

# *TECHNICAL MANUAL*

## **Industrial Motor**





- Type: professional central vacuum unit
- Model: Industrial motor
- Revision 2.0.0

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Line

# Industrial Motor

## INSTRUCTIONS MANUAL

- Type: professional central vacuum unit
- Model: Industrial motor
- Revision 2.0.0

### INTRODUCTION

Dear Customer,

TECNOPLUS S.r.l., owner of the SISTEM AIR Trademark would first of all like to thank you for having chosen to buy our new “Industrial Motor” blowers. We are sure that the characteristics described in this manual will satisfy your needs.

Our new “Industrial Motor” blowers have been designed and produced in strict compliance with the Machinery Directive 2006/42/CE (transposed into Italian Legislation by Decree Law 17/10), Low Tension Directive 2006/95/ CE, and Electromagnetic Compatibility Directive 2004/108/CE. The system has been manufactured with top quality materials and with particular care paid to reducing as much as possible the risk of injury.

We have therefore written this manual in order to provide adequate instructions for the correct use and maintenance of the system which are crucial to ensure the user’s safety, the correct functioning and the long working life of the vacuum cleaning unit.

**Read the entire manual carefully, follow the instructions precisely, and above all, for safety reasons, do not intervene in any way if not specifically indicated.**

For the best results, we suggest to use SISTEM AIR original accessories and materials. The SISTEM AIR Trademark is a registered trademark and is property of TECNOPLUS S.r.l.

## GENERAL INFORMATION

### 1. HOW TO USE THE MANUAL

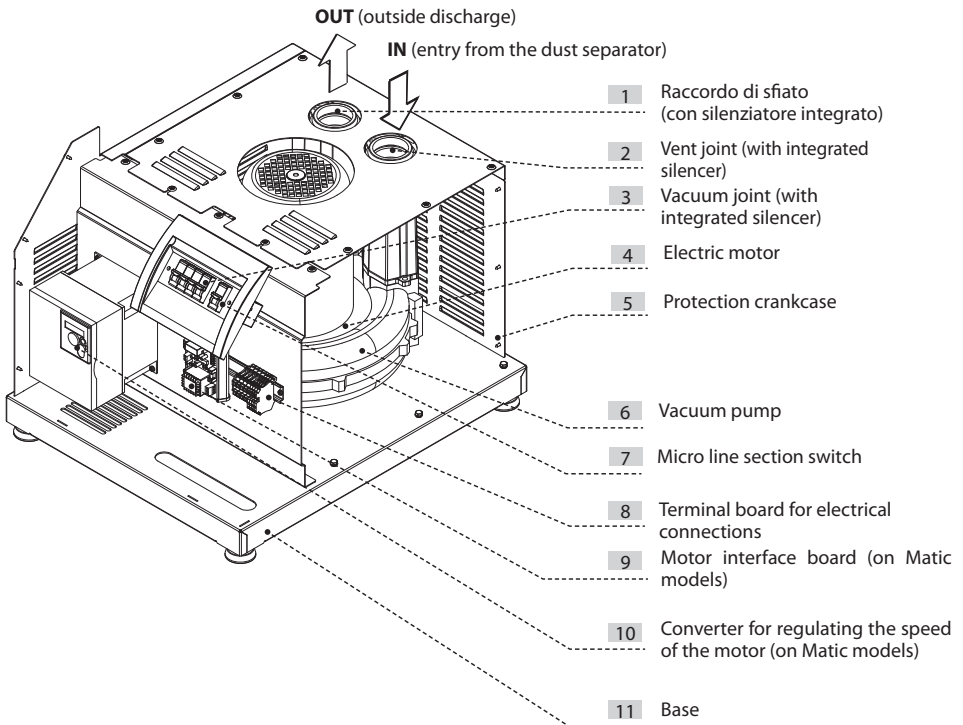
The instruction manual has been written by the manufacturer and is an integral part of the vacuum cleaner. If the system is resold, given or hired out to others, the manual must be handed over to the new user or owner.

We recommend using and storing it carefully for the entire working life of the vacuum cleaner.

This manual explains how to use the equipment correctly in order to obtain the best performance while maintaining optimal working and safety conditions.

It is strictly forbidden to reproduce, copy or disclose any part of this document by any means without prior written consent of TECNOPLUS s.r.l. which is the owner of the SISTEM AIR Trademark. TECNOPLUS s.r.l. reserves the right to upgrade or modify this manual or the vacuum cleaner itself anytime without giving any prior notice to third parties.

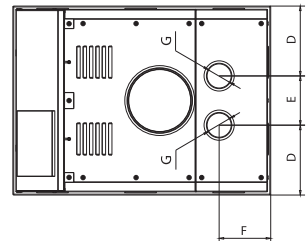
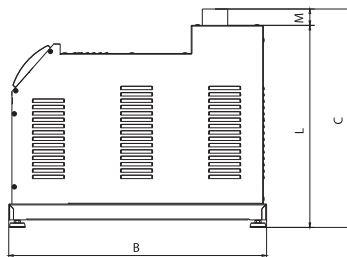
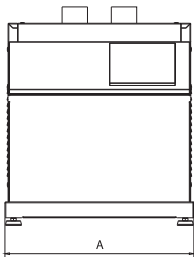
### 2. TECHNICAL FEATURES



Industrial Motor line									
Model Article		U1	U1 Matic	U2	U2 Matic	U3	U3 Matic	U4 Matic	
		3500.1M	3503.2M	3500.3M	3503.4M	3500.5M	3503.6M	3503.7M	
Electrical converter of speed		NO	YES	NO	YES	NO	YES	YES	
Protection degree	IP	20	20	20	20	20	20	20	
Supply	Fasi / V ac	3/400	3+N/400	3/400	3+N/400	3/400	3+N/400	3+N/400	
Frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60	
Motor power	kW	2,2*	2,2*	4*	4*	5,5*	5,5*	7,5*	
Absorption	A	4,6*	4,6*	8,1*	8,1*	11,1*	11,1*	15,7*	
Vacuum inlets supply	V dc	12	12	12	12	12	12	12	
Maximum air flow	m <sup>3</sup> /h	304*	366	304*	414*	536*	740	914	
Air vent		YES	YES	YES	YES	YES	YES	YES	
Weight kg		58	68	79	89	110	120	125	
Measurement A	mm	540	540	540	540	595	595	595	
Measurement B	mm	660	660	660	660	812	812	812	
Measurement C	mm	513	513	513	513	688	688	767	
Measurement D	mm	207,5	207,5	207,5	207,5	220	220	206,5	
Measurement E	mm	125	125	125	125	155	155	182	
Measurement F	mm	108	108	108	108	162,5	162,5	130	
Measurement G (air entrance)	mm	60	60	80	60	80	80	101,6	
Measurement L	mm	507	507	507	507	636	636	715	
Measurement M	mm	50	50	50	50	52	52	52	
Noise level lower than	dB(A)							60 - 80	

(\*) Frequency 50 Hz

**N.B.:** levels of nominal noise. Levels can vary according to the environment where the unit is installed and the type of installation. Matic Industrial Motor line, with the same level maximum air flow level, generates higher levels of depression.



### **3. CONSTRUCTION FEATURES**

The industrial suction units are divided into two main categories:

- Those without electronic management for controlling the suction power (direct starting):
- Those with electronic management for controlling the suction power (Matic models).

These two lines of products have the same construction technology and differ in motor power and presence or not of the electronic system for managing the performances.

The blowers shall be chosen according to the number of users simultaneously and to the specific requirements of the installation.

Recommended number of users	MODEL	ARTICLE
1	Industrial Motor U1	<b>3500.1M</b>
	Industrial Motor U1 Matic	<b>3503.2M</b>
2	Industrial Motor U2	<b>3500.3M</b>
	Industrial Motor U2 Matic	<b>3503.4M</b>
3	Industrial Motor U3	<b>3500.5M</b>
	Industrial Motor U3 Matic	<b>3503.6M</b>
4	Industrial Motor U4 Matic	<b>3503.7M</b>

The side channel blower compresses the air, according to a dynamic principle and works by a wheel without contact, therefore it doesn't need any maintenance. It is equipped with an integrated electric motor and, on its extremity, an impeller with two parallel flows is fixed; proportionally to its measurements, the motor fan ventilates both the blower and the motor.

The control board is equipped with an electronic device for controlling the speed of the blower and the optimization of the performances required on the frequency converter cooling system (on the compatible models). All the models are equipped with a general switch and thermal-magnetic protection, connection terminal board and all the accessories for the connection to pipe network.

**The main technical features can be listed as follows:**

- Load-bearing metallic base painted with epoxide paint
- Professional motor pump group in compliance with CE regulations, class IP 55, insulation class F, yield class IE2 (high yield). The powers varies according to the model.
- The suction and discharge channels with integrated silencers.
- Side channel vacuum pump with light alloy cover, which guarantees high performances and doesn't need any maintenance intervention. Performances vary according to the model.
- Speed electronic converter (inverter) with auto ventilation and safety system for protecting the vacuum unit (only for Matic models), for regulating automatically the vacuum power and the electricity.
- General supply 400V ac + N, 50/60 Hz.
- Thermal-magnetic protection switch with control board.
- Multiple possibilities of installation with different motors connected to each other.
- Connection CAN-BUS with Industrial Clean separator and motor (only Matic model).
- Reduction of the sound impact in comparison with the previous models.
- Installing the system is easier than before.



