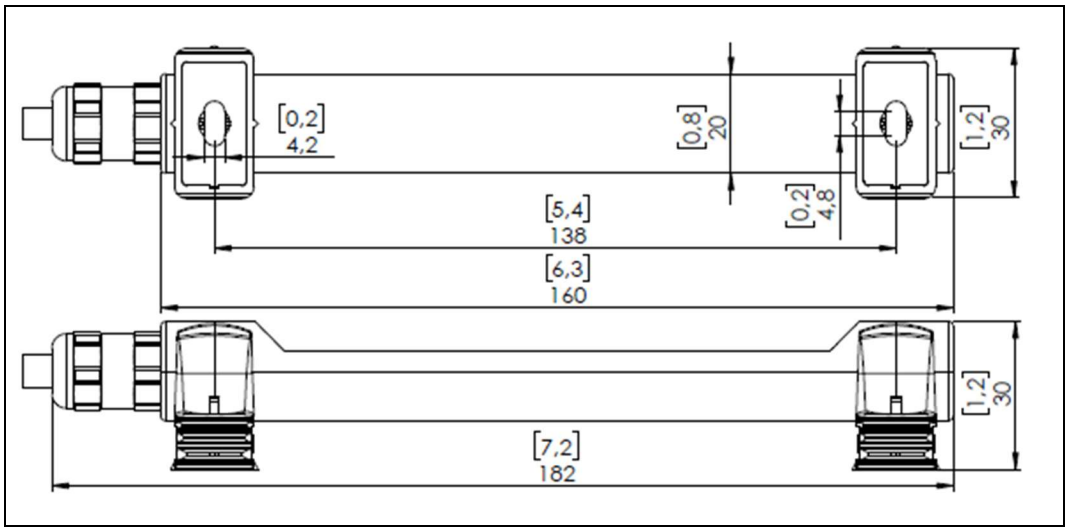
- Lighting in and on machines and systems.
- Process visualization in production and assembly lines.
- Lighting in conveyor technology, packaging systems, and testing facilities.

3.2 Technical

Technical data ML-3-LK-M12/LC	
Electrical	
Supply voltage	24 V DC (21 - 27 V DC)
Nominal current consumption	< 135 mA
Electrical remote control	OFF: EN <1V ON: EN > 8V
Protection class	
Permissible power supply	Class 2 for use in the USA/Canada)
Connection	ML-3-LK-M12: M12 plug 200 mm ML-3-LK-LC: 3 m PVC/PVC cable
Reverse polarity protection	Internal
Operating mode	Continuous operation
Life time	60.000h (L70)

Technical data ML-3-LK-M12/LC		
Mechanical		
Dimensions	ML-3-LK-M12 / LC (L × B × H): 160 x 30 x 30 mm (6,3'' x 1,2'' x 1,2'')	
Weight	ML-3-LK-M12:120 g ML-3-LK-LC: 200 g	
Installation position	Any	
Mounting	Front mounting with 2× M4 hexagon socket cylinder screws (DIN ISO 4762)	
Optic	Polycarbonate 1 mm, UV-stabilized	
Housing material	Aluminum	
Protection and environmental conditions		
Protection class / NEMA	IP54 / Type 3	
Ambient temperature	-20 °C to +50 °C	
Storage temperature	-40 °C to +70 °C	
Permissible humidity	40 - 60% (non-condensing)	
Meters above sea level	2000 m	
Earthquake class	No earthquake zone	
Chemical composition	Halogen-free, silicone-free, REACH/ROHS	
Optical data		
Luminous color	5700K	
Color rendering index	>90	
Energy efficiency class	D	
Luminous flux	380 lm	
Ecodesign Regulation 2019/2020 EU	ML-3-LK LC - EPREL Reg.-Nr.: 2091705	ML-3-LK M12 - EPREL Reg.-Nr.: 2091706

3.2.1 Dimensions



1 : Dimensions

4 Transport and storage

4.1 Delivery by an authorized transport company

machine light is delivered to the customer by a transport company authorized bySchrempp electronic GmbH .

