



TOROBOT

CLEANING ROBOT

Article number TOROBOT



USER MANUAL



Scan to view the video tutorial
and all product information



IMPORTANT!! READ THIS MANUAL BEFORE START USING THE MACHINE

These instructions must always be available for anyone using the machine, make sure that anyone who uses the machine has read and understood the instructions in these pages. Compliance with the recommendations in this manual ensures a long product life and reduces the possibility of the creation give yourself to things and people

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GENERAL INFORMATIONS

MEZ-TECHNIK Torobot is an electric duct cleaning machine remote controlled by joystick

The Robot is single phase from 110/230 V. Two electronic switching convert main power in low tension 24 V, one switching is for Brush Motor that rotate left and right the cleaning brush, the other is for lifting arm (UP/DOWN) motor that support motor brush and feed the two traction motors for motor driving and control direction.

One more 12V Switching is for lights and two Video Cameras.

This machine is NOT waterproof DO NOT use TOROBOT with liquid accessories or in ducts/pipelines with water or over wet surfaces

It is not allowed to use it for purposes other than which it was designed, the manufacturer assumes no responsibility for damages to people, animals or things or subsequent consequences that may be arose becuse of different uses but duct cleaning.

This machine must be used by personnel who have received instruction for proper use and who have read this manual thoroughly. The responsibility of successful operator training is carried out in the proper way, is under responsibility of the buyer of this machine. MEZ-TECHNIK under prior Agreement with the buyer is available to give the right information about product use. User should strictly observe these instructions and evaluate the use of the machine and its accessories is suitable in the work environments.

No safety function must be removed or temporarily excluded while using the machine.

Machinery and accessories have been manufactured and assembled in accordance with European Union regimentations. It is possible that those rules and regulations suffer during the time some changes or updates, MEZ-TECHNIK will be grateful even now to those who will send any future updates that are currently not in this manual.



Important!!

Maintain over time this manual, the regulations may change over years and also the CE and the security related protocols are subjected to changes.

Keep this manual in addition to being a proof of purchase and allow us to trace back your purchased product and send you and upgrade if Standards undergo to changes that are necessary toreplace or update this document.

Congratulations on your New Robot Cleaner
TOROBOT is a Duct Cleaning robot with Electric control.
With this machine you can Fit the proper brush on the motor spindle and drive machine inside ventilation air ducts while cleaning with total control, without effort in safety and control your job thanks to a video joystick in your hands.

TECHNICAL INFORMATIONS

**WARNING:
IT IS FORBIDDEN TO MAKE ANY CHANGE TO THIS MACHINE**

Brush engine:	Electric 12 V
Motor height adjustment arm brush	Electric 24 V
Rotation speed:	Up to 530 rpm
Noise level:	50 dB (A) to ISO / CD 15 744
Robot video cameras	2 cameras colors HD controlled by Video Switch on Joystick panel 1for back view 1 for frontal view with possibility of Manual regulations for different kind
Robot driving control:	Manual joystick
Change rotating brush motor:	Electrical switch located on the joystick
Brush connection:	spindle
Height: H Width: W Length L:	230 mm with arm in lower position 280 mm 490 mm with arm in lower position
Weight Robot / suitcase with	12 kg / 20 kg
Total power supply cable lengt	20 m
Main Power Supply 220V	Fuse 8A (Before electric Transformer)
Electric motor drive circuit fuse	24 V DC (FUSE 10 A)
Circuit Electric Motor brush Arm	24 V DC (FUSE 10 A)
Cameras Robot	12 V (Switching Fuse 10 A)
Lights Robots	12 V (switching Fuse 10A)
Robot Frame:	Aluminum
Wheels traction	Traction metal chains inside robot body
Transport (2 cases)	Stackable aluminum on wheels

OPERATING INSTRUCTIONS

CE Label is marked on Robot upper plate, on electric box top part and joystick.

The information's on this manual must be considered during use, maintenance, and spare parts request.

1. Uses permitted

Torobot single phase machine is a semiautomatic robot for ventilation duct cleaning, it is manufactured to clean the inner part of ventilation ducts surfaces with a mechanical process by brushing method.
Any other use not expressly permitted in writing by manufacturer is not allowed

2. General Information's

Torobot is designed to meet cleanliness requirements inside circular, rectangular or squared ventilation ducts with size from 300 to 900 mm. The innovative principle of this Robot are the electric complete autonomy and total control of machine and work progression by a special Video joystick.

With video joystick it is possible to control Robot direction back and forth, Brush motor rotation Left and Right, lifting brush arm control Up and Down, illumination by light dimmer, video camera selection front cam or back cam and see in real time job process.

Robot main cable has two ends, one is fixed to the machine, the other must be connect by plug to electric box.

