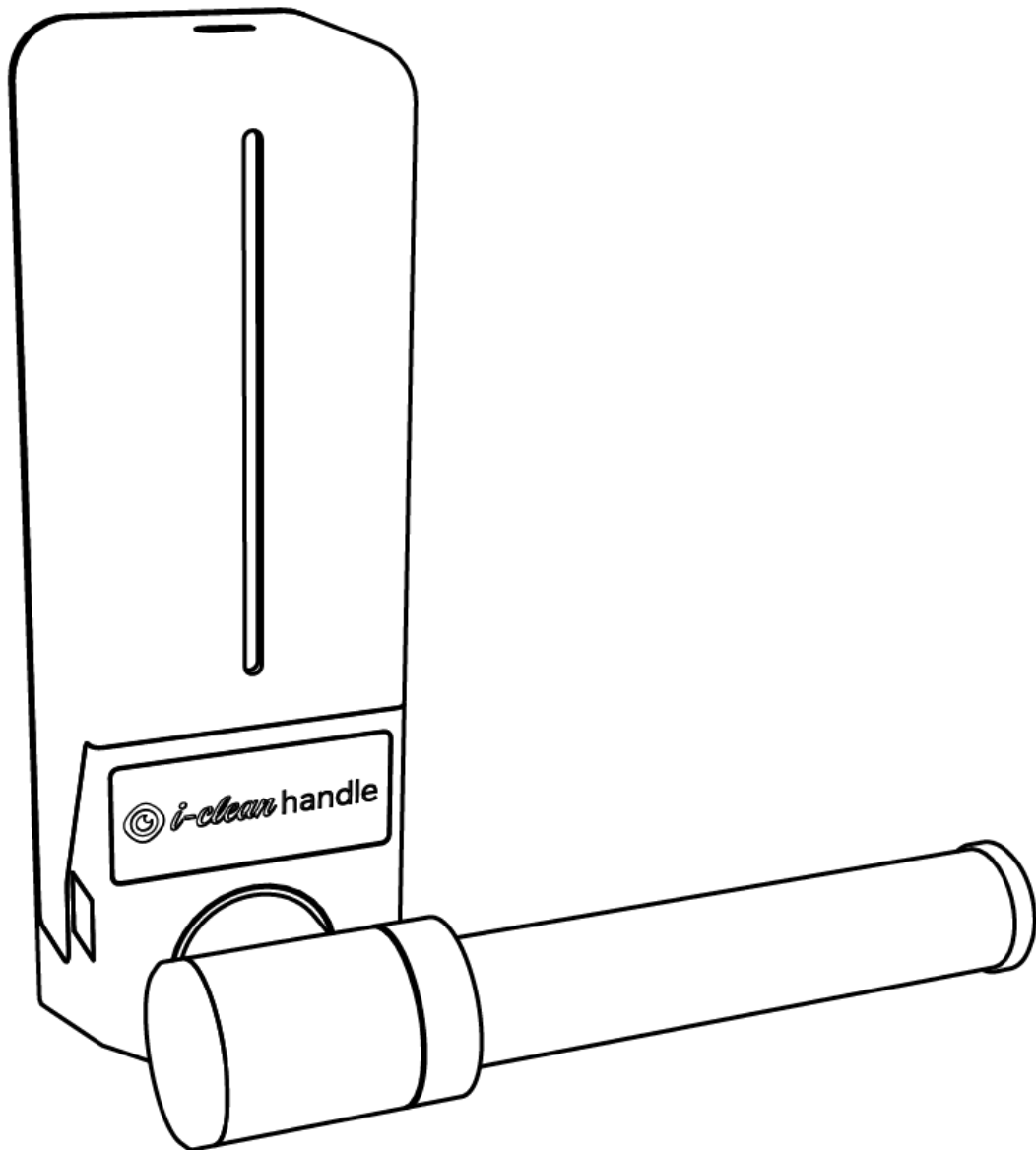


i-clean handle

User manual



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Original user manual, written in the English language
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Model: i-clean handle
Product codes: ICD.I-V.0000B/S, ICD.I-V.0000B/L and ICD.I-V.0000B/R

Date: Nov/2024
Version: v1.0



Preface

Thank you for purchasing the i-clean handle. Please read the important safety information and user instructions in this manual carefully before installation. Save this manual for future reference.

i-link®

The LORA-one connects each i-clean handle to the cloud. It has a small integrated transmitter, already connected to the i-link cloud. This transmitter will send the number of running cycles and status of both the battery and the cleaning fluid tank to the i-link cloud continuously. It's also possible to set rules for notifications (e.g. reminders for maintenance) and to troubleshoot an issue with the machine through your i-partner. For more information, see the Lora-one manual.

Purpose of the installation and maintenance manual

The user manual provides the user with all necessary information to install, use and maintain the i-clean handle safely and correctly. This even in cases of reasonably foreseeable misuse, as described in section 1.2 of this manual.

The manual contains instructions regarding:

- personal safety of installers and maintenance persons;
- intended and non-intended use of the i-clean handle;
- installation instructions;
- maintenance instructions;
- disposal of the i-clean handle.

These instructions must be considered to avoid risks that could lead to physical and/or material damage.

Target audience

This manual is intended for installers of the i-clean handle and anyone carrying out maintenance, as well as partners and importers.





Persons installing or maintaining the i-clean handle

The i-clean handle may only be installed or maintained by a person who is confident and has fully read and understood the instructions in this manual.



Reading guide

The following symbols and terms are used throughout this manual to alert the reader to safety issues and important information:

Symbol	Term	Explanation
	WARNING	Indicates a hazardous situation which, if the safety instructions are not followed, can lead to injuries of the operator or bystanders, light and/or moderate damage to the product or the environment.
	CAUTION	Indicates a hazardous situation which, if the safety instructions are not followed, can lead to light and / or moderate damage to the product or the environment.
	ATTENTION	Indicates a liability situation, where the manufacturer or its partners and affiliates cannot be held accountable for damages caused by non-compliance.
	BATTERIES	Indicates a battery-operated machine, batteries must be charged according to the instructions in the separate class I battery charger user manual. Batteries must be disposed of according to local laws and regulations.



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1. Introduction

The i-clean handle is a self-cleaning door handle. It cleans itself after each use, thereby eliminating bacteria and viruses. It can be used on both new doors and as a replacement for existing door handles.

This manual helps you to get started and explains the installation and maintenance procedure.

This manual is intended for those who install the i-clean handle or perform maintenance on it. The manual must be read fully, before starting the installation of or maintenance on the device. This manual describes the correct method of use, safety measures and maintenance.

The manufacturer continuously improves all its products based on user experience and feedback. Any deviations between the texts and/or images from the manual and your i-clean handle can therefore arise from the difference in model, or from possible changes due to continuous development and innovation.

1.1. Intended use of the product

The i-clean handle is a self-cleaning lever type door handle, intended to safely open the door.

Cleaning will take place automatically after each time the door handle is used. It is designed with patented technology to create a safer, healthier workplace.

The device uses a cleaning liquid specially developed by i-team Hygiene and Services.

The i-clean handle is intended for indoor use only.

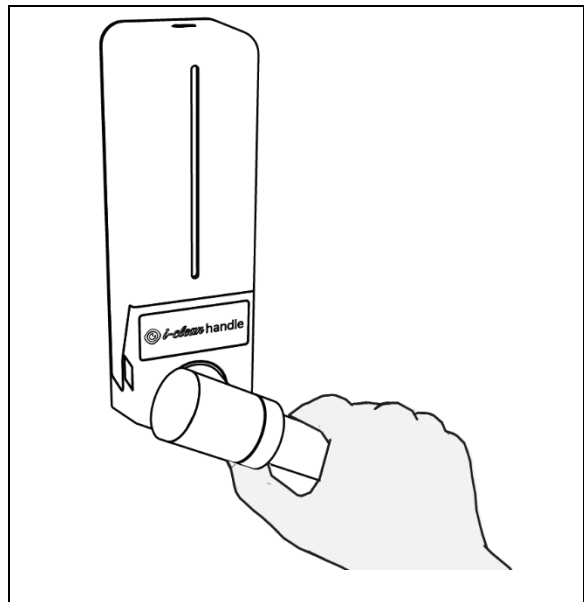


Figure 1



1.2. Non-intended use of the product



WARNING

Non-intended use can have consequences for the safety of operators and bystanders and will void the warranty on the product.

- This product is not a toy and should not be used as such.
- DO NOT immerse the product in water or other liquids and do not rinse under a tap.
- DO NOT use the i-clean handle for anything other than the intended use, described in section 1.1.

1.3. Lifespan

The sustainable service life of the i-clean handle is over 200,000 running cycles.