#### **4. SAFETY FEATURES**

**It is recommended to read carefully all the installation, use and maintenance instructions detailed in this manual.**

Furthermore, the following WARNINGS should always be observed:

- Never use the machine for unauthorized purposes.
- Keep children away from the vacuum cleaner whilst in function. Children should not play with the machine nor with the suction sockets.
- This equipment should not be used by persons (including children) with reduced psychic, sensory or mental capacities or by persons with no experience nor knowledge of the system, unless they are under the guidance or instructed to use the machine by persons responsible for their safety.
- Children must always be supervised to ensure they do not play with the machine.
- Switch off the power supply immediately if:
  - the electric cable is damaged or worn
  - The vacuum cleaner has been exposed to rain or excessive humidity
  - The vacuum cleaner has been knocked or the outer cover has been damaged in any way
  - You think the system requires maintenance or repair.
- Wear protective gloves and mask to carry out maintenance, to empty the dust bin or replace and clean the filter.
- Only use original spare parts and accessories.
- Do not vacuum clean fabrics, heavy materials, ashes or hot embers.
- Never vacuum clean liquids.
- Do not use the system without a filter cartridge.
- Do not block the exhaust air pipes or the motor cooling intakes.
- No part of the body should come into contact with the suction accessories.
- Do not leave the system switched on when not using it and disconnect it from power supply when the system is not to be used for a long period of time.
- Do not vacuum powder such as concrete, lime wastes, plaster dust, etc. This will quickly clog the filter cartridge and the system too.
- **Do not vacuum any material which may cause electrostatic charges in the piping system, if not previously communicated to the constructor.**

Finally, remind that pictograms or danger and warning signals can be found on those parts of the equipment where, if not strictly followed, potential risky situations may occur.

**WARNING:** TECNOPLUS S.R.L. declines any form of responsibility or guarantee if the purchaser, or anyone in his stead, makes even the slightest modification or adjustment to the purchased product.

The unit has been designed to satisfy at best the present needs of the domestic central vacuum cleaners

market, both in terms of quality and operating capacity.

All materials and components used to manufacture this product comply with CE safety regulations. All relevant certifications are held at TECNOPLUS S.R.L. headquarters.

#### 4.1 IP protection degree

IP 20: The appliance features a protection against solid objects having a size exceeding 12 mm. The appliance is not protected against water penetration.



#### 4.2 Electric insulation degree

CLASS I: the appliance features basic electrical insulation.

It must be connected to the grounding circuit through the main electric wiring.



#### 4.3 Declaration of absence of dangerous substances

TECNOPLUS S.r.l. declares that its products and appliances have been manufactured with materials which comply with the restrictions established by the health and environment protection regulations in force and do not contain SVHC-classified substances (Substance of Very High Concern) in compliance with CE regulation 1907/2006 (REACH: i.e. Registration, Evaluation, Authorization and Restriction of Chemical Substances). Although these substances have not been used during the processing cycles of raw materials and during the manufacturing cycles of our products, their presence in p.p.m. (parts per million) cannot be completely excluded due to micro-pollution of raw materials.

#### 4.4 Fixed closure guards safety

The access to the electric parts is protected by a cover which can only be removed by unscrewing the Torsen screws used to fix the soundproofing dome of the housing where the suction motors are assembled.

Every intervention on the control board and on the motors must be carried out by qualified personnel only after disconnecting the electrical power supply and by removing the electric plug from the electric socket.

#### 4.5 Movable closure guards safety

There are no movable closure guards assembled on the appliance. Every guard assembled is considered

a fixed guard and is fastened with special screws.

TECNOPLUS s.r.l. will immediately suspend the product guarantee in case of machine tampering carried out by the Customer.

### **5. CORRECT USE OF THE VACUUM CLEANER**

The “Industrial Motor” vacuum unit has been designed exclusively to vacuum clean dust, very small-size solids and dry materials.

The use of the central vacuum cleaner is authorized for household and civil uses, and connected to a wall traced pipe network and to a standard home electrical wiring.

**The “Industrial Motor” vacuum unit must be used together with Industrial Clean Small and big Industrial dust separators with installation designed for air flows up to 700 m<sup>3</sup>/h for the Small model and up to 1200 m<sup>3</sup>/h for the Big model.**

## 6. INCORRECT USE OF THE VACUUM CLEANER

It is extremely important **NOT** to use the system in the following circumstances which are considered to be inappropriate and dangerous:

- The system must not be used to vacuum clean fabrics, heavy or hot/burning materials.
- The system must not be used to vacuum clean liquids.

Furthermore the system has not been designed for use in environments with risk of explosion, and therefore:

- it is forbidden to suction clean materials with high explosion risk (gunpowder) or materials which are individually inert but that, once collected and mixed in the dust bin, could provoke dangerous chemical reactions.
- It is absolutely forbidden to use the vacuum cleaner in explosive atmosphere or outside the standard temperature, pressure and humidity levels.
- **Do not vacuum any material which may cause electrostatic charges in the piping system, if not previously communicated to the constructor.**

Any use of the appliance other than those specified above is forbidden.

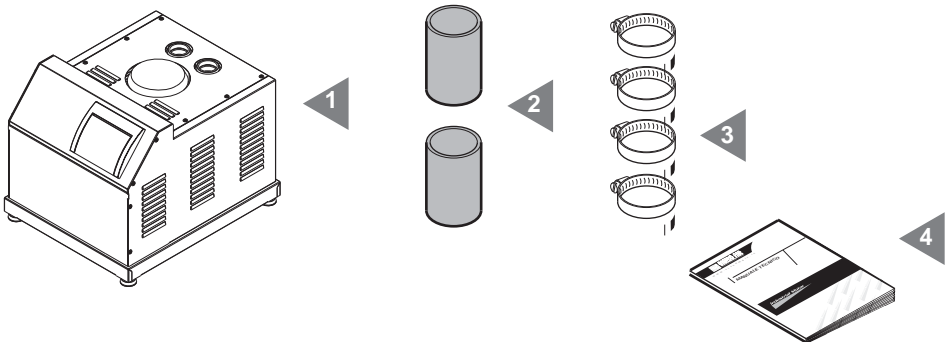
Any change or modification made to the system in order to suction clean a particular type of material must obtain the prior written approval of the manufacturer.

The use of the system for purposes other than those for which it was manufactured, represents an irregular condition which can cause damage to the product and seriously compromise the operator's safety.

## 7. EQUIPMENT AND ACCESSORIES

The packaging of the vacuum cleaner also includes a series of accessories as detailed below:

- 1) N°1 "Industrial Motor" suction unit
- 2) N°2 rubber sleeves for the connection to the suction pipe network
- 3) N°4 hose clamps to fix the sleeves
- 4) N°1 technical manual



Check that the system, the accessories and the kit correspond to the products ordered and that they have not been evidently damaged during transport.

In case of problems contact your Retailer immediately.

## 8. INSTALLATION



**- CAUTION -  
THESE PROCEDURES MUST BE CARRIED OUT  
ONLY BY QUALIFIED PERSONNEL!**

### 8.1 Recommended installation

The suction Industrial Motor module in combination with the dust separator is equipped with connection to the air vent line, a necessary condition to be able to expel the micro dust that the filter box can not contain. It must be installed in technical rooms or service spaces (such as boxes, basements or other), protected from weather, humidity and excessive temperature changes. **(Ambient temperature Work “-5 to 45 ° C”, relative humidity 20 to 85% without condensation or freezing).** You must choose to install places away from heat sources, such as heaters or central heating (N.B: degree of protection IP 20).

It is recommended, at the design stage, to perform more of the surveys in order to predict the ideal positioning of the centrals compared to the installation, considering a reasonable space for the installation, operation, maintenance, and proper air circulation around the central. The special design features also allow you to connect the central plant with piping coming from both the right and left. In the event of a system on several floors, it is recommended the installation always at the lowest level. In caso di dubbi chiedere consiglio al Servizio Assistenza del Costruttore.

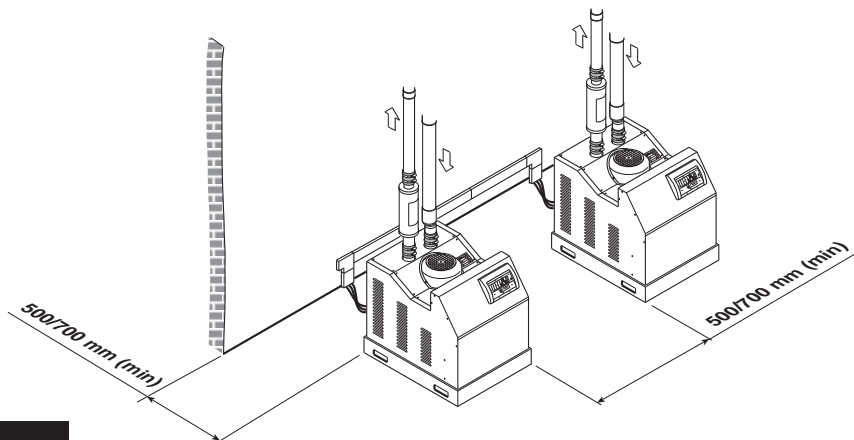
### 8.2 Installation spaces

Provide clearance (about 700 mm) and good lighting around the unit, in order to allow maintenance, repair and, at the same time, favoring adequate recirculation of air for cooling the motor.