About joystick, one cable end is fix to electric box the other must be connected to joystick by its plug.

REMEMBER WHEN START TO USE TOROBOT DO NOT LEAVE THE MAIN CABLE ROLLED, PLEASE UNROLL CABLE TO AVOID ANY POSSIBLE OVER HEATING AS ELECTRIC CURRENT NORMALLY NEEDS.

DO NOT USE TOROBOT WITH ELECTRIC CABLE ROLLED IN

At same time take care of metal screw inside duct that may be damage robot cable.

SAFETY

Before to start your job session prepare all the necessary parts, brush sets, shaft holder (prevent cable damages) , brushes adapters and what else required by the specific job to do.

brushes



brush adapter



shaft holder



Prepare the access inlet for Torobot, minimum opening 400x300 mm, detach front camera support, if necessary, in order to avoid damages to camera arm, then place Torobot inside Duct.

DO NOT use stairs to lift Torobot, machine weight is 12 Kg and may be dangerous bring it on a stair, so use a safe scaffolding to transport and lift the machine

SAFE



DANGER



SAFETY

Do not use TOROBOT inside Insulated Duct, use Torobot only with the delivered brushes we have tested machine with these brushes other brushes different may cause damage to Robot or Duct Surfaces.

Do not Use Torobot without negative air machine connected to duct and turned on, Motor Brush cooling came from ventilation create from negative air machine, a session of job without negative air machine is useless and may cause motor overheating.

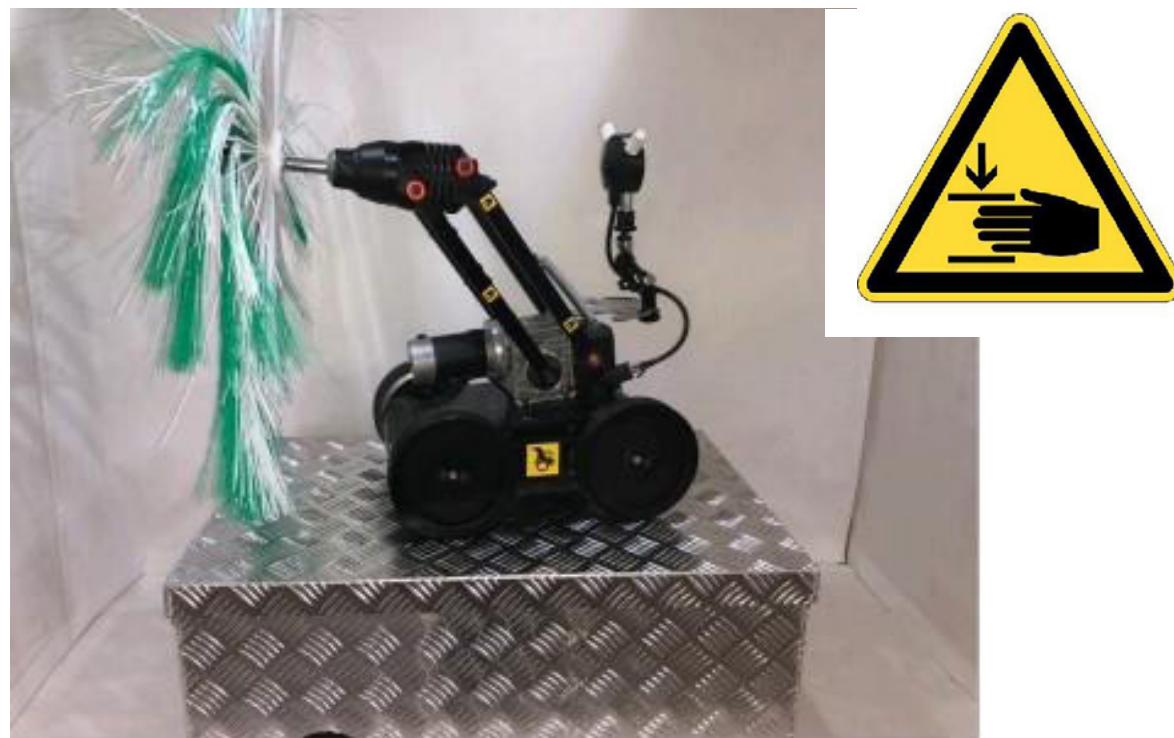
Do not use Torobt with chemical products, liquids or other wet/damp systems, Torobot is NOT WATERPROOF.

Do not Use Torobot to spray coating agents inside insulated/damaged ducts.