4.2 Inspection upon receipt by the recipient

Upon arrival of themachine light at the customer's premises, it must be inspected for visible transport damage.

► Report any transport damage immediately to the delivery company.

4.3 Packaging

The mode of transport is a decisive factor in determining the type of packaging. Unless otherwise agreed in the contract, the packaging complies with the HPE packaging guidelines, which were established by the Federal Association of Wood Products, Pallets, and Export Packaging (Bundesverband Holzmittel, Paletten, Exportverpackung e. V.) and the Association of German Engineering Companies (Verein Deutscher Maschinenbauanstalten).

► Please observe the pictograms on the packaging.

4.3.1 Unpacking

When unpacking themachine light , proceed as follows:

- ► Remove the packaging. Dispose of packaging materials such as plastic film and adhesive tape in the appropriate manner.
- ► Always remove all packaging before installing themachine light .
- ► Keep the original packaging for return/further transport.
- ► Check the delivery against your order to ensure it is complete.
- ► Be sure to keep the documents supplied, as they contain important information on how to use themachine light .
- ► Check the packaging contents for visible transport damage.
- ► If you discover any transport damage or discrepancies between the packaging contents and your order, please informSchrempp electronic GmbH .

4.3.2 Repackaging

See chapter "4.3.1 Unpacking ".

4.4 Information on hazards during transport

⚠ WARNING

The following specific hazards may occur when transporting the machine light:

Suspended loads may fall, posing a risk of death!

Protruding edges can cause crushing or cutting injuries!

- ► Only use approved load-bearing devices.
- ► Always wear the personal protective equipment required for the respective task (protective clothing, protective gloves, protective helmet, and safety shoes) while working.
- ► Ensure that you and other people do not stand under suspended loads.
- ► Do not use cables or attachments as attachment points.

4.5 machine lightope of delivery

The scope of delivery of the machine light consists of the following components:

- machine light machine light ML-3-LK-M12 or LC
- 2x M20 mounting clips
- Quick guide

4.6 Temporary storage

If themachine light is not installed immediately after delivery, it must be stored carefully in a protected location. Themachine light must be stored in such a way that it is protected from cold, moisture, dirt, chemical and mechanical influences. The recommended storage conditions for machine lightcan be found in the chapter "Ambient conditions".

We accept no liability for damage resulting from improper storage!

5 Installation

The machine light is designed for permanent, stationary installation in industrial environments. It is installed on the front of a suitable mounting surface and must be positioned so that the lighting is sufficient for operating and maintenance personnel and does not cause glare. The lights are rotatable. Align the light appropriately.

Check the machine light for damage before installation. If there is visible damage, the machine light must not be installed and the manufacturer must be contacted.

5.1 Pre-assembly by Schrempp electronic GmbH

The machine light is completely pre-assembled bySchrempp electronic GmbH . Connection to the machine/system is carried out by the machine/system supplier.

5.2 Information on hazards during installation

⚠ WARNING

Improper mounting poses a hazard!

Failure to observe this warning may result in head, hand, or foot injuries!

- ► Only fasten the machine light with suitable means and tighten the screws to the specified torque.
- ► Exceeding the permissible ambient conditions (temperature, humidity, vibration load) can lead to failure. Check the installation location in advance.
- ► Always wear the personal protective equipment required for the respective work (protective clothing, protective gloves, protective helmet, and safety shoes) while working.
- ► Use fasteners in accordance with the manufacturer's instructions and tighten them to the specified torque.
- ► Do not use the machine light as a climbing aid. Misuse may cause themachine light to break off or be damaged in other ways.
- ► Do not rotate the lights more than 360°! This could damage the connection cable!
- ► Install the machine light so that it cannot be used as a climbing aid.

⚠ CAUTION

Risk of tripping due to improperly laid power supply cables!

Failure to comply may result in injury!

► Always lay cables in such a way that they do not cause tripping hazards or barriers.

► Mark unavoidable tripping hazards with color.

⚠ CAUTION

Risk of injury due to unsuitable mounting materials!

Unsuitable mounting materials can result in injuries during operation!

