



Installation and Maintenance Instructions

Inset light 12"

Preface

- Please read carefully and understand the contents of this manual.
- Failure to read the manual may result in serious injury, or serious damage to equipment.
- Make sure these instructions are always accessible for all users and ensure that you have read and understood the contents.

Document Information

Name : **05_LED_AGL_Installation_instruction_12-inch_inset_lights_03-71084**

Version	Date	Description
V2.3	27-11-2023	Original
V2.4	09-07-2024	Added instructions to perform leakage test after opening and closing fixture

The English version of this document is the original version; this language version is verified by the manufacturer. All other language versions are translations of the original English language version. For the latest version of this document see <https://www.tkh-airportsolutions.com/airfield-products/> or scan:



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1. About this manual

This manual contains information about the installation and maintenance of the LED-AGL Inset light 12”.

1.1 Symbols used

The following marking conventions are used in this manual to draw attention to specific topics or actions:



DANGER! - This sign indicates a hazardous situation that, if not avoided, will result in death or serious injury.



WARNING - This sign indicates a hazardous situation that, if not avoided, could result in death or serious injury.









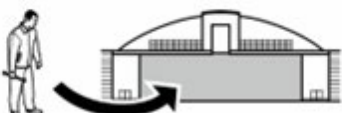


CAUTION - This sign indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.



NOTICE - is used in this manual to indicate a situation that could result in damage to property or equipment.

The following symbols are used in pictures for explanation or an action:

<p>Correct / Incorrect</p> 	<p>Look / See</p> 	<p>Location / position</p> 	<p>Movement</p> 
<p>Connect / Disconnect</p> 	<p>Photobiological safety</p> 	<p>ESD warning</p> 	
<p>Work carried out on runway</p> 		<p>Work carried out in workshop</p> 	

The following symbols are used on equipment and in this manual to warn of potential hazards:



DANGER of electrical shock or arc flash. Failure to observe this warning will result in serious injury or death.



WARNING or CAUTION: where this symbol is used on the equipment, it is mandatory to consult the manual to find out the nature of potential hazards and any actions which have to be taken to avoid them.

1.2 Storing the manual

- This manual is a part of your product. Store the manual in a location that can be easily accessed by personnel working on the product.
- It is the responsibility of the company operating this equipment to ensure that its personnel is provided with a copy of this manual.

1.3 Limitations of the Document

TKH Airport Solutions reserves the right to revise this document without notification.

The data provided in this document is based on the most recent information at the time of publication. TKH Airport Solutions is continually seeking to ensure that its products are developed to the latest technological standards. As a result, it is possible that there may be some differences between the product and the information in this manual.

For further information regarding adjustment, maintenance or repair which is not described in this document, please contact the Customer Service department of TKH Airport Solutions.

The information in this document concentrates solely on use of the products as intended by the manufacturer.

1.4 Terms and Abbreviations

This document may include the terms and abbreviations as listed below.

AGL	Airfield Ground Lighting
EASA	European Aviation Safety Agency
ICAO	International Civil Aviation Organization
IEC	International Electrotechnical Committee
LED	Light Emitting Diode

1.5 Liability and Warranty

TKH Airport Solutions cannot be held responsible for injuries or damage resulting from non-standard, unintended use, faulty or improper installation of its equipment, or failure to follow the instructions and safety guidelines in this manual. The safety of any system incorporating the LED-AGL Inset light 12” is the responsibility of any site installation, commissioning, maintenance, and operational personnel using the system.

NOTICE

Disregarding the safety instructions in this manual will result in the loss of warranty in case of damage.

Refer to the general TKH Airport Solutions Terms and Conditions document supplied with your sales order contract for a complete liability and warranty description.

1.6 Manufacturer Details

TKH Airport Solutions

Elektrostraat 17
7483 PG Haaksbergen
The Netherlands

- Tel.: +31 (0)53 5741456
- Email: info@tkh-airportsolutions.com
- Internet: www.tkh-airportsolutions.com

For service requests, please contact the TKH Airport Solutions Customer Service department:

- Email: service@tkh-airportsolutions.com

2. Safety

2.1 Safety



This section contains general safety instructions for using your TKH Airport Solutions equipment. Some safety instructions may not apply to the equipment in this manual. Note all warnings and follow all instructions carefully. Failure to do so may result in personal injury, death, or property damage.

To use this equipment safely,

- Refer to the International Standard IEC 61820, Electrical installation for lighting and beaconing of aerodromes - Constant current series circuits for aeronautical ground lighting - System design and installation requirements, and to the International Standard IEC 61821, Electrical installations for lighting and beaconing of aerodromes - Maintenance of aeronautical ground lighting constant current series circuits for instructions on safety precautions.
- Observe all safety regulations. To avoid injuries, always remove power prior to making any wire connections and touching any live part. Refer to the International Standards IEC 61820 & IEC 61821.
- Read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- Read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- Store this manual within easy reach of personnel installing, operating, maintaining, or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies.

2.2 Qualified Personnel

The term "qualified personnel" is defined here as a person who thoroughly understands the equipment and its safe installation, operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations, and have been trained to safely install, operate, maintain, and repair the equipment. It is the responsibility of the company installing, operating or maintaining this equipment to ensure that its personnel meet these requirements.

2.3 Intended use



DANGER!

Use of this equipment in ways other than described in the datasheet and this manual may result in personal injury, death, or property damage. TKH Airport Solutions cannot be held responsible for injuries or damage resulting from non-standard, unintended application of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered to be unintended use. Unintended use may result from taking the following actions:

- making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine TKH Airport Solutions replacement parts or accessories
- using materials or auxiliary equipment that are inappropriate or incompatible with your TKH Airport Solutions equipment
- allowing unqualified personnel to perform any task

2.4 Installation



WARNING

A thorough understanding of system components and their requirements will help you install the system safely and efficiently. Failure to follow these safety procedures can result in personal injury or death.

NOTICE

Read the safety and installation sections of all system component manuals before installing your equipment.

- Allow only qualified personnel to install TKH Airport Solutions equipment and auxiliary equipment. Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals and will void the warranty.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Do not hold or carry the light assemblies by the cables.
- Install all electrical connections according to local codes and regulations, provided they are not in contradiction with the general rules.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current and voltage demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure the wires will not be damaged by moving equipment and animals (e.g. rodents).
- Protect components from damage, wear, and harsh environmental conditions.
- Allow sufficient room for maintenance, panel accessibility (power products), and cover removal (power products).
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for maintenance, re-install them immediately after the work is completed and check them for proper functioning.

2.5 Operation



Only qualified personnel (see section Qualified Personnel) should operate this equipment. Read all system component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.

- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.
- Never operate equipment with a known malfunction.
- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Never touch exposed electrical connections on equipment while the power is ON.
- Never look directly in the light source while the power is ON.
- For fixtures/spare parts marked with the photobiological safety symbol avoid prolonged staring in the switched ON fixture.

2.6 Action in the event of a system or component malfunction



Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual. Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks. Only persons who are properly trained and familiar with TKH Airport Solutions equipment are permitted to service this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
- Use only approved TKH Airport Solutions replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals, impair specified performance and create safety hazards.
- Check interlock systems periodically to ensure their effectiveness.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.
- Make sure to perform a leakage test, as explained in chapter 6.9, everytime a fixture is opened and closed

3. General Recommendations

3.1 Receiving, Storage and Unpacking

- 1 Upon receipt of goods at the site store, check all packaging for visible damage. Every damaged box should be opened and its contents inspected for damage. If equipment is damaged, a claim form shall be filled with the carrier immediately. It may then be necessary for the carrier to inspect the equipment.
- 2 Store the light assembly preferably in its original packaging in a protected area. When stored unpacked, please take care not to damage the cable insulation.
- 3 Unpack the light assembly at the installation site to avoid damage during transportation and handling.

3.2 Electrical Connection

The light assemblies covered by this manual are designed for connection to 6.6-A series circuits via one or two L-830 or L-831 series transformers. The current to the light should not exceed 6.6 A + 5%. The series transformers are to be ordered separately.

3.3 Base Earthing

Whatever the chosen installation method, it is strongly recommended to earth the base, especially in locations presenting a risk of lightning strikes. Failure to earth the base correctly will void the warranty for all damages occurring as a result of voltage surges.

4. About the Inset light 12”

TKH Airport Solutions LED Inset lights 12” are constructed mainly by using standard components from TKH Airport Solutions standard program of inset lights. There are many variants available for approach, runway and taxiway use.

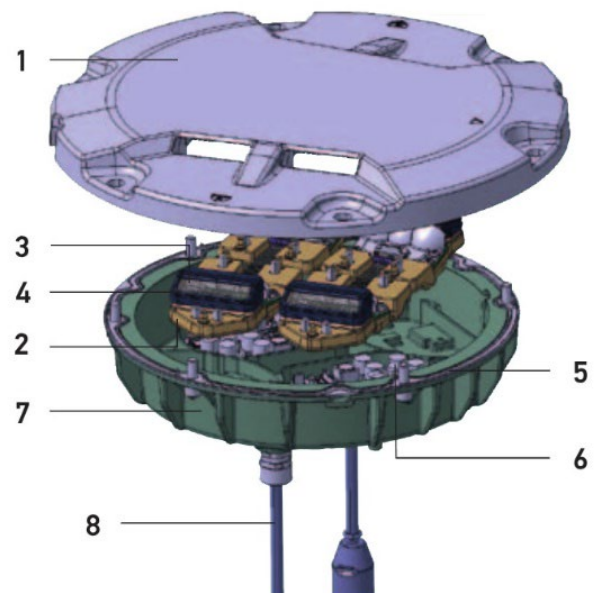
4.1 Inset light 12” description

TKH Airport Solutions inset lights are efficient and high-performing LED lights, providing at least 50,000 hours of service life at full 6.6A operation. The LED light fixtures have a simplified modular construction, consisting of five main components:

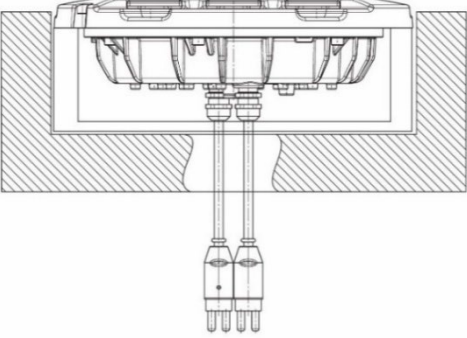
- Aluminum forging cover plate, with mechanical load capabilities exceeding FAA requirements
- Interchangeable LED light module
- Electronic driver board with housing
- Borosilicate glass prism with optional sapphire glass
- Secondary cable in accordance with FAA or ICAO requirements

Pos.	Component
1.	Cover (drop forged AL, anodised)
2.	High power LED module 1, 2, 3 and 4
3.	Prism (borosilicate glass)
4.	Sealing aperture (Fluor silicate)
5.	Sealing - housing ((Fluor silicate)
6.	Electronics
7.	Housing (Aluminium, die-cast)
8.	FAA L-823 plug

(Bi-directional variant shown in illustration)



4.2 General specifications

Nominal AC frequency:	40-70 Hz
Operation on constant current source:	max. 6.6 A
Ambient temperature:	-40°C (40°F) / +75°C (+167°F)
Weight: approx.	5.8 kg
Dust and water tightness:	IP68
Operation position must be according the drawing (note: drawing is indicative only):	<p style="text-align: center;">UP ↑</p> 

4.3 Operation Information

The LED-AGL Inset lights 12" are for outdoor use only for dedicated airfield installation. The power consumption and rated voltage are different for each function of the Inset lights 12". Optionally, the inset lights can be supplied with heating. Refer to the table below:

Power consumption of the Inset Lights 12 inch ¹					
Light	Function	Colour	Max. power consumption (W)	Max. power consumption with heating (W)	Max. rated voltage (VAC) normal/heating
APH	Approach	White	94	122	15 / 19
SR	Side Row	Red	56	84	9 / 13
THR	Threshold	Green	53	80	9 / 13
THRW	Threshold Wing Bar	Green	108	135	17 / 21
THRE	Combined Threshold/ Runway End	Green/red	68	96	11 / 15
	Combined Threshold/ Runway End (5-eyes)	Green/red	75	115	12 / 18
REH	Runway Edge	White	50	64	8 / 10
		White/white	100	128	16 / 20
		White/yellow	71	99	11 / 16
		Yellow	21	35	4 / 6
		Red/white	97	125	15 / 19
		Red/yellow	68	96	11 / 15
		Red/red	94	122	15 / 19
		Red	47	61	8 / 10
RWE	Runway End	Red	38	52	6 / 8

¹ = Power consumption is for the fixture only. Cable losses, transformer efficiency etc. are not included.

