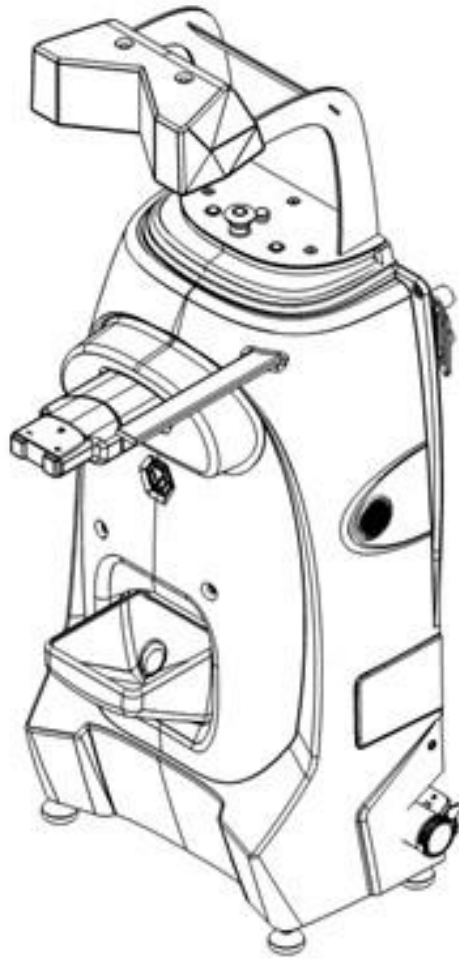


REX REFUEL STATION-RXRSSCR-1.1: OPERATION MANUAL



AUTONOMOUS CLEANING ROBOT – REX REFUEL STATION

ENGLISH (EN)

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OPERATION MANUAL

Rev. 0.9 (09-2022)



ORIGINAL INSTRUCTIONS MANUAL



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INTRODUCTION TO THE REX - REFUEL STATION

The REX REFUEL STATION is an autonomous charging and water refill and discharge station developed by LionsBot. The REX REFUEL STATION is equipped with one charger, emergency stop, 3 input buttons and three control valves for automated charging of the battery, disposal of waste water and refill of clean water operations.

All operations with the REX REFUEL STATION can be carried out through the Robot touchscreen or LionsClean mobile app.

This document introduces the user to the overall structure and components of the REX REFUEL STATION, safety precautions related to its use, and the procedures for work preparation, cleaning and maintenance with the REX REFUEL STATION. Any questions pertaining to this manual or REX REFUEL STATION operation in general should be directed to the respective distributor or the original manufacturer (see [‘DISTRIBUTOR INFORMATION’](#) or [‘CONTACT INFORMATION’](#) sections).

This machine will provide excellent service. However, the best results will be obtained at minimum costs if:

- The machine is operated with reasonable care.
- The machine is maintained regularly - per the machine maintenance instructions provided.
- The machine is maintained with manufacturer supplied parts.



Read this manual completely and understand the machine before operating or servicing it.

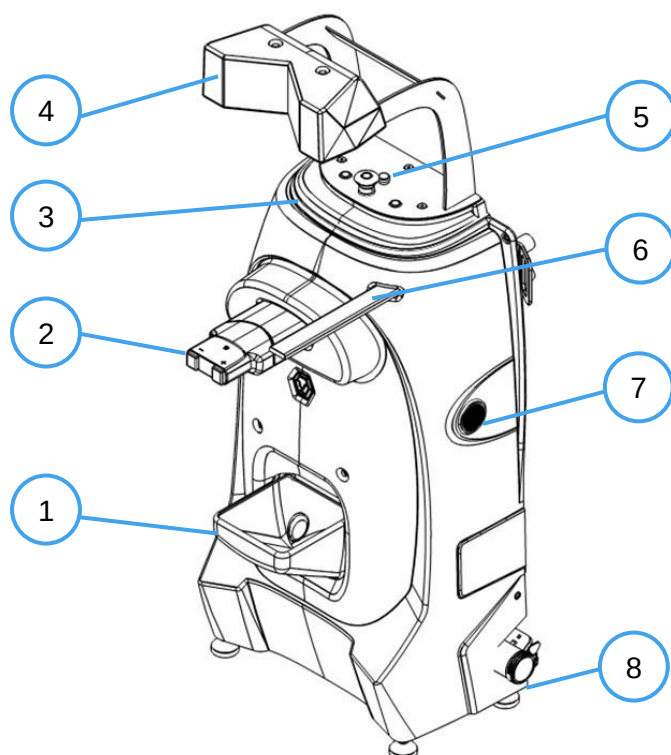


PROTECT THE ENVIRONMENT

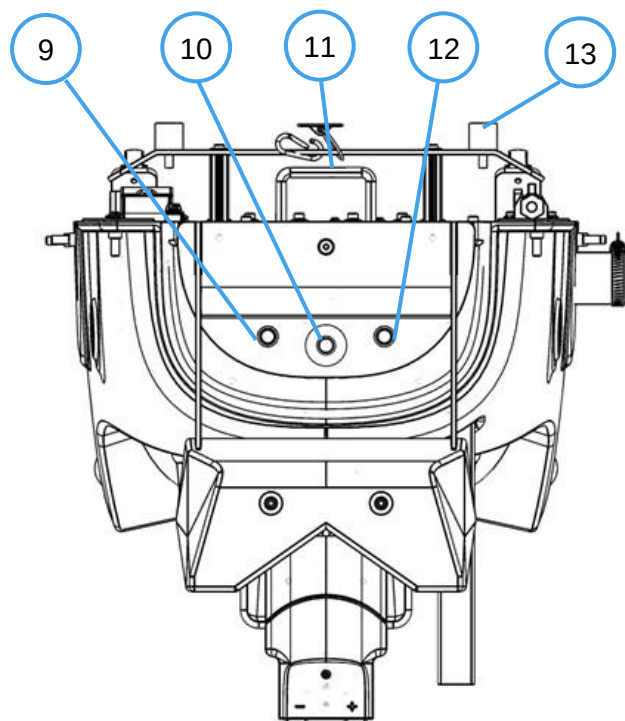
Please dispose of packaging materials, used components such as batteries and fluids in an environmentally safe way according to local waste disposal regulations.

This operator manual contains information to allow for quick start-up of the REX REFUEL STATION, powered by LionsOS. This document may be periodically revised. The REX REFUEL STATION, can be used in manual charge mode or in automatic mode. Product updates requires a subscription to LionsBot International Autonomy Services. It is important to follow all provided instructions and warnings. Failure to adhere to instructions could result in damage to the machine and injury. The REX REFUEL STATION is a service station for the REX powered by LionsOS software. When in robotic mode, the station must be localized on the REX. The product may be covered by one or more patents or pending patent applications. Email LionsBot International for details. Discrete portions of this product were made possible by open-source software. Please email LionsBot International for details.

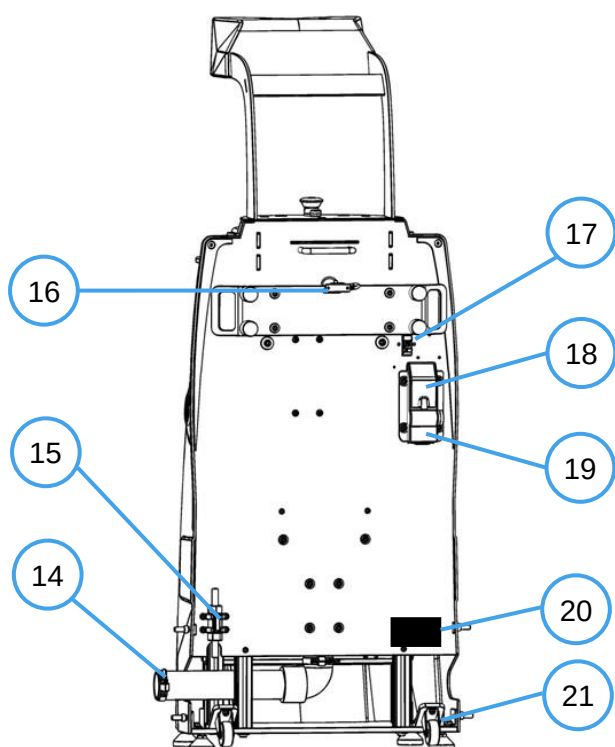
MAIN REX REFUEL STATION COMPONENTS



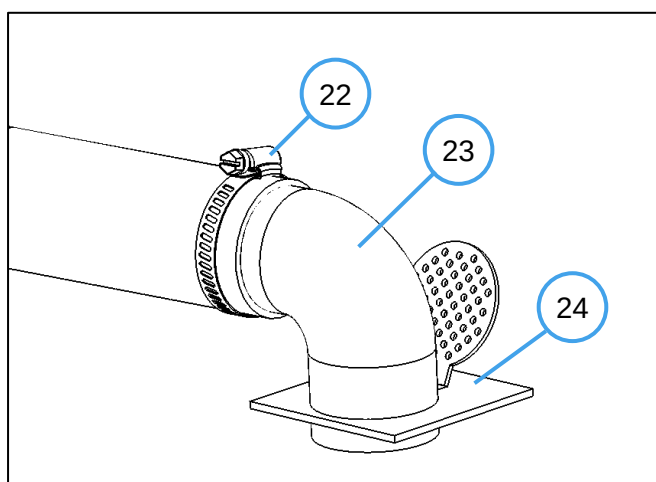
1. DRAIN BASIN
2. CHARGING CONTACTS
3. LED STRIP
4. REFELCTOR
5. POWER INDICATOR
6. CLEAN WATER OUTLET
7. VENTS
8. ADJUSTABLE FOOT



9. RESET BUTTON
10. EMERGENCY STOP
11. HANDLE BAR
12. UNDOCK BUTTON
13. RUBBER STOPPER



- 14. DRAIN HOSE
- 15. CLEAN WATER VALVE
- 16. ANTI-TIPPING TAB
- 17. CIRCUIT BREAKER
- 18. PAIRING BUTTON HOUSING
- 19. AC POWER PORT
- 20. NAME PLATE
- 21. CASTER WHEELS



NOT INCLUDED IN PACKAGE

- 22. HOSE CLIP
- 23. PVC ELBOW PIPE
- 24. DRAIN COVER

INTENDED USAGE ENVIRONMENT

The REX REFUEL STATION is designed and built for the REX only, it is to be for commercial use (ex. large offices spaces, wide corridors, indoor-stadiums, warehouses and exhibition halls) with compact flooring and by a qualified operator in proven safety conditions. It is only intended to be used in an enclosed indoor environment. This machine is not intended for use in outdoor environments. Only use this machine as described in operation manual.

Use the machine in approved environments in accordance with the LionsBot Software End User License Agreement (EULA). Approved environments shall also be limited to cleaning areas with adequate cellular communication signals permitting cellular data communication with the machine to enable periodic safety-related updates.

The operator is responsible for the use of each REX REFUEL STATION in all modes of operation. As the machine begins robotic operation, observe refuel performance to ensure that all components are functioning properly. Each operator must be mindful to use the machine in accordance with its intended use and precautions at all times. Operators will not engage in any of the following conduct or activities with respect to the Autonomy Services or LionsOS:

- Transmission of any software or other materials that contain any viruses, worms, trojan horses, defects, spyware, spiders, screen-scrapers, or other items of a destructive or disruptive nature.
- Exploitation of the Autonomy Services, LionsOS, hardware in any unauthorized manner, including by trespassing or burdening server or network capacity or infrastructure;
- Framing, mirroring, or reselling any part of the Autonomy Services or LionsOS without written authorization from LionsBot International;
- Unauthorized collection of user information;

Or

- Attempting to deliberately damage the Autonomy Services or LionsOS, or undermine the legitimate operation of the Autonomy Services or LionsOS.

GENERAL SAFETY

This section consists of safety information which must be read and understood by the user before the first usage of the station. Operator cooperation is paramount for accident prevention; most workplace accidents are caused by a failure to adhere to safety regulations. An attentive and careful user is the most effective guarantee against accidents.

The following symbols are used to indicate any potentially hazardous situations. Please take the necessary precautions to protect people and objects that may be present around the REX REFUEL STATION.

DESCRIPTION OF SYMBOLS

The following symbols categories explain the level of harm or damage that can occur if warnings are not observed, and the machine or related equipment is used incorrectly. Understand these symbols and their correlating meanings before reading the remainder of this manual.

	DANGER: Indicates an imminent hazardous situation which, if not avoided, could result in serious injury or death.
	WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in injury or major damage to the equipment.
	CAUTION: Indicates a situation which, if not avoided, could result in major damage to the equipment.

PICTORIAL INDICATIONS

The following pictorial indication categories explain information to be observed. Read this guide after thoroughly understanding the information.