► If necessary, use only the mounting material supplied.

5.3 Preparatory measures

5.3.1 General

Before installing the machine light , ensure that:

- additional lighting equipment (e.g., hand lamps) is available for installation (if necessary),
- the installation surface at the installation site is clean and free of dust,
- the necessary tools for installation are available:
  - Hex key for M6
  - Torque wrench (adjustable)
  - Screwdriver for electrical connections (qualified personnel only)

5.3.2 Preparatory measures for electrical work

Before installing themachine light , ensure that:

- The connections for the power supply are prepared.
- The work area is secured and de-energized.
- The installation position has been determined (clear view, protection against damage).
- The mounting holes or T-slot nuts for M4 screws are prepared.

5.4 Machine light mounting

⚠ WARNING

Risk of injury due to instability!

There is a risk of serious injury due to instability of the individual assemblies when mounting themachine light as a result of incorrect mounting!

- ► Please note that the application surface must be:
  - flat and level
  - has the necessary load-bearing capacity,
  - is temperature-resistant, non-flammable, and
  - vibration-free
- ► Only allow authorized and trained personnel to carry out the installation work.
- ► Observe the tightening torques for all screw connections during installation.
- ► Always wear the protective equipment required for the respective work (e.g., protective work clothing and safety shoes) while working.
- ► Avoid locations for the machine light that are close to impermissible electromagnetic fields.
- ► Do not install the machine light in locations where there is a corrosive or explosive atmosphere.
- ► Please note that the machine lightis only intended for indoor use.
- ► Do not use the machine lightin EX areas.
- ► Observe the ambient conditions.
- ► Please note that the machine light must be protected against the risk of accidental impact.
- ► Please note that with regard to order and cleanliness, care must be taken to ensure that: all cables and wires are neatly laid and covered if necessary, tools are tidied away from the machine light, and any parts lying around and waste (if any) are removed regularly.

5.4.1 Mechanical fastening

Proceed as follows during installation:

- ► Align themachine light in the intended position.
- ► Insert two M4 hexagon socket cylinder screws through the designated mounting holes.
- ► • Tighten the screws evenly (tightening torque: 5–6 Nm, unless otherwise specified by the manufacturer). Clip the housing into the mounting clips.
- ► Check that the light is securely fastened (no play, no twisting). Do not install lights closer than 15.25 cm to curtains or similar combustible materials.

5.4.2 Electrical connection

- ► Select the appropriate connection (M12 or LC).
- ► Plug in and lock the connection completely.
- ► Check the assignment according to the technical documentation.
- ► Only use a Class 2 power supply in North America.

5.4.3 Installation instructions

- ► Ensure direct visibility in the intended observation area.
- ► Avoid installation locations with strong external lighting or direct sunlight.
- ► Protect the light from mechanical impact, vibration, and chemical influences.
- ► The lights can be rotated. Adjust the light to the desired position. Do not rotate the lights more than 360°.

6 Commissioning

6.1 Safety measures before commissioning

⚠ WARNING

Risk of injury during commissioning!

There are various risks of injury during commissioning.

- ► Only allow qualified personnel to perform commissioning.
- ► Cordon off the danger area and keep unauthorized persons away.
- ► Lay power supply cables so that they do not cause a tripping hazard and are barrier-free (e.g., under covers).

► Familiarize yourself sufficiently with:

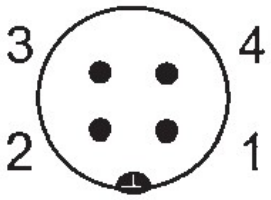
- – the features of the machine light ,
- – the operation of the machine light ,
- – emergency measures.

► Before initial commissioning, carry out the following activities:

- ► Check the machine light for visible damage; rectify any defects immediately – the machine light may only be operated if it is in perfect condition.

6.2 Connection ML-3-LK-M12 / ML-3-LK-LC

ML-3-LK-LC:	**PVC/PVC cable:**
Brown:	+24 VDC
Black:	EN
Blue:	GND
ML-3-LK-M12:	**M12 connector:**
PIN 1:	+24 VDC
PIN 4:	EN
PIN 2:	Not assigned
PIN 3	GND



7 Troubleshooting

⚠ WARNING

There are hazards associated with troubleshooting themachine light !