1.4. Modifications

It is not permitted to make modifications to the design of the i-clean handle without consultation and permission from the manufacturer. This affects the warranty, see section 1.6 of this manual.

1.5. Specifications

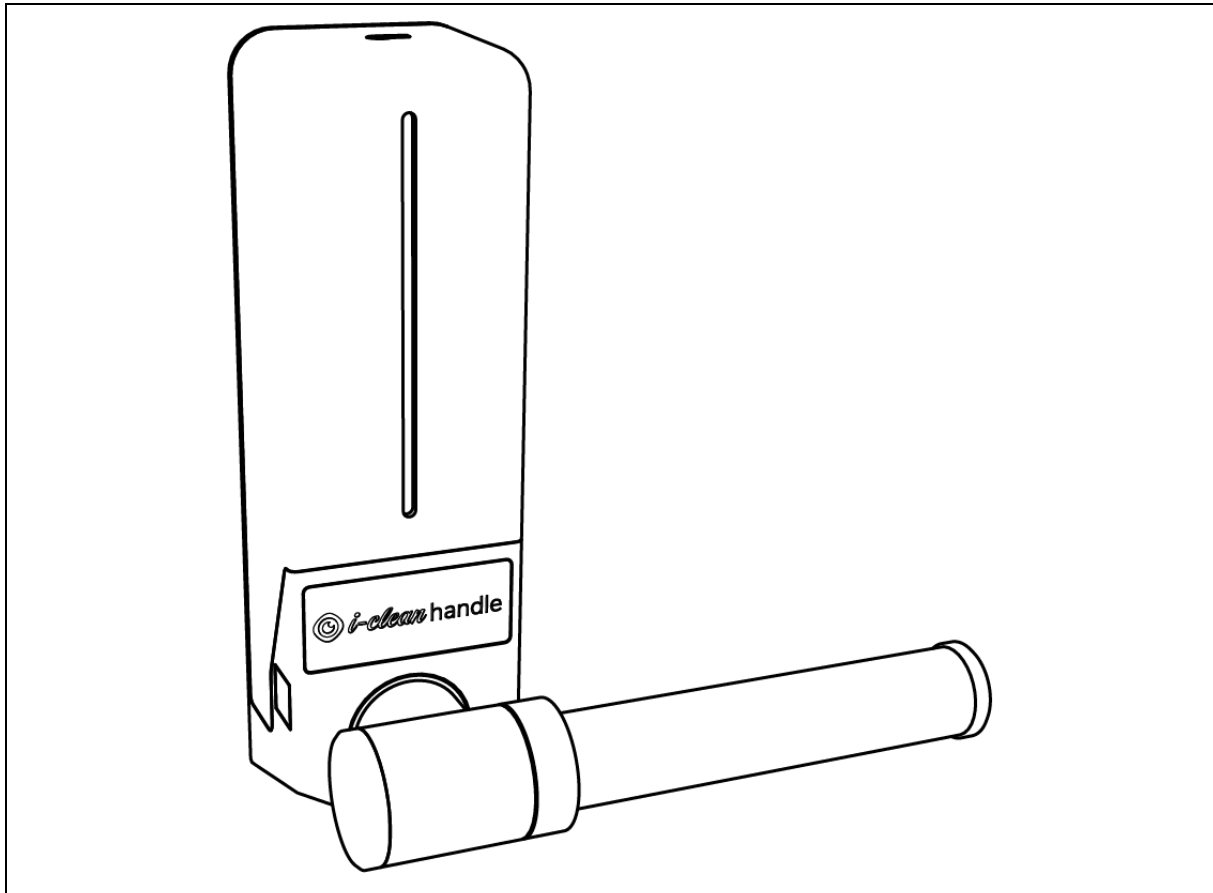


Figure 2



Product identification set	ICD.I-V.0000B/S
Product identification left handle	ICD.I-V.0000B/L
Product identification right handle	ICD.I-V.0000B/R
Product name:	i-clean handle
Product weight, including battery	0.8 kg
Product size (L x H x W)	168x199x81 mm
Tank capacity	About 95 ml
Battery type	Li-ion battery pack with type-C Charging interface and charger station interface
Battery Life	500 Normal charging and discharging times
Battery parameter	Output 5.0 V/5 Ah/25.0 Wh
Endurance of battery	About 25,000 handle pulls
Endurance of one full tank.	About 6800 handle pulls
Flow rate of one cycle for liquid	About 0.009 ml
i-charger 5V2A-5X (charger station)	5V2A, can charge 5 batteries simultaneously
Recharge time in 5V2A	About 3.0 hours
Liquid shortage reminder	<ul style="list-style-type: none">• LED light• i-Link app @Mobile reminder- LoRA
Power shortage reminder	<ul style="list-style-type: none">• LED light• i-Link app @Mobile reminder- LoRA
Running count statistics	i-Link app @Mobile reminder- LoRA
The sustainable service life of the i-clean handle	> 200,000 running cycles
Replacement time of cleaning ring	When the tank is replaced, but more often when used in a dirty environment.
The main materials of the product	Medical grade steel and others

1.6. Warranty

The i-clean handle should be installed, used and maintained as intended and described in this manual. Refilling a tank, or using any tank or battery not supplied by i-team Hygiene and Services will void the warranty on the product.

1.7. Identification

The serial number and production date can be found on a sticker on the back of the i-clean handle.



2. Description

2.1. General

The i-clean handle is available in:

- a combination of a left and a right handle, or;
- a single left handle, or;
- a single right handle.

2.2. Overview

See the specifications in section 1.5 for the article codes.

The i-clean handle consists of the following parts:

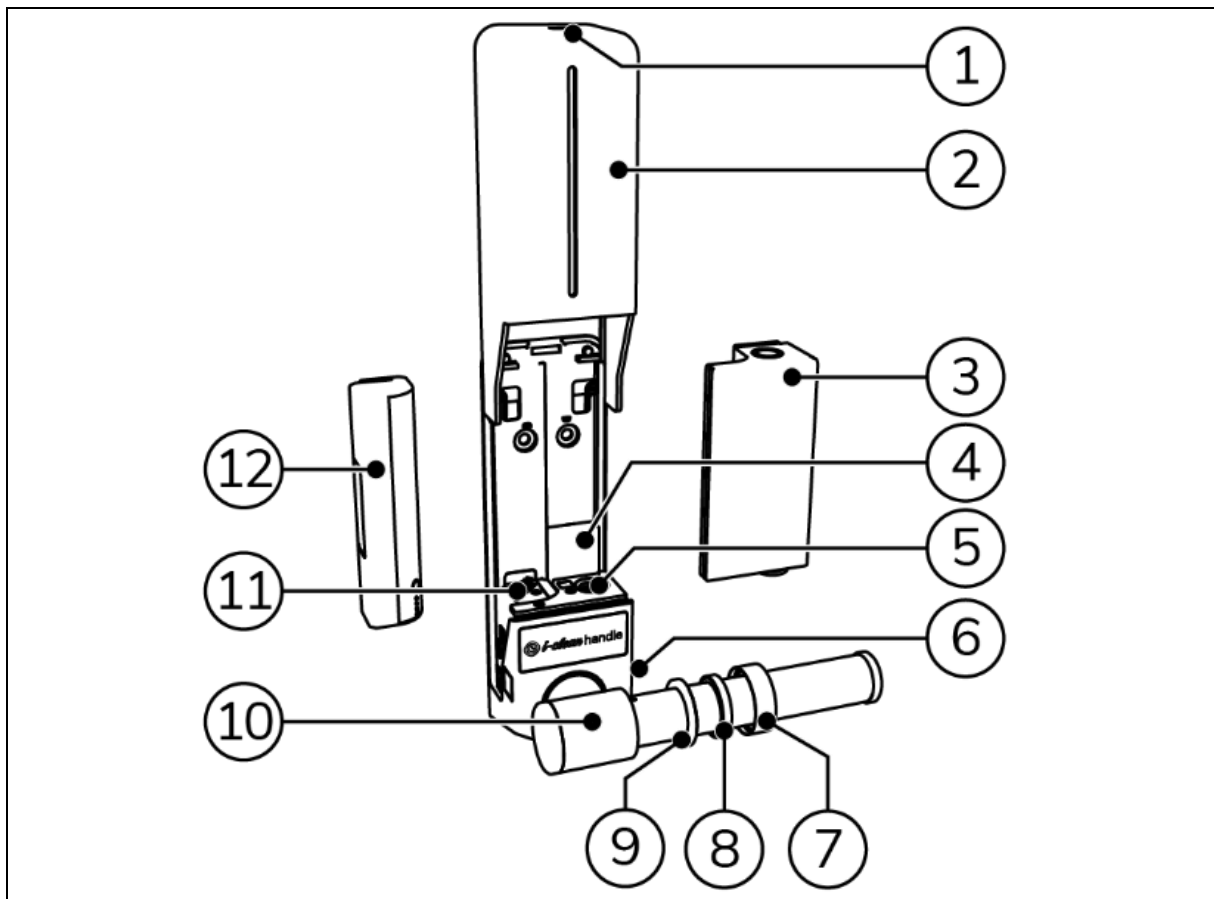


Figure 3

Legend

1. Key hole	7. Ring female
2. Shroud	8. Cleaning ring
3. Tank	9. Magnet ring
4. Liquid level sensor	10. Medical grade steel lever
5. Tank insert with O-ring	11. 5-pin battery connector
6. Infrared sensor	12. i-power 5 battery



2.3. Automated cleaning

2.3.1. Triggering the cleaning

The cleaning process of the i-clean handle is activated when a person grabs the lever, pushes it down and lets go. An infrared sensor detects the hand that is touching the lever. A few seconds after the hand is removed, the i-clean handle starts the cleaning cycle.