If you have any questions, please contact the Manufacturer's Support Service for assistance.

To guarantee the handling of the apparatus, ensure the right positioning as stated below, in order to simplify the electric connection and the opening outward.

Ensure that cooling is not obstructed, keep grid and venting openings open.



### 8.3 Types of installation

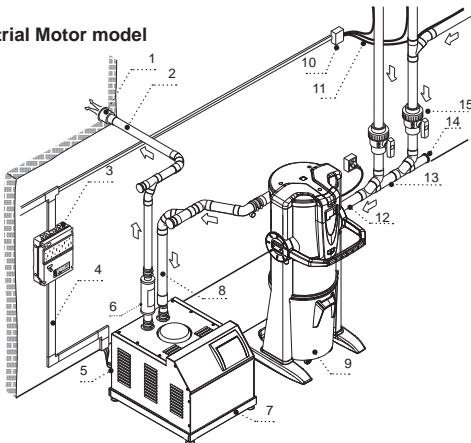
There are various types of installation, according to the sizes, number of operators and the type of building where it has to be installed. The basic condition is the existence of a suction unit and a separator, connected to a suction and discharge pipe network and an alimentation electrical wiring.

The suction motor must be collocated on a support surface which must have the following features:

- It must be solid and uniform
- It must be perfectly horizontal
- It must not be subjected to vibrations
- It must not present disconnections that can make the suction motor unstable

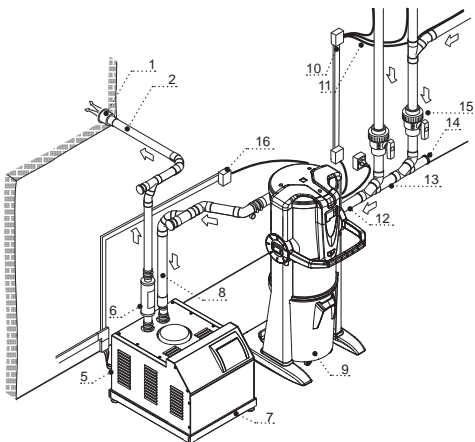
Example of basic installation

**Industrial Motor model**



- 1 - Venting grid
- 2 - External discharge pipe
- 3 - Switchboard
- 4 - Duct for cables
- 5 - Electrical connection
- 6 - Silencer
- 7 - Suction unit
- 8 - Motor air suction
- 9 - Dust separator
- 10 - Derivation box
- 11 - Micro line
- 12 - Dust inlet
- 13 - Collector
- 14 - Inspection cap
- 15 - Ball valve for manual division
- 16 - Can Bus connection patch cable (only for Matic motors)

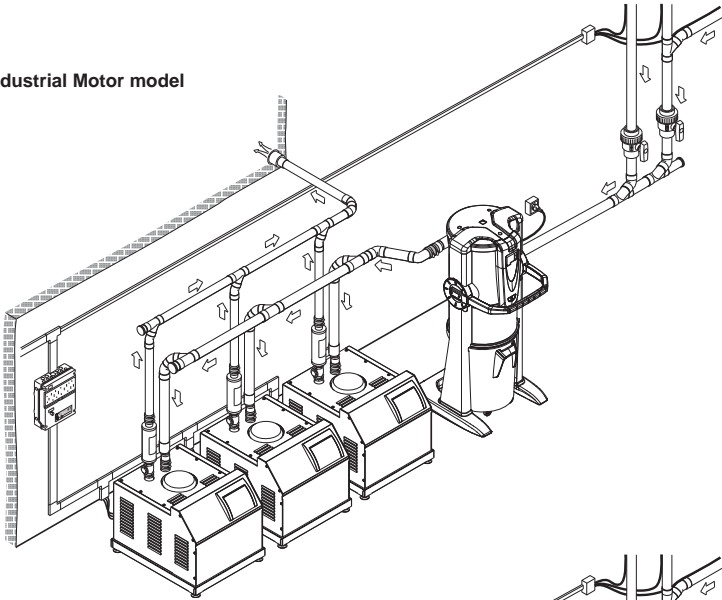
**Industrial Motor MATIC Model**



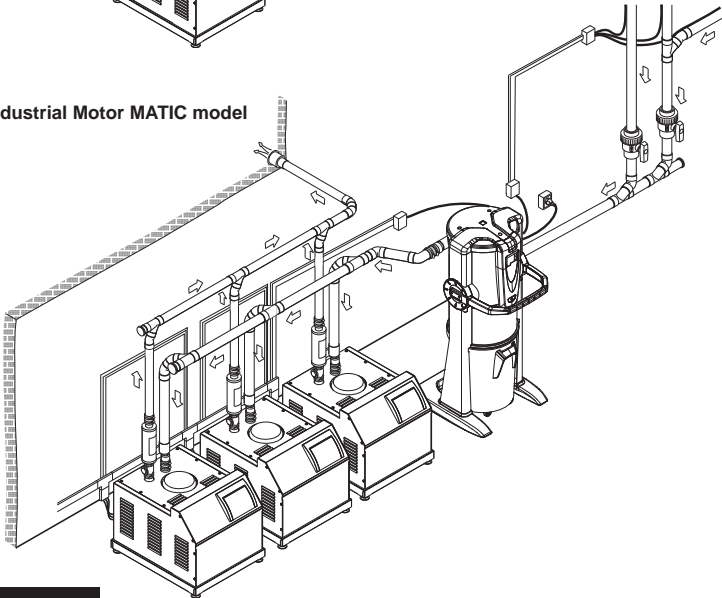
Example of installation with 3 motors and 1 Dust separator.

**WARNING:** the use of 2 or more motors simultaneously provides the application of check valves on each unit.

Industrial Motor model



Industrial Motor MATIC model



## 9. CONNECTION TO THE PIPE NETWORK

Carry out the connection of the suction unit to the pipe network by using the hose clamps and sleeves provided with the vacuum unit.

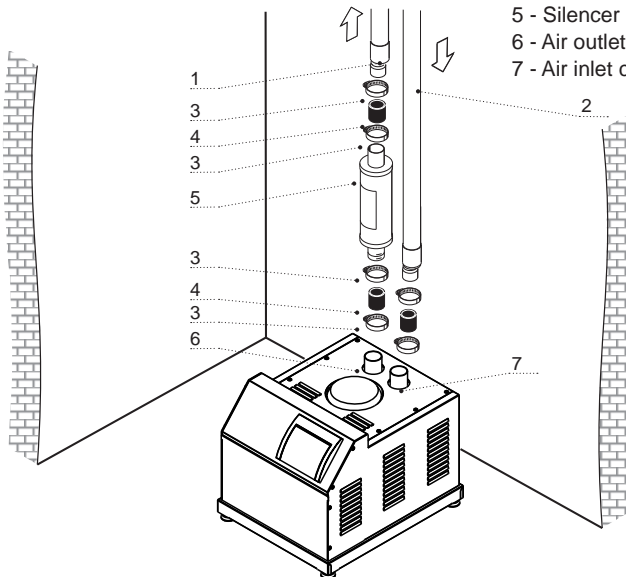
Carry out the silencer fixing.

Fix the silencer to the threaded joint, according to the sizes of the motors and models.

**In case there are more than one suction motors, it is necessary to provide the use of a check valve on each single motor.**



- 1 - Discharge pipe
- 2 - Air inlet pipe
- 3 - Hose clamp
- 4 - Connection rubber sleeve
- 5 - Silencer (optional)
- 6 - Air outlet channel turbine
- 7 - Air inlet channel turbine



**N.B.** Diameter of discharge pipes not longer than 6m 63 mm  
 Diameter of discharge pipes with a length between 6 and 8 m 80 mm  
 Diameter of discharge pipes with a length between 8 and 10 m 100 mm  
 It is not recommended to use a discharge pipe longer than 10 m because it could cause a damage to the vacuum unit.

