

# Owners manual for Danduct Clean<sup>®</sup> Multi Purpose Robot



## **Danduct Clean<sup>®</sup>**

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## **1.1 Introduction.**

We are pleased that you have chosen the Danduct Clean Multi Purpose Robot for your company.

We are sure that you will be satisfied with the equipment, but would however urge you to read this manual for obtaining a good and trouble free operation of the robot.

## **1.2 Guarantee**

The equipment is covered by a 12 months guarantee from the date of delivery to the customer. *The guarantee period comes into force after Danduct Clean have received the signed delivery report.*

The guarantee covers parts and replacement in our factory, or by our distributor. It is however a condition of the guarantee, that the instructions in this Owners manual has been followed, and that the equipment has been proper maintained.

Our guaranty however is depending on the filled out return of delivery report to our dealer, and the observance of this Owners manual. Equipment which has been repaired locally without our written consent, is not covered by this guarantee.

Claims to the guarantee from third party is not covered by this guarantee.

## **2.0 The equipment consist of:**

- Truck platform with 4 engines
- Two-way camera (colour front & black/white rear)
- Automatic liftarm
- Engine for round brushes
- Engine for square brushes
- Platform for camera (low ducts)
- Platform for engine (low ducts)
- Colour monitor with build-in video recorder
- 30 meter cable
- Transport box for robot
- 1 set brushes for square ducts (220 mm)
- 1 set brushes for square ducts (320 mm)
- 1 set brushes for square ducts (420 mm)
- 1 set brushes for round ducts (300-500 mm)
- 1 set brushes for round ducts (500-750 mm)
- 1 set brushes for round ducts (750-1000 mm)

**2**

On the following pages you will see how to assemble the Multipurpose robot for various purposes, such as inspection and cleaning in low or high ducts.

Please make sure to follow the instructions, then you ensure a long and trouble free performance.

## 2.2 Assembling of the Multi Purpose Robot (controlbox)



**1. Control box**



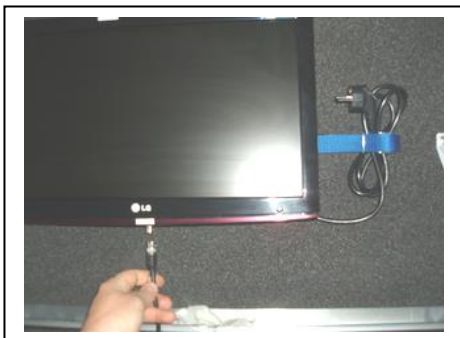
**2. Connect the power supply**



**3. Connect the robot cable**



**4. Connect the video cable**



**5. Connect the video cable to the TV**

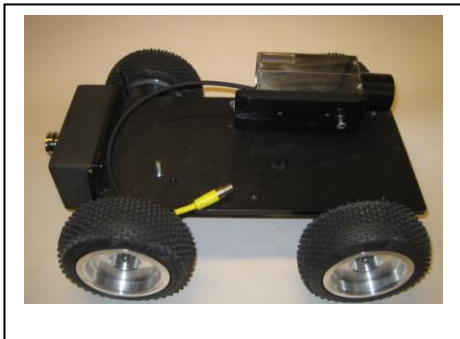
### 2.3 Assembling of the Multi Purpose Robot (Inspection)



**1. Rear of robot**



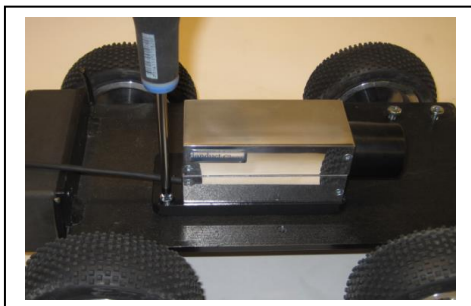
**2. Connect the robot cable**



**3. Mount camera**



**4. Fasten camera**



**5. Fasten camera with screw robot**



**6. Connect Camera plug to**

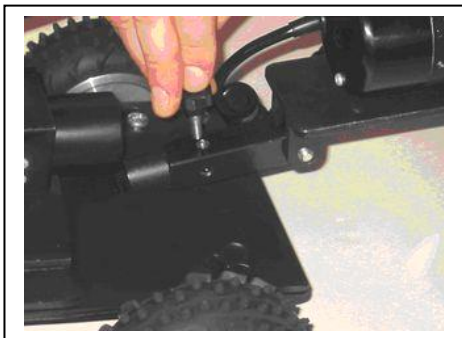
## 2.4 Assembling of the Multi Purpose Robot (Low ducts)