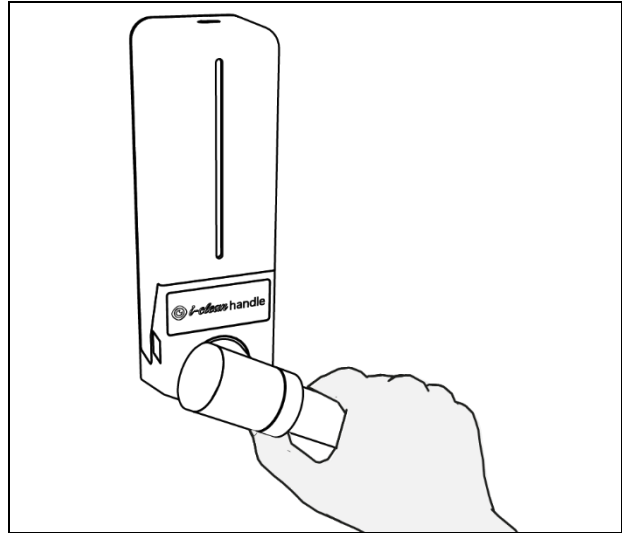


Figure 4

2.3.2. The cleaning cycle

When cleaning is triggered, a small amount (0.009 ml) of cleaning liquid is sprayed through a hole in the lever onto the cleaning ring. This ring is covered by a metal ring. Inside the lever, a motor driven worm gear with a magnet starts to turn. This will cause the magnetic ring to quickly move along the lever, and back to its starting position. A thin film of cleaning liquid is thereby spread along the lever. The lever remains moist for a few seconds, until the cleaning liquid is evaporated.

Note: the i-clean handle automatically wets the cleaning ring with cleaning liquid once per hour. This prevents the cleaning ring from drying out if the door handle is not used frequently.

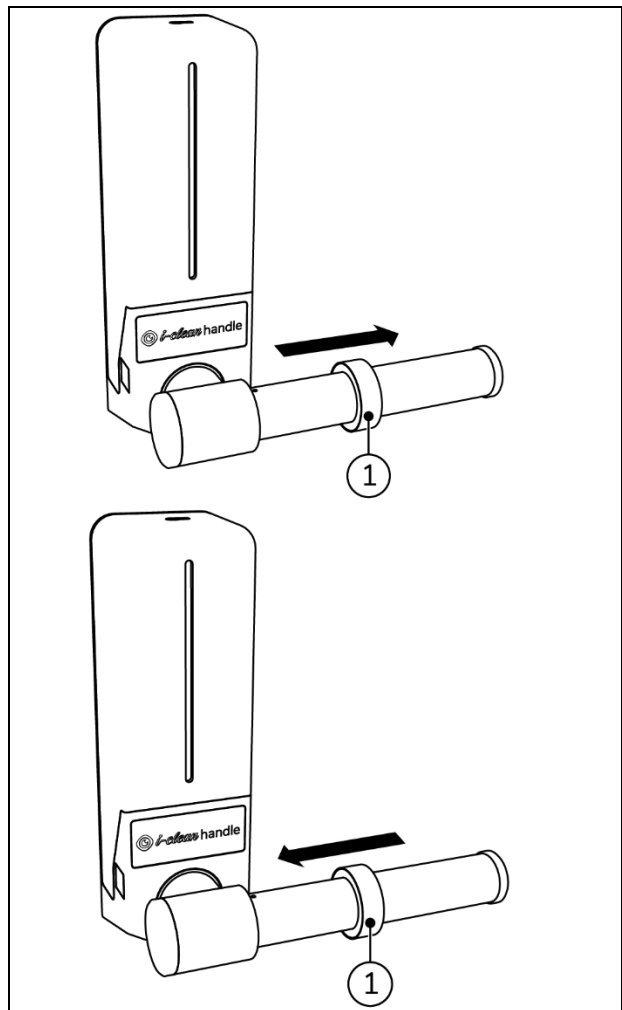


Figure 5



2.4. Indicator lights

The i-clean handle works with a rechargeable battery and a replaceable tank. The i-clean handle has two sets of indicator lights to inform the user when intervention is necessary. These lights can be seen through the vertical gap in the metal shroud of the device.

2.4.1. Power indicator

The battery status is indicated as follows:

Low voltage (<3.2 V)	Bright white
----------------------	--------------

2.4.2. Tank indicator

The tank status is indicated as follows:

Low liquid (<5.0 mm)	White “breathing”
----------------------	-------------------

2.4.3. Operation indicator

The operating status is indicated as follows:

Normal operation	Bright blue
Pump (full speed)	Green-flash

2.5. Battery

The battery provides power.

New batteries are available as spare part.

For the replacement and charging procedures, see section 5.2.3.

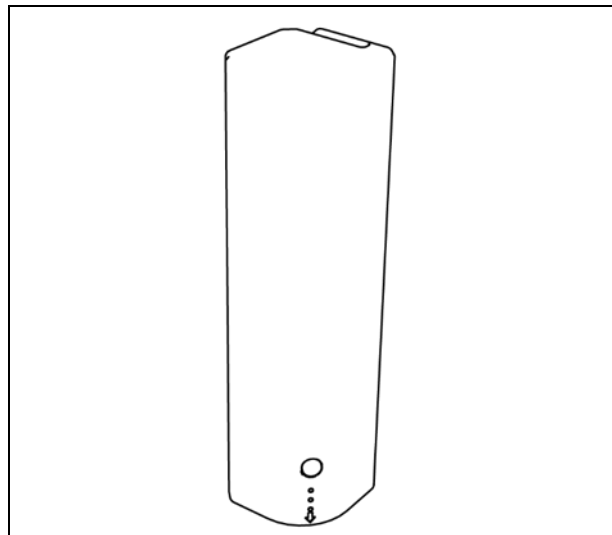


Figure 6



2.6. Tank

The tank contains the cleaning liquid.

New tanks are available as consumables.

For the replacement procedure, see section 5.2.2.

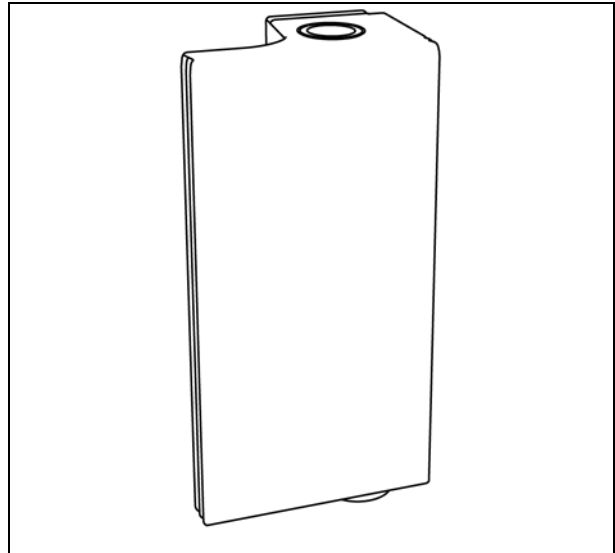


Figure 7

2.7. Maintenance tool

The maintenance tool has two functions:

- The key part (Figure 8, left side) can be used to unlock the shroud of the i-clean handle for access to the battery and tank.
- The spanner part (Figure 8, right side) can be used to open the metal ring unit. This part will be used to replace the cleaning ring.