## 9.1 Check valve

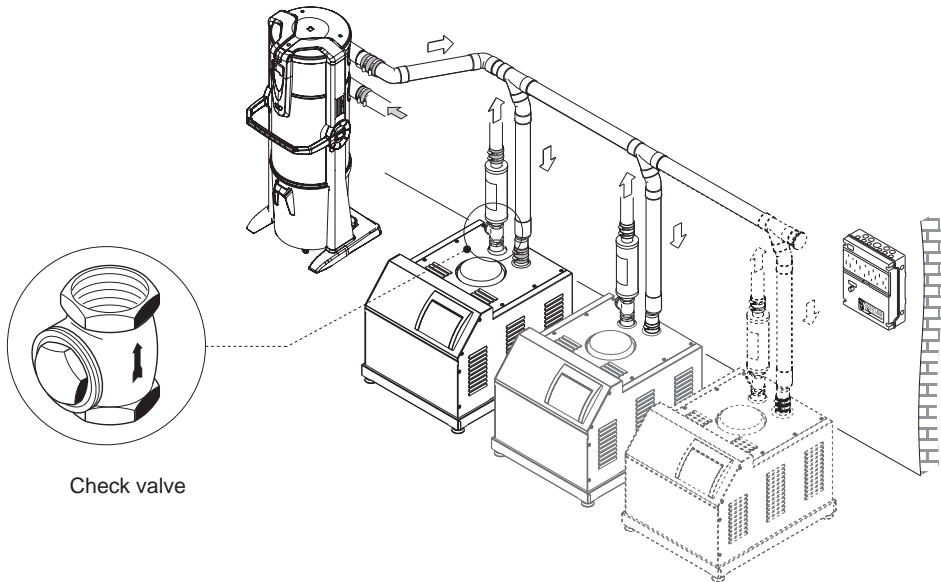
**The check valve must be installed anytime installations with 2 or more suction units are installed.**

It is necessary to install a check valve on each suction unit.

**The fixing must be carried out on the discharge air channel of the motor (see "OUT" label).**

It doesn't need any adjustment and it prevent the free spin of an inoperative turbine in case the other one is vacuuming.

According to the type of turbine used, you determine the size of the valve.





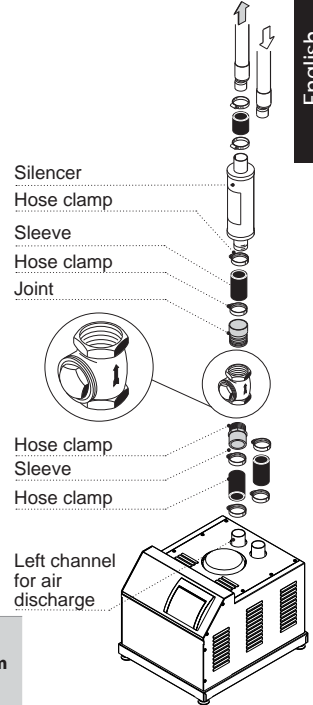
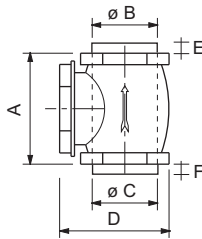
## 9.2 Installation of the check valve

Connect the check valve on the air outlet and screw the joint.

N.B: The motor joints vary in form and size according to the power and size of the model.

Install the valve in the correct sense, with the indicator arrow pointing upwards in the direction of the external air discharge.

ARTICLE	3500.1M	3503.2M	3500.3M	3503.4M	3500.5M	3503.6M	3503.7M
010001 (2")	•	•		•			
0110003 (3")			•		•	•	
0110002 (4")							•



ARTICLE	Measurement	Ø TUBO	A mm	B mm	C mm	D mm	E mm	F mm
010001	2"	63	97	63	63	92	52	52
0110003	3"	80	136	80	80	132	70	70
0110002	4"	100	165	4" F	4" M	170	-	55

## 9.3 Periodic checks

Once a year, disconnect the air discharge pipe from the check valve, checking that the starting and switching off of the suction unit to which it is connected, the valve opens and closes correctly. Grease the spinning linchpin of the valve door.

## 10. ELECTRICAL CONNECTION (see also Appendix A and Appendix B)



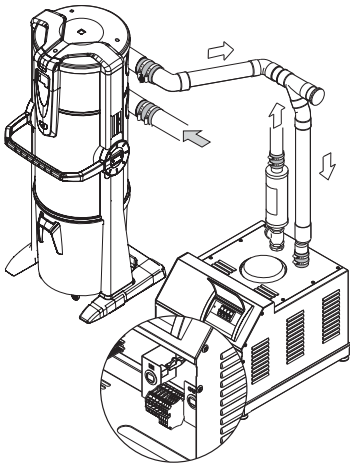
**WARNING: The electrical connection must be carried out ONLY by qualified personnel.**

### 10.1 Connection of the electric motors art. 3500.1M\_3500.3M\_3500.5M (see Appendix A)

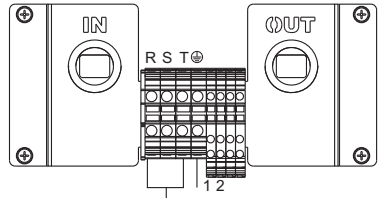
Before carrying out the electrical connection, check that the inlet supply voltage corresponds to the rated voltage indicated on the identification plate of the product.

The Manufacturer declines any responsibility for damages to people and/or things resulting from the substandard connection to an electrical installation.

- Check that the electrical installation is carried out according to the electrical technical rules in force.
- **It is not recommended to supply the unit with supply voltage originating in provisional switchboards (for instance, site switchboards) to avoid possible damages to the electronic parts.**



Terminal board for electrical connections



Number of cables	Destination
PE	Ground connection
R	400 V ac connection
S	400 V ac connection
T	400 V ac connection
N	Neutral connection
1	Vacuum activation connection
2	Vacuum activation connection

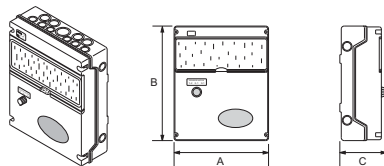
### 10.1.1 Motors selection call panels Mod. 3301.0 - 3301.6 - 3301.10

The switchboard for the motors selection call panels is used when you install, on a single installation, more than one electric motor, without electronic converter of speed (inverter).

According to the switchboard used, it is possible to manage installations with a number of connected motors which goes from 2 up to 8.

The internal electronic system permits, by using the resistive divider (art.3301.4) installed on the micro switch, to drive the starting and switching off of one or motors of the installation, according to the number of suction inlets used. It also permits to manage the operating hours of each single motor.

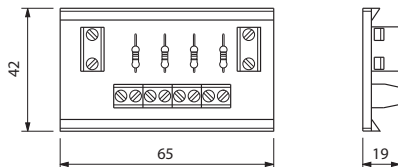
Indeed, it is possible to invert the starting priority of the motors, through a cyclic switch, balancing in this way the use state of the motors. The counters (one for each motor) placed on the switchboard permit to decide how and when modify the starting order of the motors.



PANEL code	N° Max motors	AC Voltage supply	frequency Hz	A	B	C	For article motors
3301.6	2	220/240	50/60	350	400	140	3500.1M
3301.0	3	220/240	50/60	330	400	140	3500.3M
3301.10	8	220/240	50/60	515	650	250	3500.5M

### 10.1.2 Resistive divider

The resistive divider is essential to modulate the speed of a motor group, or control the switching on and off of other motor groups. Each divider is able to accommodate up to four inlet valves, connected to each other, with no maximum limit.



### 10.1.3 Operation

The electrical panel governs the motor starting sequences.

### 10.1.4 Power On and Off

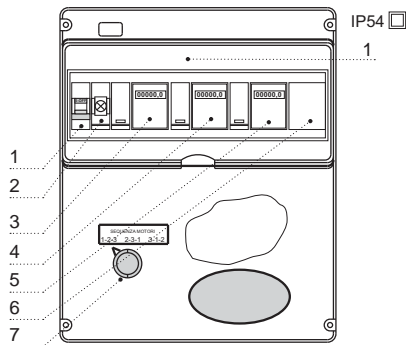
To switch on the panel, turn the main switch to position “1-On”.  
To turn off the panel, turn the switch to “0-OFF”.

### 10.1.5 Method of motor intervention selection

To select the motor start sequence, rotate the knob on the control panel, positioning the arrow on the chosen starter sequence.

### 10.1.6 Legend and connection chart (example, panel for 3 motors art. 3301.0)

- 1 - Main switch
- 2 - supply indicator light
- 3 - Motor counter “1”
- 4 - Motor counter “2”
- 5 - Motor counter “3”
- 6 - Transformer
- 7 - Motor starting sequence selector
- 8 - Relay for power



**NOTE:** For the complete connection, see the wiring diagrams enclosed in the manual

## 10.2 Electronic motor Connection of art. 3503.2M, 3503.4M, 3503.6M, 3503.7M (see Appendix B)

Before making electrical connection, check that the rated voltage corresponds to the power supply input voltage indicated on the product identification plate.

The manufacturer accepts no responsibility for damage to persons and/or property caused by the connection to a non standard electrical system.

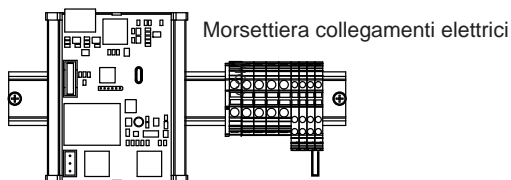
The electronic motor, equipped with frequency control system (inverter), must be earthed, in compliance with the regulations concerning high leakage currents (over 3.5 mA).