Minimum access both for rectangular or circular ducts is mm 400x300

Protect with gasket sharp metal edges





Pay attention both to brush lifting arm, and motor brush, remember to switch off main switch when you are close to move/lift/clean the ROBOT, motor arm is very powerful and may damage Fingers or hands, same risk may come from brush rotation if accidentally motor may be turned on when you are carrying it or lifting it by your hands, brush may damage your face/hands while rotating and as second consequence, Robot may fall down and hit feet or hands.

SAFETY

AVOID CROSS CONTAMINATIONS

The machine must be kept as clean as possible.

During duct cleaning phase, contaminants such as dust, molds and bacteria may be enter in contact with the machine, when you retrieve the robot and its power cable from the duct after or during the cleaning action, is necessary to keep clean the cable with a damp microfiber cloth and a chemical agent without rinse.

Ask to you supplier the most suitable products.

After using the robot, before transport the machine in other part of duct or local to clean, check the cleaning level of machine, wheels and cable.

Clean also robot case wheels when moving in new premises to avoid risk of cross contaminations.

PREVENTIVE SAFETY

Do not touch or approach to Robot during cleaning operation, always use Personal Protective Equipment when working in job area.

Make sure that working area illumination, supply of air are comfortable and appropriate, if during brushing, brush rubbing inside duct generate sparks due to electrostatic charges, Do Not work with Torobot close di sources of GAS or FLAMMABLE LIQUIDS or EXPLOSIVE AREAS Machine is not ATEX CERTIFIED.

CONSTRUCTIONS AND PHOTOS

Be careful not to damage electric cables, if for any reason electric cable become damaged, contact immediately your supplier and ask to replace with a new one.

Main Cable is Fix to the Robot, after use, remember to clean correctly the cable and rewind it correctly without forcing or stress it.

NOISE LEVEL

Noise Level comes from motor brush and it is less then 75dB

TRANSPORT AND MACHINE STORAGE

Torobot comes from factory with two strong cases connectable to each other in order to store and transport safely the machine.

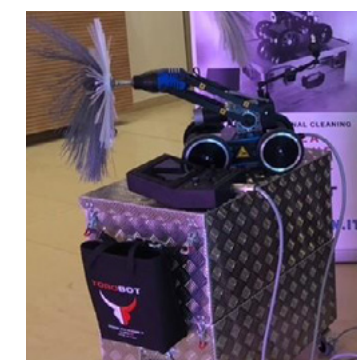
UPPER BOX aluminum case and plastic protection cover to store electric box, Joystick, camera arm (removable), brush adapters and this manual.

CONSTRUCTIONS AND PHOTOS

LOWER BOX also aluminum case with plastic cover and 4 wheels (two with brakes) to contain Torobot and its connected cable.

Included plastic pocket to store/hang joystick during work and store it after the job

In Upper case (for electric box) case there is ha hole that can may be used as exit for cable joystick and main cable for robot and to help electric box cooling fan.



Pocket (customizable) for joystick storage during work session and transport



Accessories Included

With M12 Connection it is possible to fix the adapter and achieve possibility to connect every Brush to Robot Spindle (metal screw + screwdriver)

M12 connection



Nylon center adapter



Fix them with metal screw



Do not tight!!!

screws, tension are factory pre determined, if too tight may block motor arm.



Joystick Pocket

You can store joystick inside this pocket in order to keep it safely while working, there are 2 plastic Hooks to fix it to belt operator or scaffolds



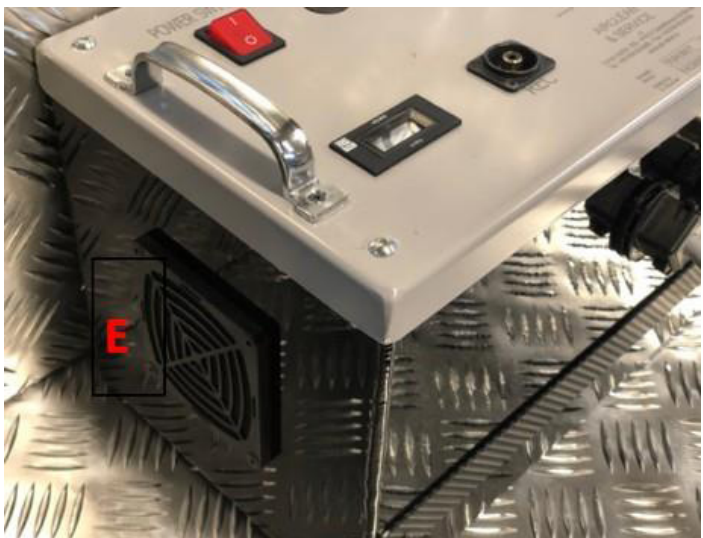
TOROBOT JOYSTICK PANEL CONTROL

- | | |
|---|---|
| 1 | lights dimmer |
| 2 | drive robot |
| 3 | lifting brush arm (Up /Down) |
| 4 | camera switch (front / back) |
| 5 | Brush motor 3 positions right stop left |
| 6 | LCD screen On Off (green light means power on) |
| 7 | Joystick Plug to electric box (connect to C Electric Box) |



