TUBO®
Smart Vacuum Net

CE

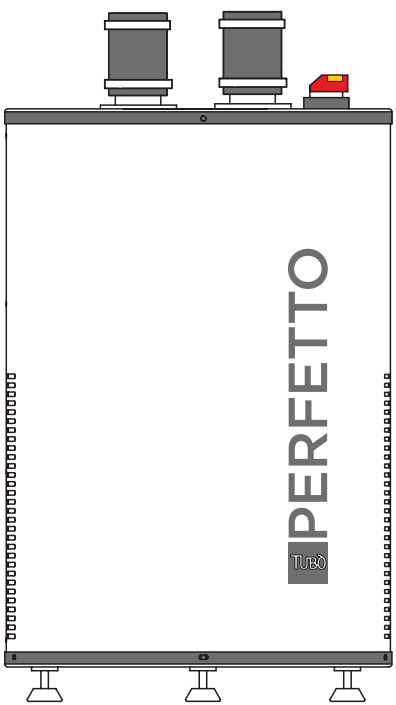
USER, INSTALLATION AND MAINTENANCE MANUAL

VACUUM MODULES WITH INVERTER

MODELS: **T30INV**

T40INV

T60INV



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GENERAL INDEX

GENERAL INFORMATION

3 EU Declaration of Conformity
4 General warnings
4 Warrant
4 Identification
4 Manufacturer
5 Manual use
5 Safety
5 Environment friendly
6 Identification plate
6 Vacuum model dimensions
7 Technical data
7 Description of parts

INSTALLATION

8 Transport
8 Installation location
8 Placing
9 Example of a vacuum unit with 1 vacuum module
9 Example of a vacuum unit with 2 vacuum modules
10 Electric connection
11 Electrical connection diagram with 2 turbines MASTER + SLAVE
12 Intended use
12 Starting / Stopping
12 Unauthorised use
12 User
13 Control panel
14 Display signalations
17 Central power unit testing

MAINTENANCE

18 Ordinary maintenance
18 Unit disposal
18 Out of service
19 Troubleshooting

EC CONFORMITY DECLARATION OF A MACHINE

CE

The manufacturer AERTECNICA. S.P.A with registered office in Via Cerchia di Sant'Egidio 760, 47521 (FC) - ITALY

With reference to:	VACUUM MODULE
Series:	T WITH INVERTER
Models:	T30INV - T40INV - T60INV

DECLARES THAT THE VACUUM MODULE
in the state in which it was placed on the market, with the exception of added components and/or operations carried out subsequently by the final user

COMPLIES WITH
The DIRECTIVE 2006/42/EC (Machinery directive) and subsequent amendments and additions.

The Directive 2014/30/UE (Electromagnetic Compatibility Directive) and subsequent amendments and additions.

The Technical File of the central power unit, made by Aertecnica S.p.A., is filed in the SERVER unit of AERTECNICA S.P.A.

The person responsible for the Technical File
is Maurizio Balbo

Declarant
Golinucci Daniele

Cesena, lì 24/01/2023

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GENERAL WARNINGS

CAREFULLY READ THE MANUAL

The installation, user and maintenance manual is an integral and essential part of the Vacuum module and must be read carefully – BEFORE USING THE PRODUCT – as it contains important information concerning operator safety, foreseen operation and the correct maintenance of the central power unit.

ATTENTION

AERTECNICA reserves the right to modify the product and the related technical documentation without incurring any obligation towards third parties.
No part of this manual may be reproduced, copied or distributed in any manner without written authorisation from Aertecnica.

WARRANTY

Warranty conditions for the European Union

AERTECNICA ensures the correct operation of the purchased vacuum module for a period of 24 months from the documented date of purchase.
If there is no documentation that proves the purchase date (invoice or tax receipt), the 24-month period will refer to the date it was sold by AERTECNICA.
The warranty conditions are in compliance with the EU legislation.
For any dispute, the Court of Forlì-Cesena (ITALY) shall have exclusive jurisdiction and Italian law will apply.

Warranty conditions outside the European Union

For countries outside of the European Union the guarantee shall be borne by the importing company and the warranty conditions are those provided by the law of the country where the product is imported to.

IDENTIFICATION

This user and maintenance manual refers to the following Vacuum modules

SERIES: INVERTER
MOD: T30INV
T40INV
T60INV

MANUFACTURER

AERTECNICA S.p.A.
Via Cerchia di Sant'Egidio,760
47521 Cesena (FC) ITALY
Tel. +39 0547/637311
Fax +39 0547/631388
info@aertecnica.com
www.aertecnica.com

Technical service

The Aertecnica Technical Service Centre can be contacted for all technical problems and if spare parts are needed. For all communications concerning the central power unit, the user should always provide the following data:
model of the central power unit
serial number
year of manufacture
purchase date

MANUAL USE

The instruction manual for use and maintenance is an integral and essential part of the product and must be handed over to the user. It must be kept in a safe place and consulted carefully as all of the warnings provide important instructions for safety during the process of installation, use and maintenance.