4.3.1 More Information

- For all technical data refer to the datasheet for your product at <https://www.tkh-airportsolutions.com/airfieldproducts/> or scan:



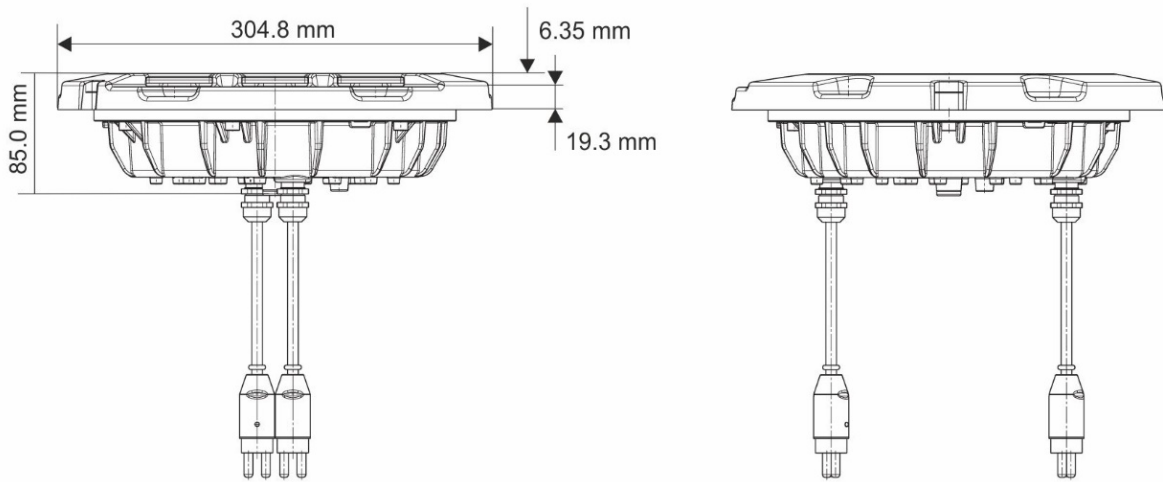
- If you have any questions about installation or maintenance, please contact TKH Airport Solutions Customer Service on service@tkh-airportsolutions.com.

4.4 Accessories

Optional accessory:

- Transformer
- Shallow base

4.5 Dimensions



(Note: drawing is indicative only)

5. Maintenance Recommendations

5.1 Warranty Limitation

The light assemblies are delivered fully tested and sealed. In case of malfunctioning during the warranty period, the defective light shall be shipped back to TKH Airport Solutions without opening it. Any attempt to open the light during the warranty period will void the warranty.

The prisms are not included in the warranty.

5.2 Maintenance in the Field

Field maintenance is limited to:

- Cleaning the surface of the front glass when necessary.
- Every 6 months, check the elevation and toe-in adjustment.

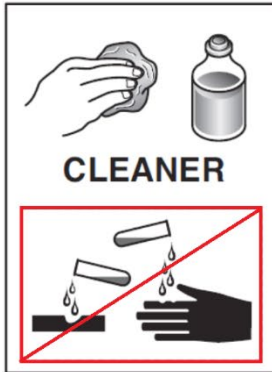
It is recommended to replace the light assembly if it malfunctions in the field or at end-of-life (after about 50000 operating hours).

5.3 Preventive Maintenance

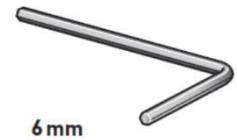
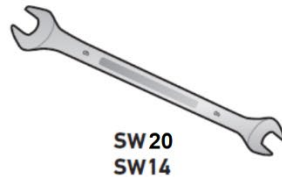
Besides cleaning the surface of the lens, no preventive maintenance is required.

6. Installation and maintenance instructions


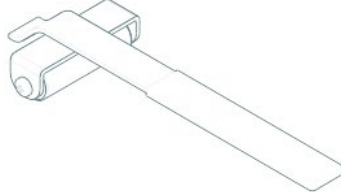

6.1 Tools Required



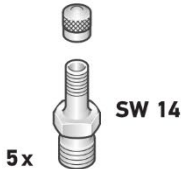
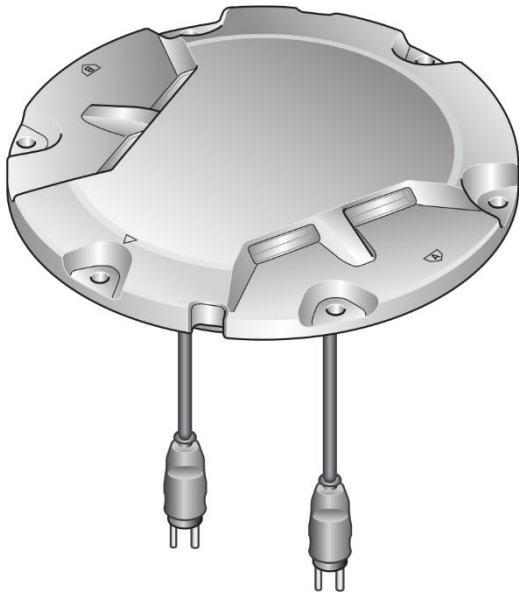
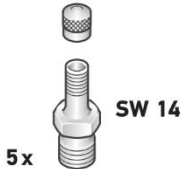
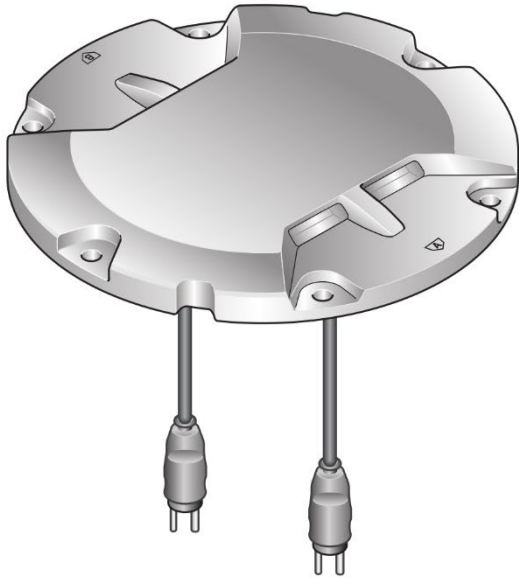
Non-caustic cleaning agent



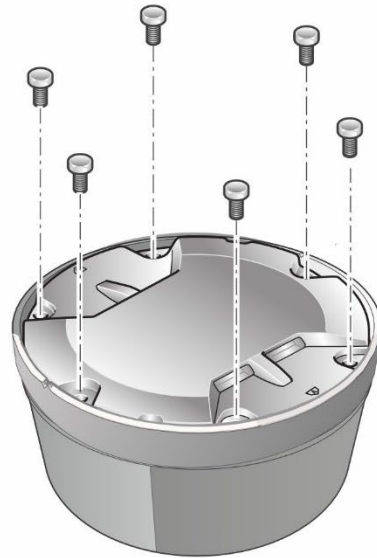
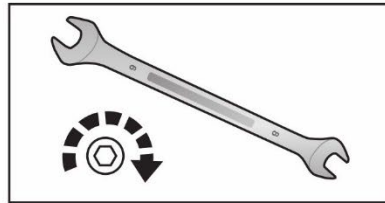
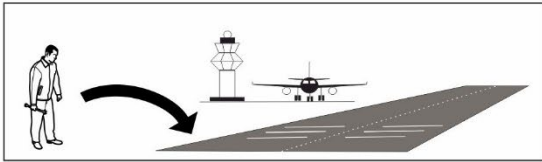
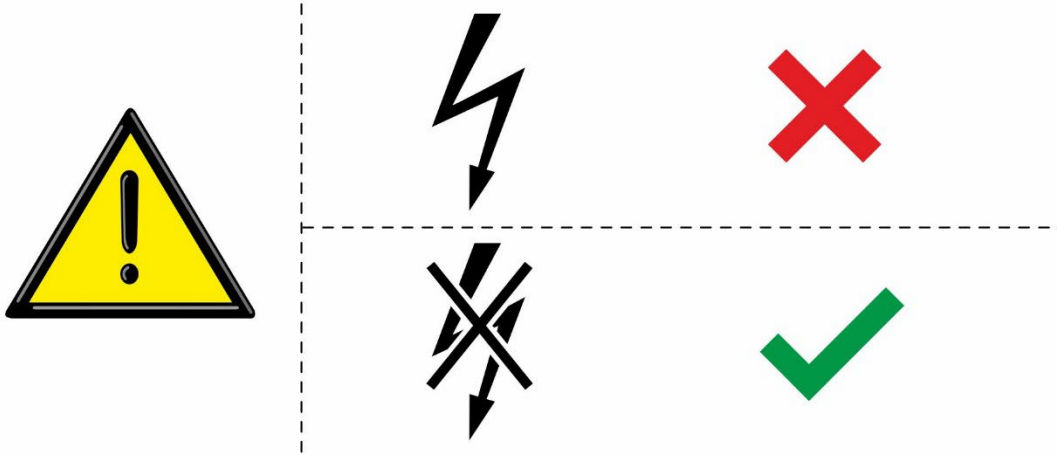
6.1.1 Optional tools available to order

 <p>Torque wrench 20 - 40 Nm (302.331)</p>	 <p>Lifting tool (302.321) to extract inset lights from the shallow base</p>
	<p>Tool set (302.311) for repair and maintenance of inset lights containing:</p> <ul style="list-style-type: none"> • Torque wrench 0-10 Nm • 13 adapters for torque wrench, covering sizes 4 mm - 14 mm • 6 Allen adapters for torque wrench, H3-H8 • 7 TORX adapters for torque wrench, T10-T40 • length adapters for torque wrench • 1 manual wrench 14 mm • 1 manual wrench 20 mm