ELECTRIC BOX LOWER PART

- A) Main Power Cord
- B) Cable to Joystick
- C) PLUG CONNECTION for Cable To Robot
- D) Cooling fan (12V)
- E) ventilation grid for cooling fan

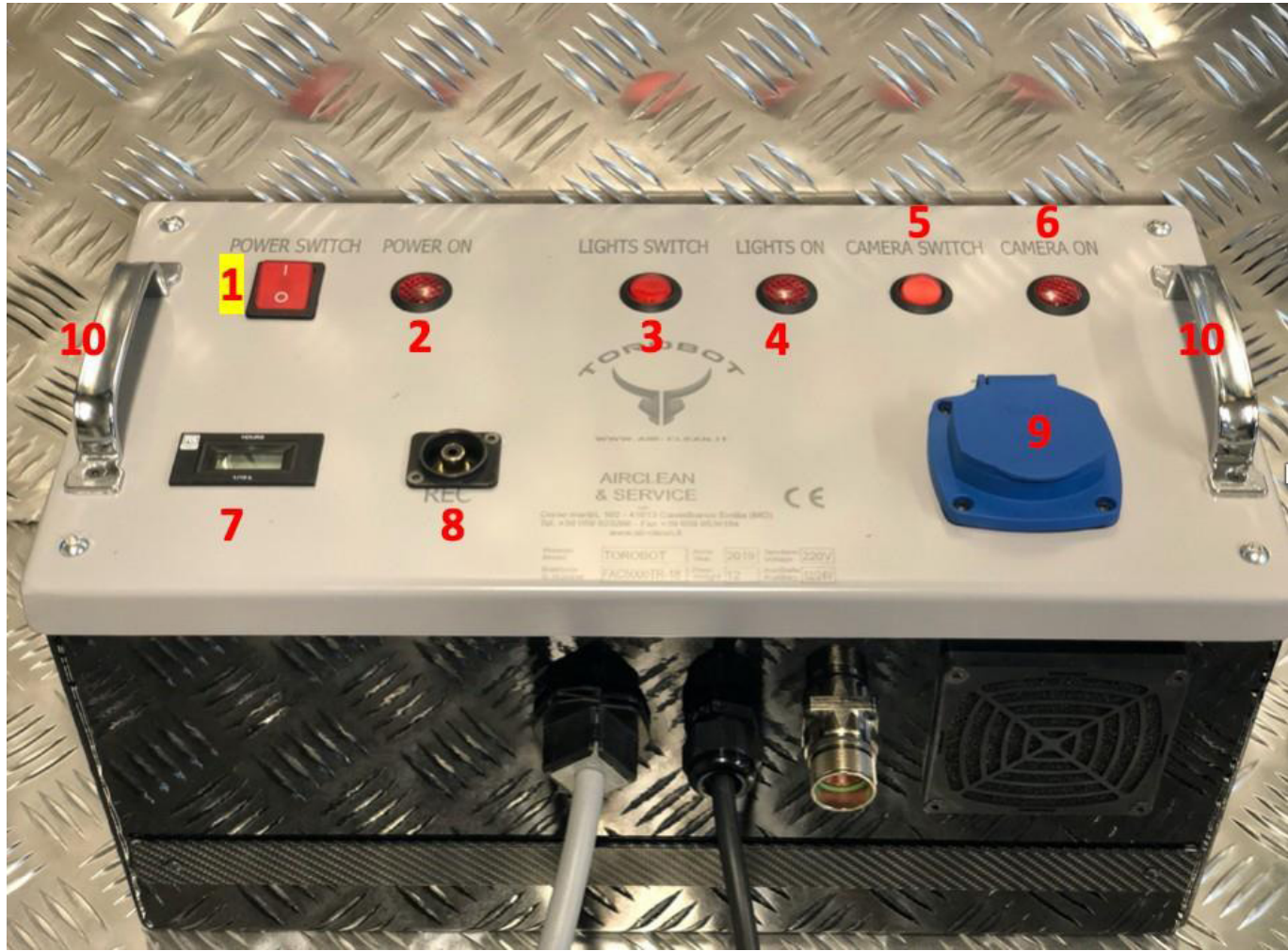


TOROBOT ELECTRIC BOX

- 1) POWER SWITCH
- 2) Power on Led (when main plug is connected red light must be on)
- 3) Lights switch (operating with Joystick)
- 4) Power on lights (robot LEDs) when light are on plug is red
- 5) Camera power on
- 6) Camera on led when camera is on red is light
- 7) Hour Counter it works only when brush motor is working (brushing time)
- 8) REC plug, any recording device may be connected to this plug
- 9) Accessory plug (220V) to connect accessory as needed (Photo camera, smartphones, or video devices)
- 10) Lifting handles