If local or national regulations requiring their upstream protection by means of circuit breakers, use a type A device for single-phase power supplies, and a type B device for a three-phase electrical supply, as defined in the IEC Standard 60755.

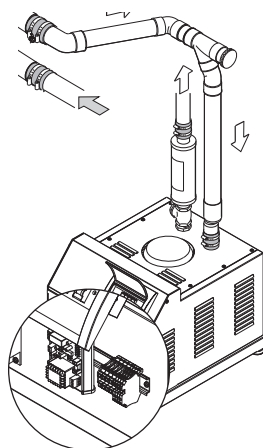
Choose an appropriate model that offers:

- High frequency current filtering,
- Devices not subject to disconnection, due to disturbances

**It is inadvisable to supply the installation with supply voltage from provisional electrical panels (for example electrical construction site boards) to avoid possible damage to electronic parts.**



N°cable	Description
PE	Earth connection
R	400Vac connection
S	400Vac connection
T	400Vac connection
N	Neutral connection
COM*	Micro line connection
1*	Speed Selection 1
2*	Speed Selection 2
3*	Speed Selection 3
4*	Speed Selection 4
A*	Control selection manual / automatic
B*	Control selection manual / automatic



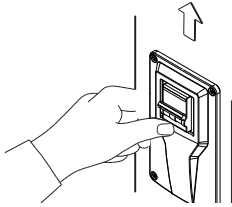
\* Connections to be used only in case of malfunction of the control board located on the Industrial Clean dust separator (see Appendix B).

Contact Technical Service

## 11. USE OF THE CENTRAL VACUUM SYSTEM

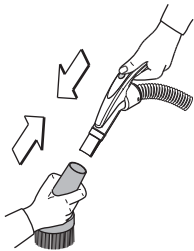
The **vacuum system**, when connected, has the ability to be activated whenever a flexible tube is inserted in one of any intake sockets in the various locations.

This is due to an electrical contact placed directly inside the socket, which when activated, turns on the vacuum motor of the installation.



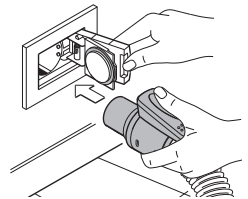
- 1** Turn the power switch on the right shoulder of the Industrial Clean dust separator to position "I-ON." The display will light up, indicating that the control panel has power.

Lift the main switch of the vacuum motor module



- 3** Install the handle of the hose of the cleaning accessory suitable for desired use, relative to the type of dirt, the surface to be cleaned, etc.

Plug the other end of the hose into the vacuum outlet. Doing so activates the central motor vacuum, thanks to the activation of the electrical signal placed in the vacuum socket.



After use, remove the hose from the vacuum inlet, having previously assisted the cover into its closed position. If the cover is left free to close by itself, it will close too sharply, as the vacuum effect of the central depression is still active and therefore will facilitate the immediate and violent snapping shut.

The vacuum unit is programmed to continue for a few seconds before turning off, as the vacuum effect on the entire affected branch of the tubing network should be completed.

## 12. MAINTENANCE



**BEFORE PERFORMING ANY INTERVENTION MAINTENANCE, IT IS MANDATORY TO DISCONNECT THE POWER CABLE FROM THE ELECTRICAL SOCKET AND WEAR GLOVES AND PROTECTIVE MASK**

### 12.1 Maintenance

In function of the total usage time of the vacuum system, it is necessary to carry out the maintenance procedures, in order to keep it efficient and to avoid severe mechanical damage.

- obstruction in air discharge pipe check
- obstruction in vacuum motor cooling fan check

### 12.2 Cleaning of the casing

Periodically clean the outer casing of the panel using a soft cloth dampened with water and mild soap.

**Warning: Use only water or water and mild soap for cleaning. Use of other solvents or alcohol can cause damage.**

We recommend to always use a suitable mask captures the dust dispersed in the air and always wear a pair of latex gloves to protect the skin of the hands.

## 13. REPAIRS AND SPARE PARTS

### 13.1 Intervention criteria

It is strictly prohibited to intervene on the vacuum unit for repairs and / or maintenance not expressly authorized in this manual.

All damage or malfunction repairs must be performed by qualified service personnel.

In the case of interventions by unauthorized personnel, any guarantee on the product becomes void and releases the manufacturer from any liability for damage to people and / or things as a result of such intervention.

## 13.2 Recommended Spares

Rapid wear components, which need a preventive stock basis, are not installed on the vacuum motor. To ensure optimum operation and long life of the central vacuum cleaner, the exclusive use of original spare parts SISTEM-AIR is recommended if necessary.

## 13.3 Decommissioning the central vacuum cleaner service (General Rules)

Should you decide to decommission the product, it must be done in accordance with our health and the environment in which we live.

Enquire if there are places and / or persons authorized for removal and disposal of this product.

Disposal and / or recycling of any of the core component must be carried out in accordance with applicable laws.

## 14. NOISE

A sound meter test measuring the sound pressure and the acoustic power of the equipment was performed. TECNOPLUS srl houses the test report.

## 15. IDEAL POSITIONING OF CENTRAL UNIT TO REDUCE SOUND EMISSIONS

To reduce the noise emission of the central unit, useful tips and suggestions can be adopted, such as:

- If necessary, resorting to sound-absorbing materials on the two side walls, if these are very close together, so as to absorb the sound waves and prevent the phenomena of resonance between the two waves that could bounce on two opposite walls
- If necessary, also soundproofing the ceiling.

## 16. VIBRATIONS

There is no hand-arm or whole body contact between the operator and the machine during the vacuum operation through the flexible tube, so there are no vibrations.

There is therefore no related risk.



**17. TROUBLESHOOTING**

PROBLEM	CAUSE	REMEDY
Vacuum does not start at any socket	Alarm on your computer	Perform RESET alarm and relative maintenance required. Extract and insert the flexible tube to start the vacuum
	Electrical protection intervention of the vacuum module	Restore power after checking the cause of the interruption
	The micro line switch is in position 0	Place the switch to I
Air intake is not activated In a single socket	Electrical contact interrupted or suction socket micro switch failure	Service Call
Vacuum is weak	Using more sockets than recommended	Reduce the number of sockets used simultaneously
	Broken cleaning accessories or clogged hose	VERIFY THE INTEGRITY OF THE HOSE AND ACCESSORIES
	Dirty filter cartridge	Clean the filter cartridge
	Dust container seal damaged	Check the integrity
	Obstruction of the vacuum tubing network pipes	Service call
	Obstruction of the air outlet	Service call
	Dust container full	Empty the dust container
	An inverter is in alarm	Service call

PROBLEM	CAUSE	REMEDY
The motor does not turn	No power supply.	Make sure the system is powered with proper voltage and current, and that the main switch of the framework is in place <b>1-ON</b>
The motor doesn't turn, but the electric panel is properly powered and the main switch is turned on.	The inverter or motor board damaged, or cable wiring is incorrect	Service call
	The motor is burnt out	Service call
The motor overheats	The motor draws too much power.	Reduce the working pressure.
	There is not enough ventilation	The ambient temperature must not exceed 40° C and good ventilation to the machine must be ensured..
	Tube network clogged	Call Customer Service
The motor is noisy and not running smoothly	The turbine seized	Call Customer Service
	- The turbine is dirty	Call Customer Service
The main switch trips frequently	- The ambient temperature is too high	The temperature of use of the machine must be between -5° C and + 40° C. Increase the machine ventilation
	- Motor phase loss	Call Customer Service
	- Motor winding damaged	Call Customer Service
	- Tube network clogged	Call Customer Service

## **18. TABLE OF INVERTER ALARM CODES AND TROUBLESHOOTING**

In case of anomalies during commissioning or normal use, please confirm the environment, mounting and connection conditions have been observed.

The first defect is detected and displayed by the management computer and intermittently on the inverter display.

### **ALARM codes that cannot be automatically restored by the controlling computer.**

The cause of the fault must be removed before resetting, by electrically switching the vacuum system off and on.

Code	Defect name	Possible causes	intervention procedure
C r F	PRELOAD	Load relay command failure or damaged charge resistor	Call the service center and replace the inverter
E E F	MEMORIA EEPROM	Failure of internal memory	Call the service center and replace the inverter
I F 1	INTERNAL COMPONENT	Unknown range	Call the service center and replace the inverter
I F 2	INTERNAL COMPONENT	Missing the inverter display	Call the service center and replace the inverter
I F 3	INTERNAL COMPONENT	EEPROM problem	Call the service center and replace the inverter
I F 4	INTERNAL COMPONENT	EEPROM fault	Call the service center and replace the inverter
O C F	OVERCURRENT	Mechanical block and / or excessive load of the vacuum motor unit	Check the condition of the vacuum motor unit and call the Help Center
S C F	MOTOR GROUP SHORT CIRCUIT	Short circuit, or earth current discharge	Check the electrical connections and the motor insulation, call the Help Center

### **ALARM codes that can be automatically restored by the controlling computer.**

The cause of the fault is reset automatically by the vacuum unit computer, following elimination of the cause.