	NOTE: Indicates safety information, precautions on dos and don'ts to ensure safe product usage and/or user safety.
	COMPULSORY: Action based on instruction must be performed.
	PROHIBITED: Not allowed action. Do not perform any operation not given in this manual. Use of the machine in a manner inconsistent with this manual may lead to personal injury or significant physical damage or property damage.
	NO WATER EXPOSURE: Do not expose to water or moisture.
	UNPLUG: Unplug from power outlet.
	RECYCLING SYMBOL: Informs the user to carry out the operations in compliance with environmental regulations in force in the place of usage of the appliance
	BIN SYMBOL: To indicate that separate collection for waste electric and electronic equipment (WEEE) is required.
	WEAR GLOVES
	WEAR PROTECTIVE EYEWEAR

USING REFUEL STATION



DANGER



- **Warranty shall be voided if instructions in this manual are not followed.**
- Immediately discontinue use if anything unusual is noticed during use, recharging, or storage such as noise, smoke, odour, etc. Failure to do so may result in fire, injury, electric shock, damage, malfunction, overheating, leakage, chemical explosion, or other damage to the machine, battery charger and docking station.
- Report machine damage or faulty operation immediately.
- Use the machine within an ambient temperature range of 2°C to 40°C, humidity of 10% to 80%. Also, store in a dry environment with no dust in an ambient temperature range of 2°C to 40°C. Failure to do so may result in fire, injury, electric shock, damage, malfunction, overheating, leakage, chemical explosion, or other damage to the machine, battery charger, battery or docking station.
- If the power cable is damaged or broken, it should be replaced by the manufacturer or authorized service personnel or a qualified person in order to prevent hazards.
- Keep sparks, flames and incandescent materials at a safe distance from the batteries and station.
- Only use station in well-ventilated areas.
- The socket for the station cable must have a prescribed earth connection. Do not modify the polarized plug to fit a non-polarized outlet or extension cord.
- **Only Use station with AGM Batteries on robot.**



- **If wearing an implanted cardiac pacemaker or implanted defibrillator, consult with the manufacturer of such medical device to confirm a safe operational distance from the machine.** Electric signals may affect the operation of the pacemaker or defibrillator.
- **Docking station must be installed against a flat wall with all four rubber stoppers in contact with surface.**
- Do not disconnect/move the robot when the station is operating. This is necessary to prevent electric arcs forming. To move the robot during charging first abort the process on the touchscreen or pressing the undock button on the station.
- Do not use extension cords or outlets with inadequate current carrying capacity.
- The station should not share an AC plug point with any other devices. Do not use more than one station per AC plug.
- Do not charge frozen batteries.
- Do not unplug by pulling on the cord. To unplug, grasp the plug and not the cord.
- Do not service the station without contacting authorized distributor center.
- Do not expose the battery charger/ docking station to high temperatures or allow moisture/ humidity of any kind to come in contact with the battery charger/ docking station.
- Do not leave the battery to charge unattended/ overnight as a safety precaution for AGM/ GEL batteries. Undock the Robot after the charging is complete (a typical full charge cycle takes about 8-10 hours).





DANGER



- Do not attempt to open or modify the station.
- Do not operate machine in environments requiring fail-safe performance (areas where machine failure could lead to personal injury or property damage).



- Do not block the machine's ventilation vents. Doing so may cause fire, injury, electric shock, damage, malfunction, overheating, leakage, chemical explosion, or other damage to the machine, battery charger.



WARNING



- Operators shall be adequately instructed on the use of these machines.
- This machines is for dry use only.
- The docking station shall be disconnected from its power source during cleaning or maintenance by removing the plug from the socket outlet.
- Install the station in a location that can be easily accessed by the robot. Away from water, on a flat surface.
- Never smoke in the machine's vicinity while the batteries are charging.
- Secure docking station to the wall.
- Install the drain hose securely and ensure drain is free of chokes.
- Ensure there are no obstructions between robot and station during the docking process.
- Use and store only indoors (i.e., in an enclosed and covered environment).
- The docking contacts surface becomes hot while charging.



- Do not allow the supply cord to come into contact with the rotating brushes. wheels or casters of the automatic floor treatment machine.
- Do not pull or carry by the cord, use the cord as a handle, close the door on the cord, or pull the cord around sharp edges or corners. Keep the cord away from heated surfaces.
- Do not touch the docking station contacts when robot is docked and after docking is complete.
- Do not turn off water mains when robot is replenishing the clean water tank.
- Do not allow children to play with the station unattended.
- Do not allow unauthorized persons near the machine.
- Do not allow machine to be used as a toy or any other function other than its intended purpose in this manual.
- Do not expose station to water. Station is not IP rated.
- Do not handle the station with wet hands.
- In the event of a fire, use a fire blanket, powder or carbon dioxide extinguisher. Do not use water.





CAUTION



- Read the instructions before using the machine.
- This machine is for indoor use only.
- This docking station is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge.



- Check the reflector is free from dirt.
- Keep clear of station when robot is docking.
- Operator cooperation is paramount for accident prevention; most workplace accidents are caused by a failure to adhere to safety regulations. An attentive and careful user is the most effective guarantee against accidents.



- Do not use any acidic, strong solvents, chlorine based and flammable chemicals.
- Do not put any weight on the station.
- Do not stand or sit on the station.
- Do not use the station to dispose of anything that is burning, such as cigarettes or matches.
- Do not use the station waste bin to dispose of waste. Only robot waste is to be disposed of in the bin.

DEACTIVATION AND STORAGE



WARNING



- This machine shall be stored indoors only.
- Turn the power switch and the circuit breaker off.



- Do not store the station near combustible materials.

CLEANING AND MAINTENANCE



WARNING



- Do not spray water directly at the station to clean it.



- Do not use chemicals such as benzene, thinner, acetone or alcohol to clean the robot.
- Do not attempt to modify, disassemble or repair the station. Repairs should only be carried out by a qualified service personnel.



- Install station on a level surface. Turn off station and remove the supply mains before cleaning.
- Wear personal protective equipment as needed and where recommended in this manual.

TRANSPORT



CAUTION The REX REFUEL STATION can only be rolled from the back. Take appropriate measures to ensure safety when moving station.

1. To roll station place hands on the back handle (Fig. 1 – 1) located on the back of the station.
2. Tilt the station to move it (Fig. 2).

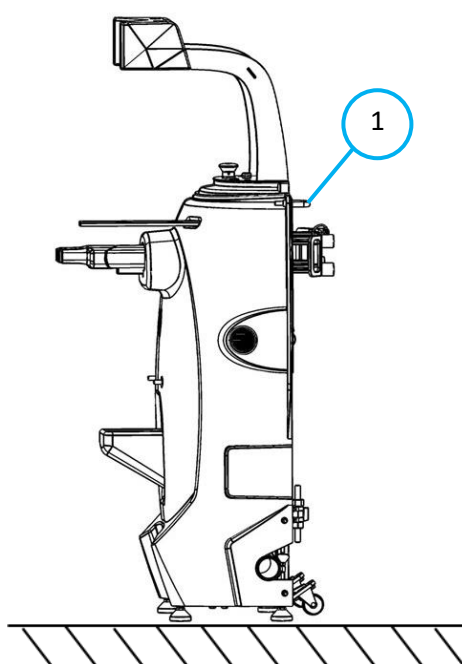


Fig. 1

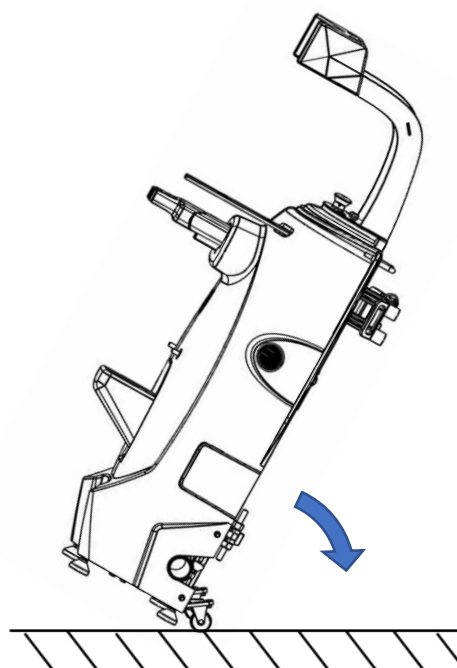


Fig. 2

- Transporting in a truck:
 - Drain and dry basin.
 - Use ramp, truck or trailer that will support the weight of the machine and operator.
 - Load the station onto vehicle.
 - Use tie-down straps to secure machine.



WARNING: The user is at risk of tipping over the station and subject to crush hazards when loading/ unloading the station. The operator and spotter are responsible for identifying and mitigating loading/ unloading hazards and taking safety precautions.

DISPOSAL



NOTE: Due to the presence of toxic or harmful materials inside the REX REFUEL STATION (e.g., charger, electronics etc.), the station should not be left unattended at the end of its working life. See section on '[DISPOSAL](#)' for instructions on scrapping.



EMERGENCY STOP ACTIVATION



WARNING

- If you anticipate any imminent danger to the REX REFUEL STATION and/or during robot operation in any situation, always be on standby to trigger the emergency stop button on the station and the robot.

Triggering the E-STOP shall terminate the charging and water refill process. The station is powered. The LED light will turn RED.

E-STOP activation on the robot shall terminate the docking process and stop the traction motor.

- The operator is to secure the robot when emergency stop is activated.
- Before resuming normal operation, the operator must check the robot's condition, station condition and surrounding for safety. Then reset the E-STOP on the robot.
- After resetting the emergency stop the operator needs to restart operation using the robot touchscreen application.

NAME PLATE

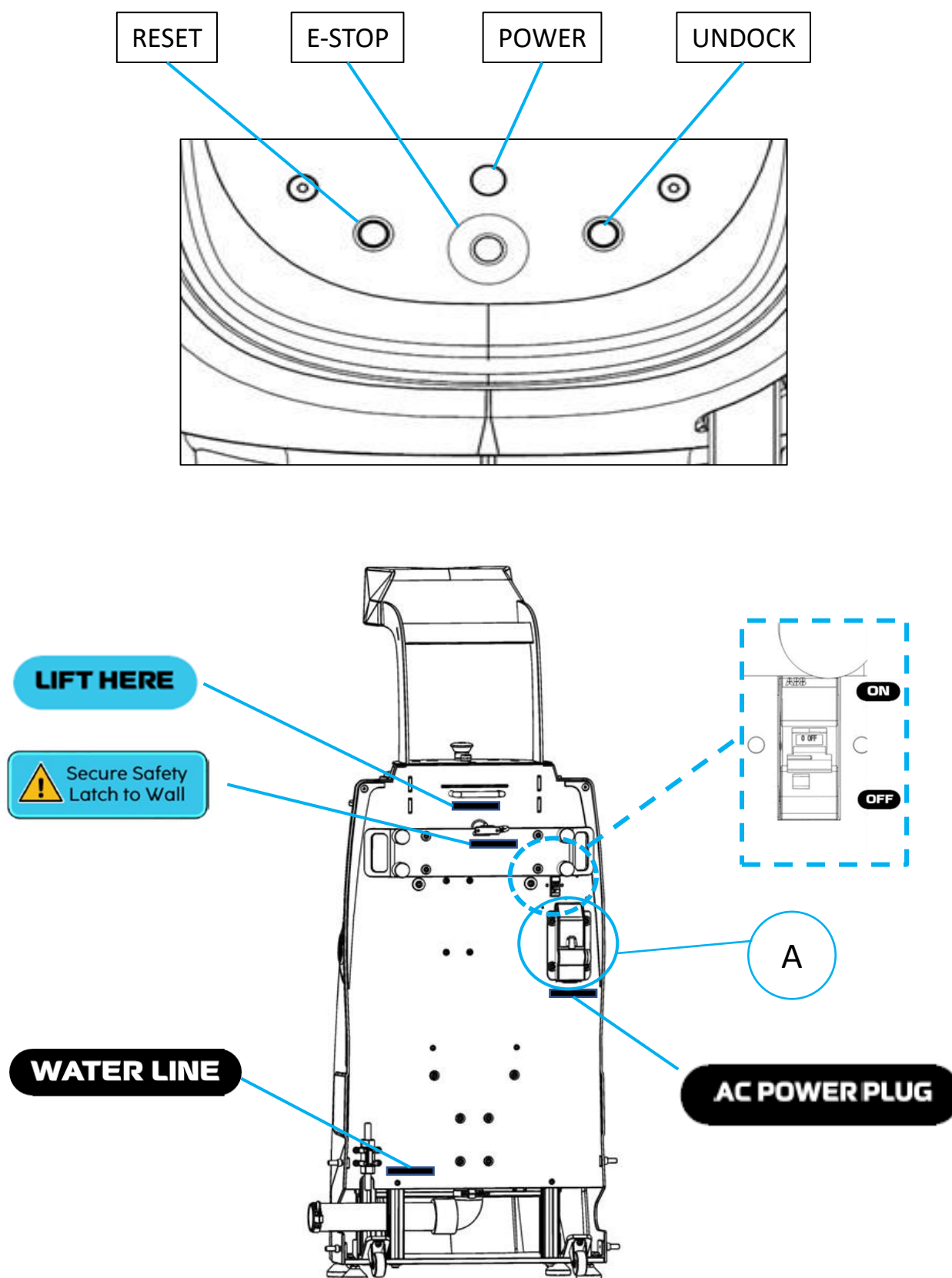
The serial number sticker is located on the robot left side. Please provide this serial number along with any request for assistance/ servicing or spare parts purchase.