DO NOT OPEN ELECIRIC BOX UPPER PART ELECTRIC DANGER

Any kind of reparation must be carried out from Authorized operators

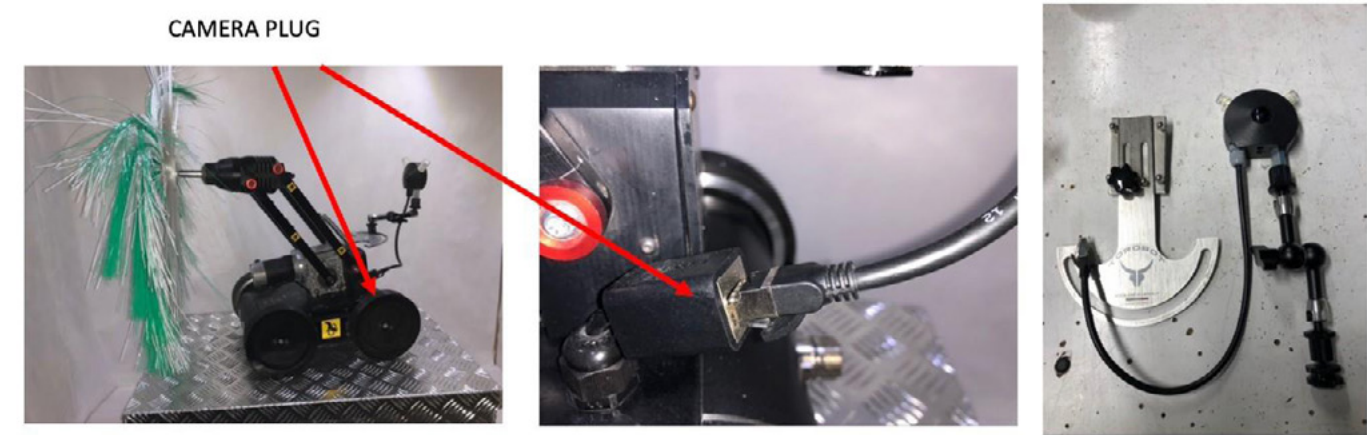


CAMERA SETTING AND RIGHT USE INFORMATIONS

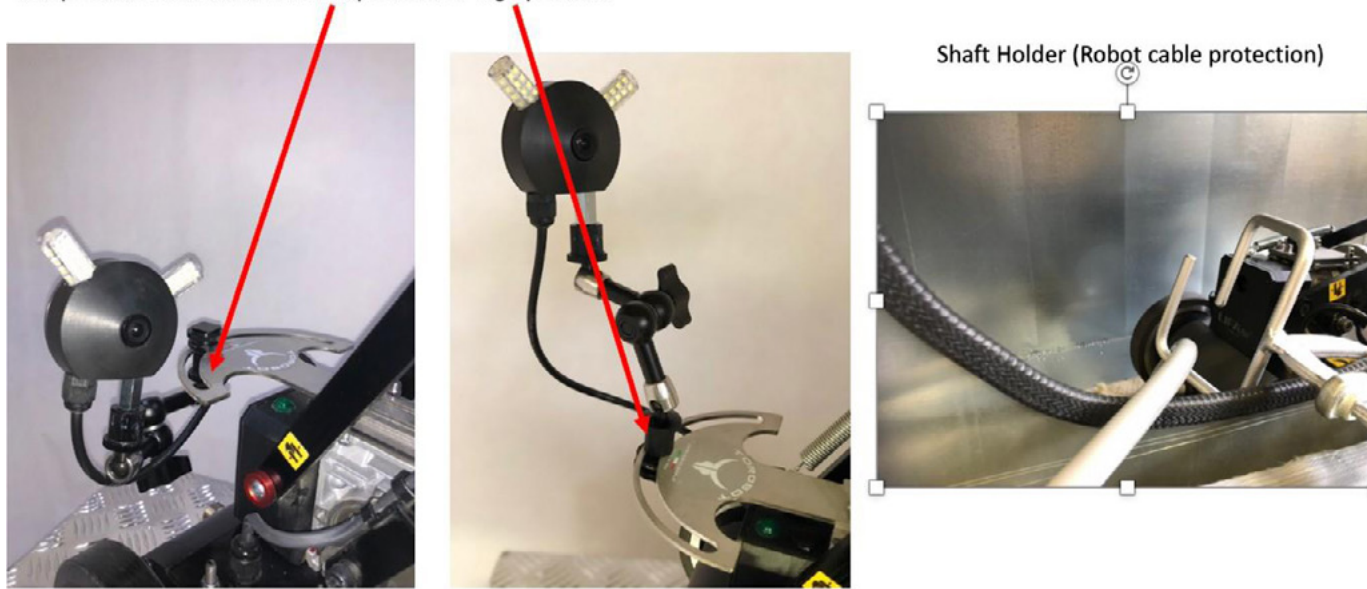
In order to ease front camera management for operator, we applied a fast connection by J45 plug, to disconnect with a “click” camera accessory.

