

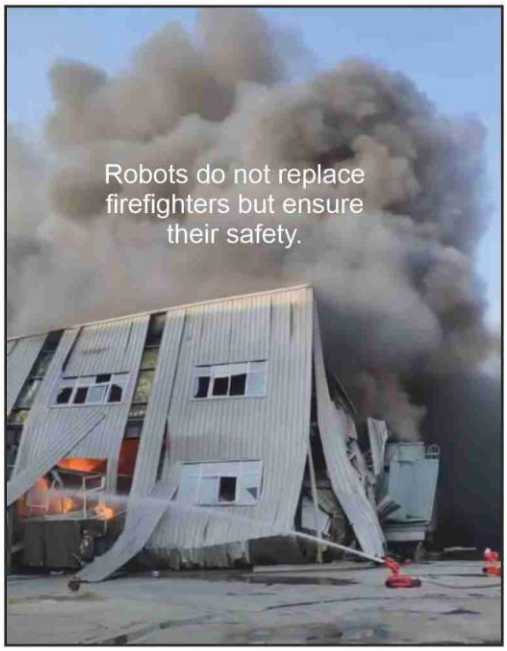



## INTRODUCTION

Firefighting robots used by firefighters play an increasingly important role in fighting fires. Industrial and petrochemical sites, tunnels, underground car parks, subways and car fires are increasing. Each time, firefighters face increased risks of collapse, explosion, poisoning or flashover. These disasters are increasingly complex to manage due to new materials, new architectures and new access difficulties. The extinguishing robot does not replace the firefighter but allows him to operate safely, remaining a few dozen meters from areas where his life and health would be in danger.

But be careful: the MRX is not a science fiction machine equipped with cameras that you control from home behind a computer. This is a terrestrial drone that must always be flown visually because the viewing angles of cameras will never replace human eyes. The option of a thermal camera attached to the monitor can actually make it possible to verify that the water jet is effectively cooling its target, but it is not intended to control the robot.

Operators remain experienced professionals equipped with PPE and capable of simultaneously identifying the actions to be taken and the dangers encountered by the personnel involved. In most cases the firefighting robot will constitute a valuable resource because it is safe and tireless, physically and mentally.



# SAFETY INSTRUCTIONS

**1. Before using, maintaining and repairing the robot, please read and keep in mind the contents of this manual, especially the safety recommendations. Use the robot in strict accordance with the requirements of this manual.**

**2.Operators should read this manual regularly and keep it in a place where it can be consulted at any time. The maintenance team, management and other relevant personnel should also know and understand the contents of this manual.**

**3. If this manual is lost or illegible, please obtain a new one from JCM Distribution. If the machine is sold, please give the manual to the new user.**

**4.The contents of this manual may be changed at any time due to continuous improvement of product design and user customization needs. This may result in inconsistencies between the Manual and the robot purchased by the user, with modifications regarding maintenance work on the robot. For the latest information on the robot and questions regarding this manual, please contact JCM Distribution.**

**★ The robot must be used by a qualified personnel who have read and understood this user manual and person others will not be able to use it without authorisation.**

**★ The robot must be used strictly according to the instructions. Any incorrect operation may cause damage to the robot or the operator himself.**

**★ Please do not use the Joystick of the remote control to take the robot out of the pallet when unpacking. The joystick is very sensitive which can damage the robot or the packaging, especially when used by untrained personnel.**

**★ Before use, make sure that the antennas are all installed correctly, otherwise damage may be caused to the transmission system.**

**First turn on the robot and then the remote control when the robot's power light is on. Otherwise, communication between the fire robot and the control box may fail**





# SAFETY INSTRUCTIONS

★ After starting the robot, do not directly touch the moving parts with your hands or bring your hands or feet close to the tracks.

★ When the robot is moving, make sure that no one is in its path.

★ If the robot needs to stop in an emergency, use the "emergency stop" button on the back of the robot.

.★ Although the robot is heat resistant, its operating temperature limit is 60°C. He must not get too close to the fire or let alone enter it, as this could damage it or even cause an explosion. If exposed to high temperatures, ensure that the sprinklers are constantly powered. Any breakdown due to overheating resulting from a shutdown of the self-protection power supply cannot be covered by the warranty.