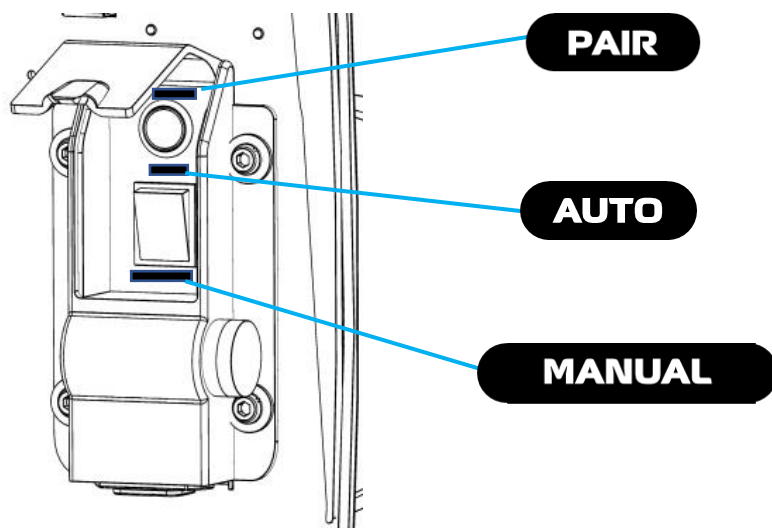
The Serial Number is formatted as follows:

1. First two alphabets (RX). Denote family
2. Next two alphabets (RS) are Refuel Station
3. Next seven digits (2200001) encode the year (YY) and sequential number of the product
4. Next three alphabets (SCR) denote the product type.

SYMBOLS ON THE REFUEL STATION

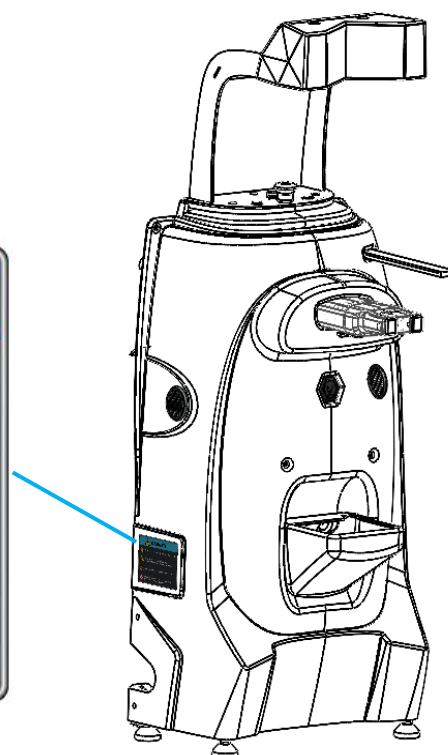


A




DANGER

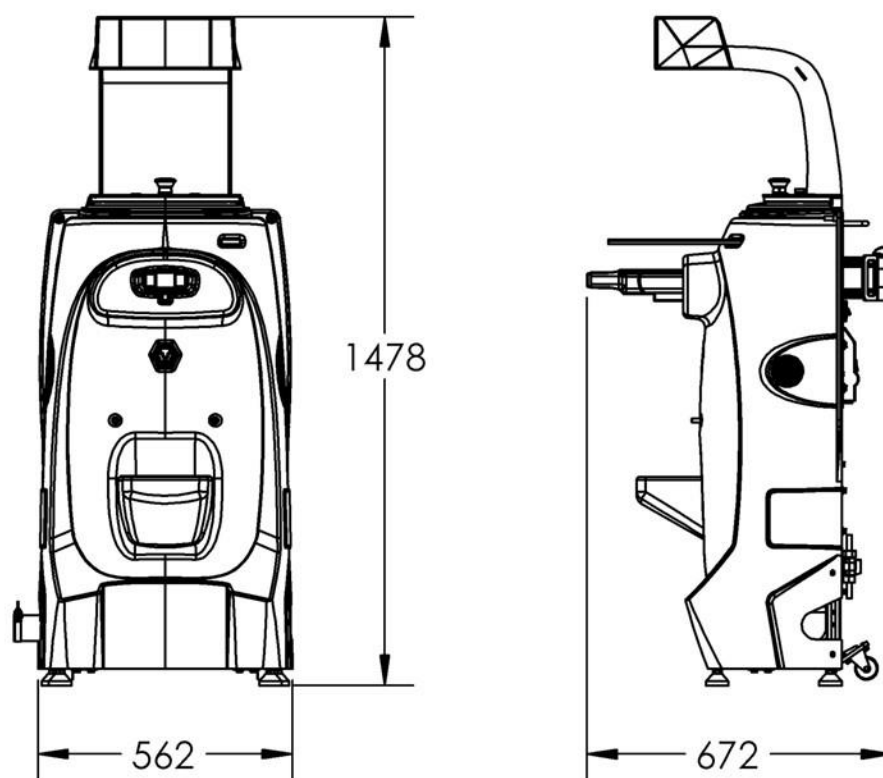
- 
 Do not probe contacts with bare hands or metallic tools.
- 
 Do not expose docking station to water. Doing so endangers risk of electric shock and fire.
- 
 Keep clear of docking station when robot is docking.
- 
 No open flames, smoking or ignition sources are permitted near the docking station.



TECHNICAL DATA

Technical Data	SI [KMS]	Value
Electrical Characteristics		
Rated Power	W	2000
Voltage In	V _{ac}	230
Voltage Out	V _{dc}	36
Power Cable Standard	-	UK IEC 60320 C13
Cable Length	m	4.5
Max Charging Current (DC)	A	30
Full Battery Charge Time Cycle ¹	H	8-10
Mechanical Characteristics		
Enclosure Material	-	ABS
Station Weight	kg	42
Station dimensions (length – width - height)	mm	1480(H) x 610(L) x 630(W)
Water Inlet Hose Fitting Standard	in	½" BSP Fitting
Water Inlet Hose Diameter	in	½
Maximum water pressure	MPa	0.4
Drain Hose Fitting Standard	in	1 ¼
Drain Hose Outer Diameter	mm	51
Drain Hose Length	m	1
Ventilation Fans	-	2
Maximum Ambient Temperature for machine operation	°C	40
Minimum Temperature for using the scrubbing function	°C	2
IP Rating	-	IPX0
Maximum Altitude	m	<2000
Storage Temperature	°C	-20 to 45
Storage Humidity	%RH	20 to 93
Installation Height	cm	148 ± 0.5

1: Lead Acid Battery Charging Cycle.



SAFETY FEATURES OF THE REX REFUEL STATION

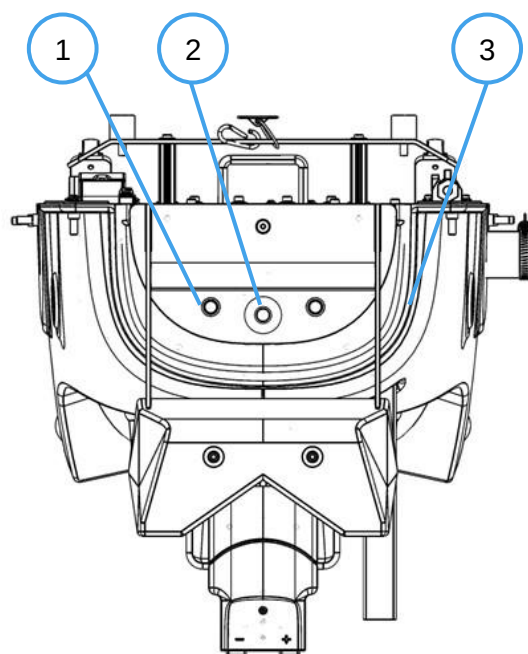


Fig. 1

The REX REFUEL STATION is equipped with a circuit breaker (Fig 2), LED strip and emergency stop.

Activate the Emergency stop (Fig. 1 – 2) in a dangerous situation. The emergency stop will cut-off power to the charger and valves and terminate the docking refuel sequence between robot and station. The LED strip when E-STOP is triggered turns red.

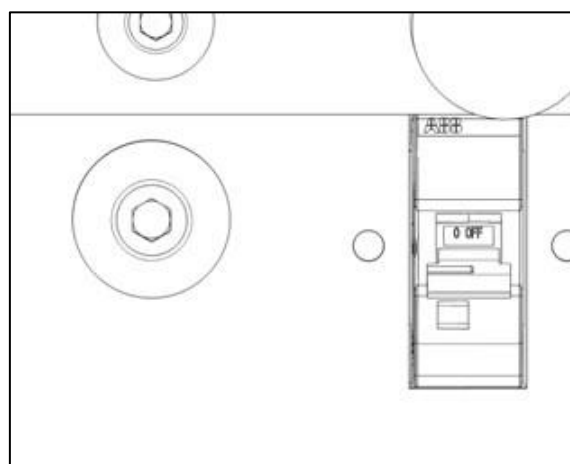


Fig. 2

The circuit breaker (Fig. 2) will trip in event of an AC over-current. This protects the user from electrical shock.

EARTH LEAKAGE CIRCUIT BREAKER

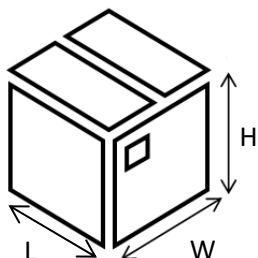
In the event of a fault in the socket outlet, the building Earth Leakage Circuit Breaker (ELCB) will trip to protect the user from electrical shock and prevent damage to the station. Users can also choose to install their own ELCB plug if the building ELCB is faulty or as an extra protective measure (Fig. 3).



Fig. 3

RECEIVING AND SETUP OF REX REFUEL STATION

The machine's overall packaged weight is 87 kg.



L	99 cm
W	88 cm
H	136 cm

It is recommended to keep the packaging components for future transportation needs.

UNPACKING THE REX REFUEL STATION

1. Open the crate and take off any protective packaging material around the machine.
2. Verify the package contents against the following packing list:

ITEM	QTY
REX Refuel Station	1
Drain Hose	1
Clean water inlet hose	1
Power Cable	1
Hose Clip	1
Reflector (V-Profile Assembly)	1
M8 x 16 Countersunk screws	6

SETTING UP THE REFUEL STATION

Follow the following checklist when selecting a place to set up the station:

- ✓ Level floor
- ✓ Against the wall
- ✓ Near clean water supply
- ✓ Near drainage
- ✓ Available power outlet

Place the refuel station at the identified location and adjust all four adjustable foot (Fig. 1) if necessary to level the station (clockwise = up, anti-clockwise = down).



CAUTION: Station must be on a flat surface. Check to ensure the station is stable by shaking it. Adjust the station feet to ensure stability.



NOTE: Before station setup, ensure the REX is operational. If not done, read the REX operation manual.

REFLECTOR INSTALLATION

The following section show the installation process of the reflector (Fig. 1).