The vacuum module must be used only for the purpose it has been designed for. Any other use is considered improper use and is therefore dangerous.

The manufacturer accepts no contractual or extra-contractual liability for damage arising from a wrong installation or operation or from a non-compliance with the manufacturer's instructions.

SAFETY

The operator must accurately comply with the operating instructions shown by the pictograms in order to guarantee the safety of persons and correct operation of the central power unit.

DANGER: this indicates that attention must be paid in order to prevent events that could cause serious accidents that may harm people and their health.

ELECTRICAL DANGER: make sure that the machine is connected by the special cable to a type-approved earth system with efficient plates. The grounding shall be checked by a specialised installer equipped with suitable instruments.

RISK OF CRUSHING: during handling and installation phases of the central power unit, use adequate lifting equipment and check for optimal leveling on the support surface.

DANGER OF DAMAGING THE UNIT: follow the use instructions in order to avoid consequences which may lead to damage of the vacuum module.

INHALATION OF HARMFUL ELEMENTS AND DUST: protect respiratory organs by using protective masks when emptying the dust containers and when replacing the filter cartridge so the collected dust is not inhaled.

SENSIVITY TO DUST: this means that hand protection must be used to prevent any harm to operators who are sensitive to the collected dust.

SAFETY SHOES: use working shoes compulsorily to prevent damage to your feet.

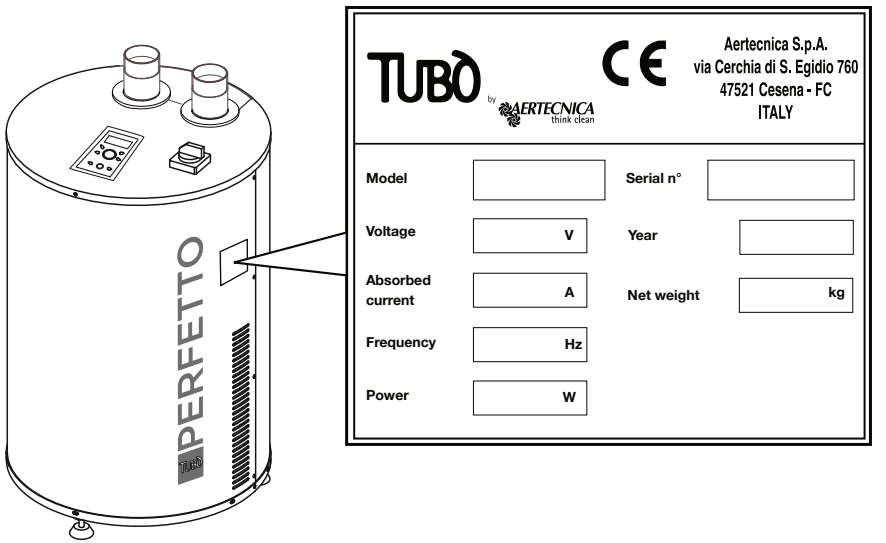
ENVIRONMENT FRIENDLY

Aertecnica develops eco-compatible technologies that respect the environment. At the end of their life cycle, the materials that make up the central vacuum unit must be disposed of correctly.

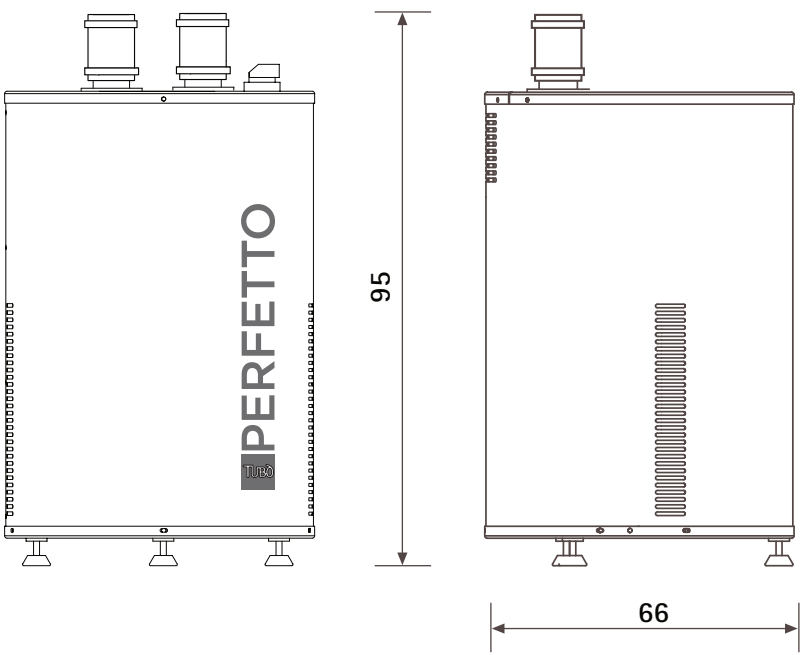
DISPOSAL AND DEMOLITION: the rules that regulate the elimination, disposal and demolition of parts, fluids and polluting substances vary from country to country.
It is recommended to obey the rules enforced by the local and national Authorities of the country of use of the product.