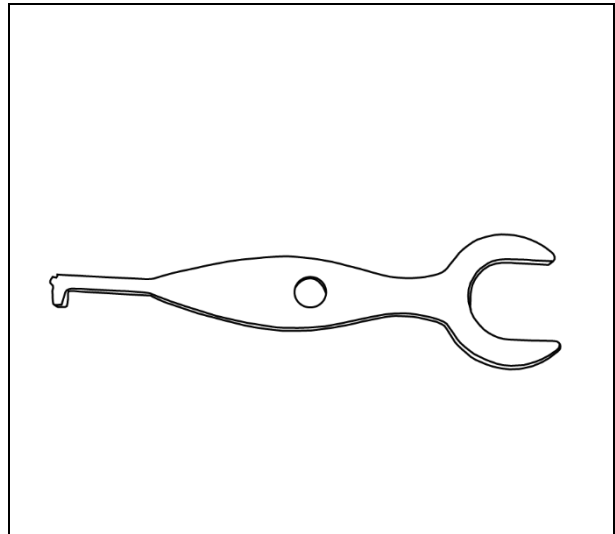


Figure 8

2.8. Charger

A charger for the i-clean handle battery is not included.

Contact your supplier for a(n):

- i-charger 2A-5x, which can charge up to 5 batteries at once;
- charger for a single battery.

Furthermore, a battery can be charged using a USB-C phone charger.



3. Safety

Safety comes first. Therefore, please take your time to read and understand these safety instructions. Improper use can cause harm and will void the manufacturer's warranty.

3.1. General safety instructions

3.1.1. Indoor use

This product is intended for indoor use only.

3.1.2. Batteries

Always use a Li-ion battery i-power5, supplied by the manufacturer.

Always use an appropriate USB-C charger or the battery charger provided by the manufacturer.

CAUTION

During normal operation, the 5 V battery causes no safety hazard on its own. Please adhere to the following safety instructions regarding batteries:



- Do not crush, pierce or damage batteries in any way.
- Do not heat or incinerate batteries.
- Do not short-circuit batteries.
- Do not dismantle batteries.
- Keep all batteries dry.
- Only charge between 5 °C~40 °C / 41 °F~104 °F.
- Only use between 5 °C~45 °C / 41 °F~113 °F.

3.1.3. Tank

CAUTION



- An empty tank should only be replaced by a new tank, supplied by the manufacturer.
- Do not refill the tank.



CAUTION

The tank contains cleaning liquid.

Please adhere to the following safety instructions regarding the tank:



- Do not crush, pierce or damage a tank in any way.
- Do not heat the tank in any way.
- Store the tank in a dry location outside the sun.
- Only store and use between 0 °C~40 °C / 32 °F~104 °F.

Please adhere to the following safety instructions regarding the liquid:

- Avoid contact with eyes.

3.1.4. Risks during installation

Installation without craftsmanship and correct use of tools may lead to injury and/or damage to equipment and tools.

3.1.5. Risks during operation

The i-clean handle is designed to provide a clean and hygienic way for opening doors.

WARNING

- The chemicals in the battery are located inside a sealed container.
- They only pose a chemical hazard if the battery is not used properly or damaged.
- Avoid contact with the electrolytes.
- Contact with a damaged or leaking battery can result in chemical burns.

If exposure to any battery chemicals happens, act as follows:



Contact to the eyes:

- Flush the eyes with plenty of water for a minimum of 15 minutes, lift the upper- and lower eyelid occasionally;
- Seek medical attention.

Inhalation:

- Vacate from the exposure environment and move to an environment with fresh air immediately;
- Seek medical attention.

Ingestion:

- Seek medical attention.

3.1.6. Risks after operation

All considerations to comply with IEC EN 1906 have been applied to mitigate risk of using the i-clean handle. For more information, refer to the standardization document for IEC EN 1906.



4. Installation

The i-clean handle is suitable only for the replacement of either:

- split type door lock handles with lock holes below the door handle, or;
- single handle non-self-locking door handles.

The door must be a **solid wooden** door, or use the optionally provided glass door kit for a glass door.

4.1. Unboxing

The box (in this case combination of a left and a right handle) contains the following items:

1. User manual	9. Wood screws (4)
2. i-clean handle left (1x)	10. Square spindle (1x)
3. i-clean handle right (1x)	11. Fitting screws long (2)
4. Tank (2x)	12. Fitting screws short (2)
5. Li-on battery i-power5 (2x)	13 Lock screws (4)
6. Cleaning rings (4x)	14 Grub screws (2)
7. Maintenance tool (2x)	15 Mounting template
8. Inserts + screws (4)	

Before installation, charge the battery for 5 hours.

4.2. Installation – replacement of a handle

Installation of the i-clean handle is very similar to that of a standard lever type door handle. See section 4.3 for instructions on installation for a new door. See the i-team Hygiene and Services [website](#) for a video.

Follow these instructions:

1. Remove the old door handle.
2. Use the key end of the tool to slide the shroud from the i-clean handle and remove both the tank and battery, see section 5.2.1.
3. Measure the thickness of the door (1) and select the longest pair of fitting screws that is shorter than the thickness of the door.

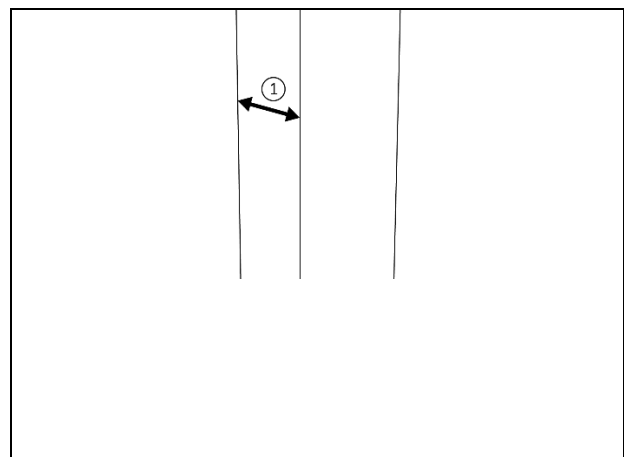


Figure 9



4. Remove the fixation plate (3) from the i-clean handle.

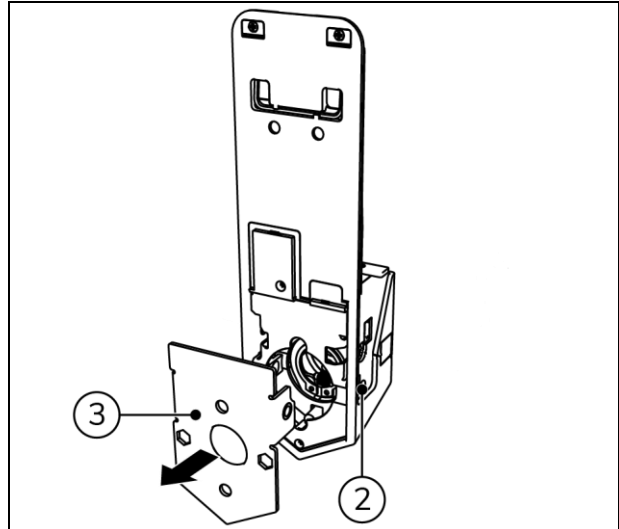


Figure 10

5. Insert the square spindle (1) in the hole.

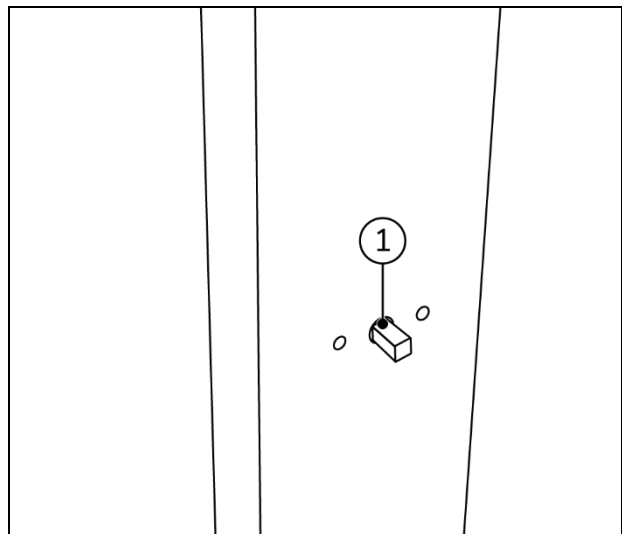


Figure 11

6. Place one metal fixation plate (1) on each side of the door.

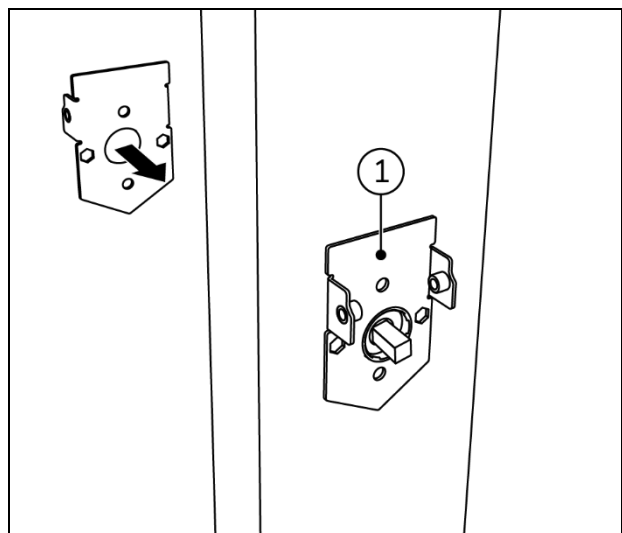


Figure 12



7. Mount the fixation plates, by inserting the bolt through fixings (2) on one side of the door, and the fitting screws (1) on the other side. Use a screwdriver to tighten the fitting screws.