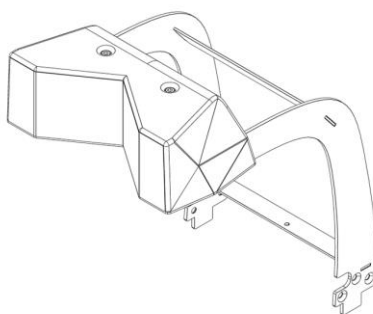


Fig. 1

1. Remove the 3-counter sunk M8 x 16 screws (Fig. 2).

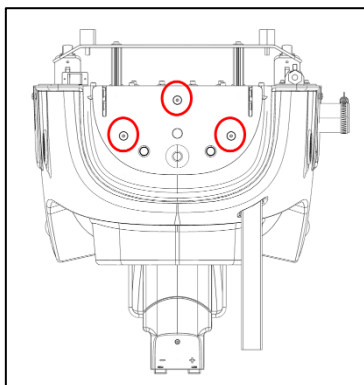


Fig. 2

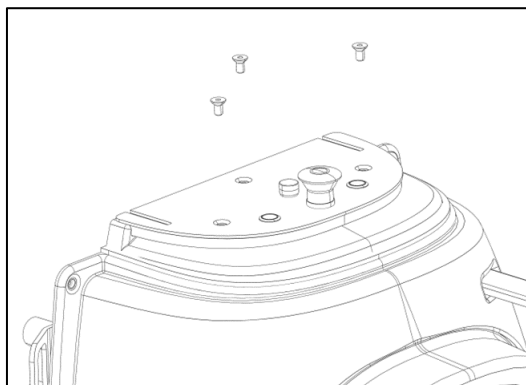


Fig. 3

2. Lift up the switch panel (Fig. 4).
3. Remove the panels plugs (Fig. 5).

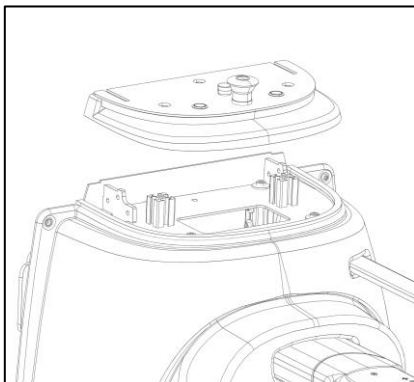


Fig. 4

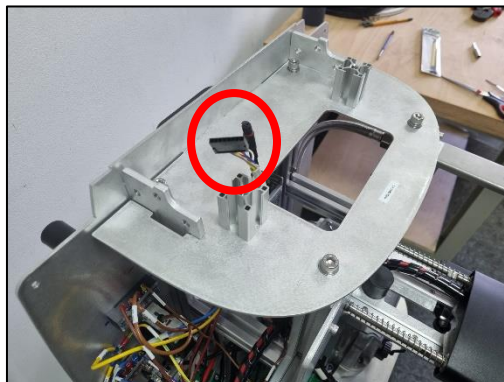


Fig. 5

4. Align the reflector to the chassis (Fig. 6).
5. Fasten the 3-counter sunk M8 x 16 screws (Fig. 7).

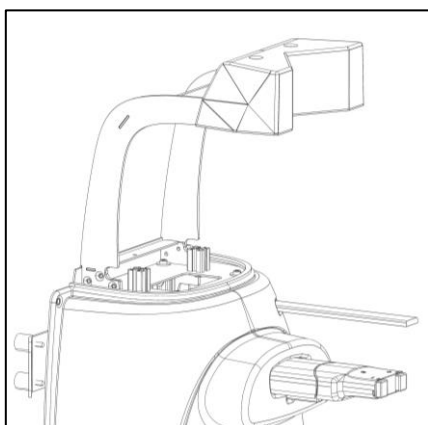


Fig. 6

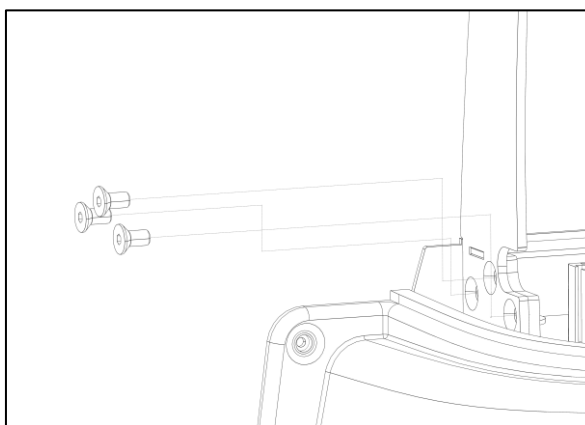


Fig. 7

6. Fasten the 3-counter sunk M8 x 16 screws (Fig. 8).
7. Reassemble the switch panel. Plug in the panel connectors in Fig 5.
8. Fasten the 3-counter sunk M8 x 16 screws (Fig. 9).
9. Assembly is complete.

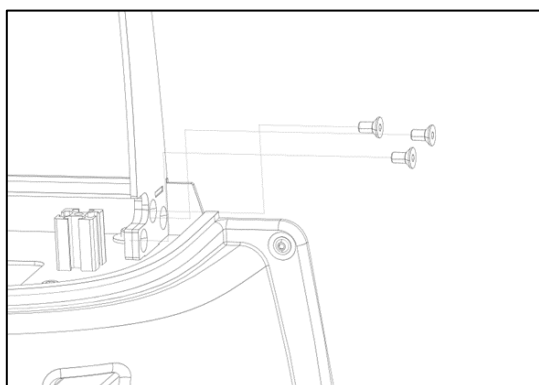


Fig. 8

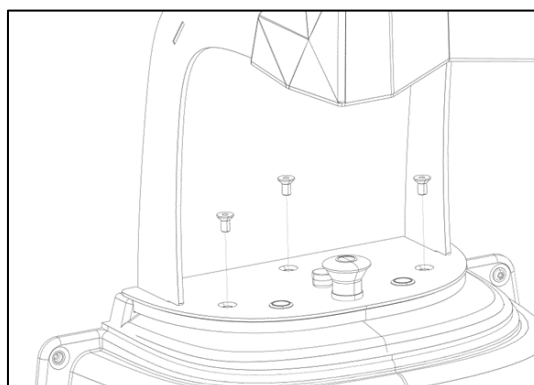


Fig. 9

STATION ADJUSTMENTS



WARNING: The station charging contacts must be aligned with the robot charging contacts. Manually measure the robot charging contact port and adjust the adjustable feet until the charging contacts are vertically aligned (Fig. 2 & 3).

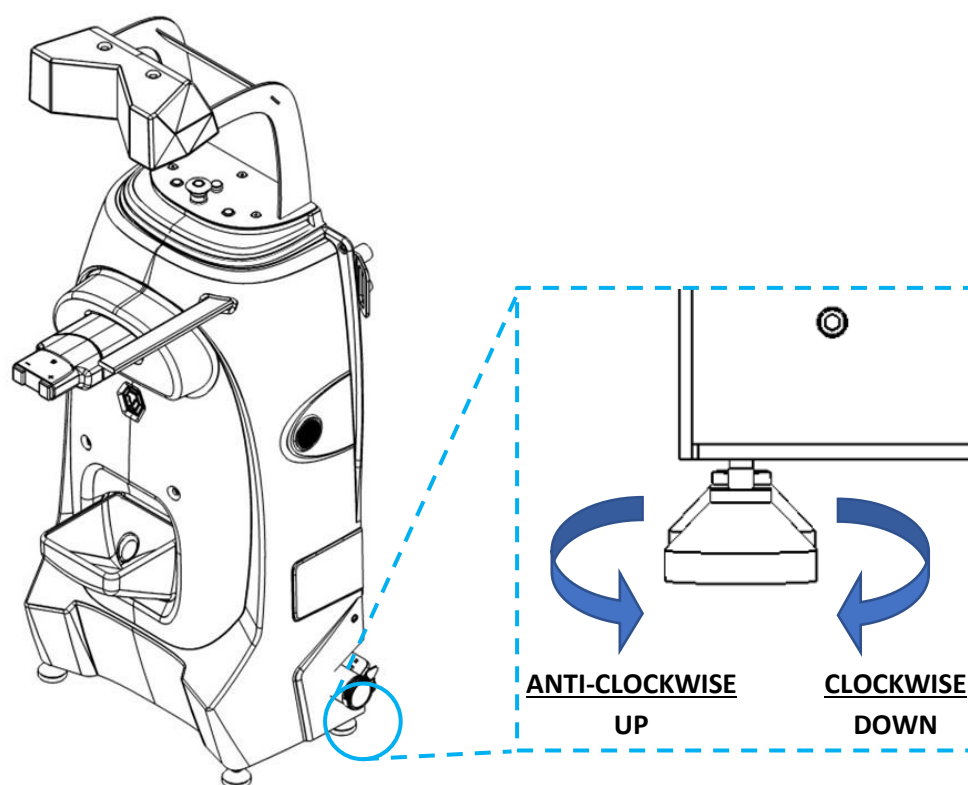


Fig. 1

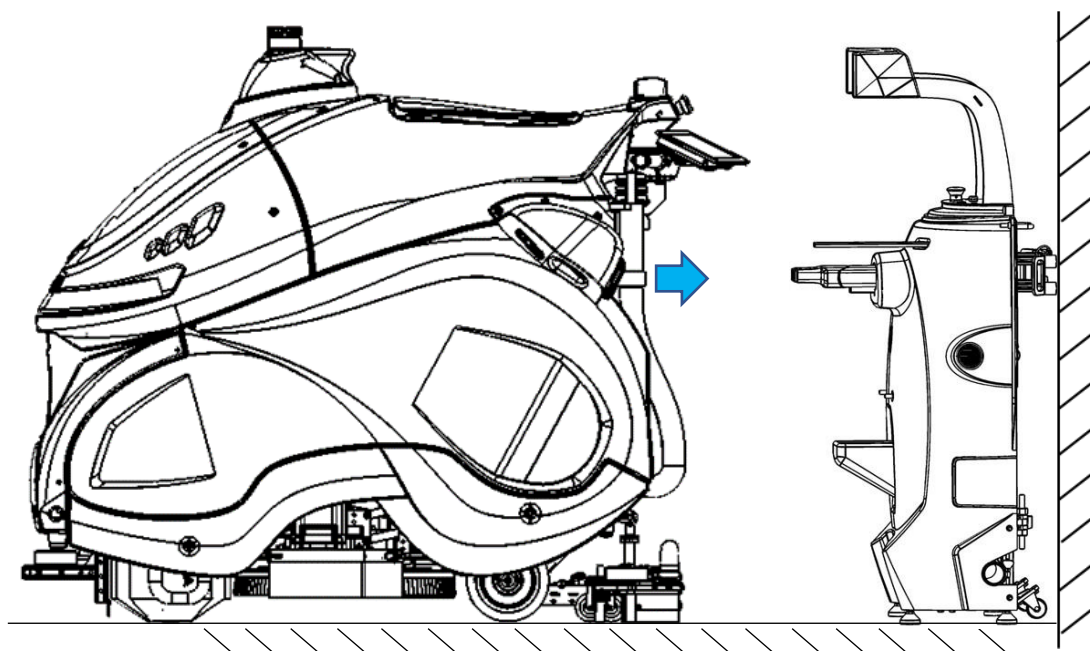


Fig. 2

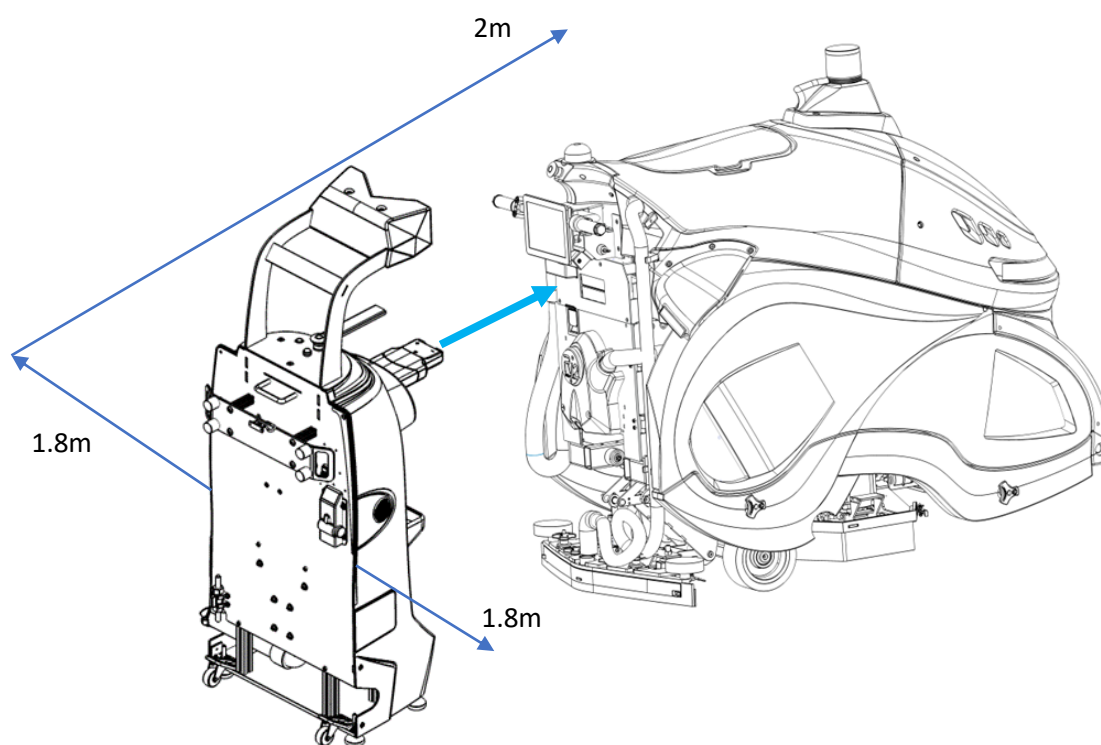


Fig. 3



WARNING: Keep an area of 3.6m (W) x 2m (L) free of obstructions for robot docking.

CONNECTING THE CLEAN WATER SUPPLY

1. Prepare a hose for the clean water inlet.
2. Attach the hose to a tap, push the hose over the tap and tighten the hose clip (Fig. 1).
3. Attach the other end of the hose to the clean water inlet (Fig. 2- 1).
4. See figures 3 to 7 for interconnections.
5. Turn on both the water tap (Fig. 1) and the water valve (Fig. 2 – 2).



NOTE: Open the water valve 1/3 of the maximum. Adjust valve as necessary to prevent spillage.