**1. You need these two parts**



**2. Mount the brush plate**



**3. Mount the brush engine**



**4. Mount brushes**



**6. Connect motor plug to robot**



**5. Fasten hexagon screw**

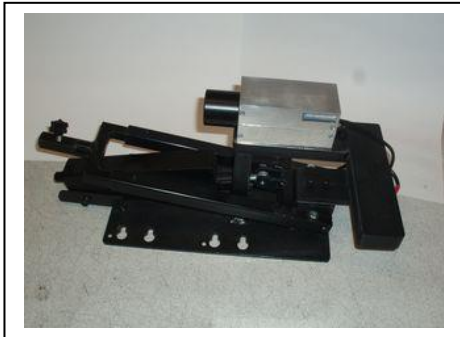


**7. Place cables in holder**



**8. Adjust motor angle by hand**

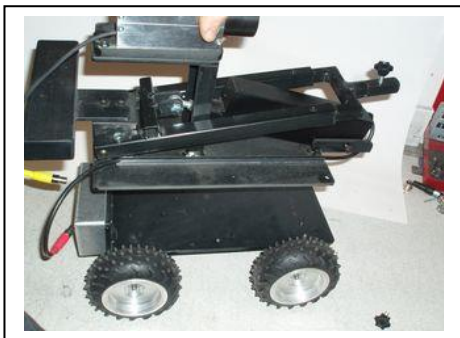
### 2.5 Assembling of the Multi Purpose Robot (Lift arm + square ducts)



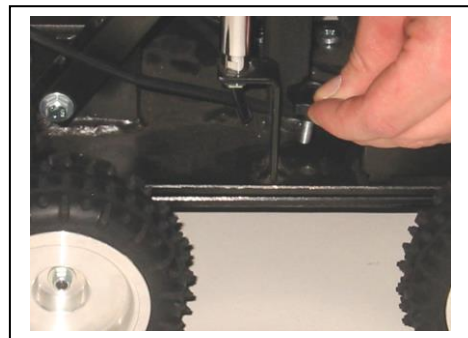
**2. You can extent the arm**



**1. You need this part**



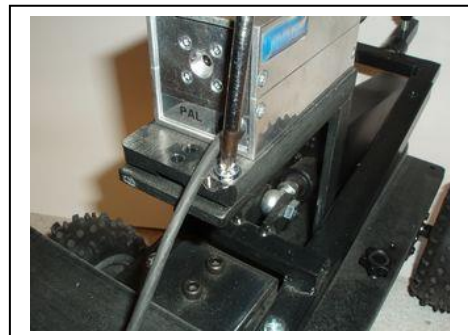
**4. Fasten with finger screw**



**3. Mount lift arm on chassis**



**5. Connect plug on the rear**



**6. Fasten camera on plate**





**7. Connect camera plug**



**8. Mount motor and fasten screw**



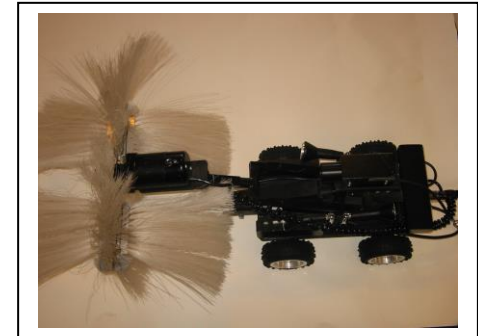
**9. Connect motor plug**



**10. Mount brushes**



**11. Fasten brushes**

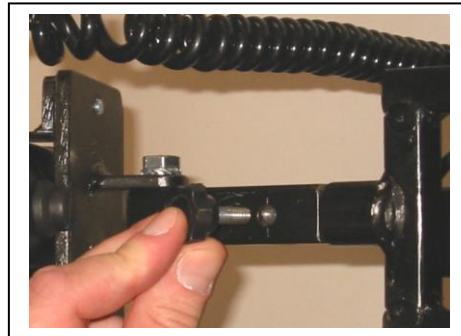


**12. ROBOT READY**

## 2.6 Assembling of the Multi Purpose Robot (Round ducts)



**1. Engine for round ducts**



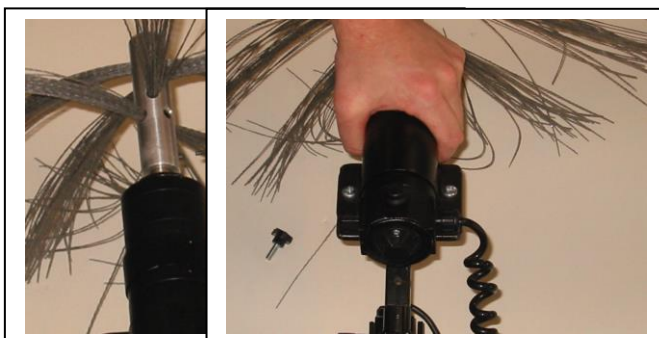
**2. Fasten the screw**



**3. Fasten the motor plug**



**4. Mount the brush**



**5. Fasten the hexagon screw**  
**6. Adjust the motor angle by hand**

### **3.0 Operating the equipment.**

The vehicle is inserted into the duct and controlled from the monitor.