In fact, many time it may be uncomfortable insert an heavy machine inside a ventilation duct door opening, so it is suggested to detach Camera and lights accessory, unscrewing plastic Knob and cable plug before introduce Torobot, then when machine is safely inside replace camera accessory and adjust it looking right vision with LCD on joystick panel.

CAMERA PLUG

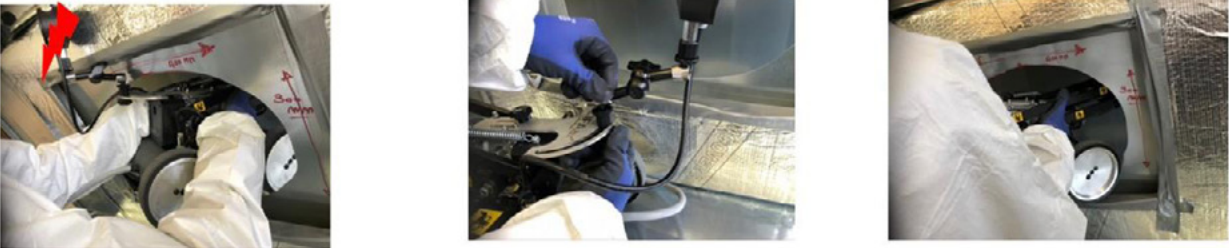


It is possible to fit camera in low position or high position



Not OK damage risk !!

Disconnect camera plug and arm. Place robot inside duct then connect it again MINIMUM OPENING mm 400x300

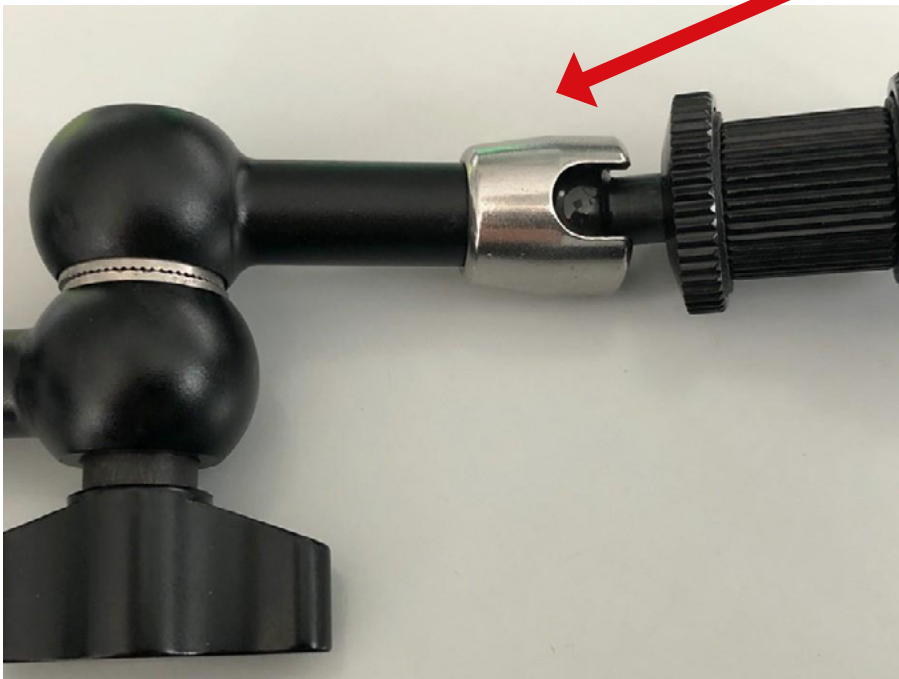


CAMERA SETTING AND RIGHT USE INFORMATIONS

Front Camera may be manually regulate depending to duct size and dimension very easily, simply unscrewing (gently) the black knob on camera arm.

Releasing it the arm will be completely loose, and it is possible to turn it and fix it in every position needed.

When position is reached, block gently the knob and all arm positions will be blocked at same time.



Take care!!!