★ When climbing a slope or a staircase, the operator must pay attention to the inclination which must not exceed 37°. Likewise, the operator must pay attention to the position of the center of gravity of the robot itself. Any excessive speed or poorly controlled rotation may cause the robot to overturn with significant damage.

★ The battery level of the robot and the remote control must be checked before and after any operation. If a battery level is too low, the equipment may not operate properly and the battery may be damaged.

★ The robot must be charged in a dry, ventilated place at a temperature of approximately 20 to 30°C, without proximity to flammable or explosive materials.

★ The robot and control box have been designed with charging protection circuits and various protection functions. But in order to minimize the risk of accidents, the entire charging process must be monitored by a dedicated person responsible for checking whether the robot, the control box, the surface of the chargers, the junction box cables and the sockets suffer from overheating. If this happens, you should immediately disconnect the power supply from the charger and remove the charger plug from the robot. If the robot battery is not charged, wait for it to cool down before recharging.

★ The charger has an automatic power-off function. But to minimize the risk of accidents, it is better to disconnect the power from the charger when charging is finished and disconnect the charger plug. Exceeding the normal charging time could reduce the performance of the lithium battery or even cause an explosion

★ When charging the robot and the control box, please use the standard chargers provided by the manufacturer to the exclusion of any other chargers.

★ It is not recommended to start the robot or control box while their batteries are charging.

★ In the event of an abnormal incident during the charging process, please contact JCM Distribution for technical assistance.

★ Disassembly of the robot without authorization is strictly prohibited to avoid further damage to the robot or personnel. In the event of a robot breakdown, please contact JCM Distribution. Any dismantling of the robot voids the warranty conditions unless expressly authorized by JCM Distribution after the required operator training.

## REMOTE

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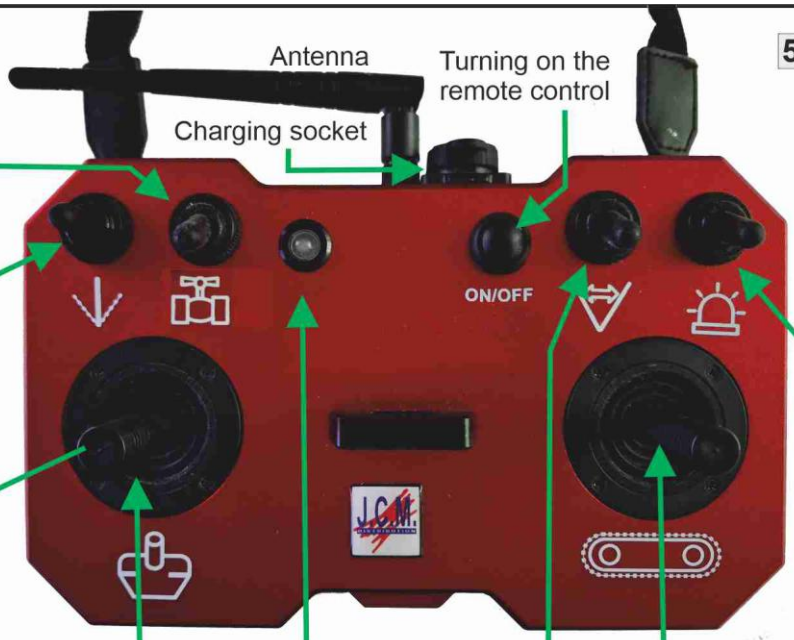


Switching on the solenoid valve and self-protection by sprinklers

straight jet / diffused jet setting

After switching on the robot and the remote control, move this joystick upwards for 1 second and release it and you will hear an audible long 'beep' for confirming communication.

Joystick for connecting the remote control to the robot receiver then controlling the monitor.

Remote control battery level indicator:
**Blue**: functional charge level.
**Yellow**: battery to be recharged
**Red**: discharged battery.

Oscillation automatic monitor

Robot control joystick: forward, backward,

Projector lighting, beacon and side LED strips.