Failure to observe these instructions may result in damage, malfunction, or total failure of themachine light , as well as compromising the safety of themachine light !

► Only qualified personnel should perform troubleshooting.

7.1 Remedial measures

Fault	Cause	Remedy
machine light machine light not working	No power supply	Check power supply and switch on
	Plug not connected correctly	Check and lock plug connections
	Defective power supply	Replace power supply according to specifications
machine light machine light is not illuminated	Error in the control system or wiring	Check the control program for enable contact "EN" and wiring and correct if necessary
machine light " machine light flashes or flickers unintentionally	Voltage fluctuations	Stabilize the power supply
	Loose connection in the supply cable or connector	Check connectors and cables
Light surface unevenly bright	Defective LEDs	Replace device

8 Mainten and cleaning

8.1 Safety measures during maintenance work

8.1.1 General safety measures during maintenance work

Perform the prescribed maintenance work, such as cleaning and inspections, in a timely manner. Read the chapter "2 Safety ".

- ► Block access to the area where the machine light is in use. Ensure that only authorized persons are in the area where the machine light is in use.
- ► Replace any defective machine light and accessories immediately.
- ► Use only original accessories and spare parts. The use of other parts will void the warranty and suitability and may result in injury.

After completing maintenance and before using themachine light , perform the following tasks:

- ► Check all previously loosened screw connections again to ensure they are tight.
- ► Check that all previously removed protective devices, covers, housing covers and, if applicable, other components have been reinstalled correctly.
- ► Ensure that all tools, materials, and other equipment used have been removed from the work area.
- ► Clean the work area.

Modifications, alterations, incorrect and improper use, and failure to observe the instructions in this operating manual will void the warranty.

8.2 Inspection and maintenance work

8.2.1 Maintenance intervals

Maintenance point	Maintenance work	See section
Monthly		
Entiremachine light	Visual inspection for damage, secure fit, and contamination.	8.2.3
Entiremachine light	Function test	
Annually		
machine light	Check electrical connections, fastening screws, and seals.	8.2.44

8.2.2 Preparatory measures for electrical system

DANGER

Danger of death from electric shock!

Live components can cause fatal electric shock or serious injury if touched!

- ► Only allow work on electrical equipment to be carried out by a qualified electrician who is specially trained to work on electrical equipment and can recognize and avoid hazards.
- ► Before performing maintenance and inspection work on themachine light , disconnect themachine light from the power supply.
- ► Secure the machine lightagainst unexpected restarting by locking the main switch with a lock.
- ► Attach a warning sign to the main switch to prevent it from being switched back on.

NOTE

► Use ESD protection measures (e.g., grounding wrist strap, conductive work mat) during maintenance.

8.2.3 Maintenance - monthly

8.2.3.1 Visual inspection

► Check the light surface for scratches, cracks, or cloudiness.

► Check that the luminaire is securely fixed (no play, no twisting).

► Check cables and plug connections for damage, corrosion, or loose connections.

8.2.3.2 Cleaning

► Use a soft, lint-free cloth.

► Clean the light surface with a mild, non-abrasive cleaning agent.

► Avoid aggressive solvents (e.g., acetone, gasoline, concentrated acids, chloroform) that can damage the diffuser.

► Ensure that no moisture penetrates the housing.

8.2.3.3 Function test

► Restore the power supply.

► Activate all lighting functions one after the other.

► Check that colors are displayed correctly.

► Document any abnormalities in the maintenance log.

8.2.4 Maintenance - annually

8.2.4.1 Electrical Check

⚠ DANGER

Danger of death from electric shock!

Live components can cause fatal electric shock or serious injury if touched!

► Only allow a qualified electrician to carry out work on electrical equipment.

► Before performing any maintenance or inspection work, disconnect themachine light from the power supply.

► Check all connectors to ensure they are securely fastened and locked.

► Check the cables for chafing or crushing.