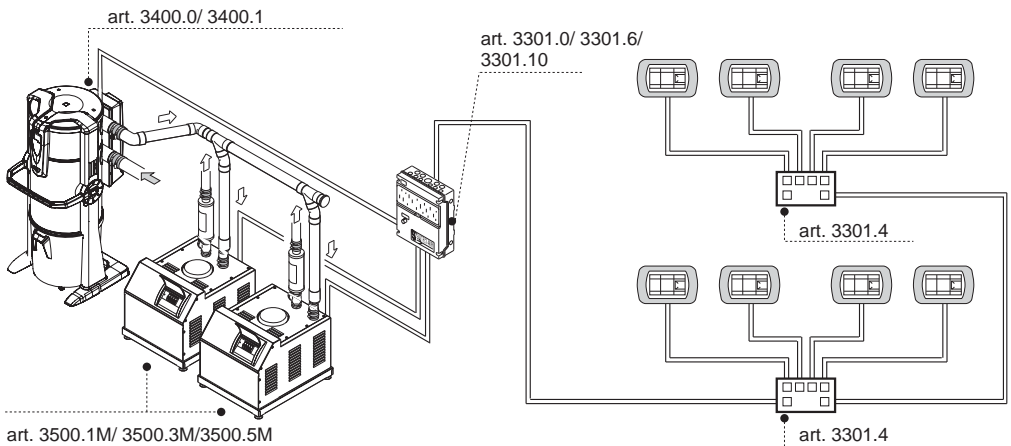
Code	Defect name	Possible causes	intervention procedure
C B F	CAN BUS COMMUNICATION	Communication with the CAN bus stopped	Check the vacuum motor unit power supply, as shown in Serial Number cell. Call Support Center
E E F	MEMORY EEPROM	Internal memory failure	Call the service center and replace the inverter
O b f	EXCESSIVE BRAKING	Suction motor group stopping too suddenly	Increase the deceleration time. Call Center Support
o h f	OVERHEATING INVERTER	The inverter temperature is too high	Check the inverter ventilation and environmental conditions. Call Support Center
O p f	MOTOR PHASE LOSS	Loss of phase on motor output	Check the connections from the inverter to the motor. Call Support Center

Code	Defect name	Possible causes	intervention procedure
0 S f	ELECTRICAL POWER GRID SURGE	The power supply voltage is too high.	Check the supply voltage. Call Center Support
P h F	NETWORK PHASE LOSS	Failure of one phase of power. Non-compliant power supply.	Check the electrical connection and possible electrical protections upstream of the suction system.
S L F	MODBUS	Communication with the MOD BUS interrupted	Check the connection between the interface board, inside the Industrial Motor, and the inverter. Call the Service Centre.
U S f	INSUFFICIENT TENSION	The power supply voltage is too low. Load resistor damaged.	Check the input voltage. Call the service center and replace the drive.

# APPENDIX A

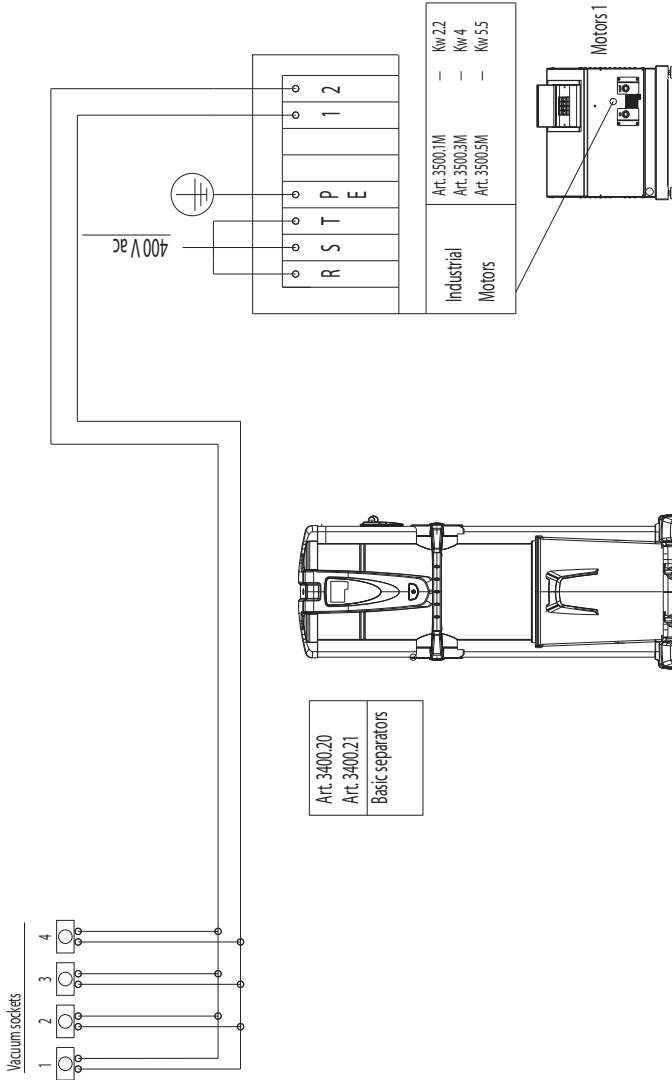
## Electric motor connections Industrial Motor art. 3503.1M, 3503.3M, 3503.5M

**EXAMPLE** Dust separator connection with two or more electric motors

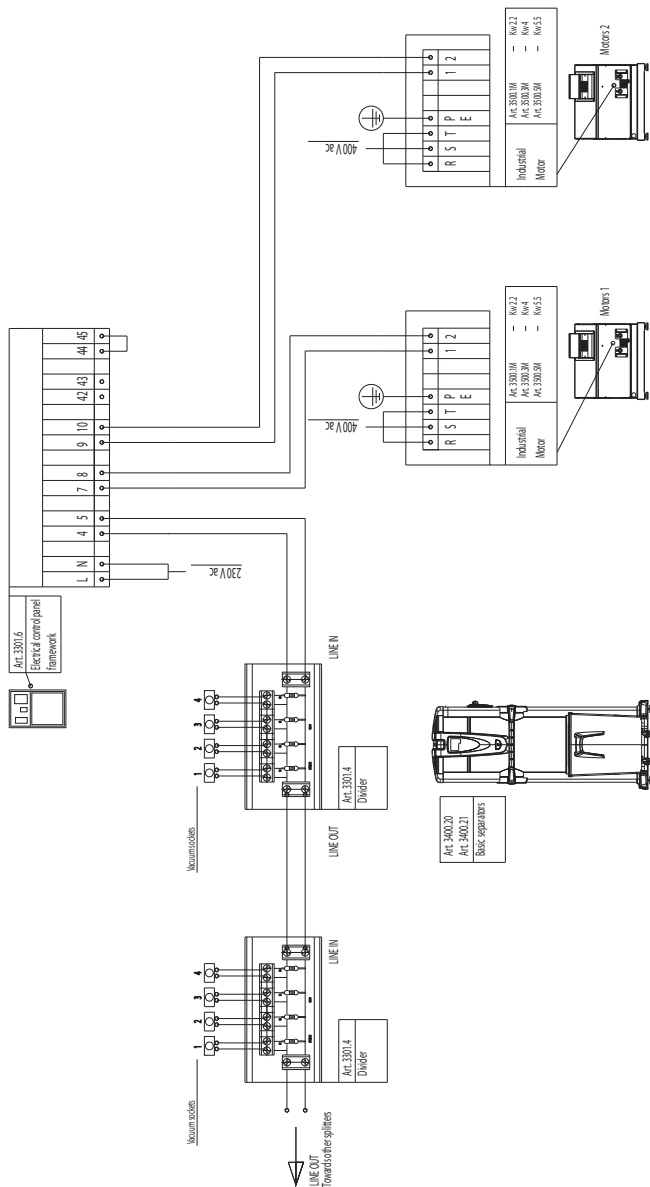


## Electric motor electrical connection diagram

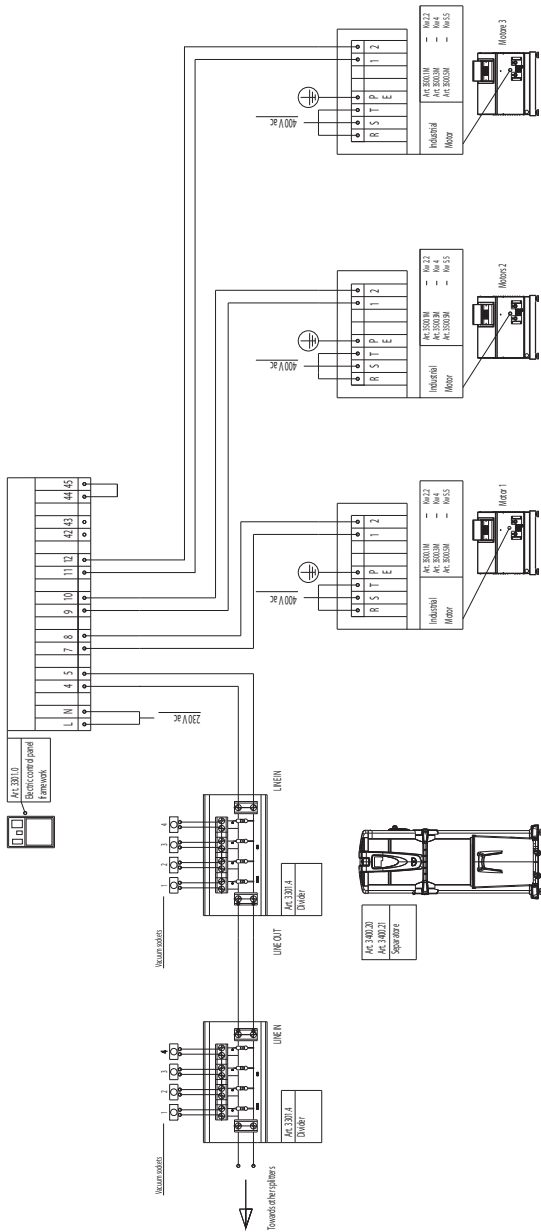
1) Connection diagram No. 1 dust separator with n ° 1 electric motor