IDENTIFICATION PLATE

For these models, the identification plate is located on the body of the vacuum module as shown in the figure.



VACUUM MODELS DIMENSION (in cm)

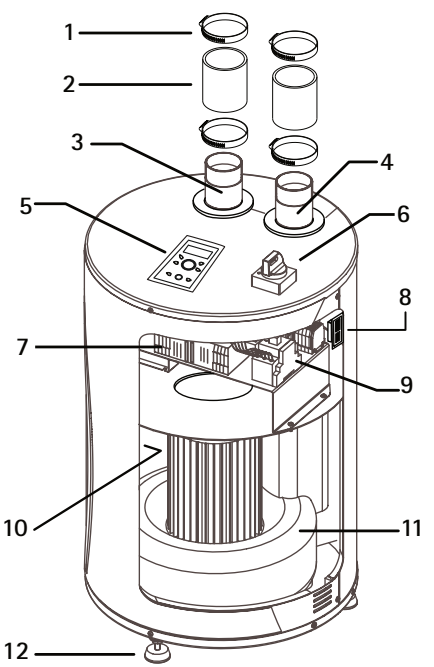


TECHNICAL DATA

Models		T30INV	T40INV	T60INV
Operators at the same time	n°	3	4	6
Inverter		YES	YES	YES
Power supply	Volt (V)	380	380	380
Motor power	Watt (W)	4.800	6.500	9.000
Frequency	Hz	60	60	60
Maximum absorption	A	8	11	15
Motor rpm	rpm	3.500	3.500	3.500
Soft Start		YES	YES	YES
Vacuum Sockets power supply voltage	Volt (V)	12	12	12
Air flow rate	m^3/h	650	800	950
Maximum vacuum	mbar	450	490	490
Dust inlet diameter	mm	100	100	100
Air exhaustion diameter	mm	100	100	100
Hight	mm	950	950	950
Diameter	mm	660	660	660
Weight	kg	72,5	86	95
Noise	dB	<70	<73	<74

DESCRIPTION OF PARTS

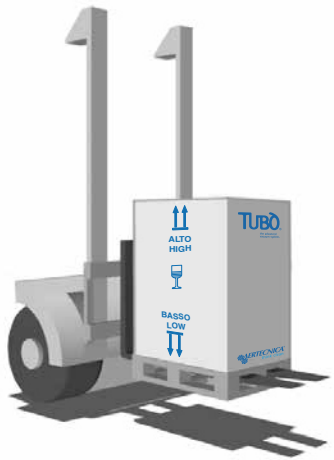
1 - Metallic clamps
2 - Sleeve
3 - Motor air expulsion
4 - Motor air inlet
5 - Control panel
6 - ON/OFF switch
7 - Inverter
8 - Terminal strip
9 - Motor protection
10 - Soundproofing sponge
11 - Sunction turbine
12 - Adjustable supporting feet



TRANSPORT

Check the overall mass of the vacuum module shown on the identification plate and use the described means for proper handling.

We recommend that you do not remove the packaging until installation so as to prevent any knocks and damage.



NOTE

Packaging parts of the central power unit are inert solid waste that must be disposed of according to current applicable regulations.

INSTALLATION LOCATION

Leave the indicated free space (in cm) around the unit, to allow cleaning and maintenance by the operator.

The temperature of the installation room must be 0°≤ room temperature ≥35°

The installation room must be sufficiently illuminated (minimum 200 lux) to allow maintenance work.

The installation room must have an air exchange rate per hour ≥ 0.5 v/room (volume/room).

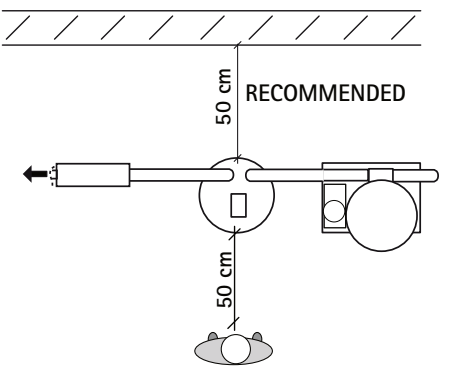
The central power unit must not be placed in an environment classified as ATEX.