6.2 Kit includes



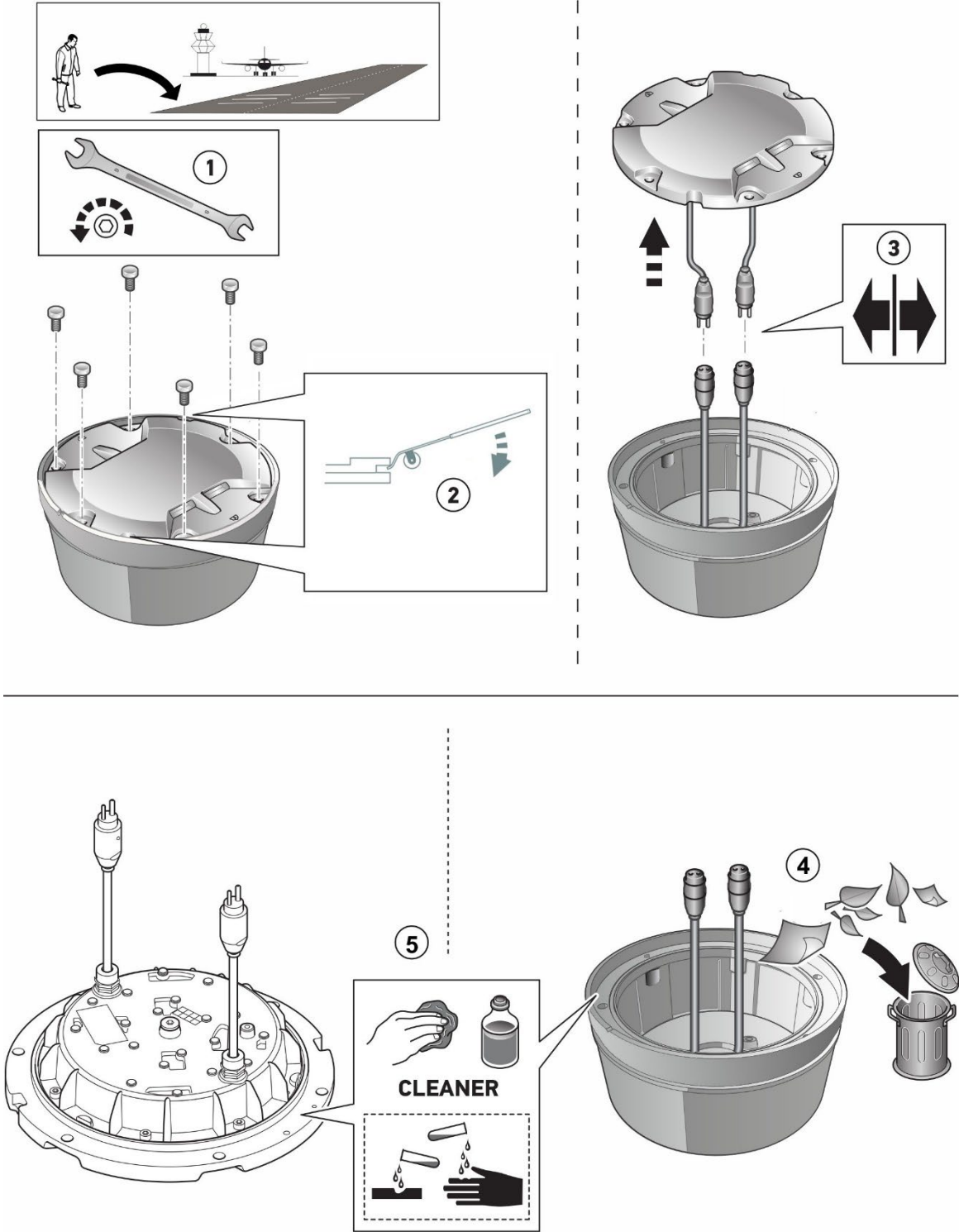
6.3 Installation

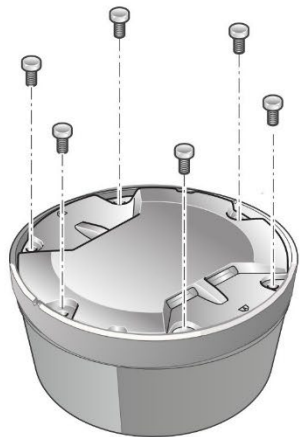
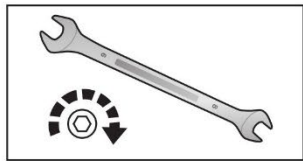
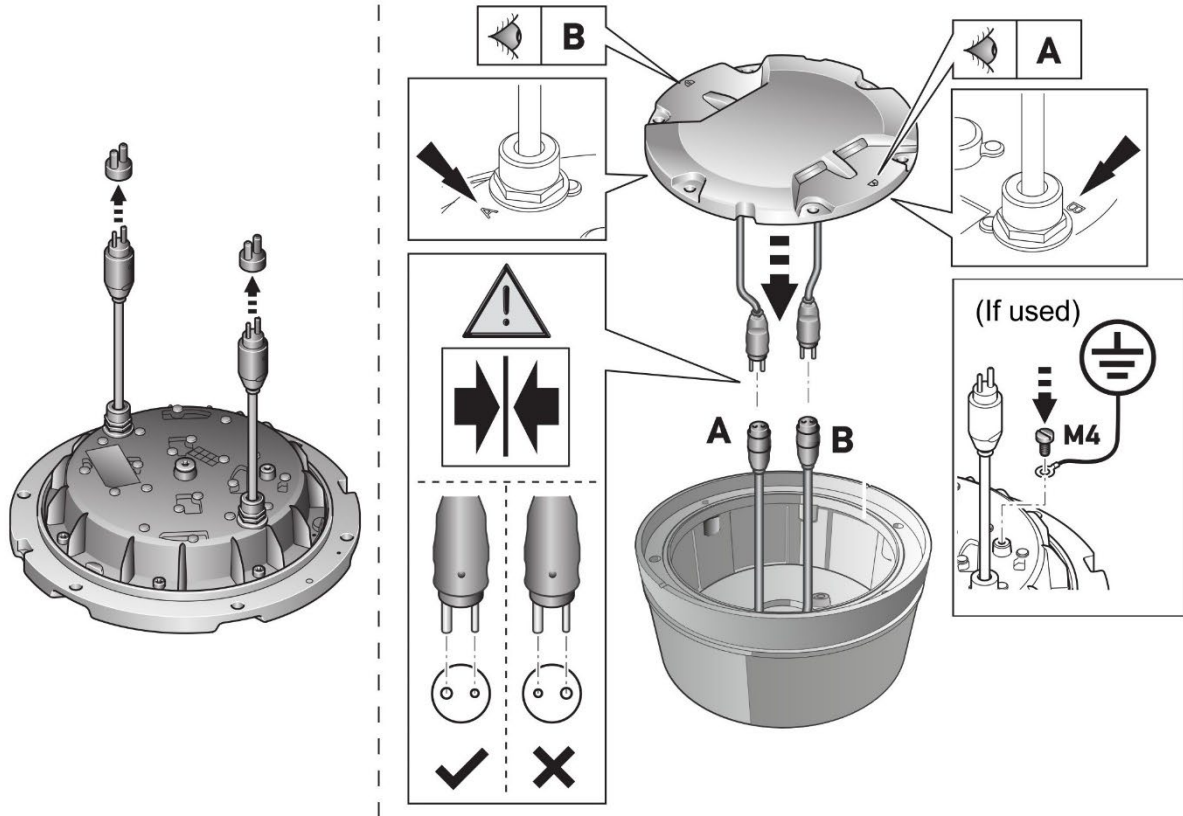


NOTICE

Tighten the nuts with a torque wrench. See specification of the shallow base manufacturer.