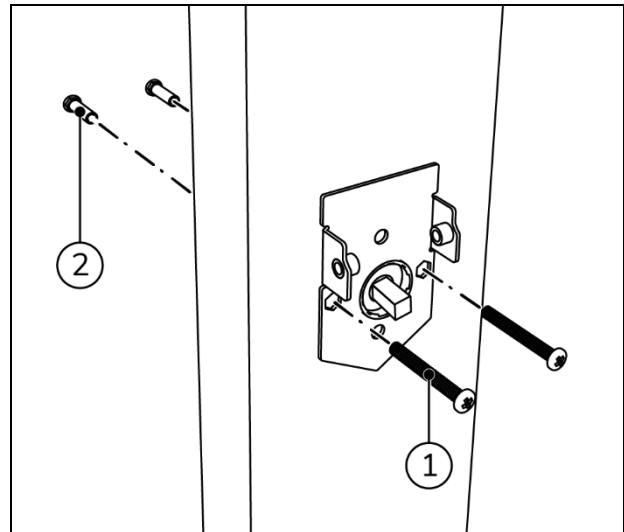


Figure 13

8. Use the mounting template to place the i-clean handle. Make sure the handle clicks in the metal fixation plate, and the square spindle fits well in its hole in the handle.
9. Screw in the lock screws (4).

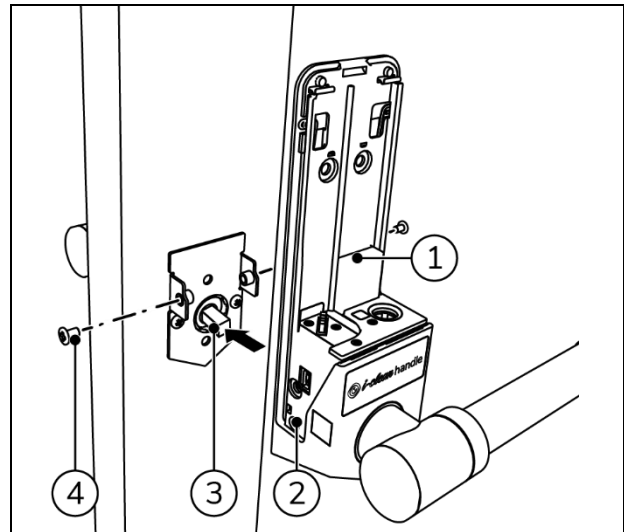


Figure 14

10. Use a marker and the mounting template to mark the location of the holes (1) for the top screws.

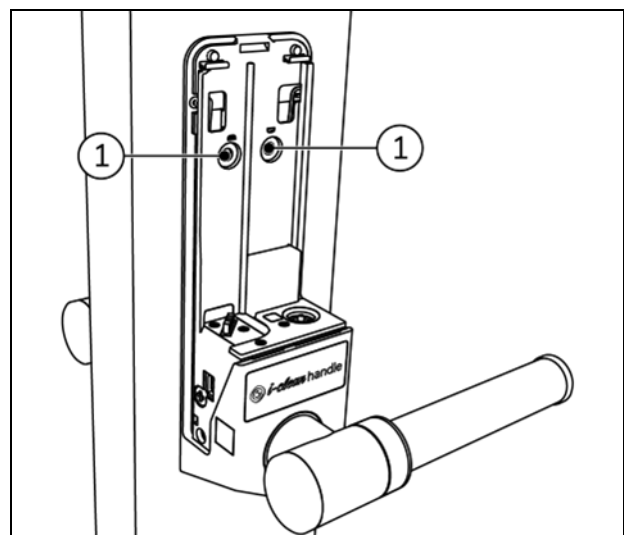


Figure 15



11. Tighten a grub screw (Allen screw) (1) on each side to connect the levers to the spindle.

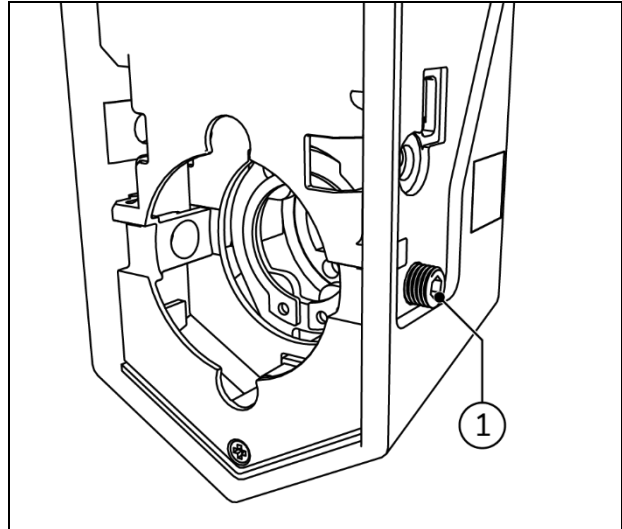


Figure 16

12. Drill small pilot holes for the screws.
Depending on the door material, use either the inserts in combination with the top screws (for soft materials), or the wood screws (for solid wood). Tighten the screws.

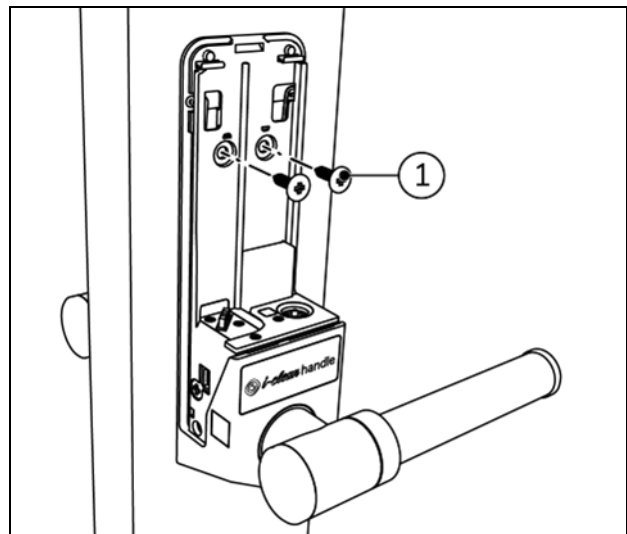


Figure 17

13. Insert a charged battery and a new tank, see section 5.2.3.



4.3. Installation – new door

To install the i-clean handle on a new door, follow these instructions:

1. Use the key end of the tool to slide the shroud from the i-clean handle and remove both the tank and battery, see section 5.2.3.
2. Measure the thickness of the door (1) and select the longest pair of screws that are shorter than the thickness of the door.