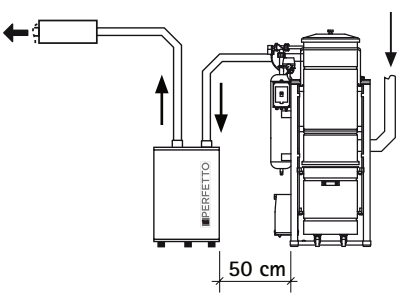
POSITIONING

Position the vacuum module according to the operative requirements to allow for the easy connection to the electrical mains. The electrical system shall conform to the technical rules in force.

Check the surface and solidity of the floor, so that the vacuum module has a uniform base, if necessary screwing or unscrewing the three adjustable feet.

Position the vacuum module and the dust separator so that there is a free space around them; this will let the operator move safely around the central power unit.

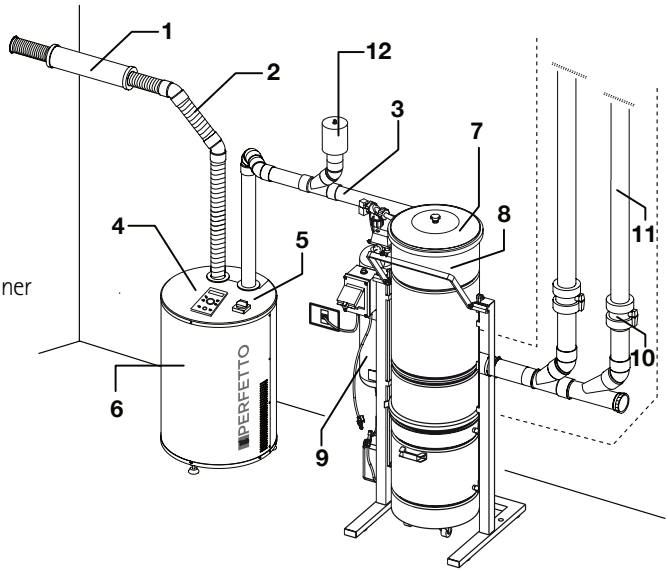




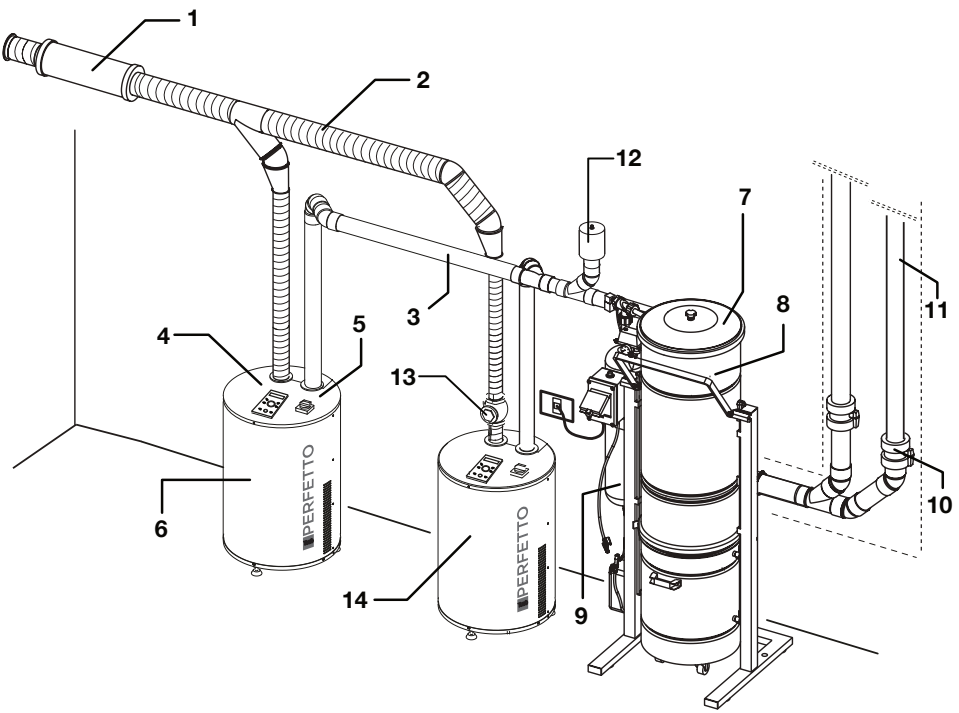
RECOMMENDED

EXAPLE OF A VACUUM UNIT WITH 1 VACUUM MODULE

1 - metallic silencer
2 - metal air expultion line
3 - air inlet
4 - digital control panel
5 - vacuum module main switch
6 - **MASTER** vacuum module
7 - dust separator
8 - opening/closing level dust container
9 - self-cleaning system
10 - sphere valves
11 - upright dust columns lines
12 - compensation valve
13 - check valve
14 - **SLAVE** vacuum module



EXAPLE OF A VACUUM UNIT WITH 2 VACUUM MODULE



ELECTRICAL CONNECTION

The electrical system of the central power unit must be made by qualified professionals and in accordance with applicable regulations.
The manufacturer assumes no responsibility for malfunction or damage to persons and/or property resulting from the incorrect connection to the electrical system.