## ROBOT

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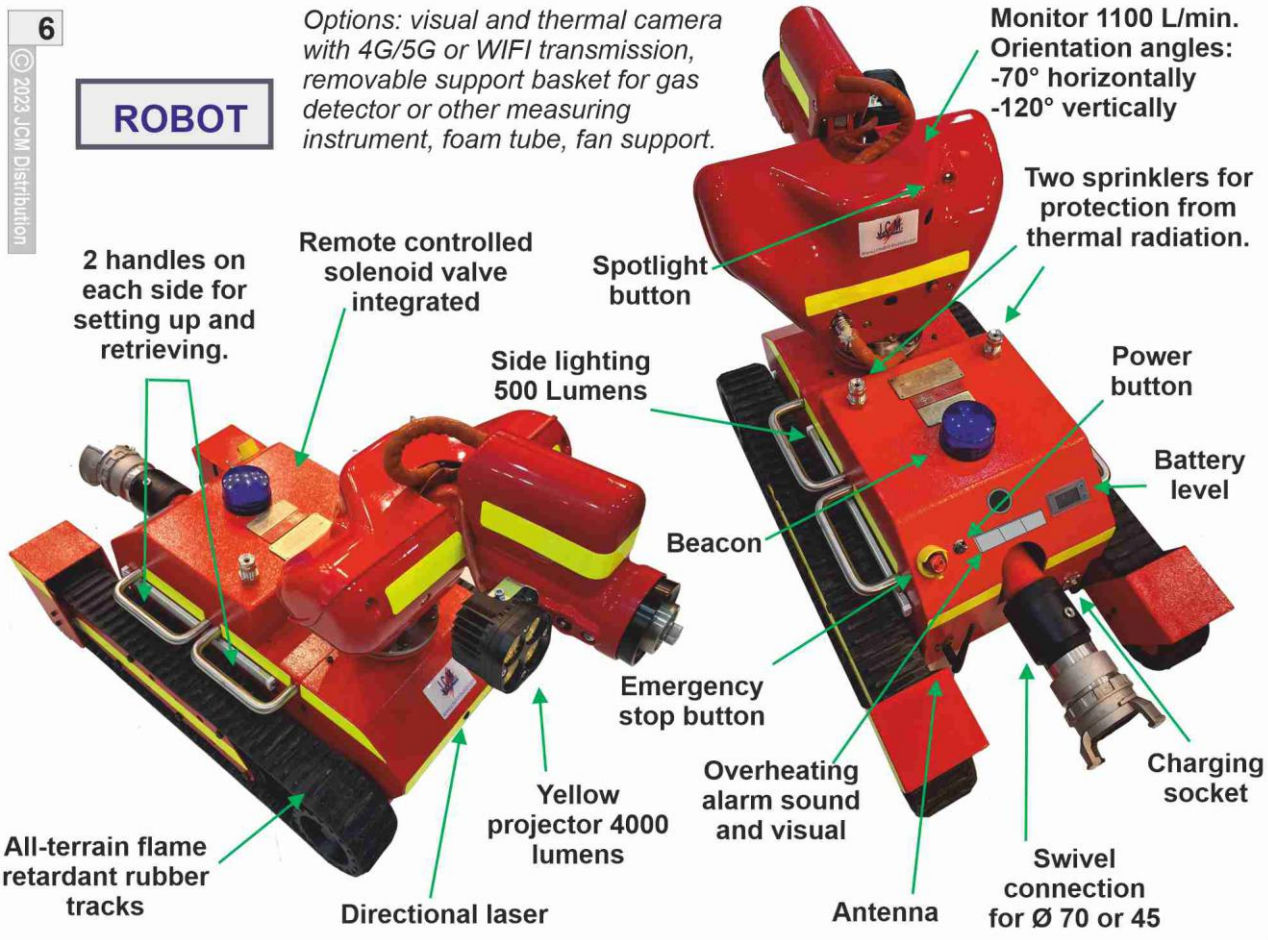
*Options: visual and thermal camera with 4G/5G or WIFI transmission, removable support basket for gas detector or other measuring instrument, foam tube, fan support.*



# PRE-START REMINDER

★ Each robot has been strictly inspected with a test run before delivery. We strongly recommend that you run your new robot for 4 to 8 hours, starting with operation without hose pulling, as this running-in will optimize its life expectancy.