When setting camera arm remember to find this opening before turn arm for right position, so 1) release plastic knob, when loose turn arm until this opening then find position and lock it again

OPERATING THE MACHINE

- **Operating Position:** Place Robot on a flat surface, take care when lifting it to possible excessive Physical stress, Robot weight is 12 KG use your legs when lifting do not strain your back
- **Temperature and overheating:** Always consider that motor brush Robot needs to have a continuous cooling source, during cleaning cooling air for motor comes from negative air machine, do not use machine outside duct without a cooling source. Machine operating is from -10 C° to + 40C°
- **ELECTRIC CONNECTIONS** Torobot may operate to from 100 to 230 V so it is possible to use it with UK and USA electric standard without any modifications
- **Fixing the electric cable connections (electric plugs)**

Robot Main Cable connection

This Robot has 21 meters cable length, one end has a plug must be connect to Robot electric box, the main cable in the other part is directly connected to Robot.

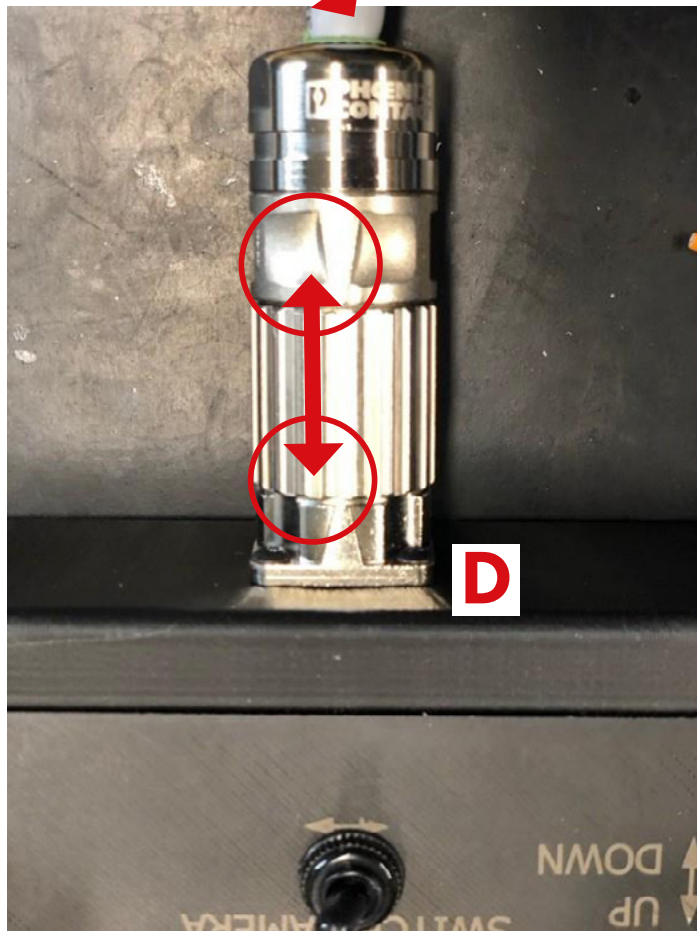
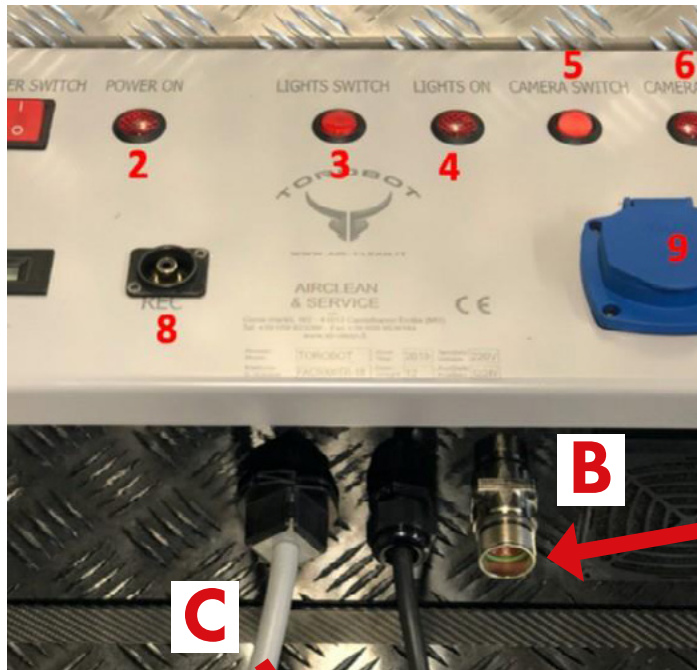


Plug (end to electric box)

How to rewind cable after job session

Direct Connection (inside Robot)

ELECTRIC CABLES CONNECTIONS



Male PLUG robot cable "A" must be connected to female plug on electric box "B"

Female Cable "C" must be connected to Joystick male plug "D"

In both cases connection must be rightly phased matching the two arrows in line on each part that needs to be aligned (careful not to damage electric pins inside both male plugs)

INSTALLATION

After connected all Robot Cables, connect main plug and switch on main plug, red light POWER ON must become RED it means that machine is under tension

At this point you can press all what you need, lights, video camera and start test Robot out from Duct testing all the operating functions, in this phase do not use machine with Brush, it may be dangerous to persons or things.