ATTENTION

380V POWER SUPPLY

The vacuum modules must be powered at 380V, using a 4–poles cable sized for the power of the engine.

ATTENTION

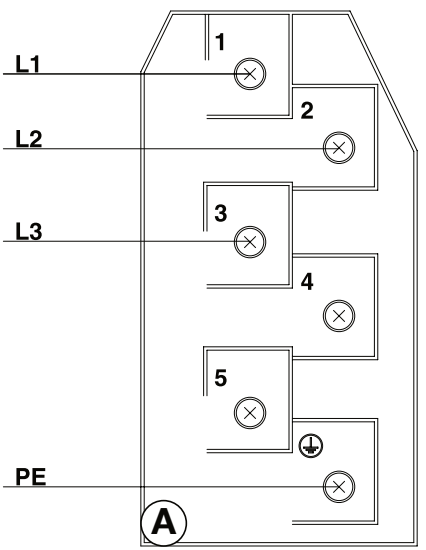
CIRCUIT BREAKER

The power supply line of the vacuum module must be sectioned by a circuit breaker

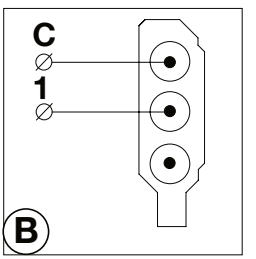
DIFFERENTIAL

You must connect the power unit to a differential for Inverter, not less than 100 mA.

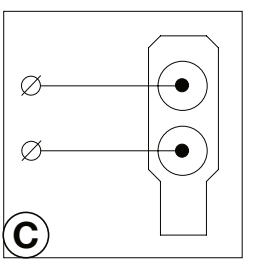
A - CONNECTION TO THE POWER TERMINAL STRIP



B - VACUUM SOCKET ELECTRICAL CONTACT LINE



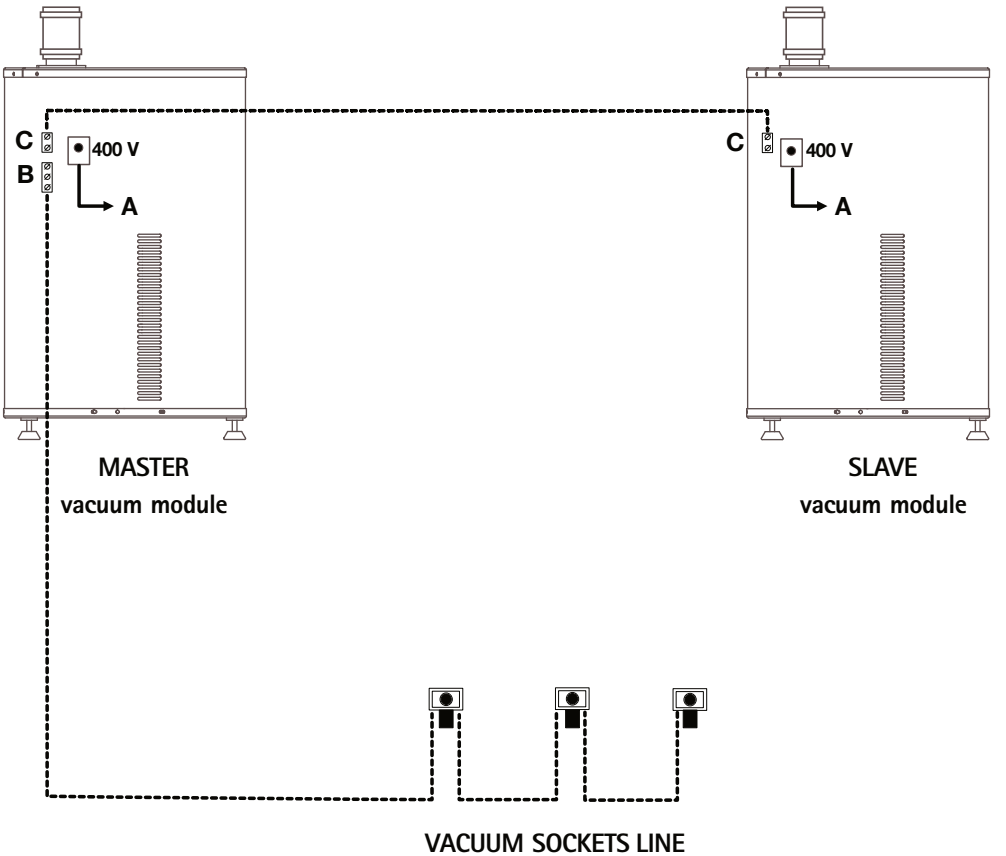
C - LOW VACUUM POWER CONTACT



ELECTRICAL CONNECTION DIAGRAM WITH 2 TURBINES

MASTER MODULE WITH SLAVE MODULE

If the vacuum system is made up of 2 turbines, carry out thew electrical connection as indicated below. The MASTER module is already set by the factory to activate the SLAVE module when necessary (check for the correct rotation direction of the SLAVE module).