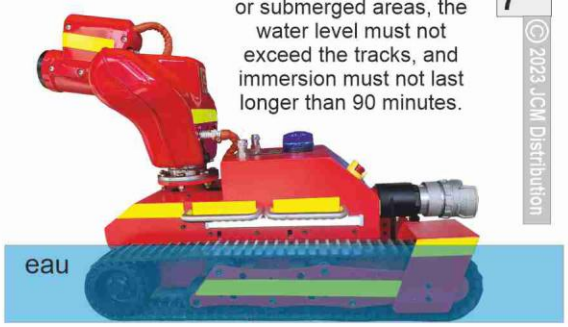
Before starting up: :

★ Check the robot and control both antennas and make sure they are correctly installed and tightened.
★Check that the robot and control box are switched on.
★ Check the communication status between robot and control box.
★ Check robot and control box battery level (Robot above 20 V; control box with blue LED)..
★ Check the robot's emergency stop button and make sure it is released.

As with any tracked machine, it is important to avoid straddling reliefs or objects (stones, hoses, etc.) which, when slid under the bodywork, reduce the grip of the tracks and can hinder progress. Similarly, beware of ditches and gutters, which can block a track.




When operating in puddles or submerged areas, the water level must not exceed the tracks, and immersion must not last longer than 90 minutes.




**WARNING !**

★ Do not use the robot in conditions that may exceed its IP65 protection rating.
★ The robot's loading and towing capacity, climbing ability, etc. should be fully understood before using it to load, climb and circulate in different environments.
★ The robot's travel speed should be slow at first, increasing gradually and gently. Make sure there are no personnel or obstacles in its path to avoid any damage or impact due to the high speed.
★ The speed of the robot's movement must be slow, especially when climbing or scaling obstacles, to avoid tipping, impact or immobilization. Familiarize yourself with the sensitive joystick, avoiding sudden movements that could prematurely wear out the wheel axles.




# USE

First turn on the robot and then the remote control as indicated on page 5, after checking that the antennas are in place and that the robot's emergency stop button is not pressed.
*(To switch off, first turn off the remote control then the robot and if necessary the emergency stop button.)*

Check that the monitor responds well to the command of the left joystick and manipulate the right joystick very gently because it is very sensitive: it is possible to maneuver the MRX very slowly and very precisely by exerting very little pressure on this joystick.
Connect the 45 or 70 diameter hose depending on the connection available. The monitor can broadcast up to 1,100 LpM at 10 bars maximum with a range of more than 30 meters. Before opening the solenoid valve, make sure that no personnel is in front of the robot.
The MRX can tow up to 30 m of fullhose in diameter 70 depending on the nature of the ground, the slope and the direction of the jet (by directing the jet towards the sky the recoil effect increases the grip of the tracks). With the hose cart, the towable length is obviously much greater.

The MRX can climb obstacles of approximately 7 to 8 cm, such as a solid 70 cm hose for example, but avoid positioning it astride a hose or relief of this height as its tracks will lose their grip.

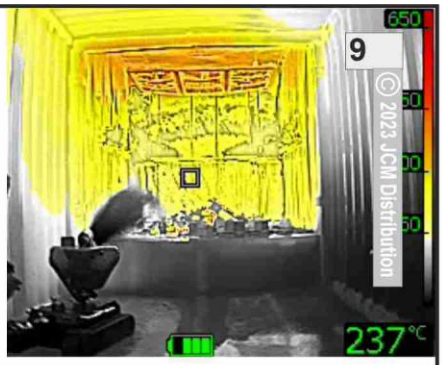
If necessary the MRX can climb stairs depending on the width of the steps but you will need to help it with the first step and ensure its stability by avoiding a rotation which would change the location of his center of gravity. In any case, the MRX is not intended to tow a hose up a staircase. On the other hand, weighing only 75 kg, it can be transported by two fire fighters thanks to its side handles.

Pay attention to the center of gravity!

# USE

*"The electronic components inside the robot as well as the monitor shroud cannot withstand ambient temperatures above 60°C."*

Thus, in an environment at 500 or even 100°C, any equipment equipped with electronic cards, whatever its level of heat resistance, will be irremediably degraded after a certain time: the duration of its resistance will depend on the nature of its insulating materials but - whatever they are - the external heat will always end up being transmitted inside the system. The only solution to lastingly protect equipment subjected to high temperatures is to water it with water which, as it vaporizes, absorbs ambient heat.