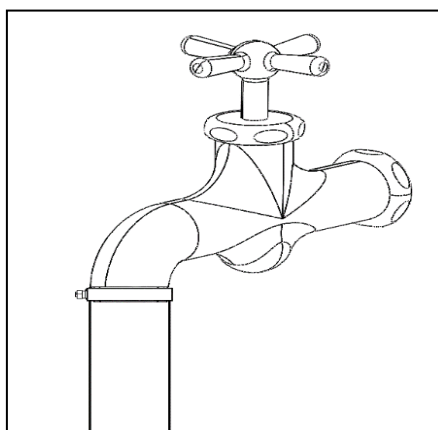


Fig. 1

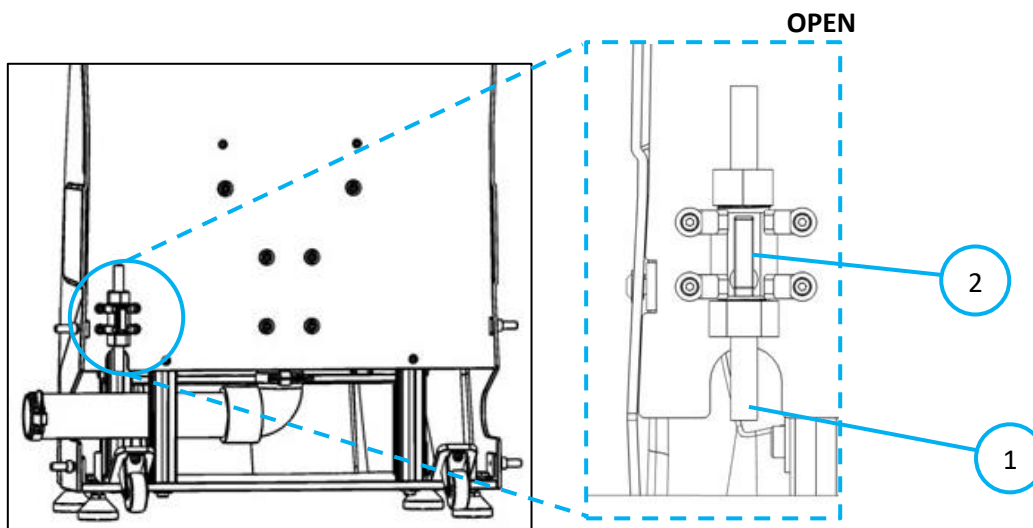


Fig. 2

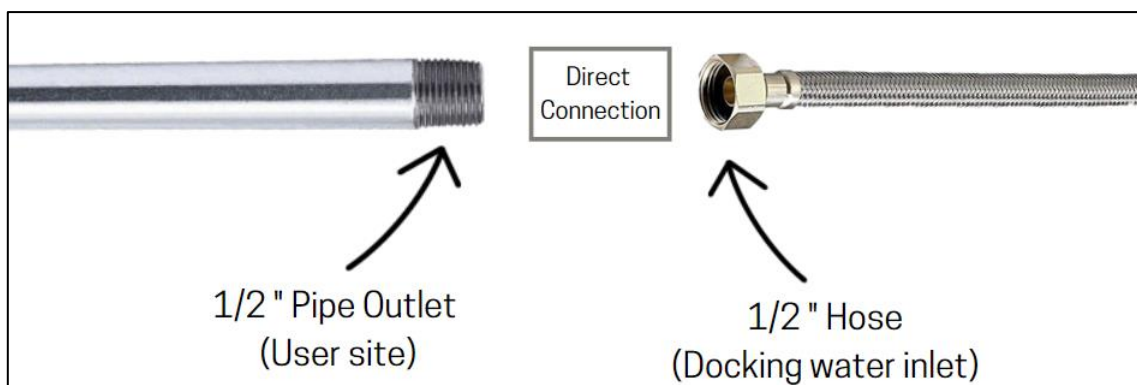


Fig. 3

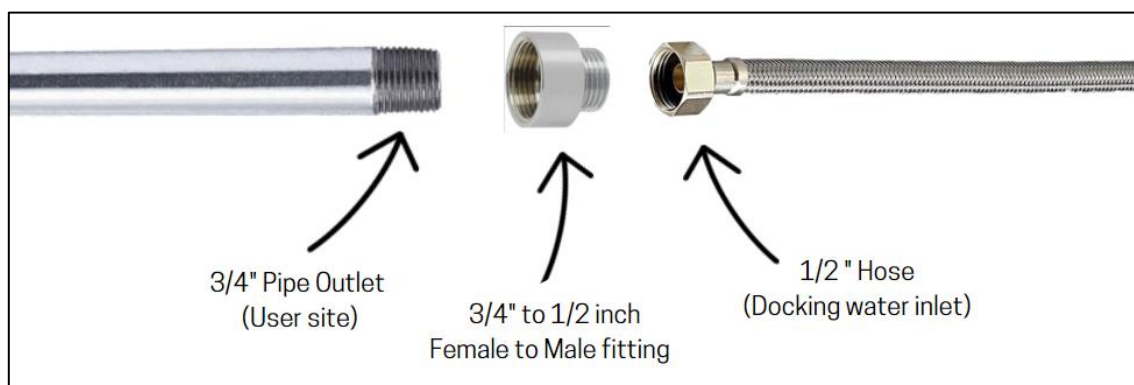


Fig. 4

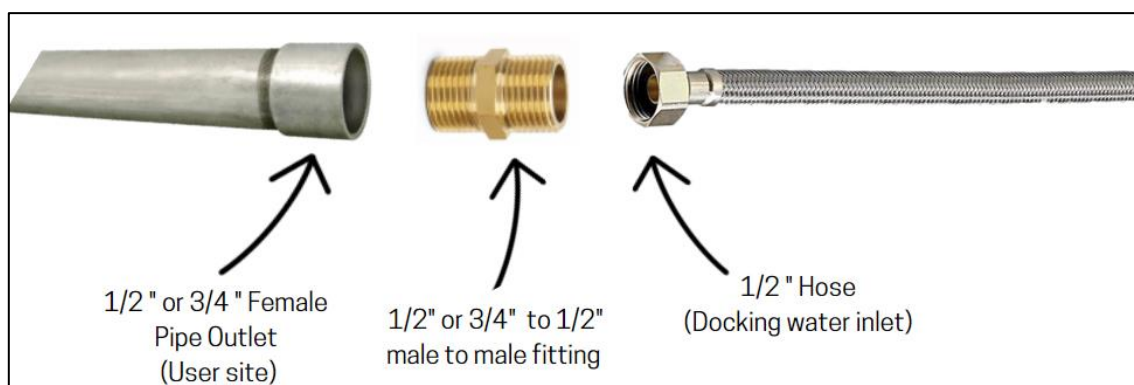


Fig. 5

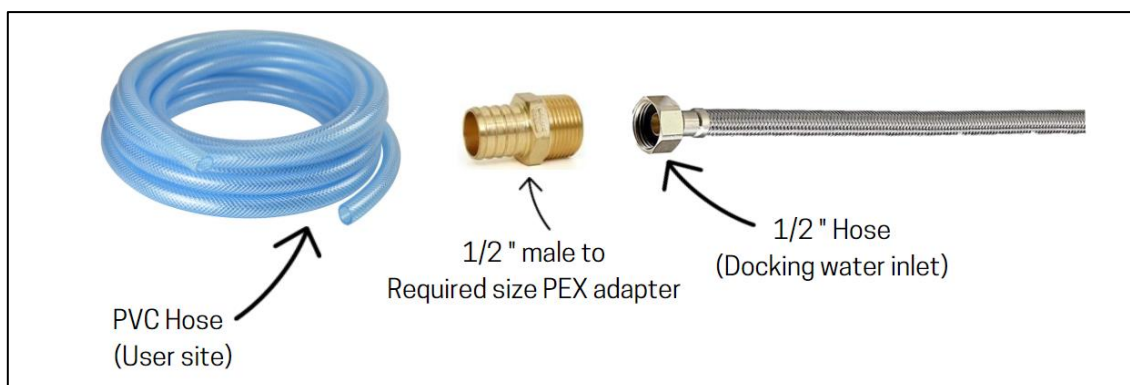


Fig. 6

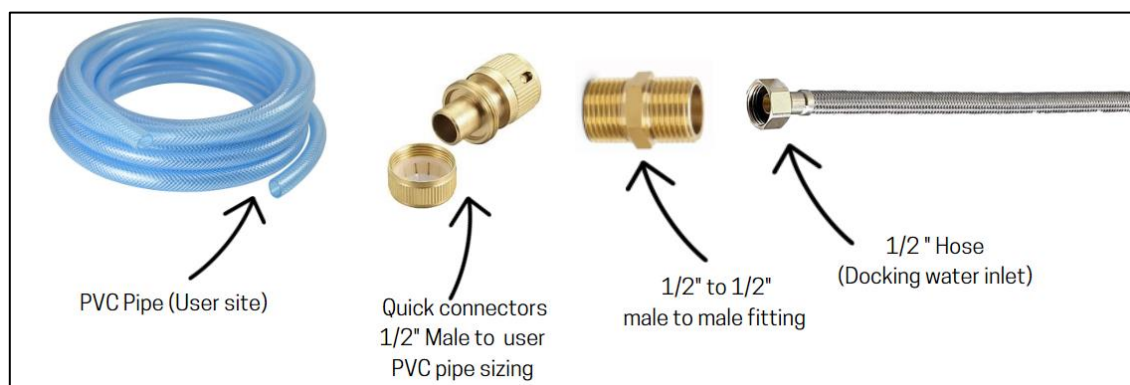


Fig. 7



WARNING: Check all fluid fittings and hoses for leaks before using station. Do not use faulty hoses and damaged fittings.

CONNECTING THE WASTEWATER DRAINAGE

1. Connect the hose to an elbow connector or pipe (1 ¼ "diameter) connected to the drain (Fig. 1).

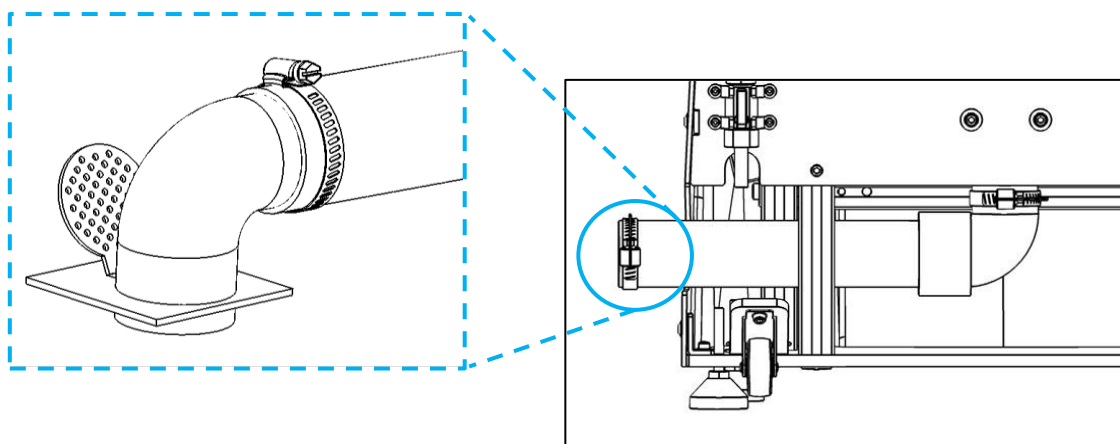


Fig. 1



NOTE: The drain hose can be adjusted to point in the desired direction as shown in Fig. 2.

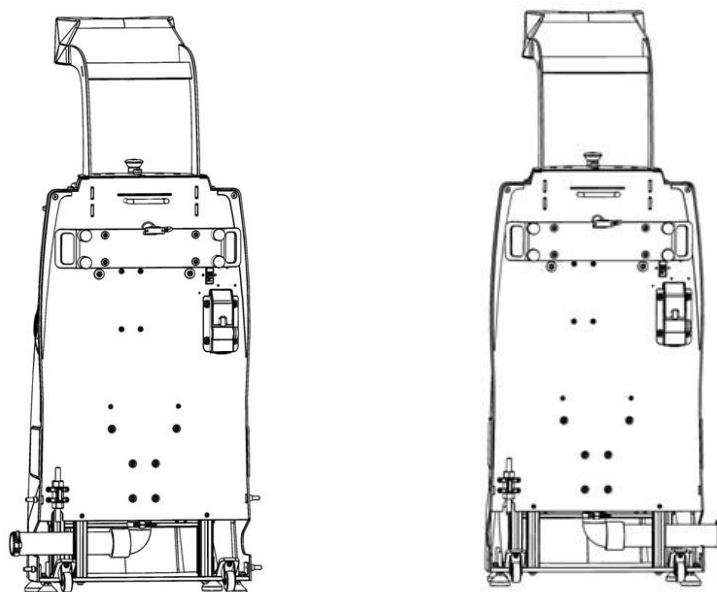


Fig. 2



NOTE: To ensure smooth water flow and prevent the drain basin from overflowing:

- Do not bend/tangle the hose, keep the hose as straight as possible.
- Do not insert the hose directly into the drain, use a PVC pipe to direct water flow into drain.