INTENDED USE

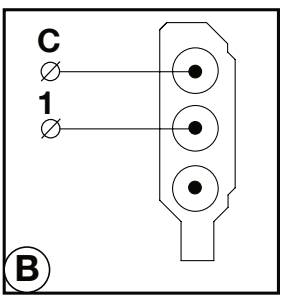
The vacuum module has been designed to be used in conjunction with a dust separator, for use in the Professional and Tertiary sector in connection with one or more Aertecnica dust separators for the suction of dust and small solid bodies.

The vacuum cleaner system can be used by several simultaneous operators based on the characteristics of the central vacuum unit.

STARTING /STOPPING

The central power unit is switched on by closing the contact on the terminal **B** (see drawing).

When the contact opens, the central power unit will turn off and the turbine will slow down until it stops.



UNAUTHORISED USE

- Do not vacuum lit cigarettes, embers or burning material: these materials may cause a fire, damaging the pipes or the power unit.
- Do not vacuum cloths, rags or other textile material: these may occlude the pipes or damage the power unit.
- Do not allow children to play with the vacuum sockets, opening and closing them continuously or inserting toys or solid items of unsuitable dimensions.
- Do not block the air exhaust line.
- Do not block the air sockets used to cool the electric motor.
- Do not use cleaning accessories to vacuum over body parts of people.
- Do not install the power unit in an ATEX classified space according to the European Union regulations.

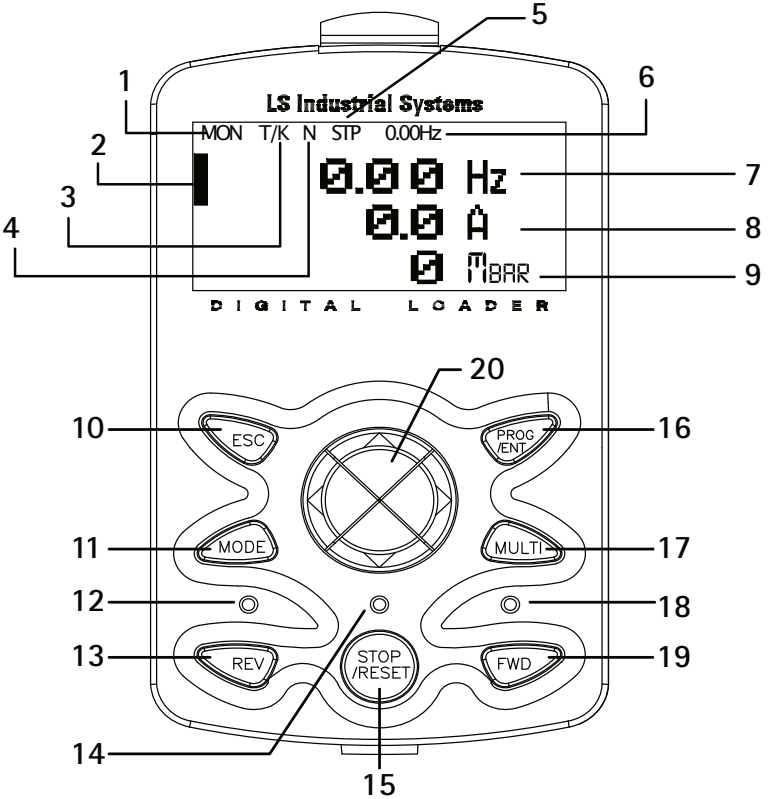
USER

The user must be in good physical and psychological condition.

The user must always be alert during use of the system in order not to trip on the hose or cleaning accessories connected to the system, and must adopt the same safety measures for every persons present in the room with them.

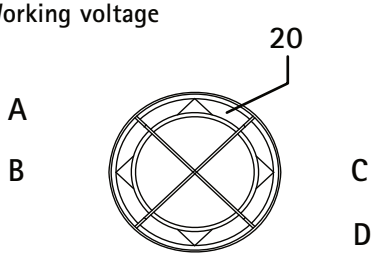
The user must be over the age of 14 years.