The intensity of the light can be controlled by means of the potentiometer on the control box.

The vehicle is maneuvered by means of the joystick on the control box. The vehicle is designed to pull the total length of the cable and 30 meters of compressed air hose, but it is however recommended to feed the cable into the duct. Pulling the cable from the ground up to the duct, might make the operation difficult.

Focusing the camera can only be done turning the inner ring on the camera lens. The other ring is for adjusting the light intensity.

The lift arm can be moved up and down from the control box according to the size of the duct.

When the size of the duct is so big that you have to drive multiple times in and out, you can brush both ways, just remember always to start from the top.

The directions and speed of the brushes can be changed on the control box. The direction of the brushes is always so that the brushes is sweeping away from the robot. When cleaning the floor in the duct - use backward – the top of the duct use forward.

### **3.1 Disinfecting/coating.**

EXTRA! Option for disinfecting and coating available. Equipment includes changes to the control box, hose for airless sprayer, Magnetic valve and nozzle. The aimozzle is spraying 360 degrees round and in a forward angel of 120 degrees. The nozzle has an opening of 0,2 mm. Pressure up to 150 bar. 24 V ball valve is activated from the on/off at the control box. 30 meter high pressure 1/4" hose with 1/4" connectors in each end.

Even very effective cleaning cannot eliminate harmful bacteria.

Disinfection or coating of horizontal ductwork can be done easily by mounting a nozzle on the robot. The vehicle is driven to the end of the duct and the duct is sprayed while the robot is reversing out. The work should be carried out while the ventilator/fan is working, in order to prevent the vehicle to become wet.

The equipment for coating can be directly mounted onto the vehicle.

NB! - If any additional equipment is build on the vehicle without the written consent of Danduct Clean, the guarantees will not be in force.

#### **4.0 Operating environments.**

The robot is designed to be used in dry ventilation ducts. The robot is classified as IP 54 (dust-proof).

The Robot is not designed to be waterproof. The use of the equipment in wet, greasy, explosive, or any other environment which is not dry, may cause damage to the equipment.

The equipment should not be used in temperatures under +0° C and above +60° C.

Humidity max. 80 %.

#### **5.0 Maintenance**

The equipment requires a minimum of maintenance. The following should however be carried out in order to let your equipment work for a long and trouble free period.

##### **5.1 Cleaning the equipment**

Having operated the equipment for one day, it might have become very dirty. A daily cleaning with compressed air is recommended. If the equipment has become greasy, the grease should be removed by means of a piece of clothes moisturised with a cleaning detergent (degreaser). Do not use any solvent.

##### **5.2 Tightening of the wheels**

After 40-50 operations the wheels should be checked for tightness to the drive shafts.

The drive shafts are tightened by means of the hexagon screw between the wheel and the gearbox.

##### **5.3 Storage**

The equipment can be stored in temperatures of –5 to 40° C. Please note, that temperature changes over night of 20° C might cause dew inside the electronics, which can cause damage to the equipment.

## 6.0 Trouble shooting

The robot will work satisfactorily for many years under the circumstance that it had been well maintained and operated under the guidelines mentioned in this manual.

However, if a breakdown should occur, the following scheme can be used for troubleshooting.

Problem	Possible cause	Solution
Vehicle does not drive	Burned fuse	Change fuse
One direction does not work		Check if all engines are driving, if not replace the defect engine.
No picture on screen	No connection to the monitor	Plug in antenna cable
	No power to the monitor	Connect power supply
	Wrong channel	Press "AV" button
Halogen light not working	Bulb burned	Change bulb
No light at all	Burned fuse	Change fuse

In all other situations we kindly ask you to contact your dealer for further instructions. For possible problems with the monitor please refer to the enclosed "owners manual" for the monitor.