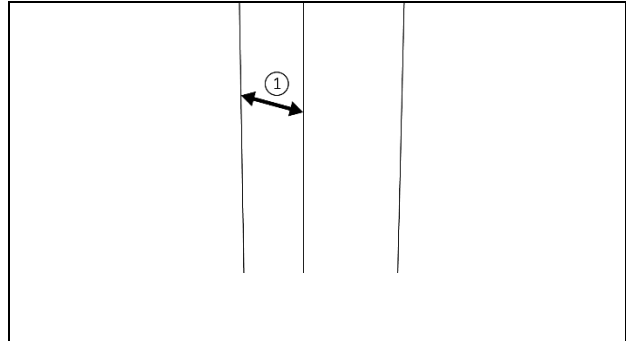


Figure 18

3. Remove the fixation plate (3) from the i-clean handle.

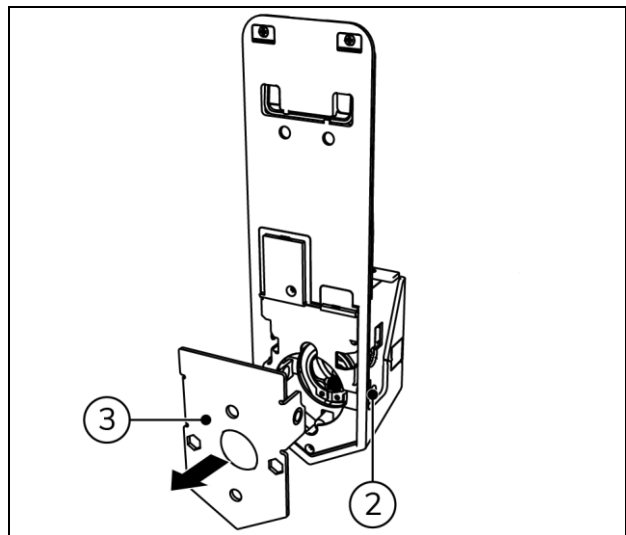


Figure 19



4. Insert the square spindle (1) in the hole.

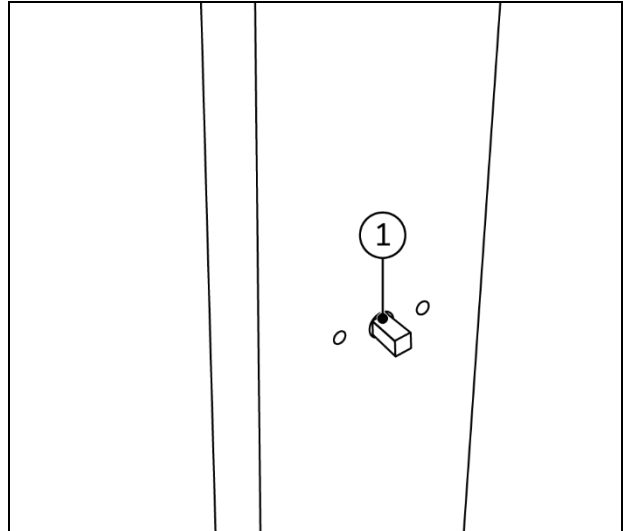


Figure 20

5. Place one metal fixation plate (1) on each side of the door.

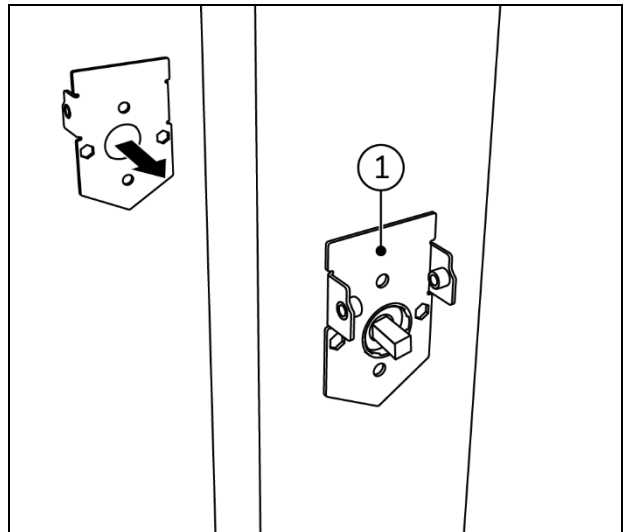


Figure 21

6. If necessary, drill the holes for the bolt through fixings on left and right sides of the spindle hole.
7. Mount the fixation plates, by inserting the bolt through fixings (2) on one side of the door, and the fitting screws (1) on the other side. Use a screwdriver to tighten the fitting screws.

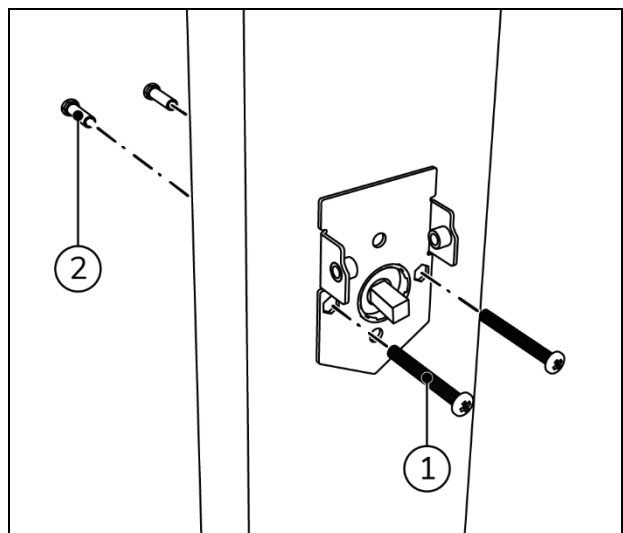


Figure 22



8. Use the mounting template to place the i-clean handle. Make sure the handle clicks in the metal fixation plate, and the square spindle fits well in its hole in the handle.
9. Screw in the lock screws (4).

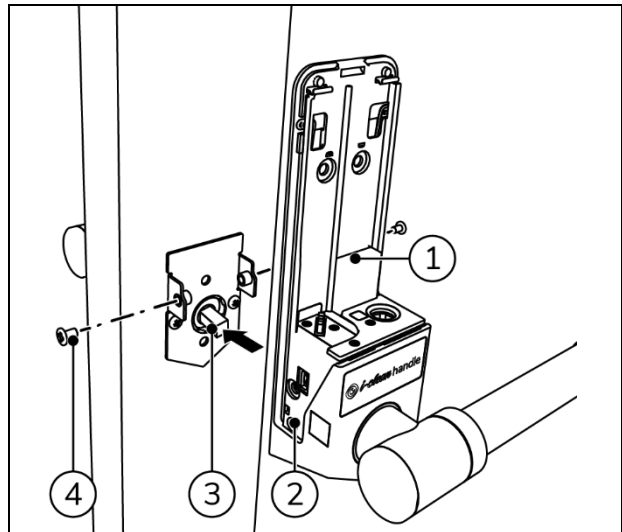


Figure 23

10. Use a marker and the mounting template to mark the location of the holes (1) for the top screws.

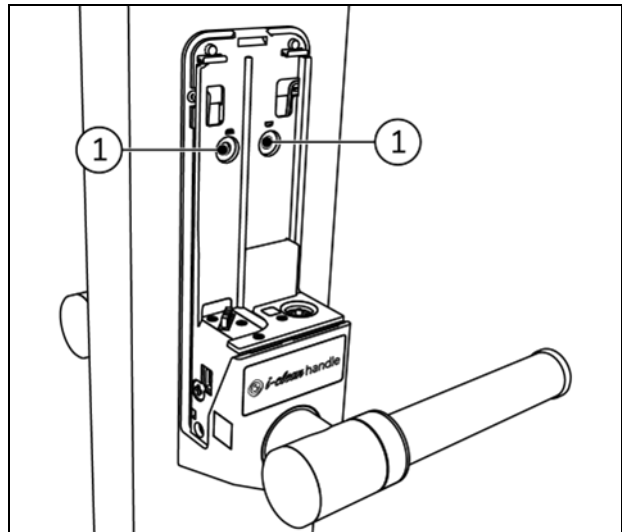


Figure 24

11. Tighten a grub screw (Allen screw) (1) on each side to connect the levers to the spindle.

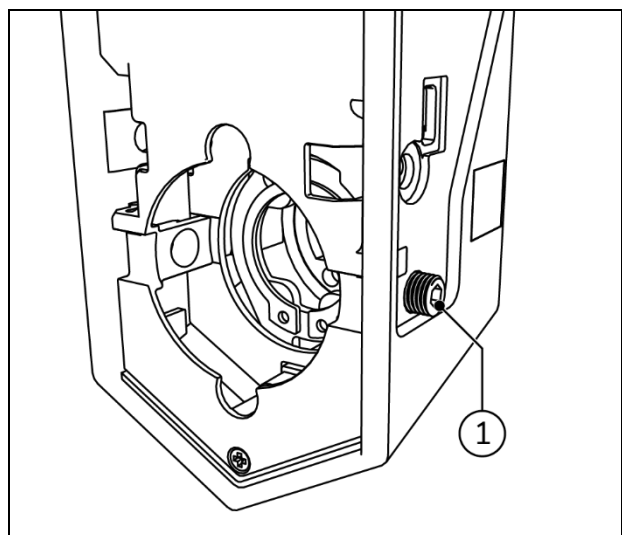


Figure 25



12. Drill small pilot holes for the screws.
Depending on the door material, use either the inserts in combination with the top screws (for soft materials), or the wood screws (for solid wood). Tighten the screws.