DISPLAY



Display signalation

1 - Mode Display
2 - Mode Cursor
3 - Operating/Frequency command
4 - Multi-function Key
5 - Inverter Operating Status
6 - Status Display Item
7 – Working frequency
8 – Working absorption
9 – Working voltage



Main keyboard functions

10 - Cancel(ESC)
11 - MODE selection
12 - Reverse operation LED
13 - Reverse operation
14 - Stop Indication LED
15 - STOP/RESET
16 - PROGRAM set
17 - Multi-Function
18 - Forward operation LED
19 - Forward operation
20 - **Cursor:**
A - Move to UP
B - Move to LEFT
C - Move to RIGHT
D - Move to DOWN

DISPLAY SIGNALATIONS

ALARM	CAUSE	REMEDY
Over load	The load is greater than the motor's rated capacity.	Determine if there is any anomaly while the turbine or system is functioning
Under load	The load is lower than the motor's rated capacity.	Determine if there is any anomaly while the turbine or system is functioning
Over current 1	The inverter load is 200% greater than the rated capacity.	Increase Acceleration/Deceleration time.
		Operate the inverter after the motor has stopped.
		Check the mechanical brake.
Over voltage	The input voltage is too high.	Increase the acceleration time.
		Determine if the input voltage is above the specified value.
Low voltage	The input voltage is too low.	Determine if the input voltage is below the specificed value.
Low voltage 2	The input voltage has decreased during the operation.	Determine if the input voltage is above the specified value.
		Check the input wiring.
		Replace the magnetic contactor
Ground Trip	A ground fault has occurred in the inverter output wiring or the motor insulation is damaged.	Check the output wiring.
		Replace the motor.

ALARM	CAUSE	REMEDY
E-Thermal	The motor has overheated.	Reduce the load or operation frequency.
		Replace the inverter with a model that has increased capacity.
		Guarantee good air circulation in the tecnical room.
Out Phase Open	The output wiring is faulty.	Check the output wiring.
In Phase Open	The input wiring is faulty.	Check the magnetic contactor on the input side.
		Check the inverter input wiring.
Inverter OLT	The load is greater than the rated motor capacity.	Check or replace the motor and inverter with models that have increased capacity.
No Motor Trip	The motor results disconnected.	Check the motor wiring.
Over Heat	There is a problem with the cooling system/ the ambient temperature is too high.	Determine if a foreign object is obstructing the air inlet, outlet, or vent.
		The inverter cooling fan is either blocked or stuck. Check it or replace it.
		Keep the ambient temperature below 35°C.
Over Current 2	Check the output wiring.	Output wiring is short-circuited.
NTC Open	The ambient temperature is too low.	Keep the ambient temperature above 0°C.
		Determine if internal temperature sensor is damaged or faulty

ALARM	CAUSE	REMEDY
Fan Trip	A foreign object is obstructing the fan's air vent.	Remove the foreign object from the air inlet or outlet.
		The inverter fan is either blocked or broken, replace the cooling fan if necessary.
Fan Warning	The fan is stuck.	The inverter fan is either stuck or broken, replace the cooling fan if necessary.
External trip	Turbine thermical anomaly	Determine if the air inlet, outlet, or vent are free.
		The turbine has overheated. Please wait to cool down.
BX	Disabling output	Contact the tecnical support.
H/W-Diag	Hardware fault	Contact the tecnical support.
Pre-PID Fail	Pre-PID alarm	Contact the tecnical support.
Ext-Brake	Brakes control fail	Contact the tecnical support.
Safety A(B) Err	Security entrance alarm	Contact the tecnical support.
INV Over Load	Inverter overload signalation	Check the motor or replace it with a model that has increased capacity.
Lost Command	Loss reporting signalation	Contact the tecnical support.

CENTRAL POWER UNIT TEST

The general centralised vacuum system test must be done after the final assembly of all vacuum sockets and compensation valve.

WITH 1 VACUUM MODULE

1 - Activate the control unit with all sockets closed and check that the pressure value read on the display is 160 mbar.

2 - If the value is higher, check that the In-54 and In-56 parameters are set to 45.

3 – If the value is lower, check:

A – any leaks in the system

B - the calibration of the compensation valve

C - that parameters In-54 and In-56 are set to 45.

4 - Insert in the vacuum sockets,in dif points of the system, the max numbers of flexible hoses allowed by the centrale power unit (Eg: T40INV = 4 flexible hoses) and determine that the read depression value on display is 160 mbar.

In case you read a lower value please refer to points A, B and C.

WITH 2 VACUUM MODULE

1 - Activate the control unit with all sockets closed and check that the pressure value read on the display is 160 mbar.

2 - If the value is higher, check that the In-54 and In-56 parameters are set to 45.

3 – If the value is lower, check:

A – any leaks in the system

B - the calibration of the compensation valve

C - that parameters In-54 and In-56 are set to 45.