## 7.0 Technical data

Voltage:	240 V AC	110 V
Frequency:	50 Hz / 60 Hz	50 Hz / 60 Hz
Current:	0,8 amp	1,6 amp
Power:	130 W	130 W
Weight of robot, complete	21,0 kg	
Weight of vehicle with camera	10,0 kg	
Weight 30 meter cable	4,5 kg	
Weight of monitor	7 kg	
Weight of aluminum case	5 kg	
Weight of control box	4,0 kg	
Height	272 mm	10,9 "
Lenght	760 mm	30,4 "
Width	300 mm	12,0 "

## 8.0 EU Agreement statement

Supplier:

Company Name: Støvsugerspecialisterne Danmark A/S (Danduct Clean®)  
Address: Teglvaenget 63  
7400 Herning, Denmark  
Phone: +45 97 12 30 30 Fax: +45 97 22 54 44

hereby declare that

Machine:	Name:	Multi Purpose Robot
	Type:	CEM
	Serial no.:	50510081 /
	Year:	

is in conformity with:

the COUNCIL DIRECTIVE of 14 June 1989 on mutual approximation of the laws of the Member States on the safety of machines (89/392/EEC as amended by directives 91/368/EEC, 93/44/EEC and 93/68/EEC) with special reference to Annex 1 of the Directive on essential safety and health requirements in relation to the construction and manufacture of machines.

- COUNCIL DIRECTIVE of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (89/336/EEC)

- COUNCIL DIRECTIVE of 19 February 1973 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (73/23/EEC)

was manufactured in conformity with the following national standards that implements a harmonised standard:

EN 292-1 Safety of machinery-Basic terminology, methodology  
EN 292-2 Safety of machinery-Tech. principles+specification  
EN 60204-1 Safety -Electrical equipment of machines  
EN 50081-1 Electromagnetic compatibility, Light industry  
EN 50082-2 EMC: Immunity - Industrial environment

Position: Managing Director  
Name: Tim Larsen  
Company: Danduct Clean

Date

Signature

## 9.0 Sparepartlist for Multi Purpose robot

Prod. no.	Product	Pcs.	Pos.
59600001	MPR – Chassis	1	1
59600002	MPR - El-box complete with plugs	1	2
59600003	MPR – Engines	4	3
59600004	MPR – Hub	4	4
59600005	MPR - Nut with nut washer	4	5
59600006	MPR - Alu-felloe	4	6
59600007	MPR - Tyre with foam	4	7
59550714	MPR/IN – Camera 2-ways PAL/NTSC	1	11
59550715	MPR/IN – Colour camera lens only	1	15
59550716	MPR/IN – B/W camera PAL/NTSC	1	16
59550717	MPR/IN – Colour camera	1	17
59600020	MPR – Liftchassis	1	20
59600021	MPR - Liftengine	1	21
59600022	MPR – Liffork, outer	1	22
59600023	MPR – Liffork, inner	1	23
59600024	MPR - Spot complete	1	24
59600027	MPR - Halogen bulb	1	27
59600031	MPR - Counter weight	1	31
59600040	MPR – Plug for round brush engine	1	40
59600041	MPR – Plug for camera	1	41
59600042	MPR – Plug for liftengine	1	42
59600043	MPR - Plug for square brush engine	1	43
59600044	MPR – Plug for low ducts plate	1	44
59600045	MPR – Plug for spot, 3 pin	1	45
59600046	MPR – Plug for camera, 7 pin	1	46
59600047	MPR – Plug for robot cable, 17 pin	1	47
59600048	MPR – Plug for brushengine, 4 pin	1	48
59600049	MPR – Plug for lift, 2 pin	1	49
59600051	MPR - Screws M 6 X 10	2	51
59600052	MPR - Bolt with nut washer	2	52
59600053	MPR - Screws m 6 X 16 with nuts	2	53
59600061	MPR - Plate for camera	1	61
59600070	MPR – Plate for brush engines (square)	1	70
59600071	MPR – Brushengine (square) with plug	1	71
59600080	MPR – Plate for brushengine (round)	1	80
59600082	MPR - Brushengine for round ducts	1	82
59600090	MPR - Plate for camera	1	90
59600091	MPR - Plate for brushengine (low ducts)	1	91
59601000	MPR - Transport boks for MPR	1	
59600110	MPR -Cable 30 m complete	1	110

## 9.1 Sparepartlist for control box (Multi Purpose robot)

Prod. no.	Product	Pcs.	Pos.
59510185	MPRB - Contol box complete	1	1
59550605	MPR/INB - Fuse 3,15 A	1	2
59550608	MPR/INB - Joy stick type: E	1	6
59550640	MPR/INB - Cable 220/110V	1	
59550660	MPR/INB - Videocable with BNC plug	1	
59550670	MPR/INB – Driver print card for steering box (big)	1	4
59550673	MPRB – Panel print card for steering box (small)	1	5
59550672	MPRB - Transformer 230/110V	1	3