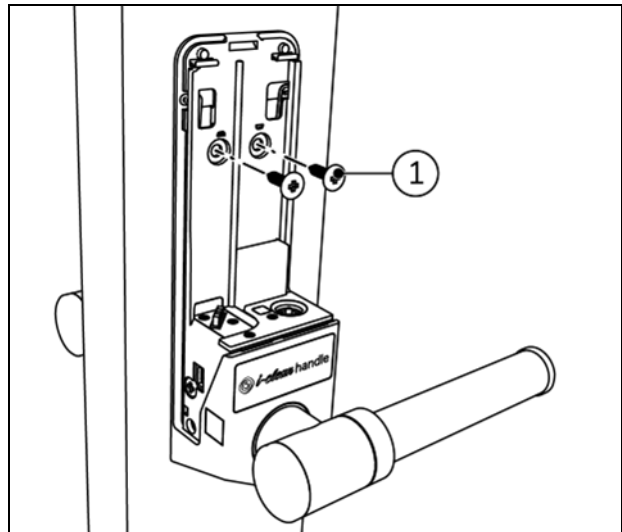


Figure 26

13. Insert a charged battery and a new tank, see section 5.2.



5. Maintenance

5.1. Overview

The following parts need maintenance:

- Battery: needs charging.
- Tank: needs replacement when empty.
- Cleaning ring on lever: needs replacement when dirty or worn.
- O-ring under the tank: needs replacement after about two years.

5.2. Procedures

5.2.1. Opening and closing of the shroud

The rechargeable battery and tank of the i-clean handle are hidden beneath a metal shroud. This shroud can be opened to recharge the battery or replace the tank.

To slide the shroud open:

1. Insert the key end of the maintenance tool in the keyhole at the top of the shroud, and rotate the key slightly.
2. Slide the shroud all the way up until it is fixed in position.

The tank is now accessible.

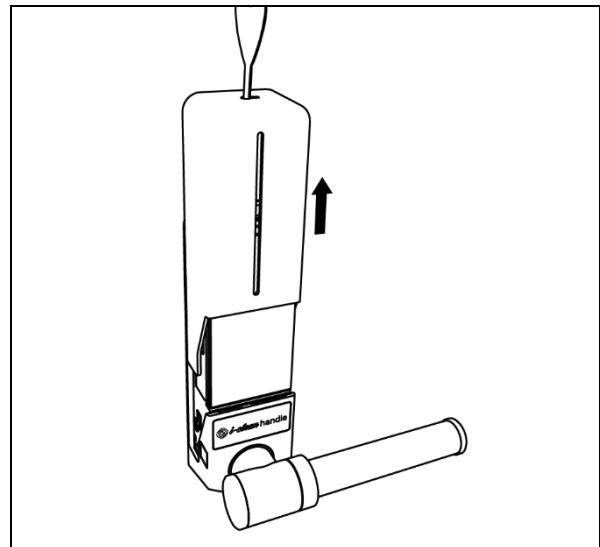


Figure 27

5.2.2. Replacing the tank

A single tank will last for approximately 6800 lever pulls. Refill is not possible. The tank is placed over a small metal nozzle through which the cleaning liquid is fed into the cleaning mechanism.



ATTENTION

Always use a tank supplied by i-team Hygiene and Services.



ATTENTION

Do not tilt the tank sideways, as this can damage the tank and the nozzle.



To remove the tank:

1. Open the shroud, see section 5.2.1.
2. Remove the tank: tilt the top side out first, and then pull the tank up.
The battery is now accessible.

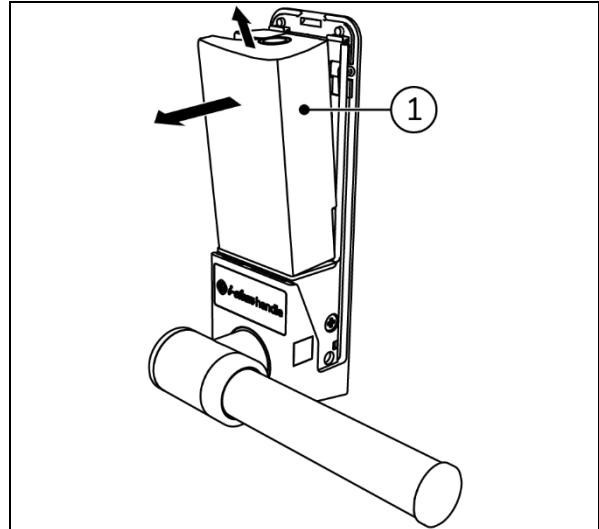


Figure 28

To install the tank:

1. Make sure the battery is installed correctly.
2. Remove the yellow safety cap on the tank. However, leave the silver cap on. This will be punctured in the next step.
3. Place the tank back over the nozzle. Make sure the protective film of the tank is punctured.
4. Press the tank into position until a click is heard.
5. Slide the shroud back into position, see section 5.2.1.
6. When replacing the tank, also replace the cleaning ring, see section 5.2.5.
7. To fill (prime) the tube and get the cleaning liquid flow going:
 - a. Move the ring to the center of the handle, so the hole is visible.
 - b. Pul the handle once, and cover the sensor with your finger. The blue light will come on. Keep your finger on the sensor.
 - c. After about 15 seconds, the light will blink green for 5 seconds and the handle will dispense liquid. Now, move the ring back to the hole, and rotate it a few times to wet the whole cleaning ring.
 - d. Remove your finger, to stop dispensing the cleaning liquid.

The i-clean handle is now ready for use.



5.2.3. Replacing the battery

The battery needs to be charged after approximately 25,000 handle pulls.



CAUTION

Make sure only the Li-on battery i-power5 is used. Contact your i-team Hygiene and Services supplier.

1. Remove the shroud, see section 5.2.1.
2. Remove the tank, see section 5.2.2.
3. To remove the battery, pull the top side out first, and then pull it up from the connector (Figure 3, pos. 11).
4. After charging, push the battery gently into the 5 pin connector.
5. Tilt the battery towards the door until it is fixed in place.

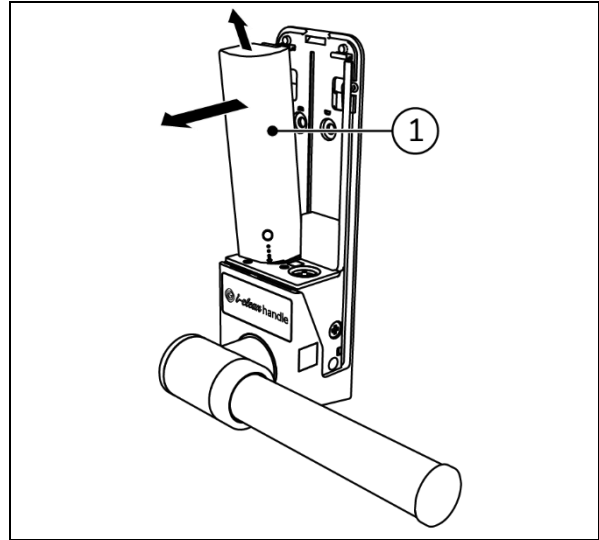


Figure 29

5.2.4. Charging the battery

Charge the battery with a USB-C cable or the i-team battery charger for the i-clean handle battery. The battery is fully charged when all three blue lights are on. Make sure the battery is charged regularly.



5.2.5. Replacing the cleaning ring

It is recommended to replace the cleaning ring when either the tank is replaced, or when it shows any sign of being dirty. The cleaning ring of the i-clean handle can easily be replaced using the maintenance tool.

To remove the old cleaning ring:

1. Manually push the metal ring towards the middle of the lever.
2. Slide the spanner side of maintenance tool (1) over the lever and push it against the inside of the ring.