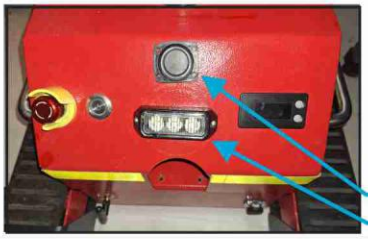



Autoprotection permanente

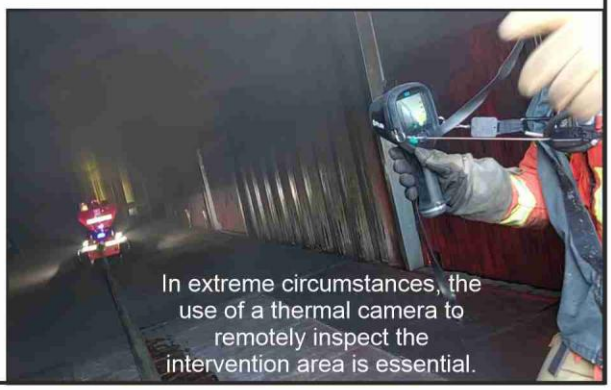
**The MRX therefore has two sprinklers connected to the water inlet upstream of the solenoid valve, so that it can be permanently cooled, even if the monitor jet must be interrupted during repositioning in front of the fireplace. .**

Note that if the water supply for self-protection is interrupted, the robot must be evacuated immediately, otherwise it will be seriously damaged. An audible and visual overtemperature alarm is triggered when the robot's interior temperature exceeds 70°C. If evacuation is only possible in reverse, personnel must be available to pull the hoses to allow this.

**ATTENTION : if the water supply for self-protection is interrupted, the robot must be evacuated immediately, otherwise it will be seriously damaged.**



If the interior temperature exceeds 60°C, an audible and visual alarm is triggered



In extreme circumstances, the use of a thermal camera to remotely inspect the intervention area is essential.





# CHARGING THE BATTERIES...

★ **Check the battery level of the robot and control box before and after each use.**

## ...for the robot :


On the back of the robot, this light indicates the charge level of the robot's battery. At 100%, the working period is 2 hours when traveling and 16 hours when operating. Full recharge in 4 hours.

It is essential to recharge if the level is less than 20% because there will then be less than 20 minutes of battery life.

Remember to reposition the waterproof caps on the charging sockets before restarting.

Even if the chargers are equipped with an overload protection system, it is always preferable to disconnect them at the end of charging. Likewise, monitor the temperature of the chargers and cables during charging (see page 4).

## ...and for the remote :


Above the remote control, charger connexion. At 100%, the working period is 2 hours. When the light turns yellow, the remaining battery life is 20 minutes and 5 minutes when the light turns red. Full recharge in 3 hours.

# MAINTENANCE

★ A person in charge of maintenance, trained by JCM Distribution, must be designated to ensure maintenance and repairs of the MRX.

★ The appropriate tools and accessories for maintaining the MRX will be defined.

★ Be careful not to drop foreign objects such as bolts, nuts, wire ends or nails inside the robot, which could cause short circuits, malfunctions or other damage..

★ After each intervention the bodywork must be cleaned, dried and carefully inspected in order to identify scratches or traces of impact which would ultimately result in oxidation. Repainting is therefore sometimes necessary without waiting for rust to appear.

★ Every three months - depending on the frequency of intervention - it is necessary to grease the axles of the 14 wheels, the monitor and the rotating connector. Clean any traces of oil from the tracks or bodywork.

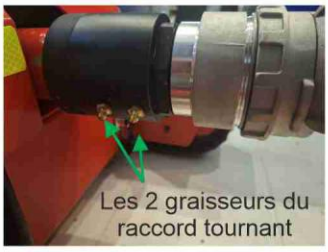
★ The state of wear of the drive wheels, guide wheels, towing wheels and load wheels must be regularly checked, particularly for the drive wheels' axle holes whose wear can cause negative effect on transmission mechanism.

★ If the MRX has not been used for approximately a month, it is advisable to operate it with its remote control for 10 to 20 minutes to eliminate humidity and renew the lubrication, with recharging of the batteries on this occasion.

★ Every 50 hours of operation, the tightness of the bolts and nuts of the various parts of the robot and the monitor should be checked, with particular attention to the bolts of the suspension system.