6.4 Work carried out on runway - cleaning





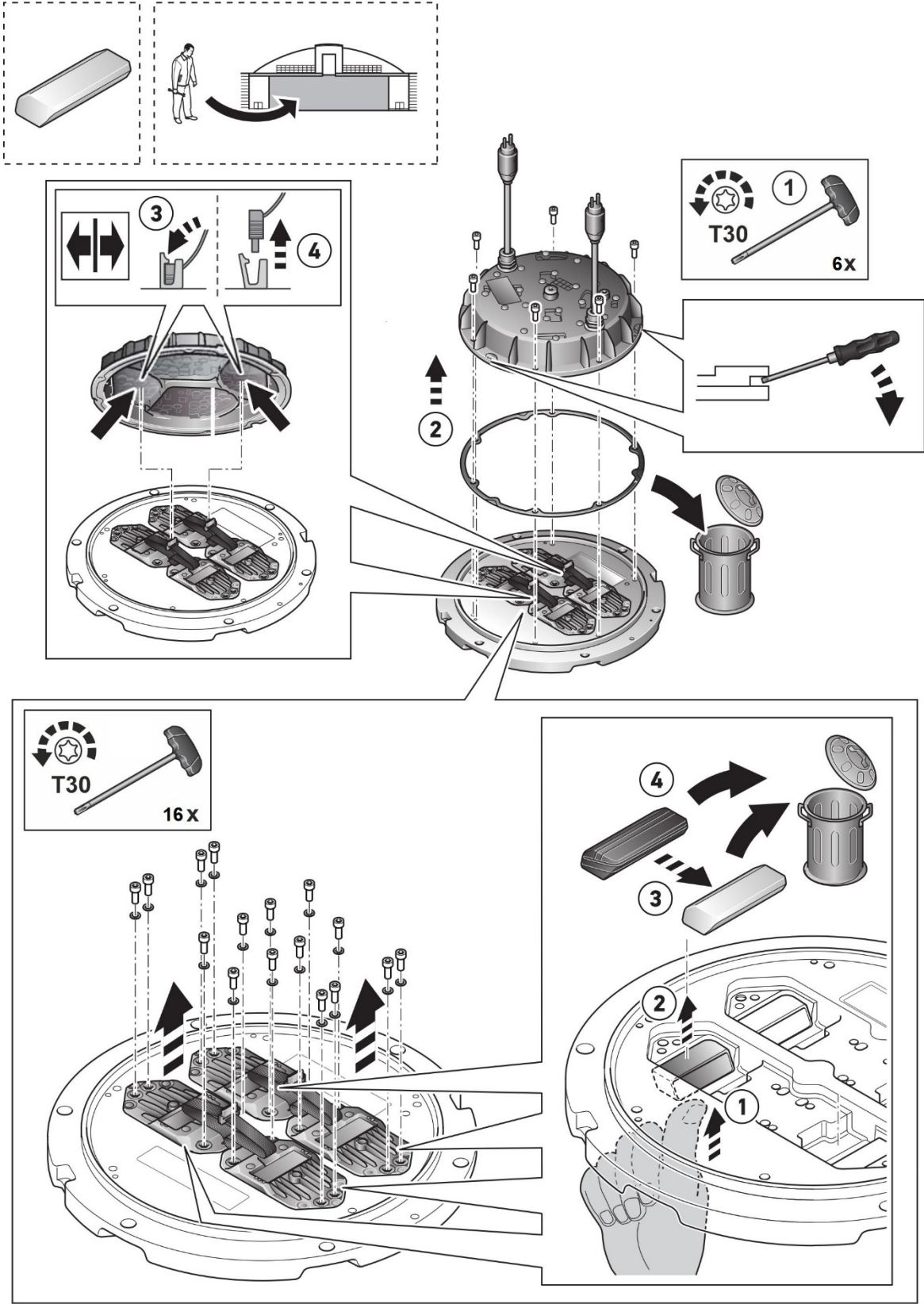
NOTICE

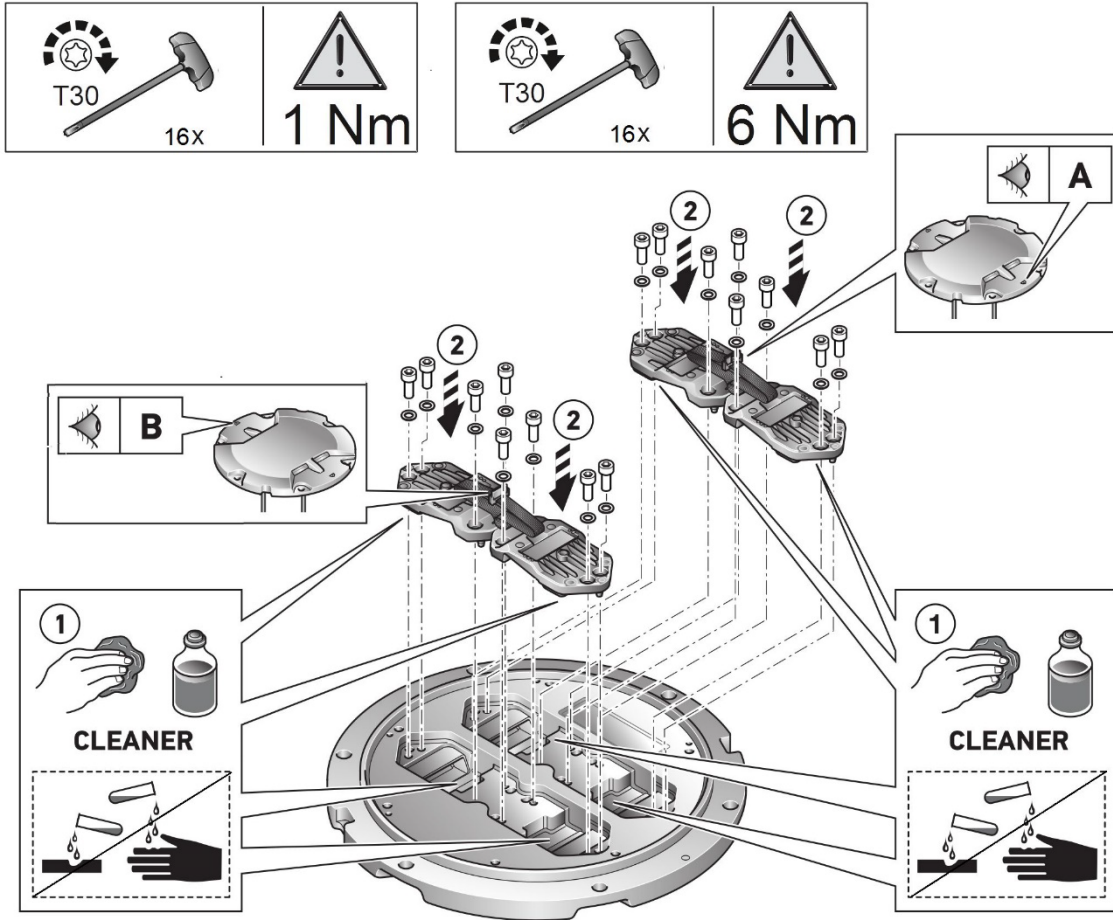
Tighten the nuts with a torque wrench. See specification of the shallow base manufacturer.

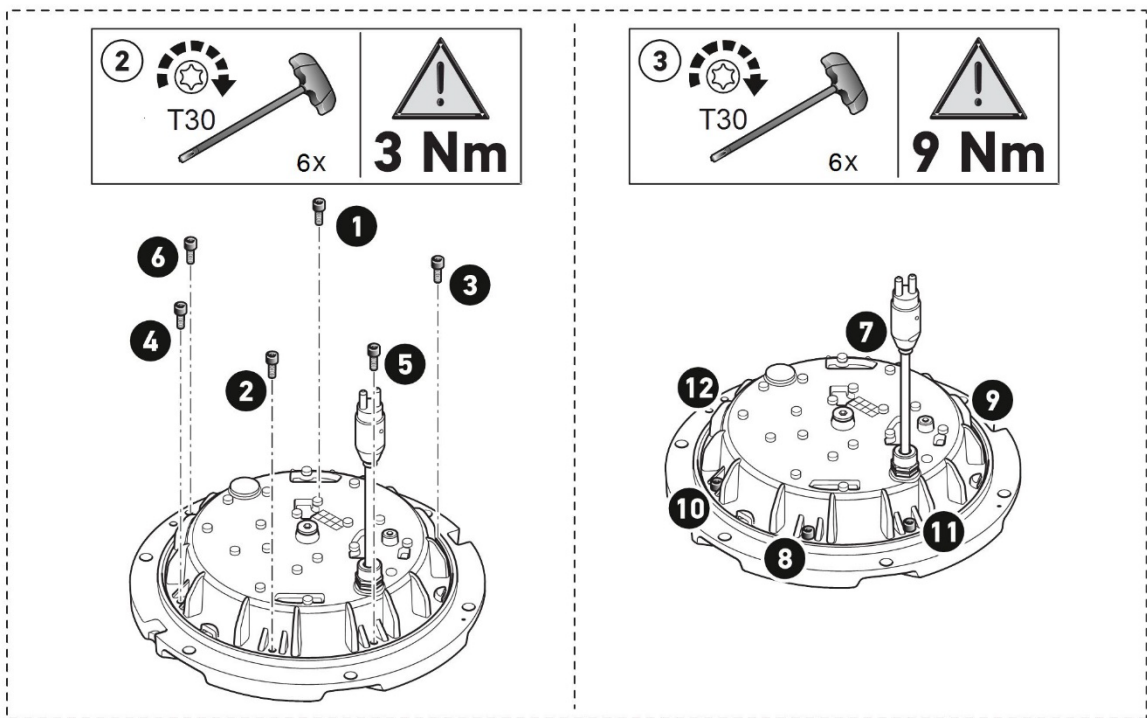
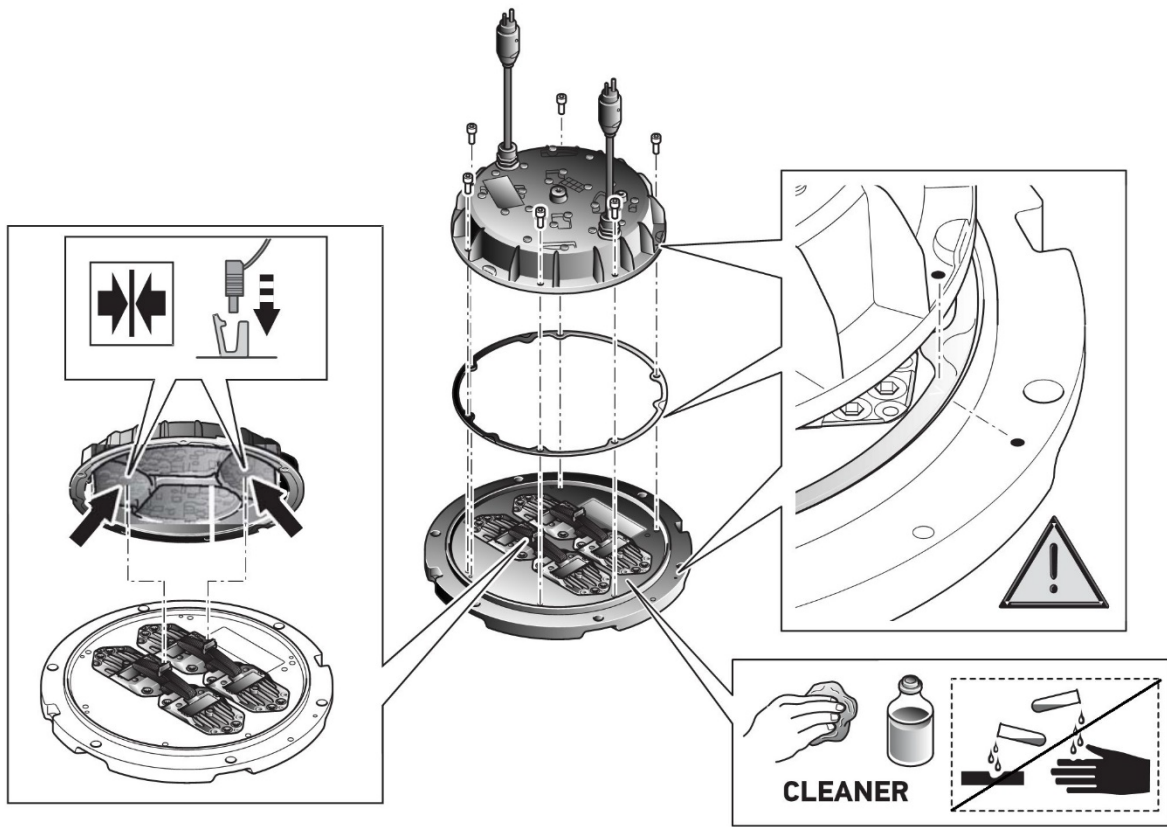
6.5 Replacing the prism

NOTICE

Follow the instructions carefully and only disconnect the cables as shown in these pictures. Do not disconnect any other cables!