4 - Insert in the vacuum sockets,in dif points of the system, the max numbers of flexible hoses allowed by the centrale power unit (Eg: T40INV + TR30S-T = 7 flexible hoses) and determine:

D - that the SLAVE turbine is activated (check for the correct rotation direction)

E - that the working depression is 160 mbar, if oyu read lower value please refer to A, B and C

5 - Leave only 3 flexible hoses connected to the system and determine if the SLAVE turbine turns off.

ORDINARY MAINTENANCE

Careful maintenance prolongs the life-time of the central power unit and guarantees better performance.

BEFORE STARTING ANY MAINTENANCE OPERATION, DISCONNECT THE CENTRAL POWER UNIT FROM THE POWER SUPPLY.

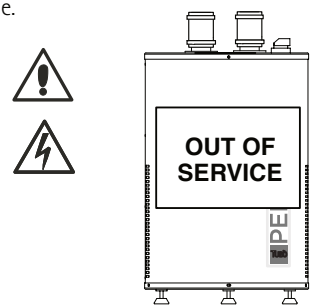
The check must be carried out by qualified personnel.
Carry out the following checks:
1 - check that the ventilation intakes og the suction module are free.
2 - check that the air expulsion line and the expulsion grill are free.

ATTENTION

Variations in normal working conditions (an increased absorbed power, anomalous noise, vibrations) are indications of incorrect functioning. In case of problems, request technical assistance.

OUT OF SERVICE

If the vacuum module is out of service due to failure, repair or for an extended period of inactivity, isolate it from the general power supply, and report the condition OUT OF SERVICE with a notice on the machine.



VACUUM MODULE DISPOSAL

At the end of its life cycle, the vacuum module must be disposed of in compliance with current applicable regulations.
The following table specifies the material with which the vacuum module is built.

TYPE OF MATERIAL	PRESENCE IN THE VACUUM MODULE	SPECIFICATION	FOR DISPOSAL
Plastic and rubber	cable gland	polyamide	The regulations that govern the disposal and demolition of the vacuum module, its components and the possible polluting material and substances change depending on the country of final use. We recommend that you contact the authorised organisations and agencies and respect the current applicable legal regulations
	rubber sleeves	SBR/NR rubber	
	sound-absorbing sponges	expanded polyurethane	
	stickers	PVC	
	feet of frame stand	megol synthetic rubber	
Galvanised components	screws and rivets	steel/stainless steel/brass	
Windings	wiring	copper	
Electronic components	inverter	electric parts	
	motor	electric parts	
	comand panel	electric parts	
	electronic card	electric parts	
Sheet metal	main body	painted steel	
Packaging	box	cartone	
	pallett	wood	
	bags	polyethyene	
	fixing screws	galvanized steel	

TROUBLESHOOTING

The table shows generic cases of malfunctions or failures that may occur during the normal life-cycle of the vacuum cleaner unit. Follow the instructions shown.

PROBLEM	CAUSE	ACTION
There is no air intake from all the sockets	Power supply cable disconnected	Connect the power supply cable
		Detemine if there is current on the terminal strip.
	12V socket cable line not connected or incorrectly connected	Connect the 12V socket cable line or check the wiring, see page 11
	The turbine is blocked	Reset the block and reboot the central power unit. If the issue persists call the tecknical support.
	The dust container is not correctly hooked	Rehook the container correctly.
There is no air intake from one of the sockets	The microswitch or the electric contacts of one of the vacuum sockets is damaged.	Fix or replace the vacuum socket.
	There is clogging in the system	Call a specialised technician.
Low amount of air intake	There is clogging in the system	Call a specialised technician.
	The filter cartridge is saturated	Perform cartridge maintenance.
	A greater number of hoses have been connected to the system compared to the characteristics of the power unit.	The central power unit can be used at the most, by the number of operators indicated in the table
	The dust container gasket is damaged or out of position	Check the gasket position of the dust container.
	The air exhaust line is clogged	Verify that the air exhaust line is free
	The hose is partially obstructed.	Free the obstruction from the hose.
The central power unit always remains activated even with the sockets closed	The microswitch or the electric contacts of one of the vacuum sockets is damaged.	Fix or replace the vacuum socket.
	The 12 volt electric line is damaged.	Please contact the technical support to verify the 12 volt electric line.
The display stays off	The main switch of the building is turned off	Turn the main switch back on
	The inverter is defective.	Call a specialised technician.

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Smart Vacuum Net

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The descriptions and illustrations may change. Aertecnica SpA reserves the right to modify the product and the related technical documentation without incurring any obligation to third parties.

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AERTECNICA S.p.A.

Via Cerchia di Sant'Egidio, 760 - 47521 Cesena (FC) - ITALY
Tel. +39 0547 637311 / Fax +39 0547 631388
info@aertecnica.com
www.aertecnica.com

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