★ If used with sea water or foam, it is essential to rinse the monitor thoroughly with fresh water.

The 4 monitor lubricators.



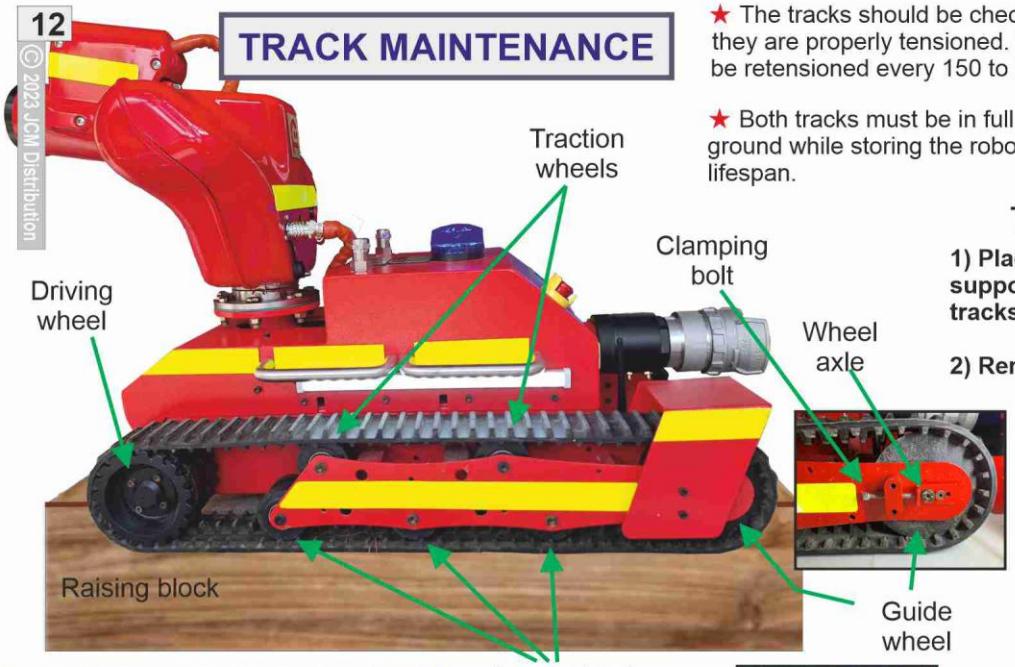





# TRACK MAINTENANCE

★ The tracks should be checked regularly to ensure they are properly tensioned. They generally need to be retensioned every 150 to 200 hours of operation.

★ Both tracks must be in full contact with the ground while storing the robot to ensure their lifespan.



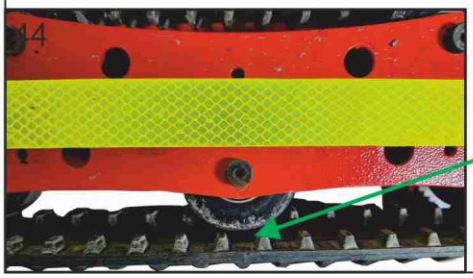

## Track tension

**1) Place the robot astride a support that allows the tracks to rotate freely.**

**2) Remove the back cover.**

**3) Loosen the wheel axle screw slightly.**

**4) Screw or unscrew the tightening bolts on each side to tighten or relax the tracks.**

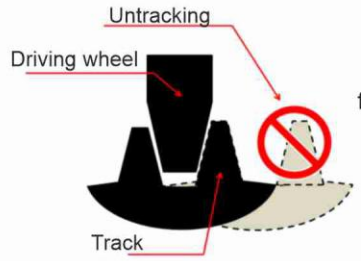


The recommended distance between the inner face of the track and the central supporting wheel is 1 to 3 mm.

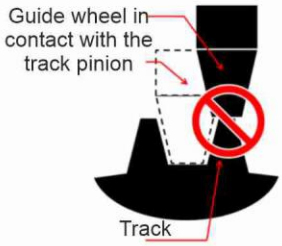
Precisely measure the spacing which must be identical on each side of the wheel before tightening the wheel axle.

# TRACK MAINTENANCE

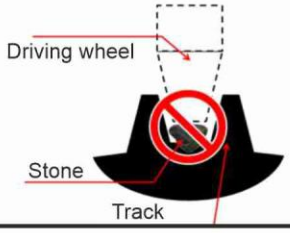
## Insufficient track tension:




The track can move away from its wheels.