► If necessary, retighten the terminal fastening screws (torque according to manufacturer's specifications).

8.2.5 Replacement of components

► Not possible. Only replacement of the complete device

9 Decommissioning and dismantling

⚠ WARNING

Risk of serious injury due to improper decommissioning or disposal of machine light!

Failure to comply may result in serious injury!

► Have all work on the electrical system carried out only by qualified electricians. Qualified electricians are specially trained to work on electrical systems, are aware of the dangers of electrical voltage, and can independently avoid potential hazards by taking the correct action.

► Only allow qualified or appropriately trained personnel who are experienced in dismantling electrical equipment to dismantle the machine light.

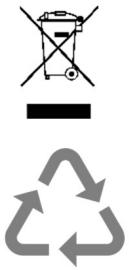
► Switch off the machine light completely before starting any dismantling work and disconnect it from the power supply at all poles.

► Always wear the necessary personal protective equipment during work, e.g., protective work clothing, safety shoes, protective gloves, and a protective helmet.

► If in doubt, contact Schrempp electronic GmbH for technical support or advice on safe decommissioning and disposal.

9.1 Disposal gen

⚠ WARNING



Risk of environmental pollution/waste of resources!

Failure to comply may result in environmental damage!

- ► Only allow trained and authorized personnel to carry out disposal work.
- ► Separate electrical and electronic components in accordance with Directive 2012/19/EU. Separate materials and packaging waste by type and send them for recycling. Recycle materials marked with a recycling symbol. The packaging is made of various materials that can be disposed of at your local recycling facility. By disposing of the packaging properly, you help to avoid potential hazards to the environment and public health.
- ► Observe local recycling regulations.

10 Appendix

10.1 EU Declaration of Conformity

On the following pages, you will find the EU Declaration of Conformity for the machine light and the attached documents.

EU Declaration of Conformity

(Original Declaration of Conformity)

Manufacturer/authorized representative:	Schrempp electronic GmbH , Wiesenstrasse 5 , D-65843 Sulzbach/Ts.
Authorized representative for compiling the technical documentation:	Schrempp electronic GmbH , Wiesenstrasse 5 , D-65843 Sulzbach/Ts.
Product:	ML-3-LK M12: 10241 / GTIN 4262388140235 ML-3-LK LC: 10278 / GTIN 4262388140488
Function:	The machine light is used exclusively for illuminating industrial machines, equipment or systems

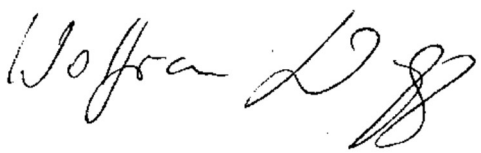
The manufacturer bears sole responsibility for issuing this declaration of conformity. The object of the declaration described above complies with the relevant Union harmonization legislation, depending on the components used, as described in the annexes to the directives, which form an integral part of this declaration of conformity:

- 2014/30/EU - EMC Directive, including the essential requirements set out in Annex I
- 2011/65/EU + (EU) 2015/863 - RoHS EU Directive, including the essential requirements of Annex II

These products comply with the current requirements of the RoHS Directive for all 10 designated materials (max. 0.1% by weight in homogeneous material for lead, mercury, hexavalent chromium (Cr6+), polybrominated biphenyl (PBB), polybrominated diphenyl ether (PBDE), diphthalate (DEHP), butyl benzyl phthalate (BBP), dibutyl phthalate (DBP) and diisobutyl phthalate (DIBP) and max. 0.01% by weight for cadmium).

Specification of the relevant harmonized standards (or parts thereof) that have been applied, including the date of the standard, or specification of other technical specifications for which conformity is declared, including the date of the specification:

- DIN EN 60598-1/A11: 2021
- DIN EN 55015: +A11: 2020
- DIN EN 61547: 2009
- DIN EN 62471: 2009
- DIN EN 60529
- EN IEC 63000:2018



D-65843 Sulzbach/Ts. , 03.11.2025

Dipl.-Ing. Wolfram Schrempp, Geschäftsführer