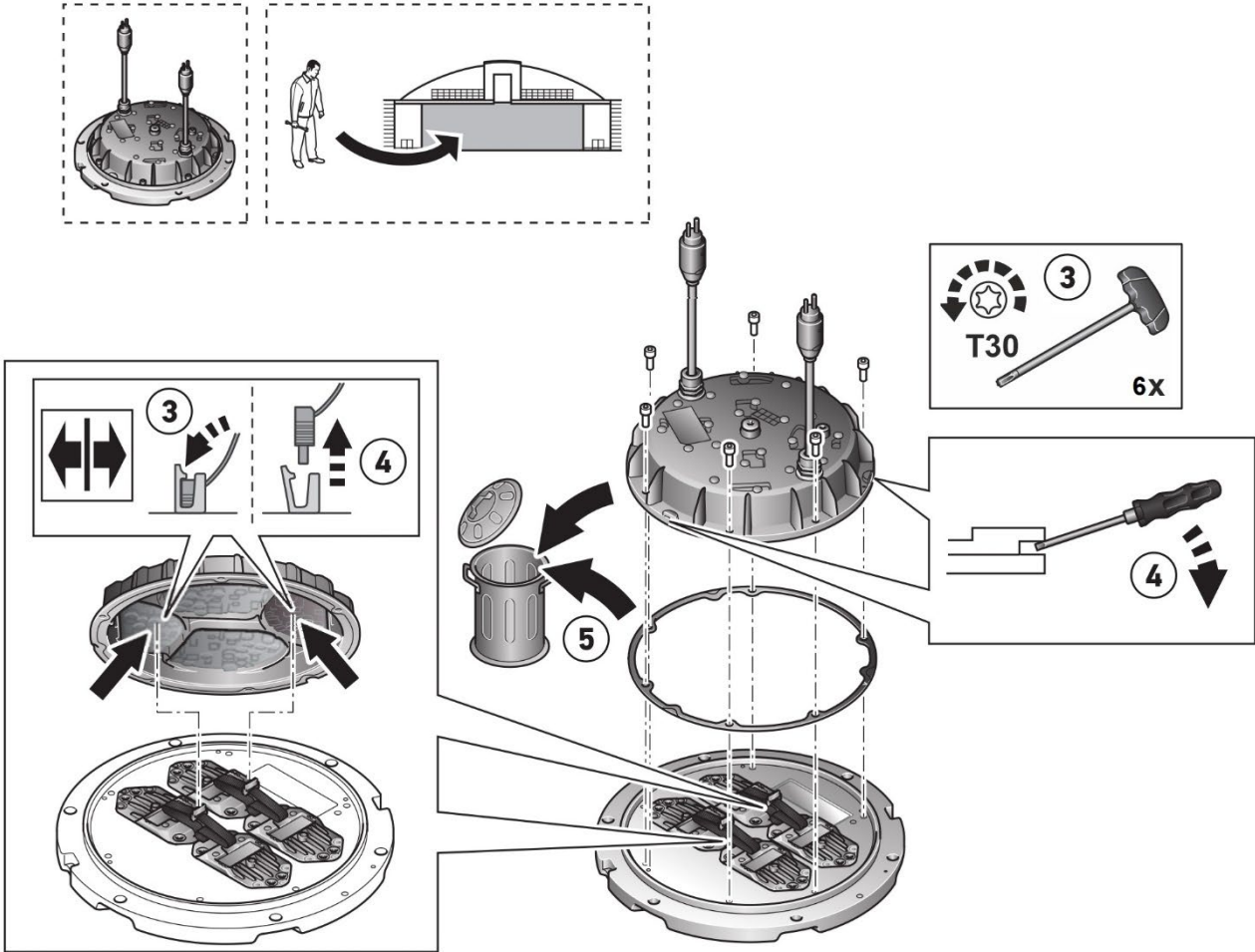
NOTICE

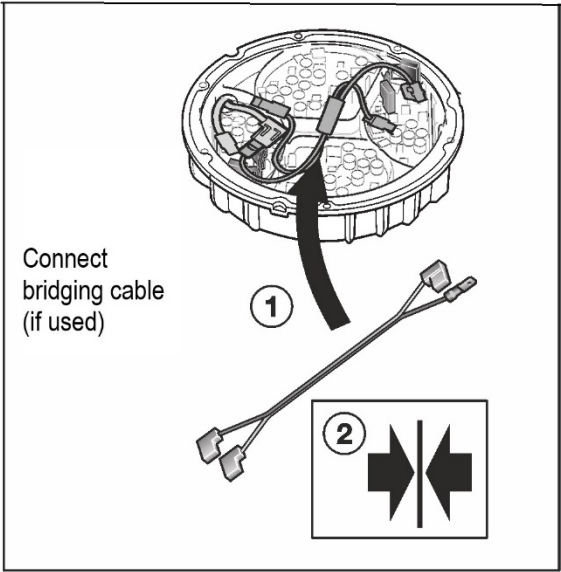
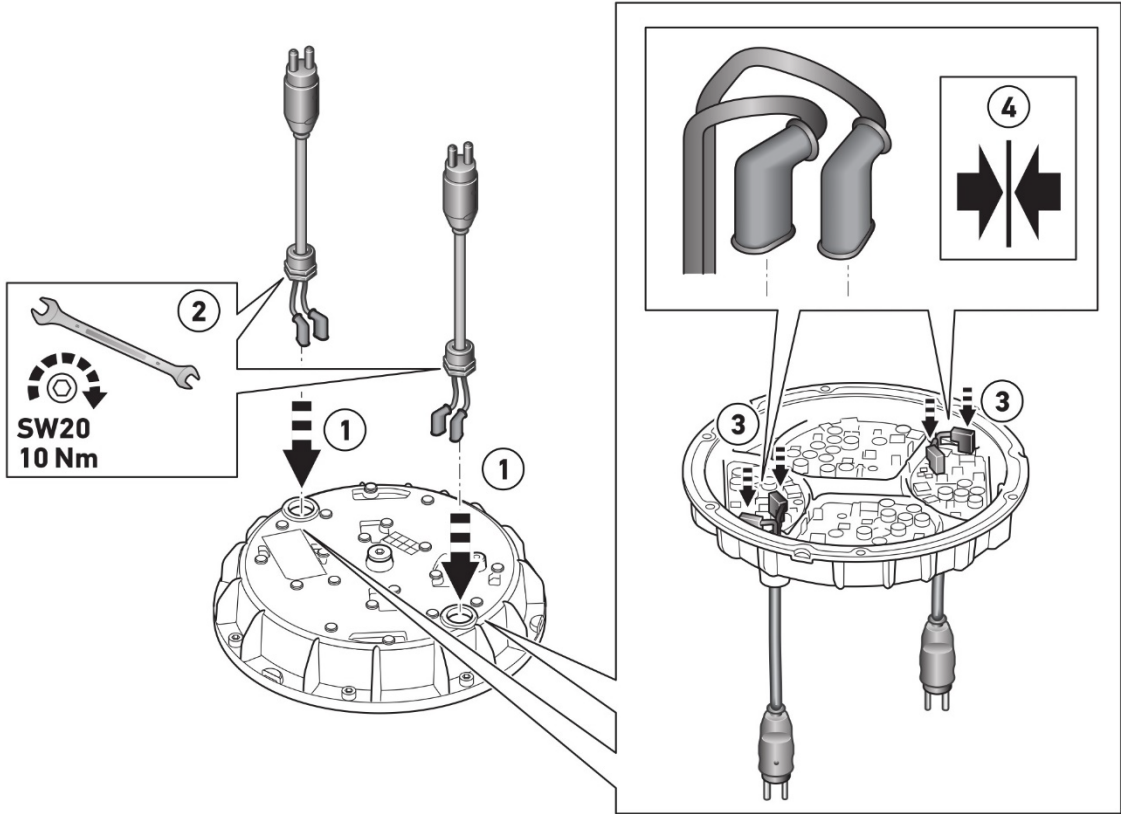
Make sure to perform a leakage test, as explained in chapter 6.9, everytime a fixture is opened and closed.

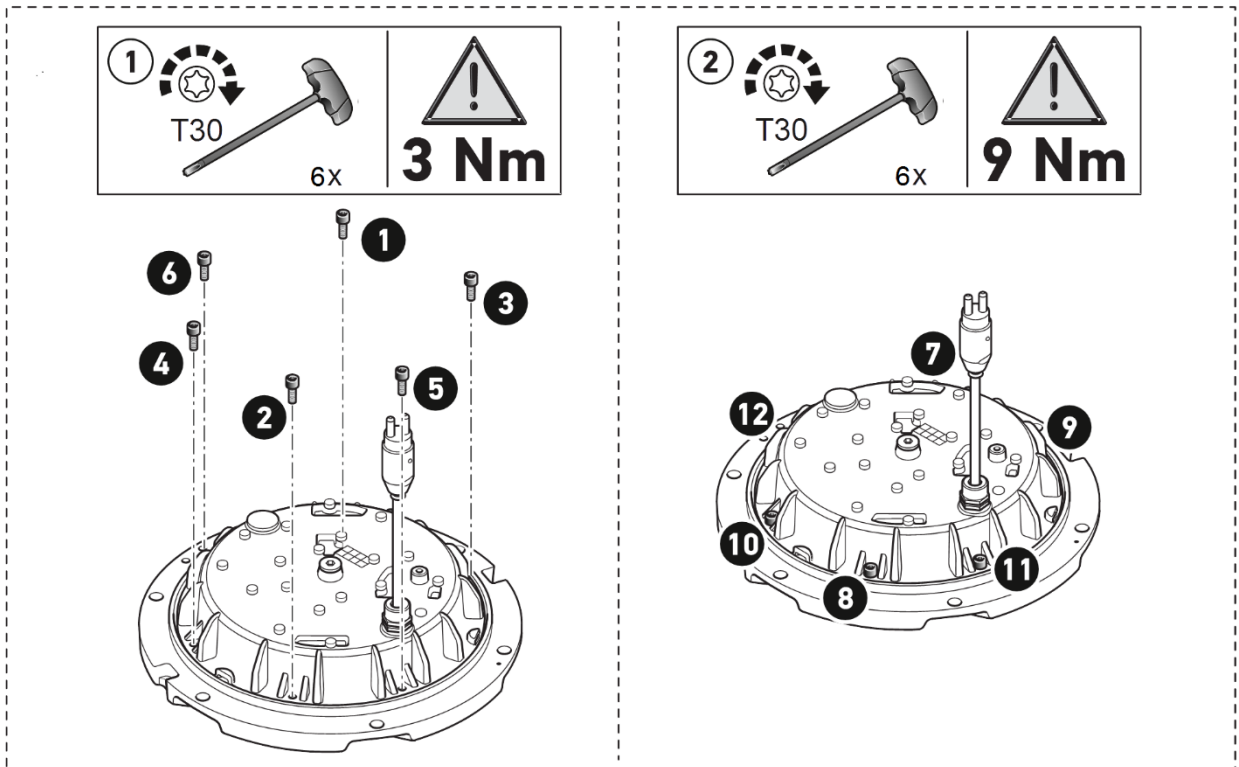
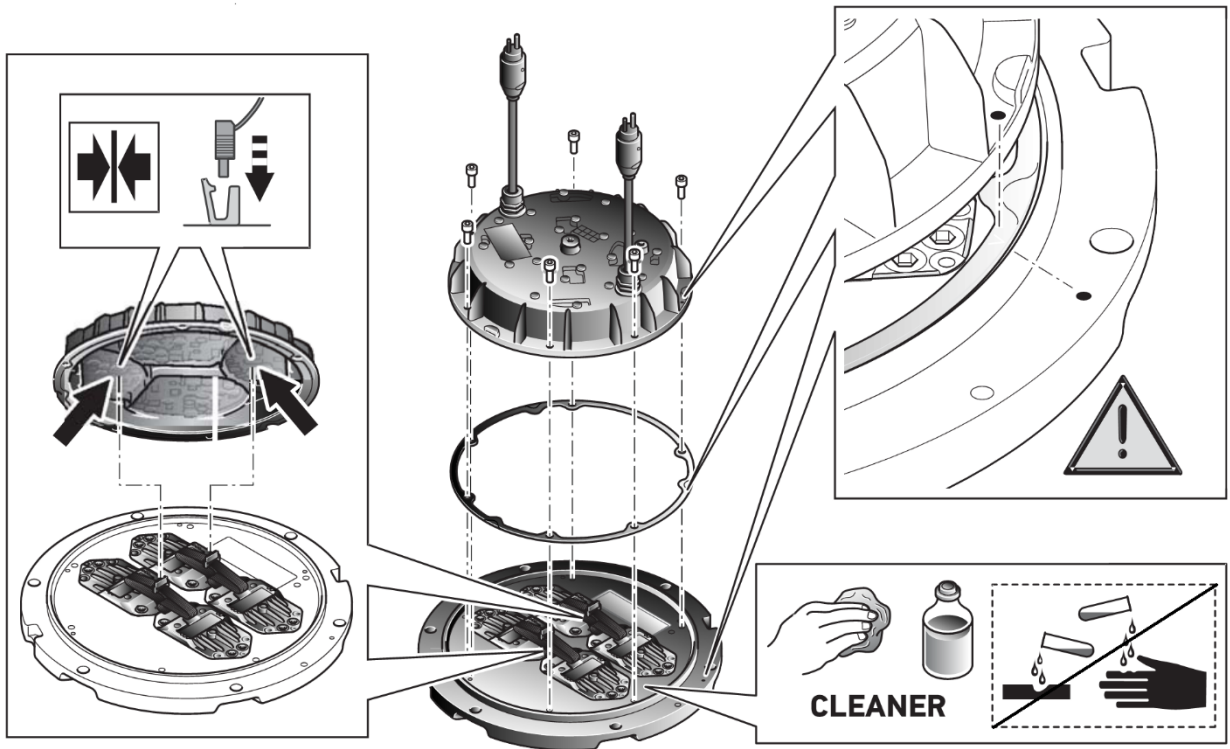
6.6 Replacing the housing group

NOTICE

Follow the instructions carefully and only disconnect the cables as shown in these pictures. Do not disconnect any other cables!