The teeth of the guide wheels or of the drive wheels can shift and damage the boss of the track pinions.




Stones can get inserted between the track and the wheel teeth and damage the track.

## Excessive track tension :

The track may stretch under extreme tension with degradation of the track bumps.

★ Rinse the tracks with a high pressure cleaner to rid them of chemicals, oil, salt and sea water which can accelerate their aging

★ Sharp materials (such as steel bars, stones, etc.) and degraded road surfaces accelerate track wear.

★ Wear manifests itself by cracks on the tread of the tracks .

★ Do not turn the robot suddenly when it is moving: risk of untracking and premature wear of the tracks.

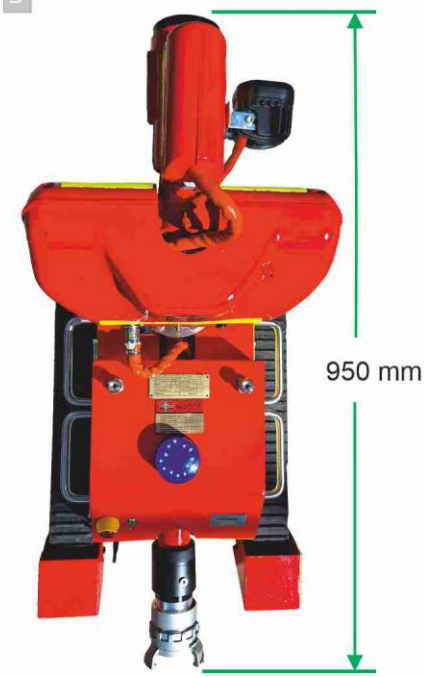
★ Any impact at high speed considerably weakens the tracks.

★ Absolutely avoid moving forward with a track in friction with a curb or equivalent: risk of untracking in addition to rapid wear of the track. Moving through ditches or trenches is one of the main causes of track damage or breakage.






# DIMENSIONS





## TECHNICAL SHEET (1/2)

| ROBOT | |
|---|---|
| Dimensions | L950 X W490 X H620 mm (including horizontal water cannon and hose connection) |
| Weight | < 75 Kg (without option) |
| Tracks | All terrain flame retardant rubber |
| Power supply | Lithium ion battery, 24V 34 Ah |
| Motors | 2,3 KW electric driven servo motors |
| Travelling Speed | 1,0 m/s |
| Crossing Height | 70/100 mm |
| Climbing Angle | >30° (slope, stairs) |
| Traction Force | > 400 N (30 m of full diam.70 hose) |
| Rotation radius | Rotation in place |
| Control Mode | Remote Control |
| Continuous Travel Duration | 2 hours |
| Continuous Work Duration | 16 hours |
| Charging period | 2 hours to go from 20% to 100% |
| Lighting | Side LED strips and projector fixed to the monitor, operated by remote control. |
| Protection Grade | IP65, water-proof |
| Self-cooling | By 2 sprinklers from the start of watering. |





## TECHNICAL SHEET (2/2)

| REMOTE | |
|---|---|
| Dimensions and weight | L230*W140*H40mm, 1,6Kg |
| Protection Grade | IP65, water-proof |
| Power supply | Lithium ion battery. 4,2V. 500 Cycles. |
| Working period | 72 hours |
| Charging period | 2 hours |
| Control Distance | 200 m |
| **WATER CANNON （Detachable）** | |
| Material | Body: 304 stainless steel, Head: hard aluminum alloy |
| Work Pressure | 6 to 8 bars |
| Maximum Work Pressure | 10 bars |
| Spray Mode | Waterspout / Water mist (Switchable during work) |
| Rated Water Flow | 1100 L/min |
| Shoot Range | 40m (8 bars) |
| Rotation Angle | Horizontally 70°, Vertically ≥70° |
| Automatic oscillation | Remote controlled (90°) |
| Hose Connector & Size | DN65 x 1, with 1.5 inch or 2.5 inch hose |
| Solenoid valve | Remote controlled |
| **OPTIONS** | |
| Thermal and visual camera | Foam tube |
| Accessory support basket | Fan support |

## OPTIONS


The fan holder