2) Connection diagram 1 dust separator with 2 electric motors



3) Connection diagram 1 dust separator with 3 electric motors

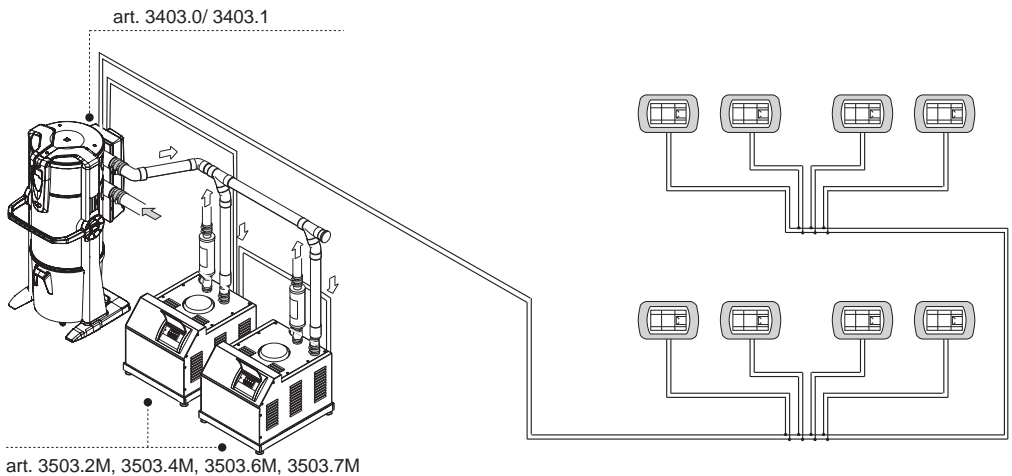




# APPENDIX B

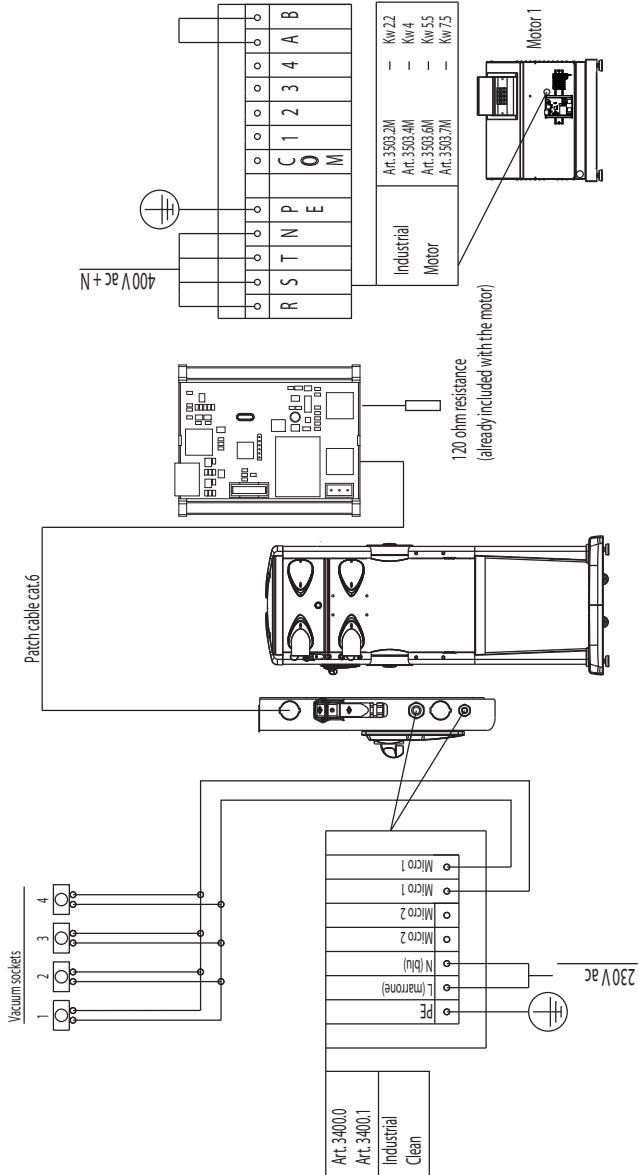
## Connecting electronic motors Industrial Motor Matic art. 3503.2M, 3503.4M, 3503.6M, 3503.7M