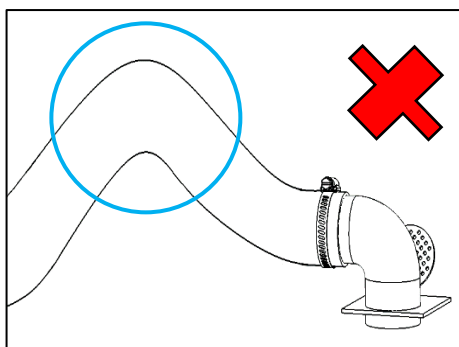


Fig. 3

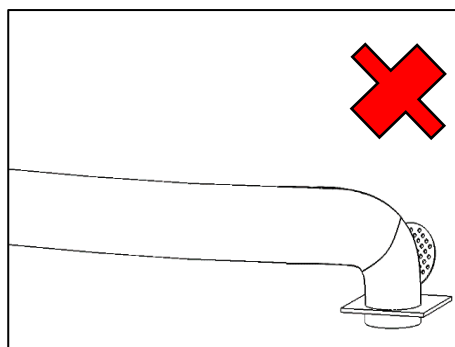


Fig. 4

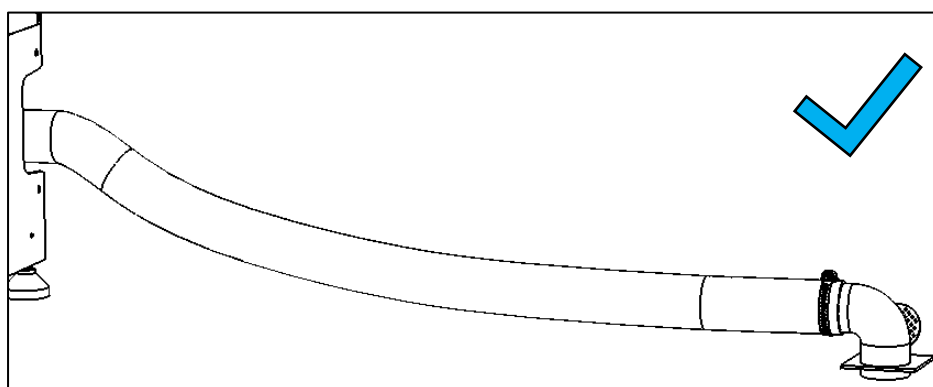


Fig. 5



WARNING: Do not install drain 5cm above the ground.

INSTALLING THE ANTI-TIPPING TAB

1. Place the refuel station against a wall. The rubber stoppers (Fig. 1 – 1) should be touching the wall.
2. Place the anti-tipping tab (Fig. 1 – 2) on the wall and secure it with screws (Fig. 2).

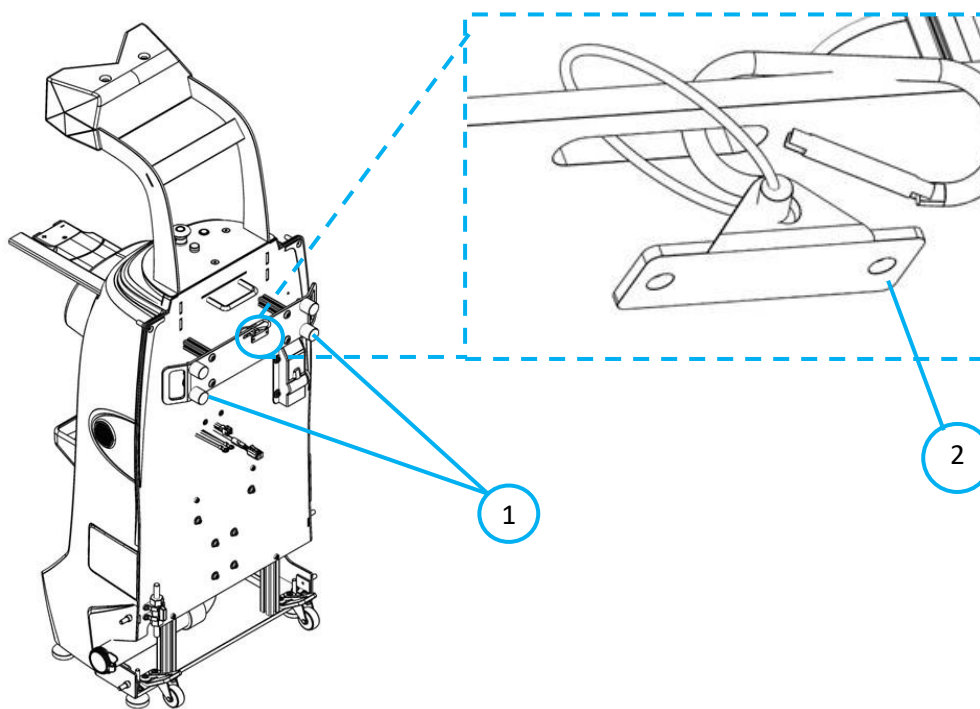


Fig. 1

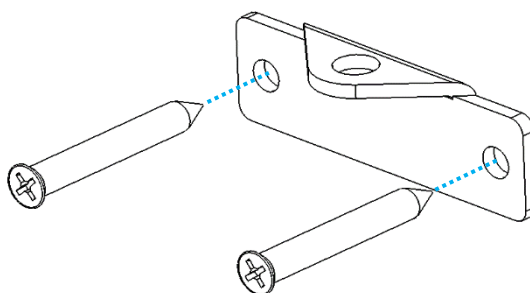


Fig. 2



WARNING: Install anti-tipping tab on wooden panels or concrete walls. Do not secure tab to dry wall.



DANGER: Not installing the anti-tipping tab against a wall, shall result in a tipping hazard and risk injury to people.

POWERING ON/OFF THE REFUEL STATION

1. Connect the power cable to the refuel station power port (Fig. 1).

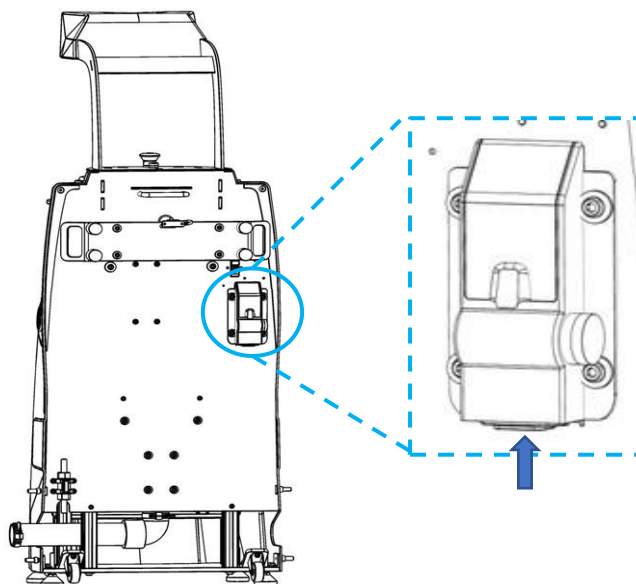


Fig. 1

2. To power on: Flip the ON/OFF switch upward (Fig. 2-1).
3. To power off: Flip the ON/OFF switch downwards.

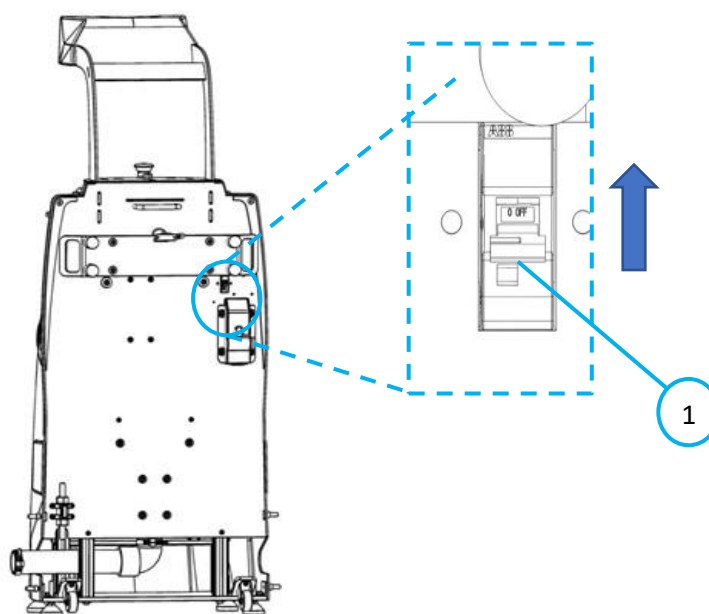


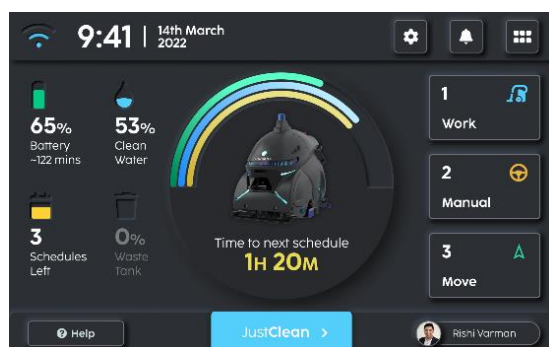
Fig. 2

REFUEL STATION TOUCHSCREEN SETUP

The following section describes the setup procedure for the REFUEL STATION using the touchscreen on the REX. The touchscreen uses the LionsClean app.

The LionsClean app is used to communicate to and work with the REFUEL STATION. Each REX user is assigned a unique user id and password for use with the app. Only account administrators and technicians can setup the REFUEL STATION. All users can operate the station.

This section provides an overview of the REFUEL STATION setup process. Before station setup up ensure the REX has the correct map loaded and is localized.



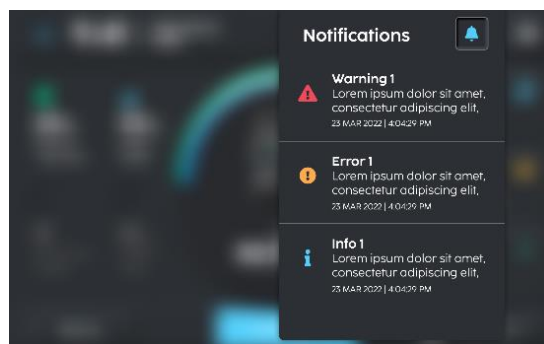
Home page



Home Menu



User Profile



Inbox

INITIAL SETUP

The following section describes the station setup procedure by using the touchscreen on the REX.



NOTE: If the station is registered go to [“ADD REGISTERED DOCKING STATION TO REX”](#).

1. Turn on the REX and login to an administrative or technician account (Fig 1).
2. Turn on the REX Refuel Station by flipping the circuit breaker on. (Fig 2).
3. Select the robot map (Fig 3).
4. Select the ‘edit’ map (Fig 4).



Fig 1

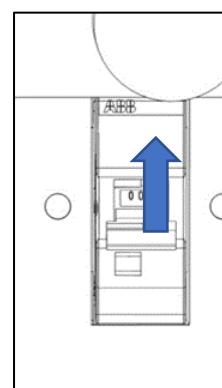


Fig 2

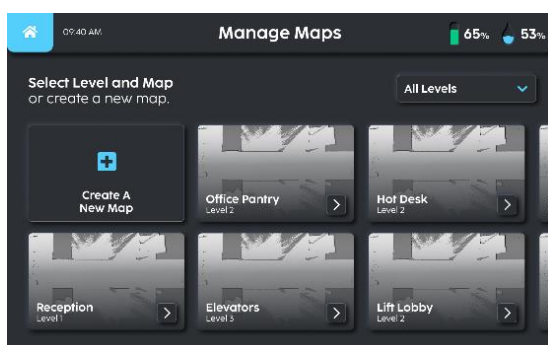


Fig 3

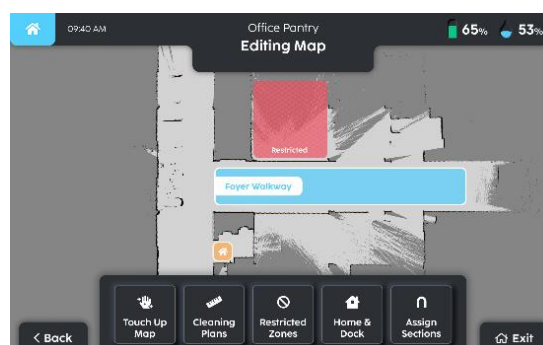


Fig 4

5. Select the ‘Landmark’ icon on the edit map page (Fig 5).

6. Select the 'Dock Point' icon shown (Fig 6).



Fig 5



Fig 6

7. On the map tap the place where the docking station is positioned (Fig 7).
8. Orient the position of the station by tapping the arrows (Fig 8).
9. Select confirm (Fig.8).



NOTE: Install station on a flat surface.



Fig 7



Fig 8

INITIAL REGISTRATION

10. Press the pairing button (Fig 9- Red Circle).



NOTE: Lift cover on pairing button housing to press button.