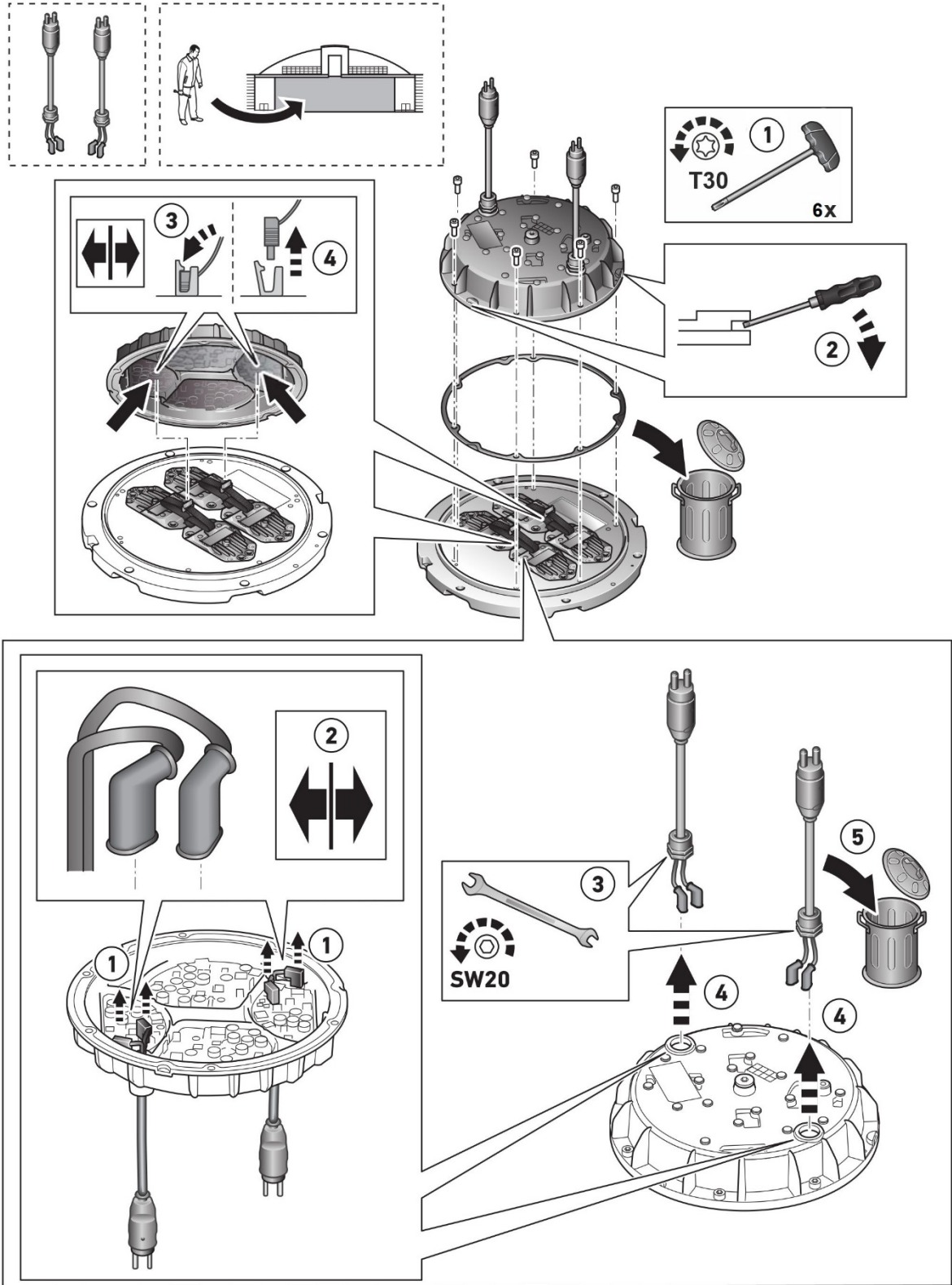
NOTICE

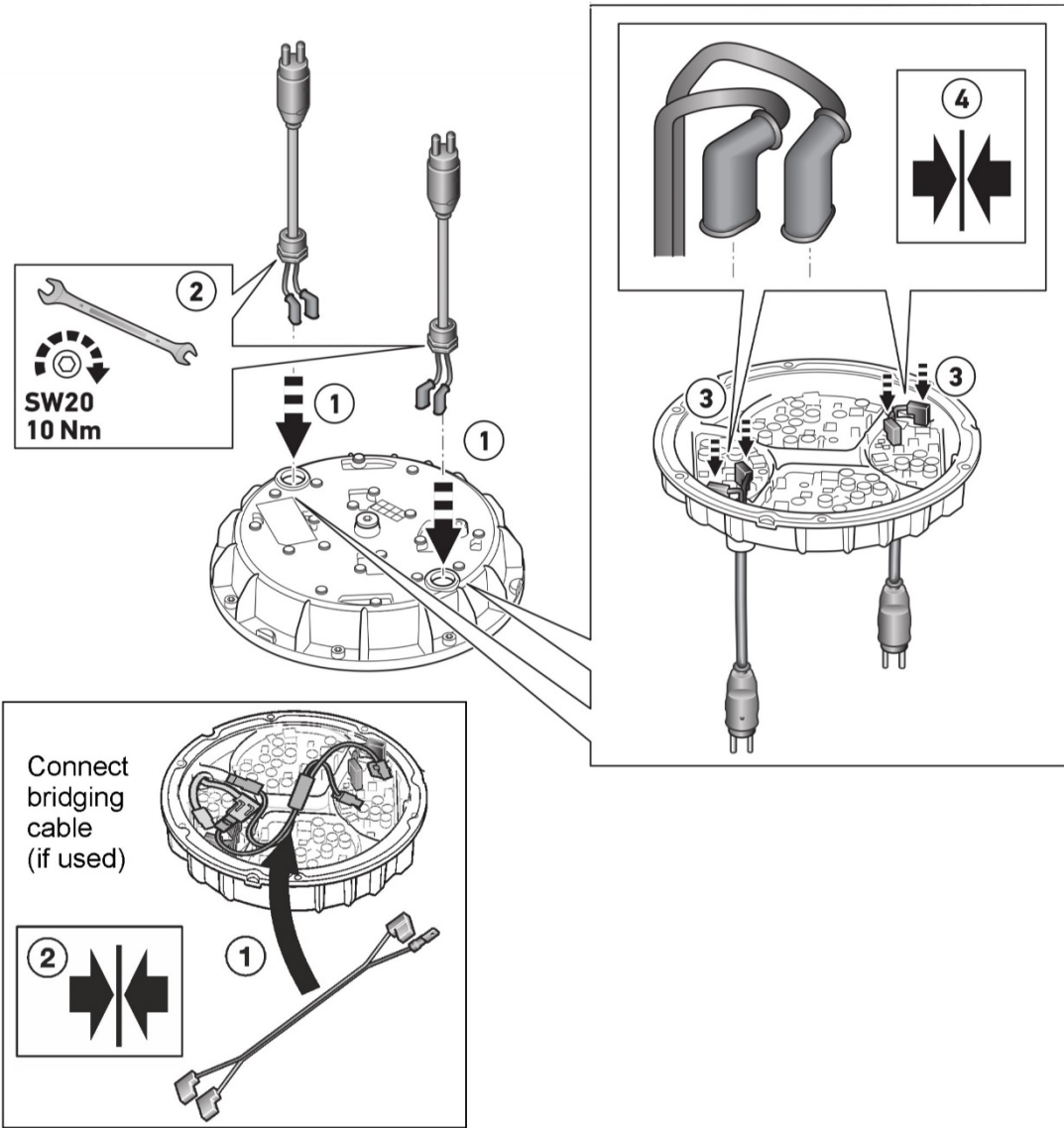
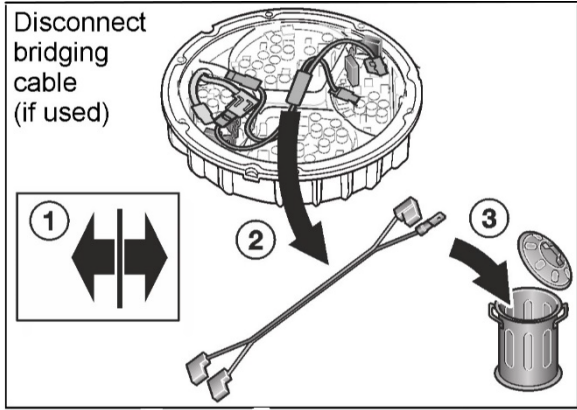
Make sure to perform a leakage test, as explained in chapter 6.9, everytime a fixture is opened and closed.