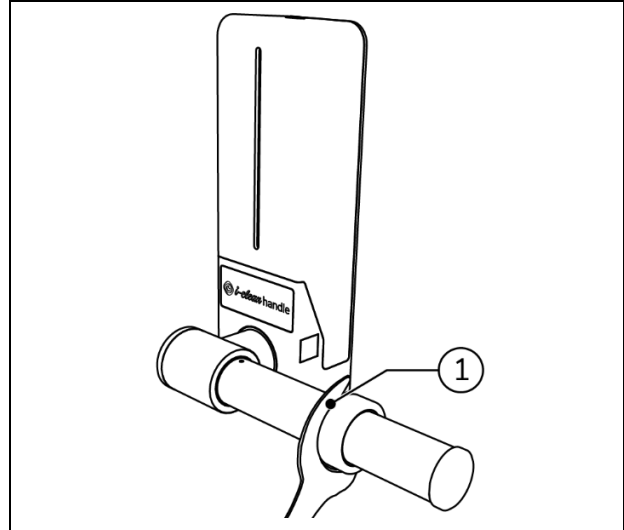


Figure 30

3. While holding the outer ring, pull the maintenance tool away along the lever. The magnet ring will slide out.

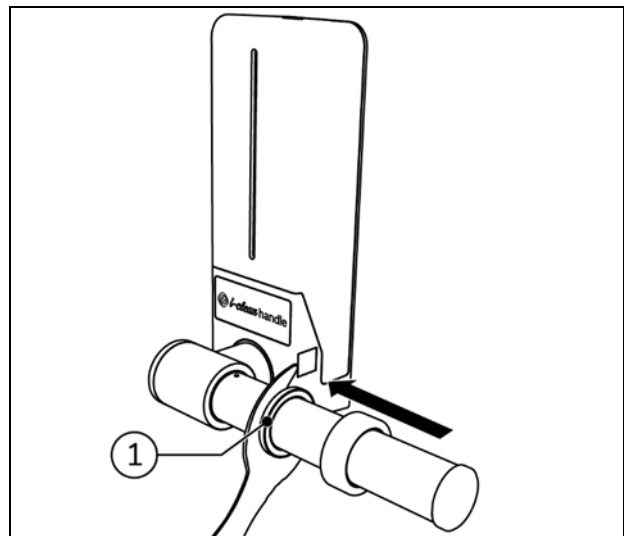


Figure 31



4. The felt cleaning ring can now be pulled from the lever.

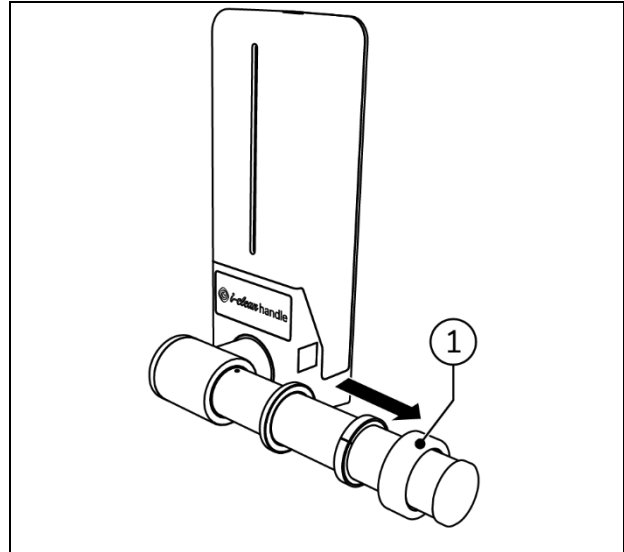


Figure 32

5. Place a new cleaning ring on the lever in between the other rings.
6. Snap the ends of the ring together.
7. Push the cleaning ring and the two other rings back together and push the assembled cleaning ring back to the base of the lever.

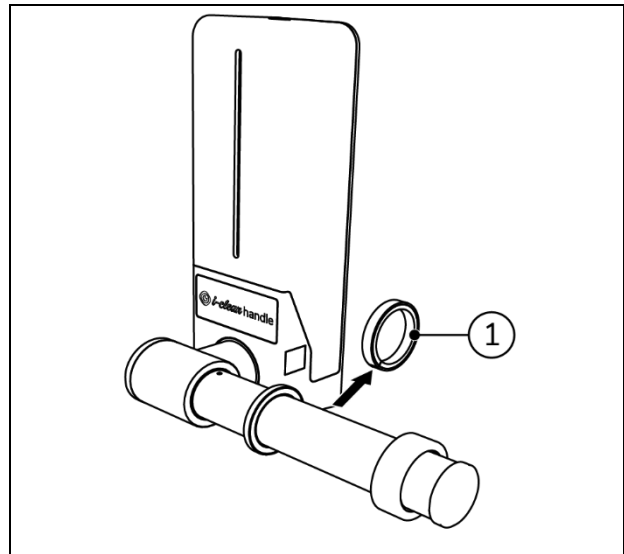


Figure 33

5.2.6. Replacing the o-ring

After approximately two years, the o-ring (Figure 3, pos. 5) located just under the tank, might get brittle, and needs replacement.

1. Open the shroud, remove the tank and battery, see section 5.2.1.
2. Replace the o-ring that seals off the connection with the tank.
3. Place the battery and tank back (see section 5.2).
4. Close the shroud.

5.3. Cleaning

5.3.1. Basic cleaning

Use a damp cloth to clean the i-clean handle.



5.3.2. Manual cleaning in dirty environments

In dirty environments there can be a build-up of particles such as sand on the lever. If these particles are coarse, i-clean handle cannot adequately clean itself. This may lead to damage of the handle and/or cleaning ring.

Therefore, manually clean the lever regularly in dirty environments.



6. Troubleshooting

If any issue might arise when using the i-clean handle, please read this chapter first.

Problem or symptom	Solution
The cleaning ring is dry.	Make sure the tank is full and is properly clicked into place.
The ring unit does not move across the lever.	Make sure the battery is charged and clicked into place.
The door handle doesn't function to open the door.	The handle was installed improperly, check installation and try again.
The ring scratches the lever and the liquid is dripping.	The cleaning ring is not installed. Separate the rings with the provided maintenance tool and place a new felt cleaning ring into the assembly.



7. Decommissioning and disposal

The packaging material of the i-clean handle is recyclable. Please dispose it off according to local laws and regulations regarding the recycling of paper and cardboard materials.



ATTENTION

It is the responsibility of the i-clean handle owner to dispose of the product responsibly.

At the end-of-life the i-clean handle still contains valuable resources and needs to be disposed of according to your local laws and regulations regarding recycling of electrical equipment.

The i-clean handle is mostly made of medical grade steel.



Before disposal please:

1. Remove the battery for separate disposal, see section 5.2.3.
2. Remove all loose components such as the tank and cleaning ring.
3. Dispose all items according to your local laws and regulations.

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8. Attachments

8.1. CE Certificate

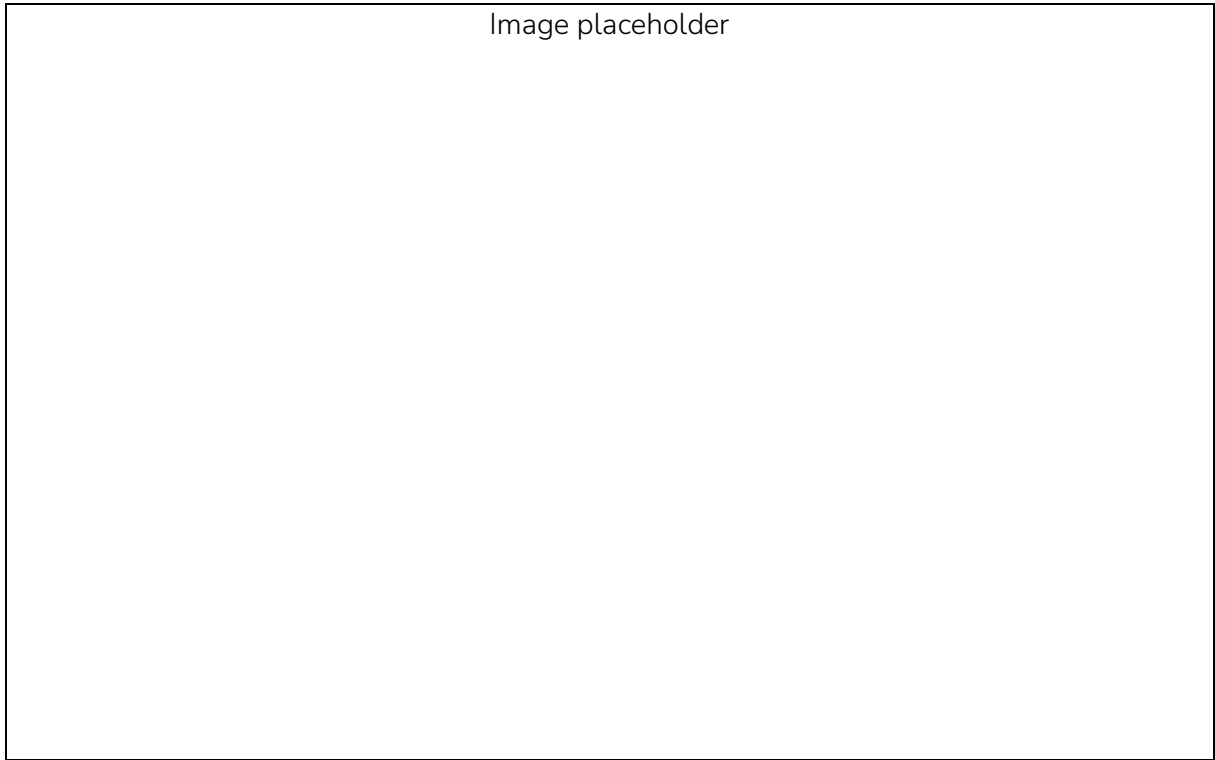


Figure 20: CE certificate