11. Wait for the station to light up (Fig 10).

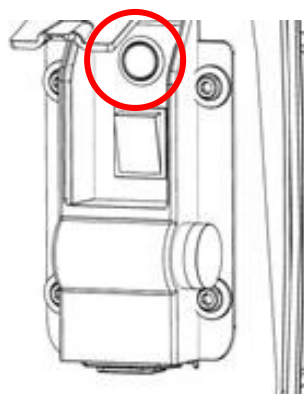


Fig 9



Fig 10

12. If the station is not found Fig 11), bring the robot closer to the station. Then select 'Try Again'.

13. If problem persists contact Lionsbot for assistance.

14. If docking station has been registered, select cancel and go to the 'POST REGISTRATION' section (Fig 12).

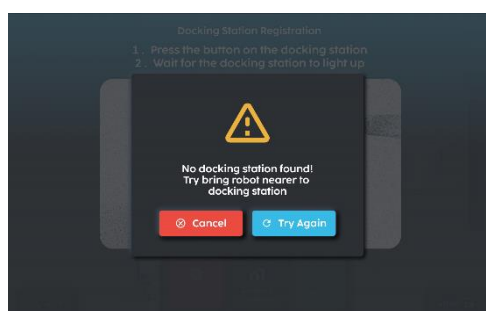


Fig 11

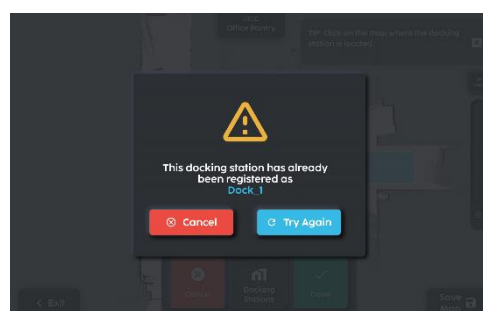


Fig 12

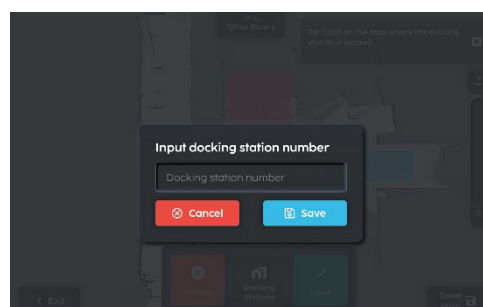
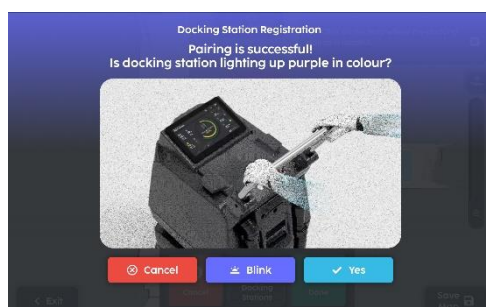


Fig 13

Fig 14

15. When station is registered (Fig 13) select 'yes'.
16. Input the docking station number (Fig 14). you may use the station serial number.
17. Save the map (Fig 15).

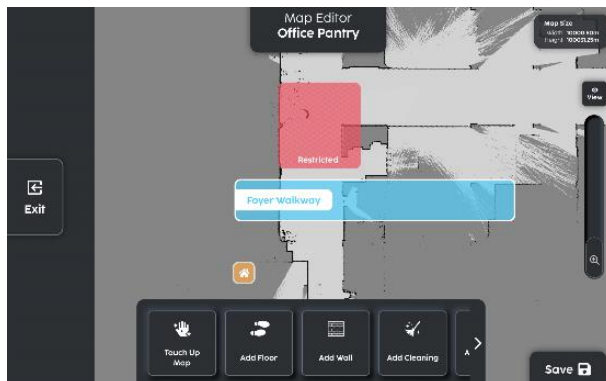


Fig 15

ADD REGISTERED DOCKING STATION TO REX

The following section describes the setup process for a registered docking station.

1. Turn on the REX and login to an administrative or technician account (Fig 1).
2. Turn on the Refuel Station by flipping the circuit breaker on. (Fig 2).
3. Select the robot map (Fig 3).
4. Select the 'edit' map (Fig 4).

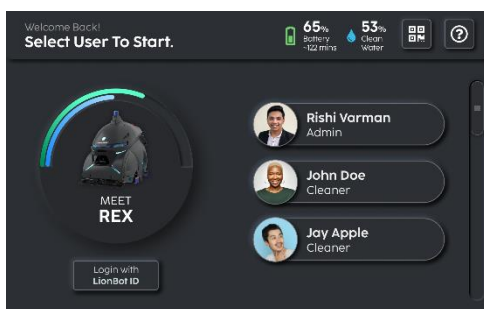


Fig 1

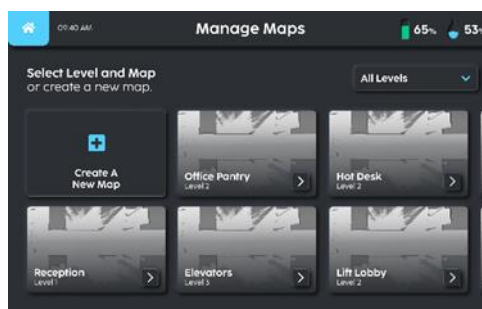


Fig 2

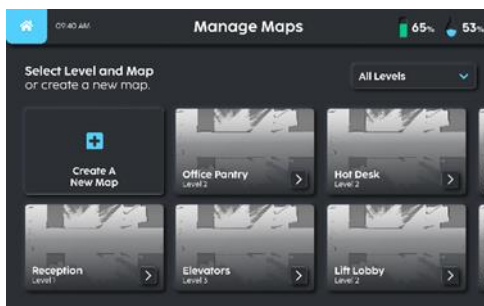


Fig 3

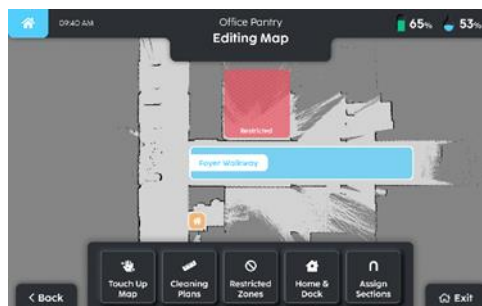


Fig 4

5. Select the 'Landmark' icon on the edit map page (Fig 5).
6. Select the 'Dock point' icon shown (Fig 6).



Fig 5



Fig 6

7. On the map tap the place where the docking station is positioned (Fig 7).
8. Orient the position of the station by tapping the arrows shown in Fig 8.

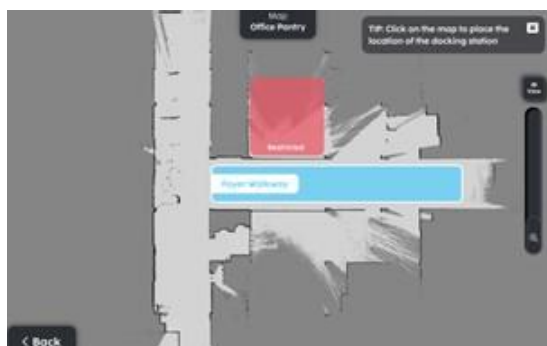


Fig 7



Fig 8

9. From a list select the docking station to use (Fig 9).
10. Selecting the 'gear' icon will open the docking setting page. The page allows you to delete, rename and view the MAC address of the station (Fig 10-13).

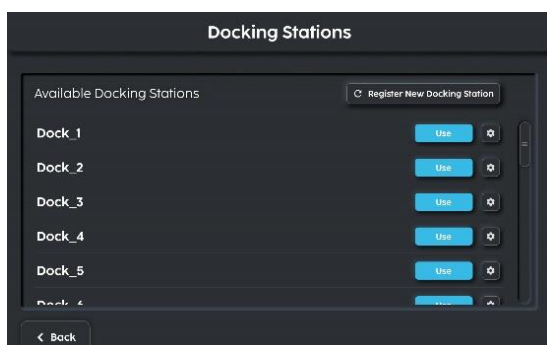


Fig 9

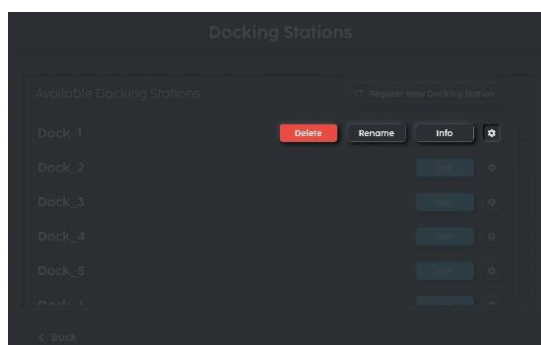


Fig 10

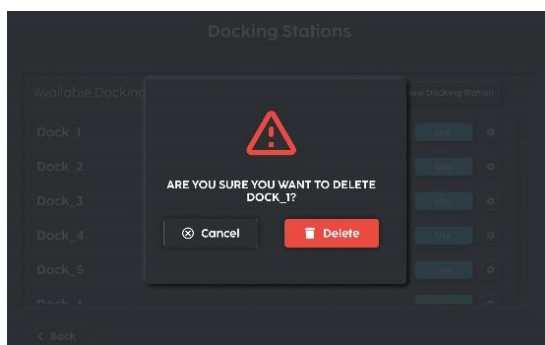


Fig 11

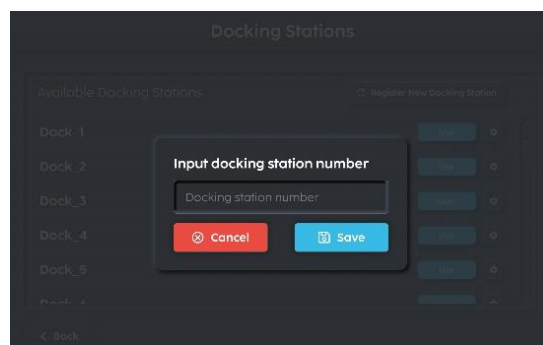


Fig 12

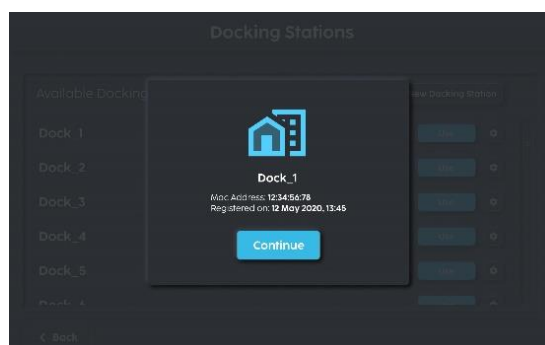


Fig 13

REX REFUEL STATION OPERATION

The REX REFUEL STATION can only be operated in autonomous mode or partially in manual mode.



DANGER: ONLY USE STATION WITH AGM BATTERIES INSTALLED ON THE REX.

The following table shows the state of the Refuel Station:

STATION LED STATE	DESCRIPTION	SOLUTION
SKY BLUE	STATION IS IDLE	-
BLUE FLASHING	MANUAL CHARGING IS ON	-
YELLOW	ROBOT IS DOCKING	-
ORANGE FLASHING	STATION IS BROADCASTING	-
GREEN	ROBOT IS CHARGING	-
RED	E-STOP IS PRESSED	RESET E-STOP
RED FLASHING	FUSES ARE BLOWN	REPLACE FUSE

DOCKING

AUTOMATIC

The REX will initiate the auto dock sequence when clean water level is empty or and a full waste water tank or when the battery reaches 10%.

MANUAL MODE

1. Select the REX touchscreen and go to the 'HOME PAGE' (Fig. 1).
2. Select the 'more options' icon to expand the menu.
3. Select 'Dock Robot' (Fig 2).



Fig. 1

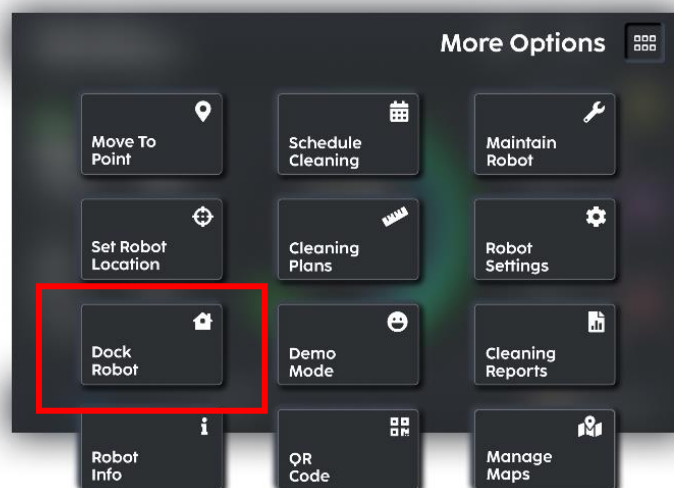


Fig. 2

4. Select docking location for the robot on the map (Fig 3).
5. Select 'Dock' to start the docking sequence (Fig 4).

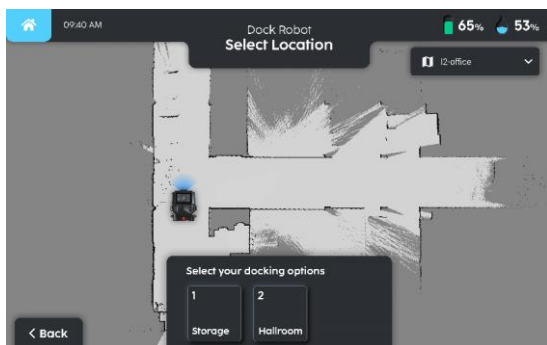


Fig. 3

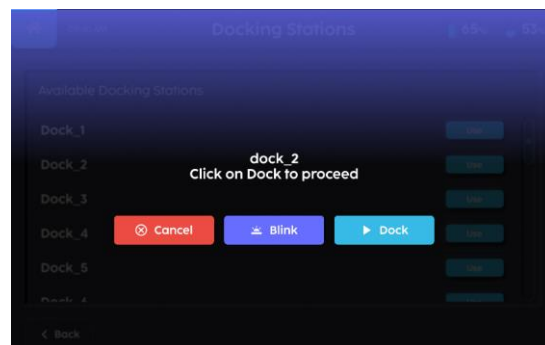


Fig. 4

6. If robot is unable to dock, select 'Dock' to try again (Fig 5). To terminate process, select 'cancel'.
7. To undock robot after charging and water exchange select 'Undock' (Fig. 6).