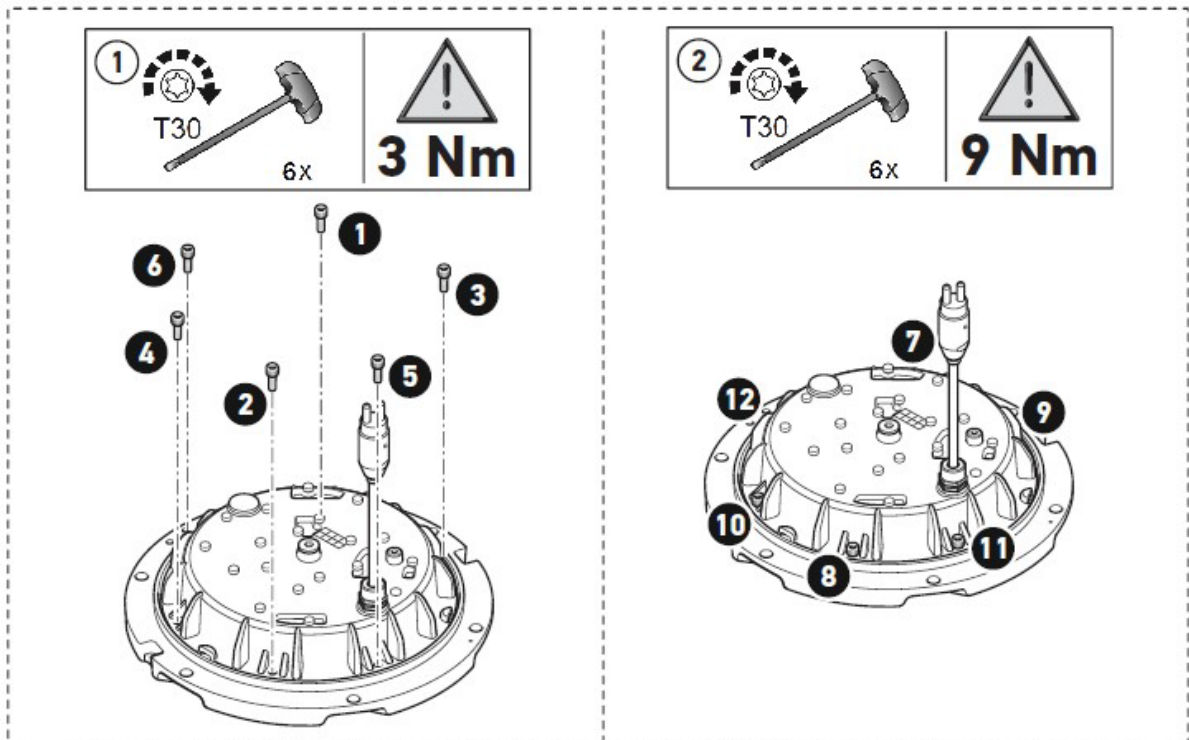
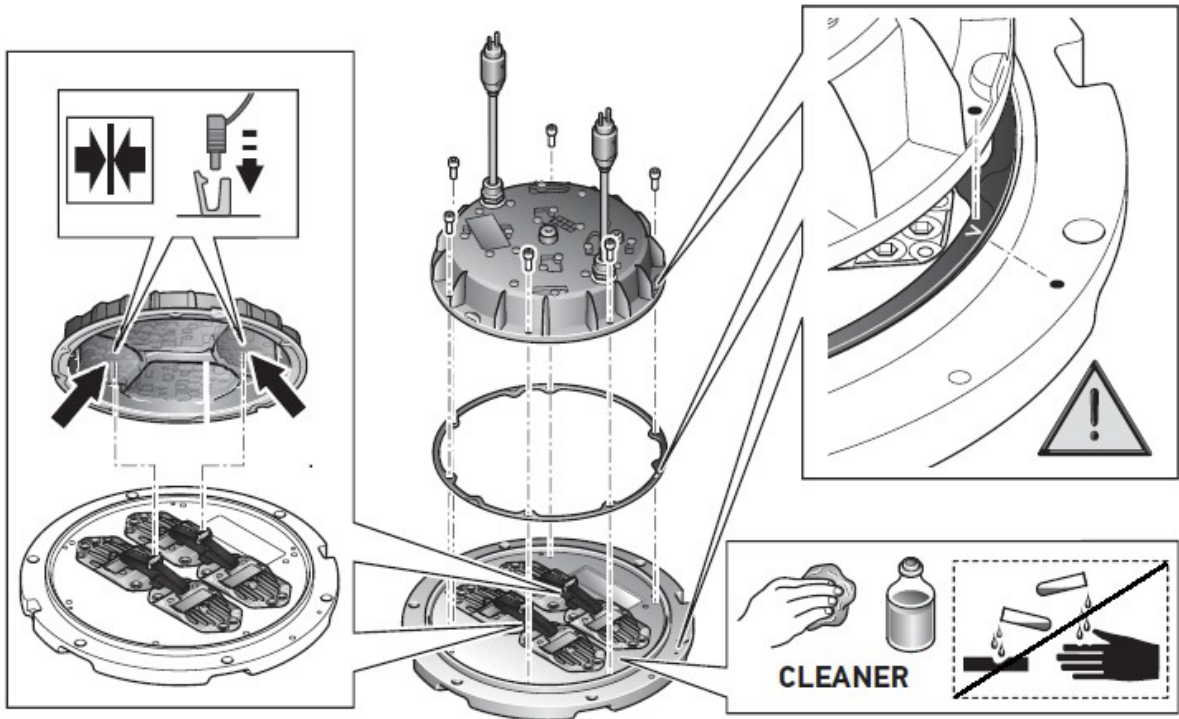
6.7 Replacing the external cable

NOTICE

Follow the instructions carefully and only disconnect the cables as shown in these pictures. Do not disconnect any other cables!







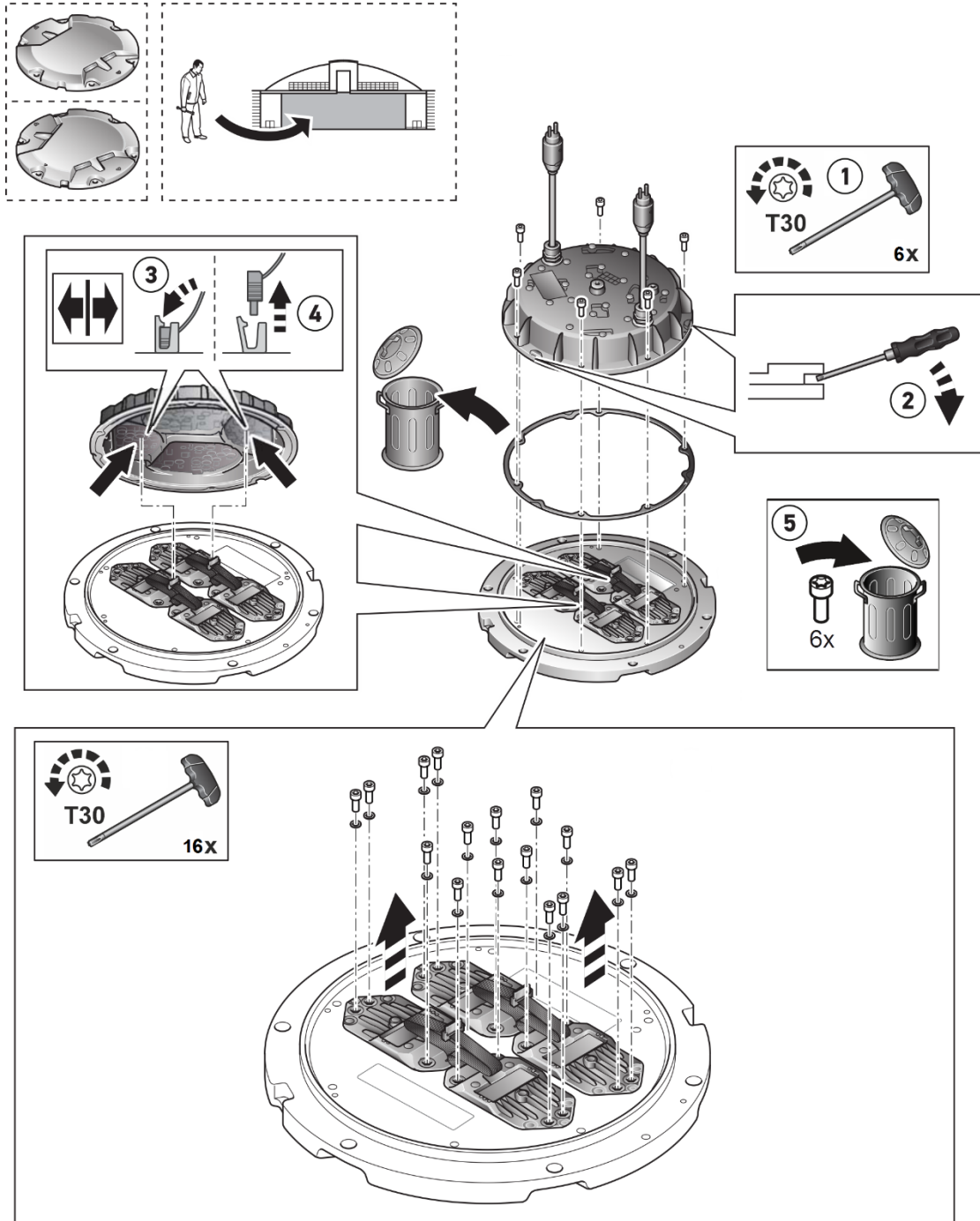
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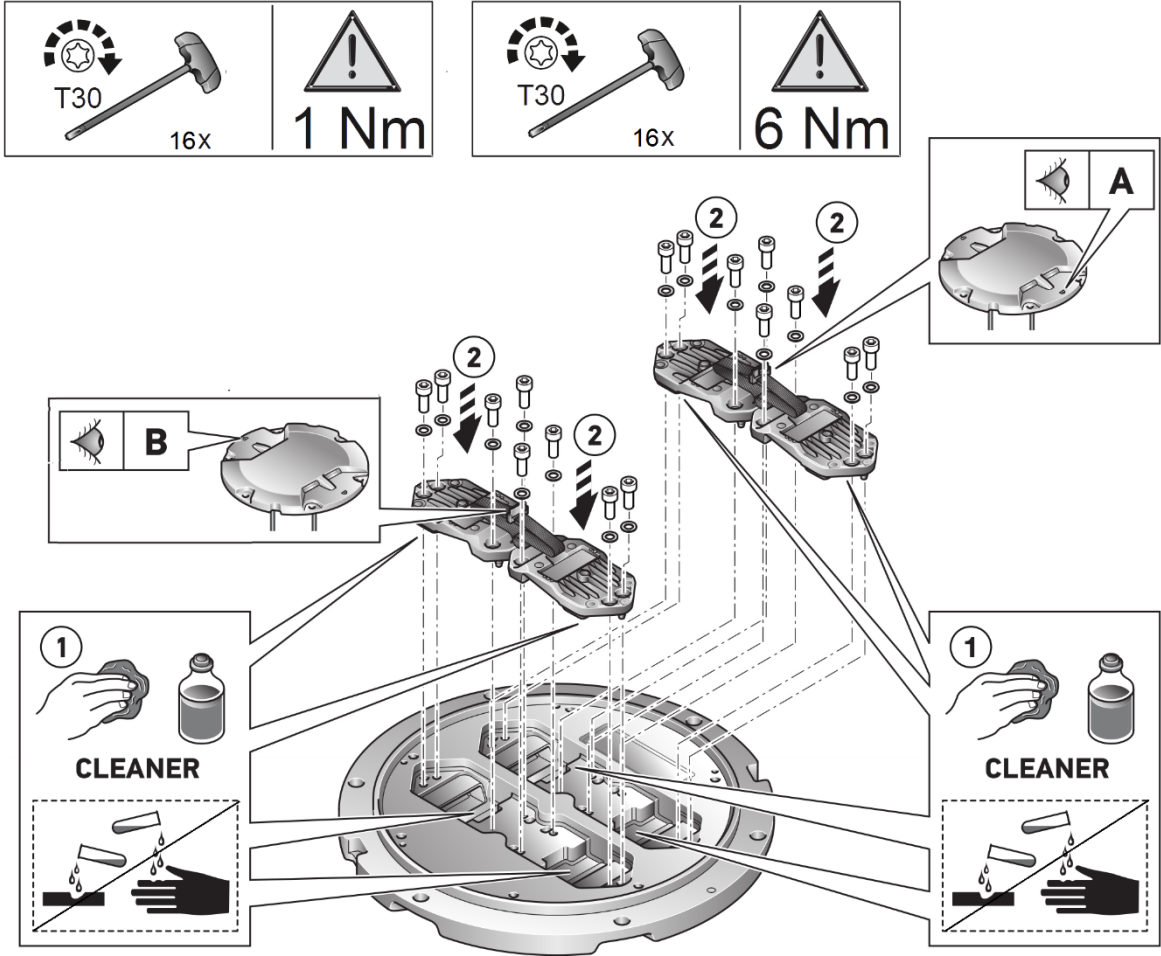
Make sure to perform a leakage test, as explained in chapter 6.9, everytime a fixture is opened and closed.