After having achieved practice handling with machine, you can introduce it inside duct with negative machine turned on, fit the right brush and start your cleaning session considering that:

Brush must not force too much inside ducts a brush too big compared to duct dimension, may cause an over stress to machine.

To work in proper way with machine brush arm should be kept in the middle of duct in height, and when necessary, increase arm pressure for necessary time to brush away dust or debris, do not use brush with size exceeding 900 mm.

Do not use Tynex Brushes or antistatic brushes or other brushes too aggressive on Reinsulated ducts (inner part is aluminum and may be damaged with a strong mechanical action)

While driving Robot toward negative air machine, be sure that main cable is completely unrolled and free to move inside duct, be careful to sharp metal edges of opening access door, use a SHAFT HOLDER to let the cable flow without any risk of cutting.

When drive back Robot, use back camera to drive it back safely, at same time pull back gently the cable and use a wet micro-fiber cloth to clean it as it comes out from duct.

Always use LCD screen to see job progression and do not enter with your head inside duct to see "how it works"

Do not use Robot if there is water or high humidity inside ventilation duct or with chemical or for grease cleaning (kitchen or other ducts with grease liquid or muddy one)

Do not Use Robot for other purposes but ducts ventilation cleaning

MAINTENANCE

We recommend machine check after 80 hours of brushing (there is a hour counter on electric box) ask to your supplier a complete check of machine in case of some bad operating capability or if you suspect that something is not operating in the right way.

Before carrying out any maintenance work disconnect the robot to main power

MACHINE CLEANING

Keep machine always clean with wet microfiber cloth, same for cameras, joystick wheels, and cables

SPARE PARTS

Any spare part request must be forwarded wit machine serial number

REPARATIONS

Any reparation must be performed from authorized persons, any kind of mechanical or electric service must be done from authorized technicians, do not modify this machine or disconnect any safety device on this machine. Any unauthorized reparation will invalidate warranty coverage.



WARRANTY

The warranty is for one year (1) from the purchase date in case there are not misused or badly mishandling of the product.

Repairs or extraordinary maintenance must be performed by the authorized dealer or MEZ-TECHNIK GmbH

MEZ-TECHNIK GmbH non liable for repairs made by unauthorized third parties in writing by MEZ-TECHNIK GmbH

The warranty does not cover misuse or use not authorized by MEZ-TECHNIK GmbH

Repairs will be carried out under warranty at no cost in the following cases:

- The problem occurs on materials or design.
- Defects due to wear are not covered by warranty.
- Repairs or extraordinary maintenance must be performed by the authorized dealer or MEZ-TECHNIK GmbH
- It must be attached to the request a written description of the problem and any photos / videos that document the problem.

Warranty repairs are totally free apart from the transport costs.

RECYCLING OF MATERIALS

In the case dismissing of Torobot it can be returned to MEZ-TECHNIK GmbH

Dispose of the parts of the machine separately, electric motor electronic devices parts must be disposed of according to regulations regarding disposal.



In the case of scrapping, or destruction of the Torobot product, it can be returned to MEZ-TECHNIK GmbH which will dispose of the product and its components in compliance with current regulations.
In case it is disposed of by the purchaser:

Dispose of parts of the machine separately, electric motors must be disposed of in accordance with disposal regulations



DECLARATION OF CONFORMITY

MEZ-TECHNIK GmbH

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72770 Reutlingen (GERMANY)
+49 (0) 7072 60098-0
info@mez-technik.de
www.mez-technik.de



Model: TOROBOT - cleaning machine ventilation ducts

MEZ-TECHNIK GmbH, declares under its responsibility that the machine fulfills the requirements of the following European Directives and their modifications:

The reference standards are:

- EMC 2014/30/EU
- EN 61000-6-2:2005 + AC:2005
- EN 61000-6-3:2007 + A1:2011 + AC:2012
Directive LVD 2014/35/EU
- EN 60335-1:2012 + AC:2014 + A11:2014
Directive ROHS 2011/65/EU
- EN 50581:2012

ADDITIONAL INFORMATION:

This product complies with the requirements for obtaining the CE mark



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