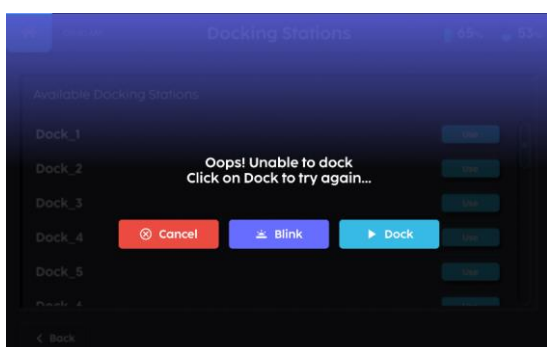


Fig. 5

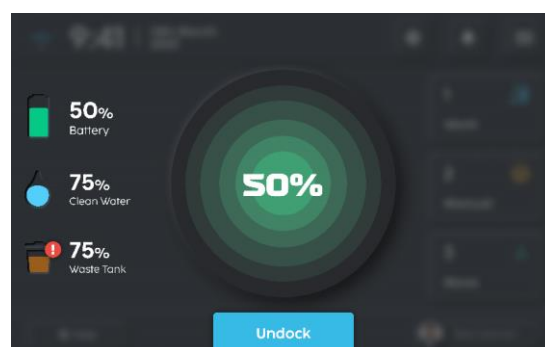


Fig. 6

8. If undocking fails, select 'Undock' again (Fig. 7) or pressing the undock button on the station. Should problems persist contact LionsBot.
9. Once undock sequence is complete the touchscreen menu returns to the 'Home' screen (Fig. 8). Note the change in battery charge, clean water and waste water levels.

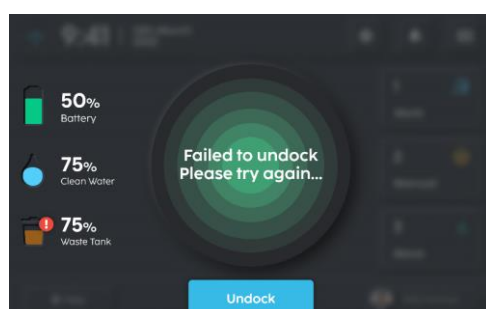


Fig. 7



Fig. 8

MANUAL CHARGING

The REX REFUEL STATION can charge the REX in manual mode.

1. Flip the station settings to 'MANUAL' (Fig. 1).

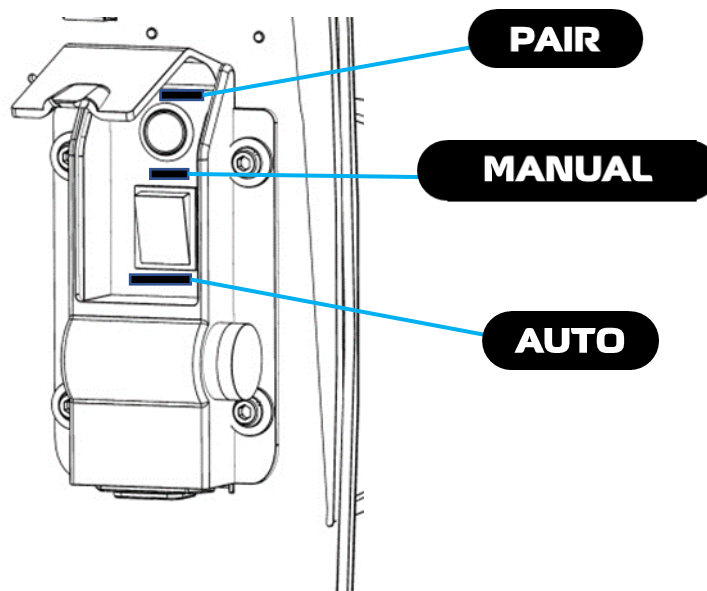


Fig. 1

2. Pull out the Anderson connector for behind the station (Fig. 2).
3. Open the Chemical cabinet on the REX (Fig. 3).
4. Unplug the battery cable (Fig. 4).



Fig. 2

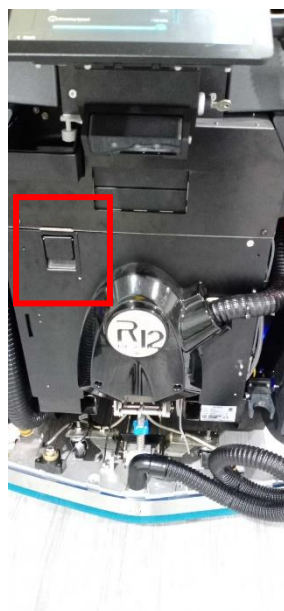


Fig. 3

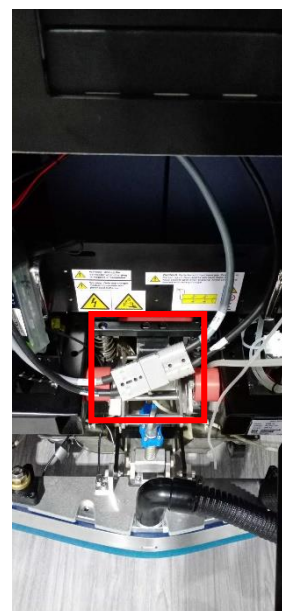


Fig. 4

5. Plug battery cable to the station.
6. Let the robot charge, observe the charger indicator (Fig. 5 and 5.1).



Fig. 5



Fig. 5.1

7. When battery is full, unplug connector.
8. Reconnect the battery cable to the REX.
9. Stow the charging cable under the station.
10. Flip the station setting switch to 'AUTO' (Fig 6).



Fig. 6



WARNING: Failure to change operation mode to 'AUTO' shall not allow the REX to charge autonomously, vice versa.



Note: Only one mode of operation is possible.

RECOMMENDED MAINTENANCE



CAUTION:

1. Switch off the station and unplug the power before performing any form of periodic maintenance.
2. For clean water supply, ensure that the water pressure is between 40 to 45 psi (tap water from normal commercial buildings is at 40 to 45 psi).
3. If any water leakage is seen, close the ball valve on the back of the station, contact an authorized distributor immediately.

RECOMMENDED MAINTENANCE SCHEDULE

OPERATION	AFTER EACH USE	DAILY	WEEKLY	MONTHLY	ANNUALLY
Rinse the drain basin					
Wipe down the refuel station					
Inspect hoses for tear/leaks					
Retighten hose clips					
Vacuum internal housing					
Inspect charging contacts for wear					
Firmware update ¹					

1: LionsBot autonomy services will update distributors when firmware updates are available.

RINSING THE DRAIN BASIN



1. Check the drain basin (Fig. 1 – 1) for debris.
2. Flush the basin with water and unclog if necessary.

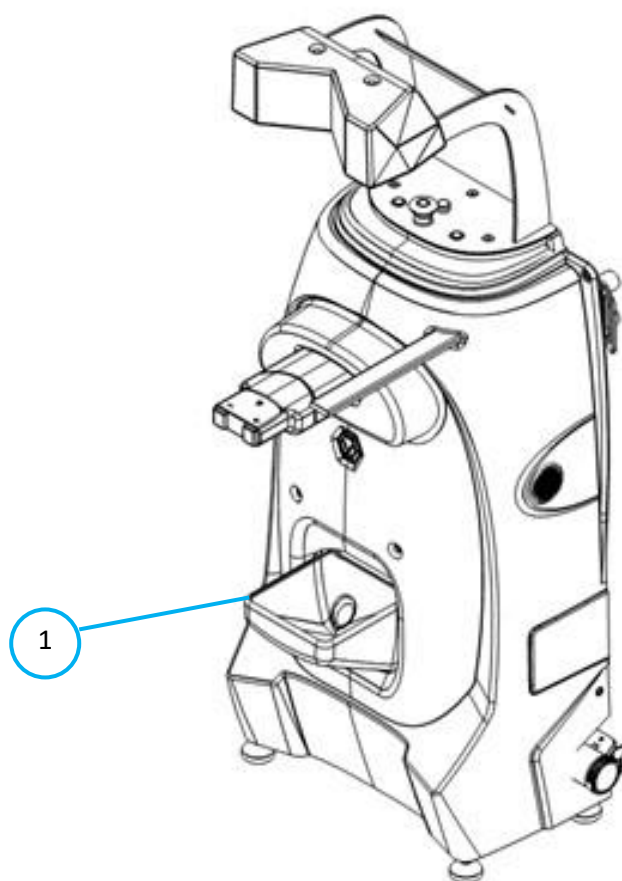


Fig 1

WIPING DOWN THE REFUEL STATION

1. Ensure that the station is powered off.
2. Wipe down the outer skin and charging contacts of the station using dry cloth.
3. Do not hose down the station.



DANGER: Do not wipe the charging contacts with a wet cloth.

UPDATING THE STATION FIRMWARE

Contact your local distributor about firmware updates.

DISPOSAL

Contact an authorized distributor for the proper disposal of the REX refuel station. Before scrapping the station, it is necessary to separate out different categories of materials for proper collection and disposal in compliance with local environmental regulations. Take particular care in handling the charger and electronic parts.

TROUBLESHOOTING

The table below lists some useful troubleshooting tips for simple issues that may arise with the refuel station. If preliminary troubleshooting is unsuccessful, please contact an authorized distributor for assistance.

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE REFUEL STATION DOES NOT START	The power cable is not connected properly.	Re-insert the power cable.
	ON/OFF Switch is not flipped to ON.	Flip the On/OFF switch to ON position.
THE LED IS RED	E-Stop is triggered.	Release the E-stop and press the reset button
THE LED IS FLASHING RED	Fuse blown	Replace blown fuse
THE LED IS FLASHING ORANGE	Station is in broadcast mode	Wait 15 minutes if there is no change, restart device.
ROBOT IS NOT DOCKING	Station is in manual mode	Flip switch on back panel to AUTO.
THE ROBOT DOES NOT CHARGE	The charging contacts are misaligned.	Re-dock the robot. Contact authorized local distributor if problem persist.
	The charger inside the refuel station is faulty.	Contact authorized local distributor immediately.
THE DRAIN BASIN IS OVERFLOWING	The drain basin/hose is clogged.	Press the e-stop immediately. Unclogged the basin/hose before restarting the refuel process.
	The drain hose is not straight	Straighten/untangle the hose
ROBOT IS NOT DOCKING STRAIGHT	V-profile reflector is loose or dirty	Clean the reflector. If the assembly is loose, contact your local distributor.

BATTERY CHARGER TROUBLESHOOTING

To access the charger, contact your local distributor.

BLINKING FREQUENCY	FAULT CAUSE	SOLUTION
E01 bAt	The battery is not connected or the battery voltage is too low.	1) Check battery connection is correct. 2) Check charger connection is correct. 3) Check each battery is good.
E02 AC	Abnormal AC Power Input (Voltage)	1) Check AC input cord is connected between charger and AC outlet. 2) Make sure AC plug is tightly inserted into AC outlet.
E03 Hot	Charger High Temperature Protection	1) Charger shuts down and enters protection mode due to charger/environmental temperature is too high. Please place the charger in a well-ventilated environment. 2) Disconnect the charger and wait for 15-20mins before reconnecting for charging.
E04 bAt	Battery High Temperature Protection	1) Charger will reduce current even stop charging to prevent the battery from overheating when battery temperature exceeds the preset value. 2) When the battery temperature drops, the charger will restart automatically.
E05 Err	Output Current is too large	Return to the factory for repair.
E06 bAt	Battery Voltage is too high	Check and assure that the correct output battery voltage is connected.

CONTACT INFORMATION

Original Equipment Manufacturer for REX Refuel Station:

LionsBot International Pte Ltd

11 Changi South Street 3

#03-02 Singapore 486122

Email: hello@lionsbot.com

T: +65 6595 4565 | DID: +65 6595 4552