**EXAMPLE** dust separator connection with two or more electronic motors

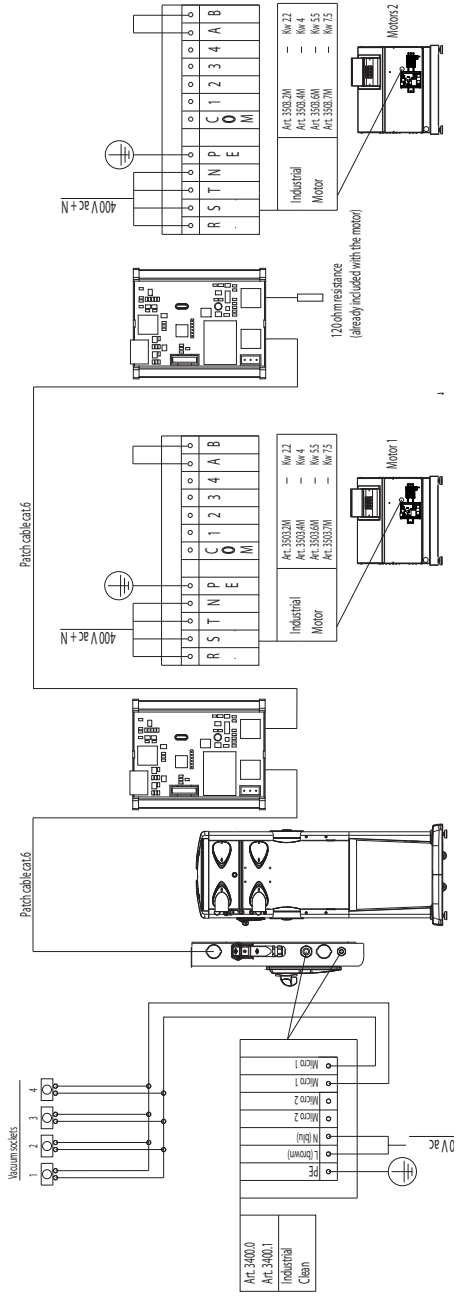


## Electronic motors electrical connection diagram

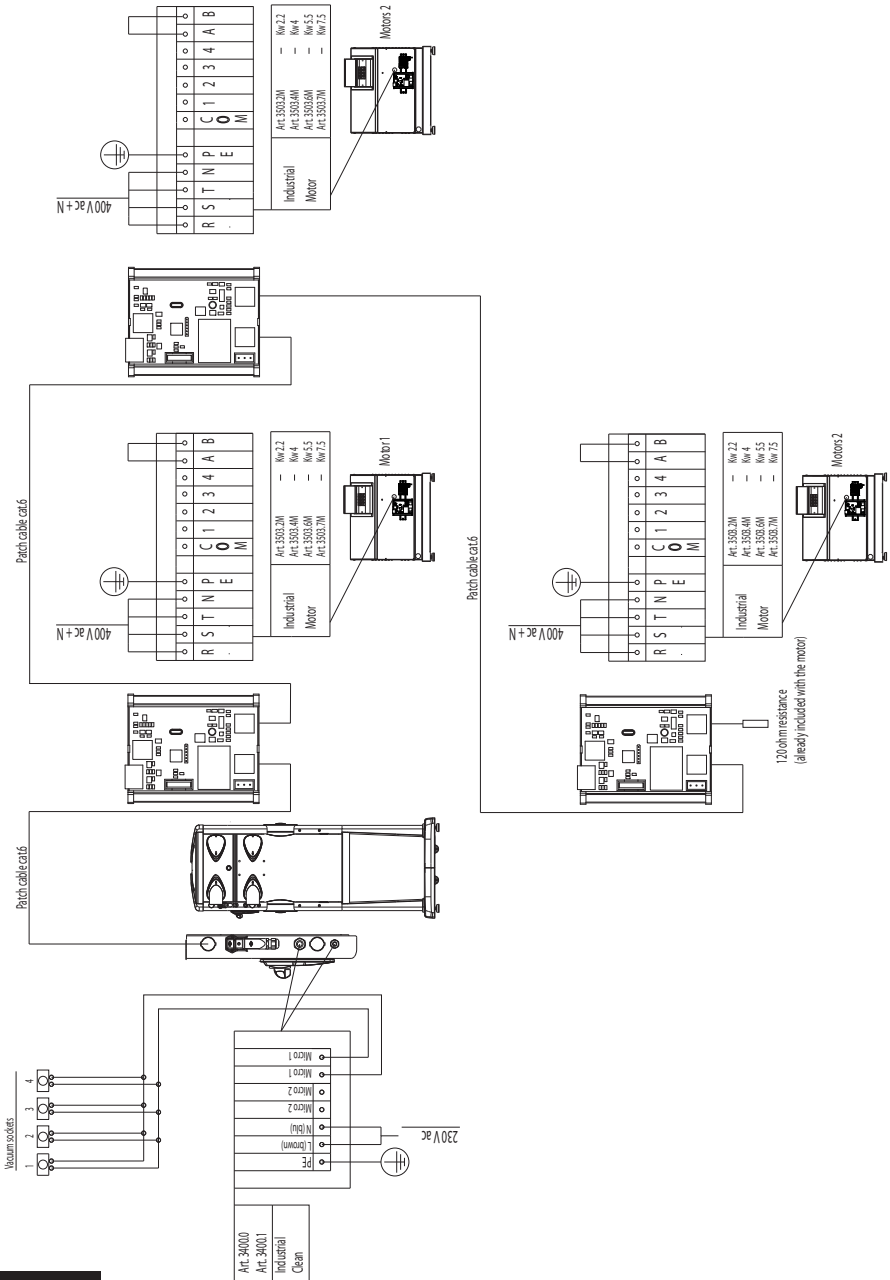
1) Connection diagram 1 dust separator with 1 electronic motor



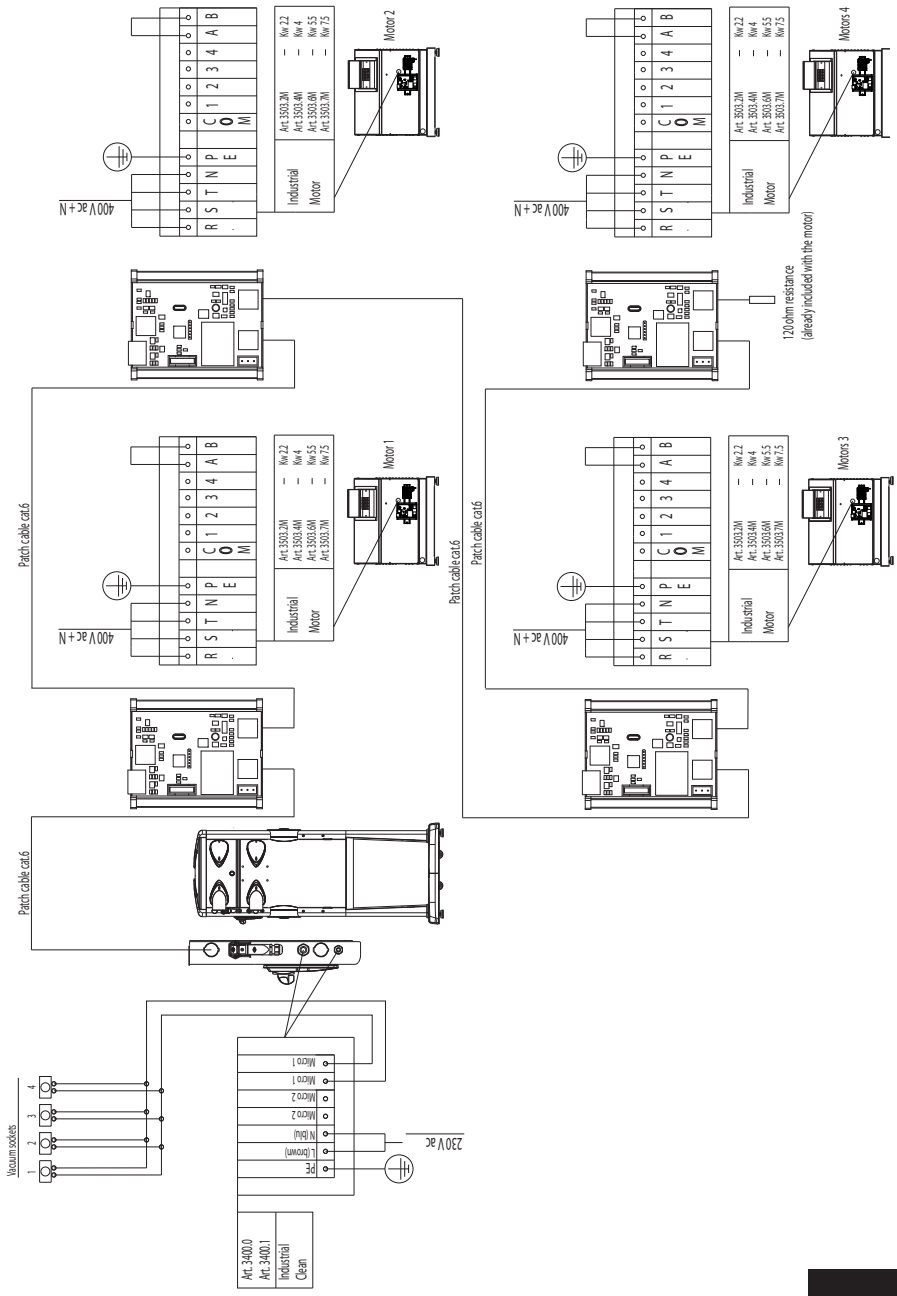
2) Connection diagram 1 dust separator with 2 electronic motors



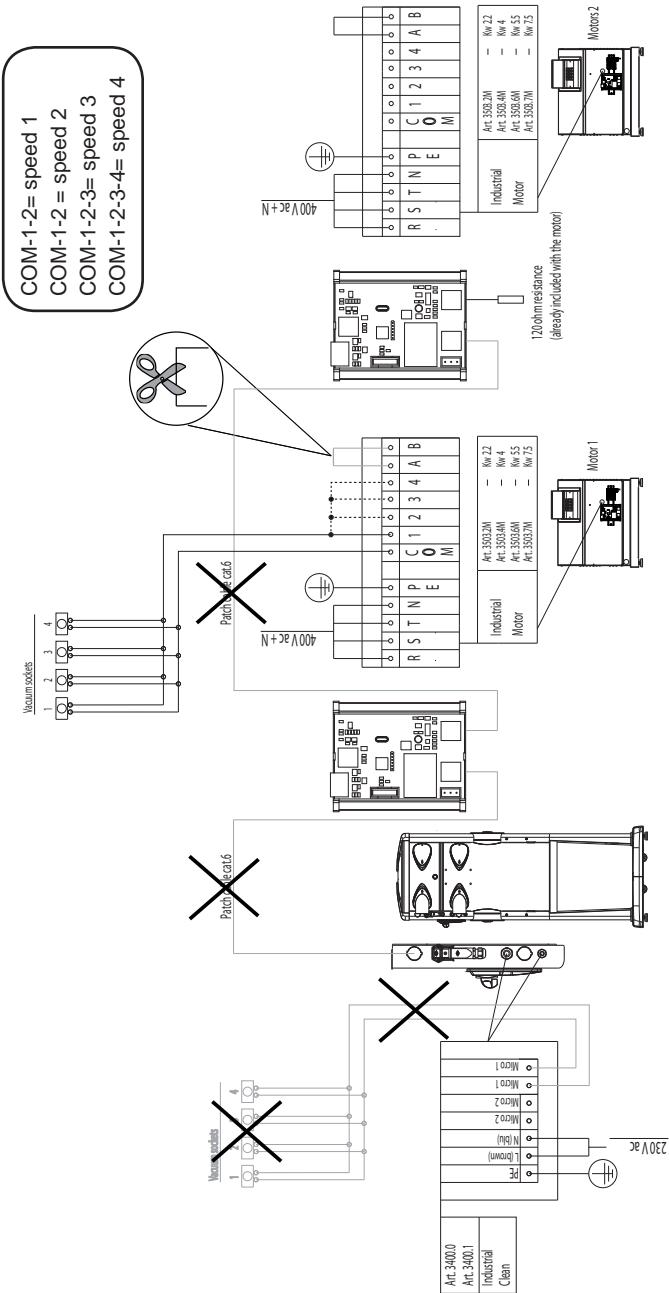
3) Connection diagram 1 dust separator with 3 electronic motors



4) Connection Diagram 1 dust separator with 4 electronic motors



5) Connection diagram in case Industrial Clean dust separator control board failure



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