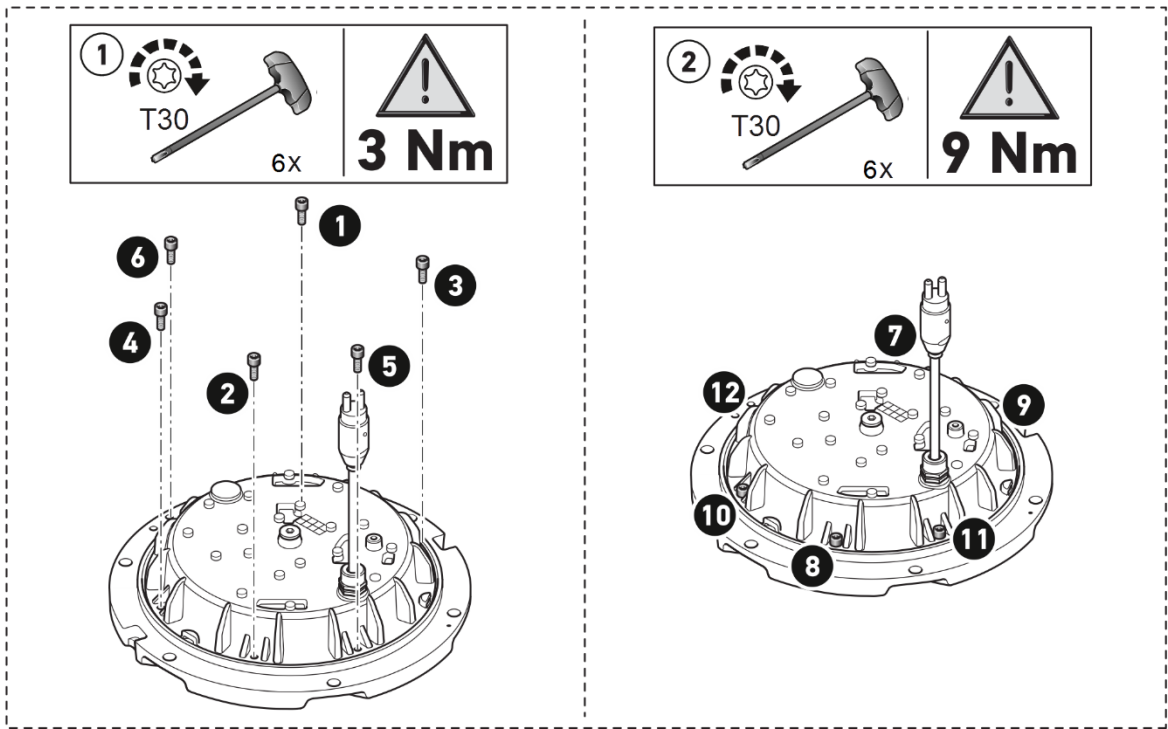
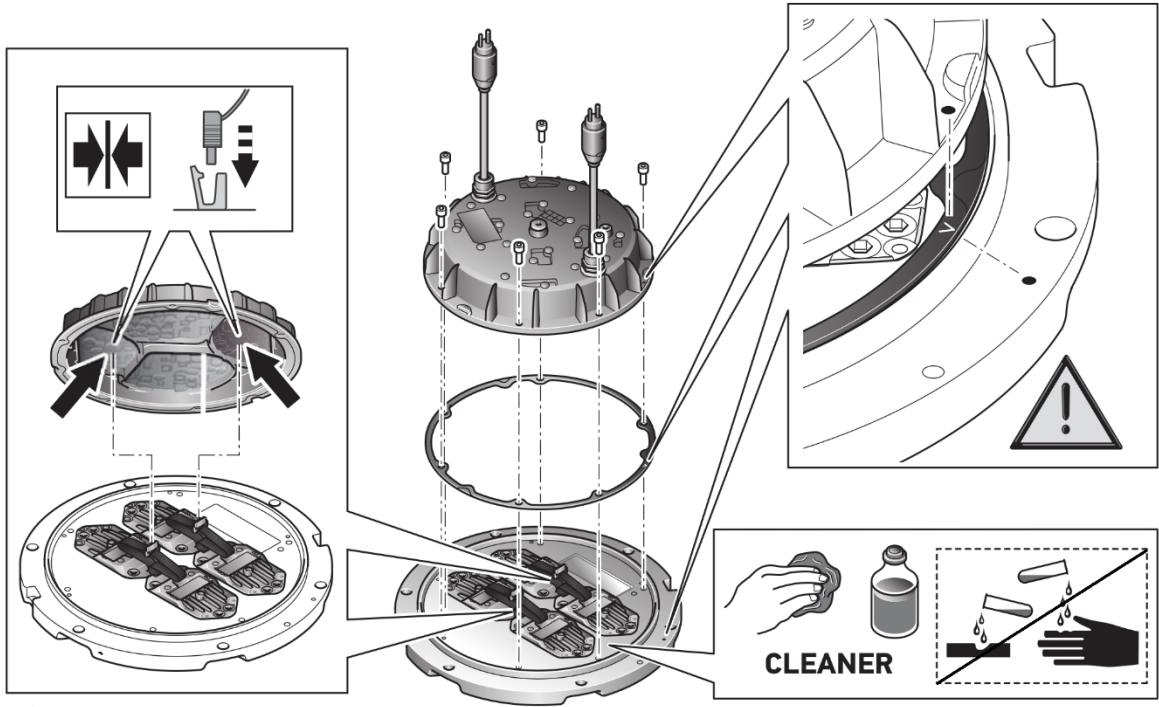
6.8 Replacing the module holder group

NOTICE

Follow the instructions carefully and only disconnect the cables as shown in these pictures. Do not disconnect any other cables!



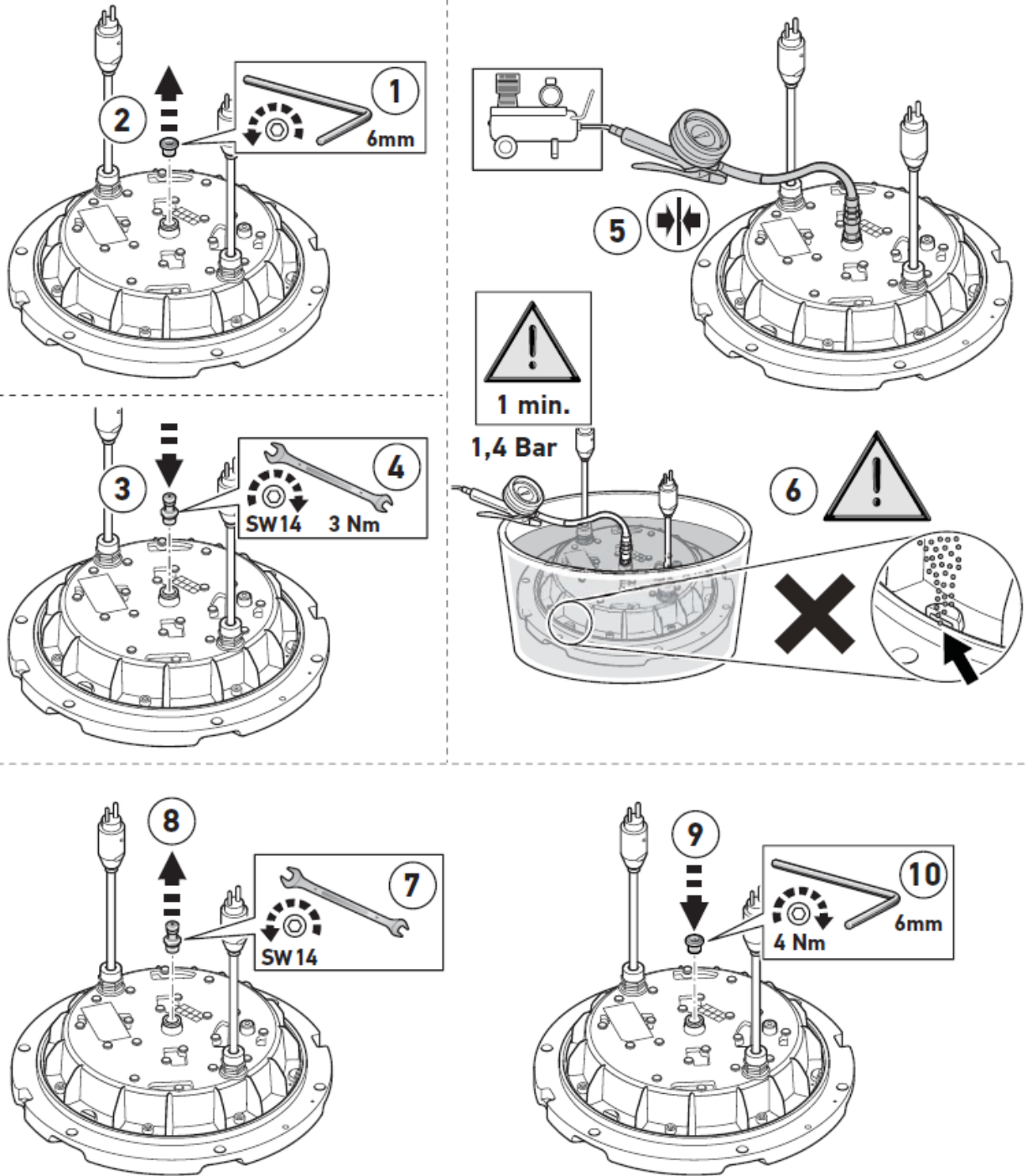




NOTICE

Make sure to perform a leakage test, as explained in chapter 6.9, everytime a fixture is opened and closed.

6.9 Leakage test



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Company profile:

TKH Airport Solutions is an innovator in airfield ground lighting, offering a complete range of LED AGL products. We build upon the know-how from a long and successful tradition of pioneering developments in the AGL and connectivity industry. Being part of the TKH Group, our company can build on a history of more than 90 years in smart connectivity, energy distribution and AGL.

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